Existing Conditions Report

A Better Way Forward

Improving Bus Travel in the World's Borough

MTA

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EXECUTIVE SUMMARY

This report on existing conditions is the first step in the bus network redesign process. The goal is to take a fresh look at the World's Borough, its people, its travel needs, and what can be done to improve bus travel to meet those needs. The Queens Bus Network has not substantially changed in decades. The continuing decline in bus ridership in Queens, and in New York City, requires a fresh look at how we provide bus service. Buses are slowing down, and bus reliability is suffering. Over that same period, our customers' needs have transformed dramatically. The bus network needs to evolve with them. We will build a new bus network to meet those needs.

This report represents a joint effort by MTA New York City Transit (NYCT) and MTA Bus Company. For everyone's sake, we will refer to the two organizations as "we" throughout the rest of this report.

A glossary of terms used in this report can be found in Appendix A.

KEY FINDINGS

Customer Priorities:

Increased Reliability
Customers want buses to be more reliable, less crowded, and less bunched.

Shorter Travel Times
Customers want shorter waits at stops, and to get to their destinations faster.

Better Connections
Customers want access to more of the city than they have now, especially better interborough connections and better access across long distances within the borough.

Easier to Use
Customers want the bus network to be easier to use.

Travel at a Glance:

- Population and employment density is concentrated along subway lines. The Queens Bus Network covers much of the rest of the borough, but travel times are often long since routes meander throughout various neighborhoods before reaching the subway.
- Only 20 of the 81 subway stations in or near Queens are accessible, according to the standards set in the Americans with Disabilities Act (ADA). The network redesign could be particularly important for those customers whose transit options are currently more limited.
- About 52 percent of Queens commuters travel via transit. According to Census ACS data, about 39 percent of Queens commuters identified rail modes as their primary means of transportation, while 11 percent identified bus as their primary means. About 38 percent of commuters drive to work.
- Most customers in Queens rely on a bus and a subway to get where they need to go.
- Most Queens residents have access to some level of bus service. Approximately 94.27 percent live within a quarter-mile walk (about 5 minutes) of a local, limited, SBS or express bus stop.

Limitations of the Existing System:

- Existing routes meander through much of the borough, since they were designed to get everyone to a subway station.
- The most productive routes are often short and mostly straight. They also tend to traverse through high-activity areas and make connections with subway lines and other key bus routes.
- Close bus stop-spacing hinders high-ridership routes by slowing down the bus at stops too often.
- Many bus routes try to serve several different purposes at once, serving none of the individual purposes well.
- Even with bus routes covering most of the borough, there are opportunities to improve system connectivity and provide easier access to places in the borough that customers want to go.

NEXT STEPS

Following this report, we will release a Draft Plan of the redesigned Queens Bus Network in November that reflects the findings of this report, information gathered from public input sessions (workshops, in-person surveys, and online survey), and additional data analyses. The Draft Plan will be developed with support from the New York City Department of Transportation (NYCDOT), an essential partner in serving the citizens of Queens. Additional public input sessions will be held following the release of the Draft Plan, from which feedback will inform the development of a Final Plan, to be released in April 2020.

The new draft bus network will be a holistic reimagining of the bus network, drawn from scratch. Any resemblance to the old network will be based on essential realities of travel in the World's Borough. High-ridership corridors will continue to be served by frequent bus service in the new plan, the same as they are in the current network.

1. THE BOROUGH OF QUEENS

- The People of Queens
- Downtowns and Other Centers of Activity
- Jobs, Businesses, Schools, and Destinations

THE BOROUGH OF QUEENS

The borough of Queens has an amazing array of people and destinations. Queens has one of the most diverse populations in the United States; it is the fourth most diverse urban center in the nation with about half of its residents born in other countries. The range of jobs and activities is incredible, extending from manufacturing and transportation to filmmaking and the preparation of Michelin-rated cuisine.

Queens is also the largest of New York City's five boroughs, with a landmass of 108.1 square miles, comparable to the city of Philadelphia (135 square miles). The next largest borough—Brooklyn—is 69.5 square miles.

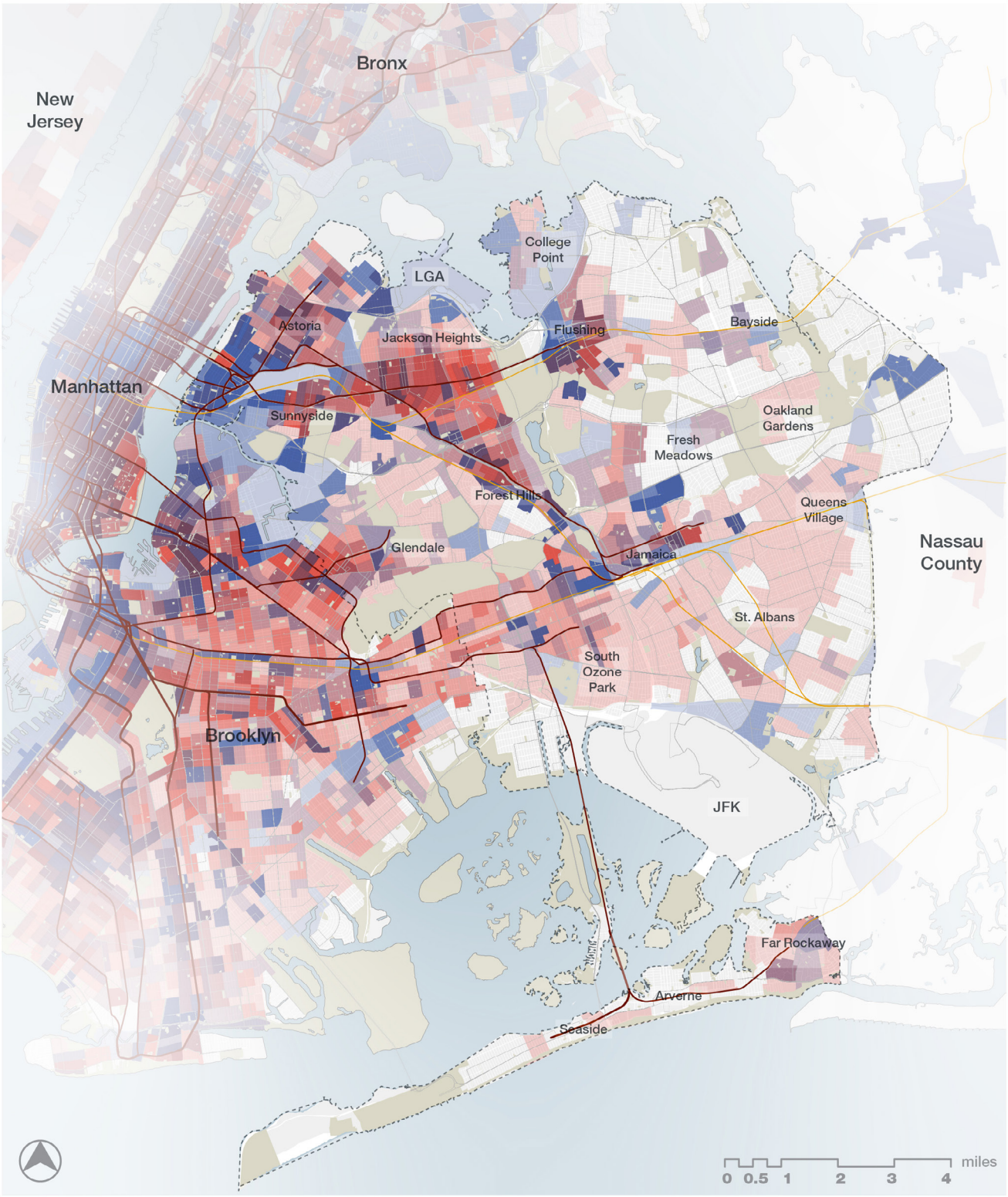
The borough has a large variety of activities and destinations, offering many opportunities for employment, education, shopping, leisure and outdoor activities at parks and beaches. The variety of destinations within a short distance of one another allows for a full life to be lived by residents of the World's Borough without having to leave home. Queens is home to both of New York City's airports, the New York Mets, and the US Open Tennis tournament. St. John's University and five CUNY campuses are among several higher educational institutions located in Queens.

Several large companies call Queens home, including internationally renowned piano manufacturer Steinway & Sons in Astoria, and JetBlue Airways in Long Island City. However, small businesses are the backbone of the Queens economy; approximately two-thirds of all businesses in Queens employee between one and four people.

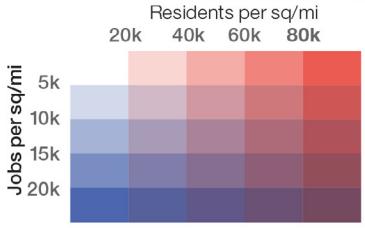
The types of neighborhoods found in Queens range from dense urban areas, such as Downtown Flushing, to less dense but still urbanized Bay Terrace, to areas such as Broad Channel and Neponsit, which feel almost a world apart from the typical image of New York City. Figure 1 shows the concentration of population and jobs throughout the borough.

[1]2017 American Community Survey 1-Year Estimates (https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?fpt=table)
[2]2006 Queens: Economic Development and the State of the Borough Economy https://www.osc.state.ny.us/osdc/rpt3-2007queens.pdf

Figure 1: Activity Index



Activity Index



- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census ACS, 2015 (5-year data); LEHD, 2015

THE PEOPLE OF QUEENS

Queens is New York's second-most populous borough, home to over 2,339,000 residents. Half the residents of Queens were born outside the US. Queens is New York's most diverse borough, with more than 61 percent of its residents being non-white. An ethnic breakdown of the borough and spatial distribution of population and ethnicity can be seen in Figure 55. Appendix B Figure 59 depicts the ethnic distribution of Queens.

Queens is home to some of the most culturally rich neighborhoods in New York and the United States. Roughly one-third of New York City's immigrant population lives in Queens.

Population in the borough grew from 2.20 million to 2.34 million between 2010 and 2017 – an increase of approximately 140,000 residents, or 6.4 percent . Development and redevelopment have increased throughout the borough, bringing commuters and visitors from throughout the region. Census data show that the number of jobs in Queens has increased from 495,922 in 2010, to 633,695 in 2015 – an increase of almost 140,000 jobs or 27.8 percent. Pockets of growth and decline are dispersed throughout the borough, with the largest growth taking place in Long Island City and South Jamaica. Meanwhile, Jackson Heights, eastern Flushing, and Queens Village have seen minimal declines in population. Figure 2 shows population changes between 2010 and 2017.

Women outnumber men in Queens by 71,000, at 51.5 percent of the borough's population. Senior citizens, teens and young adults (ages 10-24), and residents with disabilities live throughout the borough. Figure 60 shows concentrations of seniors in Astoria, Jackson Heights, Rego Park, and Flushing. Figure 61 shows that disabled residents are distributed somewhat similarly to the overall population distribution within the borough, emphasizing the importance of maintaining coverage throughout the borough despite redesigning the bus network. Residents aged 10 to 24 often depend on transit to get around, as most are not old enough to drive or have the means to own and maintain an automobile. Figure 63 shows the concentration of residents aged 10 to 24 as being somewhat reflective of overall population distribution.

[3]U.S. Census Bureau; American Community Survey, 2013-2017 5-Year Estimates, Foreign-born Population
[4]U.S. Census Bureau; American Community Survey, 2013-2017 5-Year Estimates

In addition to the demographic analysis presented above, we analyzed specific demographic data to examine how access to bus service affects different groups. For example, multiple bus routes and the 7 train serve Corona, a predominantly Hispanic neighborhood in Queens. See Figure 59.

The income level of a neighborhood is an important consideration as we design the new bus network. Lower-income neighborhoods are less likely to have high levels of automobile ownership, making access to service vital for the area to thrive. Figure 62 shows that some areas with lower median incomes, like Corona, are rich in transit. Other areas, such as Bellerose, have fewer options.

Figure 64 shows that the bus network as it exists today covers most of the borough. Maintaining coverage throughout the borough is essential, and our planners will also look at the possibility of expanding coverage to areas that might not currently have it, so long as there's an opportunity to provide coverage productively. Figure 65 shows the percentage of each neighborhood that commutes to work via bus, and Figure 66 shows the percentage of each neighborhood that commutes to work via transit. Note that the wording of the questions on the Census data used in these figures limits respondents to either choosing subway or bus, so people that use both often indicate subway as the more dominant mode. Therefore, the bus map is generally better understood as bus-only commuters.

Figure 2: Population Change, 2010-2017

Population Change 2010-2017

gain
- 0 - 9%
- 10 - 19%
- 20 - 29%
- 30 - 39%
- 40 - 680%

loss
- 0 - 9%
- 10 - 19%
- 20 - 100%

- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

DOWNTOWNS AND OTHER CENTERS OF ACTIVITY

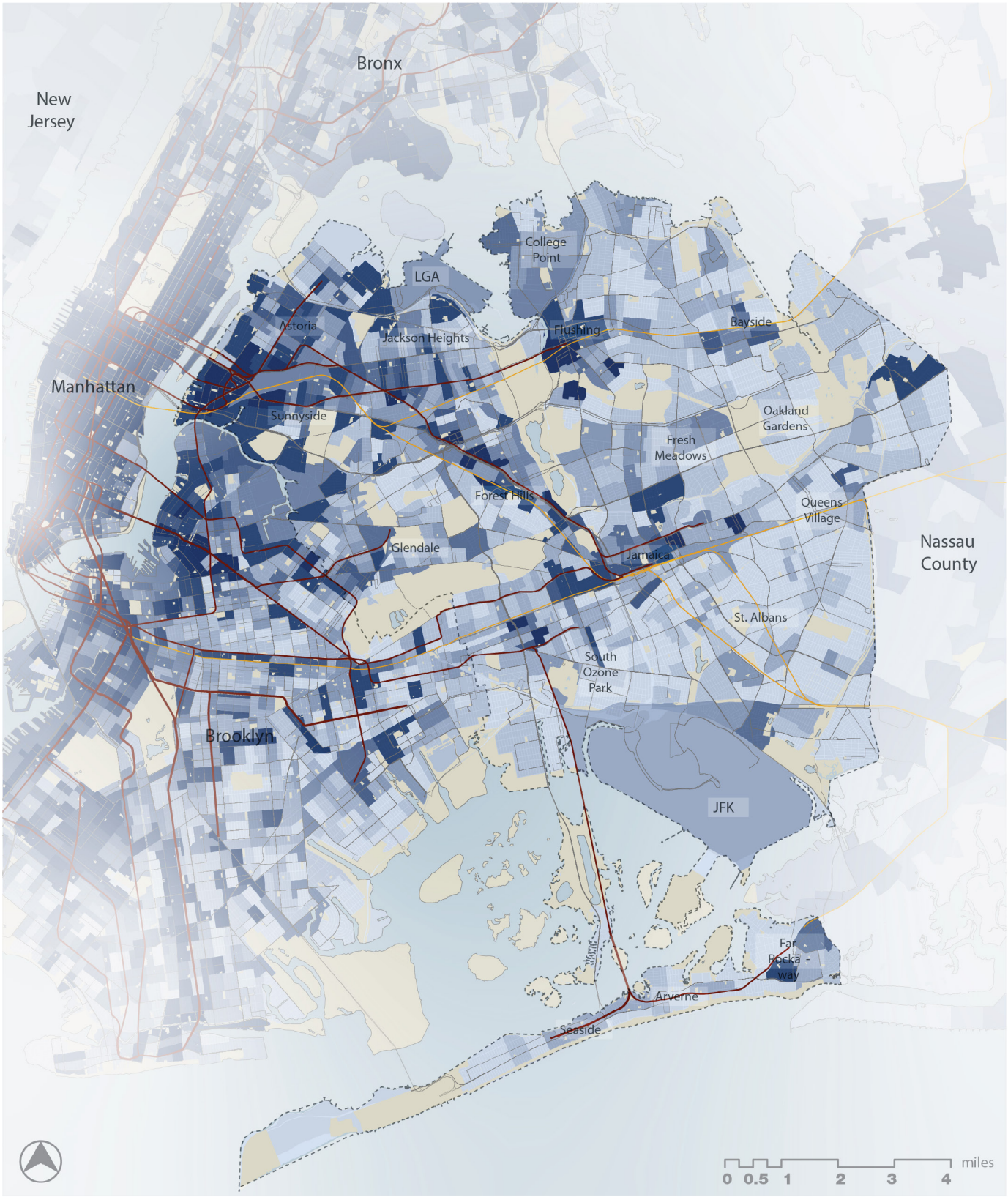
Queens has several downtowns and neighborhoods with a mix of uses at high densities, including jobs and residences packed together. Figure 3 shows the concentrations of jobs. Jamaica, Flushing, and Long Island City comprise 30 percent of the borough's population. These three areas have a combined population of 693,535—comparable to the population of Washington, D.C. Figure 4 shows the land use patterns in Queens.

Much of the continuing development in Queens, and much of the future population growth, will occur in specific pockets of development. Additional towers have yet to be built in Hunters Point, at the southwestern tip of Long Island City. Growth throughout Long Island City will continue to include mixed-use buildings, with high-density residential maintaining the concentration of population. The Hallets Point development on the East River in Astoria includes new buildings and infill buildings within the Astoria Houses NYCHA (New York City Housing Authority) property. Willets Point redevelopment will include residential towers alongside offices and hotels, connected to LaGuardia Airport by the new AirTrain. Flushing and Jamaica continue to redevelop with large buildings going up in each, increasing the populations of these major downtowns. The Sunnyside Yard Master Plan is in development, and will lead to additional changes slowly over the course of the next several decades. Outside of these major areas, much of the borough is already developedand not as likely to see major increases in population in the coming years.

Demographic and Development Changes in Queens

Increased redevelopment is most obvious in Long Island City, where several companies have relocated to take advantage of lower overhead costs when compared to Manhattan and the Brooklyn waterfront. Downtown Jamaica continues to grow as an important employment and activity center. The area boasts frequent connections to John F. Kennedy (JFK) Airport, Manhattan, Brooklyn, and Long Island via the Long Island Rail Road, AirTrain, and four subway lines.

Figure 3: Queens Employment Density



Employment Density jobs per square mile

- < 2,000
- 2,001-4,000
- 4,001-6,000
- 6,001-8,000
- 8,001-10,000
- 10,001-12,000
- 12,001-14,000
- 14,001-30,000
- 30,001-500,000
- 500,001-1,023,015

- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census LEHD, 2015

Figure 4: Land Use

Land Use

- low density residential
- medium density residential
- high density residential
- commerical
- mixed use
- industrial
- transportation/utilities
- open space
- wetlands/wooded
- institutional
- bus routes
- subways
- LIRR
- waterbodies, rivers, and streams

Source: New York City, MapPLUTO 18v2.1

JOBS, BUSINESSES, SCHOOLS, AND DESTINATIONS IN QUEENS

Overall Economic Conditions in Queens

Business growth in Queens—22 percent since 2009—exceeds the citywide growth rate of 17 percent over the same period. As of 2017, Queens was home to an estimated 52,100 businesses, two-thirds of which had fewer than five employees, indicating that the Queens economy is built on small enterprise. Flushing has the highest number of businesses in the borough and is experiencing the greatest increase in businesses.

Average salaries in Queens reached $48,400 in 2016, the highest average salary within the City outside of Manhattan.[3] The largest employers by sector are health care, transportation, and retail trade.

LaGuardia and JFK airports employ over 49,000 people and contributed $64.4 billion in regional economic activity to the New York/New Jersey region in 2017.[5]

Employment Change

Between 2010 and 2015, Queens experienced the second-largest spike in employment growth at nearly 138,000, or 28 percent (see Table 1). The largest increases in employment occurred near Sunnyside and Forest Hills.

Table 1: Employment Change

Borough	2010	2015	Absolute	Percentage
Queens	495,922	633,695	137,773	28%
Manhattan	2,128,612	2,408,160	279,548	13%
Brooklyn	748,774	721,639	(27,135)	-4%
Bronx	236,581	308,503	71,922	30%
Staten Island	88,766	100,762	11,996	14%

Source: LEHD (LODES) 2010-2015

[5] Office of the New York State Comptroller, An Economic Snapshot of Queens, https://www.osc.state.ny.us/osdc/rpt1-2019.pdf, accessed on July 30, 2019

Employment Density

Employment density in Queens is concentrated in the Astoria and Sunnyside neighborhoods. Concentrated levels of employment density exist largely along the Flushing and Queens Boulevard subway lines through Astoria and Sunnyside. Comparable levels of density also exist along the Jamaica Avenue Line. Figure 3 shows the key employment clusters throughout the borough.

2. TRAVELING AROUND QUEENS

- Subways
- Long Island Rail Road
- Access-A-Ride
- Taxis, Vans and Transportation Network Companies
- JFK and LGA
- Travel within Borough
- Connections to Neighboring Areas

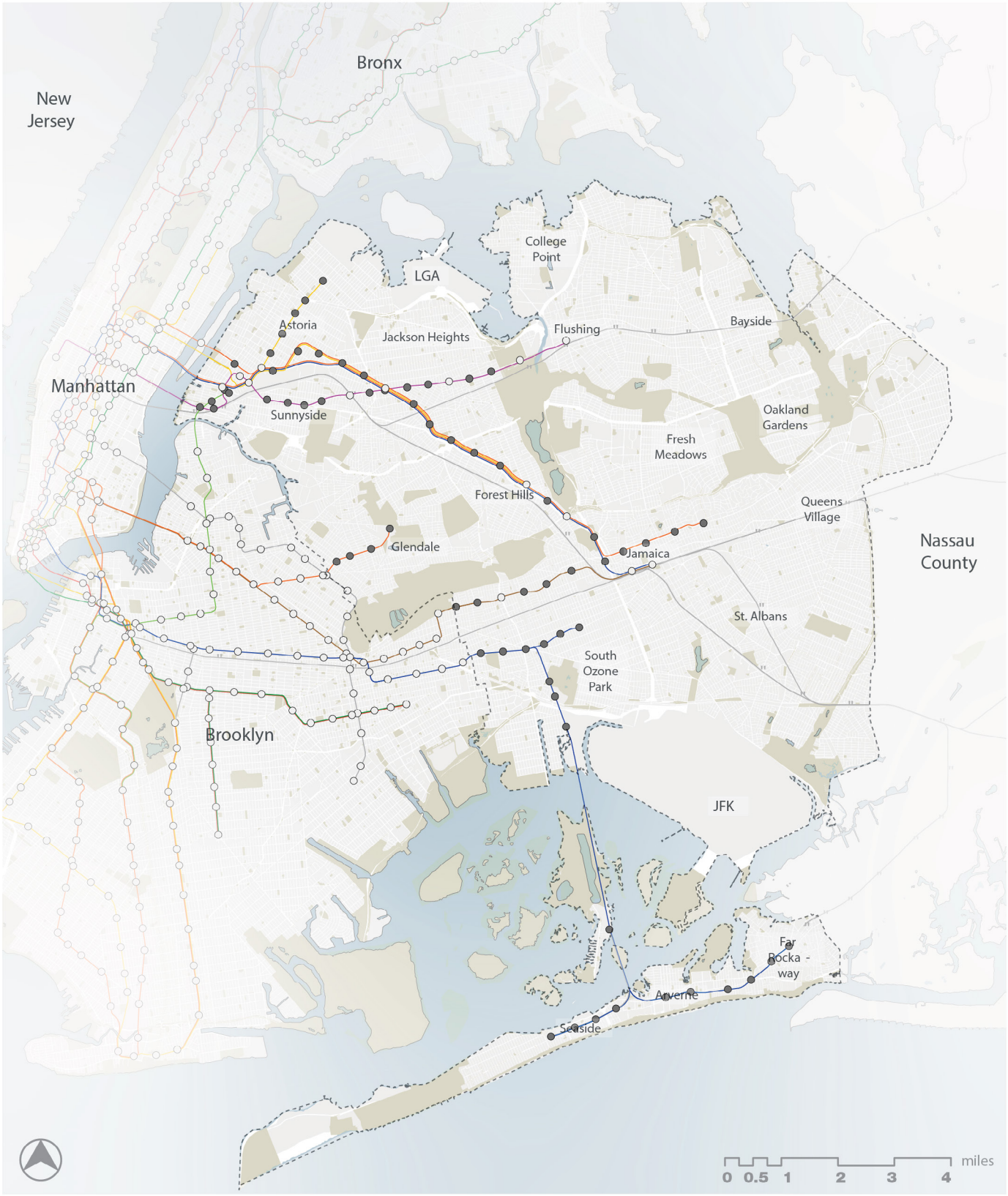
TRAVELING AROUND QUEENS

The robust Queens public transportation network includes subways, Long Island Rail Road commuter rail, ferries, taxis, Transportation Network Companies (TNCs) like Uber and Lyft, and buses. The subways and Long Island Rail Road (Figure 5) are heavily oriented toward feeding residents into Manhattan's central business district below 60th Street, the region's most densely-developed and important employment center. The subways and Long Island Rail Road also provide connections to the downtown areas of Brooklyn and Long Island City. Buses cross the entire borough.

Figure 6 shows a variety of destinations within Queens, including two major airports, various colleges and universities, and cultural institutions.

There are many options for traveling within and out of the borough to nearby destinations or across the world. While much of Queens is crisscrossed with infrastructure, creating choke points and funneling many people through a few bridges and tunnels, this infrastructure also provides access across the city and ties together all the different neighborhoods of the city.

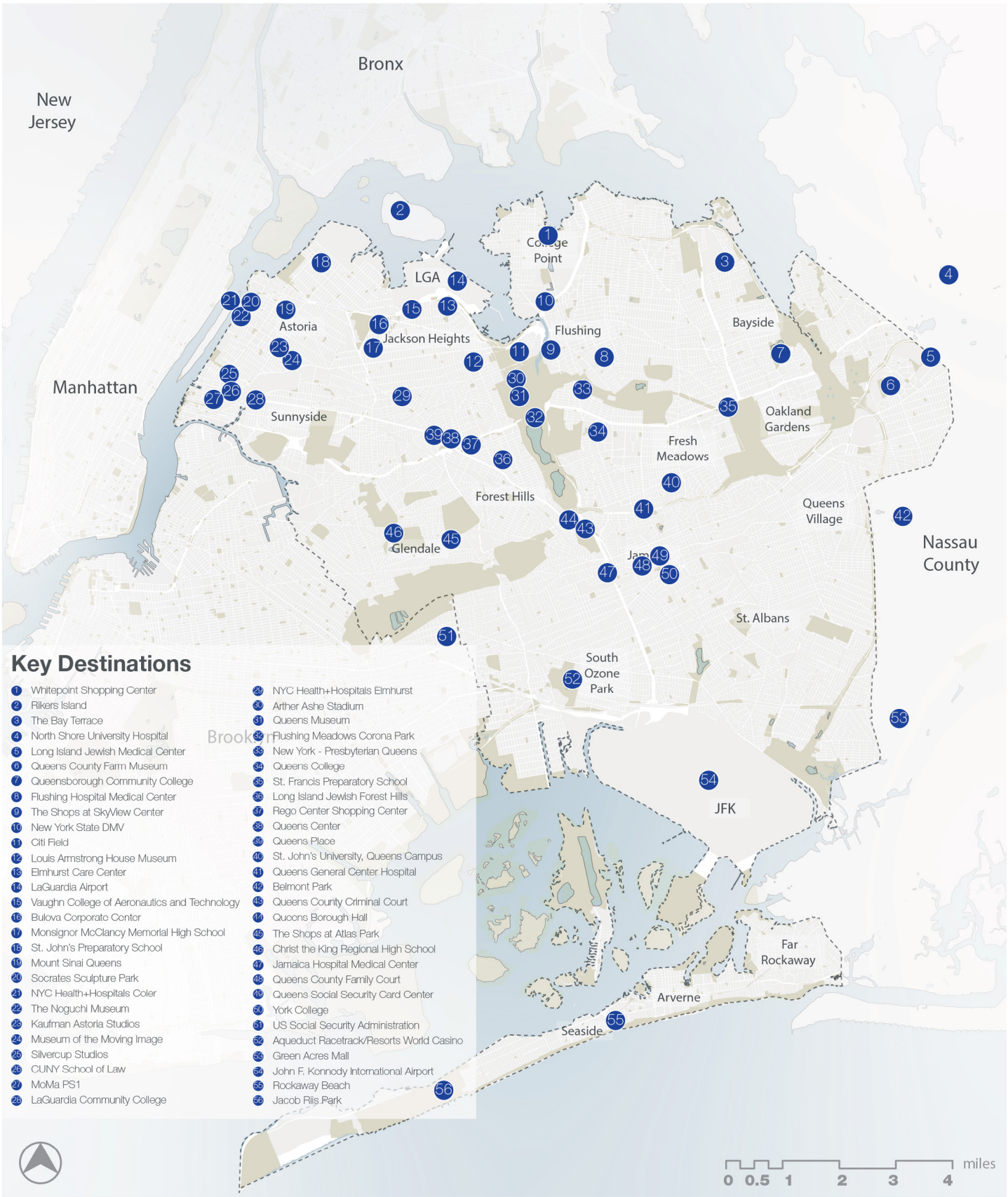
Figure 5: Queens Rail Transit



Queens Rail Network

- subways & local stops
- subways & express stops
- LIRR & stations
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Figure 6: Key Destinations in Queens



Key Destinations

parks, cemeteries, and open space

waterbodies, rivers, and streams

SUBWAYS

Queens is served by eleven subway lines: the Queens Boulevard Line E F M R, the Flushing Line 7, the Astoria Line N W, the Jamaica Avenue Line J Z , and branches of the A G. Both the Queens Boulevard and Flushing Lines operate above capacity during peak hours. The Astoria Line has seen significant increases in ridership over recent years.

The A train has three branches in Queens—Liberty Avenue, Far Rockaway and Rockaway Park — and serves JFK Airport (via the AirTrain), Downtown Brooklyn, and virtually all of Manhattan. The G train from Brooklyn serves two stations, including its terminus, in Long Island City. The M train has the unique characteristic of having both of its terminals in Queens, serving several stations in Ridgewood and Middle Village on one end, and Forest Hills, Rego Park, Elmhurst, and Long Island City on the other. The Jamaica Avenue Line links Jamaica with Lower Manhattan.

Subway Deserts

Large parts of the borough, including the entire eastern half outside of Flushing and Jamaica, lack subways. These subway deserts constitute a challenge for travel, and lead many residents in these areas to either submit to long commutes or buy an automobile. Households that can rely on public transportation and other methods to get around beyond owning a personal automobile are concentrated around the subways. The number of households with vehicles increases significantly east of Jamaica and Flushing, as seen in Figure 7.

ADA Accessibility

Accessible transit service is important to residents throughout the borough of Queens, and buses are a key element of this service where subway accessibility – and subway service in general – are lacking. There are high-density areas of disabled residents along the N W R and 7 E F M subway lines in Astoria and Jackson Heights, in the central and Rockaway parts of Queens along the J Z, and in Jamaica and the Rockaways. These are shown in Figure 58.

Areas of moderate density of disabled residents are present in areas away from subway lines and in several neighborhoods in the eastern region of the borough: Glendale, College Point, Bayside, Fresh Meadows, Oakland Garden, Queens Village, and St. Albans.

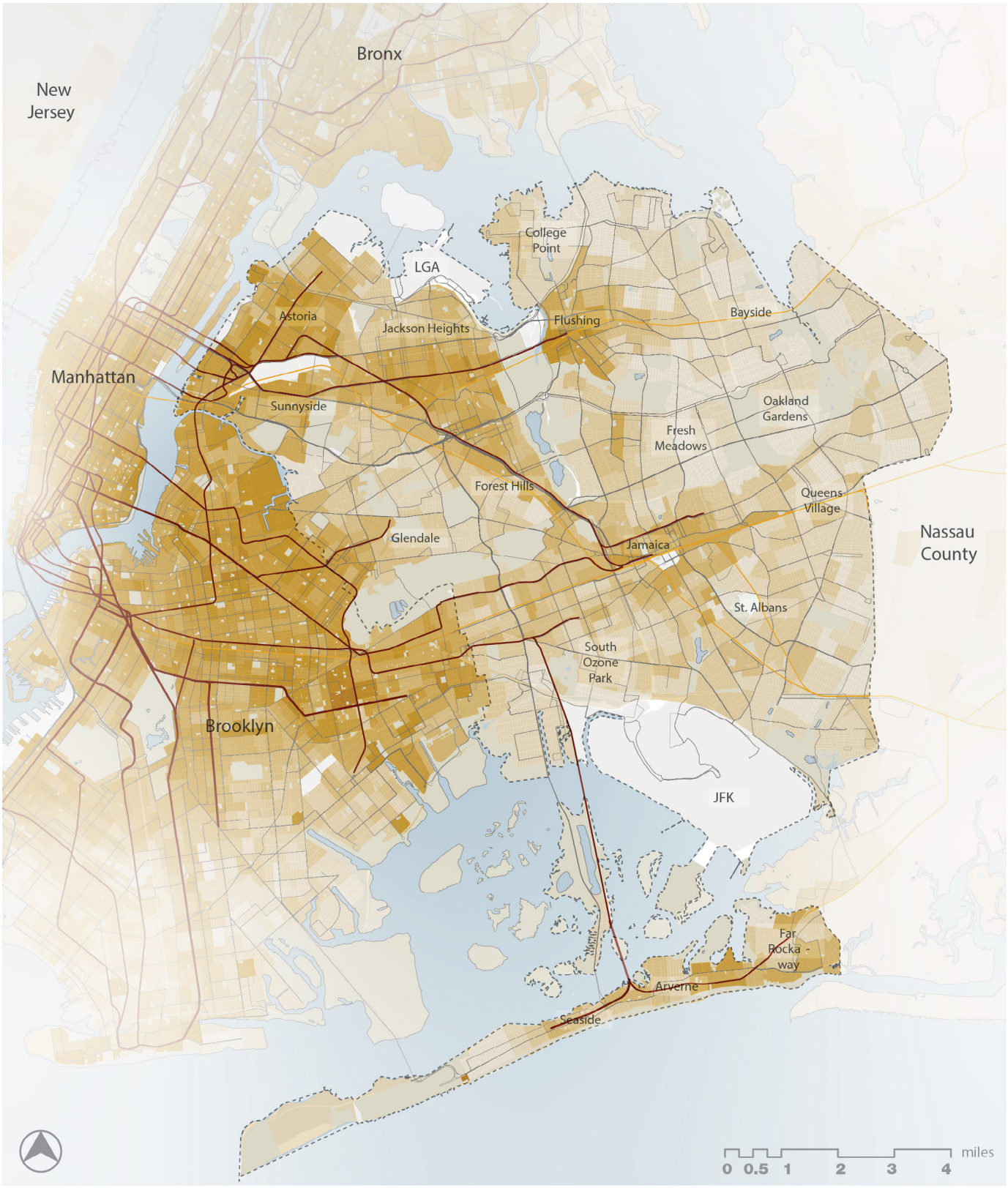
Twenty of the 81 subway stations in or touching Queens are accessible according to standards set in the Americans with Disabilities Act (ADA), limiting transit options for those with mobility-related disabilities to get around Queens smoothly. Most of the current accessible subway stations in Queens have elevators, and some are located at street level, such as the Middle Village-Metropolitan Avenue stop on the M line. Figure 9 shows the stations within Queens that are currently accessible in both directions.

There are funded plans to make more than a dozen additional stations ADA accessible as part of the 2015 – 2019 capital plan, including three stations in Queens: Astoria Boulevard station N W; Woodhaven Boulevard (J Z) station; and Court Square (G train only). We're currently working to make stations accessible at a faster rate than ever before, and anticipate at least five additional station accessibility projects in Queens in the upcoming 2020-2024 capital plan. Still, it'll be at least a decade before all stations are accessible.

The Queens Bus Network helps fill in the transit service gaps left by subway stations that are not accessible, both by supplementing service along Queens corridors and by connecting customers to accessible subway stations. Importantly, the bus fleet is well-equipped to serve customers with disabilities, as 100 percent of buses are compliant with ADA accessibility standards.

The pedestrian infrastructure—sidewalks, street crossings, and grades—is another element connected to bus service that can impact customers with disabilities. Sidewalks that have breaks or do not extend all the way to the curb are especially challenging for customers who use mobility devices trying to reach bus stops. In support of expanding accessibility, New York City Department of Transportation (NYCDOT) will conduct a citywide survey of bus stop accessibility, so gaps can be addressed and the accessibility of the bus network can be maximized.

Figure 7: Zero-Vehicle Households



Zero-Vehicle Households percent of households without a car

- <10%
- 10% - 19%
- 20% - 29%
- 30% - 39%
- 40% - 49%
- 50% - 59%
- 60% - 69%
- 70% - 79%
- 80% - 89%
- 90% - 100%

- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

Figure 8: Accessible Stations

Accessible Subway Stations

- accessible subway stations
- station accessibility modifications underway (as of July 2018)
- non-accessible stations

- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

LONG ISLAND RAIL ROAD

Long Island Rail Road (LIRR) primarily serves suburban Nassau and Suffolk Counties with terminals at Penn Station, Atlantic Terminal in Downtown Brooklyn, and Hunterspoint Avenue in Long Island City, as well as a major transfer hub in Jamaica. A connection to Grand Central Terminal, known as East Side Access, is scheduled to open in 2022.

There are several LIRR stations throughout Queens, particularly in the northeast and southeastern quadrants of the borough. Service at many of these stations is infrequent, and fares are higher than subway and bus fares. Despite these shortcomings, LIRR offers fast peak-hour/peak-direction service to and from the Manhattan Central Business District (CBD). Many Queens customers also ride the LIRR east in the morning to go to work or school on Long Island.

Along Long Island Rail Road's Main Line (the trunk that serves the multiple branches as the line proceeds east), there are stations at Bellerose (physically in Nassau County), Queens Village, Hollis, Jamaica, Kew Gardens, Forest Hills, and Woodside. Along the Atlantic and Montauk Branches, there are stations at St. Albans, Locust Manor, Laurelton, and Rosedale. The Far Rockaway Branch serves stations in Nassau County, then re-enters Queens, terminating at Far Rockaway. This particular station is used by relatively few customers. The Port Washington Branch serves multiple stations in northeast Queens, including Mets-Willets Point, Flushing Main Street, Murray Hill, Broadway, Auburndale, Bayside, Douglaston,and Little Neck. In addition, Belmont Park, a Special Events station that is served by a track spur off the Main Line, has train service for horse racing events only.

ACCESS-A-RIDE

Access-A-Ride Paratransit Service provides public transportation for eligible customers with disabilities or health conditions that prevent them from using the public buses and subways for some or all their trips. Access-A-Ride operates 24 hours a day, 7 days a week, 365 days a year. Eligible customers can use the service throughout all of New York City, and within a three-quarter-of-a-mile corridor beyond fixed-route bus and subway service across the NYC border into nearby areas of Nassau and Westchester counties.

TAXIS, VANS, & TRANSPORTATION NETWORK COMPANIES (TNCs)

New York City "Yellow" taxis do not often serve much of Queens, except to bring customers to or from the two airports. Queens is more effectively served by the recent addition of city-regulated "Green" outer-borough taxis. There remain a multiplicity of for-hire taxis, Uber and Lyft vehicles, and "black cars" that serve the borough as well. In certain corridors, particularly south and east of Jamaica, there are shared-ride van services that are popular for residents heading to and from subway terminals.

Popular origins and destinations in Queens include Long Island City, Queens Plaza, LaGuardia Airport, JFK Airport, Jackson Heights, Elmhurst, and Sunnyside. Less popular but still significant origins and destinations include Forest Hills, Flushing, and Jamaica. Figure 83 in Appendix E depicts TNC origins and destination flows for trips starting and ending in Queens.

Transportation Network Companies (TNCs)

New York has seen substantial growth in both the number of TNC vehicles and passengers in a short amount of time. From 2010 to 2016, the number of for-hire vehicle registrations doubled, reaching 85,000 vehicles.[6] This has contributed to an increase in total mileage driven in New York, jumping up by 600 million miles between 2013 to 2016. Over that same period, TNCs accounted for 19 percent of the total miles driven in NYC in a given year, up from 14 percent. TNC use has grown even more dramatically than vehicle registrations. Between 2013 and 2016, TNC ridership doubled annually, with 133 million passengers in 2016.[6] Many of those trips likely replaced rides on transit. A NYCDOT mobility survey found that 50 percent of respondents used for-hire vehicles to complete trips that could have been made using public transit.[7]

[6] New York City Mobility Report, June 2018, New York City Department of Transportation
[7] Unsustainable? The Growth of App-Based Ride Services and Traffic, Travel and the Future of New York City, February 27, 2017, Schaller Consulting

Commuter Vans

Commuter vans are 9-20 passenger vans and minibuses that can be licensed by the Taxi and Limousine Commission (TLC) to operate in specific territories. Licensed commuter vans are not permitted to duplicate MTA bus routes, stop at bus stops or accept street-hail passengers. Most commuter vans operating in the borough do so outside of the regulations and without a license. Many vans focus their operations along corridors also served by buses and often pick up passengers at bus stops.

In 2017, NYCDOT conducted a study of commuter van operations around the City, including those that serve parts of Queens. The primary territories are southeast Queens, the Rockaways, Flushing, and Elmhurst. The services in Far Rockaway and southeast Queens typically run to and from Jamaica and downtown Far Rockaway, while the services in Elmhurst and Flushing connect to Chinatown (Manhattan) and Sunset Park (Brooklyn). Nearly 85 percent of commuter vans in Queens operate without an active TLC license.

The commuter vans operate their service differently depending on the geography they are serving. In southeast Queens and Far Rockaway, vans travel to and from Jamaica Center along the Guy R. Brewer Boulevard & 147th Avenue corridor, the Merrick Boulevard, Liberty Avenue, and Linden Boulevard corridors, and within the Rockaways along Beach Channel Drive. Commuter vans on these corridors connect residential neighborhoods of southeast Queens and transit hubs in Downtown Jamaica. From the Jamaica Center hub, van operators typically fill their vehicles before beginning their trips. Return trips do not wait to fill vans due to dispersed ridership as the routes fan out southeast of Jamaica.

The Rockaways are served by two routes, one connecting Far Rockaway and Jamaica Center, and the other connecting Far Rockaway to Rockaway Beach along Beach Channel Drive near Beach 88th Street.

In Flushing and Elmhurst, the commuter van services are targeted to the local Chinese communities. The vans operate as express services, loading the vehicles at either end of the trip and then traveling direct to their destination with no interim stops.

OTHER LOCAL TRANSPORTATION OPTIONS

Ferries

Ferry service recently expanded throughout the city. Queens has ferry landings at three locations on the East River: Hunters Point South, Long Island City, and Astoria/Hallets Point. There is also a ferry from Rockaway Park to Manhattan. These ferries do not have the capacity to carry large groups across long distances in a timely manner, but they are popular with local residents. Unlike the bus network, ferry terminals are not centrally located relative to most popular destinations and thus require additional connections.

Citi Bike

Citi Bike is a bikeshare program run by Lyft for NYCDOT. Citi Bikes are available at approximately 80 stations throughout Long Island City and Astoria, with a few in Sunnyside. In July 2019, it was announced that new stations would soon arrive in Ridgewood. Additional stations will be installed during the next phase of expansion, which will take place from 2020 to 2023. Those new stations will serve Sunnyside, Maspeth, Elmhurst, Jackson Heights, and Corona.

Lime Bike

Lime Bike is a dockless bikeshare system currently running a pilot program in the central Rockaways. NYCDOT has not made any announcements regarding the continuation of the program or any expansion throughout the rest of the borough.

JFK AND LaGuardia AIRPORTS

Most air travel in the New York City region occurs in Queens at JFK and LaGuardia airports. Many employees work at these two job centers, in addition to the daily travelers entering Queens specifically for air travel at these locations. Businesses cluster around the airports, creating additional travel in the area. The airports are undergoing renovations worth billions of dollars to ensure New York City's place as a premier destination for world travelers and businesses. These renovations are causing some headaches as construction creates congestion that makes accessing the airports difficult. However, the benefit of having world-class airports in the borough vastly outweighs the hassle created by the ongoing construction.

AirTrain

The JFK AirTrain connects the airport with the A train at Howard Beach and with the E J Z and LIRR at Jamaica Station. The proposed LaGuardia AirTrain, which will provide connections with the LIRR and 7 subway at Mets/Willets Point, is currently in the planning phase.

TRAVEL WITHIN THE BOROUGH

The borough's major east-west arterial corridors include Northern Boulevard, Hillside and Jamaica Avenues, and Union Turnpike, Other east-west corridors include Horace Harding Expressway, Queens Boulevard, and Merrick Boulevard.

Figure 12 shows the borough's major bus corridors. In western Queens, the Woodhaven/Cross Bay Boulevard corridor connects the neighborhoods of Rockaway Park and Rego Park. Service north of Queens Boulevard is more dispersed due to the existing street network. To the east, taken together, Merrick Boulevard and Guy R. Brewer Boulevard south of Jamaica, and Queens Boulevard north of Jamaica, form a diagonal corridor across the borough from Long Island City and midtown Manhattan to Springfield Gardens and Rosedale.

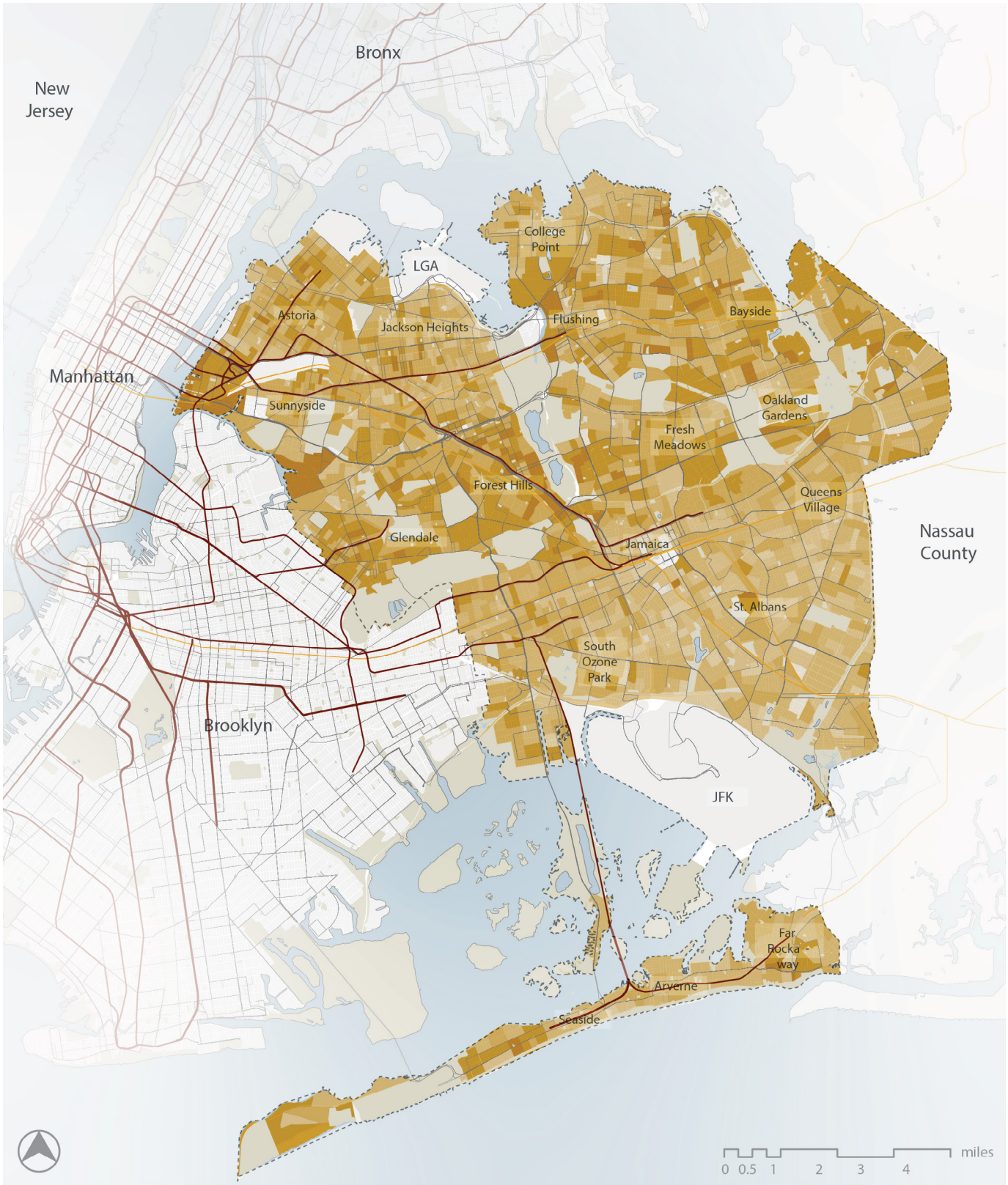
In eastern Queens, there are a few thoroughfares which offer continuous north-south connections across Hillside Avenue, including Francis Lewis and Springfield Boulevards. Most major north-south streets terminate at Hillside Avenue or Jamaica Avenue.

CONNECTIONS TO NEIGHBORING AREAS

Jurisdictional boundaries established centuries ago are less relevant in an age when development brings residents and workers across long distances every day. Travel between Brooklyn and Queens is heavy for residents of both boroughs, as the border winds through neighborhoods that blur the boundaries. Travel to Manhattan and the Bronx by various bridges creates connections to many more jobs and destinations than could otherwise be accommodated in one single borough. Queens and Nassau County share a border crossed by innumerable roadways, to facilitate daily shopping trips and errands, as well as workers' commutes. Trips across Queens itself can be long, since the borough is so large geographically.

After World War II, many of the newer residents in recently-developed outer areas were white-collar workers heading into Manhattan as part of the peak commuting crowd. Over the last several decades, commuting trips made for 9-5 jobs decreased as a percentage of total trips. Some areas of Queens include many trips made outside the peak commuting times, especially for residents of Jamaica, Hollis, and surrounding neighborhoods. Figure 9 shows the percentage of each borough's residents commuting during peak hours.

Figure 9: Peak Commuters



Residents Commuting During Peak Hours % of residents commuting to work between 6AM and 10AM

- 21% - 29%
- 30% - 39%
- 40% - 49%
- 50% - 59%
- 60% - 69%
- 70% - 79%
- 80% - 89%
- 90% +
- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

3. BUSES IN QUEENS

- Improving Transportation in Queens
- History
- For Whom the Buses Travel
- Reliability: Buses Arrive Late
- Speed: Buses Are Slow
- Connectivity: Buses Don’t Take You Everywhere You Want to Go
- Ease of Use

IMPROVING TRANSPORTATION IN QUEENS

Travel throughout Queens is available via several different modes, including automobiles, subways, Long Island Rail Road, ferries, Citi Bike, taxis, commuter vans, black cars, Transportation Network Companies, Access-A-Ride, and our bus network, as well as Nassau Inter-County Express (NICE) Bus. There are severe limitations to how much each mode can be improved as part of our effort to enhance public transit in and around Queens.

Bus service is the only transportation mode that can mass-produce access affordably to everyone in a timely manner. Improving transportation in Queens begins with a new, better bus network.

Expanding subways and Long Island Rail Road with new track segments as part of new lines is expensive and can take decades to complete.

The airports are being renovated and redeveloped, but only serve people arriving to or departing from Queens.

Historically, yellow cabs did not provide mass-produced access in the outer boroughs. Understanding this, the City of New York created Green Cabs, which provide access to more people, but still not for everyone (and at a higher cost to customers). Black cars similarly produce access, but not affordably and not in mass quantities. Uber, Lyft, and other TNCs can mass-produce access, but it's not affordable for many, and limited for people in wheelchairs and people with children.

Individual automobile ownership is available for many, but affordable for few. Access is limited by congestion and the availability of parking at either end of the trip.

Commuter vans can mass-produce affordable access to people in areas with high ridership (usually already served by buses), but not to everyone (persons in wheelchairs, children), and specifically not in areas that need coverage.

Bikeshare can mass-produce access somewhat affordably (public housing residents receive discounts) to people in areas of high ridership, but only for able-bodied people, and specifically not in the areas that need coverage.

Access-a-Ride can produce affordable access, but only for people who qualify.

HISTORY

Geographically, Queens is city's the largest borough. Of the four boroughs with subway service, Queens has the smallest percentage of land area within walking distance of a subway line. Some of the subway lines serving Queens were among the last to be built, and subway service only covers portions of the western half of the borough. Decades ago, the Long Island Rail Road operated service on many more lines than it does today, and served more stations in Queens. Over time, Long Island Rail Road discontinued service to Whitestone and the Rockaways. New York City Transit began operating A subway line service on the southern portion of the Rockaway Beach Branch in 1955.. With relatively poor rail coverage, much of Queens was built around its surface transportation network, especially after World War II.

Many trolley lines operated in the borough in the 1930s, though the Queens trolley network was never as dense as Brooklyn's. Most trolley lines connected Queens to Brooklyn, though some connected Queens to Nassau County. Trolley lines operated on streets such as:

- Jamaica Avenue
- 164th Street
- Guy R. Brewer Boulevard
- Myrtle Avenue
- Metropolitan Avenue
- Vernon Boulevard
- Jackson Avenue
- Steinway Street
- Main Street
- Northern Boulevard
- Queens Boulevard
- Grand Street
- Junction Boulevard
- Linden Place

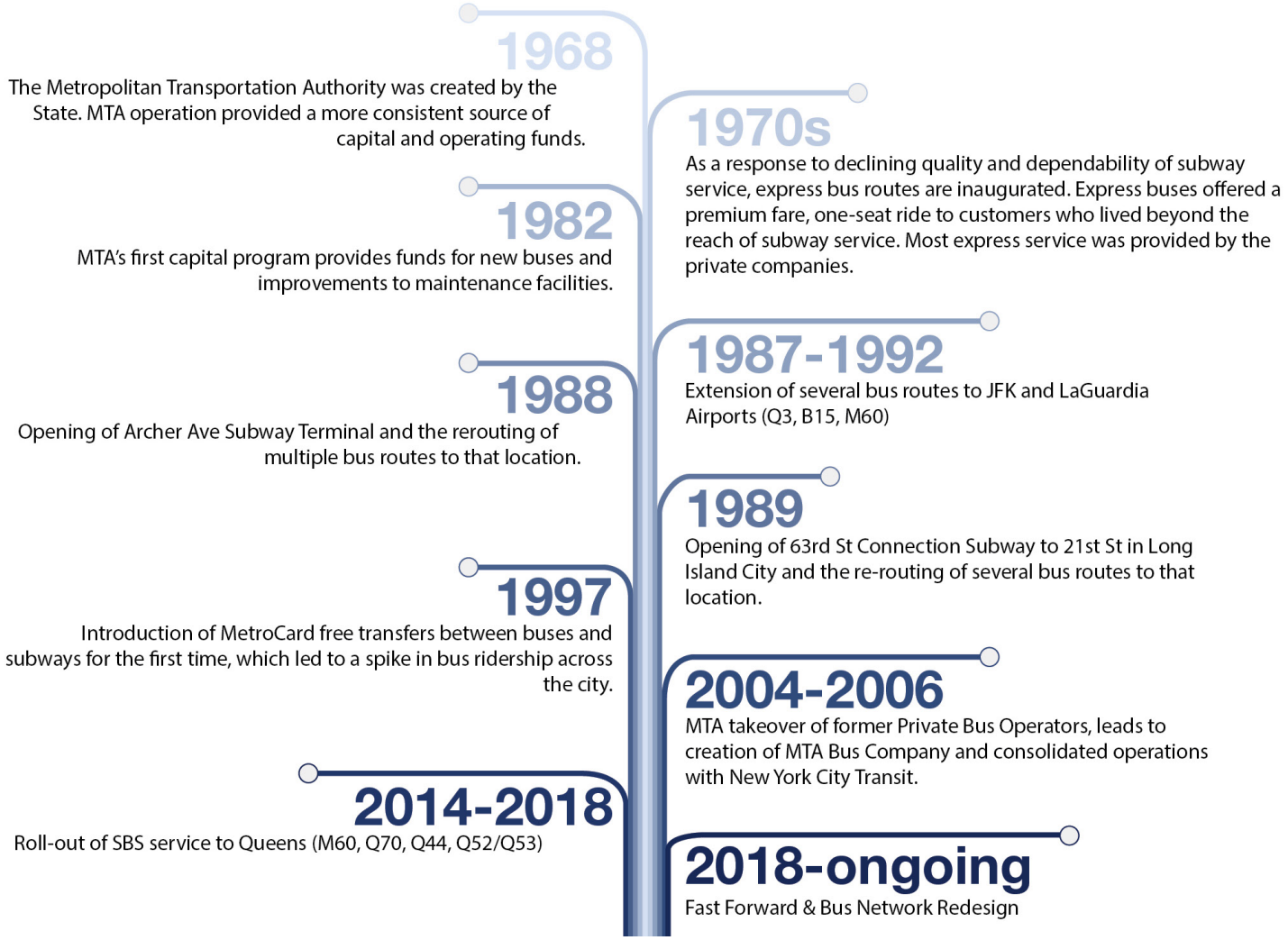
Bus service began in Queens in the 1910s, at first accompanying trolley routes, then later replacing them. Numerous competing private companies operated bus service, and there were multiple rounds of bus service consolidations. In 1947, New York City took over the routes formerly operated by the North Shore Bus Company. These routes form the core of what is the current New York City Transit Queens bus network.

By 1955, all trolley lines were replaced by buses. The bus network was focused on Flushing, Jamaica, and Long Island City, with connections to subway stations throughout the borough. In the meantime, companies such as Queens Surface, Green Bus Lines, Jamaica Buses, Triboro Coach, and Steinway Transit continued to operate for many more years. See Figure 11 for the Queens bus network as it existed in 1981.

Figure 10: 1981 Queens Bus Network

Various noteworthy improvements that happened over succeeding decades are represented in Figure 11.

Figure 11: Queens Bus Transit History



FOR WHOM THE BUSES TRAVEL

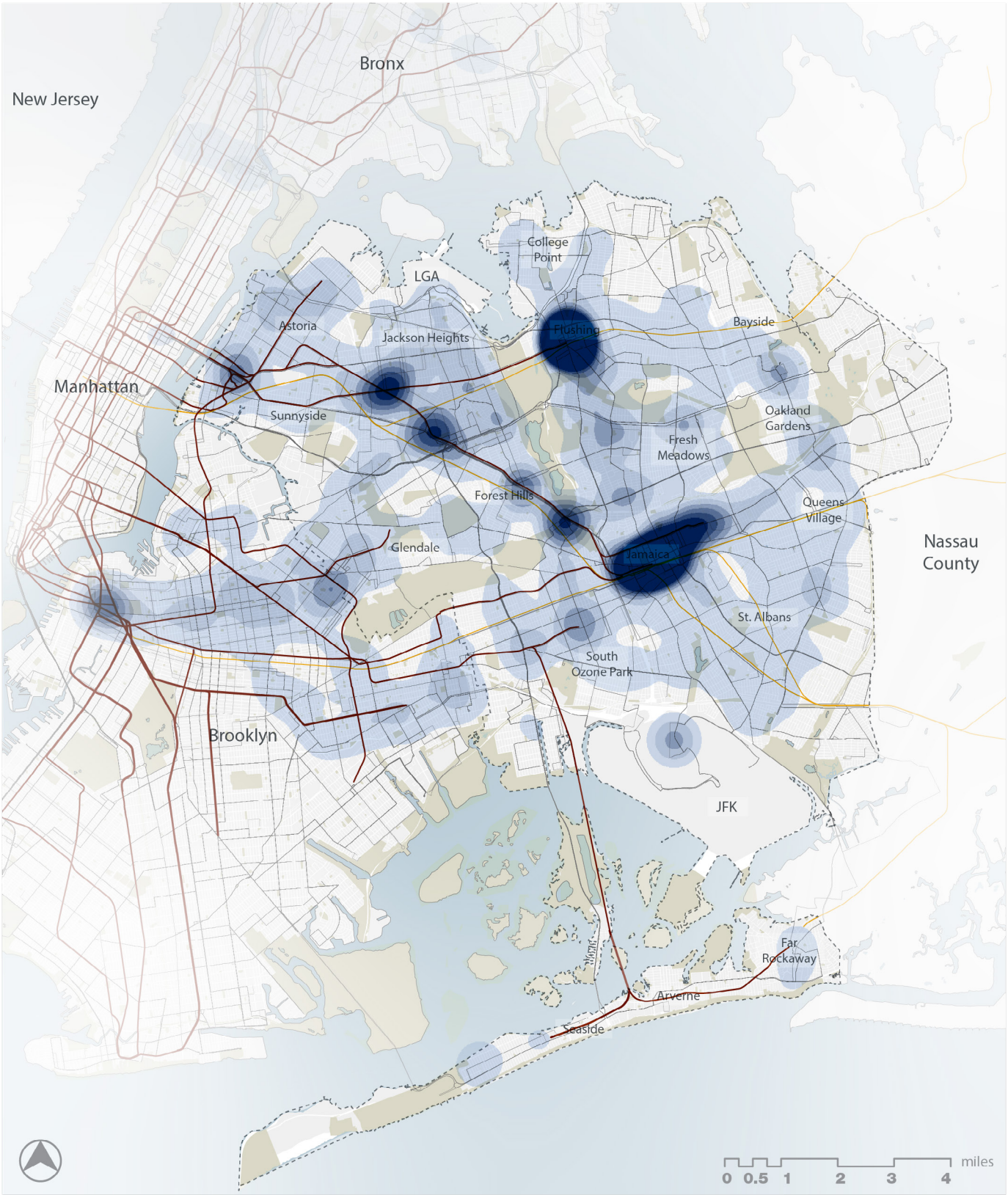
Ridership

The bus network serving Queens currently extends across Queens and into Brooklyn, the Bronx, and Manhattan. In total, these routes carry over 700,000 riders on an average weekday. Ridership is highly concentrated in several specific areas, including Downtown Flushing, Downtown Jamaica, Jackson Heights, and the Queens Boulevard corridor. As seen in Figure 12, some areas have a fair amount of ridership over a large area, such as Jackson Heights, East Elmhurst, and Corona. Other sections of Queens, especially areas further east which are filled with large parks and highways bisecting several neighborhoods, have little ridership.

Figure 13 shows the various customer flows throughout the day. Some areas receive a disproportionate amount of ridership—most often major subway stations and the surrounding areas that require access. Flushing and Jamaica are the largest bus-to-subway hubs, but the Jackson Heights station with five subway lines is also popular. The Kew Gardens subway station at Queens Boulevard, which creates a connection for residents of Richmond Hill and South Ozone Park, is also popular. Riders mainly rely on buses along Lefferts Boulevard to reach these subway stations.

About 52 percent of Queens residents commute by transit. According to Census ACS data, about 39 percent of Queens residents identified rail modes as their primary means of transportation, while 11 percent identified buses as their primary means. About 38 percent of residents drive to work. Note that the wording of the questions on the Census requires respondents to choose either subway or bus, but not both. People who use both often indicate subway as the more dominant mode. Therefore, the percentage of respondents who identify bus as their primary means is better understood as bus-only commuters.

Figure 12: Ridership Intensity

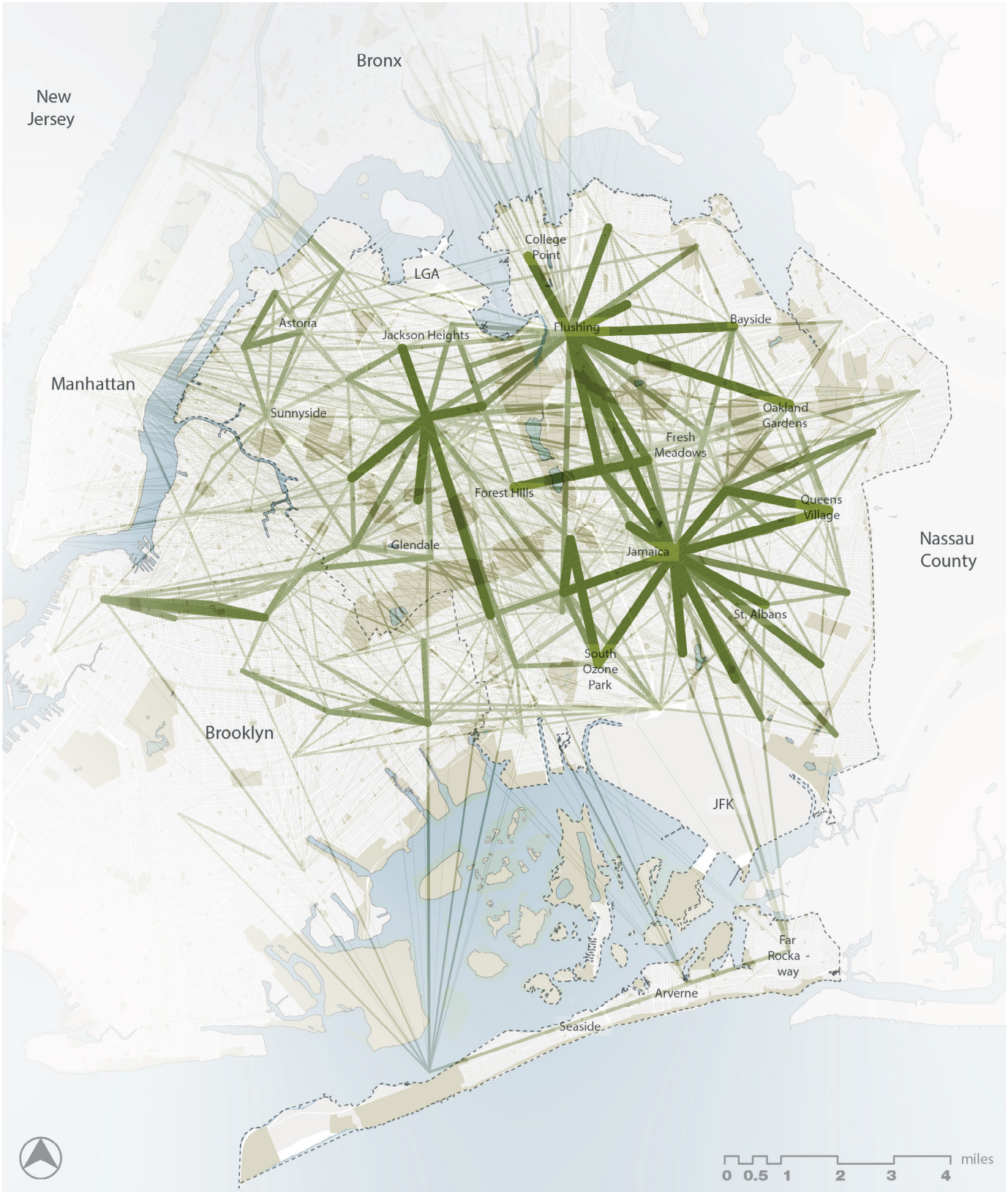


Bus Ridership Intensity

fewer boardings/alightings — more boardings/alightings

- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Figure 13: Bus Origins & Destinations



Bus Origin & Destination Flows sample weekday ridership between neighborhood tabulation areas, October 2018

- 0 - 249
- 250 - 499
- 500 - 749
- 750 - 999
- 1,000 - 1,249
- 1,250 - 1,499
- 1,500 - 1,749
- 1,750 - 1,999
- 2,000 - 2,249
- 2,250 +
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Declining Bus Ridership

Nationally, transit ridership declined by 12.3 percent between December 2014 and December 2018. New York, America's most transit-oriented city, saw transit trips in the region decline by 8.7 percent during the same period.[8] Ridership losses in New York hit the bus network the hardest, with ridership declining 9.4 percent between 2014 and 2018, compared to a 4.1 percent loss on the subway system. Bus networks in the outer boroughs experienced greater declines in ridership between 2014 and 2019, with ridership decreasing by 5.3 percent in Queens.[9] Note that we account for fare evasion in our evaluations of ridership and build into our overall analysis the "missed" subway swipes and bus dips.

There are many explanations for this ridership loss, including increasing economic prosperity and higher automobile ownership, consistently low gasoline prices, and even declining numbers of immigrants, who disproportionately use transit, particularly in their first years in the US. However, advances in technology play a serious role in ridership declines: competition from TNCs like Uber and Lyft, availability of bikeshare, and increasing numbers of people telecommuting and working flexible schedules.

The evolving economy of New York City has changed the travel patterns of residents in the outer boroughs. Decades ago, many residents worked in the same borough they lived in, riding buses to reach their jobs. As industrial and commercial activity in New York transformed, many of these businesses dissolved, changing the dynamics of neighborhoods in the outer boroughs. At the same time, white-collar jobs with 9-to-5 shifts grew in Manhattan, taking commuters off intra-borough bus routes and redirecting them to Manhattan-bound subway service. This pattern aligns with the increased ridership during peak hours that the subway has experienced over the last two decades.

[8] Data from FTA (December 2014 – December 2018).
[9] Rest of data from MTA website is total annual ridership.

Coverage

In many cities with large bus networks, a portion of the network is built to serve as a lifeline for residents to provide access and achieve specific social goals. This is typically referred to as coverage service. The remainder of the bus network is focused toward high-ridership areas of the city where the bus network works productively. Coverage services require subsidies, as they do not get enough ridership to pay for the cost of running bus service in the area. However, a transit organization like the MTA determined that the benefits of serving the area outweigh the costs of providing the financially unproductive service. Cities must try to accommodate coverage services while pursuing ridership. They do this by limiting the areas of the city where these coverage services run.

Other large cities with complicated bus networks provide parts of their cities, and possibly the surrounding suburbs, with some level of bus coverage. New York City is an outlier; it covers much of its population and jobs. We have guidelines in place that establish the goal that residents should be within a quarter-mile walk of a bus route if the population density in the area is above 12,000 people per square mile and the number of zero-vehicle households exceeds 15 percent. Some areas of Queens that are not covered by bus service, such as Bayswater, fall into the category of less-dense, auto-oriented neighborhoods. Other neighborhoods, such as Breezy Point, have private roads that prohibit easy operation of buses in the neighborhood, and may have their own shuttle buses to transit facilities in lieu of public bus service.

Ridership vs. Coverage

Our bus network consists of services oriented towards ridership, coverage, and connectivity. In New York City, and especially Queens, most residents are within a quarter-mile walking distance of a bus route, as seen in Figure 62 in Appendix C. Therefore, the trade-offs of allocating bus resources are not as much between coverage-oriented services and ridership-oriented services, but rather between ridership-oriented services and connection-oriented services. Some bus routes are intended to make a connection across long distances and provide access to larger parts of the city. During the MTA's 2010 budget cuts, several routes were eliminated due to low ridership. While those routes may have had low ridership, some accomplished the intended purpose of connecting routes across long distances.

RELIABILITY: BUSES ARRIVE LATE

Bus riders in Queens face a harsh reality: buses arrive late all the time. It's difficult to rely on buses to go to work, school or appointments if the buses don't arrive when they are scheduled to.

Trip time is only a part of the actual time a person needs to allocate to get to work on time. Wait time, the time it takes to transfer, and the time it takes to walk to and from stations and stops all factor into how a person plans their commute. Since bus service as it exists today is unreliable, that same person must also account for delays related to overcrowding, bunched buses or congestion in the time they allocate to get to work. In an ideal situation, that person's commute might take 45 minutes. Factoring in all the things that could go wrong, that same person may instead allocate an hour and 15 minutes to make that same commute to assure they arrive at work on time.

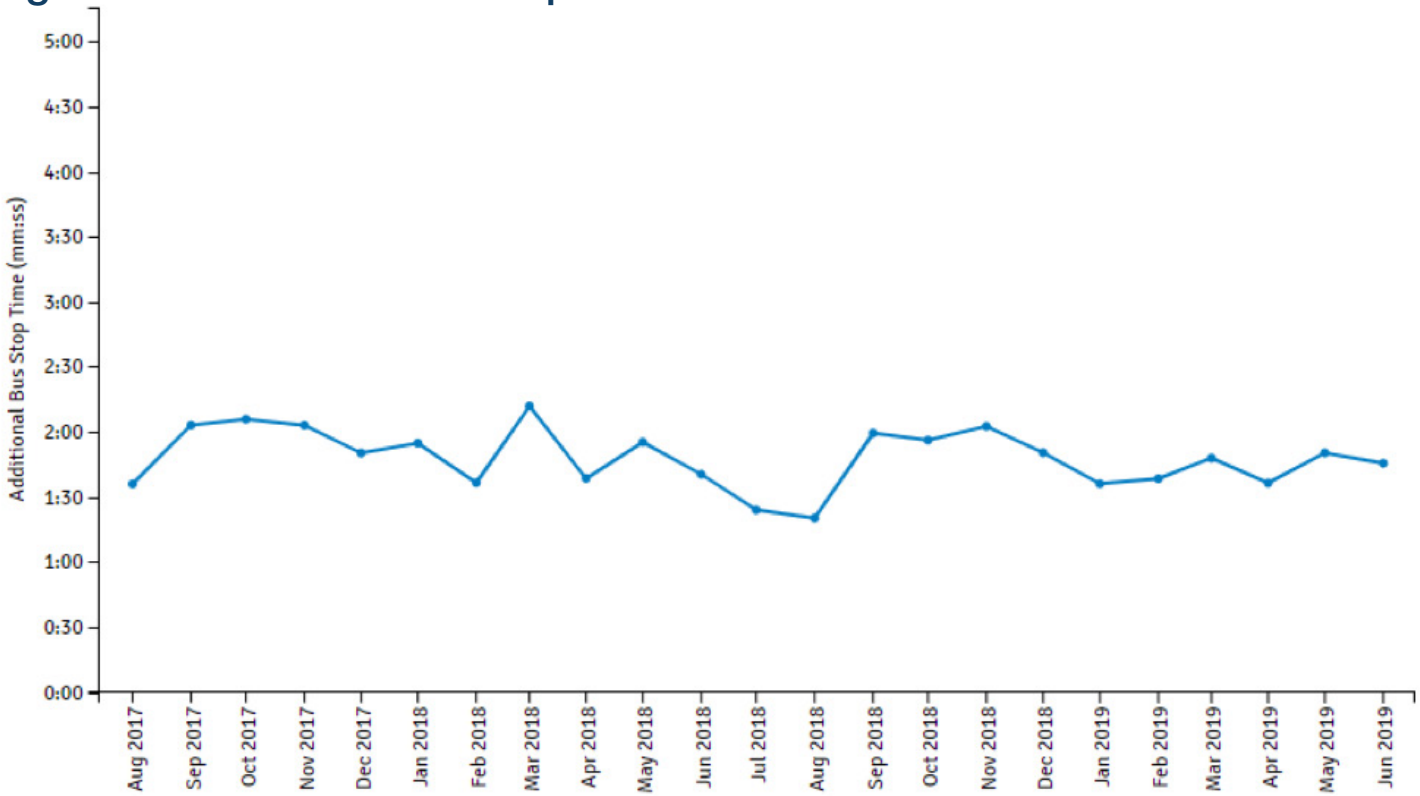
Excess Wait Time and Travel Time

Customers wait longer for the bus than they expect to, about two minutes on average for each trip. Figure 14 shows that this performance fluctuates a small amount during the summer months, but reveals no overall trend of getting better or worse. That said, the two-minute average does not tell the full story.

A person may arrive at a bus stop and expect to wait 10 minutes because a bus passed by recently. Yet they are pleasantly surprised when another bus arrives immediately—a bus that is bunched not far behind the previous bus.

A different person who arrived at the bus stop earlier, before the two bunched buses arrived together may have waited 20 minutes, because the first bus ended up 10 minutes behind schedule and the second bus was on time. Taken together, the average wait time for these two customers would be 10 minutes, even though one waited twice as long as they expected to.

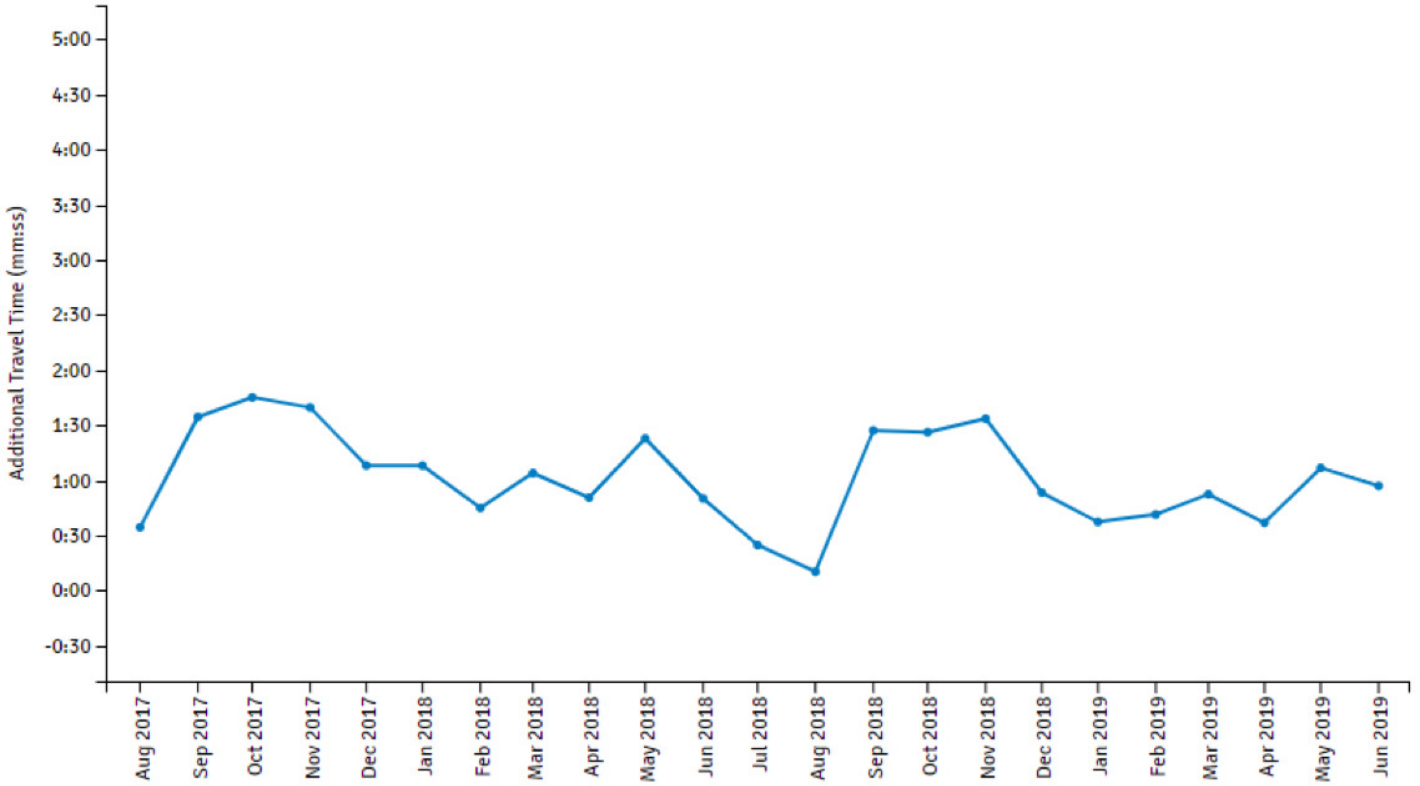
Figure 14: Additional Bus Stop Wait Time



Source: MTA BusTime, 2017 - 2019

Customers spend more time on the bus getting to their destination than they expect to, around one minute or so. Figure 15 shows that this metric fluctuates more seasonally than in Figure 14, with fewer en-route delays for buses during the summer due to fewer automobiles on the road.

Figure 15: Additional Onboard Bus Travel Time



Source: MTA BusTime, 2017 - 2019

Customer Journey Time Performance (peak local and peak express)

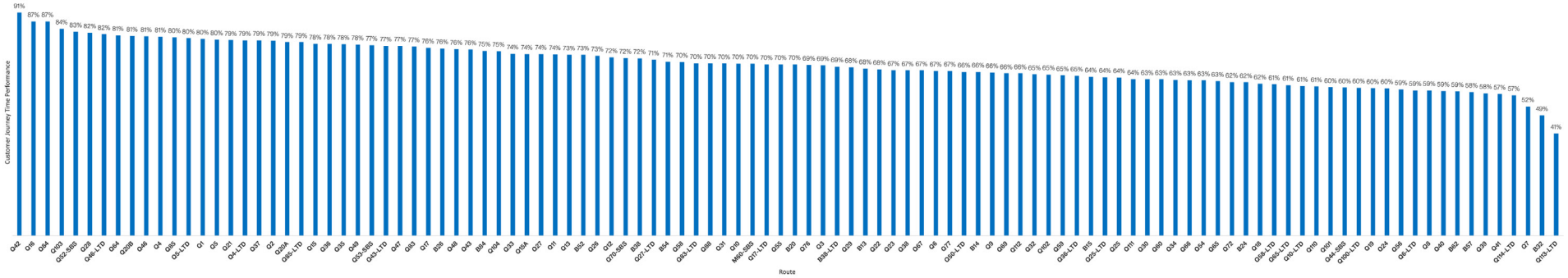
Customer Journey Time Performance measures the percentage of trips successfully made no more than 5 minutes later than scheduled. The average Customer Journey Time Performance for local, limited, and Select Bus Service (SBS) routes serving Queens in the peak hours (7:00 AM – 9:00 AM and 4:00 PM – 7:00 PM) during October 2018 was 70 percent. As seen in Figure 16, the highest-performing routes had lower levels of ridership. Some of the worst performers were routes with high ridership. The clear connection between performance and ridership is related to bus stop spacing. When buses stop too often along a corridor, performance drops. High ridership along a corridor ensures that the bus stops at every stop and never picks up sufficient speed, resulting in longer travel times.

Figure 16: Customer Journey Time for Queens Local Buses

Customer Journey Time Performance (CJTP) by Route (Local, Limited, and Select Bus Service)

October 2018

Source: NYCT Operations Planning, July 2019



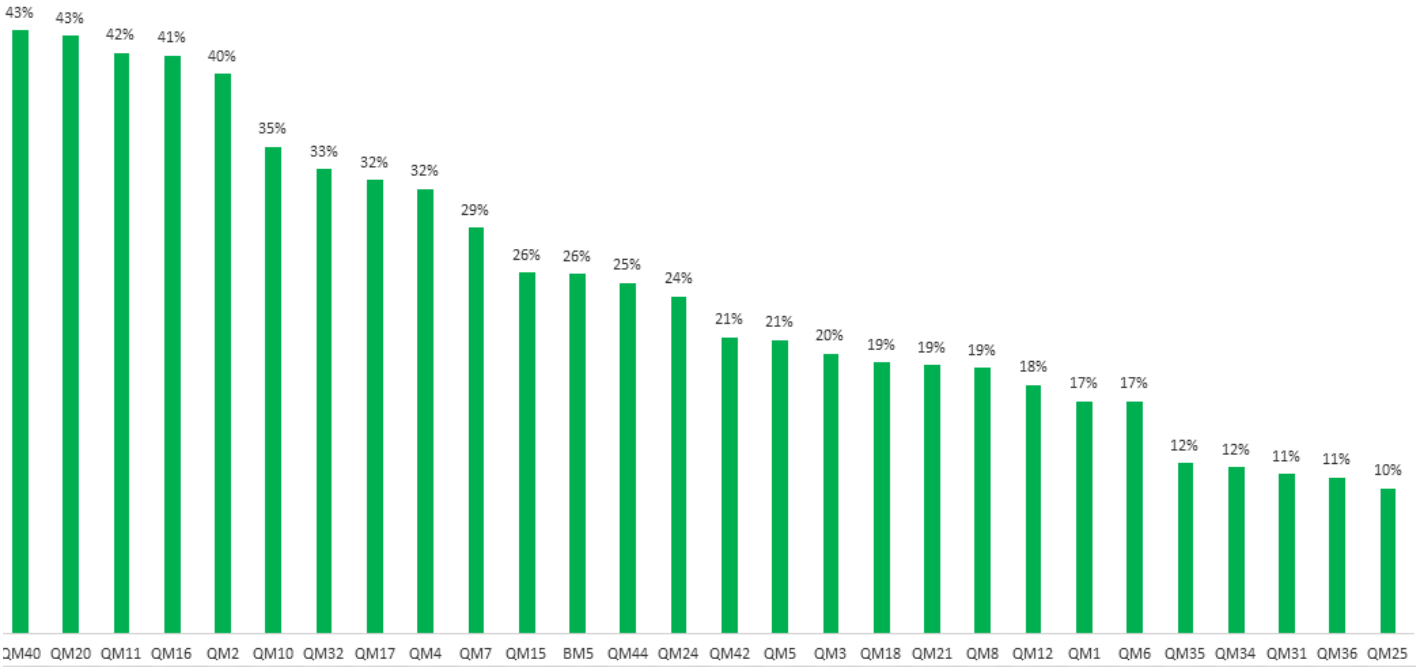
Source: MTA BusTime, 2017 - 2019

Express routes serving Queens performed much worse according to this metric. The October 2018 average Customer Journey Time Performance for these routes was only 25 percent. As seen in Figure 20, even the best performers did not crack 50 percent, while there were five routes that were either at or below 12 percent.

Figure 17: Customer Journey Time for Queens Express Buses

Customer Journey Time Performance (CJTP) by Route (Express)
October 2018

Source: NYCT Operations Planning, July 2019



Source: MTA BusTime, 2018

On-Time Performance

On-time performance is a reliability metric that measures how well a bus route performs compared to its schedule. On-time performance is defined as the percentage of buses that are between one minute early and five minutes late, as compared to the schedule at specific locations along the route defined for evaluating punctuality.

Although Queens has the second-highest on-time performance of the five boroughs, that number has dropped 12 percent since 2014. See Appendix C Figure 64 for Citywide On-Time Performance by Borough. The average on-time performance for all local, limited, and SBS routes serving Queens in October 2018 was 59 percent. Only ten of those routes had an on-time performance above 75 percent, and they generally have lower-than-average ridership. Twenty-one routes had an on-time performance below 50 percent. The lowest-performing route had an on-time performance rate of 30 percent—partially influenced by the combination of high ridership and long overall route length. See Appendix C Figure 68 Appendix C for On-Time Performance of Queens Local Buses.

During October 2018, express routes serving Queens had an average on-time performance of 62 percent. Only one route was above 72 percent, while four express routes were below 50 percent. See Appendix C Figure 69 for On-Time Performance of Queens Express Buses.

On-Time Performance Changes 2014-2018

From October 2014 to October 2018, on-time performance for all local, limited, and SBS routes serving Queens decreased 12 percent. Over the same time, express routes serving Queens saw a 3 percent average increase in on-time performance. See Appendix C Figure 70 for Changes to Citywide On-Time Performance by Borough. See Appendix C Figure 68 for Changes to On-Time Performance of Queens Local Buses. See Appendix C Figure 69 for Changes to On-Time Performance of Queens Express Buses.

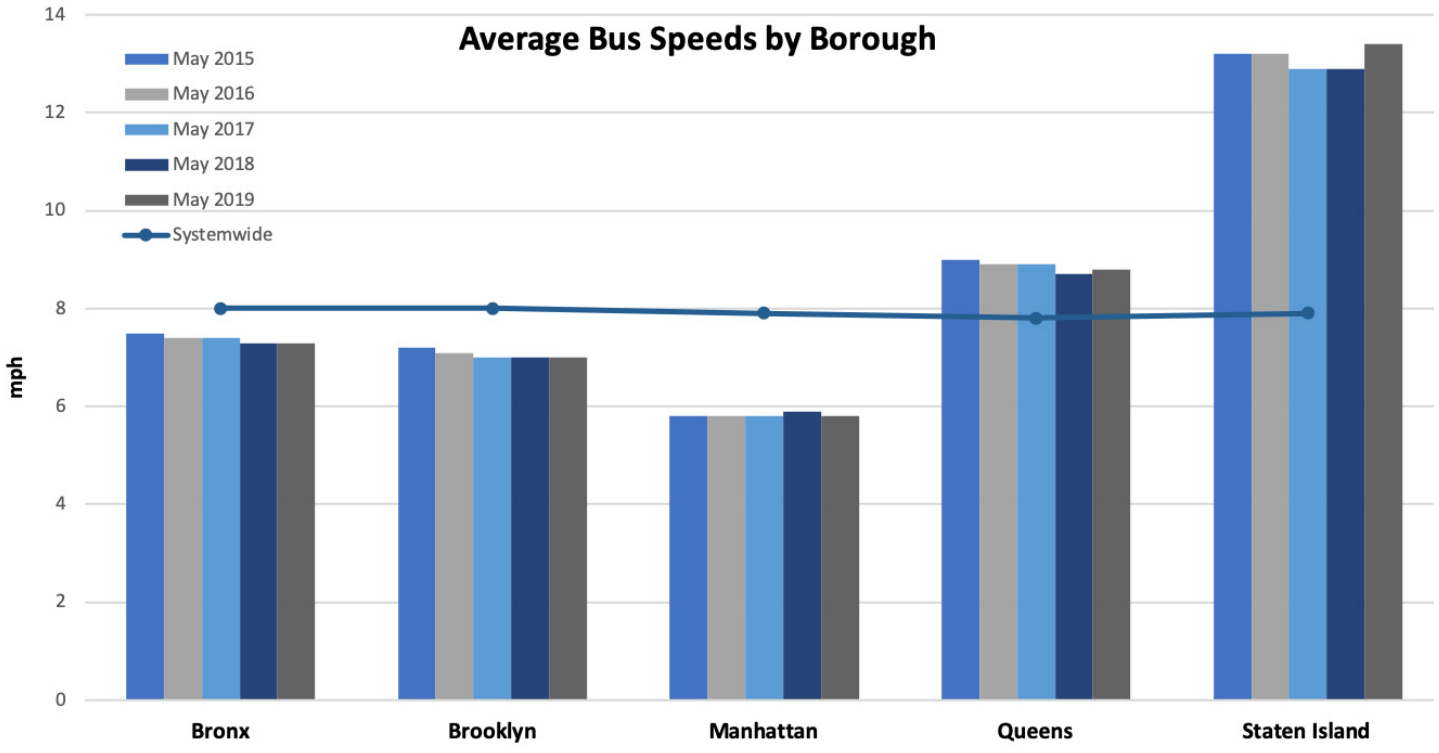
SPEED: BUSES ARE SLOW

Customers' travel time on the bus continues to increase as buses continue to slow down; a challenge to fast and reliable bus service. As congestion intensifies, it is crucial that we work with NYCDOT to increase bus speeds and move New Yorkers to their destinations as quickly and safely as possible.

Slowing Bus Speeds

Bus speeds fell significantly across New York over the past five years. Figure 18 shows speeds falling system-wide on our routes since 2014. Average speeds in Queens are the second-highest of the five boroughs, at 8.7 miles per hour (MPH) in October 2018. However, the average speed fell 3.3 percent from 2015, when average speed was 9.0 MPH.[10] Data represented in this chart is available on the MTA's performance dashboard.

Figure 18: Average Bus Speeds by Borough

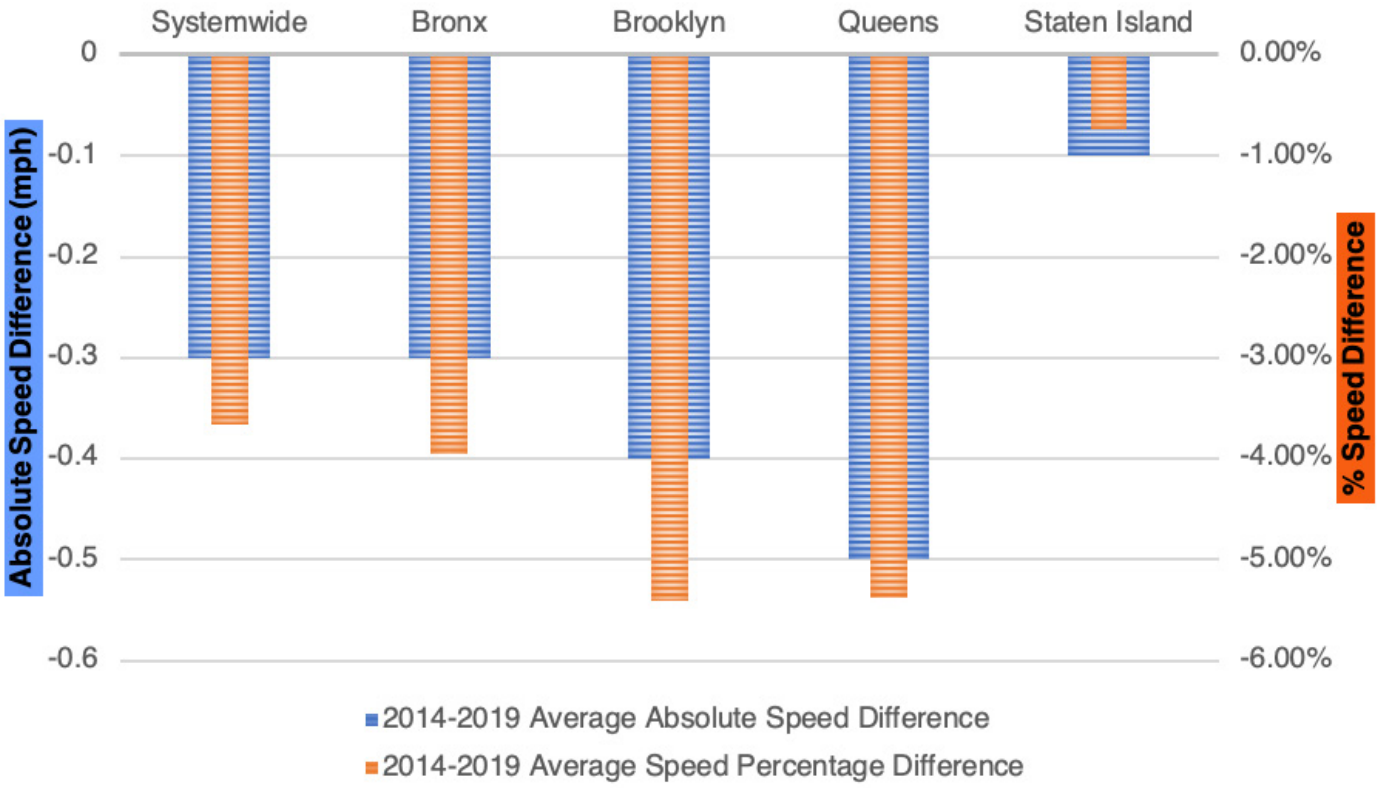


Source: MTA BusTime, 2018

[10] Data from MTA Dashboard.

As the graph in Figure 19 shows, bus speeds have fallen in Queens more than any borough except Brooklyn, with the average drop in absolute speed and percentage speed falling by around 3 percent. Note that Manhattan's average bus speed did not drop, so it does not show up in the chart. That said, it was already the slowest, at an average of 5.9 MPH.

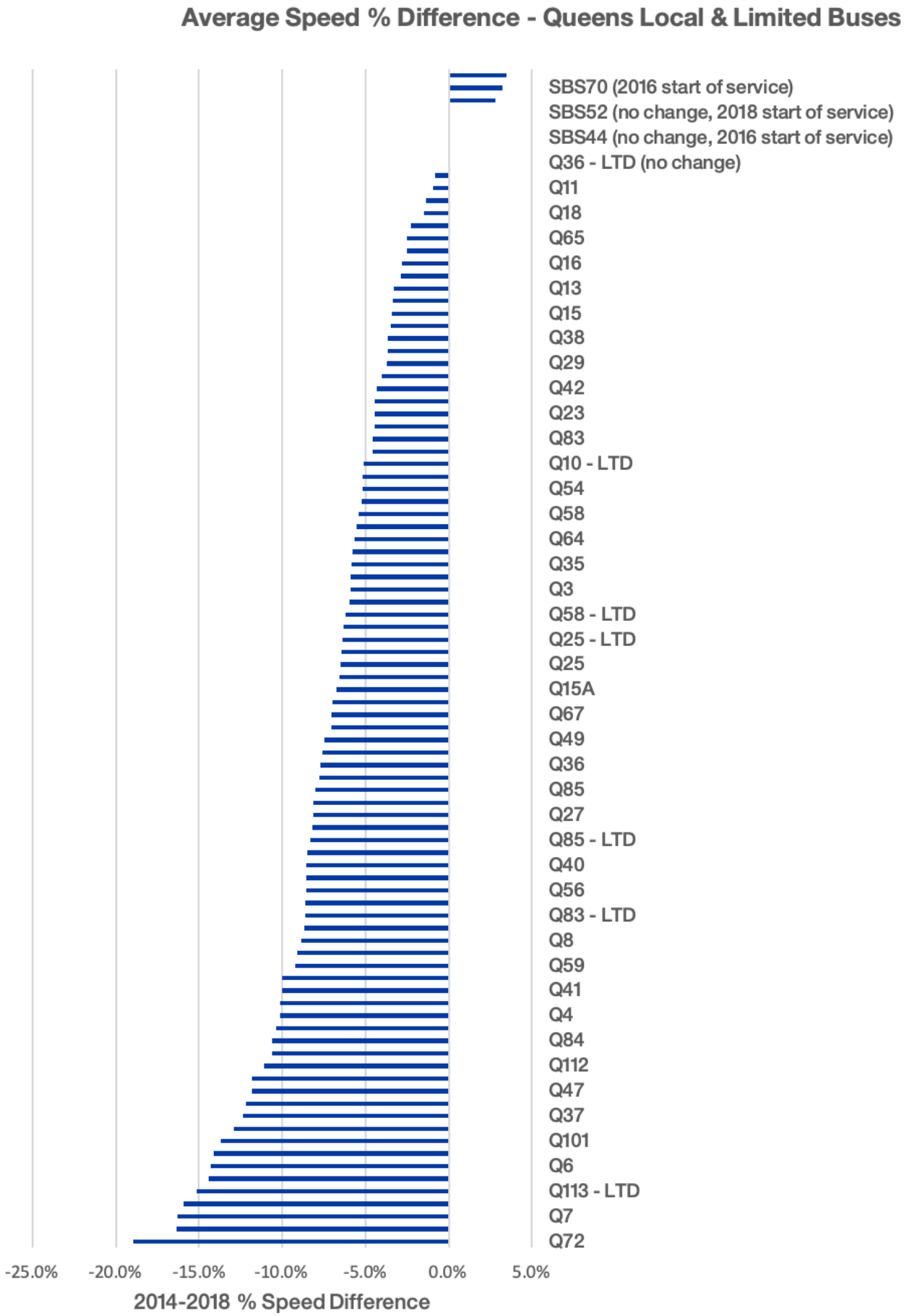
Figure 19: Change in Average Bus Speeds by Borough



Source: MTA BusTime, 2018

The loss in average speed affected many routes, as seen in Figure 20. Speed declined on almost all routes, and by more than 5 percent on more than half of them. Eleven routes saw their speed decline by more than 10 percent. Note that these are high-ridership routes. None of the routes with the largest drops in speed share significant common alignments, suggesting that loss of speed is a widespread problem on the Queens Bus Network.

Figure 20: Average Speed % Difference – Queens Limited Buses

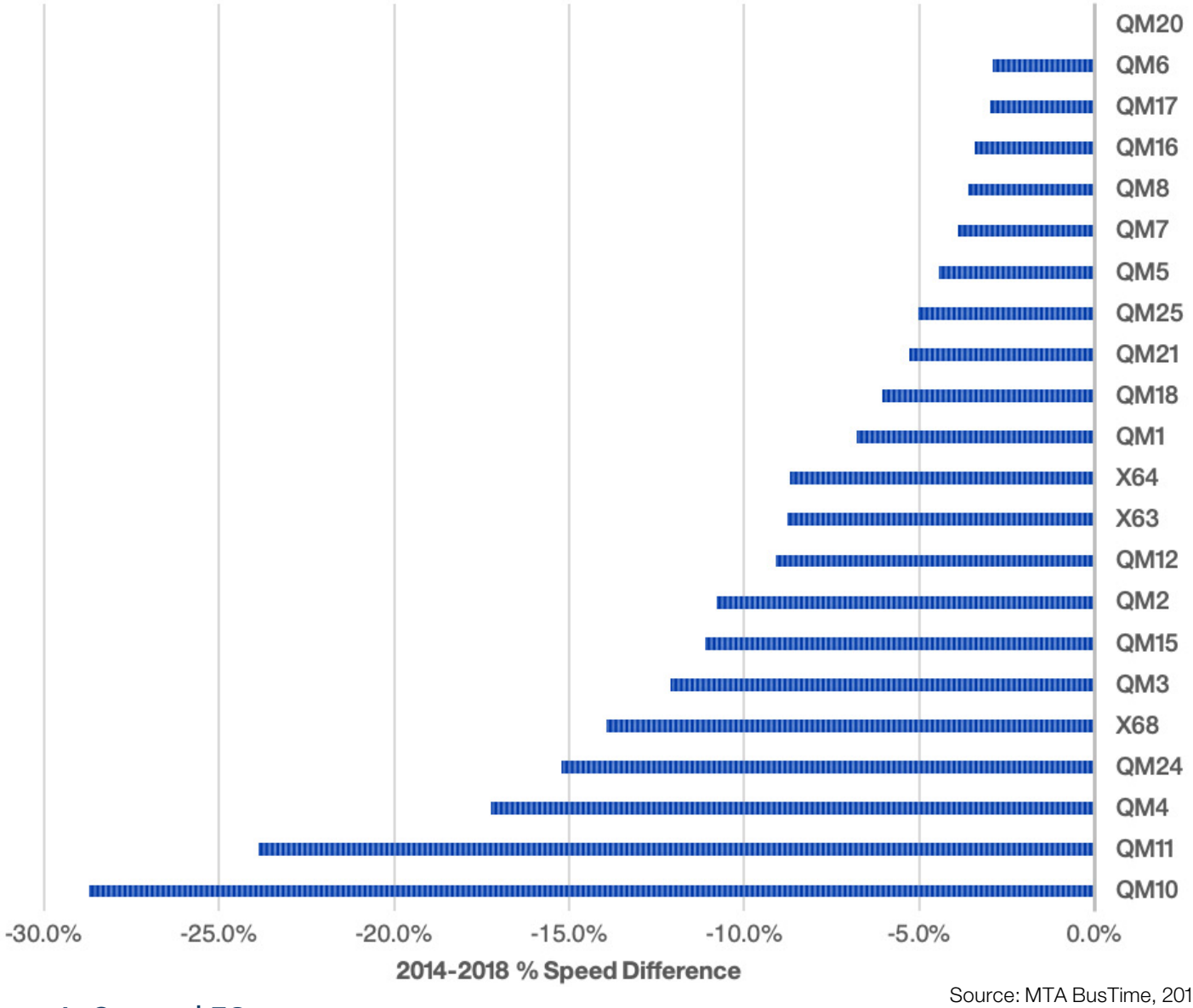


Source: MTA BusTime, 2018

Figure 21 shows that express routes experienced an even greater loss in average speed. More than two-thirds of the Queens express routes showed a loss of average speed, and half (15) showed a loss of 5 percent or more. Eight routes saw their average speeds decline by more than 15 percent, and two by more than 20 percent.

Most routes serving the Queens Center Mall-Rego Park area experienced decreases in average speed since 2014. Of the 11 routes that serve this area, eight lost average speed, including five of the eight routes that lost more than 10 percent, and both routes that lost more than 20 percent. It is possible that delays on some routes may occur on the portions of the routes operated in Brooklyn and/or Manhattan.

Figure 21: Average Speed Percent Difference – Queens Express Buses



Source: MTA BusTime, 2018

Slow Bus Corridors

Average speed declined by more than 6 percent on most of Queens' major bus corridors, including Hillside, Jamaica and Atlantic Avenues, Merrick Boulevard, Queens Boulevard, Grand Avenue, portions of Northern Boulevard, and many others. The most severely affected corridors, on which average speed declined by more than 12 percent, include Flushing to Jamaica via Kissena Boulevard, Astoria Boulevard, Ozone Park to Kew Gardens via 111th Street, LaGuardia Airport to Rego Park, Steinway Street, and Guy R. Brewer Boulevard and 147th Avenue to Rosedale. These corridors share little in common to suggest why they would be the most affected by declining speeds, and further analysis will be required to determine the specific causes of delay.

In October 2018, local, limited, and SBS routes serving Queens had an average speed of 11.97 MPH, and express buses traveled an average speed of 12.16 MPH. Citywide, local, limited, and SBS routes traveled at 9.53 MPH, while express buses traveled
at 13.68 MPH.

There are a few locations in Queens that slow down buses considerably. The primary location is within Jamaica, where buses travel along Parsons Boulevard, Archer Avenue, Jamaica Avenue, Merrick Boulevard, Hillside Avenue, and 150th Street. Routes in this area grind to an average of 2-to-4 MPH. Other problem areas include Junction Boulevard, Queens Boulevard near Woodhaven, and East 60th Street in Manhattan. See Figure 22 for bus speeds along various segments within the borough.

Figure 22: Bus Speeds by Segment

Segment Bus Speeds MPH, PM Peak October 2018

- 2.5 - 5.9
- 6.0 - 9.9
- 10.0 - 13.9
- 14.0 - 17.9
- 18.0 - 25.7

- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: MTA BusTime, 2018

Bus Priority

The New York City Department of Transportation (NYCDOT) controls street infrastructure, oversees on-street bus infrastructure, and builds bus priority lanes and signal technology.

Through the Select Bus Service (SBS) program, we've worked with NYCDOT to offer bus rapid transit (BRT) features, such as dedicated bus lanes, off-board fare collection, bus stop spacing, and transit signal priority (TSP). These features help create faster and more reliable service on high-ridership bus routes. SBS projects are also designed to make bus service easier to use, through features like bus bulbs, real-time passenger information, and overall attention to pedestrian and vehicular safety. Moreover, SBS features can also be applied individually in locations not appropriate for full SBS treatment.

In partnership with NYCDOT, we're working to prioritize our buses on streets. Currently, there are seven locations in Queens with dedicated bus lanes (Archer Avenue, Cross Bay Boulevard, Hillside Avenue, Jamaica Avenue, Main Street, Sutphin Boulevard, and Woodhaven Boulevard). In addition to bus lanes, there are currently eight locations where bus routes serving Queens operate with TSP.

In conjunction with the Queens bus network redesign, NYCDOT is conducting an analysis of major Queens bus corridors to identify streets where future bus lanes and other priority treatments would provide the biggest benefit to Queens bus riders. The goal of this analysis is to identify streets for further study, planning, public outreach, design, and implementation of street interventions that enhance the customer benefits of Bus Network Redesign. NYCDOT will continue to refine this analysis and present draft corridors in the draft Queens Bus Network Redesign plan.

Adding bus priority elements helped prevent bus speeds from further deteriorating, and in many cases, increased speeds. Figure 23 displays existing on-street infrastructure, NYC Vision Zero priority corridors, and TSP corridors in Queens.

Figure 23: Bus Priority Map

Bus Priority existing in-street infrastructure and Vision Zero priorities

- bus lanes
- HOV lanes
- corridors with TSP
- Vision Zero priority corridors
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: NYCDOT

Street Widths

Narrow streets in Queens handcuff the reliability of bus service. Narrow streets and tight turns cause buses to get caught in traffic, and in some instances, negotiate with other vehicles to determine who can traverse particularly narrow streets first. Numerous streets are too narrow for two buses to pass each other, including 127th Street in College Point (24 feet wide with three total lanes), Austin Street in Forest Hills, as seen in Figure 24 (30 feet wide with three total lanes), and Holly Avenue in Flushing (24 feet wide with two total lanes). These are just a few instances where our buses currently run on streets that are too narrow, creating reliability issues that ripple throughout the system. Appendix C Figure 70 shows the widths of the streets within Queens.

Figure 24: Austin Street, Narrow and Congested

Competition from Commuter Vans

Using time lapse video, we observed commuter vans blocking the curb at two locations adjacent to the Jamaica Center transit hub: the bus stops along Archer Avenue and the dedicated commuter van stop on Parsons Boulevard. Despite the dedicated commuter van space available on Parsons Boulevard, at the Archer Avenue stop, we observed nine incidents per hour in which commuter vans interfered with bus operations and/or obstructed the bus lane. Figure 25 illustrates an example of a commuter van obstructing a bus lane and interfering with bus operations. Throughout the city, bus lane violations were the most common traffic violation for commuter vans, comprising 11 percent of the 13,000 violations issued from January 2016 through August 2017. New York City is increasing bus lane enforcement, devoting additional resources to ticketing and towing vehicles that block bus lanes and stops.

Figure 25: Commuter Van Interfering with Transit Bus on Archer Ave between 153 St and Parsons Blvd

Source: NYCDOT

CONNECTIVITY: BUSES DON'T TAKE YOU EVERYWHERE YOU WANT TO GO

To provide critical transit connections to residents of and visitors to the myriad communities and neighborhoods throughout Queens, we operate an extensive network of 97 local (including SBS and limited service) and 31 express bus routes. Buses provide critical transit connections throughout the borough, especially in subway deserts of eastern Queens. Though daily ridership declined by approximately 37,000 between 2013 and 2018, or 10 percent, Queens bus routes are still heavily used, with daily weekday ridership exceeding 700,000. Buses provide several intra- and inter-borough connections that cannot otherwise be made via the Manhattan-centric subway network.

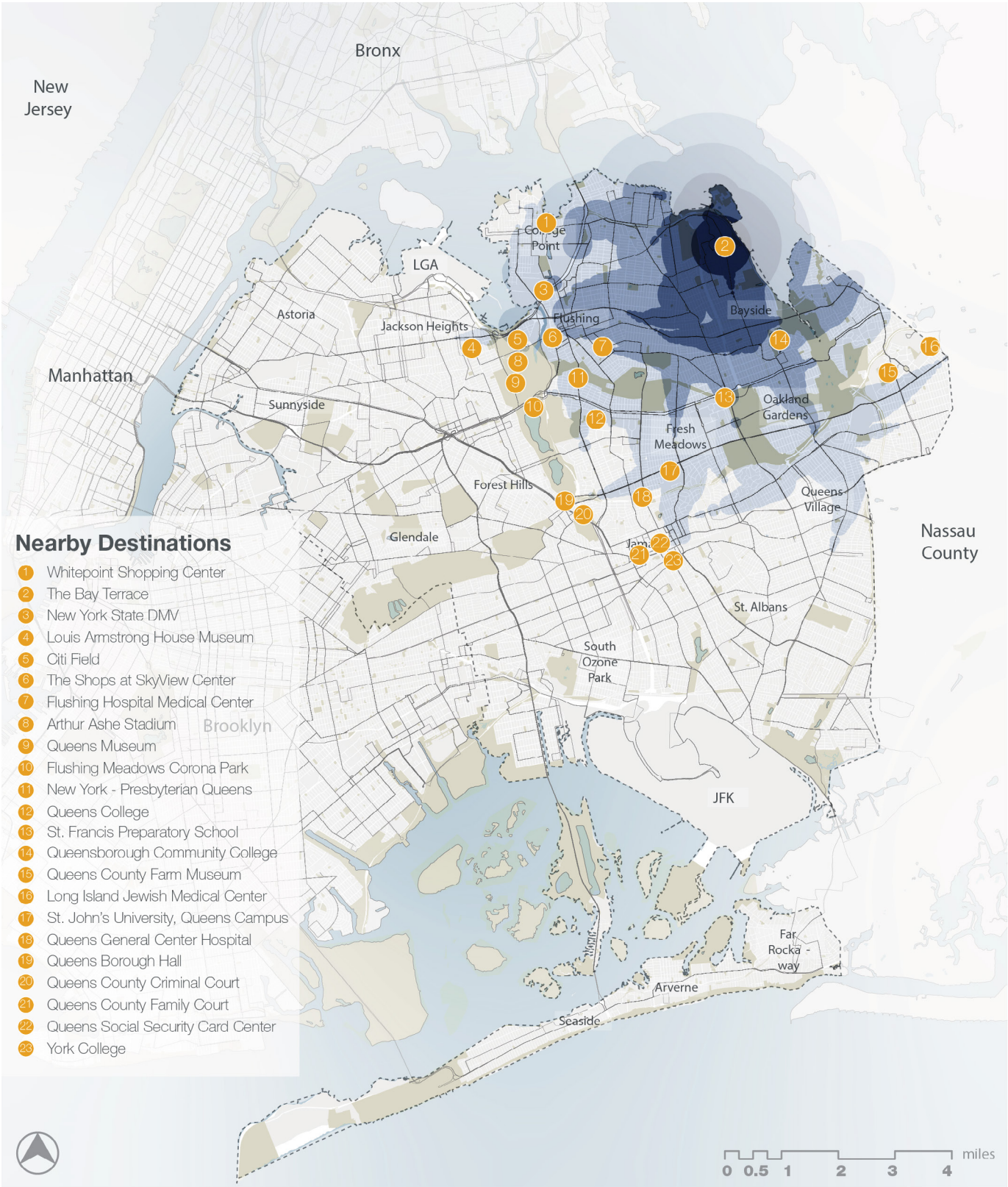
Today, most bus routes serve multiple neighborhoods. They bring customers to subway stations in Jamaica, Flushing, Jackson Heights, Kew Gardens, and Long Island City. Most routes also carry a substantial number of secondary school students and intra-borough travelers. Buses feed existing and emerging job centers, such as Queens Center, Flushing, and College Point. Buses also bring students to Queens College, Queensborough Community College, and St John's University, none of which are served by the subway. Hospitals are also important destinations for bus customers. Finally, buses bring many employees to the airports, as well as some air travelers.

How Far Can You Go?

One of the tools we have at our disposal is an isochrone. An isochrone uses trip data to create a visual map of how much of a surrounding area you can access in a set amount of time. This helps us identify portions of the bus network that provide weak access. Figure 26 shows how far you can go from Bay Terrace at noon on a weekday, based on existing bus service. You can get to Flushing within 45 minutes, and to the edge of Downtown Jamaica within an hour, but not to the AirTrain station for service to JFK Airport, even though there is a direct connection from Bay Terrace to the AirTrain station. The bus ride takes 47 minutes to get from the stop to the station. Add the few minutes it takes to get to the nearest bus stop from your point of origin, and the time it takes to walk through the LIRR station in Jamaica to connect to the AirTrain, and the time spent waiting for each connection, and the trip is now well over an hour long.

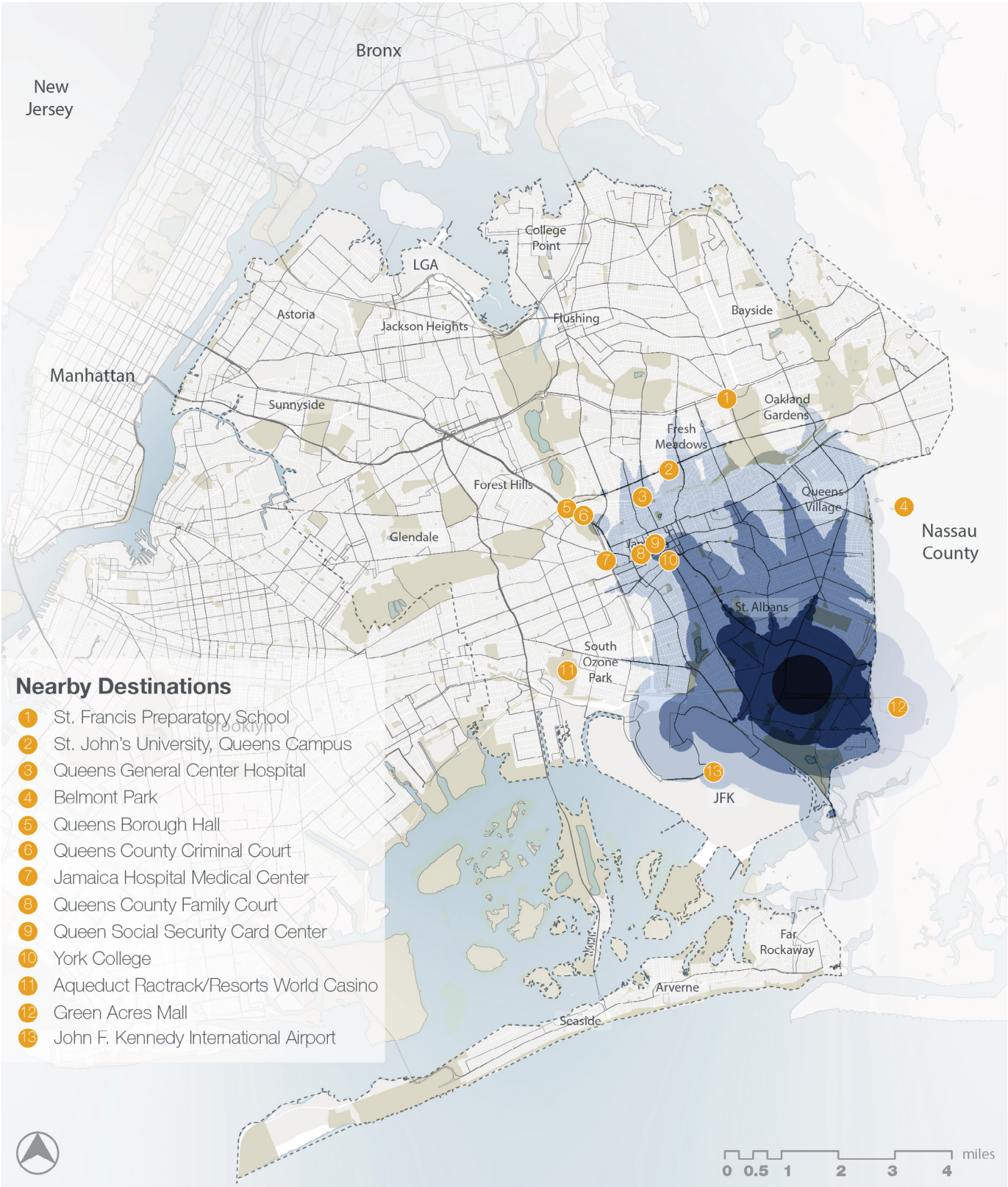
At noon on a weekday, the bus in Bay Terrace is scheduled to run every 20 minutes. If it's running on time, but you leave for your trip at a random time, you will wait anywhere from zero to 20 minutes for the next bus, for an average wait of 10 minutes. If that bus ran more frequently, you'd be much more likely to get to the AirTrain in less than an hour. Note that there are other transit resources available, including subway and LIRR, that significantly add to coverage.These maps are for illustrative purposes about bus-only trips.

Figure 26: Sample Bus Travel Times from Bay Terrace



A trip from Laurelton at noon on a weekday reveals a similar pattern, and likely requires a transfer from one bus to another to get to many of the most popular destinations. Figure 27 shows that you can get to Jamaica in less than an hour, but not very far past it. This is likely caused by the wait for the first bus combined with the wait for the second bus, neither of which run frequently. The combined waits add a significant amount of time to the total trip, and reduce the number of places you can get to within an hour.

Figure 27: Sample Bus Travel Times from Laurelton

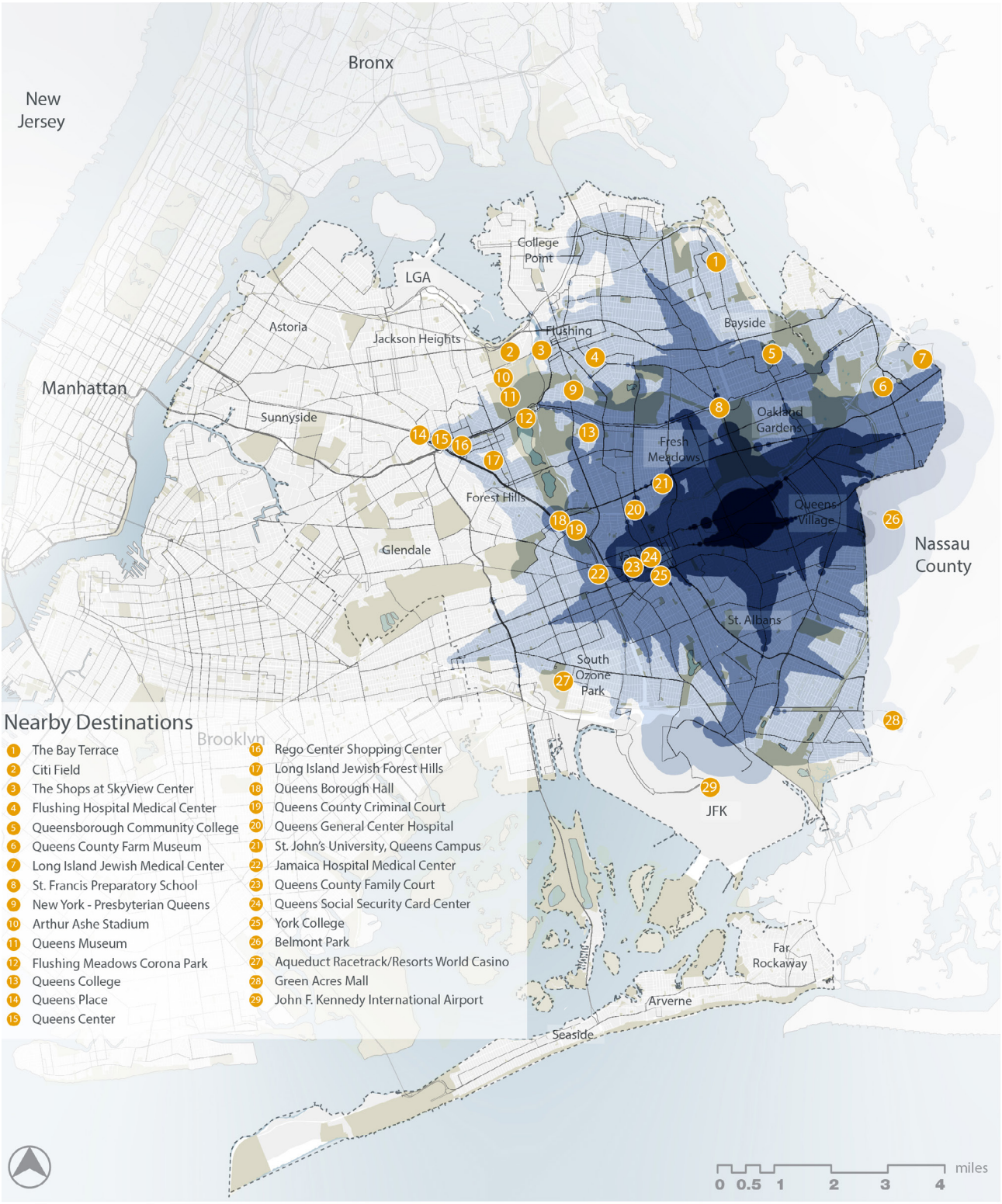


Sample Transit Times from Laurelton avg midday weekday trip and wait times in minutes

- 0 - 15
- 16 - 30
- 31 - 45
- 46 - 60
- bus routes
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

A trip from Hollis at noon on a weekday seems to provide better access to much of eastern Queens. This is due to its central location within the borough, as well as the higher frequency of combined service along Hillside Avenue that reduces wait time. Figure 28 shows that you can get to the Queens Center Mall, and almost get to Brooklyn, within an hour.

Figure 28: Sample Bus Travel Times from Hollis



Sample Transit Times from Hollis avg midday weekday trip and wait times in minutes

- 0 - 15
- 16 - 30
- 31 - 45
- 46 - 60

- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

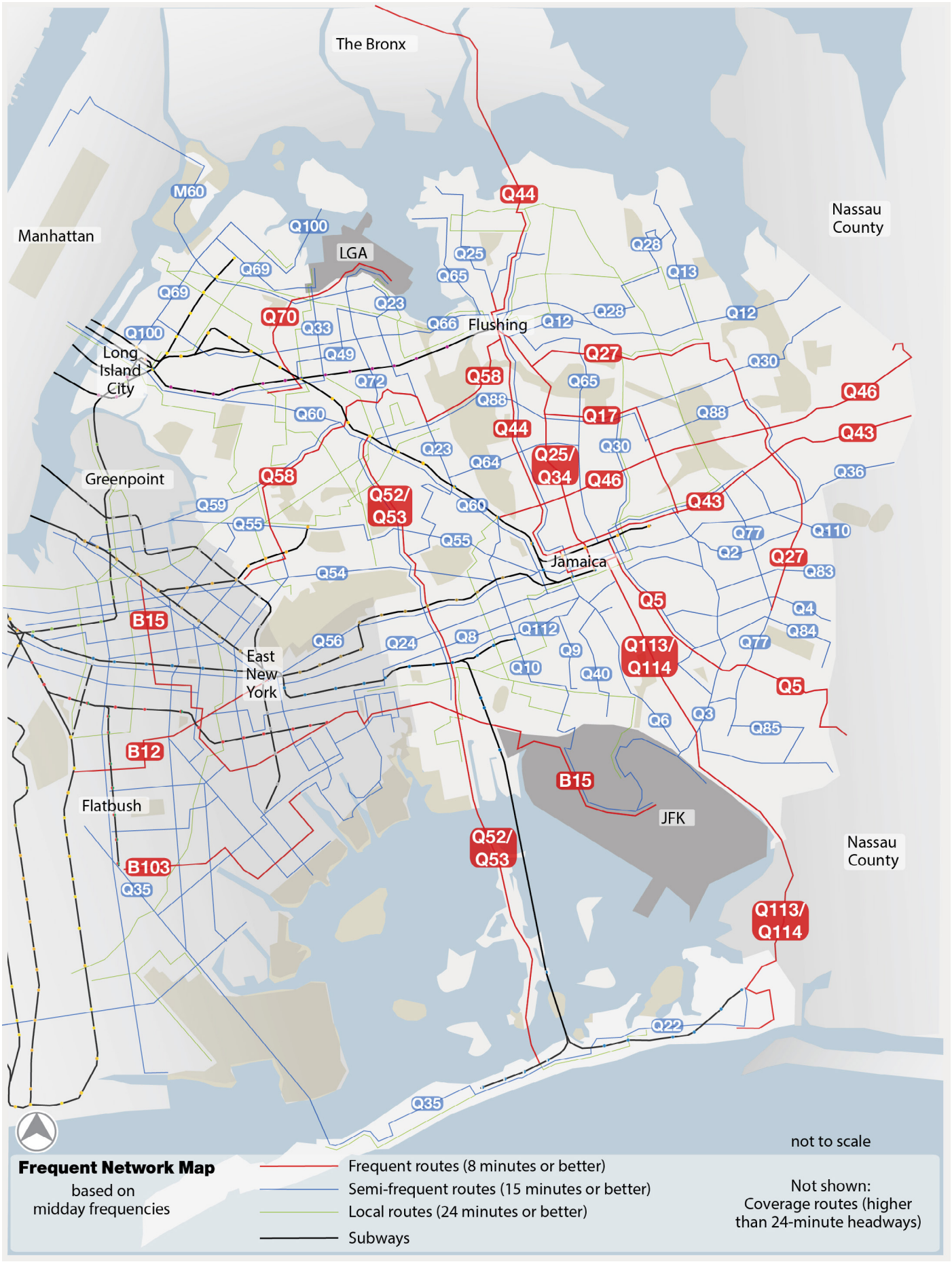
Frequency

How frequently your bus is scheduled to arrive depends on how many people ride it. We measure ridership on routes, and adjust schedules to accommodate the number of passengers. If a new apartment complex opens on a route and additional riders start filling up the bus, we'll add service to that route based on the resources available. If the increased frequency leads to shorter wait times for people who ride the bus occasionally, they may choose to take it more often now that they don't have to wait as long. As additional riders start showing up in the measurements, we may add more service. This "more-success-to-the-successful" feedback loop will eventually be held in check by the limited resources available to add more frequency to the route. At that point, overcrowding can make the bus less popular and some of the newer riders may switch to another option. This self-leveling effect leads to slow but continual changes to ridership and demand on every route over time.

Frequent bus service in New York City means a bus arrives every eight minutes or better during the midday (11:00 AM to 1:00 PM), while semi-frequent service means a bus arrives every 15 minutes or better. Figure 29 shows frequent (red) and semi-frequent (blue) routes within the overall network. For bus routes serving Queens, ten are frequent and 51 are semi-frequent. The feedback loop described above often leads to frequency serving ridership, but this does not mean that all frequent routes have high ridership throughout the entire route.

For example, a semi-frequent route with a bus every 15 minutes during the midday serves the eastern portion of 120th Avenue in Cambria Heights, an area without much ridership. The service in this area is for the purposes of coverage. However, the total route combines this coverage-oriented area with a ridership-oriented area along Merrick Boulevard, confounding easy analysis of the route's productivity and value.

Figure 29: Frequent Network Map



Connectivity Across Corridors

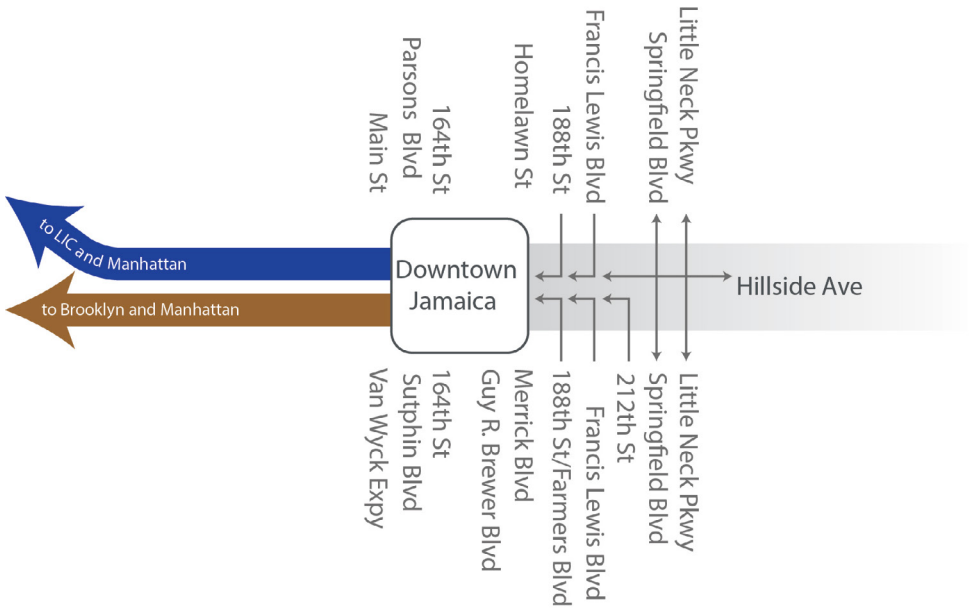
Buses run on most of the major roadway corridors in Queens. Some corridors allow travel across long distances. Several corridors support east-west movements across Queens toward Brooklyn and Manhattan. North-south corridors connect to Flushing or Jamaica, or areas north and south of Hillside Avenue. However, many of Queens' north-south oriented routes function more like radial routes, both because Flushing and Jamaica are themselves major destinations, and because they provide connections to the subways and Long Island Rail Road stations, which are the primary ways that Queens residents use transit to access Manhattan and Brooklyn. Queens has very few routes that function as true crosstown connectors, intended to support north-south movements and provide connections among east-west routes.

The existing Queens Bus Network primarily supports east-west movements; specifically, moving riders west toward Brooklyn and Manhattan or feeding them into the subway network. All bus routes connect to a subway station, with many terminating at those stations. Few bus routes that originate from eastern Queens continue west beyond Flushing, Jamaica or Queens Boulevard.

Most north-south routes in Queens do not truly serve the borough from north to south. In eastern Queens, most north-south routes turn west onto Hillside Avenue to connect with Downtown Jamaica and subway stations to Brooklyn and Manhattan.

Figure 30 is an illustrative example of discontinuous routes in Jamaica.

Figure 30: Example Discontinuous Routes



Difficult Trips

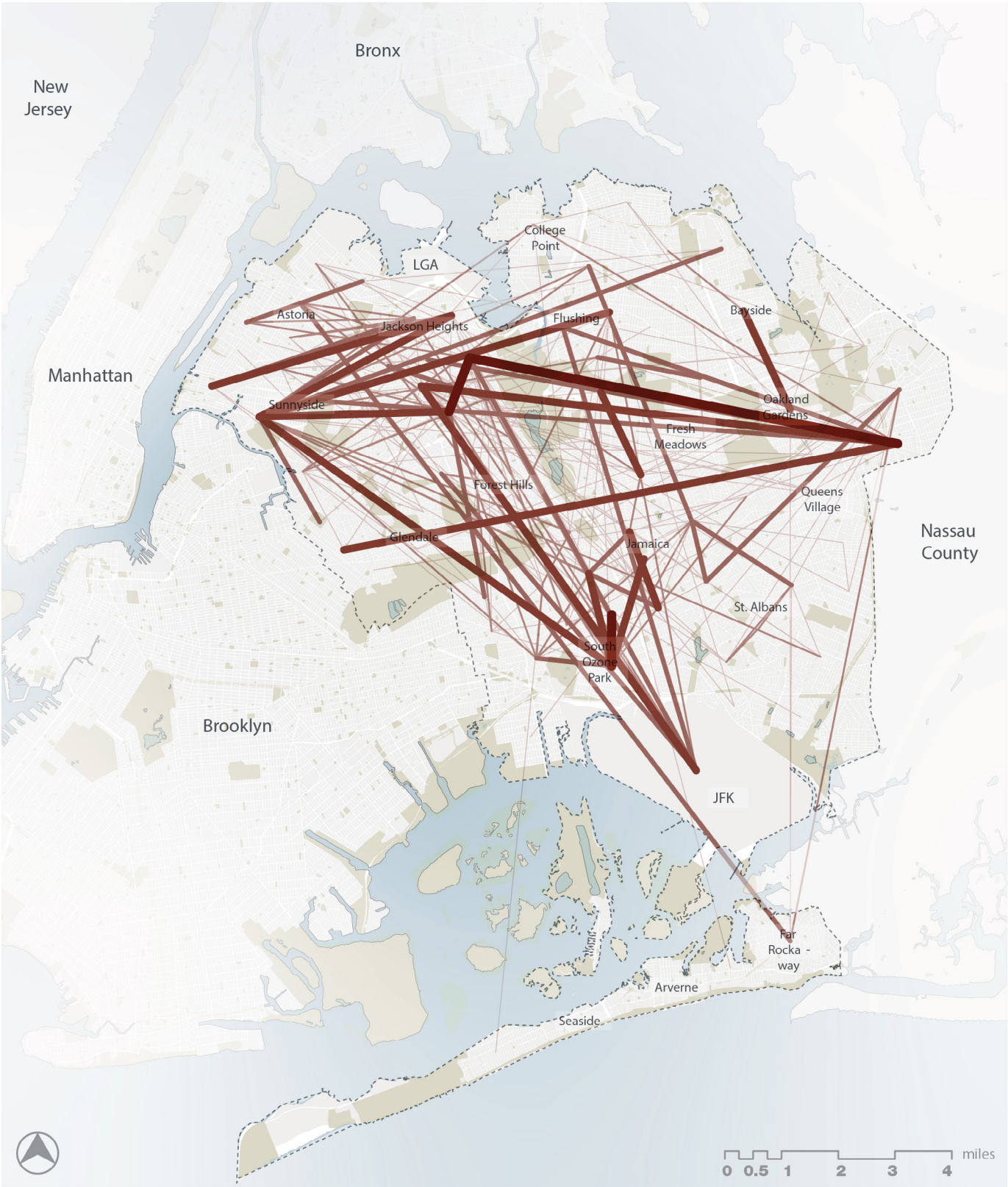
Figure 31, as well as Figure 82 in Appendix E, illustrate difficult trips according to an NYCDOT Network Matching Tool. The tool analyzed travel between NYCDOT's Transit Analysis Zones using travel directions from Google Maps. Each trip's flow is based on data from the Census Transportation Planning Products, adjusted by New York City Department of City Planning to 2015 levels.
The Census Transportation Planning Products, while robust, are infrequent and limited in the timeframes available. The data have been updated to bring the timeframe forward for more appropriate analysis.

Each potential trip was run for driving directions and transit directions during the AM peak. Difficult trips are classified as having one or more of the following criteria: no good transit options, long trips, burdensome trips, and long and slow trips. The criteria are defined as:

- **No good transit options:** Transit trips that meet one of the following two criteria—
  - Require 2 or more transfers, or
  - Require walking more than 1-mile roundtrip for subway, regional rail or SBS, or more than 0.5 miles for non-SBS buses
- **Long trips:** Transit trips that take longer than 60 minutes
- **Burdensome trips:** Transit trips that take at least 20 minutes and take 1.5 times as long or longer as the driving time
- **Long and slow trips:** Transit trips that take at least 30 minutes and whose overall speed is less than 8 miles per hour

As seen in the following figures, there are a number of commuter trips in which transit does not currently provide a convenient travel option. While some of this may be due to the size of Queens and long commutes into Manhattan or to the airports, many trips are of a moderate distance that could be better served by improved bus service.

Figure 31: Network Matching Tool Intra-Borough Difficult Trips



Network Matching Tool Difficult Trips Queens intraborough trips

- 100 - 149
- 150 - 199
- 200 - 249
- 250 - 349
- 350 - 450

- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: CTPP 2006-2010; US Census LEHD, 2015; NYCDCP; NYCDOT

Connections to Commuter Rail

There are 22 Long Island Rail Road stations in the borough of Queens, and three that are outside of Queens in Nassau County, but still accessible by walking from residences in Queens. Some LIRR stations are served by multiple bus routes, such as Queens Village station. Other LIRR stations, such as those in Auburndale and Douglaston, have bus routes in the general neighborhood area, but are not directly served by a bus route.

Connections to the Airports

There are currently four routes that serve LaGuardia Airport and five routes that serve JFK Airport. Two of the routes serving LaGuardia Airport are SBS routes, and connect directly from subways to the airport. During the ongoing renovations at LaGuardia Airport, congestion has become a problem for many travelers. To encourage airport customers to use public transit instead of driving, the Port Authority of New York and New Jersey subsidizes trips on the SBS route from Woodside and Jackson Heights. During peak air travel periods, such as holidays and the summer, these trips are free. Marine Air Terminal, or Terminal A, also is served by buses, though with less-frequent service.

Buses serve the central terminals at JFK via the connection to the AirTrain at Terminal 5. From there, customers can access the rest of the airport. We also serve the long-term parking AirTrain station on Lefferts Boulevard.

Airport employees make up many of the trips to the airports, though customers flying out of the airports also use our buses. Figure 32 shows where airport employees live.

Figure 32: Airport Employee Home Zip Codes

Place of Residence of Airport Employees

- LaGuardia Airport Employees
- John F. Kennedy International Airport Empolyees

2015, PANYNJ

- parks, cemeteries, and open space
- waterbodies, rivers, and streams

EASE OF USE: BUSES CAN BE HARD TO FIGURE OUT

Queens has a dense bus network with routes that provide different types of service. Each route is classified as either local, limited, express, or SBS. Among the local routes, however, there are wide variations in the functions and characteristics based on alignments, spacing (relationship to nearby routes), activity centers and critical destinations along the route, neighborhoods served, frequency, and ridership volume. In addition, the subway system influences the function and design of several bus routes. Some routes serve to feed residents to subway stations, while others provide underlying local service parallel to subway lines to fill in gaps between widely-spaced stations.

Service Types: Local/Limited/SBS Routes

There are 76 local Queens-numbered bus routes and 13 Brooklyn-numbered routes that serve parts of Queens. The M60-SBS also serves parts of Queens on its way to LaGuardia Airport. There are 19 limited-stop bus routes that serve the busier corridors in the borough, most of which are complimented by a local bus route. Also, there are 10 NICE Bus routes that connect to subway terminals in Flushing, Jamaica, and Far Rockaway.

Four SBS routes offer faster service within Queens:

- SBS connecting Jamaica, Flushing, and the Bronx;
- SBS connecting the subways and Long Island Rail Road to LaGuardia Airport;
- SBS connecting Manhattan and many subway lines to LaGuardia Airport, and
- SBS connecting the Rockaways to central Queens.

The local and limited-stop route networks serve multiple places, but are primarily focused on bringing customers to the subway and to three primary business districts: Jamaica, Flushing, and Long Island City. Many people work, shop, and study in these business districts.

Service Type: Express Routes

Parts of eastern and central Queens are served by a network of premium-fare express bus routes. The express bus services offer a one-seat ride from residential parts of Queens to either Midtown or Downtown Manhattan. There are 31 express bus routes that serve Queens.

Express buses have high-back seats, reading lights,and luggage racks. During the AM Peak, the trip to Manhattan is accelerated by a contra-flow bus lane on the Long Island Expressway, where all 31 routes converge. There is currently no companion eastbound bus lane during the PM peak, and various paths are used outbound into Queens.

Peak Service

The bus system carries an incredible number of people, and many of these people use buses during the peak commute times. The highest demand for bus service occurs between 7:00 and 9:00 AM, while a secondary peak occurs between 4:00 and 7:00 PM. Many jobs start around the same time as the school day begins, leading to a sharper morning peak as students and workers travel to their respective destinations. School lets out earlier than most workplaces, and workdays end at different times, helping to spread out the afternoon peak.

A typical peak period requires every one of our buses to be out on the street and in service. Finding land to build additional depots is incredibly difficult, which sets a hard limit on the number of buses we can run at any given time. This forces us to become as efficient as possible during peak service demand. To accomplish this, we have specialized routes to help increase the productivity of those limited resources. Some routes run solely during the peak period. Some routes have limited-stop variants of local routes that run only during the peak period to help customers get across the city faster during periods of the greatest congestion.

Off-Peak Service

Outside times of peak demand, bus frequencies vary. Some routes, especially routes that feed subway terminals, see a drastic reduction in demand after the morning peak, and a drastic increase in demand once again for the afternoon peak. Other bus routes, especially ones traveling along corridors with a mix of uses, see sustained demand throughout the day. These corridors with high off-peak demand are more productive, making better use of limited resources.

Overnight Service

Forty-four of the bus routes serving Queens have frequencies of 60 minutes or better between 1:00 AM and 4:00 AM. Of these, five have overnight service of 48 minutes or better. Six have overnight service of 30 minutes or better. One route serving JFK Airport and one route serving LaGuardia Airport have overnight service at 20-minute frequencies.

Weekend Service

Many of the limited-stop, peak-hour-only route variants operate during weekdays only. Weekday peak-only routes do not run on weekends. Smaller neighborhood routes typically do not run on weekends. Less-frequent variants along popular corridors usually do not run on weekends. Several express bus routes that run during the week do not have Saturday service, and even more lack Sunday service. Five express routes serving Queens have both Saturday and Sunday service. Two routes have Saturday service in addition to weekdays. The remainder of the express routes only operate during weekdays.

Understanding the System

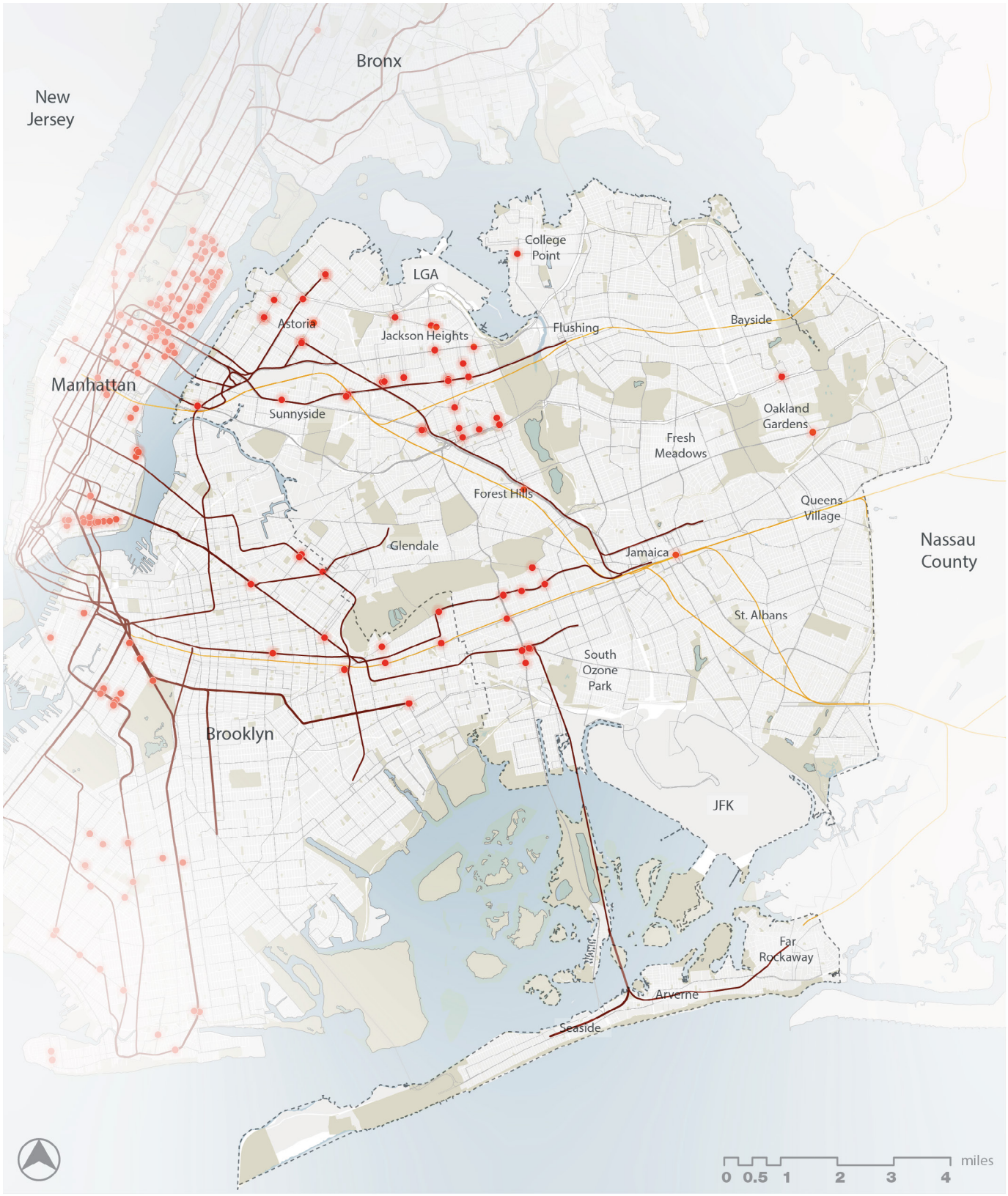
Currently, each borough has its own bus map. These maps contain all the local and express routes serving each borough. Brooklyn and Queens bus maps each show portions of the other borough, as several routes originating in one provide service to areas in the other.

Real-Time Bus Information

Customers have a few different ways to find the real-time location and anticipated arrival of buses. The Bus Time app and the MYmta app show the location of buses in real-time, and their expected arrivals, across the entire system. SMS messaging services are available by sending a 6-digit code posted at each bus stop to receive a text message with the anticipated arrival of the next bus. Some bus stops have pole signs indicating the expected arrival times. Customers can sign up to receive alerts related to their preferred routes with MYmta Alerts.

There are currently 47 Bus Time pole signs displaying arrival times throughout Queens. These poles are concentrated in Astoria, Corona, Elmhurst, and Woodhaven. As seen in Figure 33, some areas lack any Bus Time pole signs. These signs are usually funded through local city budget allocations based on community input in participatory budgeting or line-items created by local city council members.

Figure 33: Real-Time Bus Arrival Information Poles



Real-Time Bus Arrival Information existing bus stops featuring real-time bus arrival information signs

- bus stop pole sign with arrival information

- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: NYCDOT

Payments & Transfers

Currently, all customers must board through the front door of the bus and pay at the farebox using a MetroCard or exact change, except Select Bus Service customers, who use off-board fare collection and all-door boarding. On Staten Island, a pilot of the new OMNY system allows customers to use their mobile phones or contactless credit or debit cards to pay the fare on the bus, speeding up boarding times. OMNY will roll out to other boroughs by the end of 2020.

Currently, each customer gets a free transfer from one transit vehicle to another. There are a select few instances where three-legged transfers are granted. Three-legged transfers allow a customer to move among three different transit vehicles (bus-subway-bus), all for one single fare.

Boarding the Bus

Bus stops are designed to allow buses to pull up to the curb, so that customers can board from the sidewalk with ease. Not all bus stops have concrete sidewalks covering the entire length of the stop. Many times, buses are not able to reach the curb due to awkward placement of the bus stop, or other vehicles blocking all or part of the stop. Passengers must walk in the street on these occasions, making the experience more difficult and less safe.

Connections to Other Transit

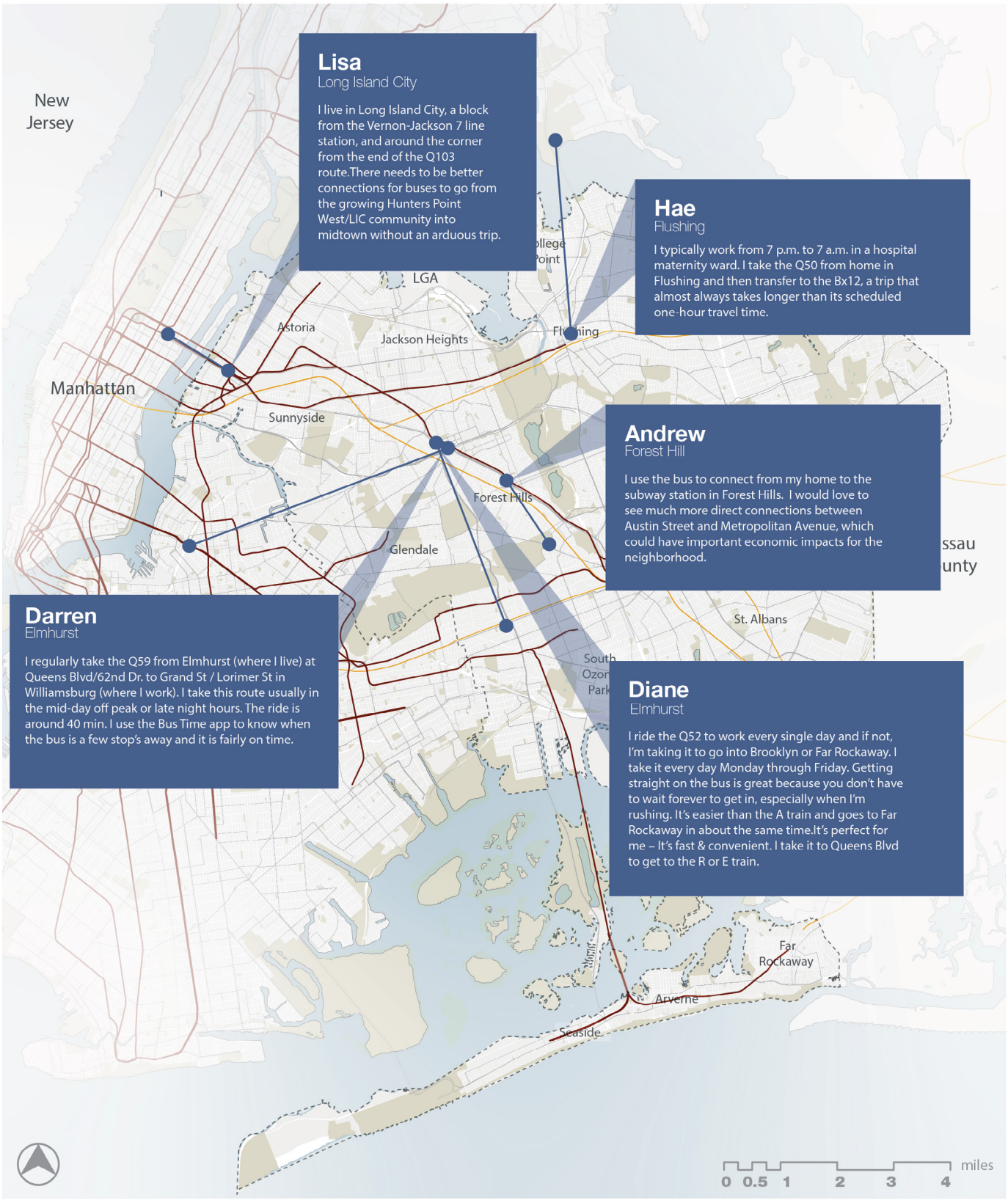
All bus routes currently serve subway stations, and most of the bus stops at subway stations allow for quick and easy transfers from the bus to the subway. Bus stops for buses departing from a subway station at the beginning of a route are not always as well located. This is especially true in Flushing and Jamaica, where many routes start and an enormous number of buses must maneuver past each other to pick up subway passengers.

Many bus-to-bus transfers occur with a short walk between buses. Some transfers are simple, easy, and require no walking at all—simply alighting from one bus, waiting, and boarding the next bus. Crosswalks are present for almost all the transfers that require the customer to cross a street to get to the connecting bus service.

4. WHAT CUSTOMERS WANT

- What We've Heard
- Priority 1: Reliable Service
- Priority 2: Faster travel
- Priority 3: Better Connections
- Priority 4: An Easy Ride

Figure 34: Commuter Stories



Commuter Stories

origins and destinations

bus routes

subways

LIRR

parks, cemeteries, and open space

waterbodies, rivers, and streams

What We've Heard

Every year, we receive thousands of suggestions from customers, advocates, and elected officials about changes they would like to see made to bus service. In addition to those, we went out and asked for more. From April through July 2019, we held dozens of meetings with elected officials, hosted public input sessions, met with community boards and civic associations, and talked to people on streets and on buses. Just under 2,000 respondents completed our online survey.

Throughout the feedback process, common themes quickly surfaced, regardless of where a customer lived or worked. People want to be able to rely on buses. They want faster service. They want better connections to more places. They want the whole process to be easier. We received plenty of route-specific advice, and we received some suggestions as simple as, "Fix your buses."

We listened at the open houses and read the survey responses. We then grouped the responses into these four primary areas of concern: reliability, travel time, connections, and ease-of-use.

Table 2: Customer Priorities

Customer Priorities	Definition/Importance	Components
Increased Reliability	The provision of consistent, timely, and dependable service.	On-time operation Know the bus will have sufficient capacity Know when the bus will arrive Know when you will reach your destination
Faster Travel	Moving customers more quickly from their origin to their destination, without undue delay from congestion or excessive dwell time.	Shorter total travel time Less time spent on the bus Fewer delays Wait time is reduced Transfers are more reliable Know the bus will not get stuck in traffic
Greater Connectivity	How much of the city is reachable from a given location?	More people can reach more places in less time The system is usable for more people, based on faster speeds, more reliability.
Improved User Experience	Taking the bus is a simple and comfortable exercise for new and recurring passengers Service and vehicles are accessible to people of all ages and abilities.	Easy to understand the service Know where the bus will take you (route directness) More comfortable while on the way All buses equipped with a ramp or lift.

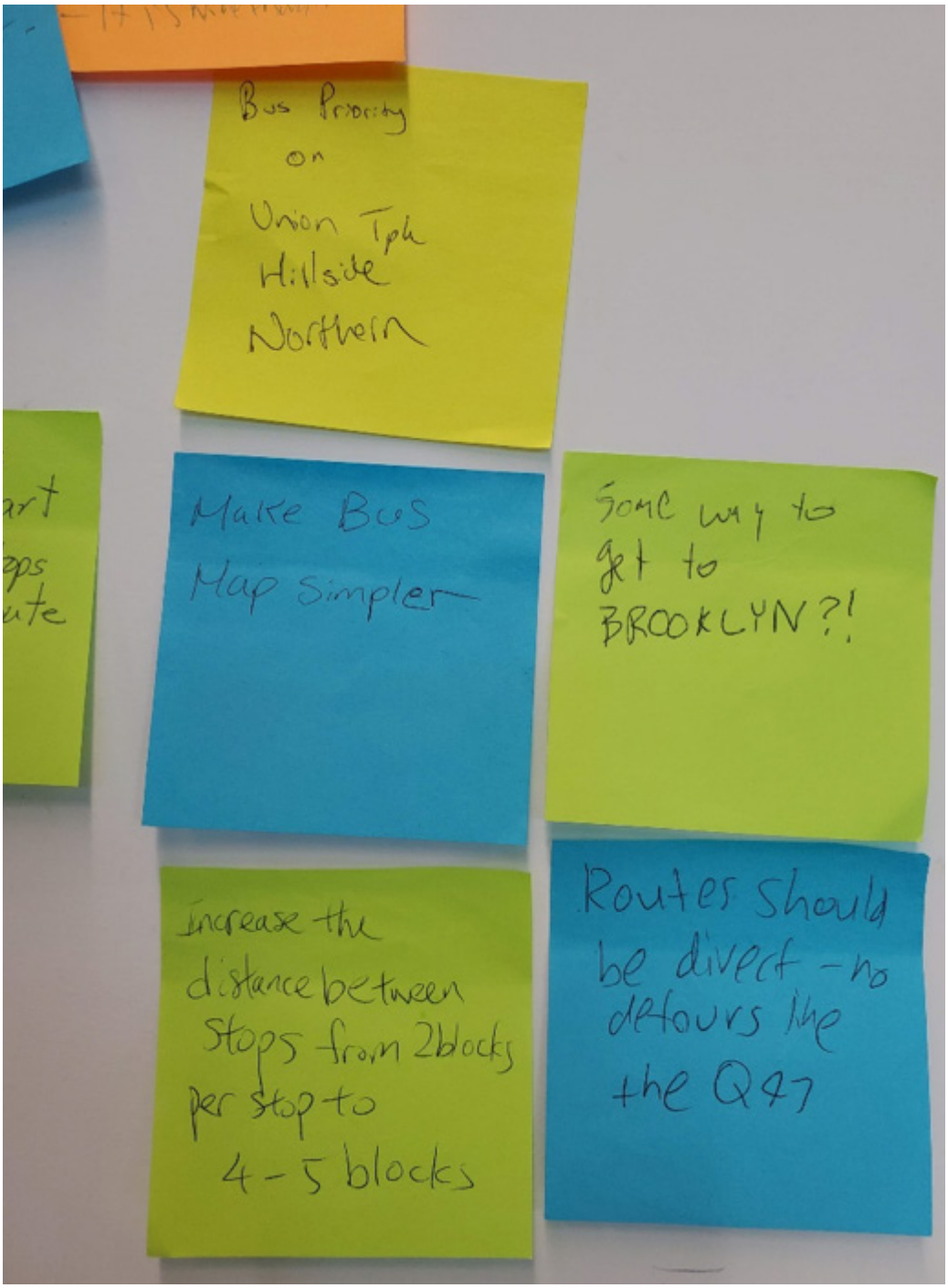
Open Houses

To introduce bus network redesign to residents and collect early input about how they would like bus service to be improved, we conducted nine open houses throughout Queens in May and June 2019. In total, nearly 300 attendees watched a short video introducing the complicated trade-offs made as part of bus network redesign, then heard a short presentation about the process of bus network redesign in Queens. Attendees then examined boards about specific bus-related issues that were staffed by professionals from the MTA and NYCDOT,as seen in Figure 35. Attendees expressed concerns about their existing bus services, offered ideas for improvements, and voted on their top priorities.

Figure 35: Open House in Jamaica

Comments included specific desires, such as, “More frequent service from LIC to Williamsburg,” and, “Make bus map simpler” (Figure 39).Some comments included actions that can be taken immediately without going through the entire network redesign process, like addressing the dangerous or awkward locations of bus stops. Some comments, such as making transitin New York City entirely free, are far beyond the scope of this project.

Figure 36: Customer Ideas from Open Houses



Attendees were asked to vote for priorities with the following prompt: "With limited resources, we need to focus on certain priorities. Using 4 dots, vote for your priorities." The results are shown below in Table 4: Votes for Customer Priorities.

Table 3: Votes for Customer Priorites

Priority	Vote Percentage
Bus Priority – dedicated bus lanes, TSP, other infrastructure improvements to speed the bus along	22%
Frequent Service – how often the bus comes, arriving as often as every 5 or 10 minutes	20%
Service after 9 PM – bus service later in the evening and into the late night	14%
Weekend Service – bus service on Saturdays and Sundays	13%
Real-Time Information – having a countdown clock at your bus stop that lets you know when the next bus is coming	11%
Bus Stop Amenities – having lighting at the bus stop, shelters, benches, schedule information, map of the route	9%
Midday Service – bus service in the middle of the day between the AM and PM rush hours	7%
Comfort – how relaxed/comfortable you feel on the bus; it is important to have a seat on the bus or a good amount of space to stand	5%

Survey

We conducted an online public survey to begin the Queens Bus Network Redesign project. Nearly 2,000 respondents took the survey, providing information on the existing bus network and their everyday experiences using it.

Sixty-nine percent of respondents use the bus more than 3 days a week, and 84 percent use it at least weekly.

Seventy-five percent of respondents use both buses and subways, and 11 percent just use a bus. Sixty-three percent of respondents transfer between a single bus and the subway on their typical one-way trip. Eight percent use two buses and the subway. Four percent use more than two buses and the subway.

Respondents were asked, "Which off-peak periods would you like to see run more service? If you had 10 coins to spend, how would you allocate them to increase service during these off-peak time periods?" As seen in Table 5: Off-peak Priorities, respondents prioritized the time periods just outside the peak (evening after the peak and midday between the peaks), over other choices.

Participants at open houses were asked a similar question. However, their prioritization task included other possible priorities to allocate resources toward, such as bus stop amenities and frequent service. With these additional options, midday service ended up much lower on the list of priorities with only 6.5 percent of the respondents voting for midday service in that informal poll.

Table 4: Off- peak Priorites

Priority	Vote Percentage
Evening after the peak (7-10 PM)	24%
Midday (9 AM - 3 PM)	22%
Saturday	19%
Sunday	17%
Late Night (10 PM - 1 AM)	12%
Overnight (1-6 AM)	7%

Respondents were told, “The new Queens Bus Network may look different than today; trips may need connections between buses or from the bus to subway.” and asked, “To improve connections, which of the following are most important to you?” As seen in Table 6: Improving Connections, reliable service slightly beat out short waits, with real-time arrival information close behind.

Table 5: Improving Connections

Priority	Vote Percentage
Reliable service	22%
Short waits	21%
Real-time arrival information	19%
Bus shelters	10%
Lighting	9%
No crowds	8%
Street furniture like benches or leaning bars	7%
Ample pedestrian space	5%

Among the specific questions, respondents were asked about destinations they typically travel to, as indicated in Figure 38. The most popular destinations among respondents include areas in Flushing, Long Island City, Astoria, Elmhurst, Jamaica, and Forest Hills. Other moderately popular destinations include JFK Airport, College Point, Bayside, Oakland Gardens, Queens Village, Glendale, Sunnyside, and Kew Gardens Hills.

Customers were also asked to identify segments of routes in which bus service slows down during their commute. The most popular slow segments identified include Downtown Flushing, Downtown Jamaica, the Queens Boulevard Corridor, and Long Island City. Outside of Queens, Midtown Manhattan, Greenpoint, and Williamsburg were identified as popular slow bus segments.

On-Street Engagement

Our staff went out to various locations throughout the borough in July 2019, to meet bus riders at bus stops and subway entrances. Hundreds of customers completed our survey based on these in-person discussions. We also handed out 11,000 pamphlets introducing bus network redesign, and gave people the opportunity to take the survey on an iPad right then and there. Some riders had specific recommendations for the bus stops we were at, such as creating more separation between express bus pickup locations and local bus pickup locations so the two groups of riders don't interfere with each other's boarding activities. Some riders explained how they have adapted to the bus system over time; for example, taking the bus to the E train at Parsons/Archer Av in the morning because it's closer, but riding the F train to Hillside in the afternoon to get a seat on the bus ride home.

Figure 37: More Customer Ideas from Open Houses

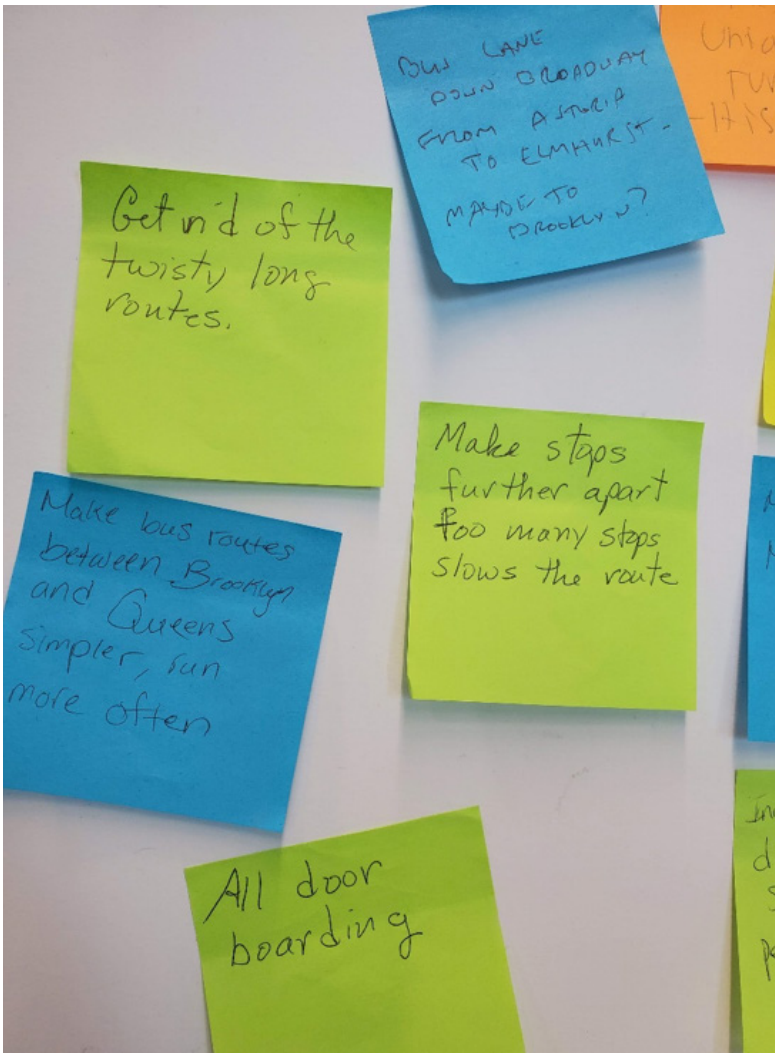
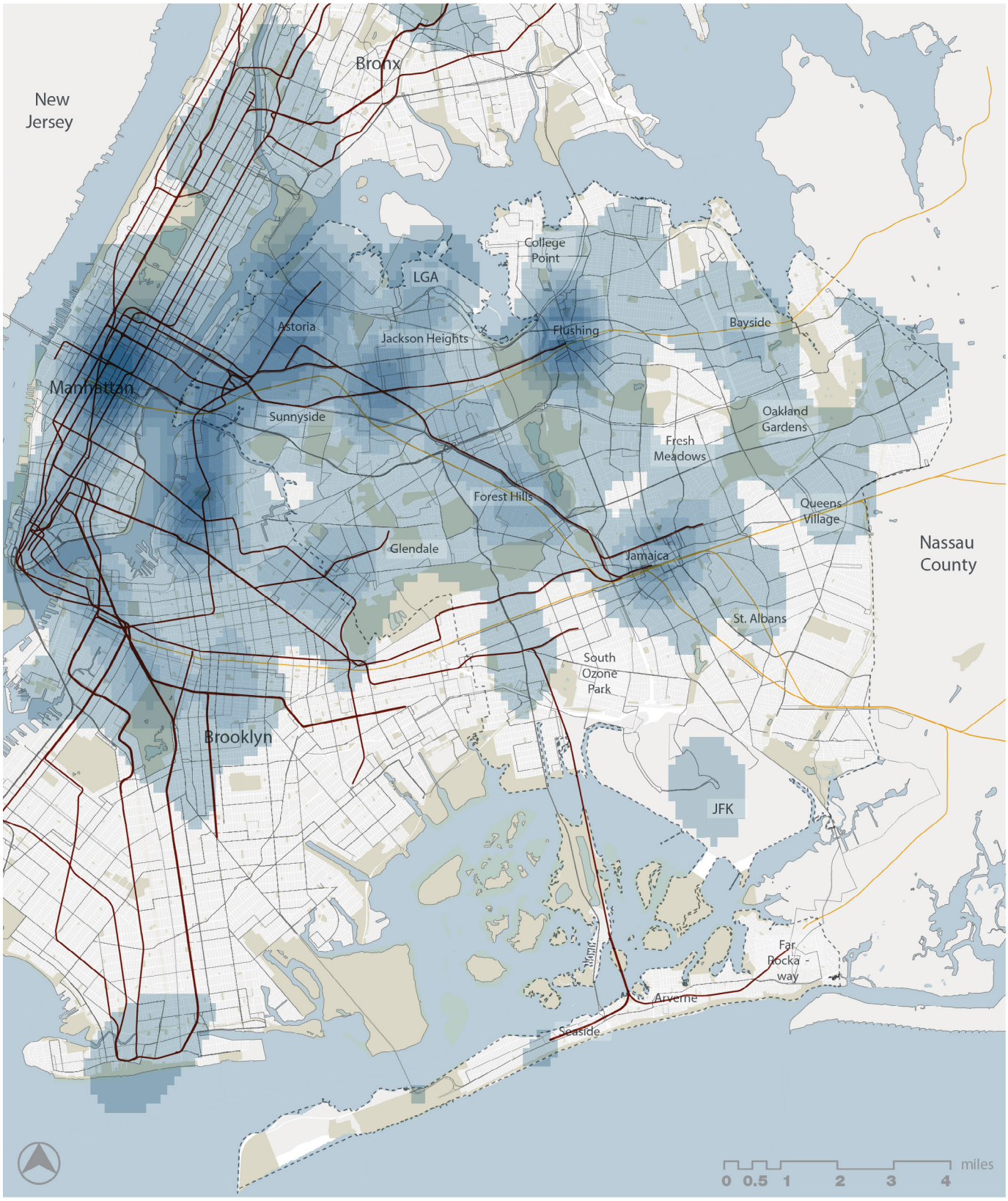


Figure 38: Popular Survey Respondent Destinations



Survey Respondents' Destinations

popular destination — most popular destination

bus routes
subways
LIRR
parks, cemeteries, and open space
waterbodies, rivers, and streams

PRIORITY ONE: RELIABLE SERVICE

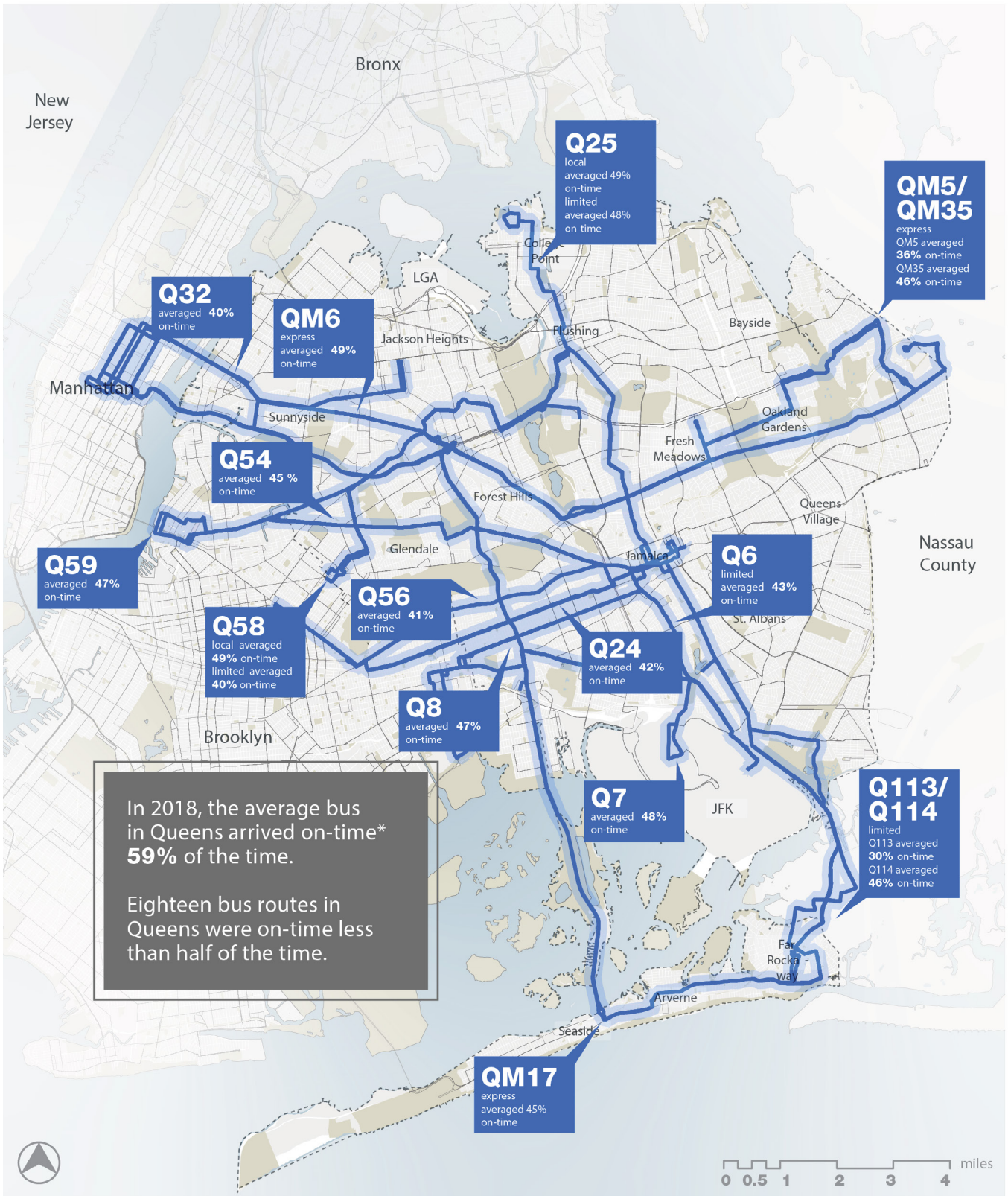
We received numerous comments about the need for bus service that arrives and departs consistent with its schedule. In 2018, the average bus in Queens arrived on-time only 61 percent of the time. Figure 39 identifies the 13 bus routes that were on-time less than half of the time in 2018.

On-Time Performance

On-time performance equals reliability. Routes can fail to operate on time by arriving at designated locations late (after the scheduled arrival time) or leaving stops early (before the scheduled departure time). Occasionally, routes, individual trips or segments within a route will operate consistently. But bus routes that routinely run late tend to operate inconsistently and experience overcrowding at certain points along the route. One trip will operate on time while the next runs significantly behind schedule. Or a trip runs on time one day, but not the next. This inconsistency, combined with the likelihood of having to stand for part of the trip, is frustrating to passengers and ultimately leads to ridership loss.

Buses can run late for any number of reasons: congestion, overcrowding delays, or scheduling issues. Often, these issues are related, making it difficult to pinpoint the exact causes of late, inconsistent service. The reason for delays can change from day-to-day, or even along different segments of a route. A double-parked car blocking a lane on a narrow street in the early segment of the route can cause buses to bunch. The bunching may then result in crowding delays farther down the route. If we don't identify and address the issues that occur on that narrow street early in the route, any fixes we try to apply to the overcrowding, like running additional buses, won't work, and may even make things worse.

Figure 39: Low On-Time Performance Routes



Bus Routes with On-Time Performance Below 50% (October 2018)

routes where on-time performance is below 50%

bus routes

parks, cemeteries, and open space

waterbodies, rivers, and streams

*on-time is defined as one minute early to five minutes late from the scheduled arrival time

Source: MTA BusTime, 2018

Overcrowding

In Queens, as in the other boroughs, headways (the amount of time between scheduled buses) on most bus routes are demand-driven. They tend to fluctuate throughout the day and evening as we attempt to match capacity with the ups and downs of travel demand.

Demand can change over time, both gradually and suddenly. A neighborhood can change demographically and socio-economically in just a few years. A school can close along one route and another can open along another route, shifting hundreds of daily trips. A large employer, residential complex, or mixed-use development can come on-line at any time, generating a sudden, localized demand surge.

As demand increases along a route, buses stop more frequently and dwell at stops longer, increasing travel time. If a bus arrives behind schedule, it picks up passengers who should have caught the next bus, further burdening its passenger load and travel time. When loads exceed the seating capacity of the bus, passengers take longer to get on and off the bus, and operators usually drive less aggressively to avoid injuring standees, increasing travel time still further.

Our planners regularly monitor total ridership and ridership patterns closely and try to reallocate resources to provide sufficient capacity. When gaming machines were introduced at the Aqueduct Racetrack, we extended bus service into the parking lot to accommodate customer demand. As the popularity of the casino increased, we increased service in kind. We also adjusted service after the Gateway Mall expanded in Spring Creek, extending bus routes and adjusting service to meet the additional demand.

Bunching

Customers pointed to bus bunching as a key issue with reliability. Bunching occurs when buses run close together, leaving service gaps between. For example, one bus may run into delays from a double-parked car. By the time the bus gets around the double-parked car, the next scheduled bus is hot on its heels. When that next bus arrives, the double-parked car may be gone, and this second bus cruises right through, catching up to the bus in front of it.

"Bus bunching is incredibly frustrating. You wait a long time for a bus, then one packed bus and two empty buses show up at the same time. I don't understand how the two empty buses caught up with the packed bus if traffic was impacting all of them."

– from the Queens Bus Redesign Online Survey

Narrow Streets

Some streets were repeatedly mentioned by customers as too narrow for bus service, such as Holly Avenue in Flushing. Customers identified narrow streets in comments at open houses, in the online survey, and in meetings at civic associations. Some streets do have nearby parallel streets that might be appropriate for bus service. Other streets are the most appropriate streets for bus service in an area where all streets are narrow. In the cases where a street is essential for bus service to the neighborhood, we will look at other options to keep the bus on schedule.

PRIORITY TWO: FASTER TRAVEL

Queens buses averaged 9.0 MPH in 2015, but slowed down to an average of 8.7 MPH in 2018. Customers noticed.[11] Figure 40 illustrates slowing bus speeds throughout Queens with a few notable routes highlighted.

Residents of "subway deserts" want to get to the subway as quickly as possible. While there are limits to how quickly we can move people over a certain distance, we can make changes that get customers from places like Rosedale to the central business district of Manhattan more efficiently.

"It's frustrating how often buses get caught up in traffic exiting the Queensboro Bridge, even though none of these buses go over the bridge. It would be nice to examine other routes around that congested area."

– from the Queens Bus Redesign Online Survey

Frequency Improvements

Customers asked for improvements to frequency, and complained about buses that serve other routes coming and going by before the one they want ever arrives.

"If you miss a bus during rush hours you may not see another bus for 15-20 minutes, by which time the stops are packed and people are left waiting or have to walk."

– from the Queens Bus Redesign Online Survey

Too Many Bus Stops

Customers complained about too many, closely spaced stops on their routes. Once aboard a bus, every additional stop the bus makes adds time to their travel. They told us they want fewer stops.

"Fewer stops on Q18. Stops don't have to be a few blocks apart. They can be farther so bus moves faster."

– from the Queens Bus Redesign Online Survey

[11] Data from MTA Dashboard.

Figure 40: Slowing Bus Speeds

Average Bus Speed & Change in Bus Speed (2014-2018)

- routes with speeds below the average (under 8.6 mph) and with a decrease in speed over 10% between 2014-2018
- routes with a decrease in speed over 10% between 2014-2018
- routes with speeds below the average (under 8.6 mph)
- bus routes
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: MTA BusTime, 2018

PRIORITY THREE: BETTER CONNECTIONS

Customers want to go more places, faster. While part of the solution certainly involves speeding up buses, there are other things we can do, like establishing connections between routes that don't currently exist in the bus network. Since the bus network has not changed much in the last 50 years, there are many pairs of origins and destinations that are not served well. These include both trips within and between Queens neighborhoods, and trips to other boroughs.

"Bus service changes should be focused on connecting areas of Queens that are currently bisected by highways and rail yards."

– from the Queens Bus Redesign Online Survey

Connections to Other Boroughs

Connections to Manhattan will likely be the most vital and often used. Customers certainly want to experience improvements along those connections. That said, during our outreach, we also heard about the need for additional connections between Queens and Brooklyn, and Queens and the Bronx.

"Please also focus on bus connectivity to Brooklyn. There is not much subway access across the boroughs (particularly to the area of Downtown Brooklyn) and this could be improved a lot."

– from the Queens Bus Redesign Online Survey

Destinations in Brooklyn that customers would like to reach more easily include Williamsburg, Downtown Brooklyn, the Brooklyn Botanical Gardens, and Bed-Stuy. Popular destinations in the Bronx include the South Bronx, Yankee Stadium, and the Bronx Zoo.

Connections to the Activity Centers of Queens

Many customers want more direct access to downtown areas, either for the subway connection or for the activities concentrated there. Existing bus services do bring many customers into these areas, but the routes usually turn circuitously, winding their way across various neighborhoods to pick up people.

Most residents of Queens live within a five-minute walk of a bus stop. However, not all live within a five-minute walk of a bus stop with frequent service to central hubs, such as Jamaica, Flushing, and Long Island City. Only a few neighborhoods — Flushing, Jamaica, and Jackson Heights —have frequent service to more than one downtown.

Figure 41 identifies the areas within a five-minute walk of a bus stop with service frequencies of 5-10 minutes to Jamaica in the AM peak period.

Figure 41: Jamaica Connectivity

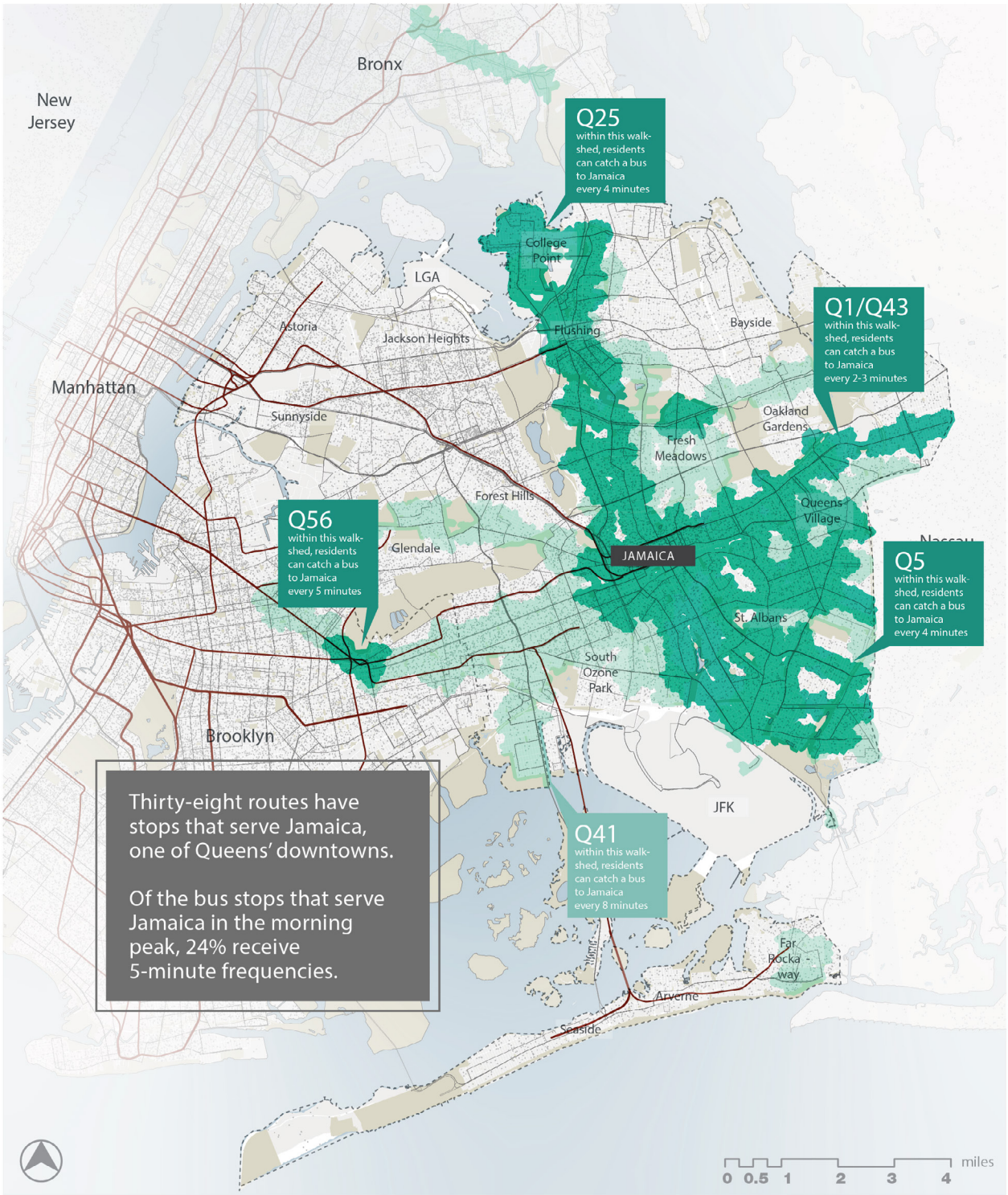


Figure 42 identifies the areas within a five-minute walk of a bus stop with service frequencies of 5-10 minutes to Flushing in the AM peak period.

Figure 42: Flushing Connectivity

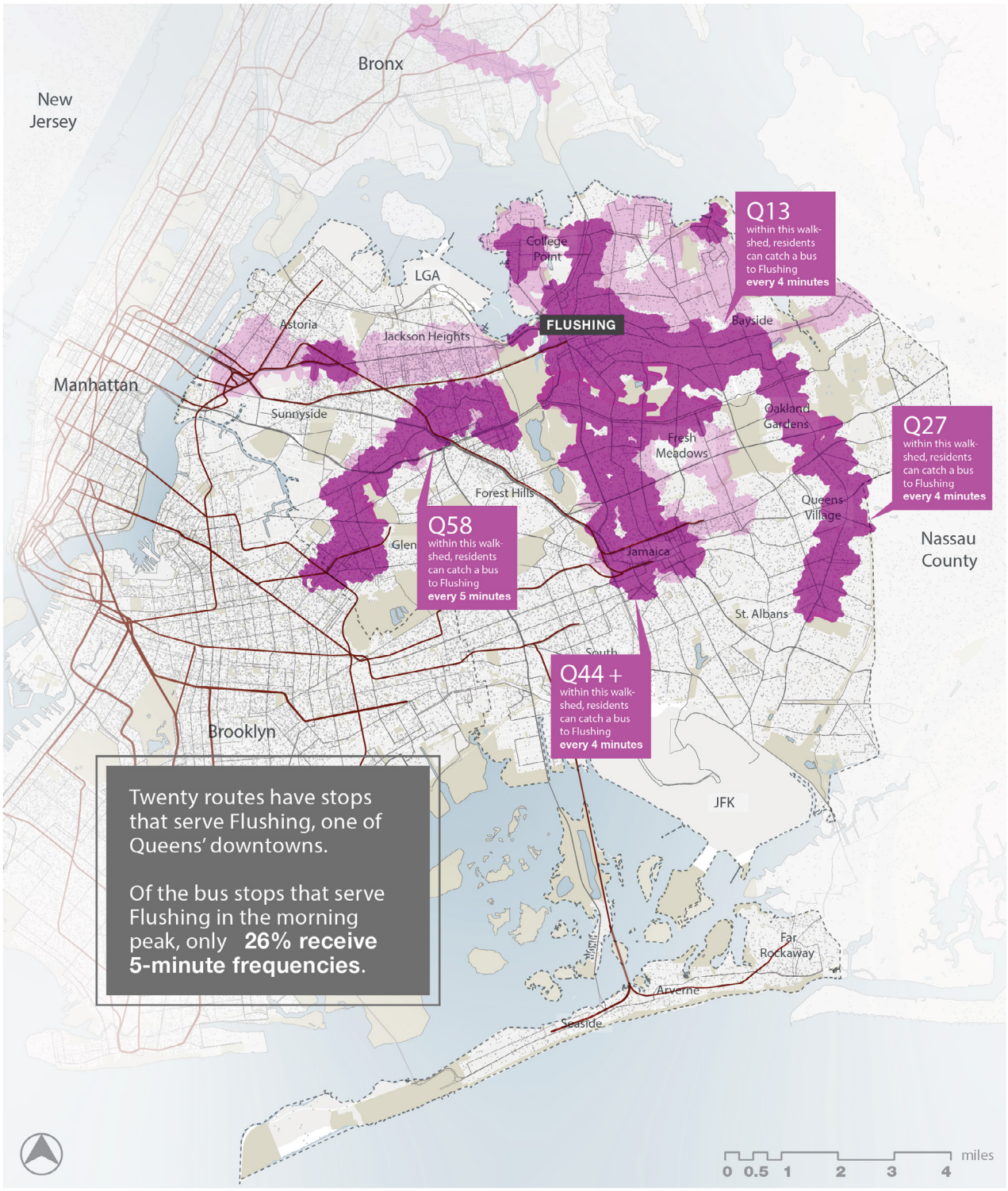
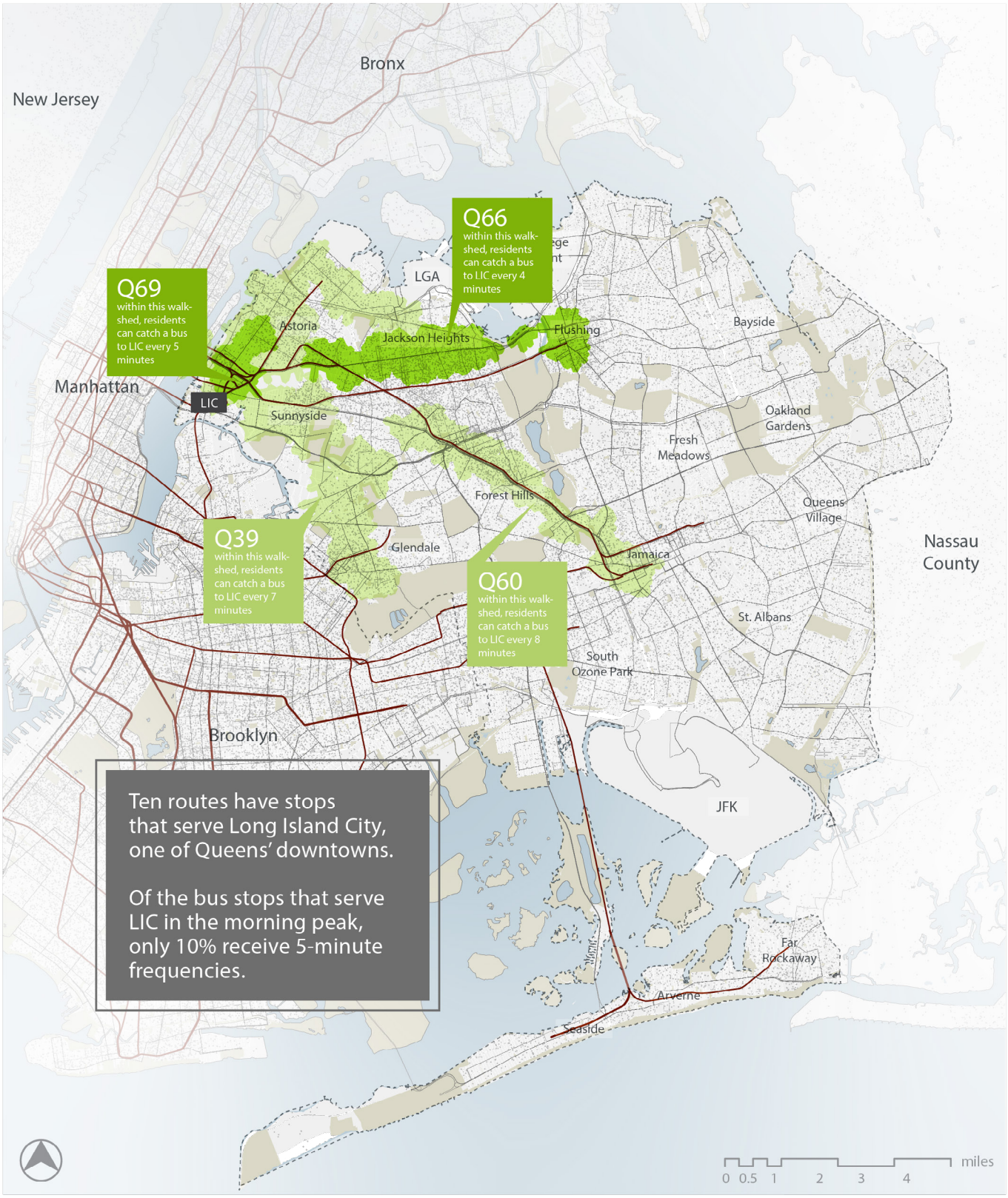


Figure 43 identifies the areas within a five-minute walk of a bus stop with service frequencies of 5-10 minutes to Long Island City in the AM peak period.

Figure 43: Long Island City Connectivity



Five-minute Walkshed (quarter-mile) to Bus Stops Serving LIC, 5- and 10-minute Frequencies (AM Peak)

- 5-minute frequenices
- 10-minute frequenices
- bus routes
- subways
- 1 dot = 100 residents
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Corridors

Customers want routes to move more quickly through corridors, as well as for routes in corridors to be better aligned. Some corridors contain multiple routes that are not coordinated except for bus stop locations.

Customers understand the bus network in terms of which corridors are long, straight routes and which are circuitous. Some corridors pose a conundrum: they are home to important destinations like shopping and subway access, but congestion along the street slows down bus service, making it less useful in the immediate area, and less reliable along the rest of the route. Junction Boulevard is an example of a corridor that is both essential and troublesome for bus service.

Connections to Commuter Rail

Customers want bus service to connect to many of the Long Island Rail Road stations that do not currently have bus service. For LIRR stations that do have bus service, some customers asked for better scheduling between the buses and the trains. While this is understandable, it's likely not feasible. LIRR commuter service runs at varying headways that rarely sync up with bus service, which requires a consistent schedule to deliver reliable service to all parts of the route.

In addition, many Long Island Rail Road stations are located in areas with low bus ridership. There might be a full half-hour wait between buses during the midday. If the train comes soon after the bus departs, long waits are possible.

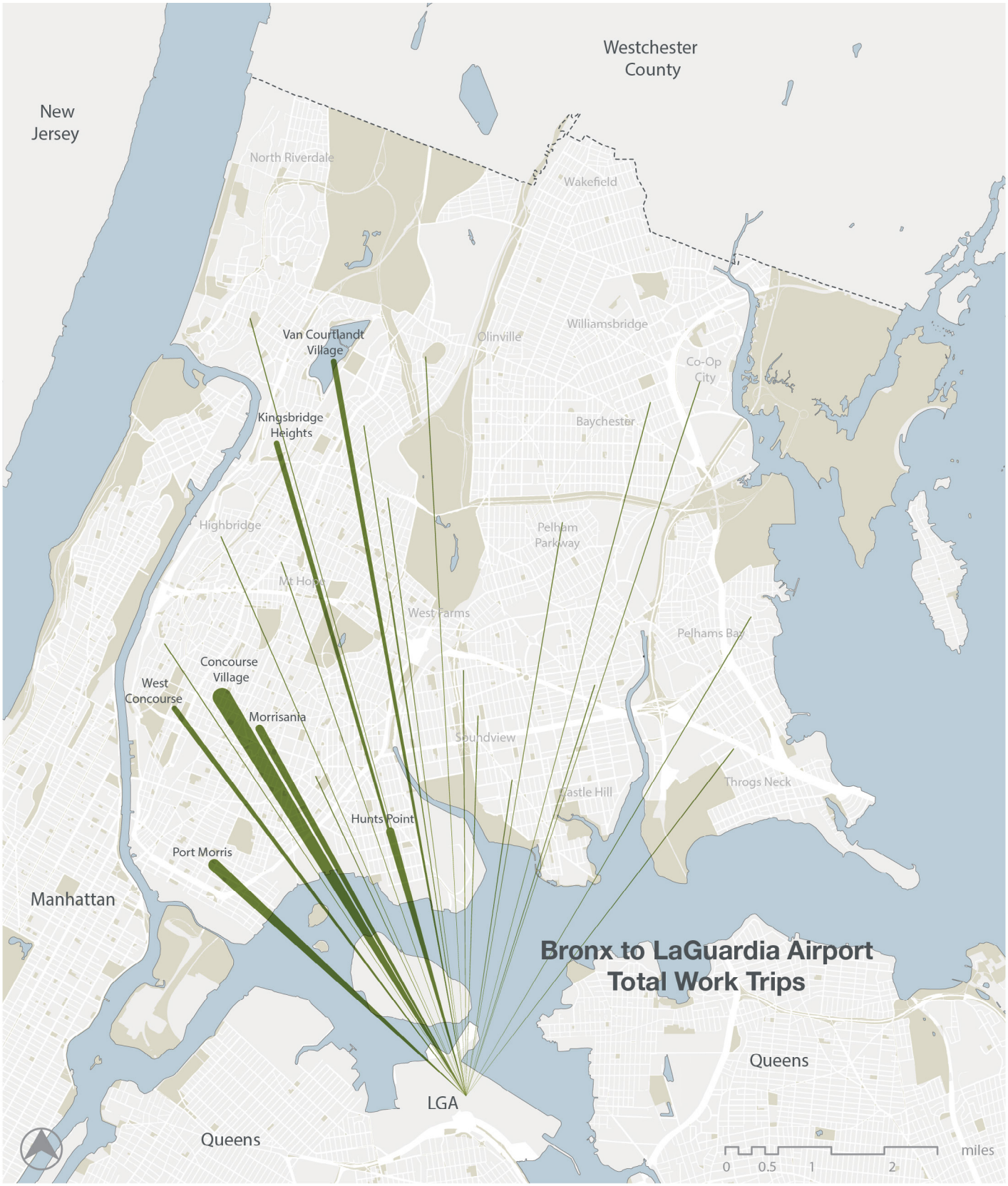
Connections to the Airports

Many customers want more direct service to the airports. There was a large constituency of residents in the Bronx who work at LaGuardia Airport and requested a new, direct connection to the airport. Currently, residents of the Bronx have a few options, but all include transfers:

- Travel to Harlem and board the SBS bus from there to the airport
- Travel on one of the two Bronx-to-Flushing buses and transfer in Flushing to the bus that serves the airport.

LaGuardia Airport employees who live in the Bronx mostly reside in the South Bronx, as seen in Figure 44. They typically commute by traveling south to Harlem, where they can transfer to a Select Bus Service to reach LaGuardia.

Figure 44: LaGuardia Airport Employees Commuting from the Bronx



LaGuardia Airport Employees Commuting from the Bronx by Neighborhood Tabulation Area, CTPP, 2015

- fewer total work trips
- more total work trips
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

PRIORITY FOUR: AN EASY RIDE

Customers want the whole process of riding the bus to be easier, from figuring out which bus to take, to finding the right bus stop, to paying and boarding, to knowing when to get off. Riding the bus can be daunting for those who have never done it before. You must have enough change to board a local bus, or a MetroCard with money on it. If you don't, and it's too much trouble to get them, you're likely going to find another option. The convenience of on-demand technology has set expectations for quick, easy, user-friendly service in all aspects of life. Customers expect riding the bus to be no different.

Understanding the System

Customers need to be able to figure out where a bus goes, and how long it will take. Trip-planning software helps guide them, but only when they have a specific destination in mind. Nothing exists in the customer realm to help them understand all the places they could reach in a reasonable amount of time if they wanted to. They are unaware of indirect connections that might take them to their destination more quickly, and don't know what destinations exist along connecting bus routes.

"Make the map easier to understand. It's crazy. That's why people don't take the bus, you have no idea where you're going... or what stop is next. Make it more like the subway or an M60/Q70 bus."

– from the Queens Bus Redesign Online Survey

Customers are interested in overnight service that takes them across the borough. About half of the routes serving Queens (41 routes with varying frequencies) have overnight service. But there is a lack of information available on where customers can go at night via bus service. The subway system has a night network map, but the bus system does not. Some agencies provide information on the graphic portion of a system map to indicate which services run at night. Our borough bus maps indicate night service on the back side in the service descriptions.

Real-Time Bus Information

Customers overwhelmingly value real-time information. They want to know that the bus is coming and when it will arrive. They stated that the BusTime App, which shows the locations of buses en-route, is not very reliable at the beginning of a route. And they asked for more real-time displays at bus stops to indicate how soon the bus is coming.

Payments & Transfers

Customers who use Select Bus Service want to see all-door boarding incorporated into more, if not all routes. They believe it helps speed up the boarding process, and helps fit more customers on the bus by allowing for multiple points of entry.

We also heard about the challenges customers face when trying to access a MetroCard Vending Machine when they don't live near a subway station. Mobile payment (like OMNY, our new fare payment system currently available on a limited basis) would help address this challenge.

Customers also expressed interest in having more flexibility with free transfers.

Boarding the Bus

Customers were particularly concerned with how often they are forced to board and alight in the street instead of on the curb. Many customers acknowledge the presence of other vehicles blocking the bus stop, but some also asked for better bus stop placement or additional room for buses to pull to the curb.

Connections to Other Transit

Customers asked that buses have transfer locations that are better planned, with no requirement to cross a street, if possible. They indicated that the amount of time spent waiting for the bus is one of the key factors in satisfaction with transfers, as well as the reliability of the connecting service and the availability of real-time information.

5. FINDING THE WAY FORWARD

- Design a Network to Be More Reliable
- Decrease Travel Time & Speed Up Buses
- Expand Connectivity Across the Borough and City
- Make it Easier to Travel by Bus
- Improve Productivity & Financial Efficiency

FINDING THE WAY FORWARD

In May 2018, Andy Byford, President of New York City Transit, announced that as part of the Fast Forward plan, we would reimagine the entire bus network over the following three years. This effort is essential to move beyond the complications attached to the existing network. Much of the existing bus network was developed piecemeal almost one hundred years ago, with few structural changes made since. One route still serves an area where the ferry to the Bronx stopped running soon after the Whitestone Bridge opened in 1939. Another terminates at some ballfields south of Jamaica, because that's where former trolley barn used to be.

We've made small changes to the bus network for decades. These include regular adjustments to schedules and rerouting along neighboring blocks. Other changes might split a route into two routes with different purposes, one to serve the airport from the subway, the other to serve the neighborhood. More drastic changes include the creation of Select Bus Service. These changes helped, but they were not enough to overcome the inertia of the existing system. Tinkering at the edges cannot solve the major problems with our bus network. To really make a difference, we need to look at the entire network.

A network redesign is a comprehensive restructuring of an existing transit system's layout and operations. The goal of this network redesign is to draw a new bus network as a comprehensive whole, rather than through incremental, short-term planning-which, over time, can lead to a fragmented, poorly coordinated network.

Goals identified by our customers for this bus network redesign include:

- Improved on-time performance and reliability
- Increased frequency and bus speeds
- Improved connections to more places
- Network simplification to increase ease of use

Transit service improvements will likely include:

- Emphasis on a new high-capacity/high-frequency core
- New routes and changes to route alignments and schedules to improve connectivity
- Bus stop consolidation to increase travel speed and schedule reliability
- Bus priority improvements along major transit corridors to increase travel speed and schedule reliability
- Infrastructure improvements, including bus lanes, queue jumps, and other operational and passenger amenities
- Schedule and travel time adjustments to improve service frequencies, address on-time performance issues, and reduce overcrowding and bus bunching
- Travel paths designed to avoid excessively narrow streets
- Straighter routes, with fewer left turns

A bus network redesign is essential to improve bus transit and to reverse ridership loss. To turn the corner, we must develop a redesigned network of routes and schedules that better respond to origin-destination patterns, passenger demand, and traffic conditions. This will help maintain existing ridership and attract more riders.

The scope of the Queens Bus Network Redesign includes all routes that touch Queens. Included are all "Q" local, limited, and SBS routes, "QM" and "X" express routes operating in Queens; 13 local Brooklyn routes with a "B" designation running near Queens or into Queens; one "BM" express bus that runs in Queens; and a Manhattan SBS route than runs in Queens. This makes a total of 144 routes that are included in this analysis.

Increasing traffic congestion—whether caused by new development, more trucks and delivery vehicles on the street or the proliferation of rideshare options—is taking a toll on New York City's bus network. Continued erosion in bus speeds and on-time performance impacts service reliability and passenger confidence in the bus system, contributing to ridership loss. As more riders abandon buses for other modes, congestion worsens, and transit operations and ridership are further impacted.

Relief is not coming from an expanded subway network, which is less robust in western Queens than in most of the rest of New York, and entirely absent in the half of the borough east of Flushing and Jamaica. Resources for the subway are focused on repairing the existing system and increasing accessibility, which may provide relief for surface transit in the long term, but will have little or no impact in the short-term.

Buses already cover most of the city, and will continue to cover most of the city, so "coverage" issues that other cities face are not our issues. We need more connectivity across long urban distances. So, our trade-off is between high-ridership orientation (short fast trips to the subway, for example) and frequent-enough access across distances that otherwise require an automobile (whether it's your own and you must park it, or a taxi, or a TNC, or a black car, or a dollar van). Those trips need to be as fast as possible, and not get slowed down to stop at every cross-street along the way.

"A bus network that follows the western Queens grid would be a great service. The more frequent the better"

– from the Queens Bus Redesign Online Survey

The following are strategies we can use to improve various aspects of the passenger trip.

Before the Trip

- Provide easy access to a high-quality trip planner with real-time bus and train location information, schedules, maps, fare policies and payment, information on attractions around stations and stops, and other helpful information for the customer

At the Bus Stop

- Improve pedestrian paths and connections to bus stops

Fare Payment

- Make mobile payment the easiest and most convenient way to pay bus and subway fares
- Install tap-and-go card readers at every door of every bus to speed up boarding

Increasing Bus Speed

- Consolidate bus stops to reduce the number of stops along the route
- Adjust bus stop locations to reduce conflicts with vehicle traffic
- Adjust lane markings and intersections to avoid buses getting stuck in traffic
- Implement Traffic Signal Priority treatments
- Develop queue jump lanes by allowing buses to make through movement from right turn lanes
- Operate full-time or part-time dedicated bus lanes

At Transfer Points

- Locate buses as close to rail station entrances as possible to reduce customer walking distance

DESIGN A MORE RELIABLE NETWORK

Making service more reliable is far from simple, and correcting reliability issues for even one route can mean tackling a wide range of problems, some of which are outside the direct control of this transit agency. However, improving reliability is the best way to retain existing riders, and to encourage for more types of trips.

Physical Layout

The bus routes that serve the primary downtowns within Queens (Flushing, Jamaica, and Long Island City) carry a disproportionate share of the Queens Bus Network ridership, as seen in Figure 45. Why is this important? Since so many of the Queens bus routes pass through these three business districts, delays that start in these centers often cascade to other areas of Queens. Are there ways to serve these downtown areas without excessive delays due to congestion? Are there corridors through these downtowns that would allow direct connection to the subways, but also allow fast travel through the downtown?

Figure 45: Queens Downtown Bus Riders

Paradoxically, the very factors that promote and encourage bus ridership—dense urban areas that are walkable and have lots of activity—are the same factors that contribute to bus delays. Because so many bus trips serve dense downtown areas, a large portion of the bus network is susceptible to problems associated with slow speeds and severe congestion, especially during commuting peaks.

What is This Route For?

Some routes should focus solely on providing coverage services, giving access to a wide portion of the borough. Others can focus on getting large groups of people across large distances quickly, especially interborough trips and long intraborough trips. Some routes should be created simply to serve a high-ridership corridor in a short, succinct pattern.

The current bus network has routes with too many variants—short turns, variations of destinations, and partially overlapping pieces of route structures. Customers have been very clear about wanting more clarity in the design of the bus network, with simpler routes that serve a single purpose. It needs to be clear what each bus route accomplishes. When possible, most routes should just take the most direct path between major destinations, and not try to serve too many diverse constituencies.

Is This Street Fit for a Bus?

Customers, bus operators, and MTA staff all identified streets throughout the borough that need to be examined to determine if they're too narrow for bus travel. If these streets do prove to be too narrow for fast, frequent bus travel, they will be avoided when drawing the new bus network, if possible. Some streets may be the best possible way to move across the borough or serve a specific neighborhood. So, instead of avoiding the street altogether, where possible, we'll work with NYCDOT to examine possible improvements to the street to better accommodate bus travel.

Is This Turn Worth It?

Many routes meander through the borough and take multiple turns along the way. Turns slow the speed of buses. Left turns are especially cumbersome.

For example, in analyzing bus speeds on the route on Seagirt Boulevard, one turn immediately jumps out as extremely detrimental to service.

Heading eastbound on Seagirt Boulevard, there is a far-side stop on Crest Road for the customers living in the Wavecrest Apartments (see Figure 46). Bus operators on this route have only 600 feet after the stop to cross three lanes in order to turn left. Speeds drop to incredibly low averages on this portion of the roadway. This turn is essential to get customers from the Rockaways to the center of Far Rockaway at Mott Avenue, and to shopping and other activities in the area.

To provide direct access from Seagirt Boulevard to Mott Avenue, we could run service along the Rockaway Freeway. Doing so would bypass the troublesome area of this combined stop and turn. However, the ridership between the Wavecrest Apartments and Mott Avenue is too significant to bypass. Therefore, a new solution needs to be developed.

Can the stop be moved further west, away from the highest density of residents? Is there a different travel path that will allow the Wavecrest Apartments to be served, without slowing bus speeds? These are the types of situations we'll examine and answer as part of a bus network redesign.

Generally, straighter lines make for better transit, because fewer turns mean faster buses. However, running fast service is not always the goal of a bus route. Coverage services do not serve a goal of ridership, but instead provide essential access to areas that lack enough of the ingredients to merit a high-frequency, ridership-oriented service. For these routes, curving and meandering might be acceptable if they serve the purpose of providing access. However, for ridership-oriented routes, any turns created as part of the new network will be evaluated to determine their necessity. The bar is set higher for turns on ridership routes, especially left turns.

Figure 46: Left Turn Slowdowns

Left Turn Slowdowns Q22 eastbound speeds, 2017

Crawl — Sprint

parks, cemeteries, and open space

waterbodies, rivers, and streams

Source: MTA BusTime, 2017 - 2019

DECREASE TRAVEL TIME & SPEED UP BUSES

Improving on-street infrastructure and operations to halt and reverse the decline in bus speeds means changing the operations of the streets themselves. This requires the coordination and cooperation of other stakeholder agencies, local communities, and other users of the right-of-ways along with an intensive application of staff resources and capital funding.

Table 6: Strategies to Keep the Bus Moving

Cause of Delay	Strategy
Congestion	Bus priority, including full or part-time dedicated lanes and queue jumps (including right turn lane queue jumps)
Traffic signal delays	TSP, planning the network to avoid long signal delays, changes to traffic operations and signal timing to increase bus travel speeds
Un-signalized/unprotected left turns	To be avoided wherever possible
Left turns (signalized)	Review stop positioning prior to a left turn to ensure that buses have sufficient distance to transition from stop to left turn lane
Dwell time during boarding and alighting	All-door boarding, increased use of mobile payments
Deceleration towards a stop/ Acceleration from a stop	Fewer bus stops with wider bus stop spacing (stop consolidation), move stop locations to avoid traffic delays (near side/far side, parking and traffic operations issues)
Re-entry delay due to passing traffic	In-lane bus stops (bus bulbs and boarding islands), review of stop locations to avoid parking and traffic operations issues
Other buses (bus bunching)	Tiered stops, non-duplicative services, sufficient time in schedules to provide bus spacing

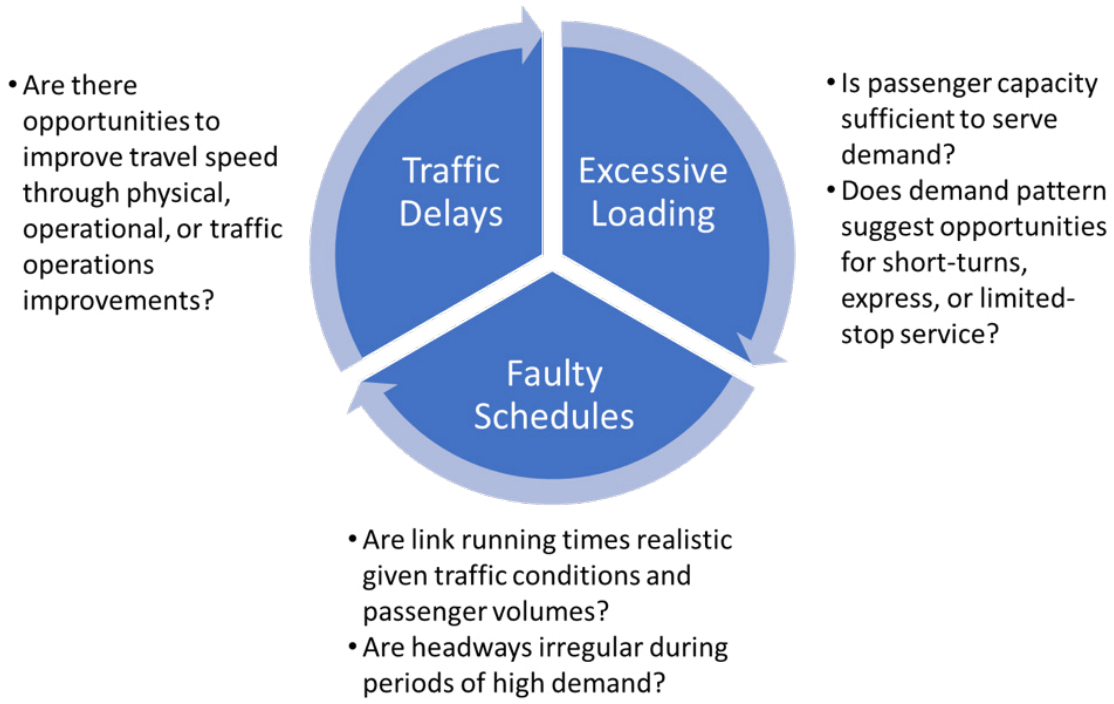
Traffic Delay

Traffic volumes grow as population and employment grow. In Queens, as in most of New York, it's not possible to add roadway capacity to absorb increases in traffic volume. Traffic congestion impacts buses more acutely than other vehicles, because of their frequent stopping to pick up and drop off passengers at the curb, their need to merge back into traffic, and because they are larger, less maneuverable, and take longer to accelerate and stop. Increasing traffic congestion can also make bus speeds slower. If travel time on a route steadily increases, is similar on most weekdays, increases more during peak traffic periods and on trips in the peak travel direction, increases in some parts of the route more than others, and increases without a significant ridership increase, then growing traffic volumes and congestion are most likely the primary causes.

There are various methods available to speed up buses, but the best way to avoid traffic delay is with dedicated bus lanes. The more a bus lane is separated from other traffic, the faster and more reliably it can run.

Figure 47: Delay Diagnosis depicts a brief on-time performance diagnosis that can attribute delays to various causes

Figure 47: Delay Diagnosis



NYCDOT's Queens Plan

New York City Department of Transportation is an essential partner. They're committed to helping us address slow bus speeds and reliability issues that stem from road conditions and operations in tandem with the Queens Bus Network Redesign.

We work continuously with NYCDOT to improve bus speeds through many different strategies. The Better Buses Action Plan, released in April 2019, contained several excellent opportunities to help speed up buses, including:

- Improve existing bus lanes (protected bus lane pilot on Archer Avenue)
- Install new bus lanes
- Long-term capital improvements, including special accommodations for buses (Queens Boulevard)
- Intersection-specific projects to benefit riders (Liberty Avenue)
- Roll out TSP to more intersections every year
- Expand bus lane enforcement, including tow truck teams
- Add bus bulbs and bus boarding islands to speed up boarding and eliminate re-entry delay (Northern Boulevard)
- Add bus queue jump signals

The map in Figure 23 shows that there is an opportunity to build a network of bus lanes that would prioritize bus flows in Queens, instead of the current unconnected bus lane segments throughout the borough. The strongest corridors with consistent bus priority are Woodhaven Boulevard and Main Street south of Flushing. Building out this network would help improve bus speeds and get Queens customers to their destinations quickly and efficiently.

NYCDOT is progressively improving bus lanes, not just by increasing the total lane-miles of bus lanes, but also enhancing existing bus lanes. A pilot project for the bus lane on Archer Avenue is going to physically separate the bus lane from other traffic using various temporary physical barriers. After further study, including increasing the length of the segment protected, NYCDOT can later decide how best to permanently protect this and other bus lanes from intrusion.

Bus Stop Consolidation

Bus stops in our system can be so close together that the bus barely has enough time to leave one bus stop before it enters the next one. A 40-foot long bus traveling between two stops that are 400 feet apart is already a tenth of the way to the next stop as soon as it pulls out. During the interludes between stops, the bus never picks up any real speed. This contributes to the overall reduction in speed experienced by customers. Some routes have fewer than 500 feet between stops.

Fewer stops on a route also reduces re-entry delay. This is the time that passes between the bus door closing and the bus rejoining the flow of traffic. This delay can easily reach 20 seconds per stop during off-peak travel times. In peak rush-hour traffic, that delay can exceed one minute per stop. Taken together, these small delays create major problems with service that directly impact reliability.

Figure 48 shows two bus stops that were on the same block, only 330 feet from the front of one to the front of the other. The rear bus stop was removed in 2018 as part of a project to consolidate bus stops and increase service. Bus stop consolidation involves an in-depth analysis of bus stop usage, analysis of the demographics of users – including those who would be most impacted by a stop removal, outreach to riders, and potential improvements to remaining bus stops.

NYCDOT is improving bus stops to make them accessible throughout the city, but we do not want to make investments in stops that are likely to be removed. We're coordinating closely with NYCDOT during the network redesign to ensure that bus stops scheduled for upgrades will remain after bus network redesign has been implemented and that investments in bus stop accessibility are well-targeted to areas of the greatest need based on our own demographic analysis.

Figure 48: Bus Stops on the Same Block

Google, "Streetview," digital images, Google Maps (http://maps.google.com), photograph of 55-05 Beach Channel Drive, Arverne, NY, taken October 2017, annotated.

EXPAND CONNECTIVITY ACROSS THE BOROUGH AND CITY

Crosstown Corridors

A series of major corridors form the backbone of the Queens Bus Network. Combined, the corridors carry most of the ridership in Queens, and share many of the same route characteristics:

- Direct alignments with minimal, or no, detours and diversions
- High service frequency with no need for passengers to follow a schedule to determine when to catch the bus
- Strong linkage of major origins and destinations
- High residential and commercial density
- Major activity centers and trip destinations located throughout the corridor
- Steady on-off activity along the entire corridor
- Heavy bi-directional passenger flows throughout the day
- High ridership volumes, including heavy off-peak ridership

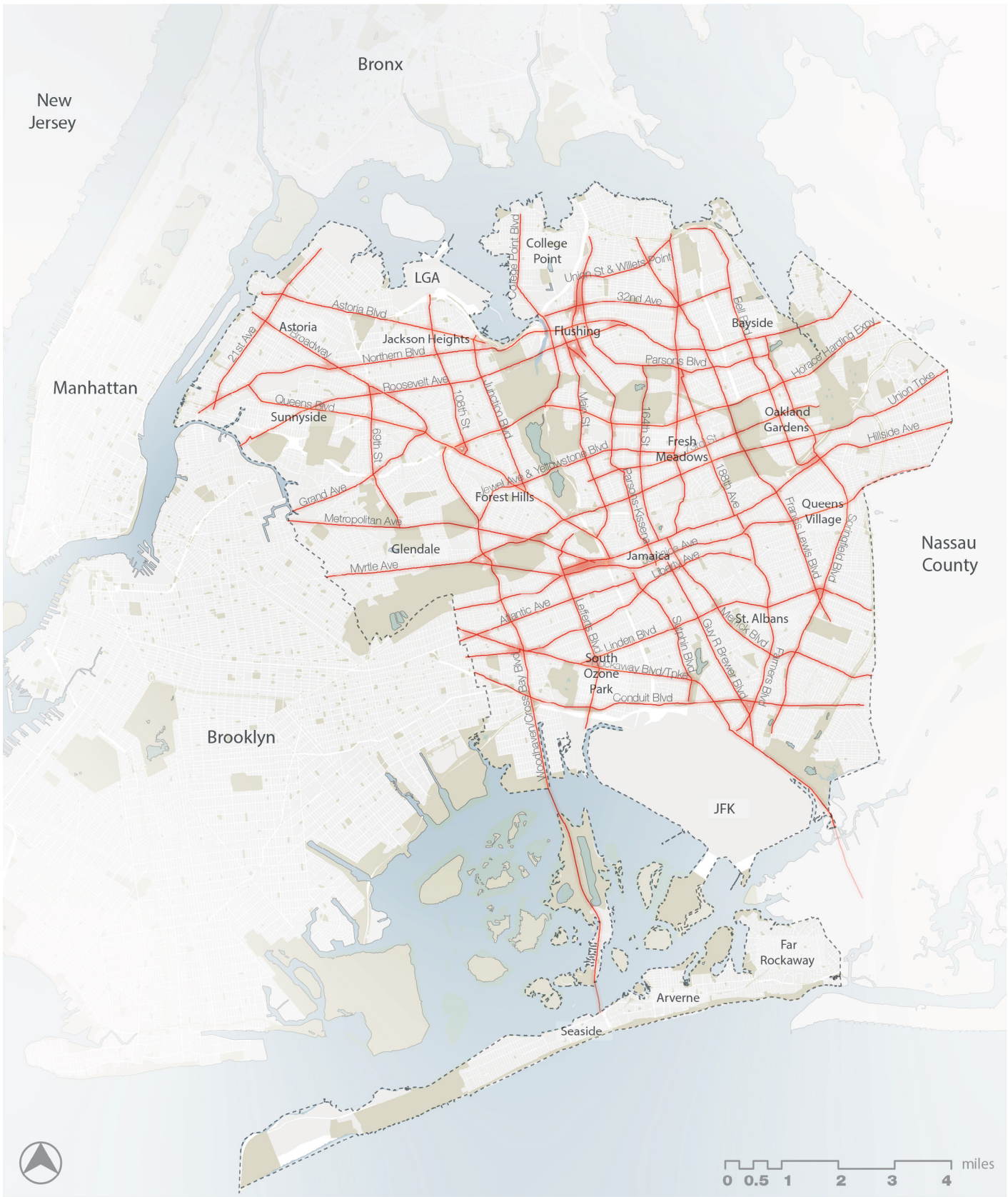
Major corridors with high ridership can see significant gains in bus speeds and reliability with enhanced facilities, such as exclusive or priority lanes and treatments. Investments in improved service and facilities typically focus on major corridors to achieve maximum ridership impact.

In addition to efforts to speed up buses, the network itself can be designed to take advantage of the structure of the city. Our staff is analyzing choke points throughout Queens to determine what limitations exist to running buses in long, straight lines through various corridors. Appendix F contains profiles for 41 corridors in Queens. These are not the only corridors studied, but represent the segments of continuous roadway with few or no impediments to running a bus across a long distance, with minimal turning required. Figure 49 shows the 41 corridors represented in Appendix F.

Trade-offs become apparent immediately: the wider the roadway, the easier it is to run the bus there. But land use around wider roads is often low density, and therefore not as ripe for potential ridership. Areas along subways have great ridership potential and provide mobility options to all riders, including those who cannot use accessible stations. But running a route underneath an elevated train has severe drawbacks. The support poles holding up the elevated tracks limit the ability of buses to maneuver around obstructions, causing speeds to drop so low that they limit the usefulness of the route to anyone seeking a fast trip.

The network redesign process will look at the possibility of creating a grid of long crosstown routes to establish access across vast distances. Trade-offs will include having stops widely spaced enough to keep a bus moving quickly, but not so few stops that is skips the customers who might make the route viable.

Figure 49: Crosstown Corridors serving Queens



Crosstown Corridors

analyzed crosstown corridors

parks, cemeteries, and open space

waterbodies, rivers, and streams

Subway Deserts

The bus network provides a lifeline for residents living in subway deserts, ensuring that these areas are not completely without public transit service. But it's not enough to just have service; if the buses take too long to connect riders to the subway, they'll find a different option.

Redesigning the bus network affords us the opportunity to analyze travel time for residents riding to the nearest subway station or other subway lines, and determine what challenges they face and how to address them. Developing a grid network, which is a possibility for this network redesign, might help optimize those bus-to-subway trips, as well as speed up long intra-borough trips. That said, it may mean that some customers will need to transfer from a local coverage route to a high-frequency ridership route that can then speed them through a corridor to a subway station, instead of sending every bus in Queens to Downtown Flushing or Downtown Jamaica.

Connections to Commuter Rail

Long Island Rail Road stations will be studied as part of the network redesign process to see how well they might integrate with new or better bus service, and how they fit into the overall network of bus travel. Some stations will continue to be served because of their location near strategic intersections of major corridors, such as Queens Village. Other stations, such as Auburndale, would be difficult to serve, as it does not exist on or near a straight line between any major destinations, and therefore would require a meandering route to serve the station.

Connections to the Airports

We're working with the Port Authority of New York and New Jersey to evaluate the best ways to serve the airports. As major destinations, the airports will remain important anchors in the new bus network. Since the airports are at the edges of the land mass, they are best served as terminal points for bus routes. Attempting to find space to accommodate buses during layovers between in-service runs proves quite difficult in busy locations such as airports. The needs of operations must be balanced with the needs of customers as we work with the Port Authority to design routes that serve the airports well and operate smoothly.

MAKE IT EASIER TO TRAVEL BY BUS

Part of the network redesign process goes beyond the route network itself, and considers the ease-of-use for customers. What issues frustrate riders? Are there ways to adjust the bus network itself, or the way we run buses, to alleviate some of the frustration and make the entire experience easier and more likely to result in additional use?

Understanding the System

As part of network redesign, staff will look to build a simpler grid that is easier for customers to understand. Knowing where each bus goes and where customers can get to in a reasonable amount of time is easier if the system itself is easy to read and understand. New bus maps will take advantage of advances in technology to include new digital map products in the coming years. Other possibilities might include the creation of a bus map that only shows overnight service. The creation of the new bus network means we can plan a better night network that will then be easier to learn and use. A frequent network map, such as in Figure 29, might also be more useful and legible with a new network that functions as a grid.

We'll also consider new types of service as part of the bus network redesign, beyond the four service types currently deployed (local, limited-stop, SBS, and express). A zone-express service, which acts like a local to serve a neighborhood, and then like an express to get to a downtown area within the same borough, might be useful for customers on the eastern and southeastern edges of the borough.

A comprehensive bus network redesign process is the perfect time to design routes that clearly reflect the type of service provided. A certain bus route might be short and frequent and intended solely to feed people to the subway all day long. Another bus route might cross long distances with few stops in between, focusing on lowering the travel time on the long journey. These routes can be designed to make it clear to customers the purpose of the route itself, so that they can make better choices to get around to more of the borough.

Real-Time Bus Information

Part of this bus network redesign will include creating bus routes that are fast, frequent, and reliable, so customers can depend on the routes without having to know the schedule. This may involve moving to a system in which buses are advertised as arriving "every 8 minutes or better" instead of arriving at seemingly random times. This would help us better allocate resources, and performance can be judged on the more appropriate measure of time between buses, rather than unrealistically tight adherence to a printed schedule.

Payments & Transfers

As part of Fast Forward, all-door boarding will be launched on all bus routes in 2021. This will significantly reduce the time required to board the bus, as well as alleviate some of the seemingly-overcrowded conditions that are caused by front-door boarding and passengers not moving toward the back. The new OMNY payment system will allow customers to make tap-and-go fare payments with a smartphone or contactless credit or debit card, speeding up the payment process as well. These improvements should cut down on the amount of time spent boarding buses, which can be upcycled into more service for the same number of service hours, based on faster speeds along the route.

The network redesign may result in some riders requiring a second transfer to complete their trip. An additional second free transfer will be provided in these cases to minimize the number of riders adversely affected.

Boarding the Bus

As part of the network redesign process, staff will make adjustments to bus stops, including eliminating some bus stops to speed up travel along a corridor, creating bus stops on corridors not currently served by a bus, and shifting bus stops to help buses avoid unnecessary delays. We will evaluate bus stop locations for the appropriateness for customers, the ability of a bus to properly get to the curb to eliminate passengers boarding in the street, and ensuring other vehicles or obstructions don't interfere with safe, fast bus service.

Recently, we removed the last of our high-floor local buses. This ensures that entering and exiting the bus are not unduly complicated, slow or burdensome for those with limited mobility. NYCDOT continues to roll out more bus bulbs and bus boarding islands each year to help ease the boarding process. These specialized bus stops can also be useful in allowing a bus to stop in a traffic lane rather than pull off into a bus stop, eliminating the re-entry delay that slows down buses.

Connections to Other Transit

With a revised grid of bus routes and wider stop-spacing in much of the borough, special attention will be given to transfer locations between buses. Customers that need to transfer from one route to another to access more of the borough should be able to see immediately where the bus stop is for the connecting service. It should be located nearby, if not at the same stop, and if crossing a street is required, there should be a crosswalk available.

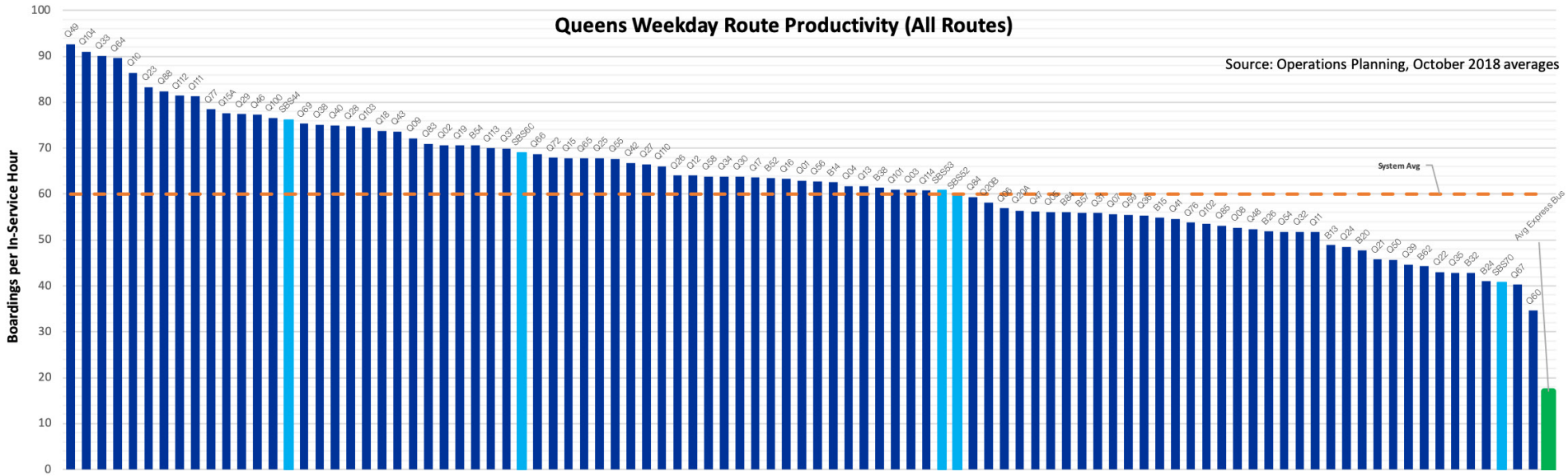
PRODUCTIVITY & FINANCIAL EFFICIENCY

The operation of transit services is subsidized in most cities in the United States. Still, there is a limit to how much funding is available to subsidize operations, even if the budget grows.

Transit, by definition, relates to the act of moving people. Therefore, the more people it moves, the more successful it is. However, a transit agency operating under a fixed budget must track ridership relative to cost as a measure of success. Ridership relative to cost is called "productivity." We use boardings per in-service hour as a measure for productivity.

Productivity is a metric that helps track the goal of maximizing ridership. Bus service can be designed for different goals, like coverage routes that provide lifeline access. These services may not be highly productive.

Figure 50: Weekday Route Productivity



Source: MTA, 2018

Productivity

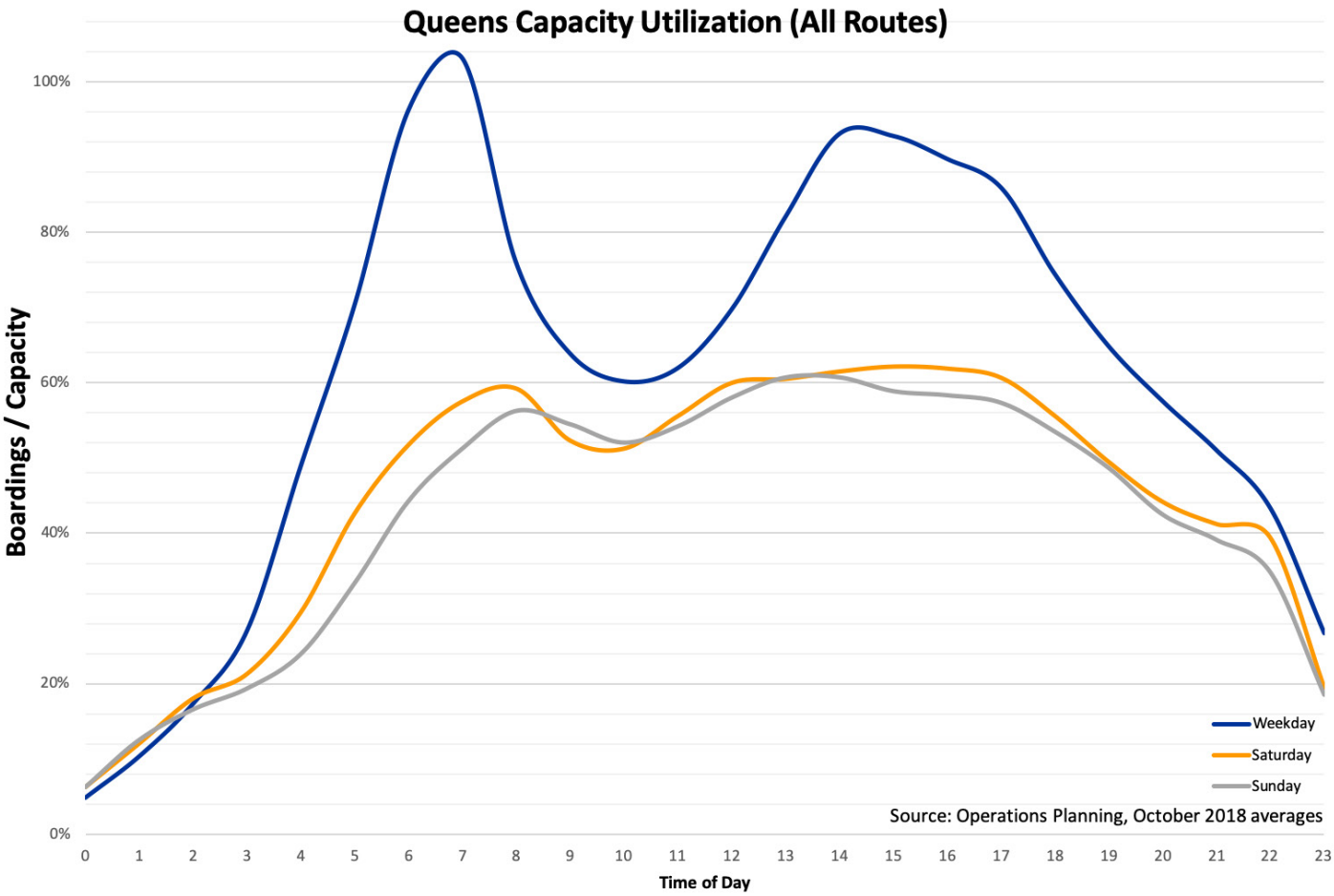
Figure 51 shows the weekday boardings per in-service hour of all Queens routes. In October 2018, an average of 60 people boarded an MTA bus for every hour of service provided on a weekday. The productivity of MTA bus routes on weekdays in Queens ranges from a high of 93 boardings per in-service hour to a low of 13. It's worth noting that productivity on express bus routes' averages 17 boardings per in-service hour. Appendix D Figure 71 and Appendix D Figure 72 show route productivity on Saturdays, and Appendix D Figure 73 and Appendix D Figure 74 show route productivity on Sundays.

Capacity utilization measures the number of unlinked passenger boardings compared to the total number of seating and standing spaces that are scheduled on a route. This measure considers vehicle size and capacity (e.g. standard versus articulated) and is represented as the percentage of total scheduled spaces that are used by customers. Routes with significant passenger turnover may have a capacity utilization over 100 percent. A limitation of this measure is that is does not consider the length of time a vehicle is on the road. As a result, it favors longer routes that generate more opportunities for customers to board and alight.

Figure 51 displays the average capacity utilization by hour for weekdays, Saturdays, and Sundays on bus routes in Queens. Capacity utilization goes above 80 percent between 6:00 AM and 9:00 AM on weekdays, peaking during 7:00 AM at over 100 percent. Additionally, average capacity utilization on Saturdays and Sundays behaves similarly and is stable throughout most of the day. This chart shows that whenever these lines rise, buses are, on average, more crowded. During weekdays, buses are typically more crowded during the AM and PM peak periods.

On the other hand, Figure 51 also shows that average capacity utilization never goes beyond 62 percent on Saturdays and Sundays, with no indication of peaks. Interestingly, service provided during weekends is more uniform and less oriented to peaks. In other words, while there is still additional capacity available throughout Saturdays and Sundays (about 35 percent-48 percent), the service supply distribution is even and does not show a dip in capacity utilization; this is unlike weekday service, where boardings and service provided decrease heavily during off-peak and shoulders.

Figure 51: Average Capacity Utilization



Source: MTA, 2018

Financial Efficiency

Measures of financial efficiency typically correlate with productivity measures and provide insight into a route's performance. We examined the following measures when analyzing the financial efficiency of routes:

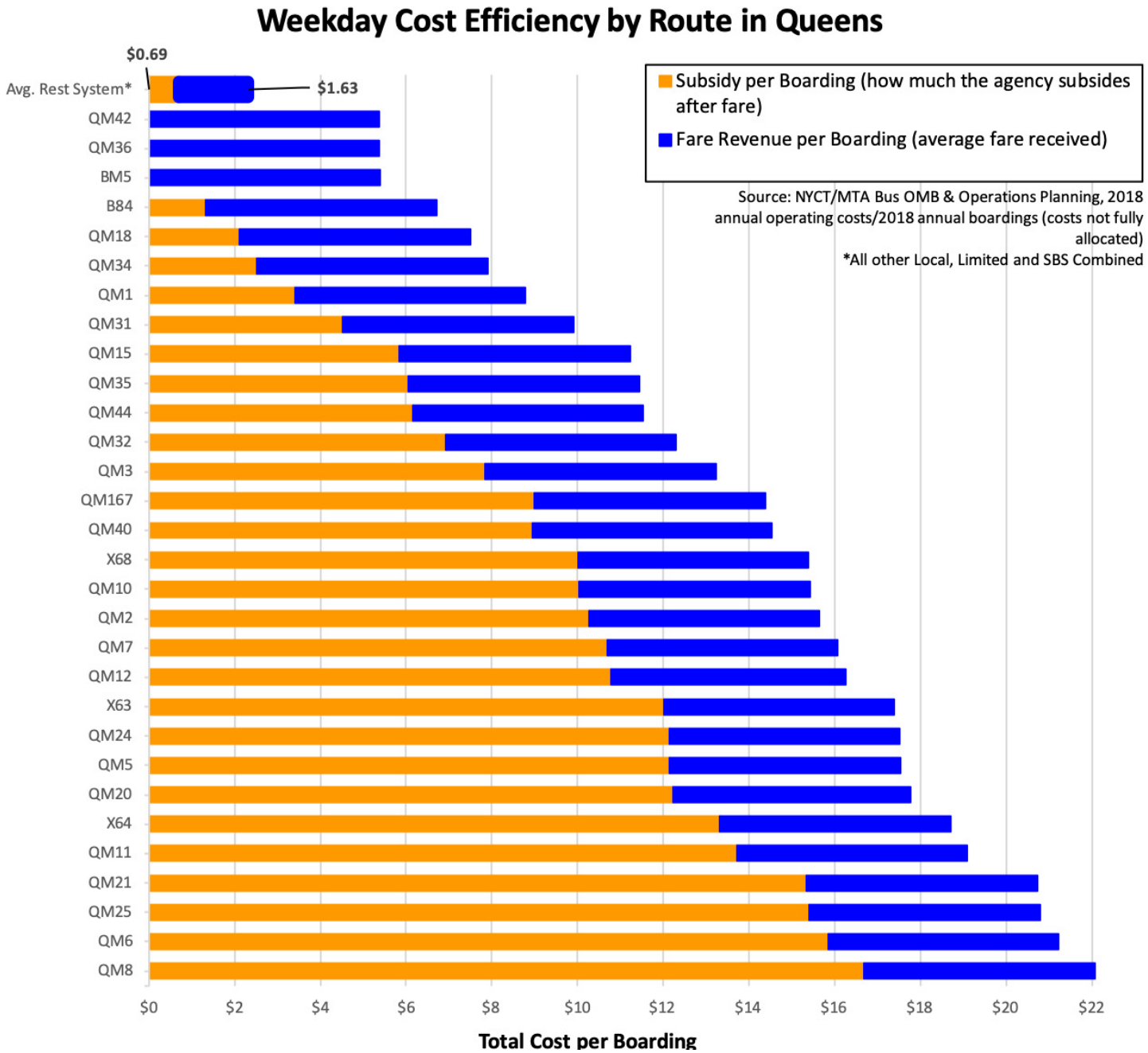
- Cost per boarding measures the cost of providing bus service relative to the number of customers using that service (annual service cost divided by annual boardings). The measure is broken down to show how much of the total cost per passenger is recovered from fare revenue (shown as Fare Revenue per Boarding), and how much is subsidized by the agency after fare (shown as Subsidy per Boarding). This measure is related to farebox recovery, but adds ridership into the equation, and is shown as a dollar figure. This metric is shown in Figure 52.

- Farebox recovery ratio is the ratio of operating revenue to operating cost. Subsidized routes have a farebox recovery ratio below 100 percent, while profitable routes have a farebox recovery ratio over 100 percent. This metric is shown in Figure 53.

Figure 51 shows the cost per boarding on bus routes in Queens during weekdays. Each bar is split to show the fare revenue per passenger (blue) and subsidy per passenger (orange). The lower the operating cost per passenger, the more financially efficient the route. The greater the operating cost per passenger, the more subsidized the route and the greater the cost to provide service. Appendix D Figure 75 shows cost efficiency on Saturdays, and Appendix D Figure 76 shows cost efficiency on Sundays.

The cost per boarding of all express routes ranges between $5.34 and $22.07. On the other hand, the average total cost per boarding of all other routes in Queens is $2.32 (the individual route values range between $1.05 to $4.04). Figure 77 in Appendix D shows farebox recovery on Saturdays, and Figure 78 in Appendix D shows farebox recovery on Sundays.

Figure 52: Weekday Cost Efficiency



Source: MTA, 2018

Only 11 routes have farebox recovery ratios over 100 percent, meaning that they turn a profit.The average ratio of the Queens network is about 70 percent. It is worth noting that not all express bus routes are unprofitable; three have farebox recovery ratios around 100 percent. However, most of the express bus routes have farebox recovery ratios under 46 percent.

While providing public transportation is expensive and rarely turns a profit, there are opportunities to improve productivity and financial efficiency to maximize use of the fixed resources available. Our initial findings regarding the productivity and financial efficiency of Queens buses are below:

- Express bus routes are less productive overall. Express bus routes typically cost more to operate, as they are peaked, directional service and travel longer distances with less passenger turnover.
- Higher "deadhead" times make Express buses more expensive to operate. Deadhead time is the time a bus spends out-of-service on its way to the beginning of its route.
- Operating specialized routes that are not efficient, such as Express bus routes or small neighborhood routes, use resources that can be utilized to provide more frequent service along more productive routes.

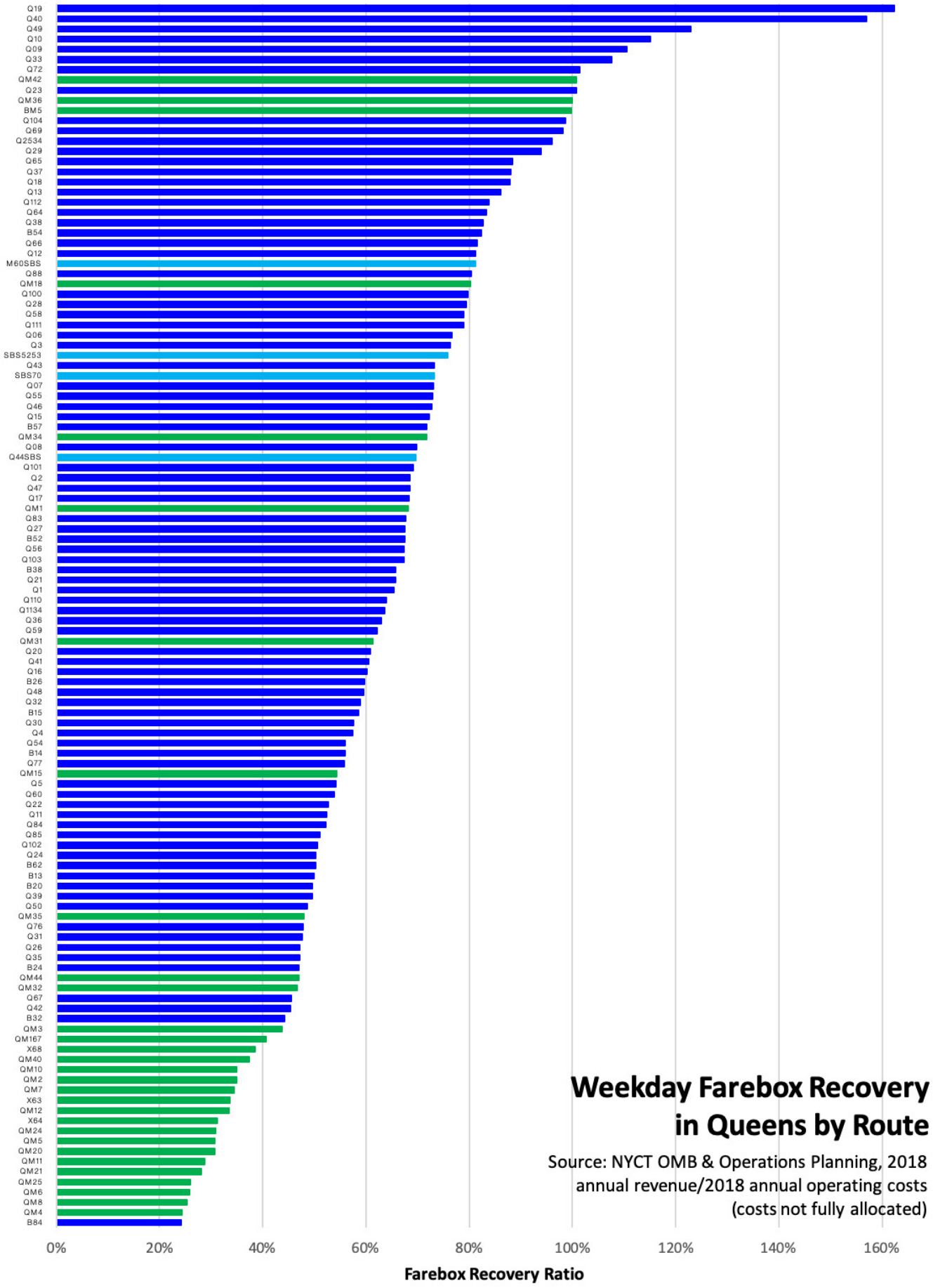
- Express routes that serve communities also partially served by the subway are not very productive. This may be due to potential customers choosing the faster subway service. Subway fares are also less expensive than Express bus fares: $2.75 vs. $6.75, respectively.

- To improve the productivity of the system, bus service needs to be ridership-oriented. Factors that impact ridership include mixed, high activity density, linearity of the bus route, walkability, and connectivity.

- Ideally, the amount of service provided should be sufficient so that capacity utilization is even throughout the day. This can be achieved by reallocating service hours from unproductive services and assigning them to more productive, ridership-oriented services.

- High-frequency routes are more productive, but we must allocate that frequency where it can spur additional ridership. Higher ridership-per-operator-hour leads to a positive feedback loop: more fare revenue allows us to increase operator hours, which creates even more frequent service, which in turn spurs increased ridership. To expand low ridership-per-operator-hour service would require additional revenue from other sources, because the fare revenue on the route isn't sufficient. The only path to avoid additional funding gaps is to focus service where ridership can grow: dense walkable places where most people do not own cars.

Figure 53: Weekday Farebox Recovery



Source: MTA, 2018

Depots

Buses serving Queens operate out of both NYCT and MTA Bus Company depots. NYCT depots serving Queens include Michael J. Quill (M), East New York (Bk), Fresh Pond (Bk), Grand Avenue (Bk), Casey Stengel (Q), Jamaica (Q), and Queens Village (Q). MTA Bus Company depots include Eastchester (Bx), College Point (Q), LaGuardia (Q), JFK (Q), Far Rockaway (Q), Baisley Park (Q), and Spring Creek (Q).

Bus Transit Centers

Queens has one dedicated bus terminal located at 165th Street in Jamaica. This terminal serves 11 MTA routes and six NICE Bus routes. Customers expressed a desire for more centralized bus transit centers to be built. The lack of a bus transit center in Downtown Flushing is a known customer issue. We continue to study the feasibility of a bus transit center whenever a possible location is identified. Some locations, such as Long Island City in or around Queens Plaza, would require a mixed-use building, with a bus transit center at street level and other uses, such as offices and/or residences above. The feasibility of such a building has not yet been successfully established, but efforts are ongoing.

DESIGNING A NEW NETWORK FROM SCRATCH

To meet current and future needs, the new network must balance the needs of numerous stakeholders, including the agency, bus operators, bus dispatchers, and, most importantly, the customers.

The process begins with input from the customers and incorporates feedback from many stakeholders:

- Customers
    - o Open houses (May and June 2019)
    - o Project website (launched April 2019)
    - o Online survey and comments (May through July 2019)
    - o On-street pop-up outreach events (July 2019)
    - o Social media (ongoing)

- Queens' community boards and civic associations
- Permanent Citizens' Advisory Committee
- NYCDOT
- Queens bus operators
- Bus operator unions

The project team will collect and analyze recommendations and concerns while taking a 'blank slate' approach to drawing the new bus network. Data analyses include on-time performance of buses, census data, existing bus origin-destination patterns, activity hubs, and also Transportation Network Company data to understand current non-bus trip patterns. Identifying prime corridors, understanding trip patterns, and striking a balance between local, express, and effective operational routes will be the challenge in creating a new, customer-driven bus network.

The bus network redesign for Queens will begin with existing ridership, but may not preserve specific parts of the existing network. There will always be buses on Hillside Avenue, Merrick Boulevard, and Northern Boulevard, but they will not necessarily continue to the same destinations or have the same frequencies.

All options will be examined to maximize the ability of the network to meet the needs of customers. Buses will run better if we run them in straight lines. Buses will be more on-time if they have fewer turns. A network more closely resembling a grid will help create access across the borough and neighboring boroughs. But this may involve adding a transfer for some customers.

In low ridership areas with coverage-oriented service, it may be possible to connect those routes with a more frequent route that heads straight into downtown or the subway, providing a faster trip than the previous, one-seat ride on the meandering route. If the additional wait time for the transfer is short, and the buses are faster, it is possible to speed up the trip even with a transfer in the middle. These kinds of route designs will be analyzed and compared to the number of customers affected and the total effect of adding the transfer to the trip.

Staff is analyzing bus network redesigns undertaken in other cities to determine how applicable those efforts are to a network like ours, as well as any lessons learned and what elements were essential for success.

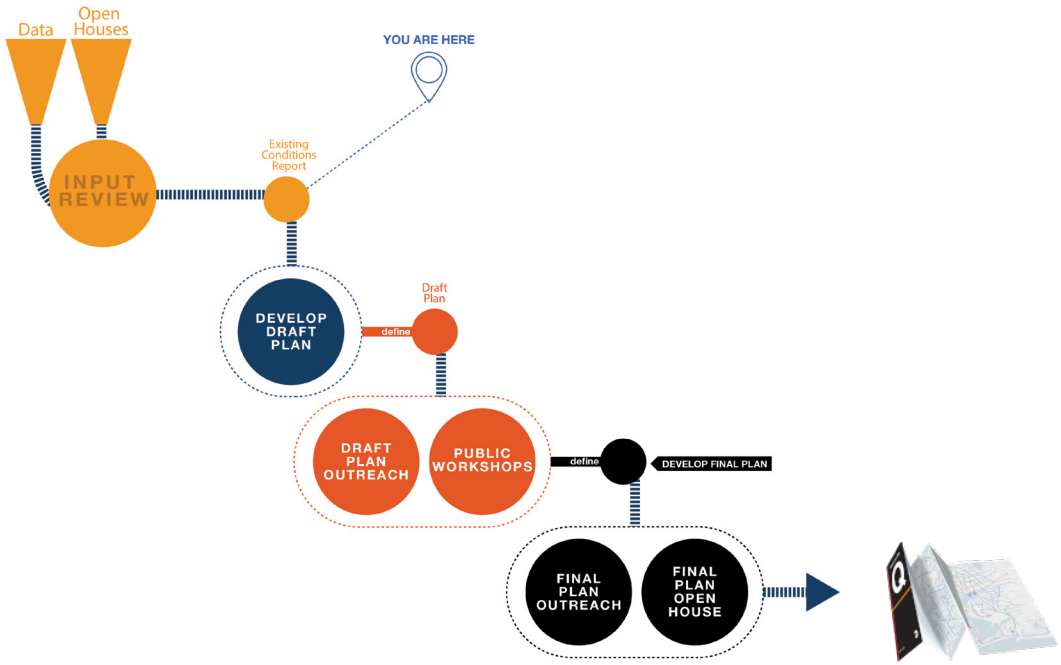
6. NEXT STEPS

NEXT STEPS

PROJECT APPROACH AND PROCESS

This Existing Conditions Report marks the completion of the first phase of the Queens Bus Network Redesign project. Subsequent project phases will include outreach to review the Existing Conditions Report, and further analysis of Queens and its bus network. These will inform a Draft Plan, and ultimately the Final Plan that will be adopted by the MTA. Figure 54 identifies the various components of the Queens Bus Network Redesign project and the project's process.

Figure 54: Project Process



NEXT STEPS

Following this report, we will share the existing conditions findings with the Queens Borough Board and any Queens Community Boards that request our attendance. We will then develop a Draft Plan that reflects the findings in this report and the input we receive. We'll develop the Draft Plan with support and participation from NYCDOT. Additional public input sessions will be held following the release of the Draft Plan. We will ask the public to share their thoughts and provide input on adjusting the Draft Plan to better suit their needs. Input received will help inform the development of the Final Plan, to be released in April 2020.

7. APPENDICES

- **A:** Glossary of Terms
- **B:** Demographics
- **C:** On-Time Performance
- **D:** Financial Efficiency and Productivity
- **E:** Travel Flows
- **F:** Corridor Profiles

A: GLOSSARY OF TERMS

Accessibility – a service, vehicle, or facility is accessible if it is in compliance with the **ADA**, or in general (nonlegal) terms, if it is readily usable by persons with disabilities.

ADA – the Americans with Disabilities Act of 1990, which applied to public transit, requires that transit providers must follow regulations ensuring that services, vehicles, and facilities are accessible to and usable by individuals with disabilities.
See: **accessibility**

Alighting – exiting or getting off a bus, train, or other mode of transit.
See: **boarding**

Articulated bus – a bus with "two connected passenger compartments that bend at the connecting point when the bus turns a corner."
From the APTA Glossary of Transit Terminology.

Boarding – entering or getting onto a bus, train, or other mode of transit.
See: **alighting**

BRT – Bus Rapid Transit. BRT systems strive to bring faster, more reliable, bus service to high ridership corridors by combining amenities of rail-based rapid transit systems with the flexibility of buses. New York City Transit's implementation of BRT is Select Bus Service (SBS), which improves speed and reliability through dedicated bus lanes, off-board fare payment, stop spacing, and transit signal priority.

Bus boarding island – a bus boarding platform separated from the sidewalk to accommodate a bike lane that enables easier boarding for bus passengers and continuous flow for bicyclists. Bus boarding islands are as close to level with the floor of the bus as feasible.

Bus bulb – a sidewalk platform extending from the sidewalk that enables easier boarding for bus passengers. Bus bulbs are as close to level with the floor of the bus as feasible.

Bus depot – a site used to store buses overnight, often with maintenance facilities and office space for administration and bus operator facilities.

Bus lane – a lane of the roadway dedicated exclusively to bus movement.

Bus network – a collection of bus routes, including the physical paths they take as well as their scheduled frequencies and spans of service. Essentially, where buses travel, when buses travel, and how often buses travel.

Bus priority – any number of techniques or tools that enable bus transit to take precedence over other modes of surface transportation in traffic. For example, with transit signal priority (TSP), traffic lights can change more quickly from red to green or a green light can be held longer if a bus is approaching.

Bus stop consolidation – removing and relocating bus stops so that buses can travel more quickly along their routes. Buses currently stop too frequently. With bus stop consolidation, improvements in overall travel time and reliability will outweigh small increases in the time spent walking to bus stops.

Bus time pole signs – real-time passenger information signs resembling standard bus stop lollipops that are digitized and provide bus arrival time information.

Bus transit center – a location where multiple bus routes terminate, often at the location of a transfer to a different mode of transit, such as the subway. These transit centers are often off-street facilities that include amenities for passengers not normally found at on-street bus stops, such as improved protection from the elements and additional information boards.

Capacity utilization – the number of unlinked passenger boardings compared to the total number of seating and standing spaces that are scheduled on a route.

Corridor – one or more roadways that connect to provide continuous travel. For example, Utopia Parkway and Homelawn Street combine to form a north-south corridor north of Jamaica.

Cost per boarding – the ratio of the cost of bus service provision to the number of passengers that use this service. In this report, the cost per boarding is calculated by dividing the annual service cost by annual boardings.

Coverage service – bus service that operates every 30 minutes during the midday.

Crosstown – bus service operating primarily to connect disparate parts of the borough, not necessarily to feed passengers immediately to the subway.

Customer Journey Time Performance – the percentage of customers whose journeys (trips) are completed within five minutes of the scheduled time. Customer journey time performance considers both how long customers wait at the bus stop beyond what they would have if their bus arrived on time, as well as how long customers spend on the bus beyond what they would have if the bus completed its trip in the time allotted in the schedule.

Express bus service – bus service focused specifically on transporting commuters between Manhattan and the outer boroughs. Express bus routes typically have a series of pick-up locations in one borough and a series of drop-off locations in the other, between which is an express segment. The bus does not stop throughout the express segment, which is generally on a highway.

Farebox recovery ratio – the ratio of operating revenue to operating cost. A route with a farebox recovery ratio greater than 100 percent indicates that the route is profitable, while a farebox recovery ratio less than 100 percent indicates that the route is subsidized.

Fast Forward Plan – New York City Transit's 2018 strategic plan to modernize transit in New York City.

Frequency – the rate at which buses run along a specific route.
See: **headway**

Headway – the scheduled interval of time between buses running along a specific route.
See: **frequency**

In-service hour – the unit of time during which a bus route is in operation. This measure is especially helpful for an understanding of efficiency when comparing different routes across the system. For example, one route may have many more riders than another, but is aided by being in service for much longer throughout the day.

Limited bus service – often operates in conjunction with a local bus serving the same corridor, but makes fewer stops to travel the length of the route more quickly.

Local bus service – the most commonly provided bus service. Local bus service—in contrast to limited bus service—makes all stops along a route.

MetroCard – the Metropolitan Transit Authority's predominant fare payment method, being phased out in favor of OMNY.

NYCDOT – New York City Department of Transportation

OMNY – the MTA's new contactless fare payment system, replacing the MetroCard. Customers can use contactless debit and credit cards, as well as smart devices, to pay their fare. Full rollout of OMNY throughout the entire subway system and on all bus routes is expected by late 2020.

Peak – the times during which commuter demand is heaviest and typically when the most service is provided. The morning peak period is weekdays between 7:00 AM and 9:00 AM. The afternoon peak period is weekdays between 4:00 PM and 7:00 PM.

Productivity – the measure of ridership given the level of service provided. Bus routes are more productive when they attract more riders per unit of time in service.

Queue jump – queue jump lanes give buses priority at signalized intersections by providing buses the space (a dedicated lane) and time (a bus-specific, early green light) to enter traffic flow ahead of other vehicles.

Reliability – service reliability constitutes buses arriving at stops on time and at regular intervals, as well as customers completing their journey in the scheduled time frame. Our reliability metrics include measures of passenger wait times, on-time performance, and customer journey time performance at the borough-wide and route levels.

Ridership – the total number of customers using a specific route or the bus system generally.

SBS – Select Bus Service. New York City Transit's branded implementation of BRT (Bus Rapid Transit).

Span – the time period throughout the day that a route is in service.

Stop spacing – the average traveled distance between bus stops along a route.

Tiered stop – a pair of local and rapid stops where the local bus pulls off into a bus stop but the rapid stop is an in-lane stop, usually in front of the local stop. Sometimes the tiered pair is separated as a local bus stop on the near side of an intersection and a rapid stop on the far side of the intersection. Tiered stops were installed on Woodhaven Boulevard as part of the implementation of SBS on that corridor.

TNC – Transportation Network Company. Also known as ride-hailing service companies. TNC customers hail for-hire vehicles using mobile apps associated with various TNCs. Companies with a significant presence in New York City include Uber, Lyft, Juno, and Via.

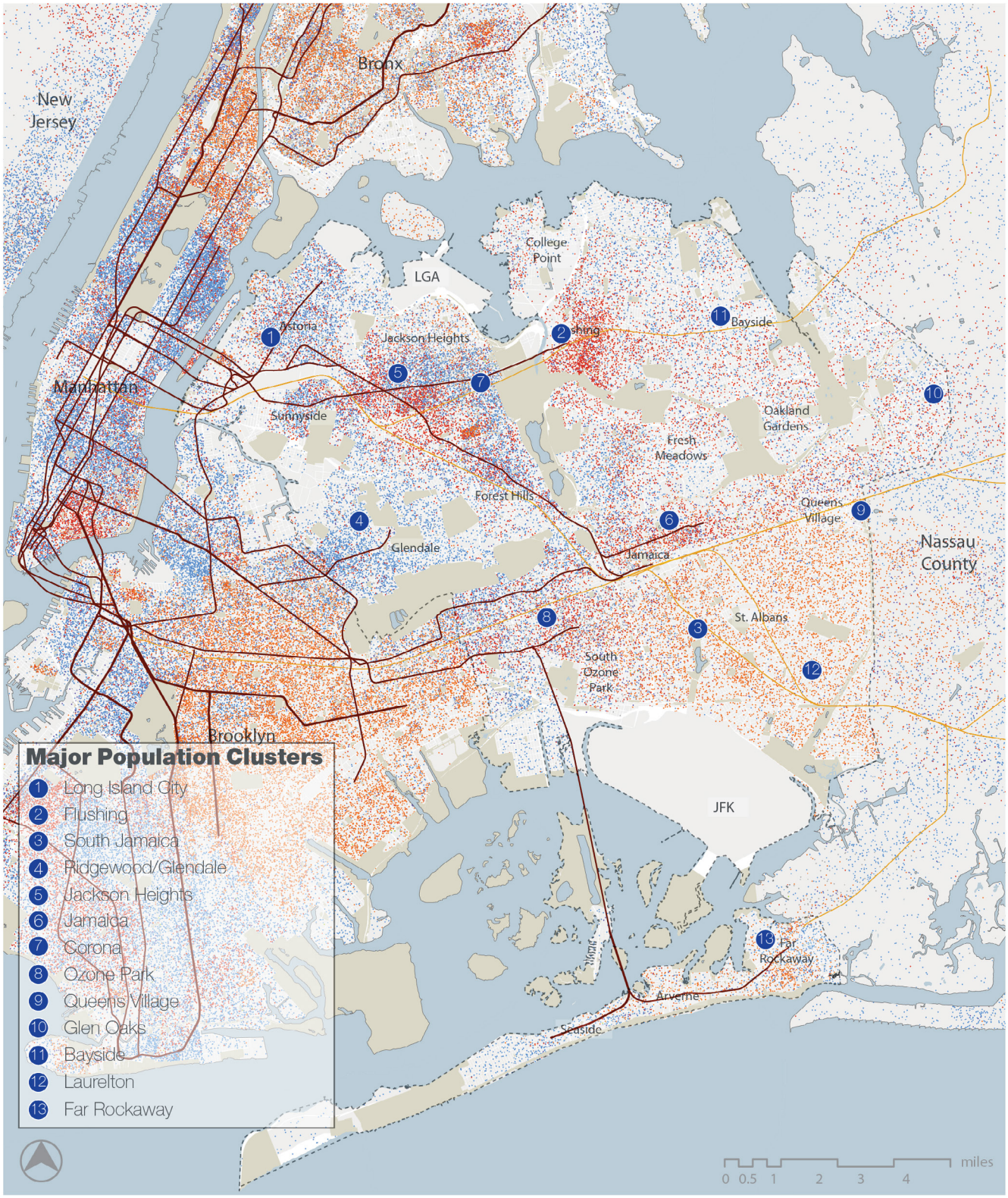
TSP – Traffic Signal Priority. See: bus priority

Vision Zero – the City of New York's plan to end traffic fatalities and injuries in New York City.

B: DEMOGRAPHICS

Demographic data, like population and employment densities, help inform our analyses of where to run bus service and how. Appendix B contains visual representations of different demographic information as it relates to the borough.

Figure 55: Queens Population & Race Distribution



Race

- white (38%)
- black (18%)
- native american (<0.1%)
- asian (24%)
- native hawaiian of pacific islander (<0.1%)
- other (13%)
- two or more (7%)

1 dot = 100 people

- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

Figure 56: Queens Population & Ethnicity Distribution

Ethnicity

- non-hispanic
- hispanic

1 dot = 100 people

- bus routes
- subways
- LIRR
- parks, cemeteries, and open
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

Figure 57: Residents 65 Years of Age or Older

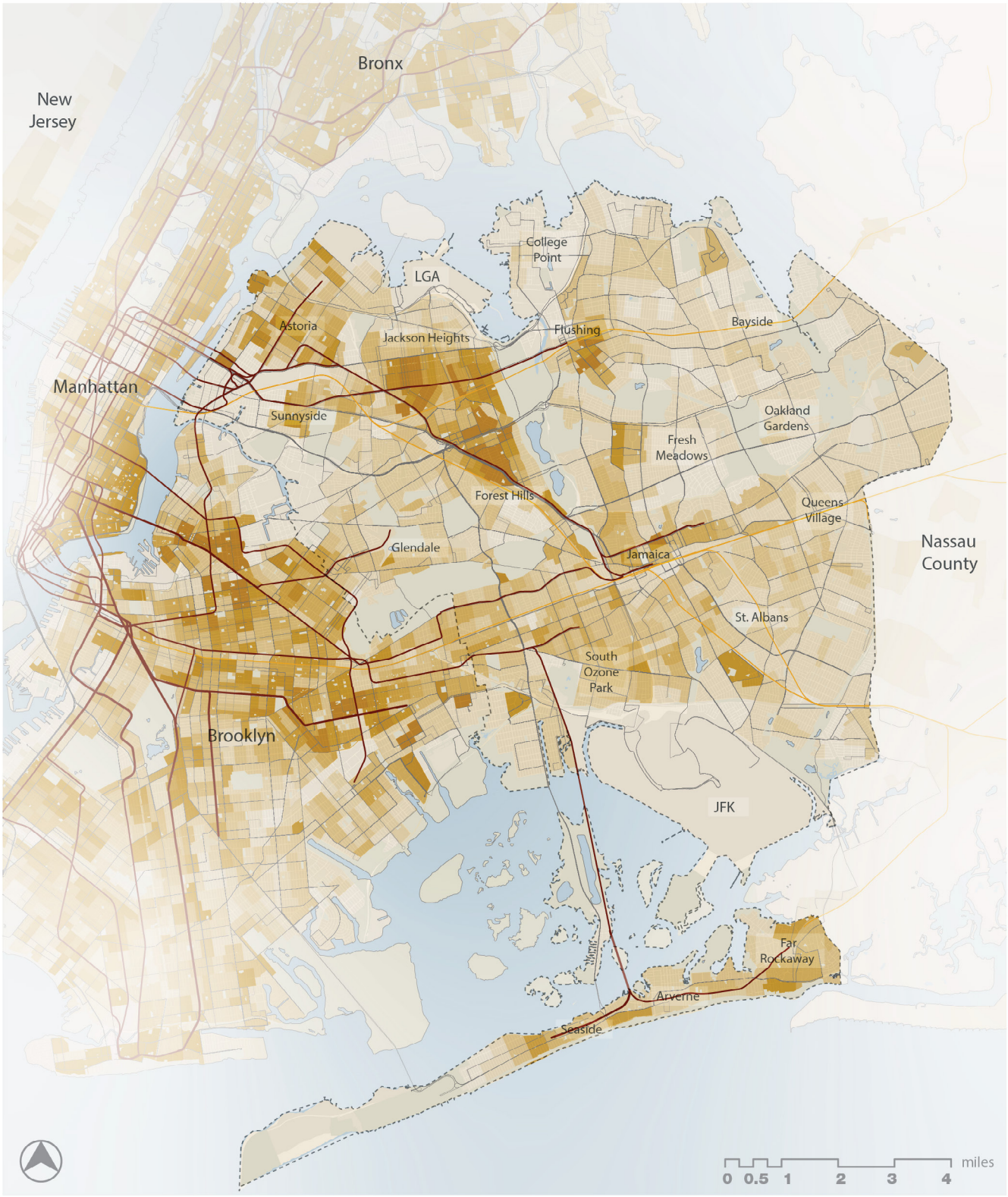
Residents 65+ Years of Age persons per square mile

- 0 - 2,499
- 2,500 - 4,999
- 5,000 - 7,499
- 7,500 - 9,999
- 10,000 - 12,499
- 12,500 - 14,999
- 15,000 - 17,499
- 17,500 - 19,999
- 20,000 - 22,499
- 22,500 +

- bus routes
- subways
- LIRR
- parks, cemeteries, and open
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

Figure 58: Disabled Residents

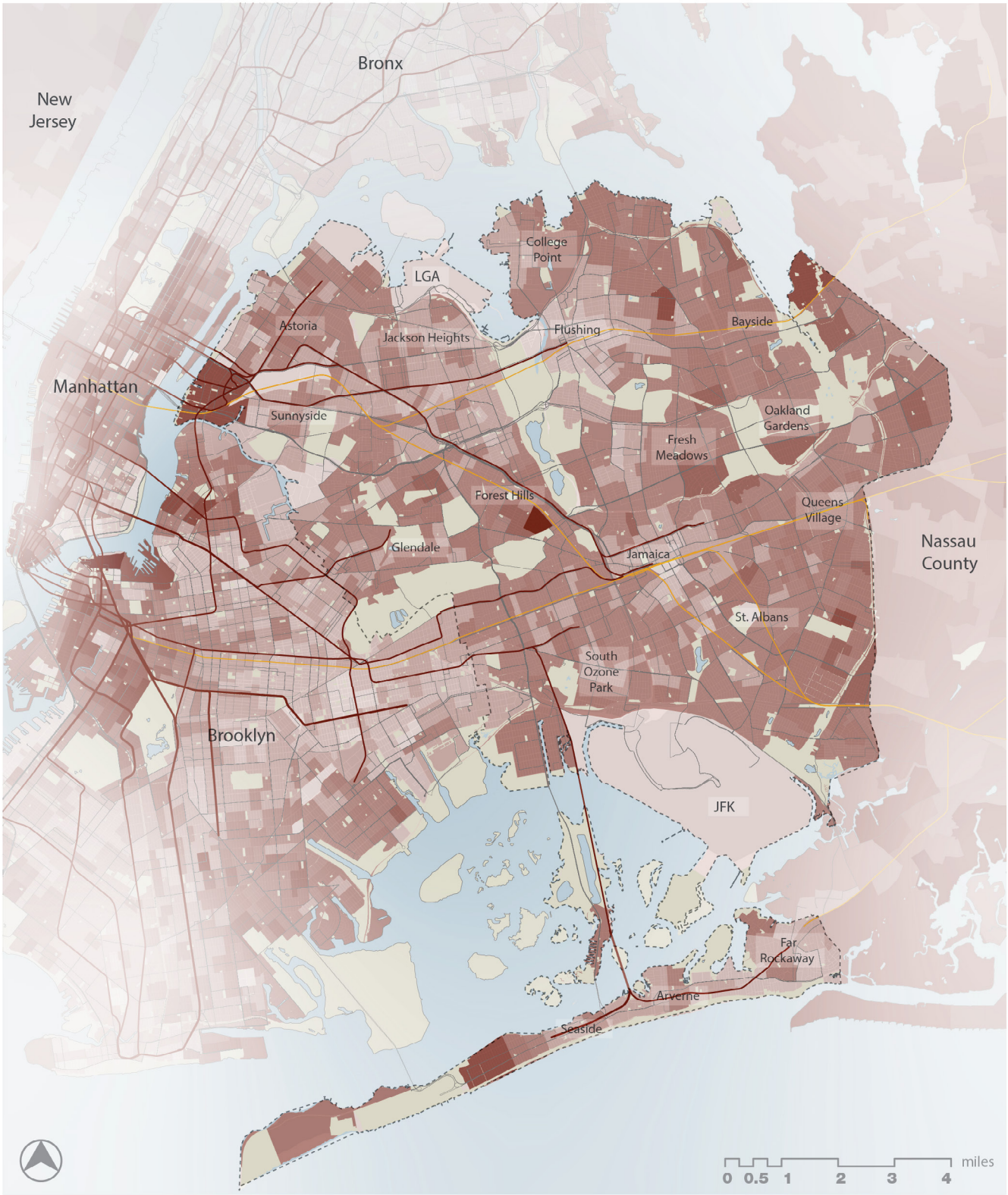


Disabled Residents persons per square mile

- 0 - 999
- 1,000 - 1,999
- 2,000 - 2,999
- 3,000 - 3,999
- 4,000 - 4,999
- 5,000 - 5,999
- 6,000 - 6,999
- 7,000 - 7,999
- 8,000 - 8,999
- 9,000 +
- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

Figure 59: Median Income

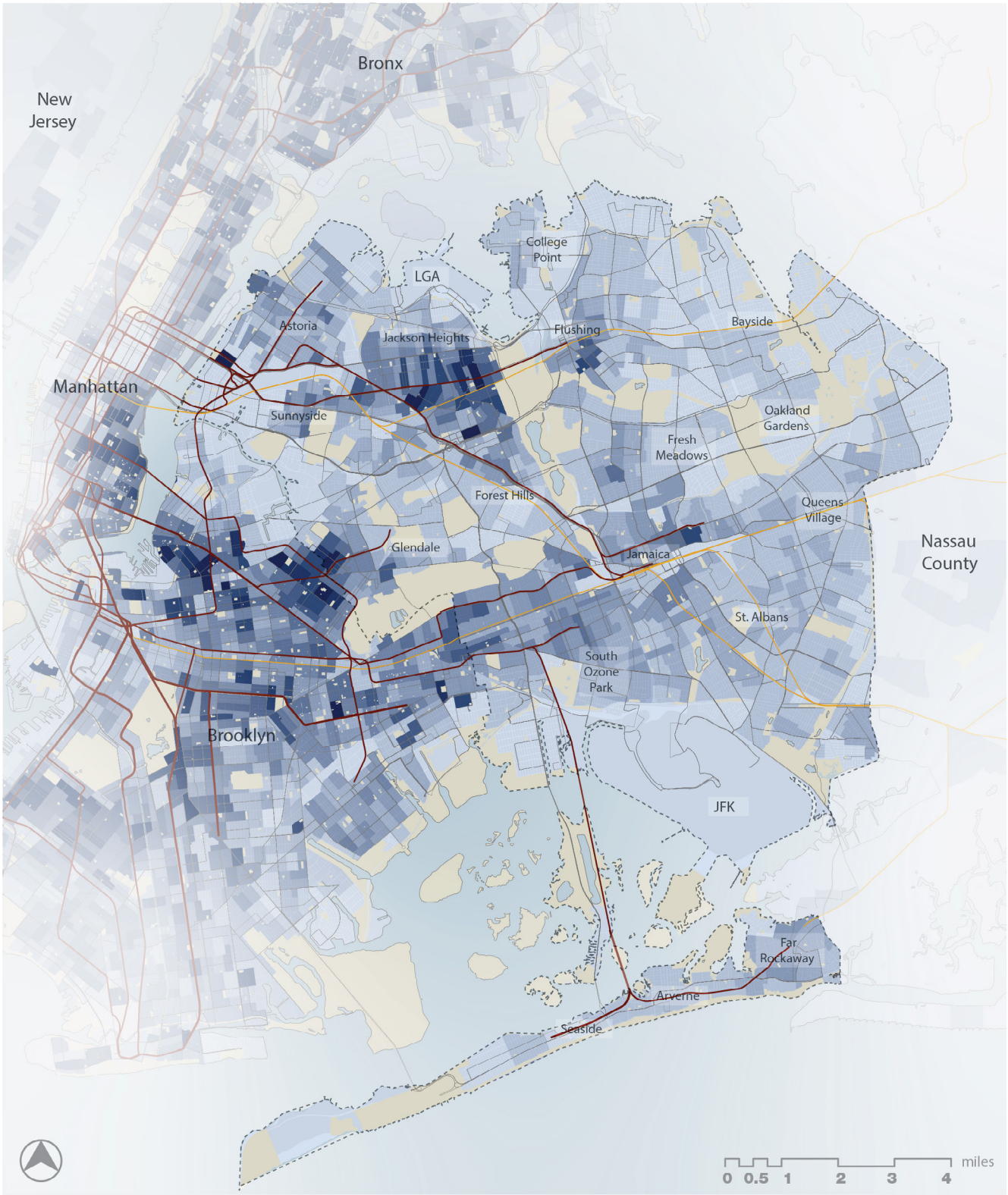


Median Income USD

- $0 - $20,000
- $20,001 - $40,000
- $40,001 - $60,000
- $60,001 - $80,000
- $80,001 - $100,000
- $100,001 - $120,000
- $120,001 - $140,000
- $140,001 - $160,000
- $160,001 - $180-000
- $180,001 +
- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

Figure 60: Residents 10-24 Years of Age



Residents 10-24 Years of Age persons per square mile

- 0 - 2,499
- 2,500 - 4,999
- 5,000 - 7,499
- 7,500 - 9,999
- 10,000 - 12,499
- 12,500 - 14,999
- 15,000 - 17,499
- 17,500 - 19,999
- 20,000 - 22,499
- 22,500 +
- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

Figure 61: Queens Bus Network Stop Walksheds

Bus Stop Accessibility

- within 1/4 mile of bus stop
- within 1/2 mile of bus stop
- within 3/4 mile of bus stop
- 1 dot = 100 people

- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

Figure 62: Percent of Residents Commuting to Work via Bus

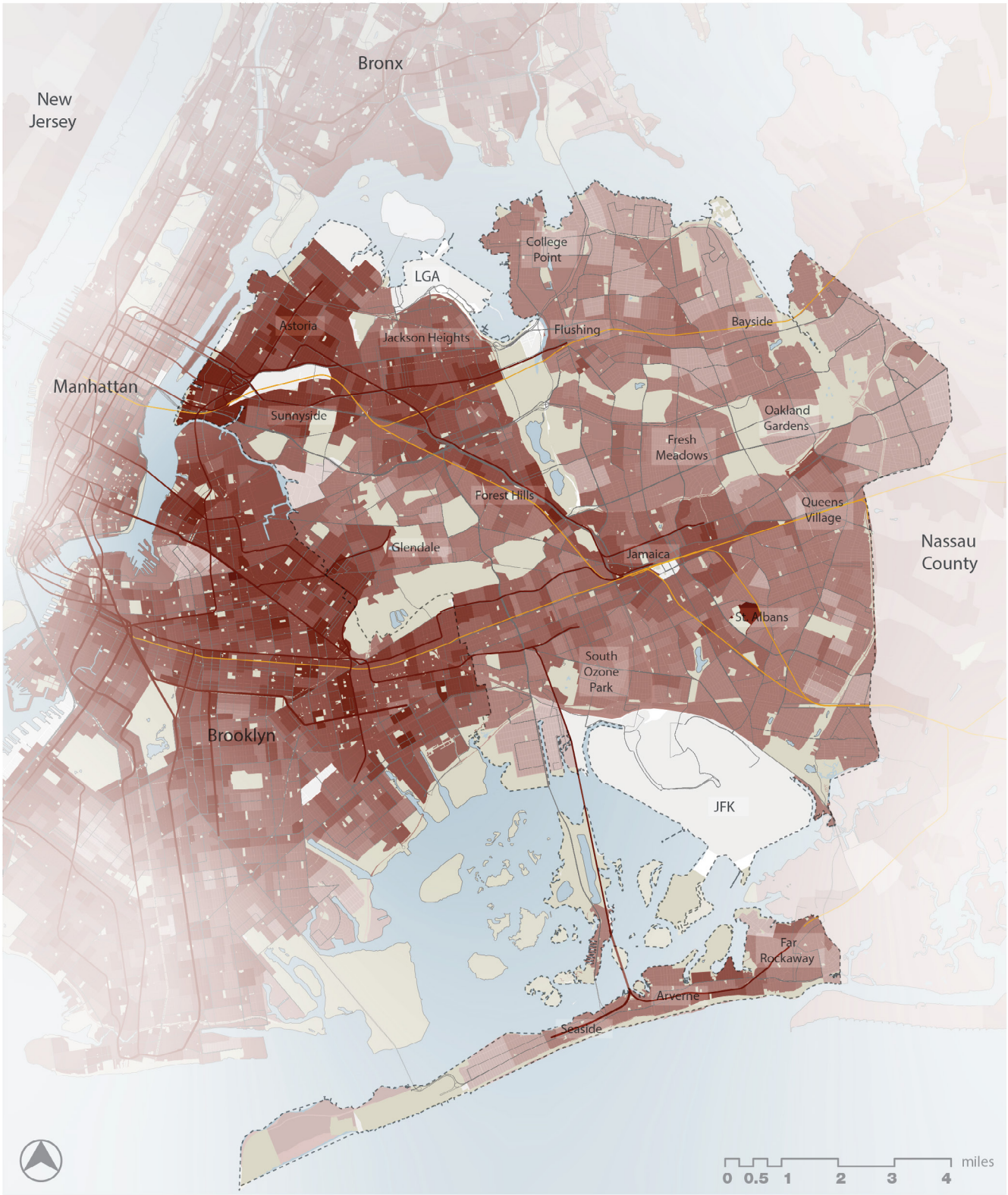
Bus Use percent of population commuting to work via bus

- <5.01%
- 5.01%-10.00%
- 10.01%-15.00%
- 15.01%-20.00%
- 20.01%-25.00%
- 25.01%-30.00%
- 30.01%-35.00%
- 35.01%-40.00%
- 45.01%-50.00%
- 50.01%-100.00%

- bus routes
- subways
- LIRR
- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

Figure 63: Percent of Residents Commuting to Work Via Transit



Transit Use percent of population commuting to work via transit

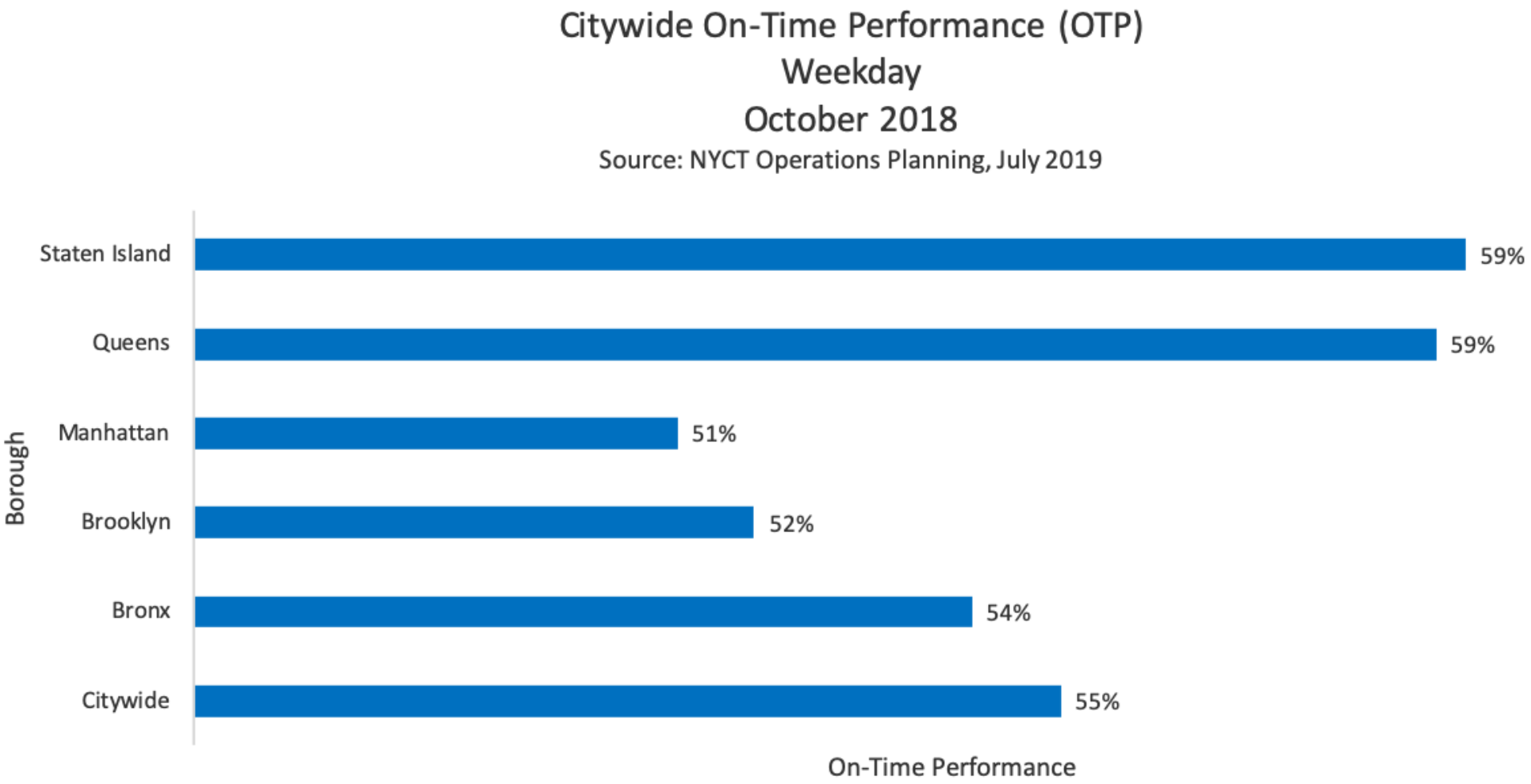
- <10.01%
- 10.01%-20.00%
- 20.01%-30.00%
- 30.01%-40.00%
- 40.01%-50.00%
- 50.01%-60.00%
- 60.01%-70.00%
- 70.01%-80.00%
- 80.01%-90.00%
- 90.01%-100.00%
- bus routes
- subways
- LIRR
- parks, cemeteries, and open
- waterbodies, rivers, and streams

Source: US Census ACS, 2017 (5-year data)

C: ON-TIME PERFORMANCE

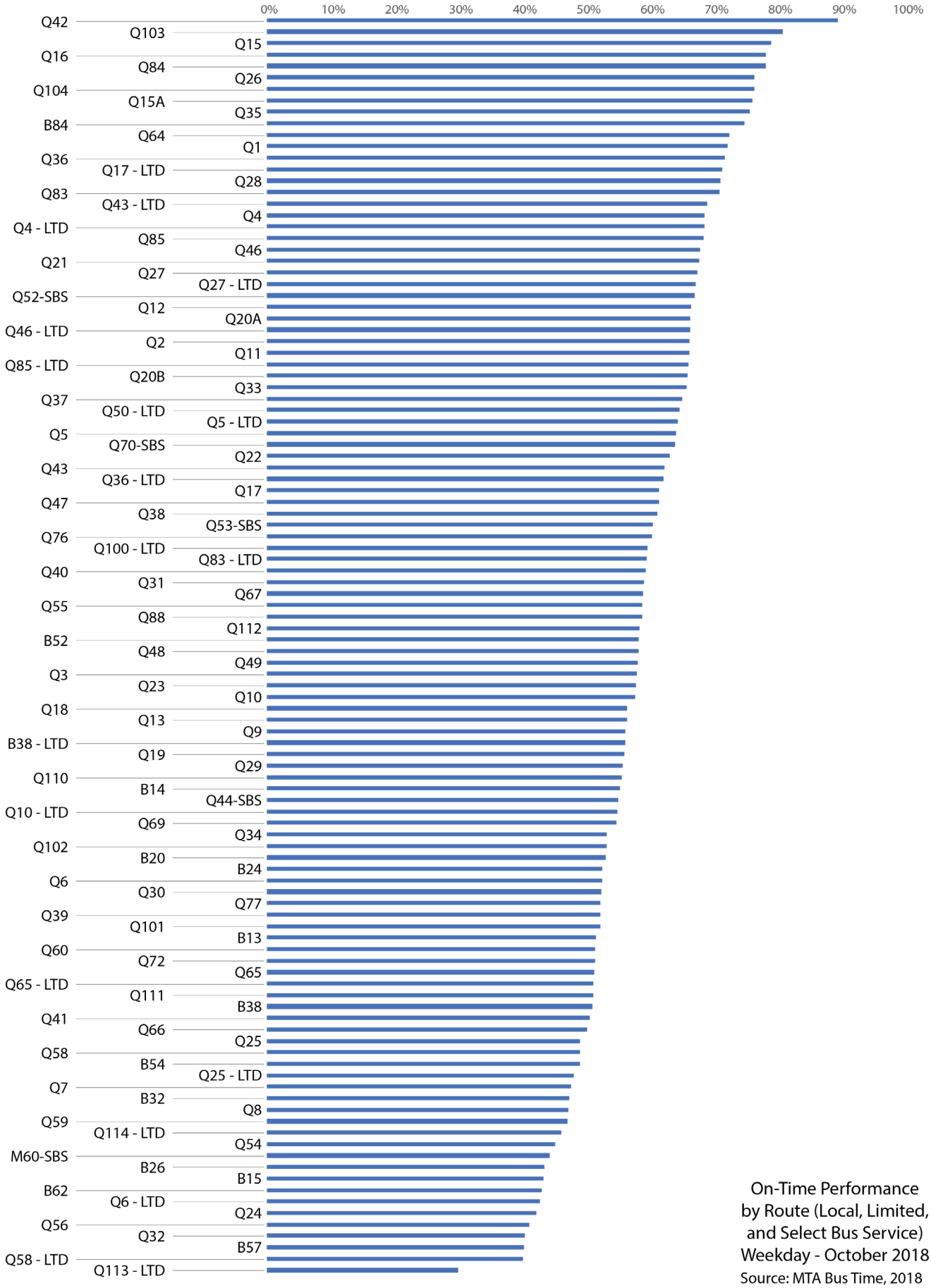
On-time performance is another metric, like excess travel time and customer journey time performance, that can be used to analyze existing bus service and look for ways to build a better network. Figure 64 shows on-time performance by borough. Figure 65 shows on-time performance for local/limited/SBS buses serving Queens. Figure 66 shows on-time performance for express buses serving Queens. Figure 67, Figure 68, and Figure 69 show changes to on-time performance for each of these sets of bus routes from 2014 to 2018.

Figure 64: Citywide On-time Performance



Source: MTA BusTime, 2018

Figure 65: On-Time Performance of Queens Local Buses

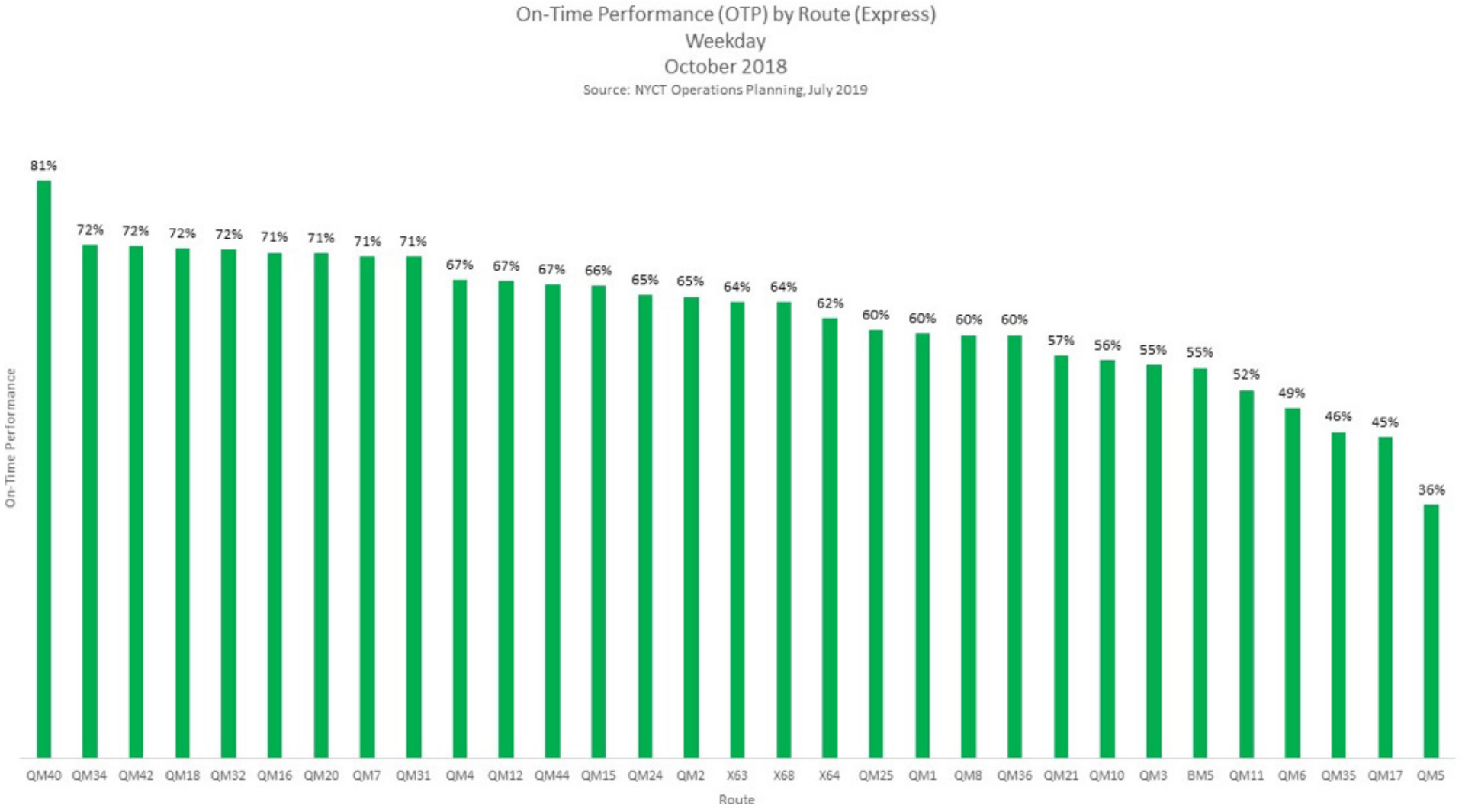


On-Time Performance by Route (Local, Limited, and Select Bus Service) Weekday - October 2018

Source: MTA Bus Time, 2018

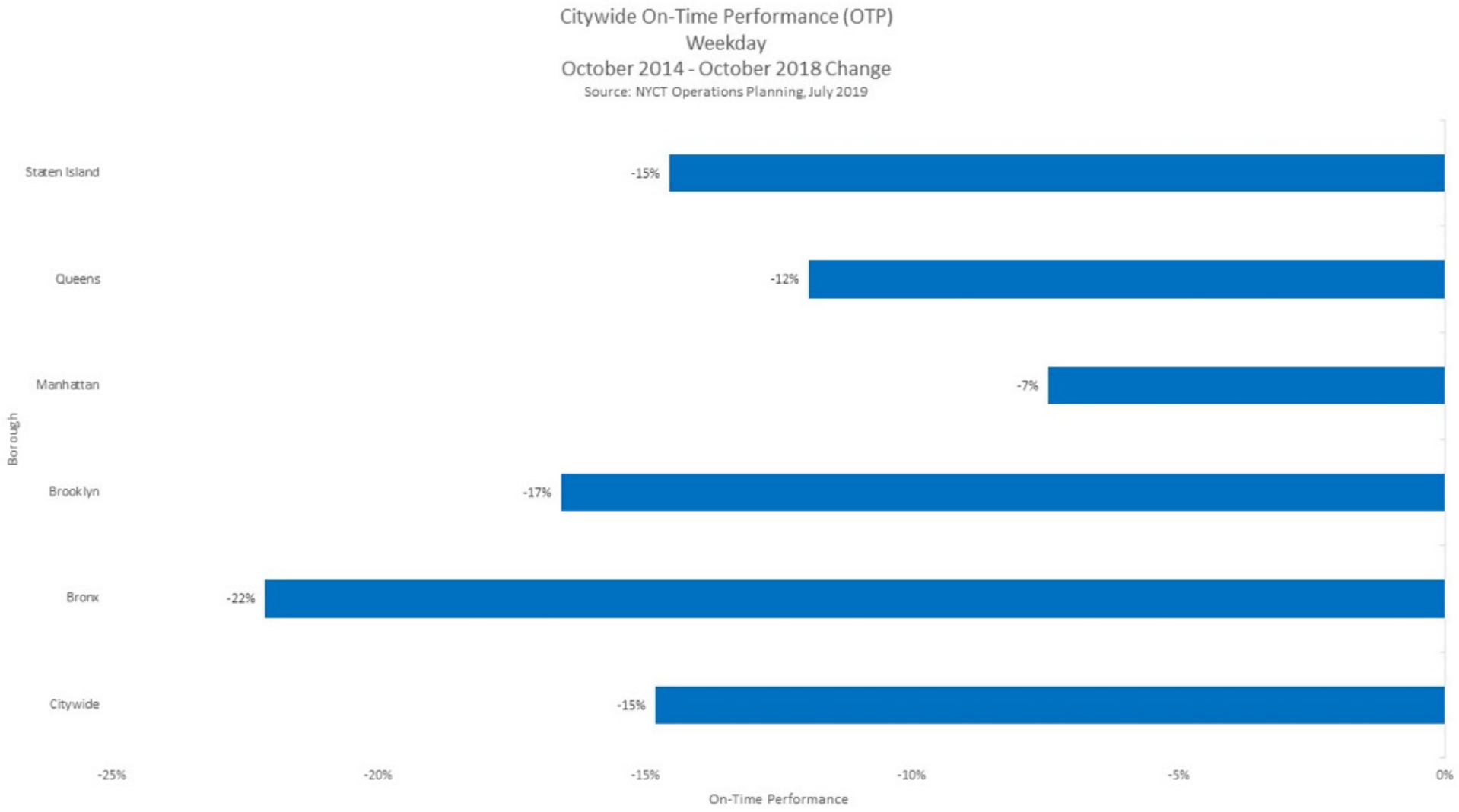
Source: MTA BusTime, 2018

Figure 66: On-Time Performance of Queens Express Buses



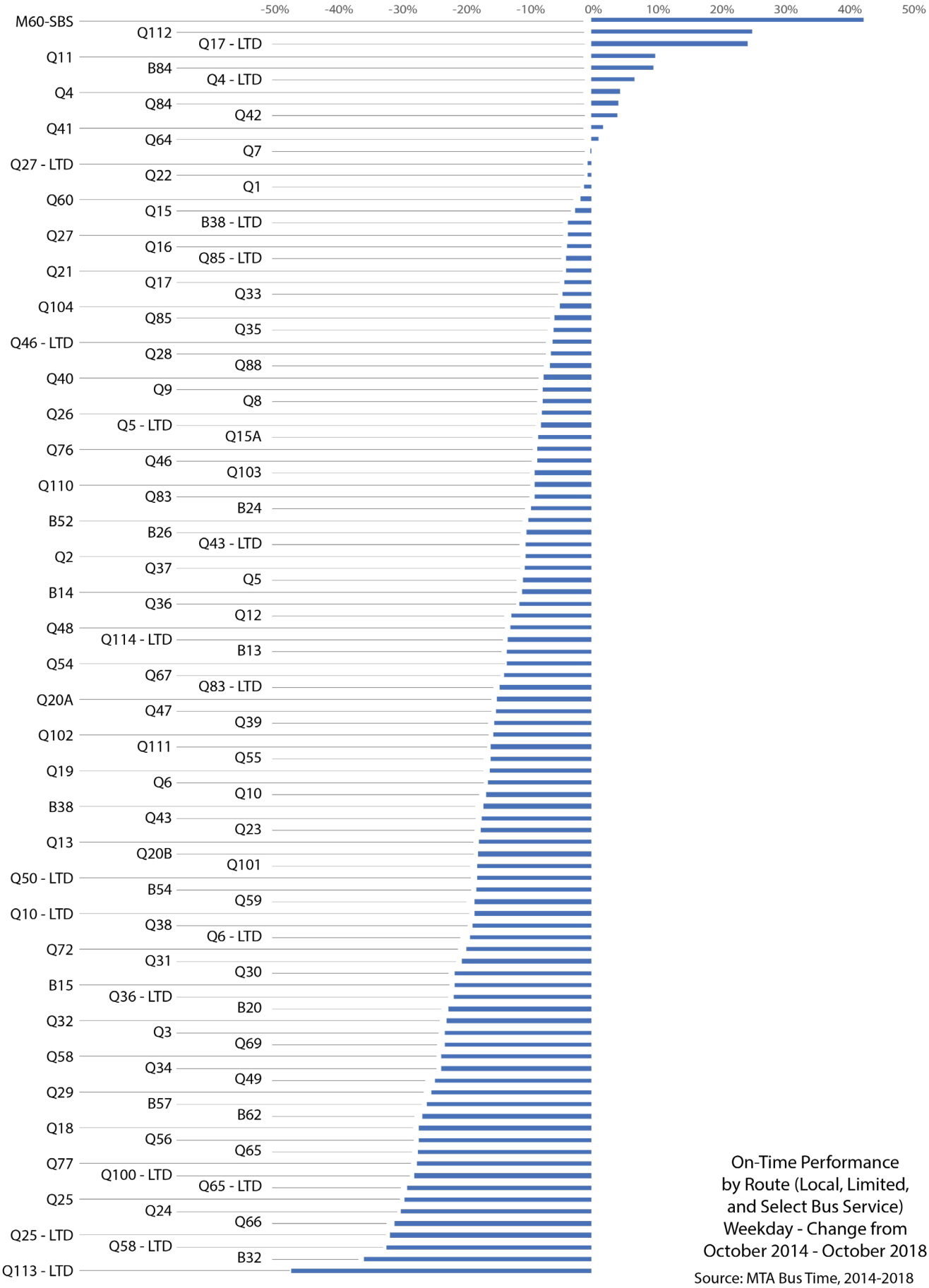
Source: MTA BusTime, 2018

Figure 67: Changes to Citywide On-time Performance



Source: MTA BusTime, 2018

Figure 68: Changes to On-Time Performance of Queens Local Buses

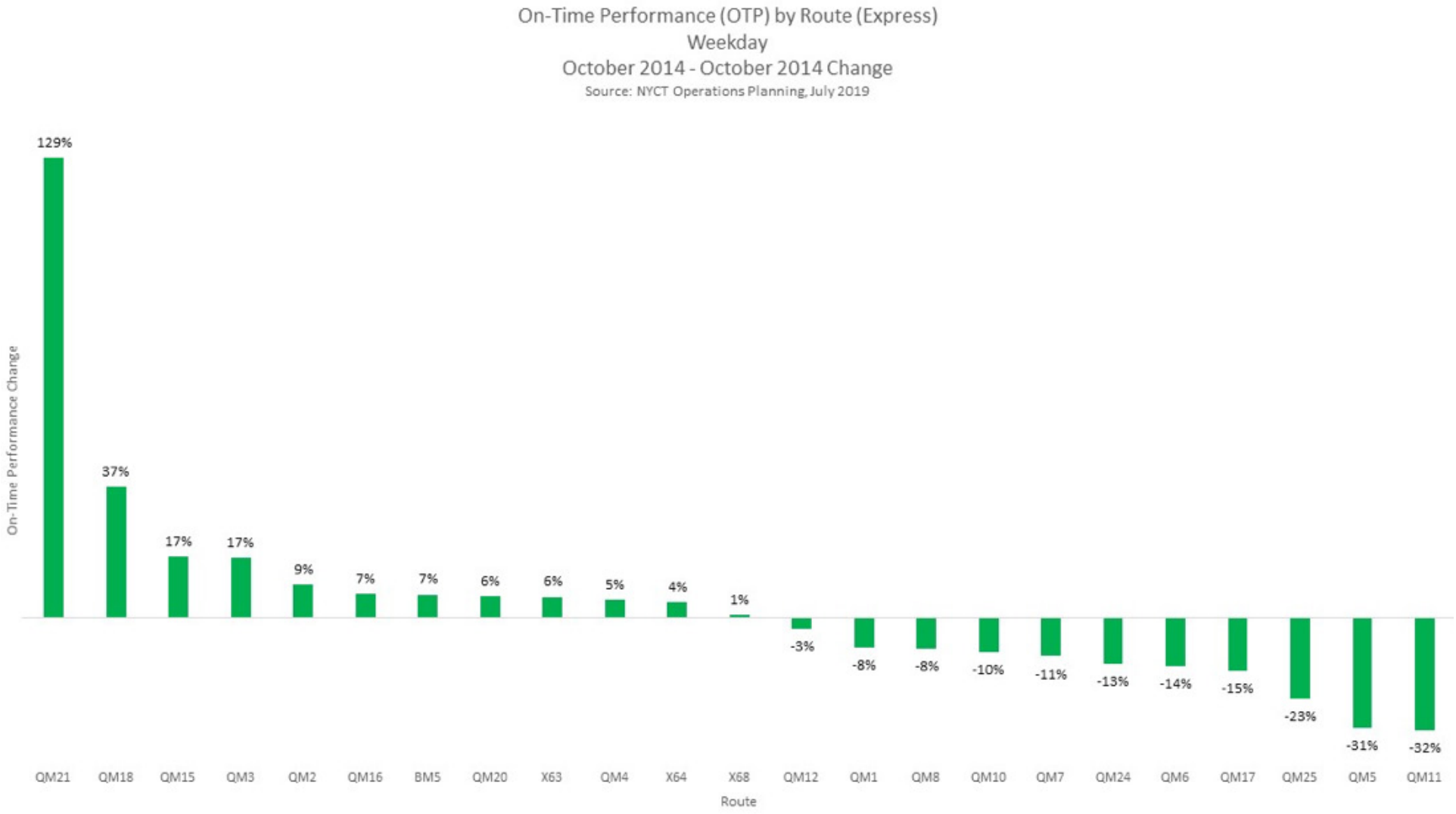


On-Time Performance by Route (Local, Limited, and Select Bus Service) Weekday - Change from October 2014 - October 2018

Source: MTA Bus Time, 2014-2018

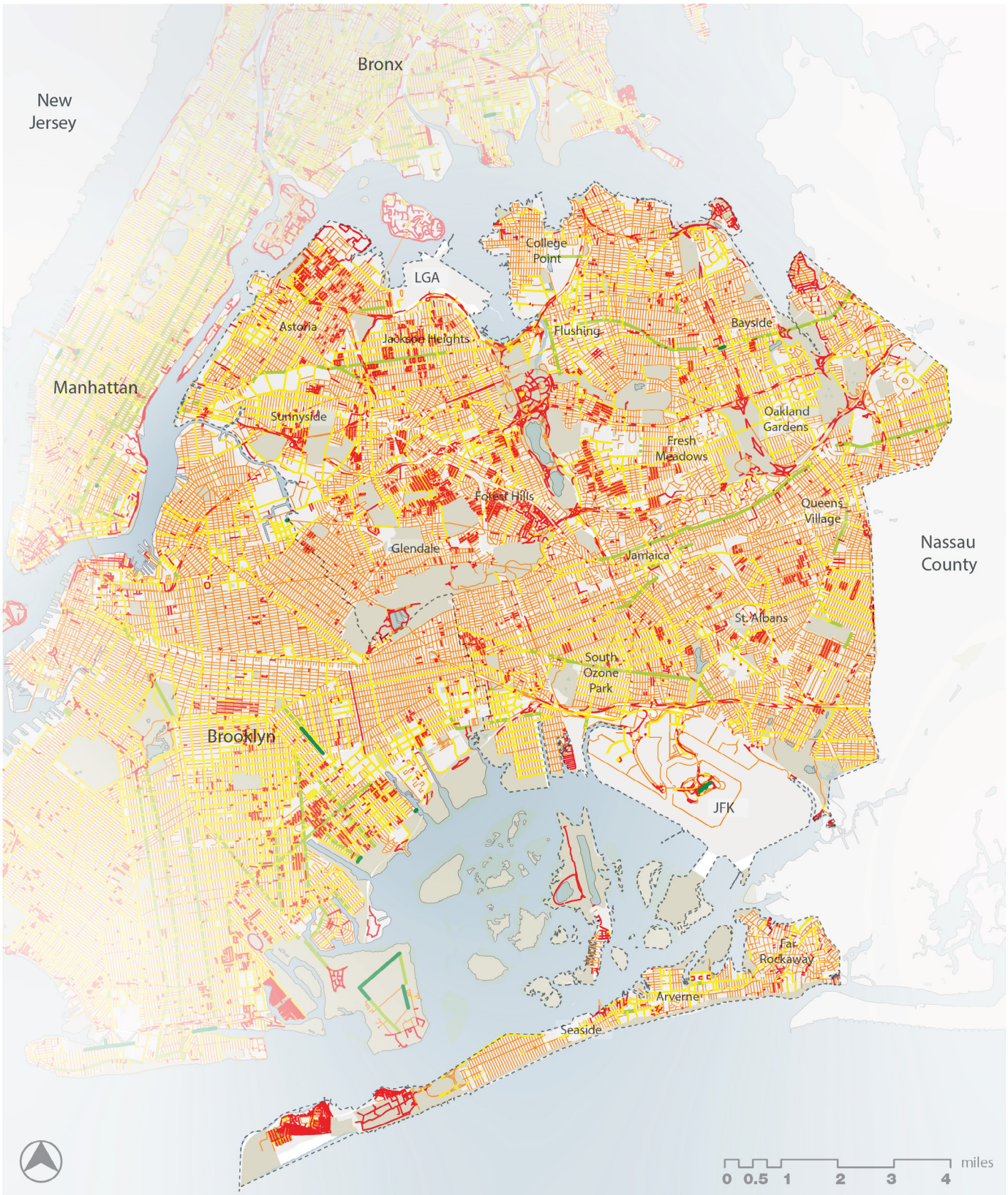
Source: MTA BusTime, 2018

Figure 69: Changes to On-Time Performance of Queens Express Buses



Source: MTA BusTime, 2018

Figure 70: Street Widths



Street Widths feet

- 4 - 20
- 21 - 40
- 41 - 60
- 61 - 80
- 81 - 300

- parks, cemeteries, and open space
- waterbodies, rivers, and streams

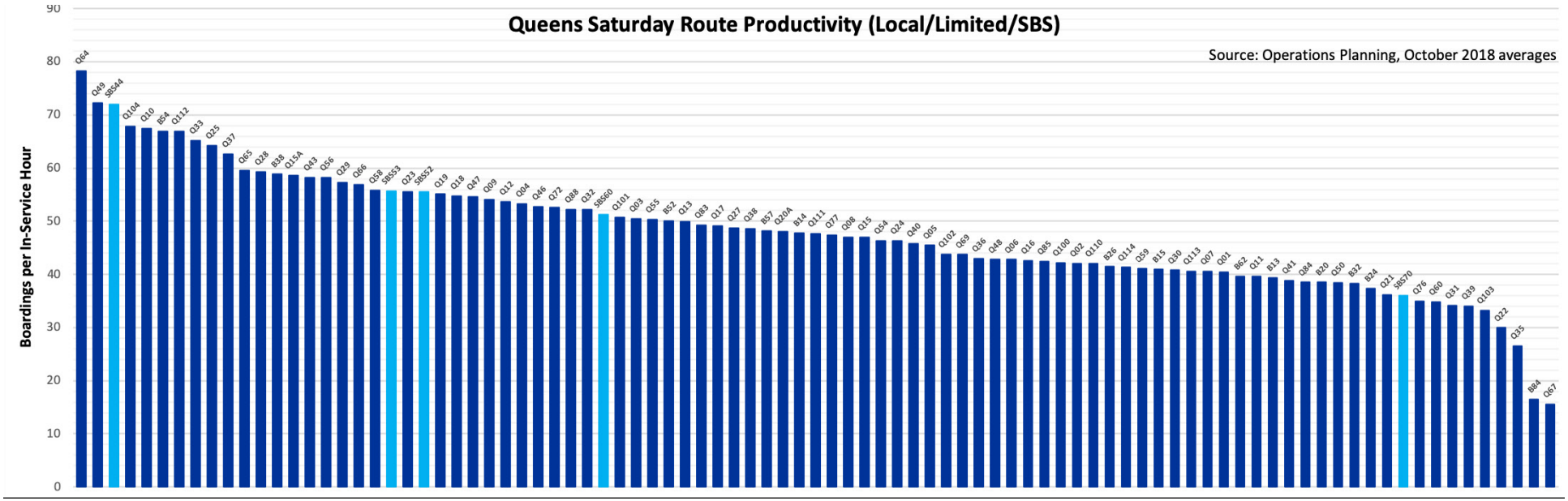
Source: NYC Lion Database, 2019

D: FINANCIAL EFFICIENCY AND PRODUCTIVITY

Below are additional charts of financial efficiency and productivity for Queens bus routes including weekend service. Figure 71 shows route productivity for local, limited, and SBS routes on Saturdays. Figure 72 shows route productivity for express routes on Saturdays. Figure 73 shows route productivity for local, limited, and SBS routes on Sundays. Figure 74 shows route productivity for express on Sundays.

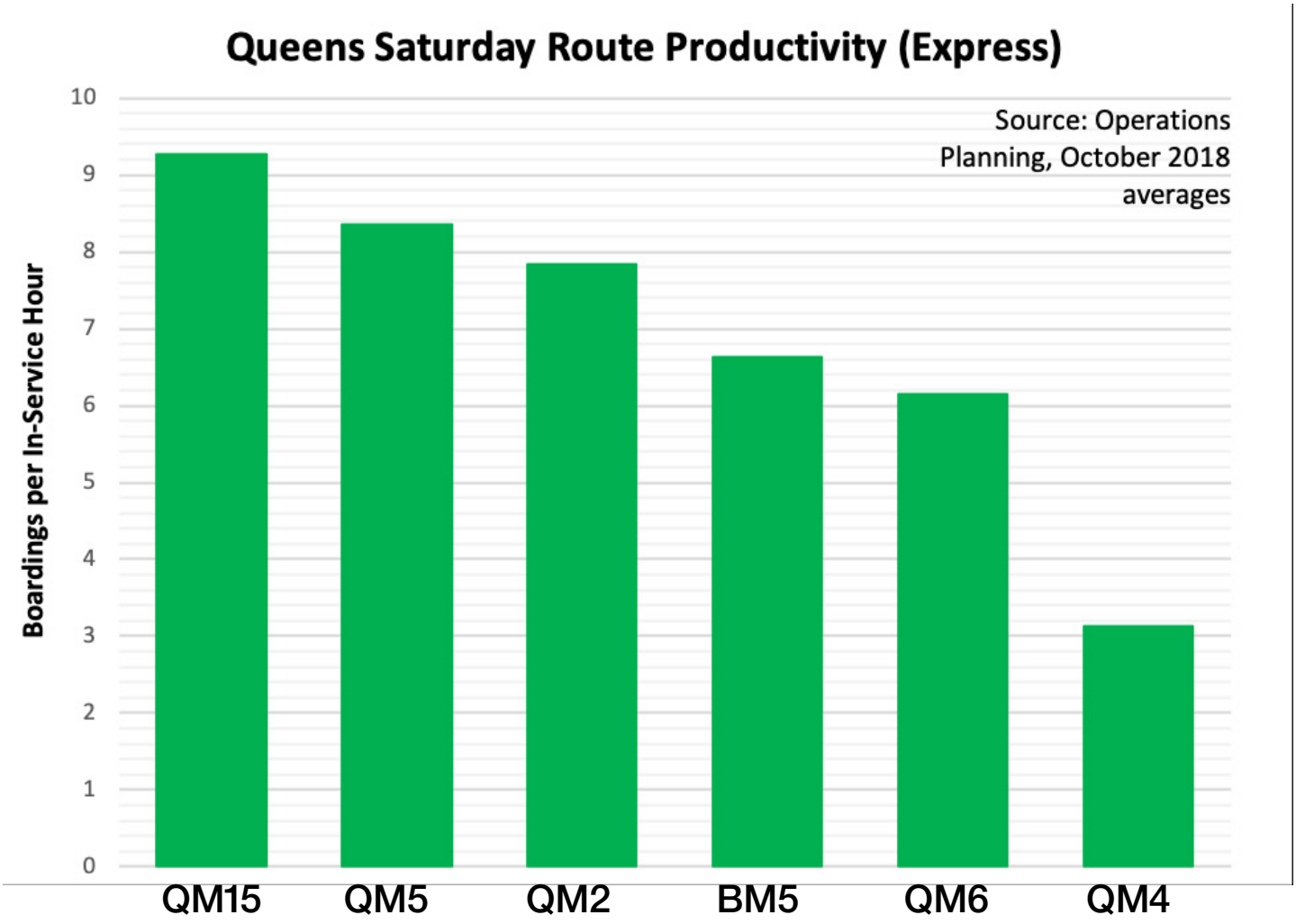
Figure 75 shows cost efficiency for Queens routes on Saturdays. Figure 76 shows cost efficiency for Queens routes on Sundays. Figure 77 shows farebox recovery for Queens routes on Saturdays. Figure 78 shows farebox recovery for Queens routes on Sundays.

Figure 71: Saturday Route Productivity - Local/Limited/SBS



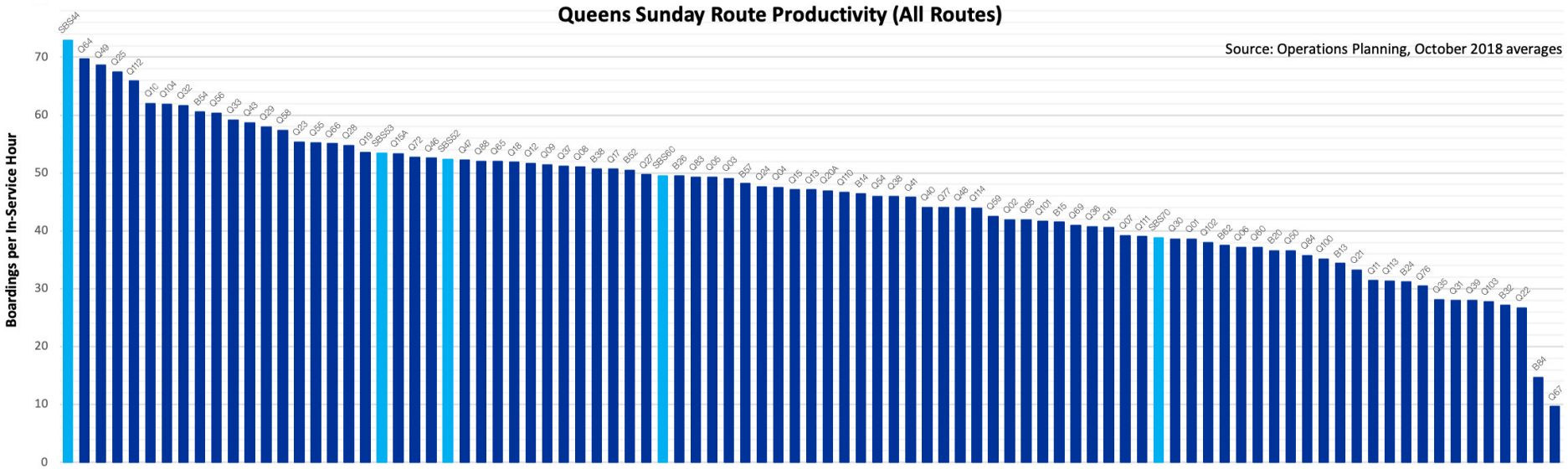
Source: MTA, 2018

Figure 72: Saturday Route Productivity - Express



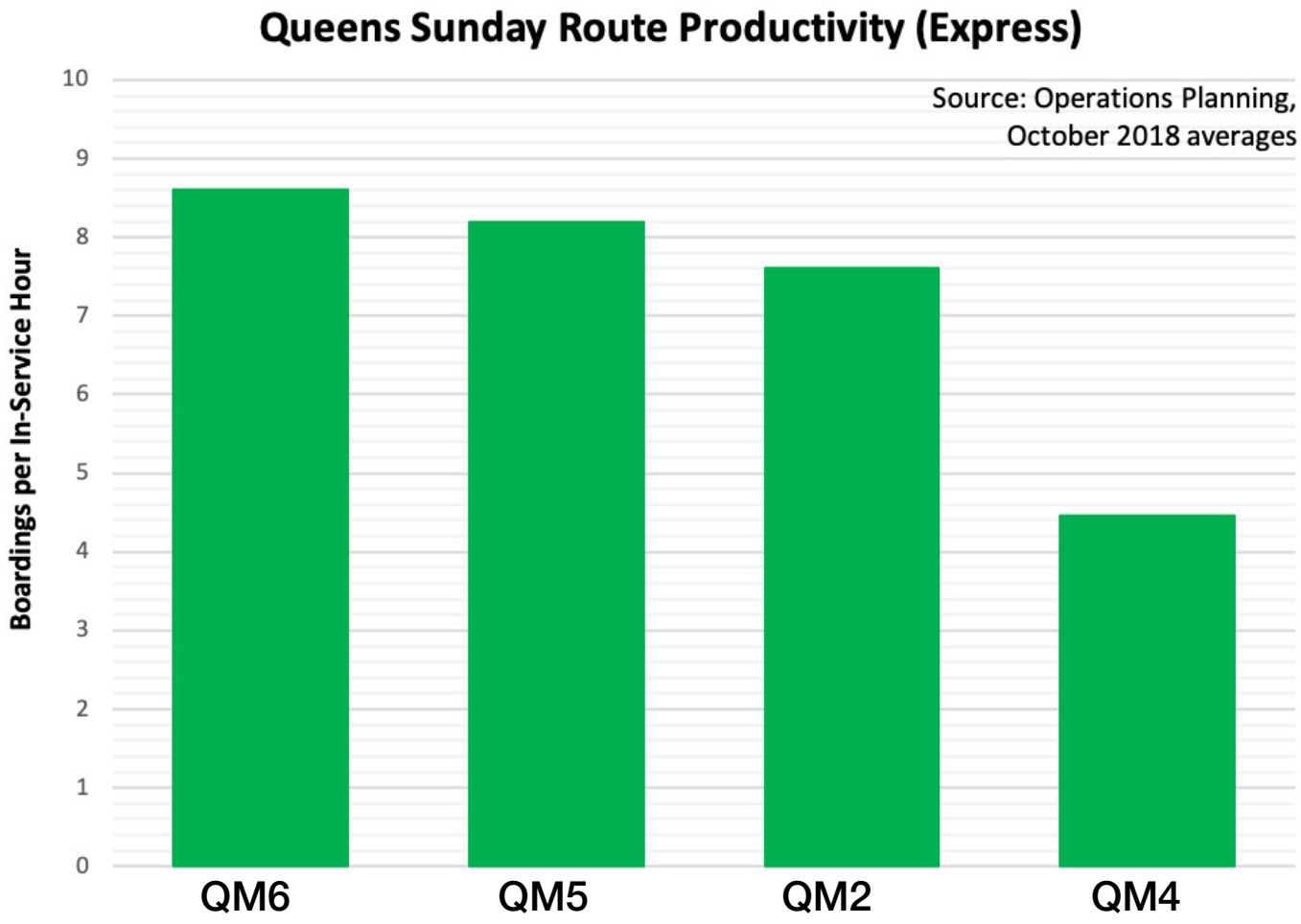
Source: MTA, 2018

Figure 73: Sunday Route Productivity - Local/Limited/SBS



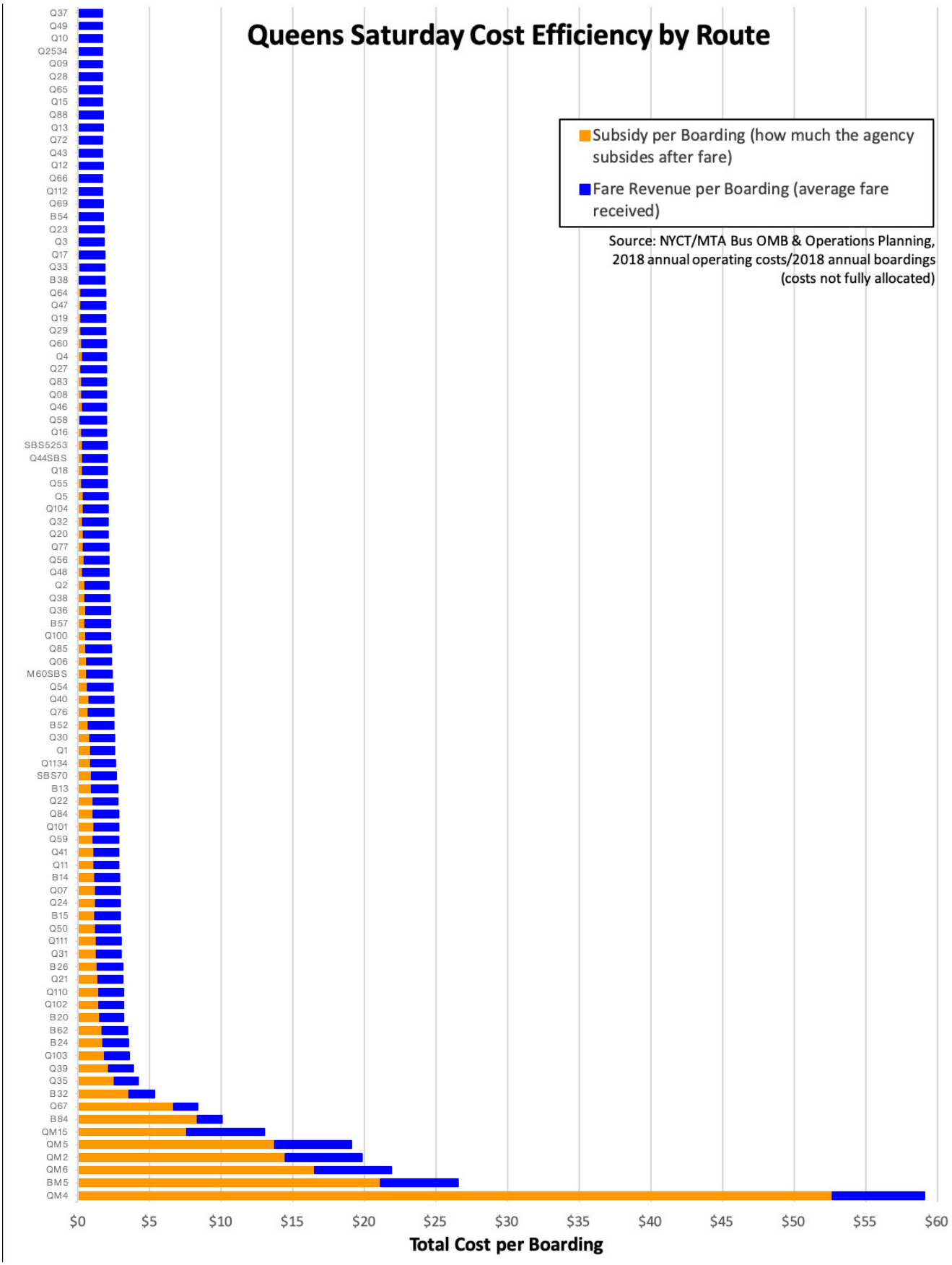
Source: MTA, 2018

Figure 74: Sunday Route Productivity - Express



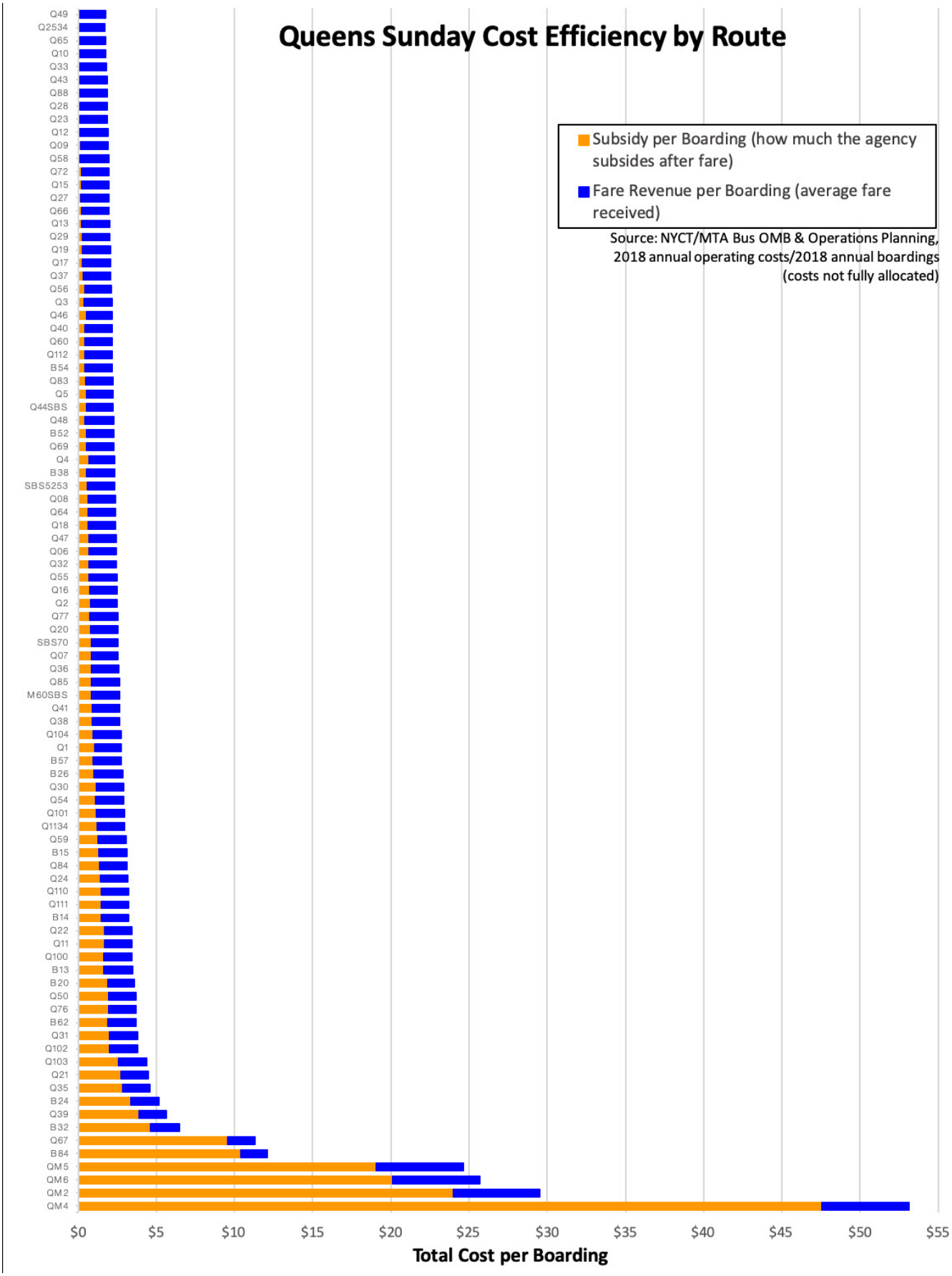
Source: MTA, 2018

Figure 75: Saturday Cost Efficiency



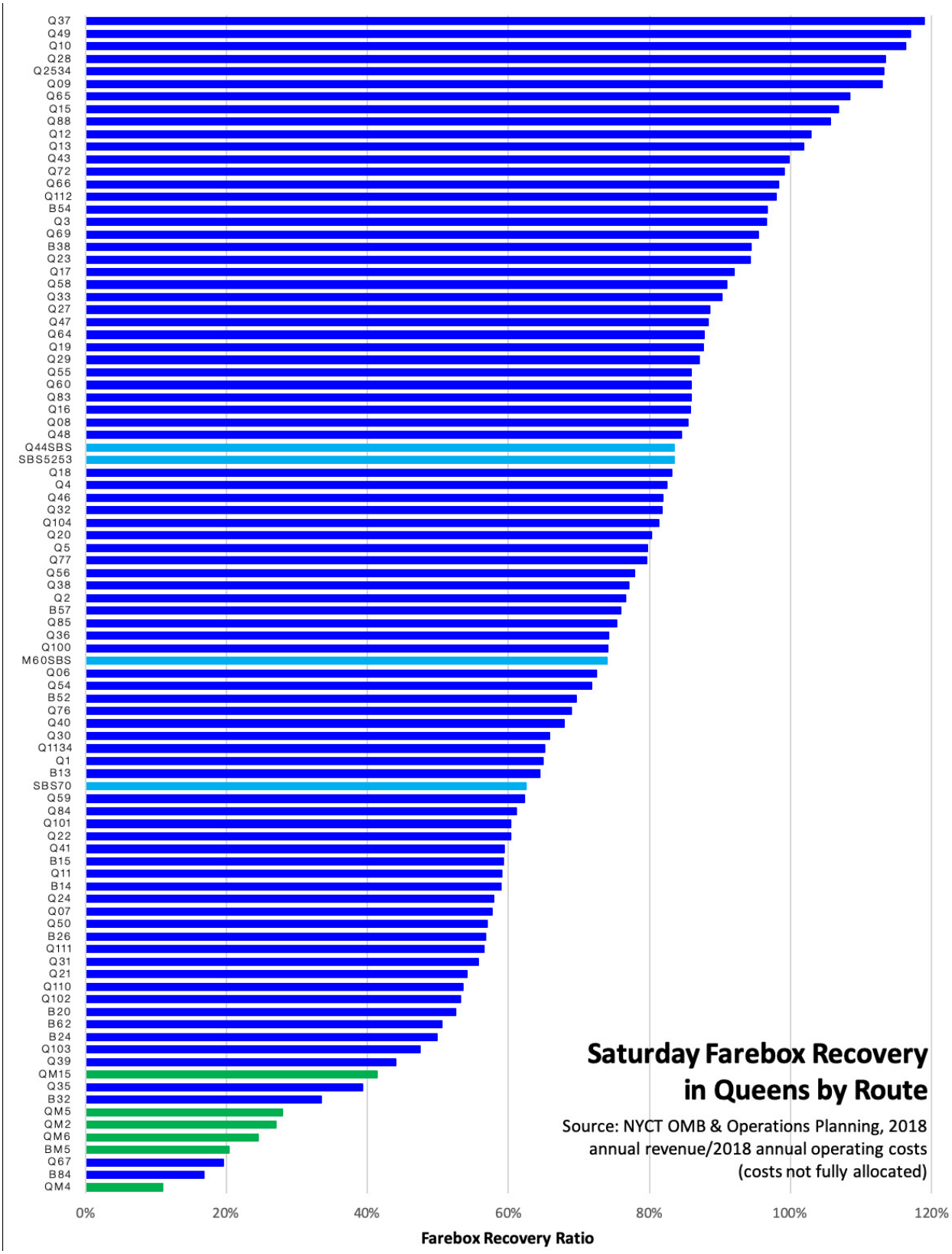
Source: MTA, 2018

Figure 76: Sunday Cost Efficiency



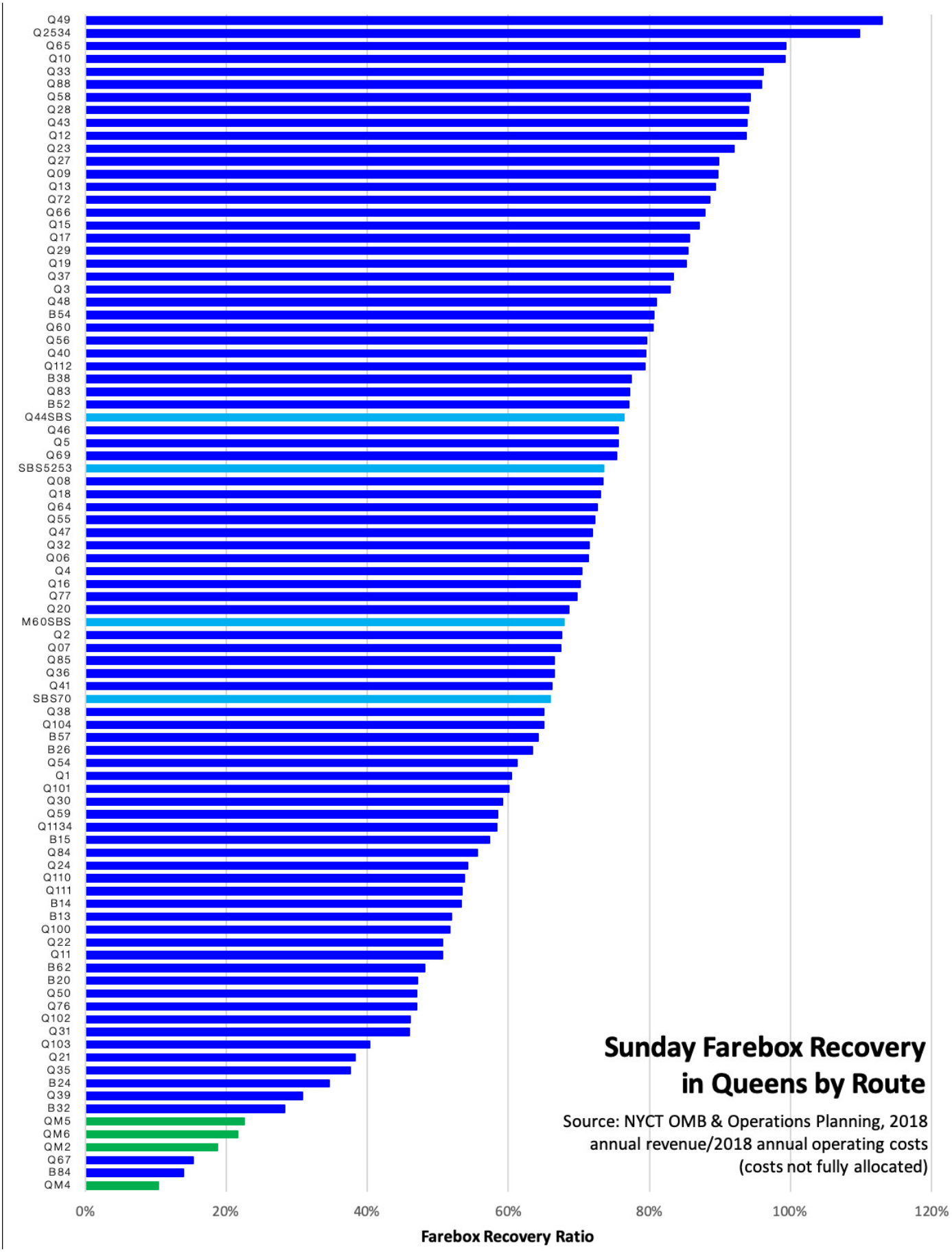
Source: MTA, 2018

Figure 77: Saturday Farebox Recovery



Source: MTA, 2018

Figure 78: Sunday Farebox Recovery



Source: MTA, 2018

E: TRAVEL FLOWS

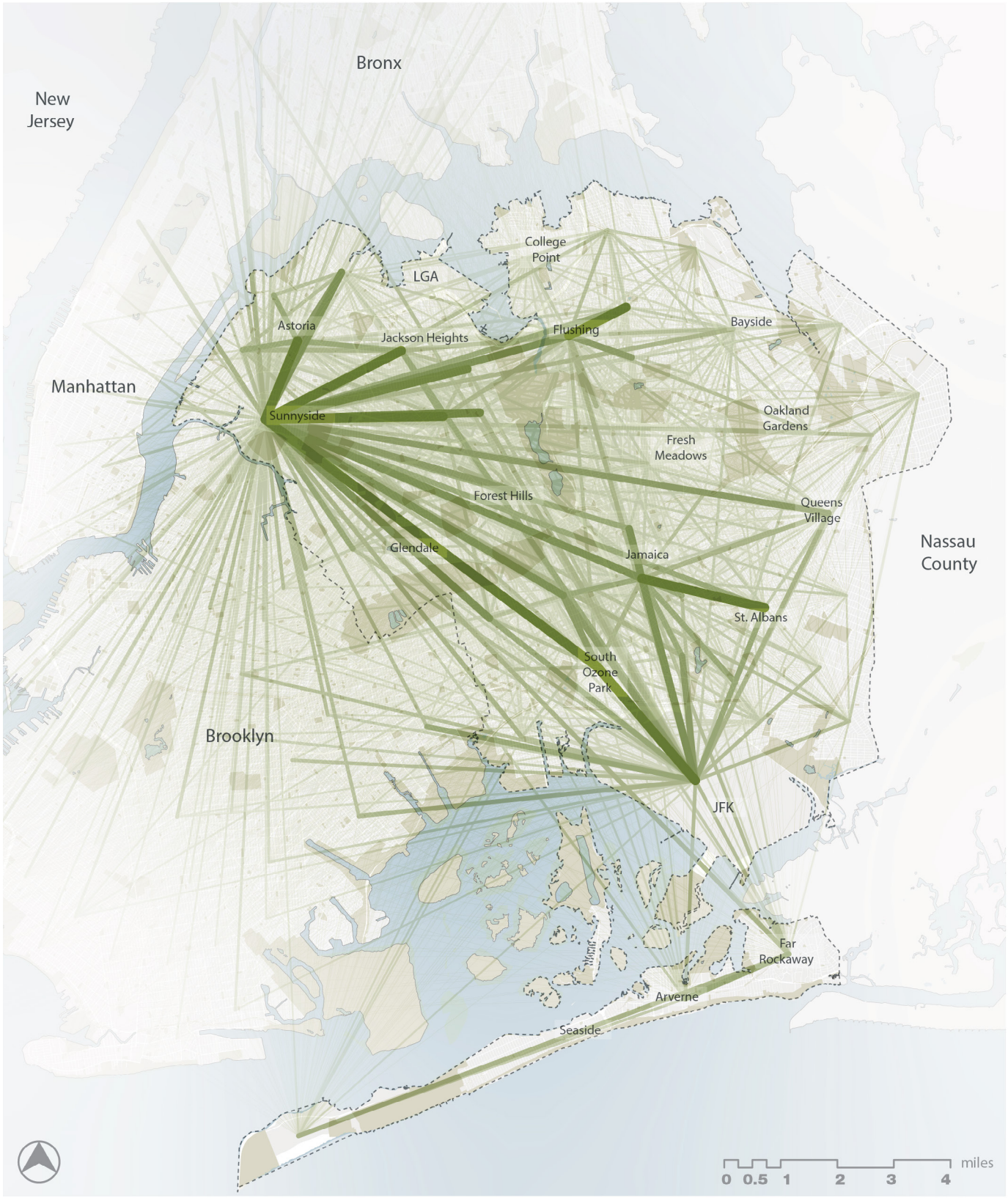
The Queens bus network is a legacy network that has largely maintained its form over several decades. As seen in Figure 14, bus origins and destinations (ODs) are largely concentrated to and from the downtown areas of Jamaica and Flushing. Elmhurst is also a significant OD. Other popular ODs include Long Island City, Queens Village, Ridgewood, and Fresh Meadows.

The comparison of bus commuter and non-bus commuter ODs identifies several key OD pairs that bus service may not be serving adequately. Figure 79 depicts all Origin & Destination Flows of Queens Neighborhood Tabulation Areas. The employment center of Long Island City/Sunnyside is a significant hub for many trips in the borough. Data also conveys several longer trips exist among all commuters when compared to bus commuter ODs.

As seen in Figure 14, most bus trips stay within Queens, with a focus on Flushing, Jamaica, and Elmhurst. Portions of eastern Queens have fewer trips, perhaps an indicator of poor transit connectivity to much of the borough.

Figure 80 and Figure 81 depict TNC trips for comparison to bus trips. Popular TNC trips that are not as popular by bus (relative to other trips by the same mode) are seen at LaGuardia and JFK airports, trips across the Queens Boulevard corridor, Fresh Meadows-Forest Hills trips, and several far-eastern Queens trips to points west.

Figure 79: Census Transportation Planning Products Queens Origin & Destination Flows



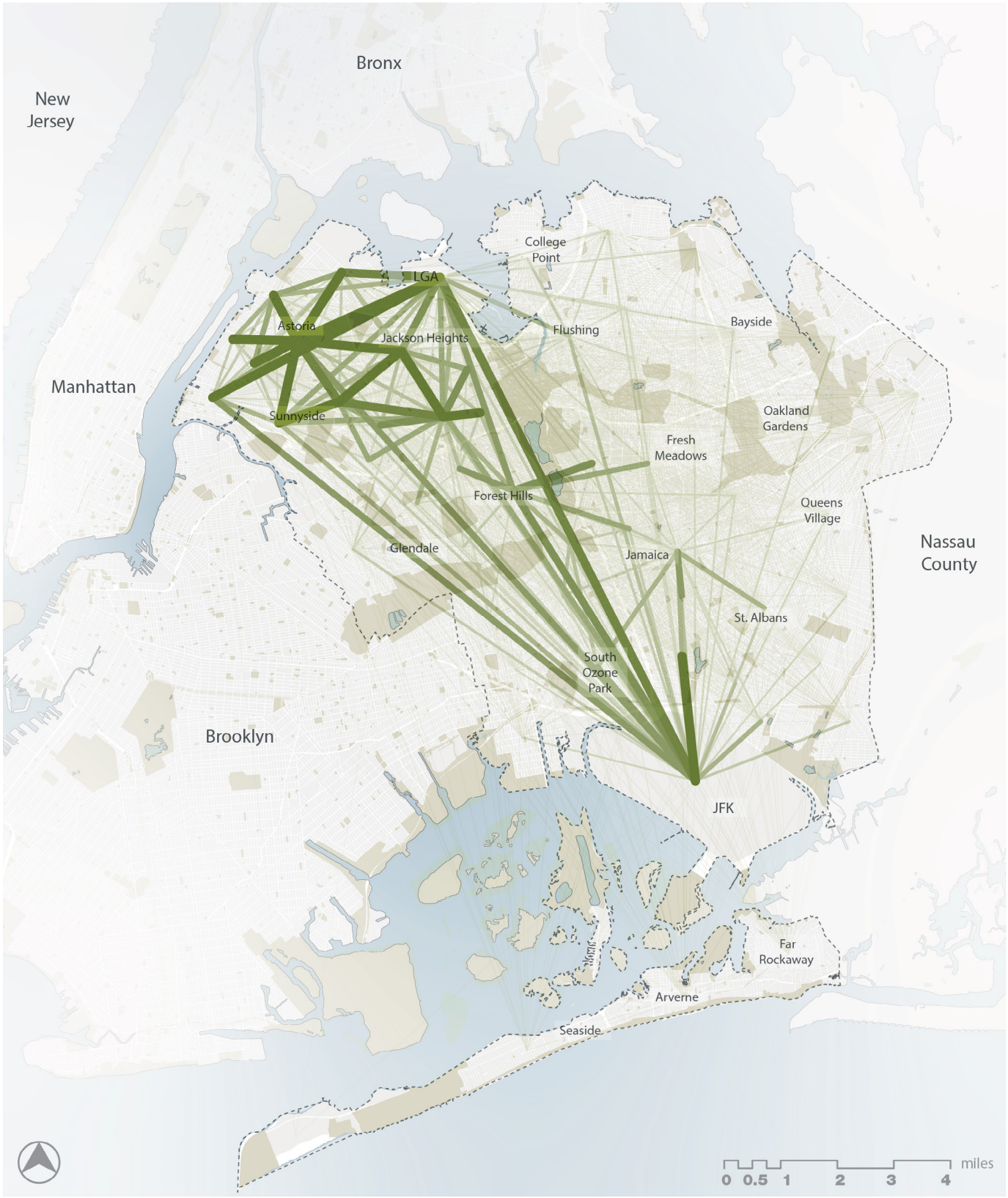
CTPP Origin & Destination Flows weekday

- 0 - 99
- 100 - 199
- 200 - 299
- 300 - 399
- 400 - 499
- 500 - 599
- 600 - 699
- 700 - 799
- 800 - 899
- 900 +

- parks, cemeteries, and open
- waterbodies, rivers, and streams

Source: CTPP, 2012-2016

Figure 80: TNC Queens Origin & Destination Flows



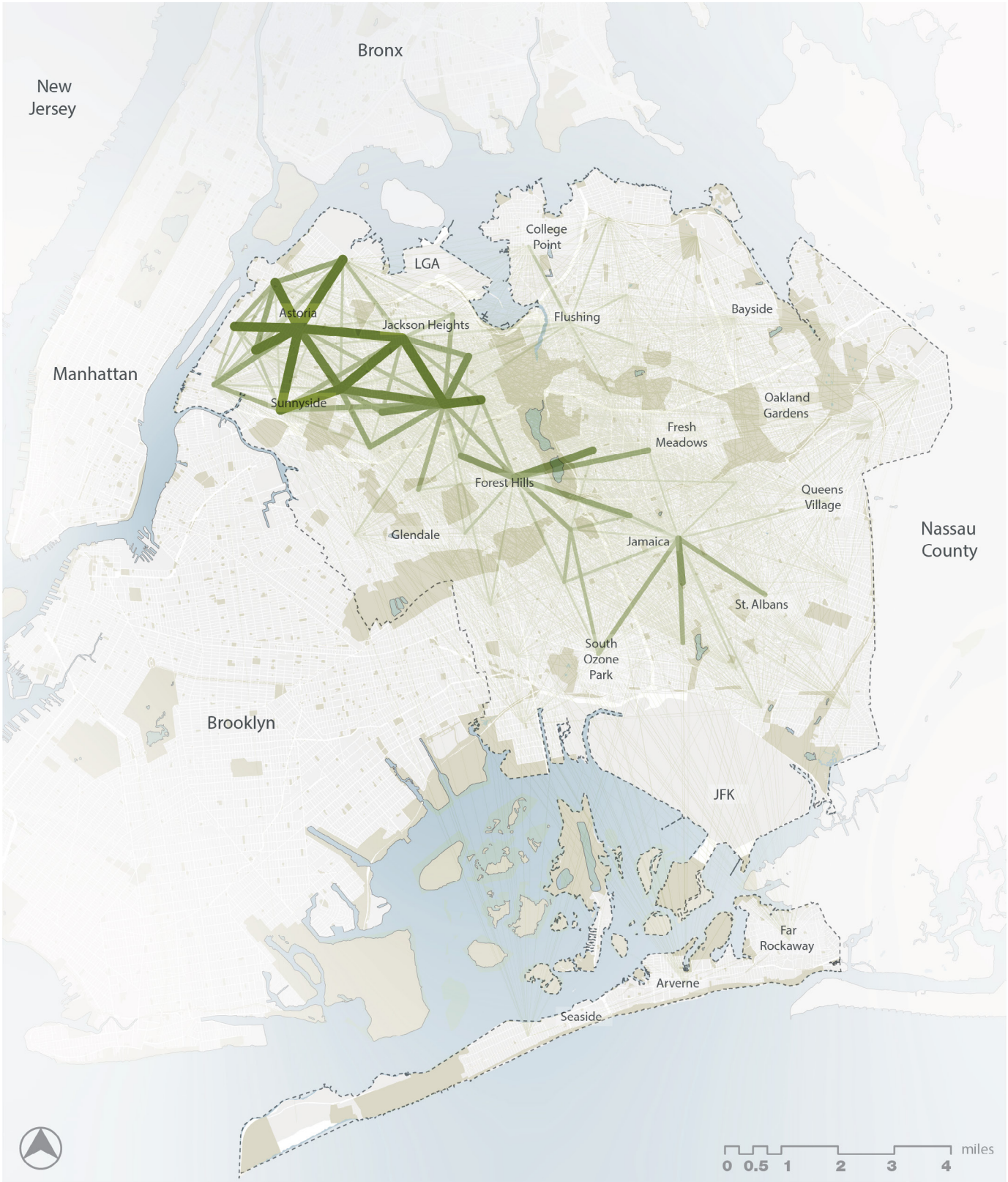
TNC Origin & Destination Flows May 2018

- 0 - 249
- 250 - 499
- 500 - 749
- 750 - 999
- 1,000 - 1,249
- 1,250 - 1,499
- 1,500 - 1,749
- 1,750 - 1,999
- 2,000 - 2,249
- 2,250 +

- parks, cemeteries, and open
- waterbodies, rivers, and streams

Source: NYC Taxi & Limousine Commission, 2018

Figure 81: TNC Queens Origin & Destination Flows Excluding Airport Trips

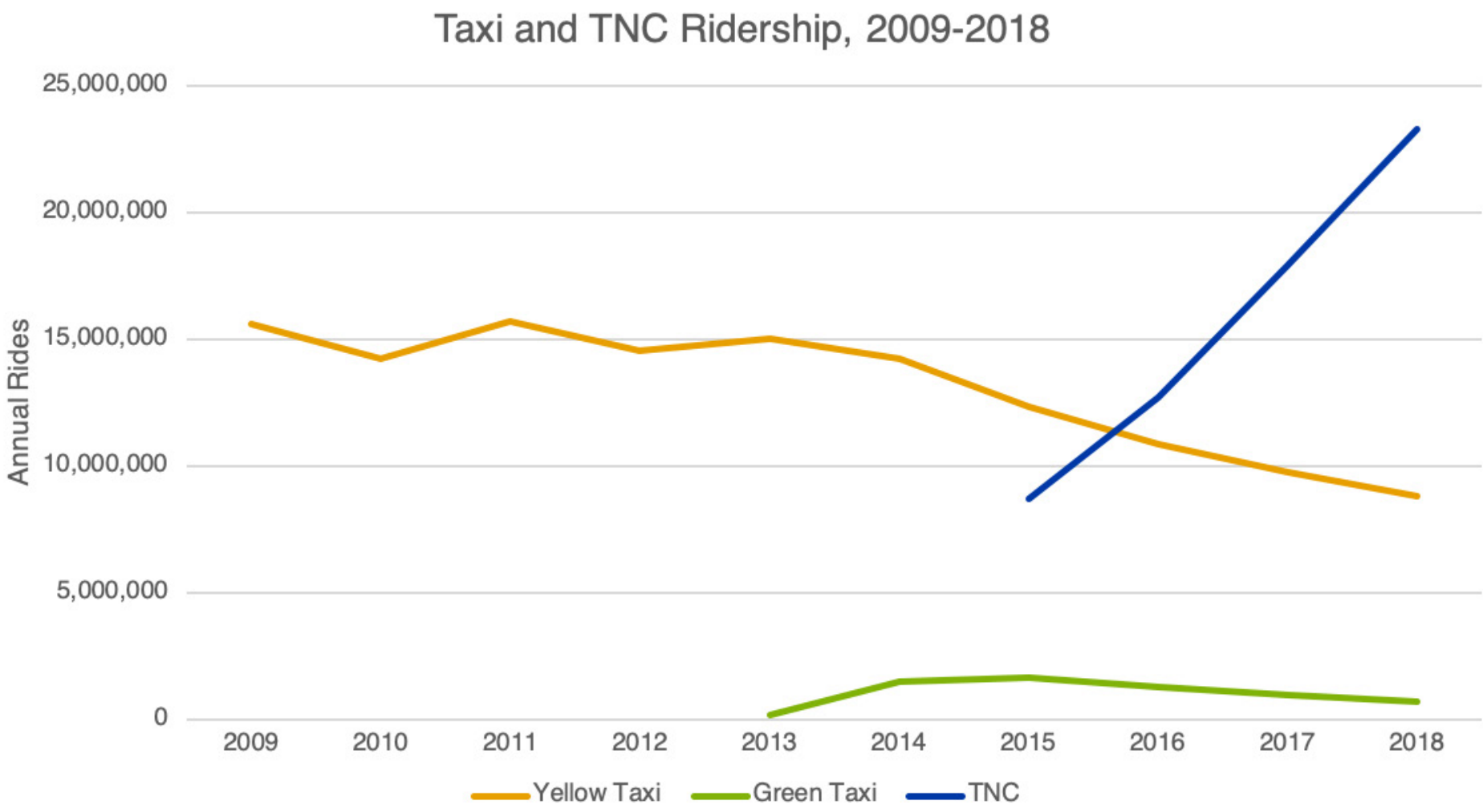


TNC Origin & Destination Flows May 2018 (LGA and JFK trips excluded)

- 0 - 249
- 250 - 499
- 500 - 749
- 750 - 999
- 1,000 - 1,249
- 1,250 - 1,499
- 1,500 - 1,749
- 1,750 - 1,999
- 2,000 - 2,249
- 2,250 +
- parks, cemeteries, and open
- waterbodies, rivers, and streams

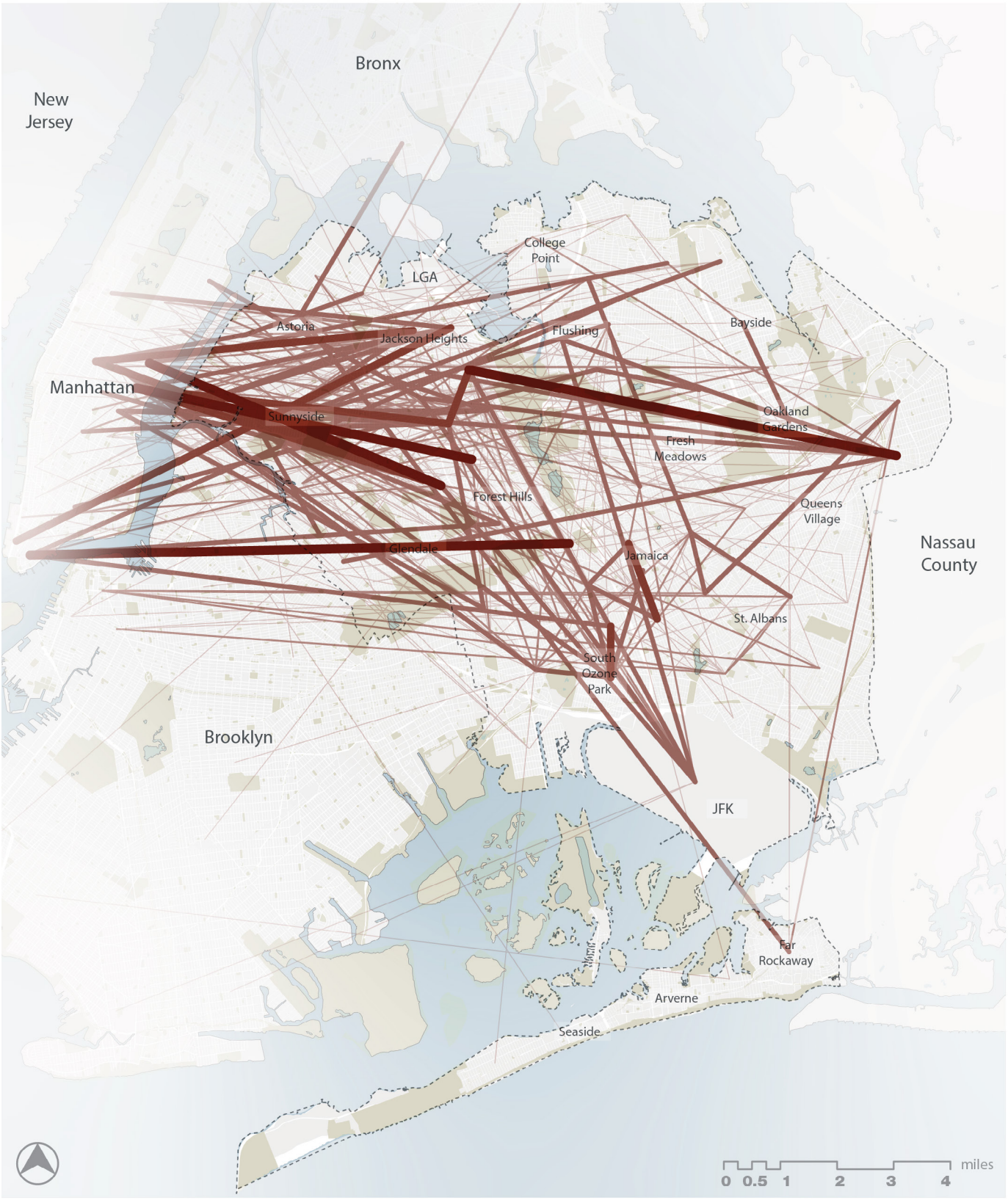
Source: NYC Taxi & Limousine Commission, 2018

Figure 82: TNC Growth



Source: CTPP 2006-2010; US Census LEHD, 2015; NYCDCP; NYCDOT

Figure 83: Network Matching Tool Intra- and Inter-Borough Difficult Trips



Network Matching Tool Difficult Trips Queens intraborough and interborough trips

- 100 - 149
- 150 - 199
- 200 - 299
- 300 - 399
- 400 - 549

- parks, cemeteries, and open space
- waterbodies, rivers, and streams

Source: NYC Taxi & Limousine Commission, 2009-2018

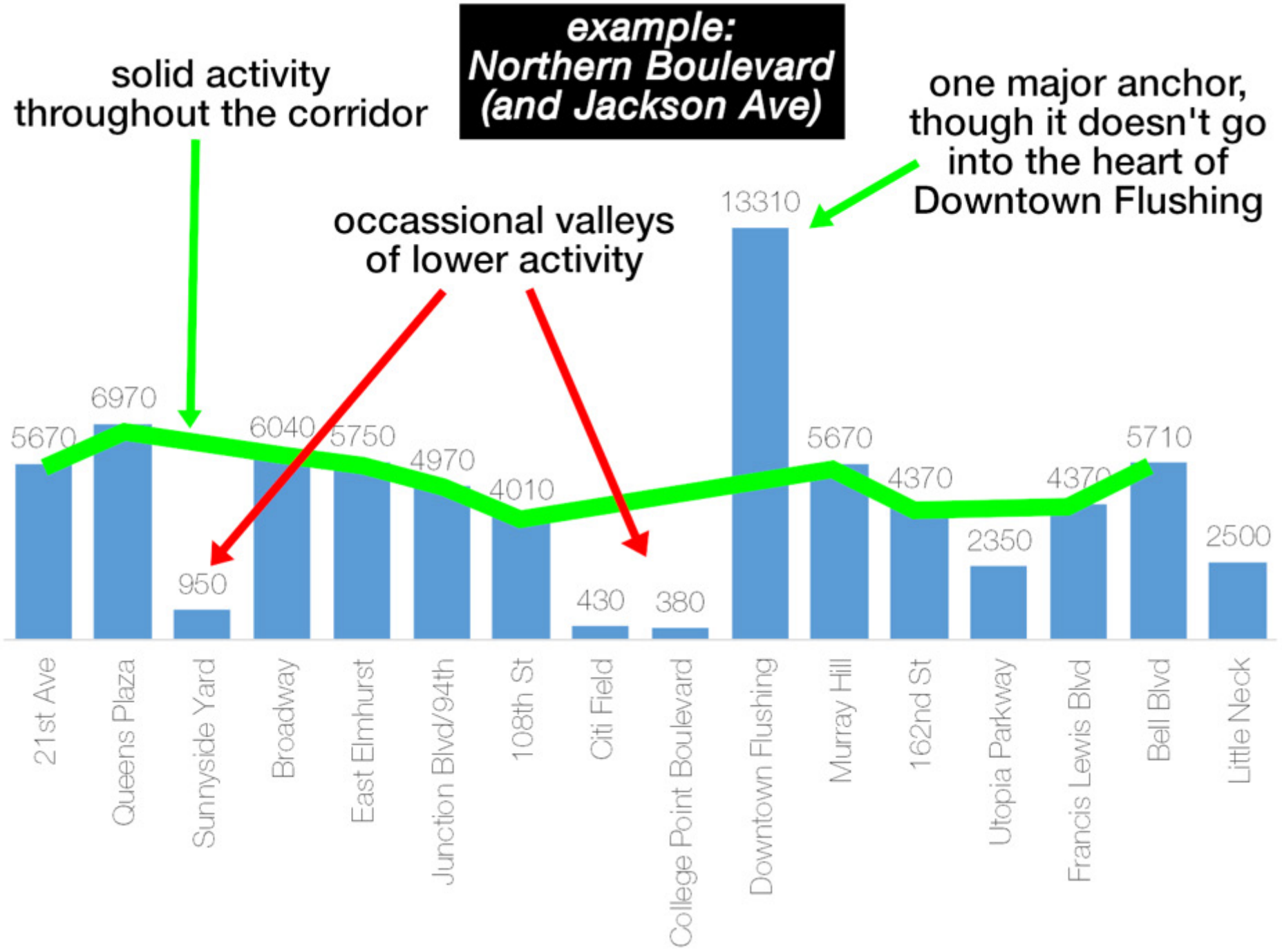
F: CORRIDOR PROFILES

The following pages include 41 corridors that we analyzed based on land use, density, bus boarding activity along the corridor, and features of the street that affect bus travel. Additional corridors were evaluated, but we are focusing on the longer, straighter corridors for the purposes of this report. Input from our customers indicated that traveling long distances across Queens and between Queens and Brooklyn is difficult and needs to be greatly improved. Analyzing these corridors seeks to examine the borough from a blank-slate perspective, evaluating what corridors exist and how well the corridors might accommodate bus travel. The corridors following are relatively straight, with a maximum of one or two turns along the way. In some instances, they are completely straight. All are at least 2.5 miles long. Some important corridors, such as Fresh Pond Road, were analyzed, but not listed here, as their contribution to crosstown travel is limited based on their short straight distance.

In the following bar charts, the numbers and height of the bar represent ridership levels currently in the area, but that should not be assumed as indicative of possible ridership if a new route is developed along the length of the corridor. The numbers allow us to analyze the relative levels of activity at each of the named locations. When combined with an analysis of land use and density, this can help lead to which portions of the corridor might have potentially high ridership, or which portions of the corridor might better serve longer crosstown trips.

Bus routes that have anchors at each end of high-activity centers, with varying high activity centers in between, make the best use of available bus operator and vehicle resources. They allow us to serve the most people in the most efficient way. These charts help identify possible pairs of anchors on corridors that might be productive well as high ridership routes. Lower levels of activity along the corridor might indicate that the route is better for long-distance crosstown travel. If a corridor has high levels of activity, but severe peaks and valleys throughout, it might merit a limited-stop service for the busiest areas on top of a local service to serve the entire corridor.

The bar charts are all drawn at the same scale, so that the levels of activity indicated at each location on each corridor can be compared among different corridors within this appendix. Some locations, such as Downtown Flushing and Downtown Jamaica, are off-the-charts, in that the height of the bar is higher than this scale will allow. The corridors are ordered by the total activity levels divided by the corridor length. So shorter, busier corridors show up first. The first two corridors listed are the main corridors between Downtown Flushing and Downtown Jamaica. Corridors at the end have relatively low levels of activity and/or are long corridors.


example:
Northern Boulevard
(and Jackson Ave)
solid activity throughout the corridor
occassional valleys of lower activity
one major anchor, though it doesn't go into the heart of Downtown Flushing
5670
6970
950
6040
5750
4970
4010
430
380
13310
5670
4370
4370
2350
5710
2500
21st Ave
Queens Plaza
Sunnyside Yard
Broadway
East Elmhurst
Junction Blvd/94th
108th St
Citi Field
College Point Boulevard
Downtown Flushing
Murray Hill
162nd St
Utopia Parkway
Francis Lewis Blvd
Bell Blvd
Little Neck

PARSONS BLVD/KISSENA CORRIDOR PROFILE

Subway Connection	At Parsons Boulevard F At Jamaica Center–Parsons/Archer E J Close to Flushing–Main Street 7 Close to Flushing Main Street LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	130,000
Corridor Length in miles (within Queens)	4.5
Average Ridership per miles (within Queens)	28,900
East-West or North-South?	North-South
Location	This 4-and-a-half-mile corridor stretches from Main Street on the south side of Downtown Flushing to Archer Avenue in Jamaica.
Local/Limited/SBS	**Q17/Q25/Q34**
Ridership along this corridor	This corridor has very strong anchors at each end in Flushing and Jamaica. Even the areas that are just outside of the downtown get high ridership. The busiest spot in between these two downtowns is Queens College.
Land use & density	There is a mix of uses throughout the corridor, and the only location where density drops off is at Kissena Park. The strong anchors on each end of the corridor are supplemented with additional spots of higher density scattered along the corridor.
Road conditions	The corridor has only one travel lane in each direction throughout most of its length, and at some points the streets are so narrow that no parking can be accommodated. This area was examined years ago when the Q25 route that travels this corridor was considered for conversion to Select Bus Service. The study revealed very few opportunities to add bus lanes to the corridor. This is unfortunate based on the high ridership per mile throughout this corridor. This corridor has TSP installed from Maple Avenue to Hillside Boulevard.

RIDER ACTIVITY IN AREA

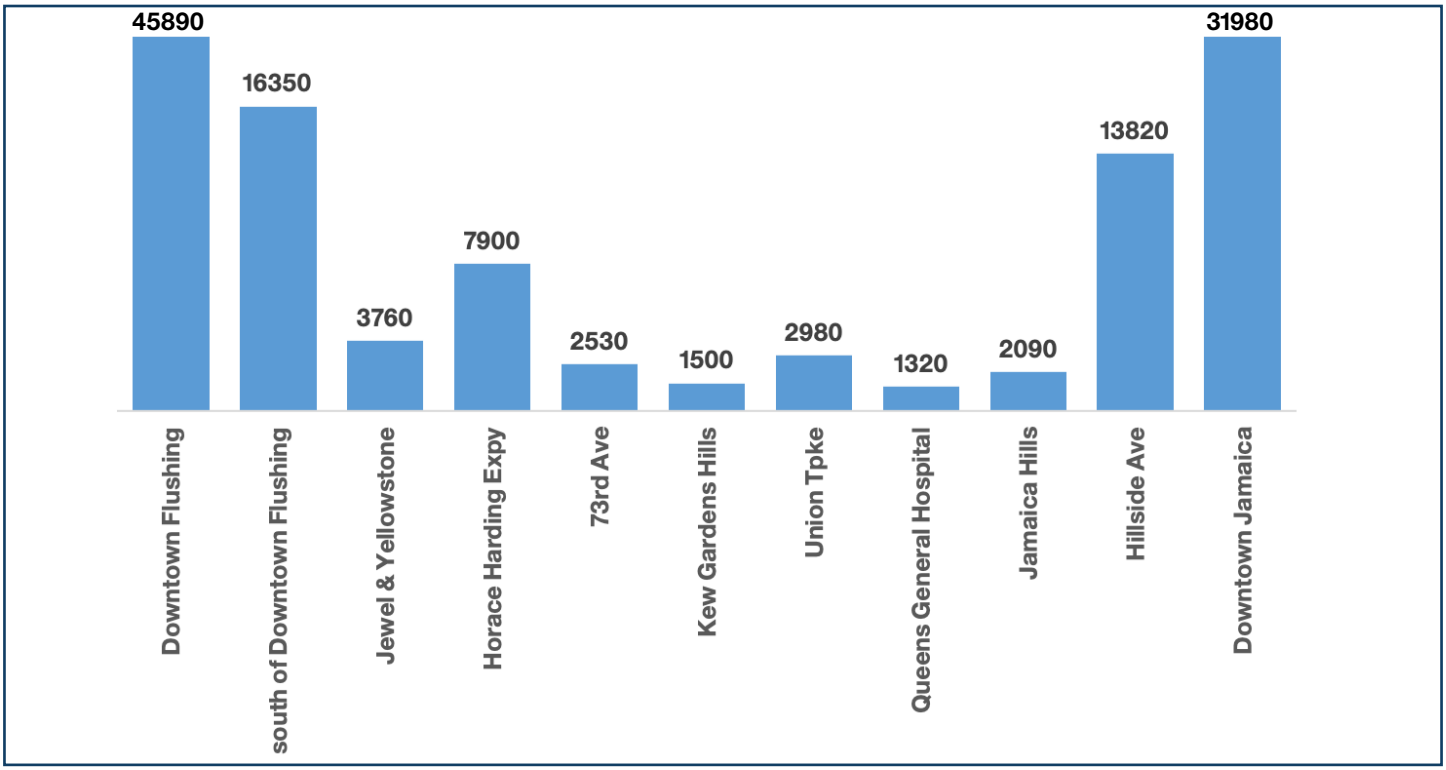
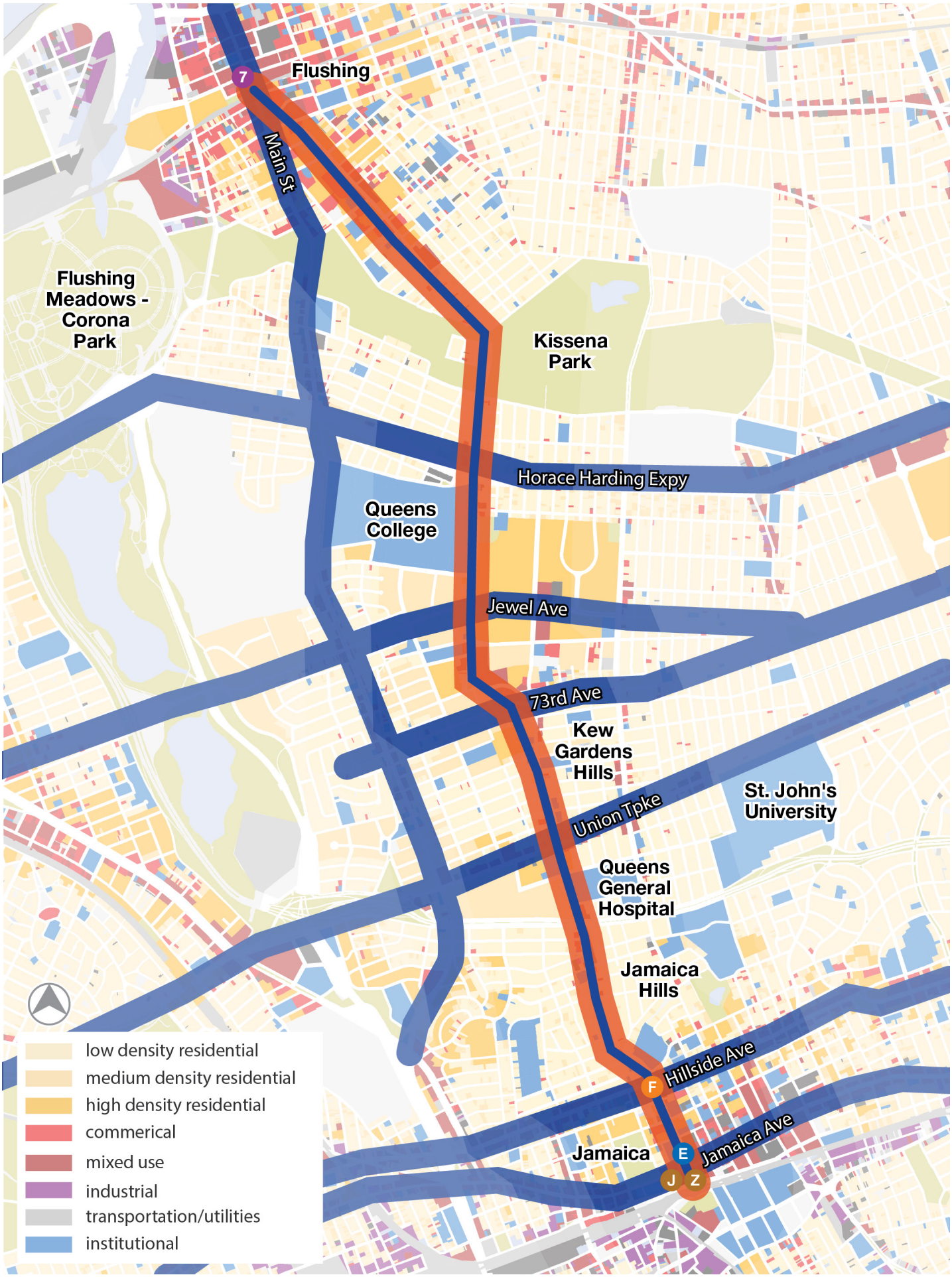


Figure 84


Flushing
7
Main St
Flushing Meadows - Corona Park
Kissena Park
Horace Harding Expy
Queens College
Jewel Ave
73rd Ave
Kew Gardens Hills
St. John's University
Union Tpke
Queens General Hospital
Jamaica Hills
Hillside Ave
F
Jamaica
E
Jamaica Ave
J
Z
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

MAIN ST CORRIDOR PROFILE

Subway Connection	At Flushing–Main Street 7 At Briarwood E F At Flushing Main Street LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	80,000
Corridor Length in miles (within Queens)	3.9
Average Ridership per miles (within Queens)	20,500
East-West or North-South?	North-South
Location	This 4-mile corridor stretches from Northern Boulevard at the north edge of Downtown Flushing, to Queens Boulevard and the Van Wyck Expressway.
Local/Limited/SBS	**Q44-SBS/Q20A/Q20B**
Ridership along this corridor	Main Street stretches between Downtown Flushing and Briarwood, similar to the Parsons Boulevard/Kissena Avenue corridor, but doesn't have as steady ridership throughout the corridor.
Land use & density	South of Downtown Flushing, density along Main Street drops off and then thins out along Cedar Grove Cemetery, as well as less-than-urban densities in Kew Gardens Hills, before rising again in Briarwood.
Road conditions	The corridor is wide throughout, and has bus lanes in certain portions that were installed during the conversion of the Q44 to Select Bus Service. This corridor has TSP installed from Maple Avenue to Queens Boulevard.

RIDER ACTIVITY IN AREA

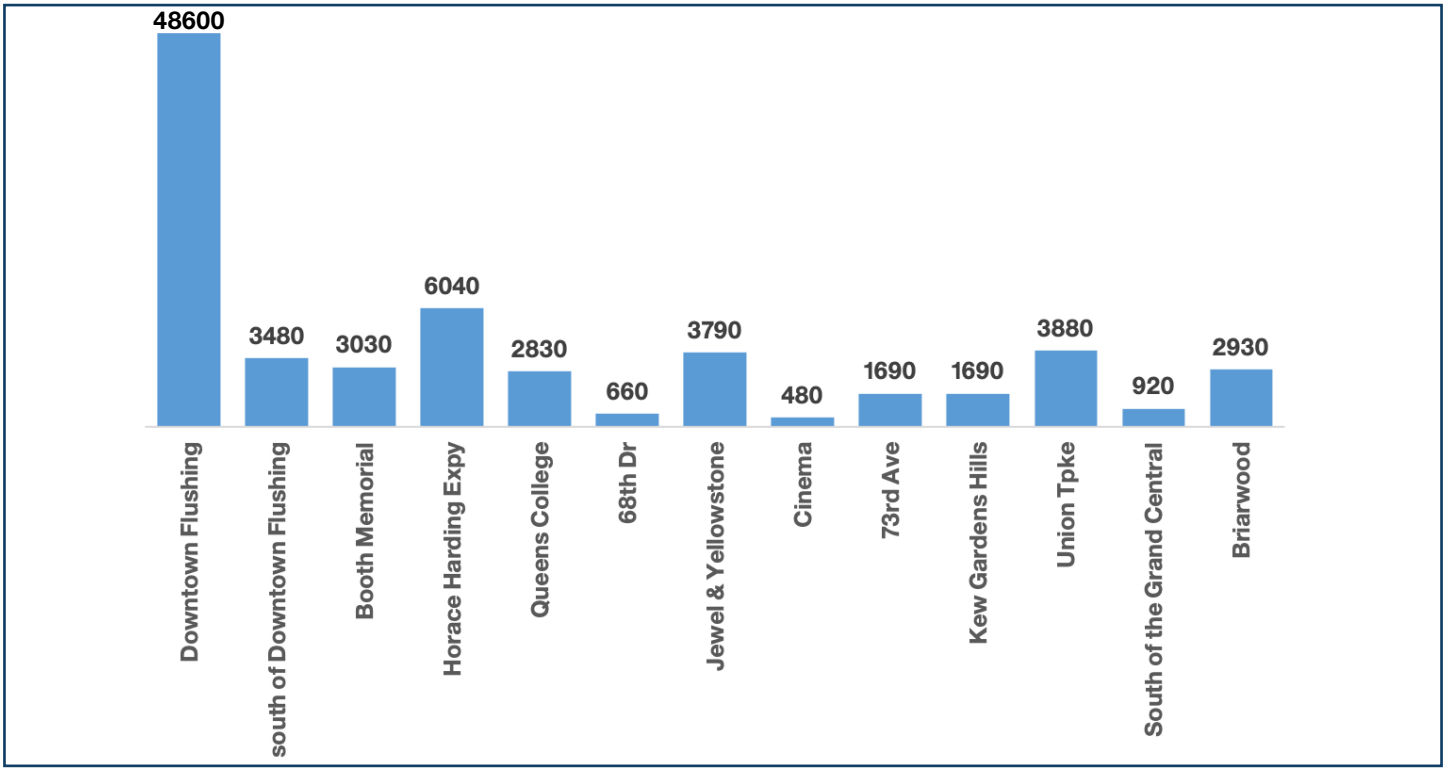
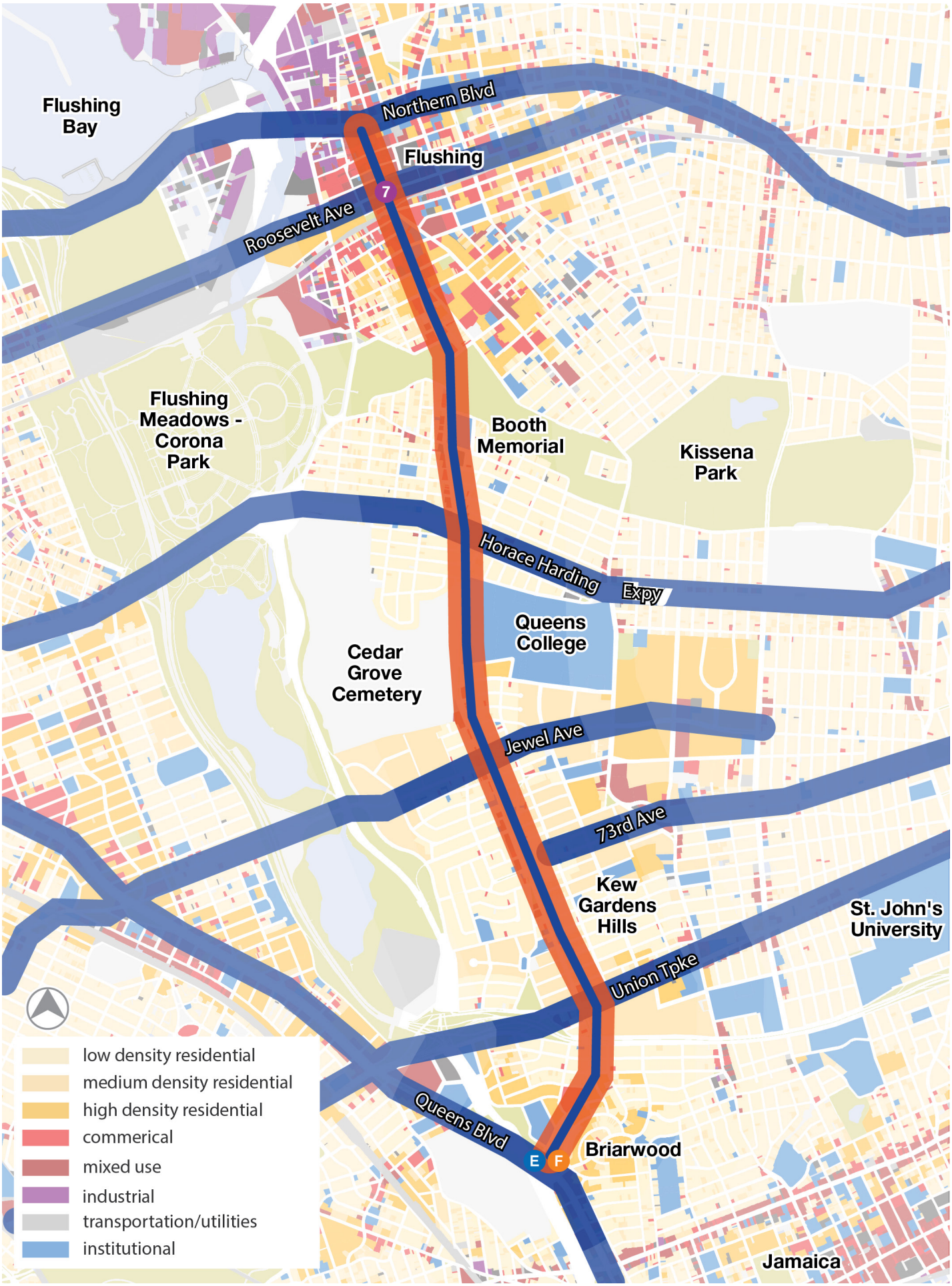


Figure 85


Flushing Bay
Northern Blvd
Flushing
7
Roosevelt Ave
Flushing Meadows - Corona Park
Booth Memorial
Kissena Park
Horace Harding Expy
Queens College
Cedar Grove Cemetery
Jewel Ave
73rd Ave
Kew Gardens Hills
St. John's University
Union Tpke
Queens Blvd
E
F
Briarwood
Jamaica
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

JAMAICA AVE CORRIDOR PROFILE

Subway Connection	At Jamaica - Van Wyck (E) Close to Sutphin Boulevard–Archer Avenue–JFK (E) (J) Close to Jamaica Center–Parsons/Archer (E) (J) Close to Jamaica–179th Street (F) At Queens Village LIRR station Close to Jamaica LIRR station Close to Hollis LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	127,000
Corridor Length in miles (within Queens)	9
Average Ridership per miles (within Queens)	14,200
East-West or North-South?	East-West
Location	This corridor is almost 11 miles long, from East New York extending into Nassau County where it becomes Jericho Turnpike.
Local/Limited/SBS	**Q56/Q110/Q36**
NICE Bus	**N24**
Ridership along this corridor	The busiest portion of the corridor is between Woodhaven Boulevard and Springfield Boulevard, with a peak of activity in Downtown Jamaica.
Land use & density	Jamaica Avenue is one of the primary east-west corridors in Downtown Jamaica, with a variety of important destinations, such as shopping and government offices. West of Downtown Jamaica, there are dense multistory buildings and a mix of uses forming solid urbanism. East of Downtown Jamaica, the corridor maintains some multistory buildings and density and mix of uses, similar to Northern Boulevard in Corona/East Elmhurst.
Road conditions	Most of the western portion of the corridor is under the elevated (J) (Z) train. Buses running beneath the el are often slow due to the tight space constraints of the columns.The eastern portion is wide with a median and oftentimes protected turning lanes.

RIDER ACTIVITY IN AREA

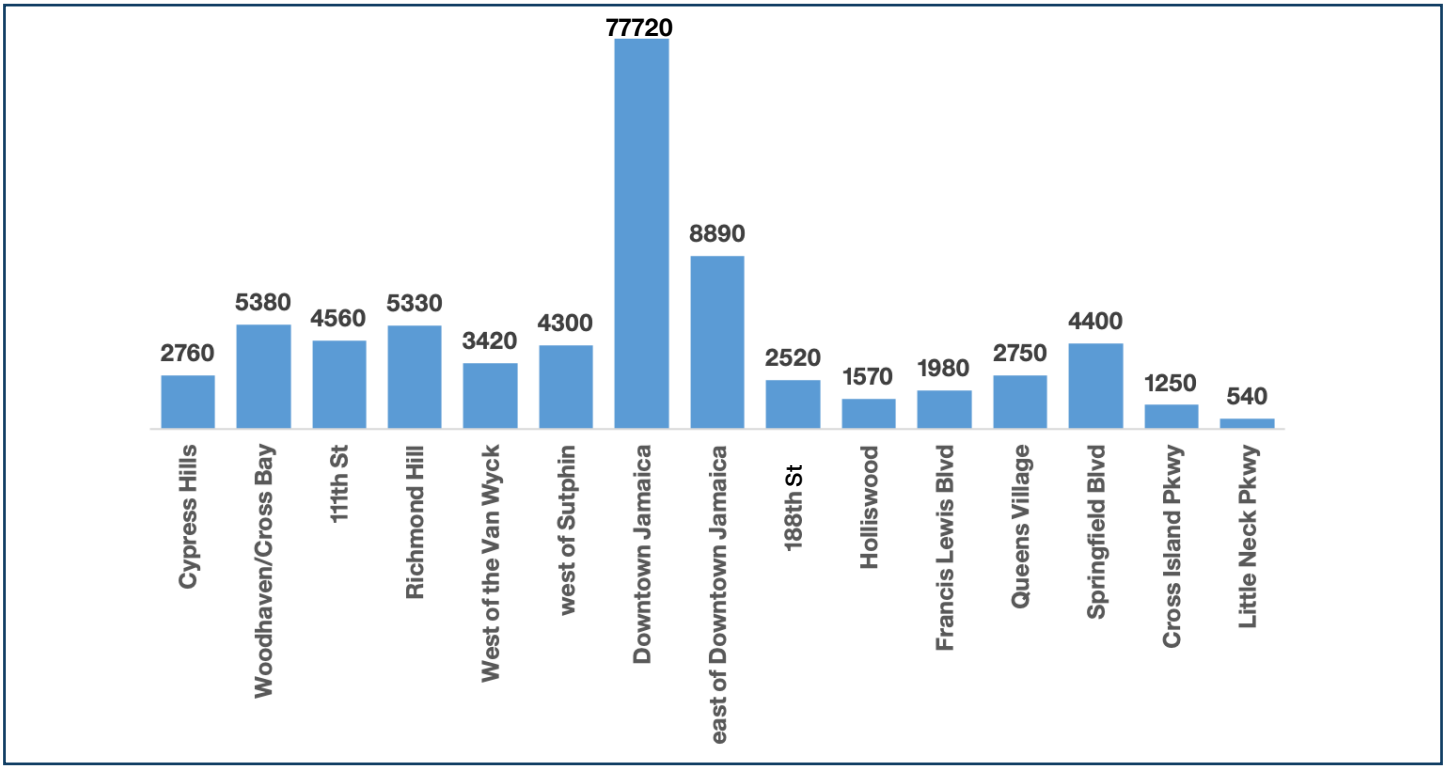
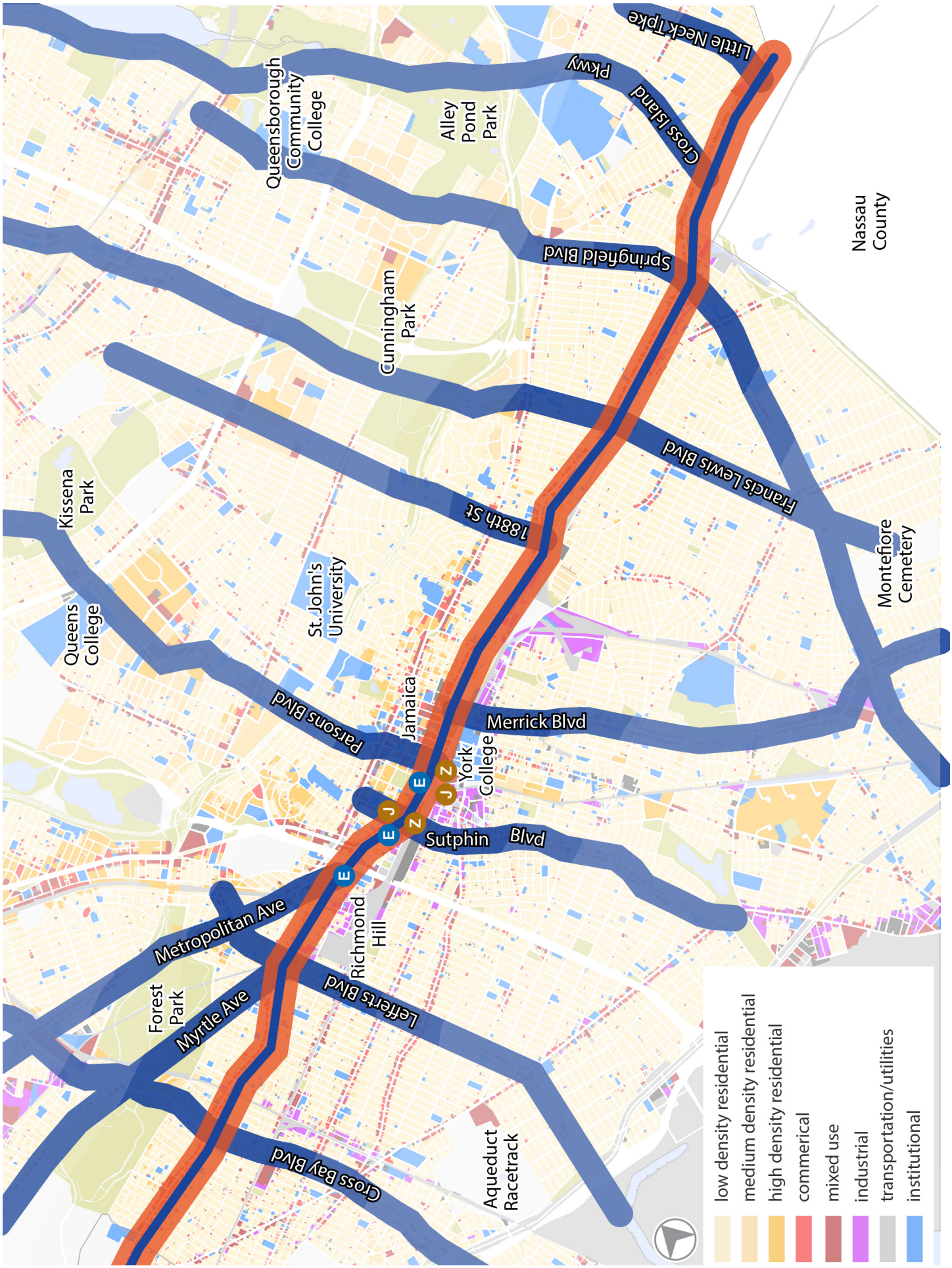


Figure 86


Little Neck Tpke
Pkwy
Cross Island
Queensborough Community College
Alley Pond Park
Springfield Blvd
Nassau County
Cunningham Park
Francis Lewis Blvd
188th St
Kissena Park
St. John's University
Montefiore Cemetery
Queens College
Parsons Blvd
Jamaica
Merrick Blvd
York College
Sutphin Blvd
Metropolitan Ave
Richmond Hill
Forest Park
Myrtle Ave
Jefferts Blvd
Cross Bay Blvd
Aqueduct Racetrack
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

SUTPHIN BLVD CORRIDOR PROFILE

Subway Connection	At Sutphin Boulevard–Archer Avenue–JFK E J At Sutphin Boulevard F At Jamaica LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	36,000
Corridor Length in miles (within Queens)	2.6
Average Ridership per miles (within Queens)	14,000
East-West or North-South?	North-South
Location	This 3-mile corridor stretches between Hillside Avenue and the Conduit.
Local/Limited/SBS	**Q6**
Ridership along this corridor	The corridor has solid ridership throughout.
Land use & density	The densities of Downtown Jamaica slowly give way to lower densities farther south along the corridor.
Road conditions	The corridor has one travel lane in each direction for most of its length.

RIDER ACTIVITY IN AREA

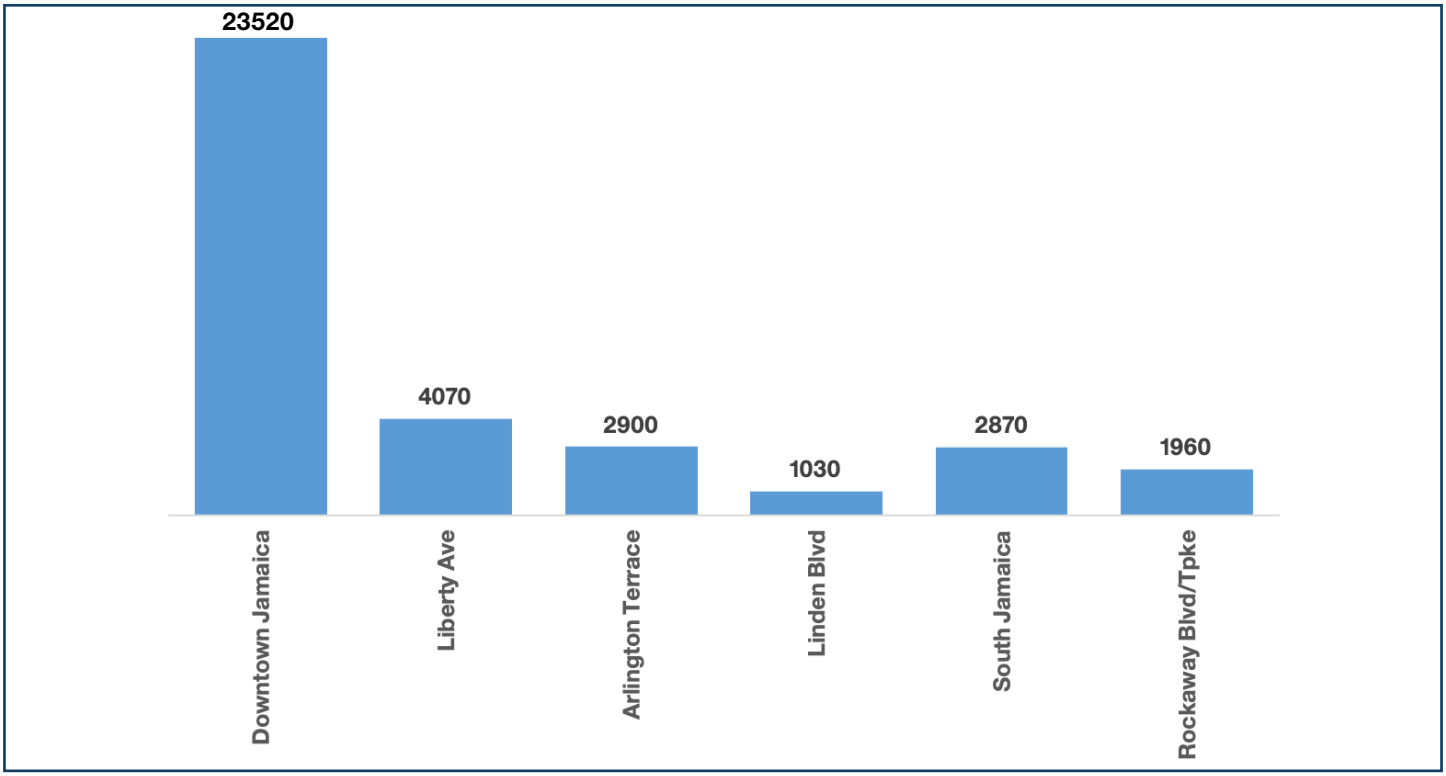


Figure 87


Hillside Ave
F
Jamaica
Jamaica Ave
Archer Ave
E
J
Z
York College
Liberty Ave
Arlington Terrace
Linden Blvd
South Jamaica
Baisley Pond Park
Rochdale Village
Rockaway Blvd
Conduit Ave
JFK
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

HILLSIDE AVE CORRIDOR PROFILE

Subway Connection	At Parsons Boulevard (F) At Sutphin Boulevard (F) At Jamaica-179th Street (F) At 169th Street (F) Close to Jamaica - Van Wyck (E) Close to 121st Street (J) (Z)
Average Weekday Ridership on Local/Limited/SBS (within Queens)	93,000
Corridor Length in miles (within Queens)	7.5
Average Ridership per miles (within Queens)	12,400
East-West or North-South?	East-West
Location	This seven-and-a-half-mile corridor stretches from Myrtle Avenue in Richmond Hill across into Nassau County, continuing on until it reaches Jericho Turnpike in Westbury. It forms the northern border of Downtown Jamaica.
Local/Limited/SBS	**Q43/Q77/Q1**
Express	**X68**
NICE Bus	**N22A/N22/N26**
Ridership along this corridor	This corridor has solid ridership throughout, with few spots on the eastern end that aren't busy.
Land use & density	West of the Van Wyck Expressway, the corridor has solid urbanism, but no bus service. Above the F train, there are spots of density immediately next to auto-oriented uses. East of the 179th Street subway terminal, development maintains a somewhat-dense urbanism for about seven-tenths of a mile until 191st Street, when density drops suddenly to suburban levels. There are a few spots of density east of there, and eventually the low-slung suburban pattern becomes solid.
Road conditions	East of the Van Wyck Expressway, the avenue is wide, with multiple travel lanes. This corridor has TSP installed from Parsons Boulevard to 214th Street.

RIDER ACTIVITY IN AREA

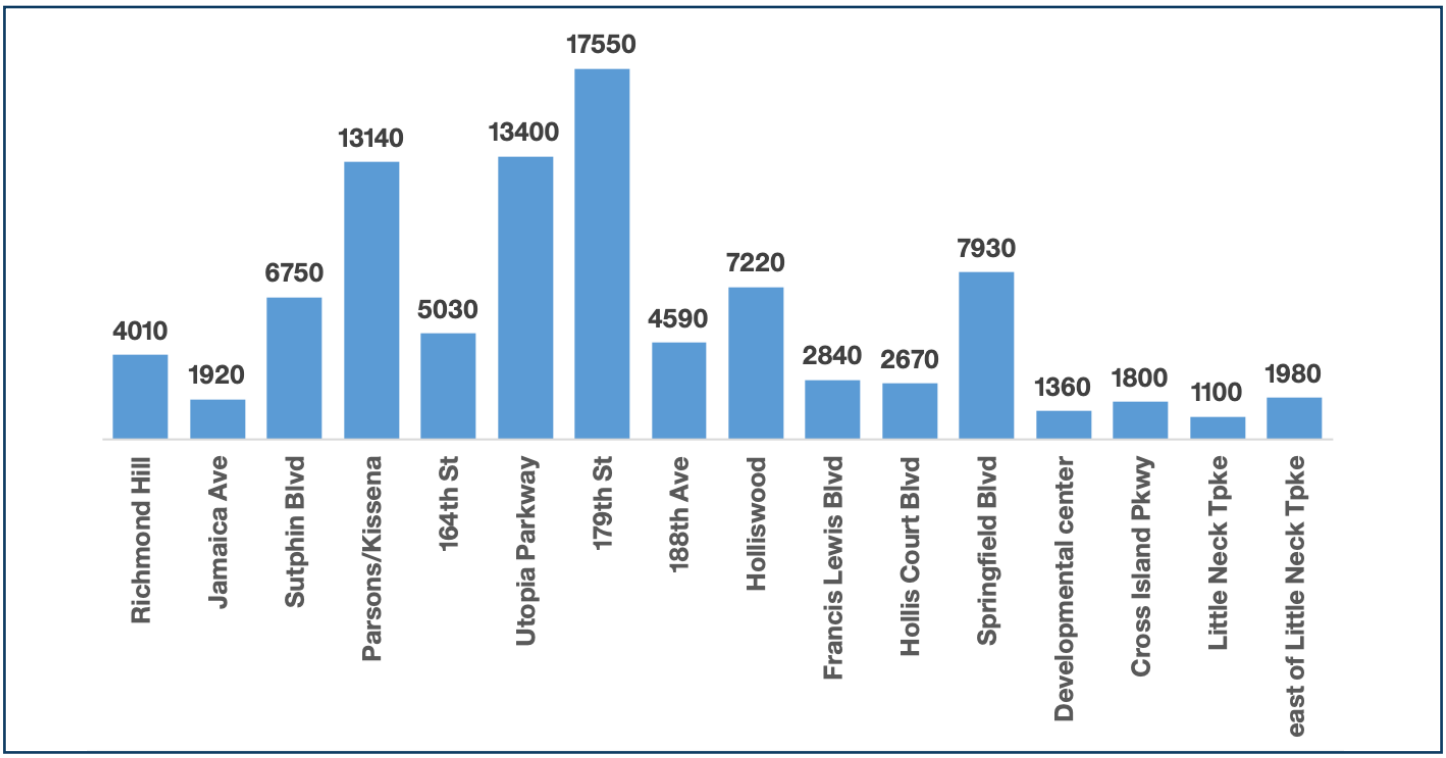
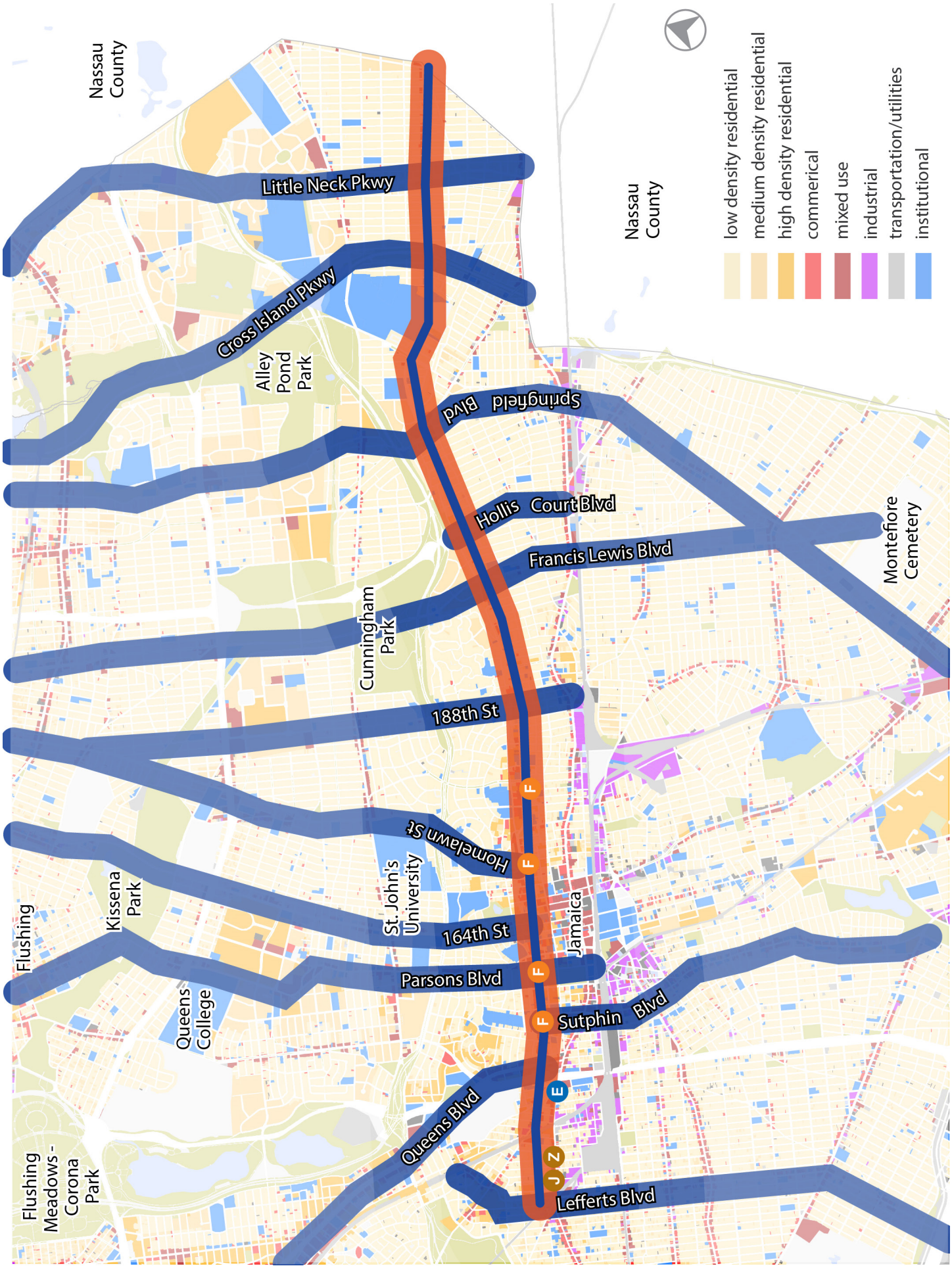


Figure 88


Nassau County
Little Neck Pkwy
Cross Island Pkwy
Alley Pond Park
Springfield Blvd
Hollis Court Blvd
Francis Lewis Blvd
Cunningham Park
188th St
Homelawn St
St. John's University
Kissena Park
Flushing
164th St
Jamaica
Parsons Blvd
Sutphin Blvd
Queens College
Queens Blvd
Flushing Meadows - Corona Park
Lefferts Blvd
Montefiore Cemetery
Nassau County
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional
F
E
J
Z

MERRICK BLVD CORRIDOR PROFILE

Subway Connection	Close to Jamaica Center-Parsons/Archer E J Z
Average Weekday Ridership on Local/Limited/SBS (within Queens)	55,000
Corridor Length in miles (within Queens)	4.8
Average Ridership per miles (within Queens)	11,500
East-West or North-South?	North-South
Location	This 4-and-a-half-mile corridor stretches from Hillisde Avenue in Jamaica into Nassau County on the way to Rockville Center.
Local/Limited/SBS	**Q4/Q5/Q84/Q85**
Express	**X63**
NICE Bus	**N4/N4X**
Ridership along this corridor	The corridor has solid ridership throughout.
Land use & density	The high density of Jamaica drops off significantly southward along the corridor. South of Linden Boulevard, the mix of uses gets closer to suburban scale and level of auto-orientation.
Road conditions	The corridor begins a one-way north-south pair, with 168th Street, through Downtown Jamaica. The pair combines to become a wide thoroughfare south of Liberty Avenue and remains so throughout its length. This corridor has TSP installed from Liberty Avenue to Farmers Boulevard.

RIDER ACTIVITY IN AREA

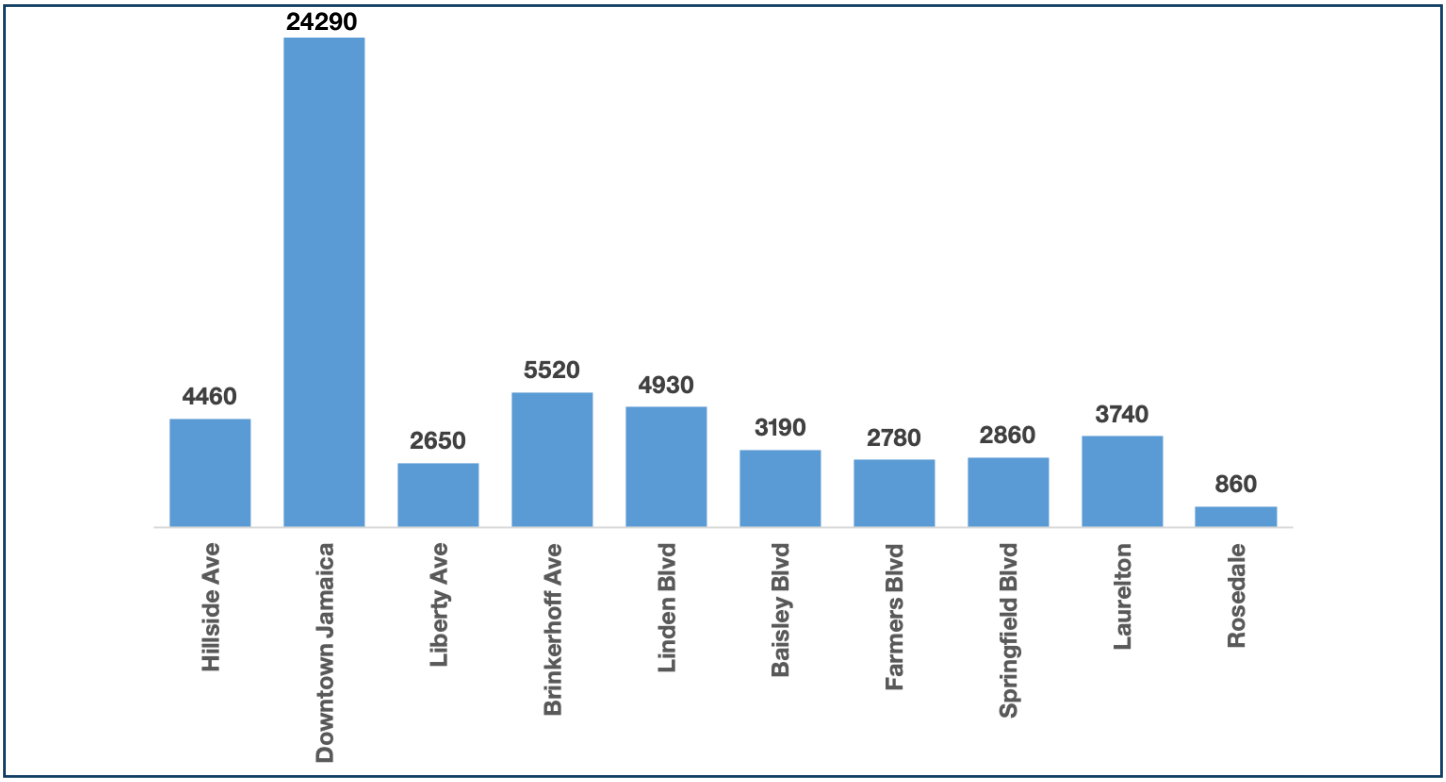


Figure 89


Hillside Ave
Jamaica
Jamaica Ave
E
J
Z
York College
Liberty Ave
Brinkerhoff Ave
Linden Blvd
St. Albans
Baisley Pond Park
Rochdale Village
Farmers Blvd
Montefiore Cemetery
Nassau County
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

ROOSEVELT AVE/GREENPOINT AVE CORRIDOR PROFILE

Subway Connection	At 69th Street 7 At Flushing–Main Street 7 At 46th Street–Bliss Street 7 At Jackson Heights–Roosevelt Avenue E F M R 7 At 52nd Street 7 At 111th Street 7 At 103rd Street–Corona Plaza 7 At 61st Street–Woodside 7 At 82nd Street–Jackson Heights 7 At 90th Street–Elmhurst Avenue 7 At Junction Boulevard 7 At Mets–Willets Point 7 At Woodside LIRR station At Flushing Main Street LIRR station At Murray Hill LIRR station Close to Mets-Willets Point LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	83,000
Corridor Length in miles (within Queens)	7.3
Average Ridership per miles (within Queens)	11,300
East-West or North-South?	East-West
Location	The 8 miles covered by Roosevelt Avenue (and Greenpoint Avenue) is dominated by the 7 train running overhead. Once Roosevelt Avenue runs east of Flushing, it just becomes another neighborhood street, no longer an important east-west corridor.
Local/Limited/SBS	**B24/Q32/Q33/Q48**
Ridership along this corridor	Portions of Roosevelt Avenue have ridership, but usually just at subway stations where riders transfer from buses to the subway.
Land use & density	This corridor has solid urbanism throughout, based on the important subway line overhead.
Road conditions	Buses running beneath the els are often slow due to the tight space constraints of the columns. Double parking and truck deliveries limit the ability to use this corridor for significant East-West bus travel.

RIDER ACTIVITY IN AREA

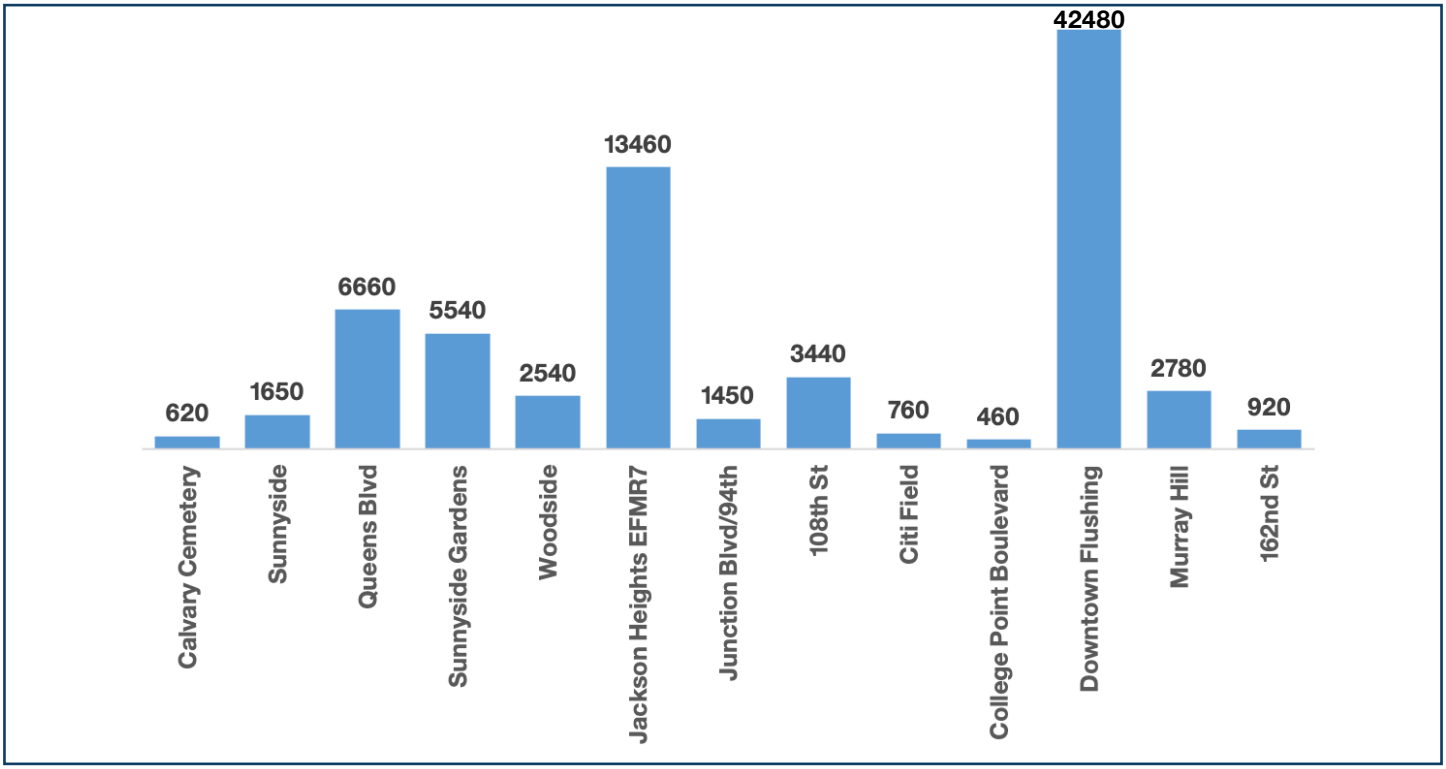
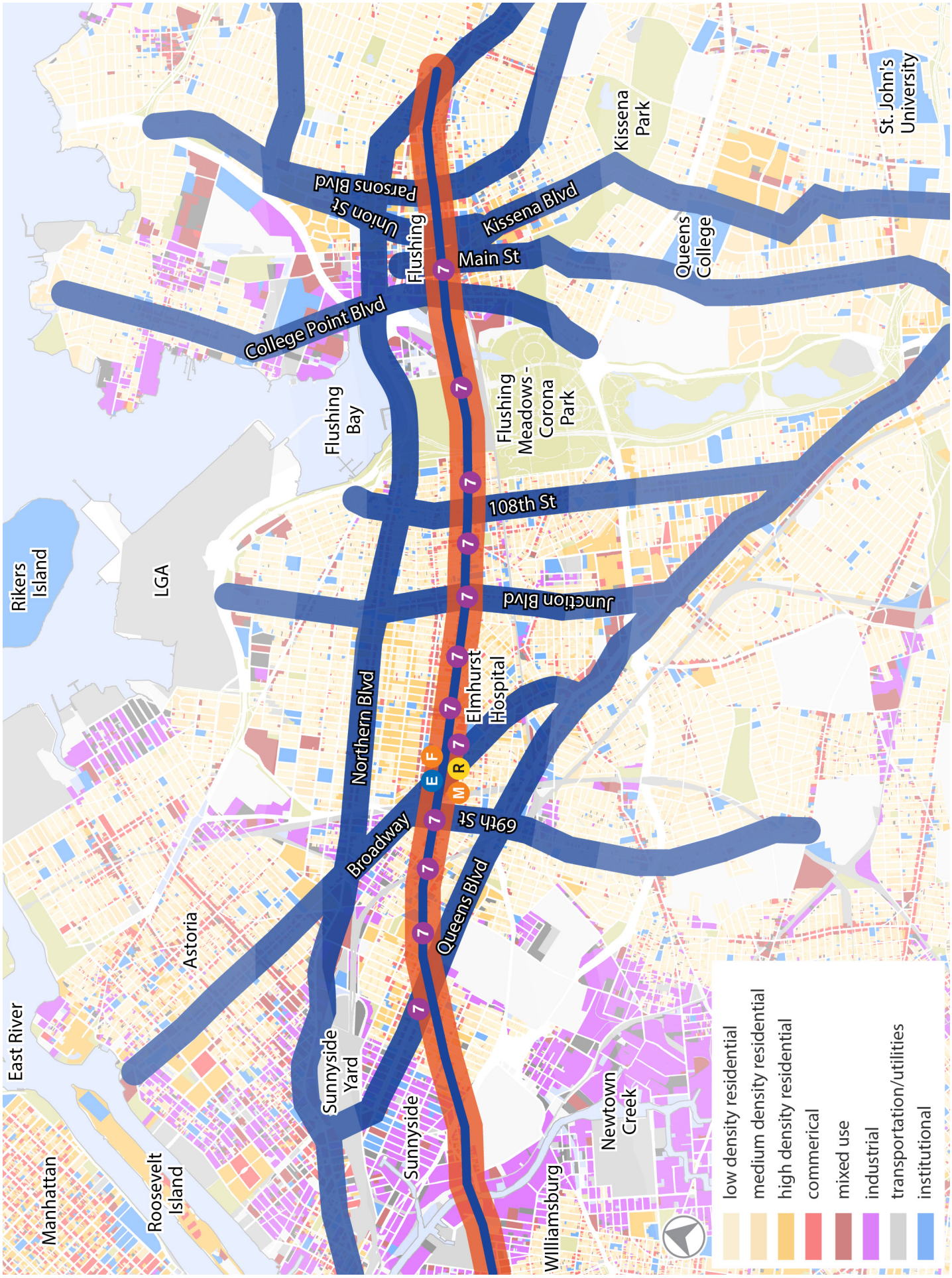


Figure 90


Rikers Island
LGA
East River
Astoria
Manhattan
Roosevelt Island
Sunnyside Yard
Sunnyside
Williamsburg
Newtown Creek
Broadway
Northern Blvd
Queens Blvd
69th St
Elmhurst Hospital
Junction Blvd
108th St
Flushing Bay
Flushing Meadows - Corona Park
College Point Blvd
Union St
Parsons Blvd
Flushing
Main St
Kissena Blvd
Queens College
Kissena Park
St. John's University
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

108TH ST CORRIDOR PROFILE

Subway Connection	At Forest Hills – 71st Avenue E F M R Close to 111th Street 7 Close to 103rd Street–Corona Plaza 7 Close to Forest Hills – 71st Av LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	32,000
Corridor Length in miles (within Queens)	2.9
Average Ridership per miles (within Queens)	10,900
East-West or North-South?	North-South
Location	This 3-mile corridor stretches between Queens Boulevard and Astoria Boulevard.
Local/Limited/SBS	**Q23/Q48**
Ridership along this corridor	The corridor has quite strong ridership throughout, especially south of Northern Boulevard.
Land use & density	In Forest Hills between Queens Boulevard and the Horace Harding Expressway, the density of the corridor is relentless, consisting of many multistory complexes in close proximity. North of the Long Island Expressway, the density is lower by a fair amount, but still at a decent level of urbanism.
Road conditions	The corridor has one travel lane in each direction for most of its length.

RIDER ACTIVITY IN AREA

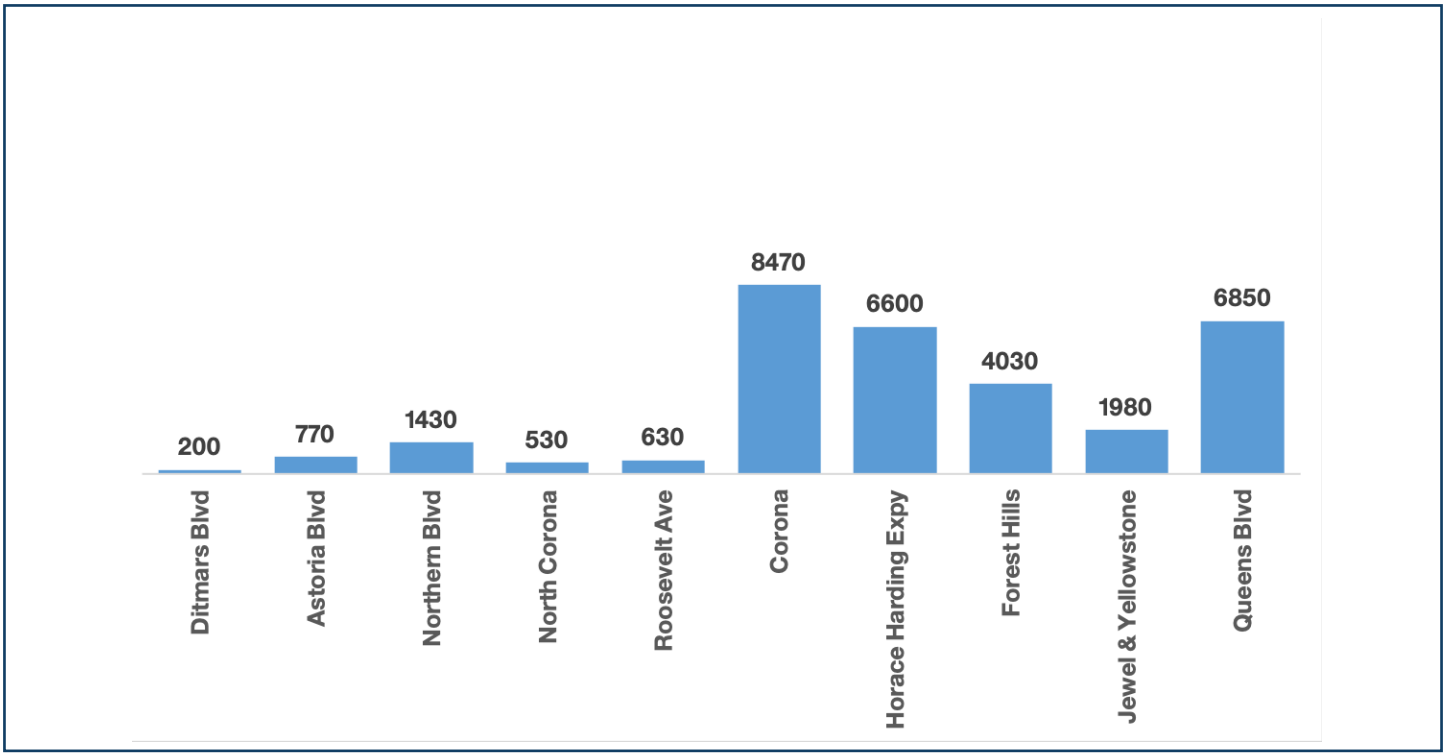
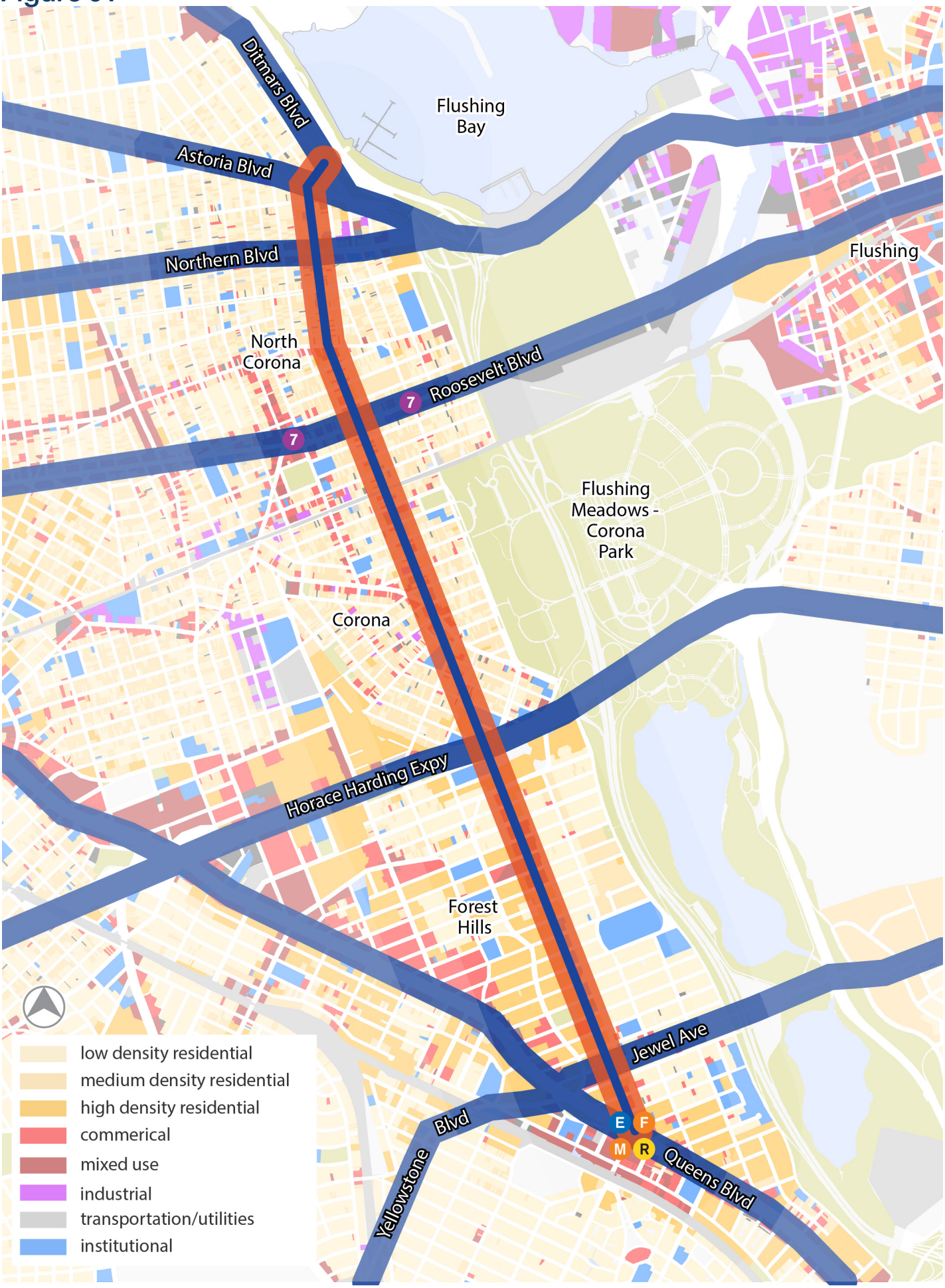


Figure 91


Ditmars Blvd
Astoria Blvd
Northern Blvd
Flushing Bay
Flushing
North Corona
Roosevelt Blvd
7
7
Flushing Meadows - Corona Park
Corona
Horace Harding Expy
Forest Hills
Jewel Ave
E
F
M
R
Queens Blvd
Yellowstone Blvd
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

QUEENS BLVD CORRIDOR PROFILE

Subway Connection	At 46th Street–Bliss Street 7 At 33rd Street–Rawson Street 7 At 40th Street–Lowery Street 7 At Briarwood E F At Kew Gardens–Union Turnpike E F At 75th Avenue E F At Forest Hills–71st Avenue E F M R At Queens Plaza E M R At Grand Avenue–Newtown M R At Court Square E M G 7 At Woodhaven Boulevard M R At 67th Avenue M R At Queensboro Plaza N W 7 Close to 52nd Street 7 Close to Forest Hills – 71st Av LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	80,000
Corridor Length in miles (within Queens)	7.4
Average Ridership per miles (within Queens)	10,800
East-West or North-South?	East-West
Location	This seven-and-a-half-mile corridor stretches from the Ed Koch Queensboro Bridge to Jamaica.
Local/Limited/SBS	**Q60/Q32**
Express	**QM11/QM18**
Ridership along this corridor	The corridor is busy while traveling along the 7 train, but then has lower ridership throughout the main portion of the corridor, with some higher spots throughout.
Land use & density	Just east of the 7 train, tall apartments are clustered, and then similar clusters exist farther east along the corridor until density becomes increasingly solid approaching the Queens Center Mall. Density is then solid all along the E F M R lines until the Van Wyck Expressway interrupts.
Road conditions	New York City Department of Transportation has been working for years on improving Queens Boulevard, first with temporary projects and later with capital projects to make the changes permanent. Along with this effort, the MTA has been working with DOT to develop a plan to create bus stops along the center lanes, so that once the capital projects are complete, the buses can speed along in the center lanes and not the service roads.

RIDER ACTIVITY IN AREA

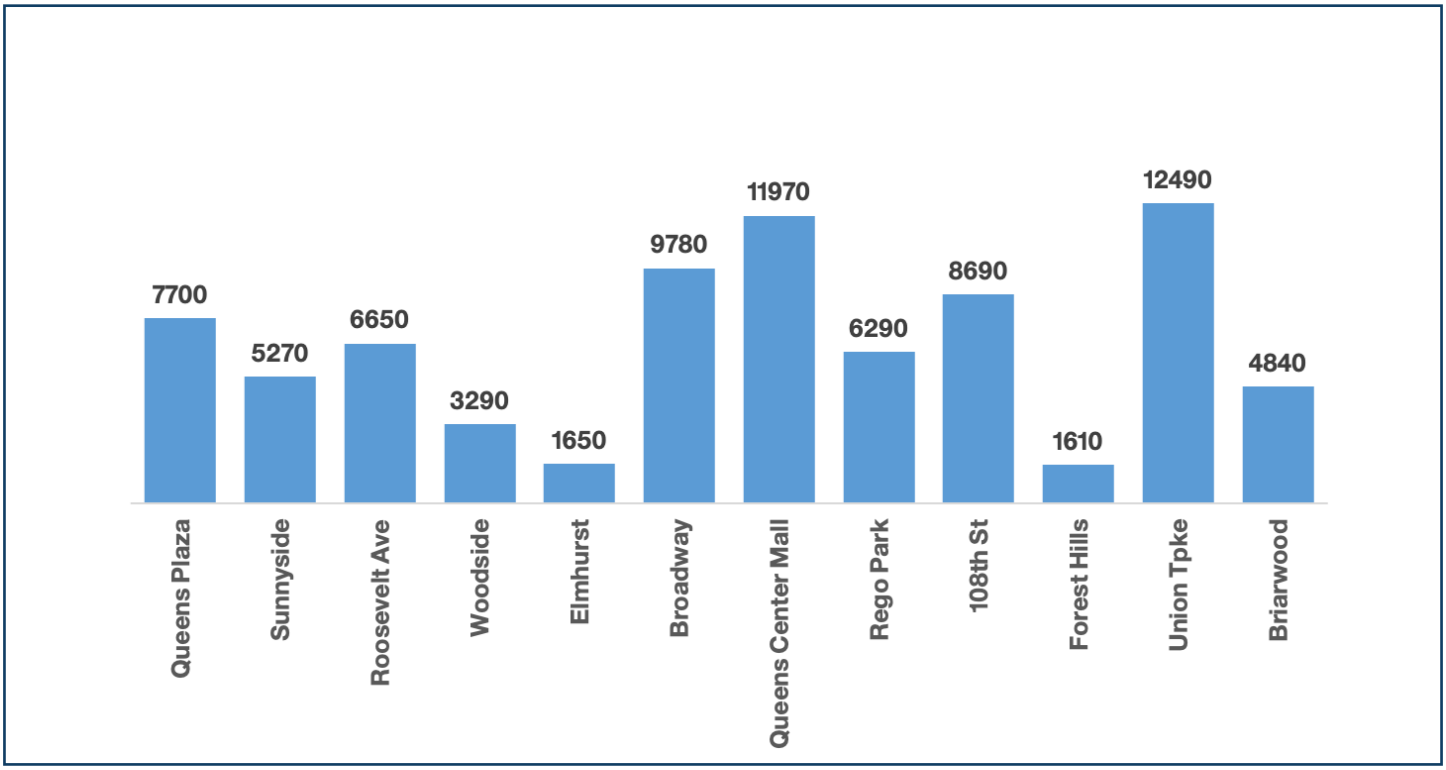
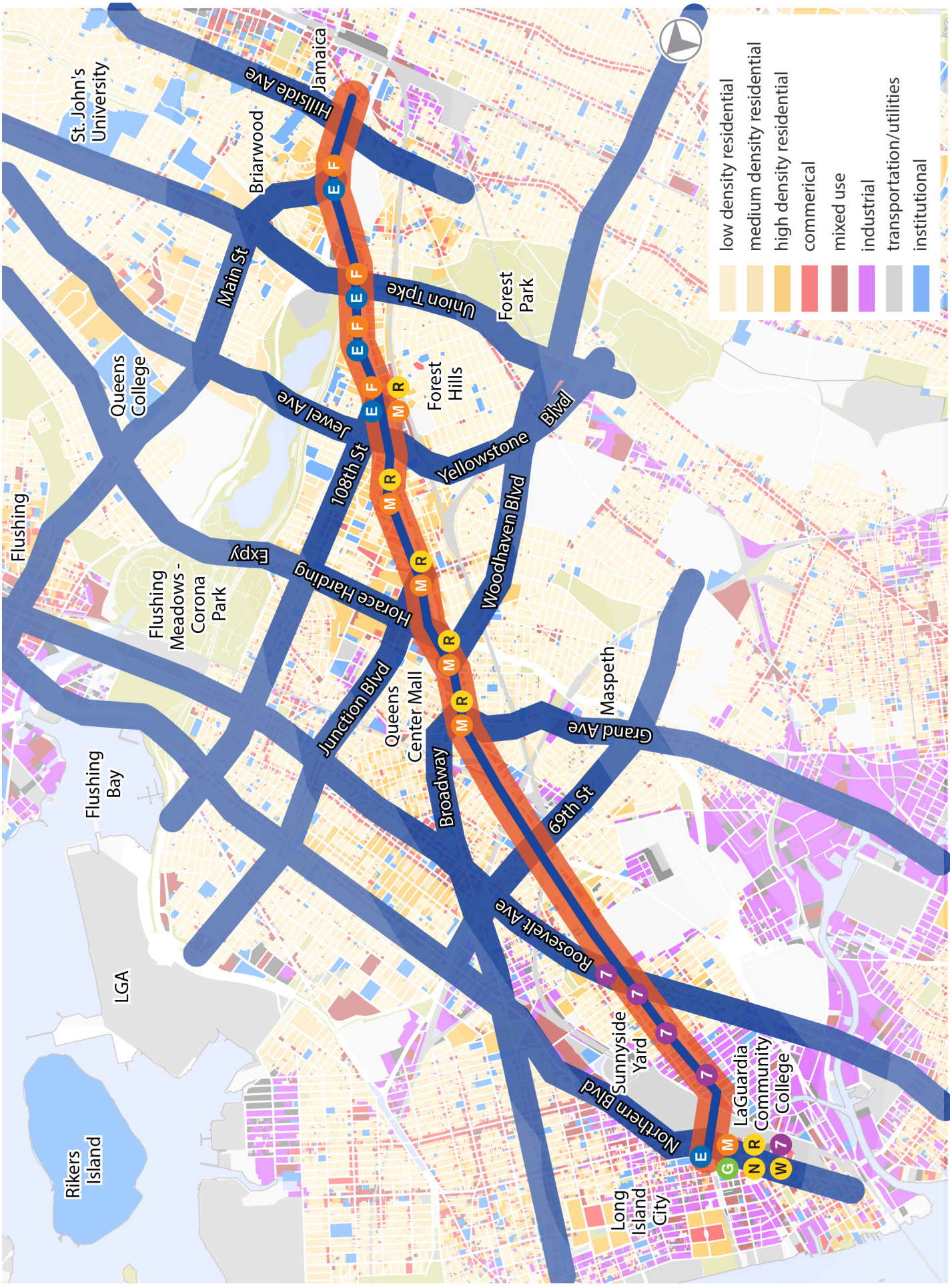


Figure 92


low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional
St. John's University
Briarwood
Jamaica
Hillside Ave
Main St
Union Tpke
Forest Park
Queens College
Jewel Ave
Forest Hills
108th St
Yellowstone Blvd
Flushing
Flushing Meadows - Corona Park
Horace Harding Expy
Woodhaven Blvd
Junction Blvd
Queens Center Mall
Maspeth
Grand Ave
Broadway
69th St
Flushing Bay
LGA
Roosevelt Ave
Northern Blvd
Sunnyside Yard
LaGuardia Community College
Long Island City
Rikers Island

UNION ST & WILLETS POINT BLVD CORRIDOR PROFILE

Subway Connection	Close to Flushing-Main Street 7 Close to Flushing Main Street LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	33,000
Corridor Length in miles (within Queens)	3.3
Average Ridership per miles (within Queens)	10,000
East-West or North-South?	Both
Location	This 3-mile corridor stretches between Sanford Avenue on the southeast side of Downtown Flushing north through Linden Hill, then northeast to the intersection of Utopia Parkway and the Cross Island Parkway.
Local/Limited/SBS	**Q44-SBS/Q20A/Q20B/Q34**
Express	**QM20**
NICE Bus	The busiest area is along the Union Street portion of the corridor.
Ridership along this corridor	The portion of the corridor labeled as Willets Point Boulevard can't match the density of Downtown Flushing or the Mitchell Gardens Co-ops, but it still maintains a solid lower-density throughout, never devolving to auto-oriented uses or single-story buildings.
Land use & density	Though there is only one travel lane in each direction, it is wide throughout.
Road conditions	The corridor is two-way south of Tuskegee Airmen Way, and is wide throughout this portion.

RIDER ACTIVITY IN AREA

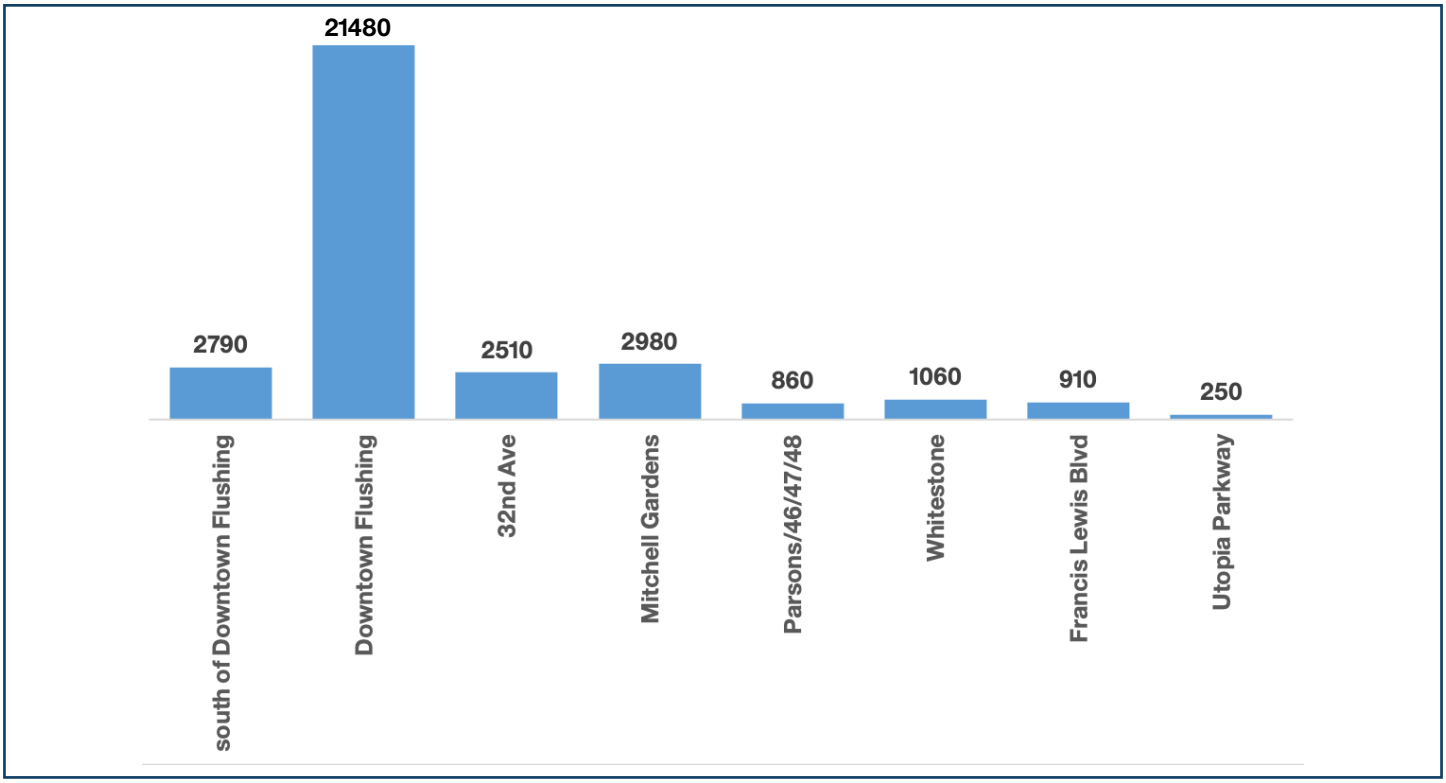
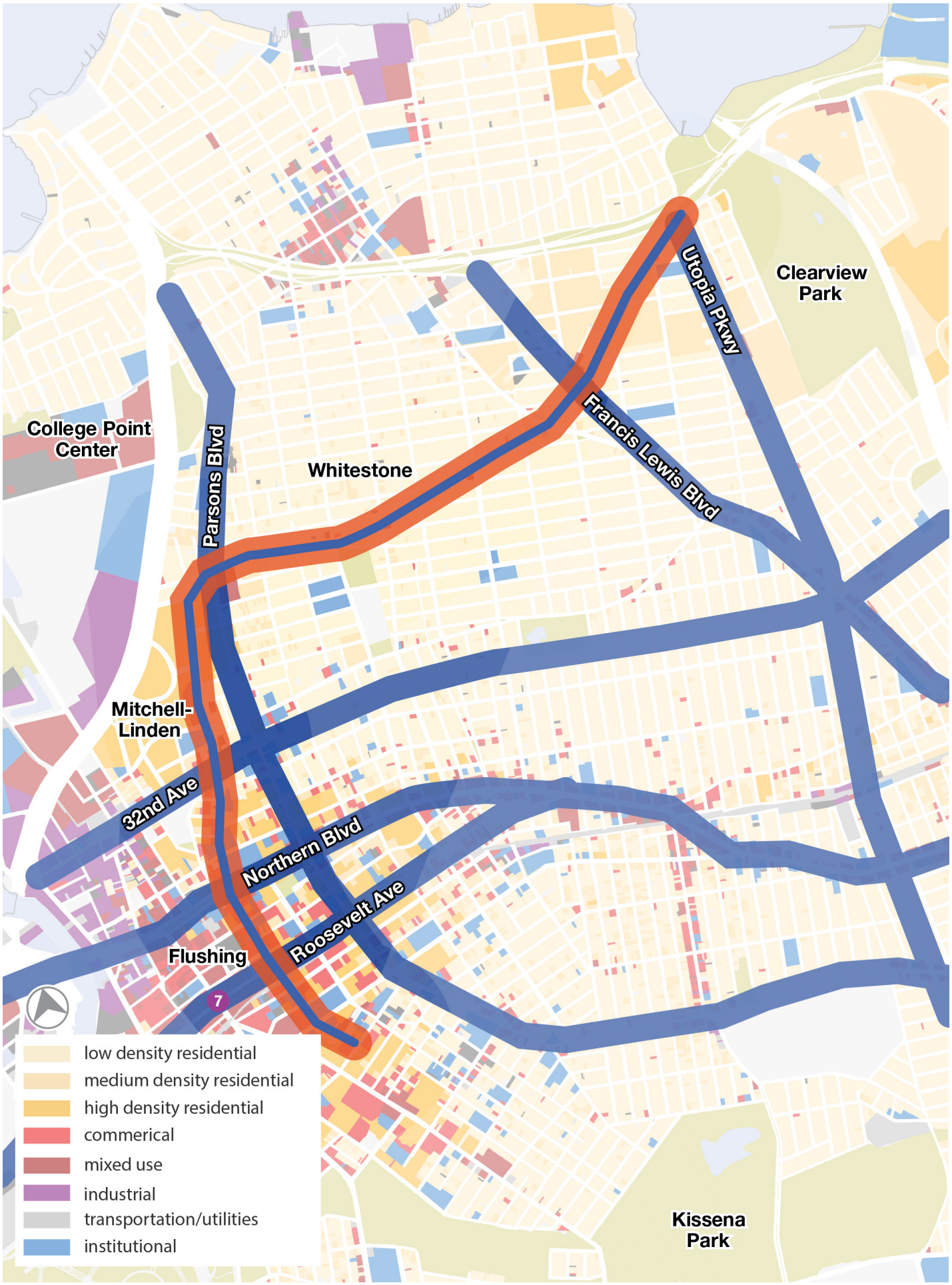


Figure 93


College Point Center
Parsons Blvd
Whitestone
Francis Lewis Blvd
Utopia Pkwy
Clearview Park
Mitchell-Linden
32nd Ave
Northern Blvd
Roosevelt Ave
Flushing
7
Kissena Park
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

GRAND AVE CORRIDOR PROFILE

Subway Connection	At Grand Avenue–Newtown M R
Average Weekday Ridership on Local/Limited/SBS (within Queens)	27,000
Corridor Length in miles (within Queens)	2.8
Average Ridership per miles (within Queens)	9,800
East-West or North-South?	East-West
Location	This 5-mile corridor stretches from the Williamsburg Bridge to Queens Boulevard and Broadway.
Local/Limited/SBS	**Q54/Q59/Q58**
Ridership along this corridor	The eastern half of the corridor, the Queens portion, has solid ridership.
Land use & density	The solid urbanism in Williamsmburg gives way to large industrial uses, warehouses, and auto-oriented uses closer to Newtown Creek. Some lower-density urbanism exists east of Rust Street, and increases significantly as the corridor approaches Queens Boulevard.
Road conditions	The corridor is mostly a single lane in each direction. The bridge over Newtown Creek's east branch is rather narrow.

RIDER ACTIVITY IN AREA

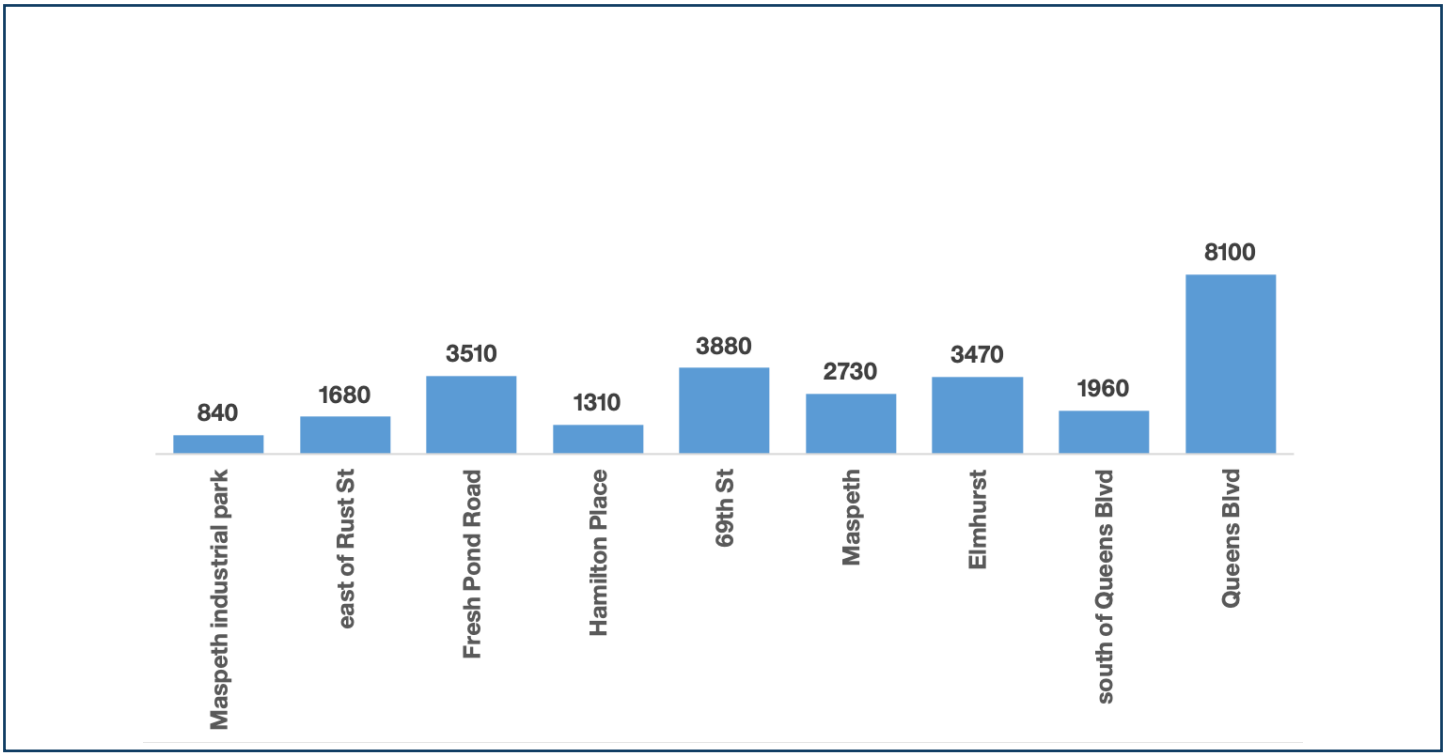
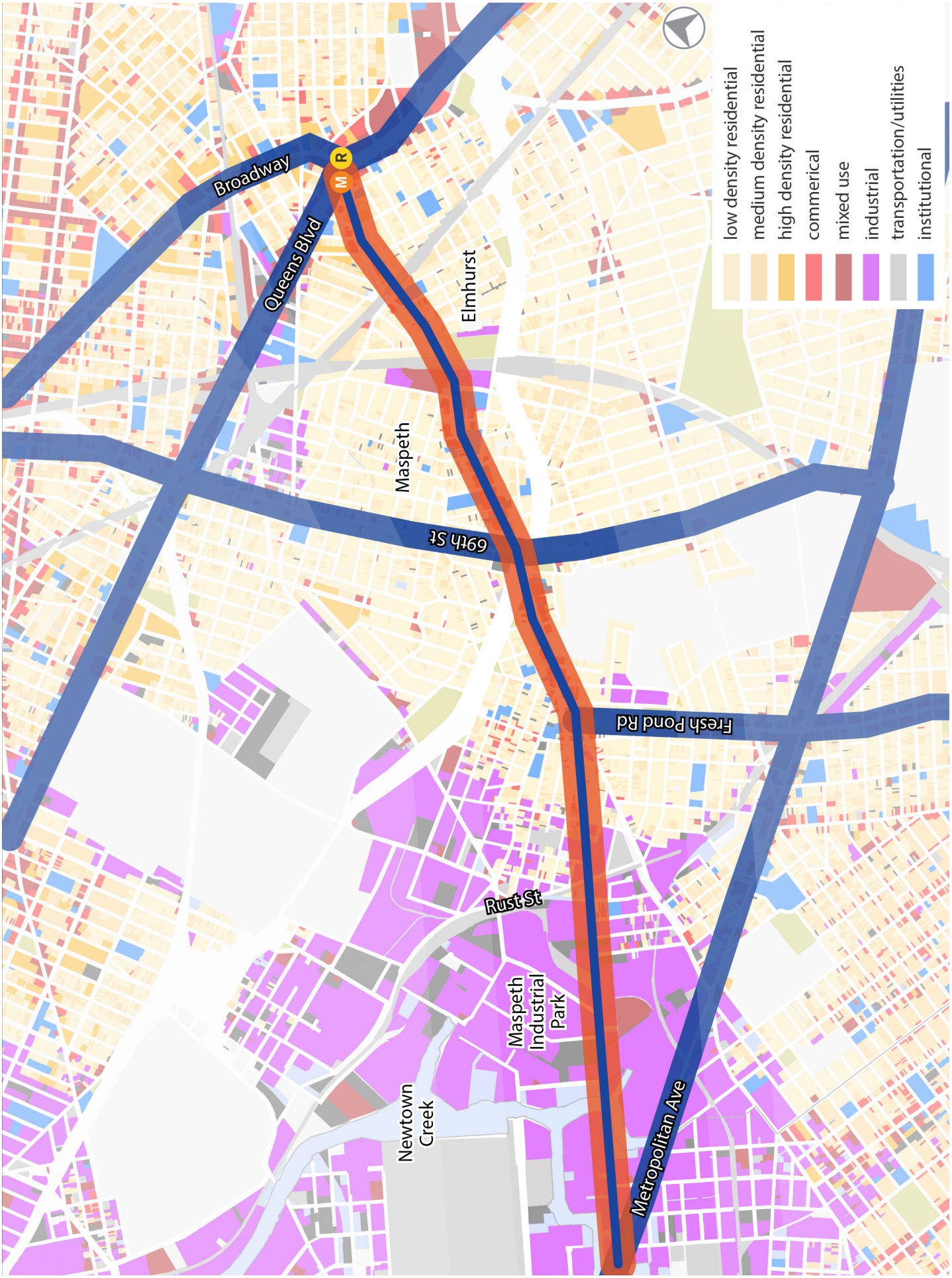


Figure 94


Broadway
Queens Blvd
R
M
Elmhurst
Maspeth
69th St
Fresh Pond Rd
Rust St
Maspeth Industrial Park
Newtown Creek
Metropolitan Ave
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

LEFFERTS BLVD CORRIDOR PROFILE

Subway Connection	At Ozone Park–Lefferts Boulevard (A) Close to 121st Street (J) At Kew Gardens LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	36,000
Corridor Length in miles (within Queens)	3.7
Average Ridership per miles (within Queens)	9,600
East-West or North-South?	North-South
Location	This 4-mile corridor stretches between JFK Airport and Kew Gardens Road, stopping short of directly accessing Queens Boulevard at Union Turnpike.
Local/Limited/SBS	**Q10**
Express	**QM18**
Ridership along this corridor	Between Queens Boulevard and Rockaway Boulevard, the corridor is farily busy, but thins out south of Rockaway Boulevard.
Land use & density	There is a steady drop in density from the dense Kew Gardens to the slightly-less-dense Richmond Hill, getting less dense as the route heads south, until Wakefield where the single-family homes are larger and spaces slightly farther apart.
Road conditions	The roadway is tight in many segments in the northern part of the corridor, but finally widens out to four lanes south of Rockaway Blvd before ending at Pan Am Road in JFK Airport.

RIDER ACTIVITY IN AREA

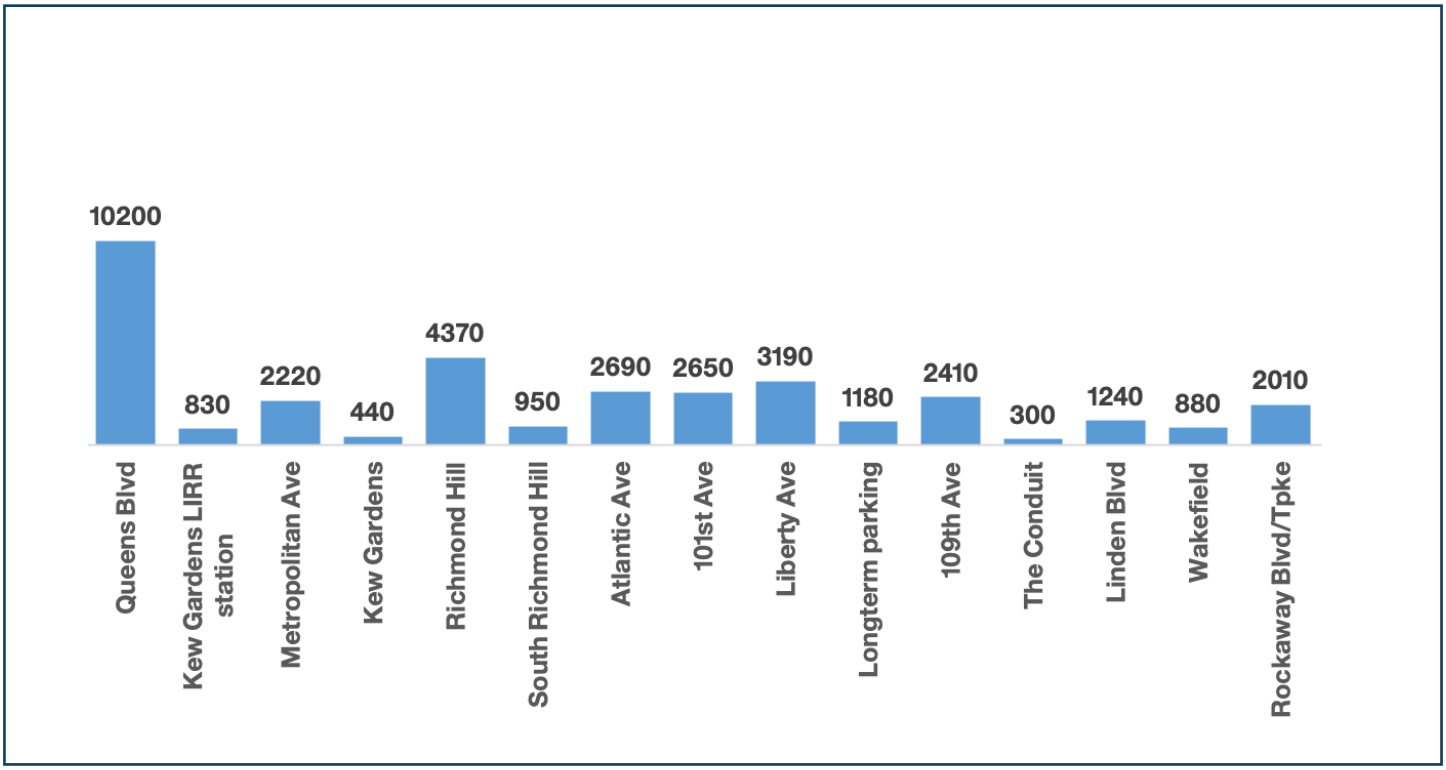


Figure 95


Queens Blvd
Kew Gardens LIRR station
Metropolitan Ave
Forest Park
Kew Gardens
Hillside Ave
Jamaica
Jamaica Ave
Myrtle Ave
J
Z
South Richmond Hill
Atlantic Ave
101st Ave
Liberty Ave
A
109th Ave
Linden Blvd
Rockaway Blvd
Aqueduct Racetrack
Wakefield
Conduit Ave
Long-term Parking
JFK
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

BROADWAY CORRIDOR PROFILE

Subway Connection	At Jackson Heights–Roosevelt Avenue-Broadway E F M R 7 At Grand Avenue–Newtown M R At 65th Street M R At Northern Boulevard M R At 46th Street M R At Elmhurst Avenue M R At Broadway N W Close to Steinway Street M R
Average Weekday Ridership on Local/Limited/SBS (within Queens)	32,000
Corridor Length in miles (within Queens)	3.8
Average Ridership per miles (within Queens)	8,400
East-West or North-South?	East-West
Location	This 4-mile corridor stretches between Vernon Boulevard in Astoria and Queens Boulevard in Elmhurst.
Local/Limited/SBS	**Q104/Q53-SBS**
Ridership along this corridor	The western and eastern edges of the corridor have solid ridership. The middle is somewhat less busy.
Land use & density	The density of the corridor thins out around the wide intersection with Northern Boulevard. The Elmhurst Hospital is the largest destination between the subway stations.
Road conditions	The corridor has one travel lane in each direction for most of its length.

RIDER ACTIVITY IN AREA

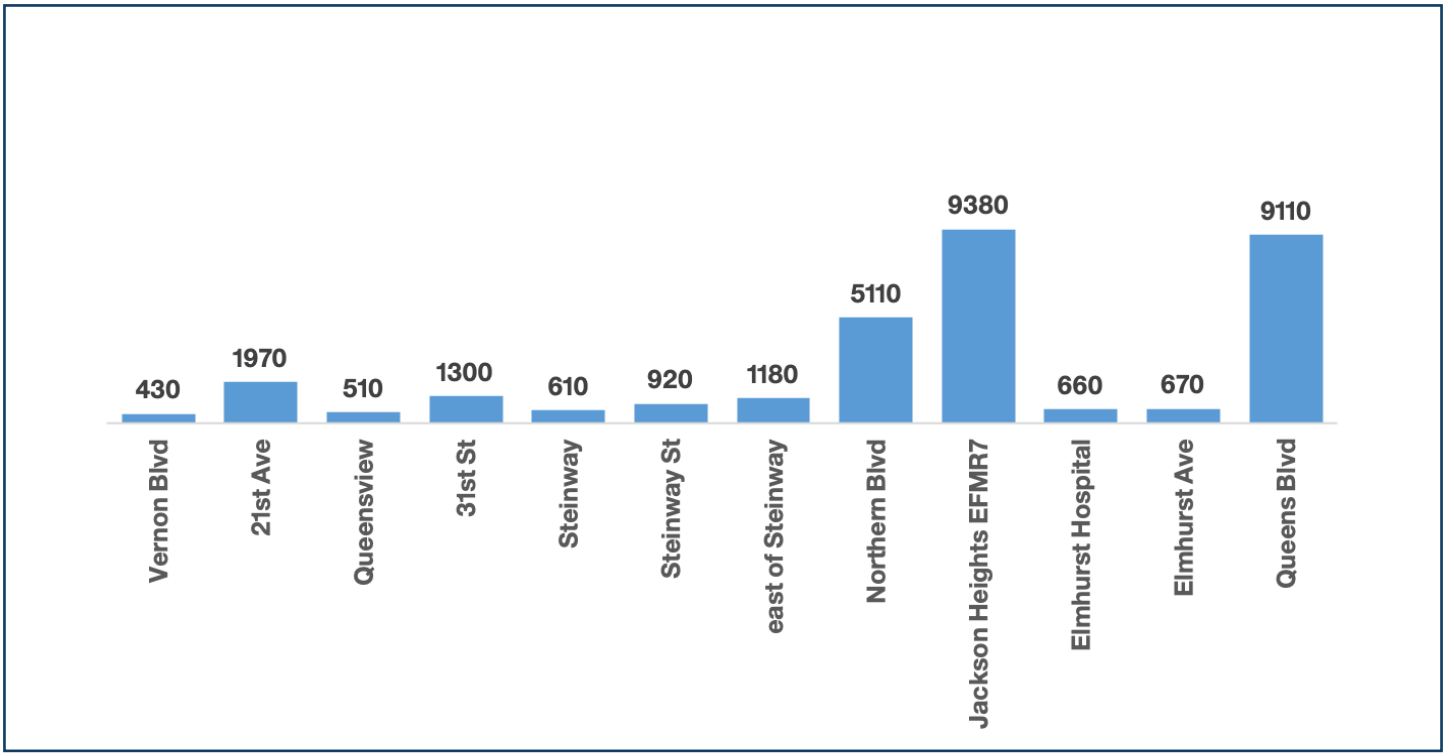
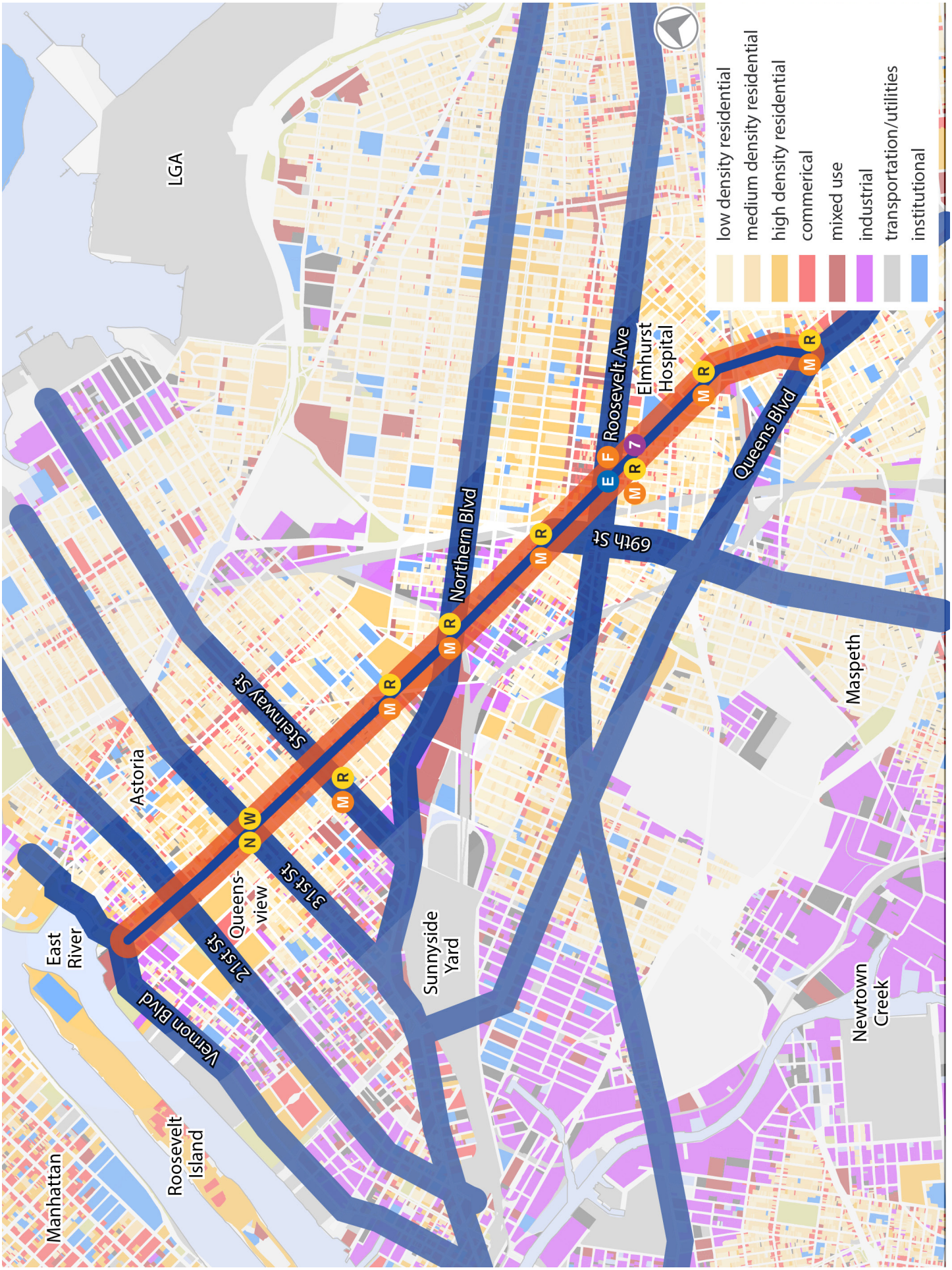


Figure 96


LGA
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional
Northern Blvd
Roosevelt Ave
Elmhurst Hospital
Queens Blvd
69th St
Steinway St
31st St
21st St
Queens-view
Astoria
Sunnyside Yard
Maspeth
Newtown Creek
East River
Vernon Blvd
Roosevelt Island
Manhattan
N
W
M
R
E
F
7

HORACE HARDING EXPY CORRIDOR PROFILE

Subway Connection	Close to Woodhaven Boulevard (M) (R)
Average Weekday Ridership on Local/Limited/SBS (within Queens)	61,000
Corridor Length in miles (within Queens)	8.2
Average Ridership per miles (within Queens)	7,400
East-West or North-South?	East-West
Location	This 8-mile corridor serves as the north and south service roads of the Long Island Expressway between Queens Boulevard and the Nassau County border.
Local/Limited/SBS	**Q88/Q17/Q30**
Ridership along this corridor	The Horace Harding Expressway has some pockets of robust ridership, especially at transfer points with major north-south routes. However, low densities of development and the presence of the highway splitting adjacent areas into separate neighborhoods limits transit patronage in some areas.
Land use & density	LeFrak City, 4 large high schools, Queens College, and Queensborough Community College are the major drivers along this corridor. The distance between buildings on opposite sides of the Horace Harding Expressway is around 300 feet for much of the corridor. But with few streets crossing the chasm, though bolstered by several pedestrian crossings, the highway creates a border vacuum between separated neighorhoods. The presence of transit service and some stores at major crossings is not able to sew together the disparate neighborhoods. Transit demand is therefore lower because the walk to a bus stop on the opposite side of the expressway becomes a deterrent.
Road conditions	The roadway itself is not the primary impediment, but rather the separation of the directions of service.

RIDER ACTIVITY IN AREA

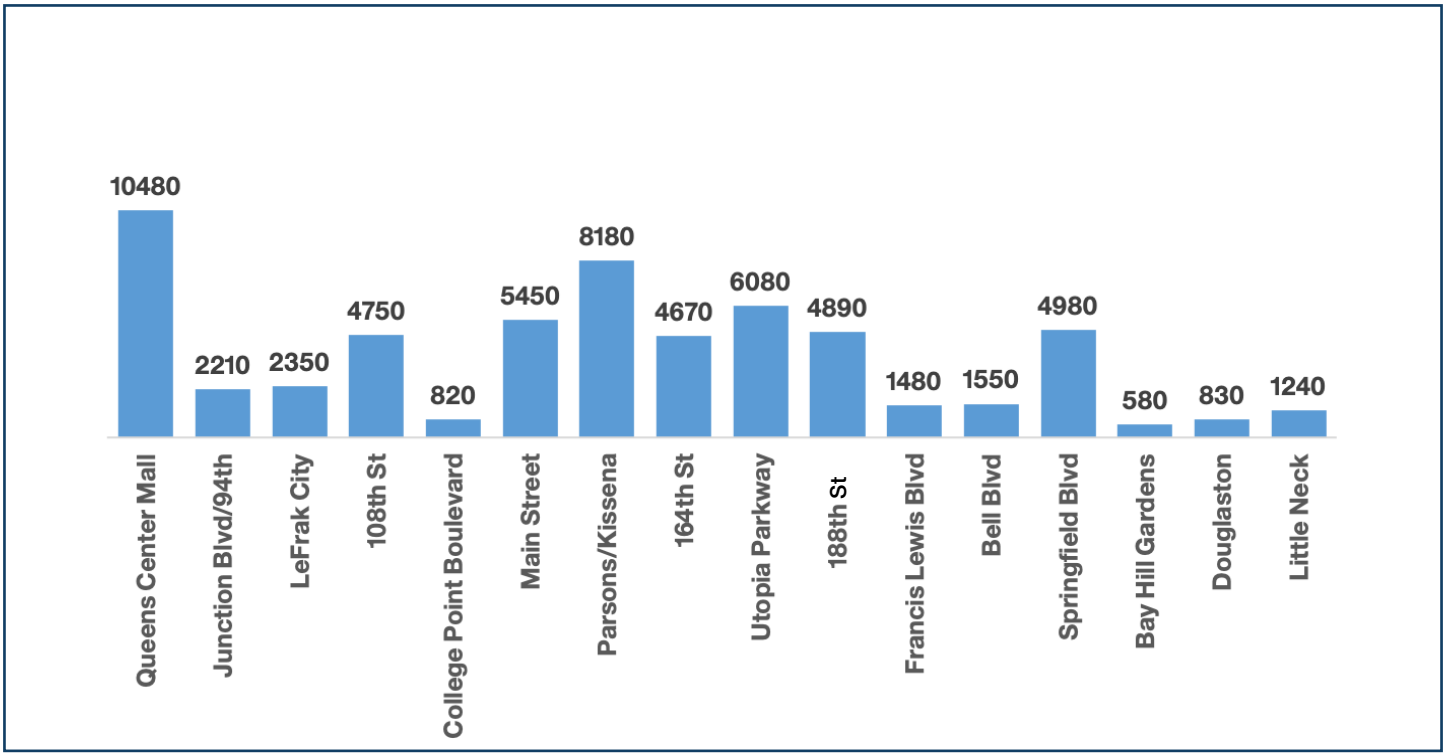
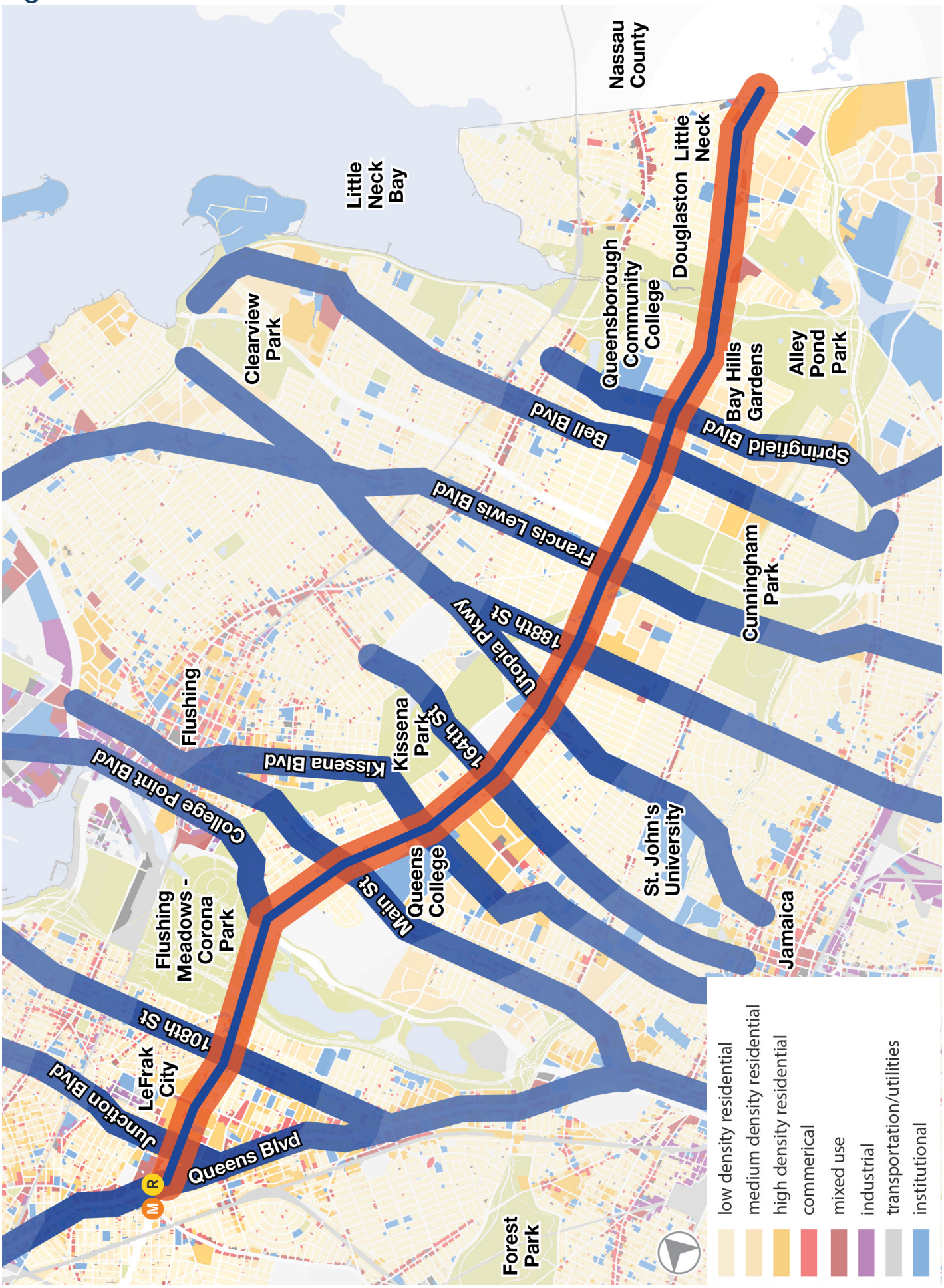


Figure 97


Nassau County
Little Neck Bay
Douglaston
Little Neck
Queensborough Community College
Clearview Park
Bay Hills Gardens
Alley Pond Park
Bell Blvd
Springfield Blvd
Francis Lewis Blvd
Cunningham Park
188th St
Utopia Pkwy
Flushing
Kissena Park
164th St
Kissena Blvd
College Point Blvd
St. John's University
Queens College
Main St
Flushing Meadows - Corona Park
Jamaica
108th St
LeFrak City
Junction Blvd
Queens Blvd
Forest Park
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

FARMERS BLVD CORRIDOR PROFILE

Subway Connection	No subway nearby At Locust Manor LIRR station Close to Hollis LIRR station Close to St. Albans LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	27,000
Corridor Length in miles (within Queens)	3.8
Average Ridership per miles (within Queens)	7,200
East-West or North-South?	North-South
Location	This 4-mile corridor stretches between Jamaica Avenue in Hollis and Rockaway Boulevard outside JFK Airport.
Local/Limited/SBS	**Q3**
Express	**X64**
Ridership along this corridor	There are nodes of ridership throughout the corridor, mostly at the major intersections.
Land use & density	The density on the northern end of the route is low-to-moderate, but the density falls farther south, including many auto-oriented uses.
Road conditions	The corridor has one travel lane in each direction for most of its length.

RIDER ACTIVITY IN AREA

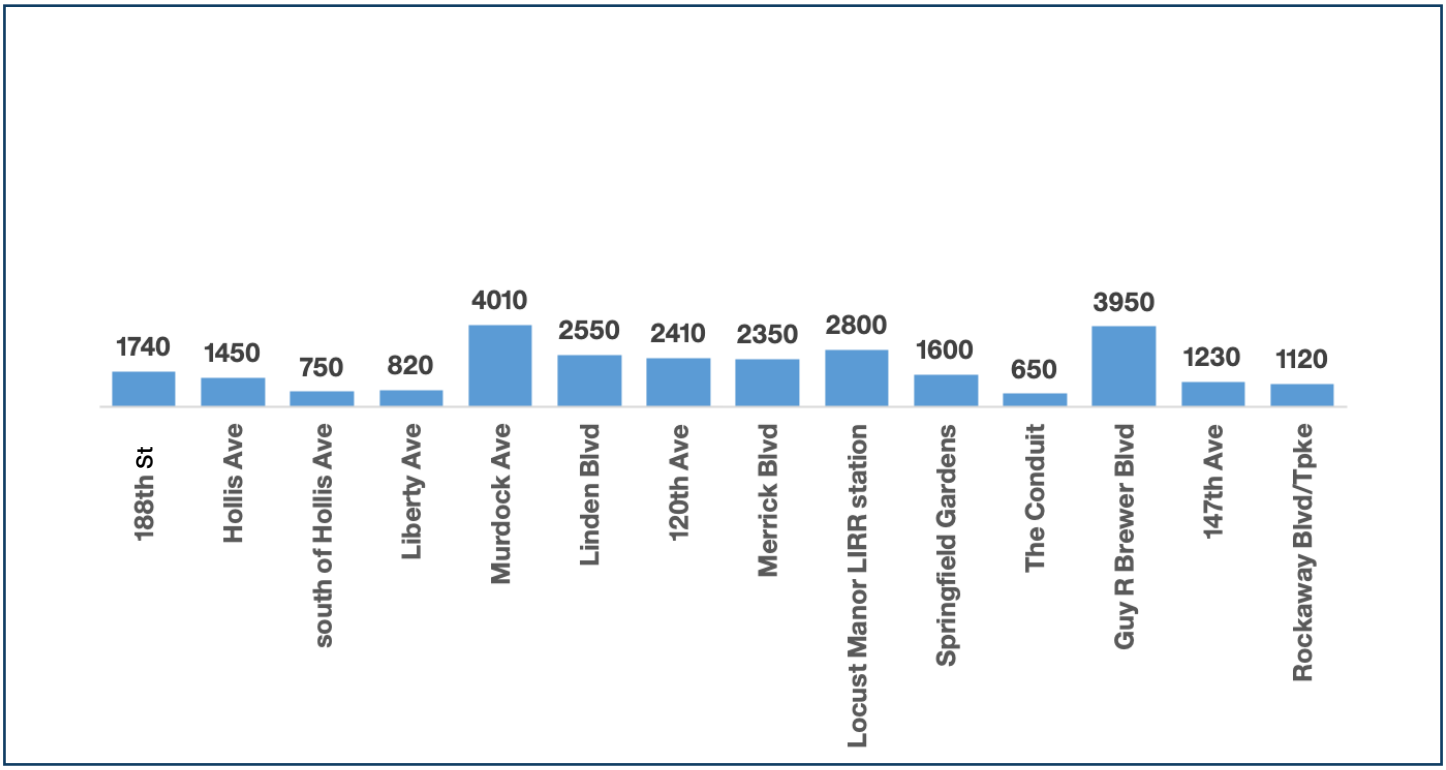


Figure 98


Jamaica
Hillside Ave
Hollis Ave
Liberty Ave
Murdock Ave
Linden Blvd
St. Albans
Montefiore Cemetery
Merrick Blvd
Baisley Pond Park
Rochdale Village
Guy R Brewer Blvd
Conduit Ave
147th Ave
Rockaway Blvd
JFK
Idlewild Park
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

ATLANTIC AVE CORRIDOR PROFILE

Subway Connection	Close to Sutphin Boulevard–Archer Avenue–JFK (E) (J) At Jamaica LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	23,000
Corridor Length in miles (within Queens)	3.3
Average Ridership per miles (within Queens)	7,100
East-West or North-South?	East-West
Location	This corridor is almost 11 miles long, from the upper Hudson Bay to the Van Wyck Expressway, where it becomes 94th Avenue for a short distance in Downtown Jamaica.
Local/Limited/SBS	**Q24**
Ridership along this corridor	The busiest portion of the corridor is between Crescent Street in Brooklyn and Lefferts Boulevard.
Land use & density	This corridor has a shifting amount of development along it, never quite achieving full urban density.
Road conditions	This wide corridor provides ample room, once the LIRR tracks sink beneath the surface in Brooklyn.

RIDER ACTIVITY IN AREA

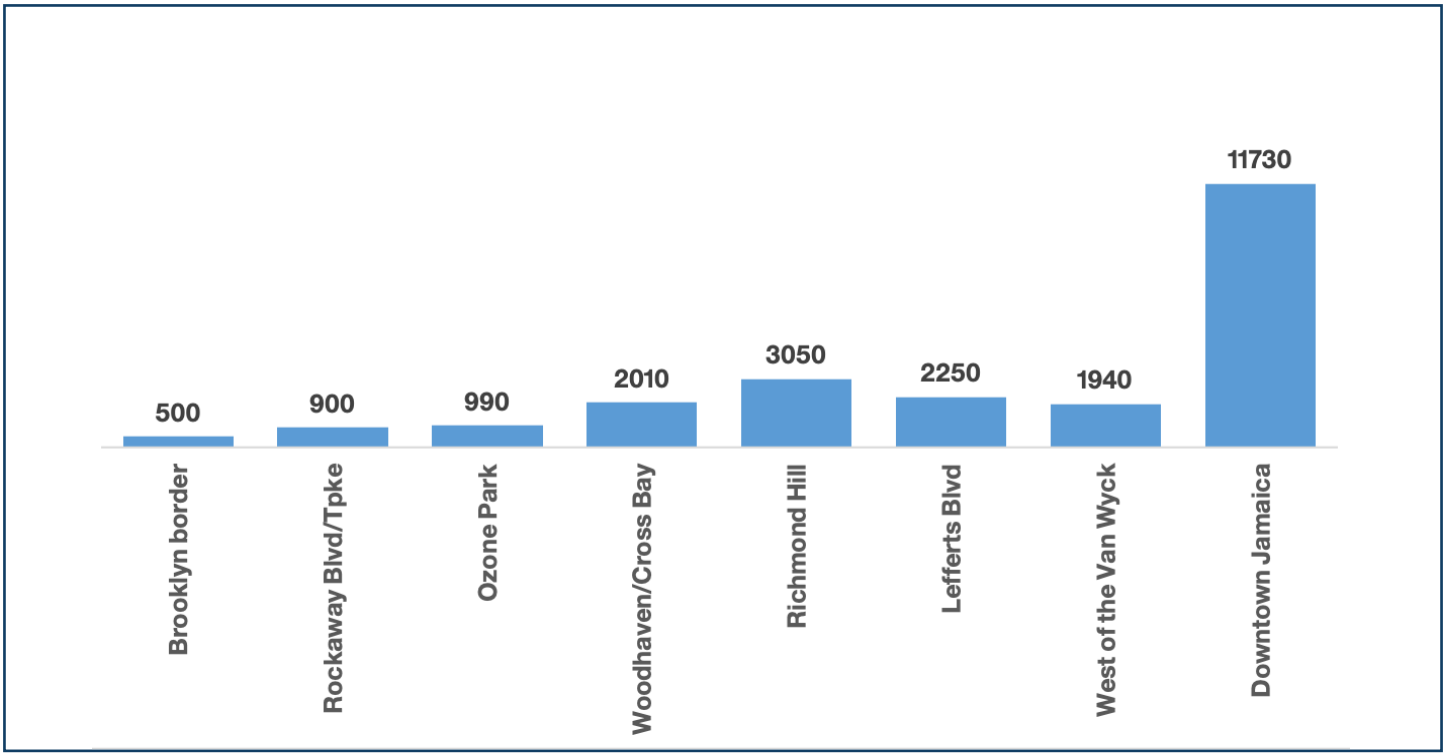
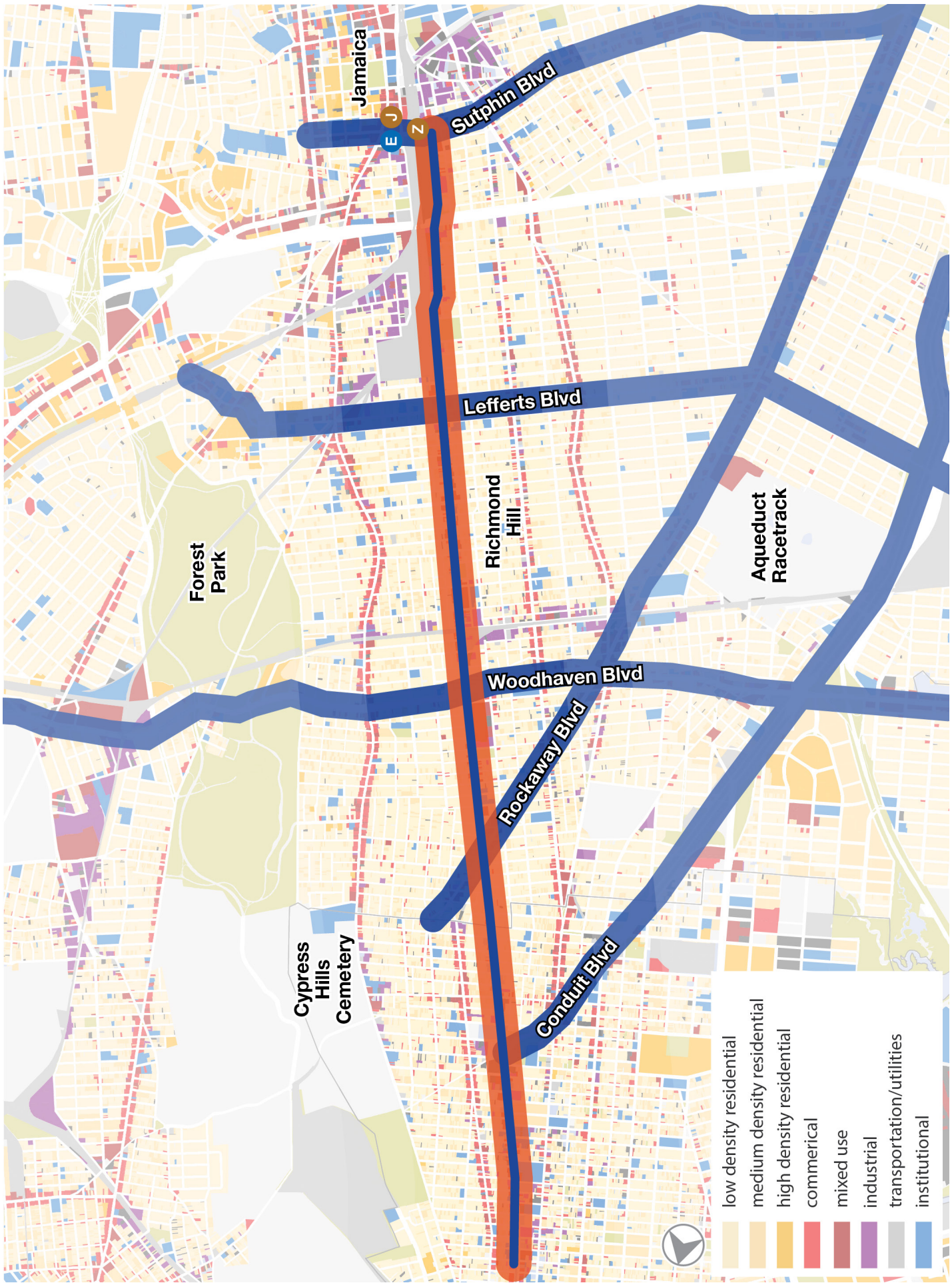


Figure 99


Jamaica
J
E
Z
Sutphin Blvd
Lefferts Blvd
Richmond Hill
Forest Park
Aqueduct Racetrack
Woodhaven Blvd
Rockaway Blvd
Cypress Hills Cemetery
Conduit Blvd
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

GUY R BREWER BLVD CORRIDOR PROFILE

Subway Connection	Close to Jamaica Center-Parsons/Archer E J Z
Average Weekday Ridership on Local/Limited/SBS (within Queens)	26,000
Corridor Length in miles (within Queens)	3.6
Average Ridership per miles (within Queens)	7,100
East-West or North-South?	North-South
Location	This 3-and-a-half-mile corridor stretches between Downtown Jamaica and Rockaway Boulevard.
Local/Limited/SBS	**Q111/Q113/Q114**
Express	**QM21/X63/X64**
Ridership along this corridor	The corridor has solid ridership throughout.
Land use & density	The corridor sees a decrease in density the further away from Downtown Jamaica, but this is interrupted by sporadic multifamily complexes such as Cedar Manor and Rochdale Village injecting high densities in among the otherwise sprawling land uses. South of the Belt Parkway, the corridor approaches suburban densities.
Road conditions	The corridor has one travel lane in each direction for most of its length, with the exception of a four lane section along Rochdale Village.

RIDER ACTIVITY IN AREA

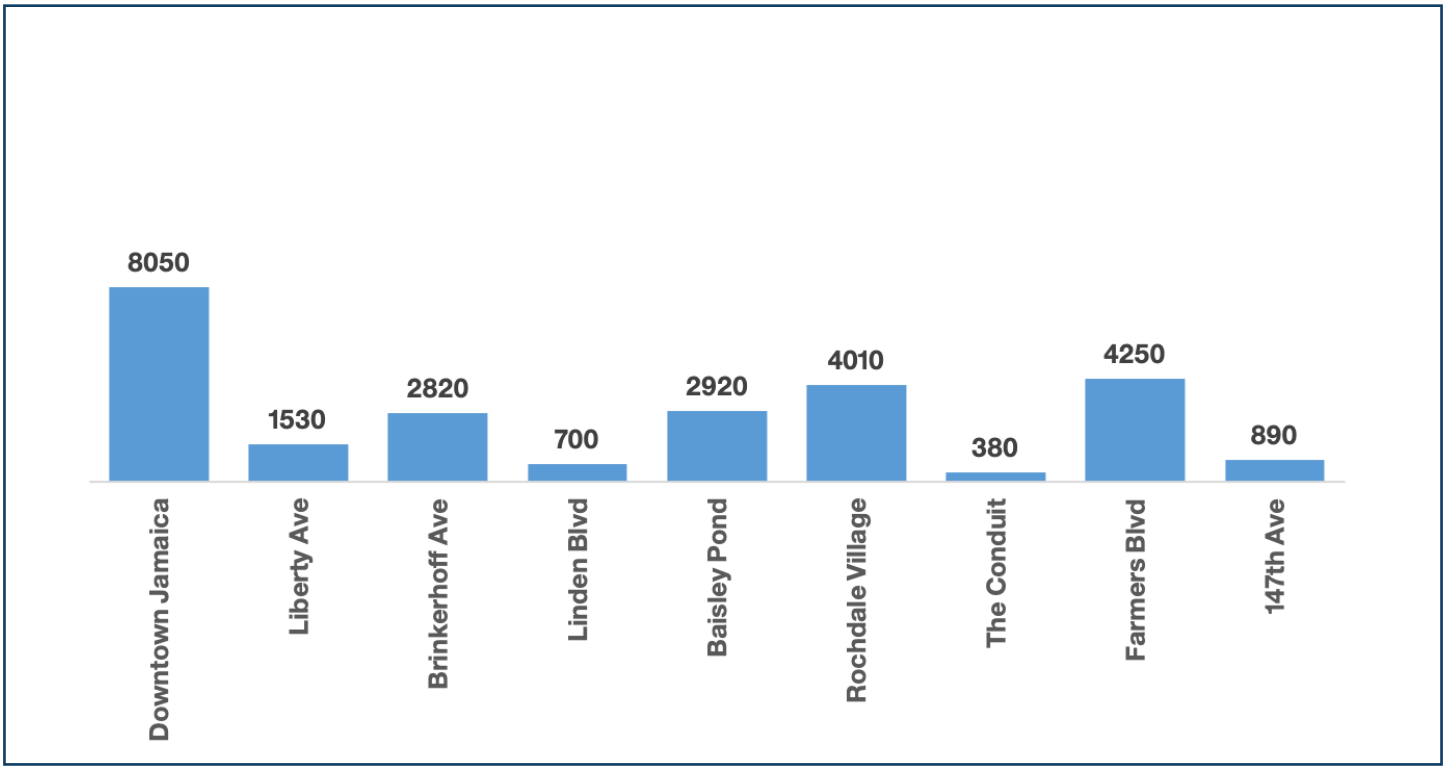


Figure 100


Jamaica
Hillside Ave
Archer Ave
Liberty Ave
E
J Z
York College
Brinkerhoff Ave
Linden Blvd
St. Albans
Cedar Manor
Baisley Pond Park
Baisley Blvd
Rochdale Village
Conduit Ave
Farmers Blvd
147th Ave
Rockaway Blvd
JFK
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

SPRINGFIELD BLVD CORRIDOR PROFILE

Subway Connection	No subway nearby At Queens Village LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	55,000
Corridor Length in miles (within Queens)	7.8
Average Ridership per miles (within Queens)	7,100
East-West or North-South?	North-South
Location	This 8-mile corridor runs from Northern Boulevard just north of Queensborough Community College to 147th Avenue in Springfield Gardens.
Local/Limited/SBS	**Q27/Q88/Q77**
Ridership along this corridor	The corridor has robust ridership throughout its length, primarily at major intersections and transfer points. There is very heavy school ridership with several large high schools, junior high schools and Queensborough Community College dotted along the corridor. Springfield Boulevard is busiest south of Union Turnpike.
Land use & density	South of Jamaica Avenue, the corridor never achieves much density, with few buildings rising above 2 stories. North of Jamaica Avenue, the density is above suburban levels, but never reaches truly urban levels. The Queensborough Community College campus and Cardozo High School together form a strong anchor on the north end of the corridor.
Road conditions	The corridor is wide throughout.

RIDER ACTIVITY IN AREA

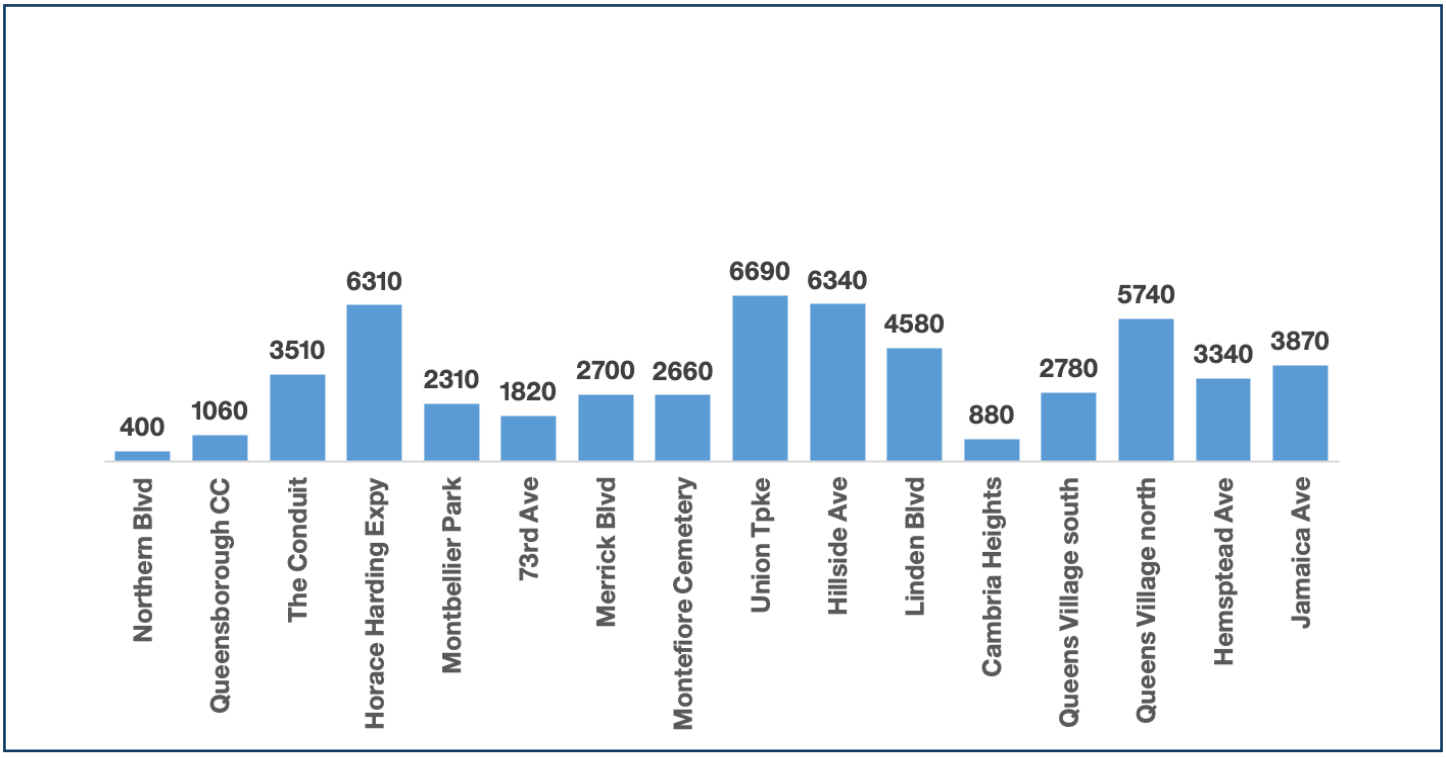
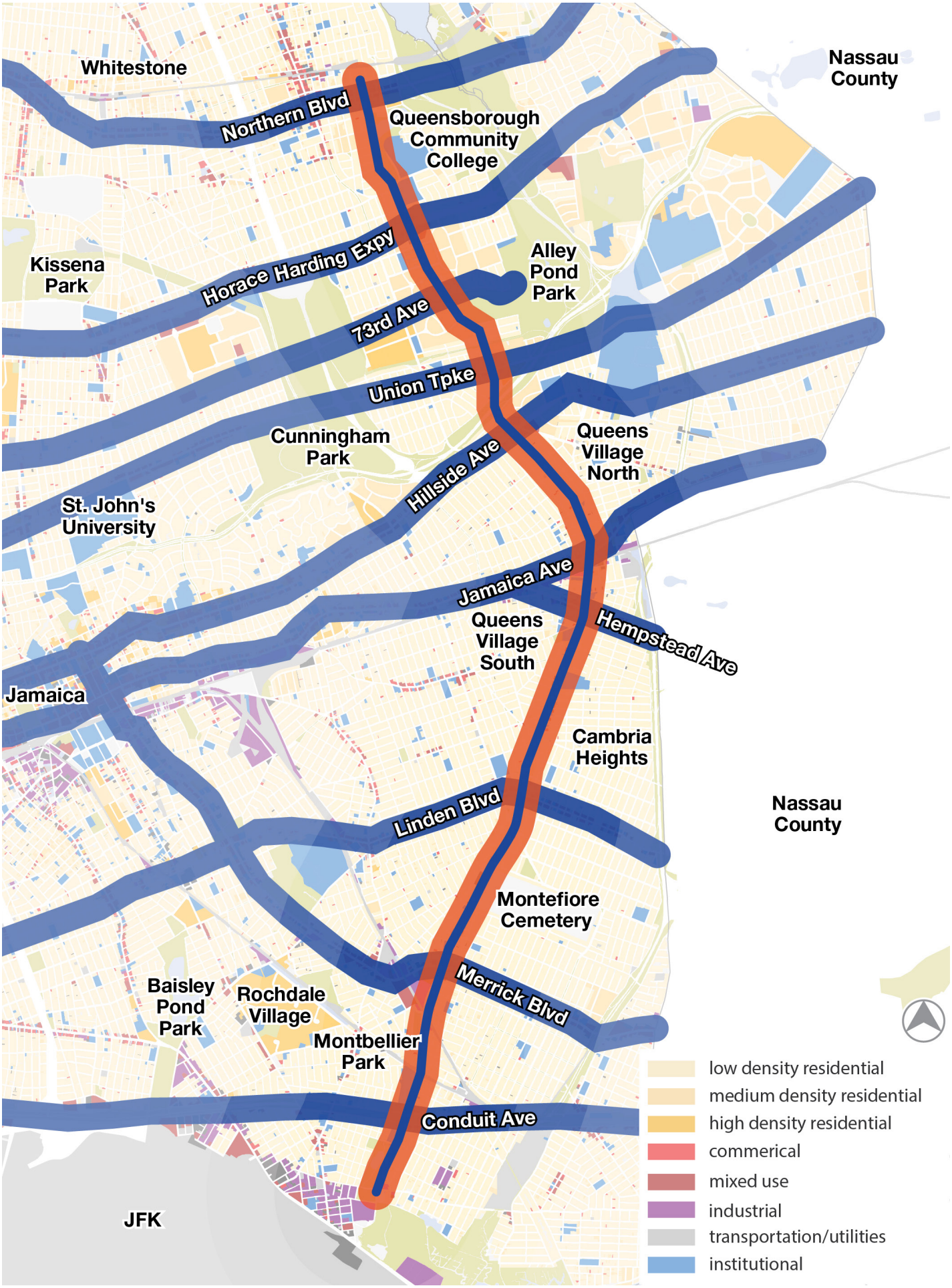


Figure 101


Whitestone
Nassau County
Northern Blvd
Queensborough Community College
Kissena Park
Horace Harding Expy
Alley Pond Park
73rd Ave
Union Tpke
Cunningham Park
Queens Village North
Hillside Ave
St. John's University
Jamaica Ave
Queens Village South
Hempstead Ave
Jamaica
Cambria Heights
Linden Blvd
Nassau County
Montefiore Cemetery
Merrick Blvd
Baisley Pond Park
Rochdale Village
Montbellier Park
Conduit Ave
JFK
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

JUNCTION BLVD/94TH ST CORRIDOR PROFILE

Subway Connection	At 63rd Drive–Rego Park M R At Junction Blvd 7
Average Weekday Ridership on Local/Limited/SBS (within Queens)	21,000
Corridor Length in miles (within Queens)	3.1
Average Ridership per miles (within Queens)	6,900
East-West or North-South?	North-South
Location	This 3-mile corridor stretches between Queens Boulevard in Rego Park and LaGuardia Airport.
Local/Limited/SBS	**Q72**
Ridership along this corridor	The middle portion of the corridor, around the 7 train, has higher ridership than the outer ends.
Land use & density	The southern portion has a high concentration of regional retail stores, just south of LeFrak City. Between LeFrak City and Northern Boulevard there is a solid mix of urbanism, though not as dense as some other nearby areas. The retail around the 7 train is quite popular for the neighborhood. In East Elmhurst, the corridor becomes mostly single-family housing, though at higher densities than in outer areas of the borough.
Road conditions	There is one lane in each direction, which causes problems because of the intensity of uses along the corridor, especially with double parking along the retail area near the 7 train.

RIDER ACTIVITY IN AREA

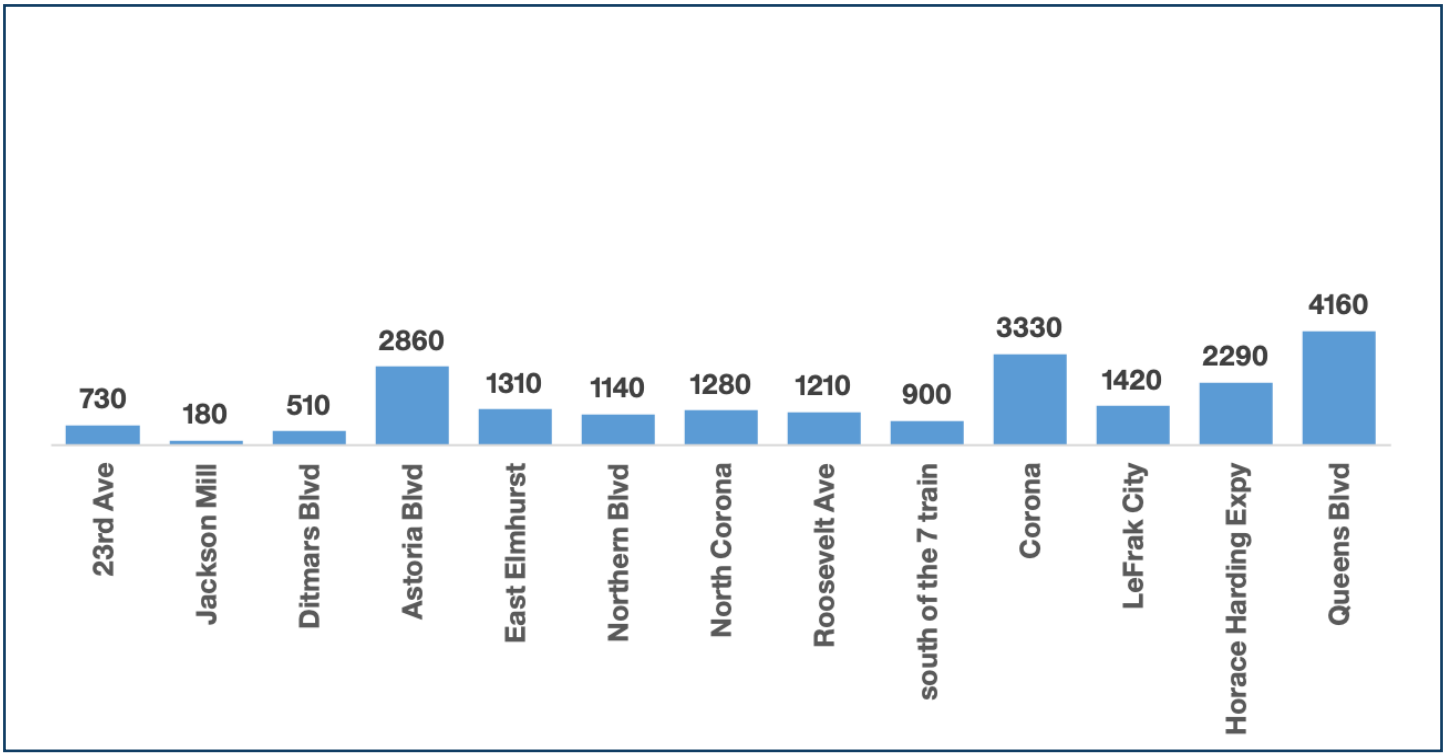
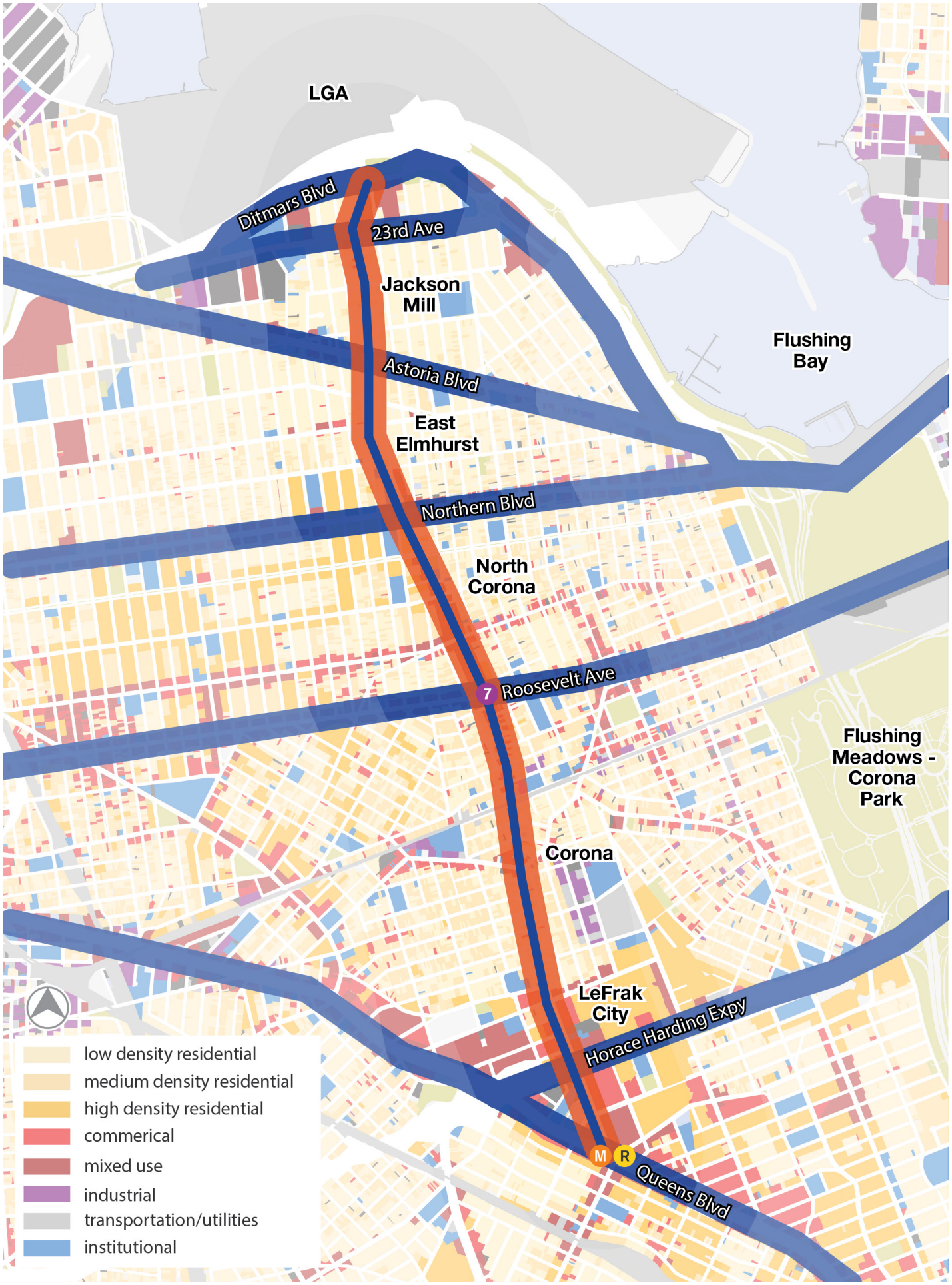


Figure 102


LGA
Ditmars Blvd
23rd Ave
Jackson Mill
Flushing Bay
Astoria Blvd
East Elmhurst
Northern Blvd
North Corona
7 Roosevelt Ave
Flushing Meadows - Corona Park
Corona
LeFrak City
Horace Harding Expy
M R Queens Blvd
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

PARSONS BLVD/46/47/48 AVE CORRIDOR PROFILE

Subway Connection	No direct subway access - passes just east of Flushing
Average Weekday Ridership on Local/Limited/SBS (within Queens)	37,000
Corridor Length in miles (within Queens)	5.3
Average Ridership per miles (within Queens)	6,900
East-West or North-South?	Both
Location	This 5-mile corridor has several different street names along its curving path from 14th Avenue near the Whitestone Expressway to Springfield Boulevard near Queens Community College. The corridor passes just to the east of Downtown Flushing. The streets include Parsons Boulevard, 46th Avenue, Hollis Court Boulevard, 47th Avenue, Rocky Hill Road, and 48th Avenue.
Local/Limited/SBS	**Q44-SBS/Q20A/Q20B/Q26/Q27/Q31**
Ridership along this corridor	The corridor has busy sections just north of Downtown Flushing and on the eastern end near Queensborough Community College.
Land use & density	North of Flushing has solid density with multiple apartment buildings. East of Flushing has lower densities, and some auto-oriented uses. Various schools exist along the corridor. Queensborough Community College is just southeast of the end of the corridor.
Road conditions	There is only one travel lane in each direction, but there are portions of the corridor throughout that are quite tight and cannot accommodate parking on each side and allow two buses to pass each other.

RIDER ACTIVITY IN AREA

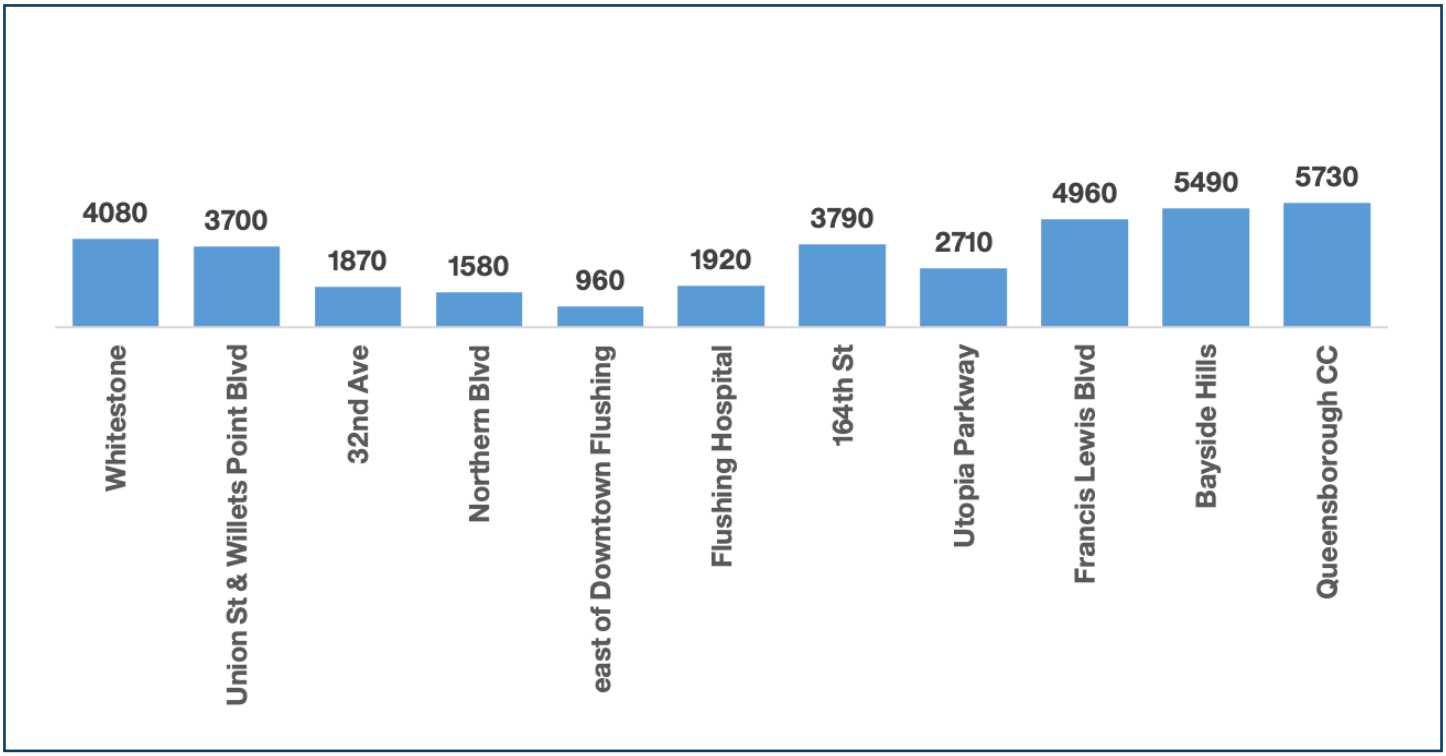


Figure 103


College Point Center
Whitestone
Mitchell-Linden
Willets Point Blvd
Northern Blvd
32nd Ave
Roosevelt Ave
Downtown Flushing
Flushing Hospital
Clearview Park
Fort Totten
Little Neck Bay
Kissena Park
164th St
Utopia Pkwy
188th St
Bell Blvd
Bayside Hills
Francis Lewis Blvd
Queensborough Community College
Springfield Blvd
Cunningham Park
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

METROPOLITAN AVE CORRIDOR PROFILE

Subway Connection	At Jamaica - Van Wyck (E) At Metropolitan (M)
Average Weekday Ridership on Local/Limited/SBS (within Queens)	37,000
Corridor Length in miles (within Queens)	5.5
Average Ridership per miles (within Queens)	6,700
East-West or North-South?	East-West
Location	This 8-mile corridor runs from Williamsburg to Richmond Hill, stopping short of making a direct connection to Downtown Jamaica.
Local/Limited/SBS	**Q54**
Ridership along this corridor	This corridor has pockets of ridership throughout, especially in Ridgewood, Forest Hills, and Kew Gardens.
Land use & density	The eastern and western ends of this corridor are significantly more dense than the middle, especially because of the presence of long stretches of uninhabited areas such as Lutheran Cemetery, St. John's Cemetery, and Forest Park.
Road conditions	The corridor has one travel lane in each direction for most of its length.

RIDER ACTIVITY IN AREA

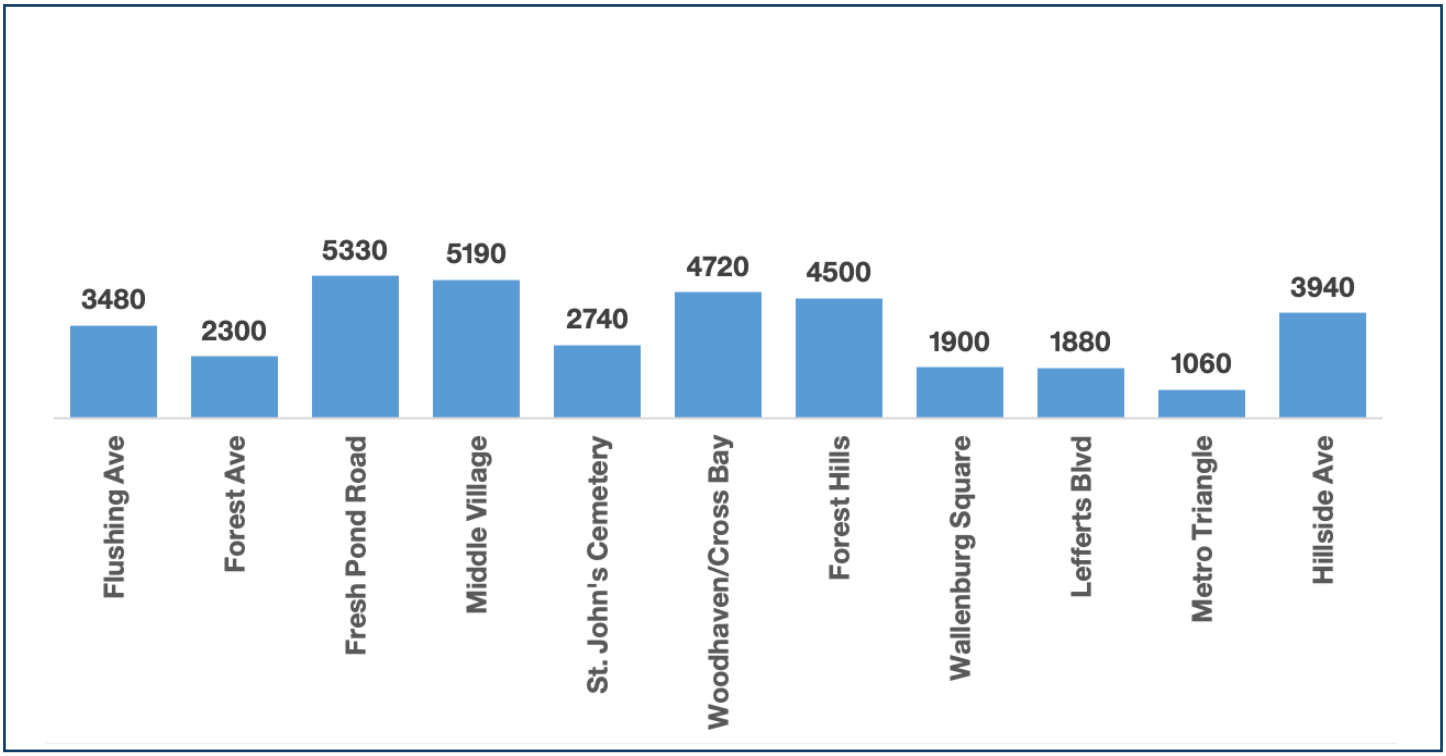
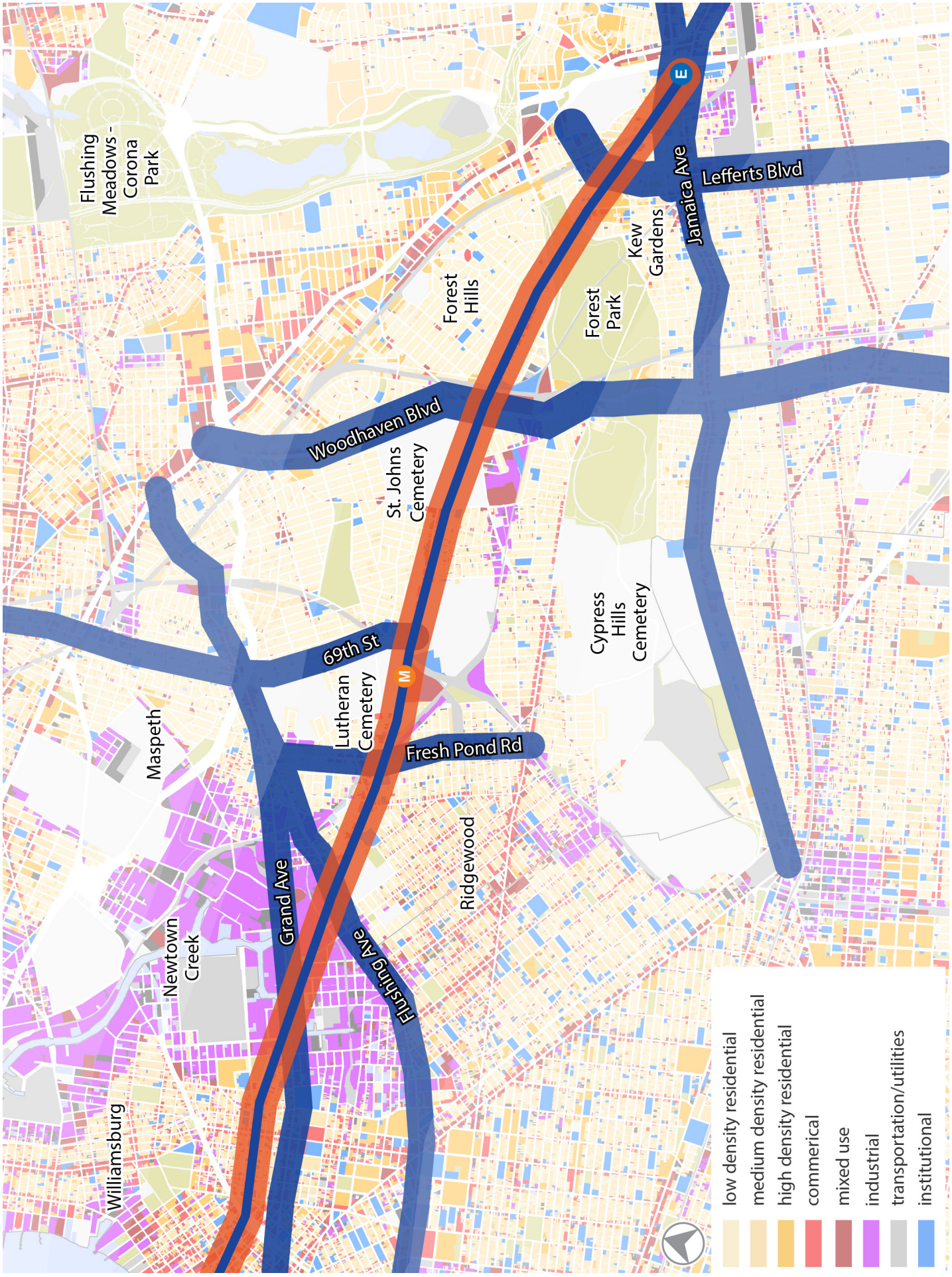


Figure 104


Flushing Meadows - Corona Park
Forest Hills
Forest Park
Kew Gardens
Jamaica Ave
Lefferts Blvd
Woodhaven Blvd
St. Johns Cemetery
Cypress Hills Cemetery
69th St
Lutheran Cemetery
Fresh Pond Rd
Maspeth
Ridgewood
Grand Ave
Flushing Ave
Newtown Creek
Williamsburg
E
M
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

ASTORIA BLVD CORRIDOR PROFILE

Subway Connection	At Astoria Boulevard N W Close to Astoria ferry terminal
Average Weekday Ridership on Local/Limited/SBS (within Queens)	27,000
Corridor Length in miles (within Queens)	4.1
Average Ridership per miles (within Queens)	6,500
East-West or North-South?	East-West
Location	This 4-mile corridor stretches between Vernon Boulevard in Astoria and Flushing Meadows.
Local/Limited/SBS	**Q19/M60-SBS/Q49**
Ridership along this corridor	The western and eastern edges of the corridor have solid ridership. The middle is limited by the presence of St. Michael's Cemetery.
Land use & density	There is solid urbanism west of the subway. Between 31st and 82nd Streets, Astoria Blvd serves as the north and south service roads for the Grand Central Parkway. The portion between 31st Street and St. Michael's Cemetery has solid density, but the border vacuum created by the parkway limits the ridership demand, as pedestrians are forced to walk several hundred feet further than usual because of the separated nature of the roadway. East of St. Michael's Cemetery, the Bulova Center is the largest major destination. The eastern portion of the route has some spots of density in between great distances of auto-oriented, sprawling low-density uses.
Road conditions	The portion west of 31st Street has one lane in each direction. Between 31st Street and 82nd Street, it is a service road for the Grand Central Parkway with two lanes in each direction. East of 82nd Street, the corridor is a six-lane boulevard with three travel lanes in each direction and left turn lanes at key intersections. Astoria Boulevard has TSP installed between 94th and 31st Streets.

RIDER ACTIVITY IN AREA

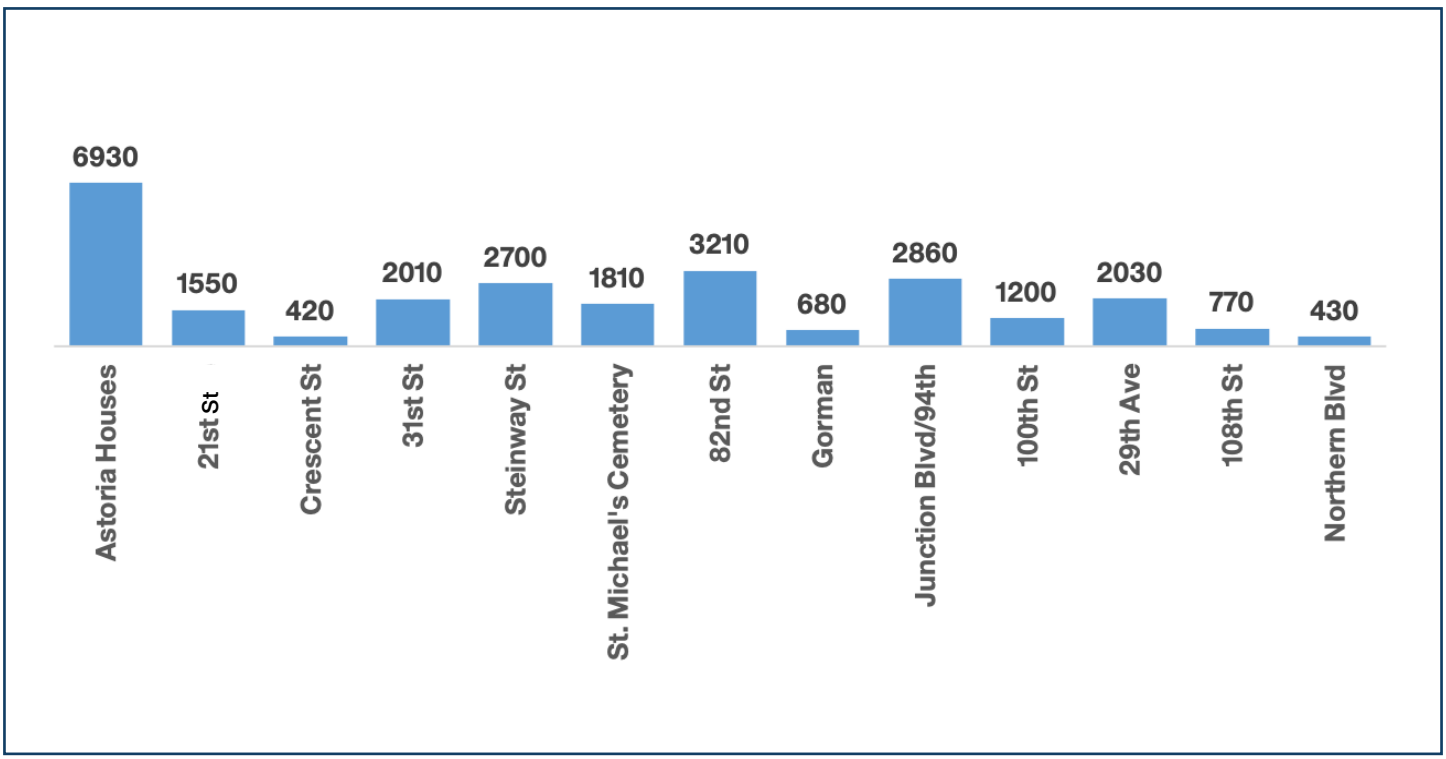
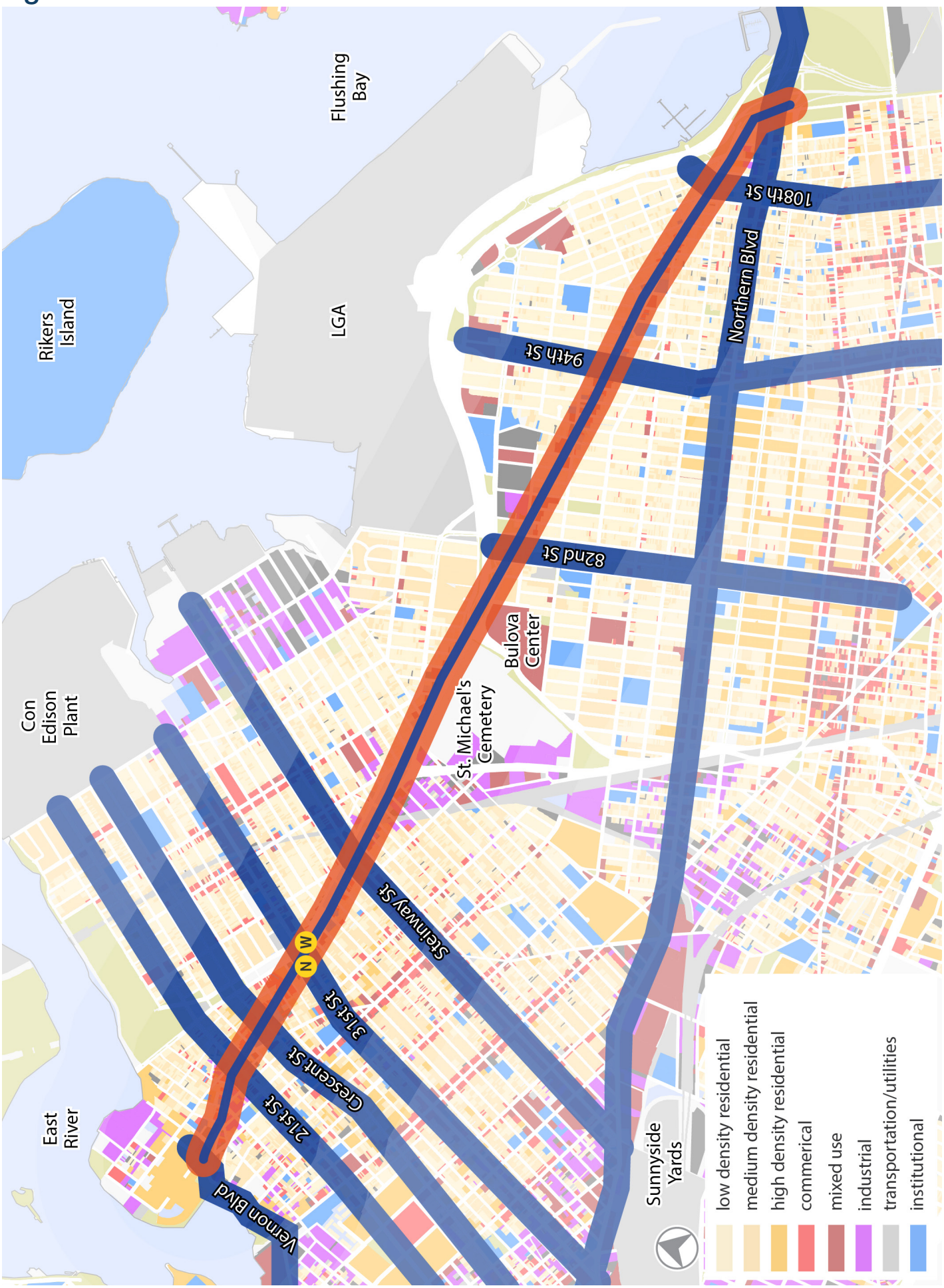


Figure 105


Flushing Bay
Rikers Island
LGA
Con Edison Plant
East River
Vernon Blvd
21st St
Crescent St
31st St
Steinway St
M
W
N
St. Michael's Cemetery
Bulova Center
82nd St
94th St
Northern Blvd
108th St
Sunnyside Yards
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

LIBERTY AVE CORRIDOR PROFILE

Subway Connection	At Ozone Park–Lefferts Boulevard (A) At Rockaway Boulevard (A) At 104th Street (A) At 111th Street (A) At 80th Street (A) At 88th Street (A)
Average Weekday Ridership on Local/Limited/SBS (within Queens)	37,000
Corridor Length in miles (within Queens)	5.6
Average Ridership per miles (within Queens)	6,500
East-West or North-South?	East-West
Location	This 8-mile corridor stretches from East New York, Brooklyn to Farmers Boulevard in St. Albans, running just south of Downtown Jamaica.
Local/Limited/SBS	**Q112/Q83**
Express	**X64**
Ridership along this corridor	The busiest portion of this corridor is beneath the elevated (A) train between Woodhaven Boulevard and the Van Wyck Expressway.
Land use & density	Liberty Avenue contains some lower levels of density along it, though not as dense as other corridors like Myrtle Avenue or Roosevelt Avenue. East of the Van Wyck to Dunkirk St, there is a mixed-use of industrial/residential, with York College and the LIRR Hillside Facility serving as major destinations.
Road conditions	The western portion of this corridor is rather narrow. The central portion is located underneath the el. The eastern portion of this corridor is wider than the western end, but still has just one travel lane in each direction. At the Rockaway Boulevard (A) train station, Liberty Avenue is physically cut by the Woodhaven-Cross Bay north-south corridor, requiring multiple additional turns in order to serve both sides of the corridor.

RIDER ACTIVITY IN AREA

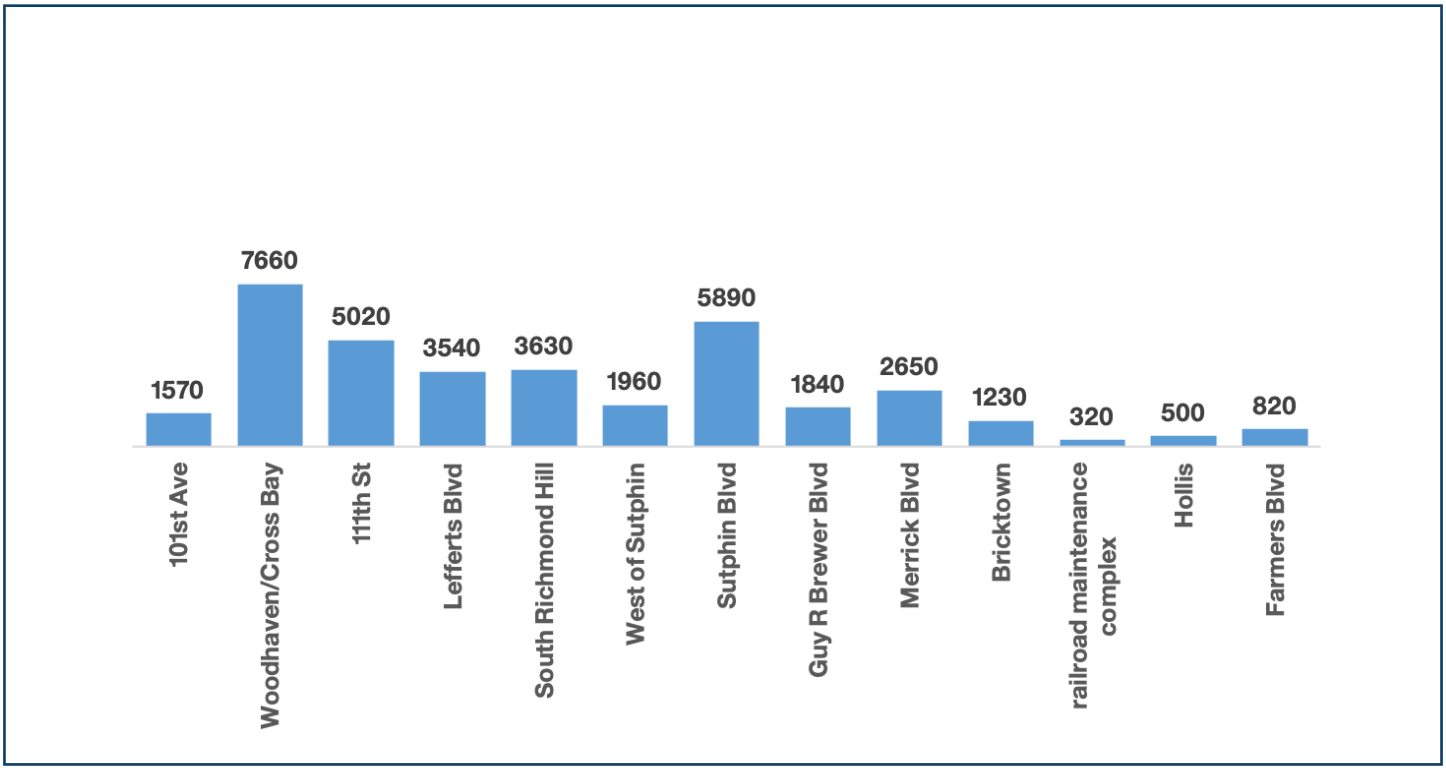
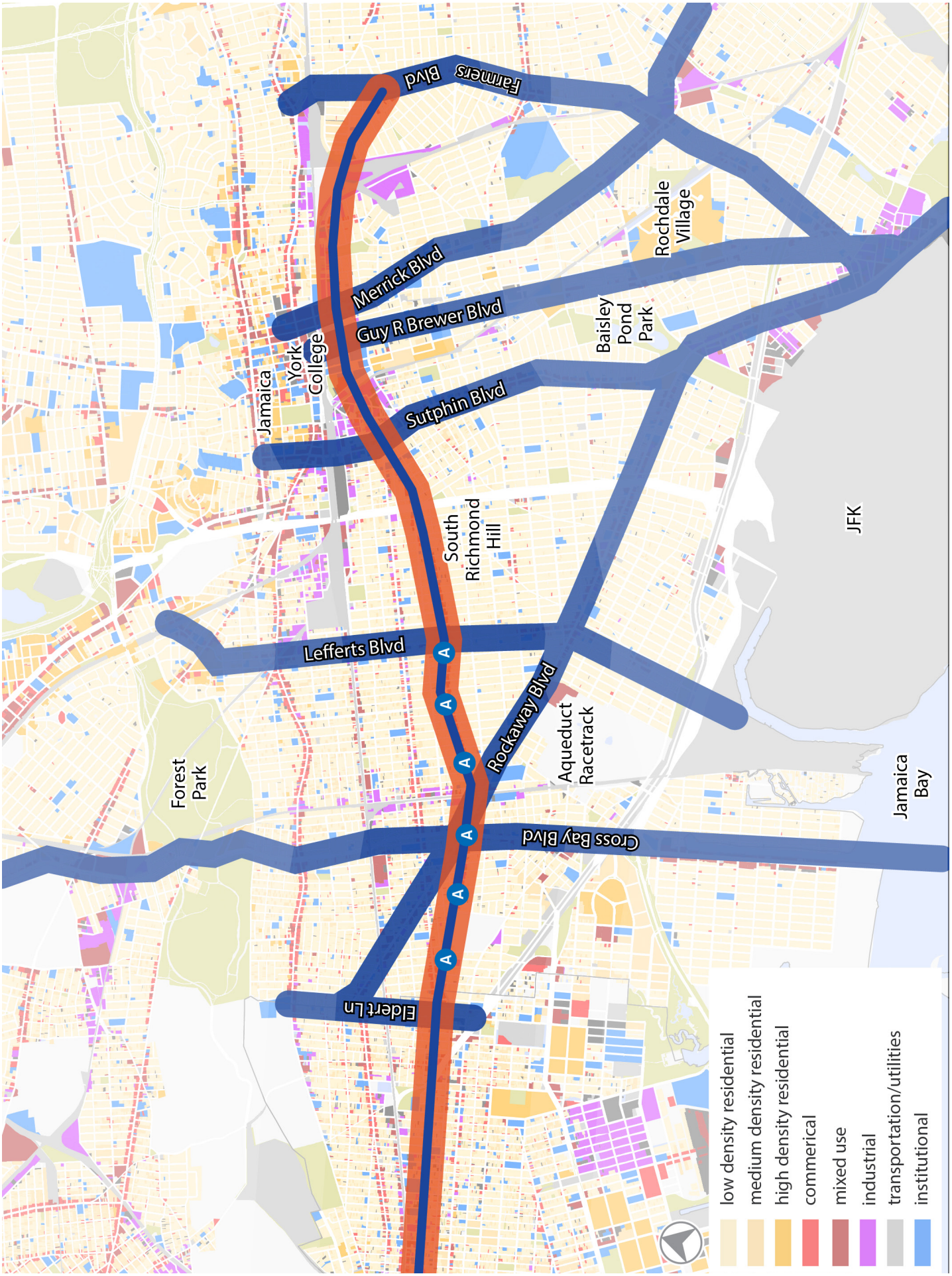


Figure 106


Farmers Blvd
Merrick Blvd
Guy R Brewer Blvd
Sutphin Blvd
Lefferts Blvd
Rockaway Blvd
Cross Bay Blvd
Elder Ln
Jamaica
York College
South Richmond Hill
Forest Park
Aqueduct Racetrack
Baisley Pond Park
Rochdale Village
JFK
Jamaica Bay
A
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

164TH ST CORRIDOR PROFILE

Subway Connection	No direct subway access - ends at Hillisde Avenue, halfway between two F train stations
Average Weekday Ridership on Local/Limited/SBS (within Queens)	20,000
Corridor Length in miles (within Queens)	3.2
Average Ridership per miles (within Queens)	6,300
East-West or North-South?	North-South
Location	This 3-mile corridor stretches between 46th Avenue at Flushing Cemetery (as Pigdeon Meadow Road) to Hillside Avenue in Jamaica.
Local/Limited/SBS	**Q65**
Ridership along this corridor	There are busy portions at each of the ends, but less activity in the middle.
Land use & density	Parks and cemeteries on the top portion of the route limit the overall density there. There are patches of density in the southern half of the route.
Road conditions	There are portions of the corridor with two travel lanes, and some of the areas with only one travel lane are still wide.

RIDER ACTIVITY IN AREA

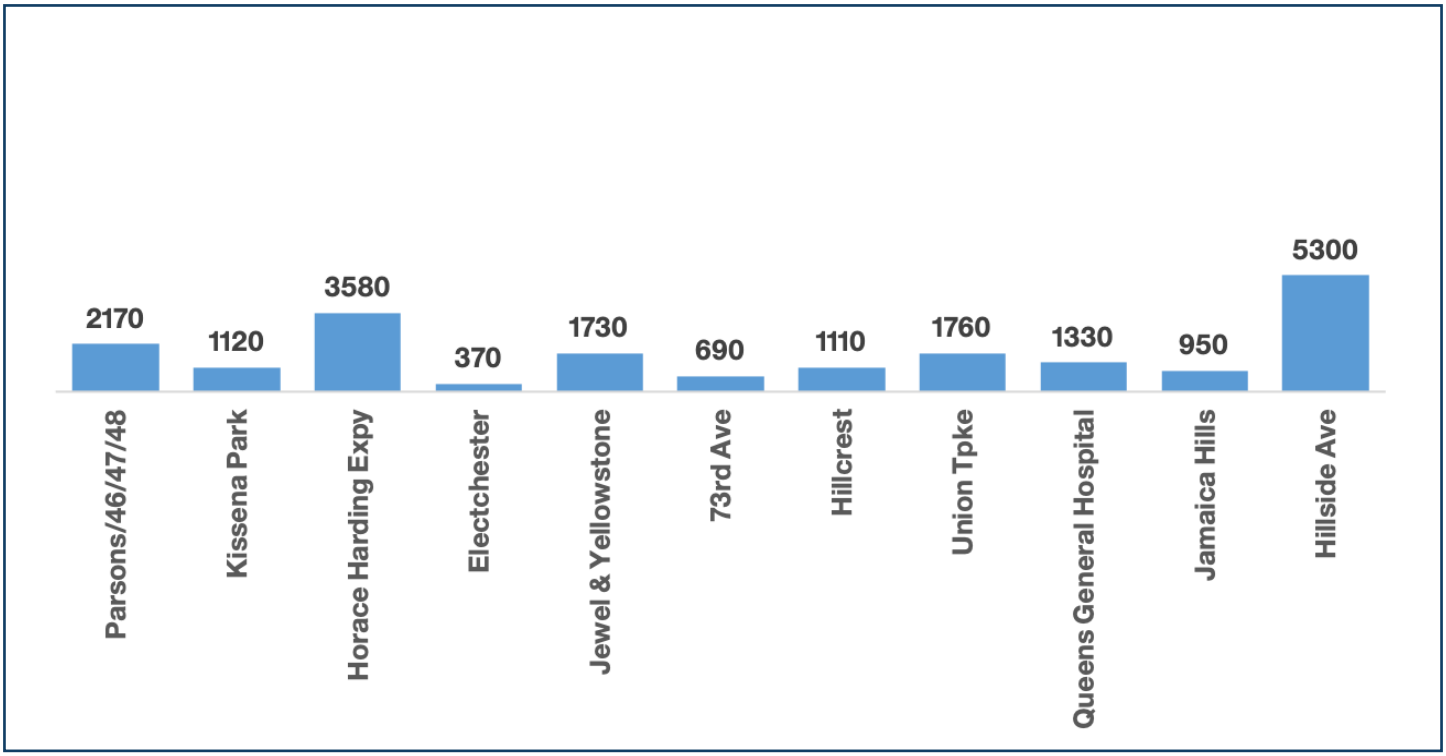
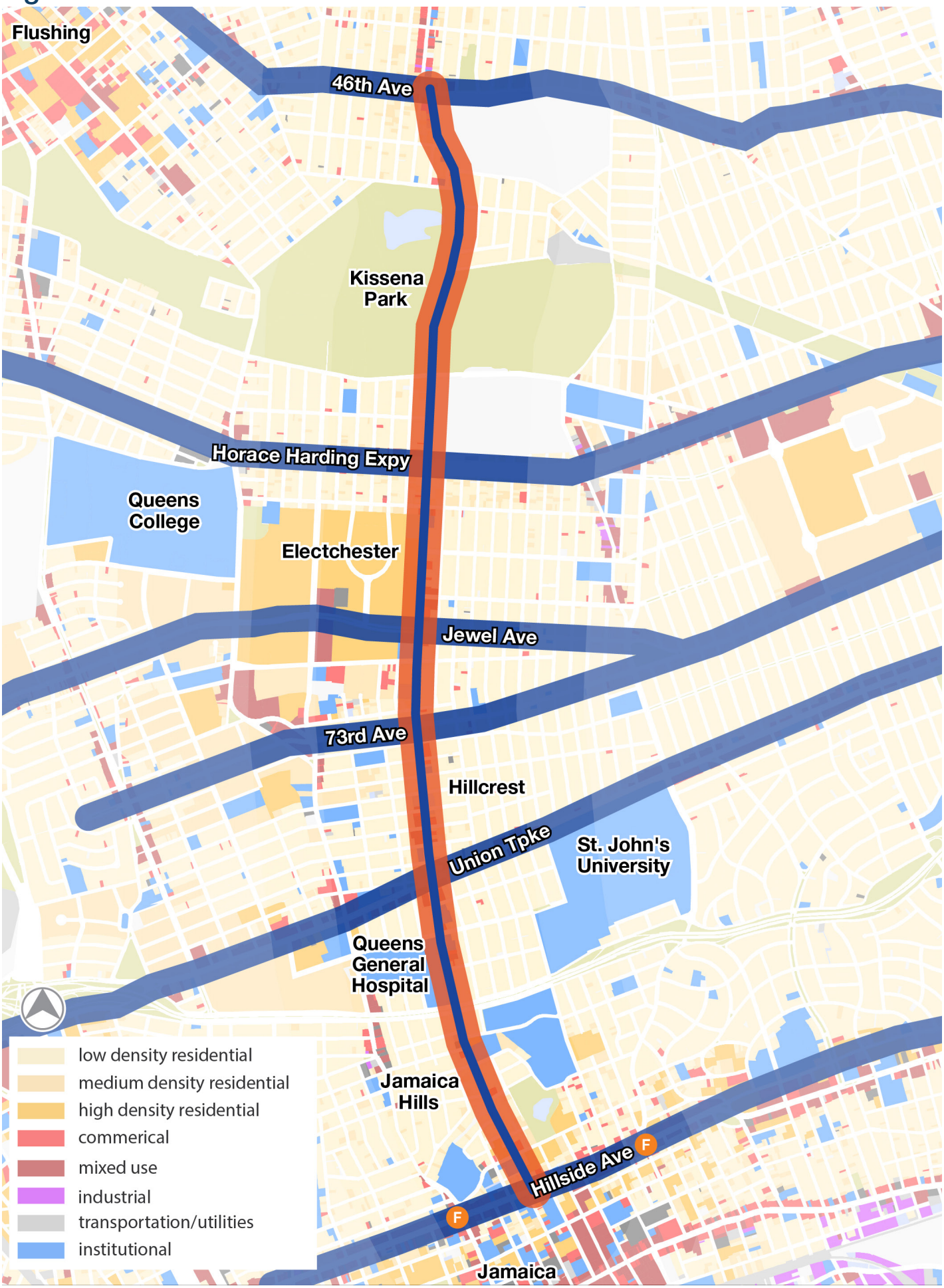


Figure 107


Flushing
46th Ave
Kissena Park
Horace Harding Expy
Queens College
Electchester
Jewel Ave
73rd Ave
Hillcrest
Union Tpke
St. John's University
Queens General Hospital
Jamaica Hills
Hillside Ave
F
F
Jamaica
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

MYRTLE AVE CORRIDOR PROFILE

Subway Connection	At Myrtle-Wyckoff Avenues L M Close to 121st Street J Z
Average Weekday Ridership on Local/Limited/SBS (within Queens)	26,000
Corridor Length in miles (within Queens)	4.2
Average Ridership per miles (within Queens)	6,300
East-West or North-South?	East-West
Location	This 8-mile corridor runs from Downtown Brooklyn to Richmond Hill, stopping short of making a direct connection to Downtown Jamaica.
Local/Limited/SBS	**B54/Q55**
Ridership along this corridor	The busiest portions of the corridor are in Brooklyn, with some ridership in Ridgewood and Glendale.
Land use & density	Myrtle Avenue has solid urbanism of at least three stories for much of the corridor. East of Cooper Avenue, Mt. Lebanon Cemetery and Forest Park thin out development density.
Road conditions	Between Broadway and Wyckoff Avenue, the elevated train constrains the flow of traffic underneath. East of this segment, Myrtle Avenue is still just one travel lane for the majority of the corridor.

RIDER ACTIVITY IN AREA

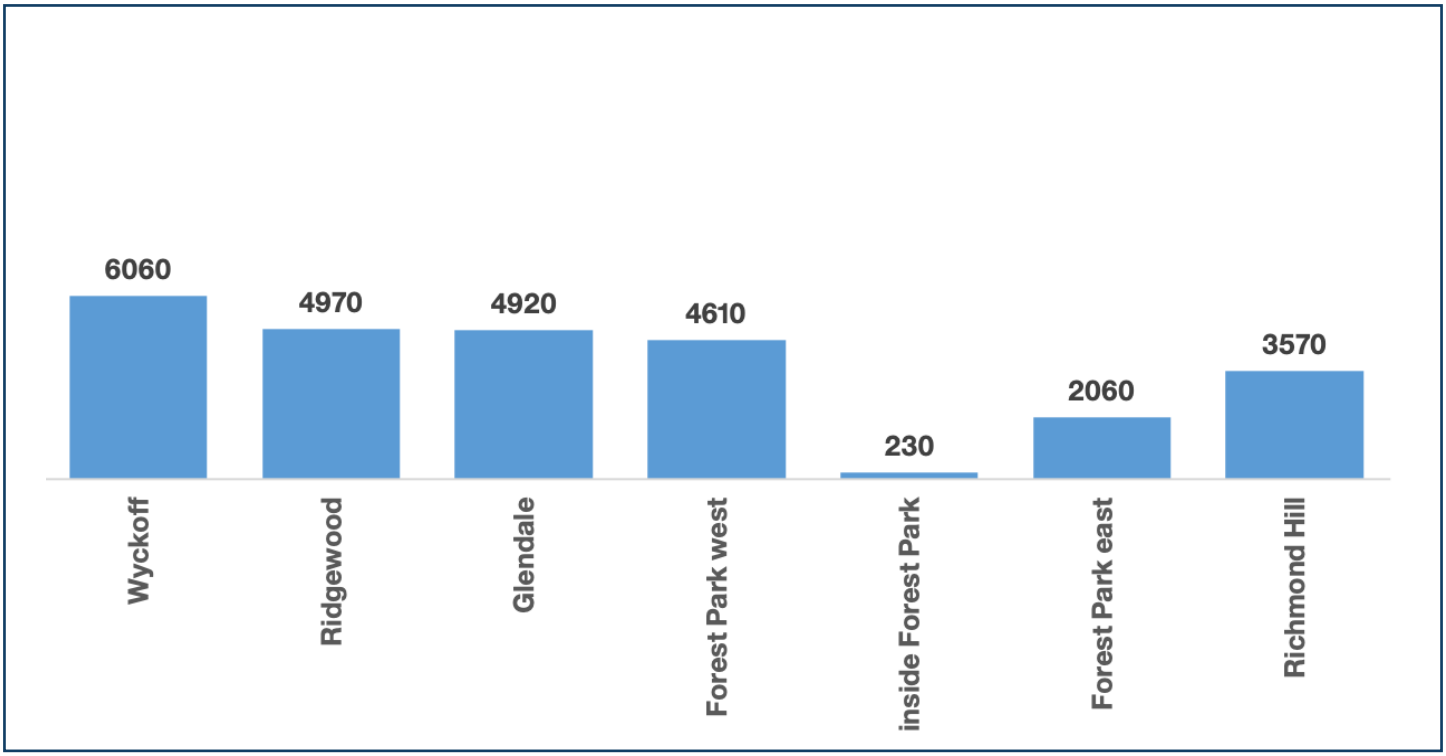
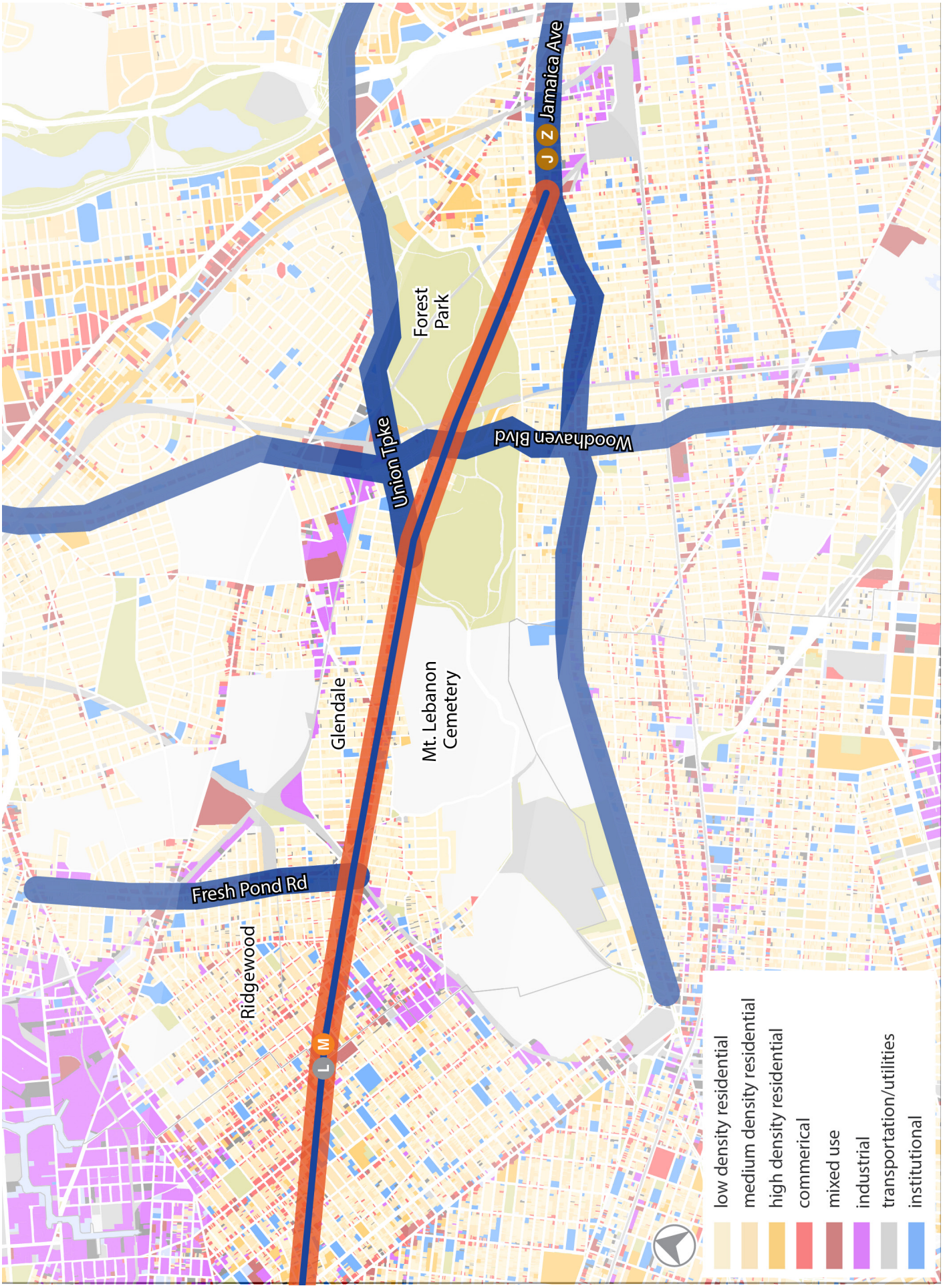


Figure 108


Jamaica Ave
J Z
Forest Park
Union Tpke
Woodhaven Blvd
Glendale
Mt. Lebanon Cemetery
Fresh Pond Rd
Ridgewood
L M
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

21ST STREET CORRIDOR PROFILE

Subway Connection	At Court Square E M G 7 At 21st Street–Queensbridge F 21st St G Close to Hunters Point Av 7 Close to Hunterspoint Avenue LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	22,000
Corridor Length in miles (within Queens)	3.5
Average Ridership per miles (within Queens)	6,200
East-West or North-South?	North-South
Location	This 3-and-a-half-mile corridor runs through Long Island City and Astoria, parallel to the East River.
Local/Limited/SBS	**Q100/Q69/Q66**
Ridership along this corridor	The corridor has solid ridership south of the RFK Bridge.
Land use & density	North of the corridor is the Con Edison plant. Solid urbanism exists along much of the corridor, though occassionally the auto-oriented uses thin out the density. In other areas, such as the Queensbridge Houses and Ravenswood Houses, density is somewhat higher.
Road conditions	South of the RFK Bridge, there are two travel lanes in each direction, making it the widest north-south corridor in the area.

RIDER ACTIVITY IN AREA

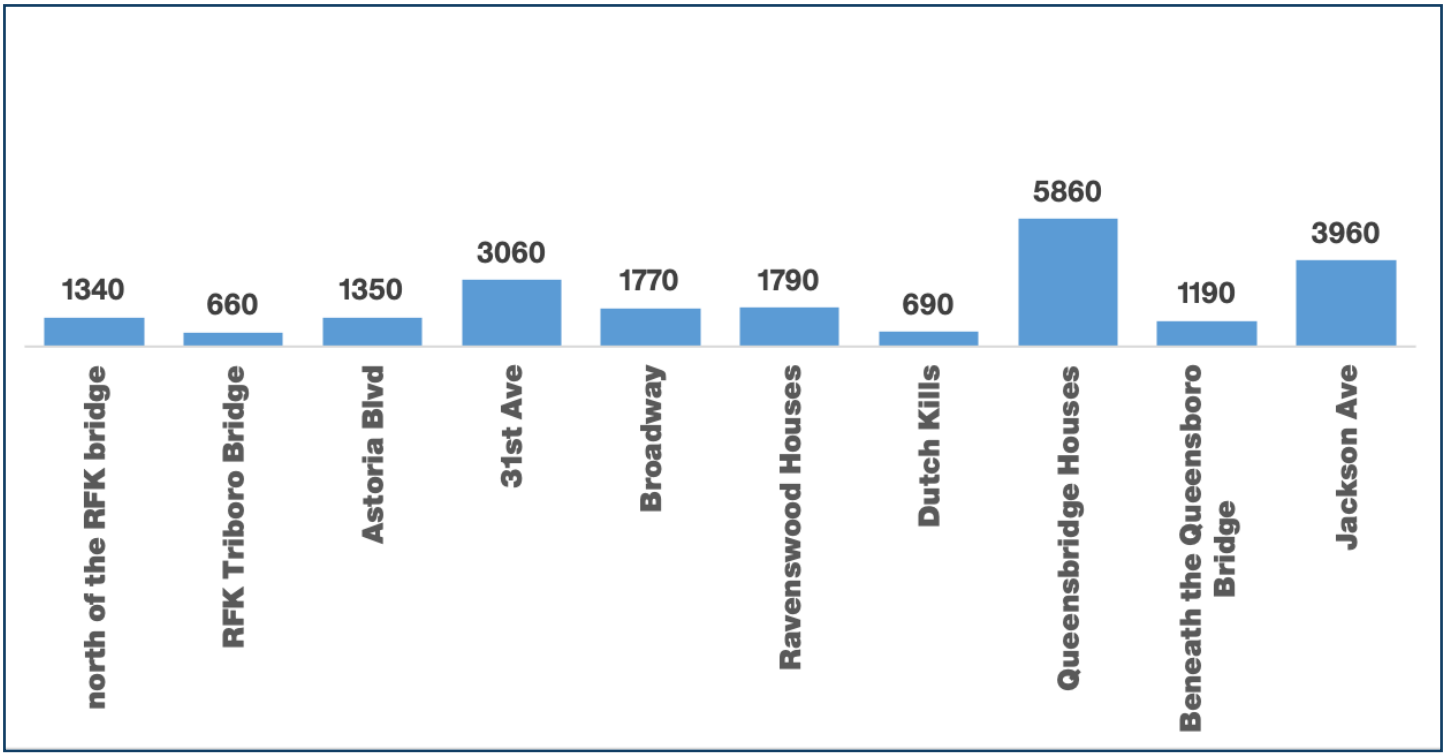
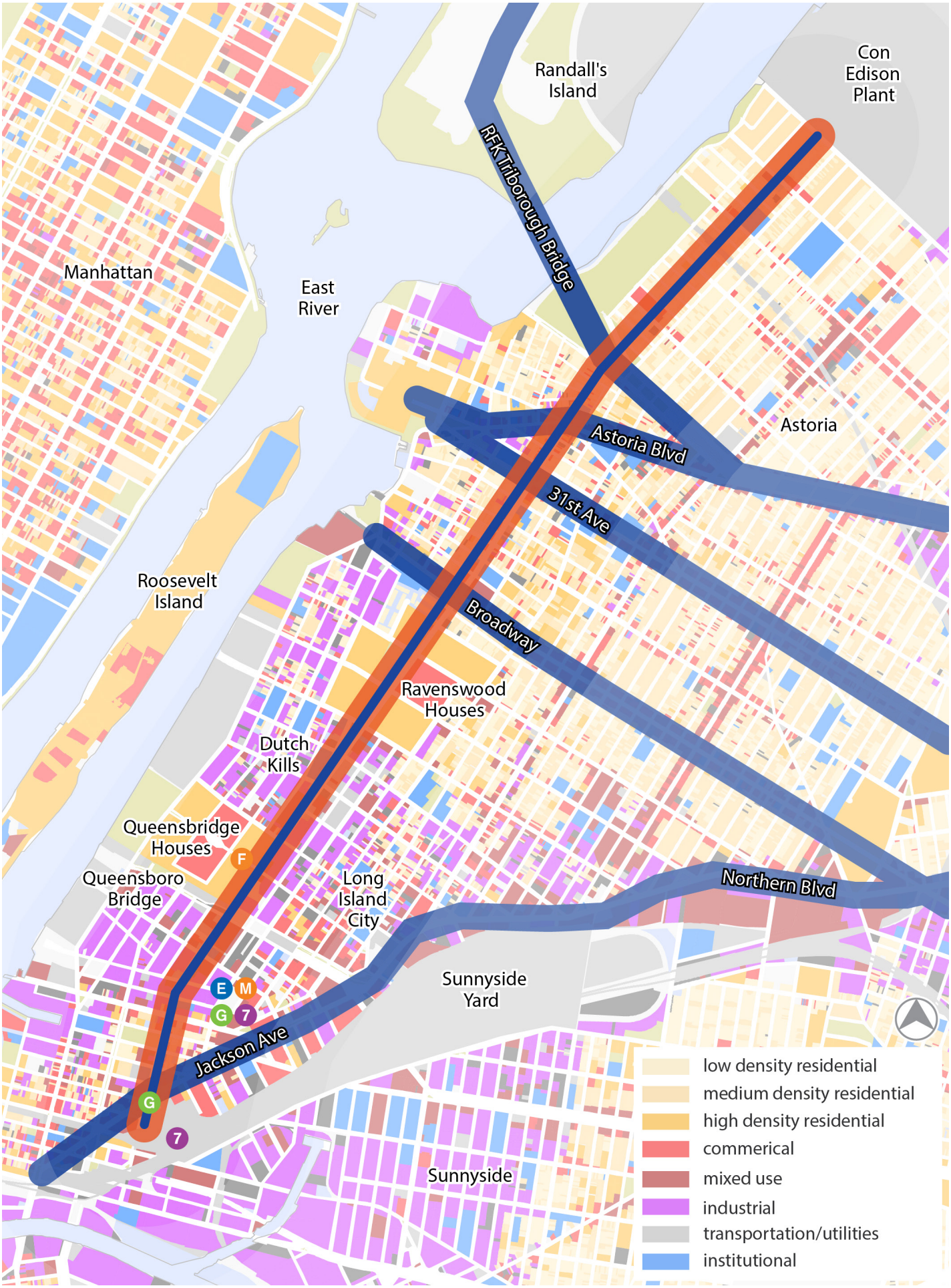


Figure 109


Randall's Island
Con Edison Plant
RFK Triborough Bridge
Manhattan
East River
Astoria
Astoria Blvd
31st Ave
Roosevelt Island
Broadway
Ravenswood Houses
Dutch Kills
Queensbridge Houses
Queensboro Bridge
Long Island City
Northern Blvd
Sunnyside Yard
Jackson Ave
Sunnyside
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

188TH STREET CORRIDOR PROFILE

Subway Connection	No subway nearby
Average Weekday Ridership on Local/Limited/SBS (within Queens)	20,000
Corridor Length in miles (within Queens)	3.2
Average Ridership per miles (within Queens)	6,100
East-West or North-South?	North-South
Location	This 3-mile corridor stretches between Utopia Parkway and Jamaica Avenue.
Local/Limited/SBS	**Q17**
Express	**QM1/QM7/QM31**
Ridership along this corridor	There is some ridership throughout the corridor, but at lower levels than other nearby corridors.
Land use & density	The Fresh Meadows Apartments are the sole portion with any real density, as some of the other portions of the corridor have suburban densities.
Road conditions	The corridor has one travel lane in each direction for most of its length.

RIDER ACTIVITY IN AREA

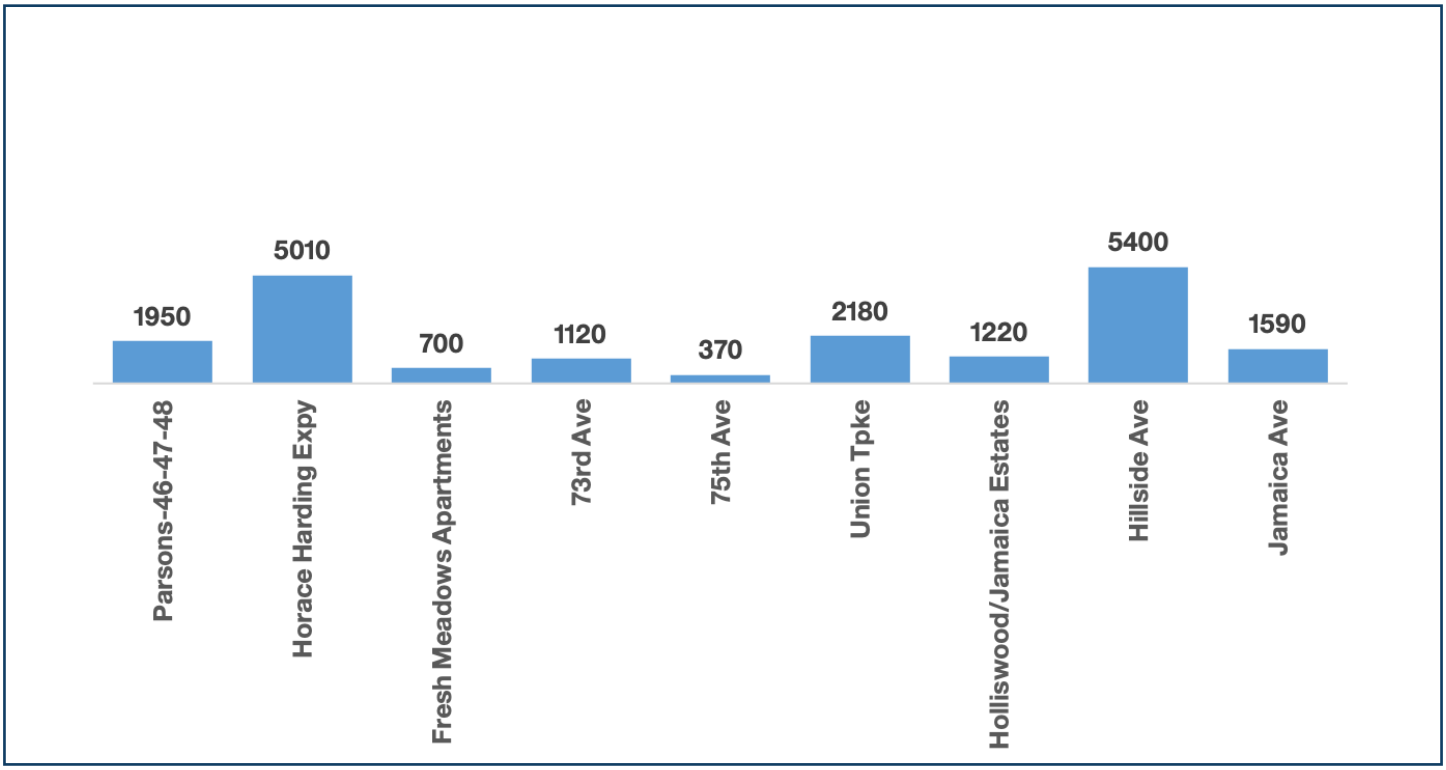


Figure 110


Queensborough Community College
46th Ave
47th Ave
Utopia Pkwy
Kissena Park
Horace Harding Expy
Fresh Meadows Apartments
73rd Ave
75th Ave
Union Tpke
Cunningham Park
St. John's University
Holliswood
Jamaica Estates
Hillside Ave
Jamaica Ave
Jamaica
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

UTOPIA PKWY CORRIDOR PROFILE

Subway Connection	At 169th Street (F) Close to Auburndale LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	33,000
Corridor Length in miles (within Queens)	5.4
Average Ridership per miles (within Queens)	6,100
East-West or North-South?	North-South
Location	The 5-and-a-half-miles covered by Utopia Parkway (and Homelawn Street) stretches from the Long Island Sound to Hillside Avenue.
Local/Limited/SBS	**Q30/Q31/Q16**
Express	**QM20**
Ridership along this corridor	Any significant ridership along Utopia Parkway occurs at the major intersections.
Land use & density	The area along Homelawn Street is more dense than the northern portion along Utopia Parkway. St. John's University is the single largest key destination along the corridor.
Road conditions	Homelawn Street has one travel lane in each direction, while Utopia Parkway is mostly wide throughout, with the exception of a narrow stretch between 33rd Avenue and 39th Avenue.

RIDER ACTIVITY IN AREA

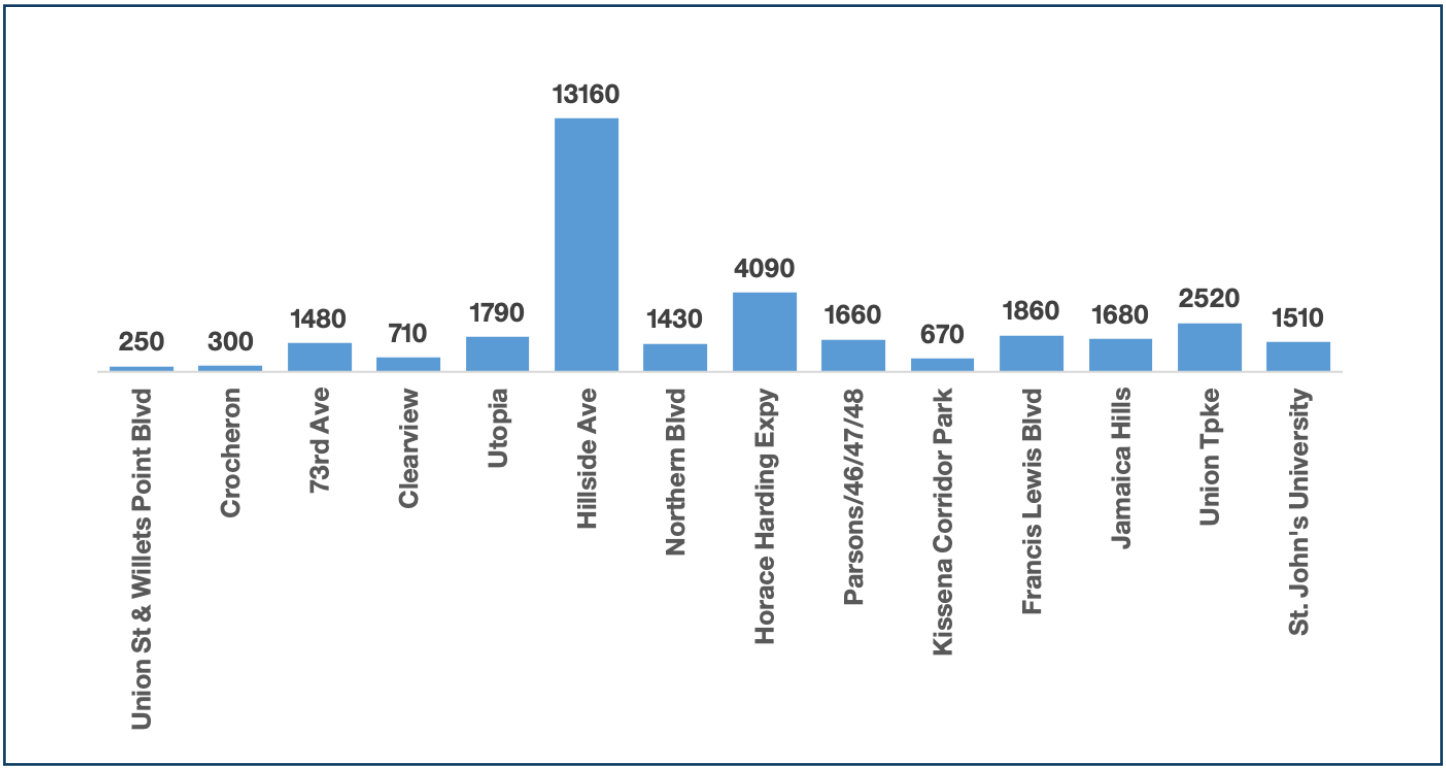
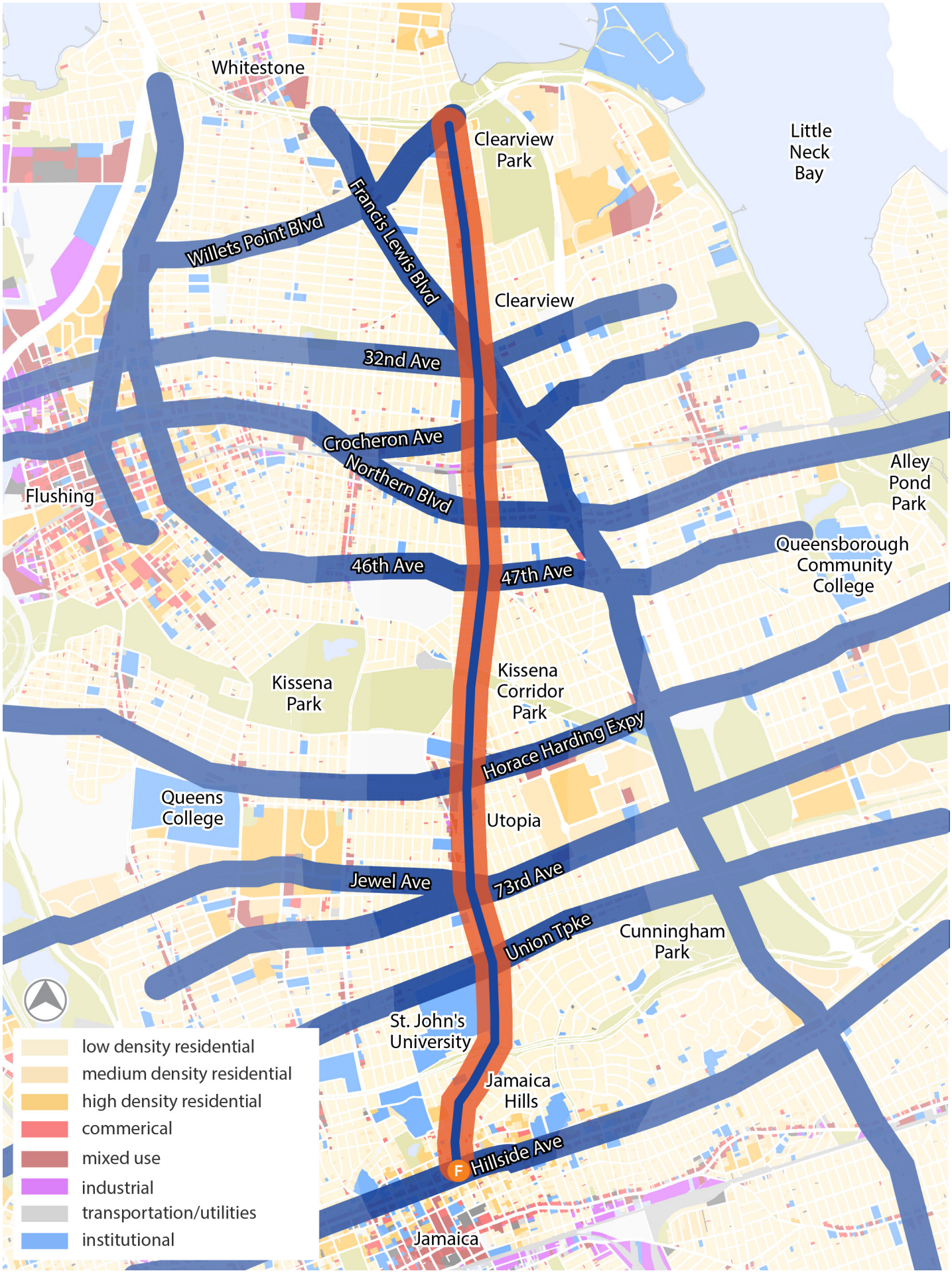


Figure 111


Whitestone
Clearview Park
Little Neck Bay
Francis Lewis Blvd
Willets Point Blvd
Clearview
32nd Ave
Crocheron Ave
Northern Blvd
Flushing
Alley Pond Park
Queensborough Community College
46th Ave
47th Ave
Kissena Park
Kissena Corridor Park
Horace Harding Expy
Queens College
Utopia
Jewel Ave
73rd Ave
Union Tpke
Cunningham Park
St. John's University
Jamaica Hills
F
Hillside Ave
Jamaica
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

JEWEL AVE & YELLOWSTONE BLVD CORRIDOR PROFILE

Subway Connection	Close to Forest Hills-71st Avenue E F M R
Average Weekday Ridership on Local/Limited/SBS (within Queens)	23,000
Corridor Length in miles (within Queens)	3.9
Average Ridership per miles (within Queens)	6,000
East-West or North-South?	East-West
Location	This 4-mile corridor stretches from Woodhaven Boulevard past Queens Boulevard, Grand Central Parkway, and Van Wyck Expressway, ending as a dead end just east of Utopia Parkway.
Local/Limited/SBS	**Q64**
Express	**QM12/QM42/QM4/QM44**
Ridership along this corridor	There are moderate bus-to-bus transfers at Main Street and Kissena Boulevard.
Land use & density	There are moderate-to-high density apartments east of the Van Wyck Expressway, including the Electchester Co-op Apartments and NYCHA's Pomonok Houses towards the eastern end. Queens College is a major destination, located just north of this corridor.
Road conditions	Between Queens Boulevard and the Grand Central, Jewel is one-way eastbound. During this stretch, 69th Street runs one-way westbound about 260 feet north, forming a one-way pair. The corridor west of 164th Street is wide. East of 164th, there are 4 blocks of one-way travel eastbound when the roadway narrows. There is no comparable westbound road to form a one-way pair with.

RIDER ACTIVITY IN AREA

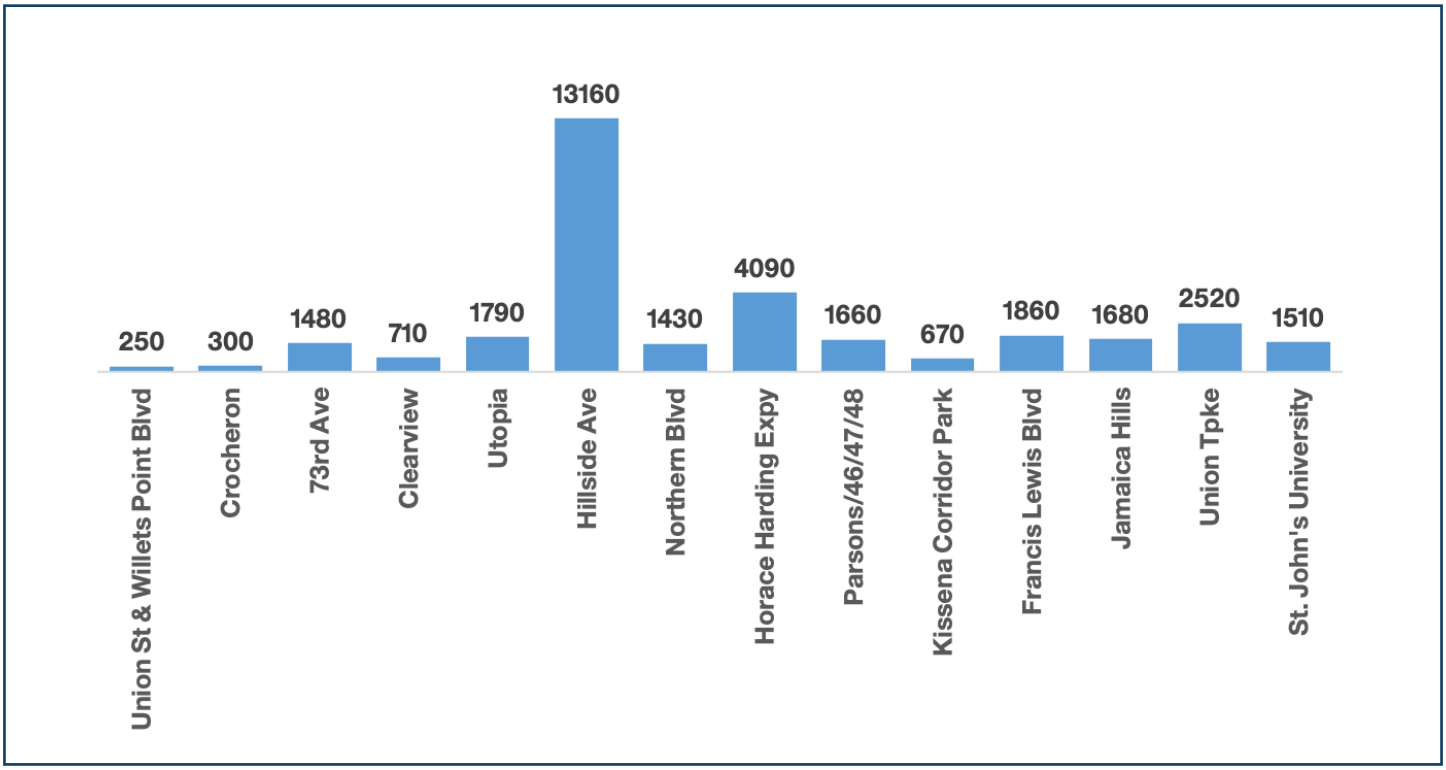


Figure 112


Utopia Pkwy
St. John's University
Kissena Park
164th St
Kissena Blvd
Parsons Blvd
Queens College
Jamaica
Main St
Flushing Meadows - Corona Park
Queens Blvd
E
F
M
R
108th St
Forest Park
Forest Hills
Woodhaven Blvd
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

NORTHERN BLVD CORRIDOR PROFILE

Subway Connection	At Hunters Point 7 At Vernon-Jackson 7 At Court Square E M G 7 At Queens Plaza E M R At 21st St G At Northern Boulevard M R At 36th Street M R At Queensboro Plaza N W 7 Close to 39th Avenue N W At Broadway LIRR station Close to Murray Hill LIRR station Close to Bayside LIRR station Close to Long Island City LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	73,000
Corridor Length in miles (within Queens)	12.5
Average Ridership per miles (within Queens)	5,900
East-West or North-South?	East-West
Location	The 12-and-a-half miles covered by Northern Boulevard (and Jackson Avenue) stretch across the entirety of Queens. This corridor continues into Nassau County and through different street names occur along the way, the corridor itself extends well into Suffolk County to Smithtown Bay.
Local/Limited/SBS	**B62/Q66/Q13/Q28/Q12**
Express	**QM3**
NICE Bus	**N20G**
Ridership along this corridor	The two busiest sections of this corridor are in Corona/East Elmhurst, serving as a feeder route to the Northern Boulevard station with service from the M R trains; and in Auburndale, west of Bell Boulevard and serving as a feeder into Flushing.
Land use & density	In Long Island City, Northern Boulevard travels alongside Sunnyside Yard, with auto-oriented uses and large industrial buildings. The segment in Corona/East Elmhurst is wide but still contains multistory buildings and moderate density. The eastern portion thins out to single-story buildings and drive-through restaurants.
Road conditions	The corridor bypasses the heart of Downtown Flushing, running approximately 1500 feet to the north. This distance causes bus routes along Northern to divert to serve the center of Flushing.

RIDER ACTIVITY IN AREA

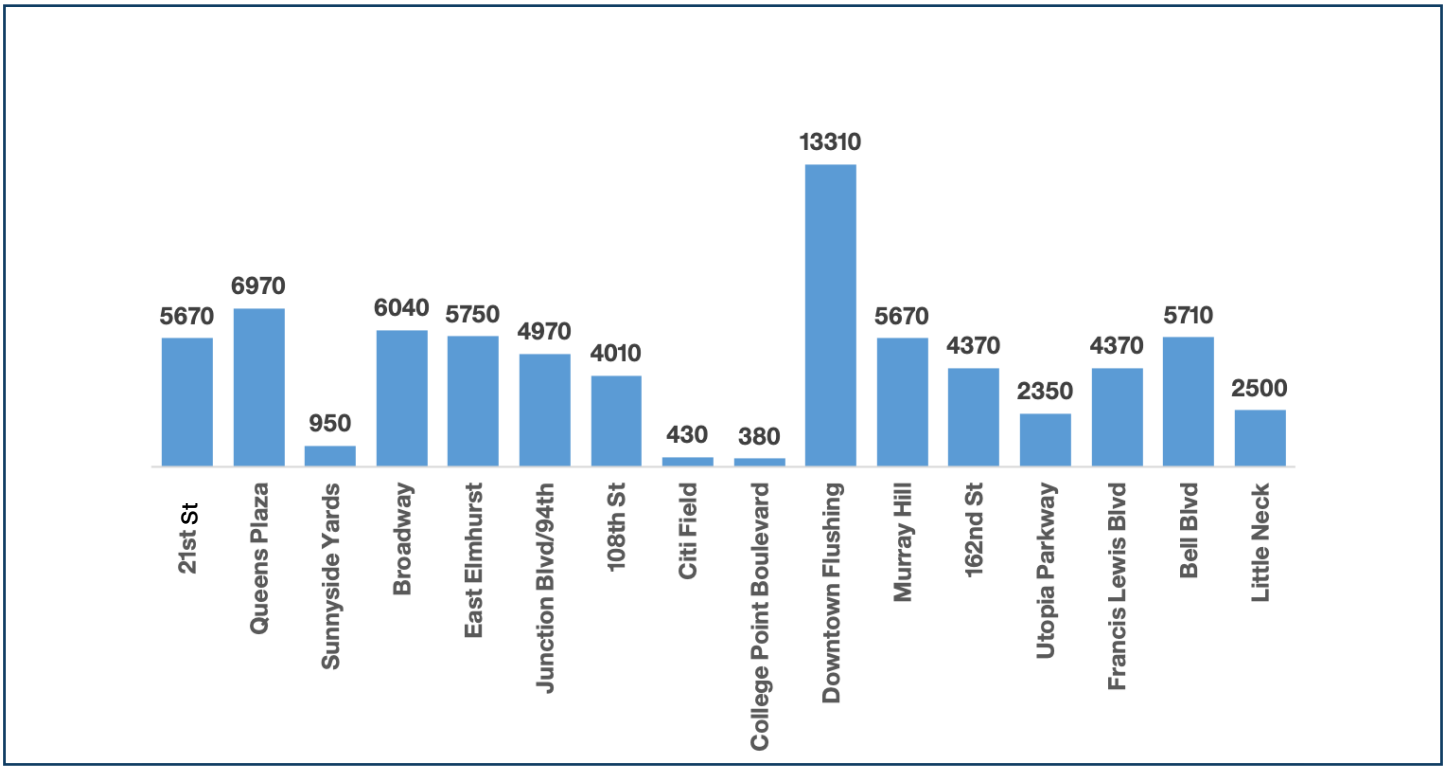


Figure 113


Nassau County
Little Neck Bay
Fort Totten
The Bronx
Bell Blvd
Springfield Bl
Francis Lewis Blvd
Utopia Pkwy
College Point Blvd
Main St
Flushing
Kissena Park
Rikers Island
LGA
Flushing Bay
Roosevelt Ave
Queens College
St. John's University
Astoria Blvd
108th St
Flushing Meadows - Corona Park
Junction Blvd
East Elmhurst
Broadway
Queens Blvd
21st St
Long Island City
E G M R N W 7 M R
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

69TH ST CORRIDOR PROFILE

Subway Connection	At 69th Street 7 Close to Metropolitan M Close to 65th Street M R
Average Weekday Ridership on Local/Limited/SBS (within Queens)	14,000
Corridor Length in miles (within Queens)	2.6
Average Ridership per miles (within Queens)	5,600
East-West or North-South?	North-South
Location	This 2-and-a-half-mile corridor stretches between Metropolitan Avenue in Middle Village and Broadway in Woodside.
Local/Limited/SBS	**Q67/Q18/Q47**
Ridership along this corridor	The busiest segment of this corridor is the central area in Maspeth, as other areas are interrupted by large rights-of-way or cemeteries.
Land use & density	The corridor has a decent mix of uses along it, but the density never rises to urban levels. Much of the southern half lacks buildings above two stories, though the northern end does have some taller buildings.
Road conditions	The corridor has one travel lane in each direction for most of its length, though it is relatively wide.

RIDER ACTIVITY IN AREA

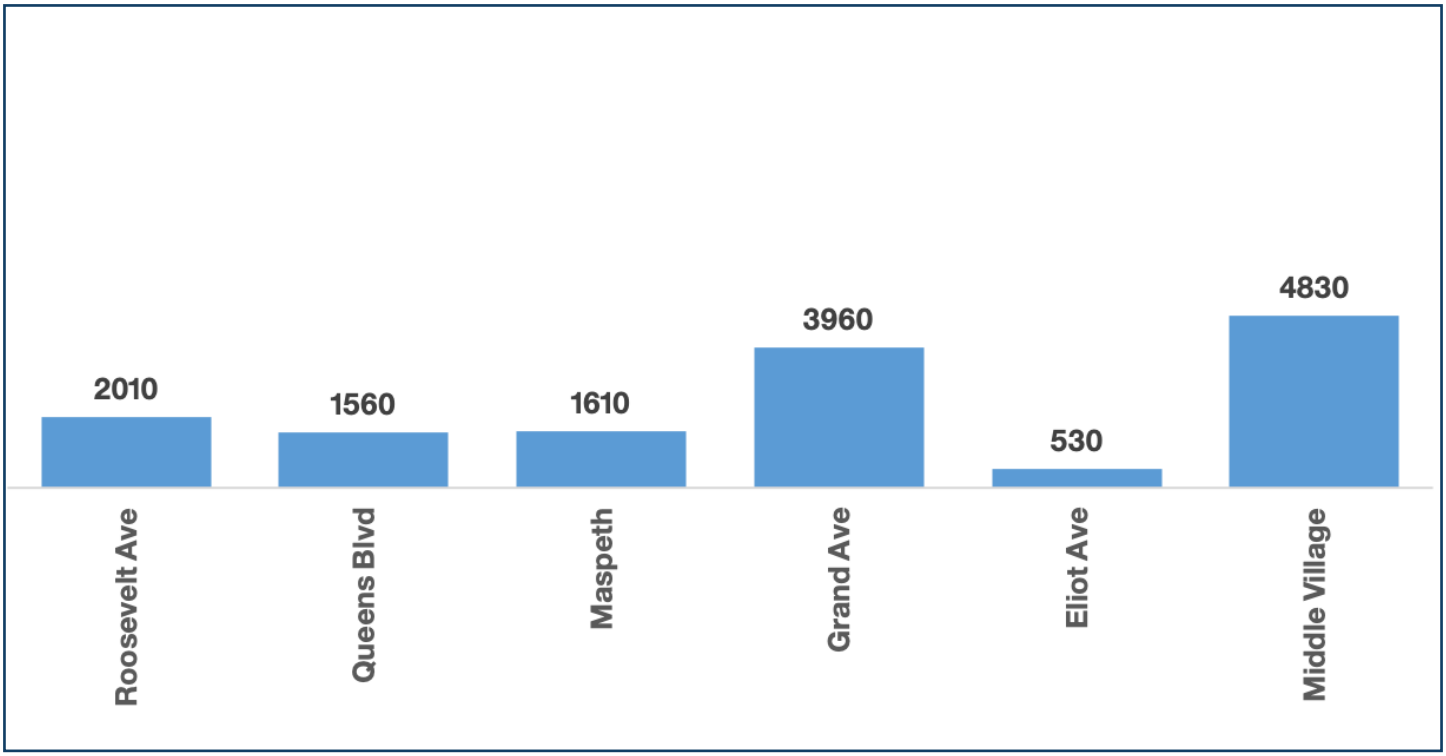


Figure 114


M
R
Broadway
Roosevelt Ave
7
Elmhurst
Queens Blvd
Maspeth
Grand Ave
Flushing Ave
Eliot Ave
Juniper Valley Park
Middle Village
All Faith's Cemetery
Metropolitan Ave
M
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

UNION TPKE CORRIDOR PROFILE

Subway Connection	At Kew Gardens–Union Turnpike E F
Average Weekday Ridership on Local/Limited/SBS (within Queens)	48,000
Corridor Length in miles (within Queens)	9.2
Average Ridership per miles (within Queens)	5,200
East-West or North-South?	East-West
Location	This 9-mile corridor stretches from Myrtle Avenue at Forest Park into Nassau County just east of Glen Oaks.
Local/Limited/SBS	**Q46**
Express	**QM1/QM5/QM6/QM7/QM8/QM31/QM35/QM36**
Ridership along this corridor	The segment of this corridor between Main Street and Utopia Parkway has significant ridership, and includes a feeder service to the subway at Queens Boulevard.
Land use & density	The portion of this corridor east of Grand Central Parkway has some density and important land uses such as St. John's University. The eastern portions consist mostly of housing interrupted by Cunningham Park, Alley Pond Park, and major highways. The westernmost segment of the corridor runs along Forest Park.
Road conditions	Various portions of the corridor are channelized to run under rail lines or major roads, limiting access to adjacent land uses.

RIDER ACTIVITY IN AREA

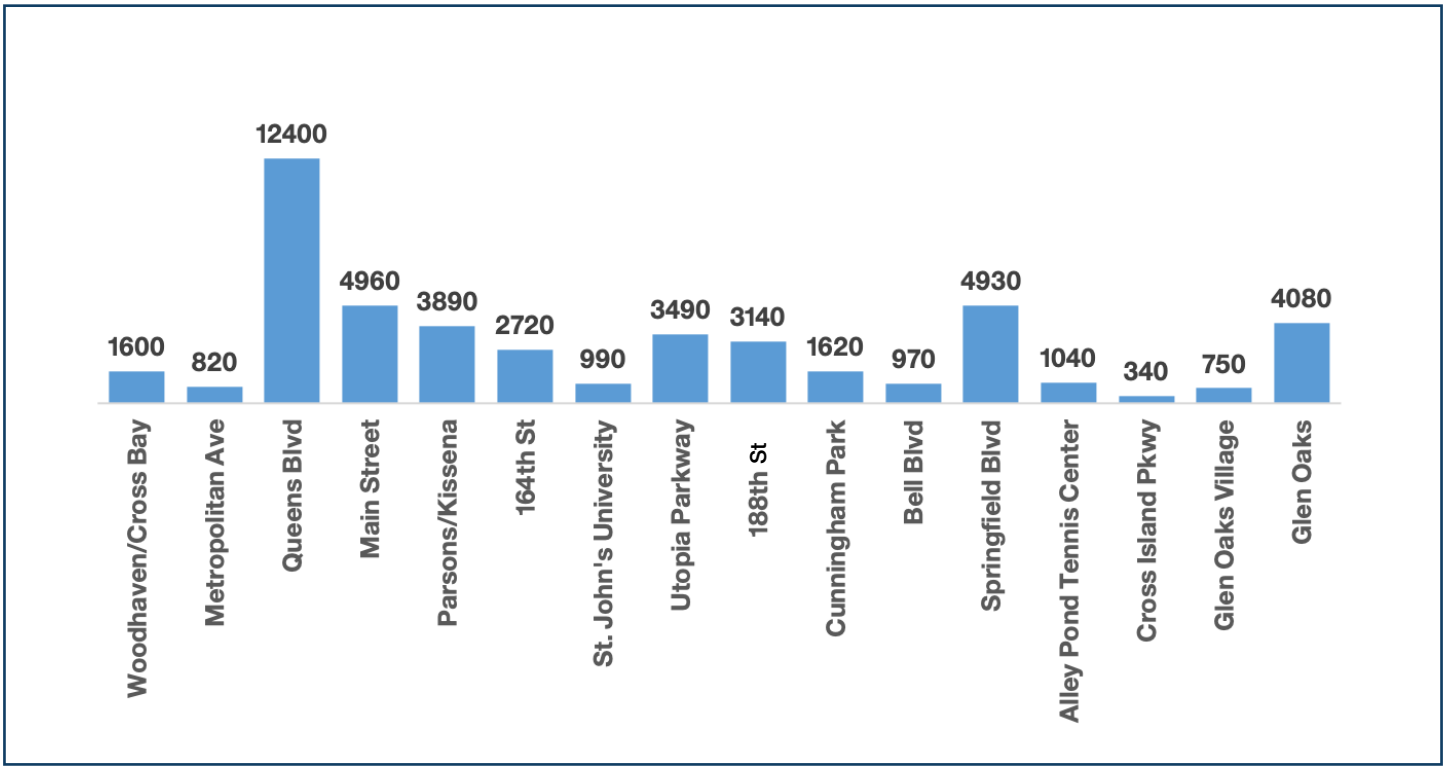
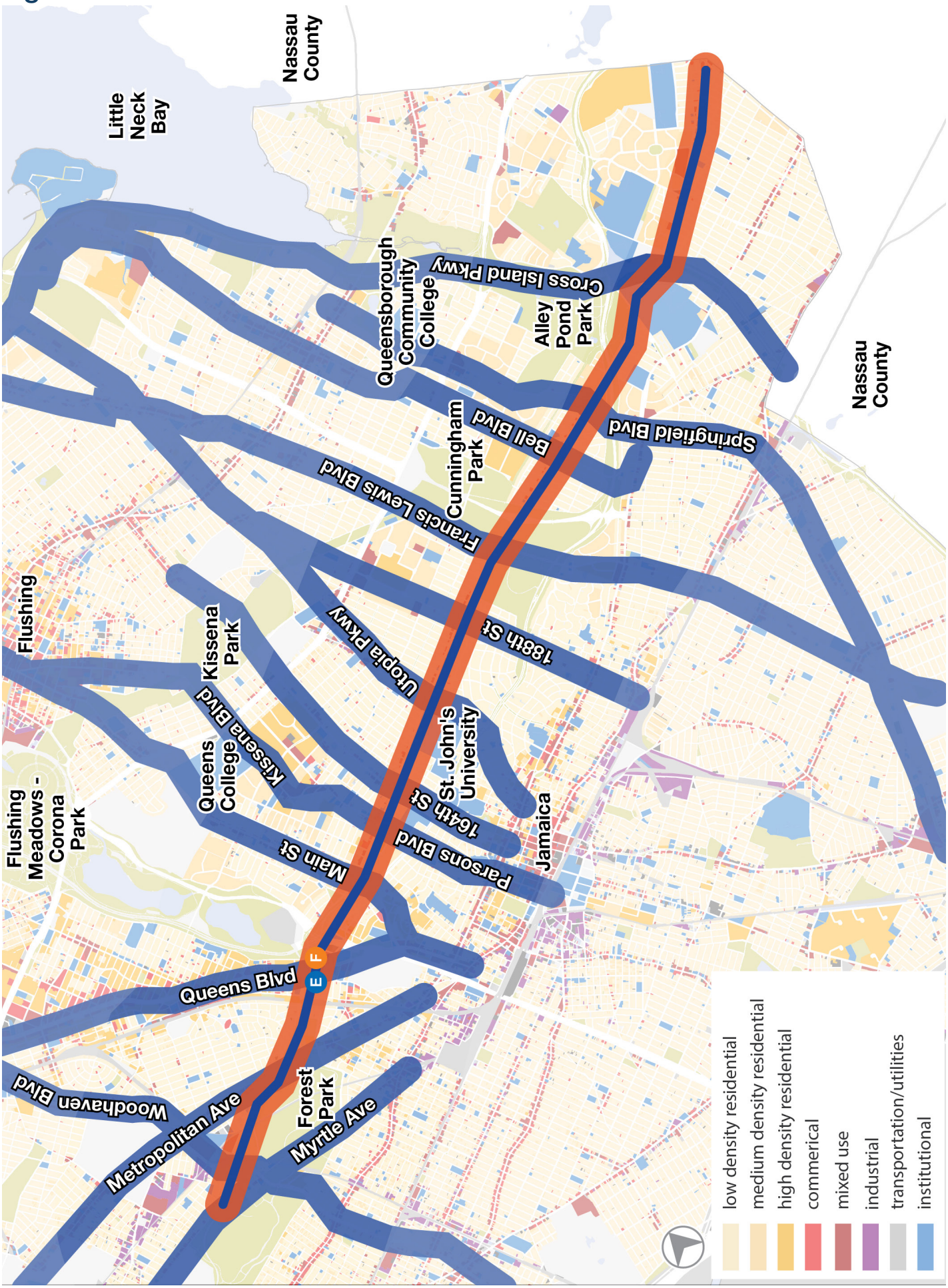


Figure 115


Nassau County
Little Neck Bay
Queensborough Community College
Cross Island Pkwy
Alley Pond Park
Nassau County
Springfield Blvd
Bell Blvd
Cunningham Park
Francis Lewis Blvd
188th St
Utopia Pkwy
Kissena Park
Flushing
Kissena Blvd
Queens College
St. John's University
164th St
Jamaica
Parsons Blvd
Main St
Flushing Meadows - Corona Park
Queens Blvd
E
F
Woodhaven Blvd
Metropolitan Ave
Forest Park
Myrtle Ave
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

FRANCIS LEWIS BLVD CORRIDOR PROFILE

Subway Connection	No subway nearby Close to Auburndale LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	38,000
Corridor Length in miles (within Queens)	7.7
Average Ridership per miles (within Queens)	4,900
East-West or North-South?	North-South
Location	This 8-mile corridor runs from the Cross Island Parkway to Springfield Boulevard, staying far east of Downtown Flushing and Downtown Jamaica.
Local/Limited/SBS	**Q76/Q77**
Ridership along this corridor	The corridor has some ridership in spots throughout, but the strongest segment is between Hillside Avenue and Springfield Boulevard.
Land use & density	North of Cunningham Park, the corridor never achieves much density, with few buildings rising above 2 stories. Hollingswood is by far the most dense area along the corridor. South of Hillside, it is more dense than the northern portion, but still wide and somewhat auto-oriented.
Road conditions	The corridor is wide throughout.

RIDER ACTIVITY IN AREA

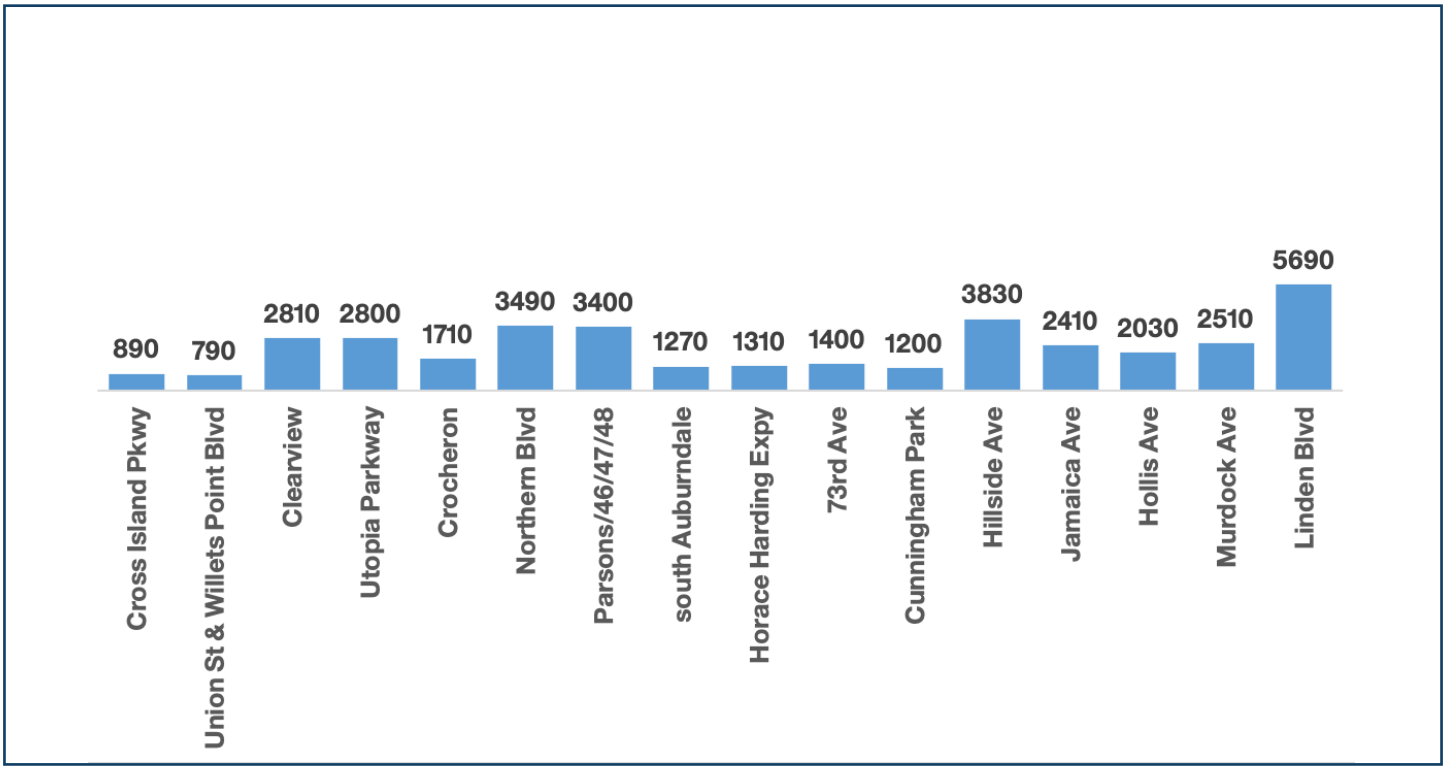
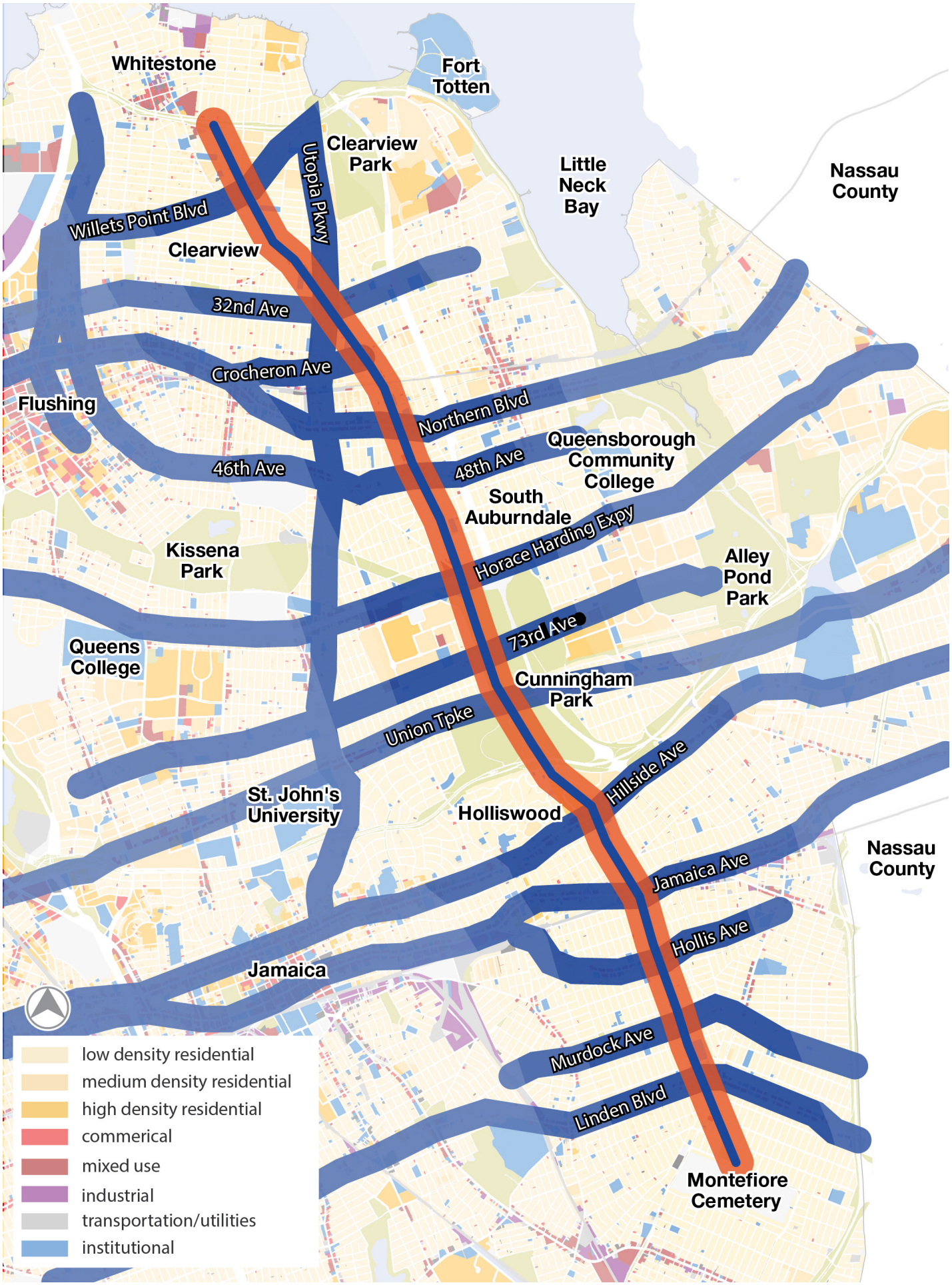


Figure 116


Whitestone
Fort Totten
Clearview Park
Little Neck Bay
Nassau County
Utopia Pkwy
Willets Point Blvd
Clearview
32nd Ave
Crocheron Ave
Flushing
Northern Blvd
46th Ave
48th Ave
Queensborough Community College
South Auburndale
Horace Harding Expy
Kissena Park
Alley Pond Park
73rd Ave
Queens College
Cunningham Park
Union Tpke
Hillside Ave
St. John's University
Holliswood
Nassau County
Jamaica Ave
Hollis Ave
Jamaica
Murdock Ave
Linden Blvd
Montefiore Cemetery
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

WOODHAVEN BLVD/CROSS BAY BLVD CORRIDOR PROFILE

Subway Connection	At Woodhaven Boulevard J At Woodhaven Boulevard M R Close to Broad Channel A
Average Weekday Ridership on Local/Limited/SBS (within Queens)	51,000
Corridor Length in miles (within Queens)	10.7
Average Ridership per miles (within Queens)	4,800
East-West or North-South?	North-South
Location	This corridor is almost 11 miles long, from the Queens Center Mall in Elmhurst to The Rockaways. North of Liberty Avenue and Rockaway Boulevard, it is Woodhaven Boulevard; to the south it is Cross Bay Boulevard.
Local/Limited/SBS	**Q52-SBS/Q53-SBS/Q11/Q21/Q41**
Express	**BM5/QM15/QM16/QM17**
Ridership along this corridor	Ridership along this corridor is spread throughout, focused around the subway stations and major intersections.
Land use & density	This corridor suffers from large portions of uninhabited land along it, including St. John's Cemetery, Forest Park, and Jamaica Bay. Land uses along the corridor change dramatically, from tall buildings and corner stores near the subways, to short buildings and single-family houses in the Cross Bay segment.
Road conditions	The corridor contains bus lanes installed during the deployment of Select Bus Service on the corridor. The SBS routes use the center lanes while locals switch back and forth between the center lanes and service lanes, depending on the street connectivity.

RIDER ACTIVITY IN AREA

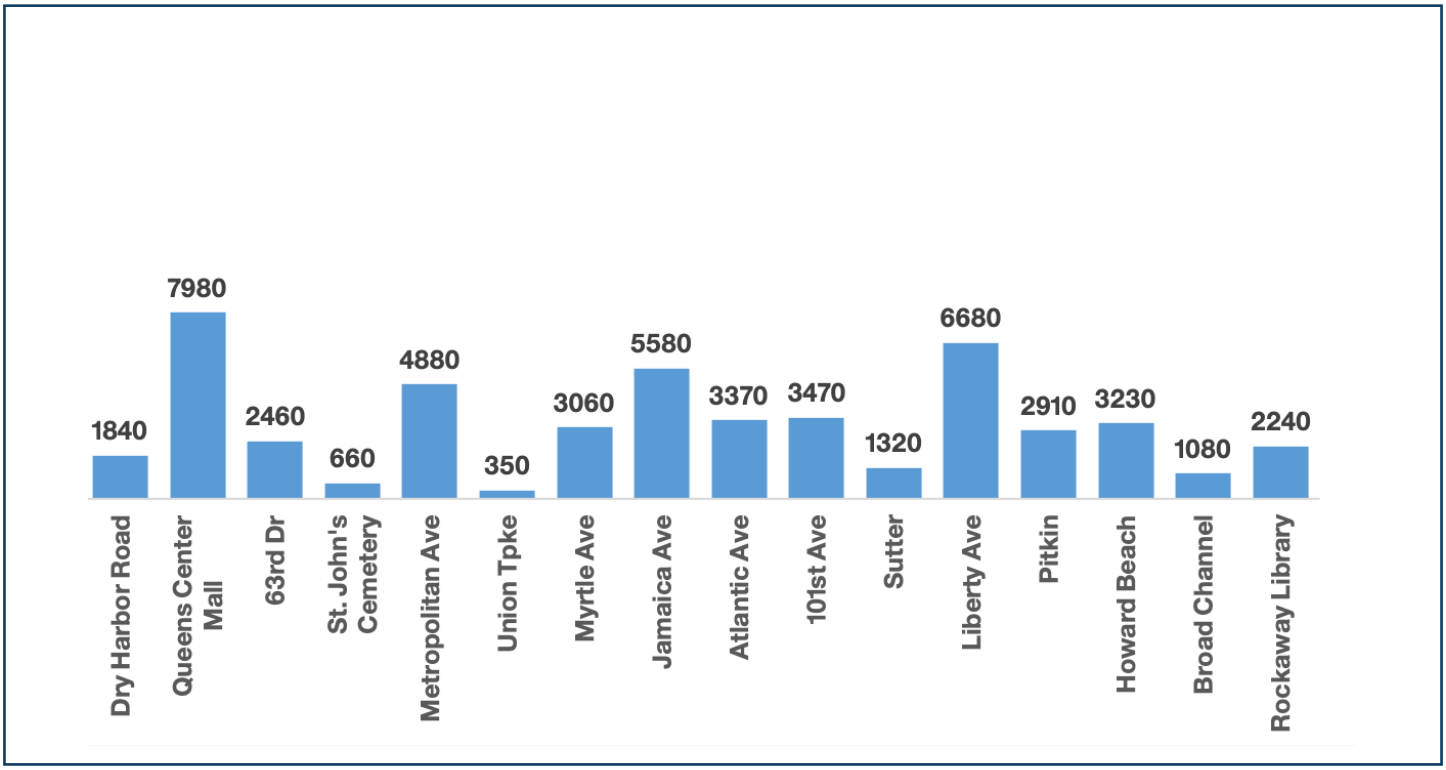
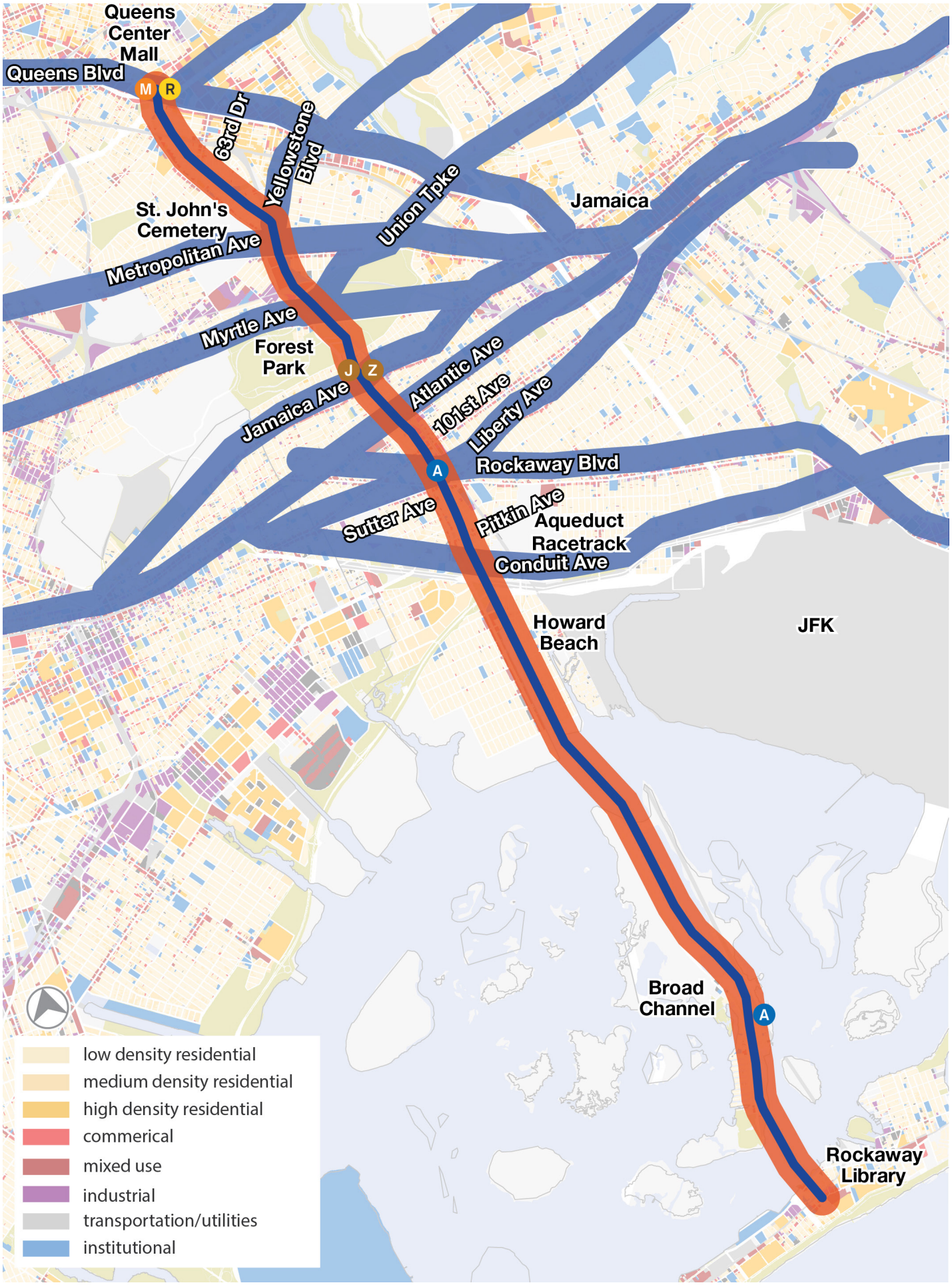


Figure 117


Queens Center Mall
Queens Blvd
M
R
63rd Dr
Yellowstone Blvd
Union Tpke
Jamaica
St. John's Cemetery
Metropolitan Ave
Myrtle Ave
Forest Park
J
Z
Jamaica Ave
Atlantic Ave
101st Ave
Liberty Ave
Rockaway Blvd
A
Sutter Ave
Pitkin Ave
Aqueduct Racetrack
Conduit Ave
Howard Beach
JFK
Broad Channel
A
Rockaway Library
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

32ND AVE CORRIDOR PROFILE

Subway Connection	No direct subway access - passes just north of Flushing
Average Weekday Ridership on Local/Limited/SBS (within Queens)	13,000
Corridor Length in miles (within Queens)	3.4
Average Ridership per miles (within Queens)	3,900
East-West or North-South?	East-West
Location	This 3-mile corridor stretches between College Point Boulevard and Bell Boulevard.
Local/Limited/SBS	**Q28/Q31**
Ridership along this corridor	There are a few busy areas along the corridor, but mainly at important cross-streets.
Land use & density	Density is relatively low throughout, with some minor areas of higher density. There are no real centers of urban-level density.
Road conditions	There is one travel lane in each direction throughout, and some portions that are somewhat narrow.

RIDER ACTIVITY IN AREA

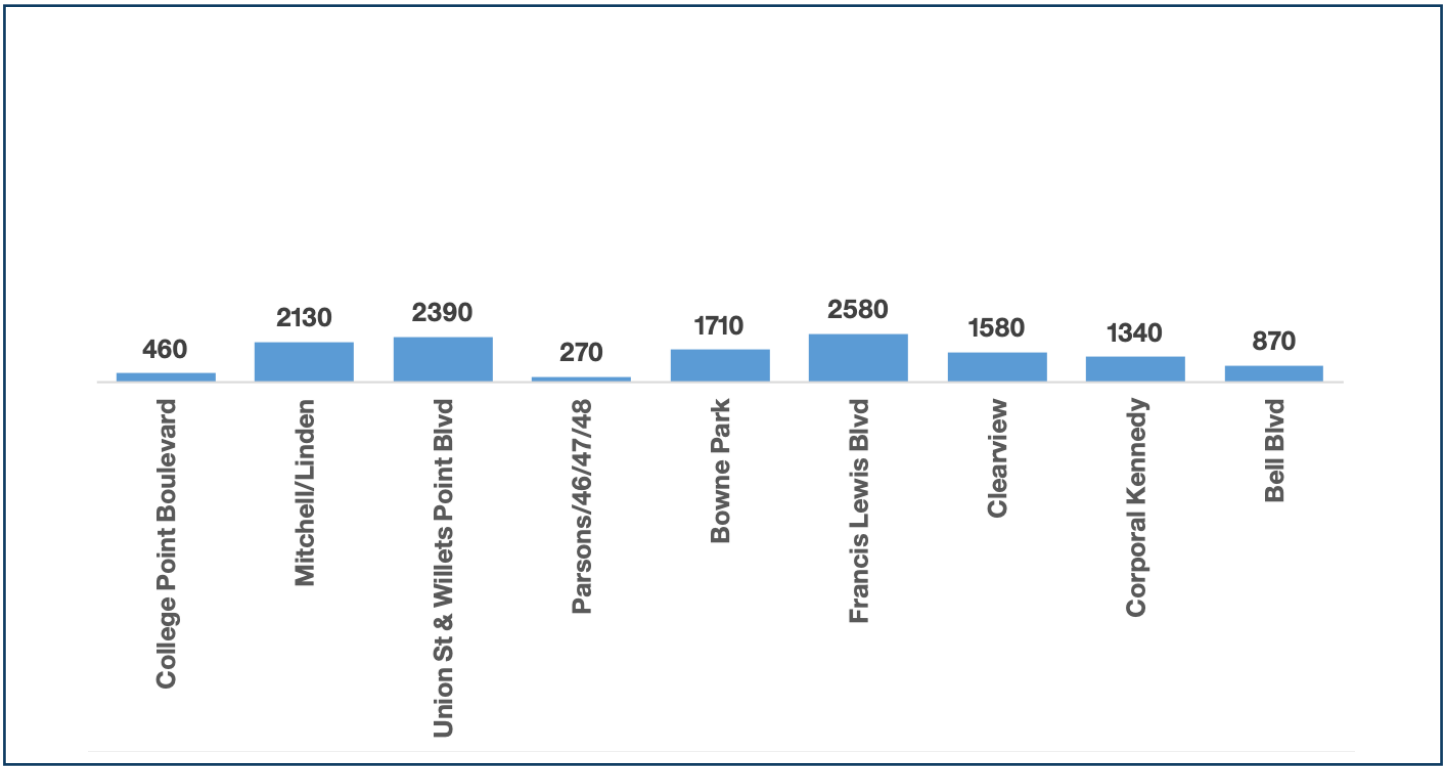
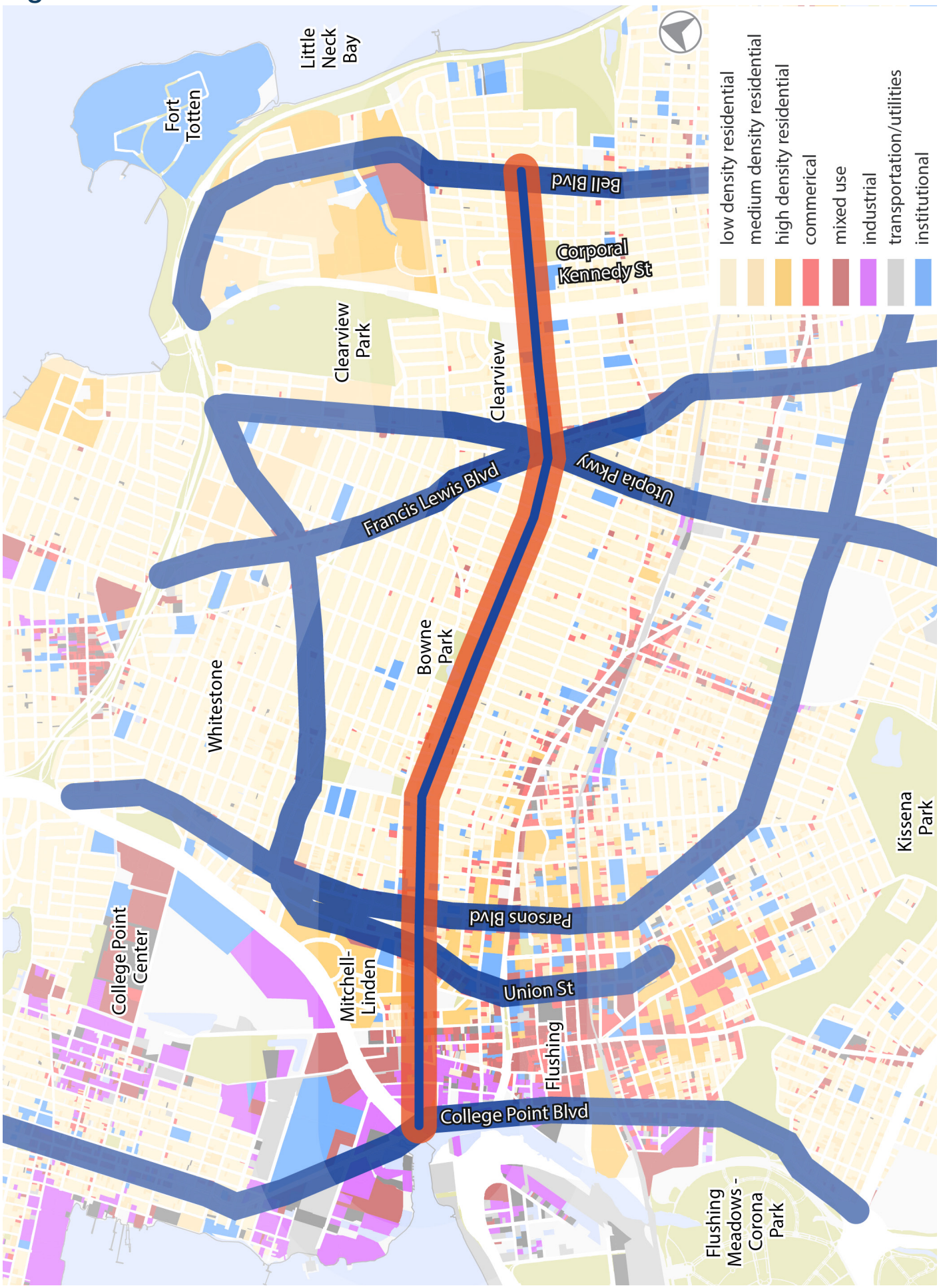


Figure 118


Little Neck Bay
Fort Totten
Bell Blvd
Corporal Kennedy St
Clearview Park
Clearview
Francis Lewis Blvd
Utopia Pkwy
Whitestone
Bowne Park
Kissena Park
Parsons Blvd
College Point Center
Mitchell-Linden
Union St
Flushing
College Point Blvd
Flushing Meadows - Corona Park
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

BELL BLVD CORRIDOR PROFILE

Subway Connection	No subway nearby At Bayside LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	20,000
Corridor Length in miles (within Queens)	5.3
Average Ridership per miles (within Queens)	3,800
East-West or North-South?	North-South
Location	This 5-mile corridor stretches from the Throgs Neck Bridge to Hillside Avenue and Braddock Road.
Local/Limited/SBS	**Q13/Q21**
Ridership along this corridor	The busiest portion of the corridor is near the Bayside LIRR station, between Northern Boulevard and 32nd Avenue. A second node of ridership occurs at the Bay Terrace Shopping Center.
Land use & density	Bay Terrace and Oakland Gardens have large apartment developments, and the Bay Terrace Shopping Center has a high level of activity.
Road conditions	Except for two lanes in each direction in Oakland Gardens, the corridor only has one lane in each direction.

RIDER ACTIVITY IN AREA

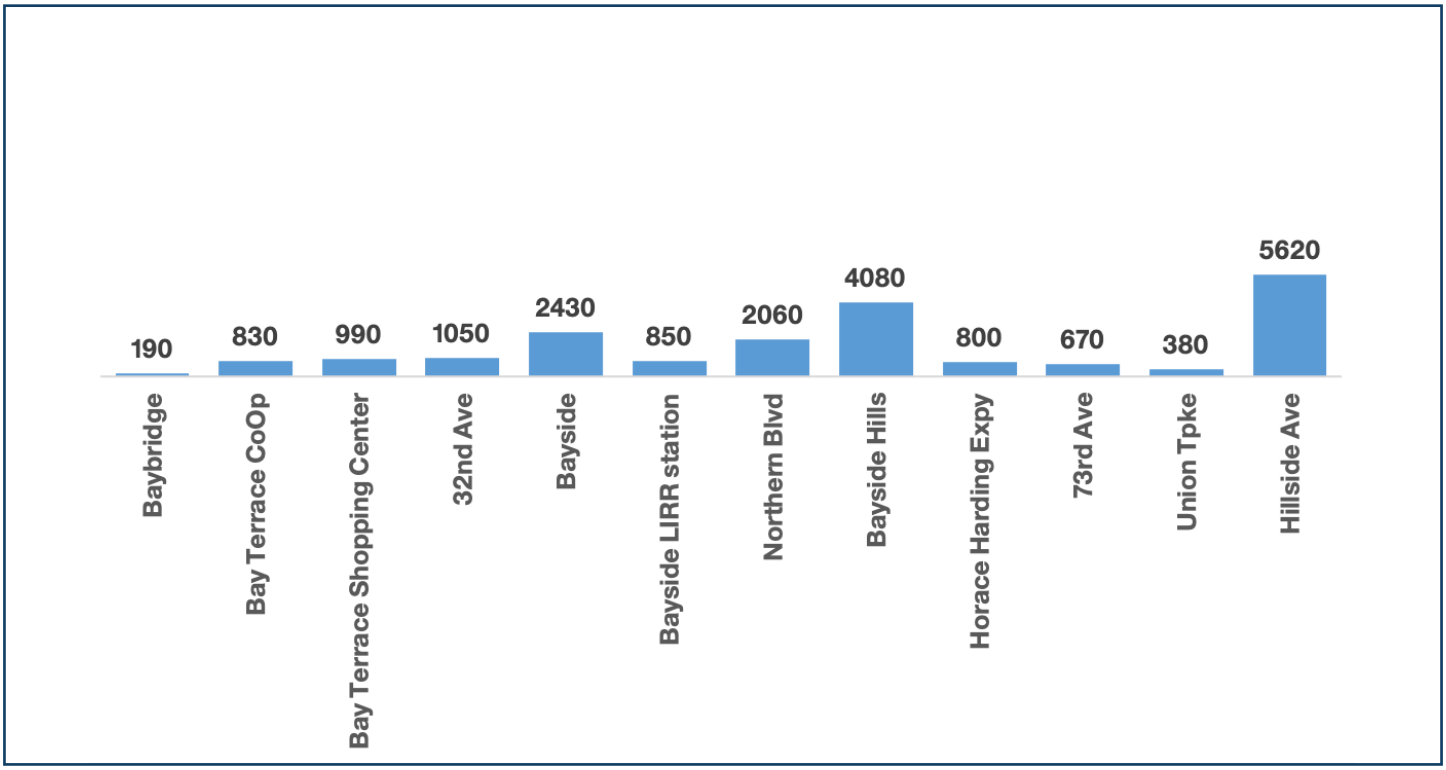


Figure 119


Fort Totten
Nassau County
Baybridge
Bay Terrace Co-Op
Bay Terrace Shopping Center
Little Neck Bay
32nd Ave
Bayside
Bayside LIRR Station
Northern Blvd
Queensborough Community College
48th Ave
Kissena Park
Horace Harding Expy
Oakland Gardens
Alley Pond Park
Cunningham Park
73rd Ave
Union Tpke
Hillside Ave
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

LINDEN BLVD CORRIDOR PROFILE

Subway Connection	No direct subway access - ends short of Rockaway Boulevard (A) At St. Albans LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	21,000
Corridor Length in miles (within Queens)	5.5
Average Ridership per miles (within Queens)	3,800
East-West or North-South?	East-West
Location	This 5-and-a-half-mile corridor is discontinuous with the Linden Boulevard that traverses portions of Brooklyn across the border into Queens, as well as a portion that exists between Woodhaven Boulevard and the Aqueduct. This portion stretches from Rockaway Boulevard at the Aqueduct to the Nassau County border and the Southern State Parkway.
Local/Limited/SBS	**Q4**
Express	**QM21/X63/X64**
Ridership along this corridor	The eastern portion of the corridor is busy. The western portion had insufficient ridership, which led to the discontinuation of the Q89 as part of the 2010 service reductions.
Land use & density	There are some low-to-moderate patches of density between Merrick Boulevard and the Cross Island Parkway, but mostly low density on the western portion. The St. Albans VA Hospital is a major destination along this stretch.
Road conditions	The corridor has one travel lane in each direction for most of its length.

RIDER ACTIVITY IN AREA

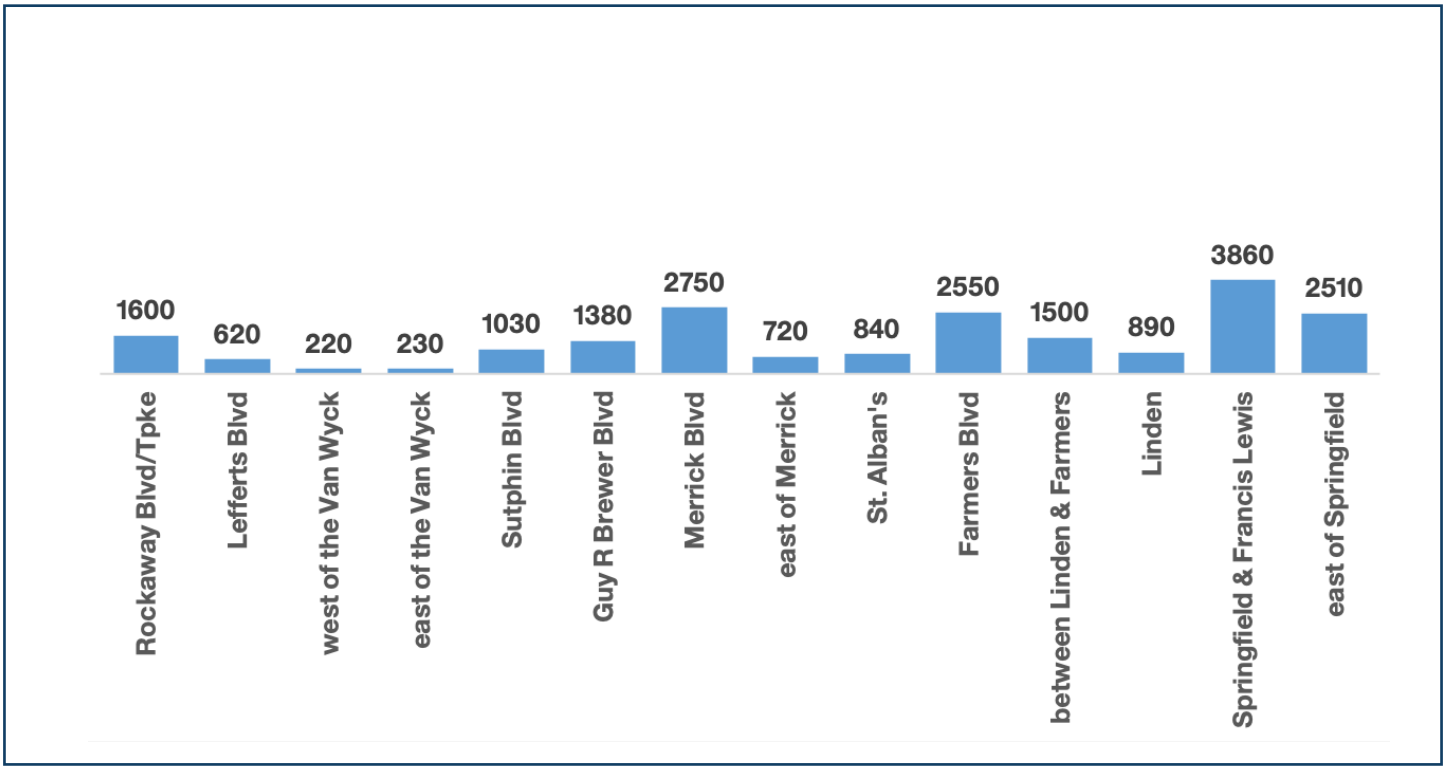


Figure 120


Cross Island Pkwy
Springfield Blvd
Francis Lewis Blvd
Nassau County
Montefiore Cemetery
Farmers Blvd
St. Albans
Merrick Blvd
Rochdale Village
Guy R Brewer Blvd
Baisley Pond Park
York College
Jamaica
Sutphin Blvd
JFK
Rockaway Blvd
Lefferts Blvd
Aqueduct Racetrack
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

ROCKAWAY BLVD/TPKE CORRIDOR PROFILE

Subway Connection	At Rockaway Boulevard (A)
Average Weekday Ridership on Local/Limited/SBS (within Queens)	32,000
Corridor Length in miles (within Queens)	9.4
Average Ridership per miles (within Queens)	3,400
East-West or North-South?	East-Eest
Location	This 9+ mile corridor begins at Elderts Lane at the Brooklyn-Queens border, passing through Ozone and South Ozone Parks, before serving as the northern border of JFK Airport to Brookville Boulevard. Rockaway Boulevard continues east, crossing into Nassau County, becoming Rockaway Turnpike in the Five Towns area. The roadway terminates in Lawrence where it becomes Meadow Lane.
Local/Limited/SBS	**Q6/Q7/Q113/Q114**
Ridership along this corridor	This corridor has moderate ridership east of Woodhaven Boulevard, despite the middling densities nearby.
Land use & density	This corridor suffers has a shifting amount of development along it, never quite achieving full urban density. East of Springfield Boulevard, JFK Airport and the wetlands of Idelwild Park create a large swath of uninhabited land before entering Five Towns with its commercial and retail destinations.
Road conditions	Much of the corridor west of Woodhaven Boulevard has only one travel lane. The corridor widens out east of Woodhaven Boulevard.

RIDER ACTIVITY IN AREA

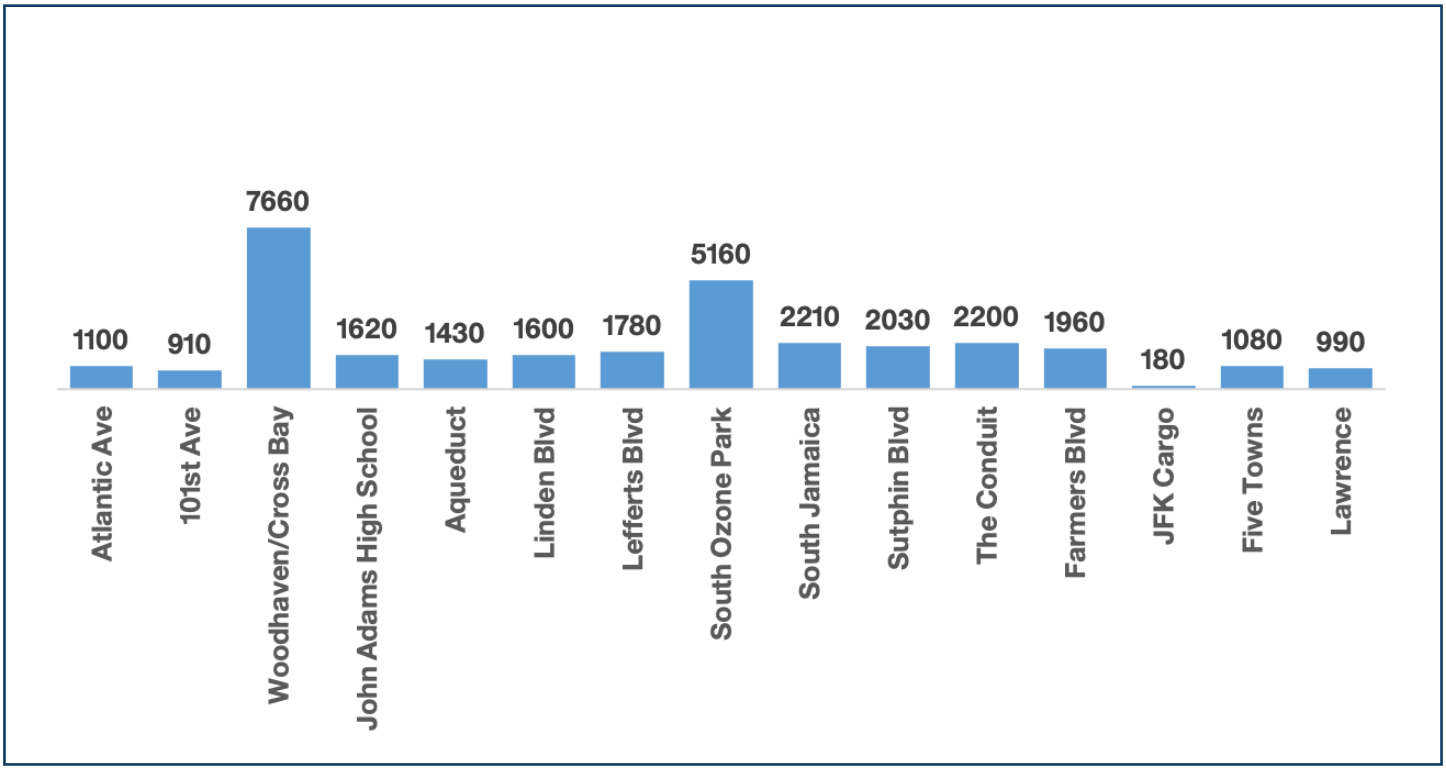
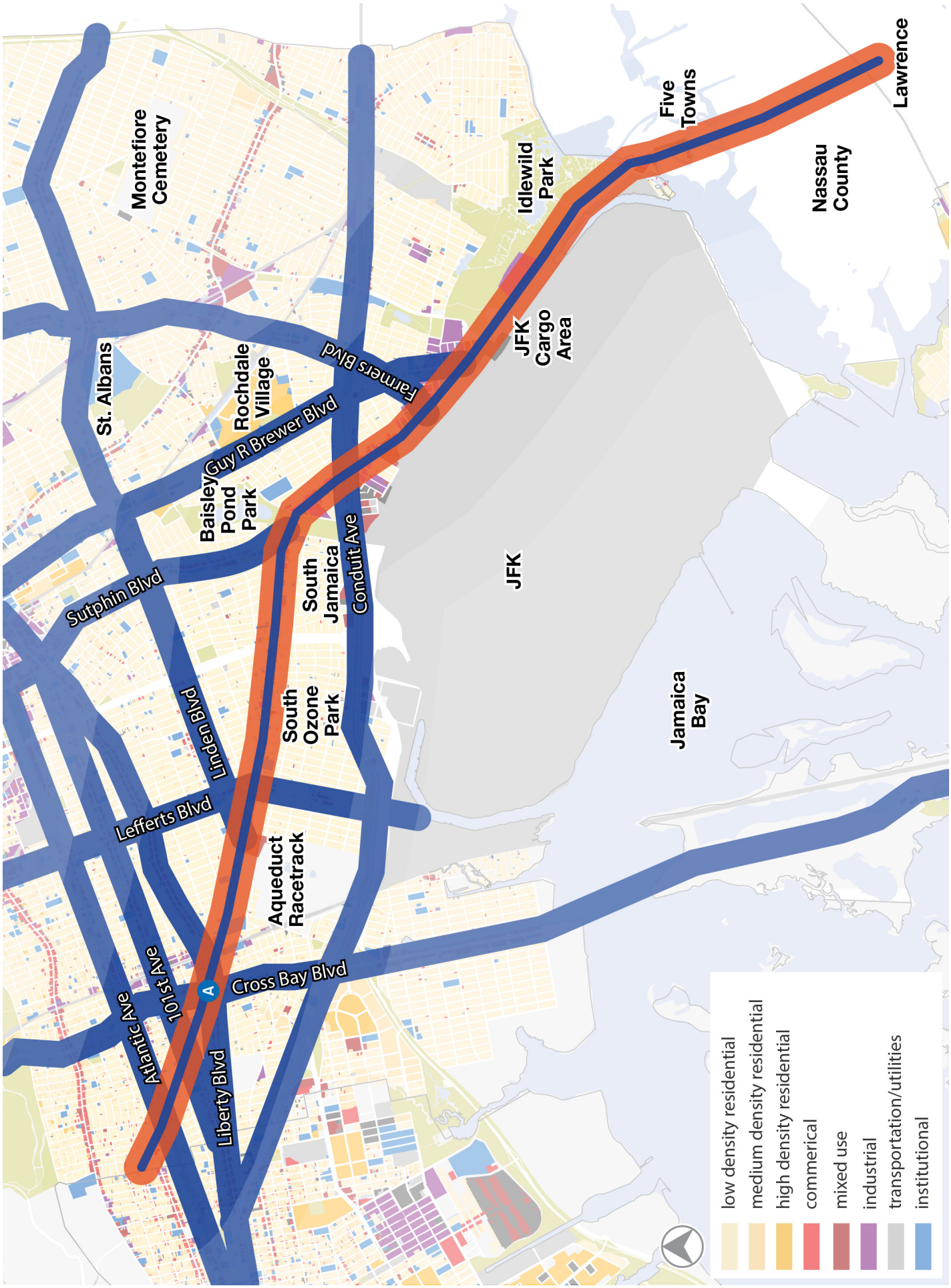


Figure 121


Montefiore Cemetery
St. Albans
Rochdale Village
Farmers Blvd
Guy R Brewer Blvd
Baisley Pond Park
Sutphin Blvd
South Jamaica
Conduit Ave
Linden Blvd
South Ozone Park
Lefferts Blvd
Aqueduct Racetrack
Atlantic Ave
101st Ave
Liberty Blvd
A
Cross Bay Blvd
JFK
JFK Cargo Area
Idlewild Park
Jamaica Bay
Five Towns
Nassau County
Lawrence
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

COLLEGE POINT BLVD CORRIDOR PROFILE

Subway Connection	Close to Flushing–Main Street 7 Close to Flushing Main Street LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	12,000
Corridor Length in miles (within Queens)	3.7
Average Ridership per miles (within Queens)	3,100
East-West or North-South?	North-South
Location	This 4-mile corridor stretches between 5th Avenue at the north end of College Point to the interchange of the Long Island Expressway and Van Wyck Expressway, traveling along the western border of Downtown Flushing.
Local/Limited/SBS	**Q65/Q58**
Ridership along this corridor	There are a few busy areas throughout, separated by large swaths of low-density uses with low ridership potential.
Land use & density	The commercial strip in College Point between 15th Avenue and 20th Avenue has a diversity of uses and is a solid neighborhood center. The rest of the corridor is a mix of large-lot uses, industrial uses, parkland, and some houses in between. The Police Academy in College Point recently expanded.
Road conditions	Most of the corridor south of 26th Avenue has two travel lanes in each direction. The northern portion has one travel lane in each direction, and can be quite tight at certain locations.

RIDER ACTIVITY IN AREA

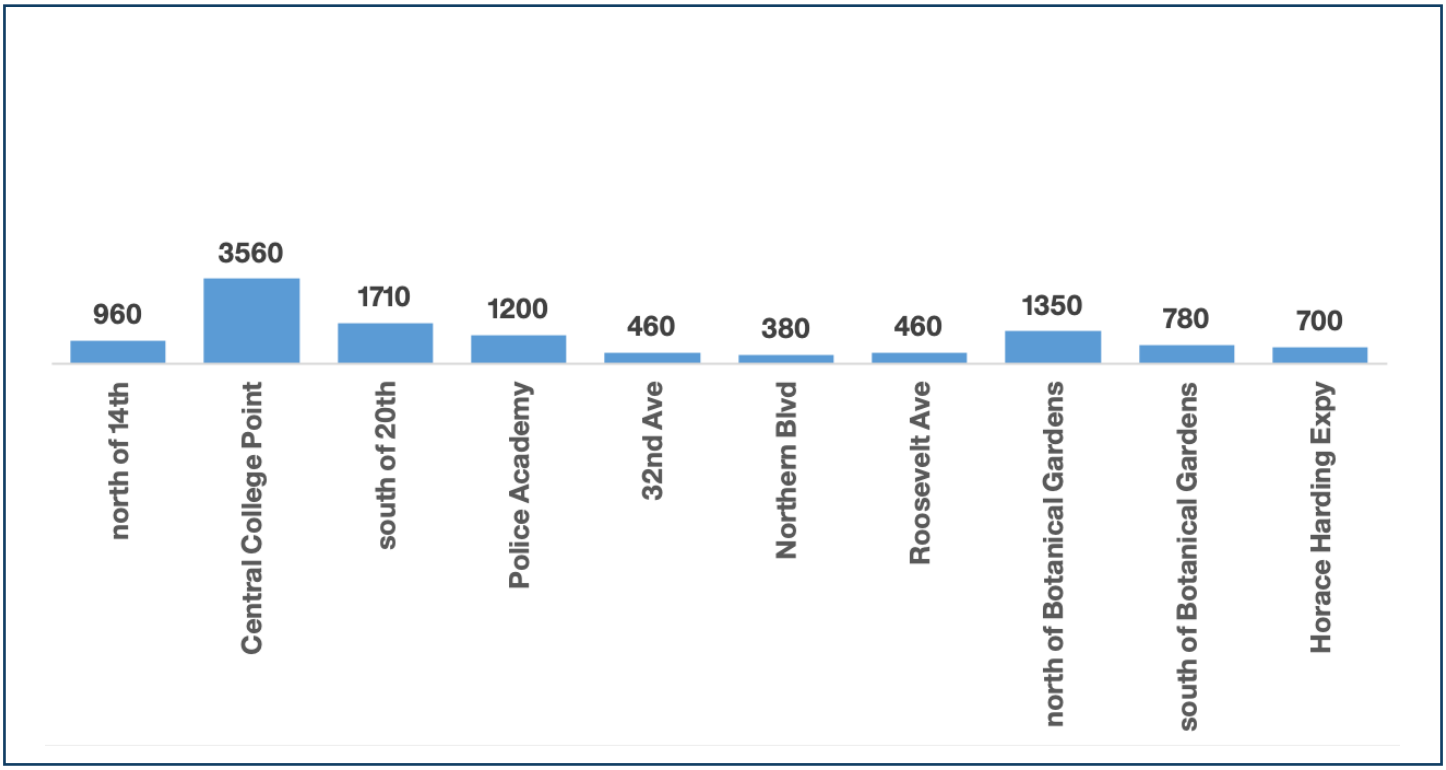
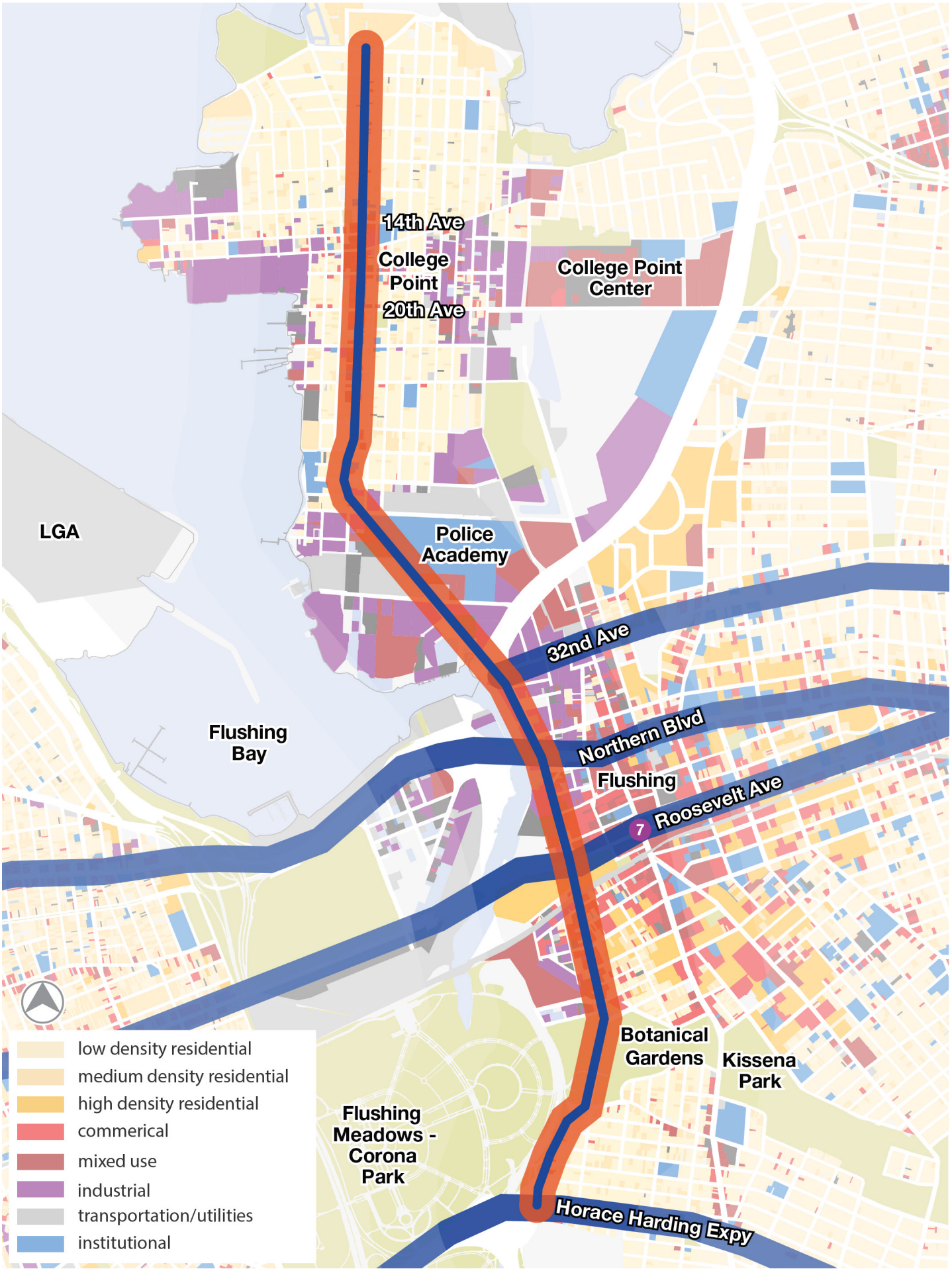


Figure 122


14th Ave
College Point
20th Ave
College Point Center
LGA
Police Academy
32nd Ave
Flushing Bay
Northern Blvd
Flushing
7
Roosevelt Ave
Botanical Gardens
Kissena Park
Flushing Meadows - Corona Park
Horace Harding Expy
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

73RD AVE CORRIDOR PROFILE

Subway Connection	No subway nearby
Average Weekday Ridership on Local/Limited/SBS (within Queens)	12,000
Corridor Length in miles (within Queens)	4.3
Average Ridership per miles (within Queens)	2,800
East-West or North-South?	East-West
Location	This 4-mile corridor stretches from Main Street through Fresh Meadows, ending in Oakland Gardens at 230th Street and Alley Pond Park.
Local/Limited/SBS	**Q88**
Express	**QM5/QM8/QM35**
Ridership along this corridor	The corridor serves as the southern border of the Fresh Meadows Apartments. Otherwise there are low-to-medium levels of activity throughout, never rising to any real density to build ridership.
Land use & density	Apartments are spread throughout the corridor, along with some parks and lower-density single-family houses.
Road conditions	The corridor has one travel lane in each direction throughout, but is relatively wide, sharing bike lanes along its length.

RIDER ACTIVITY IN AREA

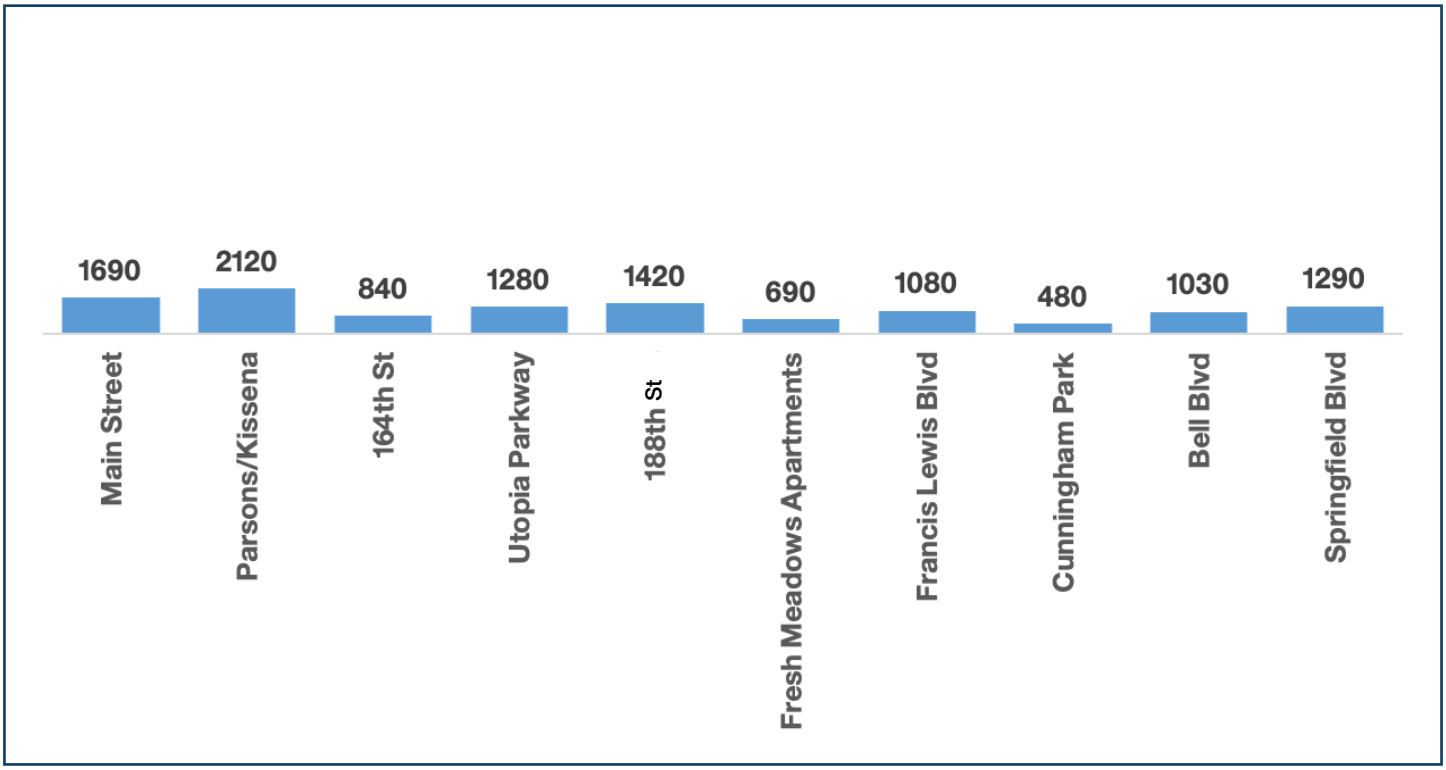
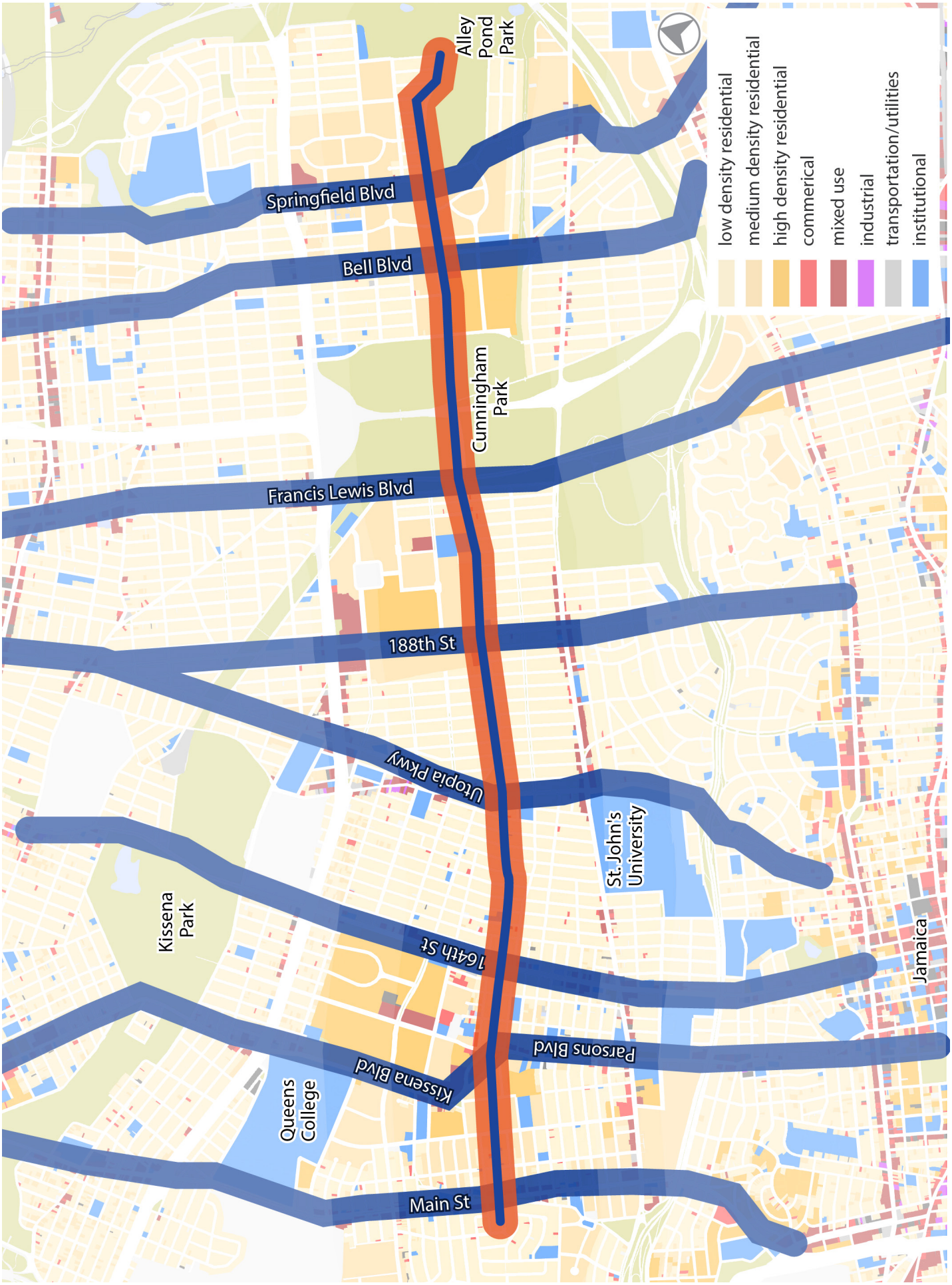


Figure 123


Alley Pond Park
Springfield Blvd
Bell Blvd
Cunningham Park
Francis Lewis Blvd
188th St
Utopia Pkwy
St. John's University
Kissena Park
76th St
Jamaica
Parsons Blvd
Kissena Blvd
Queens College
Main St
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional

CONDUIT BLVD/N & S CONDUIT AVENUE CORRIDOR PROFILE

Subway Connection	At Grant Avenue (A) (just inside the Brooklyn border) At Rosedale LIRR station Close to Laurelton LIRR station
Average Weekday Ridership on Local/Limited/SBS (within Queens)	9,000
Corridor Length in miles (within Queens)	7.1
Average Ridership per miles (within Queens)	1,300
East-West or North-South?	East-West
Location	This 8-mile corridor begins in Brooklyn at Atlantic Avenue. The roadway is Conduit Boulevard until Sutter Avenue. When it crosses into Queens, it becomes North Conduit Avenue and South Conduit Avenue. East of Hook Creek Boulevard, South Conduit becomes eastbound Sunrise Highway entering Nassau County, and then into Suffolk County terminating at Montauk Point. North Conduit ends as a non-descript local street at Hook Creek Blvd.
Local/Limited/SBS	**B15/Q85**
Ridership along this corridor	Activities are spread thin throughout most of the corridor, especially because of the broad width of the roadway separating neighborhoods.
Land use & density	Many auto-oriented uses and other low-density uses exist at this border vacuum, the edge of low-density neighborhoods.
Road conditions	The corridor is mostly wide throughout, though it is subject to bottlenecks frequently, as well as traffic entering and exiting in large volumes. At the junction with the Belt Parkway, the roadway splits to serve as the north and south service roads of the parkway until it curves northward at Brookville Blvd. East of there, North and South Conduit Avenues are still seperated; this time by the Long Island RailRoad right-of-way and the westbound lanes of Sunrise Highway. Eastbound, South Conduit resembles a limited-access highway between Cross Bay and Lefferts Boulevards. The eastbound Nassau Expressway begins along this portion. Because this is the primary east-west corridor between Brooklyn and Queens across southern Queens, congestion is present throughout much of the day.

RIDER ACTIVITY IN AREA

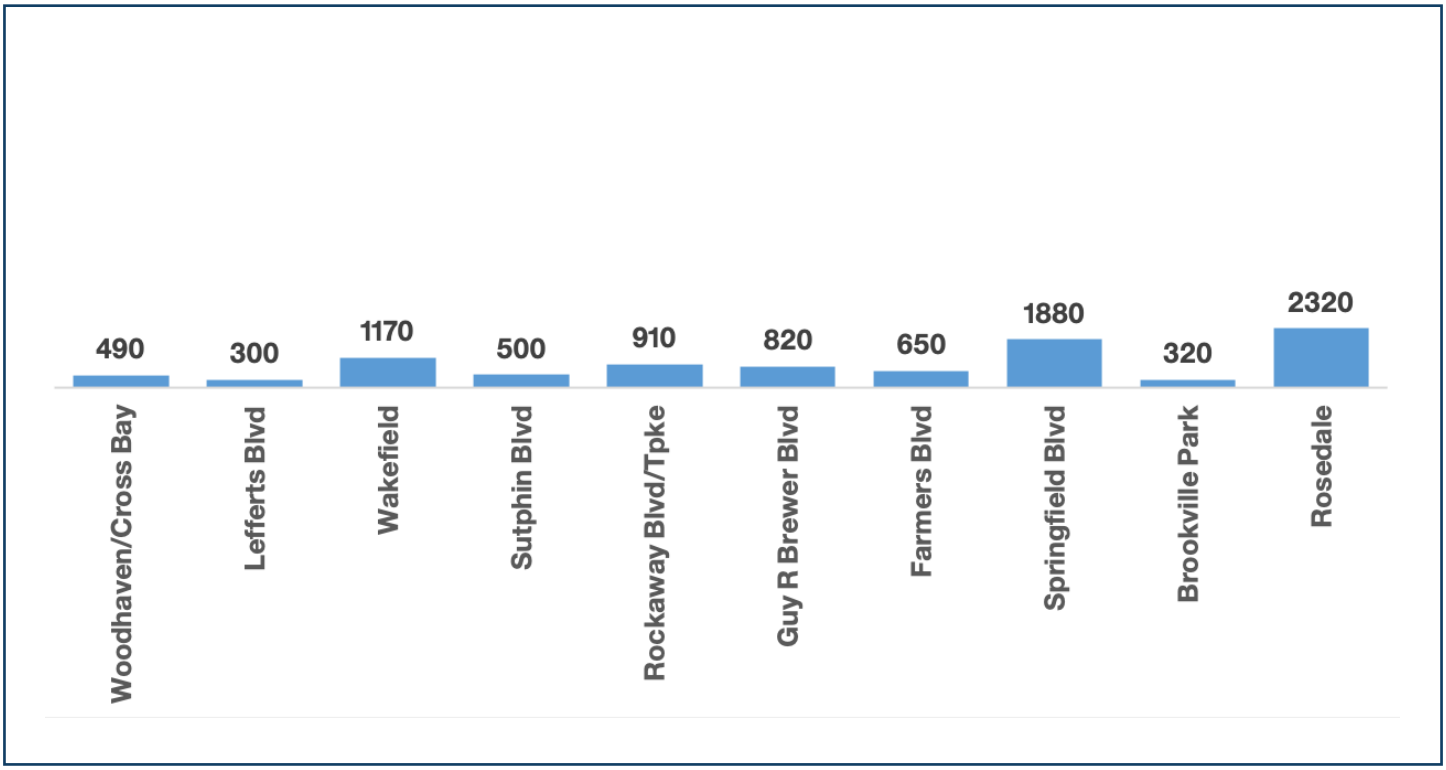


Figure 124


Montefiore Cemetery
Springfield Blvd
Farmers Blvd
St. Albans
Rochdale Village
Guy R Brewer Blvd
Baisley Pond Park
Jamaica
Sutphin Blvd
150th St
Rockaway Blvd
Wakefield
Lefferts Blvd
Aqueduct Racetrack
Cross Bay Blvd
JFK
Jamaica Bay
Rosedale
Idlewild Park
Nassau County
low density residential
medium density residential
high density residential
commerical
mixed use
industrial
transportation/utilities
institutional