

**NEW YORK CITY DEPARTMENT OF TRANSPORTATION TESTIMONY FOR
HEARING BEFORE THE
CITY COUNCIL COMMITTEE ON TRANSPORTATION
November 12, 2015**

Good morning Chairman Rodriguez and members of the Transportation Committee. I am Polly Trottenberg, the Commissioner of the New York City Department of Transportation (DOT). I am joined by Assistant Commissioner for Intergovernmental and Community Affairs, Jeff Lynch, and Senior Director of Transit Development, Eric Beaton.

Thank you for inviting me to testify today on behalf of the de Blasio Administration on the important issue of providing better transportation options in New York's underserved areas—so called "transit deserts." We share this Committee's strong desire to ensure that New Yorkers at every income level in every neighborhood have access to safe, efficient and affordable transportation choices.

In April, Mayor de Blasio released OneNYC, which identified and analyzed a list of priority communities where transit access is comparatively poor and where residents had median incomes below the citywide average. A few examples of these neighborhoods include Hunts Point in the Bronx, Glendale in Queens, East Flatbush in Brooklyn, and Mariners Harbor on Staten Island. These are neighborhoods where low-income residents have long commutes and difficulty accessing a broad range of employment opportunities.

OneNYC laid out a range of strategies—from Select Bus Service expansion to potential subway extensions—to address transportation needs in these underserved neighborhoods. We are now aggressively implementing those strategies, working closely with local communities and in partnership with many of you on the Council.

We are continuing to expand Select Bus Service, which now includes eight routes throughout the five boroughs. With SBS, our goal is to extend the reach of the rapid transit network, not to duplicate existing rail lines. This was true with the first SBS route on Fordham Road and Pelham Parkway, connecting across the Bronx for 48,000 daily riders, and will be true with the City's

next SBS route connecting the Bronx to Flushing and Jamaica in Queens. This upcoming Bronx - Flushing - Jamaica SBS line will improve service for more than 42,000 daily riders by reducing their commute times and connecting them to the 2, 5, 6, 7, E, F, J and Z subway lines.

We are also working to implement SBS on the B46 route on Utica Avenue in the Flatlands neighborhood in Brooklyn. The B46 carries 49,000 daily riders on a north-south connection to employment hubs and the subway system. Currently, a resident of Flatlands can only access about 70,000 jobs in a 45 minute transit trip, compared to a neighborhood like Long Island City, where residents can access 2.3 million jobs within a comparable commuting time. SBS will make an enormous difference to people's livelihood and quality of life in the Flatlands neighborhood.

The de Blasio Administration is also providing a new, affordable way to travel between waterfront communities throughout New York City from the Rockaways to Soundview with citywide ferry service, set to launch in 2017. Led by EDC, the service will include five new ferry routes—in addition to the existing East River Ferry service—for a fare of \$2.75. When the citywide ferry service is fully operational in 2018, it will carry an estimated 4.6 million trips per year.

In addition to public transit, cycling is an inexpensive, efficient way to connect New Yorkers to their closest subway stop or other destinations. The City now boasts a bike network of over 1,000 miles that continues to grow, making cycling safer and more convenient throughout the City.

In Canarsie, we are extending the protected bike path from Canarsie Circle to Flatlands Avenue, which will safely connect residents to Canarsie Pier and the surrounding neighborhood. Our Citi Bike system is also filling in gaps in the transit network and will expand to even more neighborhoods next spring, including Harlem and Red Hook in Brooklyn.

The City has also made an unprecedented commitment of \$2.5 billion to the MTA's current five-year capital plan to ensure the continued safety and good repair of our subway and bus system, which now regularly carries over eight million riders daily. That capital plan also provides funding for key system expansions, including the second phase of the Second Avenue Subway,

bringing Metro North to Penn Station with four new Bronx stations coming to Hunts Point, Parkchester, Morris Park and Co-op City, and the environmental work for the Staten Island North Shore Bus Rapid Transit.

As part of its contribution, the City was also able to secure some of the transit priorities outlined in OneNYC. This includes over \$300 million for projects that support our affordable housing and economic development strategy, including the Livonia Avenue-Junius Street Station Connector in Brownsville and critical subway station access improvements throughout the City, as well as studies on extending the Eastern Parkway Line south along Utica Avenue and a bus facility in Flushing, Queens.

But it is clear that even as both the City and State have made unprecedented commitments to invest in the City's transportation network, our needs continue to grow. The City now boasts its largest population ever—8.5 million—and our subway ridership is setting new records each year, with over 1.75 billion riders in 2014. Our transportation system is bursting at the seams.

Meanwhile, due to resource constraints at all levels of government, especially at the Federal level, we have seen only modest efforts to expand the system in the last few decades. Before the Hudson Yards station was added to the 7 line this September, New York City had not seen a new subway station in 25 years. And the Hudson Yards project took 13 years to complete and cost \$2.4 billion.

Given this reality, the challenge we face at this moment is how do we best serve the transportation needs of our City as equitably and efficiently as possible, given today's fiscal realities?

In transit there is a spectrum of options that scale up rapidly in terms of cost and complexity, starting with regular bus service, and then on to Bus Rapid Transit, streetcars, light rail, and finally grade-separated subway or commuter rail. There is no one size fits all for any given corridor, instead we should choose the mode that makes the most sense for each community and

is technically and economically feasible. Any new mode also needs to fit in with and complement the rest of our transit system.

As such, DOT would like to suggest that the two bills that are the topic of today's hearing—Intro 965 relating to transit deserts and Intro 964 relating to the feasibility of light rail—be integrated with the upcoming BRT study, which the Council mandated earlier this year. Council Member Lander championed this bill and the resulting plan will consider areas of the City in need of additional rapid transit options, strategies for serving growing neighborhoods, and integration with current transit routes.

There is significant overlap in the BRT study and the two studies proposed today. Each study requires DOT to observe areas in the City poorly-served by public transit and to offer recommendations to improve transportation options. Therefore, we think a comprehensive, citywide study examining the best mode for each area of the City would be the most effective way to analyze the problem of transportation deserts. And we hope we can work with you, Mr. Chairman, and the Council to craft an integrated approach that works for us all.

Let me now turn to Resolution 670, Council Member Miller's proposal to expand the CityTicket program to allow New York City residents to pay lower fares to use the commuter railroads. This proposal could dramatically improve commute times and lower transportation costs for New Yorkers in underserved areas.

Many parts of the City with the longest commutes into Manhattan, like eastern Queens and the northern Bronx, have commuter railroads running through them. However, lower-income City residents often choose express bus or far-away subway service due to the very high ticket prices for the LIRR and Metro-North.

To give an example, a trip from Rosedale in Queens to midtown takes 83 minutes on an express bus, but takes only 32 minutes on the LIRR. Those LIRR trips are discouraged by a \$10 fare, compared to \$6.50 for an express bus, or \$2.75 for the local bus and subway.

To meet the needs of those residents, the de Blasio Administration strongly supports expanding CityTicket. But we do also recognize that the MTA has indicated that an expansion could entail significant revenue loss. As a result, the City and the MTA have agreed to explore in the coming months the possibility of expanding CityTicket to better serve New York residents while ensuring it is also fiscally and operationally feasible for the MTA. And we look forward to working with Council Member Miller and other stakeholders as well.

In conclusion, on behalf of the de Blasio Administration, I want to thank you, Mr. Chairman and Members of the Committee, for your leadership and steadfast commitment to our shared goal of ensuring all New Yorkers have access to safe, affordable and efficient transportation choices that connect them to jobs, education and opportunity. In doing so, together we will help create a more equitable City for all.

I am happy to take your questions.

FOR THE RECORD



Metropolitan Transportation Authority

State of New York

November 12, 2015

Honorable Ydanis Rodriguez
Chairman
NYC Council Committee on Transportation
250 Broadway
New York City, NY 10007

Dear Chairman Rodriguez:

Thank you for inviting me to submit testimony today on two important New York City Council resolutions that call on the MTA to evaluate or implement certain transportation improvements:

- **Res. No. 0903-2015 - Resolution calling upon the Metropolitan Transportation Authority to conduct a comprehensive study of unused and underutilized railroad rights of way in New York City for the purpose of evaluating the feasibility of increased passenger service along such corridors.**
- **Res. No. 670 - Resolution calling upon the MTA to allow riders travelling within New York City limits to pay a fare for commuter rail equal to that of a MetroCard ride on New York City Transit subways and buses; and allow for free transfers between commuter rail and New York City Transit subways and buses.**

Before this letter covers these topics, I'd like to start with some recent MTA-related developments that should give all New Yorkers cause for optimism.

First is the MTA Board's approval, in October, of a \$29 billion Capital Program, covering MTA capital projects from 2015 to 2019. New York State has committed to \$8.3 billion to fund the Program, and New York City has committed to \$2.5 billion. We at the MTA are extremely grateful to our State and City for providing this essential funding, which will allow us to renew, enhance, and expand our indispensable transit network.

Yet more good news can be found in our record ridership numbers. In 1994, we carried 3.5 million customers a day. We struggled to set ridership growth targets as we set out to rebuild North America's largest transit system. Just look at how far we have come two decades later, thanks to recurring capital programs. Today, we are carrying more customers on the subway system than since right after World War II, when people were still working six days a week in an industrial economy.

The agencies of the MTA

MTA New York City Transit
MTA Long Island Rail Road

MTA Metro-North Railroad
MTA Bridges and Tunnels

MTA Capital Construction
MTA Bus Company

Some recent ridership milestones include:

- Carrying more than 6 million customers on 29 separate days in 2014.
- From 1999 to 2006, adding as many daily customers as the entire Chicago subway system, third largest in the nation.
- On top of that, since 2006, adding as many daily customers as the entire Washington Metro system, second largest in the nation.
- We have done this without adding the equivalent of Chicago's and Washington's subway cars and tracks and stations—just their customers.

Record ridership is great for our economy, but it also means our network is challenged to serve the new demand. Because of the growth of tourism, “non-9 to 5” industries like healthcare and education, and the generational propensity of “millennials”—now the largest segment of the U.S. population—to use transit for many different purposes beyond simply work, much of the growth in the system has been outside of traditional peak periods where there is daily capacity. But as the economy has continued to grow in recent years, we find peak usage growing, as well, which stretches the capacity of the system, particularly on the workhorses: the Lexington Avenue Line (4, 5, and 6 trains), the Queens Boulevard Line (E, F, M, and R trains), the #7 Line, and upper Seventh Avenue Line (1, 2, and 3 trains).

Res. No. 0903-2015 - Resolution calling upon the Metropolitan Transportation Authority to conduct a comprehensive study of unused and underutilized railroad rights of way in New York City for the purpose of evaluating the feasibility of increased passenger service along such corridors.

The MTA is deeply familiar with our city's unused or underutilized rights of way, and believes the lines do not present as clear a solution as might be assumed. For one, these lines must be able to tie into the greater transportation network at strategic locations, serve key markets, and relieve key choke points, which they do not appear to do.

Also, rail freight activity accounts for the use of many of the “lower usage” lines, and the rail freight industry continues to grow significantly within the City, the region, and nationally. Rail freight use is important to the City economy, particularly the industrial/manufacturing sector, and helps ease congestion, as well, as rail freight keeps trucks off the highways.

Additionally, mixing passenger rail with freight rail is complicated and heavily-regulated, and for these reasons doesn't present a clear capacity solution. And because these freight rights of way are generally not near our capacity problems, they don't offer much opportunity for relief.

The MTA has identified an opportunity on the North Shore of Staten Island where we are advancing further environmental work on an abandoned rail right of way where considerable development is planned. The corridor provides a potential path for a “busway” which would benefit a considerable part of today's congested Staten Island bus network.

Other lower utilized or abandoned former rail rights of way require more complicated discussions among local elected officials and neighborhoods about their re-use. A good example is the former Rockaway Beach branch of the LIRR, where service was discontinued in 1950 after a fire destroyed the trestle for the Rockaway peninsula. The southern segment of the right of way was returned to transportation use in 1956 as part of A train subway service.

Currently, there is a community-based movement to convert the remaining northern right of way—owned by the City—into a park/trail use to meet the ever-growing need for open space.

We have already identified urgent needs in our subway system for additional capacity. In some places—like Manhattan's East Side and coming into New York City from Long Island—our system simply was not built to handle the demand it's facing today. We're addressing these constraints by physically expanding our transportation network for the first time in more than 60 years.

In September, we opened the spectacular new 7 train extension, creating a vital transit link to the Far West Side. The extension will bring millions of MTA customers to the Jacob Javits Center, the High Line, Hudson River Park, and Hudson Yards. It also instantly improves service reliability for all 7 Line customers by providing additional storage space for trains, which is helping us accommodate surging ridership.

We're on-schedule to finish—in December 2016—the first phase of the Second Avenue Subway, which will decrease peak crowding on the Lexington Avenue Line by as much as 13 percent. The 2015-2019 Capital Program includes \$535 million for design, planning, environmental review, utility relocation, and construction preparations for the next phase of the Second Avenue Subway, bringing the line to East Harlem.

Also through this Capital Program, we'll begin installing Communications-Based Train Control on the E, F, M, and R lines in Queens, the A, C, and E lines in Manhattan, and the F Line in Brooklyn. This system—which is fully in place on the L Line and under construction on the 7 Line—allows us to run more trains, move more people, and provide better, safer service.

And, we'll continue the enormous progress we've made on the largest transportation project in the entire country: East Side Access, bringing the Long Island Rail Road directly into Grand Central Terminal. This incredibly ambitious project will increase the number of LIRR trains into Manhattan by 41 percent, reducing commuting times by as much as 40 minutes a day for about 160,000 Long Island commuters, while adding new terminal choices—GCT or Penn Station—for Jamaica, Queens railroad commuters, as well. Moreover, sending some LIRR trains to Grand Central will free up space in Penn Station, allowing Metro-North Railroad to build four new stations in the Bronx and bring those customers into Penn.

In short, the MTA is an agency with limited resources, responsible for safely and reliably moving 8.7 million people every day. We have competing priorities we need to balance, and these projects must get our priority attention now.

Res. No. 670 - Resolution calling upon the MTA to allow riders travelling within New York City limits to pay a fare for commuter rail equal to that of a MetroCard ride on New York City Transit subways and buses; and allow for free transfers between commuter rail and New York City Transit subways and buses.

A second Council resolution calls on the MTA to allow riders travelling within New York City limits to pay a commuter rail fare equal to that of a MetroCard ride on New York City subways and buses, and to allow a free transfer between commuter rail and New York City subways and buses.

This proposal would be a dramatic departure from our current railroad fare structure, which is a distance-based, higher-priced ticket for a commuter rail service that does not include a free transfer from the railroad to either the subway or the bus. Even our existing program for City stations is more limited; \$4.25 for single-direction one-way City travel for customers travelling on Saturday and Sunday between Brooklyn, Manhattan, and Queens on the LIRR, or Manhattan and the Bronx on Metro-North.

The problem—and it's a big one—is that this idea takes us in the direction of deliberately decreasing MTA revenues by \$70 million per year, risking budget balance. It is also important to point out that \$70 million in revenue supports \$1 billion in bonding for our capital program. As you can see, to remain financially whole, MTA would need to be reimbursed for these discounts. Unfortunately, history has shown that we do not always receive reimbursement after we've spent the money. For example, MTA has had to absorb the cost of operating paratransit services in New York City and providing senior and student discounts. This year, the cost of these services is approximately \$540 million more than what the City pays.

The MTA system is also extremely interrelated and interconnected, so this new discount would likely lead to unintended consequences and complications. For example, it could cause significant overcrowding on already heavily-used lines and routes at stations in Queens and the Bronx. Or—in the case of express bus services—it could move customers away from those services to the point where they may no longer be viable to operate.

Ultimately, our goal is to provide good service to as many people as possible, in as many neighborhoods as possible. That's what makes our transit network—and our subways in particular—so invaluable. Our system gives New Yorkers access to the best our city has to offer; schools, work, cultural institutions, you name it. Its breadth is beyond anything available in any city in the United States. In fact, in its August 2014 report, the Citizens Budget Commission showed how our transit system—its breadth and its fares—make New York City one of the most affordable cities in the U.S.

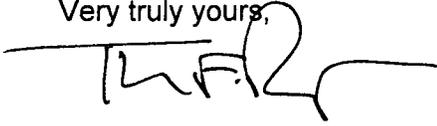
The truth is, no mass transit system in the country supports itself on fares alone. Moreover, when you compare the public support—subsidy per passenger trip—given to mass transit agencies nationwide, it is very clear that MTA's fare structure apportions much less of the cost of a trip to subsidies from our government funding partners. That's why we consider it essential to consider carefully the source of funding for any increase in service or discounted fare.

All of you know why: Transit is the engine that powers New York. It's fundamental to the economic well-being of our city. It's the very foundation of our economy. It's what allows New York City to have about four times the job and population density of the next largest U.S. city. It enables the most valuable real estate market in the country. With regional ridership at 8.7 million a day, it opens up countless job opportunities for millions. It is, quite simply, the fuel that powers our \$1.4 trillion regional economy, second in the world only to Tokyo, and comprising 11 percent of our nation's GDP.

Hon. Ydanis Rodriguez
November 12, 2015
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Again, thank you for this opportunity to submit written testimony to the Council.

Very truly yours,

A handwritten signature in black ink, appearing to read 'T.F. Prendergast', with a long horizontal flourish extending to the right.

Thomas F. Prendergast
Chairman and Chief Executive Officer

November 12, 2015

Committee on Transportation
City Hall

FOR THE RECORD

Re: Testimony by Assemblyman Phil Goldfeder (D-Rockaway Beach) on underutilized rights-of-way and the reactivation of the Rockaway Beach Rail Line

My name is Assemblyman Phil Goldfeder and I represent the 23rd Assembly District, which encompasses the Queens neighborhoods of Ozone Park, Lindenwood, Howard Beach, Hamilton Beach, Broad Channel and Rockaway.

First, I would like to acknowledge the New York City Council Committee on Transportation for its continued leadership in advocating for improved transportation access for every NYC resident and community and for its foresight in calling this hearing into transportation deserts, an issue that cannot be ignored as we experience continued growth throughout the city in the coming years. I would especially like to recognize Committee Chair Ydanis Rodriguez and my colleagues Council Members Eric Ulrich and Donovan Richards, who both understand the challenges faced by our transit-starved communities and who have both worked tirelessly to improve commutes for our families.

I come before this committee today to speak not just as an elected official and transit advocate, but as a lifelong Queens resident who knows firsthand what it means to live, work and raise a family in a community with limited transportation access. Throughout southern Queens and Rockaway, our families are forced to endure some of the longest commutes in the entire city. On normal days, a morning commute by train to midtown could easily take an hour and a half. By car, commuters face deteriorating roadways and unbearable gridlock on the Belt Parkway, Van Wyck Expressway and along Cross Bay and Woodhaven Boulevards. This means less time spent at home with loved ones and decreased productivity in the workplace.

It wasn't always this way. From the late nineteenth century until the mid-twentieth century, a branch of the Long Island Rail Road connected the Rockaway Peninsula to central Queens via an elevated train line through Ozone Park, Woodhaven and Rego Park. The Rockaway Beach Rail Line, also known as the White Pot Junction, provided a 30 minute single seat ride to midtown Manhattan. To this day, many of my older constituents will come up to me and tell stories from their childhood about riding the Rockaway Beach Rail Line into the city.

Over the years, decreased ridership and frequent track fires on the old wooden trestle led the line to be sold to the city in 1955 and eventually decommissioned in 1962. The section of the line running south from Liberty Avenue in Ozone Park through Broad Channel and Rockaway was integrated into the present-day A-train and Shuttle Subway lines. Everything to the north was left, and remains untouched.

Since service ended on the Rockaway Beach Rail Line, we have seen incredible changes in Queens and throughout the city. During this time, the populations of both Rockaway and Queens

as a whole have doubled. Between 2000 and 2030, the population of our borough is expected to grow another 15%. Business districts from Jamaica to Forest Hills to Long Island City are growing at record paces. This past summer, nearly 8 million beachgoers came to Rockaway, more than double the number from 2014 - a true milestone in our city's recovery from Sandy.

Queens is fast becoming a world-class destination. Sadly, our local communities do not yet have the world-class transportation to match. This is largely due to the fact that our current transportation system is not designed to handle this tremendous growth we've seen. Of the 26 subway routes we have now in this city, all but two converge in Manhattan, even though more than half of all Queens residents do not work there. Those who do have to fight overcrowded trains, frequent delays and, as we saw during Sandy, major infrastructure uncertainties.

Queens residents overwhelmingly agree that the reactivation of the Rockaway Beach Rail Line would help solve many of these problems. I have advocated for the reactivation of the Rockaway Beach Rail Line because it is the best and most cost efficient way to create a true north-south subway corridor in Queens. Reactivation would help ease overcrowding on our existing train lines, take cars off our roads and create a direct link from Midtown to JFK Airport.

With the right-of-way still in city hands, we could do this without the high land acquisition and infrastructure costs associated with other projects. Phase I of the Second Avenue Subway project will cost \$4.45 billion to build less than 2 miles of track. By contrast, reactivating the Rockaway Beach Rail Line could cost as little as \$1 billion to create 3.5 miles of new train lines on the existing right-of-way. A recent study by the Queens College Urban Studies Department found that this could generate up to half a million trips per day.

Investment in transportation is not only about transportation, but also about economic development and jobs for our struggling residents.

In its Twenty-Year Capital Needs Assessment, the MTA called for the reutilization of the Rockaway Beach Rail Line and other abandoned rights-of-way as a way to expand network capacity and help reduce land acquisition and construction costs. State Comptroller Thomas DiNapoli went a step further, saying that restoring the Rockaway Beach Rail Line would be a less costly way to speed commutes between Queens and Manhattan, improve travel within the borough and promote economic growth. The MTA Reinvention commission, convened by Governor Cuomo and made up of transit experts from NYC and all over the world agreed that utilizing existing rights of way was the most efficient option to increase transit capacity to currently undeserved communities.

Support for the plan has gained traction among local civic organizations, unions and elected officials. I'm proud to say that Queens Community Boards 5, 10 and 14 support reactivation, as do the Transit Workers Union 100 and Iron Workers Local 361. Earlier this year, a majority of the NYS Assembly Queens delegation signed a letter in support of funding for a comprehensive study to determine feasibility of fully restoring the Rockaway Beach Rail Line.

There is no greater asset to our transit network than existing rights-of-way. With the Rockaway Beach Rail line and the other underutilized rights-of-way throughout the city, we have a once-in-

a-lifetime opportunity to make lasting improvements to our transportation network and meet the demands of our growing populations. I fully support the proposed Council Resolution 0903-2015 calling on the MTA to study the potential use of these vital assets; and urge the City Council to continue its advocacy on behalf of our families as we work to end transportation deserts and create the equal access to transit options we deserve. As Queens residents, we are not asking for more than others, but rather for a fair share, to give our families the opportunity to thrive and grow.

**Amalgamated Transit Union (ATU) Urges Council Look to Buses
to “Connect Transportation Deserts”**

**Testimony to City Council Committee on Transportation
Int. Nos. 964 and 965 and Res. 670 and 903**

by

Mark Henry, President and Business Agent, ATU Local 1056

FOR THE RECORD

Thank you for the opportunity to comment on legislation – Int. Nos. 964 and 965 and Res. 670 and 903– that focus on improving public transit. As mass transit professionals, ATU offers unique and valuable insights. ATU 1056 and ATU 1179 members – bus operators and mechanics – work for MTA New York City Transit's Queens Bus division and serve the riding public

One thing the package de-emphasizes somewhat at the expense of capital-intensive rail approaches involves the use of buses.

Buses offer a quick means to addressing a dearth of service or improving what exists throughout the city and especially in Queens, where ATU members serve its residents, visitors, workers and students.

ATU takes no position on Int. 964 which would mandate NYC's Department of Transportation, to study building a light rail system in the city with an emphasis on serving underserved communities. The street grid already exists; NYC, its DOT and the MTA just need to look at opportunities to effectively use the grid by deployment of more buses and establishing expanded and new routes. Any study to improve transit falls shorts without concurrently looking at bus utilization.

DOT's focus on Bus Rapid Transit (BRT) or Select Bus Service (SBS) routes involves no significant service upgrades; studying the metrics makes clear the need to look at the larger picture. ATU favors BRT and SBS approaches as part of any plan to improve bus service system wide. Unfortunately the deployment of substantial human and money resources to date diverts attention for the needed holistic approach to public transit in places that need more, better and the introduction of bus service.

ATU favors Res. 670's call on the MTA to allow riders traveling on commuter rail within the city to pay a fare equivalent to NYC Transit subways and buses. The express bus fare may offer an appropriate standard but ATU leaves that determination to others. ATU strongly recommends amending this resolution sponsored by Council Member I. Daneek Miller to include a free transfer between each transit mode, as currently exists between buses and subways and local and express buses.

ATU has routes including the Q2, Q3, Q27, Q31, Q36, Q43, Q44 and Q88, that intersect with LIRR stations in eastern Queens. This transfer option could induce greater ridership and remove a more people from cars. In addition explore extending an appropriate transfer options to stations just outside the city limits that serve Queens residents, including the Hempstead LIRR line which includes stops in Floral Park and Bellerose Village running parallel to the city line just a few blocks beyond it. The bus routes formally known as the Q5AS Laurelton and Q5S (Q86) Rosedale Shuttles serviced LIRR stations during rush hours and similar opportunities exist with other routes in southeast Queens.

Amalgamated Transit Union (ATU) Urges Council Look to Buses to “Connect Transportation Deserts”
Testimony to City Council Committee on Transportation on Int. 964 and 965 and Res. 670 and 903
by Mark Henry, President and Business Agent ATU Local 1056

ATU supports the need to identify “transportation deserts” envisioned every five years by Int. No. 965. Many communities that require transit or more of it already clamor for better options. Int. No. 965 works best as means to help drive needed improvements in bus service.

ATU offers no position on Res. 903 concerning unused and underused rail rights of way other than to re-emphasize the utility of buses as a service option.

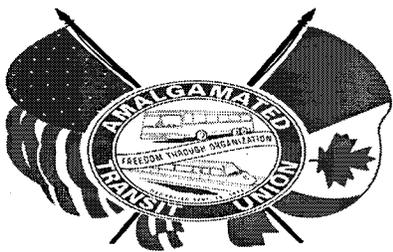
Building in smarter transit options using buses could assist many residents who currently rely on personal vehicles.

Buses connect neighborhoods. City Hall's plans to develop more affordable housing units and housing with less or no parking requirements needs adequate public transit options in place, and not just to funnel commuters to subway and rail; the city needs buses in place to take residents to school, work, recreation and family within boroughs such as Queens. The Council should support advocacy by ATU and others for more buses that the MTA needs to maintain and expand service.

Buses, new and existing, require fully-functioning depots and in many cases terminals to facilitate commuter transfer between transit modes. The City needs to make sure progress continues on the MTA's Jamaica bus depot. The City really need to look at identifying a site for a bus terminal serving downtown Flushing before development makes it impractical; it may not be too late to incorporate it in the plans for the Flushing municipal lot, which may present the best location.

If this hearing can help direct attention to better use of buses, providing more buses and service, greater progress on depots and identifying needed bus terminal sites, it help the cause and benefits so many New Yorkers including those who live in those transportation deserts.

Thank you.



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For more information: Corey Bearak, ATU 1056 & 1179 Policy &
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Testimony of *Riders Alliance* before the City Council
Committee on Transportation
November 12, 2015

Good morning. I'm Masha Burina, Organizer with the Riders Alliance. We are New York's grassroots organization of subway and bus riders pushing for better service, affordable fares and more public investment in our mass transit system. Thank you Chairman Rodriguez and the Committee on Transportation for the opportunity to testify today.

As an organization of subway and bus riders, we talk to many New Yorkers for whom efficient transportation is out of reach. Shining a light on the communities that lack good transit options is important, and we're glad you're doing it.

Transit in the outer boroughs is under resourced. Nearly 1 million New Yorkers travel over an hour to get to their job, and 2/3 of those jobs pay less than \$35,000 / year. These are often the same people who walk long distances to reach subway or bus routes, far from where they live and work.

That's why the Riders Alliance has focused on bringing attention to the need for better buses. Whether in Flushing-Jamaica or Woodhaven Cross-Bay Blvd., we've been organizing outer borough residents who are demanding we transform our streets and commutes through the expansion of more robust Select Bus Service.

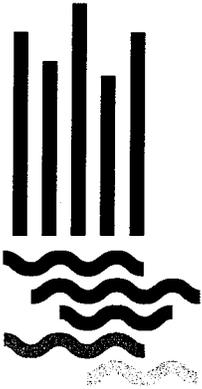
SBS is one solution to transit deserts. The administration aims to install 20 routes by 2017. But we should also expand local buses in areas without good service.

Many of our members have punishingly long commutes. For instance, bus rider Nancy Morales travels nearly two hours to get to work from Woodhaven, Queens to Kings Highway in Brooklyn.

For many in these communities, services are unaffordable or don't go to their neighborhoods at all. . . Given the predicament of a transit desert - what choice would you make? Take a cab? Or maybe you'd order an Uber?

The reality is that many riders simply don't have the luxury of choice. It is incumbent on this body and the relevant agencies like the DOT / MTA to know where our fellow riders live and work, particularly those who are on the margins of our transit system. We need to make sure all residents, regardless of where live or work, can access jobs and vital services.

**Testimony of Roland Lewis
President & CEO, Waterfront Alliance
New York City Council Committee on Transportation - Oversight Hearing
Re: Next Stop: Exploring Methods of Connecting Transportation Deserts
November 12, 2015**



The Waterfront Alliance is a coalition of over 850 community and recreational groups, educational institutions, businesses, and other stakeholders committed to restoring and revitalizing the New York and New Jersey waterways. We have raised the call for new waterborne transportation—and improved connections between ferries and upland transit modes—as a targeted, cost-effective complement to our bus and subway network to connect transportation deserts within our region. In the next 25 years, New York is projected to grow by almost a million people, and much of that growth will occur on the waterfront. Those neighborhoods often enjoy fewer transportation choices than inland communities. Of the 35 neighborhoods identified in the City’s One New York plan as both low-income and transit-poor, most could be served by expanded ferry service. Waterborne transit can and must be a part of a plan to ensure that all New Yorkers have equitable access to job centers and economic opportunities.

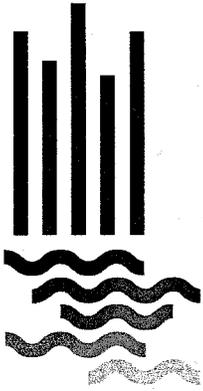
Ferries’ relatively low barrier to entry is perhaps their single greatest advantage. There are no expensive tracks to lay, and new routes can be implemented quickly at a relatively low cost. The de Blasio Administration has announced a new Citywide Ferry Service (CFS), scheduled to expand waterborne transit to all five boroughs by 2018, and doubling the number of New York City neighborhoods with regular ferry service. CFS will be delivered relatively quickly, and at a dramatically lower cost per mile of service relative to other transportation projects. Its infrastructure can be moved to other locations if more suitable locations are identified. The proposed \$55 million capital expense is a rounding error in public transit infrastructure terms, and its subsidies will be competitive with those for local buses and below those for express bus and commuter rail.

CFS will provide substantial travel time savings for a number of underserved neighborhoods, including Red Hook, Brooklyn; Astoria, Queens; Soundview, Bronx; and the Rockaway peninsula. With the Second Avenue Subway still years away from fully constructed, CFS also presents an important step for those on Manhattan’s east side, where there are fewer transit options than the west side. Commuters in lower-income neighborhoods served by CFS will save, on average, nearly 20 minutes per trip to lower Manhattan or east Midtown. That 40 minutes a day represents a substantial quality of life improvement to over-stretched commuters.

Expanded ferry service, combined with new Select Bus Service and bicycle improvements, provides an economically responsible option for significantly expanding economic opportunity for residents of transportation deserts. Yet for ferries to succeed, they must connect with the wider transportation network, both physically and psychologically. In particular, the projected absence of free or discounted transfers to New York City Transit (NYCT) services will limit the CFS’ ability to serve low-income riders. We urge continued discussion between CFS administrators and representatives from MTA to incorporate ferries as a one of many transportation services participating in a unified fare-payment system, including not only NYCT buses and subways but also PATH rail; the Roosevelt Island Tramway; AirTrain JFK; and Westchester County’s Bee-Line.

The City’s commitment to support the service with affordable fares equivalent to a subway or bus ride will be an essential component of its success. We urge policymakers to implement a dedicated, sustainable source of operating funding, to

preserve its benefits beyond the five-year pilot window. One option is the Move NY fair tolling plan, of which the Waterfront Alliance is a coalition member. It would rebalance toll charges to relieve congestion, and direct funds to roads, bridges and public transit. It would also allocate a modest sum that could help defray ferry operating costs. Ultimately, ferries will never be a substitute for subway service, but should be seen as an important tool for transportation planners in our island metropolis to serve transit-starved waterfront districts, where other options are unavailable, insufficient, or prohibitively costly.





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FOR THE RECORD

Statement of Support for Int. 965, Identifying Transit Deserts, and Support for the QueensWay; Marc Matsil, NYS Director, The Trust for Public Land, 666 Broadway, New York, NY 10012, (212) 574-6868.

The QueensWay, a cultural greenway, is an innovative program that will transform an abandoned rail corridor into a linear park through the heart of Queens neighborhoods connecting six communities to rail transit, each other, and to Forest Park and, ultimately, Jamaica Bay and Flushing Meadows Corona Park (through short street connections).

Transit Connections:

The QueensWay will create viable links through an alternative transit bikeway and walking corridor to 7 subway transit hubs (M, R, E, F, M, J, Z and A trains—as well as the nearby LIRR in Forest Hills), 12 schools, 2 little league complexes, 9 commercial districts, and Forest Park. At its northern end, the QueensWay will link one mile of on-street paths to Flushing Meadows-Corona Park, providing cycling access park amenities; the QueensWay' southern connections are within a mile of the Jamaica Bay-Gateway bike paths.

Auto-Pedestrian Safety

The QueensWay will provide an alternative to some of the most dangerous roads in the City. These include New York City's second and third most dangerous roadways. Woodhaven Boulevard, which runs parallel to the QueensWay, is the most dangerous artery in Queens with eight pedestrian fatalities in 2013. Union Turnpike, which intersects the QueensWay, had five pedestrian fatalities in 2013. Queens Boulevard, to the north of the QueensWay, was ranked the borough's second most dangerous roadway. The QueensWay will contribute to the Mayor's Vision Zero initiative to reduce auto-pedestrian fatalities, providing safe alternative routes to schools, transit hubs, work places and Forest Park.

The community vision is to create an asset that will increase access to transit, recreation, jobs, and shopping, and will highlight the diverse cultures, arts, and cuisines of Queens. The QueensWay will transform 3.5 miles of abandoned rail line into a vibrant park-and-trail system. In 2014, The Trust for Public Land, in partnership with the Friends of the QueensWay, completed a feasibility study and conceptual plan, funded with a NYS Regional Economic Development Council grant and private donors. In 2015, the QueensWay received another REDC grant to commence the first part of the first phase of design. The QueensWay will provide much-needed green space for the 322,000 people who reside within a mile of the abandoned rail line. The QueensWay will address park equity disparities, provide safe access to transit and recreation, connect six neighborhoods (representing dozens of cultures), and create jobs. In just four years, The Friends of the QueensWay (representing more than 5,000 community residents) and The Trust for Public Land have completed the Feasibility Study (which received awards in 2015 from the American Institute of Architects and the American Society of Landscape Architects, as well as A Better New York), was awarded State funds for the first part design, and has captured the imagination of donors and foundations including the CITI Foundation, Tiger Baron Foundation, Scherman Foundation, NY Community Trust and others.

Park Equity—An additional benefit

As stated, in partnership with local group, Friends of the QueensWay, we have completed an initial round of community visioning and participatory planning of the feasibility study and conceptual plan. QueensWay is endorsed by several Queens elected officials including Congress Members Joe Crowley and Grace Meng, City Council Member Karen Koslowitz, State Senator Stavisky and Assembly Member Hevesi, as well as the Queens Tourism Council and others. The QueensWay will address park equity issues in New York City. Notably, neighborhoods at the southern end of the QueensWay are currently at only 1/10 the NYC-standard for open space.¹ Elsewhere along the line, with the exception of Forest Park, there are few existing parks, all less than one acre in size.

Economic Development

The creation of the QueensWay will contribute to economic development and neighborhood revitalization. Economic projections in the feasibility study reveal that the QueensWay will draw close to 1 million visitors per year, each of whom will spend \$7-21 locally. In addition, the linear park will include up to four plazas that can host food festivals, cultural events that celebrate Queens' diversity, concessions, and markets. Finally, it is estimated that building the park will create approximately 700 jobs.

QueensWay Support

The QueensWay has the support of a number of elected officials; dozens of local and citywide community-based organizations and major news outlets including the NY Times, The New Yorker Magazine, The Wall Street Journal, The Daily News, DNA Info, and others. The project has also secured notable private and public funds, including two grants from the New York State Regional Economic Development Council, and undergone a substantial and thorough conceptual planning with significant community input, participatory design workshops in a process that involved some of the top park and urban-planning experts in the world, and hundreds of the community members.

In conclusion, the QueensWay will provide great access to transit hubs for the more than 322,000 people that live within a 15-minute walk of the proposed greenway.

¹ According to our GIS analysis: The 50,349 residents of Ozone Park living within ½ mile of the southern section of the QueensWay have 0.21 acres of park per 1,000 people compared to the NYC Department of City Planning-standard of the 2.5 acres per 1,000 people.



NYCTRC

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**Testimony of William Henderson, Executive Director
Permanent Citizens Advisory Committee to the MTA (PCAC)
before the New York City Council Committee on Transportation**

Thursday, November 12, 2015

Good morning, my name is William Henderson, and I am the Executive Director of the Permanent Citizens Advisory Committee to the MTA (PCAC), which is an umbrella organization comprising three riders' councils including the New York City Transit Riders Council (NYCTRC). Both the PCAC and the NYCTRC have long advocated for better transit connections in NYC neighborhoods that are transit underserved.

The Council believes that the MTA must invest resources in measures that will meet the system's growing ridership. Innovative, efficient, and timely solutions are needed to accommodate this increasing demand. As population and job growth continues city-wide, areas in the outer boroughs are lacking adequate transit options to support this growth. Therefore, the Council encourages both the City of New York and the MTA to work together to identify solutions to meet ridership demands on all MTA modes of travel.

The first step should be to reduce commuter rail fares within NYC, which would provide affordable fares while drastically reducing travel times for outer borough commuters. In 2003, the PCAC worked with the MTA to create City Ticket, which created a lower weekend fare on both Metro-North and Long Island Rail Road within city limits. Now, as NYC Transit's ridership has increased and will continue to do so, it has become imperative to reexamine the City's commuter railroads to see how they can relieve pressure on our overcrowded subway system, as well as improving transit service in the areas of our city most underserved by transit.

In several weeks, the Council will be releasing a new report entitled, *The Freedom Ticket: A Southeast Queens Proof of Concept*. Freedom Ticket will expand the premise of City Ticket and allow customers to use any MTA mode that meets their needs, be it bus, subway, or commuter rail, within a given zone, for a reduced rate on weekdays.

The NYCTRC envisions implementation of Freedom Ticket in Southeast Queens, where the nearest subway access can be up to five miles away, resulting in long and difficult commutes with many required connections. In neighborhoods like Rosedale, Queens over thirty-four percent of the commuting population travels 60 minutes or more each way to work. Travel to and from these neighborhoods on NYC Transit can be over an hour and a half each way, compared to only thirty-seven minutes on the LIRR.

Unfortunately, the current price of a LIRR fare from Rosedale to either Penn Station or Atlantic Terminal is \$10, prohibitively expensive for most, and substantially more expensive than the \$2.75 NYC Transit fare. Therefore, the NYCTRC proposes that the MTA implement a new fare class, the Freedom Ticket, to reduce per-ride, weekly, and monthly fares on its commuter railroads and provide transfers to NYC Transit to complete the trip. This fare may be greater

than the existing local transit fare, but must still be affordable to riders, including provisions for weekly and monthly fares to reduce the cost of travel for commuters.

It is crucial in this time of record-breaking ridership and limited financial resources that we use all our assets in the most efficient manner possible. Lowering fares on the City's commuter railroads is key to accommodating the increasing demand on our subway system, and can be done at an affordable cost to the MTA. The NYCTRC envisions the expansion of Freedom Ticket, beyond the Proof of Concept, to include all LIRR and MNR stations where neighborhoods are far from subway connections and ultimately all City stations. Only through these type of efforts can the MTA be able to keep up with its growing ridership and move people more quickly across all five boroughs.



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**** SUPPORT ****

Committee on Transportation – Intro 965-2015

Testimony by Paul Steely White, Executive Director, Transportation Alternatives

Thursday, November 12th, 2015

Thank you, Chair Rodriguez and the members of the Committee on Transportation, for convening this hearing.

I am Paul Steely White, Executive Director of Transportation Alternatives. We are a 42-year old nonprofit, with more than 150,000 activists in our network, dedicated to improving the safety of New York City's streets. We are here to lend support to all the proposed bills, but in particular, we want to draw attention to **Intro 965**, which proposes a study about transportation deserts.

We have a motto: "One less car." We urge New Yorkers to walk, bike, or use public transportation whenever possible. Like our name says, we want people to have as many alternatives to cars as possible, and so we are very concerned by the number of New York City residents who find themselves poorly served by the subway and buses by virtue of where they live. These New Yorkers have two realistic options, neither of them ideal:

- Either use a car and contribute to the worsening congestion in our city, or spend mind-boggling amounts of time traveling on multiple buses and trains.
- There needs to be something better, and we can start exploring options once we have clearer details about the situation.

Therefore, we strongly support Intro 965, which will provide data on transportation deserts which can be used to better plan expansion of the public transit network and improve service for residents of these communities.

Transportation Deserts

Congestion is a fact of life in New York, but it is made worse when more vehicles are added to our roads. The best solution is safe, reliable, fast public transit that can accommodate large numbers of New Yorkers regardless of age or physical ability.

- Our iconic subway system is recognized around the world and is the envy of so many other cities, but unfortunately it does not link all communities equally.
- Large swathes of the city, including Staten Island, eastern Queens, and parts of southeastern Brooklyn, are poorly served or not served at all by the subway or SBS routes.

The results are alarming:

- New York City residents have the longest commutes of any major city in the country, with an average of six hours and 18 minutes spent traveling to and from work each week.
- That's about thirty-eight minutes for each trip, compared to an average of 25 minutes nationwide.

- In some parts of the outer boroughs, average commute time exceeds 45 minutes in each direction. For example, in St. Albans, Queens, the average commute takes 50 minutes each way - double the national average.* The closest subway station, Jamaica Center, is far beyond walking distance.
- Comptroller Scott Stringer released a study this past March showing that the average weekly commute time for New Yorkers is nearly an hour longer than for workers in the city with the second-longest time, San Francisco.

And it's not just commutes that take a long time. People living in transportation deserts may experience **difficulty accessing other necessities**, such as doctors' appointments, or visiting friends and family. When every trip is an inconvenience, life becomes stressful and potentially isolating. All this time spent traveling is time that cannot be spent with family or engaging in all the opportunities New York City offers. This is **time taken away** from learning new skills, gaining new qualifications, taking part in volunteer work, or simply enjoying leisure time. For the majority of New York City residents, who do not walk or cycle to and from work, this is also **sedentary time**, which has an adverse impact on health. And with the unpredictability of conditions on our roads and rails, it is also a source of **stress** when delays make people late for work or appointments.

We would like to propose an addition to section (b)(3) of Intro 965:

- As it stands in this bill, the threshold for an intolerably long commute is a three-hour round trip, or an hour-and-a-half each way for the majority of residents in a census tract.
- While it is important to learn more about these New Yorkers who are most severely "commute-burdened," it does not mean that a daily commute of slightly less than three hours is by any means quick.
- Commuting more than one hour in each direction should be considered cause for concern, and thus we recommend that you also look at census tracts in which the average daily round-trip commute for a majority of residents takes more than **two** hours.

In addition, we urge you to consider adding **active transportation** to the study:

- An increasing number of New Yorkers are finding that bicycles are an excellent and convenient means of transportation, especially for short trips.
- The number of bicycle commuters has increased steadily over the past several years.
- Bicycles are also useful for bridging gaps between subway stations and homes or destinations. The de facto standard for a station's catchment area, based on how far a person will walk to get there, is a half-mile radius. Having a bicycle extends that radius by allowing a rider to get to and from the station much faster than by walking. Bicycles can thus "shrink" the transportation desert by essentially bringing subway stations closer to home.

The way to encourage cycling is to make sure it is as safe as possible, and we know that having protected bike lanes is crucial for this. Unfortunately, many areas that qualify as transportation deserts are also bike deserts, with few protected bike lanes and no access to Citibike in the foreseeable future. Therefore, we urge you to add a further criterion to your evaluation – identifying census tracts that are located more than one-third of a mile from a protected bike lane, and including recommendations related to improving access to the bike network in such areas.

*Source: WNYC Average Commute Times Project, <http://project.wnyc.org/commute-times-us/>

Testimony to New York City Council Committee on Transportation
November 12, 2015
Eric McClure
Executive Director, StreetsPAC
eric@streetspac.org
(646) 522-2589

On behalf of my colleagues at StreetsPAC, I commend Chairman Rodriguez and the Committee on Transportation for holding this hearing today. The lack of good access to transit is a significant challenge for too many New Yorkers, and it's an issue that doesn't get enough attention.

It's imperative that we increase and improve the mobility of residents of New York City. Our economic health depends on it, and improved mobility is fundamental to reducing inequality in our city. As the cost of housing in Manhattan and parts of Brooklyn and Queens rises unabated, and large numbers of residents are driven by financial concerns to move farther away from our key business districts, it's critical that we find ways to shorten and improve commutes.

In solving the mobility challenge, it's important that we look to modes of transit capable of moving the greatest numbers of people with the greatest efficiency. There is, of course, no rival to our subways in that regard, but the costs of extending our subway system are enormous, as we're seeing with the Second Avenue subway.

That's why a resolution to have the MTA study unused and underutilized railroad rights of way makes tremendous sense. There's been much talk about the Triboro RX line since it was first proposed two decades ago, but little action. The restoration of rail service on the abandoned Rockaway Beach branch has the potential to connect northern and southern Queens and move tens of thousands of riders a day. Are these ideas feasible? We can't know for sure without a comprehensive study.

The same holds true for the study of light-rail implementation in New York City. Does light rail make more sense than Bus Rapid Transit? Can it move more passengers and spur more development and economic opportunity? Those are things we should know as we tackle the transit-desert problem. Regardless, we must summon the political will necessary to reallocate street space from automobiles to transit.

-more-

On its surface, expansion of the CityTicket program appears to make great sense. Allowing city-zone riders to use Long Island Railroad or Metro North trains at a cost comparable to a MetroCard fare would speed commutes and improve access. However, commuter trains carry their fullest passenger loads within the city zone, so a concurrent increase in capacity would surely be necessary. And free rail-to-subway transfers might have the unintended consequence of adding to the large subsidies suburban rail commuters already receive. Those are details that can be ironed out, however, as we work toward the worthy goal of fare equalization within the five boroughs.

Lastly, while the expansion of ferry service in New York City waters has great political support, it's important that we look at cost vs. benefit. Ferry rides are far more substantially subsidized than most other modes of transit, and ridership is relatively low. About 10 times as many people take a Citi Bike ride daily as cross the East River by ferry, without any subsidy (public dollars for Citi Bike, and its further expansion, is a topic for another day). For certain parts of the city, however, ferry service may be the best transit solution.

Of course, solving the transit-desert challenge will take more than innovative thinking. It will also take substantial, perhaps historic, investment. The first step toward achieving that investment is to implement the Move New York plan, without further delay. We need Albany to act, and this Council must unite behind Move New York to help make that happen.

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FOR THE RECORD

Statement at November 12, 2015 NY City Council Committee on Transportation Hearing on
Connecting Transportation Deserts

My name is Ed Walters and I live in Jackson Heights, Queens.

I strongly urge the New York City Council to adopt the four measures being discussed today.

Among New York City's greatest assets are the magnificent beaches on the Rockaway Peninsula. Unfortunately, at the present time it is a long, time-consuming jaunt to reach these beaches using public transit from Jackson Heights. The Q53 bus cannot always accommodate the beachgoing crowds during the summer season.

Clearly, restoring the 3.5 mile disused LIRR Rockaway Beach Line between Rego Park and Aqueduct would make a big difference. Including this rail link within the MetroCard service area, whether it is operated as a branch of the LIRR or a connection to the subway, would be very important.

Furthermore, the extension of the MetroCard to both the LIRR and Metro North lines within NYC would ease travel for many trips made by Jackson Heights residents. Visiting friends in eastern Queens, the Bronx, or traveling to cultural assets like the Bronx Botanic Garden or the Queens Museum would be made much easier if these rail lines were included in the basic MetroCard fare system. The proposed reopening of the LIRR Port Washington Branch station at Elmhurst would also be important for those of us living in Jackson Heights, considering how overcrowded the E, F, R and 7 lines at all times of day.

Lastly, it would be terrific if the one-day transit pass was reinstated. When friends visit it is very costly and inconvenient to have to replenish the Metrocard. This policy is commonplace everywhere except New York City. It certainly would encourage people to leave their cars home and use mass transit.

I strongly urge you to adopt these measures.

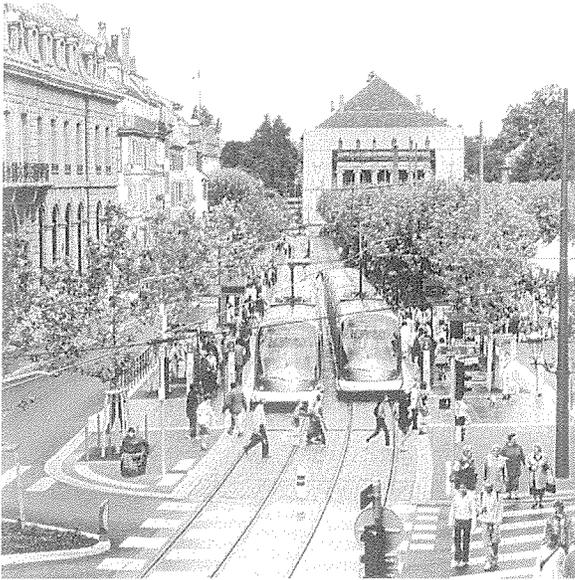
Sincerely,

Edward Walters

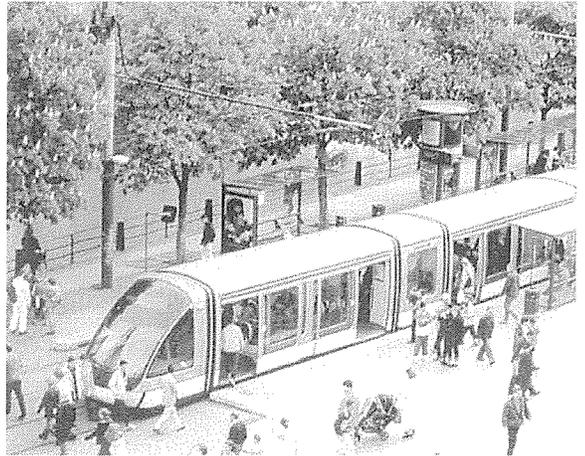
FOR KEY, SELECTED SURFACE TRANSIT STREETS

Why light rail, rather than bus rapid transit or select bus service?

Because rail vehicles are reliably guided by their tracks, they require a minimum width of right-of-way, which is of great importance in a crowded city like New York. This also makes **surface light rail** especially appropriate and safe for streets with heavy crowds of pedestrians.



The rails also provide a smoother, more appealing ride and an obviously dedicated and self-enforcing path, which discourages motorists from entering it and delaying the transit line. This results in reliable trip times and a strong record of attracting riders of all income levels, including former motorists. As a "surface subway" (albeit at a lower speed than a subway) light rail extends the effective reach of the subways, yet **at a cost that is only about one-tenth as much per mile as subways**.



Rail vehicles are reliably guided by their track, requiring a minimum width of right-of-way. This makes light rail especially appropriate and safe for pedestrians.

Light rail in Strasbourg, France.

Located at-grade, light rail's easy, quick boarding and inexpensive station platforms will allow frequent access points at every major cross street, making it an ideal distributor for existing subways and buses.

There has already been a considerable amount of research performed on the feasibility of building a river-to-river light rail line on Manhattan's 42nd Street — **vision42** — including its economic benefits, construction impacts, and implications for traffic and deliveries. The project's economic benefits are projected to fund its construction in a short period of time due to dramatic increases expected in retail and restaurant business.

Forty-second Street is an important portal that connects with 17 of the city's subway lines, leading to all five boroughs. Having light rail on 42nd Street could open the way for building other lines throughout the city. There are many bus lines in New York City (see attached sheet) that carry more passengers than recently completed light rail lines around the country, and therefore merit serious consideration for conversion to light rail.

Potential connections between light rail and proposed citywide ferry network

Light rail will be able to meet the ferries, something that most of the city's subways *cannot* do. This can lend credence to the City's interest in a citywide ferry network. Light rail can serve massive new developments planned along the East and Hudson Rivers, as well as important tourist generators on the waterfronts, such as the United Nations Headquarters and the Javits Center.

Testimony pertaining to a study to determine the feasibility of building a light rail system in the City of New York

Prepared for NYC Council Committee on Transportation Hearing on Thursday, November 12, 2015, 10:00 am, Council Chambers, City Hall, New York

20 NYC BUS LINES SHOW GOOD POTENTIAL FOR CONVERSION TO LIGHT RAIL

ROUTE	Av. Weekday Ridership	ROUTE	Av. Weekday Ridership
1. M15 1st/2nd Aves.*	52,723	11. Bx19 Southern Blvd./E149 St.	31,435
2. Bx12 Fordham Rd./Pelham Pkwy.	47,328	12. Bx36 E174/E180th Streets	31,353
3. B46 Ufca Ave.	47,239	13. Bx15 3rd Ave.	31,158
4. B6 Ave.D/Flatlands Ave.	42,275	14. M101 Lexington/3rd Aves.	29,403
5. Q44/20 Jamaica—Bronx Zoo	41,857	15. Q58 Flushing—Ridgewood	28,850
6. Bx1/2 Grand Concourse*	38,861	16. Bx40/42 Tremont Ave.	27,658
7. B44 Nostrand Ave.*	36,624	17. Q27 Flushing—Cambria Hts.	25,070
8. M14 14th Street	35,891	18. M86 86th Street Crosstown	25,023
9. B35 Church Ave.	32,073	19. M34 34th Street Crosstown*	17,175
10. B41 Flatbush Ave.	31,900	20. M42 42nd Street Crosstown	13,885

* Select Bus Service Routes, currently

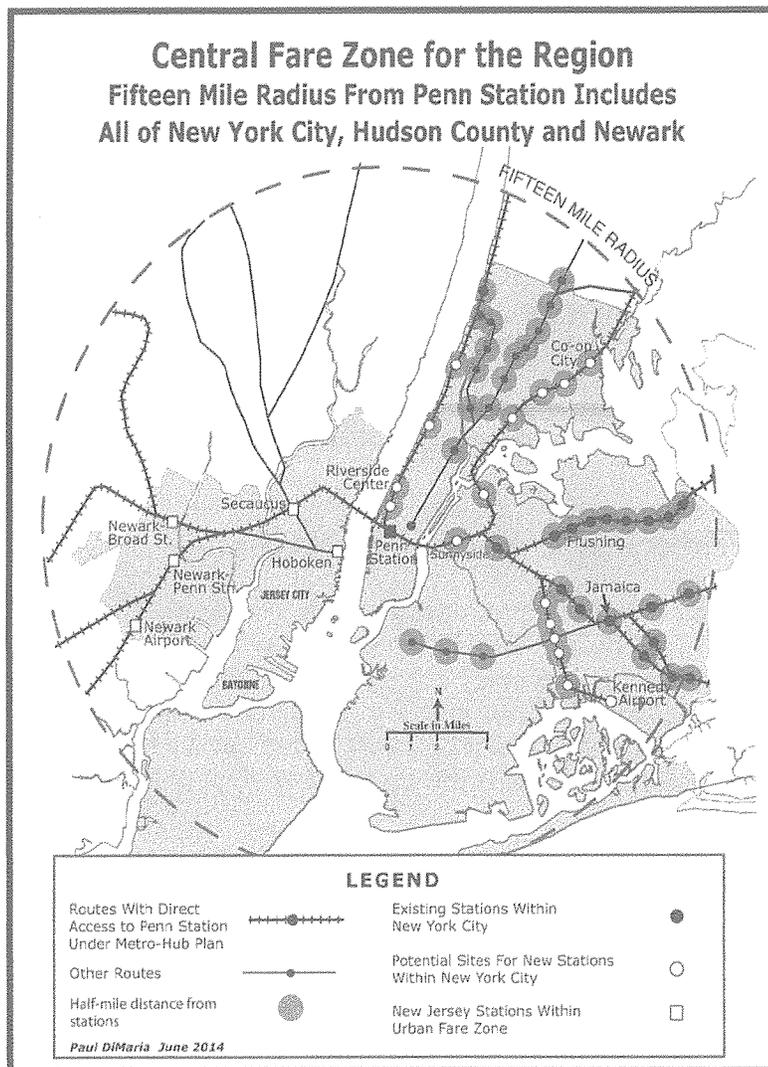
Data provided in 2014 by Paul Gawkowski, former Director of Surface Transit for Brooklyn and Queens, and Director of Short-Range Bus Service Planning for all of New York City. Average weekday ridership is one of many useful indicators for converting buses to surface light rail.

This list is based on an average weekday ridership of at least 25,000 per weekday, with the M34 and M42 making the list because of their very high ridership per route mile. Using average weekday ridership as an initial tool for creating a list of candidate bus routes for upgrading is a standard and generally accepted transit planning practice. It was, in fact, the methodology used to select potential candidate NYCT bus routes for conversion to BRT, later christened Select Bus Service.

Of course, making the candidate list is only the first step in the extensive research which would be necessary to determine which of these bus routes would be the most appropriate for conversion to light rail. However, neither the MTA nor New York City Transit has ever studied the possibility of converting any of these candidate routes for conversion to light rail, not even as a possible alternative to Select Bus Service routes.

**Statement at November 12, 2015 NY City Council Committee on Transportation
Hearing on Connecting Transportation Deserts**

George Haikalis, President, Institute for Rational Urban Mobility, Inc.



The Institute for Rational Urban Mobility, Inc. (IRUM) is a NYC-based non-profit concerned with reducing motor vehicular congestion and improving the livability of dense urban places.

IRUM urges the NY City Council to adopt all four measures relating to *transportation deserts*.

1. study feasibility of possible locations for a light rail system in the city of New York.

IRUM has long supported introducing modern light rail (called trams in other countries) to significantly upgrade surface transit in NYC. To breathe new life into the 42nd Street light rail line, first proposed in 1978, IRUM developed its **vision42** initiative for an auto-free light rail boulevard. Since pedestrians outnumber autos by a ratio of five-to-one it is only fair to give the lion's share of this street space to pedestrians. Generally, elsewhere in the city, light rail would

share streets, operating in dedicated lanes. Several light rail concepts that IRUM has developed through the years are described in the attached pages.

2. develop a plan for connecting areas identified as “transportation deserts”

Clearly, new light rail lines could help serve areas that are not walking distance from subway or regional rail stations. NYCDOT and NYCDCP should work closely with MTA to identify locations and develop plans for improving surface transit, including light rail, to enhance mobility in these areas.

3. allow riders using commuter rail within NYC to pay regular MetroCard fares

The existing MetroCard system allows bus and subway riders to make trips without paying double fares. This could be quickly extended to include rail stations within the city. To make the most effective use of the very extensive transit system already in place, MTA should expand its unlimited-ride 7-day and 30-day passes to include 24-hour and 2-hour passes. MTA could go to a “proof-of-purchase” fare system, now used on its *Select Bus Service*, system-wide. This would speed boarding and reduce fare evasion. The Central Fare Zone, shown in the map, would be extended to include PATH, light rail and regional rail stations in Hudson County and Newark, reducing cross-Hudson gridlock.

4. introduce regional rail service on underutilized railroads in NYC

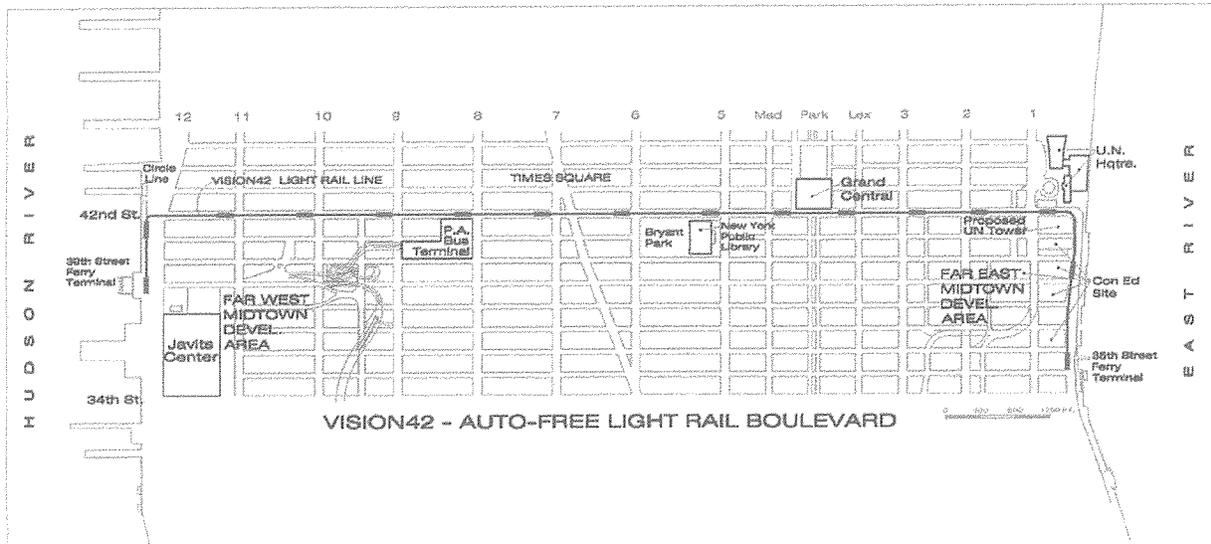
Regional rail service could be quickly added on two existing Amtrak rail lines in NYC, its Hell Gate Line and its West Side Line. The disused LIRR Rockaway Beach Line in Central Queens is largely in place, and could be restored very quickly – serving as an express one-seat ride rail line to JFK airport, as well as a critical link to improve access to flood-devastated Rockaway communities. The Bay Ridge freight line could be upgraded to handle freight and passenger trains, continuing on the Port Morris Branch in the Bronx, as well as the Montauk Branch in Queens.

Planning at the regional level is needed

These four measures should be advanced as part of a *comprehensive regional transportation plan* for NYC and the entire metropolitan area. In addition to integrated fares described above, the plan should include enhanced frequency on each major regional rail line, with at least one train every 20 minutes, including weekends and evenings. To handle the increased loads that would result, *through-running* operation at Penn Station is essential, avoiding conflicts between inbound and out bound trains and increasing capacity by 20% or more. More stairways and wider concourses at Penn Station are needed. By improving cooperative planning for regional rail in the near future are better positioned to advance more ambitious plans for much needed increases in Cross-Hudson rail capacity in the longer term, including a new rail link between Penn Station and Grand Central as described in the attached thumbnail.

The NY City Council should urge the NYCDOT and NYCDCP to take a leadership role in advocating for this plan. The commissioners of these two city agencies serve as voting members of the NY Metropolitan Transportation Council (NYMTC) and should outline a comprehensive planning work program that can be Federally- funded through NYMTC.

Statement at September 21, 2015 NY City Council hearing on Citywide Ferry System
George Haikalis, President, Institute for Rational Urban Mobility, Inc.



The Institute for Rational Urban Mobility, Inc. (IRUM) is a NYC-based non-profit concerned with reducing motor vehicular congestion and improving the livability of dense urban places.

IRUM urges the NY City Council to seriously consider including a 42nd Street light rail line – river-to-river, ferry dock-to-ferry dock, as an integral part of a plan for a citywide ferry system. A map of this proposal – **vision42** - is shown above.

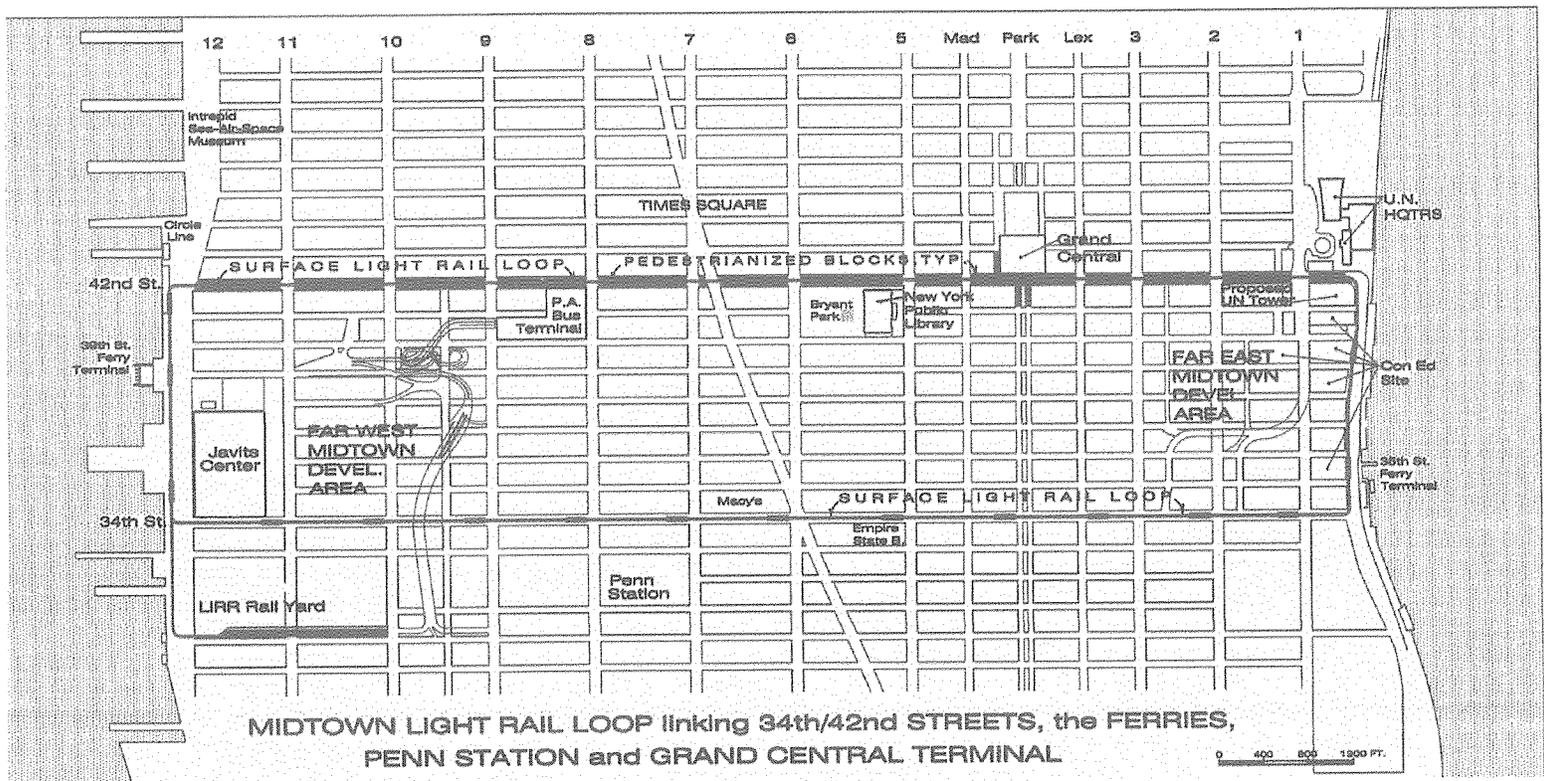
The Manhattan Central Business District (CBD), by far the nation's largest, is an important economic engine for NYC and the entire the NY-NJ-CT region and is a key generator of public transit trips. Clearly good access to the core of the CBD is an important element in a successful ferry system. The Staten Island Ferry owes its utility to the valuable subway and bus connections at South Ferry.

A crosstown surface light rail on 42nd Street would allow passengers using ferries to reach important destinations that are a long walk from the city-owned waterfront ferry terminals at 39th Street on the Hudson River, and at 35th Street on the East River. While the Hudson River ferry terminal is an imposing new facility, the East River terminal clearly needs a major expansion.

The 42nd Street light rail line is estimated to cost a half billion dollars. It will greatly improve access to the many developments that line this renowned thoroughfare, boosting commercial and residential property values in the corridor by an estimated four billion dollars. Capturing a fraction of this gain would pay for the light rail investment, not even counting the enhanced value to a citywide ferry system.

As a second phase, the light rail line could be extending across 34th Street, creating a loop that would conveniently distribute ferry riders to much of Midtown.

IRUM urges the City Council to seriously consider this inland connection as an integral part of a citywide ferry system.



Midtown Light Rail Loop

Creating a river-to-river light rail loop in Midtown Manhattan, extending the **vision42** concept for an auto-free light rail boulevard on 42nd Street to include a dedicated transitway on 34th Street, would greatly enhance surface transit mobility and improve the pedestrian environment in traffic-clogged Midtown Manhattan.

Light rail transit is much more appealing than bus transit. Its proven technology provides a smoother ride with a self-enforcing path and has the permanence that reinforces development. A five-mile loop would cost about \$1 billion, less than half the cost of the one-mile, one stop #7 subway extension to Hudson Yard now under construction.

The two-way light rail loop would be fully integrated into the existing bus and subway system using a proof of purchase fare collection system similar to the ones in place elsewhere in NYC. The auto-free plazas on 42nd Street would be fitted with pedestrian amenities like plantings and benches, and where appropriate, bike lanes would be included. North-south traffic would continue to operate as at present. Space for trucks making deliveries to businesses on 42nd Street would be reserved on avenues. Studies have shown that increased business activity on these blocks would more than offset the added cost of deliveries. On 34th Street light rail line would also be placed in the center of the street. The three blocks on 34th Street between 5th Avenue and 8th Avenue which have some of the highest pedestrian volumes in the city, would also become auto-free. Elsewhere, a limited portion of the street would remain open for deliveries and local access.

The loop will provide high quality surface transit access to waterfront parks and would serve as a distributor for East River and Hudson River ferries and for Penn Station and Grand Central Terminal. It will stimulate and reshape development projects in the more remote East Midtown and West Midtown areas, making them more transit friendly and sustainable.



Light Rail/Pedestrian Street Grid For Manhattan

Starting with **vision42** - an auto-free light rail boulevard on 42nd Street – as a prototype, a whole grid of these streets would make sense in Manhattan, the nation’s most crowded urban place. While a number of options are worth considering, the grid shown in this diagram includes many of the streets that have the greatest number of pedestrians. Light rail would replace existing local and limited city bus routes on most of the avenues and many crosstown streets. About 61 miles of light rail line are included in this plan, of which 51 miles would be in pedestrian-only streets. At \$200 million per mile, the grid would cost about \$12.2 billion to construct. This plan would work best if combined with key strategies to reduce car use, like congestion pricing and car free Central Park Drives. Enough streets would remain open to traffic to accommodate goods movement and essential car traffic. In Lower Manhattan and in the Village additional auto-free streets, without light rail lines would make sense.

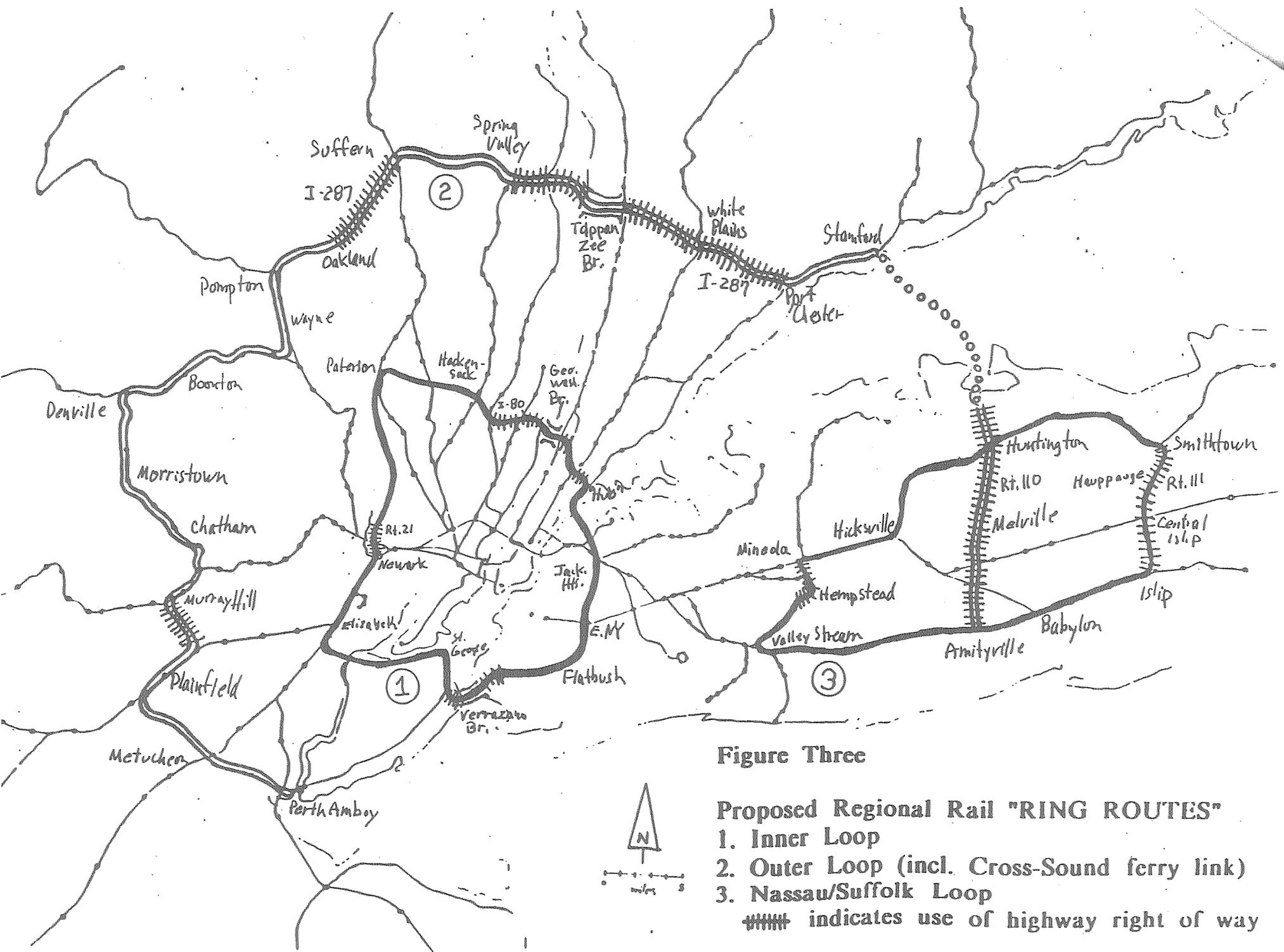
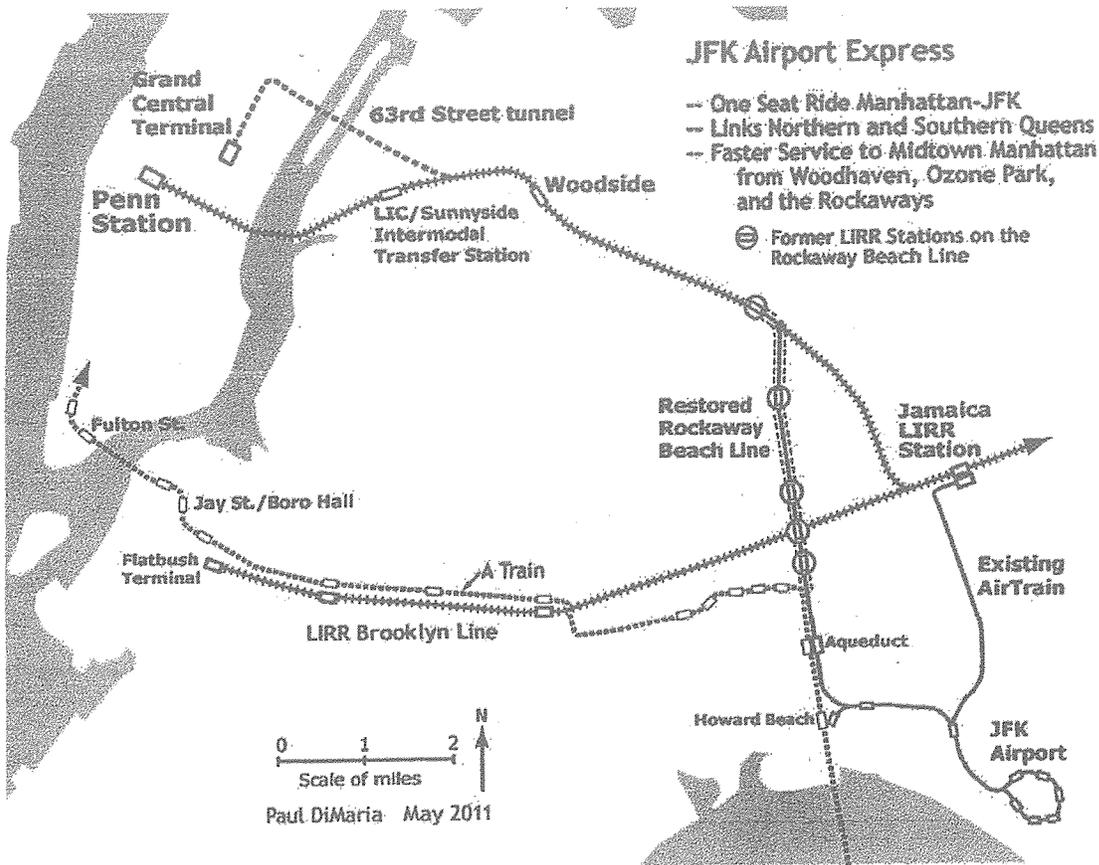


Figure Three

Proposed Regional Rail "RING ROUTES"

- 1. Inner Loop
- 2. Outer Loop (incl. Cross-Sound ferry link)
- 3. Nassau/Suffolk Loop

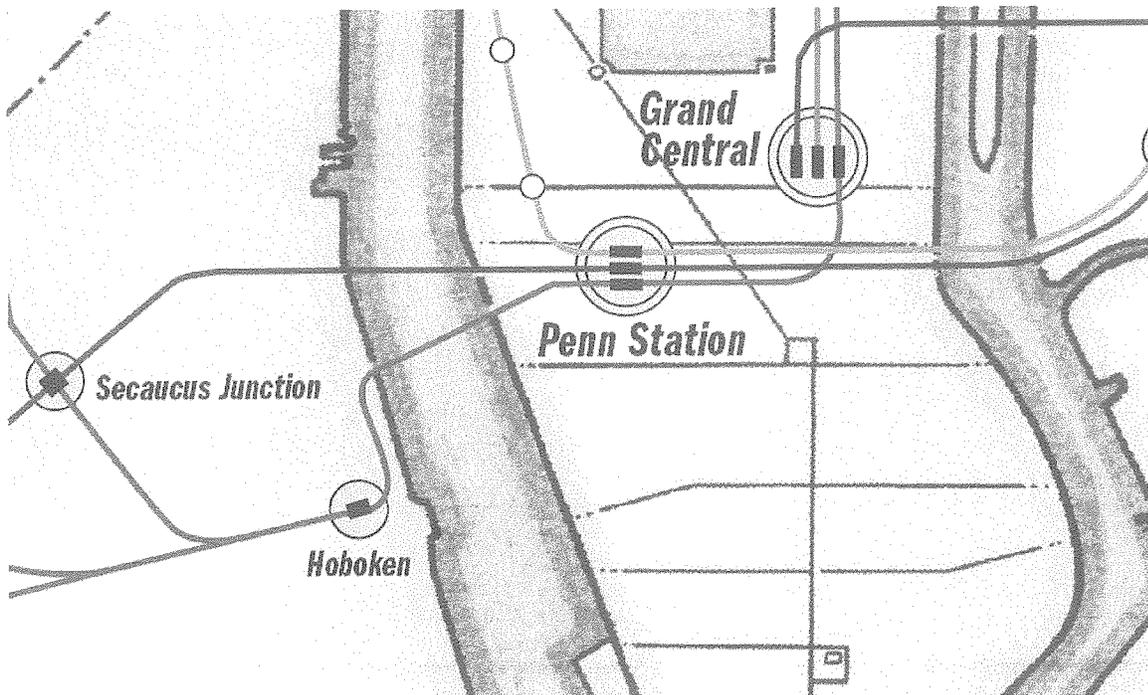
indicates use of highway right of way



A Greener Queens: Rail-Plus-Trail for LIRR Rockaway Beach Line

Restoring the 3.5 mile disused LIRR Rockaway Beach Branch in Central Queens for a fast one-seat ride rail service between Manhattan and JFK Airport, and using the remainder of this city-owned right of way for a walking/cycling trail and more public open space would produce a greener, more sustainable Queens. A high quality rail link would reduce the noise and pollution produced by the legendary traffic overloads on Woodhaven Boulevard and the Van Wyck Expressway, while enhancing the economic viability of the airport, which is a major employer in Queens, and the Manhattan business center – an important workplace for many Queens residents. It would cut travel time by 30 minutes between the storm-ravaged Rockaway Peninsula and Northern Queens and Midtown Manhattan.

The new one-seat service would use a small fleet of specially designed rail cars that could operate on both LIRR and AirTrain tracks, and a short track connection north of Howard Beach. At Aqueduct, a cross-platform transfer would make it easy for A train riders to use the JFK Airport service to Midtown Manhattan and permit airport riders to reach Downtown Brooklyn and Lower Manhattan.¹ Special provision for noise barriers would be an important feature. With frequent service and integrated fares, the rail link would encourage transit use throughout Queens. Consideration should be given to asking motorists, who now use costly on-airport roadways to drop off and pick up passengers without charge, to pay their fair share and help fund the rail-plus-trail, easing congestion and producing a Greener Queens.



Build new Hudson River Passenger Rail Tunnels via Hoboken/Jersey City/Penn Station and Grand Central

A simple and cost-effective way to remake the region's three commuter rail lines into a coordinated **Regional Rail System** is to route much-needed new Hudson River passenger rail tunnels by way of the Hoboken/Jersey City waterfront business district. A new on-line station would be constructed just south of the Hoboken Terminal and a new 2.3 mile two-track tunnel would connect with existing tracks and platforms at Penn Station, NY. A new 1.2 mile two-track tunnel would be constructed under 31st Street and Park Avenue to link with existing tracks and platforms in the Lower Level of Grand Central Terminal. New stairways and wider concourses are critical to rebuilding Penn Station into a suitable gateway to NYC. Thru-running increases capacity and connectivity while permitting removal of rail yards for new resilient waterfront development. It efficiently uses existing rail infrastructure, avoiding adverse environmental impacts of new rail trackage in the Hackensack Meadowlands. The Penn Station-Grand Central connection avoids the costly plan to expand Penn Station to the south, which require acquisition of dozens of buildings, displacing thousands of workers.

The Penn Station-Grand Central connection allows west of Hudson residents to reach destinations in East Midtown, the largest concentration of office buildings in the nation and makes it easier for Bronx, Westchester and Connecticut residents to reach the growing West Midtown area as well as Hoboken/Jersey City, Newark and Newark Airport. An interconnected **Regional Rail System** -- with frequent service, integrated fares and through-running -- provides an attractive alternative to driving on crowded highways that cannot be expanded and increases the economic viability of the region in the face of growing global competition.

Remarks Regarding Intros. 670, 965 and 903

by Stephen Bauman, sbauman@abt.net

Intro 670. This resolution calls upon the MTA to equalize fares and transfers between the NYC subway system and the commuter railroads within NYC. It does not make clear whether the equalization should be accomplished by lowering the commuter rail fares within NYC or by raising the subway fares.

Intro 965. The MTA has not been expanding the subway system with great rapidity. Each five year report is likely to be a copy of its predecessor. Reports using census blocks yield more accurate and precise results rather than those using census tracts. The one third mile distance criterion for describing a transit desert too strict.

I have made my own transit assessment, using different category criteria. My categories are: less than ½ mile (walking), between ½ and 2 miles, and greater than 2 miles. The ½ mile walking distance criterion is based on the Board of Ed's no school bus policy for 8 year old third grade students some 60+ years ago.

The city and borough wide totals are shown in Table 1.

Area	0.0 to 0.5 Miles		0.5 to 2.0 Miles		More than 2.0 Miles	
	Population	Percent of Area	Population	Percent of Area	Population	Percent of Area
Bronx	1,131,961	81.7%	240,409	17.4%	12,738	0.9%
Brooklyn	2,137,994	85.4%	357,851	14.3%	8,855	0.4%
Manhattan	1,544,824	97.4%	41,049	2.6%	0	0.0%
Queens	1,163,141	52.1%	692,635	31.0%	374,946	16.8%
Staten Island	145,522	31.0%	201,384	43.0%	121,824	26.0%
New York City	6,123,442	74.9%	1,533,328	18.8%	518,363	6.3%

This table shows that many Queens and Staten Island residents lack the walk to subway access that is available in other parts of the City.

Figures 1 to 5 are borough maps that show these three access categories. The red hatched area shows the 0.0 to 0.5 mile walking distance area with the corresponding subway entrance. The green hatched area shows the 0.5 to 2.0 mile area with half mile contours. The white areas show parts of New York City that are more than 2.0 miles from a subway entrance.

The areas more than 2.0 miles from a subway entrance are Northeast, Eastern and Southeast Queens and Northern and Western portions of Staten Island. It comprises one half million people or 6% of the City's population. As gentrification progresses, poorer people will be pushed into these areas. This is the trend of most European cities. Those with money live in the city center; those without live in the far fringes.

It stands to reason that priority for subway expansion should be directed towards providing access to these areas. Too many current and past projects concentrated on improving service

to areas that already enjoyed it. One metric for judging how well a project contributes to the goal of meeting the needs of these under-served areas is how many new residents are brought within 0.5 miles of a subway station.

Intro 903. There is a reason many rail corridors in the City are underutilized. The subway expansion of the 1910's and 1920's proved too competitive. The nickel fare drove these commuter rail lines out of business. The commuter rail corridors survived in the area beyond the subway expansion. Therefore, it's not likely that using any of these underutilized rail corridors would bring much service to those who live more than 2.0 miles from an existing subway entrance.

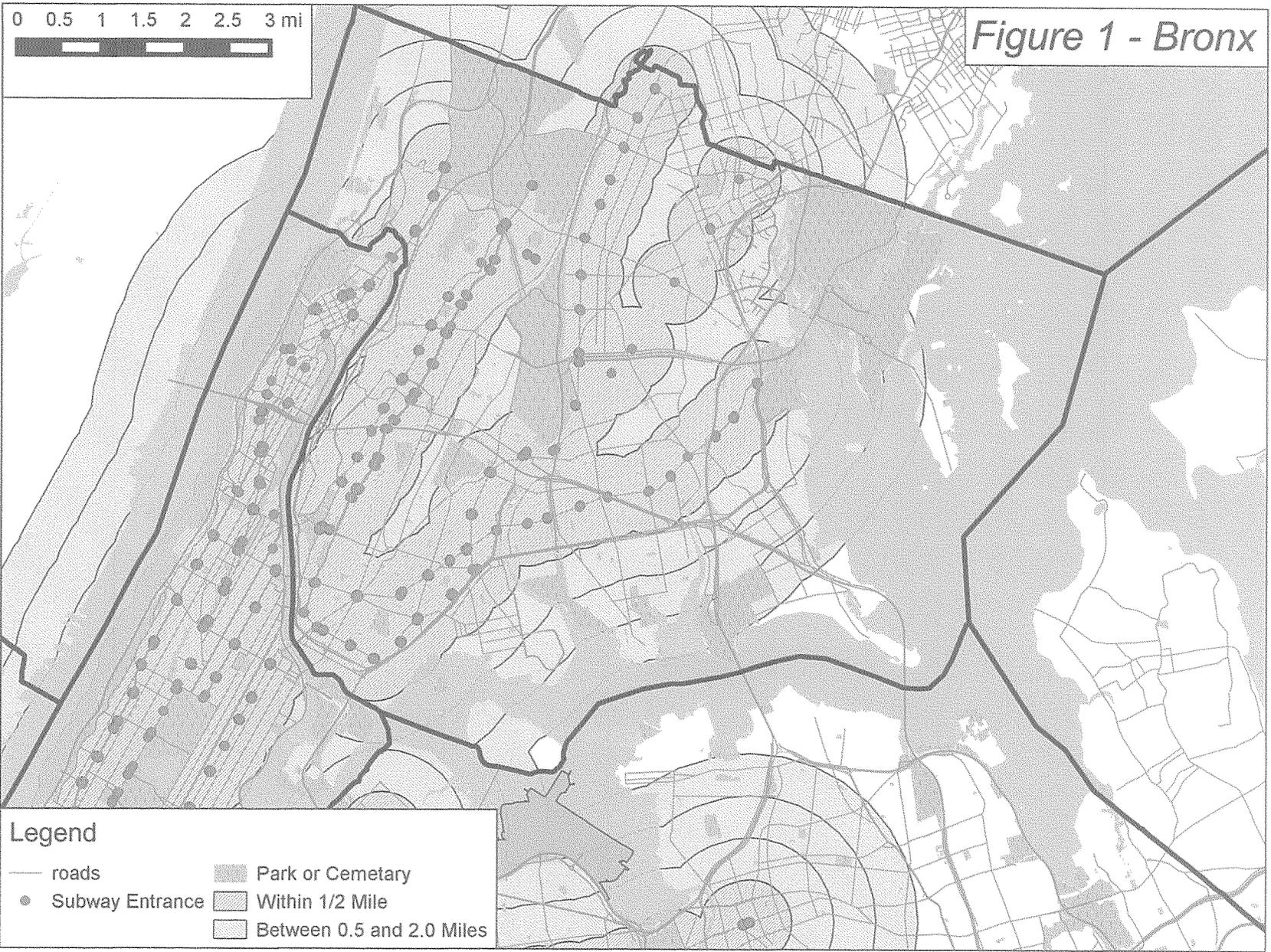
Reactivating the Montauk Branch between Long Island City and Jamaica will provide 31,766 new New York City residents 0.5 mile access to a subway entrance. However, as Figure 6 shows, all these residents were within 1.5 miles of an existing subway entrance. None lives beyond 2.0 miles.

Reactivating the Rockaway Beach Branch between Rego Park and Ozone Park will provide 13,491 new Queens residents 0.5 mile access to a subway entrance. However, as Figure 7 shows, all these residents were within 1.5 miles of an existing subway entrance. None lives beyond 2.0 miles.

The Regional Plan Association's Triboro Rx plan between Bay Ridge and Woodside will provide 0.5 mile subway entrance access to 76,012 new New York City residents. 53,000 will live in Brooklyn and 23,000 will live in Queens. However, as Figure 8 shows all these residents already live within 1.5 miles of a subway entrance. None lives beyond 2.0 miles.

None of these projects will benefit the half million residents who currently live beyond 2.0 miles of a subway entrance. Projects must point east and southeast in Queens to help these people.

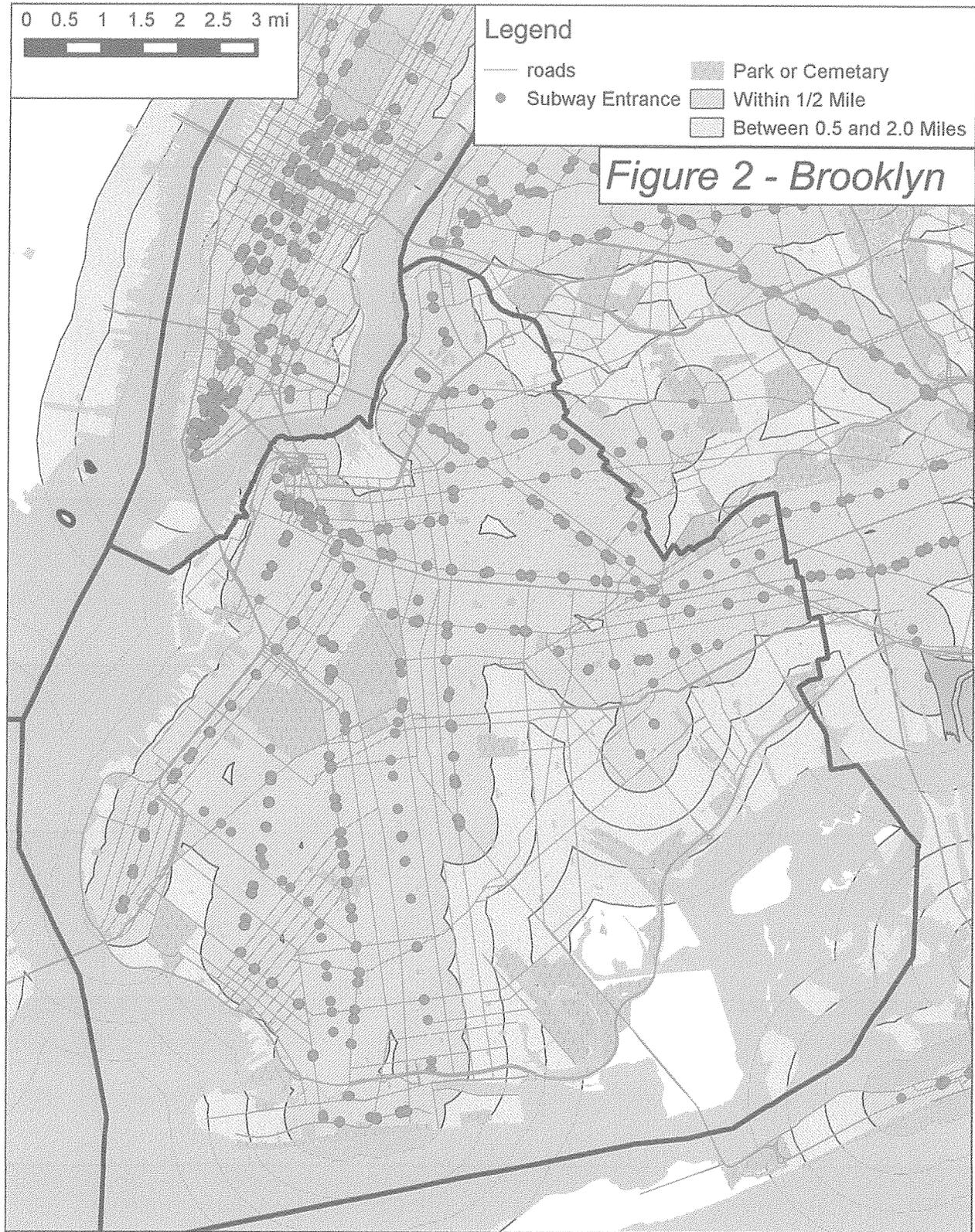
Utilizing Staten Island's North Shore right of way will bring 52,035 new residents within 0.5 mile one of the old SIRT stops. Many will be beyond 2.0 miles from an existing SIRT station.



0 0.5 1 1.5 2 2.5 3 mi

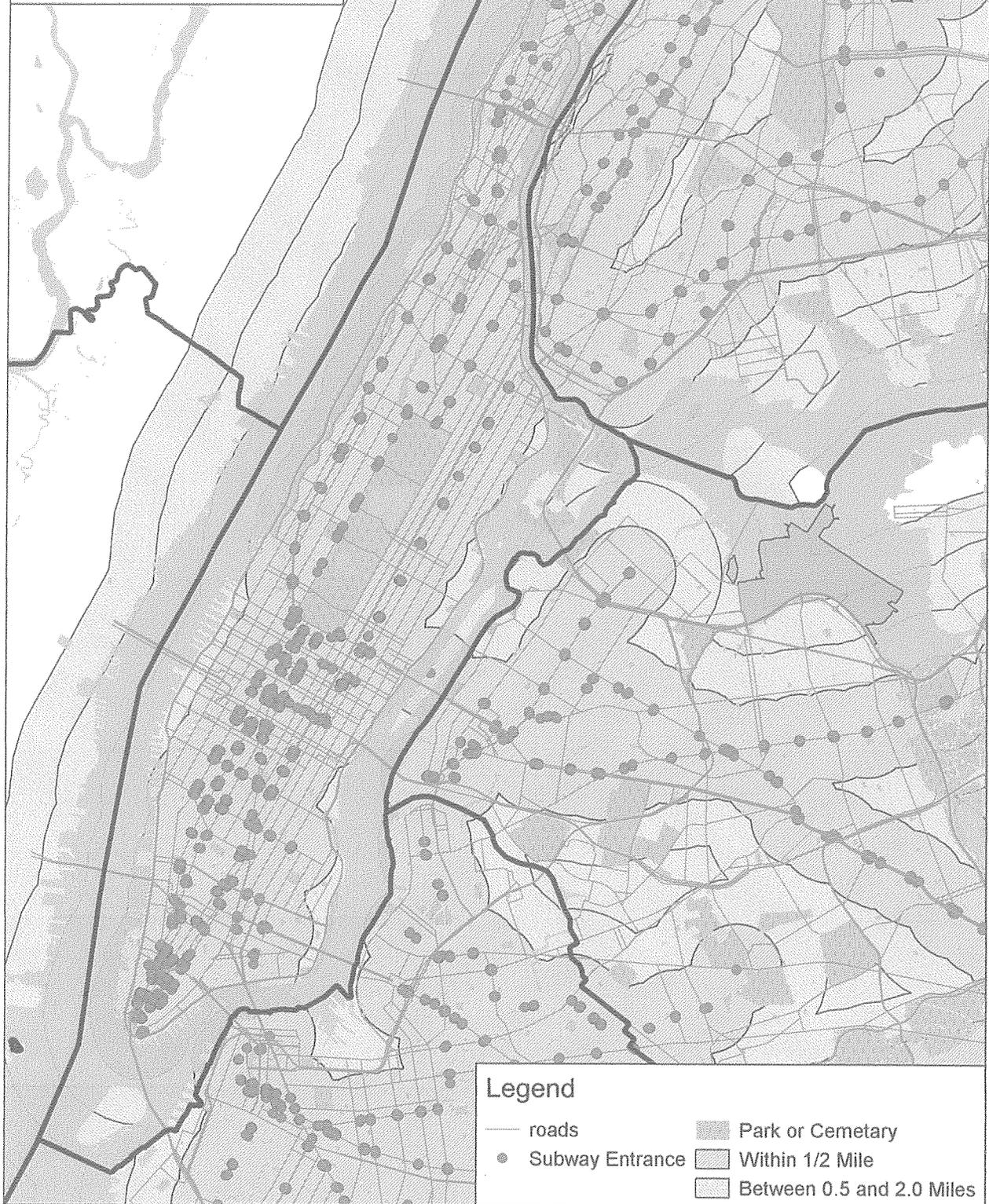
Figure 1 - Bronx

- Legend**
- roads
 - Subway Entrance
 - Park or Cemetary
 - Within 1/2 Mile
 - Between 0.5 and 2.0 Miles



0 0.5 1 1.5 2 2.5 3 mi

Figure 3
Manhattan



Legend

- roads
- Subway Entrance
- ▨ Park or Cemetary
- ▩ Within 1/2 Mile
- ▧ Between 0.5 and 2.0 Miles

0 0.5 1 1.5 2 2.5 3 mi

Figure 4 - Queens



Legend

— roads	■ Park or Cemetary
● Subway Entrance	■ Within 1/2 Mile
	■ Between 0.5 and 2.0 Miles

0 0.5 1 1.5 2 2.5 3 mi



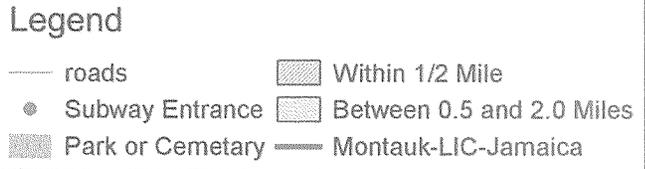
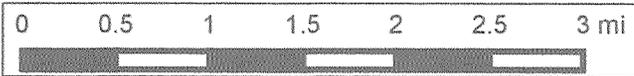
Figure 5 - Staten Island



Legend

- roads
- Subway Entrance
- Park or Cemetary
- ▨ Within 1/2 Mile
- ▩ Between 0.5 and 2.0 Miles

Figure 6
Montauk Br
LIC - Jamaica



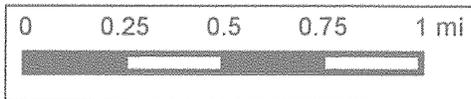
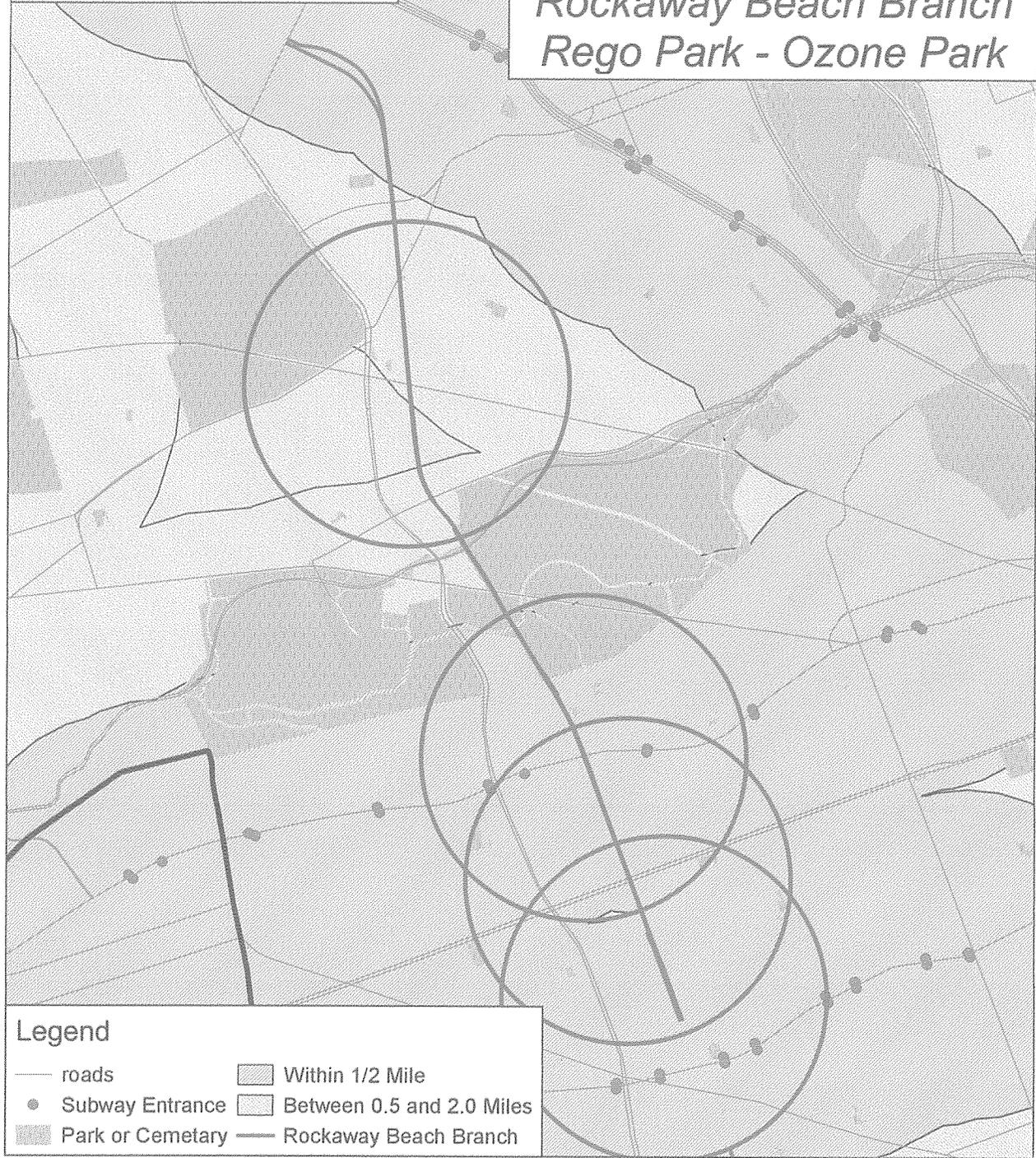


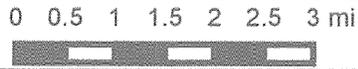
Figure 7
Rockaway Beach Branch
Rego Park - Ozone Park



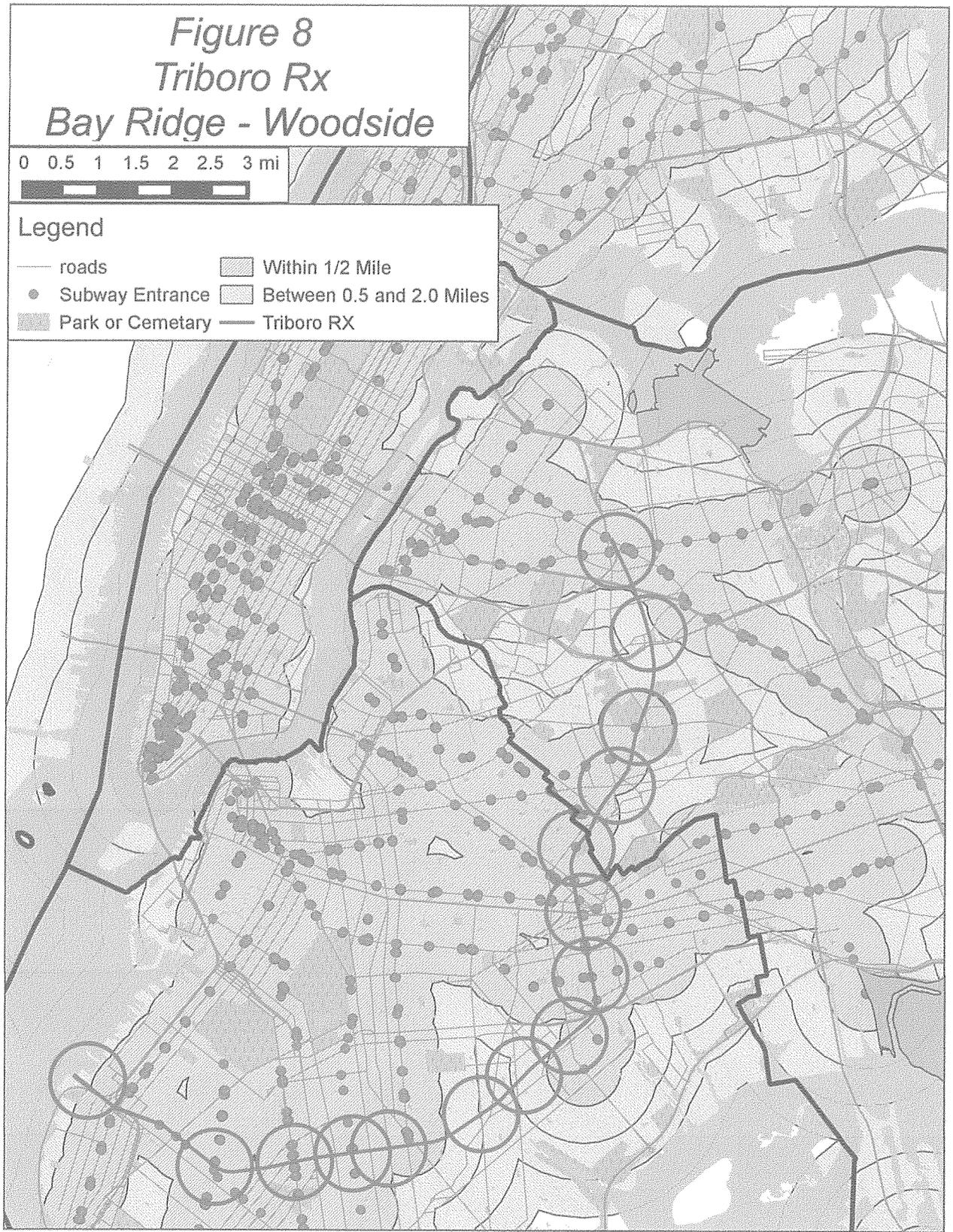
Legend

— roads	◻ Within 1/2 Mile
● Subway Entrance	◻ Between 0.5 and 2.0 Miles
▨ Park or Cemetary	— Rockaway Beach Branch

*Figure 8
Triboro Rx
Bay Ridge - Woodside*



- Legend**
- roads
 - Subway Entrance
 - Park or Cemetary
 - Within 1/2 Mile
 - Between 0.5 and 2.0 Miles
 - Triboro RX





New York City Council Committee on Transportation
Hearing on Int. 964, 965 and Res. 670
Connecting Transportation Deserts

November 12, 2015

Testimony by Pierina Ana Sanchez,
Associate Planner, New York
Regional Plan Association

Good morning, my name is Pierina Ana Sanchez and I am an associate for policy and planning at Regional Plan Association, which aims to improve the New York metropolitan region's economic health, environmental sustainability and quality of life through research, planning and advocacy.

We appreciate the Council's efforts to address one of New York's most critical problems—insufficient transportation to underserved neighborhoods. Earlier this year, RPA released a report, *Overlooked Boroughs: Where New York City's Transit Falls Short and How to Fix It*, with findings and recommendations that are relevant to the resolutions before the council today. I'd like to highlight a few of these for the committee's consideration.

Though New York's transit network was designed in the early part of the last century to bring residents to the urban core and out again, today, more outer borough residents commute within and between the boroughs than they do to Manhattan; **1.7 million** commuted to jobs within the boroughs in 2010, an increase of 18% from a decade earlier. Fewer New Yorkers -- about one million -- commuted to jobs from the outer boroughs to Manhattan, up 12% from 2010.

Today, three core challenges confront residents of the other boroughs trying to get to work, schools, doctor's appointments, shopping and other needs:

- The subway is of limited use for travel within the boroughs.
- Bus service in the boroughs is slow and infrequent, and many residents need to take two or more buses to reach their destination.
- The metropolitan region's vast commuter rail network could be far better utilized in the boroughs.

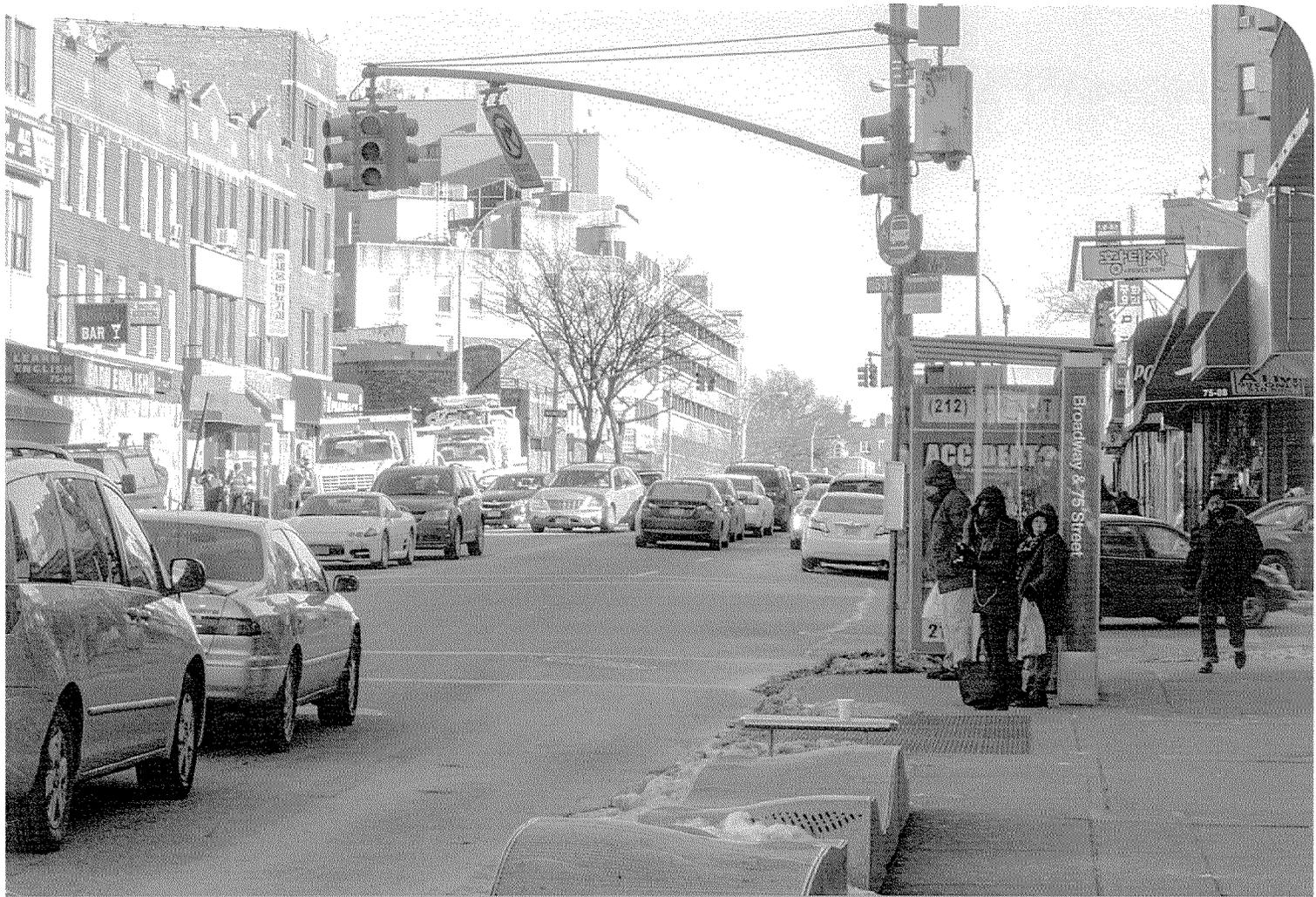
Residents of the outer boroughs sometimes need to take circuitous journeys through Manhattan in order to travel to work or school in another borough, adding significant time to their commutes. The transit gap falls especially hard on lower-income households, who are less likely to own cars and rely heavily on mass transit for their daily commutes. Lower-income residents are more likely to work in sectors such as retail and health care, industries with jobs spread throughout the five boroughs. They also are less able to afford taxis, and have fewer service and retail options within walking distance than more affluent neighborhoods. And the higher cost of commuter rail service can be a barrier to residents who might otherwise look for reverse-commute jobs in the suburbs.

Much of the growth in jobs, homes and travel in the coming decades will take place outside Manhattan, but that growth won't be sustainable unless we make some very significant changes to our transit system. Good transit access plays an enormous role in expanding opportunity to education and jobs. As New York works to foster a new supply of housing to meet surging demand, we need to think more broadly about how our transit network will accommodate the city's needs well into the 21st century.

We can address this need through a series of short- and longer-term measures, including the following:

- **Increase the frequency of bus service on dozens of outer-borough routes:** There are 56 bus routes in the city where frequency falls short of an acceptable standard of 10 minutes in the peak period, 15 minutes at other weekday times, and 20 minutes on weekends. We estimate that it would cost \$28 million per year, not including capital costs for additional buses and depots, to bring all routes up to these standards.
- **Speed bus service by implementing contactless fare payment, better traffic enforcement and other measures.** Right now, the average speed of a local bus in New York City is 8 miles per hour. The measures suggested here could improve speeds on all 200 bus routes in the city.
- **Expand Select Bus Service on an additional eight corridors, two in each borough except for Manhattan.** The eight SBS routes implemented to date have demonstrated that faster service is possible. The additional routes recommended in our report meet several criteria for successful SBS service.
- **Run a 24-mile over-ground rail line running on an existing rail right-of-way from Bay Ridge in Brooklyn, through Queens, to Co-Op City in the Bronx, to carry passengers directly from one outer borough to another.** These lines can successfully handle both freight and passenger service. We estimate that more than 100,000 riders would use the 24-mile, 22-station Triboro line, with stops strategically situated to establish convenient transfers to subway stops and bus route.
- **Extend the Second Avenue subway both north to the Bronx and south to Lower Manhattan.** It is critical to restore funding in the MTA's capital plan to complete the extension of the subway to East Harlem. This could set the stage for future extensions that would serve low-income communities in the Bronx as well.
- **Increase off-peak and reverse commute service on Metro-North in the Bronx and the Long Island Rail Road in Queens.** Six stations in the Bronx all fall short of a 20-minute peak (both directions) and 30-minute off peak standard. In Queens, eight stations have inadequate service in the off-peak and during midday hours
- **Reduce weekday commuter rail fares for trips within New York City.** Today, the railroads offer a half-price City ticket — but only on weekends. This makes using the railroad a prohibitive burden for many city residents. RPA recommends that expansion of the discount to weekdays. The commuter rail service would become more competitive to the subway, shifting some borough residents from the subway to the railroads, if they were willing to pay a small premium, reducing crowding on subway lines in Queens and the Bronx. The estimated cost to the MTA after accounting for the revenue gained by the shift from subway to commuter rail is \$30 million annually.

We would be happy to provide additional information on any of these recommendations as the Council deliberates on the resolutions and actions before it today.

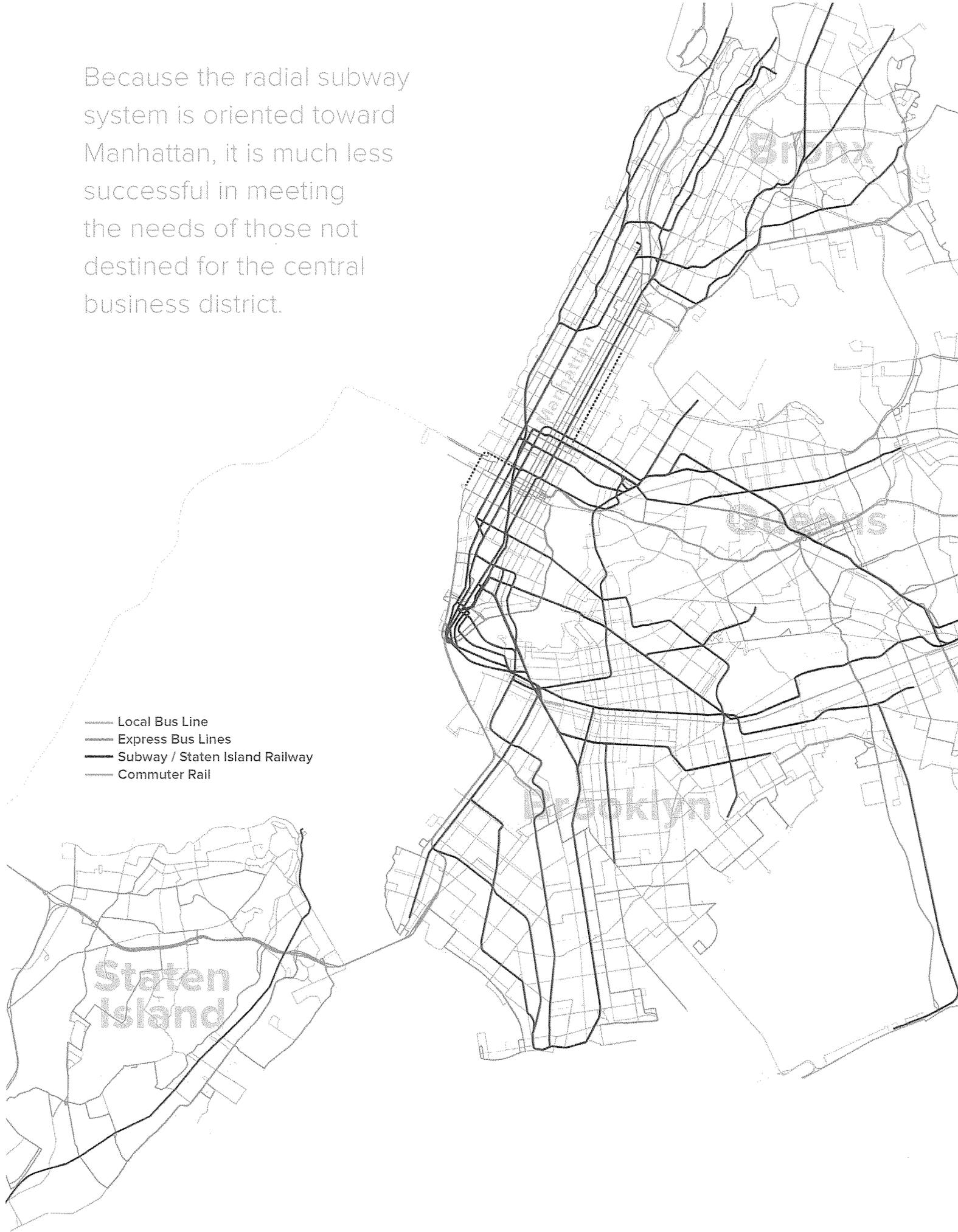


Overlooked Boroughs

Where New York City's Transit Falls Short and How to Fix It

Executive Summary | February 2015

Because the radial subway system is oriented toward Manhattan, it is much less successful in meeting the needs of those not destined for the central business district.



- Local Bus Line
- Express Bus Lines
- Subway / Staten Island Railway
- Commuter Rail

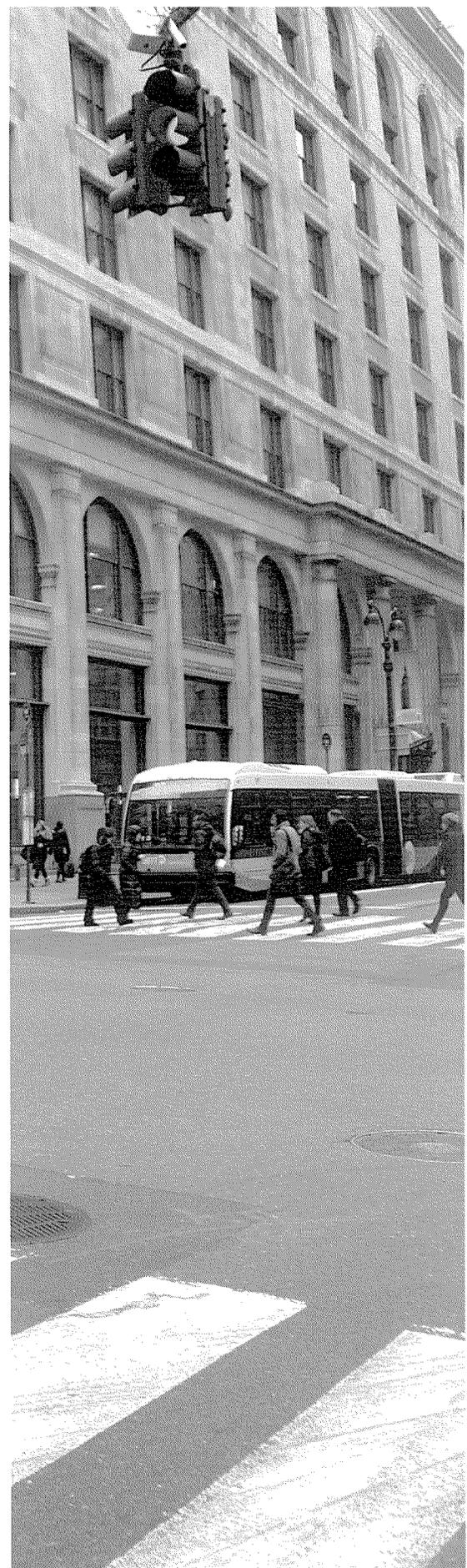
New York City's subway system, built mostly in the first third of the 20th century, was designed to open up the rapidly growing city to residential development beyond lower Manhattan. That was accomplished remarkably well. Collectively, the Bronx, Brooklyn and Queens added three million people from 1910 to 1940. Today, these subway lines, along with bus, commuter rail and ferries, deliver almost 90% of those traveling to work in Manhattan below 60th Street. Without this transit network, the economic engine and the heart of New York region couldn't function.

Because the radial subway system is oriented toward Manhattan, it is much less successful in meeting the needs of those not destined for the central business district. Indeed, less than half of the 3.4 million trips made within and between the boroughs¹ are made on transit. In contrast, almost nine in every 10 trips for work made to and from the boroughs to the Manhattan business district are on transit.

A well-functioning transit system is especially important for both low- and average-income New Yorkers, the majority of whom who don't own a car. Not only does the system put them in reach of millions of jobs, but it enables them to get to schools, hospitals, cultural facilities, parks and services. This helps mitigate New York's high cost of housing, and it is part of the reason that low-income New Yorkers have a better chance of getting ahead than residents of many other U.S. regions.²

¹ In this report, the boroughs are defined as the Bronx, Brooklyn, Queens, Staten Island and Manhattan north of 96th Street on the East Side and north of 125th Street on the West Side.

² Raj Chetty, Nathaniel Hendren, Patrick Kline, Emmanuel Saez, *The Economic Impact of Tax Expenditures: Evidence from Spatial Variation Across the U.S.*, The Equality of Opportunity Project, July 2013. Summary of Project Findings. Among its findings, this comprehensive study found that the New York region ranked high on scales that measured the chances of someone born in a low-income household achieving a relatively high income as an adult. It found several contributing factors, including shorter commuting times, characterizing places that provided greater opportunity for upward mobility.



The Boroughs Have Outgrown Our Manhattan-Oriented Transit Network



Photo: The All-Night Images (flickr)

The Bronx, Brooklyn, Queens, Staten Island and Upper Manhattan are home to 7.3 million people, who make more than 20 million trips a day.

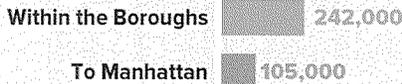
Job Growth, 1993-2013

Source: Bureau of Economic Analysis



Journey-to-Work Trips, 2000-2010

Source: U.S. Census

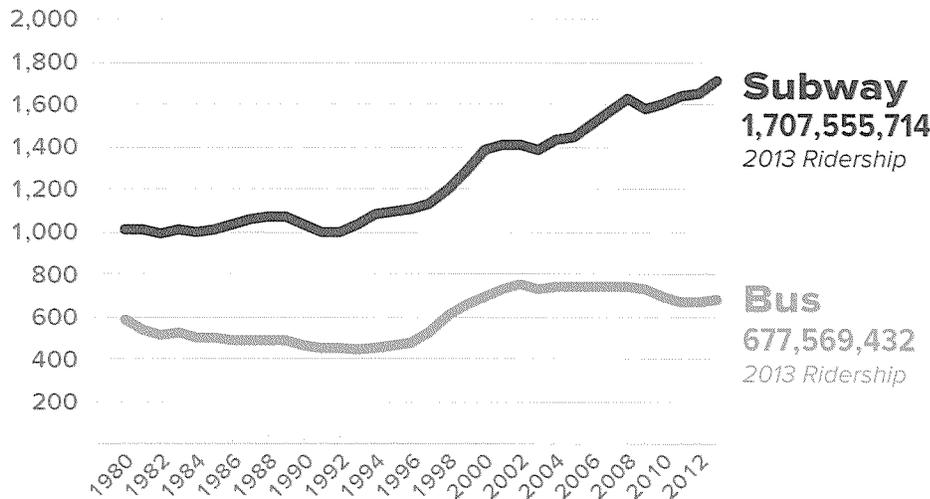


Jobs and population are growing faster in the boroughs and upper Manhattan than in the central business district. Over the last two decades, 774,000 jobs were created in the Bronx, Brooklyn, Queens and Staten Island, where jobs grew twice as fast as in all of Manhattan. What's more, growth in travel *within* the four boroughs exceeded the growth in travel into Manhattan. From 2000-2010, the number of people living and working in the boroughs grew by 242,000, while those destined for Manhattan grew by only 105,000. Sixty-one percent of New York City workers residing outside of Manhattan work in the other boroughs as well.

Inadequate service is a likely reason that New York's bus ridership has declined by 7% since 2003, even though the city's population and economy have grown and subway ridership has risen by 23% during that same period. For those who don't own a car and are unable to use the subway, including many seniors, the disabled and those not living near a subway, lack of good bus service is a significant detriment to quality of life and economic opportunity.

Annual Subways and Bus Ridership (millions)

Source: MTA



The disproportionate growth in jobs and travel outside of the central business district is expected to continue. As the workforce of the boroughs expands, more jobs will follow. There is more room for growth outside of Manhattan, and many future jobs will be in health care, education, technology and other sectors that don't need to be in a high-cost office district. More jobs outside Manhattan's core can help revitalize neighborhoods, expand economic opportunity and increase the city's tax base. Yet growth won't be sustainable if the transportation network is ill-equipped to handle it, and opportunities will be limited if it's too difficult for residents to get to jobs.

This report examines how effectively our transit system meets the mobility needs of the boroughs today and recommends both small- and large-scale changes in the transit system that would expand opportunities for borough residents and create benefits to the economy of the city and region.

The Manhattan-oriented transit network is already straining to meet rising demand, and the burden will only grow. Many heavy travel markets are unserved, requiring circuitous, time-consuming and multiple-transfer journeys by combinations of bus and subway. Even those traveling at times and to places where transit is more available will often choose to drive if they own a car rather than dealing with the shortcomings of traveling by transit within the boroughs.

The subway network leaves out large parts of the city, and is of limited use for travel within the boroughs.

In parts of Queens, Brooklyn and the Bronx there are entire neighborhoods located beyond a comfortable walking distance to a station, making it necessary to rely on another vehicle, usually a bus, to access the subway. Staten Island doesn't have a subway, and the Staten Island Railway, built in the early 20th century, serves only a small fraction of that borough's land area. Even for those who live near a subway, many trips that stay within the outer boroughs require an additional mode

of transportation. Even when they can be accomplished via transit, trips between boroughs by subway are especially long and arduous, often requiring a trip through Manhattan first. Many places around the world – London, Madrid, Tokyo and others - have long since identified this limitation and taken steps to introduce partial or complete circumferential lines to allow riders to navigate around city centers. Aside from travel time savings and improved access, circumferential services also provide redundancy for the system, take pressure off existing radial lines and foster development in outlying areas of the city.

Bus service in the boroughs is slow and infrequent.

The average speed of a local bus is New York City in 8 miles per hour. In Manhattan and much of the Bronx and Brooklyn, speeds are even slower, only twice as fast as a pedestrian and slower than cycling. Even express buses, which are designed to serve travel to Manhattan, average only 11 miles per hour. Local bus service is often infrequent, meaning long waits and crowded buses. Many routes aren't aligned with the most desired trips, leaving the rider no choice but to transfer, adding to the time and inconvenience of bus use.

The commuter rail networks largely bypass the boroughs.

The service and fare policies of Metro-North and Long Island Rail Road aren't designed to attract those living and working within New York City. There has been a substantial increase in reverse commuting from Manhattan and the Bronx to the northern suburbs, fueled largely by the job growth in White Plains and Stamford and new track capacity that permitted additional reverse service. The LIRR hasn't experienced similar growth, due to insufficient capacity for rush-hour reverse service and few large job concentrations near suburban stations.

Low-Income and Car-Less Households Are Especially Burdened



Photo: Susan Sermoneta (flickr)

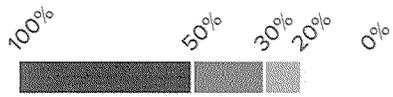
Many residents of the boroughs depend on the transit system because they don't own a car. More than half the households in the city are without one, including almost four of five in Manhattan, close to 60% in the Bronx and Brooklyn, and more than one-third in Queens. Most of the remaining households in those boroughs own only one vehicle, which is a handicap for two-worker households. On Staten Island more than half the residents own one or none. Low-income households depend on good transit service. While most low-income neighborhoods are within walking distance of a subway station, there are several communities with high poverty and a high share of autoless households that are not, including parts of Morrisania and East Tremont in the Bronx, East Harlem in Manhattan, East New York, Flatlands, and Canarsie in Brooklyn, and Elmhurst, Corona and South Jamaica in Queens.

Even low-income residents who live near a subway are more burdened by the lack of effective intra-borough transit. On average, jobs in the Manhattan central business district have higher education and entry-level requirements than jobs in the other

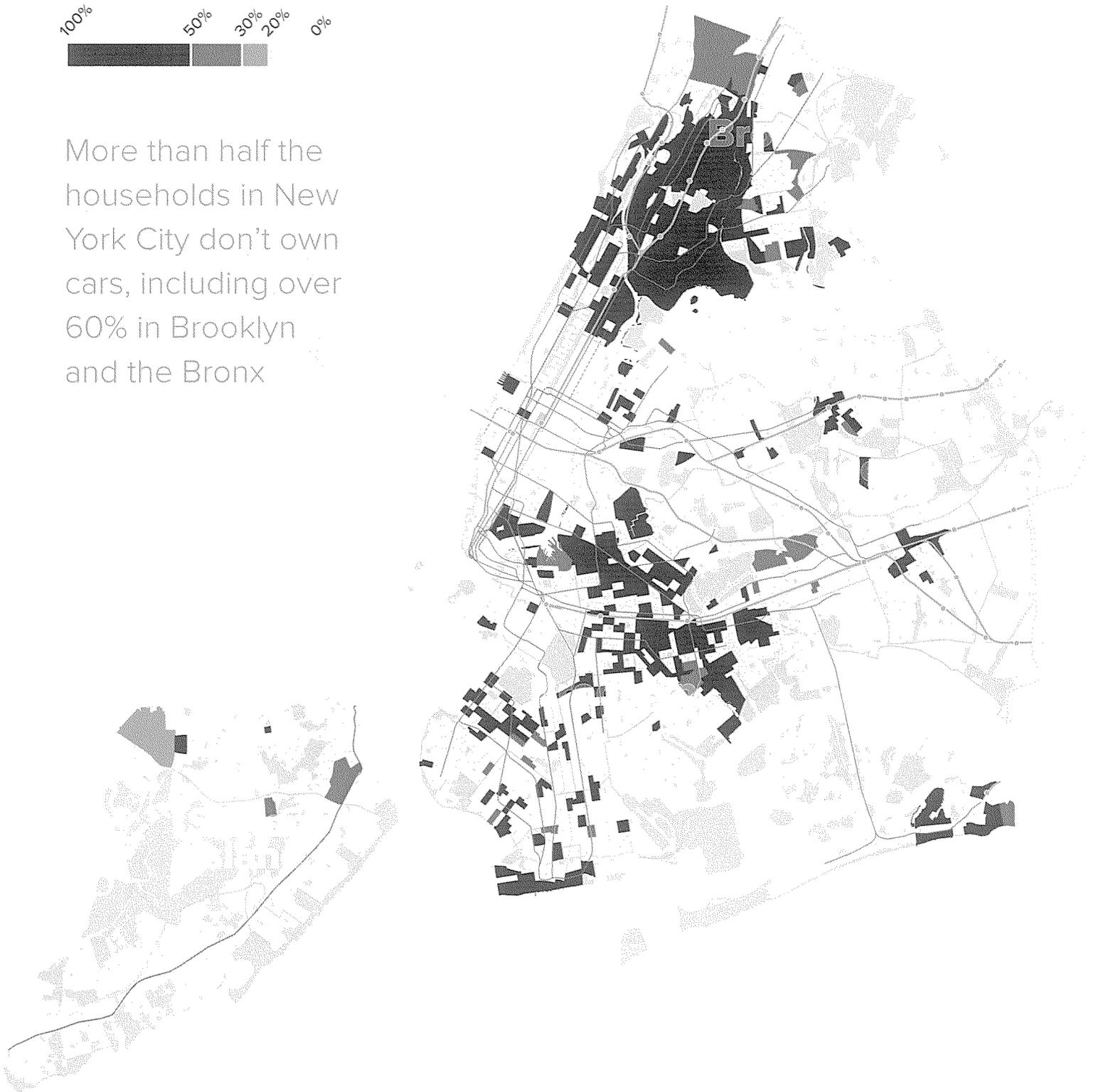
boroughs, leaving many poor and moderate-income households more dependent on retail, industrial, health care and service jobs that are spread throughout the boroughs. Many poorer neighborhoods have relatively few jobs within walking distance, leaving many workers to rely on long and often unreliable bus or subway trips.

Lower-income households also are less able to afford taxis and frequently have fewer service and retail options within walking distance than more affluent neighborhoods. The cost of commuter rail service also is a barrier for many who might otherwise look for jobs in the suburbs or use commuter trains where subway service is lacking.

Car-Less Household Shares
in Low Income Areas



More than half the households in New York City don't own cars, including over 60% in Brooklyn and the Bronx



Recommendations

New York's transit system, designed to accommodate demographic and travel patterns that existed 100 years ago, needs to be adapted and expanded to better address the way residents work and live today and to take into account how the city is likely to change and grow in the coming decades.

Much can be done to address the transit network's shortcomings and expand economic opportunity for residents of the four boroughs and Upper Manhattan. Many improvements are low-cost steps that can make a big difference in the short term. Others will cost more and take longer.

A comprehensive strategy to upgrade the transit system will need to achieve three complementary goals:

- ▶ Create a first-rate bus system
- ▶ Improve and extend rail service
- ▶ Make commuter rail work for borough residents

The recommendations that follow were developed from a rigorous evaluation of existing service using nine criteria that a transit user would consider — proximity, frequency, span, speed, crowding, reliability, connectivity, amenity and price (*see diagram on following page*). Particular attention was given to the needs of low-income and auto-less households who are most dependent on transit.

In addition to data and service analysis, public meetings were held in five communities across the city. These meetings produced a wide variety of ideas and actions. Among the most often mentioned problems were the long walk needed to reach subways and buses, the need to make too many transfers, slow speed, particularly of buses, and infrequent service.

1 Create a first-rate bus system



Photo: zackz (flickr)

2 Improve and extend rail service



Photo: RPA

3 Make commuter rail work for borough residents



Photo: Nancy Borowick

9 Key Things That Determine the Appeal of Transit

Proximity: Is the transit stop nearby or will I have to walk too far at either end of my trip?

Frequency: Will I have to wait too long for a train or bus?

Span: Is service available and frequent enough at the times I need to make the trip?

Speed: Can I reach my destination in a reasonable period of time?

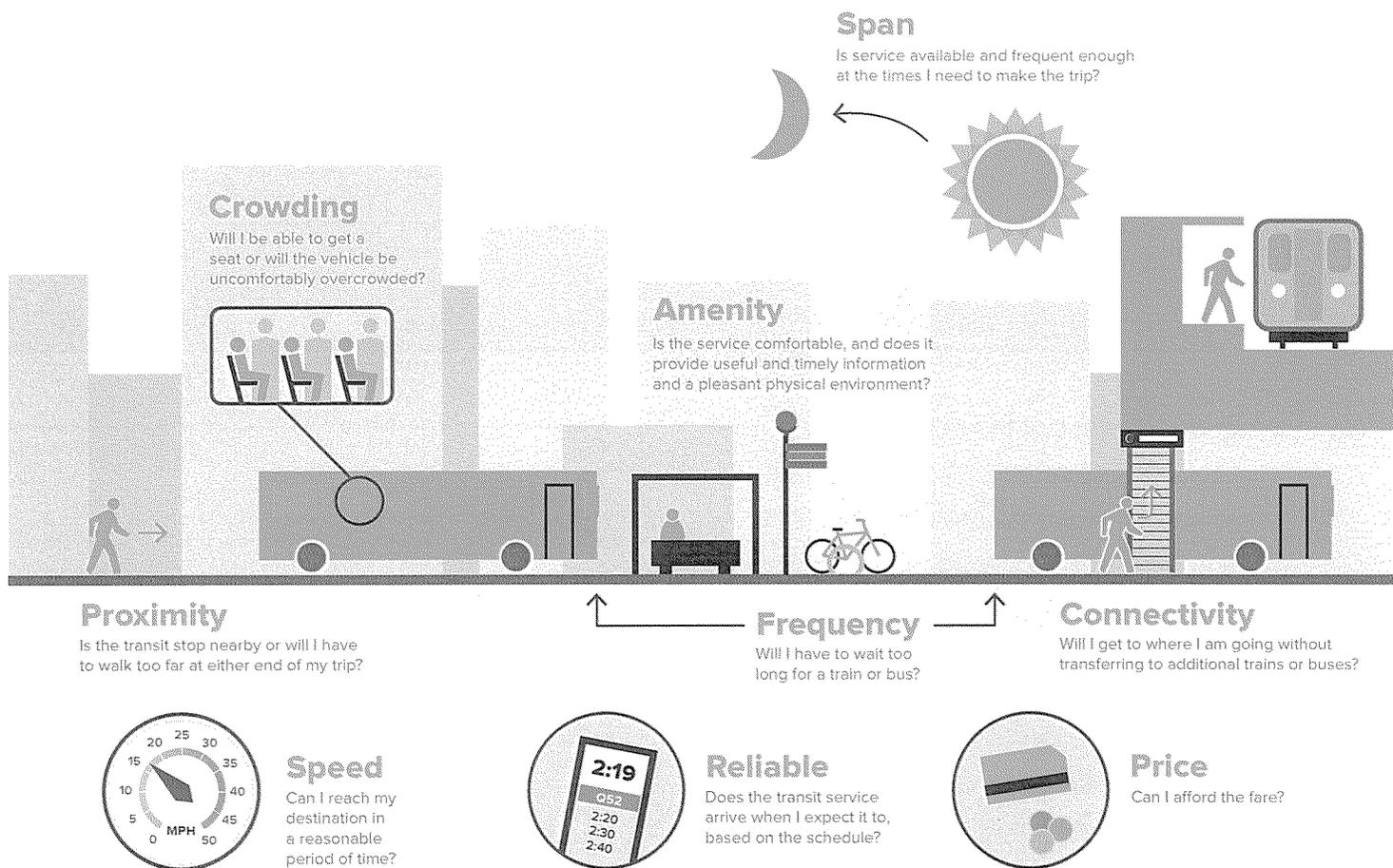
Crowding: Will I be able to get a seat or will the vehicle be uncomfortably overcrowded?

Reliable: Does the transit service arrive when I expect it to, based on the schedule?

Connectivity: Will I get to where I am going without transferring to additional trains or buses?

Amenity: Is the service comfortable, and does it provide useful and timely information and a pleasant physical environment?

Price: Can I afford the fare?



Create a First-Rate Bus System



Photo: Marcos Vasconcelos (flickr)

The many weaknesses of the bus system perpetuate its image as a second-rate system. The image itself becomes a problem, depressing ridership and making new investment less likely. But these weaknesses can be addressed to create a more virtuous cycle, with improvements attracting more riders and more investments. Many improvements can be made with small initial investments and can save money in the long term by making the system more efficient. A comprehensive strategy would include the following objectives and actions:

Increase Frequency on Selected Routes, Initially on an Experimental Basis

Local bus frequency falls short of an acceptable industry standard of a bus every 10 minutes in peak periods, every 15 minutes at other weekday times and every 20 minutes on weekends. There are 56 routes with bus service that falls short of these standards for one or more time periods or days of the week. Service should be increased in those cases. Another 36 bus routes tend to be overcrowded and additional service would ease that problem. These additions would not only shorten waiting times but partially mitigate the negative effects of multiple transfers. Similarly, service should be added selectively where late-night service is absent, and to express service in the weekday off-peak and on weekends.

The estimated operating cost of these added services is estimated at \$28 million, not including additions to the bus fleet and added bus depot space. It would be prudent to increase these services on a carefully monitored demonstration basis, starting with the most heavily used service.

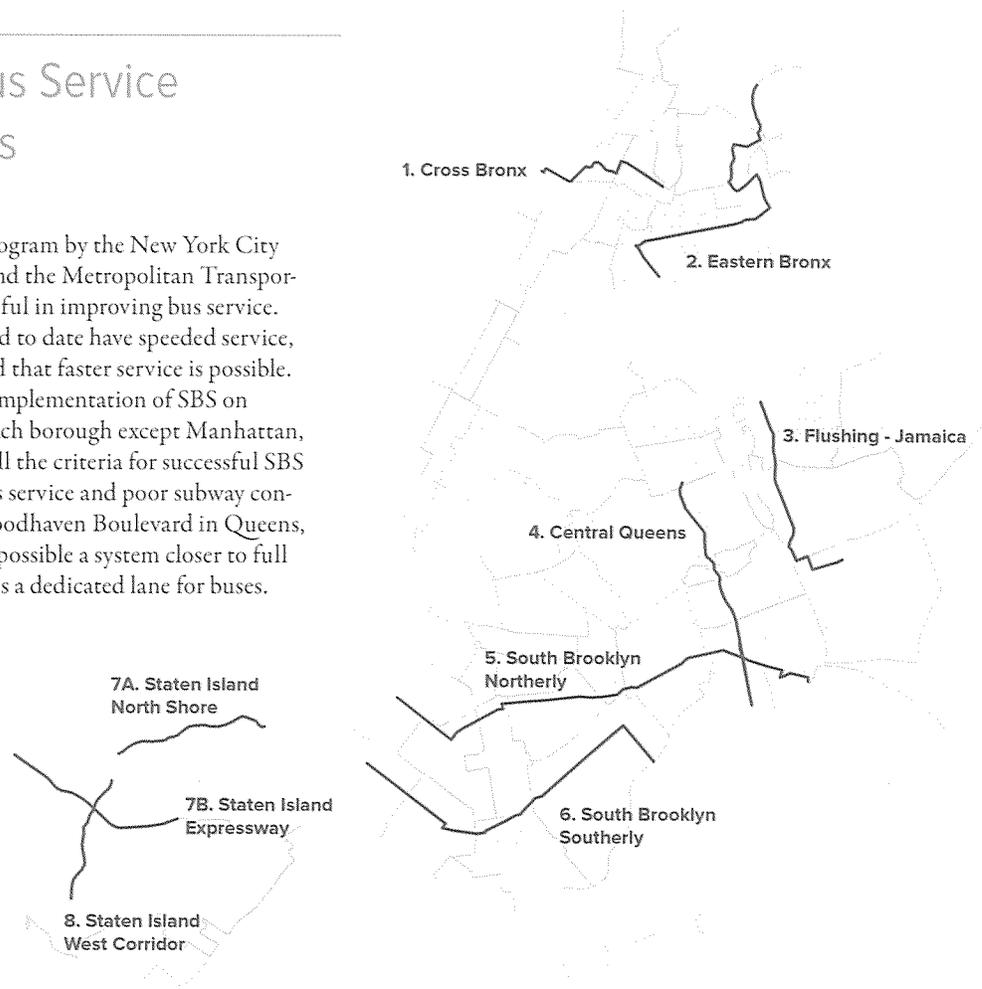


Photo: David Tan (flickr)

Expand Select Bus Service in Major Corridors

The current Select Bus Service program by the New York City Department of Transportation and the Metropolitan Transportation Authority has been successful in improving bus service. The eight SBS routes implemented to date have speeded service, attracted riders and demonstrated that faster service is possible. We recommend prioritizing the implementation of SBS on another eight corridors, two in each borough except Manhattan, shown in Figure S-1. They meet all the criteria for successful SBS service: sizable ridership, slow bus service and poor subway connectivity. Most noteworthy is Woodhaven Boulevard in Queens, where a wide right-of-way makes possible a system closer to full Bus Rapid Transit, which includes a dedicated lane for buses.

RPA's Recommended SBS/BRT Routes



Explore Variable Pricing

Lower fares on subway and buses in the off-peak and on weekends should be considered to move trips into time of days when there is less crowding, and to help lower-income residents with either the need or option to travel more in the off-peak.

TFL Ways to Pay @TFLWaysToPay

Oyster pay as you go fares are cheaper after 7pm. Find out about off-peak fares tfl.gov.uk/oyster

Travel after 7pm for a cheaper fare

Pay as you go (contactless) can travel on the Tube, DLR, London Overground and most National Rail services for a cheaper fare from 7pm until close and from 03:00 until 06:00. To find out more about off-peak fares visit tfl.gov.uk/oyster

RETWEETS: 61 FAVORITES: 58

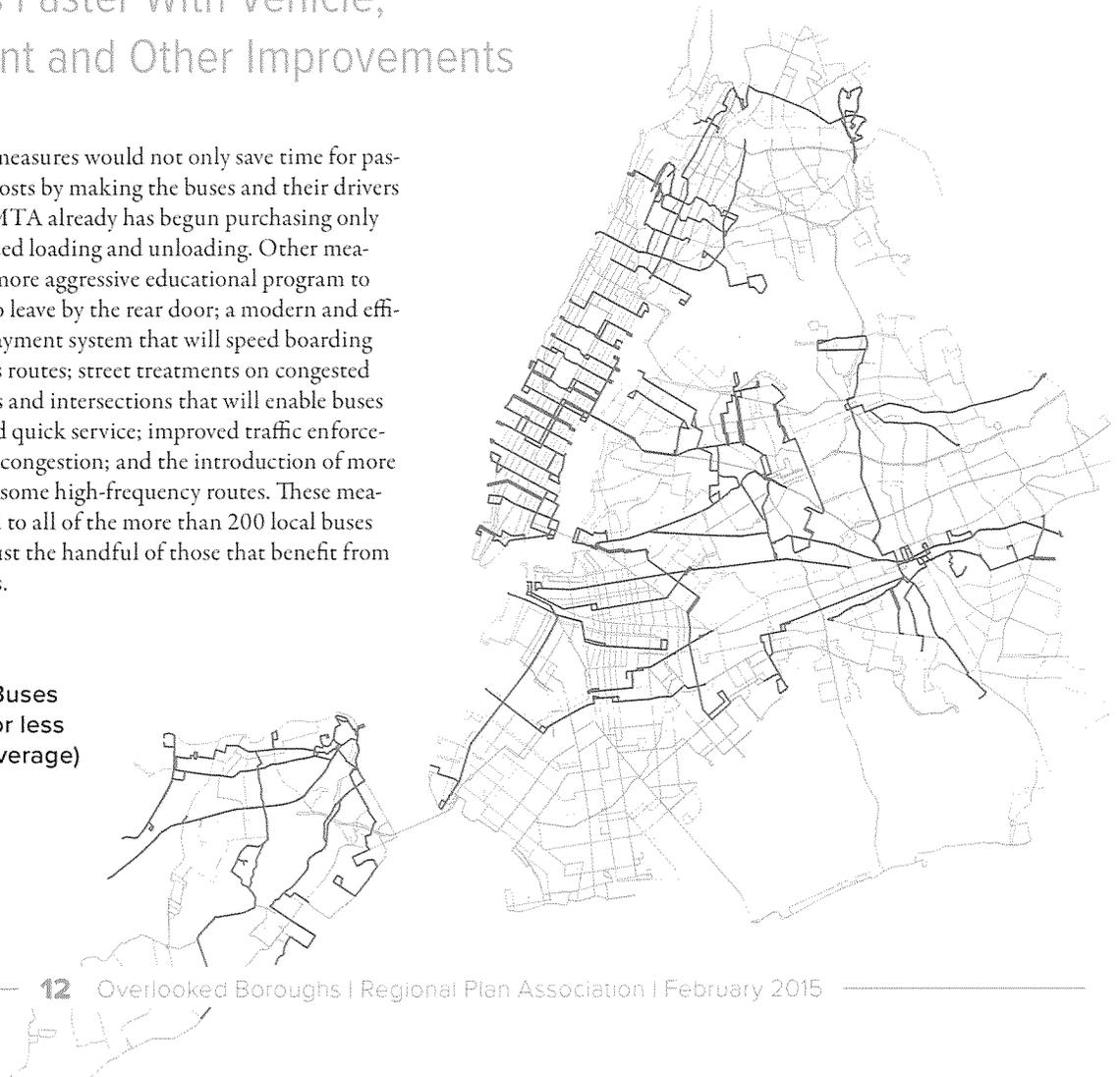
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Make Buses Faster With Vehicle, Fare Payment and Other Improvements

Numerous short-term measures would not only save time for passengers but also lower costs by making the buses and their drivers more productive. The MTA already has begun purchasing only low-floor buses that speed loading and unloading. Other measures should include a more aggressive educational program to encourage passengers to leave by the rear door; a modern and efficient contactless fare payment system that will speed boarding and alighting on all bus routes; street treatments on congested or high-traffic corridors and intersections that will enable buses to maintain reliable and quick service; improved traffic enforcement to further reduce congestion; and the introduction of more limited-stop service on some high-frequency routes. These measures would be directed to all of the more than 200 local bus routes in the city, not just the handful of those that benefit from SBS or BRT treatments.

Slow Local Buses (Buses traveling one mph or less than the borough average)

- Local Bus Lines
- Slowest Lines



Improve Bus Amenities

Improving amenities are important to signal commitment to a better quality of service. Greater priority should be given to improving bus shelters, bus schedules and maps, real-time bus arrival information, and easier fare payment systems. These include shelters that are properly enclosed from the elements, dynamic signs with accurate bus arrival times, and real-time information for connecting transit services.



Bus Rapid Transit (BRT) Station in Santiago, Chile

Photo: RPA



Bus Station in Los Angeles

Photo: Dan Reed (flickr)

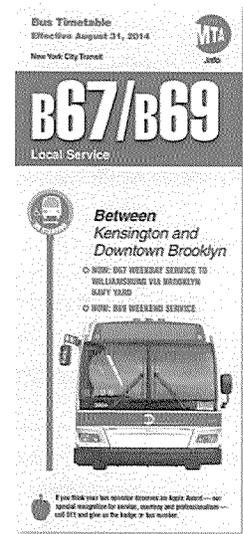
Initiate New or Modified Routes

During the investigations and outreach process, many ideas for new or rerouted routes were suggested. Many would serve industrial areas, such as Maspeth in Queens and Hunts Point and Zerega Avenue in the Bronx. Other routes were suggested to serve the airports, which would serve both airport workers and air passengers. Following further market and operational analysis, these could also be tried on an experimental basis with sunset provisions and clear criteria for whether or not to continue service.



Hunts Point Avenue

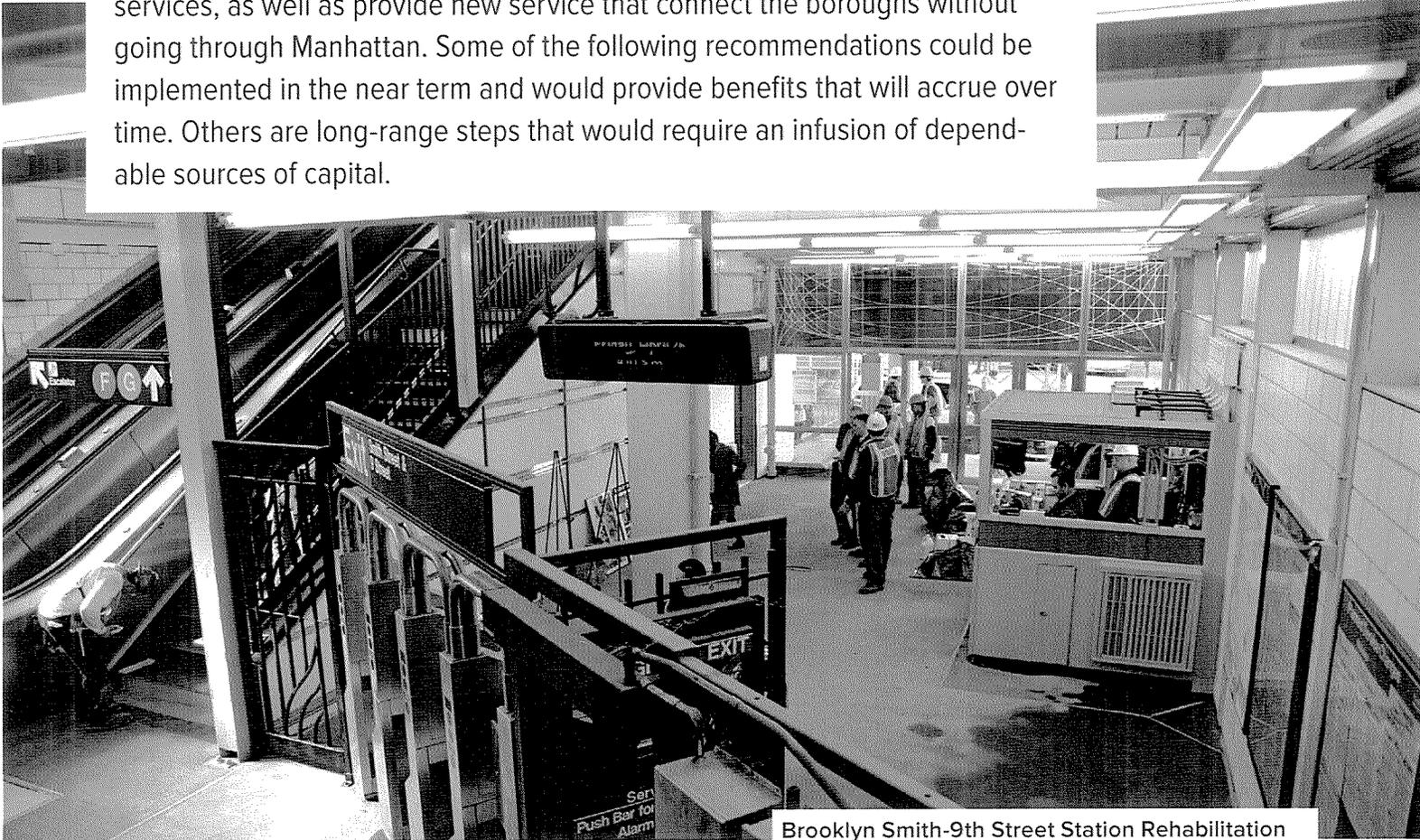
Photo: Henry Gass (flickr)



MTA Bus Schedule Highlighting New Service to Brooklyn Navy Yard

Improve and Extend Rail Service

There are a number of actions that improve or better connect existing subway services, as well as provide new service that connect the boroughs without going through Manhattan. Some of the following recommendations could be implemented in the near term and would provide benefits that will accrue over time. Others are long-range steps that would require an infusion of dependable sources of capital.



Brooklyn Smith-9th Street Station Rehabilitation
Photo: MTA New York City Transit / Marc A. Hermann

Improve Stations Throughout the Boroughs

The subway station upgrade program should be targeted to overcome an imbalance in the pace of boroughs' stations improvements and give greater attention to station needs outside of Manhattan. Also, the MTA should accelerate its program to implement communications-based train control, which would replace outmoded signals from an earlier era and improve capacity and flexibility throughout the system.¹

Pursue Future Phases of the Second Avenue Subway and Other Subway Expansion

The completion of the initial phase of the Second Avenue subway followed by segments north to 125th Street and south to the Battery has both short- and long-term benefits for those living in the boroughs. The extension of the first phase between 96th and 63rd streets will have the initial effect of serving parts of

East Harlem and of relieving severe overcrowding on the 4, 5 and 6 trains serving the Bronx and the east side. An extension north to 125th Street would bring service to all of East Harlem and relieve overcrowding on Bronx trains. Moreover, the extension northward could serve as a catalyst to extend the service northward into low-income neighborhoods of central Bronx with poor subway service, including East Tremont, Morrisania and Melrose.

The extension of the Second Avenue subway to the south would create better access from upper Manhattan and the Bronx to Midtown and Lower Manhattan. It also would set the stage for new lines in Brooklyn and Queens. Most immediately, funds need to be maintained in the MTA capital program for the next two stations to the north in East Harlem and at 125th Street, where connections to lines from the Bronx and to Metro-North could be made.

¹ RPA's 2014 report, *Moving Forward: Accelerating the Transition to Communications-Based Train Control in New York City's Subways*, details the benefits of CBTC.

Provide New Rail Alternatives for Boroughs Using Unused or Underused Rail Rights-of-Way

There are numerous possible rail expansions directed to borough needs that will cost less than subway extensions. By far the most promising is the Triboro Rx, a largely above-ground line first conceived by RPA in the mid-1990s that would stretch from Bay Ridge in Brooklyn through Queens to the South Bronx. This line would address many of the weaknesses found in the transit system in the boroughs – poor connectivity within and between the Bronx, Queens and Brooklyn, slow bus service, excessive transferring and service reliability. Current bus service and improved SBS/BRT routes would be hard pressed to duplicate its speed and connectivity advantages.

The right-of-way is now used exclusively by freight services, but this valuable resource could be used for both freight and passenger service, as numerous other rail lines do around the world.

We estimate that more than 100,000 riders would use the 24-mile, 22-station Triboro Rx line, with stops strategically situated to establish convenient transfers to subway stops and bus routes. Station locations would become a catalyst for development in areas where housing will be needed to meet New York City's anticipated population growth.

The most promising of other rail possibilities involves the use of the Atlantic and Montauk branches of the LIRR east of Jamaica, which can be reconstituted and combined with service on the Atlantic Branch between Jamaica and the Barclays Center in Downtown Brooklyn. The current LIRR plans are to convert the Atlantic Branch into a shuttle service once the East Side Access project is completed in the early 2020s. We recommend that the MTA's LIRR, working with the New York City Transit and NYC's Department of City Planning determine how they should best be used.

Rail Recommendations

- Commuter Rail
- Existing Subway / SIR
- Second Avenue Subway
- SAS Extensions
- Triboro Rx
- Atlantic Branch
- New Station with Transfers
- New Station



Triboro Rx Proposed Rights-of-Way
Photo: RPA

Make Commuter Rail Work for Borough Residents



Metro-North and LIRR can be made to work better for the borough communities that they serve without significantly reducing service for suburban riders commuting into the city.

Increase Off-Peak and Reverse Commute Service

For many Metro-North and LIRR stations located within the Bronx and Queens, service frequency in the peak in both directions and at midday is very limited. Six stations in the Bronx all fall short of a 20-minute peak (both directions) and 30-minute off peak standard. In Queens, eight stations have inadequate service in the off-peak and during midday hours. In all cases, one more train per hour during the affected periods would meet an acceptable standard. Service could be expanded with a demonstration program to determine whether goals for increased ridership are met.

Reduce Weekday Rail Fares for Trips Within New York City

Today, the railroads offer a half-price City ticket — but only on weekends. This makes using the railroad a prohibitive burden for many city residents. RPA recommends that expansion of the discount to weekdays. The commuter rail service would become more competitive to the subway, shifting some borough residents from the subway to the railroads, if they were willing to pay a small premium, reducing crowding on subway lines in Queens and the Bronx. The estimated cost to the MTA after accounting for the revenue gained by the shift from subway to commuter rail is \$30 million annually.

Bring Metro-North Service to the East Bronx and Penn Station

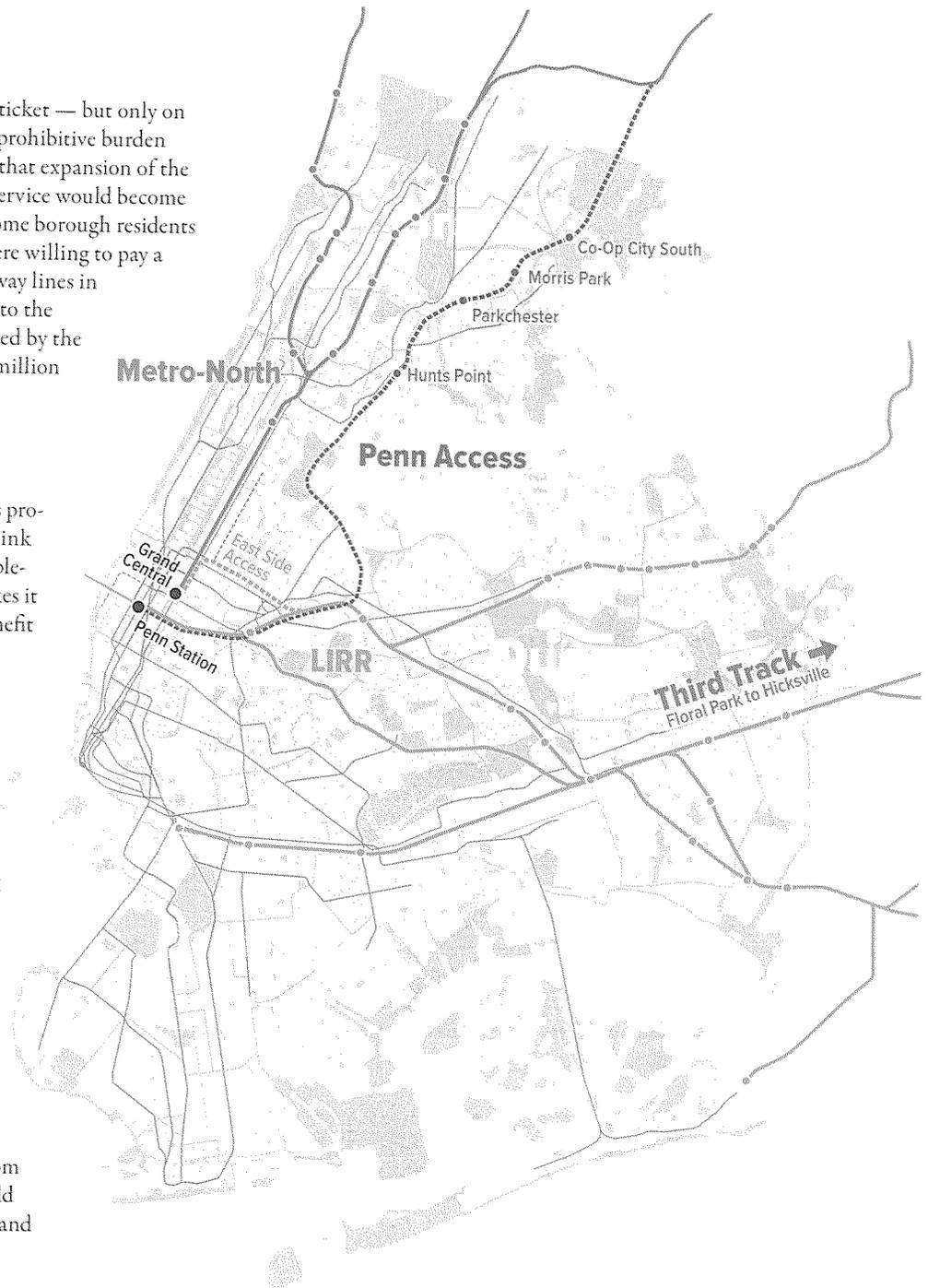
Metro-North should move forward with its proposal to operate a commuter rail service to link the Bronx with Penn Station once the completion of LIRR's East Side Access project makes it operationally feasible. The Bronx would benefit with four stations in the eastern part of the borough to allow residents to reach West Midtown faster, gaining access to jobs in Connecticut.

Add LIRR Mainline Capacity to Create More Reverse-Commute Opportunities

Today, transit options from the city to Long Island are severely limited by the lack of capacity for reverse peak service, denying city residents transit access to Long Island jobs, and Long Island employers access to the city's workforce. On the LIRR, added service in the reverse direction would be helped by the addition of a third track on the Main Line in Nassau County. The LIRR proposal would build an additional track on its main line from Floral Park to Hicksville, a project that would open up reverse commuting jobs on Long Island for Queens and Brooklyn residents.

Commuter Rail System and Recommendations

- Existing Subway / SIR
- Metro-North
- Penn Access Alignment
- Long Island Rail Road



It's Time to Give the Boroughs the Attention They Deserve



Photo: NACTO (flickr)

Until recently, the inattention to the needs of the boroughs has nowhere been truer than in its transit system. The subways were built to bring people to the core, only incidentally serving people traveling within the boroughs. Express buses, too, have been designed to deliver borough residents to Manhattan. The commuter rail network pays little attention to the boroughs. This has left the local bus network to be the workhorse for the mobility of borough residents. But buses are slow, unreliable, infrequent, and often do not take people where they want to without long walks or multiple transfers.

This is starting to change. Select Bus Service is a major improvement for the neighborhoods it serves. The large number of neighborhood plans and rezonings in the last decade provide a foundation to combine growth with more livable communities. And Mayor Bill de Blasio's ambitious, five-borough Housing New York Plan is taking on the difficult challenge of making neighborhoods both livable and affordable.

But these efforts will fall short unless we create a transportation system that takes residents where they need to go quickly, reliably and affordably. Some recommendations in this report can be implemented today and save money in the long run. Others have a high price tag and will take several years to complete. Taken together, these actions will help create a city that is more prosperous, fairer and healthier. Employers would keep and create more jobs because they would have access to a larger number of workers and have fewer problems with lateness and absenteeism. Residents would have access to a larger number of job opportunities. The city could create more affordable housing with a larger number of locations that are well-served by transportation. Congestion and air quality would improve because people would drive less. And New York would enjoy a transit system befitting one of the wealthiest and most successful cities in the world.

Follow-Up Efforts by RPA

Regional Plan Association has a long history of not only providing research on regional planning and public policy issues, but of following them up by advocating for the steps to turn these plans into reality. The recommendations in this report are no exception. We believe that the theme of this report, that transit mobility in the boroughs has historically been neglected, is extremely timely today as a public policy issue, and we are in a position to press for change to overcome past indifference.

The steps we will take fit well with our Fourth Regional Plan (4RP) work that began in earnest in 2014, and which we will be driving toward completion in the next two or three years.

Toward these ends, we intend to pursue the specific recommendations in the plan:

- ▶ Follow up with the MTA on our bus service recommendations and demonstration program, working with them to develop the sunset clauses for service continuation;
- ▶ Meet with the MTA and the NYCDOT and press our priorities for SBS/BRT services;
- ▶ Press for accelerated program for advanced fare collections technology advances that will help speed bus boarding;
- ▶ Work toward a system of compatible passenger and freight service with freight operators using the Triboro Rx right-of-way;
- ▶ As part of the 4RP, initiate a Transportation Oriented Development program for the MTA's subway and SIR stations, identifying the most promising station areas in the city with an eye to simultaneously advance the City's housing program;
- ▶ Continue to keep in the public eye on the Second Avenue subway extension options so that the limited segment soon to be opened does not become a "stubway";
- ▶ Press for needed commuter rail and subway projects that will service new markets in the city and the surrounding suburban counties;
- ▶ Explore with the MTA the options for use of the underused and abandoned rail rights-of-way throughout Brooklyn and Queens; and
- ▶ Because the MTA's operating and capital programs are far short of the funding necessary to insure continued reliability, it would be remiss not to raise this issue here, therefore: we will continue to advocate for adequate funding with our partners in the business, environmental and civic sectors to prevent the decay of the transit system and decline in mobility throughout the boroughs if transit is underfunded.

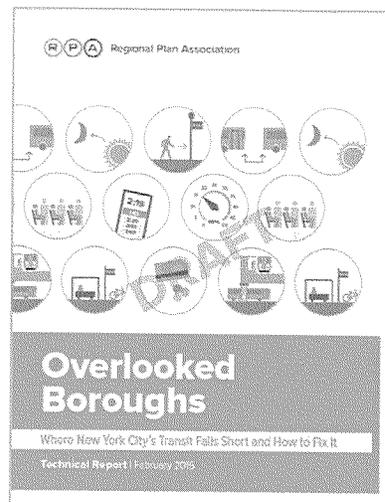
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The report was designed by Ben Oldenburg, RPA's Senior Graphic Designer. The report was copy edited by Wendy Pollack, RPA's Director of Public Affairs.

Technical Report

For more details on RPA's recommendations to improve mobility in the boroughs, visit www.rpa.org/overlooked-boroughs.





Regional Plan Association

Regional Plan Association is America's oldest and most distinguished independent urban research and advocacy group. RPA works to improve the economic competitiveness, infrastructure, sustainability and quality of life of the New York-New Jersey-Connecticut metropolitan region. A cornerstone of our work is the development of long-range plans and policies to guide the growth of the region. Through our America 2050 program, RPA also provides leadership in the Northeast and across the U.S. on a broad range of transportation and economic-development issues. For more information visit, www.rpa.org.

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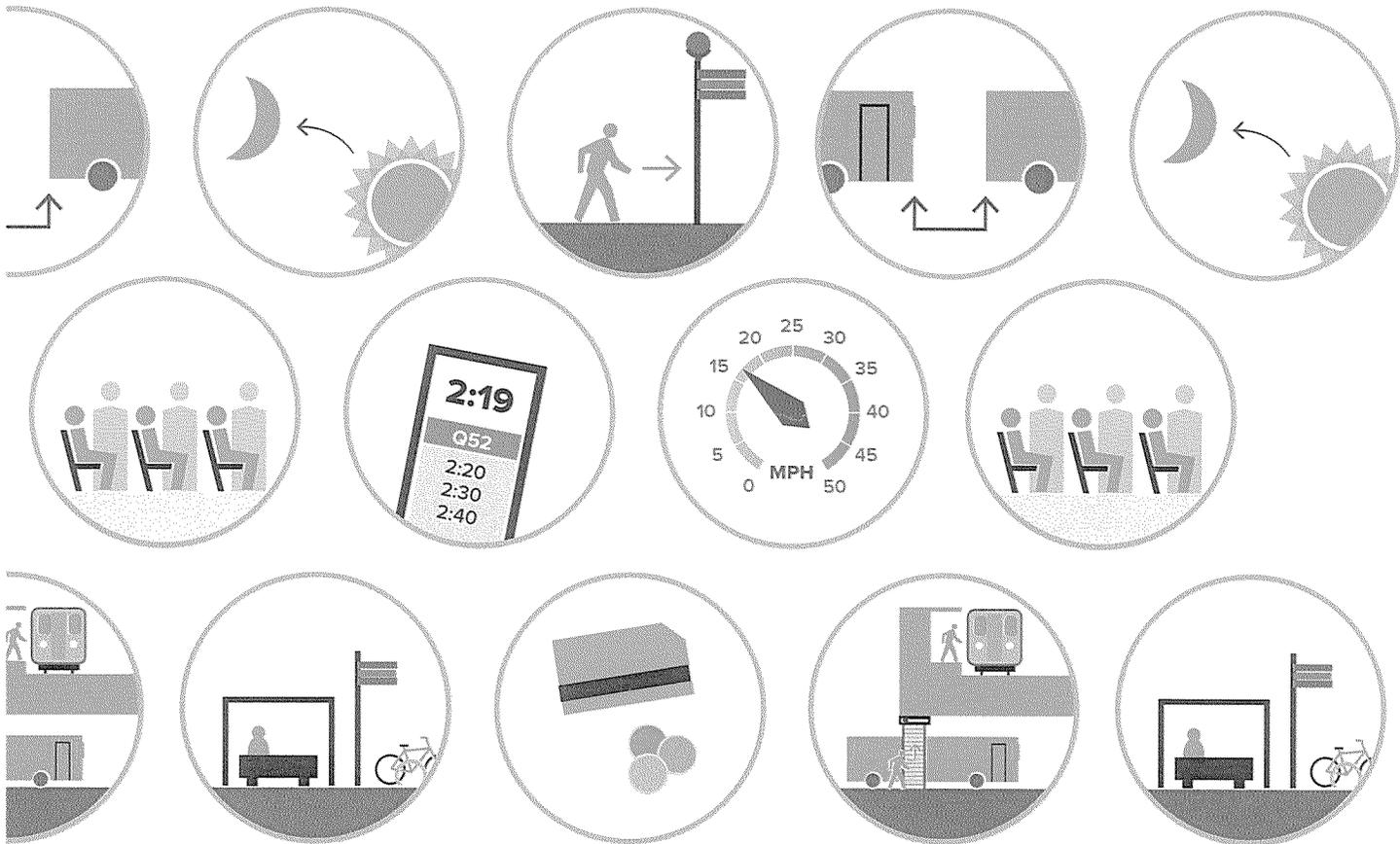
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Overlooked Boroughs

Where New York City's Transit Falls Short and How to Fix It

Technical Report | February 2015

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Relationship to Regional Plan Association's Fourth Regional Plan

RPA began to work on the foundations of what will become the Fourth Regional Plan in the history of the region more or less simultaneously with the research and analyses in this report. As with previous plans, transportation will be a key part of the 4RP. And it stands to reason that the work in this report on mobility of the more than 7 million people living in the boroughs will be integrated into the 4RP work, addressing the mobility needs of all 23 million people living in the metropolitan region.

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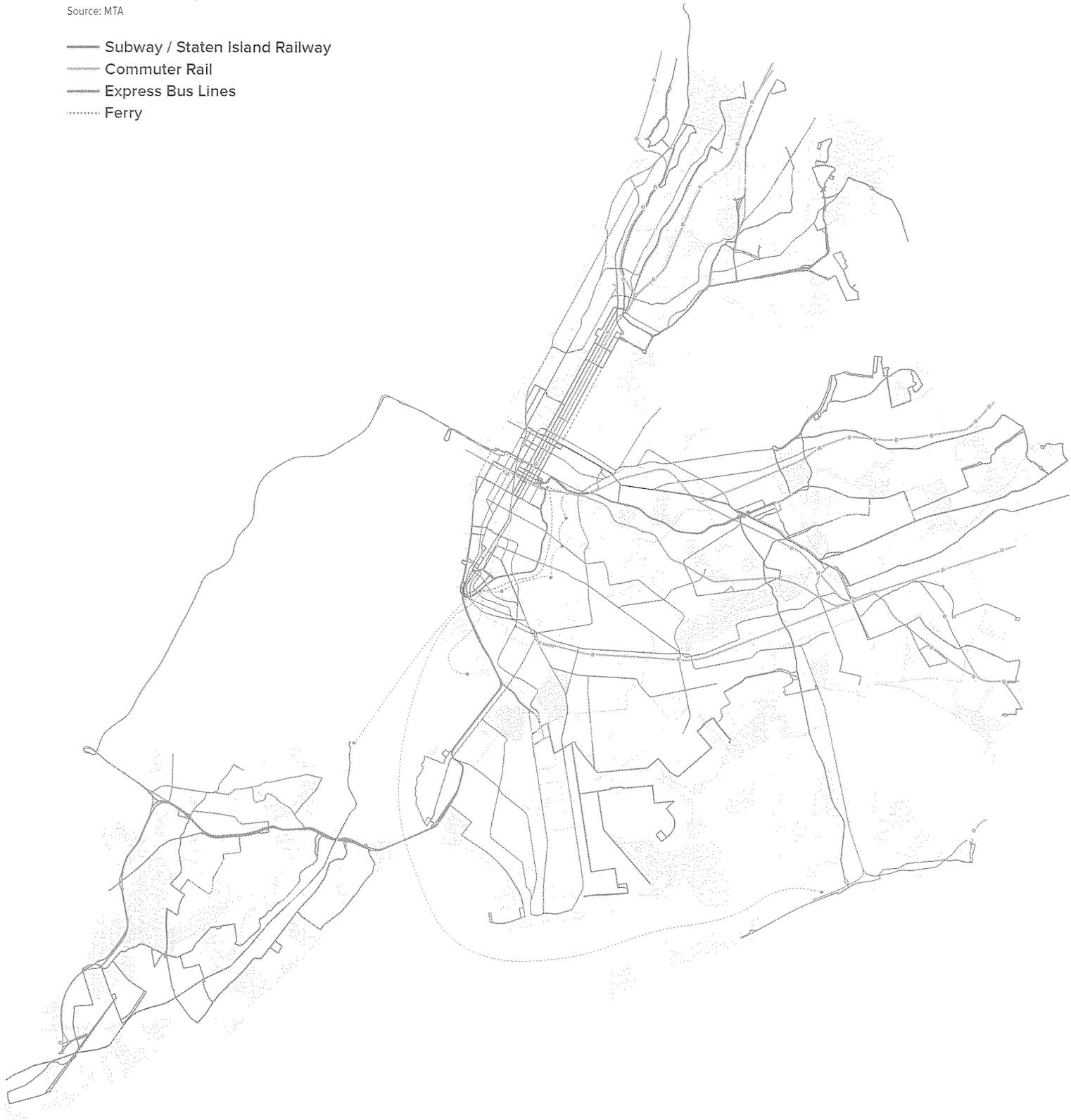
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**Figure 1: Transit Systems
in New York City**

Source: MTA

- Subway / Staten Island Railway
- Commuter Rail
- Express Bus Lines
- Ferry



Scale 1:228,000
0 1 2 3 4 Miles

Introduction and Approach

To many outsiders, “New York City” refers to Manhattan south of 125th Street. Yet, not only do nearly 90 percent of the city’s 8.2 million city residents live outside this part of Manhattan, but the Bronx, Brooklyn, Queens and Staten Island are also home to more than half of the city’s jobs, and have experienced job growth twice as fast as Manhattan’s during the past two decades. This report uses “the boroughs” to refer to where nearly 90 percent of the city’s population lives – the Bronx, Brooklyn, Queens, Staten Island and northern Manhattan – and “CBD” or central business district to refer to Manhattan south of 60th street. The focus of this report is transit-based mobility for access to jobs and other activities in the boroughs, increasingly vital to the city and state economy, and the well-being of its residents.

Built mostly in the first third of the 20th century, New York City’s subway system was designed to open up the rapidly growing City to residential development beyond lower Manhattan and improve transportation capacity to job concentrations in the CBD. This was accomplished remarkably well, but today the transit system is not meeting the travel needs of the boroughs, which have outgrown our Manhattan-oriented transit network.

For instance, of the 26 distinct subway routes, 24 converge on Manhattan’s core, only incidentally offering service for travel within the other boroughs. And Staten Island has no subway at all, but rather one rail line; the 14-mile, 22 station Staten Island Railway (SIR) service that terminates at the ferry terminal in St. George. Express buses attempt to fill in this radial pattern for service to Manhattan, albeit with less frequent service than the subway system, fewer Manhattan destinations, and more limited off-peak and weekend schedules. Nor do the express buses operate to serve travelers moving among the boroughs. Figure 1 depicts the subway routes, the express bus routes and the SIR.

The 228 local bus routes that operate within the five boroughs serve residents seeking transit for shorter trips within their own or nearby boroughs. These routes tend to be slow, though limited-stop routes can increase speeds. In recent years the NYCDOT and the MTA have initiated Select Bus Service (SBS) along 6 corridors. SBS services require off-vehicle fare purchases, have fewer stops and designated rights-of-way, all intended to speed service. The region’s three commuter rail networks provide limited service to and from the boroughs to either Manhattan or to the suburbs surrounding the City, since their primary purpose is to speed suburban residents to the Manhattan core. They represent an untapped resource for residents in the boroughs. There is also a limited ferry network that operates within New York City. The iconic Staten Island Ferry operates from St. George to Lower Manhattan and is the most important transit lifeline between the often neglected borough and the region’s commercial core. In addition, in recent years the city has experimented

with various ferry services either in response to 9/11 or the Sandy storm. Currently, there is the East River ferry route that connects one point in Queens with four in Brooklyn and two in Manhattan and a service from Red Hook to Lower Manhattan subsidized by IKEA. There is also an experimental route from the Rockaways, a barrier peninsula in southeast Queens, to Lower Manhattan, stopping at Pier 11 and at 34th Street on the East River. The service costs only \$2 and operates only on weekdays during peak periods. These routes require short-term subsidies that must be renewed periodically. The NYC Economic Development Corporation is considering the initiation of other routes.

Figure 1 shows the subway, commuter rail and ferry network and Figure 2 shows the local bus network.

A well-functioning transit system is especially important for both low- and average income New Yorkers, the majority of whom do not own a car. Not only does the system put them in reach of millions of jobs, but it enables them to get to schools, hospitals, cultural facilities, parks and services. This helps mitigate New York’s high cost of housing, and it is part of the reason that low-income New Yorkers have a better chance of getting ahead than residents of many other U.S. regions.

This report pursues several parallel paths to gain an understanding of the transit needs in the boroughs of New York City. These include:

- ▶ Understanding current travel patterns using US Census travel to work data. Trips to and from work constitute half of all trips made on the New York City subway system and almost one-third of all the trips made on local buses. Although work trips are only part of the travel picture, these data help to understand the relative size, geographic orientation, and mode choices of the travel markets in the City.
- ▶ Identifying areas of the city where good transit is especially important because auto ownership is low. This analysis also identifies areas of high auto ownership as areas where shift to transit would be more problematic.
- ▶ Using these data to formulate statistical models that recognize factors other than transit service that explain why people use transit, including land use densities in residential and work locations, the cost of auto use (including parking and tolls), and income (which mitigates the high cost of auto use for some trips). This analysis helps to identify the markets in the city where transit use is poor after accounting for non-transit-service factors.

**Figure 2: Local Bus Network
in New York City**

Source: MTA

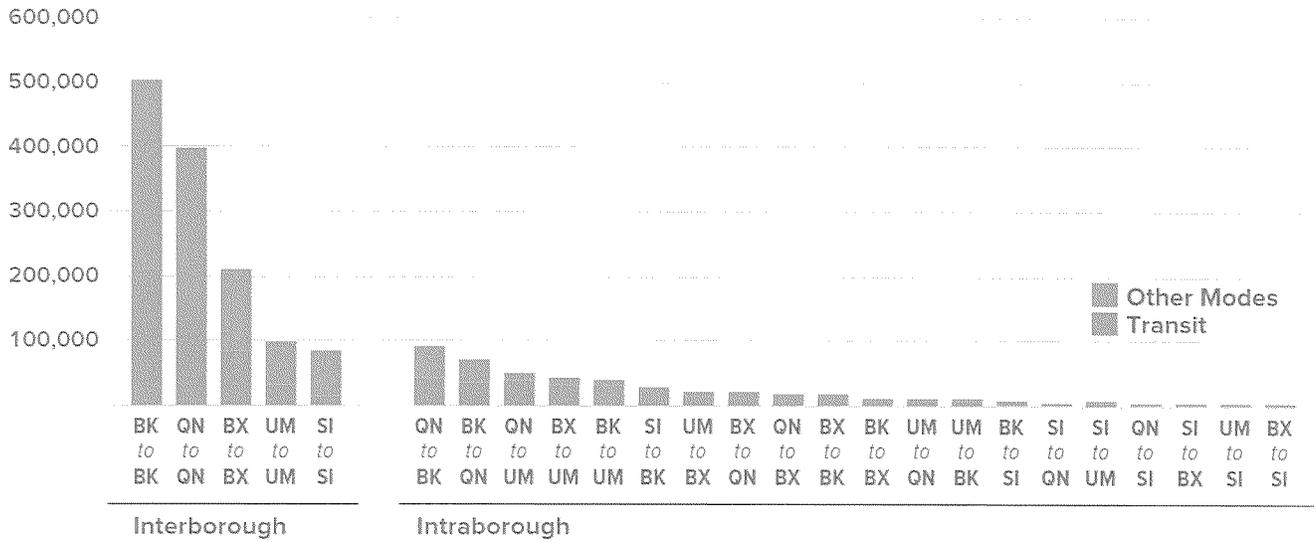
- Local Bus Line
- Subway / Staten Island Railway
- Commuter Rail



Scale 1:225,000
0 1 2 3 4 Miles

Figure 3: Borough to Borough Trips to Work

Source: U.S. Census Bureau, 2010



- Understanding public priorities. On the proposition that people who live and work in an area are most familiar with the shortcomings of the transit system, RPA met with five community boards, one per borough, to discuss their transit needs. Although no single community board can be representative of an entire borough, much less the city, this process helped identify some transit service characteristics that attract people to transit and areas in the boroughs where service is lacking. This was done by prompting the attendees to discuss the nine factors that attract riders, presented in the form of questions, as follows:

In addition to community board outreach, RPA established an advisory committee consisting of representatives of transportation advocacy groups with deep local transit knowledge, and transit operators who would be responsible for implementing recommendations. The composition of this committee is provided in the Acknowledgements.

The recommendations in this report are based on the investigations of the transit deficiencies and the feedback from the outreach process. These recommendations may be generic, i.e. applicable to the entire transit system and the entire city, or geographically specific within a borough or a neighborhood, a subway line or a bus route. The agencies responsible for implementation are then identified.

Patterns of Travel to Work: Borough Demands and Transit Shares

Residents of the city, and people everywhere for that matter, need the transportation system to get to and from work, and to carry out their other normal daily activities – shop, visit others, go to school, and to reach various recreation venues. This report initially focuses on gaining a better understanding of work trip patterns for the boroughs’ residents, and how the transit system serves them today. There are a number of reasons for doing this.

- The work trip is taken daily and making improvements to it can have a greater quality of life impact;
- Work trips are more often made during peak times when transit service is more essential because road traffic is more congested;
- Work trips tend to be made alone making transit more economical, while non-work trips are often made by family members traveling together making auto travel more economical;
- Work trips tend to be made to centers of economic activity, such as major central business districts;
- Getting to work is critical to economic well-being of New Yorkers;
- Work trip data is available in great detail from US Census surveys while data for non-work trips are gathered more sporadically and less universally.

Recent work trip data is available through the American Community Survey which surveyed households annually from 2006 to 2010. When combined for those five years the sample

Table 1: Borough to Borough Work Trips by Mode: 2010

	Residence	The Bronx	Brooklyn	Manhattan	Queens	Staten Island	TOTAL
Work Location	The Bronx	226,315	19,960	191,620	21,565	615	460,075
	Brooklyn	13,535	533,685	391,010	69,680	6,695	1,014,605
	Manhattan	27,180	23,905	696,080	20,085	1,420	768,670
	Queens	21,040	84,985	370,245	430,250	2,080	908,600
	Staten Island	1,580	29,970	52,940	5,700	95,780	185,970
	TOTAL	289,650	692,505	1,701,895	547,280	106,590	3,337,920
Percent by Transit	The Bronx	40.2	78.8	83.8	59.4	64.2	61.0
	Brooklyn	56.6	42.3	90.2	49.7	35.7	61.5
	Manhattan	69.2	75.6	58.2	68.9	47.2	59.4
	Queens	37.1	41.2	85.5	33.0	23.3	55.2
	Staten Island	12.3	19.0	75.1	16.9	16.3	33.4
	TOTAL	43.3	43.4	74.9	37.3	18.3	57.7
Percent by Sub-way	The Bronx	13.9	67.7	68.6	45.8	27.6	40.5
	Brooklyn	52.0	24.6	83.6	38.3	17.0	48.6
	Manhattan	44.4	70.3	47.9	60.4	31.3	48.8
	Queens	29.4	31.4	72.6	16.0	19.2	40.8
	Staten Island	4.4	2.1	7.2	3.4	0.8	3.0
	TOTAL	19.6	27.3	62.6	21.5	2.8	42.9
Percent by Bus	The Bronx	25.5	7.8	11.2	10.8	10.6	18.1
	Brooklyn	2.6	16.9	4.6	9.8	12.8	11.5
	Manhattan	22.0	3.0	8.9	5.6	9.2	9.1
	Queens	6.4	7.5	7.6	16.3	3.6	11.7
	Staten Island	5.7	14.5	54.0	9.8	14.2	25.4
	TOTAL	22.6	14.9	9.3	14.8	13.8	12.7
Percent by Auto	The Bronx	36.1	20.5	15.1	39.9	30.9	26.8
	Brooklyn	41.1	31.7	8.3	46.9	60.5	24.0
	Manhattan	27.6	18.6	8.0	26.6	43.0	9.6
	Queens	62.0	57.1	13.6	47.1	76.0	34.8
	Staten Island	83.5	80.2	23.9	82.3	73.2	60.7
	TOTAL	37.7	36.2	10.6	46.4	71.8	26.1

Source: U.S. Census Bureau, American Community Survey 2006 to 2010

rate includes over 8 percent of households, an adequate sample unless dealing with very small areas with low volumes of trips.¹

The overall pattern and modal shares of travel within and between the boroughs is shown in Table 1. Over 3.3 million daily work trips are represented in Table 1. This is the sum of all trips taken for work purposes within the five boroughs. As might be expected, the number of people who travel to Manhattan is high and the share that uses transit from the other boroughs to Manhattan is also high, from 75 percent for Staten Islanders to 90 percent for Brooklyn residents. Note the Manhattan to Manhattan anomaly with only 58 percent using transit, a result of the high share of these trips made on foot.

Inter and Intra Borough Travel

The high volume of trips made within each of the non-Manhattan boroughs is significant. If not working in Manhattan, New Yorkers are likely to work closer to home. Approximately half of the workers living in each of the four non-Manhattan boroughs also work in their own borough. For all of these trips, less than

half use transit – 40 percent for the Bronx, 42 percent for Brooklyn, 33 percent for Queens and barely one in six for Staten Island. For the intra-Bronx trips, buses are used twice as much at the subway while in Brooklyn substantially more ride the subway. The Queens trips are split evenly between the two transit modes, and the Staten Island trips are almost exclusively by bus, since there is no subway service there; the Staten Island Railway is barely used at all for trips within that borough.

There is also substantial travel between the boroughs. By far the largest are the flows in each direction between Brooklyn and Queens, the only borough pairs that are contiguous, i.e. not separate by a major water body. Eighty-five thousand people travel from Queens to Brooklyn jobs and another 70,000 make the trip from Brooklyn to Queens' job sites. Over half of the Queens-Brooklyn flow is made by car, as is 47 percent of the flow in the other direction. Among those using transit in each direction, most ride the subway rather than buses.

The other inter-borough flows are much lower. Staten Island to Brooklyn, with 30,000, is the highest but only 19 percent use transit. In contrast, other notable borough pairs have higher transit shares – the Bronx to Queens and to Brooklyn are 58 percent and 79 percent transit use, respectively, and Queens to the Bronx at 37 percent. Most of these longer distance trips are by subway. Since these trips tend to be longer than those within

¹ Data recorded includes the dominant mode of trip, estimated travel times, and time of departure. The home origin of the trip is organized by census tract and census block level. The work trips destination, i.e. the work site is established by the work address from the survey and is coded to enable aggregation by various units of geography, including census block, census tract, zip code, municipality or county, or as often used by transportation planners, by specialized Transportation Analysis Zones (TAZ).

Table 2: Work Trips From the Boroughs to the Suburbs: 2010

	Residence	Work Location	Total	Transit	Percent Transit	Likely Transit Option
To New Jersey	Manhattan	Bergen	6,760	530	7.8	Subway to bus
	Bronx	Bergen	3,590	485	13.5	Bus to GWBBS to Bus
	Queens	Bergen	3,265	385	11.8	Subway to Bus
	Brooklyn	Bergen	2,200	245	11.1	Subway to Bus
	Manhattan	Essex	4,040	1,940	48.0	Subway to Bus or NJT
	Brooklyn	Essex	2,965	1,425	48.1	Subway to NJT
	Queens	Essex	2,075	765	36.9	Subway to NJT
	Staten Island	Essex	2,025	55	2.7	Bus
	Brooklyn	Hudson	7,245	4,980	68.7	Subway to PATH
	Manhattan	Hudson	6,820	5,455	80.0	Subway and PATH
	Queens	Hudson	5,665	3,545	62.6	Subway to Bus or PATH
	Staten Island	Hudson	4,245	770	18.1	Bus, LRT, PATH
	Bronx	Hudson	2,585	1,245	48.2	Subway and PATH
	Staten Island	Middlesex	3,180	40	1.3	None
	Brooklyn	Middlesex	2,250	300	13.3	NJT to Subway
To Long Island	Queens	Nassau	75,025	13,130	17.5	Subway to LIRR or Bus
	Brooklyn	Nassau	11,000	3,185	29.0	Subway to LIRR or Bus
	Manhattan	Nassau	4,340	1,410	32.5	Subway to LIRR
	Bronx	Nassau	2,590	620	23.9	Subway to LIRR
	Queens	Suffolk	13,815	1,545	11.2	Subway to LIRR
	Brooklyn	Suffolk	2,720	555	20.4	Subway to LIRR
	Manhattan	Suffolk	2,345	810	34.5	Subway to LIRR
	Hudson Valley and Connecticut	Bronx	Westchester	37,585	11,725	31.2
Manhattan	Westchester	9,415	3,655	38.8	Subway to Metro North	
Queens	Westchester	8,670	1,275	14.7	Subway to Metro North	
Brooklyn	Westchester	3,135	1,260	40.2	Subway to Metro North	
Manhattan	Fairfield	4,570	2,775	60.7	Subway to Metro North	
Bronx	Fairfield	2,495	490	19.6	Subway or Bus to Metro North	
Queens	Fairfield	2,300	285	12.4	Subway to Metro North	

Source: U.S. Census Bureau, American Community Survey 2006 to 2010
 Note: Deficient routes shaded.

boroughs, the faster subway becomes a more likely transit option, and direct subway service becomes more relevant. Of course, in the absence of a subway at all, as with Staten Island, transit is considerably less attractive.

For trips from Manhattan to the boroughs of the Bronx, Queens or Brooklyn, each with 20,000 or more trips, the transit share is higher, mostly by subway.

Comparisons of these data with the earlier US Census produce some welcome findings. Almost all the borough-to-borough work trip flows have become more transit oriented. The total number of work trips has also grown substantially from 2.9 to over 3.3 million, paralleling the growth in the city's population.

Travel Between Boroughs and Suburbs

Many borough residents work outside the city. In Table 2 the work trips data for travel from the boroughs to nearby suburban counties is presented for those county-to-county markets that exceed 2,000 work trips a day. Twenty-nine pairs meet that threshold, totaling 239,000 trips. Not surprisingly, the highest volumes are from boroughs to contiguous suburban counties – Queens to Nassau and the Bronx to Westchester. Other high volume pairings are from Queens to Suffolk and Manhattan to Westchester. The trip-making to New Jersey counties are more

defused with Brooklyn to nearby Hudson County leading the pack.

The service and fare policies of Metro-North and Long Island Rail Road are generally not designed to attract those living and working within New York City. However, the growth in commutation on Metro-North from New York City to the suburbs shows what is possible. There has been a doubling of reverse commuting from Manhattan and the Bronx to the northern suburbs since 1995, fueled largely by the job growth in White Plains and Stamford and new track capacity that permitted additional reverse service. The LIRR hasn't experienced similar growth, due to insufficient capacity for rush-hour reverse service and few large job concentrations near suburban stations.

The transit modal share collectively for the trips in Table 2 is 27 percent; the pairs exceeding 30 percent are highlighted in gray. The transit shares vary widely by market. These markets either have direct commuter rail service, or have it combined with subway or bus and destined for either the nearby counties of New Jersey with rail service to other suburban counties adjacent to the city. The exceptions are the two Manhattan to Long Island markets which exceed 30 percent transit. There are only two markets that fall below 30 percent that have New Jersey or Hudson Valley destinations – Brooklyn/Middlesex and Queens/

Table 3: Work Trips from the Suburbs to the Boroughs: 2010

	Residence	Work Location	Total	Transit	Percent Transit	Likely Transit Option
From New Jersey	Bergen	Bronx	6,515	420	6.4	Bus via GWBBS and Bus
	Bergen	Brooklyn	2,740	975	35.6	Bus to Subway
	Bergen	Queens	4,230	935	22.1	Bus to Subway
	Essex	Brooklyn	2,470	1,275	51.6	NJT or Bus to NYC and Subway
	Hudson	Brooklyn	3,430	2,135	62.2	LRT/PATH to Subway
	Hudson	Queens	2,270	1,235	54.4	LRT/PATH or Bus to Subway
	Middlesex	Brooklyn	3,155	795	25.2	NJT to Subway
	Middlesex	Staten Island	3,035	59	1.9	None
	Monmouth	Brooklyn	3,550	710	20.0	Rail and PATH to Subway
Monmouth	Staten Island	3,585	95	2.6	None	
From Long Island	Nassau	Bronx	6,335	395	6.2	Bus or LIRR to Subway
	Nassau	Brooklyn	25,255	4,355	17.2	Bus or LIRR to Subway
	Nassau	Queens	70,435	6,365	9.0	Bus or LIRR to Subway
	Suffolk	Bronx	3,565	385	10.8	LIRR to Subway
	Suffolk	Brooklyn	10,250	2,535	24.7	LIRR to Subway
	Suffolk	Queens	25,050	3,595	14.4	LIRR to Subway
From Hudson Valley	Orange	Bronx	3,980	234	5.9	None
	Rockland	Bronx	5,680	84	1.5	Bus to GWBBS and Bus
	Westchester	Bronx	29,910	3,345	11.2	Metro North or Bus to Subway
	Westchester	Brooklyn	3,820	1,730	45.3	Metro North to Subway
	Westchester	Queens	5,450	755	13.9	Metro North to Subway

Source: U.S. Census Bureau, American Community Survey 2006 to 2010.
 Note: Deficient routes shaded.

Fairfield; in both those cases the auto trip is much more direct than the transit option.

The major county-to-county commutes from the surrounding, mostly suburban counties to the boroughs is of somewhat less interest in this report, since the focus is on mobility improvements for borough residents. Nevertheless, better access to jobs in the boroughs builds their economic strength and is worthy of mention here. The suburb-to-city work trip travel is presented in Table 3 and shows all markets of more than 2,000 work trips.

There are 225,000 trips represented in Table 3, but only 14 percent use transit. High auto ownership levels among suburban residents undoubtedly explain some of this low share, compared to the 27 percent for the borough-to-suburb transit share. The highest transit shares are found among those pairs that are close in suburban counties and that involve Brooklyn and Queens. The transit shares tend to be higher where a trip would involve traveling to and through Manhattan, where the transit network is more robust and travel by car is more onerous. Westchester to Brooklyn is a good example.

From the three preceding tables of work trip flows in the New York region, a number of key points relevant for borough work trip mobility stand out.

- ▶ There are 1.7 million borough residents that work in Manhattan (Table 1). With most, 1.4 million, working below 96th Street on the east side and 125th Street on the west side.
- ▶ An almost equal number of borough residents, 1.6 million, work in the other boroughs.
- ▶ Of these, by far the largest travel flows are internal to each borough; less than half of these flows are made by transit.

Reliance on buses is high in these boroughs, especially where the subway is not oriented toward many trips as in the Bronx and Queens or where a subway is totally absent as on Staten Island.

- ▶ Travel between the adjacent borough of Queens and Brooklyn is also significant. Car use for these trips is high. Subway use far exceeds bus use for these trips, in part a consequence of poor direct bus service between the two boroughs.
- ▶ The volumes of trips to suburban counties are much lower than travel within the boroughs. By far the highest volumes are: from Queens and to a lesser extent Brooklyn to Nassau County, from Brooklyn, Manhattan and Queens to Hudson County, and from the Bronx and Manhattan to Westchester. Where rail transit is available, it is well used. Where buses are the major transit option, transit shares are lower.
- ▶ Suburbs-to-boroughs transit shares are highest where the city transit system can aid the trip, lowest where the system is not available or not especially robust.

Up to now the emphasis has been work trips. These trips are important for obvious reasons, but they are in the minority. Over the course of a week about half of all trips made on the NYC subway and about 70 percent of all trips made on buses are for purposes other than going to or from work.² Recently, the MTA has made available raw survey data they have collected for all their trips, but the effort to organize and compile these data for non-work trips has not been undertaken in this report, given the extensive tasks required. Instead, the discussion of non-work trips is addressed through other types of analyses.

² NYMYC-NJTPA 2010-2011 Regional Household Travel Survey

Determinants of Transit Use Other Than Transit Service Quality

The county level work travel patterns summarized above mask the key factors that determine the share of work trips made by transit. By looking in greater geographic detail at the community board level, it is possible to ferret out those factors that explain in large part why some people opt to travel by car and others by transit. Many make the choice because they are affected by the areas they work or live in. For instance: dense areas are more congested and road traffic tends to be greater; the cost of owning a car is higher; and, transit service tends to be more robust. At low densities, driving tends to be cheaper and easier, and transit service more sparse. Additionally, higher incomes indirectly produce a lower share of transit users. Higher income households tend to own more cars, all else being equal, and with a car affordable, may choose to own it and use it.

Auto Availability

The relationships between auto availability, and transit use is a complex one – the more cars that are owned, the less transit is used, the more transit is available the fewer the cars that are owned. Further complicating the matter is that people with higher incomes, those living at lower densities or households with more people of driving age all tend to be associated with more car ownership, independent of the quality of the transit service.¹

Table 4 shows the distribution of auto availability² by household in the five boroughs. Manhattan, not surprisingly has the highest share of households without a car, with very few owning two. The Bronx and Brooklyn have similar distributions, over half own none, and only about one in ten households own two or more. Queens is more car-oriented and Staten Island still more so, with only about one in six households owning none, similar to suburban county averages. In Staten Island almost half of the households have at least two autos available to them.

Table 4: Household Auto Availability in New York City by Borough: 2010

Borough	Zero Cars	One Car	Two or More
Bronx	58.8	30.5	10.7
Brooklyn	56.5	33.0	10.6
Manhattan	77.7	19.8	2.5
Queens	36.3	40.2	23.4
Staten Island	15.7	37.0	47.3
New York City	54.6	31.5	13.9

Source: U.S. Census Bureau, American Community Survey 2006 to 2010

¹ For a more complete discussion of these relationships see Pushkarev and Zupan, *Public Transportation and Land Use Policy*, Chapter 2, Indiana University Press 1977.

² The Census Bureau asks respondents how many vehicles are available in the household, rather than how many are owned. In this report the two terms are used interchangeably, if imprecisely.

The analysis of borough level work trip patterns and auto ownership, while instructive in providing a picture for the City and for the individual boroughs can mask details that are best understood at a finer geographic level.

The importance of these data can be thought of in two ways. First, the absence of cars in a household, whether for reasons of income, lifestyle choices, transit quality, parking availability or density, translates into reliance on public transit for mobility. Therefore, it is particularly important that transit service be available in areas with high concentrations of households without cars. Figure 4 shows the density of carless households in New York City, highlighting the areas of below average income. Most of the areas that stand out also have nearby subways, which can take the sting out of being carless. But there are exceptions – neighborhoods with high concentrations of households without cars and poor access to the subway network. These include the Third Avenue corridor in Morrisania and East Tremont and Soundview/Castle Hill in the Bronx, parts of East Harlem in Manhattan, Elmhurst and Corona in Queens, and the neighborhoods of Bedford/Stuyvesant, Bushwick, East New York, Sunset Park and Flatlands in Brooklyn. Second, the presence of two or more cars in a household makes it much more unlikely that for most trips there will be an inclination to travel by transit, the exception being mostly for trips into Manhattan where the cost of using the car will inhibit car use.

The availability of a car in a household is a prime determinant of modal choice. Without one the choice of transit is an obvious one; the traveler is “captive.” And with little choice, if the transit service is deficient, the traveler is stuck without a decent alternative. That lack of adequate transit service for this person is a matter of equity, with society limiting his or her mobility and economic and social well-being. For those with a car available, the traveler has a choice and any deficiencies in the transit service will tilt the traveler toward using their car, contributing to the environmental and social costs of using an automobile. Either way, better transit is good for both groups of people.

Other Factors That Influence Public Transit Ridership

Other factors were identified that influenced the travel mode used. The high cost of car use – including parking costs and tolls – help to explain why many choose not to drive. And the absence of a direct subway option that avoids multiple transfers (other than those across the platform) is another explanation why some people do not choose to use public transit.

By isolating these factors, we can identify the extent to which transit service matters and can be altered to provide more service.

Figure 4: Car-less Household Shares in Low Income Areas



It enables us to be more realistic as to what transit can accomplish and what it cannot, whether because the “cards are stacked” by non-transit service factors or the current configuration of the subway network, which has hardly changed in the last 70 years.³

When this is done it is found that these non-transit factors, especially income and job and residential density for work trips, account for more than three-fourths of the variation in the mode chosen to travel to work. Unfortunately, these factors are not easily changed in the near term. But over time, densities can be increased by zoning changes, toll policies can result in higher tolls where transit is readily available, and parking costs can increase naturally if parking supply is limited. Nor can the directness of subway service be modified without significant expenditures. Viable solutions in the short term include improvements in bus service, and possibly, in subway and commuter rail service. These possibilities will be discussed, informed first by the outreach to selected neighborhoods to gain the perspective of those who use the services on a daily basis. A fuller discussion of this analysis is presented in Appendix A.

³ This is done by a statistical process known as multiple regression analysis, which in this case takes all the non-transit service variables and “explains” how much of the variation in the mode chosen is caused by those variables and “how much is left to be explained by transit service.”

Outreach: Input From the Community

Table 5: Characteristics of Selected Community Boards

CB	Populations Density (Persons per Square Mile)	Ratio of Transit to Auto Based Work Trips	Percent Zero Car House-holds	Percent Two+ Car House-holds	Mean Household Income, \$	2012 Avg. Weekday Subway Boardings	Percent of Community Board Served by Subway
BX9	42,362	2.57	46.0	16.2	48,308	31,785	31.2%
BK5	32,111	2.81	44.2	17.1	44,508	59,925	55.0%
MN11	50,317	9.70	74.5	5.3	53,745	73,056	47.4%
QN5	22,537	1.51	27.1	33.5	65,951	22,934	17.9%
SI1	12,988	0.82	16.2	47.5	73,524	NA	6.3%

Sources: U.S. Census Bureau 2010, Metropolitan Transit Authority, Regional Plan Association

Note: Staten Island has no subway and Staten Island Railway station counts are not taken since no fares are collected and therefore there are not turnstiles to count passengers.

The outreach process to communities in the boroughs had two purposes, to inform our understanding of how riders themselves value the various components of their transit service that evolved into the nine factors discussed earlier and to confirm or modify the transit service deficiencies in the neighborhoods that the analyses revealed. Given the size of the city, it is not realistic to engage every neighborhood. Rather, one community board from each borough was selected to distinguish among the unique transit characteristics of each borough, to buttress some of the insights gained from our analyses, and to add to our understanding of transit deficiencies as seen by users of the transit network.

The five community boards were selected, one from each borough, by considering a number of factors including: low transit use, low auto ownership (specifically, high shares of households without cars), income, the scope of existing transit services, existence of ongoing transit issues, history of activism on transportation issues (for which we relied on the experience and knowledge of advisory committee members), the ratio of transit to auto shares (a measure of transit orientation), and subway station boarding (orientation toward the subway). Income was used as a descriptor of the neighborhood and to evaluate diversity of transit choices considered. Before a final set of factors were agreed to, an attempt was to check for ethnic diversity across all five choices. After much discussion, the advisory committee reached consensus regarding these choices. Key characteristics of the five selected community boards are shown in Table 5 for the selected boards. They are mapped in Figure 5.

The five selected community boards have a wide range of characteristics. As might be expected, the Manhattan CB ranks highest on density and transit use, and the Staten Island CB ranks lowest on density and transit use, but high on auto ownership. Subway service availability and use is low in the selected Queens CB and doesn't exist at all in Queens. The neighborhoods in these selected community boards are listed in Appendix B.

A total of seven outreach meetings were held, either by meeting directly with the community boards or through meetings with larger groups of citizens organized by the boards. The concerns expressed varied widely with six items surfacing to be of most concern – long walking distances to subways or buses that give access to key destinations, necessity to transfer to reach desired destinations, slow and unreliable service, infrequent service, crowded conditions on buses, and lack of amenities. Each of the community boards are discussed below, highlighting their specific transit concerns.

Queens Community Board 5

Queens Community Board 5 area is located on 7.5 square miles in south central Queens bordering on Brooklyn and includes the neighborhoods of Glendale, Maspeth, Middle Village and Ridgewood. The community board is situated along the Brooklyn border and suffers from limited subway service and poor bus service to the north to the rest of Queens and to the south to Brooklyn. It was chosen because of this isolation and because of the limited bus service to the adjoining borough of Brooklyn.

As of the 2010 US Census, there are 169,000 people living there with an average density of 22,500 per square mile, a 2 percent increase (3,000 people) from 2000. The population is just over one-half white non-Hispanic, a decline of some 10,000 in the ten-year Census period. The growth has been among Hispanics who have increased by 25 percent in that period to about one-third of the population, particularly in Ridgewood in the southwest portion of the CB, where they are now in the majority.

Just over 25 percent of the households in the area do not own a car, and another one-third own two or more cars, which is almost precisely the Queens borough-wide average. These community board-wide shares mask the distinctly different distri-

Figure 5: Location of Selected Community Boards



bution in the Ridgewood neighborhood where 51 percent are without a car and only 11 percent own two or more.

The bus network in the district includes 22 local routes that cover most of the district well. There are also 8 express routes. The subway service in the district is limited the Myrtle Avenue (M) line with four stations within the area serving the Ridgewood neighborhood. Most residents of CB5 who wish to travel by subway require buses as feeders. Maps showing the local bus, express bus and subway coverage for each of the selected community boards are presented in the Appendix B to this report.

The QN5 outreach meeting with its board members had about two dozen attendees and produced a lively discussion about transit needs in the district. The community board members were well versed in the local transit issues and an informed discussion took place regarding transit deficiencies.

The community board discussion produced the following key observations, concerns and suggested solutions:

Bus Service

- ▶ Select bus service has limited potential as a solution because of narrow streets and heavy truck use on some roads. The most likely possibility is along Woodhaven Boulevard, while outside the district would benefit QN 5. However, local opposition has held this project back. Woodhaven could be an alternative for buses to the beach and to the overcrowded Van Wyck Expressway.
- ▶ Service on the Q 24 and Q 55 routes are heavily used; evening and weekend service is limited.
- ▶ Services to Queens Boulevard shopping, Jamaica Center, and Flushing and to the beach (Rockaway) are limited.
- ▶ The Q24 should be extended to the M subway stop at Myrtle Avenue.

Subway Service

- ▶ A transfer point should be built between the L and G subway stations at Lorimer Street and Broadway.
- ▶ While the rerouting of the M to midtown has been a big improvement, it should not be turned into a shuttle late at night.
- ▶ Rehabilitation of M stations, long delayed, should be given priority.

Commuter Rail Service

- ▶ There was interest expressed in the construction of the third track on the Long Island Rail Road to provide reverse access to jobs on Long Island.

Underserved Areas Mentioned

- ▶ Maspeth Industrial Area with 15,000 jobs.
- ▶ Downtown Brooklyn from the northern part of the CB where there is no subway service.

- ▶ Both LaGuardia and JFK airports – slow bus service to LGA and no direct bus service from the community board area to JFK.
- ▶ St. Francis and Molloy High Schools.
- ▶ Brooklyn Museum and Prospect Park.
- ▶ Maspeth – no commuter rail, subway or express buses to Manhattan.
- ▶ Highland Park which could be accessed if the B13 or the B20 were rerouted.

New or Revived Rights-of-way

- ▶ Use of the Montauk Branch of the LIRR at the four stations in Queens should be revived.
- ▶ The Rockaway Beach Branch should be reactivated.
- ▶ The Triboro Rx concept should be applied along the Bay Ridge freight line.

Other Relevant Comments

- ▶ Interest in public transit is much greater in the southern part of the district (Ridgewood) and less so in Middle Village and Glendale.
- ▶ The land uses in the district, with its many cemeteries, result in circuitous travel.
- ▶ The bus depots serving the district are mostly across the borough border in Brooklyn, which tends to focus more service in Brooklyn, depriving the Queens 5 residents of bus service.
- ▶ There is interest in bringing bike share to the district.

Bronx Community Board 9

Bronx Community Board 9 area in the eastern part of the borough contains the neighborhoods of Castle Hill, Parkchester, Soundview, and Unionport, among others. There is limited subway service, with only one subway line, operating through the western side of the area, missing much of the community board area. The area is relatively isolated, cut off by the Bruckner Expressway from the rest of the Bronx. Reaching other parts of the borough often requires long rides on buses, sometimes requiring two or more transfers to complete a trip.

About 172,000 people live in this area of 4.1 square miles, at a density of 42,000 people per square mile. About 58 percent of the population identifies themselves as Hispanic, and another 31 percent as black. Fifty-four percent of the households in the area do not own a car, slightly higher than the borough-wide average of 46 percent, and only one in ten own two or more cars, less than the 18 percent in all of the Bronx.

The district is served by nine local bus routes. One inter-borough service, the Q44, operates to Queens. There are two express bus lines that stop in BX9. Subway service is limited

to #6 Pelham Bay line. More than half of the land area in BX9 district is beyond walking distance to a subway station.

The community board discussion produced the following key observations, concerns and suggested solutions:

- ▶ The #6 Pelham Bay line is beyond walking distance for many residents of the district.
- ▶ Hunts Point access requires two buses for residents of BX9 who work at the food market.
- ▶ The BX 5 bus route operates very inconsistently with poor headways.
- ▶ SBS service for the BX5 should be considered.
- ▶ BX 5 service does not operate late enough.
- ▶ Zerega Avenue should have bus route to serve the industrial area there and the new development at the Whitestone multiplex.
- ▶ Traffic conditions at the time of school let-out are a problem for buses, with crowding on the buses.
- ▶ The Bronx 36/39 on White Plains Rd experiences extreme cases of bunching.
- ▶ Close Avenue should have bus service.
- ▶ Express buses should terminate in lower Manhattan rather than terminating in Midtown.
- ▶ Express bus stops are not well located for many residents.
- ▶ There was concern about crowded buses.
- ▶ Service frequency was too limited on buses at midday.
- ▶ Service late at night was insufficient for late-night workers.
- ▶ Faster buses to the Hospital complexes, Co-op City, and the County Courthouse on 161st Street are needed.
- ▶ Express buses to LaGuardia Airport are needed.
- ▶ Bus access to St. Barnabas HS was needed.
- ▶ Transit access to the Grand Concourse was difficult.
- ▶ There is interest a ferry service to lower Manhattan from Soundview which is being considered by the NYCEDC, and
- ▶ There is enthusiasm about Metro-North's Penn Access plan not only for quicker commute it would provide to Manhattan but also because it would further open up job centers in Westchester and Connecticut.

Notably, nearly all issues raised were related to the inadequacies of the bus service, rather than the subways. This reflects both the problems this CB has with the quality of the bus service and the relative importance of buses to their mobility needs.

Brooklyn Community Board 5

Brooklyn Community Board 5 covers an area stretching from Broadway Junction south through New Lots to Starrett City and Spring Creek. Its subway service in the northern part of the district is plentiful, particularly where five lines converge at Broadway Junction at the CB's border, but service is slow and indirect to many places, particularly on the J line. The L line operates at the western edge of the district and the #3 penetrates the area and terminates in New Lots. The southern portion of the area is a "two-fare" zone and likely to be remote from many destinations.

There are parts of 13 local bus routes that operate in the district, generally covering the area well with a few exceptions. Of these, four are designated as Queens routes and are routed between the two boroughs. Bus service tends to be widespread in the southern portions of the district, particularly in Starrett City and Spring Creek, to compensate for the absence of any subway service. Three routes also operate as expresses to compensate for the isolation of these two neighborhoods.

Efforts to set up an outreach meeting with this community board were unsuccessful, despite repeated attempts. At one point a meeting was set up but a snowstorm forced its cancellation. Attempts to reschedule were also unsuccessful.

Manhattan Community Board 11

Manhattan Community Board 11 area is located between the Fifth Avenue and the East River from 96th Street north in Manhattan, entirely in East Harlem. The district's population stood at 120,500 according to the 2010 US Census, on a land area of just 2.4 square miles, putting the density at just over 50,000 persons per square mile. The district also includes Randall's and Ward's Islands (now joined), where 1,600 people live, largely in institutional quarters.¹

Fifty percent of the population identifies themselves as Hispanic, and another 31 percent as black. The white population has grown by 69 percent in the 2000 to 2010 period, while the Hispanic and black populations have each declined. Three quarters of the households do not have an automobile available to them, 20 percent own one car, and a mere five percent own two or more. This 70/20/5 split mirrored closely the borough-wide average of 72/24/4.

The district is served by 19 bus routes, six with limited stops through the districts. These local routes cover the district thoroughly, operating on all the major north-south avenues, and on the major east-west streets of 96th, 106th, 116th and 125th Streets.

Subway service is confined to the Lexington Avenue line, with four stops from 96th to 125th Street, the last with express

¹ Originally, the study was not going to look at Manhattan. However, the advisory committee felt that representation in the northern third of Manhattan was important. Manhattan Community Board 11 in East Harlem was chosen because it lacked subway coverage on its eastern half and it had limited east-west bus options.

trains (#4 and #5), with the local #6 service stopping at all of them. Five routes that operate along 125th Street offer service to the subway lines to the west, all out of the district.

The Metro North commuter railroad stops at 125th Street and Park Avenue in the northwest corner of the community board, where “reverse” service to Hudson Valley and southeastern Connecticut destinations are available.

The community board discussion, which included the major officers of the community board, produced the following key observations, concerns and suggested solutions:

- ▶ The M116 bus is very crowded for students traveling to Manhattan Science H.S.
- ▶ The new East River Plaza shopping center, the only shopping mall-style commercial center in East Harlem and with many national chain stores, located east of First Avenue between 116th and 119th Street, requires more than one transfer for many residents. Anyone beyond walking distance requires the use of the M116 bus which can be infrequent and/or crowded. The north south lines that connect to it are infrequent in some cases, especially the M1 and M101. Some routes do not extend north of 125th Street, and make it more difficult to reach that shopping center for those living to the north. Options for more direct service should also be considered.
- ▶ Reaching locations on the west side often requires two or more transfers. The M96 is infrequent during off hours. The M101, M102 and M103 are subject to bus bunching and consideration should be given to dividing these long routes. The M98 is a good service but does not run in off-peak hours or on weekends.
- ▶ Access to Randall’s Island is dependent on the M35 bus route, which is also used by homeless and institutionalized members of the population to reach the facilities on the Island, mostly by boarding at the route’s terminal at Lexington Avenue and 125th Street, causing crowded conditions that are unpleasant for all riders. (Following the meeting RPA experienced the difficulties firsthand on the M35 by riding this route, boarding at 125th Street). The community board has been in discussions with the MTA without a resolution to date. A number of remedies were suggested by MN11 members. These include:
 - i. Extend the M100 onto Randall’s Island and eliminate the M35. This would provide more frequent and less crowded service. It would also ease the pedestrian crowding issues at the M35 terminus.
 - ii. Move the 126th Street Bus Depot onto Randall’s Island and have the M15SBS and M15 local terminate on Randall’s Island. This would also improve service frequencies and make use of articulated (longer, sixty-foot) buses as well as eliminating the M35 terminus. Moving the depot would also free up valuable real estate in upper Manhattan.

iii. Extend a bus line through Randall’s Island and into Queens. Such a route would require shorter headways and larger buses. Extending the line to Queens would also give residents of this borough direct public transit access to the Island.

- ▶ Transit service to recreational points in Queens, such as Citifield and Arthur Ashe stadium are limited.
- ▶ Access to the handicapped was also extensively discussed. Currently, there are a host of issues that limit the mobility of seniors and handicapped individuals. Among the remedies suggested were the revamping of subway escalators to accommodate wheelchairs, and the modification of the E-Hail program to accept them. The Access-a-Ride program was described as woefully inadequate today.
- ▶ The group was upset at the rejection of the M60 as an SBS service along 125th Street. However, since the meeting, there was a reversal and the M60 SBS has now opened, serving both the community and those using that route to reach LaGuardia Airport.
- ▶ The group expressed support for the Second Avenue subway continuation to 125th Street.

Staten Island Community Board 1

Staten Island Community Board 1 is located on the northern portion of the island. Given the nature of the Staten Island transit system and the isolation of the Island from the rest of the City, it was difficult to focus on the transit needs of just this area without fully considering the needs of the entire island. Therefore, the outreach meeting invited and included residents throughout the borough.²

The public transit system on Staten Island has two purposes – to serve people who travel within the Island and to serve those wishing to travel off-Island, largely to Manhattan. The locally oriented service is primarily local buses; 22 routes attempt to cover the 59 square miles of the borough. Fifteen of these routes also serve an off-island function – 12 by bringing riders to St. George to the ferry, two to Bay Ridge, Brooklyn, and one to the New Jersey Transit light rail line in Bayonne. The second purpose of Staten Island’s transit system is to provide access to Manhattan. On Staten Island this is done in two ways – connections to the ferry at St. George by bus and by the SIR, a 14 mile, 22-stop rail line running the length of the borough along its southeastern flank and by the 28-route express bus network that uses the Verrazano-Narrows Bridge into Brooklyn and then to the Brooklyn-Battery Tunnel into Manhattan.

The community board discussion produced the following key observations, concerns and suggested solutions:

² Selecting one community board for Staten Island was particularly difficult; however, transit deficiencies are similar throughout the island. While S11 was selected, much of this report combines the research for the entire Island and thus much of the material and recommendations are presented for the entire borough.

Local Buses

- ▶ S40/90 is slow and crowded, in part because of school children use. The west shore expressway currently has no local bus service making the Teleport and DMV (the only one on the island) hard to reach.
- ▶ Local bus service does not solve the problem of travelling from the North Shore to the South Shore. Additionally, bus stops are poorly placed.
- ▶ There should be bike racks on buses.
- ▶ Buses will be further slowed when the SI Ferris Wheel opens.
- ▶ A reconfiguration of the S66, S57, and S54 routes is needed.

Express Buses

- ▶ There should be free transfers to and from express buses and other MTA services.
- ▶ The MTA should notify passengers of the presence of empty seats on express buses (perhaps using some form of sensor that detects if a seat is occupied) to avoid standees on long trips.
- ▶ Express buses from Tottenville should be reestablished.
- ▶ Express buses stop too frequently in Manhattan.
- ▶ The S89 should have a longer service span.

Ferry

- ▶ There is a desire for south island ferry service.
- ▶ Using ferry terminals as economic development opportunities was mentioned multiple times.
- ▶ It was suggested that tourists should pay to use the ferry while it remained free for residents of Staten Island.

North Shore

- ▶ There were mixed messages regarding the MTA decision to pursue this right-of-way as a busway. Many preferred light rail, but there was no strong consensus.

Miscellaneous

- ▶ There should be a bus or ferry service between Staten Island and Queens, particularly to make the new Ferris wheel and outlet mall more attractive.
- ▶ The NYC subway should be extended to Staten Island.
- ▶ There should be a bus service between Newark Airport and Staten Island.
- ▶ There should be two free transfers with MetroCards because of the excessively long trips Staten Island residents make.

- ▶ Increased frequencies were suggested to help boost SIR ridership.
- ▶ Traffic signal prioritization was suggested to help buses and cars move more efficiently on the Island.
- ▶ There are an insufficient number of places (TVM and retail outlets) to purchase MetroCards on Staten Island.
- ▶ There were repeated concerns of car pollution and the health effect it has on the local population.
- ▶ Bridge tolls were a lightning-rod issue, with strong interest in seeing lower tolls, even if current tolls might be used to improve transit.
- ▶ The general consensus of the group was that the Island has been neglected by the MTA and City.
- ▶ The fact that Staten Island has the longest commute time in the country was brought up multiple times. This reduces the quality of life for those on the Island as well as their ability to compete economically.

Outreach Summary

Residents of these areas have strong feelings about transit improvements, which they see as necessary and desirable. The reported feedback from these meetings was not scientific or exhaustive. Some of the outreach meetings were very well attended, others less so; some groups were more attuned to transit issues than others.

A number of themes emerged from the process. The local residents were overwhelmingly concerned about the quality of the bus service – it is too far away, it is slow, it is infrequent, and it is indirect for the places they most want to travel to. Some destinations are not served at all, especially to jobs sites nearby. The major complaint about subway service was its absence in their neighborhoods, which is understandable since the communities selected, for the most part were beyond walking distance of the subway network.

All concerns and proposed solutions should be addressed, even those that some might dismiss out of reach. In the next sections of the report, we take a quantitative approach to answer similar questions and find that residents' concerns are very real, and generally borne by the data.

Nine Characteristics That Determine the Attractiveness of Transit

This section explores the characteristics that define how riders perceive the transit system, to isolate the factors causing performance to fall short of some reasonably objective standards. Many interrelated and complex factors go into the decision to use transit for a particular journey. Individuals considering transit may ask a series of questions, listed below. If all these could be answered favorably, ours would be a system that all New Yorkers could be proud of.

- ▶ **Proximity:** Is the transit stop nearby or will I have to walk excessive distances at either or both ends of the transit trip?
- ▶ **Frequency:** Will I have to wait at the transit stop an excessive amount of time?
- ▶ **Span:** Is the transit service available and /or frequent enough at the times I need to make the trip, particularly during late at night or early morning?
- ▶ **Speed:** Is the transit service slow, requiring a long time to reach my destination?
- ▶ **Crowding (capacity):** Will I be able to get a seat or will the vehicle be uncomfortably overcrowded?
- ▶ **Reliability:** Does the transit service arrive when I expect it to, based on the schedule?
- ▶ **Connectivity:** Will I get to where I am going without transferring to a second or worse a third vehicle?
- ▶ **Amenity:** Does the service give me a sense that the transit provider is interested in offering a high class service, including creature comforts, useful and timely information, and a pleasant physical environment?
- ▶ **Price:** Can I afford the fare or is it a heavy financial burden?

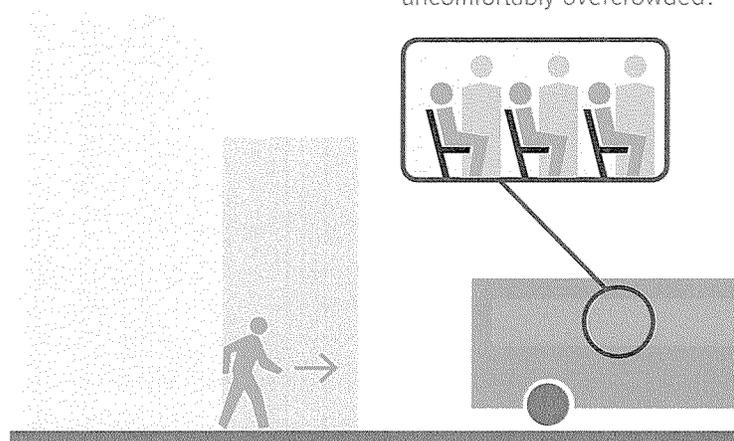
Each of these are factors can be identified with one word, with the number of mentions from the outreach meetings given here in parentheses: proximity (17), frequency (7), span (4), speed (14), capacity/crowding (6), reliability (2), connectivity (15), amenity (6), and price (4). A few stand out: proximity, connectivity and speed. This finding suggests that recommendations in this report should prioritize addressing these issues. It is also notable that concerns about price emanated primarily from Staten Island, where travel to Manhattan is more expensive for some commuters.

For each of these features the transit system should be able to provide the service at an acceptable standard. In this section performance standards are presented, where applicable, and are then applied to identify the deficiencies across the system. Some

of these factors lend themselves to route- or geography-specific analyses, while others are system-wide in nature. Most of these are applicable to both the bus and subway systems, while a limited number are also relevant to the less widespread commuter rail and ferry services in the boroughs.

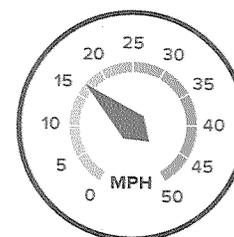
Crowding

Will I be able to get a seat or will the vehicle be uncomfortably overcrowded?



Proximity

Is the transit stop nearby or will I have to walk too far at either end of my trip?

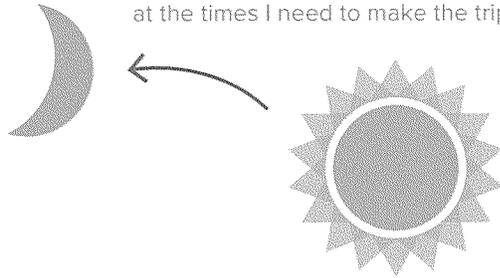


Speed

Can I reach my destination in a reasonable period of time?

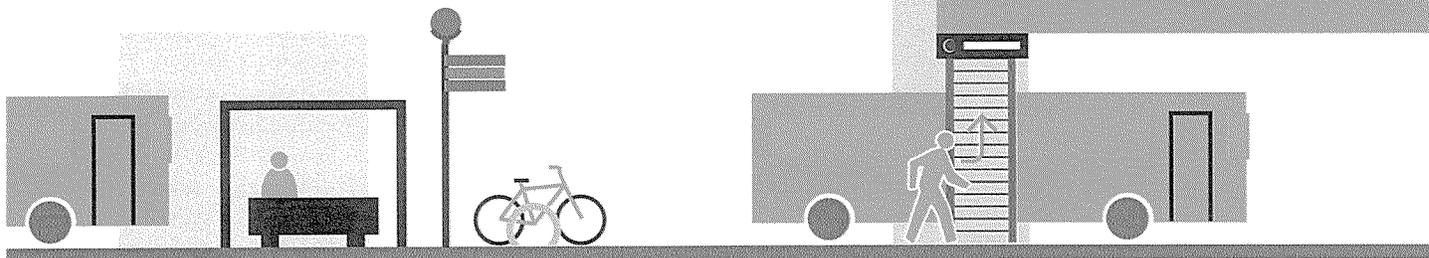
Span

Is service available and frequent enough at the times I need to make the trip?



Amenity

Is the service comfortable, and does it provide useful and timely information and a pleasant physical environment?



Frequency

Will I have to wait too long for a train or bus?

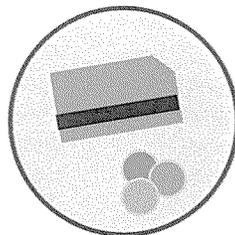
Connectivity

Will I get to where I am going without transferring to additional trains or buses?



Reliable

Does the transit service arrive when I expect it to, based on the schedule?



Price

Can I afford the fare?

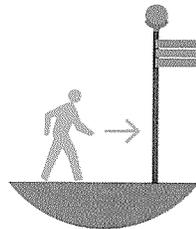
Table 6: Share of NYC Population within Walking Distance of Buses, Subways and SIR by Borough

Borough	Total Pop	Served by Local Bus		Served by Express Bus		Served by Subway		Served by Subway and/or Express Bus	
		Population	Percentage	Population	Percentage	Population	Percentage	Population	Percentage
Bronx	1,385,108	1,352,410	97.6	716,034	51.7	805,235	58.1	1,051,276	75.9
Brooklyn	2,504,700	2,457,356	98.1	604,731	24.1	1,617,994	64.6	2,003,849	80.0
Manhattan	1,585,873	1,582,652	99.8	770,657	48.6	1,306,646	82.4	1,413,464	89.1
Queens	2,230,722	2,137,137	95.8	1,056,408	47.4	736,491	33.0	1,522,612	68.3
Staten Island	468,730	397,993	84.9	326,187	69.6	65,269	13.9	344,177	73.4
NYC	8,175,133	7,927,548	97.0	3,474,018	42.5	4,531,635	55.4	6,335,380	77.5

Sources: U.S Census Bureau 2010. Metropolitan Transit Authority, Regional Plan Association

Proximity

Is the transit stop nearby or will I have to walk excessive distances at either or both ends of the transit trip?



The subway and bus networks in New York City are very extensive; New York also has the most extensive passenger rail network of any U.S. city and rivals the extent of systems in other world cities. The subway system is 231 miles long, has 468 stations, and provides 26 separate services. There are 228 local bus routes in the five boroughs and another 45 express bus routes designed to move travelers to Manhattan from areas without subway service. Table 6 summarizes the population within walking distance of these services and Figure 6 shows where these areas are. The table assumes that the acceptable walking distances are one-third of a mile for subways and express buses and one-quarter of a mile for local buses.

As Figure 7 shows, the local bus service covers almost all of the populated parts of the city; 97 percent of the city's population is within walking distance of at least one bus route. Only Staten Island dips below 95 percent coverage. Of course, being near a bus route does not guarantee that the bus service is necessarily going where a particular rider wishes to go.

The subway system's coverage stands at 55 percent. Manhattan leads the way with 82 percent covered, and Staten Island lags at only 14 percent, accounted for by the Staten Island Rapid Transit system. When express buses are combined with subways (the premise being that they fill in gaps in subway coverage) then the subway and express bus combination climbs to 77.5 percent overall and at least 68 percent in each borough. The express buses alone provide extensive coverage of Staten Island, compensating for the absence of a robust rail system. To a lesser extent the same thing is true for Queens. However, they are not a direct substitute for the subway for a number of reasons because, for the most part, they do not operate throughout the day, late into the evening and on the weekends, and unlike the subway, they are largely point to point services that give access to only a limited number of locations in Manhattan.

The areas that stand out as being beyond a reasonable walk from the subway are concentrated in northeastern Queens (including the College Point and Whitestone), southeastern Queens (Springfield Gardens, Laurelton, Hollis, St. Albans, Rosedale, and South Jamaica), and south central Queens (Glen-dale, Maspeth, Middle Village), portions of south Brooklyn (Flatlands and portions of Canarsie), the south central Bronx (Morrisania and East Tremont), the northwest Bronx (Riverdale), a number of neighborhoods in the northeast Bronx, and in the Lower East Side of Manhattan. Additionally, the only rail service on Staten Island is found along its southeastern flank; the rest of that borough relies on buses.

There is a long history of planning for the expansion of the NYC subway system to fill in some of these gaps. This will not be fully recounted here. Suffice it to say that gaps still exist and needs remain. The recommendations section of the report offers some approaches to fill these gaps.

Commuter rail and ferry coverage, when compared to the bus and subway coverage in the boroughs is extremely limited and their fares are considerably higher than subway or local bus fares. Thirty-six commuter rail stations are within New York City. Queens has 17 LIRR stations, mostly serving the outer portions of that borough that fill in the gaps in the eastern part of the borough without subway service. The Jamaica Center station provides connections to and from the LIRR with three subway line and many bus routes. The Bronx has 13 stations on the Harlem and Hudson lines operated by Metro North. A number of them have very limited service, particularly those in the southern part of the borough. The Fordham Road station is well situated to connect parts of the Bronx with the Westchester suburbs. Brooklyn has only three stations, with only Atlantic Terminal providing frequent service to Downtown Brooklyn. In Manhattan, the 125th Street station is well located for access at from 125th Street connecting Harlem to the Westchester suburbs. The two major stations – Grand Central and Penn Station offers wide access to the region and beyond.

Other than the Staten Island ferry, waterborne passenger service today is limited to the one Rockaway stop, Bush Terminal in Brooklyn and four Brooklyn and one Queens stop on the East River. These ferry stops only serve a small number of borough residents.

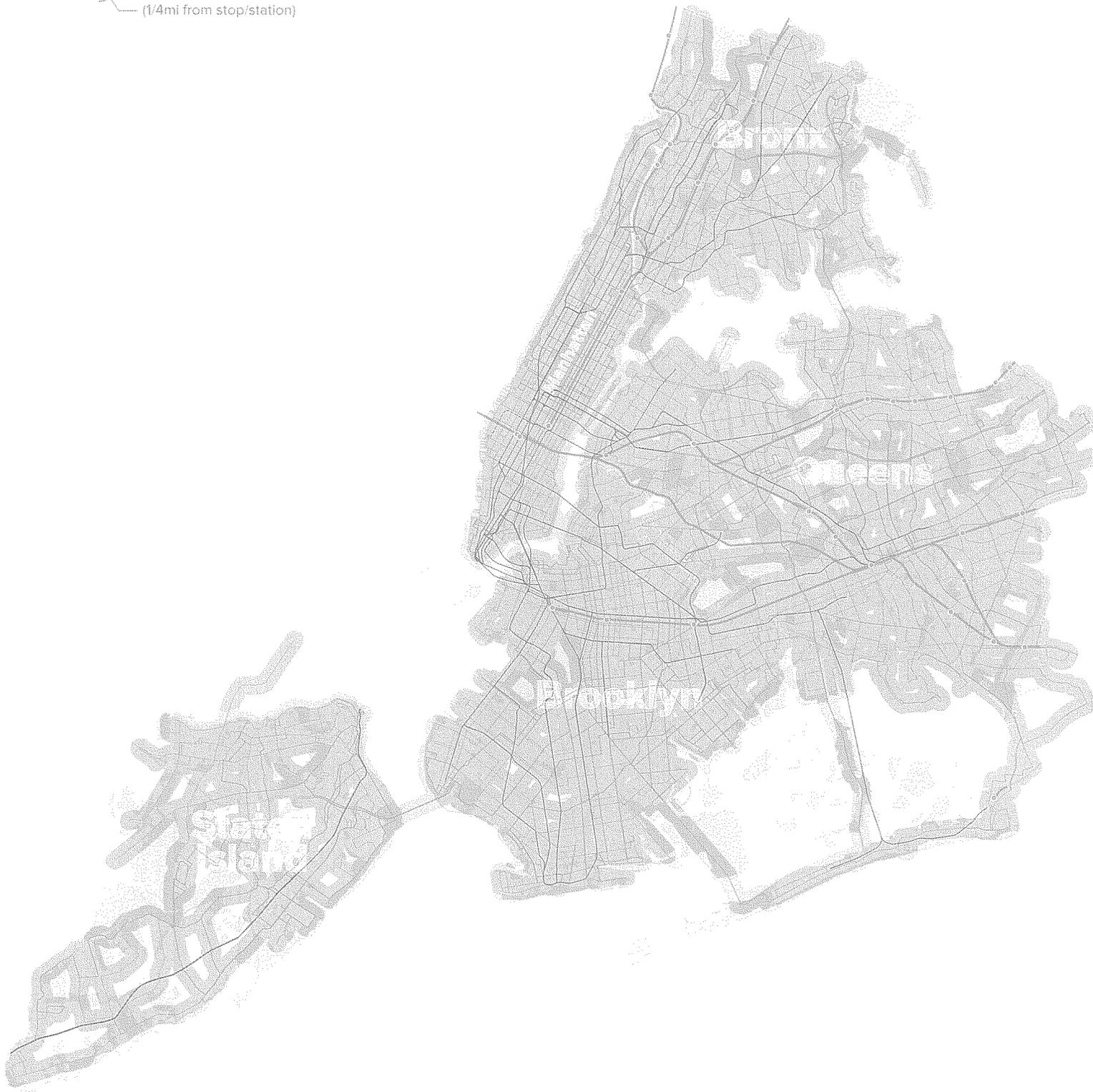
Figure 6: Subway and Express Bus Coverage in New York City

- Subway / SIR Coverage
- Express Bus Coverage
(1/3mi from stop/station)



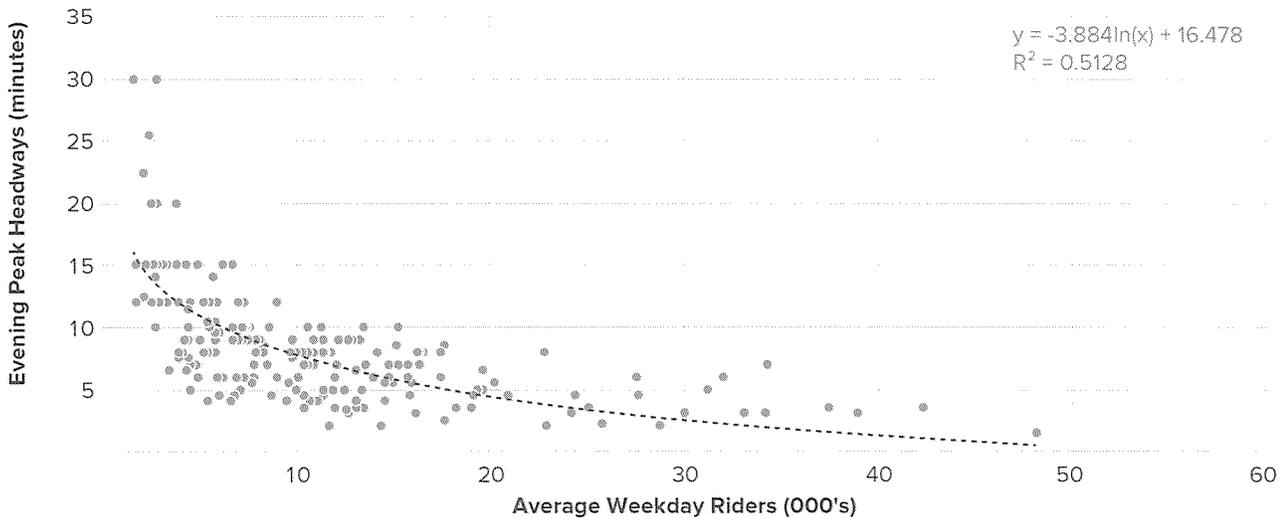
Figure 7: Local Bus Coverage

Local Bus Line
(1/4mi from stop/station)



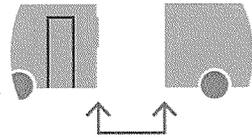
Scale 1:228,000
0 1 2 3 4 Miles

Figure 8: Evening Peak Headways and Weekday Ridership – MTA Local Bus Routes



Frequency

Will I have to wait at the transit stop an excessive amount of time?



Acceptable level of service must be weighed against ridership levels and the financial ability of the transit operator. It would be desirable to have service arrive every minute or two on every route every hour of the day, but this is not feasible. The transit operator must attempt to provide service in proportion to existing ridership. Yet, more service would likely result in more riders and conversely, less service would make it less attractive.

The question then is: Are there routes, times of day, and days of the week when the service delivered is less than it could be given existing ridership? With respect to buses, research has shown that when buses arrive every 12 minutes or less, passengers do not find it necessary to consult a timetable.¹ This is especially convenient for travel to and from work, which usually occurs in the traditional morning and evening peak hours. Accordingly, frequency performance standards are set here as follows:

- ▶ Six per hour or every ten minutes during peak hours;
- ▶ Four per hour or every 15 minutes during midday and the evening until 9pm; and
- ▶ Three per hour or every 20 minutes throughout weekends.

However, these standards might be too demanding if the ridership is not there. To test this, a series of four scatter diagrams were developed to compare ridership with current service frequencies on MTA bus routes. Figure 8 shows one of these

which plots for weekday ridership against evening peak period headways, which is the span of time between departure of one bus and the arrival of the next.

Figure 8 indicates a reasonably close and expected relationship between the two. In general, the more riders there are the lower the headways. But if there are fewer riders, keeping a more exacting headway standard could result in excessive service and empty buses. Thus, the headway performance standard was relaxed using the relationship in Figure 8 and similar ones for the morning peak and midday periods, and for weekends. If weekday ridership dipped below 4,000 per day, the headway peak period threshold increased from 10 to 12 minutes and if it dipped below 2,000 per day it was relaxed still further to 15 minutes. Similar adjustments were made for middays and weekends. The application of these standards produces a list of local bus routes that could use more service. Table 7 enumerates how many routes in each borough fall short of adequate service frequencies at various times of day and days of the week. The table is most revealing in two respects. First, the evening peak has more inadequate routes than the other times. Second, the borough of Queens clearly is the most poorly served by this measure, accounting for well over half of the all the routes that fall short of meeting service frequency thresholds. Fifty-two separate routes have insufficient service during one of these five time periods, 24 in Queens alone. These routes are provided in Appendix C to this report.

There are also routes that meet the minimum standards but are so heavily used that they could use even more service. Using the scatter diagrams and best fit curves like the one in Figure 8, routes were identified that fall short of the service frequency that their ridership suggests. These are summarized by borough and time period in Table 8 and detailed in Appendix C. Brooklyn stands out as the borough with more instances where more frequent bus service is needed. In contrast there are no instances where Staten Island routes are so well used that they should be receiving more service than they currently receive. Forty-seven instances on 36 separate routes “deserve” added service based on this analysis. When added to the 56 routes falling short of the minimum thresholds, a total of 92 local bus routes of the 228

¹ P.A. Seddon and M. P. Day, “Bus Passenger Waiting Times in Greater Manchester, Traffic Engineering and Control, January 1974.

Table 7: Bus Routes by Borough With Inadequate Service Frequency

	Weekdays			Weekend	
	AM Peak	Midday	PM Peak	Saturdays	Sundays
Bronx	2	2	4	1	1
Brooklyn	3	7	7	0	2
Manhattan	3	0	5	0	0
Queens	11	18	15	5	6
Staten Island	4	1	6	1	0
TOTAL	23	28	37	7	9

Source: Regional Plan Association

Table 8: High Ridership Routes Deserving Service Greater Than the Minimums

	Weekdays			Weekend	
	AM Peak	Midday	PM Peak	Saturdays	Sundays
Bronx	1	2	3	1	1
Brooklyn	4	5	7	0	3
Manhattan	4	0	4	2	2
Queens	1	2	1	2	2
Staten Island	0	0	0	0	0
TOTAL	10	9	15	5	8

Source: Regional Plan Association

Table 9: Local Bus Routes by Borough With Insufficient Late Night Service

	Service Ends at:						Total	All Routes
	7pm	8pm	9pm	10pm	11pm	Midnight		
Bronx		1	1	1	3	14	20	39
Brooklyn			1		1	20	22	50
Manhattan		1			1	9	11	36
Queens		3		1		29	33	74
Staten Island	1				1	10	12	32
TOTAL	1	5	2	2	6	82	98	231

Sources: Metropolitan Transit Authority, Regional Plan Association

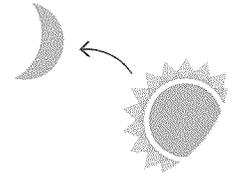
Note: The number of local bus routes in the city differs from table to table in this report, since the data varies by source. Some bus routes have variants that are counted in some cases and not others, and limited express service are sometimes counted and other times not.

in New York City are found to warrant additional service. The routes summarized here are listed in Appendix C.

The subway frequencies were examined to see if service fell short of the bus frequency standards. In no case did the subway not meet these standards. In contrast, almost all of the commuter rail stations have service that fell short of the frequency standards, the exceptions being Jamaica and Woodside on the LIRR and 125th Street and Spuyten Duyvil on Metro North. In those cases, riders are more likely to find it unnecessary to consult a time table in planning their arrival at the station.

In sharp contrast, the 36 commuter rail stations (excluding Grand Central Terminal and Penn Station) fall woefully short of providing frequent service in the boroughs. Only Woodside and Jamaica in Queens and 125th Street in Manhattan reached the 10 minute standard in the peak period for reverse commuters or the 15 minute midday standard. In the evening after 8pm the inner LIRR Brooklyn and Queen stations west of Jamaica and the Port Washington branch stations offer 30 minute service or better. Across the board, the southeast Queens and the Bronx stations do not reach any of these standards.

Span



Is the transit service available and /or frequent enough at the times I need to make the trip, particularly during late at night or early morning?

Many New Yorkers depend on transit to get home from jobs that end well into the night. This is particularly true for late night shifts at hospitals and for restaurant workers. The subway operates on a 24-hour schedule but none of the bus routes do. Assigning performance standards to this feature is straightforward, if somewhat arbitrary: if there is bus service on weekdays as late as 1am then the bus route passes the test. While the compilation below indicates routes without weekday service as late as 1am, it might not be necessary to provide this level of service for routes with insufficient ridership. Only by examining the evening ridership patterns route by route could a definitive judgment be made. As Table 9 shows, the MTA provided local bus service until at least midnight for all but a handful (16) routes. Eighty-two routes end around midnight. The table provides a starting-point to determine if there are some routes where late night service might be expanded.

Subway service in New York City, unlike any metro in the world, operates on a 24-hour basis. This puts an enormous burden on the MTA to maintain the system while trains continue to operate. For budgetary and maintenance reasons, the closing

of the system for a few hours overnight has been proposed from time to time, but has been rejected because of the burden to late night workers. However, there is now a program in place to close service on line segments overnight to enable more rapid completion of needed maintenance tasks.

The commuter rail service at the 36 stations in the boroughs (outside Manhattan CBD) operated up to midnight in all but four stations – two lightly used stations in the Bronx, Tremont and Melrose, and Hunters Point and St. Albans in Queens. None of the ferry services operate past midnight other than the SI ferry, which operates on a reduced schedule through the night seven days a week.

Speed

Is the transit service slow, requiring a long time to reach my destination?

The speed of a bus route is dependent to a large degree on the density through which the route passes. In denser areas there is generally more traffic congestion that slows the service. There are higher ridership levels that can slow buses since the boarding and alighting process is longer. Express buses are intended to provide faster service for longer distances from areas of the city without subway service by making fewer stops and are routed over highways, which should speed them up. In Table 10 the average bus speeds for local and express service for all MTA buses is shown. As would be expected, in Manhattan the bus speeds are slowest, almost two miles under the citywide average of 8.2 mph, and in lower density Staten Island speeds are fastest, over three miles higher than the average. The ranking of speeds is the same as the average borough-wide population densities, as would be expected; the denser an area, the slower bus speeds tend to be. Express buses which operate from four of the five boroughs to Manhattan are surprisingly slow, likely a result of the time spent in Manhattan working their way through peak hour traffic.

The analysis isolated bus routes that function particularly slowly for the environment in which they operate. The average local bus route in New York City travels at only 8.2 miles per hour, slower in the Bronx, Brooklyn and Manhattan, and faster in Queens and Staten Island. Express routes average 11.4 mph. Table 10 indicates how many local routes in each borough fall one mph or more below their borough averages and how many express buses citywide fall one or more mph below the express bus average. Of the 228 local routes, 62 are characterized as slower. Fifteen of 62 express routes also fall short.

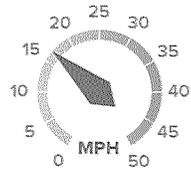


Table 10: Number of Routes by Borough with Slow Bus Speeds

	Speed (mph)	# Routes	# Routes > 1 mph Under Average
Local Routes	Bronx	7.6	39
	Brooklyn	7.8	50
	Manhattan	6.4	33
	Queens	9.2	74
	Staten Island	12.2	32
	All Local Routes	8.2	228
All Express Routes	11.4	50	15

Source: Metropolitan Transit Authority, Regional Plan Association

Figure 9 maps out these slow routes.

These include:

- ▶ In the Bronx, the slower routes are mostly in the south Bronx, with the exception of the B38 along Gun Hill Road.
- ▶ In Manhattan almost all of the slow routes operate as cross-towns. These routes must deal with the traffic signal green time advantage that avenues have over cross streets.
- ▶ In Brooklyn, many of the slow routes operate in an east-west direction, including routes that connect across the borough from New Lots to Sunset Park, and a number of routes that operate into downtown Brooklyn from both central Brooklyn and southern Queens locations.
- ▶ In Queens the routes that fall short of the speed standard serve Flushing, Jamaica Center, and Long Island City.
- ▶ On Staten Island all the slow routes feed directly into St. George and the Staten Island ferry. The routes operating on the north shore of the island are conspicuously included among these slow routes. They generally must negotiate narrow streets.

There are numerous steps that can be taken to speed buses. These include: increasing limited-stop bus service, increasing number of low-floor buses to speed boarding times, providing contactless fare payment, encouraging greater rear door use, instructing stricter enforcement of parking and traffic regulations, and increasing use of preferential treatments for buses. This tool box of measures can be combined to effect significant improvement in bus speeds.

Service on the New York City subway system averaged 18 miles per hour, more than twice the average local bus speed. Still, subway speeds can be increased too. Parts of the system have four tracks, allowing parallel express and local service. There are also segments of the system with three tracks, which allow for express service in the peak direction, but there are still other lines or line segments with a third track that is no longer used. These include the #4 line in the Bronx along Jerome Avenue and the Jamaica Avenue (J/Z) line in Queens. Subway service can be increased by eliminating some stops that are very lightly used and by upgrading its operation to communications based train control, a system that enables more trains to operate in the peak thereby alleviating crowding on all the lines reaching back into the neighborhoods currently experiencing overcrowding.

Figure 9: Slow Local Buses
Buses traveling 1mph or less than the borough average

- Local Bus Lines
- Slowest Lines



Reliability

Does the transit service arrive when I expect it to, based on the schedule?



The unreliability of bus service is a source of continued frustration by riders of buses in New York City. The sight of two or three buses arriving in a pack after an overly long wait has been a staple of the New York transit experience for a long time. The MTA has taken measures to try to alleviate the problem, or to relieve some of the frustration by informing passengers when they can expect the next bus. The MTA is presently measuring this phenomenon at the bus route level on a sample basis using an indicator, but the analysis is not yet complete. It could be helpful to address specific traffic bottlenecks on a route by route basis through signal preemption for buses, queue jumping lanes, and other preferential treatments.

The subway system does not have to contend with street traffic; its reliability depends largely on how well its infrastructure functions, including its signal system. But a system as old as New York's will break down, and while the enormous investments made in the last 30 years have helped to militate against more frequent problems, more work is needed. Continued investment in the subway's infrastructure, particularly for stations and signals, is necessary to further improve its performance and prevent backsliding.

Crowding (capacity)

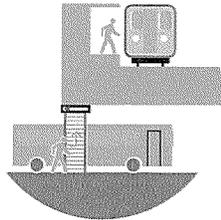


Will I be able to get a seat or will the vehicle be uncomfortably overcrowded?

The shortage of capacity for bus routes requires substantial detailed field data collection and analysis. However, the identification of those bus routes with high usage and deficient frequency, as summarized in Table 8 earlier, can serve as a useful surrogate. It stands to reason that routes with high ridership but inadequate service frequency are also routes that are likely to be overcrowded, and that addressing the frequency needs will result in less crowding and more capacity to serve existing riders. These routes are compiled in Appendix C.

Figure 10 highlights the twelve subway lines exceeding peak hour capacity based on RPA loading standards from the point in the network where the peak crowding conditions occur. The map shows substantial areas of the boroughs that tend to be faced with the most crowded subway lines, including much of the Bronx, east Harlem and Harlem in Manhattan, Astoria, Elmhurst, Corona, Flushing, Middle Village, Rego Park, Forest Hills, and Jamaica in Queens, and Greenpoint, Bushwick, East New York, Borough Park and Bensonhurst in Brooklyn.

Connectivity



Will I get to where I am going without transferring to a second or worse a third vehicle?

To examine how well the boroughs are connected by the subway network, high volume work-trip origin-destination² pairs without direct subway routes were identified and mapped. As shown in the series of maps in Figure 11A, the prevailing patterns for intra-borough poorly served markets include:

- ▶ In the Bronx, markets oriented in any east-west direction;
- ▶ In the Bronx, markets for travel within the northeast quadrant;
- ▶ In Queens, markets whose work destination were either in Long Island City or Astoria from many parts of central and eastern Queens;

- ▶ In central Queens, markets oriented in a north-south direction (e.g. between Glendale and Flushing);
- ▶ In eastern Queens, markets oriented in a north-south direction;
- ▶ In Brooklyn, markets oriented in an east-west direction toward communities along the waterfront from Bay Ridge up to Red Hook;
- ▶ In Brooklyn, from the neighborhoods of Starrett City, Spring Creek and Canarsie; and
- ▶ In Brooklyn, from neighborhoods in northern Brooklyn such as Bushwick to Sunset Park.
- ▶ The inter-borough markets with indirect or no subway services are shown in Figure 11B. These include:
 - ▶ From Staten Island to the waterfront markets in Brooklyn;
 - ▶ Between the Bronx and upper Manhattan;
 - ▶ Between Rockaway and most of southern Brooklyn;
 - ▶ From much of central and eastern Queens to downtown Brooklyn; and
 - ▶ Between northern Brooklyn and south central Queens.

These shortcomings can all be traced to the limitations of the subway network. In many of the cases the indirectness in service can be traced directly to the orientation of the subway, radially toward Manhattan rather than circumferentially within and between the boroughs-- east-west in the Bronx, east-west in southern Brooklyn, north-south between northern Brooklyn and southern Queens. In other cases the subway may be routed toward Manhattan via Queens, missing Brooklyn destinations such as downtown Brooklyn or via Brooklyn, missing Queens destinations such as Long Island City. Finally, in some cases the subway just does not extend far enough, falling short of southern Brooklyn, eastern Queens, and of course to Staten Island. These findings suggest attention be paid to these underserved markets, either by expediting bus service in the short term, or subway or other rail options in the longer term.

Connectivity for bus travel is also important, especially for short trips. It is particularly galling for riders to be required to use two or more buses for short *as-the-crow-flies* trips. Where two buses are unavoidable, more frequent service, discussed earlier, would ease the burden of the transfer, leading to shorter waits. Amenities at the waiting areas, particularly weather protected shelters and “next bus” information would also be helpful. This raises the next category that can attract transit riders: service amenities.

² Community board to community board

Figure 10: Subway Lines Exceeding Peak Hour Capacity, Standards and the Neighborhoods Affected

Source: Regional Plan Association; *Moving Forward: Accelerating the Transition to Communications-Based Train Control for New York City's Subways*; May 2014

- Subway / SIR
- Peak Load Point
- Affected Subway
- Affected Neighborhoods

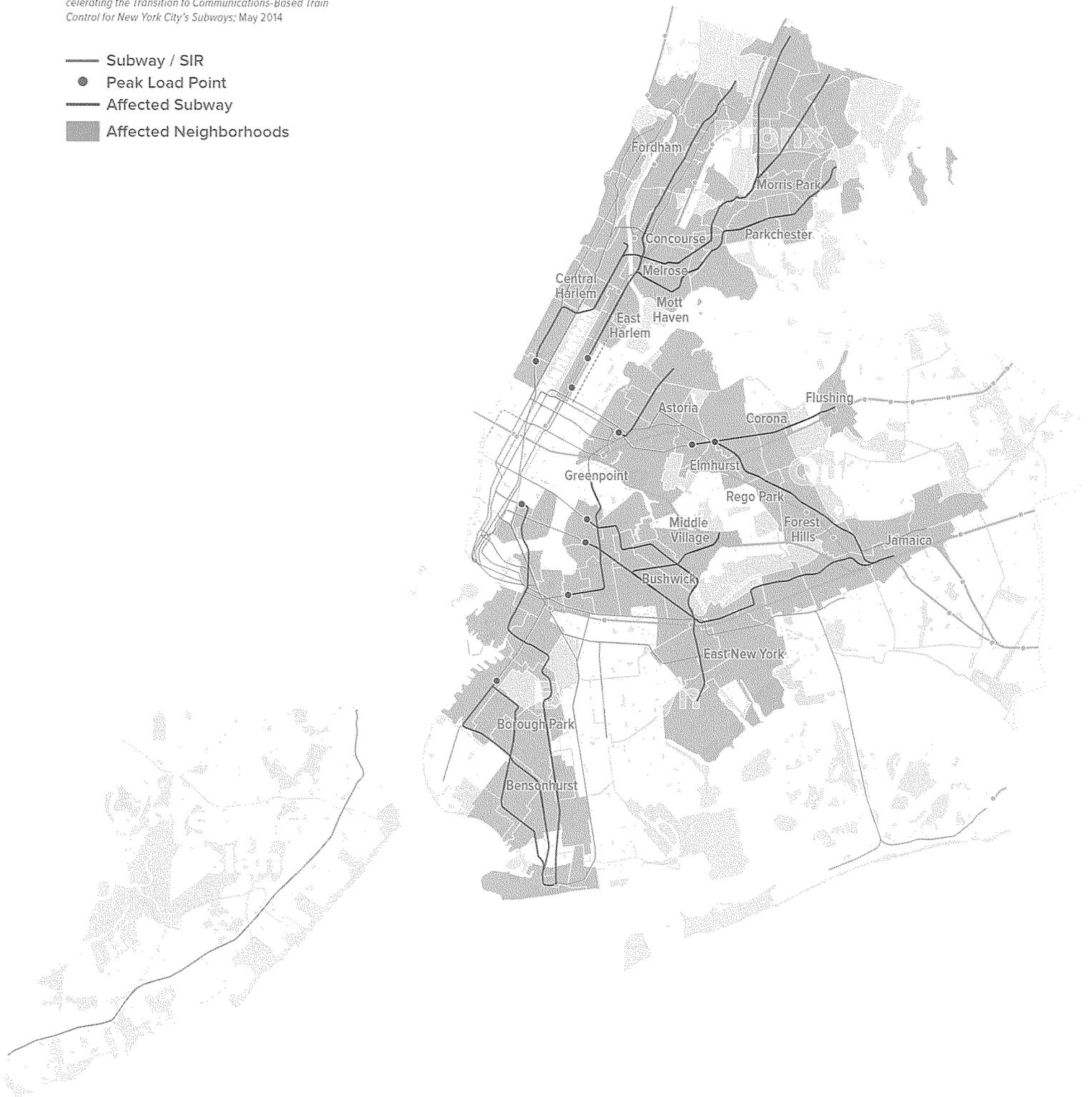


Figure 11B: Inter Borough Markets Poorly Served by Subway

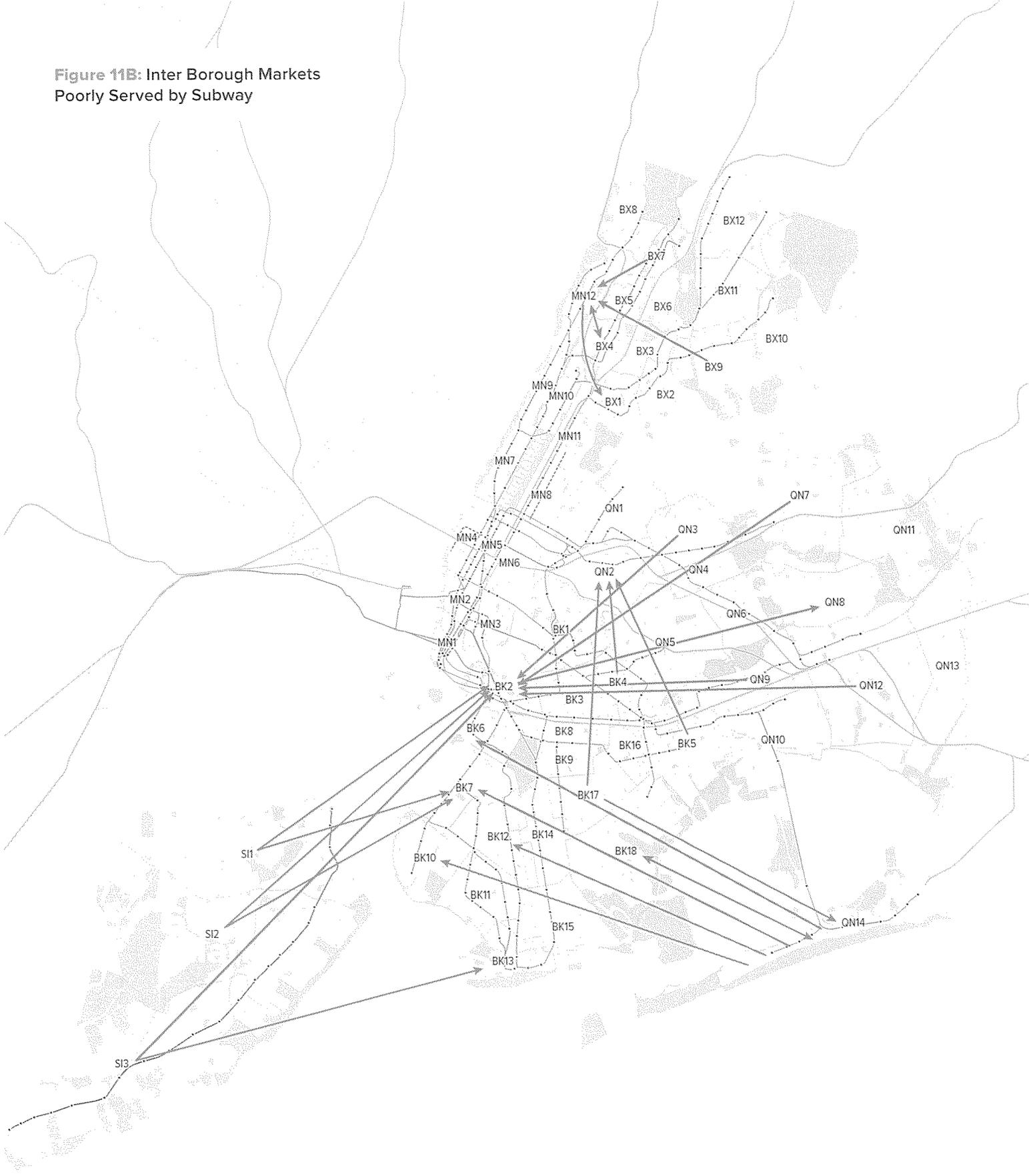


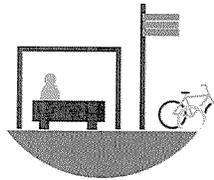
Table 11: Station Rehabilitation by Borough

Borough	# of Stations	1992 to 1999		2000 to 2014		1992 to 2014	
		Number	Percent	Number	Percent	Number	Percent
Bronx	68	6	8.8	40	58.8	46	67.6
Brooklyn	157	15	9.6	59	37.6	74	47.1
Queens	79	8	10.1	24	30.4	32	40.5
Upper Manhattan	38	4	10.5	9	23.7	13	34.2
Rest of Manhattan	79	37	46.8	18	22.8	55	69.6
TOTAL	421	70	16.6	150	35.6	220	52.3

Sources: Metropolitan Transit Authority, Regional Plan Association

Amenity

Does the service give me a sense that the transit provider is interested in offering a high class service, including creature comforts, useful and timely information, and a pleasant physical environment?



The subway stations are the front door for over 5 million riders a day, and their overall condition can reflect well or poorly on the MTA. Up until recently, upgrading of the stations in the boroughs outside of the CBD had been excruciatingly slow, as reflected in Table 11 and shown in Figure 12. The disparity of work done in the boroughs versus Manhattan from 96th Street and below is startling. Some of the disparity can be explained by priority given to higher volume stations, which tend to be in the Manhattan CBD, but as of 1999 only 22 stations were rehabbed in all of the Bronx, Brooklyn, Queens and upper Manhattan, while 26 were completed in Manhattan from 96th Street south. In recent years the boroughs have started to catch up, but northern Manhattan and Queens remains well behind. Much of the more recent work has been on a component-basis, rather than full rehabilitations, aimed at speeding the work and focusing on components in poorest conditions that might also be a safety hazard.

Buses are a second class mode of travel in the minds of many, not without some justification. While slow, bumpy, and unreliable might be the most likely words used to describe the bus ride itself, the off-vehicle experience also leaves a lot to be desired.

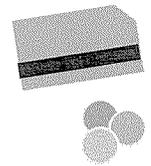
Amenities at bus stops can give the rider greater assurance that the transit operator cares. These can include bus shelters, bus schedules and maps, real time bus arrival information, and easier fare payment systems.

Shelters that are properly enclosed from the elements, with seating in a well-lit, safe environment offer both comfort and a sense of security at stops. Signage that clearly indicates the bus frequency by route and time of day and transit system maps that indicate transfer points should all be standard practice. Dynamic variable messaging signs with accurate bus arrival times can: ease rider anxiety, create a sense that the transit system is well

run and reliable, and provide information about system delays and other urgent rider notifications. This information should also be made available via smartphones, web browsers, and other internet connected devices to allow riders control over their wait times. The MTA's BusTime system currently provides bus status on the internet and smartphones, based on distance from the stop rather than estimated bus arrival time, an easy to understand service indicator for riders.

Price

Can I afford the fare or is it a heavy financial burden?



Transit affordability is tied to income. In Figure 13 the City is mapped to show the share of income that is required for two people to purchase weekly MetroCards. Of course, the map does not account for individual situations and should be seen as a broad indicator of where the cost of transit may be burdensome; there may be fewer than two persons using transit in any individual household, incomes vary from the median within any particular census tract, either a monthly or single ride MetroCards may be used, etc.

The map indicates what would be expected: a pattern that closely reflects the lower income distribution of residents in New York City, particularly in the south and central Bronx, central Brooklyn, Coney Island, Far Rockaway, and Manhattan above Central Park. There are also significant sections of the city with moderate incomes and where the cost of transit exceeds five percent.

Whether these costs are excessive is discussed in the recommendations section of this report. Fare levels depend on operating budgets, labor costs, government contributions at all levels, and are part of an ongoing public debate. Suffice it to say here that many who pay large percentages of their income for public transit are disproportionately located in the Bronx, upper Manhattan and Brooklyn as indicated in Table 12. This suggests that special attention needs to be paid to the service offered in areas inhabited by low and moderate income families.

**Figure 12: Subway Station
Rehabilitation Progress Since 1992**

Source: MTA and RPA

- Subway Station
- Rehabilitated (1992-1999)
- Rehabilitated (2000-2014)
- Component/Renewal (2000-2014)

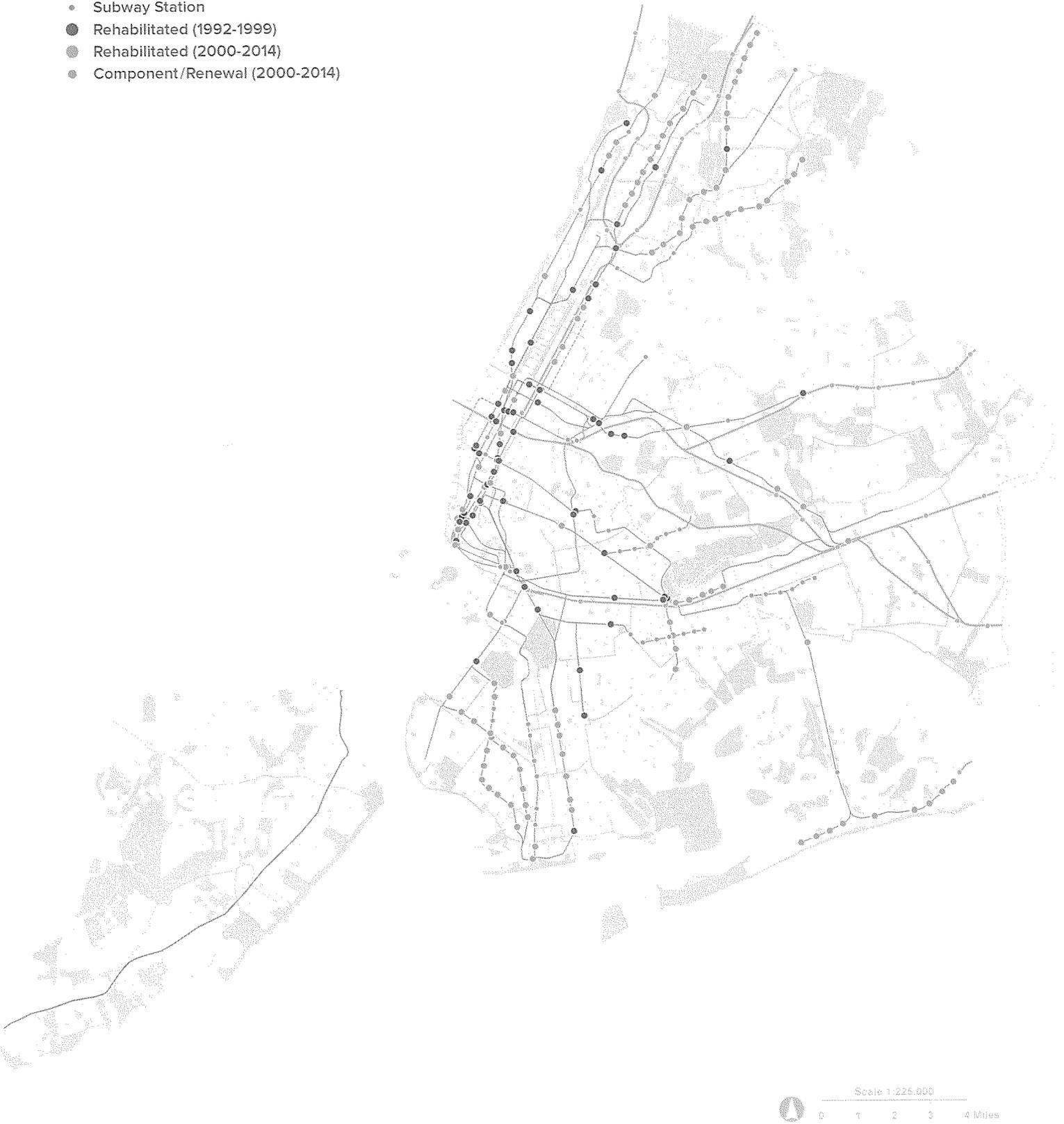
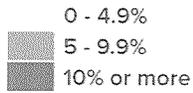


Figure 13: Affordability of Transit Fare
Share of Income to Pay for
Two Monthly MetroCards

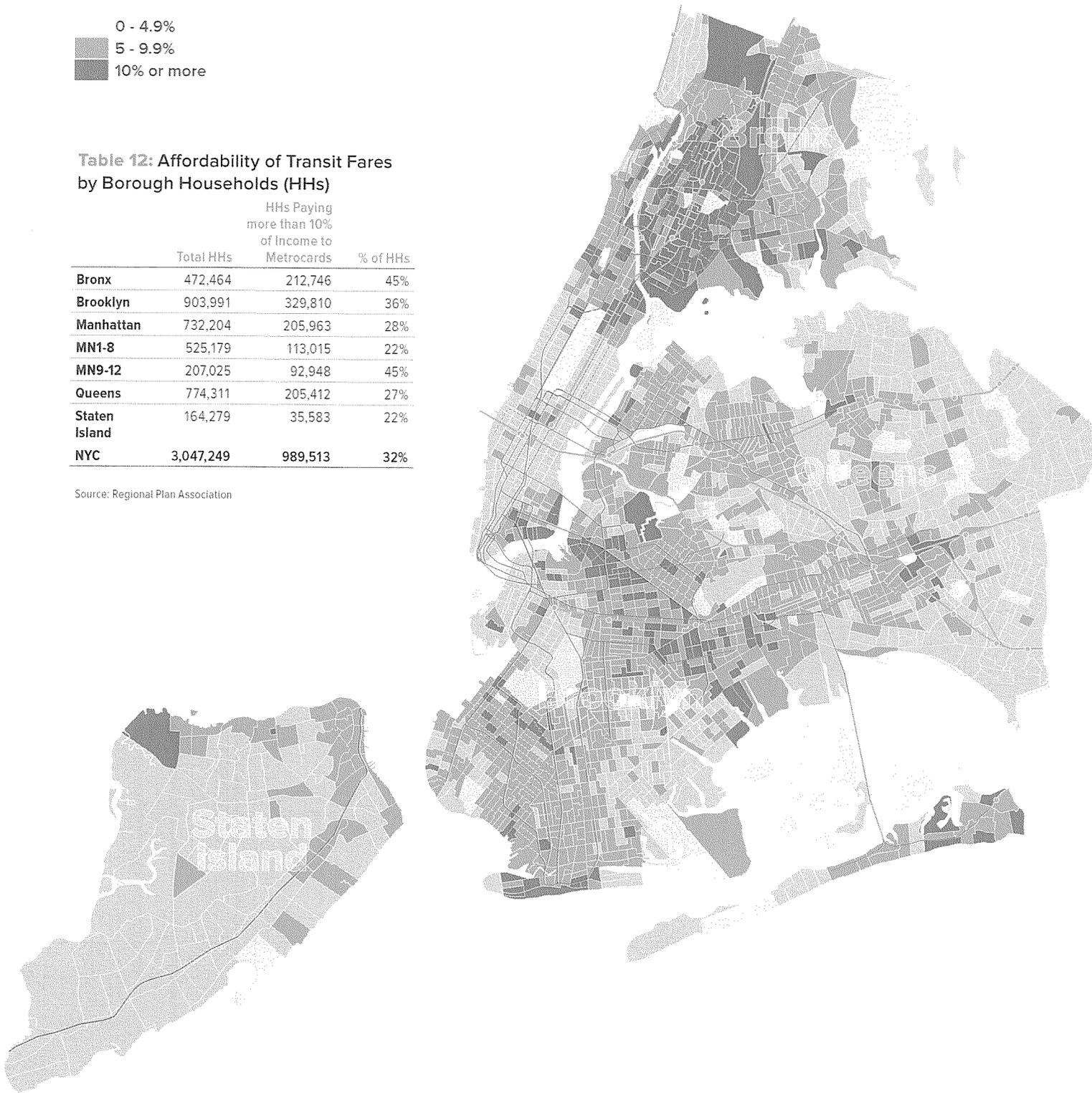
Source: US Census, RPA



**Table 12: Affordability of Transit Fares
by Borough Households (HHs)**

	Total HHs	HHs Paying more than 10% of Income to Metrocards	% of HHs
Bronx	472,464	212,746	45%
Brooklyn	903,991	329,810	36%
Manhattan	732,204	205,963	28%
MN1-8	525,179	113,015	22%
MN9-12	207,025	92,948	45%
Queens	774,311	205,412	27%
Staten Island	164,279	35,583	22%
NYC	3,047,249	989,513	32%

Source: Regional Plan Association



Recommended Actions

These recommendations aim to build on the positive features of New York City's vast transit system by addressing its weaknesses, especially ones that limit the mobility of borough residents. This translates to a set of recommendations that emphasizes the bus network and can more immediately be implemented. The objective is to improve the quality of the bus network by making it faster and more reliable. The recommendations also address the subway network and other modes that can supplement the bus and subway system, including the two commuter rail systems and to a lesser extent, ferries.

These recommendations are mindful of basic facts that underlie available travel choices. More than half of borough residents do not have access to a car. When the transit system does not meet their transit needs adequately, they have little choice but to suffer its indignities. Further, transit must overcome the dual handicap of time lost in access and in waiting for the vehicle, while these factors are largely absent for a trip made by car. For those with a car available, it offers instant availability at any time day and night, advantages difficult to overcome. This disadvantage for transit is particularly acute for shorter trips where in access and waiting times loom larger. The competitive disadvantages of transit can be overcome. When driving becomes expensive because of parking or tolls and traffic congestion becomes insufferable, the advantages that transit can offer come into play, provided transit's attractive features can be achieved.

The recommendations for improving the transit systems in the boroughs are based on the three sets of information gathered and discussed in this report. These include the analysis of the nine factors that influence transit use, the insights gained from the analysis of the non-transit factors that affect transit use, and the insights gained from the community board outreach.

The recommendations that emerge from these analyses and community inputs are reorganized by time frame of prospective implementation, i.e. what is the earliest possible time the recommendation could be put in place? Generally, recommendations that require considerable capital investment will take longer, those that can be accomplished with a change in operations or by policy fiat could happen quicker. Within that construct, the recommendations are organized by mode.

The Boroughs Deserve a First-Rate Bus System

Added Bus Service

This report identifies local bus routes in the boroughs that fall short of the reasonable standard of service frequency (see Table 7). Of the 228 local routes operated by the MTA, there are 89 instances during weekdays—in the morning peak, evening peak, or midday—when service is inadequate. Another 16 instances of weekend service shortfalls are identified. Taken together, there are 52 separate routes with insufficient service during one or more times. In addition, there are 35 other routes whose peak service levels could be increased given their high ridership levels (see Table 8). Adding service in these instances could reduce crowding.

Implementation of these recommendations would not only lead to shorter wait times and greater convenience for transit riders, but would also serve to mitigate the negative effect of transfers between buses where they are unavoidable.

Evening local bus service is also lacking in some cases. Sixteen routes end service by 11pm and another 82 end service at about midnight (see Table 9). These should be examined to determine if the last operating bus indicates a need for more late night service.

Express buses are mostly intended to fill in the gaps where subway service is lacking, even so, these buses almost exclusively serve the morning and evening peak periods leaving midday, late night, and weekend customers unserved. This provides support for the recommendation to operate express bus service at times other than the peak on weekdays and on the weekends.

The limited bus service to Brooklyn destinations from Bay Ridge, Bush Terminal, Sunset Park, and Red Hook indicates that expansion beyond the one Staten Island route to Brooklyn be considered, delivering riders to the R line subway station at 86th Street to distribute them further north. To the MTA's credit, there are already three Staten Island routes that do this. Other new or modified routes were suggested during the outreach process, including one along the industrial park area on Zerega Avenue in Bronx Community Board 9 (a direct route from that CB to Hunts Point versus the two buses presently required for a short trip to a major work destination), and a modified route to deliver workers to the industrial parks in Maspeth, Queens. The repeated mention of service to industrial areas suggests that the MTA should take a close look at all bus service to these areas.

Taken together, these recommendations for more bus service, if fully implemented, would hardly come free. They would have a significant impact on the MTA's operating budget, potentially requiring added rolling stock, bus storage, and maintenance facilities. A rough estimate of implementing the full set of bus service recommendations comes to about \$28 million annually, which though less than one percent of the \$3 billion spent annually for bus service, should be approached judiciously given the difficult budget situation. Thus, these recommendations should be seen as a starting point for the MTA with incremental changes implemented first, ones that could be accomplished with limited or no additions to the bus fleet or to bus facility requirements. As such, this report recommends the MTA initiate a demonstration program that selects two or more routes in each borough for both local and express bus service improvements in each time category, including late night local bus service, to demonstrate the value of the added services. Such a demonstration project would cost the MTA \$10 million per year.

Each added service in the demonstrations would have a sunset clause that would result in the cessation of the demonstration should ridership gains not warrant their continuation. The experiment period should be two years. Ridership gains would be closely monitored. These criteria would be made public beforehand and publicly advertised on the routes, i.e. use it or lose it. Transportation advocates would also be asked to assist in deciding if the demonstration should be continued. Patterns of success (or failure) would suggest where further service increases should be tried. Of course, it would be valuable for the MTA to do this for all their routes and publicize them in order to make their decision making process more transparent.

Speedier Bus Service

Perhaps the most cost effective way of improving service to the boroughs is to speed up buses, particularly for markets where the subway option is poor, as highlighted in the discussion of subway connectivity. Unlike other recommendations requiring the addition of service that would add to the operating budget of the MTA, or new facilities that would add to the capital budget of the MTA, faster buses can actually save money. They do this by making the driver more productive, which in turn can be converted either into cost savings or more service. Thus, faster buses benefit both the MTA's bottom line and customer needs.

Buses are slow for many reasons.

- ▶ Spacing between bus stops is too close.
- ▶ It takes time for passengers to board and alight buses. Bus designs with high steps make matters worse.
- ▶ It takes time to process fare collection as customers fumble for their MetroCards.
- ▶ Many customers use the front door to leave the bus, delaying boarding passengers.
- ▶ Buses have to negotiate their way through traffic congestion.
- ▶ Buses, as do other vehicles, stop at traffic signals.

- ▶ Buses must share the street and even their dedicated stops with other vehicles, negotiating around: taxis picking up and dropping off customers, double parkers, illegal parkers in bus stops, bicyclists, and pedestrians.

Addressing these issues requires a program whose elements fall into distinct implementation categories – operational, capital and policy. Combined, these actions form a program of actions to speed up buses and make them more reliable. The recommended elements of the program have the following features:

More distant stops. There is a trade-off between less frequent stops to speed buses and longer walks for riders to and from the stops. It is possible to create two services on one route: one a limited stop service, and the other making all stops. This can be a compromise, but can avoid higher costs because the two service frequencies can reduce demand for local service. Technology also has the potential to speed up service, allowing for dynamic real-time bus routing based on passenger digital travel diaries or prompting riders to select their destination at the bus stop then informing them which bus will make their stop (i.e. similar to modern elevators that group passengers with common destinations).

Low floor buses. All buses should be converted to a low-floor configuration, from the high steps that slow boarding and alighting. This program is already underway; as of today, 68 percent of local buses are low floor, and the entire local bus fleet will become low-floor as older buses are retired. Combining low floor buses with the raising of street curbs by just a few inches can provide for level boarding, which would eliminate the need for ramps or the need to “kneel” the bus for elderly or disabled customers – further speeding up bus service.

More rear door use. Encourage passengers to leave by the rear door. This will reduce boarding and alighting time because boarding passengers will not have to wait for passengers to exit at the front of the bus. Replacement of older model buses to those with low-floor designs currently underway and pushing for buses with more sets of doors will also speed loading and unloading.

More efficient fare collection. Set up off-vehicle fare payment using a proof of payment system. Passengers will not only board faster, but they will also be able to board using either front or back doors. However, the high cost of this option makes it impractical for system-wide implementation. Alternatively, the MTA should shift to touch or vicinity passes, the successor to the MetroCard, which is fast becoming obsolete. The bus fleet is already equipped with the telecommunications subsystems, because of the BusTime program, and can support this real-time “open payment” fare collection system. The MTA should aggressively move to adopt this contactless card as part of its 2015-2019 Capital Plan. One of the outstanding issues that would need to be resolved is whether customers would be allowed to enter through all sets of doors (installing readers at all entries) or would be required to march by the bus driver to verify payment, as they do today. RPA recommends that the MTA pilots the

former on the busiest routes, allowing customers to use all doors with enforcement by fare control agents.

Preferential bus treatments. Establish preferential treatments for buses that would allow them to speed past seriously congested locations, i.e. “queue jumping.” Physically separating these bus facilities from mixed-traffic has the benefit of ensuring that other vehicles will not block them, which has been a problem with painted bus lanes in New York City. Police camera enforcement of the bus lanes can help deter this type of behavior as well, but their use and numbers are limited by the State Legislature. Unlike most of the bus lanes in the city, queue jumps can be relatively short treatments – a block or two – that allow all buses to quickly move through a congested intersection or entrance to a major mixed-traffic facility. In some cases, a grade-separated treatment might be called for to maneuver buses around pedestrians and other surface traffic. In all cases, most of these treatments should be targeted for the benefit of the most number of routes and not be limited to just a handful of corridors.

Smarter response to traffic congestion. Identify locations where traffic congestion has the greatest effect of slowing buses and making them less reliable. A program of encouraging bus drivers to identify these locations may have a beneficial effect and should be tried. The GPS units onboard the buses should provide a clear indication of where the bottlenecks occur along the route. The GPS information along with driver observations should be used to target the placement of preferential treatments so buses may pass through without delay, or to alter the route to avoid areas prone to congestion (either permanently or temporarily, in the case of a construction zone).

More effective traffic signals. Provide signal pre-emption or transit signal priority for buses to allow the signal to turn green when buses are present – adjusting signal phasing to favor the bus.

Stricter enforcement. Focus enforcement attention at locations where bus delays caused by other vehicles are most severe, especially in cases when vehicles are blocking preferential treatments reserved for buses.

Many of these changes to speed buses can be made relatively quickly with operations and policy actions, while others, such as the eventual replacement of the current MetroCard system will take a few years to implement. The establishment of preferential treatment on city streets can be done quickly or take several years depending on the complexity and capital costs of the intervention.

Bus Rapid Transit / Select Bus Services

In 2008 the MTA and the NYC Department of Transportation, recognizing the problem of slow and unreliable buses, initiated a program to address it. Fifteen high priority corridors were identified and five were initially chosen, one in each borough. The objective was to replicate to the degree possible a bus rapid transit (BRT) system that has been successful elsewhere, most

notably first in Curitiba, Brazil and Bogota, Columbia in South America, and then later in Los Angeles, Cleveland and Boston in the United States. These BRT systems, for the most part, have separate rights-of-way. They provide for off-vehicle fare collection, queue jumping and signal pre-emption, comfortable stations for passengers to wait, and an array of customer information, and service quality features.

Because the creation of separate rights-of-way is difficult where streets are not wide enough and may be costly to construct, the MTA/DOT program does not have all these features and is called Select Bus Services (SBS). The first project opened along Fordham Road in 2008 and has speeded up buses and attracted passengers. Seven routes have followed, with progress slowed by local resistance to closing lanes and removing parking. The Nostrand Avenue SBS in Brooklyn has the greatest number of BRT features. The agencies continue to pursue projects, and have issued a report¹ highlighting their progress and recommending corridors where a second wave of SBS routes could be installed. Their report considers many of the same deficiencies, including poor subway access and slow buses, discussed here.

In addition, the Pratt Center for Community Development issued a report in 2013 recommending eight corridors for study and possible implementation by the NYCDOT and the MTA.² Some overlapped with the MTA/DOT corridors. Pratt considered the lack of subway access, car ownership, income levels, and key destinations such as schools and hospitals in developing its recommendations. The Pratt proposals identify these corridors for BRT treatment although they recognize that creating them with the full bus separation from traffic may be difficult on some streets with insufficient rights-of-way.

Figure 14 shows the existing SBS routes, the additional corridors suggested by the MTA/DOT and the proposals by Pratt. The analysis in this report examines these proposed corridors and adds another dimension – poor subway connectivity as a criterion for consideration in the analysis. In those corridors where the configuration of the subway system makes the subway option a less attractive choice, the establishment of faster buses can help to fill the transit service gap by not only speeding buses, but by connecting places to make transit more “rapid.”

Whether there are full BRT treatments possible among the proposals by the MTA/DOT and Pratt remains to be seen. In this report, the feasibility and acceptability of BRT or SBS are not judged other than to acknowledge the relative difficulty of installing bus treatments of any kind, depending largely on the available width of the rights-of-way and local opposition to losing vehicle space and parking. Narrower widths tend to result in local resistance from those concerned about loss of parking and of street capacity, which can result in more congestion for vehicles other than buses. In the assessment, BRT and SBS are grouped generically as “streetments,” which are bus treatments to offer a variety of preferences for buses, with the precise features to be determined by the combination of physical feasibility and public acceptance.

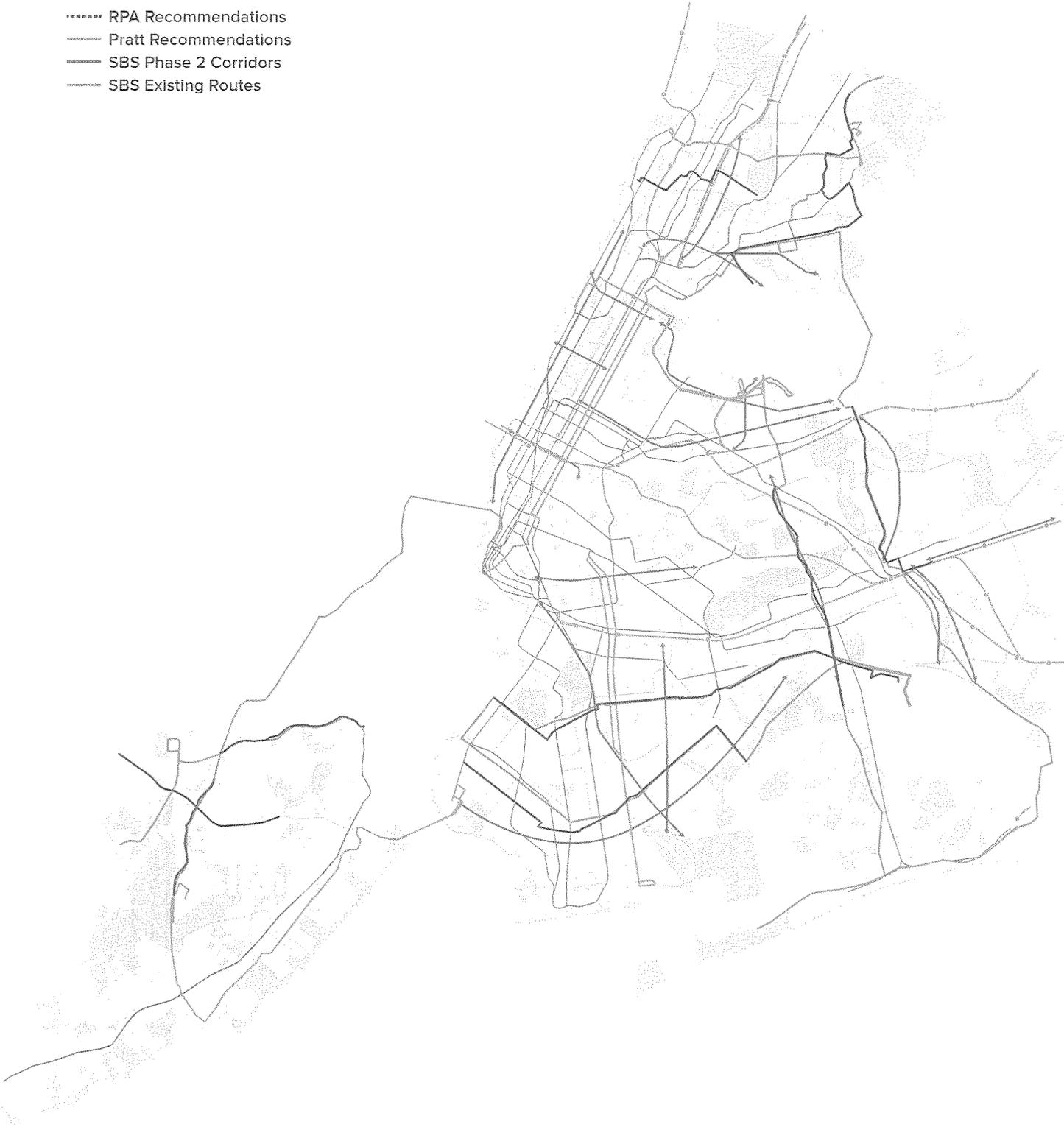
¹ NYCDOT and NYC Transit; *Introduction to Bus Rapid Transit Phase II*

² Pratt Center for Community Development; *Mobility and Equity for New York's Transit Starved Neighborhoods: The Case for Full Featured Bus Rapid Transit*

**Figure 14: Potential SBS/BRT
Treatments to Speed Bus Service**

Sources: NYCDOT and NYC Transit; *Introduction to Bus Rapid Transit Phase II*

- RPA Recommendations
- Pratt Recommendations
- SBS Phase 2 Corridors
- SBS Existing Routes



Scale 1:225,000
0 1 2 3 4 Miles

Figure 14 also maps the SBS/BRT corridors recommended here, overlaying them on the MTA/DOT and Pratt proposed corridors. The recommended corridors are described below:

East Bronx. This route would start in the north at the edge of Co-op City and terminate at the Hunts Point Market in the southeast Bronx. The routing would operate along Westchester Avenue and then either Crosby Avenue or East Tremont Road to reach Bruckner Boulevard, and then to Hunts Point Avenue and then terminate in the market. Among the routes that it could provide supplemental service over parts of their routes are the BX5, BX6, and BX8. These routes combine for about 43,000 riders on an average weekday. This corridor would serve parts of two corridors suggested by Pratt.

Bronx Crosstown. To address the problem of east-west transit dis-connectivity in the Bronx, one or more of three routes should be considered for SBS/BRT treatment. These include the BX6 along 165th Street (23,000 daily riders), the BX36 along West Tremont Avenue and 180th Street (31,000 riders), and the BX40/42 along East Tremont and Burnside Avenues (27,000 riders). The BX36 has the advantage since it extends into Washington Heights as far as the George Washington Bridge Bus Station for connections to west side subways and buses to New Jersey.

Central Queens. This route would connect Queens Boulevard to Howard Beach along Woodhaven Boulevard. It is the central part of a route suggested by Pratt from LaGuardia Airport to Rockaway. But the northern section of that route travels along narrow 94th Street and the southern portion from Howard Beach to Rockaway has little traffic to slow the current buses once Woodhaven Boulevard becomes Cross Bay Boulevard and heads toward the Rockaways, where the rights-of-way options are limited. The Woodhaven Boulevard section is wide and may be able to accommodate a more BRT-like service. Moreover, examination of the work trip origin-destination data indicates the highest ridership in the corridor is in the recommended segment. The local bus routes served are the Q21, Q41, and Q53, with combined weekday ridership of 25,000. This recommendation dovetails with the MTA/DOT's, which is pursuing this route as an SBS treatment for its next phase.

Eastern Queens. This route would connect the two major regional centers in Queens – Flushing and Jamaica. The agencies and Pratt each highlighted this corridor for bus treatment which would operate on Main Street, where there is an available median throughout most of its length. The Q44, with 17,000 daily riders would benefit with speedier service. The Pratt proposal suggested extending this route south to Far Rockaway along either Guy Brewer or Sutphin boulevards. However, when the MTA/DOT approached the south Jamaica community with this proposal there was more interest in addressing the complex set of routes in Jamaica Center along Archer Avenue. This extra wide street where 2,300 buses a day operate along 23 separate routes requires a significant rethinking as it labors to serve Jamaica Center and connection to three subway lines, the LIRR and the JFK AirTrain.

Brooklyn – Southeast to Southwest. The subway system is incapable of meeting the needs of the many east-west movements across south Brooklyn, as highlighted in the discussion of subway dis-connectivity. Two distinct corridors are identified to serve this large market – one more northerly than the other. Both corridors were also suggested by both the MTA/DOT team and Pratt. The more northerly would operate between Bush Terminal in Sunset Park in the west, through Flatbush, using Church Avenue (two moving lanes in each direction) and then the three-lane-in-each-direction Linden Boulevard to eastern Brooklyn. The routing could continue eastward into Queens, connecting to Conduit Avenue, and possibly to JFK airport. The western portion of the route has narrow streets to contend with and careful consultation and consensus building would be needed to speed buses there.

There are two major bus routes in the corridor (B15, B35) carrying a total of 34,000 riders on weekdays. The more southerly route in Brooklyn would have similar endpoints but would operate along Bay Ridge Parkway, Kings Highway, Flatlands Avenue and Rockaway Parkway. Each of those thoroughfares has two lanes in each direction, with the exception of some short stretches. An examination of the work travel data suggests that this southern segment is likely to have at least as much ridership potential as the more northerly route. Four bus routes operating in portion of this corridor – B6, B7, B9, B11 – with almost 38,000 daily riders who would benefit. Both routes have more ridership potential in their more westerly segments, but that is also in the areas where gaining more exclusivity for buses is more difficult.

Staten Island - North Shore or Staten Island Expressway Busway Extension. The analysis of the slow buses identified the bus routes on the north shore of Staten Island as particularly slow, where the streets are narrow with indirect orientations. Rather than using the streets, buses could operate on an abandoned rail right-of-way from Port Richmond to St. George where connections to the Staten Island ferry would be made or along the center median of the Staten Island Expressway by extending bus lane from Victory Blvd to the Goethals Bridge. The MTA has suggested operating the line on the rail right-of-way as an exclusive busway. They estimate the capital cost at \$371 million. The project, like many at the MTA, is currently unfunded as the MTA battles for sufficient funding for its vast unmet needs. Pratt, which also supported this corridor for a bus treatment, suggested that the line extend south along South Avenue as far as Travis Avenue, or possibly as far as Fresh Kills Park. The South Avenue segment of the route proposed as a BRT by Pratt would operate through parkland and to the Staten Island Teleport, an office park that to date has not been successful in attracting much interest. Because of the lack of demand to the south, for now the route should terminate where it leaves the rail right-of-way in Port Richmond. Currently, there are four routes that more or less serve the corridor – S40, S46, S53, and S59. They carry about 12,000 passengers each weekday.

Pratt Center for Community Development; *Mobility and Equity for New York's Transit Starved Neighborhoods: The Case for Full Featured Bus Rapid Transit*; RPA

Staten Island - West Shore Corridor. This route would start of the Staten Island Mall in the center of the island using Richmond Avenue to extend as far as Forest Avenue. Richmond Avenue has a marked-off median area through much of its length, which is used for left turning lanes. The street is wide and can accommodate a bus treatment. Currently, all or portions of two bus routes (SI44, SI59) operate on some segment of Richmond Avenue along this proposed corridor. They carry 5,100 riders daily.

- ▶ Pratt had proposed extending the bus corridor into Bayonne across the Bayonne Bridge, along the peninsula and to and through the Holland Tunnel into Manhattan. Currently, the S89 follows this alignment on Staten Island and delivers riders only as far as the end of the Hudson-Bergen Light Rail line in Bayonne. This service carries about 1,000 riders in both directions on an average weekday. The segment of the proposal on the Bayonne Bridge is lightly used today and does not require any treatment to speed buses. Moreover, the BRT route in New Jersey is redundant with the successful light rail line that delivers workers to Jersey City and lower Manhattan today. Any bus treatment should be confined to Staten Island.

No corridors in Manhattan in the northern (the boroughs) portion of the Island are recommended here. The 125th Street corridor is in place in that highly congested street to speed slow buses. However, the buses on the other cross streets are mostly slowed by traffic signals at every avenue; the adjustment of the traffic signals to favor buses on the cross streets would be difficult because of the high volume of avenue traffic, and in most cases because of the progressive north-south signals.

The eight recommended SBS/BRT proposals are shown in Figure 14; they are summarized and compared in Table 13. The ease of implementation entries are a subjective assessment of how difficult installing preferential rights-of-way would be in the proposed corridor.

Table 13: SBS/BRT Recommended Corridor Summary

Corridor	Length (miles, approx.)	Ridership	Ease of Implementation
Eastern Bronx	10	High	Mixed
Cross Bronx	4	High	Difficult
Central Queens	8	High	Easy
Flushing –Jamaica	6	High	Moderate
South Brooklyn – Northerly	12	High	Mixed
South Brooklyn – Southerly	9	High	Difficult much of length
Staten Island – North Shore	4	Moderate	Easy, but costly
Staten Island – Expressway	5	Moderate	Moderate
Staten Island – West	3	Low	Moderate

Source: Regional Plan Association

Bus Amenities

Buses have the status of a second class mode of travel in the minds of many people, not without some justification. While slow, bumpy, and unreliable might be the most likely words used

to describe the bus ride itself, the off-vehicle experience might also leave a lot to be desired.

Amenities at bus stops can give the rider greater assurance that the transit operator cares. These can include bus shelters, bus schedules and maps, real time bus arrival information, and easier fare payment systems.

Shelters that are properly enclosed from the elements, in some cases temperature controlled, with seating in a well-lit, safe environment can offer both comfort and a sense of security at stops. Dynamic signs with accurate bus arrival times can provide still further benefit by easing the anxiety of not being certain about the arrival time of the next bus, and can create a sense that the transit system is well run and reliable. Ideally, this information would also be made available via smartphones, web browsers, and other internet connected devices to allow riders to arrive at the stop close to the time that the bus does. The MTA's Bus-Time program currently provides this service. These amenities should be provided at as many bus stops as is feasible. However, installing true bus shelters at all bus stops, especially those which see a lower level of ridership, may not be cost-effective. However, these stops with lower ridership should still have real time information regarding the arrival of the next bus. One possible way to bring down the cost of these signs would be to partner with local merchants, who would be able to install signs that tapped into the MTA's bus information system. These merchants could be compensated directly or indirectly (e.g. through access to marketing in the form of signs informing potential customers they have time pick up coffee or a newspaper before their bus arrives) to ensure proper maintenance of the sign. A similar program has been tried in Chicago with some success. The MTA should also look for ways to inform bus riders on the bus or at the shelter on the status of connecting transit services – subways, commuter rail, ferries and other buses. Real-time connecting bus information should also be available to the users of the other modes as well, on their trains or at the stations.

Improve and Extend the Subway and Urban Rail System

Subway Upgrades

Recommended actions to improve service vary from rider behavior modification to system upgrades and expansion. A number of years ago the MTA undertook a campaign to encourage boarding riders to stand aside and wait until passengers leave the train. This small act of courtesy seemed to have had a lasting effect. Markers on platforms were placed to delineating door locations helped this process. At some particularly busy locations and stations, MTA personnel are used to prevent door holding -an even more aggressive long-term approach would be to install Platform Screen Doors, which further discourage this behavior. Both of these programs must be continually reinforced to prevent backsliding. Subway station upgrade in the boroughs has lagged until recently because stations were prioritized by individual ridership

levels. With the Manhattan stations generally more heavily used, their upgrades tended to go first. The MTA has recently shifted the station upgrades to a component based approach, which has the unintended effect of making the tracking of borough by borough progress less obvious. Still, there can be little doubt that borough station fixes have lagged, particularly in inner Brooklyn, most of Queens, and parts of Upper Manhattan, as Figure 11 shows. From an equity perspective, these areas should receive higher priority.

The acceleration of the replacement of the subway's fixed block signal system, some of it approaching 90 years old, is long overdue. The moving block system, known as Communications Based Train Control or CBTC, is a system that enables more trains to operate in the peak, alleviating crowding on all the lines reaching back into the neighborhoods currently experiencing overcrowding as shown earlier in Figure 9. The system would be more reliable and it would save money, as documented in the RPA report on the subject, *Moving Forward: Accelerating the Transition to Communications-Based Train Control for New York City's Subways*. The report recommends that this system be implemented more rapidly than the current pace, which would take over 100 years.

The MetroCard system, revolutionary just 18 years ago in transforming how subway and bus fares are paid, is fast approaching the end of its useful life, estimated to be 2019. It must be replaced. Advances in technology since its inception offer an opportunity to speed payment, lower costs, and create many opportunities for innovative fare policies. The MTA is currently in the midst of deciding how best to replace the system, which would serve to speed up buses too. RPA recommends the next-generation "open payments" fare system be implemented during the course of the MTA next five-year 2015-2019 Capital Plan. The agency has already laid the groundwork for this system in the course of its current capital plan through the telecommunications upgrades it has made throughout the subway system and the installations of wireless telecommunications systems on its buses as part of the BusTime program.

Continuation of Second Avenue Subway Progress

After a sorry and checkered history dating almost 90 years, construction has finally begun on the Second Avenue subway (SAS)—at least the first 1.3 miles of it on the upper east side of Manhattan. By 2016 this short segment will be open from 63rd to 96th Street. It may appear that its value is limited to Manhattan and is irrelevant to the needs of the boroughs, but it has beneficial ramifications for upper Manhattan and the Bronx since the new service will relieve the excessive crowding on the #6 for East Harlem residents and on all five lines in the Bronx—#2, #4, #5, #6 and the D/B Concourse, especially on the #4 and #5. Even larger benefits will be seen as future phases are implemented.

The planned future phases shown in Figure 15 have passed the federal Environmental Impact Statement review process and are in line for consideration for future funding. One phase could go north for three stations terminating at 125th Street, serving East Harlem and Harlem and providing a transfer point with Metro North. Two phases to the south could extend the line to

the Battery. There is a strong argument to move quickly to build the north segment first as far as 116th Street, which would be relatively inexpensive since much of the tunnel is in place from earlier work, leaving the more expensive last piece to 125th Street for later. This report supports this argument.

Beyond that, arguments for the extension of the SAS into the Bronx and / or across 125th Street to the west each have much merit. The extension across 125th Street would knit together the north-south lines on the west side with the east side, creating numerous new and productive linkages for the subway network for upper Manhattan and Bronx residents. These possibilities can take many forms, as shown in Figure 14. All would establish or reestablish missing subway coverage either in the central Bronx in the Third Avenue corridor or further north, possibly to Co-Op City. It is time to begin serious discussions with the MTA and the affected communities to move this process along.

If SAS were extended southward to the Battery it could then be extended into Brooklyn to Atlantic Terminal and then operate on the Atlantic Branch out to Jamaica and beyond into southeastern Queens.

Other Subway Extensions

In addition to the subway extensions associated with the Second Avenue Subway there are numerous other possibilities that have long been under discussion to address the gaps in subway coverage in the City; In Brooklyn, these include the construction of the subway branch on Utica Avenue from Eastern Parkway, i.e. the extension of the #2 and #5 Nostrand Avenue subway. In Queens, these include new lines under Jewel Avenue and Northern Boulevard; these lines would require a new tunnel under the East River.

Other Urban Rail Opportunities

Barriers to speeding up buses using city streets cannot always be overcome. This suggests that where there are underused or unused rail rights-of-way, new service should be considered. In Figure 16, a number of possibilities for rail service are shown that can address the deficiencies in boroughs' transit service. These include:

1. The interconnecting freight line (New York Connecting Rail Road) from the 65th Street Yard in Bay Ridge in Brooklyn through Queens, over the Hell Gate Bridge, and into the Bronx using the Amtrak right of way in the eastern part of that borough;
2. The Atlantic Branch of the LIRR between Jamaica and Atlantic Terminals (Barclays Center), which is to be converted to a shuttle once the LIRR connects to Grand Central Terminal upon the completion of the East Side Access project in the early 2020s;
3. The re-arrangement of operations on the two LIRR branches—Montauk and Atlantic—between Jamaica and Valley Stream on the LIRR's Babylon branch, where relatively sparse service is provided for the communities in South Jamaica;

Figure 15: Second Avenue Subway Phases and Possible Northern Extensions

- Commuter Rail
- Existing Subway / SIR
- Second Avenue Subway
- SAS Extensions

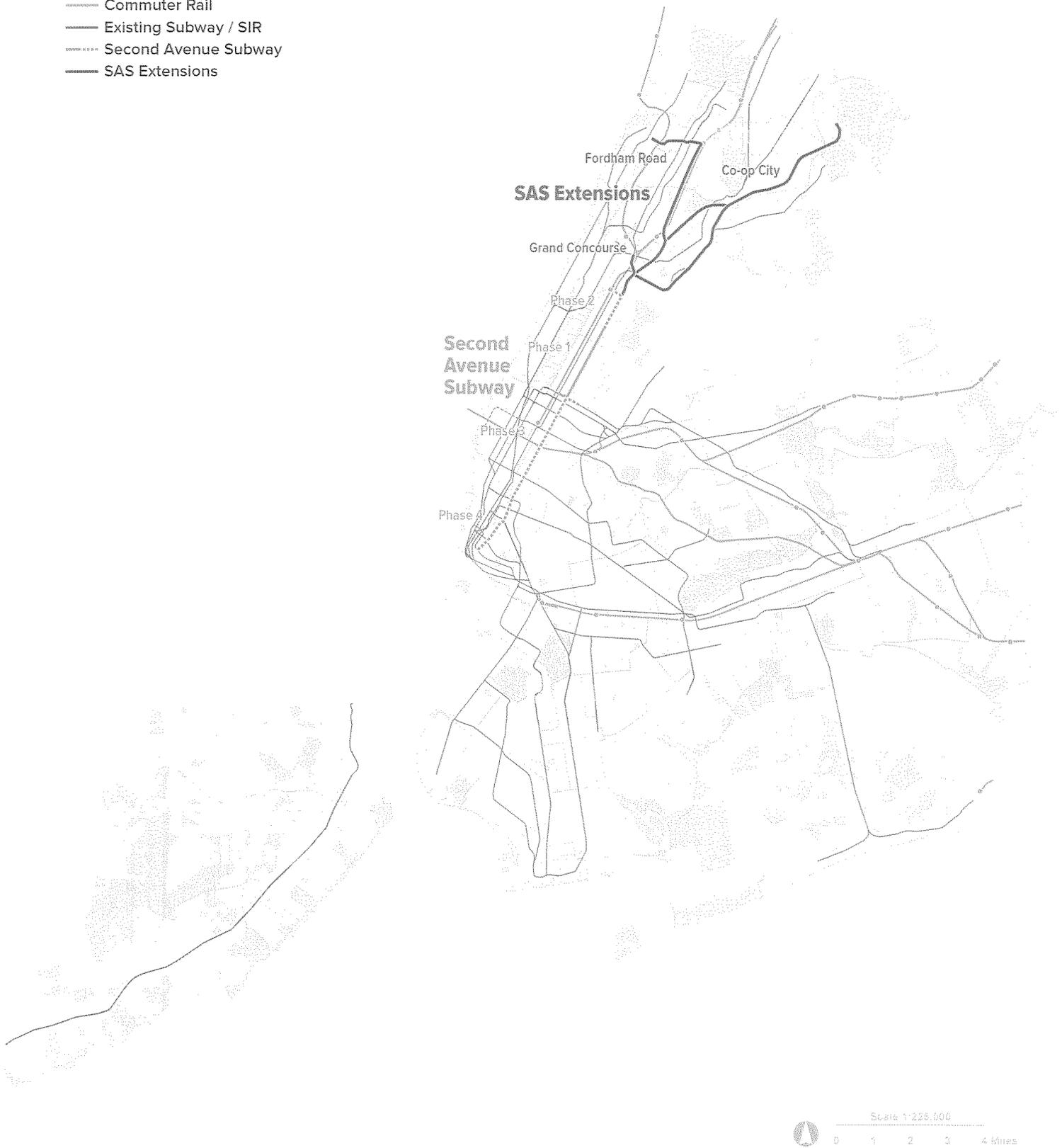


Table 14: Triboro Rx Stations

		# of Nearby Subway Lines	Annual Subway Station Boardings (mil.)	# Bus Routes	Annual Bus Route Riders (mil.)
Bronx	Co-Op City South	0	NA	2	22.3
	Eastchester Rd - Morris Park	0	NA	3	18.4
	Parkchester	1	4.7	5	24.9
	Hunts Pt Av/Garrison	1	3.3	3	20.8
Queens	Astoria	2	5.2	1	2.9
	Northern Boulevard	0	NA	3	5
	Jackson Heights	5	18	6	18.8
	Queens Blvd	0	NA	1	4.8
	Grand Ave	0	NA	2	11.4
	Metropolitan Ave	1	1.2	3	11.8
	Myrtle Ave	0	NA	2	6.8
Brooklyn	Wilson Ave	1	1.1	1	3.6
	East New York	1	0.4	1	5.5
	Livonia Ave	1	0.9	0	NA
	Rockaway Ave/Ave D	0	NA	1	3.6
	Brooklyn Terminal Market	0	NA	1	3.8
	Utica Ave/Farragut Rd	0	NA	1	15.4
	Brooklyn College	2	6.4	5	32.3
	Ave H/E 15th St	1	0.8	0	NA
	McDonald Ave	1	2	2	9.6
	New Utrecht Ave/62nd	2	1.9	1	4.3
	Brooklyn Army Terminal	2	3.8	3	5.9

Source: Regional Plan Association

4. The Rockaway Beach Branch (RBB), from Rego Park to Rockaway Boulevard in Ozone Park, long abandoned as a branch of the LIRR; and
5. The Lower Montauk Branch of the LIRR from Long Island City to Jamaica, currently used for freight and a very limited number of LIRR passengers trains.

Triboro Rx

Use of the interconnecting freight line for passenger service was proposed by Regional Plan Association in its Third Regional Plan, *A Region at Risk*, in 1996. The concept, dubbed Triboro Rx, would operate as a passenger rail line perpendicular to most of the subway lines built as radial services to deliver commuters and other travelers to Manhattan. The ability of this line to fill deficiencies in the transit service is demonstrated by shortcomings highlighted in the earlier discussion on subway connectivity. Specific markets poorly served by the subway or bus system could benefit from this service. These include the following markets: trips with an east-west orientation throughout southern Brooklyn; trips needing to connect parts of northern Brooklyn with portions of central Queens (CB5) or inner Queens (CB1 and CB2) with inadequate bus or subway service – including south to north markets into Maspeth and Long Island City); and, trips between Queens and the East Bronx.

Operating this line with the 22 well-placed stations tallied in Table 14—all near subway station transfer points or bus routes, and substantial standalone ridership— would provide ample opportunity for expanded mobility in the affected and connect-

ing corridors with existing transit services. The line is shown in Figure 17.

The 24-mile line is intact and fully grade-separated, requiring no civil structure reactivation. The major capital investments necessary would be signals, new track, and stations. Rolling stock would also constitute a significant capital investment, but could be mitigated by using light rail vehicles for the mixed freight and passenger service, which could be made to comply with Federal Rail Administration crashworthiness regulation. More conventional, heavy rail vehicles would cost more.

The availability of this right-of-way depends on the feasibility of operating both freight and passenger service on the same right-of-way. Current freight operations are handled by CSX from Fresh Pond north into the Bronx. The segment south to Bay Ridge is operated by New York and Atlantic Railway Railroad and is owned by the LIRR.

To gain a sense of the market, Community Board (CB) pairs in the corridor were identified, and work trips currently made by each mode—bus, subway and auto—were “diverted” to the line using conservative diversion assumptions. Since the diversions were based only on work trips, these were expanded to account for non-work trips, based on current ratios of work to non-work trips on each of the modes. Not included are the many trips that might use the line in combination with connecting subway and bus service that stop at or near the proposed Triboro Rx stations. The resulting estimate is summarized in Table 15, organized by borough-to-borough travel flows. Over 100,000 riders a day are expected. The assumptions are detailed in Appendix C.

This estimate only accounts for those travelers with both ends of their trips in the corridor. It does not account for those

Figure 16: Unused or Underused Rights-of-Way for Possible Urban Rail Service

- Commuter Railroads
- Underutilized Right-of-way
- Abandoned Right-of-way



Table 15: Estimated Daily Travelers for Triboro Rx

Market		Diversion From:			Total Work Trips	Non-Work Trips	Total Trips
		From Bus	From Subway	From Auto			
Intraborough	Intra Bronx	3,490	705	1,222	5,417	13,737	19,154
	Intra Queens	918	2,064	1,156	4,139	8,832	12,971
	Intra Brooklyn	5,066	1,751	3,273	10,090	26,663	36,753
	Intraborough Subtotal	9,474	4,521	5,651	19,646	49,232	68,878
Between Bronx and Queens	To Queens	168	1,017	442	1,627	3,176	4,803
	To Bronx	63	814	348	1,225	2,352	3,577
	Subtotal	231	1,831	790	2,852	5,528	8,380
Between Bronx and Brooklyn	To Brooklyn	-	636	178	814	1,348	2,162
	To Bronx	-	594	652	1,246	3,201	4,447
	Subtotal	-	1,230	830	2,060	4,549	6,609
Between Queens and Brooklyn	To Brooklyn	294	1,415	899	2,608	5,697	8,305
	To Queens	613	2,507	1,801	4,921	11,140	16,061
	Subtotal	907	3,923	2,700	7,529	16,837	24,366
	Interborough Subtotal	1,138	6,984	4,319	12,440	26,915	39,355
Grand Total		10,612	11,504	9,970	32,086	76,146	108,233

Source: Regional Plan Association

who might travel to or from outside the corridor on another transit vehicle before boarding or after alighting the Triboro Rx vehicles. These trips could add substantially to the traffic flow, therefore this estimate should be considered conservative. Nor does the estimate account for the development that may be spawned by the line itself, which could add to ridership totals, and could meet some of the city's needs for a growing population. This estimate should be seen as evidence of a sizable market. However, it is no substitute for a more nuanced approach, involving origin-destination data for non-work trips, diversion for trips with transfers to and from existing bus and subway services, and modal shifts based on a model that accounts for comparative network characteristics.

Table 15 reveals some highly relevant findings.

- ▶ Substantially more than half of the estimated trips – 62,000 of 109,000 would be internal to their own borough;
- ▶ Trips involving interchange between the Bronx and the two other boroughs account for only 19,000 trips, merely 17 percent of all trips;
- ▶ Most of the current bus trips diverted would be intra-borough trips; and
- ▶ The predominant diversion for Brooklyn-Queens trips would be from the subway, a market that requires many circuitous subway trips today, and which Triboro Rx would make much more direct

The Triboro Rx project addresses many of the nine factors that encourage people to use transit. It offers direct service for those travelers who must otherwise use two or more vehicles, it promises faster and more reliable service on rail by avoiding the traffic congestion of city streets, and it serves some areas that are devoid of any rail service including Glendale and Middle Village in Queens and Canarsie and Flatlands in Brooklyn.

LIRR Atlantic and Montauk Branches in South Jamaica, and the Atlantic Branch of LIRR from Atlantic Avenue to Jamaica

Subway service should be established on the LIRR Atlantic branch, allowing for the shift of LIRR service to the Montauk with more service, specifically, to Jamaica.

East of Jamaica Center, the Atlantic and Montauk lines of the LIRR branch out to the south and eventually connect with the Babylon Branch in Nassau County. Both have infrequent service today. The Atlantic Branch has three stops in Queens – Locust Manor, Laurelton and Rosedale and the Montauk Branch has but one – St. Albans. The service at the three Atlantic branch stations is limited to only seven trains in a 90 minute peak and hourly service at other times. The St. Albans station on the Montauk station has even less service. An added track would be required on the one-track Atlantic Branch, where room is available today.

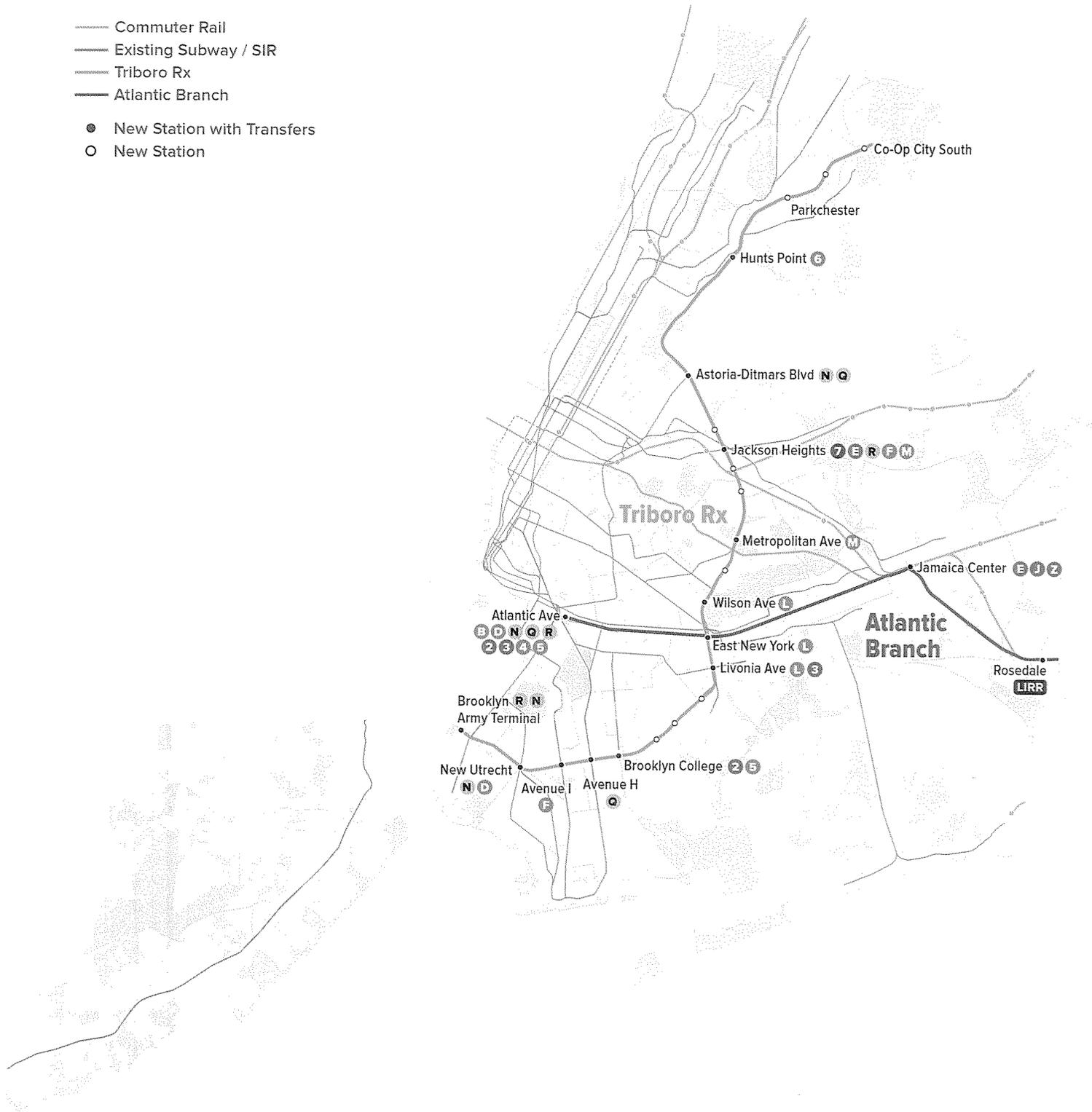
This project would best be combined with the service on the portion of the Atlantic Branch between Jamaica and downtown Brooklyn and the Barclays Center. When the LIRR's East Side Access (ESA) project is completed in the early 2020s the LIRR intends to cease operation of through trains from Nassau and Suffolk counties on this line segment to Brooklyn. Instead, they plan to convert the service between the Barclays Center and Jamaica Center to shuttles. This raises a number of possibilities for greater use of this rail segment. It could be operated as a subway, with more frequent service and a transit fare level, making the line much more useful for residents of Jamaica and central Brooklyn. The line would be extended onto the Atlantic branch of the LIRR, which would be converted to a subway as discussed above. This would give southeastern Queens residents direct service to downtown Brooklyn and with a transfer at Jamaica frequent access to the subway network.

This report recommends the addition of the third track on the Atlantic Branch and its conversion to subway service, to give transit deprived residents of southeast Queens vastly improved transit service.

Figure 17: Alignment and Possible Station Locations for Triboro Rx and Atlantic Branch

Source: Regional Plan Association

- Commuter Rail
- Existing Subway / SIR
- Triboro Rx
- Atlantic Branch
- New Station with Transfers
- New Station



Another option, not precluded by the recommendation above, is to operate a subway line branch off of Atlantic Avenue as an extension of the #2/#5 line down Nostrand Avenue, by constructing a branch from the #3 and #4 down Utica Avenue. This change would serve the isolated parts of the Canarsie and Flatlands neighborhoods in CB 18, which are devoid of subway service today. Unlike the Atlantic Branch and southeastern Queens options discussed above, this possibility would require new subway construction on new rights-of-way. This line could also replace the slow and aged Jamaica line. It can be extended east of Jamaica Center to serve parts of south Jamaica, discussed above. This last option should be fully explored and decided upon in advance of ESA project completion.

Rockaway Beach Branch and the Lower Montauk Branch

The abandoned Rockaway Beach Branch has been the source of much interest for re-use since the day it was fully deactivated in 1962. Local opposition – the right-of-way was adjacent to resident properties – has prevented the use of the line for transit. Presently, there are three forces at work on the use of this fully grade-separated right-of-way. One group has strong interest in its reactivation for transit service. A second local group would use the right-of-way as a linear park – the Queensway, a proposal buoyed by the success of the High Line in Manhattan. The third force is backed by the adjacent residents who reject both these proposals, wishing to avoid any impacts in areas adjacent to their properties that some have usurped to extend their backyards.

There are numerous ways this line could be used for transit, whether as part of the LIRR or a subway. However, the activation of the LIRR on the line requires new capacity on the LIRR main line and under the East River, which is not present now and would be problematic even with the ESA. Reviving the line as a part of the subway system, could make use of the F train, currently limited to 15 trains per hour because of congestion on the Queens Boulevard lines. The line would have sufficient capacity in Manhattan and Brooklyn to run a more robust service through the 63rd Street tunnel than it does today, but only if new bypass capacity is constructed in Queens. The most feasible bypass alignment would use the Lower Montauk Branch of the LIRR, which is aligned through Long Island City, and then through Maspeth and Glendale, two neighborhoods presently unserved by the subway system. Some F train service would be rerouted to that line and connected to the RBB in Rego Park. However, passenger service on the Lower Montauk Branch, a critical corridor for goods movement, would have to be designed to come along with existing and future increases in freight rail service.

If it becomes part of the subway, it is difficult to envision the RBB segment operating without being connected to either an existing or a new east-west bypass subway line in Queens. Almost 50 years have gone by without finding an acceptable bypass solution.

The RBB is of significant value, either as a linear park or for transit and should not be held hostage by residents who do not own the right-of-way.

Making Commuter Rail Work for Borough Residents

Reduction of Intra City Commuter Rail Fares

MTA's two commuter railroads – Metro North and the Long Island Rail Road – offer a "CityTicket" for \$4.00 for single-direction one-way travel within New York City, but only on weekends, which severely limits its attractiveness to city residents. A peak-hour trip on weekdays is double that at \$8.00 on the LIRR and \$8.25 on Metro North. Off-peak weekday trips are \$5.75 and \$6.25, respectively. Many of the stations in the Bronx, notably, Melrose, East Tremont, University Heights, and Morris Heights, are low income areas without subway service, where the availability of more affordable fares could expand mobility enormously. Similarly, the two Brooklyn stations on the LIRR's Atlantic Avenue Branch would benefit from CityTicket fare levels at \$4.00. Fares for 10-trip, weekly and monthly type tickets should also be reduced proportionately. All trips in the city on the two rail systems for trips at all times wholly within New York City would be set at the CityTicket half price level. The net loss in revenue for the MTA is estimated at \$30 million annually.

Improve Boroughs' Service Frequency

The service frequency provided by the Long Island Rail Road and Metro North in the boroughs' 36 commuter rail stations almost universally fall short of being useful to residents who could benefit from them. In only a few cases, notably at Jamaica Center, Woodside, and 125th Street, is the service frequent enough for reverse commuting or midday use. It is recommended that the two railroads buttress their meager service to these stations, and with the bus network devise a "use-it-or-lose-it" demonstration program.

New York City Access to Long Island

The possibility of adding a third track to the main line of the LIRR from Floral Park to Hicksville has been discussed for some time. The project would make commuting by the LIRR from the boroughs, mostly from Queens and Brooklyn, a realistic option. Currently, it is not possible to operate trains in the reverse peak direction (eastbound in the morning and westbound in the evening), because of heavy flows to and from Manhattan that use both of the existing tracks. This project has been resisted locally by adjacent property owners, and to date, it is not certain if it will be built. Nevertheless, this report recommends this project because of its wide benefits to both the residents of New York City and the employers on Long Island.³

Bronx Access to Connecticut

Metro North has proposed a commuter rail service to link the Bronx with Penn Station. As many as four stations would be built in the borough with service operating on the Amtrak right-of-way to the Hell Gate Bridge into Queens and then into Penn Station via the LIRR's East River tunnels. The affected

³ For a more extensive discussion of the benefits of this project see RPA's *How the Long Island Rail Road Could Shape the Next Economy*; 2013.

Bronx neighborhoods -- Hunts Point, Parkchester, Pelham Parkway and Co-op City East -- would benefit in two ways: they would have fast access to the Midtown West, and they would gain better access to jobs on the New Haven line in Connecticut, particularly in Stamford. However, this service is a long way off, requiring the completion of the LIRR East Side Access project to open up capacity at Penn Station, which will not occur until at least 2020. Use of that same right-of-way could come with the introduction of the Triboro Rx, if it is extended into the Bronx.

A More Equitable Fare Policy

The level of the subway and bus fare is a contentious subject that arises whenever a fare increase is contemplated. Arguments can be marshalled on either side of the issue -- fares should be higher to cover the full cost of the service, which now requires over 40 percent of operations to be subsidized by government; or, fares should be lower to expand the attractiveness of transit, to add ridership, and to ease the burden on those who can least afford it. Today, this argument is at a stalemate, and history suggests that this stalemate will continue, with fares increasing at or below inflation rates, straining the MTA operating budget.

Substantial numbers of people in every borough, and especially in the Bronx and parts of Brooklyn, pay high shares of their incomes for transit fares and would be disproportionately affected by fare increases. One way to address this burden is with a "social" fare, which would allow discounts for qualifying individuals with limited incomes. Opponents worry the revenue loss would be too high, the administrative costs too burdensome, and the creation a new version of fare evasion too damaging, with some taking fraudulent advantage.

Explore Variable Pricing

Charging lower fares during off-peak times and weekends and higher fares during on-peak times follows the law of supply and demand; prices increase with demand. In addition to helping lower income residents who may travel more during off-peak hours, this policy could help transit operators spread widen the peak travel time window and decrease crowding, though it is important to note that recent trends have been moving in that direction without manipulating the fare.

Eventually, new fare collection technology may be able to offer one thing that we do not have today -- nuance. Distance based fares, paying more for more service, is one example.

Though distance based fares may sound fine in the abstract, they would be difficult to implement in the subway system in practice. Logistically, riders would have to pass a control point at both ends of their trips, especially problematic at exit points in heavily used stations. Politically, the policy is likely to result in opposition because of the large fare increases that longer-distance travelers will face, which in turn will exacerbate the equity problem in transit pricing since many working-poor must travel great distances from their homes to work.

Another option would be to tailor fares by mode. Similarly to distance based fares, this policy would make the fare more proportional to the service rendered by charging less for bus trips, which are, on average, half the length of subway trips. This would not require a new fare collection system and could be initiated earlier. However, this change would create a two fare system and could create the perception of a two-class system, one for bus riders and the other for subway riders.

Replace the MetroCard With Open Fare Contactless System

The aging MetroCard must be replaced soon. As the City moves closer to implementing this change, fare innovations should be considered that create a more nuanced fare system that takes into account affordability, particularly for the resident of the boroughs. Meanwhile, the simple change in the CityTicket on the commuter rail lines should move forward, since it requires little in the way of technology advances. The expansion of CityTicket on the railroads will be a helpful measure for many city residents, even in the absence of other currently fare reduction strategies for the bus and subway network.

Expansion of the Bike Share Program

The success of the City's Bike Share program, launched in the spring of 2013, has raised the possibility of program extensions to the boroughs in order to augment mobility in the boroughs and extend the reach of transit. Bicycles are one of many means to extend this reach, as are a range of traditional and innovative systems of car-sharing mechanisms that can link to the existing network.

Currently, the bike share program logs more than one million rides per month with 6,000 bikes operating among 332 docking stations located south of 60th Street in Manhattan, and in downtown Brooklyn, Brooklyn Heights, Fort Greene and Williamsburg. Despite this high use, the program is operating at a deficit due to a number of factors, including the unexpectedly high operating costs of maintaining and rebalancing bikes at major transit terminals, and the damage incurred as a result of Hurricane Sandy. The program is being reorganized to increase its financial stability, and care should be taken not to extend the program to lower density areas that could weaken its financial condition.

Any future extensions should be contiguous to current service areas, in order to maximize on existing higher ridership areas. If done in isolation, these extensions are likely to be less effective. This suggests that the first set of extensions be immediate north of 60th Street and at landfalls of the four NYC East River bridges in Brooklyn and Queens and adjacent to downtown Brooklyn. Local bike lane networks should be installed to encourage safer riding prior to any expansion into these neighborhoods.

The NYC Department of City Planning 2009 report, *Bike-Share Opportunities in New York City*, envisioned a more

extensive second phase that includes: all of Manhattan; much of the Bronx as far north as Moshulu Parkway and as far east as the Bronx River; the Queens neighborhoods of Astoria, Long Island City, Jackson Heights and Sunnyside; and, the Brooklyn neighborhoods of Greenpoint, Bedford-Stuyvesant, Crown Heights, and Sunset Park. That report acknowledged that each extension would weaken the network financially. Therefore, it would be prudent to increase the scope of the system incrementally so as not to spread the program too thin, with too few bicycles and docking stations over a wider area, eventually requiring more public subsidy. The value of this added service requires evaluation, just as it would for other investments that increase the financial burden on government. In any case, extensions should be implemented only after a financial plan is in place. If these conditions are met, the highly popular Bike-Share program can complement the boroughs' mobility network.

Added Ferry Service

The strong interest in expansion of ferry service in New York City's harbor and rivers is a result of the undeniable logic that the city's boroughs are bordered by navigable water. Before the many bridges and tunnels were built that knit the boroughs together, there were dozens of ferries plying the East and Hudson Rivers and upper harbor. By 1969, only the highly subsidized Staten Island ferry remained. Since 1986, with the inauguration of routes crossing the Hudson River, many privately operated new routes were tried and most discontinued when their revenues could not cover their operating costs. Others were subsidized temporarily to compensate for transit service losses in the wake of emergencies, such as 9/11 and Hurricane Sandy. The hurricane resulted in a ferry route from Rockaway that had failed earlier and was about to be discontinued. Recognizing that any new ferry service would require subsidy, the City instituted the East River service with numerous stops to connect Manhattan with the new developments on the Brooklyn and Queens waterfront, subsidizing the service at \$3 million a year. The City plans to identify additional ferry services that will all almost certainly require subsidies.

As with the recommendations for added bus service, new ferry routes should contain a sunset clause such that if the service is unsuccessful it is discontinued. RPA has in the past examined the conditions under which ferry service has the best chance for success. As a guide, the following factors should be considered:

- ▶ Does the market have poor transit service, with little rail or bus improvement opportunities?
- ▶ Are large walk-on commuter-sheds or good transit delivery systems available at either or both ends of the prospective ferry route?
- ▶ Is there a large and dense pattern of development near either or both ends of the ferry route?

- ▶ Is there a direct and easily navigable water route? And, where applicable,
- ▶ Will developments near the waterfront site be willing to make permanent contributions to ferry operations?

When applying these criteria, few if any ferry routes are obvious, beyond the current Rockaway service. However, the current Rockaway ferry service with a stop at Bush Terminal and then onto Lower Manhattan should be retained given the isolation of the Rockaway peninsula demonstrated in this report and self-evident to its residents. Other routes, particularly those in areas of new waterfront development should be predicated on developer contributions. The Soundview neighborhood in the Bronx has been discussed as a new route to Lower Manhattan. However, its prospects are questionable without substantial subsidy given the criteria above, and if it is initiated, it should be clear that it must meet the "use it or lose it" demonstration criteria.

Appendix A: Factors Influencing the Choice of Transit: A Statistical Analysis

The choice to use public transit depends in large measure on factors other than the features of the transit system. Past research has continually shown that the compactness of the land uses in the area near the beginning or end of trips are highly relevant – where densities are high the automobile is more likely to encounter more traffic and move slower, the cost of driving will likely be higher, and the ownership of cars is likely to be less widespread.¹ Transit service, in general, with more people concentrated in a smaller area is likely to be more widespread and will provide more service.

To illustrate the impact of densities, a series of charts are presented next. Since it is the work trip that is under consideration, the job density at the work end of the trip and the residential density at the home end of the trip are considered. The observations are based on the 59 Community Board areas in New York City. Trips made on foot, by bike, and “trips” at home are not included to make the comparison between transit and auto clearer. In Figure A-1 the job densities are plotted against transit share for the 59 zones, revealing a close association and possibly cause-effect relationship between the two. Because the observations with the highest job densities in the Manhattan Central Business District and Downtown Brooklyn distorted the plot and made it difficult to see how the relationship performs for the rest of the city, these data points were excluded from the analyses. The linear relationship is strong with a high r-squared of 0.638 fit, meaning approximately 64 percent of the variation in transit shares for trips to work is associated and/or explained by job densities alone. The logic of the job density variable means that job density is a strong explanatory variable for transit share. Quantitatively, increases of 10,000 jobs per square mile add about 26 percent to the transit share.

At the residential end of the work trip, a similar relationship exists as shown in Figure 6. Higher residential density is associated with higher transit shares in a curvilinear relationship with an r-squared of 0.650, where higher density is associated transit shares to grow at a declining rate. It is to be expected then that when the origin-destination modal shares are modeled, both the job and residential densities at the respective ends of the work trip will result in an excellent statistical fit. This analysis is presented below.

One of the reasons some of the observations in Figure A-1 may fall below or above their lines of best fit may be because of the mix of locations at the other end of the trip. This might be best explained with an example. The three CBs in Staten Island all fall below the line of best fit in Figure A-1 – lower than their job densities would suggest. This is undoubtedly because most

of the people who fill those jobs also live on Staten Island where residential densities are low too. Thus, Figure A-2 is presented which shows the modal shares plotted against the residential density for the home end of the work trip. These two graphics suggests that considering both residential and job densities together – the residential density at the home end of the trip and the job density at the work end of the trip – should be especially fruitful.

In addition, the two density variables, the cost of using an automobile to travel to work may explain its use, and conversely the choice to use transit. To test this, these average daily parking cost and average toll paid daily were each estimated. But the cost of using a car may be of less consequence to those having higher incomes. Consequently, the median income of each of the CBs was also compiled for the analysis. These factors may be relevant too.

Transit or auto modes are not the only choices to be considered here. Some people walk / bike to work and still others work at home. The forces that drive these choices are also important to understand. If the city’s future development patterns and actions (such as an expanded Bikeshare) lead to more walking and biking and the nature of work is influenced by technological changes, it can lead to a rise in the number of workers staying at home. Modeling these trips to assist the understanding of the dynamics of these trips is certainly worthwhile.

In Figure A-3 the percent of work trips that are made on foot and by bicycle in each CB is plotted against a function of both job and residential densities in that CB. Tests of the relationship showed that both the residential and job densities significantly affect walk/bike share, but neither was very strong alone. Combined as the square root of their products established a nice fit; where both densities were high, more people walked or biked and densities accounting for about 80 percent of the variation.

The choice of transit or driving might not be the only choices. Some may work at home, with the commute no farther than the bedroom to the home office. When the data for work at home shares was examined densities did not seem to be much of an explanation. Rather, as shown in Figure A-4 there is a relationship, albeit a weak one, with income. In general, higher income areas tend to have a higher share of people working at home, but with some notable exceptions. The income factor could be explained by a greater share of residents who are self-employed entrepreneurs who do not travel to an office and by the assumption that these individuals might, but are not guaranteed to earn more.

¹ See Pushkarev and Zupan, *Public Transportation and Land Use Policy*, Indiana University Press, 1977

Figure A-1: Transit Share and Job Density, NYC Community Boards (Manhattan CBD and DT Brooklyn Excluded)



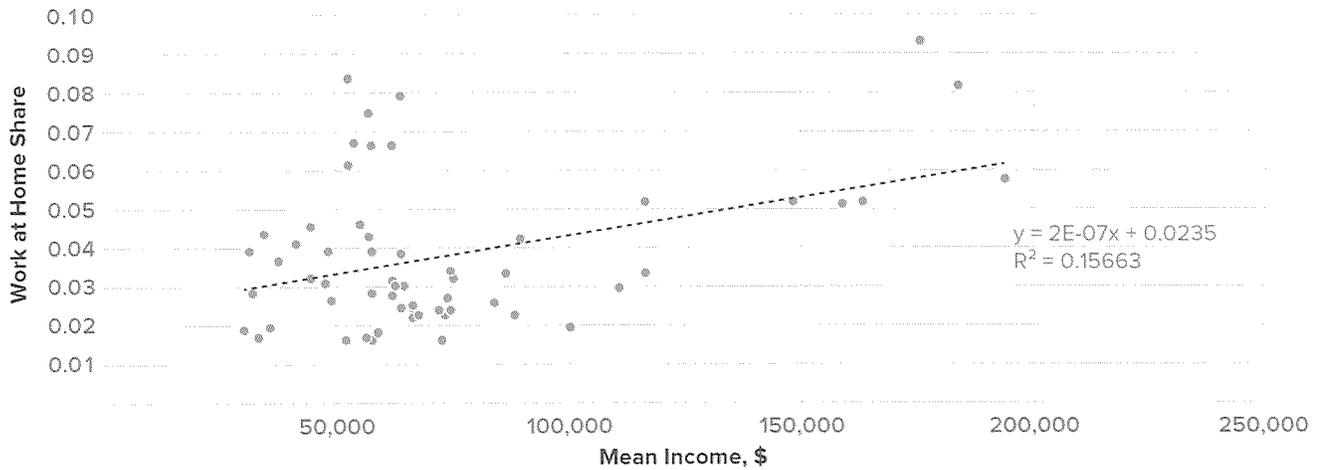
Figure A-2: Transit Share and Residential Worker Density, NYC Community Boards



Figure A-3: Walk/Bike Share as Function of Density Index*, NYC Community Boards



Figure A-4: Share Working at Home as Function of Income



When it comes to evaluating transit share and potential for added transit service, both the walker/bikers and those working at home should be accounted for.

The relationships in the preceding discussion account for those factors that are not directly associated with the transportation systems – residential and job densities, and income. When these are tested along with the transportation variables, they produce strong statistical relationships. These added variables include presence of direct transit service, cost of parking at the work destination, and the daily cost of tolls. This was done for all the CB to CB pairs in New York City. Those pairs with relatively few total trips were omitted where the small sample size would create statistical noise and obscure the relationship. Also omitted were CB pairs that were internal (to and from the same CB) since the large number of walking trips would also confuse the relationship. A multiple regression analysis using pairs with at least 1,000 trips (720 pairs) isolated the variables that are statistically significant. It produced this equation.

$$\text{Transit Share} = 23.20 \text{ Log ED} + 22.41 \text{ Log RD} - 0.177 \text{ INC} + 5.39 \text{ T} + 2.12 \text{ DS} - 128.39$$

Where:

Transit Share = Percent of trips, exclusive of those on foot that are made by a transit mode;

ED = Employment Density (jobs per square mile in thousands);

RD = Residential Density (residential labor force per square mile in thousands);

INC = Median household income at residential end of work trip, thousands of dollars;

T = Daily tolls in dollars; and

DS = Direct subway service between the home and work CB with direct service having a value of one and indirect or no service a value of 0.

The r-squared of this equation is 0.761, which indicates that these five variables collectively explain over three-quarters of the

variation in the independent variable, transit share. Each of these five variables and the equations constant are statistically significant and none of these variables fail the test of multi-collinearity, i.e. do not confuse the equation by two variables explaining the same phenomena, thereby substantially weakening their coefficients. However, Direct Transit was the weakest and barely made the statistical cut.

The equation can be interpreted as follows, all else being equal:

- ▶ Work locations with an order of magnitude higher in job density at the work location, say from 10,000 per square mile compared to 1,000 per square mile, or 100,000 per square mile compared to 10,000 per square mile, would have a higher transit share by about 23 percentage points;
- ▶ Residential locations with an order of magnitude density higher in residential labor force density, say 50,000 per square mile compared to 5,000 per square mile, would have a higher transit share by about 22 percentage points;
- ▶ Residential areas with a median income by \$10,000 higher than another area would have a lower transit share of about 1.8 percentage points;
- ▶ Each added dollar of tolls would increase transit shares by about 5.4 percentage points; and
- ▶ Work trip markets with direct subway service would have about 2.1 percentage points higher transit shares.

A similar equation was developed with Manhattan CBD destinations kept out of the analysis, since it had a tendency to distort the relationship. The sensitivities of the variables were similar, except the job density variable that fit best was a linear rather than a logarithmic one. In this case, each 10,000 added jobs per square mile added about 4.2 percentage points to transit shares.

Appendix B: Data for Selected Community Boards

This Appendix presents detailed information about each of the five selected CBs. It begins by describing the transit service available and includes maps that show the areas in the district that are within walking distance of a subway stop and areas that are within walking distance of a bus line that accesses the subway. Those areas that fall into neither of these categories have poor access to the subway network and are handicapped in their residents' ability to move about the entire city. A second map shows the areas beyond walking distance of the local bus network in the district. Those areas beyond those distances are handicapped in a different way; they are limited in their residents' ability to move about locally.

Following the coverage discussion, data is presented which arrays the bus information for routes serving the district. Performance standards for speed, frequency and span developed earlier in this of service are applied to pinpoint those bus routes that are deficient in one or more ways.

To better understand the travel patterns for the five selected community boards, the same US Census data at the borough level shown earlier was recompiled at the community board level. For each of the five, the top ten CB job destinations are ranked (excluding Manhattan CBD community boards) to highlight where in the "boroughs" people need to get to for their jobs. These are shown in tables and maps that showing how these ten are distributed within the City.

Finally, the Appendix provides a list of major non-work destinations for the district, including schools, shopping districts, recreation, and hospitals, each likely to require transit access for district residents.

Table B-1: Neighborhoods in Selected Community Boards

BK5	BX9	MN11	QN5	SI1	
Broadway Junction*	Bronx River	East Harlem	Glendale	Arlington	Randall Manor
City Line	Castle Hill	Harlem*	Maspeth	Castleton Corners	Rosebank
Crypress Hills	Clason Point	Randalls Island	Middle Village	Clifton	Shore Acres
East New York	Harding Park	Wards Island	Ridgewood	Elm Park	Silver Lake
Highland Park	Parkchester			Fox Hills	St. George
New Lots	Soundview			Graniteville	Stapleton
Spring Creek	Soundview - Bruckner			Grymes Hill	Sunnyside
Starrett City	Unionport			Howland Hook	Thompkinsville
				Livingston	Ward Hill
				Mariner's Harbor	West Brighton
				Old Place	West New Brighton
				Park Hill	Westerleigh
				Port Ivory	Willowbrook*
				Port Richmond	

*denotes neighborhoods in more than one community district. Source:

Queens Community Board 5

The bus network in the district includes 22 local routes and 8 express routes. Seven of the 22 local routes are actually Brooklyn designated routes but serve at the edges of CB 5, particularly in the Ridgewood neighborhood. There are four significant east-west streets in the district – Grand Avenue, Flushing Avenue, Myrtle Avenue and Metropolitan Avenue, each with parking lanes on both sides of the street with only Metropolitan Avenue with more than one lane in each direction. North-south roads are even more constrained with only two streets – Fresh Pond Road and 80th Street – neither running entirely through the district, blocked by one or more of the seven major cemeteries. These cemeteries are a major feature of the district, consuming about one-third of its land area. All of these streets with their combined limitations of width, parking lanes and discontinuity result in slow movement of the numerous buses that use them, and prevent significant upgrades of travel speeds. The exception is on the eastern edge of the district, Woodhaven Boulevard which is oriented north-south with three lanes in each direction.

Local bus service covers the community board area well. As shown in Figure B-1, most of the area has at least one bus line within one-quarter mile of a bus route. This does not necessarily mean that residents have a route that accommodates all of their bus trips, however.

The accompanying map in Figure B-2 shows the areas of QN 5 within walking distance of a subway stop and within walking distance of a bus that serves subway stations. And it also shows those areas within a walk of the express bus stops. Large areas of this district, particularly in Maspeth and Glendale require a bus to reach the subway. Express buses help to fill in the gaps in Glendale, but not in Maspeth. Middle Village does benefit from the presence of express buses. Only the Myrtle Avenue (M) line, with four stations and terminating at Metropolitan Avenue in Middle Village directly serves the area. In addition, one station on the Canarsie L line is on the border and another is just outside it both within walking distance of some residents. The M service operates to Sixth Avenue in midtown Manhattan via the Williamsburg Bridge, with transfers to the L for trips to 14th Street in Manhattan which require an outdoor transfer and short walk between stations and direct transfers (changing levels only) to the J and Z services for trips to Lower Manhattan and to the G for trips to Downtown Brooklyn. Subways other than the M can be reached by using buses to various stations on the J, Z, and L and the A and C at Broadway Junction or from the north end of the district to the Flushing (#7) line.

Figure B-2 also shows the coverage provided by the supplementary express bus service and local bus coverage that feeds the M line. Two express routes stop in the district; another six stopping at its edge, mostly along Woodhaven Boulevard. All eight access the Long Island Expressway to reach the Queens-Midtown Tunnel and Manhattan, using the high occupancy lane (which also allows cars with three or more people) to provide a more reliable trip. The coverage by the local routes that feed the subway fills in the areas without either walking-distance subway or express bus service, with very limited areas left completely uncovered.

Figure B-1: Local Bus Coverage - Queens Community Board 5



Figure B-2: Subway and Express Bus Access – Queens Community Board 5



Table B-2: Bus Data for Queens Community Board 5

Route	Route Type	Bi-Directional Length of Route in QN5 (Mi)	Avg. Weekday Speed Across Entire Route (MPH)	Avg. Weekday Headway			Weekday Last Bus Run (Nearest hour)	Avg. Weekend Headway		2012 Annual Ridership	Stops at Subway?
				Morning (Min)	Mid-Day (Min)	Evening (Min)		Saturday (min)	Sunday (min)		
B13	Local	5.9	9.2	12	20	12	2:00am	23	23	1,647,034	No
B20	Local	4.3	8.2	7	12	8	2:00am	15	15	2,486,766	Yes
B26	Local	0.4	7.4	6	10	7	12:00am	9	11	3,353,974	No
B38	Local/LTD	5.5	7.1	2.5	4.5	4.5	12:00am	6	9	6,511,969	No
B52	Local	0.2	6.6	5.5	8	6.5	12:00am	9	13	4,036,731	No
B54	Local	0.2	6.4	8	10	7	12:00am	14	14	3,660,051	Yes
B57	Local	2.9	8.4	12	20	15	2:00am	20	20	1,860,333	Yes
Q11	Local	8.6	9.5	15	30	15	1:00am	30	30	1,727,537	Yes
Q18	Local	2.5	7.6	9	20	10	2:00am	20	20	2,590,414	No
Q21	Local	4.3	9.4	30	30	30	1:00am	10	30	1,147,774	Yes
Q23	Local	0.5	7.8	8	10	6	2:00am	10	12	4,965,290	Yes
Q29	Local	5.7	7.8	8	20	10.5	2:00am	15	20	1,863,833	No
Q38	Local	12.8	9.0	3.5	20	12	1:00am	23	23	1,923,934	Yes
Q39	Local	11.8	9.5	6.5	15	9.5	3:00am	23	30	1,590,125	Yes
Q47	Local	3.4	8.1	7.5	20	8.5	1:00am	30	30	2,289,537	No
Q52	LTD	2.1	15.0	13.5	20	12	1:00am	30	30	671,422	Yes
Q53	LTD	2.1	14.0	6.5	10	8.5	2:00am	10	11	5,007,501	Yes
Q54	Local	14.6	8.2	6	15	10	12:00am	19	20	3,863,969	Yes
Q55	Local	8.9	7.9	5.5	15	7	12:00am	12	20	2,336,379	Yes
Q58	Local/LTD	13.0	8.4	3	7	4	12:00am	6	6	9,145,098	Yes
Q59	Local	6.5	8.1	9	20	12	12:00am	15	15	2,227,165	No
Q67	Local	5.3	9.4	12	30	14	12:00am	60	60	685,648	Yes
QM10	Express	6.0	8.6	7	none	9.5	11:00pm	none	none	88,931	NA
QM11	Express	3.0	8.6	7	none	9.5	11:00pm	none	none	102,927	NA
QM12	Express	7.6	7.7	11	none	16.5	8:00pm	none	none	118,503	NA
QM15	Express	12.1	9.2	8	60	14	1:00am	60	none	341,048	NA
QM18	Express	1.4	7.4	30	none	30	8:00pm	none	none	57,599	NA
QM24	Express	24.8	8.0	5	none	8	8:00pm	none	none	291,655	NA
QM25	Express	12.4	8.0	5	none	8	8:00pm	none	none	76,627	NA
BM5	Express	5.3	10.9	24	60	25.5	12:00am	60	none	158,979	NA

Source: Metropolitan Transit Authority, Regional Plan Association
 Note: Deficient routes shaded.

There is no commuter rail service in the district. The only possible option for commuter rail use is to access the Jamaica Center station of the LIRR either with local buses or with a bus - J/Z subway combination. The limitation for reverse service to Long Island destinations because of the absence of a third track on the LIRR main line further inhibits the use of the LIRR for district residents.

Data on all the bus routes serving QN5 is displayed in Table B-1. The data is revealing in many respects. First, as seen in the description of the other selected community boards, local bus service is exceedingly slow. No local route averaged more than 9.5 mph, with the lowest at 6.4 mph, and the rest clustering in the 7 to 8 mph range. The two limited stop services and the express service reach 15 mph.

Surprisingly, the speed of the express buses belies their name, with the eight routes hardly faster overall than the local routes. Undoubtedly, the time required to circulate locally and then having to negotiate crowded Manhattan streets slows down these routes.

Service headways vary widely too. Using the 10-minute rule of thumb for good service below which passengers no longer feel compelled to consult a schedule, 17 of the 22 local routes offer good service in the morning peak periods and 16 of the 22 in the evening peak. In midday, only half reach the service threshold of a bus every fifteen minutes, and of the 11 that do not, eight offer a bus every 20 minutes, or three per hour. On weekends, seven fall short of a bus every 20 minutes on both Saturdays and Sundays. But these routes are all among the more lightly used routes (less than 2 million annually) so it might not be reasonable to call for an increase in service. Four of the seven express buses serving QN 5 offer an attractive service frequency in the peak; only three are adequate in the evening peak and midday and weekend express service is largely non-existent.

Nighttime service ends at midnight or earlier for nine of the 22 routes, and all but one of the express services.

These deficiencies in express service are of special concern for a district such as QN 5, where subway coverage is so limited.

Not unexpectedly, as shown in Table B-2 and in Figure B-3, more QN5 residents work in their own community board than

any other. Almost 9,000 do so, and a high number work out of their home or have trip to work within walking distance. An equal number work in the two nearby CBs – QN1 and QN2 – when they are combined. These CBs include the neighborhoods of Hunters Point, Sunnyside and Woodside (QN2) and Long Island City, Astoria, and Steinway (QN1). Taken together, these three community board areas account for more than half of the top ten work sites and almost half of all Queens work destinations. In each of these cases, and indeed to all non-Manhattan job sites the share that use automobiles exceeds the share that use transit. This highlights the weaknesses of the transit network in this CB. The low transit use for traveling within QN5 can be attributed to the short distance involved. Few will voluntarily choose to wait for a transit vehicle if they have access to a car since the wait for the transit vehicle can easily exceed the time to make the trip by car.

The upper east side of Manhattan (MN8) is the next ranking destination, with ¾ of the trips made on transit, mostly by subway. The next three destination are all to Brooklyn, the first to BK2 which is downtown Brooklyn where transit shares are higher than auto shares, but the next two are CBs adjacent to QN5; again, for short trips the car is preferred. Overall, for these top ten, only 12 percent take the bus and 18 percent the subway. For all Queens’ destinations the bus shares and subway share are each about 14 percent. These low transit shares for QN5 should not come as a surprise with its limited subway coverage and the various weaknesses of the bus network, requiring more than one bus to reach many places.

Queens Community Board 5 Access to Key Non-work Destinations

Downtown Brooklyn, the Fulton Street Mall and Barclays Center are difficult to reach for much of the district since only one subway line to Downtown Brooklyn penetrates the QN5. Bus service is either indirect or slow to these destinations. Other destinations also suffer from poor access - Flushing (indirect),

Queens Center (infrequent), Citifield and Arthur Ashe Stadium (indirect). Among the schools, Brooklyn College, Queens College, LaGuardia Community and Richmond High School all require transfers for access. Rockaway Beach also requires two buses. A list of major destinations for the district is provided below.

Regional Centers

- Downtown Brooklyn
- Jamaica Center
- Flushing

Schools

- Queens College
- York College
- Brooklyn College
- LaGuardia Community College
- Grover Cleveland High School
- Christ the King High School
- Forest Hills High School
- Richmond High School

Parks / Open Space

- Flushing Meadow Park
- Rockaway Beach / Riis Park

Shopping Centers

- Queens Center Mall – Queens Boulevard
- Downtown Brooklyn – Fulton Street

Entertainment / Sports Venues

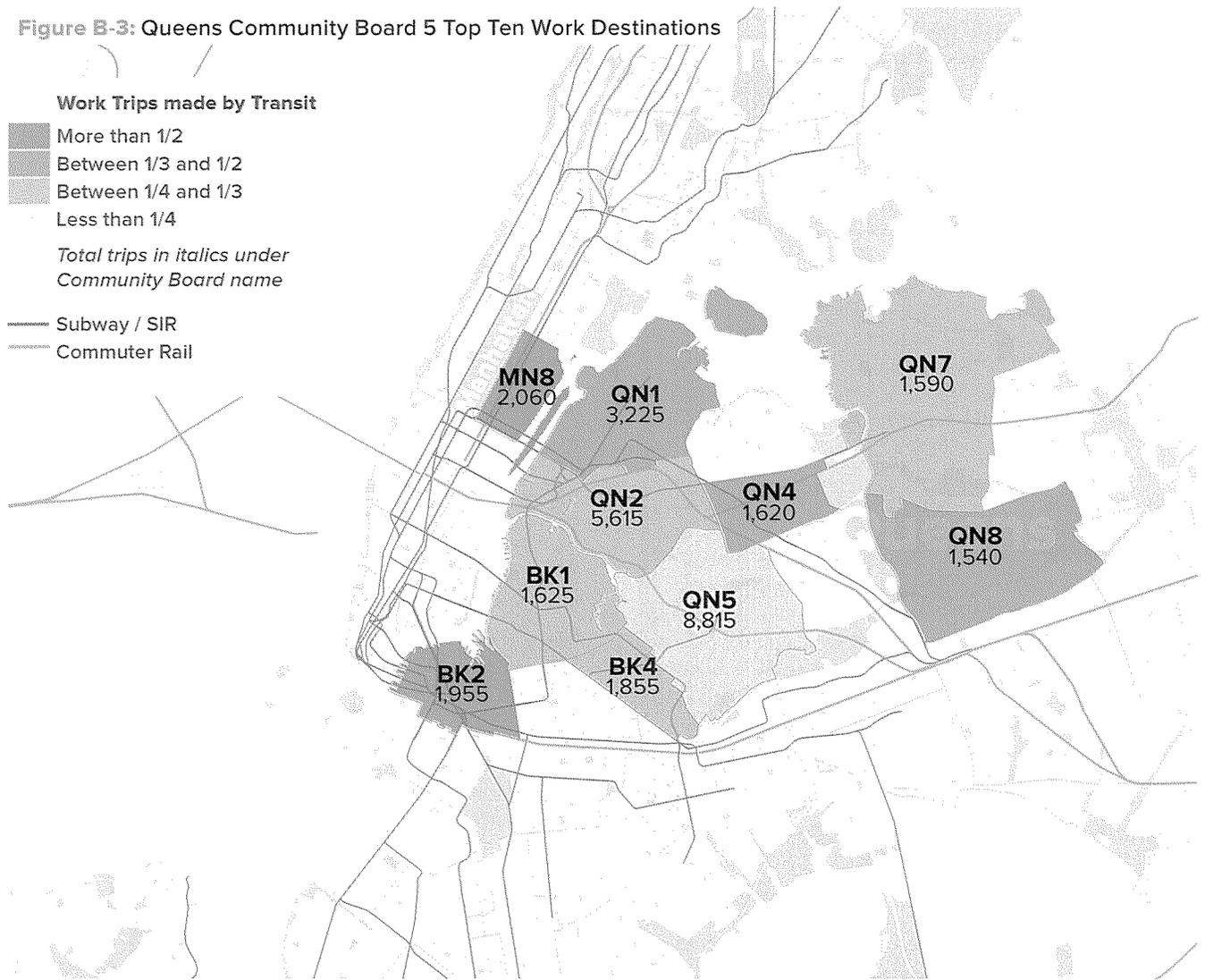
- Barclays Center
- Citifield
- Arthur Ashe Stadium

Table B-3: Top Ten Work Destinations for Queens Community Board 5 - 2010

CB	Total Trips	Percent			Walk or Work at Home	
		Bus	Subway	Transit	Auto	
QN5	8,815	5.6	3.7	9.3	42.1	46.9
QN2	5,615	13.5	15.9	29.8	59.8	8.9
QN1	3,225	15.0	26.4	42.3	47.2	9.3
MN8	2,060	7.7	63.3	74.2	25.7	-
BK2	1,955	16.4	41.9	58.3	40.1	1.5
BK4	1,855	14.3	12.7	30.2	50.9	17.3
BK1	1,625	9.8	20.6	31.1	66.8	-
QN4	1,620	27.8	14.1	41.9	49.4	5.9
QN7	1,590	17.2	10.6	27.8	61.3	9.7
QN8	1,540	15.2	21.3	36.5	59.5	3.6
Top Ten	29,900	12.1	18.3	31.0	48.9	18.7
All Queens Destinations	31,993	14.0	13.6	28.0	52.0	18.6
ALL	74,310	11.7	40.6	53.4	36.9	8.9

Source: U.S. Census Bureau, American Community Survey 2006 to 2010

Figure B-3: Queens Community Board 5 Top Ten Work Destinations



Bronx Community Board 9

The district is served by nine local bus routes. One inter-borough service, the Q44, stops at the Hugh Grant Circle in Parkchester and links the Bronx with Flushing, Queens. The local routes operate on the major east-west streets, including Westchester Avenue and East Tremont Road, with other routes extending southward into the broad peninsula made up of the Soundview, Castle Hill, Clason Point and Harding Park neighborhoods. The local bus routes and the areas within a ¼ walk are depicted in Figure B-4. It is clear that just about the entire district is within a short walk of at least one bus route. Of course, that does not guarantee that the route nearby is also one that will take residents to all the places they wish to go.

Subway service within the community board is limited to #6 Pelham Bay line that runs through the northern portion of the district, making five stops, with one, the Parkchester station, offering a semi-express service that skips many of the stops farther south in the Bronx. When it reaches Manhattan, the #6 operates under Lexington Avenue on the upper east of Manhattan and then under Park Avenue South below 42nd Street. It is not possible to transfer from the #6 to a west-side train.

There is no commuter rail service in the district. Residents in the Castle Hill or Parkchester neighborhoods could take the Bx 22 bus to the Metro North station on the Harlem Line if they are destined to Westchester County locations. Using buses it is also possible to reach the Tremont Avenue Metro North station, but the Metro North service there is exceedingly poor and sporadic.

The accompanying map in Figure B-5 shows the areas of BX9 within walking distance of a subway stop and within walking distance of a bus that serves subway stations. And it also shows those areas within a walk of the express bus service. Five express routes operate through the area, but only two stop there. More than half of the land area in BX9 district is beyond walking distance to a subway station and therefore requires a local bus. Most of Soundview, Castle Hill and all of Clason Point are bus-to-subway territory. Express buses pick up some of the coverage near the Bruckner Expressway, but express buses mainly serve Manhattan, so it is not an option for all travel. Because the #6 does not provide any place of a transfer to trains traveling to the west midtown trains, BX9 residents now probably ride the White Plains Road or Dyre Avenue subway lines (#2 or #5) to reach the west side of Manhattan. However, as Figure B-5 suggest, that requires a bus ride for some who otherwise could walk to the #6 or a longer bus ride for others. The one exception is the BX 5 bus line which connects with the 2 and 5 subway lines at the Simpson Street station. Once the Second Avenue subway is extended to 125th Street, this problem will be addressed, since it would allow riders on the #6 to transfer to the Second Avenue line which operates to the west side of midtown Manhattan.

Data on all the bus routes serving BX9 are displayed in Table B-4. Bus service is slow; only one exceeds 8 mph, with four at less than 7mph. As should be expected, the overall speeds of the express services are somewhat faster, but not by that much, ranging from 8 to 13 mph.

Figure B-4: Local Bus Service Coverage – Bronx Community Board 9

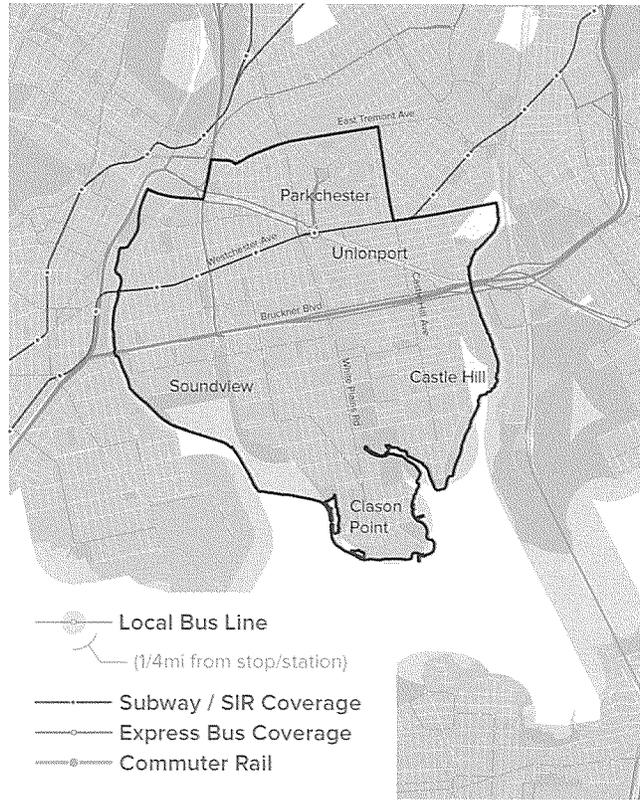


Figure B-5: Subway and Express Bus Access – Bronx Community Board 9

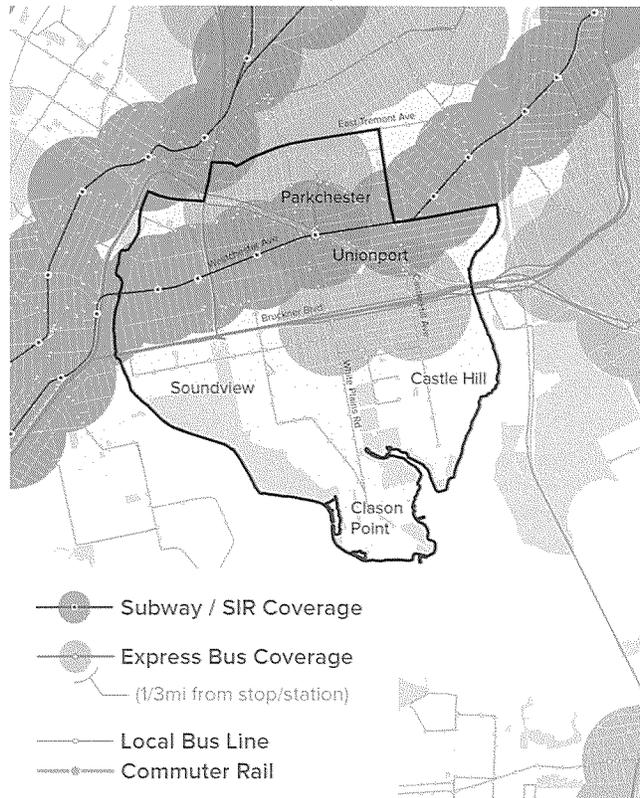


Table B-4: Bus Data for Bronx Community Board 9

Route	Route Type	Bi-Directional Length of Route in BX9 (Mi)	Avg. Speed Across Entire Route (mph)	Avg. Weekday Headway			Weekday Last Bus Run (Nearest hour)	Avg. Weekend Headway		2012 Annual Ridership	Stops at Subway?
				Morning (min)	Midday (min)	Evening (min)		Saturday (min)	Sunday (min)		
BX22	Local	18.2	6.9	7	12	7	12:00am	11	13	4,730,005	Yes
BX27	Local	10.3	7.0	5	10	6	12:00am	10	15	2,304,467	Yes
BX36	Local	15.4	7.1	3	8	5	1:00am	8	8	9,625,389	Yes
BX39	Local	4.9	6.8	7	10	9	12:00am	12	13	5,409,742	Yes
BX4	Local	4.4	6.7	6	10	9	2:00am	10	13	3,781,876	Yes
BX40	Local	2.0	7.3	6	9	6	1:00am	12	11	8,108,698	Yes
BX42	Local	2.0	7.3	6	9	6	1:00am	12	11	8,108,698	Yes
BX4A	Local	5.5	6.7	6	10	9	2:00am	10	13	3,781,876	Yes
BX05	Local	35.2	8.6	4.5	10	6	1:00am	10	13	3,726,214	No
BXM11	Express	3.2	10.1	12	30	12	1:00am	30	60	359,336	NA
BXM6	Express	2.4	8.4	20	60	20	1:00am	60	60	204,868	NA
BXM7	Express	17.6	13.2	6.5	30	6.5	2:00am	20	30	923,098	NA
BXM8	Express	8.8	10.8	11	30	9	2:00am	30	60	494,535	NA
BXM9	Express	4.4	10.6	8.5	30	9	2:00am	30	60	623,652	NA
Q44	Interboro	17.1	10.3	3	5	4	1:00am	5	5	9,513,166	Yes

Source: Metropolitan Transit Authority, Regional Plan Association
 Note: Deficient routes shaded.

Service headways for the local routes meet the service standards during weekday peaks of 10 minutes, for midday of 15 minutes, and for weekends of 20 minutes. The express bus service frequencies do not, particularly during midday weekdays and on weekends. Only two of the five routes have adequate midday service. The frequencies of the express bus service on weekends is poor, with 30 to 60 minutes the norm. Of the nine local and five express routes only three local routes do not provide service to 1am. These three are all local routes that operate in a north-south direction through areas beyond walking distance from the subway, handicapping late night travelers living in the Soundview, Castle Hill and Clason Point neighborhoods.

The BX9 top ten work destinations are listed in Table B-5 and depicted geographically in Figure B-6. They show the local nature of many trips to work, a repeating theme. As a work destination for its residents, BX9 is more than double the next ranking CB, which is the adjacent BX11 just to the north. The remaining CBs are rather evenly spread in the southern and eastern portions of the borough and to the upper east and west side in Manhattan.

Almost half of BX9 residents working in their own district either work at home or walk to work, and sizable shares walk to nearby CBs as well. Transit shares are higher to six of the eight Bronx destinations; the bus outranks the subway for all Bronx locations, while the subway is chosen more often for the two Manhattan CBs. The high bus use can be attributed to the limited subway options in BX9 and the low car ownership levels, particularly for travel within the borough where twice as many use the bus than the subway. With little prospect of new subway service, the priority should be on making this district's bus service more attractive for travel within the borough.

Bronx Community Board 9 Access to Key Non-Work Destinations

Virtually all the key non-work destinations listed below are difficult to reach by public transit from BX9 neighborhoods. Bus routes that do serve the district, with one or two exceptions do not connect directly with these destinations. Those destination in the west side of the Bronx, such as Montefiore Medical Center, Lehman College or the Fordham Road shopping district require either an exceedingly long bus trip or a down-and-back subway ride using the #6 to 125th Street in Manhattan. The Bay Plaza shopping center, Pelham Bay Park and the relatively nearby Jacobi Hospital is a two-bus ride. It is safe to say that Bronx Community Board 9 is very isolated, particularly for those residents without an automobile available.

Figure B-6: Bronx Community Board 9 Top Ten Work Destinations

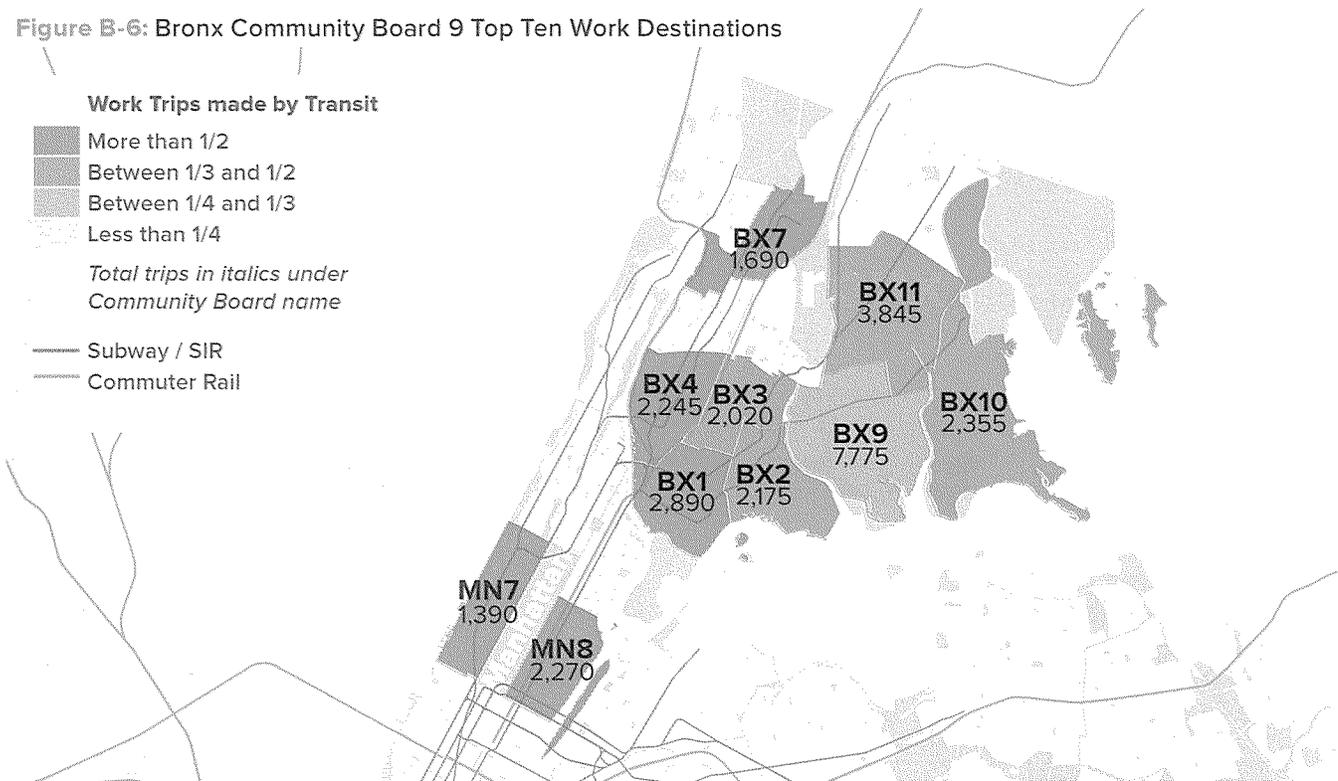


Table B-5: Top Ten Work Destinations for Bronx Community Board 9 - 2010

CB	Total Trips	Percent				
		Bus	Subway	Transit	Auto	Walk or Work at Home
BX9	7,775	20.8	7.3	28.2	23.0	48.6
BX11	3,845	29.9	16.5	46.5	39.1	12.7
BX1	2,890	36.7	17.5	54.7	41.0	3.8
BX10	2,355	28.2	20.2	49.5	43.9	3.2
MN8	2,270	4.8	79.1	85.0	13.0	0.4
BX4	2,245	37.6	23.6	62.3	29.8	8.9
BX2	2,175	26.9	18.4	45.7	45.9	7.8
BX3	2,020	26.5	11.9	39.9	54.2	5.4
BX7	1,690	39.9	18.0	61.5	36.6	1.8
MN7	1,390	14.4	63.7	80.2	20.5	-
Top Ten	28,655	26.0	22.1	48.9	33.0	17.4
All Bronx Destinations	29,705	29.7	14.5	45.0	36.9	17.4
ALL	64,954	18.6	43.3	63.9	27.5	8.1

Source: U.S. Census Bureau, American Community Survey 2006 to 2010

Among the key non-work destination for BX9 are:

Regional Centers

- Fordham Road

Schools

- City College
- Lehman College

Parks / Open Space

- Bronx Park
- Pelham Park

Shopping Centers

- Fordham Road
- Bay Plaza

Entertainment / Sports Venues

- Yankee Stadium

Hospitals

- Jacobi
- Montefiore Medical Center
- Bronx- Lebanon
- St. Barnabas Hospital
- New York Westchester Square Medical Center.

Brooklyn Community Board 5

The 16 local bus routes cover the district well and are used to access the five subway lines in the district or on its borders. The southern third of the district in the Flatlands, Starrett City and Spring Creek neighborhoods are less well served because of their distance from the subway lines. In the northern parts of the district along Jamaica Avenue residents, must rely on the slow Jamaica Avenue El, parts of which are more than 100 years old.

In Table B-6 the service data for the 16 bus routes that operate in BK5 are shown. Service frequency and span generally meet the deficiency standards used in this report, as does bus speed, but five routes do not provide service after midnight.

Brooklyn Community Board 5 is the only one of the five selected CBs where the top ranking CB destination was not itself, as shown in Table B-7 and Figure B-9. The downtown Brooklyn CB (2) outranked BK5. This can be attributed to the availability of two major subway lines that connect the areas, making BK2 the destination of choice for many. BK5 is different from the other selected CBs in other ways. Its highest ranking destinations are neither adjacent nor nearby. Not until the tenth ranked CB, BK4, is there an adjacent CB. This pattern can best be attributed to the availability of multiple subway options that make it possible for BK5 residents to reach more distant locations relatively quickly. Table B-7 illustrates this with the generally high subway shares, exceeding bus use in all but two cases. It is not a coincidence that these two exceptions are in Queens which are not reachable directly by the subway service in BK5. Almost 60 percent of this district's workers travel to Brooklyn job destinations by transit and about two-thirds of them use the subway. The message is clear. Where you have a more robust subway network more distant areas become accessible, increasing the mobility of more people.

Brooklyn Community Board 5 Access to Key Non-Work Destinations

Accessibility to major destinations by public transit from this district is decidedly mixed. Those living near the #3 New Lots subway line have direct subway access to such locations as Prospect Park, the Brooklyn Museum and Medgar Evers College; those near the northwest corner of the district have access to subway lines into downtown Brooklyn. Other neighborhoods in the district, particularly in the south in Flatlands, Spring Creek and Starrett City do not have those advantages with a bus ride to the subway. Other key destinations in Brooklyn are poorly served from all neighborhoods in the district. Two major hospitals in Flatbush require an awkward backhaul subway transfer and two others are inaccessible except with a long two-bus trip. Only Brookdale Hospital is easily accessible and then only for those living near the #15 bus route. Brooklyn College is hard to reach and King Plaza is virtually unreachable by transit.

Among the major non-work destinations for BK5 are:

Regional Centers

- Downtown Brooklyn
- Jamaica Center

Schools

- Brooklyn College
- Medgar J. Evers College
- Richmond Hill High School
- Boys and Girls High School

Parks / Open Space

- Prospect Park
- Coney Island

Shopping Centers

- Kings Plaza

Entertainment / Sports Venues

- Barclays Center
- Brooklyn Museum

Hospitals

- Beth Israel Medical Center
- Brookdale Hospital Medical Center
- University Hospital of Brooklyn
- Kings County Hospital Center
- Kingsbrook Jewish Medical Center

Figure B-7: Local Bus Access for Brooklyn Community Board 5

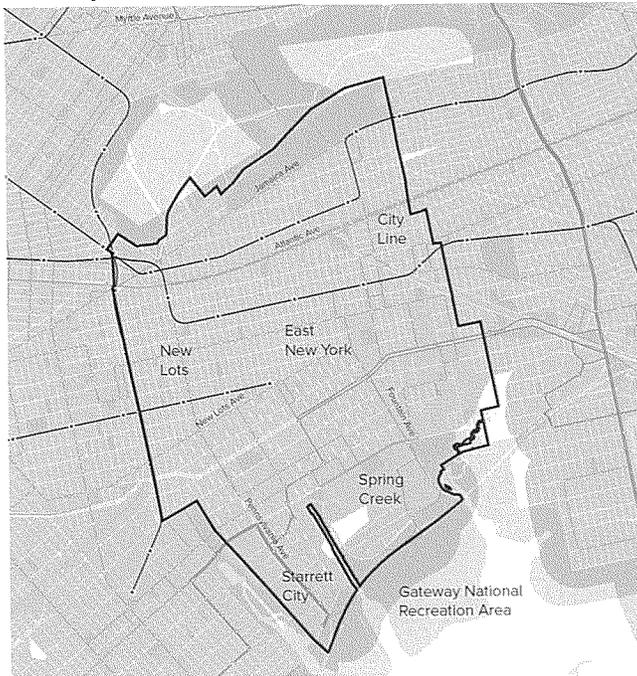


Figure B-8: Subway and Express Bus Access for Brooklyn Community Board 5

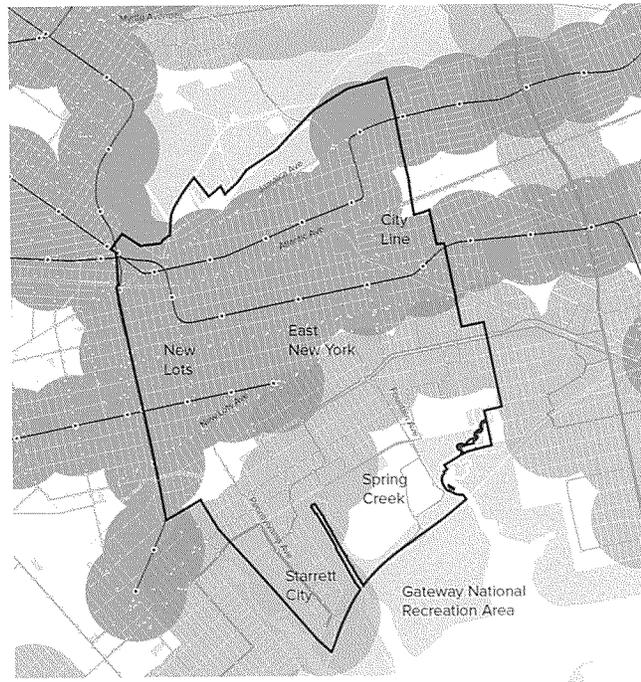


Table B-6: Bus Data for Brooklyn Community Board 5

Route	Route Type	Bi-Directional Length of Route in BK5 (Mi)	Avg. Speed Across Entire Route (MPH)	Avg. Weekday Headway			Weekday Last Bus Run (Nearest hour)	Avg. Weekend Headway		2012 Annual Ridership	Stops at Subway?
				Morning (Min)	Midday (Min)	Evening (Min)		Saturday (min)	Sunday (min)		
B103	LTD	0.2	9.6	2.5	7.5	3.5	2:00am	7.5	12	3,747,102	No
B12	Local	0.4	6.7	4	7	5	12:00am	5	10	5,490,791	Yes
B13	Local	8.6	9.2	12	20	12	2:00am	22	23	1,647,034	Yes
B14	Local	5.7	7.1	10	15	10	12:00am	11	20	2,301,166	Yes
B15	Local	30.0	9.8	4.5	9	8	1:00am	7	9	7,198,245	Yes
B20	Local	21.6	8.2	7	12	8	2:00am	15	15	2,486,766	Yes
B25	Local	0.4	7.7	8	9	8	12:00am	8	14	3,392,039	Yes
B6	Local/LTD	6.2	9.0	2.5	5	3.5	1:00am	4.5	8	13,279,268	Yes
B82	Local/LTD	6.5	8.2	3.5	10	4.5	1:00am	6	10	8,569,558	Yes
B83	Local	16.8	8.1	5.5	10	7	1:00am	7	16	2,599,400	Yes
Q07	Local	2.9	9.6	6	20	10.5	1:30am	20	30	1,574,342	Yes
Q08	Local	8.1	7.6	6.5	15	7	1:00am	11	16	3,158,685	No
Q24	Local	4.4	8.9	10	15	10	12:00am	11	17	2,520,125	Yes
Q56	Local	4.3	8.6	10	12	12	12:00am	12	16	2,900,108	Yes
BM2	Express	2.3	10.8	15	60	13	1:30am	60	none	272,302	NA
BM5	Express	6.4	10.9	24	60	25.5	12:00am	60	none	158,979	NA

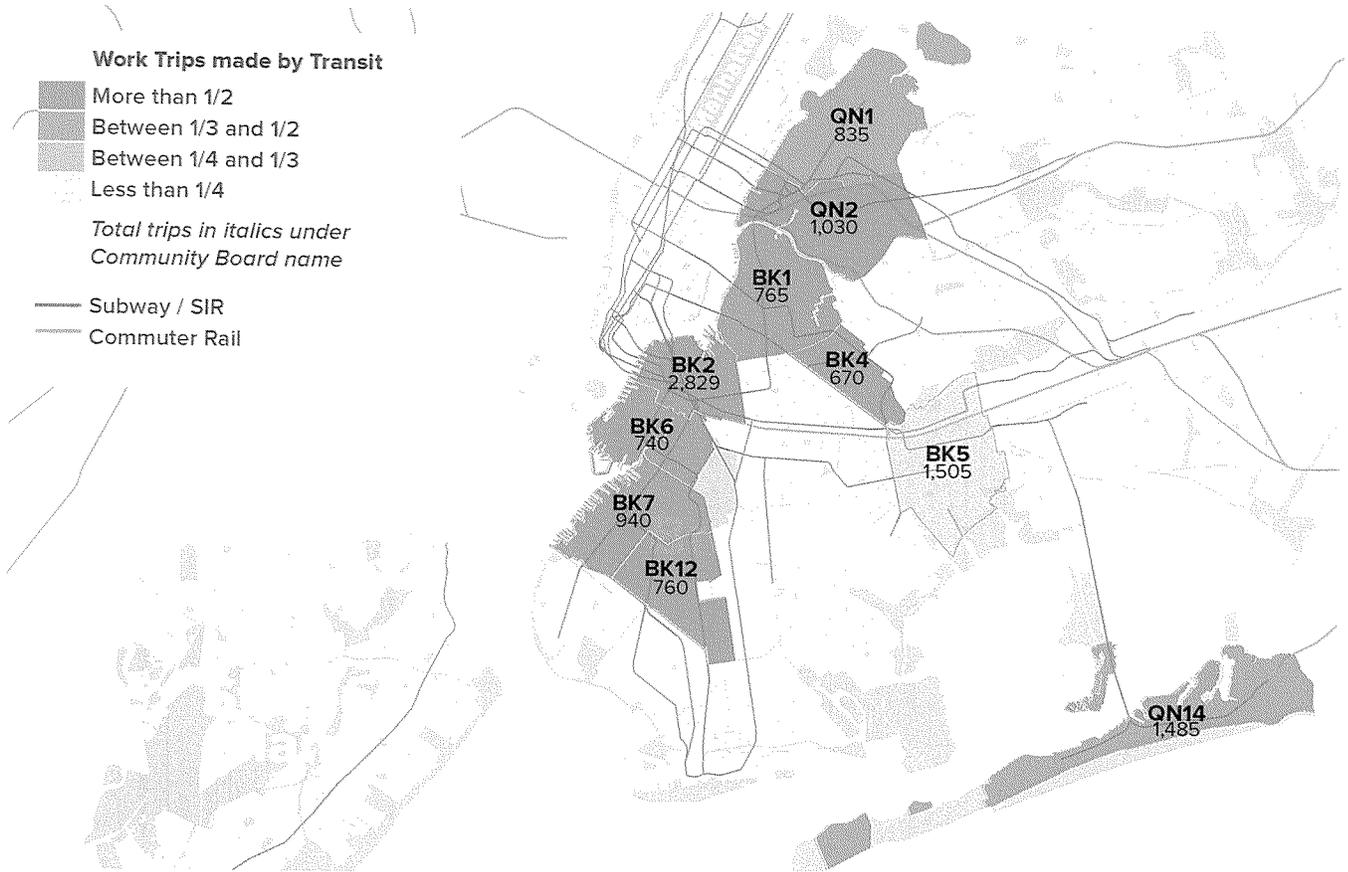
Source: Metropolitan Transit Authority, Regional Plan Association
 Note: Deficient routes shaded.

Table B-7: Brooklyn Community Board 5 Top Ten Work Destinations

CB	Total Trips	Percent				
		Bus	Subway	Transit	Auto	Walk or Work at Home
BK2	2,829	16.3	44.9	65.5	27.9	6.9
BK5	1,505	4.3	4.0	8.3	15.3	77.1
QN14	1,485	24.9	21.2	46.1	36.4	16.8
QN2	1,030	27.6	25.7	53.3	45.5	-
BK7	940	25.5	41.5	69.7	22.3	8.0
QN1	835	12.6	26.9	39.5	56.9	2.4
BK1	765	10.5	57.5	68.0	32.0	-
BK12	760	2.0	67.8	72.4	25.0	2.6
BK6	740	23.6	41.9	65.5	33.8	2.7
BK4	670	15.7	35.8	51.5	43.3	6.0
Top Ten	11,559	16.4	34.9	52.7	31.9	15.4
All Brooklyn Destinations	12,914	17.0	40.6	59.4	26.3	14.3
ALL	28,815	13.4	49.4	64.7	27.3	7.6

Source: U.S. Census Bureau, American Community Survey 2006 to 2010

Figure B-9: Brooklyn Community Board 5 Top Ten Work Destinations



Manhattan Community Board 11

Local bus service in this district is characterized by a series of east-west and north-south streets conforming to the Manhattan grid. East-west routes operate from the East River to the Hudson River, connecting the district to the upper west side of Manhattan. The north-south routes cover each of the avenues, other than Park, where commercial traffic is not permitted. These routes operate on one-way avenues, which forces residents to walk an extra-long block in one direction, but the district is otherwise fully covered by local bus service, as is clear from Figure B-10.

Subway service is confined to the Lexington Avenue line, with four stops from 96th to 125th Street, the last with express trains (#4 and #5), with the local (#6) service stopping at all of them. Five routes that operate along 125th Street offer service to the subway lines to the west, all out of the district.

The Metro North commuter railroad stops at 125th Street and Park Avenue in the northwest corner of the community board, where “reverse” service to Hudson Valley and southeastern Connecticut destinations is available.

Figure B-11 illustrates the areas of MN11 within walking distance of a subway stop and within walking distance of a bus that serves subway stations. With the exception of a very small patch centered on east 103rd Street, the entire district is can reach the subway on foot or with a short bus ride.

The data for all the districts bus routes are shown in Table B-8. Most of the local bus service in the area does not reach the 8 mph threshold, even many of those with limited stops.

Adequate service headways are not reached in the peak periods on a few routes, but they each barely fall short. Midday service frequencies are met on all but two routes, and only three routes have weekend service found wanting. Surprisingly, five routes do no operate to 1am, two end service at 8pm and 9pm. As is usually the case, the routes with more limited frequencies or service spans, tend to be those with fewer riders.

The Manhattan 11 top ten, shown in Table B-9 and mapped in Figure B-123, also has more of its workers located within their own borders. One-third of the total of the ten are working locally. And as with the others, the next ranking destinations are close by; the first five CBs in the list are located in other CBs close by in Manhattan and account for about 13,000 of the 15,400 top ten trips. The remaining five are either in adjacent CBs in the south Bronx or eastern Queens or in Upper Manhattan (MN12). Manhattan 11 is unlike the other selected CBs in two important respects: it has a very high share of transit users – far exceeding drivers, and it has a substantial number of workers who reach their jobs on foot to nearby CBs. The choice of bus or subway among its transit commuters is very much dependent on the configuration of the subway; with only one north-south line in this district, trips to crosstown locations such as MN9 are more likely to be on the bus. With the prospects of new subway service with the completion of the first phase of the Second Avenue subway, and eventually with other phases, the choice of the subway over the bus or auto could shift, depending on where future phases are built.

Figure B-10: Local Bus Coverage for Manhattan Community Board 11

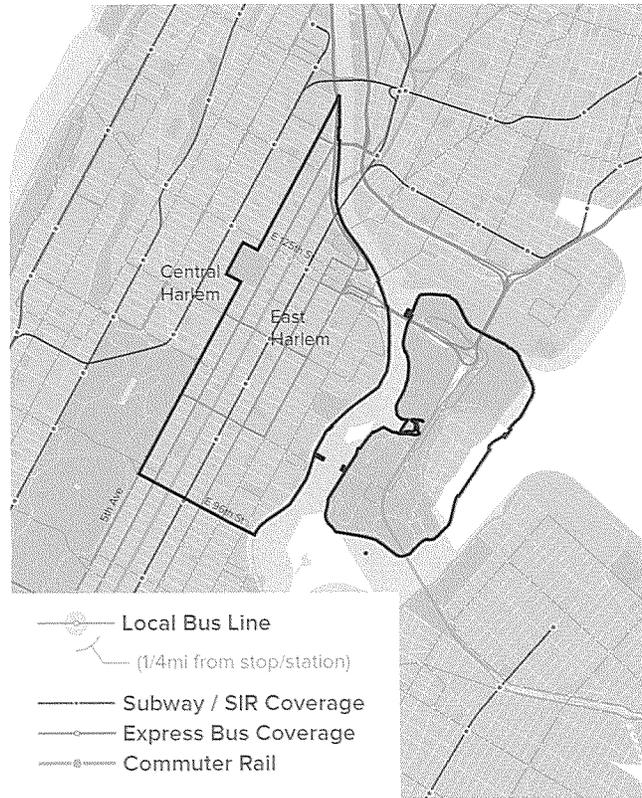


Figure B-11: Subway Coverage for Manhattan Community Board 11

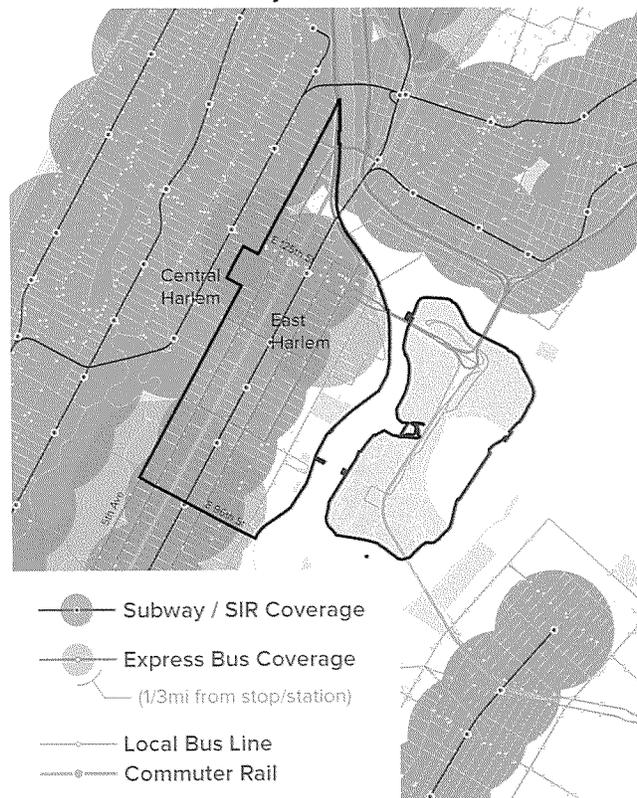


Table B-8: Bus Data for Manhattan Community Board 11

Route	Route Type	Bi-Directional Length of Route in QN5 (Mi)	Avg. Weekday Speed Across Entire Route (MPH)	Avg. Weekday Headway			Weekday Last Bus Run (Nearest hour)	Avg. Weekend Headway		2012 Annual Ridership	Stops at Subway?
				Morning (Min)	Midday (Min)	Evening (Min)		Saturday (min)	Sunday (min)		
BX15	Local	2.7	6.4	7	7	7	12:00am	7	9	7,332,265	Yes
BX33	Local/LTD	0.6	5.6	12	20	15	1:00am	23	27	927,706	Yes
M01	Local/LTD	10.3	7.0	5.5	12	5	2:00am	13	14	3,499,775	No
M100	Local	1.1	6.4	8	9	7	2:00am	11	13	5,015,397	Yes
M101	Local/LTD	16.2	6.9	3	4	3	1:00am	4	4	9,022,029	Parallels subway
M102	Local	5.4	NA	10	12	11	2:00am	11	13	4,890,719	Parallels subway
M103	Local	8.3	NA	12	12	12	2:00am	11	12	4,031,622	Parallels subway
M106	Local	2.5	4.8	12	30	15	9:00pm	30	30	596,802	Yes
M116	Local	2.4	5.3	4	11	5.5	2:00am	13	13	2,919,040	Yes
M15	Local	9.2	6.9	9	9	9	1:00am	11	11	17,792,141	No
SBS15	SBS	9.2	8.9	3	8	5	12:00am	8	9	17,792,141	No
M02	Local/LTD	2.7	8.1	9	15	9	1:00am	13	15	3,718,446	No
M03	Local	3.5	7.2	12	12	10	2:00am	11	15	4,999,124	No
M35	Local	5.1	12.3	10	10	12	1:00am	18	18	539,857	Yes
M04	Local/LTD	6.3	7.1	5.5	10	5	1:00am	12	13	6,119,006	No
M60	Local	5.0	11.5	8	9	8	12:00am	8	10	5,667,885	Yes
M96	Local	0.4	4.5	3	5	3	12:00am	8	11	4,677,777	Parallels subway
M98	LTD	5.3	6.4	6	none	12.5	8:00pm	none	none	514,894	Parallels subway

Source: Metropolitan Transit Authority, Regional Plan Association
 Note: Deficient routes shaded.

Table B-9: Top Ten Work Destinations for Manhattan Community Board 11, (Excluding Manhattan CBD) – 2010

CB	Total Trips	Percent				
		Bus	Subway	Transit	Auto	Walk or Work at Home
MN11	5,315	10.2	8.9	19.4	6.4	72.7
MN8	3,850	25.2	32.1	62.6	8.7	19.1
MN7	1,570	21.0	56.7	85.4	4.1	6.7
MN10	1,135	26.9	28.6	55.5	7.4	36.6
MN9	860	59.9	14.0	73.8	13.4	11.0
BK2	620	8.9	73.4	85.5	15.2	-
QN2	585	3.4	60.7	81.2	13.7	-
MN12	545	22.0	36.7	58.7	26.6	13.8
BX1	535	10.3	54.2	81.3	18.7	0.7
BX4	390	30.8	44.9	93.6	6.2	-
Top Ten	15,405	19.7	29.3	53.0	9.0	34.4
All Manhattan Destinations	36,915	16.0	49.3	70.0	7.4	19.7
ALL	43,172	14.8	51.8	71.6	8.7	17.1

Source: U.S. Census Bureau, American Community Survey 2006 to 2010

M11's top five non Manhattan CBD major work destinations are all in Manhattan above 59th Street. As with the other CBs examined, most people work close to home. The other top destinations are all nearby too, with three in the South Bronx, another in Washington Heights and nearby QN5 in Long Island City rounding out the list. Of these the more difficult to reach by public transit are those requiring a "dog-leg" trip with a cross-town bus ride and then a north-south subway rider. The district in Queens requires a two-subway journey.

Manhattan Community Board 11 Access to Key Non-Work Destinations

The non-work destinations on the west side of Central Park are less accessible by public transit, relying on the slow crosstown buses and an extra transfer if the destination is to the north or south of the crosstown bus location. This restricts the ability of Manhattan 11 to reach destinations on the upper west side of Manhattan such as Columbia, City College, and the retail centers along Broadway. Midtown destinations also require a transfer, either bus-subway or subway-subway. The completion of the first phase of the Second Avenue Subway (SAS) in 2016 will address that limitation. Destinations on the east side are accessible, and the concentration of medical facilities will be made more so by the completion of the SAS.

Among the major non-work destinations for M11 are:

Regional Centers

- 125th Street

Schools

- City College (CUNY)
- Manhattan Center for Science and Mathematics

Parks / Open Space

- Randall's Island
- Central Park

Shopping Centers

- East River Plaza
- 125th Street

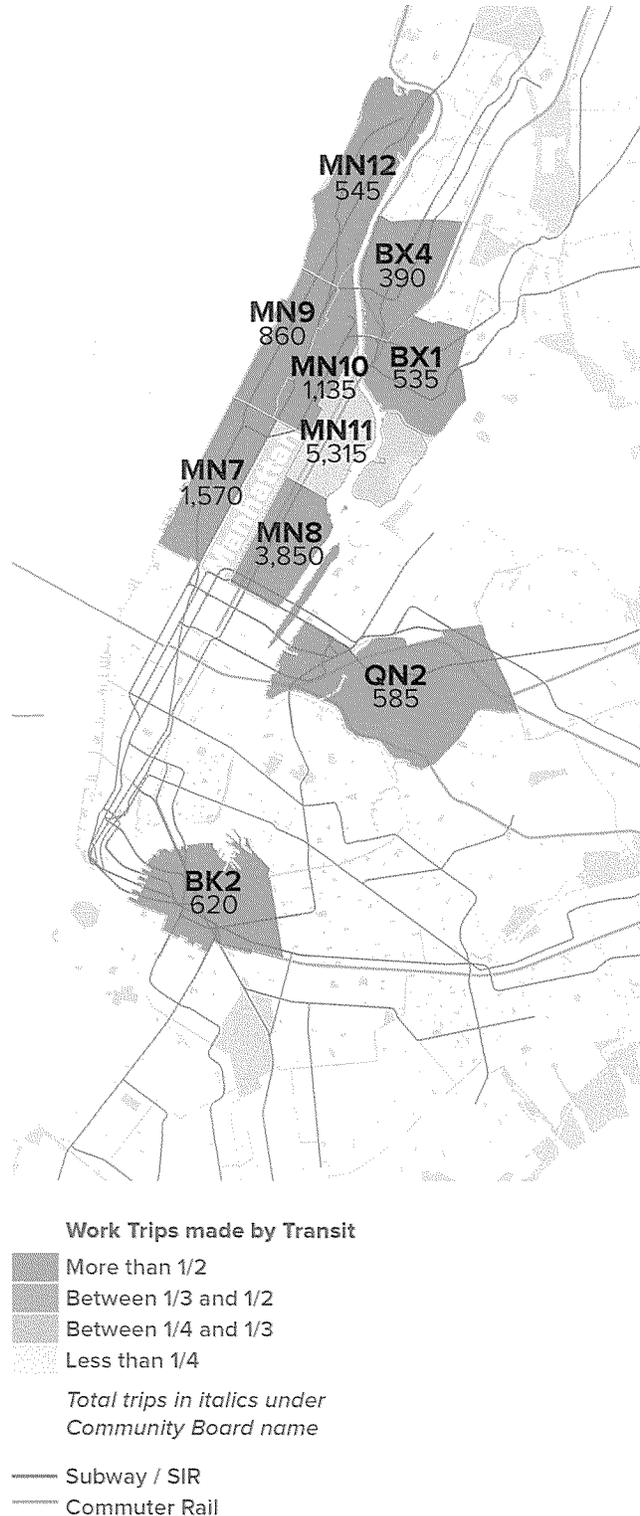
Entertainment / Sports Venues

- Madison Square Garden

Hospitals

- Mt. Sinai
- Harlem Hospital
- Hospital for Special Surgery
- Lenox Hill Hospital
- New York Presbyterian Hospital

Figure B-12: Manhattan Community Board 11 Top Ten Work Destinations



Staten Island Community Board 1

The bus network on Staten Island serves three purposes: 1) for intra-borough travel, 2) as a delivery system to the Staten Island ferry in St. George for travelers to Manhattan, and 3) as an express system to bring commuters and others to Manhattan. In Figure B-13 the 22-route local network that fulfills the first two of these purposes is shown. It covers well the northern parts of the borough but with gaps in the central and more southern parts of the borough where residential densities are lower. Figure B-14 depicts the coverage of the 20-route express bus network and the Staten Island Railway also. In addition to some of the low density gaps, there are also places in the northeastern parts of Staten Island where there is neither express bus service nor the SIR.

The local bus routes serving Staten Island are displayed in Table B-10. Unlike the bus route speeds in the other boroughs the services here all exceed the 8mph threshold. This can be explained by the lower densities on Staten Island and the lighter ridership. Service frequency is another matter, with lower levels of service provided, which fall short of the accepted thresholds.

Four of the 22 local bus routes fall below one mile per hour below the borough-wide average, all feeding St. George, mostly from points on or near the north shore. Service headways vary widely too. Using the 10-minute rule of thumb for good service below which passengers no longer feel compelled to consult a schedule, 18 of the 22 local routes offer good service in the morning peak periods, but half of the routes offer inadequate evening peak service. Worse, 16 routes provide frequencies in midday that fall short, five with half hourly service and two with none at all. On weekends, seven have no service at all and four do not meet the 20 minute headway standard on Saturdays and five on Sundays. Nighttime service ends before 1am on six of the 22 routes, four by 8pm.

Figure B-10: Local Bus Coverage for Staten Island Community Board 1

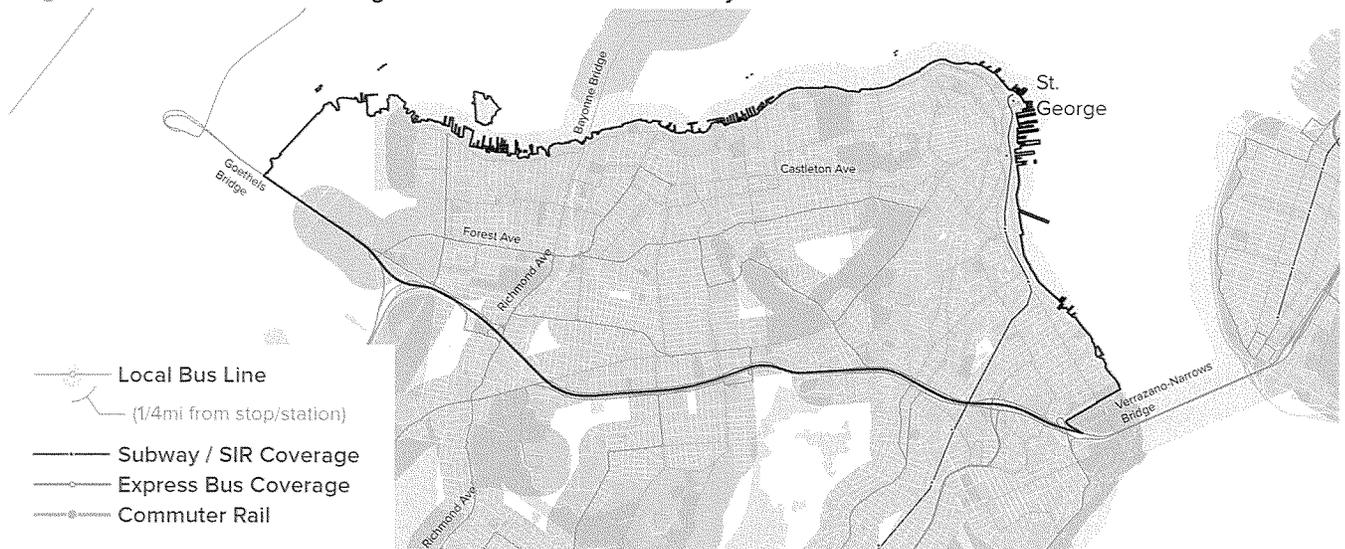


Figure B-11: Subway Coverage for Staten Island Community Board 1

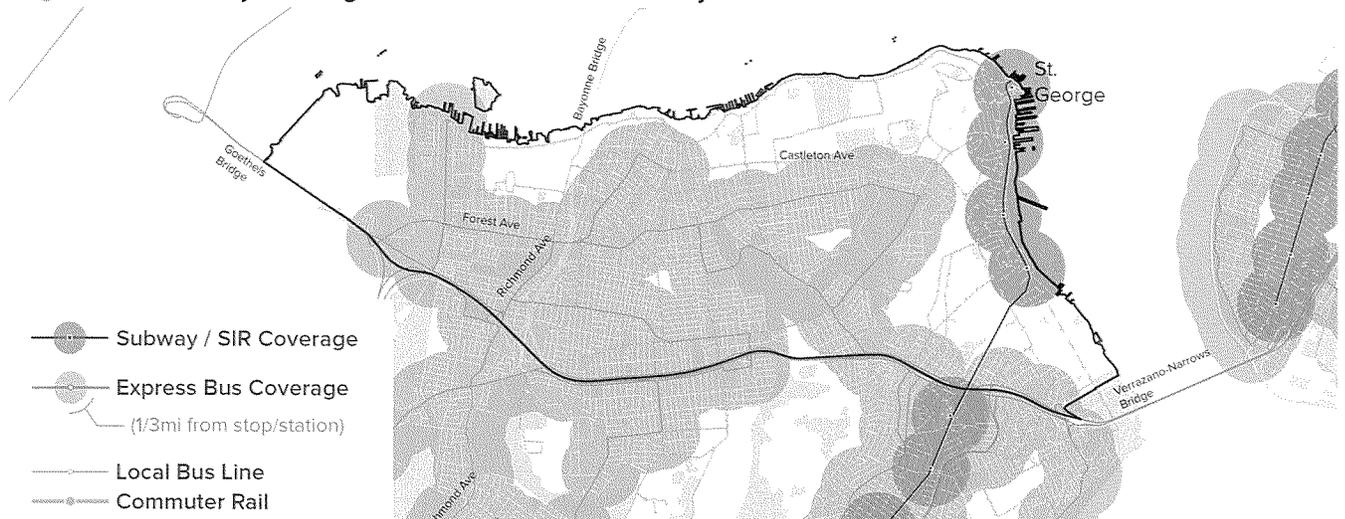


Table B-10: Local Bus Data for Staten Island

Route	Route Type	Avg. weekday Speed Across Entire Route (MPH)	Avg. Weekday Headway			Weekday Last Bus Run (Nearest hour)	Avg. Weekend Headway		2012 Annual Ridership	Stops at St. George Ferry?	Stops at SIRT?	Stops at 86th St. Brooklyn?
			Morning (Min)	Midday (Min)	Evening (Min)		Saturday (min)	Sunday (min)				
S4090	Local/LTD	12.0	5	20	9	12:00am	20	27	1,322,360	Yes	No	No
S4252	Local	9.4	15	30	15	2:00am	30	30	1,195,738	Yes	No	No
S4494	Local/LTD	11.2	5.5	20	8	1:00am	16	17	2,064,759	Yes	No	No
S4696	Local/LTD	10.3	7.5	15	10	12:00am	15	20	2,103,983	Yes	No	No
S4898	Local/LTD	8.9	6	15	5.5	12:00am	16	17	2,378,558	Yes	No	No
S5181	Local/LTD	11.3	8	20	8	12:00am	30	30	1,308,894	Yes	Yes	No
S53	Local	11.6	7	12	8	12:00am	12	11	3,223,159	No	Yes	Yes
S54	Local	10.4	9	30	5.5	11:00pm	none	none	377,190	No	Yes	No
S55	Local	14.1	15	30	30	8:00pm	none	none	138,268	No	Yes	No
S56	Local	12.1	30	30	30	7:00pm	none	none	158,183	No	Yes	No
S57	Local	11.6	12	20	8	12:00am	30	30	495,878	No	Yes	No
S59	Local	13.2	12	20	15	2:00am	22	30	1,215,207	No	Yes	No
S6191	Local/LTD	11.7	10	20	15	12:00am	20	17	1,378,342	Yes	No	No
S6292	Local/LTD	10.1	9	15	7	12:00am	16	16	1,499,918	Yes	No	No
S66	Local	12.7	15	30	15	2:00am	none	none	428,675	Yes	No	No
S7484	Local/LTD	15.6	9	20	12	12:00am	13	17	1,738,772	Yes	No	No
S7686	Local/LTD	10.7	10	20	7.5	12:00am	30	30	1,076,036	Yes	Yes	No
S78	Local	15.4	9	15	15	1:00am	16	17	1,988,371	Yes	Yes	No
SBS79	SBS	16.6	7	15	7.5	1:00am	10	12	2,979,363	No	Yes	Yes
S89 *	LTD	12.7	12	none	12	8:00pm	none	none	230,691	No	No	No
S92	LTD	10.7	15	none	15	NA	none	none	NA	No	Yes	No
S93	LTD	12.2	15	none	15	8:00pm	none	none	421,858	No	No	Yes

Source: Metropolitan Transit Authority, Regional Plan Association
 Note: Deficient routes shaded.

Table B-11: Express Bus Data for Staten Island (CHECK)

Route	Weekday Morning Headway (Min)	Weekday Midday Headway (Min)	Weekday Evening Headway (Min)	Weekday Last Bus Run (Nearest hour)	Saturday Average Headway (min)	Sunday Average Headway (min)	Stops at SIRT?
X1	6	none	6	All Night	19	22	Yes
X2	10	none	12	8:00pm	none	none	No
X3	10	none	30	7:00pm	none	none	No
X4	17	none	18	8:00pm	none	none	Yes
X5	12	none	9	9:00pm	none	none	Yes
X7	10	none	14	8:00pm	none	none	Yes
X8	13	none	14	8:00pm	none	none	Yes
X9	12	none	11	8:00pm	none	none	No
X10	12	30	15	2:00am	28	30	No
X11	19	none	11	2:00am	none	none	No
X12/X42	9	none	11	11:00pm	none	none	No
X14	13	none	12	10:00pm	none	none	No
X15	12	none	9	10:00pm	none	none	No
X17	6	none	7	1:00am	35	none	Yes
X19	11	40	14	1:00am	none	none	Yes
X22	9	none	12	11:00pm	none	none	Yes
X23	11	none	15	9:00pm	none	none	Yes
X24	10	none	15	9:00pm	none	none	No
X30	17	none	16	10:00pm	none	none	No
X31	20	none	18	10:00pm	none	none	No

Source: Metropolitan Transit Authority, Regional Plan Association
 Note: Deficient routes shaded.

All of the local bus routes on Staten Island are designed to feed some other transit service. As noted in the last three columns of Table B-10, the routes either feed the St. George ferry or the Staten Island Rapid Transit line, with two exceptions – the S89 which provides access to the Hudson Bergen Light Rail line, or the S93 which connects with the subway system in Bay Ridge, Brooklyn. However, both of these only operate in weekday peak periods.

Staten Island's extensive express bus service to Manhattan, as shown earlier, covers the island well. But, as is shown in Table B-11, in most all cases is available only during peak times on weekdays.

The top ten work destinations for Staten Island Community Board 1 are listed in Table B-12 and Figure B-15. As with the three of the other four CBs, the top ranked destination is internal. In SII's case, 20,100 of the work trips, almost half of the top ten's trips are internal. Of these over 20 percent are actually not trips but work at home residents or made by a walk to work. The next two ranked CBs are also on the Island, so that the Staten Island destinations account for almost 35,700 of the top ten's 43,800. They also amount to more than half of all the places other than to Manhattan. These internal Staten Island trips are predominantly made by car with buses accounting for most of the rest. The other major destinations are either in Brooklyn or on Manhattan's east and west side north of 60th Street, as shown in Figure A-15. The Brooklyn destinations are strung out along the western edge of the borough, bordering New York harbor. Autos remain the prime mode for trips to Brooklyn, while for trips to Manhattan, 80 percent or more use public transit, either by bus, subway or ferry in some combination. Among the Brooklyn-bound commuters, BK2, downtown Brooklyn has the highest transit share; those destined there can either use the bus routes that connect to subway in Bay Ridge, Brooklyn, or use the ferry to Lower Manhattan and transfer to one of the many subway lines there to reach Brooklyn. The concentration of job locations within Staten Island creates the onus on transit providers to improve transit within Staten Island. The bus network is the main focus, with complementary role for the SIRT.

Staten Island Access to Key Non-Work Destinations

Transit access to key locations on Staten Island depends primarily on the bus network that covers the Island. Those locations in proximity to St. George such as Borough Hall and minor league ballpark at ST. George have rather good bus coverage and the SIR from much of the northern parts of the Island. The Staten Island Mall in the center of the island is served by more than a half dozen bus routes that radiate out to the north and to Richmond Avenue, Richmond Road and Arthur Kill Road to the south. The Bricktown Mall on the southern part of the island has some local bus coverage nearby. Other key destinations are less well served with Staten Island CUNY served by only three routes, Willowbrook Park with two routes, and Wagner College, St. John's University, Staten Island University Hospital North, and Great Kills Park with only one route each.

The major non-work destinations on Staten Island are:

Regional Center

- Borough Hall

Schools

- College of Staten Island (CUNY)
- St. Johns University
- Wagner College
- Curtis HS
- Port Richmond HS
- New Dorp HS
- Staten Island Technical HS
- Susan E. Wagner HS
- Tottenville HS

Parks / Open Space

- Gateway
- Silver Lake
- Fresh Kills
- Great Kills Park
- Willowbrook Park
- Wolfe's Pond Park

Shopping Centers

- Staten Island Mall
- Bricktown Mall

Entertainment / Sports Venues

- Staten Island Yankees

Hospitals

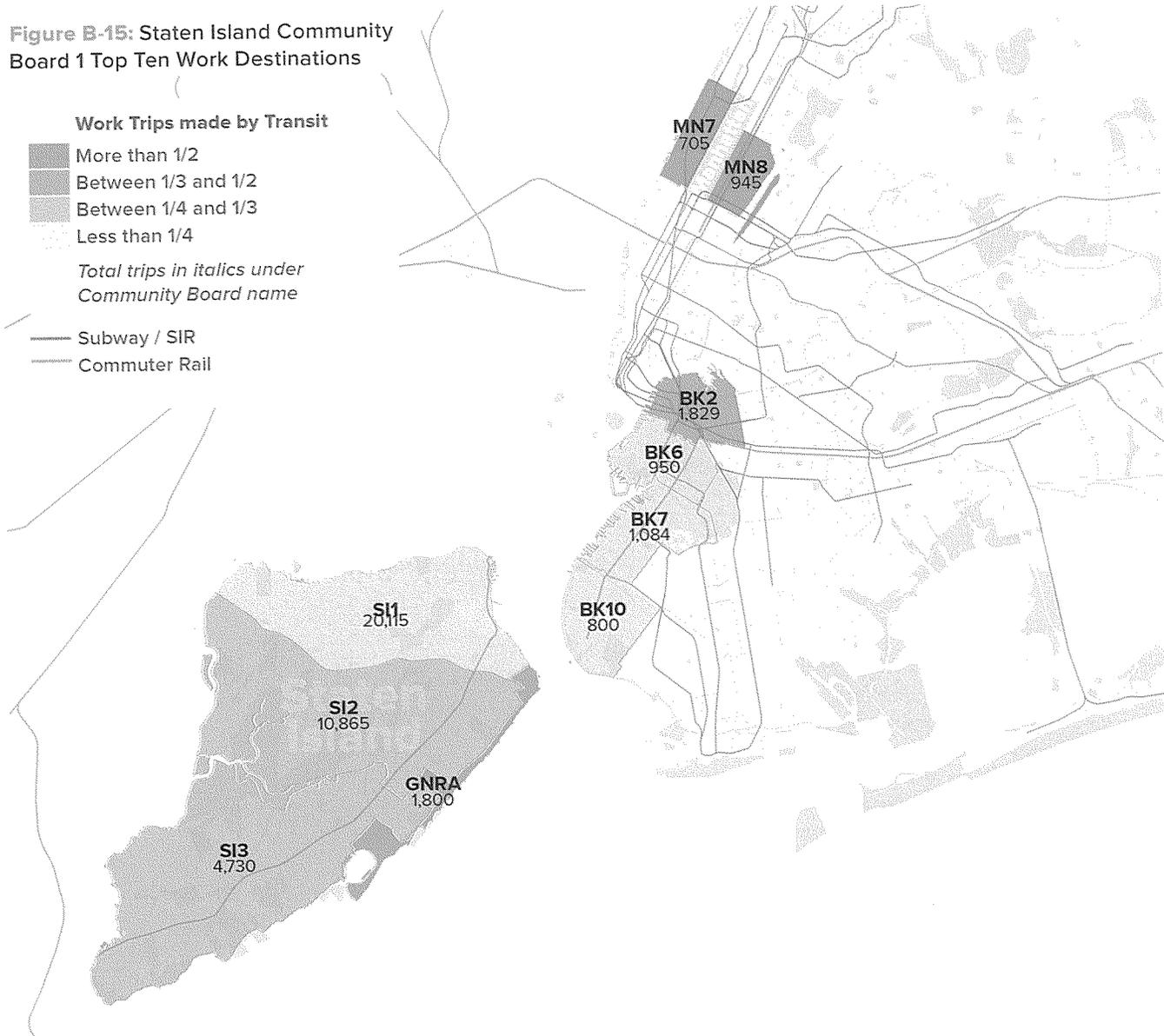
- Richmond University Hospital
- Staten Island University Hospital North

Table B-12: Top Ten Work Destinations for Staten Island Community Board 1 – 2010

CB	Total Trips	Percent					Walk or Work at Home	
		Bus	Subway	Ferry	Transit	Auto		
SI1	20,115	21.4	0.4	0.5	22.7	54.7	21.3	
SI2	10,865	24.8	0.8	-	25.6	72.3	1.5	
SI3	4,730	26.6	2.9	0.5	31.6	66.6	1.8	
BK2	1,829	18.0	8.4	14.8	41.2	59.2	-	
GNRA	1,800	36.7	0.6	0.8	38.6	56.9	3.3	
BK7	1,084	9.7	2.8	-	13.8	84.7	0.4	
BK6	950	17.4	2.6	1.1	21.1	74.6	-	
MN8	945	56.6	12.2	12.7	81.5	18.9	1.1	
BK10	800	15.6	-	3.8	19.4	78.9	1.3	
MN7	705	58.2	19.9	2.0	80.0	20.6	-	
Top Ten	43,823	24.1	1.8	1.3	27.7	60.9	10.5	
All Staten Island Destinations	35,710	23.1	0.9	0.3	24.8	61.7	12.7	
ALL	67,253	28.2	3.7	7.8	40.3	51.7	7.1	

Source: U.S. Census Bureau, American Community Survey 2006 to 2010

Figure B-15: Staten Island Community Board 1 Top Ten Work Destinations



Appendix C: Bus Route Details

Table C-1: All Bus Routes by Borough With Inadequate Service Frequency

Weekdays			Weekend		
AM Peak	Midday	PM Peak	Saturdays	Sundays	
BX24	BX16	BX24	Q21	BX8	BX30
BX29	BX29	BX29	Q35	Q21	B7
B4	B4	BX33	Q38	Q47	B13
B13	B13	Bx34	Q48	Q50	Q11
B24	B16	B4	Q50	Q52	Q38
M3	B24	B13	Q56	Q67	Q47
M20	B57	B24	Q59	S51	Q52
M50	B64	B48	Q67		Q67
Q11	B70	B57	Q72		Q72
Q19	Q7	B64	Q102		
Q21	Q11	B70	Q103		
Q35	Q15	M8	Q104		
Q48	Q18	M20	S52		
Q50	Q21	M21	S55		
Q52	Q29	M98	S56		
Q72	Q36	M106	S57		
Q102	Q37	Q7	S59		
Q103	Q38	Q11	S61		
S52	Q41	Q19			
S56	Q47				
S57	Q50				
S59	Q52				
	Q59				
	Q67				
	Q76				
	Q77				
	Q103				

Table C-2: High Ridership Local Bus Routes Deserving More Service

Weekdays			Weekend	
AM Peak	Midday	PM Peak	Saturdays	Sundays
BX39	BX9	BX4	Bx21	BX21
B43	BX15	Bx21	M7	B43
B62	B6	Bx28/38	M101	B49
B63	B8	B3	Q44	B82
B68	B19	B9	Q54	M3
M7	B36	B15		M5
M60	B82	B39		Q54
M100	Q25	B43		Q65
M104	Q65	B62		
Q23		B63		
		M3		
		M5		
		M7		
		M60		
		Q53		

Appendix D: Ridership Assumptions for Triboro Rx

The assumptions used to estimate the number of riders on the Triboro Rx fall into two categories – the diversion assumed from each of the current modes – bus, subway and auto – and the assumption of the share of each mode’s trips that are for work purposes. In Table D-1 the intra-borough and inter-borough diversion assumptions for bus, subway and auto are given. The bus and subway assumptions were based on an assessment of the overall quality of the current service. The auto diversion was based largely on distance. Shorter trips, i.e. intra-borough are likely to be more difficult to divert from cars.

Work trip and non-work splits by mode are based on data from the New York Metropolitan Transportation Council.

Table D-1: Modal Diversion Factors for Triboro Rx Estimates

Market	Diverted From:		
	Bus	Subway	Auto
Intra Bronx	33	10	10
Intra Queens	25	25	10
Intra Brooklyn	33	10	10
Between Bronx and Queens	33	33	20
Between Bronx and Brooklyn	0	25	30
Between Queens and Brooklyn	33	33	20

Transcribed from report. Source:

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Anthony R. Coscia

Lee Davis

Eva Lauren Durst

Thomas P. Fehn

Fernando Ferrer

Luke Eberly Fichthorn IV

Barbara Joelson Fife*

James E. Fitzgerald

Paul E. Francis*

Emil H. Frankel

Doreen M. Frasca

Timur F. Galen*

Jonathan L. Goldstick

Jerome W. Gottesman*

Toni L. Griffin

Maxine Griffith

John S. Griswold Jr.

Richard J. Haray

Dylan Hixon*

David Huntington

Adam Isles

Kenneth T. Jackson

Marc Joseph

Marcia V. Keizs

Gregory A. Kelly

Robert Knapp

Mitchell A. Korbey

John Z. Kukral

Trent Lethco

Christopher D. Levandos

Charles J. Maikish*

Mark Marcucci

Debra A. McDowell

Peter J. Miscovich

J. Andrew Murphy

Jan Nicholson

Joseph P. Oates

Richard L. Oram

Patricia Ornst

Sotiris A. Pagdadis

Kevin J. Pearson*

Milton Puryear

Richard Ravitch

Gregg Rechler

Michael J. Regan

Gary D. Rose

Thomas Santiago

Samuel I. Schwartz

Peggy Shepard

H. Claude Shostal

Susan L. Solomon

Monica Slater Stokes

Robert Stromsted

Michael J. Sweeney

Luther Tai

Marilyn J. Taylor*

Sharon C. Taylor

Richard T. Thigpen

Karen E. Wagner

Robert D. Yaro

John Zuccotti*

*Member of Executive Committee

November 10th 2015

New York City Council – Transportation Committee

November 12, 2015 Hearing:

Good morning committee and Council members. I am Andrea Scarborough, President of Addisleigh Park Civic Organization (APCO). Our organization serves the Addisleigh Park residents of Southeast Queens. We are committed to improving the quality of life for all of our neighbors, and ensuring that our community receives its fair share of city services.

Thank you for giving me the opportunity to submit testimony today at this Transportation Hearing. My testimony is limited to the Southeast Queens area where I reside and where a two fare zone commute has been a way of life for our residents for much too long. I support Council Member Miller recommendation to (1) Equalize commuter rail fares and eliminate a two-fare zones system, and (2) Extend express bus service. Equalizing commuter rail fares will increase ridership of the Long Island Rail Road, reduce school and work commute time as well as improve the quality of life for the residents of Southeast Queens. The accessibility of more express bus services can lead to not only a more efficient commute but also encourage ridership for leisurely type activities.

Illegal parking of commercial trucks is another concern of the residents of Southeast Queens. Overnight parking of commercial vehicles in a residential area, has become a way of life throughout our community. The trucks park all weekend and utilize our residential streets to repair their vehicles. Often times when they temporarily leave that location, they leave behind garbage and other debris. The men who service the trucks are equipped with Zenon work lights, and wear orange reflective vests while they work. Residents have observed them changing and repairing tires, replacing whole side panels, power washing their trucks, and replacing the cloth top that covers the roof. This environmental health hazard to our neighborhood is ongoing.

In concluding I trust that the City council will give serious consideration to equalizing commuter rail fares as well as extending express bus services. Also I call on the City Council to use their good office to address illegally parked commercial trucks. No longer should our community be subjected to a condition that not only is environmentally unhealthy but also negatively impacts our quality of life. Thank you again for the opportunity to testify.

Andrea Scarborough
President
Addisleigh Park Civic Organization

|

VIA TRANSPORTATION INC.
PREPARED REMARKS FOR TRANSPORTATION COMMITTEE HEARING
EXPLORING METHODS OF CONNECTING TRANSPORTATION DESERTS – 11.12.15

Good morning, Council Members. My name is Erin Abrams and I appreciate the opportunity to address you today on behalf of Via Transportation, an on-demand ridesharing platform currently providing service to most of Manhattan. Via is a true ridesharing service that aggregates, in real time, multiple passengers travelling in the same direction into a single vehicle. We currently have over 100,000 members and have provided nearly 2 million rides, the majority of which were shared.

Via got its start in 2013 serving the corridor along York Avenue on the Upper East Side, a well-known “transportation desert” that is several avenues away from the nearest subway. Particularly in light of cutbacks in the M78 and M31 bus service, some of our elderly members and those with limited mobility greatly appreciate the option for safe, reliable and affordable transportation in their neighborhood.

Today, thousands of members on the far east and the far west sides of Manhattan rely on Via’s \$5 rides to get to and from work, school and doctor’s appointments each day. We continue to progressively expand the geographic area that we cover. We recently expanded to cover Battery Park City, another neighborhood with limited subway access. We also plan to expand to Upper Manhattan and the more densely populated parts of the outer boroughs.

Since more than 70% of our rides at peak times are shared by 3 or more passengers, we are able to keep our prices relatively affordable, while also reducing the number of cars on the road in the long-term. Because our service costs far less than a cab, a private car or even other ridesharing services, it is a much more economical alternative to consumers who are not well served by public transit.

While we firmly believe that ridesharing services like Via are a part of the solution to the transportation desert problem, it is important to know that our local legislators support the true ridesharing model that Via represents. With city government as an ally in the campaign to provide access to transit for all New Yorkers, we will have the stability and certainty needed to expand our operations. To that end, if a bill like Intro 965 is passed, we hope that the resulting study takes into account the positive impact and potential of true ridesharing services to provide mobility solutions to consumers who live far from subway stops or who have to take multiple buses and trains to get across town.

Private ridesharing services can supplement the existing transit infrastructure by filling gaps in the public transit system and offering low-cost alternatives to consumers, particularly in underserved areas. Ridesharing services can help to address these concerns by offering solutions to the “last mile problem” --where a person could share a short ride from the train or bus station to their home or workplace. In our view, ridesharing works best in partnership with local government, not in competition with it.

To that end, we would support a bill like Res 670, but argue that it doesn't go far enough. To address the mobility needs of constituents living or working in transportation deserts in a transformative way, the Council might wish to consider a City partnership with ridesharing services to offer transfers to shared vehicles for consumers who have already taken the commuter rail or a NYC subway or bus as part of their commute, possibly within 1 hour. We would also like to reiterate our support for a TLC-licensed category of ride-sharing vehicles (RSVs), which incentivizes companies to offer shared rides and consumers to choose them over solo rides in for-hire vehicles.

We look forward to working with the City to implement constructive solutions to this important problem. Thank you for your time today.

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

in favor in opposition

Date: 11/12/2015

Name: Rep. Jerrold Nadler (PLEASE PRINT)

Address: _____

I represent: _____

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

in favor in opposition

Date: 11/12/2015

Name: Assemblyman Phillip Goldfeder (PLEASE PRINT)

Address: _____

I represent: _____

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 965 Res. No. _____

in favor in opposition

Date: 11/12/15

Name: ~~Paul Stealy~~ White Julia White (PLEASE PRINT) ^{Kite}

Address: _____

I represent: Transportation Alternatives

Address: 111 John St., Suite 260, NY, NY 10038

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

in favor in opposition

Date: _____

(PLEASE PRINT)

Name: STEPHEN BAUMAN

Address: 13810 FRANKLIN AV FLUSHING

I represent: SELF

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 965 Res. No. 670

in favor in opposition

Date: 11/12/2015

(PLEASE PRINT)

Name: Pierina Ana Sanchez

Address: 4 Irving Place, New York NY 10003

I represent: Regional Plan Association

Address: 4 Irving Place, New York, NY 10003

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. ALL Res. No. ALL

in favor in opposition

Date: 11/12/15

(PLEASE PRINT)

Name: ERIC McCLURE

Address: 423 4TH ST. BROOKLYN NY 11215

I represent: STREETSPAC

Address: 17 BATTERY PLACE, #204 NY NY/10004

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 964 Res. No. _____

in favor in opposition

Date: _____

(PLEASE PRINT)

Name: Doddy A. Boly

Address: 171 Mill St

I represent: _____

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

in favor in opposition

Date: Nov. 12

(PLEASE PRINT)

Name: Alex Matthiessen

Address: 64 Fulton

I represent: Move NY

Address: 64 Fulton

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

in favor in opposition

Date: 11-12-2015

(PLEASE PRINT)

Name: Polly Trottenberg

Address: _____

I represent: DOT

Address: _____

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. All Res. No. _____

in favor in opposition

Date: Nov. 12, 2015

(PLEASE PRINT)

Name: Edward Walters

Address: 83-10 35th Ave 51, Jackson Hts.

I represent: _____

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

in favor in opposition

Date: _____

(PLEASE PRINT)

Name: George Haikalis

Address: 1 Wash Sq. Villa 5D, NY 10012

I represent: Inst for Rational Urban Mob

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 965 Res. No. _____

in favor in opposition

Date: 11/17/15

(PLEASE PRINT)

Name: Erin Abrams

Address: 226 5th Ave, 3rd Floor, NY, NY 10001

I represent: VIA Transportation

Address: 226 5th Ave, 3rd Floor, NY 10001

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. Transportation Deserts Res. No. _____

in favor in opposition

Date: 11/12/15

(PLEASE PRINT)

Name: Douglas Adams

Address: 57 Montague St, #10H

I represent: Waterfront Alliance

Address: 217 Water St, NY, NY

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

in favor in opposition

Rockaway Beach Line
FERRIES Date: _____

(PLEASE PRINT)

Name: JOSEPH T. HARTIGAN

Address: 174-B 132 ST BELL HARBOR

I represent: _____

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. 965

in favor in opposition

Date: 11/12/2015

(PLEASE PRINT)

Name: MASHA BURINA

Address: 121 6th Ave, Fl. 6 NY, NY

I represent: RIDERS ALLIANCE

Address: 805 Cypress Ave, #12 RIDGEWOOD 11385

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 964 Res. No. _____
 in favor in opposition

Date: NOV. 12, 2015

(PLEASE PRINT)

Name: ROXANNE WARREN, AIA

Address: 1841 BROADWAY #1208, NYC 10023

I represent: VISION 42, INST. FOR RATIONAL URBAN MOBILITY

Address: _____

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____
 in favor in opposition

Date: _____

(PLEASE PRINT)

Name: Robert Diamond

Address: 599 E 1 ST

I represent: BHRA

Address: Brooklyn, NY 11218

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

in favor in opposition

Date: 11/12/15

(PLEASE PRINT)

Name: William Henderson

Address: 2 Broadway

I represent: NYC Transit Rider Council

Address: _____

Please complete this card and return to the Sergeant-at-Arms

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 964 Res. No. _____

in favor in opposition

Date: 11/12/15

(PLEASE PRINT)

Name: KAREN LISTOWSKY

Address: _____

I represent: FORMER CHIEF ARCHITECT OF JERUSA-

Address: LIGHT RAIL LET

Please complete this card and return to the Sergeant-at-Arms