

3.3.3 A, C (Fulton Street) Line Services and Structural Issues

The existing service pattern has been largely the same since 1999: A trains run express and C trains run local seven days a week from approximately 6:00am to 10:30pm. Most A trains have 207th Street in Inwood as their Manhattan terminus, although a few only go to Dyckman Street. In Queens, A trains mostly run to either Lefferts Boulevard in Ozone Park or Mott Avenue in Far Rockaway; five peak directional A trains run to and from Beach 116th Street-Rockaway Park weekdays. (Shuttle trains to Broad Channel serve Rockaway Park all other times.) Local service between 168th Street in Washington Heights and Euclid Avenue in Brooklyn is provided by C trains. From around 10:30pm to 6:00am, C service is suspended and A trains make all local stops to Far Rockaway. Passengers to Lefferts Boulevard transfer for a shuttle at Euclid Avenue.

Unlike the J/Z and L services described below, the A/C runs through trackage that has relatively few substandard design elements and structural deficiencies. Perhaps the most crucial one is the compression of all A and C service from four tracks to two between Hoyt-Schermerhorn Streets and Canal Street. During the AM peak, combined A/C service runs 25-26 trains per hour (tph), which is about the maximum realistic capacity possible for a single track in one direction. Even if this constriction didn't exist, the full four-track route could not operate at maximum capacity because both the A and C lines must be scheduled around other routes that share their trackage in Manhattan. However, in the long term, this bottleneck may complicate efforts to add service if needed.²⁶

As of 2006, both the A and C Line's AM peak loading points in Brooklyn were at Jay Street-Borough Hall, where the A was running at 74.61 percent of capacity and the C was at 70.62 percent of capacity.²⁷ A trains could therefore accommodate an additional 6,279 passengers in the AM peak hour; C trains could hold 2,670 additional passengers as they now run; expanded to 10 cars, they could carry 2,262 more passengers per hour above and beyond that total, for a total excess capacity of about 4,932. However, it should not be assumed that everyone boarding a C train will stay on it instead of transferring to a waiting A express at the first opportunity.

3.3.4 J/Z (Jamaica) Line Services and Structural Issues

Except for some changes in weekend Manhattan terminal locations, this service has been largely unaltered since December 1988, when J Line service was extended to Archer Avenue. All trains generally run between Broad Street in Manhattan and Jamaica Center/Parsons-Archer in Queens. On weekends, all service terminates at Chambers Street. Peak-directional express service runs between Marcy Avenue and Myrtle Avenue, Manhattan-bound between about 7:00am and 1:00pm and Queens-bound between about 1:30pm and 8:00pm weekdays.

When the Archer Avenue Extension opened, a companion peak-directional skip-stop service designated Z was created. During the peak hour J and Z trains make alternating stops between Myrtle Avenue and Sutphin Boulevard. However, all J and Z trains stop at Broadway Junction and two other stations to the east: Crescent Street and Woodhaven Boulevard.

Ample capacity exists on the J/Z lines. At Marcy Avenue, which was the 2006 AM peak load point for these routes, trains reached only 65.43 percent of capacity. At 12tph of 60.5-foot eight-car trains in the AM peak, that means that 4,813 additional passengers could be accommodated on the J/Z in the peak

²⁶ In Manhattan, A trains share trackage with the D from 59th Street to south of 145th Street. C trains share with the E from Canal Street to south of 50th Street and the B from south of 59th Street to north of 135th Street.

²⁷ Peak loading points for the A and C coming from upper Manhattan are far higher – both reach 83 to 85 percent – but these are largely passengers who are traveling from uptown to the CBD. By the time these trains get to Broadway Junction, they are operating in the reverse peak direction and are carrying far fewer passengers.

hour, even without adding additional service. (The M train, which shares trackage with the J/Z west of Myrtle Avenue, runs 6tph in the AM peak and was at 60.77 percent of capacity in the AM peak.)

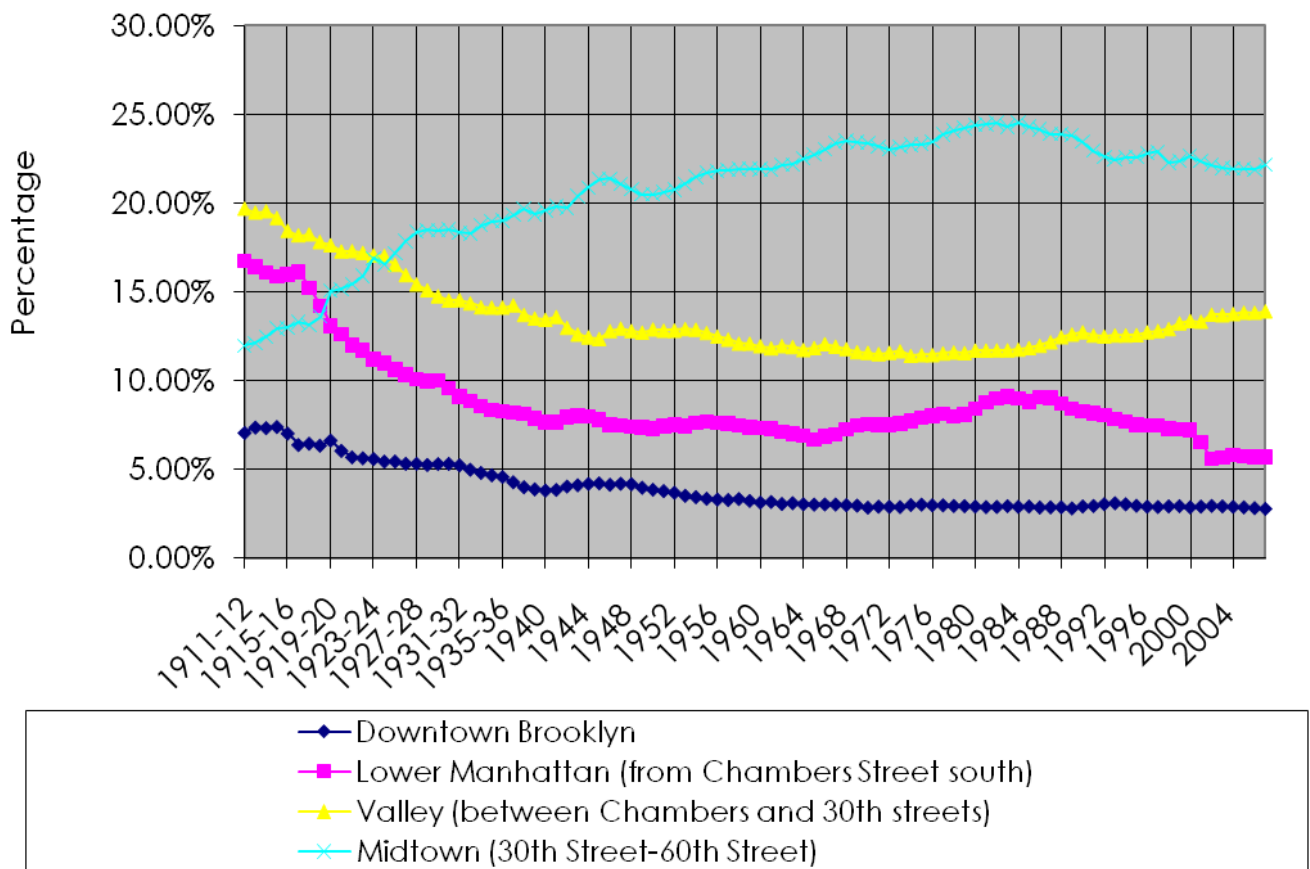
However, several factors limit the J/Z's potential appeal as a service which can provide rapid access to places that passengers may want to go. These factors may play roles in keeping passenger counts low.

Lack of Direct Service to Midtown

J/Z (and M) service does not go to Midtown. Passengers wanting to reach points north of Delancey Street must transfer for the F at Essex Street, or the N, Q, R, W or 6 at Canal Street. Figure 3-P shows just how significant this is. Seven years after the Centre Street (today's J/Z and M) Line was completed from the Williamsburg Bridge to Chambers Street in 1913, ridership from all Midtown subway stations surpassed those of Lower Manhattan. By the time the line was extended via the Nassau Street Loop to Broad Street and the Montague Street Tunnel in 1931, Midtown station entries were almost double those of Lower Manhattan's.

Since then, the gulf between Midtown and Downtown has only grown wider. While systemwide annual subway ridership has grown markedly over the past decade, ridership has remained stuck between 74

Figure 3-P: Percentage of Subway Ridership Originating from Business Districts in Manhattan and Brooklyn, 1911-2007



million and 100 million for Lower Manhattan since 1957, despite a rise in percentage terms between 1966 and 1986.²⁸ By 2007, Lower Manhattan's passenger entries had shrunk to just over one fourth of Midtown's – 89.0 million to 346.3 million.²⁹ Furthermore, a steady rise (both in percentage and absolute terms) in ridership from the “Valley” – the area north of Chambers Street and south of 30th Street – is better accommodated by the L Line, which runs crosstown in Manhattan along 14th Street, than the J/Z.

To address this long-term ridership shift, NYCT built connecting tracks between Essex Street station on the Centre Street Line and Broadway-Lafayette station on the 6th Avenue Line as part of the Chrystie Street Connection project. The resulting service, the KK (later the K), ran from 168th Street in Queens (Broadway Junction starting in 1973) to 57th Street-6th Avenue in Manhattan from July 1968 to August 1976, when the service was dropped during the City's fiscal crisis. No regular service has used this part of the Chrystie Street Connection since.

Even if demand for reinstating K Line service exists, actually doing it will be more complicated than it was 40 years ago. The station at 57th Street and 6th Avenue is no longer a terminal; F trains now use it as a through stop south of the 63rd Street Tunnel. Furthermore, 6th Avenue now has two local services, the F and V. Little room exists for a new route on either 6th Avenue or Queens Boulevard, where both the F and V routes go. Using the interlockings that connect the 6th and 8th Avenue Line tracks south of West 4th Street is not practical either – the switching movements would delay C, E, F and V trains, and capacity for additional trains on the 8th Avenue local tracks is already very limited.

At-grade Myrtle Avenue Crossover

Another design deficiency impedes existing service and may inhibit future growth. Immediately east of the three-track Myrtle Avenue express station, the two tracks which carry M service to Metropolitan Avenue cross directly through the J/Z Line tracks which continue to Broadway Junction. This at-grade intersection negatively impacts the potential for more J/Z and M service in several ways:

- Eastbound M trains have to wait for westbound J/Z trains to clear the intersection before proceeding, potentially delaying subsequent eastbound local trains.
- Westbound J/Z local trains must wait for both westbound *and* eastbound M trains to pass in front of them before continuing on to Myrtle Avenue. This also adds to train delays.
- J/Z trains running eastbound on the express track are blocked by eastbound M trains crossing in front of them, and vice versa. This prevents both trains from simultaneously leaving the station, causing delays.
- Westbound J/Z trains switching onto the express track prior to entering Myrtle Avenue are forced to wait for eastbound M trains to cross in front of them before proceeding.

During the AM peak, J/Z and M services run a combined total of 18tph west of Myrtle Avenue, which theoretically leaves capacity for eight or nine more tph. However, even if such a need ever arises, it may be difficult to add trains due to the delays caused by this junction. A complete redesign of this station, or at least a reroute of the eastbound M tracks on a combination of new viaduct and the abandoned MJ (Myrtle Avenue Elevated) viaduct, would greatly enhance the entire Jamaica Line's effectiveness.

²⁸ Source: NYCDOP Subway Ridership Database (1904-2007), with data provided by NYCT. From 1995 to 2000, Lower Manhattan ridership rose rapidly and was poised to break the 100 million mark in 2001. The World Trade Center attacks severely reduced the area's passenger totals, causing them to drop to about 78.5 million by 2003. By 2007, half of that loss had been recovered.

²⁹ While Midtown's percentage of the total system ridership has shrunk since 1984 from 24.5 percent, to 21.9 percent, its absolute ridership has grown by nearly 42 percent.

Reduced Speeds due to Sharp Curves along the Route

Five tight curves greatly reduce operating speeds along sections of the route. Four of them rank among the 30 tightest curves in the entire system, and one is effectively tied for first. From west to east, they are:

- Between Canal Street and Bowery (295-foot turning radius). Speeds are reduced along this section of the line, particularly eastbound.
- Immediately west of Marcy Avenue (190-foot radius Jamaica-bound, 175-foot Manhattan-bound). The Broadway El originally continued to a waterfront ferry terminal. This sharp curve was needed to merge the Williamsburg Bridge tracks with the existing Broadway Line. Although service to the ferry ended in 1916, this curve remains.
- Between Broadway Junction and Alabama Avenue. (175-foot radius). Speeds are reduced at this location, where trains must climb and descend to accommodate tracks passing above and below. Trains also must pass through three interlockings between these stations.
- East of Crescent Street (180-foot radius Jamaica-bound 175-foot Manhattan-bound). This nearly 90-degree curve is so sharp that trains must reduce speed before even entering Crescent Street from the west.
- West of Cypress Hills (200-foot radius Jamaica-bound, 210-foot Manhattan-bound). A similar situation exists here as at Crescent Street, where trains from the east must slow down before entering Cypress Hills.³⁰

The last two curves are particularly vexing, because they are both between the Crescent Street and Cypress Hills stations. J/Z trains must navigate the entire distance between these stations at no more than 15 miles per hour, creating significant delays for passengers.

The cumulative impact of these five curves is hard to quantify, although they foster the impression of a meandering and circuitous journey. Rebuilding any of these segments to create wider, gentler, faster curves is in most locations nearly impossible, given surrounding structures. Only at Williamsburg Bridge Plaza does space exist to completely redesign the curve.

Difficulty of restoring express service east of Myrtle Avenue

Until August 1976, when K local service was discontinued, J trains ran express in the peak direction during rush hours from Essex Street to Broadway Junction. Since then, J expresses have run only between Marcy and Myrtle avenues.

Express service from Myrtle Avenue to Broadway Junction would be impeded by the following obstacles:

- the junction at Myrtle Avenue, described above;
- determination of how many trains would run express, and the impact expresses would have on service levels at the four bypassed stops: Kosciuszko Street, Gates Avenue, Halsey Street, and Chauncey Street; and
- the likelihood that express trains would not be able to overtake and put sufficient distance in front of locals leaving ahead of them before being forced to merge back into the two-track viaduct that continues east of Broadway Junction.

3.3.5 L (Canarsie) Line Services and Structural Issues

L service runs local, making all stops from 8th Avenue to Rockaway Parkway. Middays on weekdays, some trains from Manhattan terminate at Myrtle Avenue.

³⁰ Conversation with NYCT staff.

Of all the bus and subway routes that enter Broadway Junction, the L is the service that is most in flux, both in terms of ridership and proposed capacity improvements. However, the route also has impediments that reduce its speed and carrying capacity.

Service Levels

A 2007 MTA analysis found that the L Line was operating at 103 percent of passenger capacity at its peak loading point, 1st Avenue.³¹ NYCT regards both 1st Avenue and Bedford Avenue as the line’s peak loading point.

While NYCT’s realistic train-per-hour capacity is 26 or 27 trains per track, the L currently is constrained by several factors, and until recently only operated a maximum of 15 trains per hour during peak periods. In October 2007, MTA New York City Transit announced significant service level increases on the L Line, which took effect in over the following 2 months. Table 3-F summarizes these increases below.

<i>time of day</i>	<i>before service increases</i>	<i>after service increases</i>
AM rush (weekdays)	15tph, or one train every 4 minutes	17tph, or one train every 3.5 minutes*; two new trains between 9:30am and 10:30am
Midday (weekdays)	7.5tph, or one train every 8 minutes	10tph, or one train every 6 minutes
Evenings (weekdays)	Every 6-12 minutes	Every 5-10 minutes
Saturdays	Every 6 minutes from 9:00am-7:00pm; every 8-12 minutes all other times	Every 5 minutes from 9:00am-7:00pm; every 6-15 minutes all other times except overnights
Sundays	Every 8 minutes from 12:00pm-9:00pm; every 10-15 minutes all other times	Every 6 minutes from 12:00pm-9:00pm; every 8-12 minutes all other times except overnights

*The two additional trains per hour in the AM peak began running on October 29, 2007.

Since L trains run eight-car trainsets with a guideline capacity of 1,160 passengers per train, the expanded AM peak service added capacity for 2,320 additional passengers. This brings L line service back to just below capacity, although increased ridership since could again bring this figure above 100 percent within the near future.

Substandard Platform Lengths

Unlike most of the subway system, the lines that make up the former BMT Eastern Division – the J/Z, L and M – never had their platforms extended. The L is constrained to eight-car trains of 60.5-foot cars.³³

The Canarsie Line, which was largely built later than most other BRT/BMT routes, had platforms generally capable of accommodating eight 67-foot-long cars. These cars, popularly called “Standards,” ran on BMT routes between 1915 and 1969. (See Table 3-G for L station platform lengths.) Unlike other parts of the BMT system, which had their platforms extended to accommodate 10 60.5-foot-long train cars between the end of World War II and the early 1970s, the Canarsie Line’s platforms were never lengthened, nor were those of the Broadway-Brooklyn, Myrtle Avenue, and Jamaica lines.

With the exception of 8th Avenue, the full Canarsie Line was open by 1928. Ridership peaked at the non-transfer stations in 1929-1930, when nearly 45 million passengers entered at these stations, but

³¹*New York Times*, June 26, 2007

³² 2006-2007 L Line timetables; NYCT press release, Oct. 18, 2007: <http://mta.info/mta/news/releases/?en=071018-NYCT130>

³³ NYCT’s 75-foot cars cannot run on the line due to turning radii constraints.

plummeted by approximately 30 percent over the next 15 years, and generally continued to decline through 1982, when it reached a nadir of 13.7 million in 1982. Ridership fluctuated but had rebounded to almost 18.4 million by 1997.

However, ridership growth over the past decade has eclipsed the advances of previous years. From 1997 to 2007, ridership from these stations grew to over 35.4 million – their highest ridership since 1936-1937 and a nearly 93 percent increase over the past decade, far outpacing the rest of the system’s 47 percent increase over the same period. The share of total systemwide usage at these stations was 2.27 percent, an all-time record.

Table 3-G: L Line Platform Lengths (in feet)³⁴

Blue: can accommodate 10-car 60.5-foot trains without modifications.

Green: can accommodate 9-car 60.5-foot trains without modifications.

Yellow: can accommodate 9-car 60.5-foot trains, but front and back ends of train beyond the first and last doors would be beyond the station limits.

Station	platform type	island platform	Manhattan-bound side platform	Canarsie-bound side platform
8 Ave.	island	545		
6 Ave.	Island	610		
Union Sq.	Island	519		
3 Ave.	side		529	529
1 Ave.	side		534	534
Bedford Ave.	island	530		
Lorimer St.	Side		530	530
Graham Ave.	Side		530	530
Grand St.	Side		519	519
Montrose Ave.	Side		530	530
Morgan Ave.	Side		540	540
Jefferson St.	Side		530	538
DeKalb Ave.	Side		540	540
Myrtle Ave.	island	540		
Halsey St.	Side		540	540
Wilson Ave.	Side		540	540
Bushwick-Aberdeen	Side		540	540
Broadway Junction	island + side	546		540
Atlantic Ave.	island	550		
Sutter Ave.	Side		518	518
Livonia Ave.	Side		523	523
New Lots Ave.	Side		531	534
E. 105 St.	island	575		
Rockaway Pkwy.	island	561		

An additional reason that platform extensions were not done may have had to do with systemwide integrations of BMT and IND trackage. None of them directly affected the Canarsie Line. After the BMT and IRT were taken over by the City in 1940, efforts were made to fuse the BMT and IND systems together. (The IRT’s narrower cars and clearances prevented a similar integration.) However, while the

³⁴ Source: NYCT.

Chrystie Street Connection and other efforts successfully integrated the BMT and IND systems, none of these connections seriously affected the Canarsie Line.³⁵

New York City Transit has committed to **Communications-Based Train Control (CBTC)** as a primary means of expanding capacity on the L Line. However, if ridership ever increases to the point where platforms need to be extended, NYCT will face an additional obstacle: Subway platforms are regarded by New York State as “buildings,” and thus fall under the state’s Building Code. Any attempt to add capacity to platforms would trigger Americans with Disabilities Act (ADA) regulations mandating that at least one but no less than 50 percent of all egresses from expanded stations would need to be ADA compliant. For all practical purposes, this means that newly-extended stations would need to be equipped with elevators.³⁶

As Table 3-G shows, half of the 24 stations along the L Line either exceed or meet the bare minimum length needed to accommodate nine-car trains, though for safety reasons any such platform should be at least 555 feet long. (Nine cars at 60.5 feet long each plus 10 feet to spare equals 554.5 feet.) NYCT has recently purchased semipermanently-attached four-car R160 trainsets, two each of which will make a J/Z, L or M train. Semipermanently-attached five-car R160 sets have also been purchased for 10-car N and Q or W trains. According to NYCT, these two sets could be made compatible with each other, allowing nine-car trains. L Line capacity would be increased by one-eighth if this were possible.

Communications-Based Train Control (CBTC) is a signaling system that allows trains to run with shorter intervals between them. In standard “block” signaling, trains must stop if trains in front of them have not fully cleared a preset amount of signals in front of them. CBTC signaling measures a train in terms of the relative distance between it and the train in front of it, allowing tighter spacing between trains, and adding capacity to the line as a whole.

A less obvious consequence, whether L trains were to eventually be increased to either nine or 10 cars, would be that L trains would no longer be able to run on the J/Z or M lines – the only lines the L has a connection with. The J/Z and M platforms were never lengthened either, and these routes still have ample excess capacity. Such an investment along the J/Z and M lines would be unnecessary for the foreseeable future.

Retrofitting the entire L Line to allow 10-car trains would be a far greater undertaking. Currently, only one station on the route can hold a 10-car train. However, this would bring the line into conformity with most of the rest of the subway system.

In the short and medium terms, signalization and other improvements could further boost L Line service without the need to extend platforms. However, as a long-term remedy to overcrowding, lengthening platforms should not be discounted.

Terminal Interlocking and Automatic Train Operation (ATO) west of 6th Avenue

Another constraint preventing additional service on the L Line is the location of its Manhattan terminal interlocking east of 8th Avenue, the last stop. The switches are too far from the terminal – a situation similar to that at the E Line’s Parsons-Archer terminal in Queens. Trains arriving at and leaving 8th

³⁵ At Broadway Junction, the track configuration would have allowed KK trains to use Canarsie Line stations from Atlantic Avenue to Rockaway Parkway, and while a few trains actually made this run in 1967-1968 (designated “JJ”), it was not a long-lived service pattern. Thus it would not have been necessary on service delivery grounds to extend Canarsie Line platforms.

³⁶ New York State Building Code, Appendix K9 (Additions)

Avenue are therefore forced to operate on the “wrong” track considerably farther from the terminal than is ideal. For example, a train leaving 8th Avenue terminal from the westbound track³⁷ needs to travel eastbound along that track until reaching the interlocking, where it can then switch to the correct track. Since the interlocking is farther east than just past the end of the terminal platform – the ideal location for such an interlocking – trains have to wait at 6th Avenue for longer than they otherwise should to proceed to 8th Avenue. This reduces the amount of trains per hour that the entire line can run.

The interlocking itself is also substandard, which means that trains have to move through it at a slower speed. NYCT plans to replace this switch with a higher-capacity one, albeit at the same location.

NYCT also plans to eventually improve 8th Avenue terminal throughput by installing an Automatic Train Operation (ATO) system. Right now the terminal’s signaling is set up to have trains enter the station very slowly, since the tunnel ends at a wall at the west end of the station. ATO will allow L trains to automatically enter the station faster at a preset speed, thus improving line capacity. Train operators entering an ATO area are not, strictly speaking, controlling the train’s maximum speed, although they retain the ability to slow or stop the train. Instead, they are required to punch a button at regular intervals to acknowledge that they are still lucid and capable of taking control of the train if needed. At the time this report was being written, undisclosed health and safety aspects of this plan were a source of disagreement between NYCT and the unions which operate the transit system.

CBTC and Retrofitting of the R160 Fleet

As of late 2007, most L Line service is being provided with 212 R143 model traincars. These subway cars, which entered service between 2001 and 2003, are equipped to utilize CBTC, which has now been largely installed throughout the route. However, exceptional ridership growth along the L Line, especially west of the Myrtle/Wyckoff Avenue station, led to a situation where the R143 fleet could not provide all the service that was needed on the L Line. Older R40 and R42 cars, which are not CBTC-compatible, were added or retained to provide extra service.



East New York Yard from the L Line overpass to the Manhattan-bound platform. Graffiti mars the left edge of the photo.

At the time this report was being written, newer R160 cars were being delivered, and were replacing the R40/42s. The R160 cars, while “CBTC-compatible,” were not actually delivered with the software and equipment to utilize CBTC. Therefore, before CBTC can be utilized to its utmost potential, at least the entire set of R160 cars that would be usable on the L Line will need to have CBTC installed.³⁸ This is essential for two reasons: 1) CBTC can only really be effective if multiple consecutive trainsets are equipped with it, because all train speeds are governed by their position relative to the train in front of

³⁷ Internally, NYCT generally uses only north and south when referring to directions of travel or line segments. However, since many lines run east-west along parts of their routes, this report uses all four compass directions.

³⁸ The R160 order includes semipermanently coupled four- and five-car sets. Realistically, CBTC would need to be installed on the four-car sets, which run on the L Line. CBTC implementation elsewhere in the subway system will eventually require the five-car sets to also be retrofitted.

them. A train without CBTC renders the system ineffective. 2) As the R143s begin to age, they will need to be periodically be taken out of service for system maintenance. R160 cars will need to be CBTC-compatible to maintain a high level of service.

Ultimately, NYCT wishes to reach a service level of 20-22tph, which they believe will be adequate for L Line ridership levels. Without a full CBTC fleet, other improvements such as the rebuilt 8th Avenue terminal interlocking and ATO will not reach their full effectiveness.

Lack of Storage Yard Space

L Line trains are stored at one of two locations: Canarsie Yard and East New York Yard. Canarsie Yard is primarily a storage facility, although it does have a car wash. East New York Yard, however, is also a maintenance and inspection facility; J/Z and M trains are also stored or maintained at of this yard.

A major deficiency of East New York Yard is that only a relatively small amount of uncut eight-car trains can be stored there. Due to the yard's compact layout and the fact that trains tended to be shorter many decades ago (the yard dates back in some form or another to at least 1880), most of the yard's tracks are too short to hold trains of this length, meaning that many trainsets entering the yard need to be split into smaller subsets and then reattached when going back into service. The yard's existing layout makes it hard to expand to accommodate more eight-car trains, no less nine- or 10-car sets, should that need arise.

Since more trainsets will eventually be needed to provide more frequent service on the L, additional storage space at an alternate location will be needed. Several locations where the L Line parallels the New York and Atlantic Railway cut between Wilson Avenue and New Lots Avenue could be viable. In the long term, much of the northerly outdoor storage part of East New York Yard could then be decommissioned.

3.4 Commuter and Freight Rail

3.4.1 LIRR Atlantic Division: East New York Station

The LIRR Atlantic Division runs in a two-track alignment beneath, above or alongside Atlantic Avenue throughout its entire length, from Flatbush Avenue in Downtown Brooklyn to Jamaica in Queens. East New York is one of two active intermediate stops; the other is at Nostrand Avenue, to the west of the study area. To the east lies the abandoned Woodhaven Boulevard station, closed in January 1977.

Although the station is approximately 1,000 feet south of the Broadway Junction subway station, it is almost directly below the Atlantic Avenue station on the L Line, the next stop for Canarsie-bound trains. The A and C lines largely parallel the Atlantic Division into Downtown Brooklyn, and unlike the LIRR, these subway lines continue directly into Manhattan.

The station, composed of two side platforms, is set in an unusual semienclosed environment, built as part of a complicated grade crossing



An LIRR train bound for Jamaica and Hempstead enters the East New York station.

elimination project in the early 1940s. Between Eastern Parkway and Georgia Avenue, two narrow one-way service roads remain at ground level while the main, central portion of Atlantic Avenue vaults above ground. The LIRR tracks, in a tunnel below Atlantic Avenue, rise with the through road above it, so that the East New York platforms are essentially flush with street level. While enclosed by the road above, most of the platform is indirectly exposed to open air and receives natural light. An underpass, which contains a ticket booth, provides access between the platforms and to Van Sinderen Avenue to the north.

As of November 2007, 56 eastbound and 61 westbound trains stopped at East New York on a typical weekday; 43 eastbound and 44 westbound trains stopped there on weekends. During weekdays, some additional trains bypass East New York. The default midday and off-peak service interval is 30 minutes, but trains also stop there more or less frequently by time of day and peak direction. (See Table 3-E for a more detailed breakdown.)

Trains to and from Far Rockaway and Hempstead predominate at East New York on weekdays and virtually dominate the weekend schedule, but direct service to the Long Beach and West Hempstead branches is also available to varying degrees. Less frequently, East New York also has weekday trains that serve the Babylon, Port Jefferson and Ronkonkoma lines.

Ridership to and from East New York is relatively low, according to LIRR data from the spring of 2006. Weekday ridership totaled 1,127 – just over a third of one percent of total entries and exits at the LIRR’s New York City stations. Train capacity, even at peak hours, is adequate to handle ridership at East New York and along the Atlantic Division as a whole. Depending on the time of day and demand, the LIRR runs six-, eight- or 10-car trains through the Atlantic Division (most of which continue east of Jamaica). At a capacity of 107 people per car, up to 1,070 passengers per train can be accommodated.

As shown in Table 3-H, the vast majority of ridership from East New York is to and from points east, even during peak periods when the assumption would be that more passengers would be commuting to and from Flatbush Avenue.

Table 3-H: LIRR East New York Station Ridership, Spring 2006³⁹

<i>direction/ time of day</i>	<i>entries</i>	<i>exits</i>	<i>totals</i>
EB AM Peak	290	8	EB Weekdays: 636 entries, 24 exits
EB Midday	202	8	
EB PM Peak	144	8	
EB Saturdays	353	9	
EB Sundays	304	7	
WB AM Peak	10	181	WB Weekdays: 23 entries, 444 exits
WB Midday	10	86	
WB PM Peak	3	177	
WB Saturdays	23	444	
WB Sundays	25	290	

3.4.2 New York & Atlantic Bay Ridge Line

A freight rail line also passes through the study area. Currently operated by the New York & Atlantic Railway, the right of way runs from south to north, paralleling Van Sinderen Avenue and the elevated L Line in the southern half of the study area. At East New York Avenue, the line enters an unventilated,

³⁹ Long Island Rail Road, *Origin & Destination Study Station-Based Passenger Counts, Spring 2006*. Prepared for the LIRR by SRBI, Inc.

3,500-foot-long four-track tunnel, part of which has an abandoned passenger station within.⁴⁰ This tunnel necessitated elevating the A and C (Fulton Street) Line subway station at Broadway Junction enough to force the park above it to be regarded at several feet above the surrounding ground level.

3.5 Buses

Six NYCT local bus routes traverse the study area: the B12, B20, B25, B83, Q24 and Q56. All of them except for the B12 stop immediately adjacent to the Broadway Junction subway entrance.

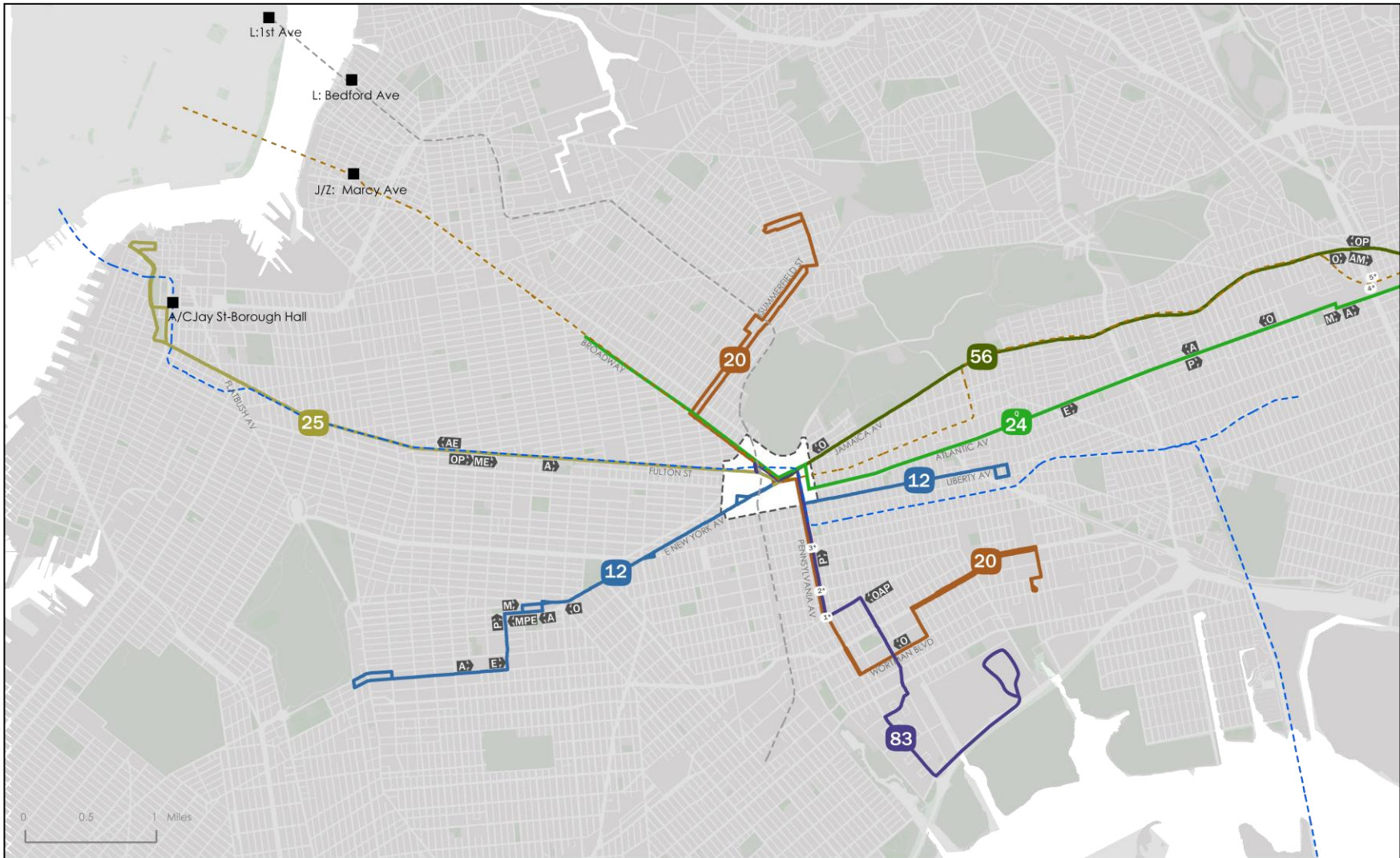
Figure 3-Q is a map of all six bus routes, with peak loading points along each route by time of day. Table 3-I shows the average hourly station entries at Broadway Junction, and hourly transfers from each bus route serving the station, for May 2007. Detailed bus ridership data for the six routes which traverse the study area, including peak loading points, stop-by-stop entries and exits by daypart, and hour-by-hour bus-to-subway transfers from each route to Broadway Junction subway station, were provided by NYCT. Such detailed data has only become possible over the last decade with systemwide conversion to MetroCards.

Table 3-I: Average Hourly Station Passenger Entries and Bus-to-Subway Transfers at Broadway Junction, May 2007⁴¹

<i>hour</i>	<i>subway entries</i>	<i>from B12</i>	<i>from B20</i>	<i>from B25</i>	<i>from B83</i>	<i>from Q24</i>	<i>from Q56</i>	<i>all bus xfers*</i>	<i>% of entries</i>
12a	85	1	5	1	2	5	3	17	20.00%
1a	40	0	2	1	0	0	1	4	10.00%
2a	26	0	0	0	0	0	0	0	0.00%
3a	34	0	0	0	0	1	2	3	8.82%
4a	85	1	0	0	0	6	7	14	16.47%
5a	249	4	13	2	37	26	27	109	43.78%
6a	658	10	67	8	106	56	75	323	49.09%
7a	1,168	11	112	13	148	73	95	453	38.78%
8a	1,082	10	89	17	111	58	57	344	31.79%
9a	644	10	48	9	66	31	38	203	31.52%
10a	416	7	33	5	47	20	23	135	32.45%
11a	365	7	31	6	43	16	19	123	33.70%
12p	367	6	37	7	37	19	20	127	34.60%
1p	393	9	37	9	48	21	16	141	35.88%
2p	426	8	45	8	53	19	18	152	35.68%
3p	552	7	49	13	56	21	17	164	29.71%
4p	522	8	55	12	46	19	16	157	30.08%
5p	508	5	48	14	46	16	17	146	28.74%
6p	374	6	36	10	35	12	15	115	30.75%
7p	306	6	30	10	33	12	12	104	33.99%
8p	261	3	26	7	37	9	12	95	36.40%
9p	221	3	21	5	25	8	9	71	32.13%
10p	195	4	13	4	19	5	11	56	28.72%
11p	123	2	5	3	9	3	3	25	20.33%
TOTAL	9,102	128	802	164	1,004	456	513	3,081	33.85%
%/route		4.15%	26.03%	5.32%	32.59%	14.80%	16.65%	100.00%	

⁴⁰ The line was once electrified, and was used for passenger service until 1924.

⁴¹ Source: NYCT *Hourly and total numbers do not add up because 14 additional transfers (no more than two in any given hour) were made from other bus routes.



Broadway Junction Transit Capacity Study
SUBWAY/BUS PEAK LOADING POINTS
FIGURE 3-Q

Study Area



Bus Routes



1* See Note

SUBWAY AM PEAK LOADING POINTS

■ Station

BUS PEAK LOADING POINTS

O Overnight (12a-6a)

A AM Peak (6a-10a)

M Midday Peak (10a-3p)

P PM Peak (3p-7p)

E Evenings (7p-12a)

NOTE: 1*

Pennsylvania Ave/New Lots Ave: B20 - NB[A]
 B83 - NB[M]
 Pennsylvania Ave/Riverdale Ave: B20 - NB[M,E]
 B83 - NB[E]
 B83 - SB[P]

NOTE: 2*

Pennsylvania Ave/Livonia Ave: B20 - SB[O,P,E]
 B83 - SB[O,M,E]

NOTE: 3*

Pennsylvania Ave/Sutter Ave: B20 - SB[A,M]
 B83 - SB[A]

NOTE: 4*

Van Wyck Expy/91 Ave: Q24 - WB[M]
 Atlantic Ave/Van Wyck Expy: Q24 - WB[P,E]

NOTE: 5*

Jamaica Ave/144 St: Q56 - EB[P]
 Jamaica Ave/146 St: Q56 - WB[M]

*On November 18, 2007, The B83 bus route was extended to Gateway Center Mall via the Bell Parkway, Erskine Avenue and Fountain Avenue. Accurate peak loading data for this newly extended route were not yet available at the time this report was completed.

Slightly more than a third of all passengers entering the Broadway Junction subway station transferred from the six bus routes in the study area. While the B83 route was responsible for the plurality of these transfers, the B20 and B83 both operate along Pennsylvania Avenue down to New Lots Avenue, so it can be reasonably assumed that some of the transferring B20 passengers are also boarding along Pennsylvania Avenue.⁴² The Q24 and Q56 bus routes, which roughly parallel each other from the study area to Jamaica, account for almost as many transferring passengers as the B83: over 31 percent. Therefore, it is likely that approximately two-thirds of all passengers transferring from buses to the subway are originating south, southeast or east of the study area.

The percentage of passengers entering the subway at Broadway Junction who transferred there from a connecting bus route remained relatively stable from 7:00am through 11:00pm, never fluctuating above 39 percent (7:00am-8:00am) or below 28 percent (5:00pm-6:00pm). Only during late nights does this share drop significantly. During the early shoulder of the AM peak – from 5:00am to 7:00am – the share of subway passengers entering the station from a connecting bus climbs to well above 40 percent, reaching nearly half of all entering subway passengers in the 6:00am hour.

A route-by-route description follows.

3.5.1 B12

This route runs between Ocean Avenue and Parkside Avenue in Prospect-Lefferts Gardens, and Sheridan Avenue and Liberty Avenue in East New York. From west to east, the B12 route runs predominantly along Clarkson Avenue, Albany Avenue, East New York Avenue, Pennsylvania Avenue, and Liberty Avenue.

During the following times, approximately every other bus to and from Ocean Avenue terminates at East New York Avenue and Alabama Avenue, adjacent to the J Line subway station immediately east of Broadway Junction:

- Weekday peak and midday hours.
- Saturdays from 7:00am to 8:00pm.
- Sundays westbound from 9:30am to 9:00pm.
- Sundays eastbound from about 10:00am to 10:30pm.

During the following times, some buses run only between East New York Avenue and Alabama Avenue, and Sheridan Avenue and Liberty Avenue:

- Saturdays westbound from 8:00pm to 5:30am.
- Saturdays eastbound from 1:00am to 8:30am.
- Sundays westbound from 6:00pm to 6:00am, especially from 12:00am to 2:00am.
- Sundays eastbound from 1:00am to 9:00am.

B12 buses run at high frequencies (with 3- to 7-minute peak intervals) and at all times. Two to seven buses per hour run overnights, and as of August 2007 19 buses had scheduled stops near Broadway Junction during the peak hour of 9:00am to 10:00am. In general, 13 to 17 B12 buses per hour stopped at Broadway Junction peaks and middays (both directions inclusive) as of August 2007.

⁴² In November 2007, B83 bus service was extended to Gateway Center Mall, which has the potential to boost station entries still further. However, a definitive analysis of the B83 extension's impact will not be practical until early in the 2010s, by which point new bus usage patterns should stabilize.

Unlike the other five bus routes, the B12 does not stop directly in front of Broadway Junction, passing only as close as East New York Avenue and Junius Street (eastbound) or East New York Avenue and Pacific Street (westbound). It has fewer weekday bus-to-subway transfers at Broadway Junction than the other five routes – 128 out of 3,081, or 4.2 percent of the total. The B12's stop at Alabama Avenue, where transfers are available to the J Line station above, is the busiest bus stop on the bus route in eastbound exits or westbound entrances.

3.5.2 B20

This route runs between Putnam Avenue and Fairview Avenue in Ridgewood, Queens, and the Brooklyn General Mail Facility in Spring Creek, Brooklyn. From north to south, the B20 route runs predominantly along Fresh Pond Road; Decatur Street (northbound) or Summerfield and Schaeffer streets (southbound); Broadway, Pennsylvania Avenue, Wortman Avenue, Ashford Street, and Linden Boulevard.

B20 service does not run overnights. Buses do not run from 2:00am to 5:00am weekdays, nor from about 2:00am to 5:45am weekends.

During the following hours, alternate buses generally end at Broadway Junction instead of proceeding north into Queens:

- Weekday peak and midday hours.
- Saturdays from about 8:45am to 7:00pm.
- Sundays southbound from 8:45am to 7:00pm.
- Sundays northbound from about 11:00am to 7:00pm.

B20 buses tended to run at 5- to 12-minute intervals during peak and evening hours, and at 12-minute intervals middays and Saturday middays. As of August 2007, 12 buses had scheduled stops at Broadway Junction during the peak hour of 8:00am to 9:00am. In general, seven to 11 B20 buses per hour stopped at Broadway Junction peaks and middays (both directions inclusive) as of August 2007.

The B20 has the second highest amount of average weekday transfers to the subway at Broadway Junction: 802 out of 3,081 total bus transfers, or 26.0 percent.

3.5.3 B25

This route runs the length of Fulton Street between Downtown Brooklyn and Broadway Junction.^{43 44} A short extension to One Main Street at Fulton Landing runs from 7:00am to 7:00pm weekdays.

B25 service runs at all times.

B25 buses tend to run at 6- to 12-minute intervals during peak and midday hours, with evening intervals ranging between 9 and 30 minutes, depending on the peak direction and time of day.

⁴³ Road construction during 2007 and 2008 is temporarily diverting B25 service to Atlantic Avenue between Vanderbilt Avenue and Bedford/Nostrand avenues.

⁴⁴ The B25 largely follows the historic path of Fulton Street. Much of Cadman Plaza West and Old Fulton Street, which the route runs along in Downtown Brooklyn, was originally part of Fulton Street. The original alignment of Fulton Street crosses diagonally northeast of Borough Hall and remains a pedestrian path.

As of August 2007, 10 buses had scheduled stops at Broadway Junction during the peak hour of 6:00pm to 7:00pm. In general, six to seven B25 buses per hour stopped at Broadway Junction during AM peaks, middays and evenings (both directions inclusive) as of August 2007.

The B25 has the fifth highest amount of average weekday transfers to the subway at Broadway Junction: 164 out of 3,081 total bus transfers, or 5.3 percent. In all likelihood this is due to the fact that the B25 largely duplicates the route of the A and C subway lines, which run below Fulton Street into Fort Greene.

3.5.4 B83

This route's northern terminal is Broadway Junction. On November 18, 2007, B83 service was extended .9 miles from its previous terminal at Pennsylvania and Seaview avenues to the Gateway Center Mall, where it now shares a terminal with the B13 route. The B83 now primarily runs along Pennsylvania Avenue, Van Siclen Avenue, the Belt Parkway, Erskine Avenue and Fountain Avenue.

B83 service does not run overnights. Buses do not run from 1:30am to 4:30am weekdays, 1:30am to 5:00am Saturdays, or 1:00am to 5:30 Sundays.

During the following hours, alternate buses generally end at Seaview Avenue and Pennsylvania Avenue instead of proceeding to or from Gateway Center:

- Weekdays southbound from 3:30pm to 8:00pm.
- Weekdays northbound from about 6:15am to 8:00am.

B83 buses predominantly run at 10-minute intervals during peak hours, and midday hours, with midday intervals ranging between 7 and 13 minutes, and evening intervals ranging between 10 and 30 minutes depending on the peak direction and time of day.

As of August 2007, nine buses had scheduled stops at Broadway Junction during each of the peak hours of 7:00am to 9:00am. In general, five to seven B83 buses per hour stopped at Broadway Junction during nearly all other hours the route was operating (both directions inclusive) as of August 2007.

The B83 has the highest amount of average weekday transfers to the subway at Broadway Junction: 1,004 out of 3,081 total bus transfers, or 32.6 percent. While it will probably be some time before the impact of the Gateway Center Mall extension is fully felt, if the extension of the B13 to the mall in April 2003 is any indication, B83 ridership could grow further. When the B13 was first extended to the mall, an average of 240 weekday, 70 Saturday and 90 Sunday customers used the route at its terminal. By the fall of 2007, approximately 1,000 customers during both weekdays and weekends accessed the B13 at the mall. According to NYCT, almost 60,000 people live within a quarter mile of the B83 route.⁴⁵ Nonetheless, the impact of the B83 extension upon ridership patterns at Broadway Junction may not be fully known until long after this project is completed.

3.5.5 Q24

This route runs between Broadway and Patchen Avenue in Bushwick, and 168th Street and Jamaica Avenue in Jamaica, Queens. From east to west, the Q24 route runs predominantly along Broadway, Fulton Street, Jamaica Avenue, Pennsylvania Avenue, Atlantic Avenue, and Archer Avenue (eastbound)/Jamaica Avenue (westbound).

Q24 service runs at all times.

⁴⁵ NYCT press release, September 24, 2007. <http://mta.info/mta/news/releases/?en=070924-NYCT118>

During the following hours, alternate buses generally end at Broadway Junction instead of proceeding northwest to and from Bushwick:

- Saturdays eastbound from about 6:00am to 6:15pm.
- Saturdays westbound from about 8:45am to 9:00pm.
- Sundays eastbound from 10:45am to 7:15pm.
- Sundays westbound from about 10:45am to 7:45pm.

Q24 buses tended to run at 8- to 10-minute intervals during the AM peak eastbound and 7- to 19 minute intervals during the AM peak westbound. Middays, intervals in both directions were 10 to 13 minutes. In the PM peak intervals were 10 to 12 minutes eastbound and 7 to 11 minutes westbound. Evenings, intervals were 13 to 20 minutes eastbound and 7 to 15 minutes westbound. Overnight intervals were about 60 minutes in both directions. Saturday intervals were 10 to 13 minutes in both directions.

As of August 2007, 13 buses had scheduled stops at Broadway Junction during three peak hours: 8:00am to 9:00am, 9:00am to 10:00am, and 6:00pm to 7:00pm. In general, 12 Q24 buses per hour stopped at Broadway Junction middays (both directions inclusive) as of August 2007.

The Q24 has the fourth highest amount of average weekday transfers to the subway at Broadway Junction: 456 out of 3,081 total bus transfers, or 14.8 percent.

3.5.6 Q56

This route runs between Broadway Junction and 170th Street and Jamaica Avenue in Jamaica, Queens. The Q24 route runs predominantly along Jamaica Avenue.

Q56 service runs at all times.

Q56 buses tended to run at to 10- to 12-minute intervals during the AM peak, midday and PM peak eastbound, and at 8- to 16 minute intervals during the AM peak, midday and PM peak westbound. In the PM peak intervals were 10 to 12 minutes eastbound and 7 to 11 minutes westbound. Evenings, intervals were 15 to 20 minutes eastbound and 10 to 15 minutes westbound. Overnight intervals were about 60 minutes in both directions. Saturday intervals were 8 to 10 minutes in both directions.

Although a 24-hour service, the Q56 runs less frequently than any of the other routes. As of August 2007, an average of six to seven buses had scheduled stops at Broadway Junction during the peak hours of 6:00pm to 7:00pm. In general, five Q56 buses per hour stopped at Broadway Junction during other weekday hours from 7:00am to 11:00pm (both directions inclusive) as of August 2007.

Despite its lower service frequency, the Q56 has the third highest amount of average weekday transfers to the subway at Broadway Junction: 513 out of 3,081 total bus transfers, or 16.7 percent – almost exactly one-sixth.

3.6 Travel Times to Other Destinations

Table 3-J summarizes the average scheduled travel times from Broadway Junction to other locations served by the bus, subway and rail routes through the area. All of the times in this station imply a one-seat ride on each particular route. In general, the lower number in each range represents travel time during off-peak periods while the higher end indicates peak travel times.

Table 3-J: Scheduled Weekday Travel Times to Selected Destinations, Excluding Late Nights, in Minutes, 2007⁴⁶

A

207 th Street (Manhattan)	54-63
168 th Street (Manhattan)	46-53
125 th Street (Manhattan)	38-47
42 nd Street (Manhattan)	28-35
Chambers Street (Manhattan)	18-24
Jay Street-Borough Hall	11-16
Euclid Avenue	4-6
Lefferts Boulevard (Queens)	14-20
JFK Airport-Howard Beach (Queens)	16-20
Rockaway Park-Beach 116 th Street* (Queens)	31-35
Far Rockaway-Mott Avenue (Queens)	35-40

* limited peak directional through service. Travel times tend to be lengthier in the peak direction. (Times listed are for express service only. A trains make all local stops late nights.)

C**

168 th Street (Manhattan)	56-64
125 th Street (Manhattan)	49-55
42 nd Street (Manhattan)	34-41
Chambers Street (Manhattan)	23-28
Jay Street-Borough Hall	16-20
Euclid Avenue	6-8

** Broadway Junction is not specifically listed on this MTA public timetables. Rockaway Avenue, the next station to the west, is. Travel times are a conservative DCP estimate. Travel times tend to be lengthier in the peak direction.

J/Z***

Broad Street (Manhattan)	24-31
Chambers Street (Manhattan)	22-28
Essex Street (Manhattan)	18-23
Myrtle Avenue	6-10
Crescent Street	6-9
Woodhaven Boulevard (Queens)	11-16
Jamaica Center (Queens)	21-25

***All J/Z trains run peak directional express service towards Manhattan from about 7:00am to 1:00pm and from Manhattan from about 1:30pm to 8:00pm. J/Z skip-stop service runs towards Manhattan from about 7:00am to 8:15am and from Manhattan from about 4:30pm to 5:45pm. Travel times tend to be quicker in the peak direction, due to the combination of skip-stop and express service.

⁴⁶ Source: NYCT online timetables. <http://mta.info/mta/schedules.htm>.

<u>L</u>	
8 th Avenue (Manhattan)	26-30
Union Square (Manhattan)	23-26
1 st Avenue (Manhattan)	21-24
Lorimer Street	15-18
Myrtle Avenue	5-7
Rockaway Parkway	9-10

LIRR Atlantic Division

Flatbush Avenue-Atlantic Terminal	9-14
Nostrand Avenue	4-7
Jamaica (Queens)	7-10

B12 (from East New York Avenue and Alabama Avenue)

Ocean Avenue/Parkside Avenue	28-46
Flatbush Avenue/Clarkson/Nostrand Avenues	21-37
East New York Avenue/Utica Avenue	12-20
Sheridan Avenue/Liberty Avenue	11-24

B20

Putnam Avenue/Fairview Avenue (Queens)	17-32
Broadway/Decatur Street	3-9
Pennsylvania Avenue/Sutter Avenue	6-15
Linden Boulevard/Ashford Street	17-33
Brooklyn General Mail Facility	23-44

B25

Fulton Landing	34-69
Cadman Plaza West/Tillary Street	33-63
Fulton Street/DeKalb Avenue	28-52
Fulton Street/Greene Avenue	22-45
Fulton Street/Nostrand Avenue	12-29

B83

Pennsylvania Avenue/Liberty Avenue	4-12
New Lots Avenue/Van Siclen Avenue	11-20
Pennsylvania Avenue/Seaview Avenue	20-36
Gateway Center Mall	32-45

Q24

Lafayette Avenue/Patchen Avenue	9-17
Atlantic Avenue/Crescent Street	11-20
Atlantic Avenue/Lefferts Boulevard (Queens)	23-37
Archer Avenue/Sutphin Boulevard (Queens)	28-50
168 th Street/Jamaica Avenue (Queens)	33-62

Q56

Jamaica Avenue/Crescent Street	9-15
Jamaica Avenue/Woodhaven Boulevard (Queens)	16-27
Jamaica Avenue/Lefferts Boulevard (Queens)	24-39
Jamaica Avenue/ Sutphin Boulevard (Queens)	30-51
168 th Street/170 th Street/Jamaica Avenue (Queens)	39-65

3.7 Roads

3.7.1 The Roadway Network

Broadway Junction is a junction in the truest sense of the word. Not only do several bus, subway and rail lines converge within the study area, but four separate street grids also meet here, each of them demarcated by major roadways.

The Bushwick grid, which extends into Ridgewood, Queens, reaches its southeastern extremity at East New York Yard. Broadway, a NYCDOT-designated local truck route, divides this grid from the Bedford-Stuyvesant grid, which has its eastern tip at the convergence of Broadway and Fulton Street. Atlantic Avenue, a major divided arterial and NYCDOT-designated through truck route, parallels Fulton Street one to two blocks to the south through the study area.

The easternmost tip of another grid lies south of Fulton Street. This is the Crown Heights extension of a mammoth grid which covers almost the entire western third of Brooklyn from Boerum Hill to Bensonhurst.⁴⁷ Eastern Parkway runs just to the north of East New York Avenue, which divides this grid from the East New York grid, which extends west to Brownsville and east to Howard Beach, Queens. By area, this grid occupies more of the study area than the others. Pennsylvania Avenue, a NYCDOT-designated local truck route, runs north to south within this grid.⁴⁸ A relatively small cove of streets bounded by the Jackie Robinson Parkway, Highland Park and Jamaica Avenue lies to the north of this grid, at the northeastern extremity of the study area.



The Jackie Robinson Parkway, Pennsylvania Avenue, Bushwick Avenue and Jamaica converge. Left: View looking south. Right: View looking north.

⁴⁷ A case can be made that this grid is separate from the larger one west of Flatbush Avenue. However, all east-west streets from Atlantic Avenue to Sterling Place bend slightly but continue west of Flatbush Avenue.

⁴⁸ See <http://www.nyc.gov/html/dot/downloads/pdf/lowertruckroute.pdf> for a map of truck routes which includes the study area. Short sections of Herkimer Street, Van Sinderen Avenue and Fulton Street are also designated local truck routes within the study area.

3.7.2 Major Roads

A concentration of major roads exist within the study area. They are summarized below, in alphabetical order.

Atlantic Avenue

This road passes from east to west through the study area. It runs the entire width of Brooklyn, with a western endpoint at the Brooklyn waterfront near the northern edge of Cobble Hill and an eastern endpoint currently at 94th Avenue in Jamaica, Queens. (A short extension is expected to be built to 95th Avenue.) Atlantic Avenue has been designated by NYCDOT as a through truck route, meaning that trucks with neither an origin nor destination within the same borough as the road may use the route.

Atlantic Avenue is a two-way street. East of Georgia Avenue, Atlantic Avenue is a divided roadway, with three travel lanes and a parking lane on each side of the median. From Eastern Parkway to Georgia Avenue, Atlantic Avenue at ground level has one lane per direction for local traffic and a parking lane; an elevated express bypass, with two travel lanes in each direction, vaults over much of the study area. (The LIRR Atlantic Division tracks rise beneath the elevated roadway; the East New York station platforms are at ground level).

Broadway

This road enters the study area from the northwest, and ends at the confluence of East New York Avenue/Jamaica Avenue and the eastern continuation of Fulton Street. Its western terminus is at Kent Avenue, on the Brooklyn waterfront in Williamsburg. Broadway has been designated by NYCDOT as a local truck route, meaning that trucks with an origin or destination within the same borough as the road may use the route to reach their destinations.

For virtually its entire length, including within the study area, Broadway lies beneath the Jamaica Elevated tracks. The support pillars in the study area are not within the street bed, but are instead on the sidewalk.

Broadway is generally a two-way street. One travel lane and one parking lane exists in each direction. However, east of Van Sinderen Avenue, Broadway is a one way street, with two westbound travel lanes and two parking lanes. One of the two travel lanes is also sometimes occupied by by parked NYCT vehicles, and a gate near Jamaica Avenue exists which can entirely block access to Broadway from the east, if need be.

Bushwick Avenue

This road enters the study area from the northwest, and ends at the junction of Pennsylvania Avenue, Jamaica Avenue and the Jackie Robinson Parkway. It generally parallels Broadway, which is one block south, but to reach its origin at Metropolitan and Maspeth avenues in East Williamsburg, the road hooks north.

Within the study area, Bushwick Avenue has two travel lanes in each direction. No parking is allowed along any part of Bushwick Avenue within the study area. However, in practice, parked cars often occupy all or part of one travel lane at the avenue's eastern extremity, between Highland Avenue and Jamaica Avenue. Often these cars are largely parked on the sidewalks, but they will sometimes edge into the adjacent travel lane, limiting that lane's viability for travel.

East New York Avenue/Jamaica Avenue

This road passes from southwest to northeast through the study area. It is essentially one continuous road, but the name changes from East New York Avenue to Jamaica Avenue at Broadway. From Williams Avenue to Alabama Avenue, Jamaica Avenue has been designated by NYCDOT as a local truck route, meaning that trucks with an origin or destination within the same borough as the road may use the route to reach their destinations.

This is one of the longest roads on geographic Long Island, changing names several different times over its entire course, East New York Avenue/Jamaica Avenue begins as Lincoln Road at Ocean Avenue in Prospect-Lefferts Gardens. East of the study area, Jamaica Avenue continues through the remainder of Brooklyn and Queens, becoming Jericho Turnpike at Bellerose, straddling the Queens/Nassau County border. This continuous road, designated NY 25, is named Main Street, Main Road Middle Country Road, or Jericho Turnpike until ending in Greenport, over 80 miles from the City line. (NY25 continues to Orient Point.)

From southwest to northeast, this road has the following configurations as it passes through the study area:

- *Mother Gaston Boulevard-Sackman Street:* Two way traffic with one travel lane and one parking lane per direction.
- *Sackman Street-Junius Street/Pacific Street:* One-way traffic with two parking lanes. No lane markers were evident on this section of East New York Avenue, and traffic generally flows in one lane. However, at the eastern end of this segment, where a bus stop precludes parking on the south side of the street, traffic was witness assuming a two-lane formation, in anticipation of the next configuration.
- *Junius Street/Pacific Street-Fulton Street/Williams Avenue:* Two-way traffic. At this point, the road divides. The exterior service road in each direction remains at ground level. Parking is only permitted on the eastbound service road northeast of Atlantic Avenue; all other service roads north and south of Atlantic Avenue have no parking. Each of these roads are cut off by the ground-level Atlantic Avenue service roads which bracket the East New York LIRR station. Through traffic on East New York Avenue travels via a four lane (two-per direction) underpass beneath the LIRR and the Atlantic Avenue service roads.
- *Fulton Street/Williams Avenue-Pennsylvania Avenue/Bushwick Avenue/Jackie Robinson Parkway:* The road, named Jamaica Avenue east of Broadway, is divided by a median, and carries two to three lanes of traffic in each direction. Parking is only permitted on the eastbound side of the street between Georgia Avenue and Sheffield Avenue.
- *Pennsylvania Avenue/Bushwick Avenue/Jackie Robinson Parkway-New Jersey Avenue/Marginal Street East:* Jamaica Avenue has one eastbound and two westbound travel lanes. There is no parking on the westbound side of the street; parking is technically allowed on the eastbound side, but the presence of a bus stop and several curb cuts limit vehicles to two parking spaces.
- *East of New Jersey Avenue/Marginal Street East:* Jamaica Avenue has one eastbound and one westbound travel lane. On the westbound side of the street, parking is allowed only from 7:00pm to 7:00am every day; parking is permitted on the eastbound side of the street.

Eastern Parkway

This road enters generally runs north-south or northeast-southwest, and largely hugs the western edge of the study area. Its northernmost block is officially known as “Eastern Parkway Extension.” The road originates at Grand Army Plaza in Brooklyn and ends at Bushwick Avenue, within the study area.

A two-way road throughout its run, the segment within the study area is divided by a median and has two travel lanes in each direction. From southwest to northeast, this road has the following parking as it passes through the study area:

- *Pacific Street-Atlantic Avenue:*
 - Northbound: no parking.
 - Southbound: no parking, and no standing from 7:00am to 10:00am Mondays through Fridays.
- *Atlantic Avenue-Herkimer Street:* parking permitted on both sides of the street.
- *Herkimer Street-Fulton Street:*
 - Northbound: parking permitted.
 - Southbound: parking permitted, but no standing 7:00am-4:00pm on school days.
- *Fulton Street-Truxton Street:* no parking on either side of the street.
- *Truxton Street-Cooke Court:* parking permitted on both sides.
- *Cooke Court-Bushwick Avenue:* no parking on either side of the street.

Fulton Street

This road passes from east to west through the study area, although it is briefly interrupted for a block between Williams Avenue and Alabama Avenue. Its western endpoint is at Fulton Ferry in Downtown Brooklyn.⁴⁹ The road continues east throughout the width of the Brooklyn before assuming the name 91st Avenue and ending about half a mile into Queens, in Woodhaven. From Williams Avenue to Alabama Avenue, Fulton Street has been designated by NYCDOT as a local truck route, meaning that trucks with an origin or destination within the same borough as the road may use the route to reach their destinations.

The western portion of Fulton Street within the study area is a two-way road, with one travel lane and one parking lane per direction. The eastern portion which runs beneath the Jamaica Elevated, is an eastbound one-way street with one travel lane and two parking lanes.

Pennsylvania (Granville Payne) Avenue

This road enters the study area from the south, and runs north, ending at the intersection of Bushwick Avenue, Jamaica Avenue and the Jackie Robinson Parkway. Its southern origin is Exit 14 of the Belt Parkway, south of Starrett City in Brooklyn. Within the Study Area, Pennsylvania Avenue has been designated by NYCDOT as a local truck route, meaning that trucks with an origin or destination within the same borough as the road may use the route to reach their destinations.

A two-way road throughout its run, two to three lanes of traffic exist in each direction. From north to south, this road has the following parking as it passes through the study area:

- *Bushwick Avenue/Jamaica Avenue/Jackie Robinson Parkway-Fulton Street:* no parking.
- *Fulton Street-Atlantic Avenue:*

⁴⁹ Fulton Street’s original path has been renamed Cadman Plaza West between Prospect Street and Pierrepont Street; the portion north of Prospect Street is now called Old Fulton Street. Additionally, a short strip of the road between Cadman Plaza West and Adams Street/Brooklyn Bridge Boulevard is now part of Cadman Plaza, but a pedestrian pathway which passes diagonally to the north of Borough Hall still marks the street’s original alignment. Finally, a section of the street between Adams Street/Brooklyn Bridge Boulevard and Flatbush Avenue is called Fulton Mall; it is effectively a busway.

- Northbound: On the northern half of the block, no standing from 7:00am to 10:00am and 4:00pm to 7:00pm, except Sundays. On the southern half of the block, a special parking restriction exists immediately in front of a medical building, but otherwise, the no standing regulation from the northern half of the block exists, along with one-hour parking from 10:00am to 4:00pm . A no stopping regulation exists immediately for a short distance to the north of Atlantic Avenue.
- Southbound: no parking.
- *Atlantic Avenue-Liberty Avenue:*
 - Northbound: One-hour parking is permitted from 10:00am-4:00pm Mondays through Saturdays.
 - Southbound: No parking.

3.8 Vehicular Traffic

While vehicular traffic was not the primary focus of this study, the confluence of several major roads – and the bus routes which travel along them – would ultimately necessitate a detailed traffic volume analysis if larger-scale development is contemplated within the study area. Any future activity within the study area, no matter how transit-oriented it is, will inevitably affect vehicular movement. Therefore, a baseline of existing conditions would be needed.

Any lack of available vehicular capacity along crucial arteries such as Atlantic Avenue, Pennsylvania (Granville Payne) Avenue, and Eastern Parkway would reinforce the need to make any future reuse of land within the study area transit oriented. Effective parking policies and siting of future land uses could encourage development predominantly reached by subway, bus and commuter rail.

3.9 On-Street Parking Regulations

In August of 2007, the study team walked all streets in the study area to inventory all on-street parking regulations. Again, this was done to provide baseline existing conditions that could be used in future analyses or activity.

The on-street parking regulations vary greatly in the area – 49 different regulation types were found within the relatively small study area. They include alternate side parking on the residential blocks to restricted parking on commercial streets such as meter parking, time restricted parking, no standing, bus stops, hydrants, and authorized parking only. Regulations cover either a specific time of the day or a specific day of the week. The most common form of curbside regulations is alternate side parking, which is necessary for street cleaning once or twice per week.

Parking is permitted within the study area, except at locations where the traffic flow would be adversely affected, particularly during the AM and PM peak periods, or where curb space is needed for trucks and/or other authorized vehicles (such as police, fire, or transit vehicles). See Table 3-K for a list of the different curb regulations and Figure 3-R for their locations.



Broadway Junction Transit Capacity Study
ON-STREET PARKING REGULATIONS
FIGURE 3-T

Study Area Open Space On-Street Parking Regulations

○ ● x

0 250 500 Feet

Table 3-K: Key to On-Street Parking Regulations in Figure 3-R

<i>number</i>	<i>regulation</i>	<i>number</i>	<i>regulation</i>
1	Bus Stop – No Standing	26	No Standing – Except Trucks Loading/Unloading - 8:00 AM to 6:00 PM – Mon–Fri
2	1 Hour Metered Parking – 8:00 AM to 7:00 PM – Mon–Fri	27	No Standing Anytime
3	1 Hour Metered Parking – 9:00 AM to 4:00 PM – Except Sun	28	No Standing Anytime - 7:00 AM to 7:00 PM – Mon–Fri
4	1 Hour Metered Parking – 10:00 AM to 4:00 PM – Except Sun	29	No Standing Anytime – Except New York City Police Department Vehicles
5	1 Hour Metered Parking – 10:00 AM to 7:00 PM – Except Sun	30	Street Cleaning Regulations – 12:00 to 3:00 AM – Mon & Thurs
6	No Parking – 7:00 to 10:00 AM – Mon–Fri	31	Street Cleaning Regulations – 12:00 to 3:00 AM – Tues & Fri
7	No Parking – 7:00 to 10:00 AM – Except Sun	32	Street Cleaning Regulations – 3:00 to 6:00 AM - Mon & Thurs
8	No Parking – 7:00 to 10:00 AM & 4:00 to 7:00 PM – Mon–Fri	33	Street Cleaning Regulations – 3:00 to 6:00 AM – Tues & Fri
9	No Parking – 7:00 AM to 7:00 PM – Except Sun	34	Street Cleaning Regulations – 7:30 to 8:00 AM - Mon & Thurs
10	No Parking – 8:00 AM to 6:00 PM – Mon–Fri	35	Street Cleaning Regulations – 7:30 to 8:00 AM - Tues & Fri
11	No Parking – 8:00 AM to 6:00 PM – Except Sun	36	Street Cleaning Regulations – 8:00 to 9:00 AM - Mon & Thurs
12	No Parking – 4:00 to 7:00 PM – Mon–Fri	37	Street Cleaning Regulations – 8:00 to 9:00 AM - Tues & Fri
13	No Parking Anytime	38	Street Cleaning Regulations – 8:00 to 9:30 AM - Mon & Thurs
14	No Parking Anytime - 7:00 AM to 7:00 PM – Except Sun	39	Street Cleaning Regulations – 8:00 to 9:30 AM - Tues & Fri
15	No Standing - 7:00 to 10:00 AM – Mon– Fri	40	Street Cleaning Regulations – 8:00 to 9:30 AM - Except Sun
16	No Standing - 7:00 to 10:00 AM – Except Sun	41	Street Cleaning Regulations – 8:30 to 10:00 AM - Mon & Thurs
17	No Standing - 7:00 to 10:00 AM & 4:00 to 7:00 PM – Mon – Fri	42	Street Cleaning Regulations – 8:30 to 10:00 AM - Tues & Fri
18	No Standing - 7:00 to 10:00 AM & 4:00 to 7:00 PM – Except Sun	43	Street Cleaning Regulations – 9:00 to 10:30 AM - Mon & Thurs
19	No Standing - 7:00 to 8:00 AM – Except Sun	44	Street Cleaning Regulations – 9:00 to 10:30 AM - Tues & Fri
20	No Standing - 7:00 AM to 4:00 PM – Except School Days	45	Street Cleaning Regulations – 9:30 to 11:00 AM - Mon & Thurs
21	No Standing - 7:00 AM to 7:00 PM – Mon–Fri	46	Street Cleaning Regulations – 9:30 to 11:00 AM - Tues & Fri
22	No Standing - 4:00 to 7:00 PM – Mon–Fri	47	Street Cleaning Regulations – 11:30 AM to 1:00 PM - Mon & Thurs
23	No Standing - 4:00 to 7:00 PM – Except Sun	48	Street Cleaning Regulations – 11:30 AM to 1:00 PM - Tues & Fri
24	No Standing – Except New York City Transit Vehicles	49	No Posted Curb Regulations or Regulation Sign Missing
25	No Standing – Except Trucks Loading/Unloading - 6:00 AM to 6:00 PM – Mon–Fri		

4. EXISTING AND PROJECTED TRANSIT CAPACITY

4.1 Methodology

This chapter attempts to project transit capacity based upon anticipated populations growth in the neighborhoods through which the A, C J/Z and L pass through east of their peak loading points in Brooklyn.

To attempt a projection of year 2030 conditions, DCP's own population projections were used. In 2006, DCP developed citywide population projections for 10-year increments through 2030. Table 4-A shows the anticipated population growth in Brooklyn and Queens (the two boroughs through most relevant to this report) through 2030.

Using a scenario where this population is generally distributed in higher concentrations along existing transit, all data was projected to 2007 by subtracting 70 percent of the projected population growth between 2000 and 2010, assuming a steady 10 percent of the 2000-2010 growth rate per year over the decade. This was done to try to eliminate projected 2000-2007 population growth so that NYCT hourly ridership data from May 2007 could match with population projections with the same year as a baseline.

The May 2007 peak hour riderships for each station at and east of the peak loading points of the A, C, J/Z and L services (shown in Figure 3-Q) were then multiplied by anticipated 2007-2030 population growth.⁵⁰ For the A, C and L lines the aggregate peak hour is 8:00am-9:00am, while for the J/Z it is 7:00am-8:00am. Since these hours reflect the peak loading points, they are the ones used, regardless of whether individual stations may have higher ridership at other hours. Broadway Junction, where all of these lines converge, has a 7:00am-8:00am peak; this hour is used in the calculations for that station. 2007 data for the Broadway Junction station itself comes from the results of DCP's internal station count, as shown in Table 3-C in Section 3.3.1.

Table 4-A: 2000 Population and Projected 2030 Populations of Brooklyn and Queens, and Projected 2000-2030 and 2007-2030 Population Changes⁵¹

<i>Borough</i>	<i>2000 population</i>	<i>2007 U.S. Census Bureau population estimate</i>	<i>projected 2030 population</i>	<i>projected 2000-2030 population change</i>	<i>projected 2007-2030 population change</i>
Brooklyn	2,465,326	2,528,050	2,718,967	10.3%	7.6%
Queens	2,229,379	2,270,338	2,565,352	15.1%	13.0%
Brooklyn + Queens	4,694,705	4,798,338	5,284,319	12.6%	10.1%

⁵⁰ May ridership tends to be over 3.4 percent above average, meaning that the final projected available subway capacity will be slightly more conservative than if the hourly ridership was taken over the course of an entire year: Source: NYCT monthly ridership reports, as analyzed by the study team.

⁵¹ <http://www.census.gov/>

Aside from structural constraints, the primary limitation affecting available subway capacity is each line’s peak loading point. (See definition, page 9) Since the most recent systemwide peak loading point data is from 2006 (Table 4-B), ridership for 2007 at all stations east of the peak loading points except for Broadway Junction was compared to 2006 (Table 4-C). While inexact, the result yielded a reasonable extrapolation of peak loading point passenger volumes for 2007. L Line service enhancements implemented in late 2007 were also factored in.

Using the subway as the prime determinant of how much capacity there is for future land uses was chosen over buses or the LIRR because the affected bus routes act to some degree as feeder services to the Broadway Junction Complex, and because the LIRR does not go to Manhattan. Motor vehicle capacity was not used because doing so would be inconsistent with the goal of encouraging transit-oriented development.

Obviously, these estimates have their limitations. Growth will not be uniform across each borough or neighborhood – specific developments may affect nearest subway station’s ridership differently depending on its land use or distance from the station. For example, neighborhoods such as East Williamsburg, which have more than one set of subway lines running through it, may not necessarily accrue ridership at the same rate adjacent to each line. Growth projections for small areas also have greater variability than city- or boroughwide projections do. Other external factors (described in Section 4.4.3) could also affect overall ridership, and if disproportionate growth in passenger levels continues, ridership may exceed projections. However, the following tables indicate, in a general sense, the pressures upon available subway capacity and how they could impact Broadway Junction’s development potential.⁵²

4.2 Current Available Transit Capacity

A step-by-step approach was taken to determine what a reasonably accurate range would be for how much additional development could be sustained within the study area, given existing and anticipated future conditions.

4.2.1 Peak Subway Loading Points

Table 4-B shows the peak loading points of each relevant subway line as of 2006, the last year for which data is available.

<i>line</i>	<i>peak load point</i> ⁵³	<i>TPH</i> ⁵⁴	<i>peak hour passenger volume</i>	<i>guideline capacity</i> ⁵⁵	<i>volume/capacity ratio</i>	<i>available capacity</i>
A	Jay Street-Borough Hall	17.7	18,454	24,733	74.61%	6,279
C	Jay Street-Borough Hall	7.8	6,417	9,087	70.62%	2,670
J/Z	Marcy Avenue	12.0	8,716	13,920	62.61%	5,204
L	Bedford Avenue	15.0	18,258	17,400	104.93%	-858
TOTALS			51,845	65,140	79.59%	13,295

⁵² Nothing in this report implies any specific sequence or timeline for development. For example, Broadway Junction is not necessarily being considered “first in line” or “last in line” as a development priority due to the data contained within this report.

Before factoring in ridership growth and service increases from 2007, the L Line was running over capacity with 15tph. While A and C Line trains had ample additional capacity, they were running at a combined 25-26tph, which is the maximum capacity of the two-track segment both lines share from Hoyt-Schermerhorn Streets to Canal Street.

To obtain a more recent estimate of peak hour passenger volumes, ridership for 2007 at all stations east of the peak loading points except for Broadway Junction (which had internal passenger flow counts done as part of this study) was compared to 2006. The total average percentage growth for each line in 2007 was then added to the 2006 peak hour passenger volumes. While inexact, the result yielded a reasonable estimate of peak loading point capacities in 2007. The results are in Table 4-C. Two additional peak hour tph introduced on the L Line in late 2007 are factored into this table.

Table 4-C: Estimated Peak Loading Point Volumes and Available Capacity of A, C, J/Z and L Subway Lines, 2007

<i>line</i>	<i>peak load point</i>	<i>TPH</i>	<i>estimated peak hour passenger volume</i>	<i>guideline capacity</i>	<i>estimated volume/capacity ratio</i>	<i>estimated available capacity</i>
A	Jay Street-Borough Hall	17.7	18,686	24,733	75.55%	6,047
C	Jay Street-Borough Hall	7.8	6,498	9,087	71.51%	2,589
J/Z	Marcy Avenue	12.0	9,170	13,920	65.88%	4,750
L	Bedford Avenue	17.0	19,645	19,720	99.62%	75
TOTALS			53,999	67,460	80.05%	13,461

The additional L service has brought that line’s v/c ratio just barely below 100 percent, but given the relentless ridership growth along this line over the past decade (which showed no signs of abating in 2007), a ratio below 100 percent appears short-lived. In Section 3.3.5, this report reviews several improvements NYCT is planning or implementing on the line to allow it to carry 20-22tph. Should that happen, 3,480 to 5,800 additional passengers would be able to utilize the L during the peak hour, increasing capacity by approximately 18 to 29 percent.

While the need for capacity expansion on the other subway lines is not as urgent, all three other routes have the potential to accommodate more passengers. C Line trains could expand from eight to 10 cars. Additional service is theoretically possible on the J line, although the numerous infrastructure deficiencies on that line may severely limit the ability to add more service if needed. In the long term, A Line capacity could be expanded slightly if the proposed 75-foot-long R179 car fleet, tentatively scheduled to be delivered in the ‘10s, eliminates transverse seating and uses standard longitudinal seats, i.e. seating entirely facing inward from both edges of the car to the center. Table 4-D summarizes potential capacity improvements on all of the above lines.

⁵³ Both the A and C lines have southbound peak loading points in Manhattan which carry more passengers than the ones in Brooklyn. Service planning decisions would probably be governed by the Manhattan peak loading points more than the Brooklyn ones.

⁵⁴ For the A and C lines, this figure represents actual tph through the peak loading point. The A has 18.0 scheduled tph; the C has 8.0 tph. The v/c ratio is calculated using actual tph, not scheduled tph. Guideline capacity is calculated by multiplying

⁵⁵ Guideline capacity is a standard used by NYCT to determine the threshold at which passenger loading exceeds available space within a subway car. For 60.5-foot B Division cars such as those on all of the above lines, the threshold is 145 passengers per car; 75-foot B Division cars, which share the A Line with 60.5-foot cars, have a 175 passenger per car threshold. C, J/Z and L trains all run 484-foot-long trains (eight 60.5-foot cars). A trains run with either 10 60.5-foot cars (605 feet) or eight 75-foot cars (600 feet), but NYCT uses 75-foot cars for it’s a Line guideline capacity calculations. If necessary, C trains can run 10 cars, but, J/Z and L trains, due to platform limitations, are confined to their current lengths.

Table 4-D: Potential Capacity Improvements on A, C, J/Z and L Subway Lines

<i>line</i>	<i>capacity improvement</i>	<i>peak hour impact</i>	<i>potential obstacles and drawbacks</i>
A	R179 subway car fleet with longitudinal seating only	Guideline raised from 175 passengers per car to 181-185, an increase of 841-1,409 passengers per hour, or 3.4%-5.7%.	Less seating; will not be available until at least 2014.
C	10-car trains	Passenger capacity increase of 2,188, or 25%.	Storage space needed for additional cars; passengers might switch to faster A express trains at the first possible opportunity, crowding them further.
J/Z	Expansion to 16TPH (leaving 10TPH for M Line)	Passenger capacity increase of 4,640, or 25%.	Numerous physical limitations of line may affect ability to add this much service; storage space needed for additional cars.
L	Expansion to 20-22TPH	Passenger capacity increase of 3,480-5,800, or 17.6%-29.4%.	Storage space needed for additional cars; contingent on planned NYCT line upgrades.

The L Line faces the press of rapidly increasing ridership, but it may be the A Line which will be the most severely constrained if ridership continues to grow along its route. In Manhattan, its southbound peak load point – 125th Street – was operating at over 83 percent of capacity in 2005 and 87 percent in 2006. Additional trains per hour on this line are not likely, since the Cranberry Street Tunnel, through which the A and C share trackage, is now maxed out at 26tph. All A trains are already running at their maximum possible lengths. Only a reconfigured car interior offers some modest relief.

4.2.2 Bus and LIRR Analyses

Lack of depot space and the cost of adding service do more to limit adding bus service than peak loading points do. A discussion of both factors, including the impact that a new depot which opened in January 2008 has had on available capacity at East New York, is included in a discussion of bus service in Section 4.4.1.

Since the LIRR’s ample capacity to accommodate additional passengers has been documented, and since future service patterns (discussed in Section 4.3.3) could assume one of several forms over the coming decades, analysis was not done of how many more potential passengers could be accommodated by this stretch of railroad.

4.3 Projected 2030 Transit Capacity

4.3.1 Subways

Table 4-E yields line-by-line estimates of available subway capacity in 2030, both using existing subway service levels and the potential capacity improvements reviewed in Table 4-D. It is important to stress that the estimated 2030 available capacity is *post*-projected population growth and *post*-capacity improvements.

The estimated ridership was *not* derived by simply adding up all of the projected 2030 boardings at each line’s station, because not all projected new passengers will be heading to the CBD/Downtown Brooklyn core. Instead, the total May 2007 average peak hour ridership for each line was compared to projected 2030 levels, and the percentage change in ridership per line was applied to the 2007 figures from Table 4-C.

Table 4-E: Potential Available Subway Line Capacities, 2030

Projected Ridership Increases: A: 16.70% C: 17.11% J/Z: 12.63% L: 13.45%

Line	2030 estimated peak hour ridership	existing 2007 peak guideline capacity	peak guideline capacity with improvements	2030 volume/capacity ratio with existing capacity	2030 volume/capacity ratio with capacity improvements	estimated available 2030 capacity with improvements
A	21,807	24,733	25,574-26,142	88.17%	83.42%-85.27%	3,767-4,335
C	7,610	9,087	11,358	83.75%	67.00%	3,748
J/Z	10,328	13,920	18,560	74.20%	55.65%	8,232
L	22,287	19,720	23,200-25,520	113.02%	87.33%-96.06%	913-3,233
	62,032	67,460	78,692-81,580	91.95%	76.04%-78.83%	16,660-19,548

Based on the data, and based on the assumptions laid out in Section 4.1, DCP estimates that, if the potential and anticipated capacity improvements from Table 4-D are made, subway routes serving Broadway Junction would be able to accommodate the possible population growth scenario for 2030, with substantial additional capacity remaining.

DCP estimates that up to 16,660 to 19,548 additional peak-hour, peak-direction subway users could be accommodated by the subway routes serving the study area. Note that this figure represents estimated future available capacity not just for the Broadway Junction station, but for other stations on these lines as well.

However, these analyses results come with a significant caveat. Note the lack of capacity on the L Line and the copious available space for passengers on the J/Z Line. Even with capacity upgrades, the L may be running at over 96 percent of peak-hour, peak-direction capacity by 2030. While this peak would not affect all L service users at all times of the day, it does represent a potential planning challenge.

While the estimates shown in Table 4-E apply to the peak hour and peak direction, it is important to note that in the coming years many new passengers may be regularly using these routes outside peak hours, or will not be commuting through the peak loading point. Many subway passengers may be reverse commuting – recent rezonings such as the one at Jamaica could encourage development of regional business centers that would generate more reverse-peak and intermediate-distance commuters. (Reverse commuting in general is growing at a faster rate than traditional commuting.)

The capacity for growth within the study area could also be affected by future land use decisions in the Broadway Junction vicinity. These decisions would require consideration of numerous factors that are outside the scope of this study, including land use, neighborhood character, and other infrastructure, and would entail outreach and consensus building with community stakeholders.

Any projection, no matter how well-grounded in available data and reason, is subject to unforeseen social, economic, geopolitical and technological developments. If the rapid subway ridership growth of the past decade continues unabated, the projected passenger loads in the above table may be reached far sooner than 2030. As with many projections, the reasoning and methodology creating it is always open to argument. Other, more mundane factors can also warp these numbers. Try as they might, after over 100 years, no one has successfully convinced New Yorkers to uniformly stay on a local train when an express is pulling in across the platform. C Line passengers in or near the study area will probably continue to seek out a faster ride on arriving A trains, making truly accurate predictions about both routes' available capacities elusive.

4.3.2 Buses

In January 2008, a new depot at Grand Avenue in Queens opened, and although none of the routes discussed in this report were transferred there, the total amount of buses stored overnight at East New York Depot and its bus storage yards dropped from 286 to 234. With a total complex bus capacity in the range of 276-279, the overnight occupancy rate has dropped to 83.9 to 84.8 percent.

At first glance, this means that 42 to 45 additional buses can be accommodated at the depot and its associated yards. However two additional factors must be considered. 1) While five of the bus routes which pass through the study area are based out of East New York, seven other routes (the B7, B14, B17, B42, B45, B65, and B82) also use East New York as their base. Ridership increases or extensions of these routes would also warrant allocation of additional buses to the depot. 2) Currently, 17 to 20 buses are stored in the “paint shop” section of the depot, and a decision about whether to demolish this structure and replace it with a new bus parking area has not yet been made. If this project were to occur in the coming years, total available capacity of the depot and its yards would temporarily be reduced to 259, shrinking the potential available capacity to 25 additional buses for at least 14 months.⁵⁶

Additional bus capacity has the potential to increase the study area’s attractiveness for development. However, an additional factor to consider is that buses and subways do not exist in a vacuum. Any significant expansions, changes, additions, or reductions to the bus network serving Broadway Junction would likely impact that station’s subway ridership, since, as seen in Table 3-I, over a third of the current passengers entering the station are doing so from local buses.

4.3.3 LIRR Atlantic Division

Even at peak hours, LIRR train capacity between Jamaica and Flatbush Avenue is adequate to handle ridership at East New York and along the Atlantic Division as a whole. (See Table 3-H in Section 3.4.1.) The vast majority of ridership from East New York is to and from points east, even during peak periods when the assumption would be that more passengers would be commuting to and from Flatbush Avenue. Since the LIRR parallels the A and C west of the study area, some of that excess capacity may have limited use as a relief valve, drawing passengers destined for Downtown Brooklyn from more crowded A trains. Reduced LIRR fares between East New York and Flatbush Avenue could draw more riders, but could push more connecting subway passengers to the already-overcrowded 2, 3, 4 and 5 lines instead of keeping them on the A and C, which have more available capacity.

Longer-term questions about utilization of the LIRR East New York station – and the Atlantic Division – remain open. One of several potential fates await this right-of-way after completion of the East Side Access project, which will provide direct LIRR service into Grand Central Terminal. Service could continue as is, or could be truncated to a permanent shuttle between Flatbush Avenue and Jamaica. If funding materializes to use the Atlantic Division as part of a link between JFK Airport/Jamaica and Lower Manhattan (either as a commuter rail or subway), the right-of-way’s use as an alternative to A and C service could become much more significant than it now is, and could augment this corridor’s capacity. Proposals to link such a route to the 2nd Avenue Subway, creating a continuous service from 125th Street in Manhattan to JFK Airport, would further amplify the line’s importance. Still other possibilities, such as partially relocating J/Z service into the tunnel east of the study area, cannot be discounted.

⁵⁶ MTA New York City Transit Contract C-40451. <http://www.mta.info/nyct/procure/miscproj/c40451.pdf>.

4.4 Factors Within and Beyond the Study Area

DCP has been able to determine a range of potential transit capacity that can be utilized at Broadway Junction. However, the complicated relationship between the study area and existing transit to and from the area prevents simple, unambiguous proclamations that all potential development is viable.

Other factors also can affect the future of Broadway Junction – some of them from well beyond the study area boundaries. These are described below.

4.4.1 Buses: Depot Storage Space and Cost of Operations

According to NYCT, peak loading is not the significant obstacle on the bus routes serving Broadway Junction that it is on the subways. Scheduling along all six routes is dictated by the ability to match capacity with the peak passenger load, and all six routes roughly achieve that match.⁵⁷ Unlike subways, buses are not as constrained by exclusive signaling and rights-of-way – buses can leapfrog a delayed bus on their own route, and as many of them can be scheduled as the road's capacity will allow. Yet buses are limited by two other considerations: depot space and operational cost.

Every route discussed in this study except for the B20 is based out of East New York Depot; the B20 originates at Fresh Pond Depot.⁵⁸ By the end of 2007, East New York – including Havens Lot and Herkimer Lot (see Section 3.2.1) – was storing 286 buses in the overnight hours, when depots are at their fullest. This was seven to 10 buses over capacity. However, in January 2008, a new depot at Grand Avenue in Queens opened, and while none of the Broadway Junction routes were transferred there, the total overnight depot and bus storage yard count was reduced from 286 to 234 due to buses serving other routes being transferred to the Grand Avenue Depot.

Cost is another factor when adding bus service. Expanding the B83 bus route is expected to increase annual operating expenses on the route by \$875,000.⁵⁹ While service expansion costs may be partially offset by the additional revenues, NYCT and the MTA as a whole are operating under tremendous economic pressures in an increasingly uncertain economic climate. The MTA is also paying for two additional major network expansions: the 2nd Avenue Subway and LIRR East Side Access – this aside from ongoing efforts to rehabilitate the subway and bus networks and keep them in a state of good repair. Amid constant pressure to keep transit fares at or close to their current levels and search for new revenue sources, NYCT may find it more difficult to obtain funding for service expansions.

4.4.2 Existing Population and Land Use Within the Study Area

Any reuse of existing land within the study area would have to be cognizant of the 4,377 residents (as of 2000) who live there. Most of these residents are predominantly clustered in the eastern and western thirds of the study area.

The eleven blocks largely along the southern edge of the study area are part of the East New York Industrial Business Zone. The Bloomberg administration has guaranteed not to support rezoning of any lots within an IBZ for residential uses. While this does not preclude development within the IBZ, it limits its type to manufacturing uses.

The land and airspace directly above and land surrounding the NYCT subway/bus depots and maintenance facilities appear to be the most viable locations for new development. One possible way to

⁵⁷ Source: Ira Haironson, Manager, Brooklyn/Queens/Staten Island Bus Service Planning, NYCT, November 30, 2007.

⁵⁸ Some buses based out of East New York normally assigned to other routes are assigned to the B20 run during school hours.

⁵⁹ NYCT press release, September 24, 2007. <http://mta.info/mta/news/releases/?en=070924-NYCT118>. NYCT expects increased ridership on the route to partially offset these costs.

accommodate new land uses is to build a deck over existing ones. Both NYCT's East New York Yards and the New York & Atlantic Railway's Bay Ridge Line are included in DCP's *Inventory of Decking Opportunities over Transportation Properties*. One such parcel in the study area lies immediately above the subway yards and measures over 5 acres.⁶⁰

4.4.3 External Factors

No neighborhood's long-term development exists in a vacuum. As of September 2007, there may have been enough combined subway capacity to add over 13,450 available passengers to the A, C, J/Z and L (see Table 4-D), but committing that number entirely to the Broadway Junction study area would be short-sighted—especially since several external factors limit the potential growth of the study area, and the transit system's ability to absorb such growth:

- *Citywide growth in subway ridership, and transit capacity constraints.* From 1997 to 2007, annual systemwide subway ridership grew by about 47.2 percent – from 1.062 billion to 1.562 billion – a level not reached since 1951.⁶¹ The disproportionate growth in subway ridership is attributable to several factors, such as introduction of universal free bus-subway transfers, unlimited-ride MetroCards, and free ride incentives for purchases on declining-balance MetroCards. Increasing system reliability and a prosperous economy may also have played roles. More recently, the high cost of gasoline may have also caused modal shifts to transit. Rapid usage growth, however, brings its own problems: by 2006, nine of the subway's 22 major lines were operating at over 95 percent of capacity at their peak loading points: the 2, 3, 4, 5, 6, 7 (express), B, E, and L.⁶² The L is a particular source of concern as far as Broadway Junction is concerned. (See Section 3.3.5.)
- *Systemic transit constraints.* The lack of one-seat J/Z service to Midtown decreases the attractiveness of the study area, but options such as combining the M and V offer no easy panacea, since the new service would not be able to run 605-foot trains. Construction of a commuter-oriented residential enclave could therefore further tax the L Line, which travels along 14th Street and provides transfers to trains along every north-south subway route in Manhattan farther north than the J/Z does.
- *Changes in bus operating practices.* In 2008, NYCT introduced limited-stop Select Bus Service on the Bx12 route in the Bronx. Incorporating some elements of bus rapid transit, Select Buses utilize priority signaling and exclusive lanes along parts of their route. Prepaid boarding, widely used in other transit systems worldwide, also reduces bus stop times, since passengers can now legally enter through the back door and avoid queuing at the farebox. Bus routes serving the study area could theoretically be candidates for future Select Bus routes, which would increase the potential reach of the study area as an easy commuting destination.
- *Other external factors.* Several other factors beyond the control of the City or community can affect the course, pace, or capacity of development in the area, such as transit fare increases, shifts in employment destinations, economic cycles and the cost of materials and labor.

⁶⁰ *Inventory of Developable Air Rights over Transportation Properties*. NYDCP, publication pending. Pp. 228-231

⁶¹ MTA NYCT 2007 subway station annual ridership data

⁶² Source: NYCT 2006 peak loading point data. While ridership has grown since 2006, it is unlikely that peak loading point ridership has broken 95 percent of capacity on any other line by early 2008. N/W Line express trains were the next most crowded, reaching 89.10 percent of capacity at Queensboro Plaza.

5. RECOMMENDATIONS AND NEXT STEPS

5.1 Recommendations Based Upon Existing Land Use and Transit Capacity

- Working with community stakeholders, a further study should be undertaken which would determine the best way to utilize the land immediately surrounding this juncture of subway, bus and rail routes.
- Determine locations within the station complex where passenger flow is constrained – both on platforms and along transfer passageways. Station element capacity expansion may ultimately be needed, especially if development occurs in the study area. The lengthy escalator and elevated walkway connecting the J/Z and L with the A, C and the front entrance may ultimately need to be widened, and a fourth escalator installed, if feasible.
- To help balance platform loading, add two seating areas at both the Queens- and Manhattan-bound J/Z platforms and the Queens- and Manhattan-bound A/C platforms. Signage encouraging passengers to move towards the center of the platforms should be installed.
- If NYCT decides to supply the C Line with 10-car trains in the near future, a targeted marketing campaign aimed at C Line passengers between Euclid Avenue and Jay Street should be launched encouraging passengers to stay on the C instead of transferring to the A train at express stops. Brooklyn C Line passengers from Broadway Junction west save up to only 6 minutes when heading to destinations as far away as 42nd Street. With 10 cars, C trains would be operating with appreciably more available capacity than A trains.

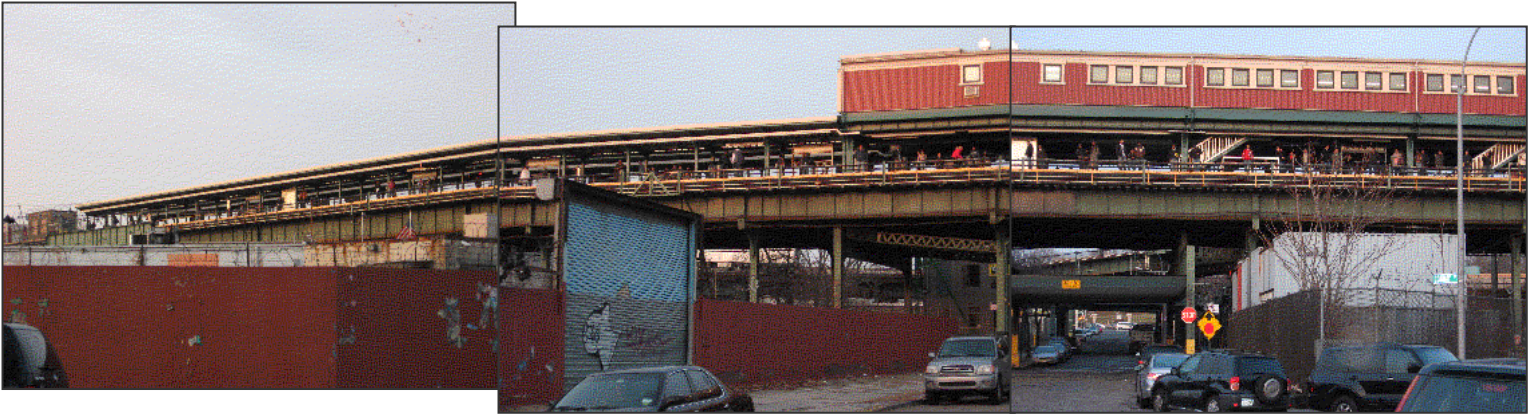


In the PM peak, passengers from a Queens-bound A train fill the platform's only existing platform exit.

5.2 Suggestions to Improve Transit Capacity, Facilities and Service

The following suggestions tend to be longer term in scope. Some of them also would require larger expenditures, but with the benefit of more significant service or facility improvements.

- To help balance platform loading, the Eastern Parkway entrance to the J/Z Line platforms should be rehabilitated and reopened – especially if increased activity comes to the study area. For the A/C platforms, stairways to Sackman Street (a short distance from Eastern Parkway) should ultimately be constructed at the west ends of both platforms.
- Investigate ways that future development in the study area could be linked with employment, residential or cultural destinations that do not involve use of the L Line. Commercial development in places such as Jamaica and reverse commute destinations could, in the long term, more equitably balance service utilization. Lower Manhattan, the Lower East Side, Downtown Brooklyn, and along Broadway in Brooklyn are among other potential destinations. The vast



Above: Although only 73 people were visible on the eastbound J/Z platform at the beginning of this typical PM rush hour period, uneven platform loading exists in this composite view. Thirty-one passengers were counted in the photo of the platform's east end (at right, near the stairs), 24 in the middle photo, an 18 in the left (western) photo – which covers more than one-third of the entire platform. When the platform is more crowded, this trend is exacerbated.

Below: the Eastern Parkway mezzanine entrance, closed to passengers.

majority of available subway capacity is geared towards these area, and while it appears that some minor excess L Line capacity will exist in 2030, it may be limited compared to that of the J/Z, C, and to some extent the A services. However, if the study area is developed as a commercial center, larger quantities of reverse peak commuters could be accommodated on the L Line.



- The upcoming R179 order of 75-foot subway cars should have longitudinal seating to allow higher guideline capacities per car.
- The L Line terminal interlocking east of 8th Avenue should ultimately be rebuilt closer to 8th Avenue, increasing line capacity.
- If significant development is expected to occur in or west of the study area along Broadway, NYCT should investigate the feasibility of reintroducing 6th Avenue K Line service via Chrystie Street to the Broadway-Brooklyn/Jamaica Line. The cost and difficulty of extending platforms to allow 10-car trains would be a major factor in determining how far east such a service would penetrate. Any analysis of reactivating K service would have to measure the impact of potential service losses along the Nassau Loop and the current peak hour M service along the West End Line. A comparative analysis of the benefits and drawbacks of K Line service versus extended V Line service to Church Avenue in Brooklyn would also need to be undertaken.
- An L Line which ultimately runs 20 to 22TPH should be able to accommodate anticipated growth through 2030. However, should additional capacity be needed, NYCT should consider undertaking detailed design, engineering and cost analyses in the short term for extending all

platforms and yard tracks used by the route to accommodate both 9- and 10-car trains in the long term.

- The City should work with and support any future efforts by NYCT to find additional yard space for L Line traincars. Construction of additional L Line yard space will ultimately be necessary, regardless of whether lengthier trains are ultimately needed. Five to six 10-car tracks could be added by adding onto to the southern flank of the six-track elevated deck which parallels Broadway within East New York Yard. (The extension would need to be at a slightly higher elevation than the existing deck.) Additional tracks could be added if the building to the southwest can be shaved down. In general, the more that East New York Yard can be reconfigured to allow complete 8- or 10-car trainsets to use it, the more operationally efficient it will be. A long-term goal should be the removal of all tracks that cannot hold at least an 8-car, 484-foot train (and preferably a 10-car, 605-foot train).

Additional storage and maintenance possibilities abound along the lengthy stretch of the L Line which parallels the NY&A Bay Ridge Line between the Brooklyn borough line and New Lots Avenue. Besides the unused elevated deck between Atlantic Avenue and Sutter Avenue (see below), two of the four trackways within the mostly-abandoned the NY&A East New York Tunnel could provide all-weather storage for approximately 116 cars if the tunnels were to be retrofitted to allow sufficient secure employee access and ventilation. Other property, including an approximately 1,900-foot-long parcel between Livonia Avenue and New Lots Avenue generally used for storage of railties and prefabricated track segments, also can be used.

- Although a significant amount of excess infrastructure was removed along the L Line between Broadway Junction and Sutter Avenue, large sections of elevated deck remain that currently serve no purpose. Three possible scenarios exist for this infrastructure:
 - Reuse as an elevated storage area. At slightly over 1,800 linear feet each, these two trackways can store a total of 60 railcars.
 - Rehabilitation of the former middle platform at Atlantic Avenue for use as a terminal for K Line service, if such a service is ever reactivated.
 - Demolition, if the active elevated deck is reinforced to make it structurally independent from the unused trackways.

Demolition would partly restore some daylight to Van Sinderen Avenue, an exceptionally narrow roadway that acts more as a service alley than a road along this stretch. This could in turn spur some modest additional industrial development along this road.

- Ultimately, if either a new maintenance facility can be built or yard leads to East New York's maintenance shops can be connected to the NY&A East New York Tunnel, the L Line could be relocated from its current alignment into the Bay Ridge Line ROW from Wilson Avenue to New Lots Avenue. Doing so would open up approximately 140,000 to 150,000 square feet of land (or more than 3 acres) within the study area for reuse.

Built and then grade-separated by two separate private railroads between about 1865 and 1915, these two parallel alignments once accommodated six elevated tracks and room for four more in an open cut.⁶³ Both alignments are now owned by MTA agencies. (The LIRR owns the Bay

⁶³ Peter Dougherty, *Tracks of the New York City Subway*, Version 3.3 (2002), pp. 64-65; Bob Emery Map Collection, LIRRHistory.com, <http://www.lirrhistor.com/emery/bayridge/br4tunlib.jpg>. Although the open cut was built to

Ridge Line.) Neither one is being used at anywhere near its capacity, and continued maintenance of both is a costly, redundant commitment of resources. As of 2008, only three out of the eight remaining trackways are in use: the two active L Line tracks on the surviving four-track elevated deck, and one NY&A freight track in the Bay Ridge Line open cut, which can accommodate four tracks. Placing the L Line in the Bay Ridge Line open cut would put three of its four trackways in use, leaving room for an additional track if future needs require it.

Connecting tracks could be built beneath Broadway between the relocated L Line and the A/C (Fulton Street) tracks, opening up new service possibilities such as a 14th Street-JFK Airport route, or an 8th Avenue-Fulton-Canarsie service. The latter could be a major service improvement, since DCP's subway count data suggests significant peak-directional passenger flows between the southeastern end of the L Line and A and C trains to and from Manhattan. Reassignment of the L fleet to Pitkin Yards could also become possible if sufficient space exists.



Rebuilt by two separate corporations in the early 20th century, today's L Line viaduct (left) and the NY&A Bay Ridge freight line (right) operate redundant rights-of-way which can be consolidated, reducing maintenance costs and opening up more space for potential reuse.

A new, consolidated, 10-car L Line Broadway Junction-Atlantic Avenue station, built between Fulton Street and Atlantic Avenue, would provide a greatly simplified transfer to the A and C platforms at its north end and the LIRR East New York station at its south end. The new station would take the place of two existing ones, further reducing travel times and operational costs.

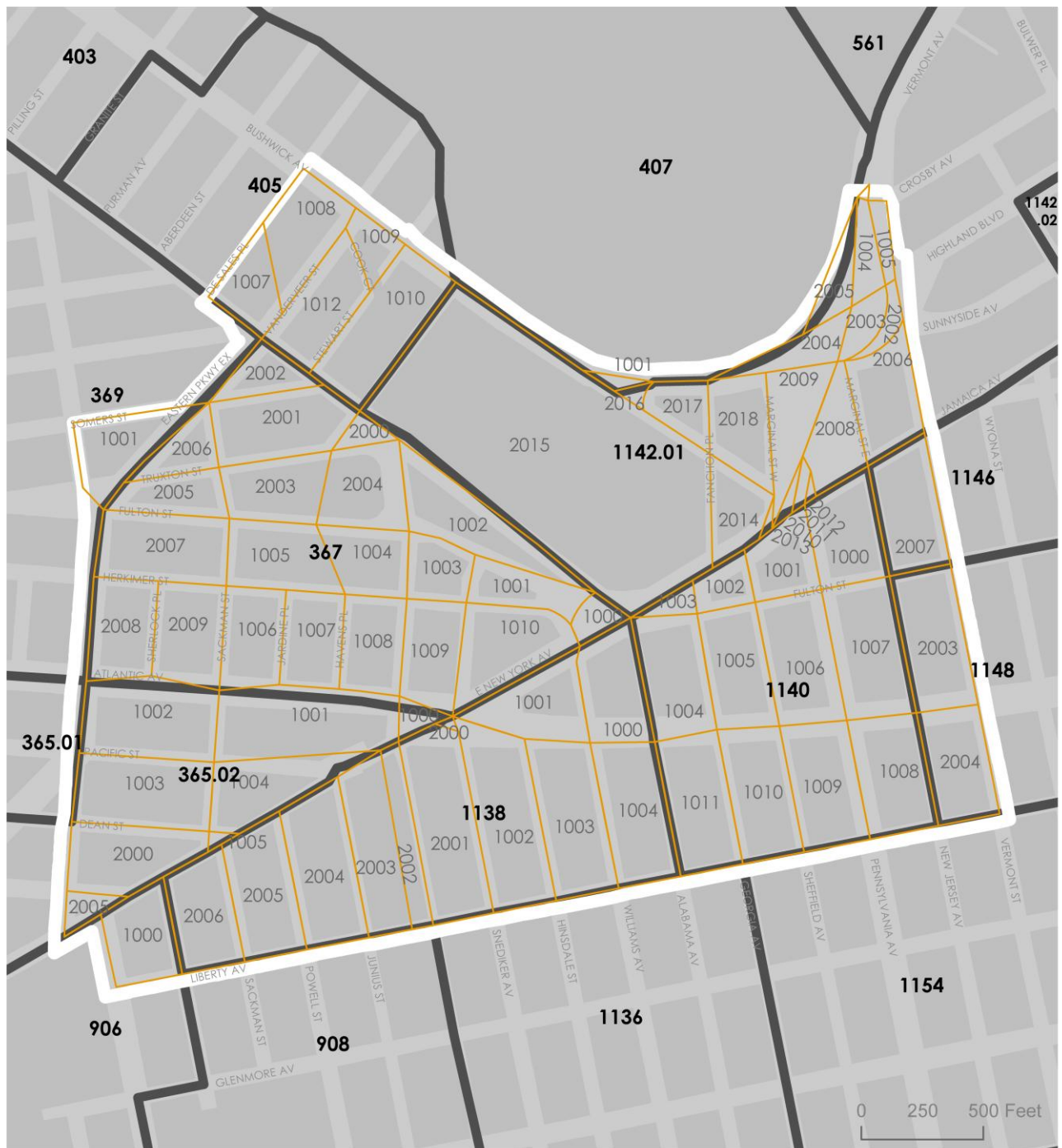
The existing elevated structure could then be demolished, Van Sinderen Avenue could also be widened to a more standard street width, if desired.

- Addressing the design deficiencies discussed in Section 3.3.4 along entire Jamaica Line would provide long-term benefits to the study area by increasing capacity and operating speeds along the route.

5.3 Next Steps

Few areas in the City have as much potential to effectively utilize their transit capacity as Broadway Junction does. Future land use and zoning analyses can consider what types of development might best take advantage of its available transit capacity.

accommodate four tracks, there is some uncertainty as to whether more than three tracks ever existed at any one time through the study area. The six elevated tracks included two which were demolished in the early 2000s that ran a block to the east above Snediker Avenue.



- 1000 Study Area Census Blocks 2000
- 100 Census Tracts 2000
- Broadway Junction Study Area

Broadway Junction Transit Capacity Study

CENSUS BLOCKS AND TRACTS
FIGURE A-A

APPENDIX A:

Table A-A: 2000 United States Census Block List, with Populations and Current Zoning

Entirely M-zoned blocks with residential populations are shaded in yellow. In 2000, 1,623 people were counted on these blocks.

2000 US CENSUS TRACT	BLOCK	BOUNDED BY:				2000 pop.	zoning
		N	E	S	W		
365.02	1000	Atlantic Ave.		East New York Ave.	Van Sinderen Ave.	0	M1-2
365.02	1001	Atlantic Ave.	Van Sinderen Ave.	Pacific St., East New York Ave.	Sackman St.	60	M1-2
365.02	1002	Atlantic Ave.	Sackman St.	Pacific St.	Eastern Pkwy. Ext.	181	R6
365.02	1003	Pacific St.	Sackman St.	Dean St.	Mother Gaston Blvd., Eastern Pkwy. Ext.	341	R6
365.02	1004	Pacific St.		Dean St., East New York Ave.	Sackman St.	149	M1-2
365.02	2000	Dean St.	Sackman St.	Bergen St., East New York Ave.	Mother Gaston Blvd.	70	M1-1, R6
365.02	2005	Bergen St.		East New York Ave.	Mother Gaston Blvd.	0	M1-1
365.02	(E)1005	Dean St.		East New York Ave.	Sackman St.	16	M1-1
365.02	(W)1005		Sackman St.	East New York Ave.	Sackman St.		M1-1
367	1000	Broadway		Jamaica Ave.	Williams Ave.	0	M1-1
367	1002	Broadway		Fulton St.	Van Sinderen Ave.	2	M1-2
367	1003	Fulton St.	Williams Pl.	Herkimer St.	Van Sinderen Ave.	0	M1-2
367	1006	Herkimer St.	Jardine Pl.	Atlantic Ave.	Sackman St.	241	M1-2
367	1007	Herkimer St.	Havens Pl.	Atlantic Ave.	Jardine Pl.	111	M1-2
367	1008	Herkimer St.	Van Sinderen Ave.	Atlantic Ave.	Havens Pl.	1	M1-2
367	1009	Herkimer St.	Williams Pl.	Atlantic Ave.	Van Sinderen Ave.	3	M1-2
367	2000	Broadway		Truxton St.	Conway St.	0	M1-1
367	2001	Somers St., Broadway	Conway St.	Truxton St.	Sackman St.	138	M1-1
367	2002	Broadway		Somers St.	Eastern Pkwy. Ext.	0	M1-1
367	2005	Truxton St.	Sackman St.	Fulton St.	Eastern Pkwy. Ext.	4	M1-1
367	2006		Sackman St.	Truxton St.	Eastern Pkwy. Ext.	140	M1-1
367	2007	Fulton St.	Sackman St.	Herkimer St.	Eastern Pkwy. Ext.	244	M1-2, R6
367	2008	Herkimer St.	Sherlock Pl.	Atlantic Ave.	Eastern Pkwy. Ext.	110	R6
367	2009	Herkimer St.	Sackman St.	Atlantic Ave.	Sherlock Pl.	256	M1-2, R6
367	(E)1004	Fulton St.	Van Sinderen Ave.	Herkimer St.	Sackman St.	0	M1-2
367	(E)2004	Truxton St.	Van Sinderen Ave.	Fulton St.	Sackman St.	0	M1-1
367	(N)1001	Fulton St.		Herkimer St.	Williams Pl.	0	M1-2
367	(S)1010	Herkimer St.	Williams Ave.	East New York Ave.	Williams Pl.	17	M1-2

367	(W)1005	Fulton St.	Van Sinderen Ave.	Herkimer St.	Sackman St.	104	M1-2
367	(W)2003	Truxton St.	Van Sinderen Ave.	Fulton St.	Sackman St.	2	M1-1
369	1001	Somers St.	Eastern Pkwy Ext.	Truxton St.	Mother Gaston Blvd.	48	M1-1
405	1010	Bushwick Ave.	Conway St.	Broadway	Stewart St.	4	M1-1
405	(N)1008	Bushwick Ave.	Eastern Pkwy Ext.		De Sales Pl., diagonal N-S line	0	M1-1
405	(N)1009	Bushwick Ave.	Stewart St.	Cooke Ct.	Eastern Pkwy. Ext.	0	M1-1
405	(S)1007		Eastern Pkwy Ext., diagonal N-S line	Broadway	De Sales Pl.	31	M1-1
405	(S)1012	Cooke Ct.	Stewart St.	Broadway	Eastern Pkwy. Ext.	97	M1-1
407	(W)1001			Bushwick Ave.		0	R3-2
906	1000	East New York Ave.	Christopher Ave.	Liberty Ave.	Mother Gaston Blvd.	78	M1-4
1138	1000	East New York Ave.	Alabama Ave.	Atlantic Ave.	Williams Ave.	5	M1-1
1138	1001	East New York Ave.	Williams Ave.	Atlantic Ave.		32	M1-1
1138	1002	Atlantic Ave.	Hinsdale St.	Liberty Ave.	Snediker Ave.	32	M1-4
1138	1003	Atlantic Ave.	Williams Ave.	Liberty Ave.	Hinsdale St.	125	M1-4
1138	1004	Atlantic Ave.	Alabama Ave.	Liberty Ave.	Williams Ave.	27	M1-4
1138	2000	East New York Ave.	Snediker Ave.	Atlantic Ave.		0	M1-4
1138	2001	East New York Ave., Atlantic Ave.	Snediker Ave.	Liberty Ave.	Van Sinderen Ave.	0	M1-4
1138	2004	East New York Ave.	Junius St.	Liberty Ave.	Powell St.	0	M1-4
1138	2005	East New York Ave.	Powell St.	Liberty Ave.	Sackman St.	14	M1-4
1138	2006	East New York Ave.	Sackman St.	Liberty Ave.	Christopher Ave.	0	M1-4
1138	(E)2002	East New York Ave.	Van Sinderen Ave.	Liberty Ave.	Junius St.	0	M1-4
1138	(W)2003	East New York Ave.	Van Sinderen Ave.	Liberty Ave.	Junius St.	0	M1-4
1140	1000	Jamaica Ave.	New Jersey Ave.	Fulton St.	Granville Payne Ave.	110	C8-2, R4
1140	1001	Jamaica Ave.	Granville Payne Ave.	Fulton St.	Sheffield Ave.	0	C8-2
1140	1002	Jamaica Ave.	Sheffield Ave.	Fulton St.	Georgia Ave.	0	M1-1
1140	1003	Jamaica Ave.	Georgia Ave.	Fulton St.		0	M1-1
1140	1004	Fulton St.	Georgia Ave.	Atlantic Ave.	Alabama Ave.	127	M1-1
1140	1005	Fulton St.	Sheffield Ave.	Atlantic Ave.	Georgia Ave.	218	C4-1
1140	1006	Fulton St.	Granville Payne Ave.	Atlantic Ave.	Sheffield Ave.	134	C8-2
1140	1007	Fulton St.	New Jersey Ave.	Atlantic Ave.	Granville Payne Ave.	23	C8-2
1140	1008	Atlantic Ave.	New Jersey Ave.	Liberty Ave.	Granville Payne Ave.	39	C8-2
1140	1009	Atlantic Ave.	Granville Payne Ave.	Liberty Ave.	Sheffield Ave.	139	C8-2, M3-2

1140	1010	Atlantic Ave.	Sheffield Ave.	Liberty Ave.	Georgia Ave.	19	M3-2
1140	1011	Atlantic Ave.	Georgia Ave.	Liberty Ave.	Alabama Ave.	0	M3-2
1142.01	1004	Jackie Robinson Pkwy: WB Highland Blvd., NW of mainline				37	R3-2
1142.01	1005	Jackie Robinson Pkwy: WB Highland Blvd., NE of mainline				44	R3-2
1142.01	2002	Jackie Robinson Pkwy: minor blocks (2002, 2003, 2008, 2009, 2010, 2011, 2012, 2013)				0	R3-2, R4
1142.01	2004	Jackie Robinson Pkwy: between EB and WB Highland Blvd.				12	R3-2
1142.01	2006	Highland Blvd.	Vermont St.	Jamaica Ave.	Marginal St. E.	205	R4
1142.01	2014	Bushwick Ave.		Jamaica Ave.	Fanchon Pl.	0	M1-1
1142.01	2015	Bushwick Ave.	Fanchon Pl.	Broadway, Jamaica Ave.	Conway St.	0	M1-1
1142.01	2017	Highland Blvd.	Fanchon Pl.	Bushwick Ave.		0	M1-1
1142.01	2018	Highland Blvd.	Marginal St. W.	Bushwick Ave.	Fanchon Pl.	134	M1-1, R4
1142.01	(E)2005			Highland Blvd.		4	R3-2
1142.01	(E)2016	EB Highland Blvd.	Bushwick Ave-EB highland Blvd cnxn.	Bushwick Ave.		0	M1-1
1142.01	(W)2016	WB Highland Blvd.		Bushwick Ave., EB Highland Blvd.			M1-1
1146	2007	Jamaica Ave.	Vermont St.	Fulton St.	New Jersey Ave.	97	C8-2, R4
1148	2003	Fulton St.	Vermont St.	Atlantic Ave.	New Jersey Ave.	267	C8-2, R5
1148	2004	Atlantic Ave.	Vermont St.	Liberty Ave.	New Jersey Ave.	85	C8-2
					TOTAL:	4,377	

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