34th Street Transit Corridor

Alternatives Analysis

Screening Report

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New York City
Department of Transportation

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S.0 INTRODUCTION

The New York City Department of Transportation (NYCDOT), in collaboration with the Metropolitan Transportation Authority (MTA) New York City Transit (NYCT) and in cooperation with MTA Bus Company (MTA Bus), is sponsoring the "Proposed Project," to implement new or enhanced transit service along 34th Street from the Hudson River to the East River in Manhattan (New York County, New York). The 34th Street Transit Corridor Alternatives Analysis considers alternatives to decrease travel times for transit riders, reduce vehicular and pedestrian congestion along 34th Street, and provide convenient connections to the major land uses and transportation facilities along the corridor. NYCDOT (the "Project Sponsor") is likely to apply for federal funds administered by the Federal Transit Administration (FTA) for the Locally Preferred Alternative (LPA). In order to select the alternative with the most significant improvements, the Project Sponsor is conducting this analysis to identify options for improving crosstown transit service along 34th Street, evaluate potential alternatives, and select an LPA, consistent with FTA requirements.

S.1 PROJECT LOCATION

34th Street spans Manhattan from the Hudson River to the East River. For much of its length, 34th Street is a five- to six-lane, two-way street. Its three to four center lanes are used for general traffic, and for much of its length, its curbside lanes are dedicated to buses on weekdays from 7:00 AM to 7:00 PM. At other times, the curbside lanes are used by standing and/or parked vehicles, including the loading and unloading of commercial vehicles.

34th Street traverses the heart of Manhattan and has access to two of the portals to the island as well as its north-south highways. 34th Street also passes a number of Manhattan's most popular and prominent destinations including the Jacob K. Javits Convention Center, Pennsylvania (Penn) Station, Madison Square Garden, the flagship Macy's store, the Empire State Building, and the New York University Langone Medical Center.

Due to its connections and adjoining land uses, 34th Street is an important travel corridor for a variety of travel types and functions. 34th Street has among the highest pedestrian volumes in New York City, with people accessing the regional transit network at Penn Station and several subway stations, or taking advantage of the area's numerous commercial and cultural destinations. The street is heavily used by local buses serving crosstown travel needs, commuter coach buses from other parts of the city and region, and some intercity bus routes. 34th Street serves as the only midtown crosstown through truck route, although legal access is limited to local truck use between 11:00 AM and 6:00 PM. 34th Street is also one of New York City's designated snow emergency streets, with parking prohibited during declared snow emergencies.

S.1.1 CURRENT AND FUTURE LAND USE

The land use study area encompasses the breadth of Manhattan between West 29th and 40th Streets. The land use patterns of the area vary depending on particular locations; however, some generalizations can be made. Overall, transportation uses are dominant in the western portion of the study area, particularly west of Ninth Avenue; commercial uses are predominant in the central portion of the study area between Eighth and Park Avenues; and residential uses are most prevalent east of Park Avenue. As discussed above, a number of Manhattan's most popular and prominent destinations are located within the study area. Route 9A, the FDR Drive, the Pier 79/West 39th Street Ferry Terminal, the East 34th Street Ferry Landing, and the Lincoln Tunnel and Queens-Midtown Tunnel access points are all major transportation uses at the western and eastern edges of the land use study area. In addition, a large number of the structures within the land use study area are historic resources, illustrating the breadth of land uses and building types that can be found within this area.

Future land uses in the western portion of the study area are anticipated to include:

- The new Access to the Region's Core (ARC) rail station beneath 34th Street between Sixth and Eighth Avenues;
- A new 7 train terminal at 34th Street and Eleventh Avenue;
- The redevelopment of the James A. Farley Post Office as the new rail terminal for Amtrak;
- A new mixed use development near the Farley Building with one million square feet of residential, hotel, and retail space; and
- A new high-rise commercial development on the west side of the block bounded by West 32nd and 33rd Streets and Sixth and Seventh Avenues, with 2.65 to 2.84 million square feet of office space with ground-floor retail.

Furthermore, the Special Hudson Yards District—which is bounded by 41st Street to the north, Eighth Avenue to the east (including Madison Square Garden), 30th Street to the south, and Eleventh Avenue to the west—as well as the Caemmerer Yard will be transformed within the next 10 to 15 years to a mix of residential, office, retail, hotel, community facility, and open space and recreational uses. The Special Hudson Yards District will also result in an expansion of the Javits Convention Center, a large amount of public parkland, and a new boulevard between Tenth and Eleventh Avenues. In general, the western portion of the study area is expected to be much more densely developed with a mix of commercial and residential uses pver the next decade.

Land use trends in the eastern portion of the study area are likely to result in moderate- to high-density residential, commercial, and institutional development. Anticipated projects include:

- Reconstruction and in-kind replacement of the FDR Drive and associated improvements;
- Improvements to the 34th Street Ferry Terminal and the 34th Street Metroport Heliport;
- New subway station at 34th on Second Avenue for the new Second Avenue subway line; and
- East Side Access, which is creating a new tunnel beneath Park Avenue to bring MTA Long Island Rail Road (LIRR) service to Grand Central Terminal.

Major private development projects in this area include the former Consolidated Edison Waterside Power Plant and two adjacent parcels along First Avenue, which will be developed with residential, office, retail, public, school, and public open space uses; East River Science Park, a 1.1 million-square-foot biotechnology/medical office complex on the Bellevue Hospital campus; and a variety of changes to the New York University Langone Medical Center campus.

S.1.2 TRAVEL MARKET

The many uses along the 34th Street corridor attract trips for a variety of purposes. According to 2000 U.S. Census data, more than 381,000 people work within the study area, and more than 43,500 live within this area. As shown in **Table S-1,** the Census showed that workers in the study area predominantly use transit modes (subway and bus) to reach their jobs; these modes represent approximately 61 percent of trips to work. Of people that live in the study area, transit modes also represent a large proportion of trips to work, with a combined share of approximately 41 percent. For both home-based and employment-based journey to work trips in the study area, walking also represent a significant mode share. Because of the availability of a large number of bus, commuter rail, and subway routes in the study area, many of the work trips are characterized by inter-modal transfers, with some involving multiple modes. Nealy all of these trips also involve at least a small walk component to travel to and from the transit stop. The 2000 Census data also revealed that households located in the study area have relatively low vehicle ownership rates as compared to vehicle ownership rates citywide (21 percent versus 46 percent), reflecting a high dependence on public transit.[1]

Table S-1

34th Street corridor Journey to Work and Reverse Journey to Work Data

Mode to Work	Total Living in Study Area	% Living in Study Area	Total Working in Study Area	% Working in Study Area
Private Auto	3,379	7.8%	57,764	15.1%
Taxi	3,511	8.1%	7,505	2.0%
Subway	13,663	31.4%	182,742	47.9%
Bus	4,268	9.8%	51,025	13.4%
Railroad	944	2.2%	61,115	16.0%
Walk	17,754	40.7%	21,179	5.6%
Total	43,519	100%	381,330	100%

Source: U.S. Census Bureau, 2000 Census Transportation Planning Package, Parts 1 and 2.

Despite the relatively low vehicle use in the overall study area, 2000 Census journey to work (Census Transportation Planning Package Part 1) data reveal that some tracts on the far east and west ends of the study area have substantially higher rates of auto and taxi commutes than those in the denser central core. These tracts are not well served by transit and, therefore, have a much lower propensity for transit commutes.

[1] U.S. Bureau of the Census, 2000, Summary File 3, Table H44.

The development projects described above will increase the number of people that work and live in the study area. Combined, these projects could add more than 75,000 workers and more than 20,000 residents.[1] The vast majority of this development would occur on the far east or far west sides, which as noted above have significantly higher auto and taxi mode shares for both origin and destination trips than the corridor as a whole.

In addition to the work-based travel, 34th Street is also a trip generator for leisure and tourism. Major area attractions include the Empire State Building observation deck (3.8 million visitors annually); the Javits Center (3 million annual patrons); and Madison Square Garden (seats between 18,500 and 20,000). The New York University Langone Medical Center, Bellevue Hospital, and surrounding medical office buildings form one of the highest concentrations of health care facilities in New York City, and the City University of New York (CUNY) Graduate Center serves approximately 4,000 students from its campus at Fifth Avenue and 34th Street.

S.1.3 EXISTING TRANSIT SERVICE

34th Street is served by multiple transit modes. Penn Station is the country's busiest rail terminal, used by Amtrak intercity trains, and New Jersey Transit and MTA Long Island Rail Road (LIRR) commuter trains. NYCT operates four subway stations along 34th Street with north-south express and local service on 15 subway routes and provides north-south bus service on 16 routes. Ferry terminals at the Hudson River (Pier 79/West 39th Street) and the East River (East 34th Street) provide commuter and special event ferry service to the Bronx, Brooklyn, Queens, and New Jersey. New York Waterway provides shuttle buses from Pier 79 to Lexington Avenue for ferry customers. In addition, NYCT, MTA Bus, Westchester County Bee-Line Bus System, and Academy Bus provide express bus service between the area and neighborhoods in the Bronx, Brooklyn, Queens, Staten Island, Westchester County, and New Jersey. These express bus services all operate on portions of 34th Street.

Commuter rail lines, subways, express buses, and ferries make 34th Street easily accessible from far-reaching destinations, and the north-south subway and bus routes provide convenient service to the area from uptown and downtown Manhattan. However, only NYCT's M16 and M34 routes provide east-west local service along most of the 34th Street corridor.

S.2 PURPOSE AND NEED

S.2.1 PROBLEM STATEMENT

The existing bus service along 34th Street operates at slow speeds with substantial delays en route, resulting in long travel times both for crosstown/local and express/commuter bus riders, increased operating costs, wasted fuel, and negative effects on air quality. Even after adding new bus lanes, the buses average 4.3 miles per hour, only marginally faster than walking. These problems and associated costs may escalate if more M34 and/or M16 bus service is added to meet future demand from upcoming growth. Furthermore, pedestrian congestion is already

[1] Based on four employees per 1,000 square feet of commercial (office, retail, and hotel) space and an average household size of 1.68 persons per unit as stated in the *Western Rail Yard Final Environmental Impact Statement* (New York City Planning Commission, September 2009).

severe along 34th Street, and will likely increase at key locations as anticipated new development and transportation projects attract more people to the area. Improved, high-capacity transit service is needed to alleviate the operating deficiencies of existing bus service on 34th Street and to ensure that future riders can be fully accommodated.

S.2.2 GOALS AND OBJECTIVES

Based on the issues identified above, the Project Sponsor, in collaboration with NYCT and in cooperation with MTA Bus, developed goals and objectives for the Proposed Project. The Proposed Project has two primary goals: 1) improve crosstown mobility; and 2) minimize capital and operating concerns. Combined, these goals and their supporting objectives aim to provide a service that not only reduces travel time and decreases congestion but also is achievable both in reasonable time and cost. At the same time, the service will strive to meet the secondary goals of the Proposed Project, by benefiting community character and avoiding or minimizing impacts on the environment.

S.3 ALTERNATIVES IDENTIFICATION

FTA requires an examination of a No Build Alternative, in which current conditions are maintained, and a Transportation System Management (TSM) Alternative. The TSM Alternative includes minimal to modest investment to improve service without extensive capital improvements. In addition to the No Build and TSM Alternatives, the 34th Street Transit Corridor Alternatives Analysis considers five build alternatives that would implement fixed-guideway (dedicated road or rail) operations with various transit modes.

S.3.1 NO BUILD ALTERNATIVE

The No Build Alternative will reflect the continuation of existing transit operations along the 34th Street corridor. This will include the curbside bus lanes in operation. It will also be assumed that NYCT would maintain its current vehicle type and schedule for the M16 and M34 bus routes and express bus operations would not change.

S.3.2 TSM ALTERNATIVE

NYCT's Select Bus Service was used as the model for the TSM Alternative. Select Bus Service is currently operating on the Bx12 in the Bronx and Manhattan, and will be implemented in fall 2010 on First and Second Avenues in Manhattan. The TSM Alternative for the 34th Street transit corridor would maintain the existing curbside bus lanes and would have limited signal priority. Existing buses would be replaced with three-door, articulated vehicles, as is proposed for First and Second Avenues. Fare collection would be off-board with ticket machines located at bus stops.

S.3.3 BUILD ALTERNATIVES

S.3.3.1 BUS RAPID TRANSIT

The Bus Rapid Transit (BRT) Alternative builds on improvements proposed for the TSM Alternative. Like the TSM, BRT would have off-board fare collection or other fare collection

technology that would allow for faster boarding and three-door, articulated buses. However, the BRT would also include a transitway, which would occupy a portion of the roadway. The transitway would be for the exclusive use of local buses, express buses, and emergency vehicles. Bus stations would be located at or near most north-south avenues. The stations would have platforms to ease boarding and alighting to low-floor buses and fare collection machines or other all-door boarding technology. Passing lanes would be provided within the transitway at certain locations, and bus signal priority would be implemented where feasible. One direction of general traffic lanes and a parking lane would be provided between Twelfth and Sixth Avenues and between Fifth Avenue and the FDR Drive.

S.3.3.2 STREETCAR AND LIGHT RAIL

The Streetcar and Light Rail Transit (LRT) Alternatives would result in at-grade, fixed-rail transit along 34th Street. The Streetcar Alternative would have tracks within the existing curbside bus lanes. These lanes could also be used by local and express buses. Streetcar stations would generally be located at the existing M34 bus stops. The LRT Alternative would operate in a median alignment; express buses would not be permitted to operate on the LRT tracks. In both cases, parking would be severely restricted along the corridor. LRT stations would likely be longer than BRT stations, but would generally be located at the north-south avenues. The Streetcar and LRT Alternatives would require a maintenance facility and storage yard at or near one or both of their terminals.

S.3.3.3 AUTOMATED GUIDEWAY TRANSIT

The Automated Guideway Transit (AGT) alternative is characterized as grade-separated, typically elevated, fixed-rail with stations along its route. Like LRT, streetcar, and heavy-rail, AGT requires maintenance and vehicle storage at or near one or both of its terminals. A number of modes can operate as AGT, including airport-style people mover systems, monorail, and personal rapid transit.

S.3.3.4. HEAVY RAIL

For the 34th Street Transit Corridor Alternatives Analysis, heavy rail mirrors the vehicle type and operation of the New York City subway.

S.4 PROJECT GOALS AND SCREENING

Performance measures were developed to evaluate alternatives consistent with the Proposed Project's goals and objectives. These measures are generally qualitative and allow for a comparison of the order of magnitude benefits and detriments of each option for the Proposed Project. In certain cases, one performance measure correlates to multiple project objectives, and certain objectives have been defined by more than one performance measure.

The Proposed Project has two primary goals: 1) to improve crosstown mobility; and 2) to minimize capital and operating concerns. Combined, these goals and their supporting objectives aim to provide a service that not only reduces travel time and decreases congestion but is achievable both in reasonable time and cost. Performance measures used to evaluate alternatives on the basis of the primary goals and objectives include end-to-end travel time,

increases or decreases in pedestrian circulation area, peak period capacity, construction duration and cost, restricted or unrestricted vehicular, delivery, and emergency vehicle access, and consistency with MTA operating procedures.

The secondary goals of the Proposed Project are: 1) to provide benefits to community character; and 2) to avoid or minimize impacts on the environment. Performance measures for the secondary goals and objectives include transit capacity and travel time, restrictions on general, commercial, and emergency vehicle access, effects on historic resources and visual character, construction requirements, and potential reductions or increase in vehicle emissions and noise.

The proposed alternatives were evaluated using a two-part screening process. The first part eliminated alternatives that could not reasonably meet the primary goals and objectives and the second assessed the remaining alternatives based on the secondary goals and their supporting objectives.

S.5 SCREENING CONCLUSIONS

Based on the 34th Street Transit Corridor Alternatives Analysis's primary and secondary screening, the BRT Alternative, which includes a transitway, is recommended as the LPA. This alternative best meets the purpose and need of the Proposed Project by improving crosstown transit and express bus operations, creating opportunities for pedestrian space, and accommodating future growth. It can be implemented at a lower cost and with shorter construction duration than the other build alternatives, and it would allow for continued local and express bus services along the 34th Street corridor. The BRT Alternative would improve both transit service efficiency and the pedestrian environment on 34th Street.

S.6 NEXT STEPS

The next steps for the Proposed Project will be to begin the preliminary design and environmental review processes, both of which will help to shape the project and answer outstanding questions related to its physical layout and potential effects on the surrounding area. It is expected that there will be substantial public outreach for both of these efforts.

The preliminary design process will develop the BRT Alternative in more detail. The Proposed Project will also undergo environmental review, which will comply with the requirements of the City Environmental Quality Review (CEQR) process and the National Environmental Policy Act (NEPA). The first step in the environmental review will be a scoping, which will determine, in consultation with review agencies and the public, the extent of the analysis to be conducted.

The next phase of the Proposed Project is also expected to include the preparation of an application to FTA for federal funds. This application will include plans that highlight information specific to the financial requirements of the Proposed Project, including capital and operating costs and probable funding sources and mechanisms.

Chapter 1: Purpose and Need

1.0 INTRODUCTION

The New York City Department of Transportation (NYCDOT), in collaboration with the Metropolitan Transportation Authority (MTA) New York City Transit (NYCT) and in cooperation with MTA Bus Company (MTA Bus), is sponsoring the "Proposed Project," to implement new or enhanced transit service along 34th Street from the Hudson River to the East River in Manhattan (New York County, New York). The 34th Street Transit Corridor Alternatives Analysis will consider alternatives to decrease travel times for transit riders, reduce vehicular and pedestrian congestion along 34th Street, and provide convenient connections to the major land uses and transportation facilities along the corridor. NYCDOT (the "Project Sponsor") is likely to apply for federal funds administered by the Federal Transit Administration (FTA) for the Locally Preferred Alternative (LPA). In order to select the alternative with the most significant improvements, the Project Sponsor is conducting this analysis to identify options for improving crosstown transit service along 34th Street, evaluate potential alternatives, and select an LPA, consistent with FTA requirements.

1.1 PROJECT LOCATION

This study focuses on 34th Street between the Hudson River and the East River and the blocks to its north and south that rely on crosstown travel along this corridor. The study area is therefore defined as the Hudson River to the west, 29th Street to the south, the East River to the east, and 40th Street to the north. Along the Hudson River, the study area extends north to include the Pier 79/West Midtown Ferry Terminal at 39th Street.

34th Street spans Manhattan from between Hudson River and the East River (see **Figure 1-1**). For much of its length, 34th Street is a five- to six-lane, two-way street. Its three to four center lanes are used for general traffic and, for much of its length, its curbside lanes are for dedicated bus use on weekdays from 7:00 AM to 7:00 PM. At other times, the curbside lanes are used by standing and/or parked vehicles, including the loading and unloading of commercial vehicles.

34th Street traverses the heart of Manhattan and has access to two of the portals to the island and its north-south highways. At its west end, 34th Street connects to Route 9A, and at its east end, to the Franklin Delano Roosevelt (FDR) Drive. Route 9A and the FDR Drive are part of the regional roadway network with connections to the interstate highways that serve New York City. 34th Street also has, between Third and First Avenues, an entrance to and exit from the Queens-Midtown Tunnel, which provides a vehicular connection between Midtown Manhattan and the Long Island Expressway. At Dyer Avenue, on the west side of Manhattan, access is provided to the Lincoln Tunnel, one of Manhattan's three vehicular connections to New Jersey.

As shown in **Figure 1-2**, 34th Street is home to a number of Manhattan's most popular and prominent destinations, including the Jacob K. Javits Convention Center, Pennsylvania (Penn) Station, Madison Square Garden, the flagship Macy's store, the Empire State Building, and the New York University Langone Medical Center.

Due to its connections and adjoining land uses, 34th Street is an important travel corridor for a variety of functions. 34th Street has among the highest pedestrian volumes in New York City, with people accessing the regional transit network at Penn Station and the several subway stations, or taking advantage of the area's numerous commercial and cultural destinations. The street is heavily used by both local buses for crosstown travel needs, commuter coach buses from other parts of the city and region, and some intercity bus routes. 34th Street serves as the only midtown crosstown through-truck route, although legal access is limited to local truck use between 11:00 am and 6:00 pm. 34th Street is also one of New York City's designated snow emergency streets, with prohibited parking during declared snow emergencies.

1.1.1 CURRENT AND FUTURE LAND USE

The land use study area encompasses the width of Manhattan between 29th and 40th Streets, and its land use patterns vary depending on particular locations; however, some generalizations can be made. Overall, transportation uses are dominant in the western portion of the study area, particularly west of Ninth Avenue; commercial uses are dominant in the central portion of the study area, between Eighth and Park Avenues; and residential uses are most prevalent east of Park Avenue. As discussed above, a number of Manhattan's most popular and prominent destinations are located within the study area, including the Jacob K. Javits Convention Center, Penn Station, Madison Square Garden, the flagship Macy's store and the Empire State Building—both of which are National Historic Landmarks—and the New York University Langone Medical Center. Route 9A, the FDR Drive, the Pier 79/West 39th Street Ferry Terminal, the East 34th Street Ferry Landing, and the Lincoln Tunnel and Queens-Midtown Tunnel access points are all major transportation uses at the western and eastern edges of the land use study area. There are limited public open spaces within the study area, excepting the linear East River Esplanade and Hudson River Park along the East River and Hudson River waterfronts, respectively (see **Figure 1-3**).

On the west side of the study area, the Amtrak Empire Line rail cut runs north-south through the Tenth Avenue to Eleventh Avenue midblocks on a slight diagonal, north of West 36th Street; south of West 36th Street, the rail cut is beneath the Javits Center plaza and then beneath Eleventh Avenue into the eastern portion of Caemmerer Yard. Caemmerer Yard (the MTA Long Island Rail Road [LIRR] storage yard and maintenance facility) comprises the blocks between West 30th and 33rd Streets from Tenth to Twelfth Avenues. Amtrak and MTA also have various structures and facilities within this area. The main entrance plaza to the Lincoln Tunnel occupies the block between West 39th and 40th Streets and Tenth and Eleventh Avenues. The open access ramps to the tunnel entrance, including exclusive bus ramps extending from the Port Authority Bus Terminal, cut beneath and above the street, and are the most visible structures in the nearby area. Other uses in this area include the Jacob K. Javits Convention Center, which extends between West 34th and 39th Streets west of Eleventh Avenue; the James A. Farley Post Office, which has serves as Manhattan's General Post Office and still contains some United States Postal Service uses; the former Westyard Distribution

building on Tenth Avenue, a commercial building that is home to the *New York Daily News*; and truck marshalling yards for the convention center, rental truck yards, gas stations, open lots for parking and storage use, and taxi dispatches. Penn Station, which lies beneath Madison Square Garden on the superblock between West 31st and 33rd Streets and Seventh and Eighth Avenues, provides regional commuter rail service via New Jersey Transit and LIRR, while Amtrak provides long-distance services along the Eastern seaboard and beyond.

The residential/mixed-use neighborhood of Hell's Kitchen incorporates the area roughly between West 33rd and 38th Streets and Ninth and Tenth Avenues, and the City's Garment District lies primarily within the area bounded by Fifth Avenue, West 35th Street, Ninth Avenue, and West 40th/41st Streets. The Hell's Kitchen area includes a number of tenement buildings with housing above and neighborhood retail uses at street level. The Garment District has lower-density commercial structures in its western portion, and higher-density structures in its eastern portion. A higher density of development along the northern and central sections of the study area characterizes the commercial office uses in the heart of Midtown Manhattan's central business district—it is the most densely developed area of the city. There are smaller institutional and community facility uses—including churches, schools, and police and fire stations—scattered throughout the study area. Some of the larger institutional uses within this area include the Morgan Library and Museum, on Madison Avenue at East 36th Street, The Mid-Manhattan and The Science, Industry and Business Libraries of the New York Public Library system, and the CUNY Graduate Center at Fifth Avenue.

In the eastern portion of the study area, there are a number of high-rise buildings, including the residential Kips Bay Plaza complex between East 31st and 33rd Streets and First and Second Avenues, and the New York University Medical Center, which covers the area between East 30th and 34th Streets, First Avenue, and the FDR Drive. The high-rise apartment buildings in this portion of the study area are mostly located along the north-south avenues and along East 34th Street. Some have publicly accessible plazas. There are also smaller apartment buildings, tenements, and rowhouses lining the area's midblocks. The area north of East 39th Street and west of Second Avenue is dominated by tall office towers. Near the United Nations, which lies to the north along First Avenue, just outside the study area, there are many associated office buildings that provide space for its administrative functions. As in the other sections of the study area, smaller uses within this area include churches, schools, libraries, and police and fire stations. Publicly accessible open spaces include St. Vartan Park on 35th Street between First Avenue and Second Avenue, and public plazas associated with residential buildings in the area.

A large number of the structures within the land use study area are historic resources, and these resources illustrate the variety of land uses and building types that can be found within this area (See **Figures 1-4 and 1-5**, and **Appendix A, Table A-1**). They include high-rise commercial office buildings, hotels, warehouses and other manufacturing structures, parking garages, banks, department stores (former and current), tenements, lofts, houses of worship, performing arts venues, hospitals, schools, dormitories, diners, private clubs, subway stations, consulates, former stables, apartment buildings, detached houses, and rowhouses. The study area also incorporates the Garment Center, Lamartine Place, Park Avenue South, Sniffen Hill, and Murray Hill Historic Districts; the Lincoln Tunnel and associated ventilation buildings; the Farley Post Office complex; the Hudson River bulkhead, and the historic High Line rail viaduct, which runs along 30th Street between Tenth and Twelfth Avenues, and along Twelfth Avenue between 30th and 34th Streets.

A number of developments are anticipated to be completed or underway in the land use study areas by the proposed build analysis year of 2035 (see Chapter 2.2.1).[1] Future land uses in the western portion of the study area will include the new Access to the Region's Core (ARC) rail station beneath 34th Street between Sixth and Eighth Avenues, and a new ❼ terminal at 34th Street and Eleventh Avenue; the redevelopment of the James A. Farley Post Office as the new rail passenger facility for Amtrak (Moynihan Station); a new development near the Farley Building with one million square feet of residential, hotel, and retail space; and a new high-rise development on the west side of the block bounded by West 32nd and 33rd Streets and Sixth and Seventh Avenues, with 2.65 to 2.84 million square feet of office space with ground-floor retail. Furthermore, the Special Hudson Yards District—which is bounded by 41st Street to the north, Eighth Avenue to the east (including Madison Square Garden), 30th Street to the south, and Eleventh Avenue to the west (including Caemmerer Yard) will be transformed within the next 10 to 15 years to a mix of residential, office, retail, hotel, community facility, and open space and recreational uses. The Special Hudson Yards District will also result in an expansion of the Jacob K. Javits Convention Center, a large amount of new public parkland, and a new boulevard between Tenth and Eleventh Avenues (see **Figure 1-6**). In general, the western portion of the study area is expected to be much more densely developed with a mix of commercial and residential uses by the project build year.

Land use trends in the eastern portion of the study area are likely to result in moderate- to high-density residential, commercial, and institutional development. Anticipated projects include the reconstruction and in-kind replacement of the FDR Drive and associated improvements; improvements to the 34th Street Ferry Terminal and the 34th Street Metroport Heliport; a new subway station at 34th Street and Second Avenue for the new Second Avenue subway line; and East Side Access, which is creating a new tunnel beneath Park Avenue to bring Long Island Rail Road service to Grand Central Terminal. Major non-infrastructure and transportation-related projects in this area include the former Consolidated Edison Waterside Power Plant and two adjacent parcels along First Avenue, which will be developed with residential, office, retail, public, school, and public open space uses; East River Science Park, a 1.1 million-square-foot biotechnology/medical office complex on the Bellevue Hospital campus; and a variety of changes to the New York University Langone Medical Center campus.

1.1.2 TRAVEL MARKET

The many uses along the 34th Street corridor attract riders for a variety of purposes. According to 2000 U.S. Census data, more than 381,000 people work within the study area, and more than 43,500 live within this area (see **Figure 1-7**).[2] As shown in **Table 1-1,** the Census showed that workers in the study area predominantly use transit modes (subway and bus) to reach their jobs; these modes represent approximately 61 percent of trips to work. Of people that live in the study area, transit modes also represent a large proportion of trips to work, with a combined share of approximately 41 percent. For both home-based and employment-based journey to work trips in the study area, walk-alone trips also represent a significant mode

[1] For the purpose of this Alternatives Analysis, it is assumed that implementation of any of the build alternatives could be finalized by 2035. Therefore, baseline conditions will reflect land use, social and demographic conditions, and transportation services in 2035.

[2] U.S. Bureau of the Census, Census Transportation Planning Package, 2000, Part 1, table 2 and Part 2, table 2.

share. Because of the availability of a large number of bus, commuter rail, and subway routes in the study area, many of the work trips to and from the study area are characterized by inter-modal transfers, with some transit trips involving multiple modes, as well as all transit trips having at least a small walk component to travel to and from the transit stop. Ferry service also plays an important role in travel to the study area – while the 2000 census lists a small number of ferry-only trips, ferries are typically part of a multi-modal journey, and the ridership may be listed in other categories. The Pier 39 ferry terminal serves approximately 8,500 trips per day, and the East 34th Street ferry terminal approximately 800 trips per day[1]. The 2000 Census data also revealed that households located in the study area have relatively low vehicle ownership rates as compared with vehicle ownership rates citywide (21 percent versus 46 percent), reflecting a high dependence on public transit.[2]

Table 1-1

34th Street Corridor Journey to Work and Reverse Journey to Work Data

Mode to Work	Total Living in Study Area	% Living in Study Area	Total Working in Study Area	% Working in Study Area
Private Auto	3,379	7.8%	57,764	15.1%
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Railroad	944	2.2%	61,115	16.0%
Walk	17,754	40.7%	21,179	5.6%
Total	43,519	100%	381,330	100%

Source: U.S. Census Bureau, 2000 Census Transportation Planning Package Parts 1 and 2.

Despite the relatively low vehicle use in the overall study area, 2000 Census journey to work (Census Transportation Planning Package Part 1) data reveal that some tracts on the far east and west ends of the study area have substantially higher rates of auto and taxi commutes than those in the denser central core. Block groups at the western end of the study area, west of Tenth Avenue, have a rate of auto and taxi commuting of 36.4 percent, more than twice the study area rate. Block groups at the eastern end of the study area, east of First Avenue, have a rate of auto and taxi commuting of 22.6 percent, which is also substantially higher than that of the overall study area. These tracts are not as well served by transit and, therefore, have a much lower rate of transit commutes.

The development projects described above will increase the number of people that work and live in the study area. Combined, these projects could add more than 75,000 workers and more than 20,000 residents.[3] The vast majority of this development would occur on the far east or far west sides, which as noted above currently have significantly higher auto and taxi mode shares for both origin and destination trips than has the corridor as a whole.

[1] NYCDOT Weekly Ferry Ridership Report, January 4, 2010

[2] U.S. Bureau of the Census, 2000, Summary File 3, table H44.

[3] Based on four employees per 1,000 square feet of commercial (office, retail, and hotel) space and an average household size of 1.68 persons per unit as stated in the *Western Rail Yard Final Environmental Impact Statement* (New York City Planning Commission, September 2009).

In addition to the work-based travel, 34th Street is also a trip generator for leisure and tourism travel. The Empire State Building's observation deck is visited by 3.8 million people each year, and the area's retail uses attract huge volumes of shoppers. The Javits Center serves 3 million annual patrons for trade shows and exhibitions; Madison Square Garden seats between 18,500 and 20,000 people for sports and entertainment events multiple times each week; and the Manhattan Center/Hammerstein Ballroom hosts concerts and other live entertainment events throughout the year. The New York University Langone Medical Center, Bellevue Hospital, and surrounding medical office buildings form one of the highest concentrations of health care facilities in New York City. Finally, the City University of New York (CUNY) Graduate Center serves approximately 4,000 students on its campus at Fifth Avenue and 34th Street.

1.1.3 EXISTING TRANSIT SERVICE

34th Street is served by multiple transit modes, as shown in **Figures 1-8 and 1-9**. Penn Station is the country's busiest rail terminal, used by Amtrak intercity trains, and New Jersey Transit and MTA LIRR commuter trains. NYCT operates four subway stations along 34th Street with north-south express and local service on 15 subway routes, and provides north-south bus service on 16 routes. Ferry terminals at the Hudson River (Pier 79/West 39th Street) and the East River (East 34th Street) provide commuter and special event ferry service to the Bronx, Brooklyn, Queens, and New Jersey. New York Waterway provides shuttle buses from Pier 79 to Lexington Avenue for ferry customers. In addition, NYCT, MTA Bus, Westchester County Bee-Line Bus System, and Academy Bus provide express bus service between the area and neighborhoods in the Bronx, Brooklyn, Queens, Staten Island, Westchester County, and New Jersey. These express bus services all operate on portions of 34th Street.

Commuter rail lines, subways, express buses, and ferries make 34th Street easily accessible from far-reaching destinations, and the north-south subway and bus routes provide convenient service to the area from uptown and downtown Manhattan. However, only NYCT's M16 and M34 bus routes provide east-west local service along most of the 34th Street corridor.

1.2 PROBLEM STATEMENT

The existing bus service along 34th Street operates at slow speeds with substantial delays en route, resulting in long travel times for both crosstown and express commuter bus riders, increased operating costs, wasted fuel, and negative effects on air quality. These problems and associated costs are likely to escalate as M34 and/or M16 bus service is added to meet future demand from upcoming growth. Furthermore, pedestrian congestion is already severe along 34th Street, and will likely increase at key locations, as new development and transportation projects attract more people to the area. Improved, high-capacity transit service is needed to alleviate the issues facing existing bus service on 34th Street and to ensure that future riders can be fully accommodated.

1.2.1 NYCT BUS OPERATIONS (M16/M34)

The M16 operates between West 42nd Street and Ninth Avenue (Port Authority Bus Terminal) and the FDR Drive and 25th Street (Waterside Plaza). This 24-hour service operates on 34th

Street between Eighth/Ninth Avenues and FDR Drive/Second Avenues.[1] The M34 travels the length of 34th Street between the Javits Center and the FDR Drive. It runs from approximately 5:00 AM to 1:00 AM on weekdays and approximately 6:00 AM to midnight on weekends.[2]

In 2008, the annual ridership on the M16 and M34 routes was 2.492 million and 2.645 million passengers, respectively, for combined annual ridership of 5.137 million passengers. As of April 2009, the combined average weekday ridership on the M16 and M34 was more than 17,400 passengers. Approximately 9,000 customers (51 percent) ride the M34 each weekday while 8,400 (49 percent) use the M16. Saturday volumes on these routes total approximately 7,500, and Sunday volumes total approximately 6,000. Like patterns of weekday travel, approximately 52 percent of weekend customers ride the M34 while 48 percent use the M16.[3]

The M34 operates the full-length of 34th Street, while the M16 serves only the portion of 34th Street between Eighth/Ninth Avenues and First/Second Avenues. While passengers traveling between Second and Eighth Avenues have the option of either bus, the M34 is the only choice for passengers traveling the length of 34th Street. Because this study will analyze transit operations for the full east/west corridor, the discussion below focuses on M34 operations.

In 2004 and 2007, respectively, a New York City transit advocacy group ranked the M34 as the slowest and second slowest bus route in the city.[4] A survey conducted in 2008 by NYCDOT and NYCT showed an average one-way, end-to-end trip time of 36 minutes, translating to an average speed of 3.3 miles per hour. Subsequently, NYCDOT and NYCT implemented roadway and operational improvements to reduce travel times for the M34. In 2008, NYCDOT introduced curbside, bus-only lanes and adjusted traffic signals. NYCT replaced the M34 fleet with low-floor vehicles, removed a stop at Dyer Avenue, shortened the route at the Javits Center, and adjusted schedules. As a result, run times of the M34 have improved, and in May 2009, the average one-way, end-to-end travel time was 28 minutes, with an average speed of 4.3 miles per hour.

While conditions have improved since 2008, the M34 still requires an average of 28 minutes to make the two-mile, one-way, end-to-end trip. As a point of comparison, at an average human walking speed of 3 to 4 miles per hour, a pedestrian could make the trip in approximately 40 minutes.[5] While the M34 is 12 minutes faster for the full length of 34th Street, walking is a viable alternative for shorter trips, especially on the most congested portions of the route between Eighth and Lexington Avenues. For longer trips, taxis often provide a quicker connection between destinations than the M34.

As shown in **Figure 1-10**, only 40 percent of the M34's total travel time is spent in motion. Of the 60 percent in stopped time, approximately 22 percent is for waiting at traffic signals, and 38 percent is to board and alight passengers (dwell time). Dwell time is heavily influenced by

[1] When traveling westbound/northbound, the M16 uses the FDR Drive Service Road and Eighth Avenue. When traveling eastbound/southbound, the M16 uses Second Avenue and Ninth Avenue.

[2] www.mta.info, August 2009.

[3] www.mta.info, August 2009.

[4] NYPRIG Straphangers Campaign and Transportation Alternatives, *2004 Pokey Awards*, September 2004, *2007 Pokey Awards*, October 2007.

[5] NYCDOT typically assumes an average walking speed of 3 to 4 miles per hour for pedestrian analyses per City Environmental Quality Review guidelines.

the number of passengers boarding at a stop and the associated time to pay the fare. Because the M34 operates with on-board fare collection, all boarding customers must enter via the front door of the bus and either pay the fare in coin or dip their MetroCard.

Combined, the slow travel speed of the M34 and its stopped or dwell time substantially reduce the efficiency and attractiveness of the route. As stated above, the average, one-way travel time is 28 minutes for the 2-mile route, meaning that one bus requires over one hour for a round trip run (including layover). The inefficient travel time and resultant vehicle requirements translate into higher operating costs from increased personnel requirements, increased fuel use, and increased vehicle maintenance. Furthermore, when stopped at traffic signals or to board and alight passengers, buses idle and burn fuel, exacerbating operating costs, wasting energy, and negatively affecting air quality.

1.2.2 NY WATERWAY FERRY BUS

The Pier 79/West Midtown Ferry Terminal, located at 39th Street and the Hudson River, provides a station for service between New Jersey and Midtown Manhattan. This ferry terminal is served by NY Waterway Ferry Buses which meet every arriving boat and utilize the local bus stops on 34th Street. During peak hours, these buses run in both directions from the ferry terminal to Lexington Avenue; during off-peak hours, a one-way operation is in effect, following a loop from the ferry terminal to 42nd Street, down Fifth Avenue and back to the ferry terminal via 34th Street.

Presently, NY Waterway Ferry Buses share the curbside bus lanes used by the M16 and M34 routes and are prone to the same congestion problems that impede the operation of the M16 and M34 local bus routes.

1.2.3 EXPRESS BUS OPERATIONS

As noted above, the 34th Street corridor provides east-west access in Manhattan for express buses seven days a week. Express bus service is most heavily concentrated in the weekday AM and PM peak hours. During the weekday AM peak hour, approximately 100 express bus trips are scheduled to operate on 34th Street, and the average weekday ridership on these routes exceeds 16,000 passengers per day.

Currently, express buses share the curbside bus lanes used by the M16 and M34 routes but have dedicated stops. To pass slower or stopped buses, express buses must merge into the general traffic lanes, which can delay their trip. Furthermore, express buses are prone to the same congestion problems that impede the operation of the M16 and M34 local bus routes.

1.2.4 PEDESTRIAN CONGESTION

The many attractions along 34th Street bring scores of pedestrians to the area. Madison Square Garden, Penn Station, Macy's and the surrounding shopping district, and the Empire State Building are located along and near the three blocks of 34th Street between Fifth and Eighth Avenues. Pedestrian congestion is a frequent occurrence as sidewalks often become so crowded that people walk in the traffic lanes (see **Figure 1-11**). Problems are even more pronounced near intersections where pedestrians queue to board buses and to cross the street. At the corners of Sixth, Seventh, and Eighth Avenues, subway stairways and the passengers ascending and descending them further crowd street-level pedestrian space (see

Figure 1-11). The congestion along this portion of 34th Street creates challenges for both pedestrian safety and comfort.

1.2.5 FUTURE DEVELOPMENT AND CROSSTOWN TRANSIT DEMAND

The future development projects identified above will generate substantial new demand for crosstown transit service. As shown in **Table 1-2**, Moynihan Station, the Eastern and Western Rail Yards, and the First Avenue Properties projects will generate more than 3,600 AM peak hour riders and nearly 3,500 PM peak hour riders on the 34th Street crosstown bus routes.

Table 1-2
Demand for M16/M34 Bus Service from Future Major Development Projects

PEAK HOUR AND DIRECTION OF TRAVEL		NEW M16/M34 BUS RIDERS			
		MOYNIHAN STATION	EASTERN AND WESTERN RAIL YARDS	FIRST AVENUE PROPERTIES	TOTAL
AM Peak Hour	Eastbound	60	1,107	237	1,404
	Westbound	185	1,967	50	2,202
	Total	245	3,074	287	3,606
PM Peak Hour	Eastbound	158	1,748	86	1,992
	Westbound	115	1,165	218	1,498
	Total	273	2,913	304	3,490

Notes:
Consistent with analysis presented in the Western Rail Yard Draft Environmental Impact Statement, the capacity of the M16 and M34 routes was assumed as 65 passengers per bus.
New demand for bus service was not fully quantified in the *ARC Final Environmental Impact Statement*.[1]
The 15 Penn Plaza and East River Science Plaza projects are not included in the above estimates, since data for these projects are not yet available.
Sources:
Empire State Development Corporation, *Farley Post Office—Moynihan Station Redevelopment Project Final Environmental Impact Statement*, August 2006.
Metropolitan Transportation Authority and New York City Planning Commission, *No. 7 Subway Extension—Hudson Yards Rezoning and Development Program Final Generic Environmental Impact Statement (CEQR No.: 03DCP031M)*, November 2004.
Metropolitan Transportation Authority and New York City Planning Commission, *Western Rail Yard Draft Environmental Impact Statement (CEQR No.: 09DCP007M)*, May 2009.
New York City Department of City Planning, *First Avenue Properties Rezoning, Final Supplemental Environmental Impact Statement (CEQR No.: 06DCP039M)*, January 2008.

The ARC project will improve access to Manhattan for commuters west of the Hudson River and will attract more people to the 34th Street area. Although the new demand for bus service was not fully quantified in the *ARC Final Environmental Impact Statement*, there will be a predicted increase in transfers between New Jersey Transit commuter rail and the M16/M34 bus routes.

Currently under construction, the East River Science Park at First Avenue between 28th and 30th Streets will provide a 1.1 million-square-foot office and laboratory space. Based on surveys prepared for the project's Final Environmental Impact Statement, nearly 62 percent of its 2,263 employees will commute by transit. A number of other developments will also add a substantial number of transit customers in the study area by 2035.

In total, future development in the study area will result in upwards of 5,000 to 6,000 new bus riders in the study area. To accommodate these passengers, it is estimated that NYCT will need to operate 34 additional bus trips in the AM peak hour and 31 additional bus trips in the PM

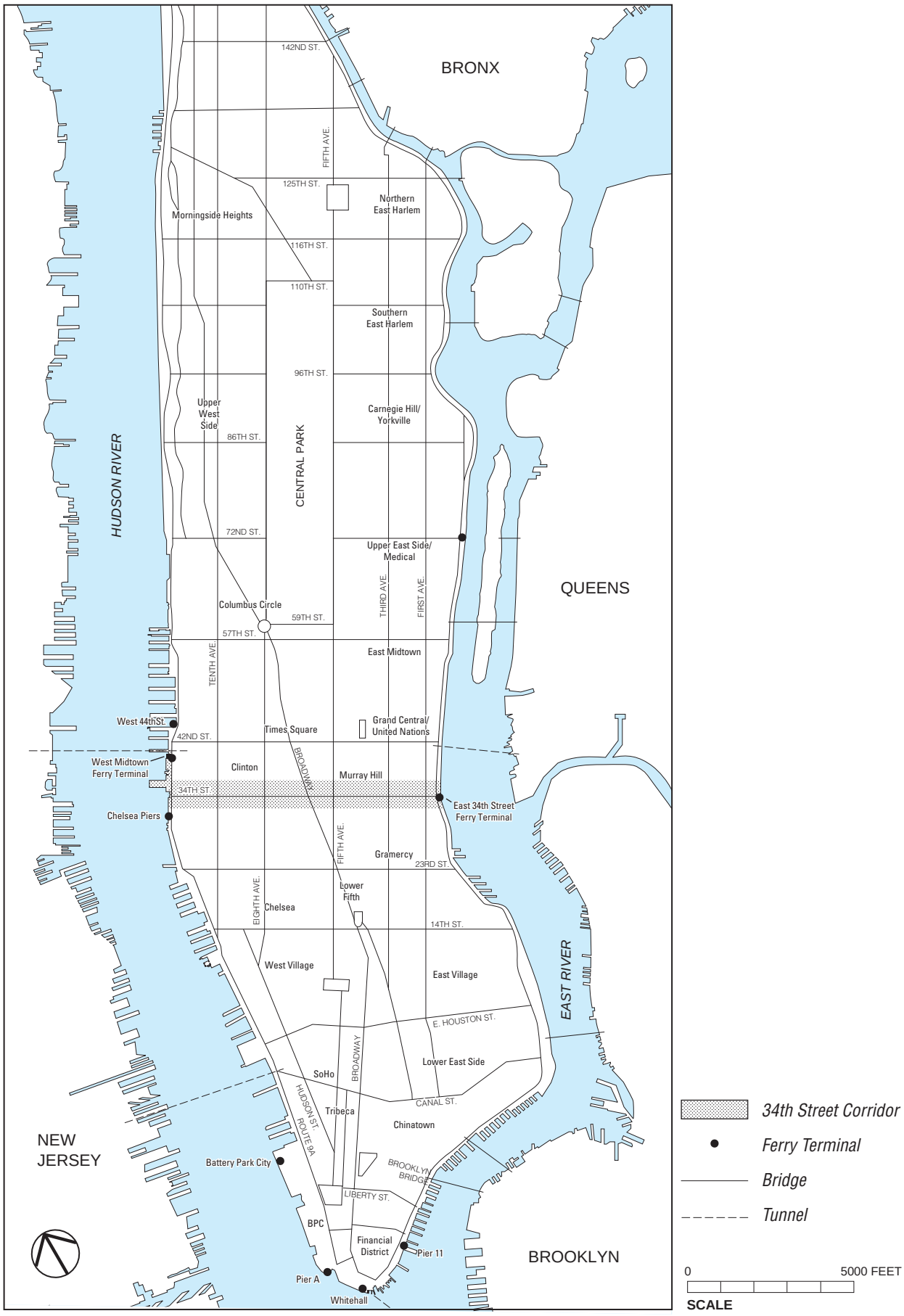
peak hour on the 34th Street crosstown bus routes. As most of this new development will be west of Eighth Avenue and east of Second Avenue, the M34 will absorb much of the new ridership. To fully meet demand, headways on the M34 would have to be less than 2 minutes - and the new bus service would be subject to the same operating difficulties as described previously for existing bus service along the corridor.

1.3 GOALS AND OBJECTIVES

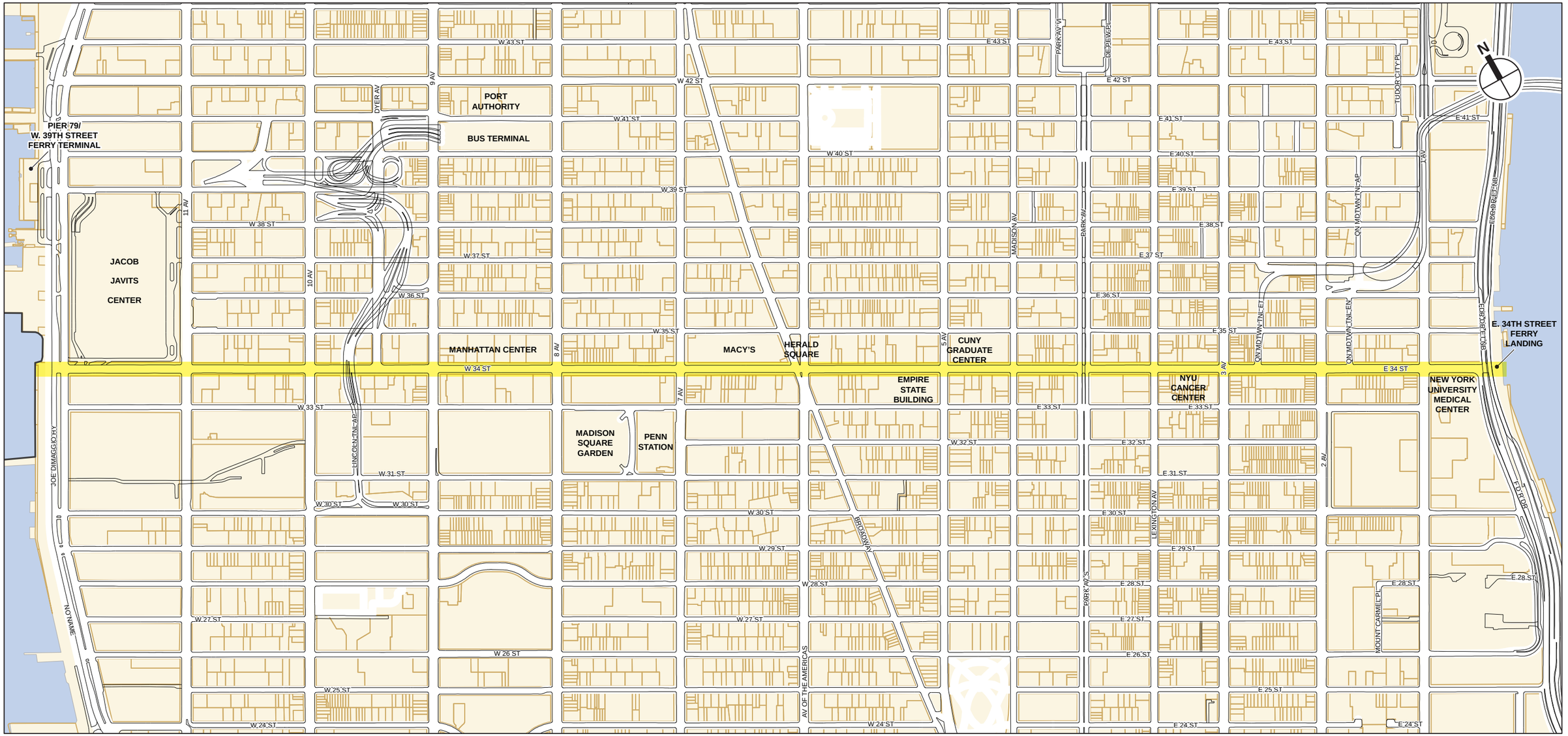
Based on the problems identified above, the Project Sponsor, in collaboration with NYCT and in cooperation with MTA Bus, has developed goals and objectives for the Proposed Project. The Proposed Project has two primary goals: 1) improve crosstown mobility; and 2) minimize capital and operating concerns. Combined, these goals aim to provide a service that not only reduces travel time and decreases congestion but is achievable both in reasonable time and cost. At the same time, the service will strive to benefit community character and avoid or minimize impacts on the environment, which are the secondary goals of the Proposed Project. The primary and secondary goals, and their supporting objectives, are shown in **Table 1-3.**

Table 1-3
Goals and Objectives

GOAL	OBJECTIVE
PRIMARY GOALS	
IMPROVE CROSSTOWN MOBILITY	• Reduce transit travel time for crosstown trips • Improve transit reliability • Reduce pedestrian congestion and improve pedestrian safety • Provide convenient connections to existing and future transit service • Improve express bus operations along 34th Street • Accommodate future transit demand
MINIMIZE CAPITAL AND OPERATING CONCERNS	• Implement within a reasonable construction timeframe • Implement within a reasonable construction cost • Be consistent with MTA operating procedures • Avoid conflicts with existing and proposed infrastructure during construction • Avoid conflicts with existing and proposed infrastructure during operation • Maintain delivery access to local businesses • Maintain access for emergency vehicles • Maintain access to arterial roadways and Manhattan portals
SECONDARY GOALS	
ENHANCE COMMUNITY CHARACTER	• Support existing and proposed development • Improve connections between residential and commercial destinations • Improve pedestrian circulation and safety
MINIMIZE ADVERSE IMPACTS ON THE BUILT AND NATURAL ENVIRONMENT	• Avoid, minimize, or mitigate adverse impacts on historic resources • Minimize encroachment on view corridors • Maintain access to existing and future uses on 34th Street • Avoid property acquisition to the maximum extent feasible • Reduce vehicular congestion, emissions, and noise • Minimize construction impacts to the extent feasible • Avoid impacts on natural features and coastal waters



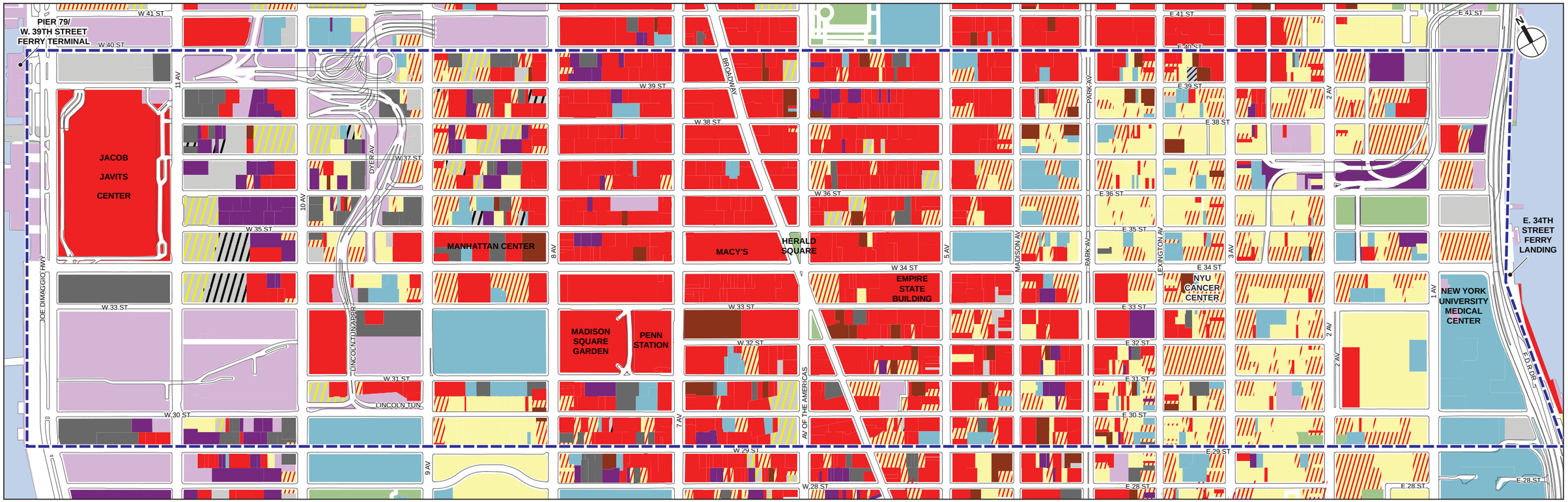
Context Map
Figure 1-1



0 0.4 MILES

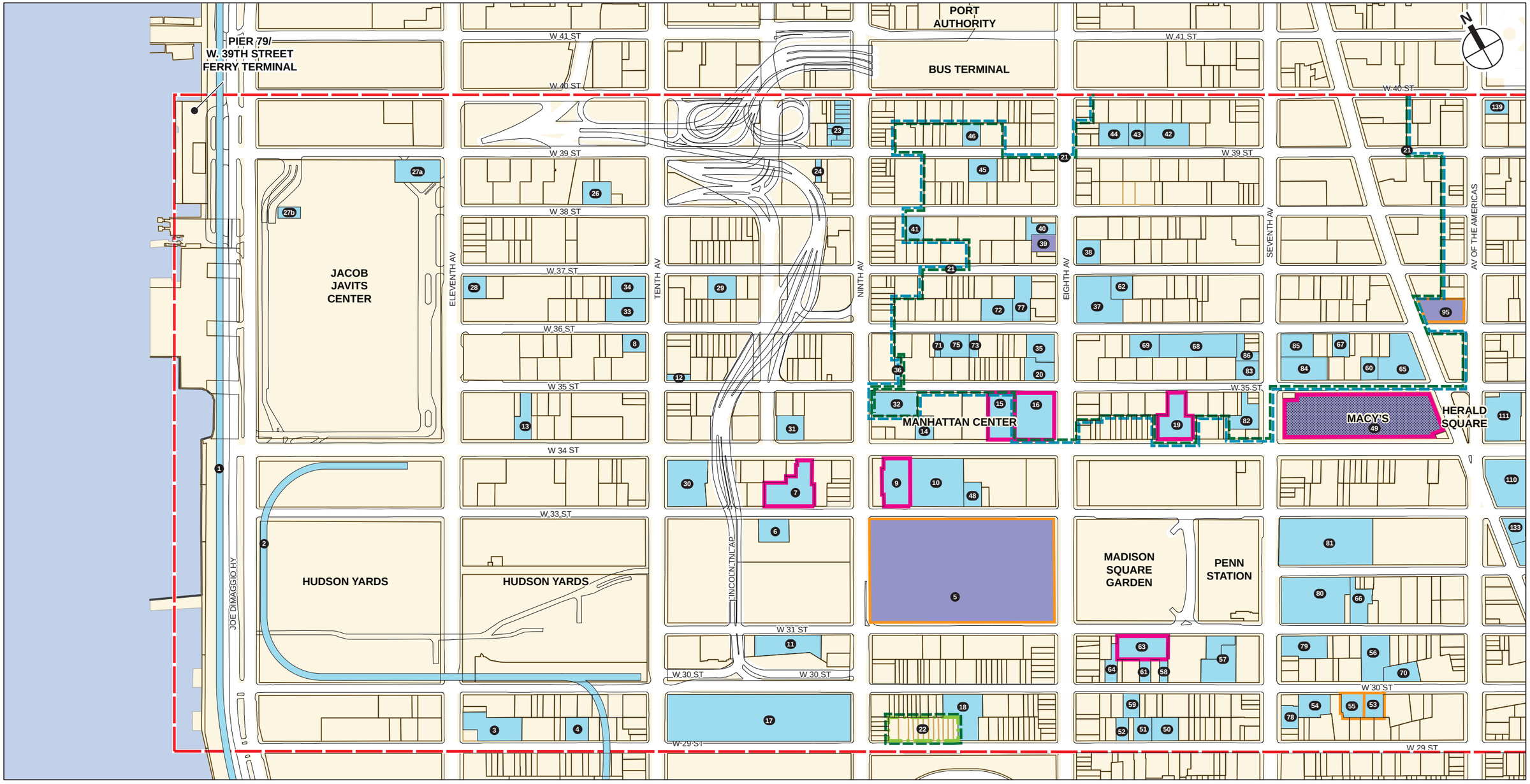
SCALE

34th Street Corridor
Figure 1-2



- *34th Street Corridor*
- *Residential*
- *Residential with Commercial Below*
- *Hotels*
- *Commercial and Office Buildings*
- *Industrial and Manufacturing*
- *Transportation and Utility*
- *Public Facilities and Institutions*
- *Open Space and Outdoor Recreation*
- *Parking Facilities*
- *Vacant Land*
- *Vacant Building*
- *Under Construction*

Existing Land Use
Figure 1-3

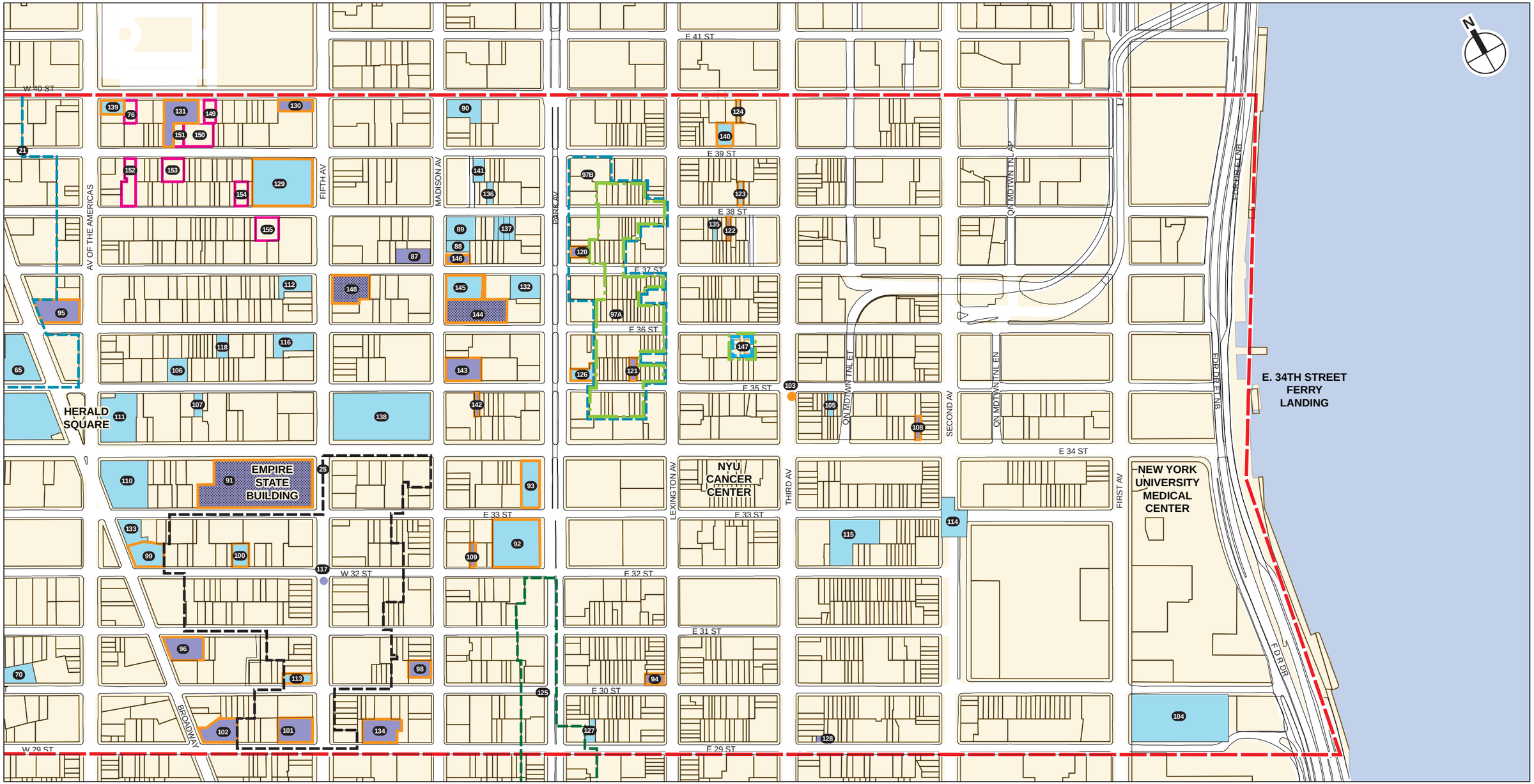


*34th Street Corridor
1 *Architectural Resource**
S/NR-Eligible (Individual)
S/NR-Listed (Individual)
S/NR-Listed (District)
S/NR-Eligible (District)
NYCL-Eligible (Individual)
NYCL - Designated (Individual)
NYCL - Eligible (District)
NYCL - Designated (District)
National Historic Landmark

**NOTE: Refer to Appendix A, Table A-1 for list of Architectural Resources*

0 1000 FEET
SCALE

Existing Historic Resources – West
Figure 1-4



34th Street Corridor

*Architectural Resource**

S/NR-Eligible (Individual)

S/NR-Listed (Individual)

S/NR-Listed (District)

S/NR-Eligible (District)

NYCL-Eligible (Individual)

NYCL - Designated (Individual)

NYCL - Eligible (District)

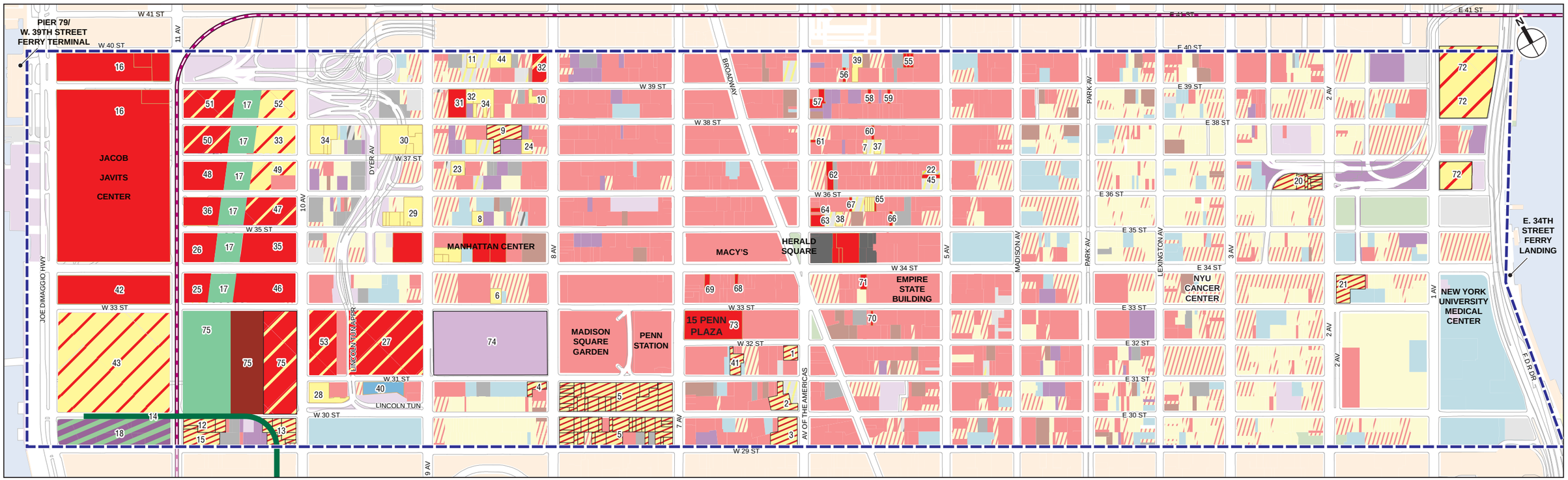
NYCL - Designated (District)

National Historic Landmark

**NOTE: Refer to Appendix A, Table A-1 for list of Architectural Resources*

Existing Historic Resources – East

Figure 1-5



34th Street Corridor

- *Residential*
- *Residential with Commercial Below*
- *Predominately Residential with Commercial*
- *Predominately Residential with Theater*
- *Predominately Commercial with Residential*
- *Commercial and Office Buildings*
- *Hotels*
- *Hotel and Residential*
- *Public Facilities and Institutions*
- *Open Space and Outdoor Recreation*
- *Open Space/Park with Accommodation for DSNY/Tow Pound Below*
- *Industrial and Manufacturing*
- *Transportation and Utility*
- *Parking Facilities*
- *Vacant Land*
- *Vacant Building*
- *Under Construction*
- *Proposed 7 Train Extension Subway Alignment*

FUTURE SITES

1. *885 Sixth Avenue*
2. *855 Sixth Avenue*
3. *835 Sixth Avenue*
4. *415 8th Avenue*
5. *West 28th/29th/30th Streets Rezoning*
6. *325 West 33rd Street*
7. *Strand Hotel: 33 West 37th Street*
8. *345 West 35th Street*
9. *310-328 West 38th Street*
10. *Sam Chang Hotels: 585 Eighth Avenue*
11. *Staybridge Suites: 334 West 40th Street*
12. *316 Eleventh Ave*
13. *Related Development*
14. *High Line Open Space*
15. *Special West Chelsea District Rezoning*
16. *Javits Convention Center Expansion*
17. *Hudson Boulevard*
18. *Department of Sanitation/ New York Police Department Facility*
19. *Open Space*
20. *Perlbinder Sit*
21. *300 East 34th Street*
22. *400 Fifth Avenue*
23. *Tower 37*
24. *307-311 W. 37th Street*
25. *Hudson Yards, Site 2*
26. *Hudson Yards, Site 4*
27. *Hudson Yards Sites 32/33*
28. *Hudson Yards site 62*
29. *Hudson Yards Site 28*
30. *Hudson Yards Site 24*
31. *Hudson Yards Site 37*
32. *Hudson Yards potential sites 68, 70*
33. *Hudson Yards Site 11*
34. *Hudson Yards Site 23*
35. *Hudson Yards Site 5*
36. *Convention Center Hotel*
37. *21 West 37th Street*
38. *57 West 35th Street*
39. *Homestead Village Hotel*
40. *Fashion Institute of Technology (FIT) dormitories, 406 West 31st Street*
41. *Friars Tower, 125 West 31st Street*
42. *33/34 Development*
43. *Western Rail Yard*
44. *Hudson Yards Potential Sites 68, 70*
45. *398 Fifth Avenue*
46. *Hudson Yards Site 3*
47. *Hudson Yards Site 7*
48. *Hudson Yards Site 8*
49. *Hudson Yards Site 9*
50. *Hudson Yards Site 10*
51. *Hudson Yards Site 12*
52. *Hudson Yards Site 13*
53. *Hudson Yards Site 31*
54. *Hudson Yards Site 39*
55. *Republic National Bank, 12-18 West 40th Street*
56. *47 West 39th Street*
57. *1026 Sixth Avenue*
58. *36 West 39th Street*
59. *24 West 39th Street*
60. *West 38th Street*
61. *1008 Sixth Avenue*
62. *59 West 36th Street*
63. *960 Sixth Avenue*
64. *968 Sixth Avenue*
65. *38 West 36th Street*
66. *23 West 35th Street*
67. *58 West 36th Street*
68. *134 West 34th Street*
69. *152 West 34th Street*
70. *36 West 33rd Street*
71. *32 West 34th Street*
72. *First Avenue Properties Rezoning*
73. *15 Penn Plaza*
74. *Moynihan Station*
75. *Eastern Rail Yard*

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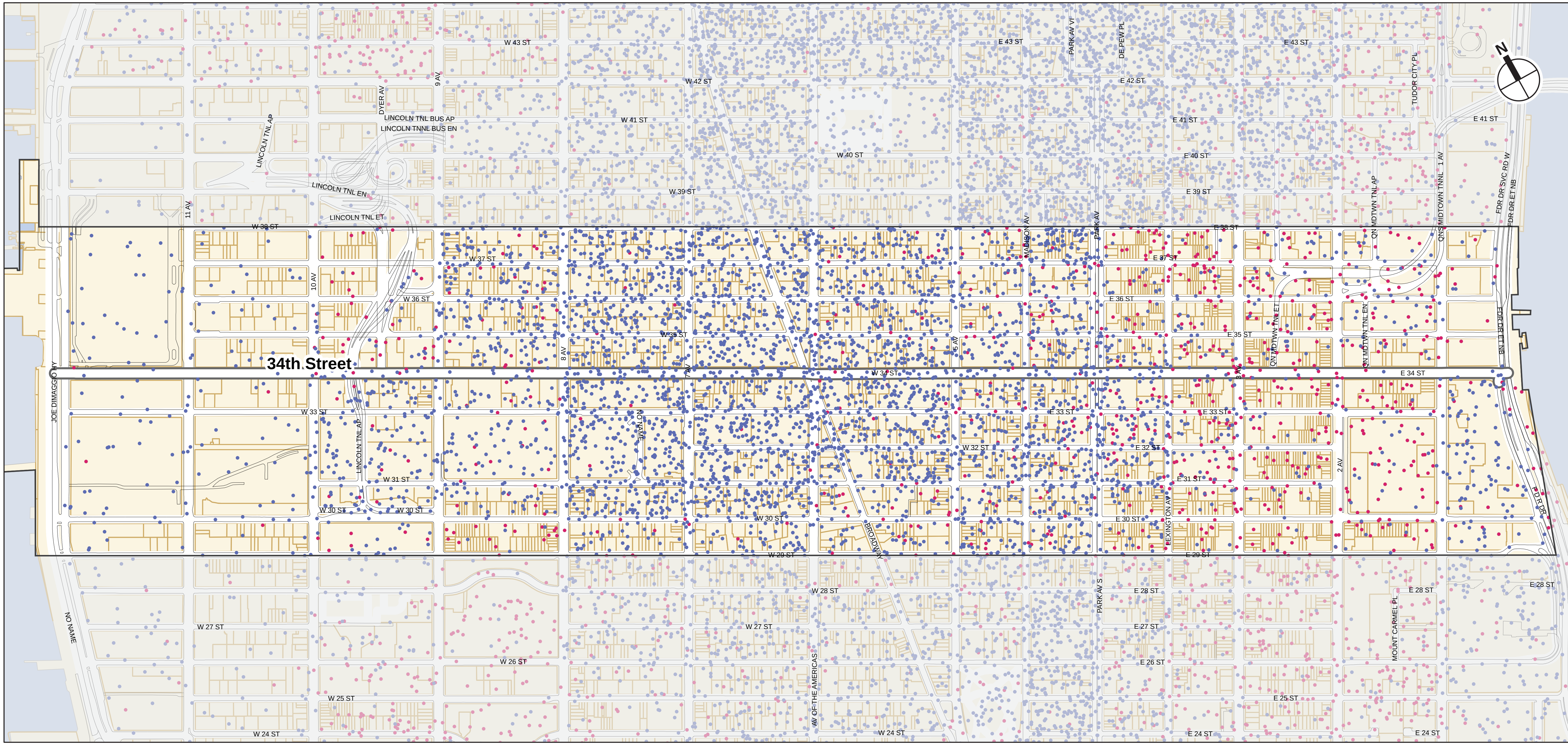
SCALE

Future Land Use Map
Figure 1-6



Study Area Commuters

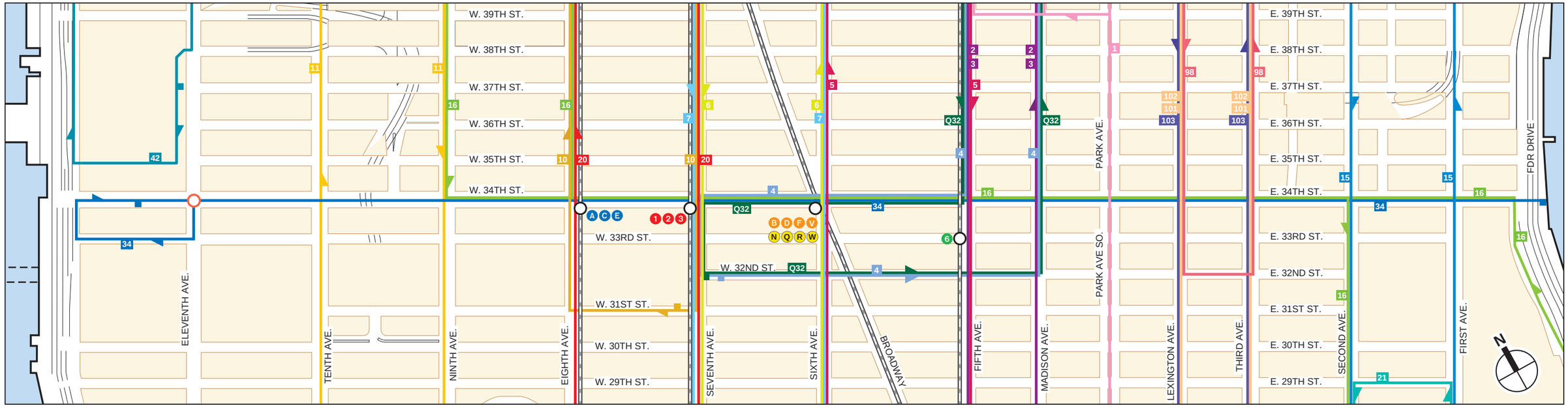
1 Dot = 50 Workers

Study Area Residents

1 Dot = 50 People

Study Area Residents and Employees

Figure 1-7



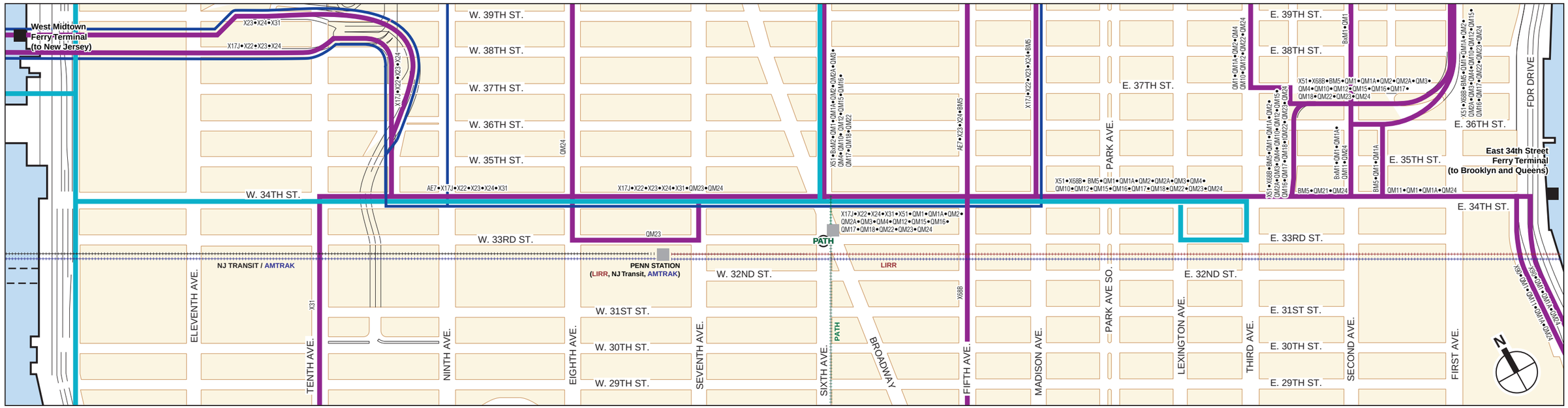
Bus Route and Terminus

20 *Bus Route Number*

Subway Route and Station

Existing Local Manhattan NYCT Subway and Bus Service

Figure 1-8

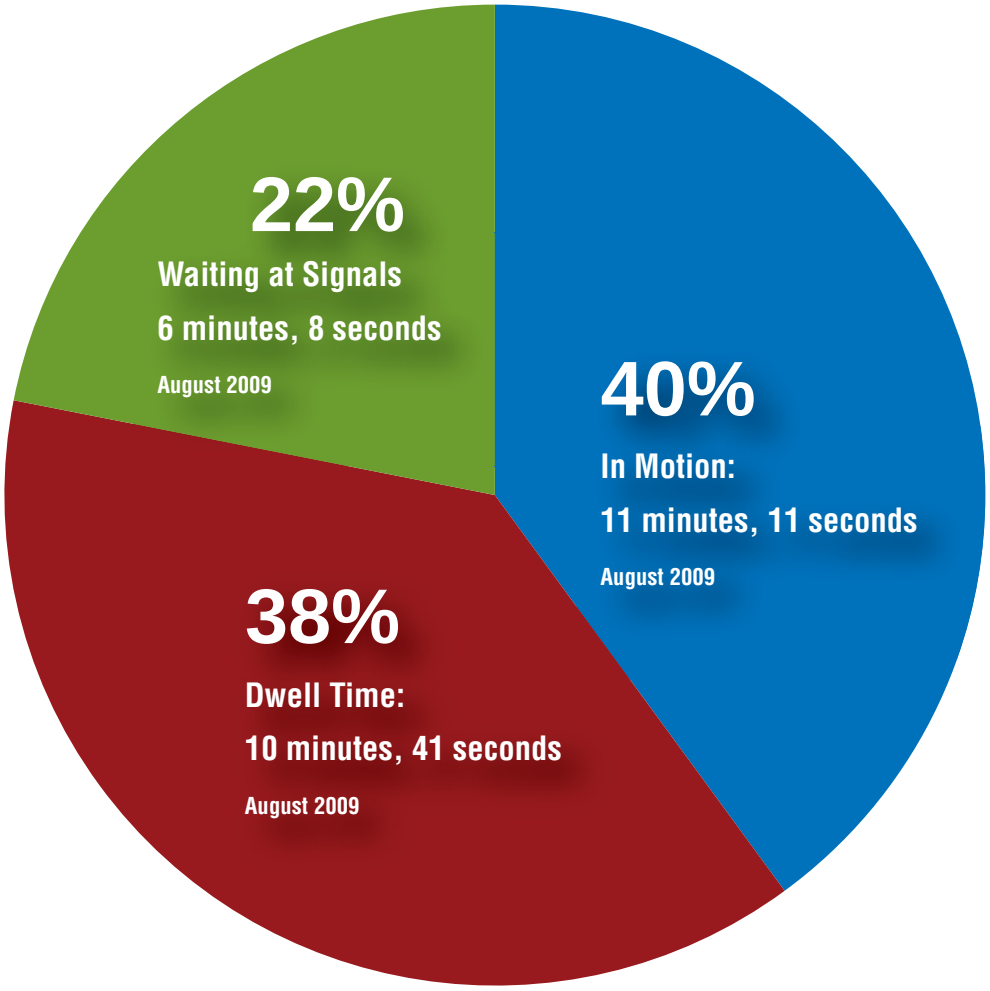


QM23 *Express Bus Routes (New York City Transit, MTA Bus Company, and Atlantic Express)*

New York Waterway Bus Route

Academy Bus

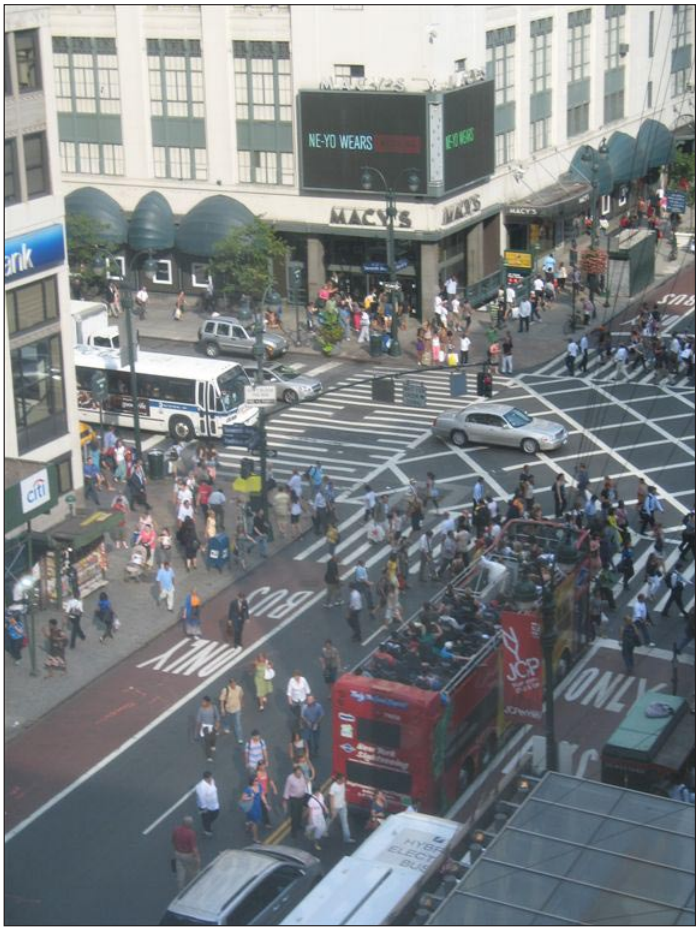
Existing Regional Transit Service
Figure 1-9



Both Directions	Percent of Total	Average Time
In Motion: 11 minutes, 11 seconds	40.0%	0:11:11
Dwell Time: 10 minutes, 41 seconds	38.2%	0:10:41
Waiting at Signals: 6 minutes, 8 seconds	21.9%	0:06:08
OVERALL AVG TRIP	***100.0%***	***0:28:00***

Time Delay Studies - M34 Bus
Figure 1-10

34th Street Pedestrians in Traffic Lanes (August 2009) **1**



34th Street Pedestrian Congestion at Intersection (August 2009) **2**

Chapter 2: Project Alternatives

2.0 INTRODUCTION

The 34th Street Transit Corridor Alternatives Analysis screening considers seven alternatives for high-capacity transit along 34th Street. The Federal Transit Administration (FTA) requires an examination of a No Build Alternative, in which current conditions are maintained, and a Transportation System Management (TSM) Alternative. The TSM Alternative includes minimal to modest investment to improve service without extensive capital improvements. In addition to the No Build and TSM Alternatives, the New York City Department of Transportation (NYCDOT), in collaboration with MTA New York City Transit (NYCT) and in cooperation with the MTA Bus Company, proposed to study five build alternatives that would implement fixed guideway (dedicated road or rail) operations with various transit modes. This chapter outlines how the alternatives were developed and presents detailed descriptions of the seven options evaluated in the screening process.

2.1 DEVELOPMENT OF ALTERNATIVES

Identifying the full range of possibilities for enhancing transit along 34th Street required consideration of three factors: alignment, logical termini, and mode. Each factor was examined in detail and then synthesized into distinct alternatives.

2.1.1 ALIGNMENT

The first step in developing alternatives was to identify the most suitable alignment for the proposed transit service. As the project intends to improve crosstown mobility in the 34th Street corridor, potential alignments included 34th Street; 32nd, 33rd, 35th, and 36th Streets; and 23rd and 42nd Streets.

34th Street: 34th Street is a two-way street with five to six lanes. Its curbside lanes are for dedicated bus use from 7:00 AM to 7:00 PM and used for standing and/or parked vehicles at other times. 34th Street is well served by transit, including north-south subway lines and local and express bus routes. The street is located one block north of Penn Station, a hub for commuter and intercity rail and local subway; there is an entrance to the station from 34th Street. In addition, ferry terminals are located at or near both ends of the street. High-capacity transit service along 34th Street would complement existing transit, and would provide convenient transfers to local and regional services while still accommodating most vehicular access.

34th Street is wider than most crosstown streets in Midtown. East of Third Avenue, the street is approximately 60 feet wide, and currently carries six travel lanes. Between Third and Ninth Avenues, the street is 50 to 54 feet wide, and currently carries four to five travel lanes. West of

Ninth Avenue, the street is 60 feet wide, and currently carries six travel lanes. The general street width and configuration is summarized in Table 2-1.

Table 2-1

34th Street: Width and Number of Lanes

Street Segment	Street Width (in feet)	Current Number of Lanes
FDR Drive-Third Avenue	60	6
Third Avenue-Ninth Avenue	50–54	4-5
Ninth Avenue-Twelfth Avenue	60	6

32nd, 33rd, 35th, & 36th Streets: The crosstown streets immediately north (35th and 36th Streets) and south (32nd and 33rd Streets) are one-way for all or most of their length and do not fully traverse Manhattan. 33rd and 35th Streets are the principal service routes for many commercial, institutional, and retail buildings that front 34th Street. To provide a transit alignment on these streets most likely would require either: 1) full closure of the street to vehicular traffic; or 2) a couplet of one-way transit guideways located two blocks apart. Since a two-way transit guideway can be provided on a wide street while maintaining partial vehicular access, these one-way streets are not preferred as the alignment for the Proposed Project.

23rd & 42nd Streets: 23rd Street to the south and 42nd Street to the north are two-way crosstown streets. Like 34th Street, both are important east-west corridors that serve a large travel market. While 23rd Street has subway and bus connections, it does not provide as many transfers to subway or express bus routes as 34th Street; it is also farther from Penn Station and the Midtown ferry terminals. 42nd Street already has high-capacity transit service for a portion of its length, including the 7 subway line and the 42nd Street S, which would be unnecessarily duplicated with additional fixed guideway service.

34th Street is the preferred alignment at this time for the reasons outlined above.

2.1.2 LOGICAL TERMINI

Following identification of the preferred alignment, the next step was to determine the most logical termini for new transit service along 34th Street. The Pier 79/West Midtown Ferry Terminal is located at 39th Street and the Hudson River; it provides ferry service between New Jersey and Midtown Manhattan. At 34th Street and the East River, the East 34th Street Ferry Terminal provides service between Midtown Manhattan and Lower Manhattan, Queens, the Bronx, and New Jersey. These ferry terminals are proximate to other major destinations, such as the Jacob K. Javits Center on the west side and New York University Langone Medical Center on the east side.

Since the ferry terminals are transportation destinations for people traveling along 34th Street and are located at either end of the corridor, they are the logical termini for the 34th Street transit corridor. Both terminals also provide the layover space needed for surface-based alternatives. As today, a single service would not necessarily need to service both terminals, but both terminals would be served by a 34th Street transit corridor improvement.

Depending on the mode, services could use all or part of the alignment to access other potential terminal points. Given the right-of-way discussion in 2.1.1, the fixed guideway improvements may be limited to 34th Street itself, depending on the mode; however, it is expected that there will be transit service from 34th Street to both termini.

2.1.3 MODE

NYCDOT, in collaboration with NYCT and in coordination with MTA Bus Company, and comments received through public feedback, has identified five potential high-capacity transit modes for 34th Street: Bus Rapid Transit (BRT), Streetcar, Light Rail Transit (LRT), Automated Guideway Transit (AGT), and Heavy Rail. Below is a general overview of the guideway, vehicles, propulsion/suspension, stops/stations, costs, and operations for each proposed mode. A summary of basic bus technology is included as a baseline comparison, as this would be the mode in the No-Build and TSM alternatives.

Section 2.2 will describe how these modes are developed into alternatives that can be analyzed for the 34th Street corridor. Section 3 presents the analysis.

2.1.3.1 BUS

Buses are rubber-tired vehicles that generally operate on roadways in mixed traffic, and are the most widely utilized transit mode.

- *Guideway:* Buses typically operate in mixed traffic, but in some instances may travel in exclusive rights-of-way.
- *Vehicle Types:* Bus transit encompasses a variety of vehicle types, ranging from vans to double-decker and articulated buses. In New York City, capacities of standard 40-foot and articulated buses range from 54 to 85 persons.
- *Propulsion/Suspension:* Diesel engines power the majority of buses currently in operation. The use of alternative fuel-powered vehicles, including compressed natural gas (CNG), and hybrid-electric, is becoming more common.
- *Stops/Stations:* Bus stop designs vary from simple signage to passenger shelters with minimal amenities for riders. Stops usually are closely spaced, ranging from one tenth of a mile to a quarter mile., Stops are typically every 600-1,000 feet apart; On 34th Street, stops occur every one to two blocks.
- *Cost:* Vehicles comprise the largest portion of capital expenses for new bus routes. Costs for buses can range from $350,000 to $1.2 million; expenses increase for newer, alternative fuel vehicles. In 2007, according to the National Transit Database (NTD), the average operating and maintenance cost per passenger mile for buses was $0.80.
- *Operation:* Buses provide occasional to frequent service. Operating speeds can reach 55 miles per hour (though typically not on city streets), but mixed traffic conditions often compromise reliability and average travel speeds.

New York City Passenger Shelter

New York City Articulated Bus
(Flyer D60HF)

New York City Hybrid Bus
(Orion 7)

Buses are the most flexible form of transit. They can operate in mixed traffic or in exclusive guideways and offer unparalleled routing flexibility. In addition, the vehicles are adaptable to a variety of fuels. New bus systems have lower capital costs than other modes. While systems are flexible, they have limited capacity and relatively slow travel times and speeds.

2.1.3.2 BUS RAPID TRANSIT

BRT is an enhanced bus system that blends the flexibility and relatively lower cost of buses with the efficiency of rail. BRT systems typically feature high-frequency, all-day service, exclusive right-of-way, level boarding, off-board fare payment, distinctive stations or stops, a quality image and unique identity, and application of Intelligent Technology Systems (ITS).

- *Guideway:* Conventional BRT operates along an exclusive busway that is access controlled. Busways can be at-grade, with pavement markings or physical barriers separating the BRT guideway from general traffic, or can be fully grade-separated. BRT vehicles can also operate in mixed traffic for some or all of their routes.
- V*ehicle Types:* BRT includes standard, articulated, and, to a lesser extent, double-articulated buses. Multiple, large doors used for both entry and exit in concert with low floors or high platforms facilitate faster passenger loading and unloading. Designs typically feature unique branding, large windows, enhanced wheelchair loading, and internal layouts that maximize passenger comfort and circulation.
- *Propulsion/Suspension:* Like traditional buses, BRT vehicles can be powered by either traditional diesel engines, or by other alternative fuels. Some clean fuel and propulsion systems include compressed natural gas (CNG), hybrid-electric, and biodiesel.
- *Stops/Stations:* BRT systems feature distinctive stops or stations that offer passenger protection, information, and fare collection equipment. Facilities can vary from simple bus shelters to full station buildings. Stops are typically spaced one half to one mile apart and can be located curbside, along the street median or a combination of both. In most systems, a combination of low-floor buses and station platforms is utilized to speed passenger boarding and unloading.
- *Cost:* The capital cost of new systems is between $7 million and $45 million per mile. The cost per vehicle ranges from $600,000 to $1.2 million. In 2007, according to the NTD, the operating and maintenance cost per passenger mile for bus systems in the United States

was $0.80. (This cost accounts for general bus service; BRT operating costs per passenger mile may be slightly higher due to additional amenities.)

- *Operation:* BRT offers frequent, reliable service during all hours of the day. Systems typically incorporate ITS elements, such as automatic vehicle location; priority or preemption at signalized intersections; and real-time passenger information systems, both on- and off-board.

Pittsburgh, PA Grade-Separated Busway

Bogotá, Colombia Median BRT Station

Interior of Beijing, China BRT bus

Orlando, FL Lymmo Real Time Information

Relative to rail modes, flexibility is a primary advantage of BRT systems. Vehicles can travel in both dedicated and non-dedicated rights-of-way and smoothly transition between the types of guideways. Other benefits include improved operating speeds and reliability due to elimination of various types of delay, as well as moderate to high vehicle capacities at a lower cost than rail. Compared with conventional bus, however, BRT yields higher capital costs and has somewhat less flexible routing. Operating in mixed traffic can compromise the travel times of BRT, thereby reducing the reliability benefits inherent in systems that run in exclusive guideways.

2.1.3.3 STREETCAR

Streetcar systems consist of electrically powered rail vehicles operated in one to three car sets. Vehicles usually share travel lanes with other traffic. Streetcars complement pedestrian-friendly development and activity and, in recent years, have reemerged as a high-quality transit alternative to support compact and higher-density development in cities that cannot afford, or do not have, sufficient demand for larger rail systems.

There are two classifications of streetcars: "heritage" and "modern." The primary difference between the two is the vehicle design. Heritage streetcars preserve the look and feel of trolleys dating back to the early 1900s, while modern streetcars incorporate the advanced technology of light rail transit, enabling quieter and smoother running vehicles. The following discussion is limited to the modern streetcar since this type allows faster boarding due to its low-floor design; it also has a higher capacity.

- *Guideway:* Streetcars operate predominately in urban centers within mixed traffic. In few instances, vehicles can operate in exclusive rights-of-way.
- *Vehicle Types:* Modern streetcars often are articulated, varying in length from 60 to 115 feet. Vehicle bodies are usually narrower than standard buses and feature large windows, wide doors, and low floors.
- *Propulsion/Suspension:* Streetcars are electrically powered and the steel wheels travel along fixed, at-grade steel rails. Overhead wires typically supply power. Underground conduits are also possible if height clearance or aesthetics are of concern. The Bordeaux tramway (streetcar) in France is currently the only system powered via underground conduit. This technology, however, has not yet proven completely reliable1.
- *Stops/Stations:* Streetcar stops are generally spaced close together, with an average distance of a quarter mile between stops. Stop designs can vary from simple signage to enhanced shelters.
- *Cost:* Capital costs of new streetcar systems are commensurate with the required level of utility relocations, roadway reconstruction, and streetscape enhancements. Costs are in the range of $25 million to $100 million per mile. The operating cost per passenger mile of U.S. light rail systems was $0.60 in 2007, according to the NTD. Streetcar and LRT costs in this document are equivalent because the FTA NTD aggregates the statistics of the two modes under one category, "light rail."
- *Operations:* Streetcars typically provide frequent service with short headways. Modern systems primarily utilize off-board fare payment and incorporate such ITS features as automatic vehicle locators, signal preemption or prioritization, and passenger information displays at stops.

Seattle, WA Streetcar showing Overhead Wire

Pedestrian Activity Adjacent to Portland, OR Streetcar

[1] This refers to current technology use. Conduit streetcars were historically used in New York City.

Streetcars are best used in dense urban centers, particularly where parking is scarce; they are well suited to circulation and short trips. Vehicles can serve constrained station areas and streets, and negotiate sharp turns and narrow rights of way. Streetcars are not designed for long distances and corridors requiring high capacities or high speeds. Similar to buses, operating in mixed traffic can slow travel speeds and times.

2.1.3.4 LIGHT RAIL TRANSIT

LRT is typically an electrically powered, at-grade rail mode featuring high-capacity vehicles. LRT is suitable for medium-distance trips in suburbs and between central business districts and other major activity centers.

- *Guideway:* LRT operates predominately at-grade in an exclusive travel lane, but may include grade-separated guideways. In rare instances, LRT can operate in mixed traffic over short distances.
- *Vehicle Types:* Recent examples of LRT vehicles in the U.S. are those having two articulated sections, with a typical articulated car ranging from 90 to 95 feet in length. Operator cabs are located at both ends of the vehicles to allow bi-directional travel. Vehicle designs feature large windows, wide doors, and low floors.
- *Propulsion/Suspension:* LRT vehicles are almost exclusively electrically powered and the steel wheels travel along fixed, at-grade steel rails. Overhead wires typically supply power. Diesel LRT vehicles can be used when height clearance or aesthetics from overhead wires are of concern. NJ Transit employs diesel technology for the RiverLINE Light Rail system. Underground conduit can also power LRT vehicles; however, this technology is unproven, and raises additional cost issues.
- *Stops/Stations:* LRT stations are generally spaced one half to one mile apart. Station designs vary from enhanced shelters to full terminal buildings.
- *Cost:* Costs of new LRT systems depend largely on the guideway type, ranging from $25 million to $220 million per mile. The operating and maintenance cost per passenger mile of U.S. light rail systems was $0.60 in 2007, according to the NTD.
- *Operations:* LRT operates with short headways and can attain speeds of up to 65 miles per hour, depending on right-of-way exclusivity and the number of stops. Systems often incorporate off-board fare collection, automatic vehicle locators, signal preemption or prioritization, and passenger information displays at stops.

Hudson Bergen LRT
Underground Station


Phoenix, AZ
LRT interior view


Charlotte, NC LRT
Boarding Passengers

LRT technology offers flexibility in alignment. Vehicles may operate in mixed traffic or in an exclusive right-of-way, and in a variety of transit envelopes, including at-grade, elevated, or in a tunnel. LRT can accommodate moderate to high capacity and serve both low- and high-density land uses.

2.1.3.5 AUTOMATED GUIDEWAY TRANSIT

AGT encompasses fixed-guideway technologies that feature automatic train operation. AGT predominately serves as a distribution system in areas where there are high volumes of trips concentrated over short distances. Also known as "people movers," AGT is found commonly in airports, zoos, amusement parks, and, to a lesser extent, central business districts.

- *Guideway:* AGT must operate in exclusive, grade-separated, fixed guideways.
- *Vehicle Types:* AGT vehicles are small to medium-sized. The vehicles can accommodate 20 to 55 persons, typically with a high amount of standing room. Train sets can vary from one to six vehicles. Designs feature large windows at both ends and multiple doors, often on both sides of the vehicle.
- *Propulsion/Suspension:* AGT most often utilizes conventional third rail electric propulsion, but in some cases employs linear induction motors. Suspension can be either steel wheel on steel rail or rubber tires.
- *Stops/Stations:* AGT station spacing is comparable to light or heavy rail, ranging from one quarter to one third of a mile in activity centers to one-half to one mile in other areas. Designs of stations vary.
- *Cost:* Capital costs of AGT systems are between $70 million and $250 million per mile. In 2007, the operating and maintenance cost of AGT systems in the US was $6.20 per passenger mile, according to the NTD.
- *Operations:* Service characteristics of AGT, including operating speeds and headways, vary. Passenger capacities are generally less than on LRT or heavy rail systems, and, depending on the context of the AGT setting, operating speed ranges between 25 and 60 miles per hour. Fare collection for AGT is off-board; in many cases, the systems operate free of charge.

Miami, FL AGT


Detroit, MI AGT Station


Interior of JFK AGT (AirTrain)

Generally, AGT is suited for short distance travel in urban applications. The fully automated, centrally controlled operations allow many small units to run at short headways. While automated operations may reduce labor costs, AGT systems have high capital costs per mile;

these costs stem from the grade separation of the automated system and a limited pool of suppliers.

2.1.3.6 HEAVY RAIL

Urban heavy rail systems include electrically powered rail vehicles that operate in exclusive, grade-separated rights-of-way. The high-capacity system exhibits high performance in terms of speed and reliability.

- *Guideway:* Heavy rail may only operate in exclusive fixed guideways. Alignments are elevated or in underground tunnels and, in limited instances, may be at-grade. No grade crossings of the right-of-way are permitted.
- *Vehicle Types:* Heavy rail vehicle capacities range from between 100 and 200 persons. Operator cabs are usually located at both ends of the vehicle sets to allow for bi-directional travel. Vehicles typically designed with multiple sets of double doors along both sides; interior seating and standing configurations vary. Vehicles typically operate in multiple car trains.
- *Propulsion/Suspension:* Electrified third rail or overhead catenary wires powers heavy rail. Domestic vehicles have steel wheels and operate on steel rails.
- *Stops/Stations:* Heavy rail stations are generally spaced one-third of a mile to two miles apart. Station designs vary.
- *Cost:* Capital costs of heavy rail systems depend largely on the vertical alignment, with cost falling between $90 million and $3.1 billion per mile. According to the NTD, the operating cost and maintenance per passenger mile for heavy rail systems in 2007 was $0.40.
- *Operations:* Heavy rail systems can operate at short headways and obtain operating speeds of up to 60 miles per hour. In urban settings, passengers generally pay fares off-board, prior to entering the station platform.

The advantages of heavy rail systems include high capacities and frequent service over short and long distance travel. The exclusive rights-of-way with no crossings enable much higher speeds than the other modes discussed previously. However, the benefits of heavy rail come at very high capital costs. Further, the need to restrict all crossings of heavy rail right-of-way can present a challenge.

NYC Subway Train

Underground London Metro Station

2.2 DESCRIPTION OF ALTERNATIVES

The 34th Street Transit Corridor Alternatives Analysis Screening evaluates a No Build Alternative, a TSM Alternative, and five Build Alternatives. These alternatives are based on the differences in modes described above. In the section that follows, they are further discussed as they pertain to the Proposed Project. The alternatives are evaluated for the 34th Street corridor in Chapter 3, "Alternatives Screening Analysis."

2.2.1 NO BUILD ALTERNATIVE

Federal regulations require that a No Build Alternative be evaluated in an Alternatives Analysis and Environmental Impact Statement (EIS). For the purposes of the Proposed Project and to be compliant with requirements of the National Environmental Policy Act (NEPA), the No Build Alternative is the baseline against which the other alternatives are compared for the extent of environmental and community impacts. The No Build Alternative assumes that MTA NYCT, MTA Bus, and other transit operators would maintain their current express and local operations on 34th Street. Transit operators would adjust service levels based on ridership changes, as is their current practice.

NYCT operates four subway stations along 34th Street with north-south express and local service on 15 subway routes and provides north-south bus service on 16 routes. Vehicle type and schedule for the M16 and M34 bus routes and express bus operations would not change in the No Build conditions. Amtrak intercity train service and NJ TRANSIT and LIRR commuter service would continue to use Penn Station, in addition to the new station that will be constructed by ARC. **Figures 2-1** and **2-2** illustrate the existing 34th Street transit network.

The No Build Alternative assumes no new improvements to the transportation system in the study corridor, other than those currently in local and regional transportation plans and which have funds identified for implementation by 2035. Therefore, for purposes of this study, the baseline condition will reflect land use, social and demographic conditions, and transportation services in 2035, by which time it is reasonable to assume implementation of any of the build alternatives.

The following transportation projects outlined in the 2010-2035 Regional Transportation Plan of the New York Metropolitan Transportation Council1 are scheduled to occur in the project study area and will augment the existing transit network:

- *Second Avenue Subway:* The Second Avenue Subway is a two-track heavy rail line that will run along Second Avenue from 125th Street in Upper Manhattan to the Financial District in Lower Manhattan, and will include a new station at 34th Street and Second Avenue. The subway will include a connection from Second Avenue through the 63rd Street tunnel to existing tracks for service to West Midtown and Brooklyn, on which service will stop at the existing 34th Street/Herald Square station. Stations will be wheelchair-accessible and include escalators, stairs, and in compliance with the Americans with Disabilities Act (ADA), elevator connections from street-level to station mezzanine and from mezzanine to platforms.

[1] New York Metropolitan Transportation Council (NYMTC): 2010-2035 Regional Transportation Plan - —A Shared Vision for a Shared Future; September 2009.

- *East Side Access:* The East Side Access project will connect LIRR's Main and Port Washington lines in Queens to a new LIRR terminal beneath Grand Central Terminal in Manhattan. The new connection will increase the LIRR's capacity into Manhattan and dramatically shorten travel time for Long Island and eastern Queens commuters traveling to the east side of Manhattan. This may reduce the number of passengers traveling from Penn Station to the East Side of Manhattan somewhat.
- *BRT:* NYCDOT and NYCT will implement BRT along First and Second Avenues, as well as along other routes in New York City. The First and Second Avenue corridor is approximately 8.5 miles long and will stretch from the South Ferry Station to 125th Street in Upper Manhattan. The M15 Limited bus currently serves this corridor. The proposed route will cross 34th St and will have stations within the corridor.
- *Extension of* ❼ *Subway Line:* In conjunction with the Hudson Yards rezoning, the MTA is extending the ❼ Subway line. The extension is from its existing terminus at West 41st Street and Seventh Avenue to a new terminus at West 34th Street and Eleventh Avenue.
- *Access to the Region's Core (ARC) Tunnel:* New Jersey Transit and the Port Authority of New York and New Jersey are constructing a new commuter rail tunnel between New Jersey and Manhattan. A new commuter rail station will be provided beneath 34th Street between Sixth and Eighth Avenues. ARC, which is planned for completion in 2017, will substantially increase the capacity of commuter rail service between Manhattan and areas west of the Hudson River.
- *Penn Station Access Study Update:* MTA Metro-North Railroad (Metro-North) has been preparing environmental analyses to examine the potential benefits and impacts associated with providing additional regional rail service within the New York Metropolitan Area from Metro-North's east-of-Hudson service territory to Penn Station, New York, and the west side of Manhattan. Proposed Penn Station Access service would be provided primarily by using existing infrastructure, with some capital improvements.

The proposed projects above would all occur in some part of the study area, and will be taken into consideration when evaluating all of the alternatives.

2.2.2 TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE

The FTA describes TSM alternatives as relatively low-cost approaches to addressing transportation needs in a corridor. The TSM Alternative represents the "best that can be done" for mobility without constructing a new transit guideway. Generally, the TSM Alternative emphasizes upgrades in transit service through operational and relatively minor physical improvements, plus selected roadway upgrades through intersection improvements, minor widening, and other focused traffic engineering actions. A TSM Alternative normally includes such features as bus route restructuring, more frequent bus service, expanded use of articulated buses to increase capacity, bus lanes, special bus ramps on freeways, expanded park-and-ride facilities, express- and limited-stop service, signalization improvements, and improved transfer operations. While the scale of these improvements is generally modest, TSM alternatives may cost tens of millions of dollars while guideway alternatives range up to several hundreds of millions or billions of dollars. TSM alternatives are important components of transit studies because they provide a baseline against which all major investment alternatives

can be evaluated. The most cost-effective TSM alternative generally serves as the baseline against which the selected Build Alternative is compared.1

For the 34th Street Transit Corridor the TSM Alternative will be based on Select Bus Service in New York City. It would include the following features between the FDR Drive and Twelfth Avenue:

- Low-floor, articulated buses that allow for near-level boarding and higher capacity;
- Existing signal timings with Transit Signal Priority (TSP) at limited locations;
- Increased enforcement of existing bus lanes; and
- Off-board or other fare collection to allow multiple door boarding.

These improvements should result in some reduction in travel time along the corridor and should provide a basis of comparison to for the alternatives discussed below. Projected end-to-end travel time for the TSM Alternative is 22 to 25 minutes based on current average travel times for buses (see Figure 1-10) and proposed improvements.

2.2.3 BUILD ALTERNATIVE 1—BUS RAPID TRANSIT

Build Alternative 1 would result in a new BRT line through the corridor. The following are the key characteristics of this alternative.

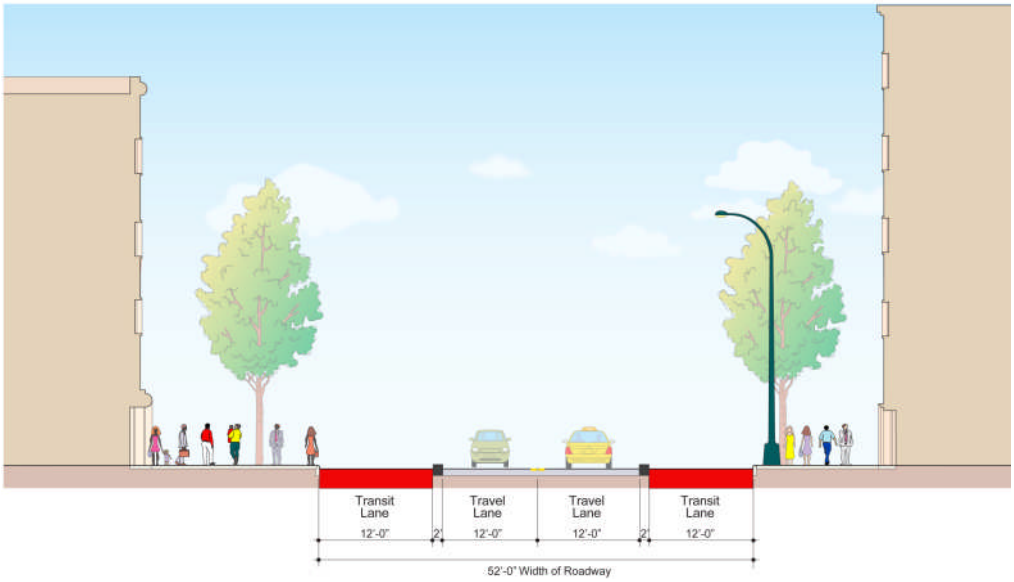
- *Technology:* Build Alternative 1 proposes BRT in the 34th Street corridor. The articulated bus proposed for the corridor will be low-floor to allow for level boarding.
- *Guideway:* Under this alternative, transit and non-transit traffic would be completely separated by a mountable physical barrier (e.g., raised curb, rumble strips, domes, etc) to reduce conflicts with vehicular traffic. Three alternative configurations for the guideway were considered, and are described below. Each configuration was evaluated for how it would fit in the existing curb-to-curb roadbed of 34th Street. It was assumed that a bus lane could be no narrower than 10 feet in width, a 12-foot-wide bus lane was preferred, and the physical barrier could be no narrower than 1.5 feet in width.
    - Curb-Running: BRT would run within the existing bus lane on 34th Street, which would be physically separated from the rest of the street. This change would have small effects on travel lanes: on some blocks one travel lane would need to be removed to accommodate the physical barriers due to the limited width of the road. Two-way traffic would be maintained for the entire corridor. Right turns along the corridor would be restricted through the use of separate signal phasing and turn prohibitions.

      Stations would be located on the existing sidewalks. Passengers would board westbound buses from the north curbside, and eastbound buses from the south curb. Both express and local buses, as well as emergency vehicles, would be able to use the bus lanes.

      Pedestrian space benefits would be limited due to the need for continuous bus lanes along the existing curb.

[1] This approach is also required for the FTA New Starts/Small Starts program.

Because of the presence of protected bus lanes along both curbs of 34th Street, parking and loading activity would be prohibited along the full length of 34th Street at all times.



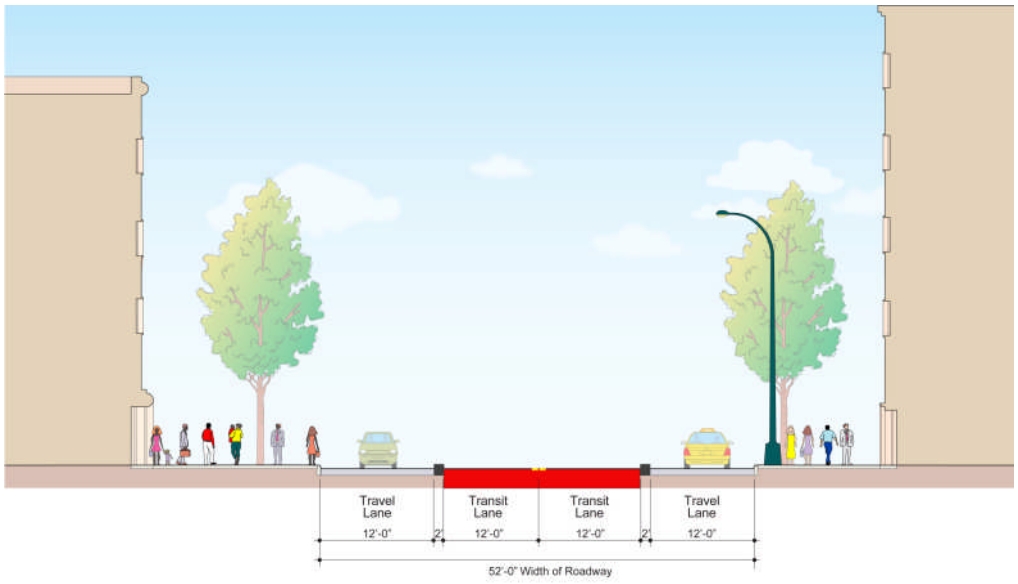
Curb alignment of transit lane on typical section of 34th Street

- Median-Running: BRT would run in the center of 34th Street. A two-way transitway would be provided with treatments to separate the BRT lanes from general traffic lanes. Both express and local buses, as well as emergency vehicles, would be able to use the bus lanes. Two-way traffic would be maintained for the entire corridor; in some locations, the number of general travel lanes would need to be reduced by one.

  BRT stations would be constructed in the center of the 34th Street right-of-way near the intersections of north-south avenues. Pedestrians would then cross the general traffic lanes to reach the north or south sidewalks of 34th Street.

  Some sidewalk expansions would be possible depending on street width. Median stations would also serve as crossing refuges for pedestrians.

  Because of the width of the street, service deliveries/loading would not be allowed along 34th Street between Third and Ninth Avenues. East of Third Avenue and west of Ninth Avenue, service deliveries/loading and parking could be permitted along one curb of the street.



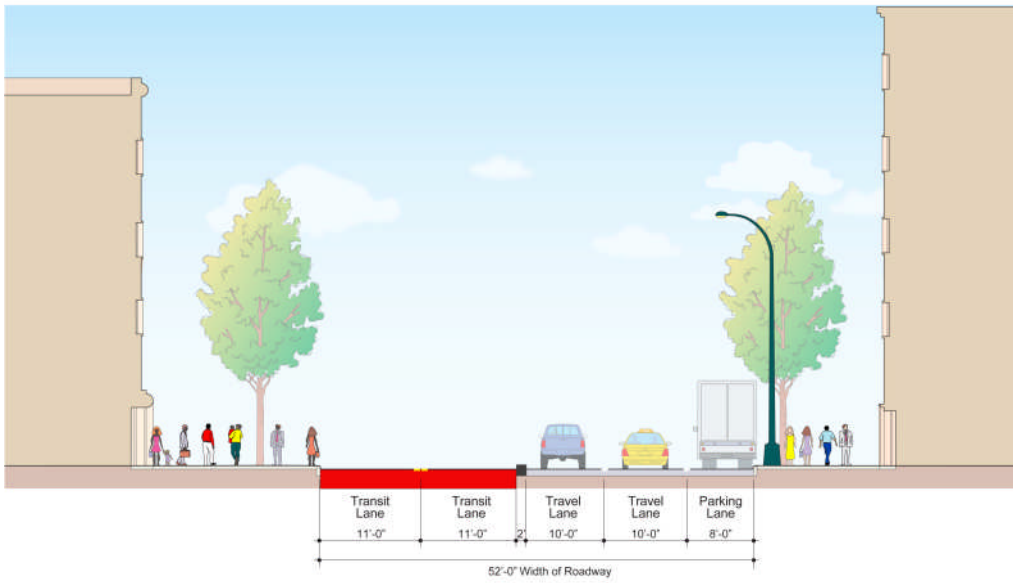
Median alignment of transit lane on typical section of 34th Street

- Single Side Running: BRT would combine operate in a bi-directional busway oriented along the north curbside, south curbside, or combination of both curbsides along the corridor. Both express and local buses, as well as emergency vehicles, would be able to use the bus lanes. The remainder of the street would be used for up to two lanes of general traffic, as well as one lane of parking.

  One direction of bus riders would enter and exit vehicles from sidewalk stations while riders in the opposite direction would enter and exit from median stations.

  Sidewalk expansions could be added at most intersections where curbside parking space is available, as well as at other locations depending on street width. Median stations would also serve as crossing refuges for pedestrians.

  Under this configuration, one curb would be available at all times for parking or service delivery/loading activity on all blocks. On some blocks, loading could be available on both curbs for limited hours of the day, although doing so would require vehicles to use the bus lanes (such as by special permit).



Single side alignment of transit lane on typical section of 34th Street

For the Alternatives Analysis, the Single Side Running alignment will be used for the BRT mode option. While the benefits of the three options are similar, the parking impacts of the Curb-Running and Median-Running alternatives are considered to be unacceptable based on community needs, as shown by the significant amount of feedback received during the Alternatives Analysis outreach process. In addition, the Single Side Running alignment provides the most opportunities for creating additional pedestrian space. Therefore, this alignment best satisfies the goals and objectives of the project.

- *Stations:* Stations would be located at nearly every avenue crossing; a potential map of station locations is shown in **Figure 2-3**. However, the final station locations would be determined through the design process. These stations could be on the center median or on the sidewalk, depending on the configuration of the guideway and the direction of travel. BRT stations would be of high-quality design and have various amenities. These treatments would include large shelters, real-time information, and bicycle parking at key locations.
- *Fare Payment:* BRT would provide fare vending machines on station platforms, or similar payment systems. This would also facilitate all-door boarding, which allows patrons to board/exit the bus from the rear or the front, and would minimize dwell times.
- *Signal Operations:* TSP would be an integral component of this alternative by decreasing the frequency of delays at intersections. TSP will be at most signals through the corridor to allow for reduced end-to-end travel time.
- *Maintenance Facility:* Buses would be maintained at existing MTA depots.
- *Travel Time:* Projected end-to-end travel time for BRT is 18 to 20 minutes, based on current average travel times for buses (see Figure 1-10) and proposed improvements.

2.2.4 BUILD ALTERNATIVE 2—STREETCAR

Build Alternative 2 would result in a new streetcar line through the corridor. Following are the key characteristics of this alternative.

- *Technology:* Build Alternative 2 proposes streetcar service in the 34th Street corridor. Catenary wires (requiring a law change) or underground conduit would need to be installed in each direction along the corridor to supply power to the vehicles.
- *Guideway:* Under this alternative, transit and non-transit traffic would be operating in mixed traffic. Three alternative configurations for the guideway were considered, and are described below. This configuration was evaluated for how it would fit in the existing curb-to-curb roadbed of 34th Street. It was assumed that a streetcar lane could be no narrower than 11 feet, and that a 12-foot-wide streetcar lane was preferred. The typical sections shown in 2.2.3 also apply to the descriptions below.
  - Curb-Running: Streetcars would run within the existing bus lane on 34th Street, which would not be physically separated from the rest of the street. Vehicular traffic would be permitted to make right turns from the streetcar lane. Two-way traffic would be maintained for the entire corridor. Vehicles will only be permitted in the streetcar lane to make right turns.

    Stations would be located on the existing sidewalks. Passengers would board westbound streetcars from the north curbside, and eastbound streetcars from the south curb. Both express and local buses, as well as emergency vehicles, would be able to use the streetcar lanes.

    Pedestrian space benefits would be limited due to the need for continuous streetcar lanes along the existing curb.

    Due to the presence of streetcar lanes along both curbs of 34th Street, parking and loading activity would be prohibited along 34th Street at all times.
  - The Median-Running alignment for streetcar is very similar to the median alignment for the LRT Alternative; however, there will be no physical barrier between the streetcar and general traffic lanes. Vehicular traffic would only be permitted to enter the streetcar lane in order to make left turns.

    Both express and local buses, as well as emergency vehicles, would be able to use the streetcar lanes. Two-way traffic would be maintained for the entire corridor; in some locations, the number of general travel lanes would need to be reduced by one.

    Streetcar stations would be constructed in the center of the 34th Street right-of-way near the intersections of north-south avenues. Pedestrians would then cross the general traffic lanes to reach the north or south sidewalks of 34th Street.

    Some sidewalk expansions would be possible depending on street width. Median stations would also serve as crossing refuges for pedestrians.

    Because of the width of the street, service deliveries/loading would not be allowed along 34th Street between Third and Ninth Avenues. East of Third Avenue and west on Ninth Avenue, service deliveries/ loading and parking could be permitted along one curb of the street.

- Single Side Running: Streetcar would combine the above options with a bi-directional streetcar oriented along the north curbside, south curbside, or combination of both curbsides along the corridor. Because some streetcar stations will be located in the median, the benefits of streetcar, operating in mixed traffic, are negated.

  Both express and local buses, as well as emergency vehicles, would not be allowed to use the streetcar lanes. Two-way traffic would be maintained for the majority of the corridor however, the number of general travel lanes would need to be reduced by one through the majority of the corridor.

  One direction of streetcar riders would enter and exit vehicles from sidewalk stations while riders in the opposite direction would enter and exit from median stations.

  Sidewalk expansions could be added at most intersections where curbside parking space is available, as well as at other locations depending on street width. Median stations would also serve as crossing refuges for pedestrians.

  Because of the width of the street, service deliveries/loading would not be allowed along 34th Street between Third and Ninth Avenues. East of Third Avenue and west of Ninth Avenue, service deliveries/ loading and parking could be permitted along one curb of the street.

For the Alternatives Analysis, the Curb-Running alignment will be used for the Streetcar mode option. The Curb-Running alternative allows for a more efficient mixed traffic operation and will require less right-of-way because the alignment will not require platforms. It will also allow express and local buses as well as emergency vehicles to use the streetcar lanes.

- *Stations:* As with BRT, stations would be located at nearly every avenue crossing as shown in **Figure 2-4**, with the final station locations to be determined during the design process. These stations would be located on the sidewalk, as the guideway would be Curb-Running. The streetcar stations would be of high-quality design and have various amenities. These treatments would include large shelters, real-time information, and bicycle parking at key locations.
- *Fare Payment:* Streetcars would provide fare vending machines on station platforms, or similar payment systems. This would also facilitate all-door boarding, which allows patrons to board/exit the streetcar from the rear or the front, and would minimize dwell times.
- *Signal Operations:* TSP would be an integral component of this alternative by decreasing the frequency of stops at intersections. TSP would operate at most signals through the corridor to allow for reduced end-to-end travel time. Streetcar operations would encounter mixed traffic at intersections where vehicular traffic makes right turns.
- *Maintenance Facility:* A new storage and maintenance facility would need to be constructed on or near the corridor for this mode.
- *Travel Time:* Projected end-to-end travel time for streetcar is 21 to 23 minutes, based on current average travel times for buses (see Figure 1-10) and proposed improvements.

2.2.5 BUILD ALTERNATIVE 3—LIGHT RAIL TRANSIT

Under Build Alternative 3, an LRT line would be constructed along the proposed 34th Street alignment. The following are the key characteristics of Build Alternative 3. The typical sections shown in 2.2.3 also apply to the descriptions below.

- *Technology:* Build Alternative 3 proposes LRT service in the 34th Street corridor. Catenary wires (requiring a law change) or an underground conduit would need to be installed in each direction along the corridor to supply power to the vehicles. Diesel LRT vehicles could also be used, which would eliminate the need for overhead catenary.
- *Guideway:* Under this alternative, transit and non-transit traffic would be completely separated by a physical barrier (e.g., raised curb) to reduce conflicts with vehicular traffic. Three alternative configurations for the guideway were considered, and are described below. These configurations were evaluated for how they would fit in the existing curb-to-curb roadbed of 34th Street. It was assumed that an LRT lane could be no narrower than 11 feet wide, a 12-foot-wide guideway was preferred, and the physical barrier could be no narrower than 1.5 feet wide.
  - Curb-Running: LRT would run within the existing bus lane on 34th Street, which would be physically separated from the rest of the street by a mounted barrier except at designated intersections where right turns will be permitted. Two-way traffic would be maintained for the majority of the corridor.

    Stations would be located on the existing sidewalks. Passengers would board westbound LRT vehicles from the north curbside, and eastbound streetcars from the south curb. Both express and local buses, as well as emergency vehicles, would not be permitted into the guideway.

    Pedestrian space benefits would be limited due to the need for continuous LRT lanes along the existing curb.

    Due to the presence of LRT lanes along both curbs of 34th Street, parking and service deliveries/loading activity would be prohibited along 34th Street at all times.
  - Median-Running: LRT would run in the center of 34th Street, where a two-way guideway would physically separate from general travel lanes. Both express and local buses, as well as emergency vehicles, would not be allowed to use the guideway. Two-way traffic would be maintained for portions of the corridor; in some locations, the only one-way traffic will be permitted.

    LRT stations would be constructed in the center of the 34th Street right-of-way near the intersections of relevant north-south avenues. Pedestrians would then cross the general traffic lanes to reach the north or south sidewalks of 34th Street.

    Some sidewalk expansions would be possible depending on street width. Median stations would also serve as crossing refuges for pedestrians.

    Because of the width of the street, service deliveries/loading would not be allowed along 34th Street between Third and Ninth Avenues. East of Third Avenue and west of Ninth Avenue, service deliveries/loading and parking could be permitted along one curb of the street.

- Single Side Running: LRT would combine the above options with a bi-directional streetcar oriented along the north curbside, south curbside, or combination of both curbsides along the corridor.

  Both express and local buses, as well as emergency vehicles, would not be allowed to use the LRT guideway. Two-way traffic would be maintained for the entire corridor, however, general traffic would be reduced to one lane in each direction between Third and Ninth Avenues.

  One direction of LRT riders would enter and exit vehicles from sidewalk stations while riders in the opposite direction would enter and exit from median stations.

  Sidewalk expansions could be added at most intersections where curbside parking space is available, as well as at other locations depending on street width. Median stations would also serve as crossing refuges for pedestrians.

  Because of the width of the street, service deliveries/loading would not be allowed along 34th Street between Third and Ninth Avenues. East of Third Avenue and west on Ninth Avenue, service deliveries/ loading and parking could be permitted along one curb of the street.

For the Alternatives Analysis, the Median-Running alignment will be used for the LRT mode option. Because the Curb-Running alignment is so similar to the Curb-Running alignment for streetcar this option was eliminated for LRT. The Curb and Singe Side Running alignments would require interrupting the mandatory physical barrier between the LRT guideway and travel lanes to get access to driveways. Therefore, safe and rapid operation of LRT can not be guaranteed with the Curb and Side Running Options.

- *Stations:* Stations would only be located at every other avenue crossing, as shown in **Figure 2-5,** with final station locations to be determined during the design process, especially taking into account transfer opportunities to other modes. These stations would be located in the median of the street with refuge areas near the crosswalks. The LRT stations would be of high-quality design and have various amenities. These treatments would include large shelters, real-time information, and bicycle parking at key stations.
- *Fare Payment:* LRT would provide fare vending machines on station platforms, or similar payment systems. This would also facilitate all-door boarding, which allows patrons to board/exit the light rail vehicle from the rear or the front, and would minimize dwell times.
- *Signal Operations:* TSP would be an integral component of this alternative by decreasing the frequency of stops at intersections. TSP would be at most signals through the corridor to allow for reduced end-to-end travel time.
- *Maintenance Facility:* A new storage and maintenance facility would need to be constructed on or near the corridor for this mode.
- *Travel Time:* Projected end-to-end travel time for LRT is 17 to 19 minutes, based on current average travel times for buses (see Figure 1-10) and proposed improvements.

2.2.6 BUILD ALTERNATIVE 4—AUTOMATED GUIDEWAY TRANSIT

Build Alternative 4 would result in AGT, such as a people mover, through the corridor. The following are the key characteristics of this alternative.

- *Technology:* Build Alternative 4 proposes a type of AGT. The system envisioned is an elevated and automated people mover that would use either monorail or third rail electric power.
- *Guideway:* Due to the general definition and characteristics of AGT (see section 2.1.3.5), the guideway would be elevated above a center median, which would need to be created for installation of the support structure. This configuration was evaluated for how it would fit in the existing curb-to-curb roadbed of 34th Street. It was assumed that the needed right-of-way for the AGT guideway structure is no narrower than 10 feet, and the existing bus lanes would be eliminated.
  - Median-Running: The AGT support structure would run in the center of 34th Street and be protected from general traffic lanes to minimize collisions against the structure. Both express and local buses, as well as emergency vehicles, would have to use general traffic lanes. Two-way traffic would be maintained for the entire corridor; in some locations, the number of general travel lanes would need to be reduced by one.

    AGT stations would be aerial at the same elevation as the AGT guideway in the center of the 34th Street right-of-way near the intersections of relevant north-south avenues. Pedestrians would cross the general traffic lanes from the north or south sidewalks of 34th Street to get to the median from where stairs, elevators, and/or escalators lead to the elevated station platform. These medians would also serve as a pedestrian refuge when crossing the 34th Street.

    Some sidewalk expansions would be possible depending on street width. Median stations would also serve as crossing refuges for pedestrians. Some sidewalk space would be required for staircases to stations.

    Because of the width of the street, service delivery / loading would not be allowed along 34th Street between Third and Ninth Avenues. East of Third Avenue and west on Ninth Avenue, service delivery / loading and parking could be permitted along one curb of the street. Alternatively, loading and parking could be allowed some hours of the day with reduced street travel capacity.
- *Stations:* Stations would be located at some of the avenue crossings (as shown in **Figure 2-6)** where transfers to other modes are possible, with final locations to be determined during the design process. All stations would be elevated and access would be located in the median. The AGT stations would be of high-quality design and have various amenities. These treatments would include large shelters and real-time information.
- *Fare Payment:* Fare collection would be achieved off-board through the use of turnstiles at or before the station platforms.
- *Signal Operations*: The AGT vehicles would operate at set speeds along the guideway. Because the AGT is grade separated, operations would be seamless and separated from vehicular traffic. Therefore, no TSP would be required.
- *Maintenance Facility:* A new storage and maintenance facility would need to be constructed on or near the corridor for this mode.
- *Travel Time*: Projected end-to-end travel time for AGT is 13 to 19 minutes, based on current average travel times for buses (see Figure 1-10) and proposed improvements.

2.2.7 BUILD ALTERNATIVE 5—HEAVY-RAIL

Under Build Alternative 5, a new subway line would be constructed beneath 34th Street. The following are the key characteristics of Build Alternative 5.

- *Technology:* Build Alternative 5 proposes heavy rail or subway for the 34th Street corridor. The subway system envisioned would be one that is similar to the systems on 14th Street (L) and 42nd Street (7).
- *Guideway:* The guideway would be underground and run between the ferry terminals at the East River and the Hudson River, using 34th Street and parts of the FDR Drive Service Road/Marginal Road and Twelfth Avenue, respectively. It is assumed that the existing bus lanes would be removed to allow various lane configurations for above-ground traffic. To be consistent with the other analyzed modes, emergency vehicles, as well as express and local buses would operate with general vehicular traffic.
- *Stations:* Like AGT, stations would be located only at some avenue crossings (as shown in **Figure 2-7)** where transfers to other modes are possible. The stations would be similar to the proposed subway stations being constructed for the Second Avenue subway, which include real-time information and additional amenities, such as elevators.
- *Fare Payment:* Fare control would be achieved through the use of turnstiles at existing subway stations.
- *Signal Operations:* Subway would operate at set speeds along the guideway. Because the subway operates below-grade, operations would be seamless and separate from vehicular traffic. Therefore, no TSP is required.
- *Maintenance Facility:* It is assumed that existing subway storage and maintenance facilities would be used for this mode, via a connection to an existing subway line.
- *Travel Time:* Projected end-to-end travel time for subway is 9 to 11 minutes, based on current average travel times for similar subway lines throughout the city.

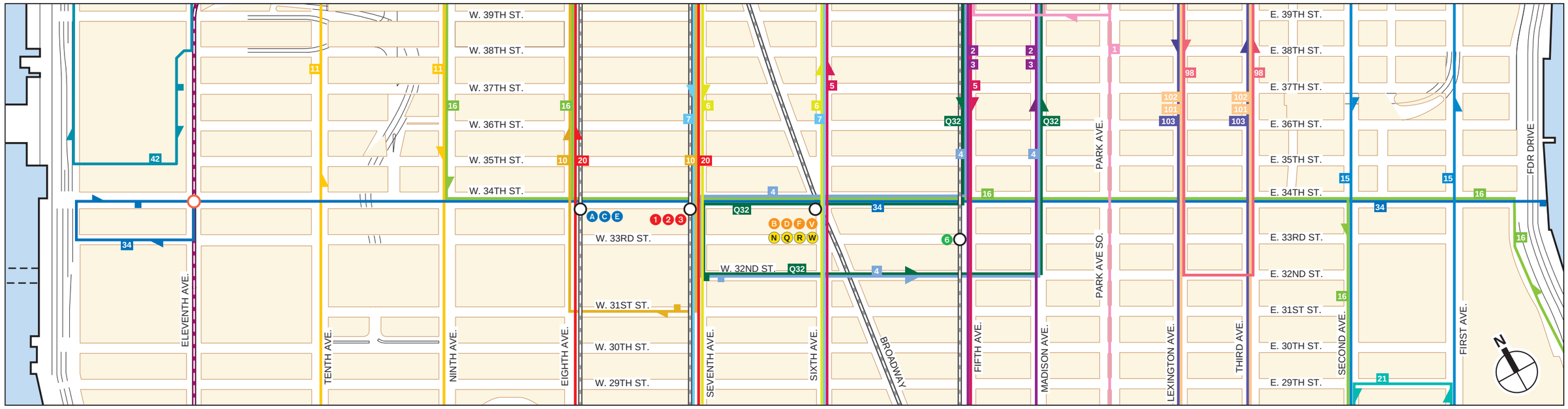
2.2.8 OTHER TECHNOLOGIES

Recommended technologies to be included in the evaluation process were presented for comment during the first public meeting in November 2009, as well as on the NYCDOT website and through other public presentations. There was general public concurrence with the technologies described in this chapter. During the outreach, other technologies were also suggested for consideration in the Alternatives Analysis. It was determined that none of the alternative technologies suggested would be able to address the full purpose and need of the proposed project; however, some may be worth considering as supplemental measures or additions to other alternatives. A complete description of other suggested technologies received through the public outreach process is contained in Chapter 4.

2.2.9 RECOMMENDED TECHNOLOGIES

All five Build alternatives, as well as the No Build and TSM alternatives, will be evaluated and screened in a two-tiered process in Chapter 3, “Alternatives Screening Analysis.”

12.23.09



Bus Route and Terminus

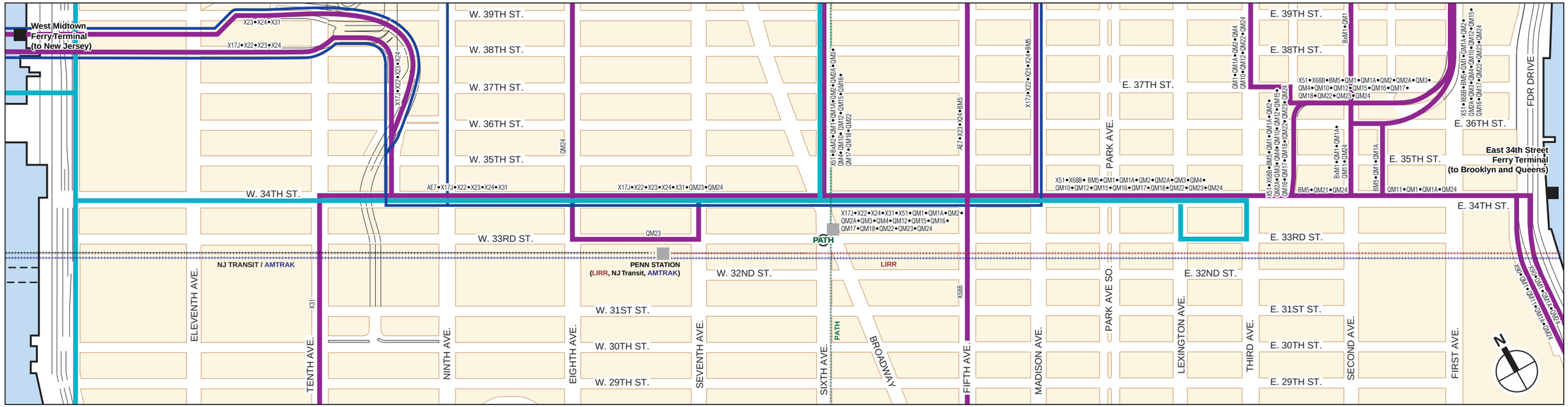
Bus Route Number

Subway Route and Station

Proposed 7 Train Extension Subway Alignment and Proposed Station

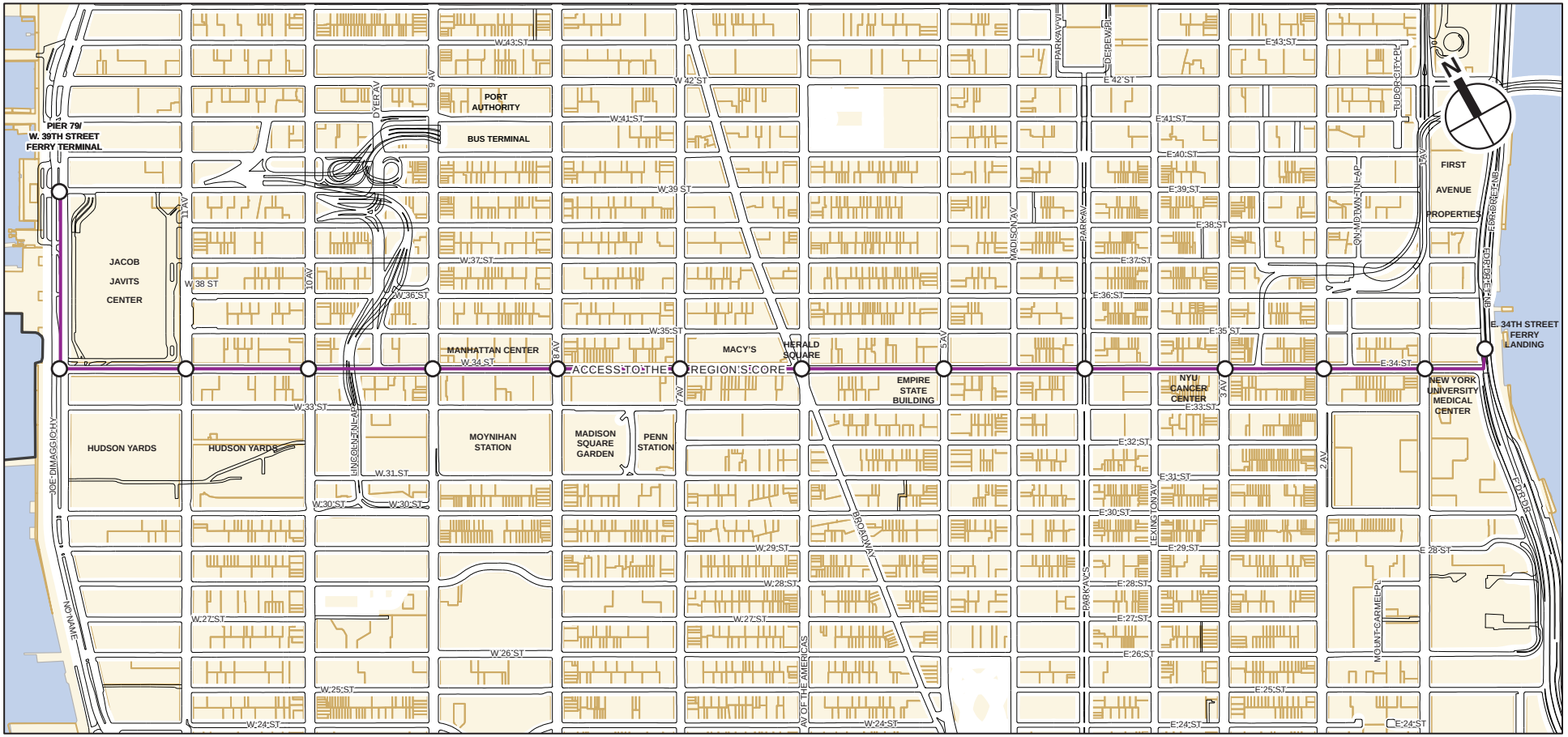
NYCT Subway and Bus Service

Figure 2-1



Other Transit Service
Figure 2-2

12.23.09



34th Street Guideway

Station

Build Alternative 1 - BRT Station Map

Figure 2-3

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34th Street Guideway

Station

Build Alternative 2 - Streetcar Station Map

Figure 2-4

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34th Street Guideway

Station

0 0.4 MILES

SCALE

Build Alternative 3 - Light Rail Potential Station Map

Figure 2-5

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34th Street Guideway

Station

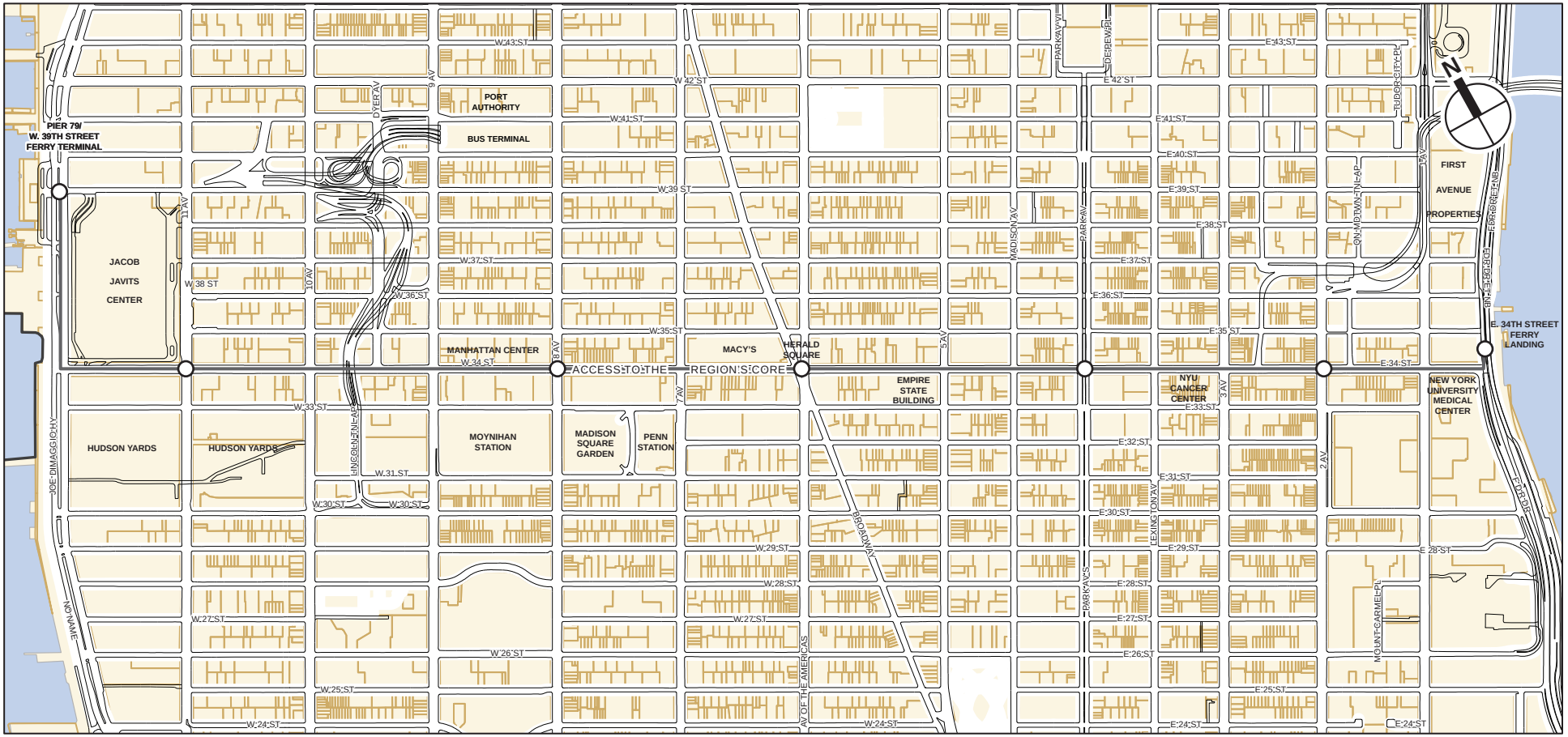
0 0.4 MILES

SCALE

Build Alternative 4 - AGT Potential Station Map

Figure 2-6

12.23.09



34th Street Guideway

Station

Build Alternative 5 - Subway Potential Station Map

Figure 2-7

3.0 INTRODUCTION

The evaluation of alternatives consists of a two-tiered process designed to assess how well the proposed modes address the Proposed Project's overall goals and objectives. This chapter outlines the methodology, describes the performance measures, and presents the results of both screenings.

3.1 METHODOLOGY

3.1.1 PERFORMANCE MEASURES

Performance measures have been developed to evaluate alternatives consistent with the goals and objectives shown in Table 1-3. These measures are generally qualitative and allow for a comparison of the order of magnitude benefits and detriments of each option for the Proposed Project. In certain cases, one performance measure correlates to multiple project objectives, and certain objectives have been defined by more than one performance measure. **Table 3-1** shows the project's objectives and the corresponding performance measures for the forthcoming evaluation of alternatives.

3.1.2 SCREENING METHODOLOGY

The proposed alternatives were evaluated using a two-part screening process. The first eliminated alternatives that could not reasonably meet the primary goals and objectives and the second assessed the remaining alternatives based on the secondary goals and objectives. In the primary screening, the proposed modes were rated using a scale that ranged from high-performing to low-performing. The rating scale used in the screening matrices is shown below.

The screening considers a baseline (No Build) condition against which the benefits and adverse effects of each alternative are to be weighed. Some alternatives could be implemented more quickly than others, but the evaluation must use a consistent baseline. Therefore for purposes of this study, the baseline condition reflects land use, social and demographic conditions, and transportation services in 2035, by which time it is reasonable to assume that any of the alternatives could be implemented.

Table 3-1
Primary and Secondary Screening Criteria

GOAL / OBJECTIVE	PERFORMANCE MEASURE
PRIMARY GOALS/OBJECTIVES	
IMPROVE CROSSTOWN MOBILITY	
Reduce transit travel time for crosstown trips	End-to-end travel time
Improve transit reliability	Remove conflicts with non-transit modes
	Remove traffic signal delay
Reduce pedestrian congestion/Improve pedestrian safety	Increase or reduction in pedestrian space
	Mode shift from walk to transit
Provide connections to existing and future transit service	Identify transit connections
Improve express bus operations along 34th Street	Travel time along 34th Street for express bus
	Passenger amenities
Accommodate future demand	Peak period capacity
MINIMIZE CAPITAL AND OPERATING CONCERNS	
Implement within a reasonable construction timeframe	Construction duration
Implement within a reasonable construction cost	Estimated construction cost
Be consistent with MTA operating procedures	Does mode integrate with MTA operations and infrastructure?
Avoid conflicts with existing and proposed infrastructure	Potential infrastructure conflicts
Maintain delivery access to local businesses	Restricted or unrestricted truck access
Maintain access for emergency vehicles	Restricted or unrestricted emergency vehicle access
Maintain access to arterial roadways and Manhattan portals	Restricted or unrestricted vehicle access to Manhattan portals and arterial roadways
SECONDARY GOALS/OBJECTIVES	
ENHANCE COMMUNITY CHARACTER	
Support existing and proposed development	Transit travel time
	Transit capacity
	Restricted or unrestricted vehicular access
	Restricted or unrestricted truck access
Improve connections between residential and commercial destinations	Transit travel time
	Transit capacity
Improve pedestrian circulation and safety	Increase or reduction in pedestrian space
	Increase or reduction in vehicular traffic on 34th Street
	Increase or reduction in street crossing time
	Improved or degraded lines-of-sight
MINIMIZE ADVERSE IMPACTS ON THE BUILT AND NATURAL ENVIRONMENT	
Avoid, minimize, or mitigate impacts on historic resources	Historic properties to be acquired
	Potential visual effects on historic resources
Minimize encroachment on view corridors	Height of above-grade infrastructure
Maintain access to existing and future uses on 34th Street	Access constraints
	Parking supply changes
	Delivery access
Avoid property acquisition to the maximum extent feasible	Identify property requirements
Reduce vehicular congestion, emissions, and noise	Transit ridership
	Noise emission of transit mode
	Vehicle emission of transit mode
	Number of vehicular travel lanes
Minimize construction impacts to the extent feasible	Construction duration
	Excavation requirements and requirements for spoils removal
Avoid impacts on natural features and coastal waters	Identify portion of alignment in coastal zone
	Identify in-water or above-water construction activities

Note: MTA=Metropolitan Transportation Authority

3.1.2.1 PRIMARY SCREENING

The primary screening addresses two specific goals: 1) improve crosstown mobility; and 2) minimize capital and operating concerns. Combined, these goals and their supporting objectives aim to provide a service that not only reduces travel time and decreases congestion but is achievable both within reasonable timeframe and at reasonable cost. The primary screening rates the performance of each alternative based on their degree of high to low performance, whereas a low-performing (empty circle) rating corresponds to a failing performance measure. Each performance measure is then rated based on the framework described below.

The screening framework assigns one of the following designations for each alternative based on the screening matrix ratings:

- ***Fails:*** Alternatives designated as "Fails" do not meet one or more of the project's goals and objectives, thus failing to address some part of the project's purpose and need. An alternative that receives an empty circle in any performance measure is designated as "Fails". These alternatives are eliminated from further consideration.
- ***Pass—Federal Transit Administration (FTA) Requirement:*** Alternatives deemed "Pass—FTA Requirement" received an empty circle in at least one performance measure, thus not meeting one or more of the project's goals and objectives, but are required by FTA to be screened as an alternative. These alternatives are advanced to the secondary screening.
- ***Pass:*** Alternatives designated "Pass" do not receive any empty circles on any performance criteria and provide substantial progress towards addressing the project's goals and objectives. These alternatives are advanced into the secondary screening.

All passed alternatives are carried forward for secondary screening.

3.1.2.2 SECONDARY SCREENING

The alternatives that pass the primary screening enter the secondary screening process. The secondary screening adds two specific goals: 1) enhance community character; and 2) minimize adverse impacts on the built and natural environment. Like the primary screening, the secondary screening rates the performance of each alternative based on a range of high to low performance. However, the secondary screening assigns point values for the respective ratings of each performance measure for the primary and secondary goals and objectives identified in **Table 3-1**. Below is the point system that is designated for the respective performance measure:

The points for all the performance measures for both the primary and secondary screening criteria are added to come up with a final point total for each alternative. The alternative with the highest point total will be designated as the Locally Preferred Alternative (LPA).

3.2 PRIMARY SCREENING RESULTS

3.2.1 FAILED ALTERNATIVES

The screening framework designated four of the five build alternatives as "fails": Streetcar, LRT, AGT, and Heavy Rail. **Table 3-2** shows the primary screening results, which are further discussed in this section.

3.2.1.1 BUILD ALTERNATIVE 2—STREETCAR

Streetcar would provide some benefit to the 34th Street corridor, including connections to existing and future transit services, and unrestricted vehicular access to arterial roadways and Manhattan portals. The new service would improve connections to transit passenger amenities and yield a modest increase in transit ridership and some mode-shift from walk to transit.

However, streetcar service along 34th Street failed the primary screening because the mode is inconsistent with current MTA operating procedures. A new storage and maintenance yard would need to be constructed for the system, which would involve both substantial expense for the project and the acquisition of property. Other issues include a minimal decrease in travel time relative to other proposed modes, no improvement to pedestrian circulation areas, and severe restriction of deliveries to local businesses due to its curbside operation. For these reasons, streetcar service is eliminated from further consideration.

3.2.1.2 BUILD ALTERNATIVE 3—LIGHT RAIL TRANSIT

LRT would provide some benefits along the 34th Street corridor, such as unrestricted vehicular access to arterial roadways and Manhattan portals, and provide limited connections to existing and future transit services (station spacing would limit connectivity to north-south bus routes). It would improve passenger amenities and transit service reliability. In addition, LRT would provide moderate peak period capacity relative to the other alternatives under consideration, accommodating increased transit ridership and a substantial mode-shift from walk to transit.

LRT failed the primary screening because it does not meet a number of the primary goals and objectives. In particular, the designated right-of-way would cause delays for express bus operations. In addition, the mode is inconsistent with current MTA operating procedures. Like the streetcar option, it would require that a new storage and maintenance yard be constructed for the system, which would involve significant additional expense for the project and entail impacts on land uses that would need to be acquired for the project. The LRT option would also cause more negative impacts to parking and loading needs than other options.

The cost for this alternative is relatively high, in part because one of the lowest cost technologies, catenary wire, is prohibited in Manhattan, and other technologies are more expensive or unproven. Construction costs range between $240 and $345 million. This cost is also driven upward by the utility relocation that would be required to construct this alternative.

3.2.1.3 BUILD ALTERNATIVE 4—AUTOMATED GUIDEWAY TRANSIT

The principle benefits of AGT are unrestricted vehicular access to arterial roadways and Manhattan portals. The above-grade alignment would yield significantly decreased crosstown travel times, substantially improve crosstown transit reliability, and cause a sizeable mode-shift

from walk to transit. The disadvantages are limited connectivity to existing and future transit services (station spacings and elevated configuration would restrict connections to north-south bus routes and would complicate transfers to subway routes).

Of the Build alternatives, AGT received the highest number of empty circles attributable to factors such as high cost and lengthy construction time. Construction cost estimates are between $560 and $610 million, and the construction period would be between 36 and 72 months. AGT is not consistent with existing MTA infrastructure, and as such would require a new storage and maintenance yard be constructed for the system. This would involve both additional expenses for the project and property acquisition. The service would be detrimental to express bus operations, resulting in an overall increase in express bus travel times due to the loss of the existing bus lanes on 34th Street. Implementation of AGT would also restrict emergency vehicle access due to the elimination of the bus lane and reduction in the street right-of-way. AGT would also raise significant aesthetic issues, as it would have impacts on viewsheds, light, and air. For these reasons, AGT is eliminated from further consideration.

3.2.1.4 BUILD ALTERNATIVE 5—HEAVY RAIL

Heavy rail, in this case subway, would generate substantial benefits in the 34th Street corridor. The below-grade, exclusive alignment would result in significantly reduced end-to-end travel times and greatly improved transit reliability. The peak period capacity would accommodate future demand and facilitate a sizeable mode-shift from walk to transit, although pedestrians would have to travel underground to access trains and stations would be farther apart. For the purposes of this analysis, it is assumed that the subway would be able to connect to and access existing NYCT subway maintenance facilities.

Despite these stated benefits, heavy rail fails the primary screening due in large part to high costs and a lengthy construction period. The estimated construction cost is between $6 and $7.8 billion, notably higher than all other alternatives under consideration; the construction period would range between 72 and 96 months. Heavy rail would also not improve pedestrian circulation area along the corridor. A subway may also cause conflicts with other underground infrastructure in the project area, such as the ARC tunnel. For these reasons, heavy rail is eliminated from further consideration.

3.2.2 PASSED ALTERNATIVES

The primary screening framework designated three alternatives as “Pass”—No Build, TSM, and BRT. The Alternatives Analysis process requires a detailed examination of the No Build and TSM alternatives to allow for a comparison to the benefits and detriments of the build alternatives; therefore, these alternatives pass the initial screen although they may not meet the goals and objectives as well as some of the build alternatives that failed the primary screening. Below is a discussion of the overall ratings of the passed alternatives.

3.2.2.1 NO BUILD ALTERNATIVE

The No Build Alternative performed poorly across several screening criteria. The alternative will not reduce crosstown travel time, increase transit ridership, accommodate future travel demand, nor improve pedestrian safety and congestion. The only merits of the No Build are

that it yields no capital or operating concerns and virtually no impact on critical roadway functions, as no new services are being implemented.

FTA requires the No Build Alternative be advanced as a basis of comparison and, per this guideline, the No Build Alternative was advanced to the secondary screening.

3.2.2.2 TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE

The TSM Alternative received an overall rating of "Pass." The alternative received mostly quarter-filled circles for each of the screening criteria, indicating that it would provide slight or modest progress toward meeting the majority of the project's stated goals or objectives. Merits of the alternative include a moderate increase in speed; connections to existing and future transit services; reasonable costs and implementation timeframe; consistency with existing MTA operations; full vehicular access to arterial roadways and Manhattan portals; and avoidance of conflicts with existing infrastructure.

Although FTA requires the TSM alternative to be advanced as a basis of comparison, it also received no empty circles and was advanced regardless of the FTA requirement.

3.2.2.3 BUILD ALTERNATIVE 1—BUS RAPID TRANSIT (BRT)

BRT received an overall designation of "Pass." The alternative did not receive any empty or quarter-filled circles, indicating that it would fully or substantially meet all of the project's stated goals and objectives. The service would provide connections to existing and future transit services and full vehicular and emergency vehicle access would be maintained under the alternative. In addition, the bus technology is consistent with existing MTA operations and stations, and would have few conflicts with existing and proposed infrastructure. Express buses could operate in a BRT transitway, improving overall travel time. Transit ridership would increase due to the moderate decrease in crosstown travel time and enhanced passenger amenities at stations. Construction costs and timeframe estimates are reasonable relative to other build alternatives. A new system would cost between $30 and $125 million, and implementation could be completed in 12 to 18 months. For these reasons, BRT was advanced to the secondary screening.

3.3 SECONDARY SCREENING RESULTS

The secondary screening assigns points to each representative scoring circle for the primary and secondary performance measures for the passed alternatives. The secondary screening results in the following point totals for the alternatives screened: the No Build Alternative received 475 points, the TSM Alternative received 525 points, and the BRT Alternative received 615 points. The detailed analysis is presented in **Table 3-3**.

3.3.1 NO BUILD ALTERNATIVE

The No Build Alternative received the fewest points of all the alternatives -475 points- indicating that it would provide little to no progress toward the project goals and objectives.

The No Build Alternative will not enhance community character. While the alternative allows unrestricted vehicular access and partial delivery access in bus lanes during certain times of the day, it would not improve transit travel time and capacity. The alternative does not improve

connections between residential and commercial destinations or support long-term land use planning. In addition, the No Build Alternative provides no change to pedestrian circulation and safety, as it does not enhance pedestrian space, vehicular traffic on 34th Street, pedestrian crossing time, or lines-of-sight.

Since the No Build Alternative would not result in construction activities or new infrastructure, it would not directly impact the built or natural environment. However, as described in Chapter 1, "Purpose and Need," a number of developments are proposed that will increase demand for transit service. The No Build Alternative would not allow for a substantial enhancement of transit operations along 34th Street and would, therefore, not support development as proposed. Although new bus service may be added to meet passenger demand, transit use would be hampered by severe crowding and congestion. In turn, workers and residents of these new developments will rely more heavily on automobile and taxis to make trips. These additional vehicle trips will increase congestion, emissions, and ambient noise and further exacerbate the problems identified in Chapter 1, "Purpose and Need."

3.3.2 TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE

Overall, the TSM alternative received 525 points. It would provide modest progress toward meeting project goals and objectives

The TSM Alternative shows limited potential to enhance community character. It results in small improvements in travel time and a slight increase in transit capacity from the use of articulated buses and more frequency of service. The TSM Alternative would allow unrestricted vehicular access, but bus lanes would impede deliveries at certain times. The TSM Alternative somewhat supports long-term land use planning and moderate improvements to connections between residential and commercial destinations, but similar to the No Build Alternative, it yields no improvement in pedestrian circulation and safety, as it does not enhance pedestrian space, vehicular traffic on 34th Street, pedestrian crossing time, or lines-of-sight.

The TSM Alternative would require limited construction activities and new infrastructure along the 34th Street corridor, but this alternative would have limited effects on the built and natural environment. New infrastructure would be located within public right-of-way; therefore, the TSM Alternative would not require property acquisition or the displacement of businesses and residents. The installation of new fare machines, shelters, and signage would require shallow excavation, but substantial impacts to archaeological resources, utilities, and hazardous materials would not be anticipated. Above-grade infrastructure would be limited in bulk and height and would not substantially alter the visual character of 34th Street.

The TSM Alternative would improve transit service and travel time along the corridor, helping to meet some of the demand generated by new development. Additional buses operating on 34th Street would increase bus noise and emissions, but this may be offset by reductions in vehicular demand. Since curbside lanes would be fully dedicated for bus operations from 7AM to 7PM on weekdays (as in the existing conditions), the TSM alternative would not allow for any curbside parking or delivery opportunities during weekday, daytime hours. The TSM alternative would also not increase pedestrian circulation space along the corridor since existing sidewalk widths would be maintained.

3.3.3 BUILD ALTERNATIVE 1: BUS RAPID TRANSIT

BRT's overall point total of 615 points was the highest point total calculated for the alternatives considered in the secondary screening. This alternative would provide substantial progress towards meeting the project goals and objectives.

This Alternative would generate moderate travel time improvements, while articulated buses and increased operational frequency would result in sizeable increases to transit capacity. BRT would allow full vehicular access, and in the preferred alignment, partial delivery access through parking/delivery bays. Overall, BRT is anticipated to support long-term land use planning and foster better connections between residential and commercial destinations. The alternative would also improve pedestrian circulation and safety. Corner bulb-outs and crosswalk refuges would increase pedestrian space and reduce pedestrian crossing time. In addition, the potential removal of one direction of traffic would improve lines-of-sight and, combined with potentially decreased auto, taxi, and bus trips, reduce vehicular traffic on 34th Street and surrounding streets. More significant study will be required to understand BRT's full effect on neighborhood and regional traffic patterns.

The BRT Alternative would include new stations along 34th Street. These stations would be located within the public right-of-way and would not require acquisition of private property or the displacement of businesses and residents. Station construction could require excavation and utility relocation but, given the development history of the area, archaeological disturbance would be limited, if any. Station shelters and signage would be located along the corridor but would not contrast drastically with the diverse urban context of 34th Street.

The BRT Alternative would allow for increased bus operations along 34th Street to meet demand from future development. Although additional buses would increase noise and emissions from bus operations, the BRT Alternative would decrease demand for and associated noise and emissions from automobiles and taxis. The BRT Alternative has the potential to reduce the number of general travel lanes on 34th Street, but it could increase opportunities for curbside parking and delivery operations and provide for more pedestrian circulation area.

3.4 CONCLUSION

Based on the primary and secondary screenings of the alternatives proposed for the 34th Street Transit Corridor, the BRT Alternative is recommended as the LPA. This alternative best addresses the full purpose and need of the corridor, in improving crosstown transit, express bus operations, creating opportunities for pedestrian space, and accommodating future growth. In addition, it responds to the public feedback received, in terms of creating opportunities for all day loading zones along 34th Street to the greatest extent possible. Based on the foregoing analysis the BRT Alternative should be advanced into the environmental review and preliminary design phases of the project.

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Table 3-2
Primary Screening Results

GOAL / OBJECTIVE	PERFORMANCE MEASURE	NO BUILD ALTERNATIVE	TRANSPORTATION SYSTEM MANAGEMENT (TSM) ALTERNATIVE	BUILD ALTERNATIVE #1 BUS RAPID TRANSIT	BUILD ALTERNATIVE #2 STREETCAR	BUILD ALTERNATIVE #3 LIGHT RAIL TRANSIT	BUILD ALTERNATIVE #4 AUTOMATED GUIDEWAY TRANSIT	BUILD ALTERNATIVE #5 HEAVY RAIL
IMPROVE CROSSTOWN MOBILITY ON 34TH STREET								
Reduce transit travel time for crosstown trips	End-to-end travel time*	27-31 min	22-25 min	18-20 min	21-23 min	17-19 min	13-15 min	9-11 min
Improve transit reliability	Remove conflicts with non-transit modes	Partial (Weekdays 7AM to 7PM Only)"	Partial (Weekdays 7AM to 7PM Only)	All but emergency vehicles	All but emergency vehicles and vehicles making right turns at intersections	No vehicles allowed in right of way. Conflicts are present only at turn locations	Non-transit modes will have no conflict with AGT which operates above grade	Non-transit modes will have no conflict with subway which operates below grade
	Remove traffic signal delay	None	Existing signal timings, TSP at select locations	TSP will be implemented	TSP will be implemented	TSP will be implemented	No delay at signals since guideway is elevated	No delay at signals since guideway is below grade
Reduce pedestrian congestion / Improve pedestrian safety	Increase or decrease in pedestrian circulation area	No Change	No Change	Increase - Corner bulb-outs, crosswalk refuges constructed at stations	No Change	Increase Crossing refuges constructed at stations	Increase - Pedestrians can take refuge at enlarged crosswalk or median underneath platform	No Change
	Mode shift from walk to transit	No Change	Slight mode shift due to decreased end-to-end travel time for crosstown trips	Moderate mode shift due to decreased end-to-end travel time for crosstown trips and increased amenities	Moderate mode shift due to travel time savings and amenities. However, streetcar also adds a sense of "charm" that will add riders	Significant mode shift due to travel time savings and amenities; however, stations will be farther apart than other alternatives.	Significant mode shift due to travel time savings and amenities; however, stations will be farther apart than other alternatives.	Significant mode shift due to travel time savings and amenities, however pedestrians must walk down to train and station distances will be far apart
Provide connections to existing and future transit service	Access to local and express bus routes from mode	Yes	Yes	Yes	Yes	Yes, however, not all north-south bus routes due to station spacing	Yes, however, not all north-south bus routes due to station spacing	Yes, however, not all north-south bus routes due to station spacing
Improve express bus operations along 34th Street	Travel time along 34th Street for express bus	No Change	Express bus travel time would slightly improve due to TSP	Express buses could operate in BRT lanes with TSP in turn reducing overall travel time	Express bus travel time would slightly improve due to TSP	Travel times will increase due to reduced right-of-way	Travel times will increase due to reduced right-of-way	Express bus operations would have no designated bus lane. Travel times will increase.
Improve Passenger Amenities	Availability and quality of passenger amenities	None	Articulated Buses and Off-Board fare collection***	Articulated Buses, Off-Board fare collection and new stations, real-time information***	Streetcar, Off-Board fare collection and new stations, real-time information***	Light Rail Vehicle, Off-Board fare collection and new stations, real-time information***	AGT Vehicle, turnstile fare collection and new stations, real-time information	Subway Stations, Turnstile fare collection, real-time information
Increase transit demand	Estimated transit ridership	No Change	Transit ridership will increase slightly due to reduced travel time for crosstown trips	Transit ridership will increase due to amenities and travel time savings	Transit ridership will increase due to amenities and travel time savings	Transit ridership will increase due to amenities and travel time savings	Transit ridership will increase due to amenities and travel time savings	Transit ridership will increase significantly due to travel time savings
Accommodate future demand	Peak period capacity	No Change	Peak period capacity will slightly increase due to articulated buses and increased ridership	Peak period capacity increase will be moderate due to increase in operational frequency and articulated bus capacity; capacity increase sufficient to handle demand	Peak period capacity increase will be moderate due to increase in capacity and frequency of Streetcar Vehicles; capacity increase sufficient to handle demand	Peak period capacity increase will be moderate due to increase in capacity and higher frequency of Light Rail Vehicles; capacity increase sufficient to handle demand	Peak period capacity increase will be moderate due to increase in volume of riders, however capacity and frequency of AGT vehicles limit overall volumes; capacity increase sufficient to handle demand	Peak period capacity increase will be high due to increase in capacity and frequency of subway trains; capacity increase sufficient to handle demand
MINIMIZE CAPITAL AND OPERATING CONCERNS								
Implement within a reasonable construction timeframe	Construction duration	None	Less than 12 Months	12 to 18 Months	24 to 36 Months	24 to 36 Months	36 to 72 Months	72 to 96 Months
Implement within a reasonable construction cost	Estimated construction cost**	None	$12.5 - $15 million	$30 - $125 million	$115 - $250 million	$240 - $345 million	$560 - $610 million	$6.0 - $7.8 billion
Be consistent with MTA operating technologies	Integration of mode with MTA operations and technologies	Mode integrates with operations and technologies	Mode integrates with operations and infrastructure. Buses can be maintained at existing facilities	Mode integrates with operations and infrastructure. Buses maintained at existing facilities	Vehicles not consistent with current MTA technologies, and would require new maintenance facility and storage facilities. May need to install catenary wires and overhead power distribution, which are against the law in Manhattan, for operation.	Vehicles not consistent with current MTA technologies, and would require new maintenance facility and storage facilities. May need to install catenary wires and overhead power distribution, which are against the law in Manhattan, for operation.	Aerial structure and AGT guideway are not consistent with current MTA technologies, and would require new maintenance facility and ancillary facilities.	Mode integrates with operations and technologies
Avoid conflicts with existing and proposed infrastructure: construction	Potential infrastructure conflicts: construction	None	None	Stations and reconstruction of portions of street will create infrastructure impacts	Need to relocate some utilities. Potential issues with subway vaults.	Need to relocate all utilities. Potential issues with subway vaults	Need to relocate utilities under support columns.	Major conflicts with utilities, water tunnel, ARC
Avoid conflicts with existing and proposed infrastructure: operation	Potential infrastructure conflicts: operation	None	None	May need to be rerouted due to utility construction.	Need to maintain catenary wires. Will be interrupted by utility construction.	Need to maintain catenary wires. Will be interrupted by utility construction.	None during operation	None during operation
Maintain delivery access to local businesses	Restricted or unrestricted truck access	Partially Restricted (Restricted Weekdays 7AM to 7PM)	Partially Restricted (Restricted Weekdays 7AM to 7PM)	Depending on alignment, parking/delivery bays are possible that are accessible 24/7	Severely Restricted due to curbside streetcar operation	Severely Restricted due to needed Right-of-way for Light Rail	Unrestricted	Unrestricted
Maintain access for emergency vehicles	Crosstown mobility of emergency vehicles	No change	No change	Emergency vehicles can use transitway to travel crosstown faster	Emergency vehicles can use transitway to get across town quicker, however, lack of maneuverability of streetcar and ability of traffic to enter transitway will hinder crosstown trips	Restricted No vehicles allowed on transitway except to access buildings in an emercency , emergency vehicles must operate in non-transit zone	Unrestricted, however bus lane is eliminated and right-of-way is also reduced. Emergency vehicles must operate in non-transit zone.	Unrestricted, however emergency vehicles must operate in non-transit zone.
Maintain access to arterial roadways and Manhattan portals	Restricted or unrestricted vehicular access	Unrestricted	Unrestricted	Turn restrictions at 34th St portals; all entrances and exits still accessible	Unrestricted	Turn restrictions at 34th St portals; all entrances and exits still accessible	Unrestricted	Unrestricted
Recommendation to move the alternative forward?		Pass (FTA Requirement)	Pass. Move Forward	Pass. Move forward	Fails. Not moving forward.	Fails. Not moving forward.	Fails. Not moving forward.	Fails. Not moving forward.

High-performing ○ ◔ ◑ ◕ ● Low-performing

* End-to-end travel times are estimated based on typical vehicle speeds and station delays
**Construction Costs are estimated to midpoint of construction
***Off-Board fare collection refers to a number of technologies under consideration that would allow for all-door boarding
The Screening Framework assigns the following designations for alternatives based on the Screening Assessment ratings:
- Fails – One or more empty circles.
- Pass – Multiple filled circles, no empty circles.

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Table 3-3
Secondary Screening Results

GOAL / OBJECTIVE	PERFORMANCE MEASURE	NO BUILD ALTERNATIVE		TRANSPORTATION SYSTEM MANAGEMENT (TSM) ALTERNATIVE		BUILD ALTERNATIVE #1 BUS RAPID TRANSIT	
Enhance Community Character							
Support long term land use planning	Transit travel time	27-31 min		22-25 min		18-20 min	
	Transit capacity	No Change		Total capacity will slightly increase due to articulated buses and increased frequency		Total capacity will increase moderately due to protected Transitway, articulated buses and increased frequency	
	Restricted or unrestricted vehicular access	Unrestricted		Unrestricted		Turn restrictions at 34th St portals; all entrances and exits still accessible	
	Restricted or unrestricted truck delivery access	Partially Restricted (Restricted Weekdays 7AM to 7PM)		Partially Restricted (Restricted Weekdays 7AM to 7PM)		Depending on alignment, parking/delivery bays that are accessible 24/7 are possible	
Improve connections between residential and commercial destinations	Transit travel time	No Change		22-25 min		18-20 min	
	Transit capacity	No Change		Total capacity will slightly increase due to articulated buses and increased frequency		Total capacity will increase moderately due to articulated buses and increased operational frequency	
Improve pedestrian circulation and safety	Increase or reduction in pedestrian space	No reduction in pedestrian space		No reduction in pedestrian space		Increase (Corner bulb-outs, crosswalk refuges)	
	Increase or reduction in vehicular traffic on 34th Street	No Change		No Change		Reduction (Potential decrease in auto, taxi, and bus trips and potentially eliminate one direction of general traffic)	
	Increase or reduction in pedestrian crossing time	No Change		No Change		Reduction (Curb bulb-outs and crosswalk refuges)	
	Improved or degraded lines-of-sight	Lines-of-sight remain unchanged		Lines-of-sight remain unchanged		Improved (Removes one direction of general traffic)	
Minimize Adverse Impacts on the built and natural environment							
Avoid, minimize, or mitigate impacts on historic resources	Historic properties to be acquired	None		None (Infrastructure is in public right-of-way)		None (Infrastructure is in public right-of-way)	
	Potential visual effects on historic resources	No visual effects		Minimal effect (Signage, shelters, and fare collection equipment)		Minimal effect (Signage, stations, and fare collection equipment)	
Minimize encroachment on view corridors	Height of above-grade infrastructure	20 feet (Max. height is overhead signs)		20 feet (Max height is overhead signs)		20 feet (Max height is overhead signs)	
Maintain access to existing and future uses on 34th Street	Access constraints	Unrestricted		Unrestricted		Partially Restricted (one-way street)	
	Parking supply changes	No Change		No change		Increase supply (Design would allow for all day curbside parking at certain locations along the right-of-way)	
	Restricted or unrestricted delivery access	Partially Restricted (Restricted Weekdays 7AM to 7PM)		Partially Restricted (Restricted Weekdays 1AM to 7pm)		Depending on alignment, parking/delivery bays that are accessible 24/7 are possible	
Avoid property acquisition to the maximum extent feasible	Identify property requirements	None		None (Infrastructure is in public right-of-way)		None (Infrastructure is in public right-of-way)	
Reduce vehicular congestion, emissions, and noise	Transit ridership	No Change		Transit ridership will increase slightly due to reduced travel time for crosstown trips		Transit ridership will increase due to amenities and travel time savings	
	Noise emission of transit mode	80 - 83 dba / bus		80 – 83 dba / bus Minimal to modest increase (Increased bus runs would increase noise emissions)		80 – 83 dba / bus Minimal to modest increase (Increased bus runs would increase noise emissions)	
	Vehicle emission of transit mode	No Change		Minimal to modest increase (increased bus runs would increase emissions; fleet will comply with NYCT emission standards)		Minimal to modest increase (increased bus runs would increase emissions; fleet will comply with NYCT emission standards)	
	Number of vehicular travel lanes	No Change		No Change		Reduction	
Minimize construction impacts to the extent feasible	Construction duration	None		Less than 12 months		12 to 18 Months	
	Excavation requirements and requirements for spoils removal	None		None		Minimal to Low	
Avoid impacts on natural features and coastal waters	Identify portion of alignment in coastal zone	Bus right-of-way and bus stops		Bus right-of-way and bus stops		Transitway right-of-way and stations; limited effect on coastal zone policies	
	Identify in-water or above-water construction activities	None		None		Stations at end of corridor on existing pier; no new water coverage	
Overall Rating		**475 Points**		**525 Points**		**610 Points**	

High-performing ● ◔ ◑ ◕ ○ Low-performing

Chapter 4: Public Outreach Process

4.0 INTRODUCTION

Consistent with Federal Transit Authority (FTA) guidance for the Alternatives Analysis process, public outreach was conducted at key milestones to solicit comments on work completed and to fully vet the alternatives with stakeholders. This chapter describes the public outreach efforts that have been undertaken for the 34th Street Transit Corridor Alternatives Analysis.

4.1 PUBLIC INVOLVEMENT PROCESS

The NYCDOT Project Team held its first Open House in November 2009 to present the proposed alternatives for the 34th Street Corridor. The purpose of the Open House was to provide information about the project, and to allow stakeholders to voice to their concerns, call attention to sensitivities, and explore potential solutions. In particular, this Open House presented the Purpose and Need for the project, the Goals and Objectives to be used in evaluating the project, and the range of alternatives to be evaluated in the study. This provided an opportunity for the public to give feedback on the purpose of the project, and the methodology of the study. This meeting was attended by 30 members of the public.

The NYCDOT Project Team held a second Open House in January 2009, at which the team presented the draft results of the Locally Preferred Alternative. At this Open House, NYCDOT presented the Purpose and Need of the project, the Goals and Objectives used to perform the evaluation, and the alternatives analyzed, as well as the results of the analysis. The Locally Preferred Alternative of Bus Rapid Transit was presented, as described in Chapter 3. This meeting was attended by 54 members of the public.

In addition to the Open Houses, NYCDOT met with several key stakeholders to present the Alternatives Analysis and receive feedback. Information about the project was also posted on the NYCDOT website, where written feedback was possible through an online submission form.

The public involvement process for the 34th Street Transit Corridor Alternatives Analysis was outlined in Attachment A of the Project Initiation Package, which was provided to the FTA in October 2009.

4.1.1 PUBLIC OPEN HOUSE #1—NOVEMBER 19, 2009

The first public Open House was held on November 19, 2009, upon completion of the FTA Project Initiation Package, which included the Statement of Purpose and Need. The meeting reviewed the Purpose and Need and Goals and Objectives of the project with stakeholders, presented the alternatives, and then solicited input on the goals and objectives, and the alternatives under consideration. The format of the meeting included an opening and board viewing, followed by a presentation and a public discussion. Comments that were received at

the Public Open House broadly fell into three categories (Proposed Alternatives, Analysis Methodologies, and General) and are summarized below. In instances where responses to comments were provided, these are also included.

4.1.1.1 COMMENTS ON PROPOSED ALTERNATIVES (PUBLIC OPEN HOUSE #1)

- The Murray Hill Neighborhood Association is opposed to a light rail system on 34th Street or 42nd Street in New York, unless there is a viable option to keep cars from shifting onto surrounding local streets. New York University (NYU) Medical Center has valet parking and emergency vehicles, and there are several hotels along the corridor where guests park to check in, all of which could cause bus lane or light rail disruption. During peak hours, 34th Street and adjacent local streets are feeder streets for heavy tunnel traffic and residential streets become crowded and less safe for residents.
- An attendee suggested that the Murray Hill Neighborhood Association might be focused on the immediate problem of excess traffic on local residential streets rather than thinking of creative long-term solutions, such as a transit corridor with light rail which would ultimately be more cost-effective operationally. Deliveries in the area can be scheduled at off times to cause less disruption to light rail service. Attendee is interested in transit capacity and the environmental impacts of transit vehicles.
- Electric-powered vehicles may be infeasible because the electronic power source could be hampered by snow and flooding. After the great blizzard of 1888, all above-ground, outdoor electrical wires (of any type) were banned on Manhattan Island.
- Trackless trolleys should be considered as another alternative. There would be both pros and cons and the alignment would need to be reviewed.
- Because there is so much bus and auto traffic from the Lincoln Tunnel on the 34th Street Corridor, NYCDOT should consider connecting the Jersey City light rail through the Lincoln Tunnel onto 34th Street, creating a loop to 42nd Street, to alleviate congestion.

Response: The alternatives are focused on the immediate area of 34th Street.

- Has a center bus lane been considered? The use of bus bulbs was also suggested.

Response: The width of the street and physical feasibility of any alignment would need to be considered.

- The underground pedestrian corridor from Herald Square to Penn Station should be reopened to move pedestrians off the sidewalks and streets where they can cause pedestrian congestion when walking against a light.
- Light rail and buses should use their own power from biodegradable fuel, which would be good for the environment. There should be a separate lane with guard rails on the opposite side of walkways with pedestrian exits to the other side of the street. This prevents cars from illegally parking. There should also be a curfew on side streets so residents have privacy.
- There are doubts about whether or not the need outweighs the cost. If crosstown transit is an issue and if pedestrian traffic is too high, pedestrians should walk down 35th Street. The majority of pedestrian traffic is milling tourists. If the need is for a

commuter to get from one line to another, they should go to Herald Square, Bryant Park or Times Square to transfer. However, if the need is larger, BRT with exclusive lanes is preferred—it's cheaper and easier than the other option; however, a streetcar would add local charm, which is valuable.

- How will a dedicated bus lane be enforced? Would cameras be placed on buses or would legislation need to be passed to have laws that enforce dedicated lanes?

Response: Several control measures will be evaluated.

4.1.1.2 COMMENTS ON ANALYSIS METHODOLOGIES (PUBLIC OPEN HOUSE #1)

- Pedestrian safety should be part of the study's primary goals rather than one of its secondary goals.

Response: Pedestrian safety was indeed added as a primary objective.

- What is the timeline for implementing any alternatives? Is this study just to get ideas or is it being implemented within a specific time?

Response: NYCDOT is looking at alternatives that could be implemented in a relatively quick time period, subject to the alternative needing to meet the purpose and need of the project.

- The study needs to consider bicycle lanes and bicyclist safety and look at the use of bicycles and safety along adjacent streets in the area.

Response: There are bicyclists who ride along the greenway near the river but are uncomfortable riding into Midtown due to vehicle congestion; bicycle parking could help encourage use of the greenways. In addition, NYCDOT has identified 30th, 31st, 39th and 40th Streets as future travel corridors in its bicycle master plan.

- Sixth Avenue to Ninth Avenue near Penn Station has excellent transit access but other streets immediately south of 34th Street also need to be examined for access and impacts.

Response: The study will look at the whole corridor, not just 34th Street.

- Local residents have complained about not being allowed to park curbside for a few minutes to unload groceries or other items. The study should look at the impact of curbside loading on bus speed and service, as well as how long each trip is delayed.

Response: NYCDOT will also look at the impact of loading.

4.1.1.3 GENERAL QUESTIONS, COMMENTS AND CONCERNS (PUBLIC OPEN HOUSE #1)

- Will NYCDOT be presenting to the transportation committees of Community Boards along the corridor when deciding on alternatives?

Response: Community Advisory Committees (CACs) have been created for other corridor projects to keep stakeholders engaged and one could be formed for the 34th Street project. NYCDOT is working with the Community Boards throughout the process in addition to CAC meetings, and has presented the Alternatives Analysis to the Manhattan CB4 Transportation Committee and other community groups.

- Past community feedback points to community members supporting more major changes and real investments rather than something simpler like Select Bus Service (SBS), which will still cost money with relatively little change. More aggressive options for community buy-in were suggested.

Response: Costs and benefits will also be considered when selecting alternatives, and significant public outreach will be involved as the project moves forward.

- How does the pre-boarding payment work on SBS or BRT buses?

Response: There is a pre-payment machine on the street near a bus stop and a person pays the fare, takes a receipt, and enters the bus. Inspectors on the bus randomly check for receipts, and fare evaders are issued a $100 summons. This payment method has worked well on BX12 in the Bronx, and the fare evasion rate is the same as for on-board fare payment.

- How would turning 34th Street into a one-way route affect emergency vehicles and patient access to the NYU Langone Medical Center?

Response: Emergency vehicle travel was considered as part of the Alternatives Analysis. Hospital access is an important consideration for the design phase.

- Since the Lincoln Tunnel, Penn Station, and PATH Trains are located in the area of 34th Street, did the Port Authority have comments about the original proposal for 34th Street transit?

Response: NYCDOT is working with other agencies and a representative of the Port Authority was in attendance at the Open House.

4.1.2 OTHER FEEDBACK (PUBLIC OPEN HOUSE #1)

In addition to feedback from the first public meeting, NYCDOT received additional feedback from meeting with Community Boards and other community groups, as well as via the online feedback form. These comments are summarized below.

4.1.2.1 COMMENTS ON PROPOSED ALTERNATIVES

Recommended technologies to be included in the evaluation process were presented for comment during the first public meeting in November 2009, as well as on the NYCDOT website and through other public presentations. During the outreach, other technologies were also suggested for consideration in the Alternatives Analysis. These suggestions, as well as the project team's evaluation and response are provided below.

- Monorail: Elevated modern monorail was suggested for inclusion in the Alternatives Analysis study.

Response: Monorail is very similar to the AGT Alternative and could potentially be the final technology selected during the design process, should AGT emerge from the Alternatives Analysis.

- Taxi Service: Improved taxi service could serve as mass transportation on the corridor without significant new infrastructure.

Response: Based on taxi GPS data, approximately 11,000 taxi trips per day have both origins and destinations within the 34th Street corridor (defined here as between 23rd Street and 42nd Street for the full width of Manhattan). Of these trips, approximately 6,000 can be considered crosstown trips (defined as crossing one or both of Fifth or Ninth Avenues). The average speed for these trips is approximately six miles per hour.

This volume of taxi trips indicates that while taxis play a significant transportation role in crosstown travel on the 34th Street corridor, they still carry a minority of the passengers using public transportation. To carry either the existing crosstown bus travel, or the projected future growth in travel, one or both of taxi occupancy or taxi availability would need to be increased significantly, with attendant impacts on travel speed and passenger comfort. In addition, improved taxi service does not fully address the purpose and need of the Alternatives Analysis, as this does not address either pedestrian congestion, or mobility for express buses. As such, this alternative was not included in the formal analysis.

However, although they will not be the primary focus of this study, taxis will continue to play an important mobility role for travel in the 34th Street corridor. Improvements to taxi service, such as improved ride-sharing capabilities, may be appropriate to consider in some locations. Through the design process, the potential and needs of taxi service improvements will be considered with the LPA.

- Heavy Rail Shuttle: A shuttle could be constructed from Penn Station to Twelfth Avenue using the existing LIRR tracks to the Caemmerer/Hudson Yard.

Response: This suggestion is considered separately from the Heavy Rail Alternative described above, as it suggests a different alignment, different proposed ridership, and different level of construction required. This mode does not meet the purpose and need for the Proposed Project, as it does not address the full-length of crosstown trips, does not improve express bus service, and does not affect pedestrian space along 34th Street. As such, this alternative is not included in the Alternatives Analysis. However, the proposal could be considered as a companion project at a later point. Based on community input, the project sponsor worked with NYCT and MTA Long Island Rail Road to evaluate the idea. What follows is a summary of the LIRR response to the proposal, which outlines some of the challenges involved.

There are a number of operational and access challenges to the LIRR being able to implement a shuttle service between Penn Station and Hudson Yards:

- Penn Station Access/Crowding: As the busiest train station in North America, Penn Station is a very fragile operation, particularly during rush hour periods. The East River tunnels and Penn Station's tracks and platforms are owned by Amtrak, with operations shared between the LIRR, New Jersey Transit and Amtrak. It would be extremely challenging to incorporate additional passenger service into a system and station that is already at capacity.
- Impacts to Yard Storage/Operation: A new shuttle would require the construction of an ADA-compliant station at Hudson Yards. Multiple exits, wide platforms, elevators, and escalators would be required in order to move customers between street level and a new station deep underground. This new station infrastructure would severely reduce

the LIRR's space in the Yard for train storage, maintenance, and inspections, and this would thus hinder LIRR's ability to meet the demands of the PM rush hour.

- Shuttle Operation: As a commuter railroad, the LIRR's fleet is sized and designed to handle longer distance trips. Because of the interior car configuration and limited number of car doors, it takes longer for LIRR trains to load and unload customers as compared to a subway car. This prevents the LIRR from implementing a frequent and rapid shuttle service, particularly given the limited dwell time and crowded platforms and staircases at Penn Station.

  Fare collection on the proposed shuttle would be difficult to implement, as the trip is far too short to allow train crews to service tickets on board. Due to the crowding conditions, it is impossible to construct any type of fare gates within Penn Station.

4.1.2.2 COMMENTS ON ANALYSIS METHODOLOGIES

- Key goals for the project evaluation expressed by the public include:
  - Increased transit speed
  - Allowing for deliveries and curb access
  - Improving pedestrian movement
  - Minimizing impacts to other traffic circulation, including private and commercial vehicles
  - Include priority for express buses
  - Do not denigrate the quality of the streetscape
  - The transit mode should not be blocked or have conflicts with other modes

4.1.2.3 GENERAL QUESTIONS, COMMENTS AND CONCERNS

- All street changes should be handicap-accessible
- Any system implemented should be expandable in the future
- The impact on surrounding streets will need to be evaluated
- 34th Street is a 24-hour street, and should be looked at for many times during the day and night

4.1.3 PUBLIC OPEN HOUSE #2 – JANUARY 21, 2010

The second Open House was held on January 21, 2010 following completion of the draft Alternatives Analysis report. The purpose of the second outreach meeting was to present the draft preferred alternative, to solicit comments on the completed analysis, and to solicit input on the alternative(s) recommended for National Environmental Policy Act (NEPA) and City Environmental Quality Review (CEQR) documentation. The meeting format consisted of an evening presentation of the process and the preferred alternative, followed by a public discussion. Comments that were received at the second Public Open House broadly fell into

three categories (Draft LPA, Other Proposed Alternatives, and General) and are summarized below. In instances where responses to comments were provided, these are also included.

4.1.3.1 COMMENTS ON DRAFT LPA (PUBLIC OPEN HOUSE #2)

- Are (BRT) buses the same as current MTA buses already in service or would the MTA have to purchase new buses for BRT? Does a BRT one-way, reconfiguration of 34th Street mean one lane of one-way traffic in both directions, both east and west? Would commercial buses such as Bolt Bus be allowed in the transitway?

Response: BRT buses would be different and have features like low floors and additional doors. The concept plan is for one way traffic westbound from Sixth Avenue, and eastbound from Fifth Avenue. Restrictions on users within the transitway have not been determined yet, but buses using the transitway would need to stop for only short periods of time so as to not interfere with other transit operations.

- Would BRT, the LPA, replace local bus service on 34th Street?

Response: The issue of local bus service along the route has not been addressed yet as NYCT has not finalized a full operating plan for the corridor, but BRT service is expected to stop at most crosstown blocks.

- If the process of implementing BRT on 34th Street is going to take 1.5 years or more, is there an interim solution that can be applied on the existing 34th Street and is there a short term list of actions? Current bus lanes on 34th Street have not sped up traffic and bus lane enforcement is lacking.

Response: Buses are running 17 percent faster on 34th Street since the addition of bus lanes in September 2008. NYCDOT will continue to improve the corridor in the short-term if improvements are available. In going through the process, the team did identify some actions which NYCDOT may apply earlier.

- Is there a plan to go all the way to 39th Street on each end? Would the bus lane on 34th Street have a physical design that would allow NY Waterway to continue the operation of its buses along the space?

Response: New York Waterway would most likely continue to operate their buses to the West 39th Street ferry terminal and they would likely be accommodated in the transitway.

- Could stations share space with the sidewalk?

Response: Curbside stations would be similar to existing bus stops but with added features like off-board fare collection and larger bus shelters.

- Why would bus lanes be placed together on only one side of the street and was there any consideration of a bike lane along the route?

Response: The proposed alignment would allow parking and loading and unloading to remain on at least one side of the street. There will be no bike lanes on 34th Street itself because other corridors are designated on the New York City Bicycle Master Plan, but the connectivity to and bike parking at the greenways could draw bicyclists to Midtown as transit riders.

- How would BRT work with Select Bus Service (SBS) on 1st and 2nd Avenues and would there be 'bus bunching' where buses are unable to pass one another?

Response: The two corridors (34th Street and 1st and 2nd Avenues) are different and have different demands. The local buses on 34th Street have a single stopping pattern, so there would not be a need for buses to pass each other unless a bus breaks down; passing lanes may be included for express buses, which operate to more limited stops. There are a large number of transfers between the M15, M34, and M16, and the design of both projects would take that into consideration.

- Will the current design of bus shelters be modified to incorporate more passengers in this corridor?

Response: Shelters for BRT buses are longer, approximately double the size of current shelters.

- Has NYCDOT considered left side boarding of a bus with a single platform?

Response: It was determined that a different vehicle design would not help to meet the purpose and need of the project.

- The Institute for Rational Urban Mobility believes the LPA should be part of a larger plan and have written asking for a comprehensive plan – not just an ad hoc proposal as the 34th Street Corridor Alternatives Analysis is promoting. New York City has a long history with Light Rail and can mix and match the technology with the running way alternatives. The term "BRT" is being misused in this project and a bus stop on each corner is not BRT. NYCDOT should change the nomenclature so as not to deceive people. Express Buses already exist and solutions should be unique and not a duplication of current service. In terms of cost per mile, NYCDOT is misleading New York City. President Obama has implemented a new "livability" rule on projects. NYCDOT should expand its scope to look at 34th Street to 42nd Street as a loop for connectivity. NYCDOT is years behind the time by not considering Light Rail and should be creative in finding a solution to stop congestion in the area, such as looking at 23rd Street for alternate routes, and should look at hypothetical alternatives. The 34th Street Corridor is not just any corridor but is neighbored by Macy's, the 'largest department store in the world', and the Empire State Building and it deserves something better.

Response: BRT was selected because it is the best alternative to meet the purpose and need of the study, in helping move both local and express transit. The service will be better than typical bus service to meet the needs of the corridor.

- There would possibly be a bottleneck on each block in the BRT alternative. Long-term parking is not needed along 34th Street at all, but illegal parking will continue and cause a traffic flow issue. A bus lane in the middle of the street is favored. Everyone must accept the reality that drivers in NYC park illegally. Long-term parking is not necessary on the street, and there should be no loading or standing opposite boarding platforms.

- Some current street features/amenities should be maintained and some of the features for BRT should be reconsidered. Suggestions include: 1) Maintain the two-way traffic on 34th Street that goes from river to river and feeds into the Lincoln Tunnel and the Queens Midtown Tunnel; 2) Put the transitway in the middle of the street and create boarding platforms; 3) Gain width needed for the center alignment by taking part of the sidewalks and keeping loading and unloading along the curb; 4) Have restricted hours or a permit system for loading area; and 5) Focus on how to make a center transit corridor manageable.
- The median transitway is the most favorable option. Was money the reason for not picking it?

Response: The median alignment was not picked because the street is not wide enough to accommodate it without completely restricting parking.

4.1.3.2 COMMENTS ON OTHER PROPOSED ALTERNATIVES (PUBLIC OPEN HOUSE #2)

- What length or depth heavy rail would have been built at for this project?

Response: The Alternatives Analysis was not a full engineering study.

- Does NYCDOT expect emergency vehicles to be able to move faster or slower along the route? What does TSP stand for? Why would an alternative be disqualified if it is not consistent with MTA operating technologies?

Response: Emergency vehicles would be allowed to use the transitway for emergencies to allow ambulances to get to hospitals as fast as possible. TSP stands for Transit Signal Priority. Alternatives are scored poorly if the MTA does not have current facilities to house or maintain the mode.

- Has NYCDOT given any thought to combining parking and delivery space along the route? Parking should not be a priority and doesn't need to be made easy. Placing the transitway in the middle of the street would provide better consideration of merchants on both sides of the street and emergency needs for hospitals. It would be problematic for people to cross a bus pathway safely. Light rail would require a narrower transitway.

Response: NYCDOT has not determined the details of curb regulations and will work with the community to do so. 34th Street is not wide enough to have a median transitway and travel and parking lanes in each direction. In other cities, light rail has needed the same right-of-way width as BRT.

4.1.3.3 GENERAL QUESTIONS, COMMENTS AND CONCERNS (PUBLIC OPEN HOUSE #2)

- What type of Federal funds will NYCDOT seek for this project and will it go through a full Environmental Impact Statement (EIS) or just an Environmental Assessment (EA)?

Response: The NYCDOT team may apply for federal funds. Options for federal funds include the New Starts/Small Smarts program, as well as the recently announced FTA Bus Livability program. The Scoping process will determine the level of environment review needed, and NYCDOT is committed to a thorough analysis.

- Will solutions be evaluated block by block? Some blocks along the route are very residential and the access of elderly people and deliveries need to be considered.

Response: Access questions have not been answered yet but they will be answered before implementation, in part through the community outreach process.

- The M16 is just a mess and there has been no improvement on it. Are there any current measures that can come to aid in the present? Try separating curbside lanes during some hours. Where will trucks go?

Response: NYCDOT is willing to implement early action changes if those are appropriate. The issue of accommodating deliveries is an important question that needs to be answered. NYCDOT will also study the impacts on the truck route network.

- Will NYCDOT look at connectivity to other transportation modes like subway and ferry?

Response: The LPA will encourage intermodal connectivity and connections to ferry terminals are very important. Access to ferry terminals is one reason NYCDOT focused on 34th Street. There are ferries on the west (Pier 79) and east ends of 34th Street that would both benefit from improved intermodal access to Midtown.

- Has NYCDOT looked into combining the express services running down from the Bronx and up from Staten Island? If there is an eastbound bus station? What is the interface between the sidewalk and the traffic lane?

Response: NYCDOT deferred to the MTA to answer and suggested that the attendee speak to a MTA representative after the meeting. Both pedestrian safety and pedestrian comfort are top priorities that would be included in the design process.

- The areas along 34th Street have different characteristics. Pedestrians, bicyclists, and drivers all experience different issues. Traffic is not slowing down traffic, but rather the boarding of passengers on buses slows down traffic.

Response: Multi-door boarding would be part of the BRT alternative, which would help with this problem.

- If there is not enough space on 34th Street and pedestrian access and safety are goals, why not consider restricting private traffic, removing single occupancy vehicles from the street, and also adding bike lanes? NYCDOT needs to make a hard decision and make 34th Street a true transit corridor.

Response: Allowing only transit traffic is tricky given this corridor's access to tunnels, and the project's goal is to find a balance among all roadway users. Regulating delivery-only access to the street would be a challenge.

- Has a survey been conducted to determine the spill space needed along 34th Street for pedestrians and bus bulbs?

Response: NYCDOT has collected and will be collecting a lot of pedestrian data and is working with the Port Authority and the ARC project team to access data they have collected.

- Back streets or midblock locations could possibly be accessed for deliveries and loading.

4.1.4 OTHER FEEDBACK (PUBLIC OPEN HOUSE #2)

- The rigid designation of street alignments for street cars (curbside), light rail (median), and BRT (single side) is flawed. This designation seemed to have been the major reason for rejection of streetcar/Light rail systems. A light rail system could be accommodated on a single side alignment and would have made a 34-42nd st loop possible, in addition to connection to the hudson-bergen light rail in NJ, through the Lincoln Tunnel, thus alleviating the over capacity of single-ocupancy vehicles in midtown.

- Express bus operations could have been improved by studying alternative routes. They do not necessarily have to use 34th St. A comprehensive transportation study from 14-59th St, river to river would be very good at studying all aspects of transportation needs including local/express bus, truck, pedestrian, bicycle, etc. and would be helpful in addressing ad hoc proposals as the 34th St alternative analysis.

- The designation of the BRT as a rapid transit is misleading as there will be stops at virtually every block. A true BRT by default refers to express buses at more spaced out stops (similar to the express subway lines vs the local lines). Thus the so called BRT alternative should be refered to a local bus system with as-of-right lanes. Since both local/BRT and express buses will utilize the reserved lanes, in addition to the long distance buses potentially (BOLT buses) will there actually be an improvement in travel times ? This was not presented here. How much faster will it be to travel river to river?

Response: More detail on the benefits on each alternative are provided at http://www.nyc.gov/html/dot/html/ferrybus/34thstreet.shtml. The BRT option is expected to save 9-11 minutes of travel time over the length of the corridor.

- what about speed of boarding? or accessibility for disabled persons? Light rail is at grade thus making boarding very accessible and easy.

Response: The draft Locally Preferred Alternative will use low-floor buses to be most accessible for all riders.

- at the initial meeting in Fall 2009, it was mentioned that 2 alternative projects would be chosen for further analysis. Could both the BRT/local bus AND the light rail system be taken forward for preliminary design and environmental review? The federal government just announced increased funding for light rail systems in the US because they improve the livability of communities. NYC DOT could benefit from these funds.

Response: During the Alternatives Analysis screening, it was determined that the only build alternative that would meet the Purpose and Need of the project was the BRT alternative.

- NYC used to be a leader in light rail/trolley systems and we tore them all down to make way for cars. Our success in doing so has come back to haunt us as we are choked to death by too many vehicles on our streets. Its time to reverse this with environmentally sustainable mass transit options.

- My own preference is the one you presented. However, as Community Board 4 Transportation Committee Chair Christine Berthet noted, there may be scope for exploring more radical options, such as reducing traffic flow in general on West 34th or routing express buses on other thoroughfares, such as West 23rd or West 14th streets. I'm concerned that the alternatives being explored now are mainly about facilitating bus traffic on West 34th Street, rather than improving the quality of life of the residents and the day-to-day operations of small and large businesses. I would encourage the DOT and the MTA to explore all options before moving ahead.

- I am sure that you have collected excellent data for 34th street, but make sure you take foot traffic into account so that you know exactly what stretches of sidewalk need to be widened. I know that the gospel of incrementalism will prevail here and slowly but surely make 34th Street a more livable (and thus profitable) experience for all.

4.1.5 STAKEHOLDER MEETINGS

Throughout the course of the project, NYCDOT has held meetings with the MTA, MTA Bridges and Tunnels, NYCT, MTA Bus Company, the Port Authority of New York and New Jersey, NJTransit, and the FTA. These meetings are targeted to specific concerns and issues that will need to be addressed to fully implement the project given the various functions that 34th Street serves. NYCDOT will continue to conduct these targeted meetings as the project advances to solicit input from these agencies and advance the project.

In addition, DOT will continue to meet with other public stakeholders throughout the course of the project.

4.2 STAKEHOLDER LIST

The following agencies, organizations, and individuals have been invited to participate or have participated in the public outreach process to date.

4.2.1 ELECTED OFFICIALS AND COMMUNITY BOARDS

4.2.1.1 FEDERAL

Senator Charles Schumer
Senator Kirsten Gillibrand
Congressman Jerrold Nadler
Congresswoman Carolyn Maloney

4.2.1.2 STATE

New York State Senator Thomas Duane
New York State Senator Liz Krueger
New York State Assemblymember Richard Gottfried

New York State Assemblymember Brian Kavanagh
New York State Assemblymember Jonathan Bing

4.2.1.3 CITY

Mayor Michael Bloomberg
Manhattan Borough President Scott Stringer
City Council President Christine Quinn
City Councilmember Rosie Mendez
City Councilmember Daniel Garodnick
Manhattan Community Board 4
Manhattan Community Board 5
Manhattan Community Board 6

4.2.2 AGENCIES

4.2.2.1 FEDERAL

Federal Highway Administration
Federal Transit Administration

4.2.2.2 STATE

New York State Department of Transportation
Metropolitan Transportation Authority
MTA Long Island Rail Road
MTA New York City Transit
MTA Bus Company
MTA Bridges and Tunnels
New Jersey Transit
Port Authority of New York and New Jersey
Bee Line Bus/Westchester Department of Transportation
Empire State Development Corporation

4.2.2.3 CITY

New York City Department of City Planning
New York City Department of Environmental Protection
New York City Economic Development Corporation
New York City Department of Sanitation
New York City Police Department
Fire Department of the City of New York

4.2.3 BUSINESSES/BUSINESS GROUPS/INSTITUTIONS:

34th Street Partnership
Macy's
Madison Square Garden
Amtrak
Hotel Pennsylvania
Bolt Bus, Inc.
NYC & Company

NYU Medical Center
US Helicopter
Empire State Building
1 Penn Plaza
Hammerstein Ballroom
Jacob K. Javits Center
Association of Private Carriers
Academy Lines
CUNY Graduate Center
New York Public Library (Science, Industry, and Business Library)
New York Waterway
New York Water Taxi
SeaStreak

4.2.4 COMMUNITY GROUPS

Tri-State Transportation Campaign
Clinton/Hell's Kitchen Coalition for Pedestrian Safety
Association for a Better New York
Hell's Kitchen Neighborhood Association
Permanent Citizens' Advisory Committee to the MTA
Straphangers Campaign
Murray Hill Association
Manhattan East Community Association

Chapter 5: Conclusions and Recommendations

5.0 INTRODUCTION

The purpose of the Alternatives Analysis phase of the Proposed Project is to evaluate the potential alternatives for transit investment along the 34th Street corridor, and to arrive at a recommendation for a LPA. As detailed in this analysis, seven alternatives were evaluated to determine how well they fulfilled the project goals and objectives. Along with this technical evaluation, input from various public agencies, elected officials, community groups, and the general public shaped the analysis and became an important indicator of project feasibility. This chapter reviews the results of the screening of alternatives and reviews the study recommendations for the LPA. Based on this analysis, and on input received, the preferred alternative should be a project that could be implemented quickly and at relatively low cost, would significantly improvement travel times along the corridor, and would expand pedestrian circulation space. The project should be consistent with federal guidelines so that it will be eligible for federal funding.

The Alternatives Analysis began with the identification of the project's primary goals and objectives: 1) to improve crosstown mobility; and 2) to minimize capital and operating concerns, reduce pedestrian congestion and improve pedestrian safety. Based on the resultant primary screening process, only one Build alternative—the BRT Alternative—satisfied the project goals and objectives enough to be advanced to the secondary screening process. Although other alternatives considered were found to have the potential to attract high ridership and would improve corridor travel time, the costs of the LRT, Streetcar, AGT, and Heavy Rail alternatives were determined to be excessively high, and the durations of construction for these alternatives were prohibitively long. However, based on its high performance in the primary screening, the BRT Alternative was advanced to the secondary screening, along with the No Build and TSM alternatives, which were advanced as required by the FTA.

The secondary screening then evaluated project alternatives based on the secondary goals and objectives: 1) to enhance community character; and 2) to minimize the impact on the built and natural environment. Based on the outcome of this secondary screening, this report recommends that the BRT Alternative be carried forward as the LPA into the preliminary engineering and environmental review phase of the project development process.

5.1 TECHNICAL SCREENING RESULTS

The alternatives screened were:

- No-Build Alternative;
- TSM Alternative;
- Build Alternative 1—BRT;
- Build Alternative 2—Streetcar;
- Build Alternative 3—LRT;
- Build Alternative 4—AGT; and
- Build Alternative 5—Heavy Rail.

The following are the key findings from the screening of each alternative.

- The ***No Build Alternative*** will be advanced to the environmental process per FTA requirements.
- The ***TSM Alternative*** serves as the baseline alternative in the analysis and will also be advanced to the environmental process per FTA requirements. The TSM Alternative scored well under many screening criteria including cost and construction duration. However, in terms of overall capacity and end-to-end travel time along the corridor, the TSM Alternative did not score as well as the other alternatives.
- The ***BRT Alternative*** (Build Alternative 1) performed best overall because of the potential for high ridership, cost-effectiveness, congruency with existing express and local bus operations, and a short construction duration. BRT will be advanced into the environmental process.
- The ***Streetcar Alternative*** (Build Alternative 2) performed well under many evaluation criteria, including ridership. However, construction costs, construction duration, and the need for a maintenance and storage facility for vehicles prevented the streetcar alternative from advancing into the secondary screening.
- The ***LRT Alternative*** (Build Alternative 3) received ratings that were similar to the Streetcar Alternative in terms of ridership and construction costs. The LRT Alternative would provide a stationary at-grade fixed transit system that typically appeals to transit riders and attracts high ridership. However, overall costs and the long construction duration prevented the LRT Alternative from advancing into the secondary screening.
- The ***AGT Alternative*** (Build Alternative 4) had the second highest construction cost, next to the heavy rail alternative. This alternative would generate substantial ridership; however, high construction costs and the long construction duration prevented the AGT Alternative from advancing to the secondary screening.
- The ***Heavy Rail Alternative*** (Build Alternative 5) was the most effective alternative with respect to ridership and travel time; however, it also had the highest construction costs and longest construction duration, which prevented it from advancing to the secondary screening.

5.2 CONCLUSION AND NEXT STEPS

The BRT Alternative (Build Alternative 1) is recommended as the LPA. It meets the project's purpose and need and goals and objectives to a greater extent than the other Build alternatives. It can be implemented at a lower cost and with a shorter construction duration than the other build alternatives, and it would allow for continued local and express bus services along the 34th Street corridor. The BRT Alternative would improve both transit service efficiency and the pedestrian environment on 34th Street.

The next steps for this project are to begin the preliminary design and environmental review processes, both of which will help to shape the project and help answer outstanding questions related to the project's physical layout and its potential environmental effects. Significant public outreach is expected as part of both of these efforts.

The preliminary design process will develop the design of the BRT Alternative in more detail. The preliminary design process will develop and define:

- A block-by-block layout of the BRT Transitway;
- The transition of the transitway from one side of 34th Street to the other to accommodate land uses;
- Station locations for local and express buses;
- The locations and designs for new pedestrian spaces;
- Parking and loading needs and accommodations, block by block;
- Changes to through and local truck routes; and
- Other changes to traffic operations (i.e., turn lanes).

After the LPA is verified, in consultation with interested public agencies, community groups, elected officials, and through feedback received at public meetings, the resultant Proposed Project will then undergo a significant environmental review, which will comply with the requirements of the City Environmental Quality Review (CEQR) process and the National Environmental Policy Act (NEPA). The first step in the environmental review will be a scoping process, which will determine the extent of the review. It is expected that the environmental review process will include:

- Public involvement in the scoping process, to ensure that all concerns are properly addressed;
- In-depth traffic analysis of traffic on 34th Street as well as any traffic impacts on nearby parallel streets, and the regional transportation network, using a state-of-the-art traffic simulation model;
- Evaluation of pedestrian crowding and safety;
- Evaluation of changes to the transit network;
- Evaluation of impacts on parking supply; and
- Evaluation of noise and air quality impacts.

In addition to the environmental documentation and conceptual engineering elements, the next phase of the Proposed Project will include the preparation of an application to FTA for federal funds. This application will include plans that highlight information specific to the financial requirements of the Proposed Project, including capital and operating costs and probable funding sources and mechanisms. These plans are dependent on the design and environmental review processes, and will be advanced along with them. The project is also expected to advance into the FTA project development process, as the New Starts program is one potential source of funds for the project.

Appendix A
Cultural Resources in the Area of Potential Effect

Table A-1

Cultural Resources in the Area of Potential Effect

Map Ref. #	Name/Type	Address	S/NR	NYCL	S/NR-eligible	NYCL-eligible
1	Hudson River Bulkhead	Roughly between the Battery and West 59th Street along the Hudson River waterfront			X	
2	High Line	Along 30th Street between Tenth and Twelfth Avenues, and Twelfth Avenue between 30th and 34th Streets			X	
3	W&J Sloane Warehouse and Garage	306-310 Eleventh Avenue and 541-561 West 29th Street			X	
4	Charles P. Rodgers & Company Building	517-523 West 29th Street			X	
5	Farley Complex	Block bounded by Eighth and Ninth Avenues and 31st and 33rd Streets	X	X		
6	Loft Building	424 West 33rd Street			X	
7	St. Michael's RC Church Complex	414-424 West 34th Street and 409-429 West 33rd Street			X	X
8	Former Pinehill Crystal Water Company	500-504 West 36th Street			X	
9	William F. Sloan Memorial YMCA	360 West 34th Street			X	X
10	Former J.C. Penney Co.	331-343 West 33rd Street; 330 West 34th Street			X	
11	Loft Building	406-426 West 31st Street			X	
12	Tenement	463 West 35th Street			X	
13	Former Gledhill Wall Paper Company	541-545 West 34th Street; 546-548 West 35th Street			X	
14	West Side Jewish Center	347 West 34th Street			X	
15	Former Manhattan Opera House	311 West 34th Street			X	X
16	New Yorker Hotel	481-497 Eighth Avenue			X	X
17	Morgan General Mail Facility	341 Ninth Avenue			X	
18	Former French Hospital	326-330 West 30th Street			X	
19	Pennsylvania Building	225 West 34th Street			X	X
20	Hoover Building	501-507 Eighth Avenue			X	
21	Garment Center Historic District	Roughly bounded by Sixth and Ninth Avenues and West 41st and 34th Streets		X		
22	Lamartine Place Historic District	333-359 West 29th Street		X	X	
23	Tenements	523-539 Ninth Avenue			X	
24	Tenement	408 West 39th Street			X	
25	Madison Square North Historic District Extension	Roughly bounded by East 29th Street, East 34th Street, Madison Avenue, and Broadway				X
26	Former Franco-American Baking Company	509-517 West 38th Street			X	
27	Lincoln Tunnel and Lincoln Tunnel Vent Buildings (Fan Shaft & Ventilation Building within study area)	West 39th Street between Tenth and Eleventh Avenues			X	
28	River Diner	452 Eleventh Avenue			X	
29	Underhill Building	438-448 West 37th Street			X	
30	Master Printers Building	406-416 Tenth Avenue			X	
31	Webster Apartments	419 West 34th Street			X	
32	Harding Building	440-448 Ninth Avenue			X	
33	Hill Building	469-475 Tenth Avenue			X	
34	Warehouse	500 West 37th Street; 483 Tenth Avenue			X	
35	Art Deco Loft Building	509-519 Eighth Avenue			X	
36	Tenement	367 West 35th Street			X	
37	Thirty-six Thirty-seventh Street Arcade	520-528 Eighth Avenue			X	

Table A-1 (cont'd)
Cultural Resources in the Area of Potential Effect

Map Ref. #	Name/Type	Address	S/NR	NYCL	S/NR-eligible	NYCL-eligible
38	Former American Union Bank	540-552 Eighth Avenue			X	
39	545 Eighth Avenue	545-551 Eighth Avenue	X			
40	Shapman Eighth Avenue Building	553-555 Eighth Avenue			X	
41	Loft Building	344-348 West 38th Street			X	
42	United Publishers Building	231-249 West 39th Street			X	
43	Art Deco Loft Building	251-255 West 39th Street			X	
44	Kermacoe Building	257-267 West 39th Street			X	
45	Finck Building	316-326 West 39th Street			X	
46	Art Deco Loft Building	323-327 West 39th Street			X	
47	Tenement	274 West 40th Street			X	
48	Glad Tidings Tabernacle	325-329 West 33rd Street			X	
49	R.H. Macy & Co. Store*	151 West 34th Street	X			X
50	Loft Building	231-239 West 29th Street			X	
51	Loft Building	241-245 West 29th Street			X	
52	Loft Building	249-251 West 29th Street			X	
53	Loft Building	130 West 30th Street		X	X	
54	Art Deco Loft Building	144-154 West 30th Street			X	
55	23rd Police Precinct Station House	134-8 West 30th Street		X	X	
56	Loft Building	115-125 West 30th Street			X	
57	St. John the Baptist Roman Catholic Church Complex	207-215 West 30th Street			X	
58	Fairmont Building	239-241 West 30th Street			X	
59	Fur Craft Building	242-246 West 30th Street			X	
60	Loft Building	131 West 35th Street			X	
61	Loft Building	247 West 30th Street			X	
62	Shapman Building	252-258 West 37th Street			X	
63	Penn Station Service Building	236-248 West 31st Street			X	X
64	Loft Building	259-261 West 30th Street			X	
65	Johnson Building	1331-41 Broadway			X	
66	Saint Francis of Assisi Roman Catholic Church Complex	129-143 West 31st Street			X	
67	Loft Building	142-4 West 36th Street			X	
68	New York Telephone Company Building	206-238 West 36th Street			X	
69	Loft Building	242 West 36th Street			X	
70	Loft Building	115-125 West 30th Street			X	
71	Former New York Edison Company Building	308-312 West 36th Street			X	
72	Art Deco Loft Building	315-325 West 36th Street			X	
73	Former Barbour Dormitory	330 West 36th Street			X	
74	Tenement	346 West 36th Street			X	
75	Christ Church Memorial	334-344 West 36th Street			X	
76	Loft Building	51-57 West 39th Street				X
77	Garment Wear Arcade	307-313 West 36th Street; 306 West 37th Street			X	
78	Loft Building	345-353 Seventh Avenue			X	
79	Former Governor Clinton Hotel	371-377 Seventh Avenue			X	
80	Former Equitable Life Assurance Company Building	383-399 Seventh Avenue			X	
81	Hotel Pennsylvania	401 Seventh Avenue			X	
82	Nelson Tower	446-455 Seventh Avenue			X	
83	Loft Building	462-468 Seventh Avenue			X	
84	Arsenal Building	463-467 Seventh Avenue			X	

Table A-1 (cont'd)
Cultural Resources in the Area of Potential Effect

Map Ref. #	Name/Type	Address	S/NR	NYCL	S/NR-eligible	NYCL-eligible
85	Armion Building	469-479 Seventh Avenue			X	
86	Loft Building	470-472 Seventh Avenue			X	
87	232 Madison Avenue	232 Madison Avenue; 17 East 37th Street	X			
88	Former Duane Hotel	237-239 Madison Avenue			X	
89	Former Fraternity Clubs Building (Madison Towers)	241-245 Madison Avenue			X	
90	273-277 Madison Avenue	273-277 Madison Avenue			X	
91	Empire State Building*	350 Fifth Avenue	X	X		
92	2 Park Avenue	2 Park Avenue		X	X	
93	Della Robbia Bar (The Crypt)	4 Park Avenue		X	X	
94	New York School of Applied Design for Women	160 Lexington Avenue	X	X		
95	Greenwich Savings Bank	1352-1362 Broadway	X	X		
96	Grand Hotel	1232-1238 Broadway	X	X		
97A	Murray Hill Historic District	Roughly bounded by Park and Lexington Avenues and 35th and 38th Streets.		X		
97B	Murray Hill Historic District	Roughly bounded by Park and Lexington Avenues and 35th and 38th Streets.	X			
98	Colony Club (American Academy of Dramatic Arts)	120 Madison Avenue	X	X		
99	Hotel Martinique	1260-1268 Broadway		X	X	
100	Aberdeen Hotel	17 West 32nd Street		X	X	
101	Marble Collegiate Church	272 Fifth Avenue	X	X		
102	Gilsey House	1200 Broadway	X	X		
103	Sidewalk Clock Thematic Nomination	Sidewalk Clock adjacent to 519 Third Avenue	X			
104	Psychiatric Building at Bellevue Hospital	500 First Avenue			X	
105	George E. Durhan & Son Building	210 East 35th Street			X	
106	The Collingwood (Hotel)	45 West 35th Street			X	
107	The Oakdale	36 West 35th Street			X	
108	Civic Club (Estonian House)	243 East 34th Street	X	X		
109	Grolier Club	29 East 32nd Street	X	X		
110	Hotel McAlpin	1282-1300 Broadway			X	
111	Marbridge Building	1328 Broadway			X	
112	Stewart & Company Building	402-404 Fifth Avenue		X	X	
113	The Wilbraham	1 West 30th Street		X	X	
114	33rd Street Subway Station	33rd Street and Park Avenue	X			
115	Public School 116	210 East 33rd Street			X	
116	Gorham Building	390 Fifth Avenue		X	X	
117	Lamppost 53	Adjacent to 314 Fifth Avenue		X		
118	Loft Building	28-30 West 36th Street			X	
119	Greely Arcade/Loft Building	127-133 West 30th Street; 128-136 West 31st Street			X	
120	Adelaide L.T. Douglas House (Guatemalan Consulate General)	57 Park Avenue	X	X		
121	James F. D. & Harriet Lanier House	123 East 35th Street	X	X		
122	Rowhouse	132 East 38th Street	X	X		
123	George S. Bowdoin Stable	149 East 138th Street			X	
124	Jonathan W. Allen Stable	148 East 40th Street		X	X	
125	Park Avenue South Historic District	Park Avenue between E 17th and E32nd Streets			X	

Table A-1 (cont'd)
Cultural Resources in the Area of Potential Effect

Map Ref. #	Name/Type	Address	S/NR	NYCL	S/NR-eligible	NYCL-eligible
126	James Hampden Robb & Cornelia Van Rensselaer Robb House	23 Park Avenue		X	X	
127	Former Hatfield House (Deauville Hotel)	103 East 29th Street			X	
128	203 East 29th Street	203 East 29th Street	X			
129	Lord & Taylor Building	424-434 Fifth Avenue		X	X	
130	Knox Building	452 Fifth Avenue	X	X		
131	American Radiator Building	40 West 40th Street	X	X		
132	Union League Club	38 East 37th Street			X	
133	Wilson Building	1270-1280 Broadway			X	
134	Church of the Transfiguration	1 East 29th Street	X	X		
135	146 East 38th Street	146 East 38th Street			X	
136	31 East 38th Street	31 East 38th Street			X	
137	Rowhouses at 32-40 East 38th Street Historic District	32-40 East 38th Street			X	
138	B. Altman & Co. Department Store (New York Public Library)	355-371 Fifth Avenue; 188-198 Madison Avenue		X	X	
139	Bryant Park Studios	80 West 40th Street		X	X	
140	The Allerton 39th Street House	145 East 39th Street			X	
141	Williams Club	24 East 39th Street			X	
142	Thomas and Fanny Clarke House (Collector's Club)	22 East 35th Street	X	X		
143	Church of the Incarnation (Episcopal) and Rectory	205-209 Madison Avenue	X	X		
144	Pierpont Morgan Library and Annex*	225 Madison Avenue	X	X		
145	Phelps Stokes—JP Morgan, Jr. House	231 Madison Avenue		X	X	
146	Joseph Raphael De Lamar House (Consulate General of Poland)	233 Madison Avenue	X	X		
147	Sniffen Hill Historic District	1-10 Sniffen Court	X	X		
148	Tiffany & Co. Building*	397-409 Fifth Avenue	X	X		
149	Engineers Club	32-34 West 40th Street				X
150	Engineering Society	25 West 39th Street				X
151	Haskins & Sells Building	35-37 West 39th Street				X
152	Colony Arcade	63-67 West 38th Street; 62-64 West 39th Street				X
153	Loft Building	42-50 West 39th Street				X
154	Loft Building	15-17 West 38th Street				X
155	Murray Hill Building	8-16 West 38th Street				X