

A. EXISTING CONDITIONS

The East Side of Manhattan, which includes some of the most heavily traveled bus corridors in the United States, is well served by frequent and comprehensive bus transportation service. There is at least one New York City Transit (NYCT) local bus route on every north-south avenue, except on Park Avenue north of Grand Central Terminal. Portions of Fifth and Madison Avenues in East Midtown have as many as six local bus routes. For the easternmost edge of East Midtown, the Upper East Side, and East Harlem, the closest subway line is on Lexington Avenue, and residents of these areas must often walk more than 5 to 10 minutes to get to the nearest subway station or rely on bus service to reach the subway. The M15 serves the densely populated First and Second Avenue corridors. Operating at 1.5- to 3-minute headways during peak hours, it has the highest ridership of any single bus route in North America. The East Side, the Lower East Side and Lower Manhattan are also served by local bus routes on every major north-south avenue. Based on the 1998 New York Metropolitan Transportation Council (NYMTC) Hub Bound Report data, the three southbound corridors that accommodated the highest volume of local bus riders entering the Central Business District (CBD) south of 60th Street during the AM peak period were on the East Side of Manhattan, namely Fifth, Lexington, and Second Avenues.

The study area is also well served by crosstown bus service. Most of the major crosstown streets—e.g., 86th, 79th, and 34th Streets—have at least one local bus route that provides transportation from river to river. These crosstown buses serve many East Side riders that use the Lexington Avenue Subway line, and whose origins and destinations are two or more avenues east of the nearest subway station.

A number of other local bus routes serve major and minor crosstown streets throughout the study area, with more than half the routes providing service 24 hours a day, seven days a week. Overall, approximately 600 buses operate in the study area during peak hours. Frequency of bus service is generally high, with scheduled headways (the time between buses) on some routes as low as 1.5 minutes during the peak periods (e.g., on the M15 in the AM peak). To ensure that there are enough buses on a given route to accommodate riders during a particular time period, NYCT has established “Local Bus Schedule Guidelines”, which stipulate the expected maximum number of riders to be accommodated per bus.

In addition to local bus service, several NYCT and private express buses provide service within the study area and from the outer boroughs. Express service is primarily provided on weekdays, in the peak travel direction only, and with service frequencies ranging from 5 to 30 minutes.

A common condition affecting bus operations is “bus bunching,” where after a long period when no buses arrive at a specific bus stop, several buses arrive within minutes or even a few seconds of each other. Several factors contribute to bus bunching, including high frequency of service, high passenger volumes, traffic congestion, and illegal parking. Buses providing regular service

generally operate at speeds in the 5 to 7 mile per hour (mph) range, while limited-stop buses, which provide service to selected bus stops spaced about every eight to 10 blocks, operate in the 7 to 10 mph range. These bus speeds are negatively impacted by street congestion and the frequency of bus stops.

A more detailed discussion of NYCT express bus service, private bus service, bus travel times and speeds, and bus schedule guidelines are provided in Appendix D.

B. FUTURE CONDITIONS COMMON TO ALL ALTERNATIVES

Bus ridership on the north/south routes through the study area is projected to increase by about 5 percent by the 2025 analysis year. There would be no new routes, and projected load levels per bus at peak load points would generally not result in significant service additions or reductions. The Third/Lexington Avenue corridor (M98, M101, M102, and M103) and the First/Second Avenue corridor (M15) would be served by articulated buses, which, at guideline, carry 85 people per bus. During peak periods, three articulated buses would replace four standard buses, providing a net increase of 20 seats. During off-peak periods, four articulated buses would replace five standard buses, providing a net increase of 40 seats.

C. CONSTRUCTION IMPACTS OF THE PROJECT ALTERNATIVES

NO BUILD ALTERNATIVE

With the No Build Alternative, the Second Avenue Subway would not be built. Therefore, there would be no surface transit impacts with the No Build Alternative.

SECOND AVENUE SUBWAY

IMPACT ON SURFACE TRANSIT SERVICES FROM SUBWAY CONSTRUCTION

The construction phase of the Second Avenue Subway could result in significant traffic impacts due to lane closures along the alignment, diversion of through traffic away from congested construction areas, and an increase of truck traffic from construction vehicles. Preliminary engineering estimates indicate that up to half of the Second Avenue roadway width would be needed at most station construction and shaft/access site locations to accommodate subway construction activities. This would reduce the width of Second Avenue adjacent to construction zones to three moving lanes for traffic at most station locations. At station locations where leaving three lanes open would cause severe traffic impacts, a fourth moving lane could be provided by narrowing the sidewalks and the moving lanes. For stations located on two-way streets, such as 125th Street and Water Street, streets would be narrowed to one travel lane in each direction with provision available for two travel lanes at some locations (i.e., at the approaches to some key intersections).

The length of the station construction and staging area would be about four to five block lengths at each location. To maintain three or four moving lanes through each construction zone, bus stops within the zone would need to be relocated up to two to three blocks away, outside of the construction area. Many station construction zones are located at major cross streets, such as 34th, 42nd, 72nd, and 96th Streets. By prohibiting bus stops within the station construction zones, riders transferring between the M15 and a crosstown bus route may need to walk an additional one to two blocks between connections. Although this would be an inconvenience for

some riders, others would benefit from a closer distance to their homes or businesses. Therefore, this is not considered a significant adverse impact. Moreover, signage advising passengers of the changed bus stop locations would also be posted to assist passengers. Similarly on Water Street and 125th Street, the bus stops would be located just beyond the construction zones so as to provide a continuous through travel lane in each direction through the construction area.

Within the Upper East Side, the 96th Street station construction zone would extend from 92nd Street to 97th Street. Just south of the 96th Street Station, another construction zone might be needed to serve as the insertion location for a tunnel boring machine and an access shaft for spoils removal and material delivery. If both of these construction zones were active simultaneously, Second Avenue would be narrowed to three or four lanes from 97th to 92nd Street with no bus stops in between. This condition could be a hardship for some local bus riders, and construction phase bus mitigation measures could be needed. Possible mitigation measures might include narrowing the moving lanes and sidewalks for a one-block segment to provide a fourth lane for bus stops or constructing a designated bus stop pull-out area within the construction zone for buses to load and unload passengers out of the main traffic stream. Signage would be posted to minimize passenger confusion.

The M15 bus route, which operates along Second Avenue, would be affected the most by the Second Avenue Subway construction. In addition to bus stop relocations, southbound service would experience additional delays and traffic congestion through the construction zones. It is also possible that at some locations, bus routes may be temporarily changed to avoid construction areas.

Roadway capacity along Second Avenue through the construction zones would be reduced to three or four moving lanes, resulting in the need to eliminate exclusive bus lanes to provide sufficient roadway capacity and to reduce significant delays for all traffic. Since the M15 bus route would be sharing the same lanes as the general traffic during the construction phase, buses on this route would no longer have the luxury of bypassing congested locations in their exclusive lanes. Furthermore, the roadway capacity reductions on Second Avenue through the construction zones would increase traffic delays and, consequently, M15 bus travel times. These delays could occur at multiple locations along the M15 route, depending upon the number of construction sites that would be active concurrently, resulting in a cumulative increase to the M15 travel time on the Second Avenue corridor.

The congestion on Second Avenue might divert some motorists and bus riders to Lexington Avenue. As a result, additional delays may be experienced by Lexington Avenue buses due to the additional traffic and diverted riders from Second Avenue. The additional riders from Second Avenue would increase boarding and alighting times at bus stops, increase bus occupancy levels, and possibly increase travel times along this route.

As described in more detail in Chapter 5D, “Transportation Vehicular Traffic,” standard traffic engineering improvements would mitigate some, but not all, traffic delays during construction. In addition, a comprehensive areawide traffic management and mitigation plan will be developed by NYCT and reviewed by an Interagency Traffic Management Task Force comprised of affected and responsible agencies. An important part of this plan would be a comprehensive traffic-monitoring program, which would continually evaluate traffic conditions—including conditions for buses—and ensure that traffic detours and mitigation measures respond effectively to traffic patterns as they change.

PHASED IMPLEMENTATION OF SECOND AVENUE SUBWAY OPERATIONS

The options for sequencing the construction of the Second Avenue Subway are described in Chapter 3, “Description of Construction Methods and Activities.” The selected construction sequencing option calls for the Second Avenue Subway to be put into operation in four phases over a period of years, as described below:

- Phase 1: The initial operating phase would extend the existing **Q** service from its current northern terminus at the 57th Street-Seventh Avenue Station to the 86th Street Station. The **Q** trains would stop at four additional stations, 96th Street, 86th Street, 72nd Street, and Lexington Avenue—63rd Street, in the Upper East Side and East Harlem neighborhoods. An across the platform transfer connection would be provided with the **F** route on the Sixth Avenue Line at the Lexington Avenue-63rd Street Station.

During this initial operating phase, the southbound M15 local bus route is expected to carry about 760 more riders at the peak load point in the East Harlem neighborhood during the AM peak hour, an increase of about 500 percent, compared with the No Build condition. Similarly, the southbound M15 Limited bus route would carry about 690 more riders at the peak load point during the AM peak hour, or an increase of 155 percent during the AM peak hour. These increases would occur because more people would be expected to use the M15 local and Limited bus routes to access the Second Avenue Subway at its interim northern terminus—the 96th Street Station. Even with these increases, both the M15 and M15 Limited bus routes would each be expected to operate with an average v/c ratio of about 0.8, which would be 80 percent of NYCT service guideline passenger loading.

In contrast, the M96 crosstown bus route, which operates on 96th Street, would have 25 percent fewer eastbound riders boarding east of Park Avenue during this initial operating segment than under the No Build condition. Most of this decrease would be due to fewer passengers boarding the eastbound M96 route at Lexington Avenue.

- Phase 2: The second operating phase would further extend the **Q** service northward to the 125th Street Station. Service on the Second Avenue Line would stop at three additional stations in the East Harlem neighborhood, 125th Street, 116th Street, and 106th Street. Transfer connections would be provided at the 125th Street Station with the **4** **5** **6** routes on the Lexington Avenue Line and with the Metro-North Railroad at Park Avenue. Ridership on the M15 local route would decrease over 25 percent, compared with the No Build condition. Moreover, ridership on the M15 Limited bus route in East Harlem would decrease by over 85 percent, compared with the No Build, as people who make longer trips switch from the bus to the new subway line. Ridership on the M96 crosstown route would continue to decrease with extension of Second Avenue subway service to 125th Street.
- Phase 3: The third operating phase would extend subway service along Second Avenue southward to the Houston Street Station and introduce a second subway service—the **T** route—to the Second Avenue Line. Six additional subway stations would be opened: 55th Street, 42nd Street, 34th Street, 23rd Street, 14th Street, and Houston Street. These stations serve the East Midtown, Gramercy Park/Union Square, East Village, and Lower East Side neighborhoods. In this phase, the **T** route would provide service at 11 station stops between and including the 125th Street and Houston Street Stations. Transfer connections may be provided with the **E** **V** routes at 55th Street, the **7** route at 42nd Street, the **L** route at 14th Street, and the **F** **V** routes at Houston Street.

The Houston Street Station will be the interim south terminus of the Second Avenue Line following completion of Phase 3 of the project. In both the existing and No Build conditions, very few AM peak hour passengers board the M15 or M15 Limited bus services at Houston Street. This can be expected to change with the completion of Phase 3 of the project. The South Ferry and Park Row/City Hall branches of the southbound M15 and M15 Limited bus routes serve Lower Manhattan; the South Ferry branch serves Lower Manhattan via Madison, Pearl, and Water Streets and terminates at Peter Minuet Plaza and South Ferry. The Civic Center is served by the Park Row/City Hall branch, which operates on East Broadway and Park Row and terminates on Park Row at City Hall Park. These branches are expected to have an additional 160 local and 620 limited riders boarding at Houston Street during the AM peak hour. This increase would be due to passengers, who want to continue their trip to Lower Manhattan, by transferring from the **T** route on the Second Avenue Subway to the M15 and M15 Limited bus routes at Houston Street and Second Avenue.

Following completion of Phase 3 of the project, the South Ferry and Park Row/City Hall branches of the M15 and M15 Limited bus routes could operate with v/c ratios of about 1.2 and 1.3 and exceed NYCT service guideline passenger load by 20 percent and 30 percent, respectively, resulting in a significant adverse impact. Adding a total of two bus runs to the South Ferry and Park Row/City Hall branches of M15 local bus route and a total of five bus runs to South Ferry and Park Row/City Hall branches of the M15 Limited bus route during the AM peak hour would mitigate this bus overcrowding in the Lower East Side. NYCT would monitor bus ridership on each route during both the AM and PM peak periods, and would increase or decrease bus service to accommodate actual ridership demands.

- Phase 4: The completion of Phase 4 between Houston Street and Hanover Square Stations would complete the full-length Second Avenue Line. Four additional subway stations would be opened: Grand Street, Chatham Square, Seaport, and Hanover Square, serving the Lower East Side, Chinatown, and Lower Manhattan neighborhoods. Additional transfer connections would be provided with the **B** **D** routes at Grand Street. At the completion of this phase, the **T** route would stop at 16 station stops along the Second Avenue corridor between and including 125th Street and Hanover Square Stations. The extended **Q** service would stop at seven stations along the Second Avenue corridor between and including 125th Street and the Lexington Avenue-63rd Street. At the completion of Phase 4, ridership decreases on M15 local and M15 Limited routes, as well as the M96 crosstown route, would be the same as the Build condition, which is described in Section D and summarized in Table 5C-1.

D. PERMANENT IMPACTS OF THE PROJECT ALTERNATIVES

NO BUILD ALTERNATIVE

Bus ridership on the north/south routes through the study area is projected to increase by about 5 percent by the 2025 analysis year. There would be no new routes, and projected load levels per bus at peak load points would generally not result in significant service additions or reductions. AM peak hour ridership on the M15 route at the peak load point would increase from approximately 1,900 riders in the existing conditions to approximately 2,000 riders in the No Build condition, with a No Build service capacity rating of 87 percent (i.e., the bus route operates at 87 percent of its guideline capacity). The route would continue to operate within the NYCT service guideline capacity.

SECOND AVENUE SUBWAY

The Second Avenue Subway would provide a faster public transportation option compared to surface buses for north and southbound transit riders through the East Side of Manhattan. This improvement in travel time would shift many existing transit users from buses to the subway, resulting in an overall bus ridership decrease on the north/south routes through the East Side of Manhattan (see Table 5C-1). The largest ridership reduction would occur on the southbound M15 route, the route that most closely follows the alignment of the proposed Second Avenue Subway. Model estimates indicate that the southbound M15 would experience nearly a 50 percent reduction in ridership in the AM peak hour, resulting in about 3,900 fewer riders in the Build condition compared with the No Build. These estimates assume that the choice between bus and subway is based on minimizing travel time, waiting time, and transfer time. Other factors, such as preference for buses or difficulty climbing stairs in the subway, will influence the actual ridership levels.

Table 5C-1
Projected Total Bus Ridership within the East Side Study Area
Route-by-Route: AM Peak Hour

Route	Direction	% Difference (No Build vs. Build)
M31 (York Avenue)	Southbound	-10%
M15 (First Avenue)	Northbound	-25%
M15 (Second Avenue)	Southbound	-45%
Aggregate of M98, M101, M102, M103 (Third Avenue)	Northbound	-25%
Aggregate of M98, M101, M102, M103 (Lexington Avenue)	Southbound	-20%
Aggregate of M1, M2, M3, M4 (Madison Avenue)	Northbound	0%
Aggregate of M1, M2, M3, M4 (Fifth Avenue)	Southbound	-5%
M96 (96th Street)	Eastbound	-35%
M96 (96th Street)	Westbound	-20%
M86 (86th Street)	Eastbound	-35%
M86 (86th Street)	Westbound	-5%
M42 (42nd Street)	Eastbound	-20%
M42 (42nd Street)	Westbound	-45%
M14 (14th Street)	Eastbound	-15%
M14 (14th Street)	Westbound	0%

It should be noted that the transit model is less precise when estimating future bus ridership than it is for estimating subway ridership levels due to the difficulties of predicting where passengers will exit. This is because riders exiting buses do not pass through a turnstile (as subway passengers do) that counts the volume of people exiting at a particular point. Instead, bus exits are estimated based upon several variables, such as census data, MetroCard boarding and transfer data for return trips in the PM peak period, and sample surveys. Despite the model’s limitations when estimating bus ridership levels, it does highlight anticipated bus ridership trends (i.e., increases or decreases in bus ridership) that would occur due to the Second Avenue Subway. The following discussion summarizes these findings.

The northbound M15 bus route on First Avenue and the northbound bus routes (the M98, M101, M102, and M103 routes) on Third Avenue would experience about a 25 percent reduction in ridership through the East Side study area. Farther west of Second Avenue, bus ridership reductions decrease as the distance between the bus route and Second Avenue increases. The Lexington Avenue bus routes would experience an 18 percent reduction in ridership, and the

Madison Avenue/Fifth Avenue bus routes would experience a ridership reduction of about 5 percent or less.

The southbound M31 bus route on York Avenue would also experience ridership reductions, but the ridership reduction would only be 10 percent, compared with the 20 and 45 percent reductions on the Lexington Avenue and Second Avenue bus routes, respectively. A possible explanation for this small ridership reduction on the M31 is that the M31 is not a true north/south bus route like the M15 or M98 routes because it also operates as a crosstown bus along 57th Street. It appears from the model results that many M31 riders use this route as a crosstown bus and would not transfer to the Second Avenue Subway since it predominantly operates north/south along Second Avenue. The Second Avenue trains serving the Broadway Line would connect to the **N** and **R** lines at 59th Street and operate eastbound and westbound for a short segment between Lexington Avenue and Seventh Avenue, but it appears that York Avenue M31 users, who would need to walk two avenues to access this subway service, would prefer to use the bus service currently provided on York Avenue instead.

Another trend that would occur due to the operation of the Second Avenue Subway is that ridership on crosstown buses throughout the East Side would also decrease. The Second Avenue Subway would be closer than the Lexington Avenue line for many riders, resulting in fewer crosstown bus trips between the Lexington Avenue Subway stations and East Side destinations.

Systemwide, the M15 would experience ridership reductions of approximately 45 and 25 percent in the southbound and northbound directions, respectively. Within the M15 bus corridor, ridership reductions would vary along the length of the bus route. For example, southbound M15 ridership reductions through East Harlem, the Upper East Side, and East Midtown would be the highest, ranging from 60 to 80 percent because the new Second Avenue Subway would follow the same alignment as the M15 bus route. In the Lower East Side, bus ridership reductions would be about 25 percent. This lower ridership reduction is due to the fact that the M15 bus route leaves the Second Avenue Subway alignment and travels along Allen Street before branching out between the City Hall and South Ferry spurs. In Lower Manhattan, the M15 follows the Second Avenue alignment along Water Street and would experience a higher southbound ridership reduction than the Lower East Side, with a 40 percent reduction.

The M98 limited-stop bus route, which operates between Washington Heights and Midtown, would experience a substantial increase in southbound AM ridership approaching the 125th Street Station of the Second Avenue Subway. This AM peak period southbound limited-stop service bus route makes a stop at Park Avenue and 125th Street, which would become a convenient transfer to the future 125th Street Station of the Second Avenue Subway. The model estimates indicate that the volume of riders exiting at this stop would more than double from today's 215 to nearly 470 passengers in the future Build condition. Despite this ridership increase, the M98 bus would continue to operate within its guideline capacity through this segment of the route.

In conclusion, bus ridership would be expected to decrease on the M15 and to a lesser extent on the other bus routes serving the East Side of Manhattan. Upon completion of the Second Avenue Subway, NYCT would continue its normal practice of monitoring bus ridership levels on each route, and would increase or decrease bus service to accommodate actual ridership demands.

E. SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

- During the subway's construction period, lane closures, traffic diversions and increased truck traffic from construction vehicles would result in service delays to some bus routes—particularly the M15 and some Lexington Avenue buses.

As described in more detail in Chapter 5D, “Transportation Vehicular Traffic,” standard traffic engineering improvements would mitigate some, but not all, traffic (including bus) delays during construction. In addition, a comprehensive areawide traffic management and mitigation plan will be developed by NYCT and reviewed, approved, and monitored by an Interagency Traffic Management Task Force comprised of affected and responsible agencies. An important part of this plan would be a comprehensive traffic-monitoring program, which would continually evaluate traffic conditions—including bus operations—and ensure that traffic detours and mitigation measures respond effectively to traffic patterns as they change.

- Following Phase 3 of the project's construction, it may be necessary to mitigate bus overcrowding in the Lower East Side south of Houston Street by adding a total of two bus runs to the South Ferry and Park Row/City Hall branches of M15 local bus route and a total of five bus runs to the South Ferry and Park Row/City Hall branches of the M15 Limited bus route during the AM peak hour. NYCT would monitor bus ridership levels on each route during both the AM and PM peak periods and would increase or decrease bus service to accommodate actual ridership demands.
- Once the Second Avenue Subway is operational, no significant adverse impacts would occur on buses. Instead, the project would generally result in overall reductions of bus ridership on north/south routes through the East Side of Manhattan. *