A. EXISTING CONDITIONS

On-street pedestrian activity differs greatly between and within the various sections of the study area. Pedestrian activity on the eastern edge of the study area is generally very light compared with the central areas of Manhattan, as surrounding land uses do not generate much foot traffic and existing subway and bus lines are located at some distance from this area. During the AM period, pedestrian activity and density increases in the vicinity of the entrances to subway stations in residential areas and at the exits to subway stations in commercial areas as people travel to work. In the PM period, the reverse is true. Despite the existence of some intense pedestrian usage at locations adjacent to dense development, conditions at key pedestrian locations, such as the midblock areas of sidewalks and the corner crosswalks and reservoir areas, are generally acceptable. A more detailed review of pedestrian analysis procedures and operating characteristics is provided in Appendix D, as well as an overview of existing pedestrian conditions in each subarea.

B. FUTURE CONDITIONS COMMON TO ALL ALTERNATIVES

Pedestrian activity levels in the study area would increase commensurate with demographic and socioeconomic trends and with any anticipated major development or redevelopment projects. Major changes in pedestrian activity patterns are not anticipated at this time. One significant exception to this would be the MTA Long Island Rail Road’s (LIRR) proposed East Side Access (ESA) project, the extension of LIRR service into Grand Central Terminal (GCT) to better serve its East Side riders. ESA would increase pedestrian traffic into and within GCT and increase pedestrian activity levels on GCT’s periphery (according to the ESA FEIS, an increase of 65,000 passengers into GCT is projected in the 6-10 AM peak period, with about half during the peak hour).

C. CONSTRUCTION IMPACTS OF THE PROJECT ALTERNATIVES

NO BUILD ALTERNATIVE

Under the No Build Alternative, the Second Avenue Subway would not be built. Therefore, there would be no pedestrian impacts caused by the construction or operation of the subway.

SECOND AVENUE SUBWAY

Construction of the Second Avenue Subway would narrow sidewalks adjacent to construction zones along the alignment; some sidewalks could also experience temporary short-term closures. For purposes of analysis, a significant adverse impact would occur if the closures at any one location were to last for longer than 2 weeks. The construction of a typical subway station is generally expected to take 3 to 5 years, and up to 10 years where access/shaft sites and staging
areas are also proposed for removal of tunnel spoils and operation of construction equipment. During this construction time, the width of the sidewalk on one side of the Second Avenue alignment corridor or the other could be narrowed to approximately 5 feet width to accommodate the construction zone. At some locations, the sidewalk on both sides of the street might need to be narrowed to provide an additional travel lane or a wider construction area. Maintenance and protection of traffic plans would be implemented to preserve pedestrian flows through areas affected by construction zones, but, at times, some temporary restrictions, narrowings, and pedestrian detours may be needed.

On-street pedestrian impacts would occur on the narrow five-foot wide sidewalks through the construction zone if the 15-minute two-way pedestrian volumes exceed 750 pedestrians within Manhattan’s CBD or exceed 650 pedestrians outside of the CBD. This assumes that the effective width through the construction zone would be four feet. The full five-foot walkway width would not be completely utilized by pedestrians since people normally do not press closely against walls lining a construction site; therefore, six inches of unused space are subtracted from both sides of the walkway when determining pedestrian level of service. Based upon pedestrian data collected at study station locations, pedestrian volumes along the alignment are substantially lower than these threshold volumes and construction phase pedestrian impacts would not be expected. One exception is the Lower Manhattan area near Wall Street where significant pedestrian impacts might occur at times since on-street pedestrian volumes are just below the threshold volume and could occasionally peak above this limit.

In most cases, the narrowing of the sidewalk would shift from one side of the avenue to the other as the station excavation process advances from one side to the other; therefore, the effects of narrowed sidewalks would be “shared” by both sides of the street. At the tunnel shaft/access sites, the duration of the narrow sidewalk condition would be substantially longer on one side of the street since spoils removal and material delivery to the northbound and southbound subway tunnels would most likely be performed from one access site.

While construction is ongoing, the Second Avenue Subway construction zones would be similar to other existing building construction sites in New York City. To ensure pedestrian safety, physical separation would be provided between the construction zone and sidewalks, such as concrete barriers, wood fencing, or protective mesh fencing. If necessary, canopied or enclosed walkways may be provided to protect pedestrians.

Movement by work vehicles and equipment across designated pedestrian paths would be minimized and, if necessary, controlled by flaggers. Similarly, the turning radii of cranes or the daily operation of other construction equipment would be monitored so that they do not encroach within the pedestrian walkways.

Despite the pedestrian protection that would be provided on the construction side of the street, many pedestrians may decide to use the non-construction side of the street instead. As a result, some pedestrian crowding may occur on the sidewalks of the non-construction side. If construction related pedestrian congestion should occur, it may be necessary to remove sidewalk furniture, such as benches, newspaper vending machines, and planters, and require that garbage be placed at the curb after the evening peak period to maximize pedestrian walking space.
D. PERMANENT IMPACTS OF THE PROJECT ALTERNATIVES

NO BUILD ALTERNATIVE

As described above under “Future Conditions Common to All Alternatives,” pedestrian volume levels in the study area would increase and could result in significant pedestrian impacts at certain locations. Deteriorated conditions would be expected at congested crosswalk and corner locations that currently operate at marginally acceptable or unacceptable levels of service. Pedestrian crosswalks and corner reservoir areas adjacent to GCT would be impacted by LIRR East Side Access into GCT, but could be mitigated by crosswalk widenings, and/or removal of street furniture.

SECOND AVENUE SUBWAY

With the Second Avenue Subway, 16 new subway stations would be built, each of which would attract riders (i.e., pedestrians). A new express subway service would also be provided along the existing Broadway Line south to Canal Street, increasing pedestrian flows at existing and stations through Midtown Manhattan as well, compared to the 2000 base year. The new Second Avenue Subway would relieve overcrowded conditions on the Lexington Avenue Line, which would also reduce on-street pedestrian congestion en route to and at Lexington Avenue subway stations.

Presently, it is unknown exactly where street-level station entrances might be located, such as within the sidewalk area or within buildings. The dimensions and configurations of the entrances as well as the number of entrances per intersection are also not yet known. For purposes of analysis, assumptions were made about entrance locations based on preliminary project plans. In addition, it was conservatively (from the perspective of pedestrian flow) assumed that station entrances would be located within the sidewalk area rather than in buildings. Prior to any construction, MTA/NYCT will continue to discuss station entrance options with the community, and more accurate information regarding station entrance location and design will be developed during the Preliminary Engineering phase to accommodate future entrance volumes and on-street pedestrian conditions.

The street corners were the primary pedestrian elements analyzed at most study locations since station entrances would feed directly into the corners, and mezzanine passageways provided below ground would eliminate the need for pedestrians to cross the intersection at street level. A representative set of crosswalk locations was also analyzed.

On-street pedestrian elements at nine representative station locations were selected for detailed analysis—the 125th, 96th, 72nd, 42nd, 14th, and Hanover Square Stations on the Second Avenue Subway, the 42nd Street/Times Square and 34th Street/Herald Square Stations on the express service on the Broadway Line, and Grand Central Station on the Lexington Avenue Line (to quantify the on-street pedestrian flow benefits of reduced ridership on the Lexington Avenue Line). The Second Avenue station locations were selected for analysis since they either represent stations with higher street entrance/exit volumes or would be located in areas with existing on-street pedestrian conditions that might be impacted by additional pedestrian volumes. The two Broadway Line stations selected had the highest station entrance/exit pedestrian volume increment, at a specific entrance, of the express service stations and are located in two areas where on-street pedestrian volumes are substantial. New on-street pedestrian counts were
performed in spring 2002 for these analyses. Pedestrian data collected in 2000 for the Goldman Sachs Office/Trading Facility at 55 Water Street was used for the Hanover Square Station area.

Station entrance pedestrian flows analyzed were obtained from the NYCT transit model of the Second Avenue Subway during the AM peak hour. Assumptions for station entrance locations at intersections, the methodology for assigning pedestrians, and the criteria for identifying significant pedestrian impacts are provided in Appendix D. On-street pedestrian level of service analyses indicate that significant impacts can be expected at some station entrance locations (see Appendix Tables D.2-15 and D.2-16). The final number and specific locations of station entrances will be determined during Preliminary Engineering. Additional significant impacts could be expected if fewer entrances are constructed than the number that was assumed for these analyses. Additional impacts could also be created at other locations where station entrances would occur. Following is a detailed explanation of the findings at study station entrances and a description of possible pedestrian improvement measures that could be considered.

**EAST HARLEM**

Pedestrian elements at the intersection of 125th Street at Lexington Avenue and 125th Street at Park Avenue were analyzed for the future 125th Street terminal station of the Second Avenue Subway. Model estimates indicate that the Lexington Avenue station entrance pedestrian flows would experience a decrease of about 20 percent (about 750 pedestrians) in the Build condition during the AM peak hour, as a result of: 1) new Park Avenue entrances that would intercept pedestrians and bus riders from the west; and 2) the new Second Avenue Subway station at 116th Street, which would attract existing subway riders from nearby residential areas who previously went to the 125th Street Station.

The combined subway pedestrian volume at the Park and Lexington Avenue entrances to the 125th Street Station would be over 40 percent higher (approximately 1,600 pedestrians) than the No Build condition’s station entrance volume at Lexington Avenue, reflective of additional subway ridership that would be attracted by the new Second Avenue Subway service.

Assuming that the number of station entrance locations does not change in Preliminary Engineering, the pedestrian analyses at the 125th Street intersections at Park and Lexington Avenues indicate that all corner reservoir areas would continue to operate at acceptable levels of service. The Lexington Avenue corners would experience an improvement from the No Build condition due to lower pedestrian flows at the station entrances. Similarly, the north and south crosswalks at Park Avenue and 125th Street would experience an improved operating condition since access to the subway would be provided at all four corners at this intersection and pedestrians would no longer need to walk to Lexington Avenue to access the subway.

**UPPER EAST SIDE**

The 96th Street Station entrances at 94th Street were selected for analysis since these entrances were estimated to process the highest AM peak hour flow of passengers within the entire Second Avenue Subway system. Model estimates indicate that over 7,800 people would use this station entrance in the AM peak hour, of which 90 percent would be entering the subway from the residential areas on the Upper East Side between 90th and 95th Streets.

The 94th Street Station entrances for the 96th Street Station were analyzed with entrances only on the north side of 94th Street. Assuming that the number of station entrance locations does not change in Preliminary Engineering, the analysis indicated that the east and west crosswalks
would deteriorate to LOS E and F conditions in the AM and PM peak hours, respectively, as pedestrians cross between the station entrances on the north side of the street to residential areas south of it. These impacts could not be mitigated to acceptable conditions by widening the crosswalk widths or providing more pedestrian crossing time. These conditions, however, could be mitigated by providing access to the station on 94th Street as well, so pedestrians could cross the streets below ground on the mezzanine level.

The corner reservoir areas are wide and would acceptably accommodate the future pedestrian flows. Pedestrian flows on Second Avenue sidewalks near the 94th Street station entrances could increase to about 800 pedestrians during the peak 15-minute period and could be accommodated provided that a minimum sidewalk effective width of 6 feet or more is maintained.

The 72nd Street Station entrances on 72nd Street itself were selected for analysis since these entrances were estimated to process the highest pedestrian volumes of any major cross-street station entrance—over 6,200 pedestrians in the AM peak hour. It was assumed that station entrances would be provided at all four corners of this intersection and a mezzanine would be provided below street level; therefore, the primary analysis locations were the four corner reservoir areas. Assuming that the station entrances at all four corners of Second Avenue and 72nd Street does not change in Preliminary Engineering, results of the pedestrian analysis indicate that all corners would continue to operate at acceptable levels of service during the AM and PM peak 15-minute periods assuming.

**EAST MIDTOWN**

In the East Midtown area, pedestrian analyses were performed for the 42nd Street Station’s entrances at 44th Street and 42nd Street. AM peak hour pedestrian flows of approximately 4,700 and 3,700 pedestrians per hour are projected at the 44th and 42nd Street entrances, respectively. Assuming that the number of station entrance locations does not change in Preliminary Engineering, the analyses indicate that the corner reservoir areas at the two intersections would not significantly deteriorate to unacceptable level of service conditions, but the east and west crosswalks at 44th Street would deteriorate to LOS E during the AM and PM peak periods. Widening the crosswalks from their existing 12-foot widths to 20-foot widths would fully mitigate the impacts on the western crosswalk, but only partially mitigate conditions on the eastern crosswalk. The crosswalk impacts could be fully mitigated by providing station entrances on all four corners that would be connected below ground by a mezzanine level. New station entrances on the north side of 44th Street would be a more costly mitigation measure since new station entrances would need to be constructed, and since the station mezzanine would need to be extended. There could be additional costs if the entrances were to be located within existing buildings.

Similar to the 94th Street entrances to the 96th Street Station, pedestrian volumes on the Second Avenue sidewalks would near 850 pedestrians in the peak 15-minute period and could be accommodated at an acceptable level of service if an effective width of 6 feet or more is provided on the sidewalk.

Pedestrian conditions at the 42nd Street intersection with Lexington Avenue were also analyzed to quantify the pedestrian benefits of fewer riders on the Lexington Avenue subway as a result of the new Second Avenue Subway and its entrance at 42nd Street. In the AM peak hour, the heavily-used Lexington Avenue station entrance would experience a reduction of nearly 2,600 pedestrians (about 25 percent) in the Build condition. This pedestrian flow reduction would
improve the northwest and northeast corners of Lexington Avenue and 42nd Street to LOS D or better in the AM and PM peak hours.

**GRAMERCY PARK / UNION SQUARE**

Within this area, AM peak hour pedestrian flows at the 23rd and 14th Street Station entrances would range from 2,600 to 4,500 pedestrians per hour. The estimated 14th Street Station entry volumes are lower than the 23rd Street Station volumes, but the 14th Street Station was selected for analysis since it was anticipated that pedestrian volumes would be more concentrated at specific sidewalk corners due to the volume of passengers transferring from crosstown buses that serve Avenues A, B, C, and D. Assuming that station entrances at all four corners at Second Avenue and 14th Street does not change during Preliminary Engineering, the analysis determined that the northwest and southeast corners would continue to operate at an acceptable level of service. These two corner reservoir areas are expected to process the highest increment of new pedestrians since these are the corners that would accommodate transfer movements between the crosstown M9 and M14 buses and the Second Avenue Subway.

**EAST VILLAGE/LOWER EAST SIDE/CHINATOWN**

The stations at Houston Street, Grand Street, and Chatham Square were estimated to process the lowest station entrance volumes along the Second Avenue alignment, ranging from 1,000 to 1,900 pedestrians during the AM peak hour. In this study area, on-street pedestrians at the Grand Street Station might experience the most substantial decline in levels of service due to the currently congested sidewalk conditions at Grand Street and Chrystie Street. The sidewalks are narrow, are occupied by obstructions such as newsstands, fruit and vegetable vendors, trash cans, and utility poles, and can become congested with a low volume of pedestrians.

A quantitative pedestrian analysis was not performed at the Grand Street Station since the B and D subway lines currently do not stop at Grand Street because of the Manhattan Bridge reconstruction project. As a result, existing station entrance volumes are lower than would normally be expected and do not provide an accurate base for future year analyses. However, significant on-street pedestrian impacts would not be expected at this station since future year conditions would be evaluated during the Preliminary Engineering phase and design improvements would be incorporated to accommodate additional pedestrian traffic. This would be the case for the Forsyth Street and Deep and Shallow Chrystie Options. (As discussed elsewhere in this SDEIS, the Shallow Chrystie Option is no longer under consideration, as it would result in more significant adverse impacts during construction than the other two options. The Shallow Chrystie Option is nevertheless discussed throughout the SDEIS for comparative purposes.)

**LOWER MANHATTAN**

In Lower Manhattan, on-street pedestrian conditions at the Hanover Square terminal station were analyzed. Assuming that station entrances on all four corners at Water Street and Hanover Square and on the two southern corners at Water and Wall Streets does not change in Preliminary Engineering, the results of the analysis determined corners would continue to operate at acceptable levels of service, but the west crosswalk at Wall Street would deteriorate from LOS B to LOS E. This LOS E condition would exist without mitigation improvements and would not be considered a significant impact since it would operate at the threshold level for impacts. This crosswalk could be widened to improve level of service conditions.
BROADWAY LINE

On-street pedestrian conditions at the Times Square and Herald Square Stations were examined to determine the effect of operating the Second Avenue express subway service along the Broadway Line. These two stations currently process high pedestrian flow volumes at their entrances and were identified to experience an increase in station entrance flows with the Second Avenue Subway service. Total station entrance flows would increase by about 7 percent (900 pedestrians) and 5 percent (700 pedestrians) at the Times Square and Herald Square Stations, respectively. Union Square Station entrance flows would experience a slight decrease in pedestrian volumes since the Lexington Avenue Line, which serves this station, would experience a ridership decrease due to the presence of the new Second Avenue Subway and its station at 14th Street.

To quantify the potential on-street impacts of the passenger flow increases at the Times Square and Herald Square Stations, pedestrian elements adjacent to the station entrances at Seventh Avenue/40th Street and at Sixth Avenue/32nd Street were analyzed. These entrances were selected for analysis since they were identified by the transit model to process the highest incremental volume of pedestrians for each station.

The pedestrian analysis at Seventh Avenue/40th Street determined that the eastern crosswalk would significantly deteriorate within LOS E, but could be mitigated by widening the crosswalk by 1 foot, i.e., from 19 feet to 20 feet. At Sixth Avenue/32nd Street, the north crosswalk and northeast corner would be significantly impacted by the additional pedestrian flows. These impacts could be mitigated with standard pedestrian improvement measures, such as widening the north crosswalk from 12 to 14 feet wide and removing trashcans from the corner reservoir area to maximize the effective pedestrian queuing space.

OTHER STATION AREAS

Although on-street pedestrian conditions were not examined at the other station entrance locations, it is possible to extrapolate the findings of the detailed analyses to these other stations. Except for the 86th Street and 57th Street Stations, model estimates indicated that all other station entrances would process pedestrian flows of 2,500 pedestrians or less in the peak travel hours. The pedestrian elements adjacent to these station entrances would mostly likely be able to accommodate these new pedestrian flows at an acceptable level of service; otherwise, standard improvements, such as widening the crosswalk or removing street furniture, would most likely mitigate potential impacts.

Model estimates indicate that the 86th and 57th Street Station entrances would process about 4,100 and 5,600 pedestrians per peak hour, respectively. Similar to the 72nd Street Station entrances, it has been assumed for these analyses that four entrances would be provided at the major cross streets, and on-street pedestrian impacts would not be expected. Pedestrian flows at the minor cross-street entrances to these two stations—at 83rd Street and 53rd Street, respectively—were estimated at 4,600 and 3,500 pedestrians per peak hour, respectively. Significant pedestrian impacts might be expected on the east and west crosswalks at these station entrances since it was assumed that station entrances might only be provided on the north or south side of the street at minor cross streets. Standard pedestrian improvement measures might not mitigate the crosswalk impacts at these two station entrances and may require that station entrances be provided on all four corners of the intersection.
Overall, on-street pedestrian impacts at station locations outside of the Upper East Side and East Midtown areas could be mitigated with standard pedestrian improvements, such as wider sidewalks or removing street furniture (i.e., trash cans, vending machines, etc.) from corner reservoir areas. In the Upper East Side and East Midtown, several station entrances that are not located on a major crosstown street may need station entrances on all four corners, connected below ground by a mezzanine level to mitigate on-street pedestrian impacts. This would be a more costly improvement measure but would reduce the number of pedestrians that would need to use the crosswalks at street level, and would consequently mitigate potential on-street impacts.

E. SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

SIGNIFICANT ADVERSE IMPACTS

- Impacts to pedestrian conditions would occur at locations where sidewalks are already congested and where such sidewalks are substantially narrowed during construction. This impact could not be mitigated because of construction constraints.
- Pedestrian impacts would also occur if the sidewalks at any one location would be closed for longer than two weeks.
- To assess operational impacts, on-street pedestrian elements at nine representative station locations were selected for detailed analysis on the Second Avenue and Broadway Lines and at Grand Central Station on the existing Lexington Avenue Line. Based on preliminary plans for entrance numbers and locations, significant adverse impacts could occur at the following crosswalk locations: east and west sides of Second Avenue at 94th Street (AM and PM peaks); east and west sides of Second Avenue at 44th Street (AM and PM peaks); east side of Second Avenue at 40th Street (PM peak); north side of Sixth Avenue at 32nd Street (AM and PM peaks). The ultimate number and locations of entrances will not be determined until Preliminary Engineering is completed. Therefore, the locations of these impacts could shift or additional significant adverse impacts could be created beyond those listed here.
- Based on the representative station analyses conducted, and using preliminary plans for entrance numbers and locations, significant adverse impacts could occur at the following pedestrian corner reservoir locations: northeast corner of Second Avenue at 94th Street (AM and PM peaks); and the northeast corner of Sixth Avenue at 32nd Street (AM and PM peaks). Since the actual numbers and locations of impacts will not be finalized until Preliminary Engineering is completed, the exact nature of the impacts at these locations may change, and more impacts or impacts during different periods or at different locations could occur.
- Depending on where and how many station entrances are ultimately constructed, once the subway is operational, significant impacts could occur at additional crosswalks near subway entrances.

MITIGATION MEASURES

- As Preliminary Engineering continues, MTA/NYCT will continue to discuss entrance locations with the community.
- Planning for station entrance locations will consider on-street pedestrian conditions before any station plans are finalized, and if significant adverse impacts were to result, NYCT would consider a variety of potential mitigation measures, including widening crosswalks, creating sidewalk bump-outs, or shifting proposed station locations.