

Appendix A:

Alternatives Screening and Evaluation

A. INTRODUCTION

The project alternatives for the East Side Access Project were identified as part of the Major Investment Study (MIS) through a comprehensive planning process that developed alternatives and evaluated them against project goals and objectives, and a number of other criteria to focus in and ultimately determine a Preferred Alternative. This chapter summarizes the alternatives identified and evaluated during the MIS phase of project planning.

Development and evaluation of alternatives in the MIS was a comprehensive process, involving consideration of the universe of alternatives that might meet Long Island Rail Road (LIRR) goals for the Long Island Transportation Corridor. To bring focus to the evaluation, it was performed in two stages. Once all options were identified, these “long list” alternatives were screened for their performance in meeting project goals and their potential for technical and operational feasibility. The remaining “refined list” alternatives that did not fail the screen were subject to a more detailed evaluation, so that project alternatives for further review in the EIS could be identified. Once a preferred alternative was selected, components of that alternative were further screened to determine their appropriateness for including in the alternative.

B. IDENTIFYING ALTERNATIVES

The identification of alternatives that could meet the project goals began in January 1995, through an MIS sponsored by the LIRR and carried out under the auspices of the Federal Transit Administration (FTA), the New York Metropolitan Transportation Council (NYMTC), and the Metropolitan Transportation Authority (MTA). The process involved several years of discussions, outreach, scoping meetings, and research geared toward developing scenarios that would improve transit access to the East Midtown Manhattan and increase the capacity of the LIRR. Above all, the project strove toward establishing ongoing dialogue among sponsoring agencies, private consultants, and the community.

The project team began by reviewing a host of reports published by public and private agencies and organizations, and convened public meetings and brainstorming sessions both large and small. Group presentations were prepared, ideas were solicited, and public concerns and comments were documented throughout the process. A Technical Advisory Committee aided in the review of technical data, and a Citizens Advisory Committee provided a formal mechanism for obtaining a broad base of community input relating to project goals.

* The description of the long list of alternatives presented here, along with the evaluation of the long and refined list of alternatives, is a summary of information from the Major Investment Study for the Long Island Transportation Corridor (April 1998) and its associated Appendices. Please refer to the MIS for additional detail.

These efforts elicited a wide variety of ideas for improving access to the east side of Manhattan—from building a new rail terminal in East Midtown, to running LIRR trains on Manhattan subway lines, to expanding subway service beyond New York City limits. With all of these accumulated ideas and thoughts in mind, the project team compiled a preliminary list of alternatives designed to capture the universe of ideas about how to improve access to East Midtown Manhattan. This was the “long list” of project alternatives. The first step in alternatives evaluation was to screen the long list candidates for their ability to meet project goals and their overall feasibility, as described below.

C. SCREENING THE LONG LIST OF ALTERNATIVES

The long list consisted of 21 separate “Build” alternatives, plus two alternatives required for consideration under National Environmental Policy Act (NEPA) regulations: the No Action Alternative, which includes improvements to the transportation system that would be implemented regardless of the construction of East Side Access; and the Transportation Systems Management (TSM) Alternative, which consists of transportation improvements that could be implemented without intensive capital expenditures. Regulations require that any selected alternative be evaluated in comparison with both the No Action and TSM Alternatives. As such, these two alternatives were not subject to the MIS screening of “long list” alternatives and are discussed separately below, followed by a summary of the screening of long list alternatives.

THE NO ACTION AND TSM ALTERNATIVES (ALTERNATIVES 1 AND 2)

Both the No Action and TSM Alternatives represent the options that a decision-maker could take other than major construction. As such, they were not subjected to the screening procedures, but remained for comparison during the detailed evaluation and for consideration in the EIS. Because transportation plans have changed over time, the two alternatives, as they are described in the MIS, are the same in concept, but different in their components from the two alternatives of the same name in this FEIS.

Essentially, the No Action Alternative consists of all transportation system improvements that are planned and funded for construction or operation by 2020—the MIS forecast year. Since the MIS was completed, some projects have already been completed (and are now incorporated as “Existing Conditions”), some new projects have been planned, and still others have been delayed beyond 2020.

The TSM Alternative comprises a set of low-cost measures designed to improve the transportation system. Some of the TSM components defined in the MIS have already been constructed, making them part of existing conditions. Others have been adopted as plans and are now included in the No Action Alternative. Others have evolved and new components have been added since the MIS. The up-to-date versions of these alternatives that form the basis of the EIS analyses are described in Chapter 2 “Project Alternatives.”

SCREENING OF THE LONG LIST BUILD ALTERNATIVES

The first screening of “long list” alternatives eliminated any alternative that either did not meet the project’s two critical study goals—to reduce travel time to East Midtown Manhattan and to relieve train traffic congestion at Penn Station—or was deemed either technically or operationally infeasible. In order to conduct the initial screening, the project team examined each long list alternative. Information was gathered and organized in the following categories: right-of-way requirements, track work, utilities, structures/tunnels, traction power, signals and

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communications, stations, parking, maintenance facilities/depots, vehicles, operating plans, impact on other operators, environmental issues, and community issues/concerns, among others. Each alternative and its first screen evaluation are described below (see also Table A-1). The names of each alternative are adaptations of names used in the MIS, while the numbers for each alternative have been retained from the MIS.

Table A-1
Screening of Long List Alternatives

Alternatives	Meets Study Goals	Technically Feasible	Operational Issues		Further Evaluation?
			Sufficient Capacity	Institutionally and Operationally Feasible	
1. No Action					Yes
2. TSM					Yes
3. Express Bus/HOV Lane*	No	Yes	No	Yes	Yes
4. LIRR East Side Terminal					
A. GCT via the Main Line	Yes	Yes	Yes	Yes	Yes
B. GCT via the Montauk Branch	Yes	Yes	Yes	Yes	Yes
C. Third Avenue via the Main Line	Yes	Yes	Yes	Yes	Yes
D. Third Avenue via the Montauk Branch	Yes	Yes	Yes	Yes	Yes
5. East Side Rail Station	No	Yes	No	No	No
6. East Side Rail Station with New East River Tunnel*	Yes	Yes	No	No	Yes
7. Sunnyside Transfer Station					
A. Queens Plaza**	Yes	Yes	Yes	Yes	No
B. Harold Interlocking	No	No	No	No	No
C. 42nd LRT to Sunnyside	Yes	Yes	No	No	No
D. Long Island City Intermodal	Yes	Yes	Yes	Yes	Yes
8. Subway Operation Over LIRR Tracks					
A. Port Washington Branch	No	Yes	Yes	No	No
B. Inner Port Washington and Rockaway Beach Branches	No	Yes	Yes	No	No
C. Atlantic Branch	No	Yes	Yes	No	No
D. Atlantic Branch Shuttle	No	Yes	Yes	No	No
9. LIRR Operation Over NYCT Tracks					
A. Port Washington Branch/BMT	No	Yes	Yes	No	No
B. Port Washington Branch/IND	No	Yes	No	No	No
C. Atlantic Branch to IND	No	Yes	No	No	No
D. Atlantic Branch—Clockwise	No	Yes	No	No	No
E. Atlantic Branch—Counter-Clockwise	No	Yes	No	No	No
F. Atlantic Branch to Fulton Street Line	No	Yes	No	No	No
Notes:					
* These alternatives passed to more detailed evaluation by exception. See text discussion.					
** Similar to Long Island City Intermodal Alternative, but not as beneficial. See text discussion.					

NON-RAIL ALTERNATIVE: BUS/HOV LANE (ALTERNATIVE 3)

This Build Alternative proposed surface transit as an alternative to rail transit. It provided for the operation of new express bus service along the Long Island Expressway (LIE). Express buses would run in each direction along High Occupancy Vehicle (HOV) lanes—some existing and some to be constructed by the New York State Department of Transportation (NYSDOT)—from the Van Wyck Expressway (Exit 22) in Queens, to Medford (Exit 64) in Suffolk County, and along normal LIE lanes east of Medford.

In the AM peak hour(s), buses would run westbound on LIE HOV lanes to the Van Wyck Expressway, via normal lanes from the Van Wyck and via express bus lanes from approximately 108th Street in Corona, Queens to the Queens-Midtown Tunnel. From the tunnel, buses would run north on Third Avenue to 57th Street. In the PM peak period, following New York City Department of Transportation policy (NYCDOT) to avoid excessive congestion in the Queens-Midtown Tunnel and backup on tunnel entrances, buses would run north on Third Avenue from 42nd Street, over the Queensboro Bridge, along Queens Boulevard to the LIE, and east along the LIE in HOV lanes to Medford; and then in normal lanes to Riverhead. Construction of HOV lanes would be accompanied by construction of bus shelters and park-and-ride lots at major LIE interchanges.

This alternative did not pass the first screen for a number of reasons. It did not meet the critical study goal of relieving train traffic congestion at Penn Station because it would not have had the capacity to divert enough riders from the LIRR to reduce the number of trains at Penn Station. Moreover, the alternative's operational feasibility was questionable because it was likely to increase traffic congestion along some sections of the route, particularly in Manhattan and at the river crossings. Despite this essential flaw, the Bus/HOV Lane Alternative was retained for evaluation in the second stage. This was done to enhance the overall review process, enabling transit and highway administrators to consider a surface transit alternative in the evaluation.

LIRR EAST SIDE TERMINAL ALTERNATIVES

Four alternatives in the long list provided for improved LIRR access to East Midtown Manhattan through the lower level of the existing 63rd Street tunnel to a terminal in East Midtown. Each of the following alternatives also provided for the construction of a new LIRR station (Sunnyside Station) in the vicinity of Thomson Avenue in Queens. Two sets of the four alternatives differed in how they would connect to the 63rd Street tunnel, and two sets differed in where they would terminate in Manhattan, as described below.

Grand Central Terminal (GCT) via the Main Line/Port Washington (Alternative 4A)

This alternative would construct access in the vicinity of Sunnyside Yard to the 63rd Street tunnel and would also construct a tunnel starting at Second Avenue and 63rd Street, curving over to and down Park Avenue, to terminate at a new track area in GCT.

GCT via Montauk/Port Washington (Alternative 4B)

This alternative was similar in concept to the alternative above, except that it would connect the Montauk Branch, instead of the Main Line, to the 63rd Street tunnel route. This would involve electrification of portions of the Montauk Branch and the construction of an 8,000-foot elevated structure in the vicinity of Sunnyside Yard.

Third Avenue Terminal via the Main Line/Port Washington (Alternative 4C) and Third Avenue Terminal via Montauk/Port Washington (Alternative 4D)

Both of these alternatives offered the same variations in Queens as the above alternatives, but would have terminated in a new, underground East Midtown Terminal to be built under Third Avenue between 42nd and 52nd Streets. This terminal location was examined because it had been proposed in a number of previous studies for the LIRR.

Screening

All four of these alternatives offered faster access to East Midtown and relieved congestion at Penn Station. Initial examination found them to be technically and operationally feasible. Thus, they all “passed” the first stage evaluation and proceeded to the second, more detailed evaluation stage.

LIRR EAST SIDE STATION ALTERNATIVES

These two alternatives used the LIRR’s current train path to Penn Station along 32nd and 33rd Streets, but added a rail station in East Midtown between Third and Madison Avenues. This station would have been a stop along the route into Penn Station.

East Side Station (Alternative 5)

This alternative proposed to widen existing tunnels between Second and Sixth Avenues to accommodate a new station on a passing siding. This would have allowed the LIRR to stop trains at the station or institute routes with no East-Side stop. The station would have had a connection to the Lexington Avenue No. 6 train (local service) at its 33rd Street station on Park Avenue.

East Side Station with New East River Tunnel (Alternative 6)

This alternative proposed to construct a new, two-track East River tunnel just south of existing tunnels, to be used by NJ Transit and Amtrak for connections to and from Penn Station. With exclusive use of the existing tunnels, the LIRR could increase capacity of the line to Penn Station and build a station in East Midtown without widening the existing tunnel. This station, too, provided a connection to the No. 6 train.

Screening Summary

The East Side Station Alternative would not have relieved—and very well could have aggravated—congestion at Penn Station by creating new restrictions to train movements. As such, it failed the first screening and was eliminated from further consideration.

The East Side Station with East River Tunnel Alternative met study goals, because it would improve access to East Midtown (by adding a rail station) and relieve congestion at Penn Station (by constructing a new East River tunnel). However, it was found to have several problems rendering it potentially operationally infeasible: (1) all LIRR trains would have had to stop at the new station, adding to running time in some cases and affecting peak hour schedules and throughput to Penn Station; (2) capacity for LIRR reverse peak service through the East River tunnel would be constrained; (3) the plan, which altered track usage and routes for NJ Transit and Amtrak, might not have been acceptable to those carriers; (4) the short distance between the new station and Penn Station would have clearly limited the LIRR’s flexibility for re-routing and changing tracks at Penn Station; and (5) connection to local subway service held the potential for pedestrian congestion.

However, because the alternative did meet study goals, had intrinsic merit in significantly expanding tunnel capacity between Queens and Penn Station, and merited a more detailed evaluation because some of the questions related to operational feasibility, this alternative was retained for the next evaluation stage.

SUNNYSIDE TRANSFER STATION ALTERNATIVES

These four alternatives addressed the concept of improving access to East Midtown by facilitating transfers from the LIRR to other carriers on the Long Island side of the East River. Each alternative created a rail station in the vicinity of Sunnyside Yard in Long Island City, close to subways, buses, or new light rail lines, which would bring commuters to East Midtown, as follows:

Queens Plaza Transfer Station (Alternative 7A)

This alternative proposed to bring diesel-hauled LIRR trains operating on the Montauk Branch to a station in Yard A where passengers would connect to the various New York City Transit (NYCT) services at the Queens Plaza and Queensboro Plaza stations.

Harold Interlocking Transfer Station (Alternative 7B)

This alternative proposed to extend the upper level of the 63rd Street tunnel east, past its terminus at Northern Boulevard, through Sunnyside Yard, to Harold Interlocking at 43rd Street. New subway service would be provided by running NYCT BMT Broadway express trains east to the transfer station, where passengers could connect to the LIRR across a platform.

42nd Street LRT Transfer Station (Alternative 7C). This alternative extended the proposed 42nd Street Light Rail Transit (LRT) system north along Third Avenue (for northbound LRT trains) and Second Avenue (for southbound LRT trains), east across the Queensboro Bridge, and into Sunnyside Yard. At a transfer station in Yard A, passengers from LIRR Montauk Branch diesel-hauled trains would connect to the LRT.

Long Island City Intermodal Transfer Station (Alternative 7D). This station plan was developed as part of the MTA Long Island City Transportation Needs and Opportunities Study. It proposed to build a new Sunnyside Transfer Station for LIRR, NYCT, and NJ Transit passengers in the vicinity of Sunnyside Yard and Queens Boulevard. It would have installed platforms on both the LIRR Hunterspoint Line tracks and the Main Line tracks, built an off-street bus terminal, and constructed pedestrian walkways over Sunnyside Yard for access to Queens Plaza and Court Square subway service. Additionally, the alternative would have used the Sunnyside Loop track to provide transfer facilities for NJ Transit passengers working in Long Island City.

Screening Summary

The Queens Plaza Transfer Station Alternative met study goals and would have been operationally feasible, but it was eliminated because it was similar to the Long Island City Intermodal Transfer Station in providing new service. Since it only provided transfer service to Montauk Branch passengers, it was not as beneficial in meeting study goals.

The Harold Interlocking Transfer Station Alternative failed to meet the study's two essential criteria: (1) use of the BMT Broadway express trains would not reduce travel time to East Midtown, because it would bring LIRR passengers only to the northern end of East Midtown, before heading to the West Side; and (2) the diversion of LIRR trains within Harold Interlocking would reduce throughput capacity of trains to Penn Station—thus it would not relieve train traffic

congestion. It would have been infeasible operationally as well, since the single-track subway line would not adequately provide the capacity to serve LIRR passengers.

The 42nd Street LRT Transfer Station Alternative met study goals; however, it would have needed an exclusive right-of-way along Second and Third Avenues in Manhattan as well as on the Queensboro Bridge, severely constraining traffic flow in Manhattan and over this key East River vehicular crossing, and was thus operationally infeasible.

The Long Island City Intermodal Transfer Station Alternative met screening level study goals and was found to be operationally feasible, so it was retained past the initial screening stage.

SUBWAY OPERATION OVER LIRR TRACKS

The concept for this set of alternatives was to provide direct service for LIRR customers to Manhattan's East Midtown by running NYCT service on LIRR tracks east of the East River. The alternatives vary widely in location and operation, as follows:

Subway Over Port Washington Branch (Alternative 8A)

This alternative proposed to connect the LIRR Port Washington Branch to the upper level of the 63rd Street tunnel and convert the entire branch to NYCT operation, with trains running along the NYCT Broadway line express tracks.

Subway Over Inner Port Washington and Rockaway Beach Branch (Alternative 8B)

This two-part alternative proposed NYCT subway operation from Great Neck on the Port Washington Branch into Manhattan through the upper level of the 63rd Street tunnel with through service either on the BMT Broadway express, as above, or on the Sixth Avenue line. The Elmhurst and Corona stations were to be reopened. In addition, the inactive Rockaway Beach Branch of the LIRR was to be reactivated and connected to the 63rd Street tunnel. This would have allowed for new NYCT subway service to JFK International Airport. Major capital improvements to the Rockaway Beach Branch were required, including extensive track work.

IRT to the Atlantic Branch (Alternative 8C)

This alternative proposed to convert the LIRR Atlantic Branch (which terminates now at Flatbush Avenue) to NYCT IRT operation and connect the branch to the IRT Seventh Avenue line. This would allow express subway service to operate between Springfield Gardens in Southeast Queens, through the LIRR station in Jamaica, to Downtown Brooklyn and Downtown Manhattan.

Convert LIRR Atlantic Branch to IND Shuttle Train (Alternative 8D)

This alternative proposed to convert the LIRR Atlantic Branch service between Jamaica and Flatbush Avenues to NYCT subway service, and extend the branch east of Jamaica to the Green Acres Shopping Center just over the Nassau County border.

Screening Summary

All four alternatives did not pass the screening. None met the basic study goals of reducing both train traffic congestion at Penn Station and travel time between Long Island and East Midtown. Alternatives 8A, 8B, and 8D would not bring riders to East Midtown, providing service either to West Midtown (with one stop at 63rd Street and Lexington/Third Avenue) or to Lower Manhattan. Alternative 8C would not provide any direct connection to East Midtown. Thus, they all

failed to meet a basic study goal. Several serious operational and institutional issues that would be difficult, if not impossible, to overcome were also associated with each alternative.

LIRR OPERATION OVER NYCT TRACKS

This set of six alternatives called for the operation of LIRR trains over tracks currently used by NYCT subways. To negotiate the more restrictive horizontal clearance, curves, and grades found on the NYCT system, each of these options required the use of hybrid, electric multiple unit (EMU) railcars. Additionally, LIRR train lengths would have had to be reduced to conform with NYCT platform lengths.

LIRR Port Washington Branch Connection to NYCT Broadway Line (Alternative 9A)

This alternative proposed to connect the LIRR Port Washington Branch to the upper level of the 63rd Street tunnel and onto the express tracks of the BMT Broadway line, giving commuters a one-seat ride to East 63rd Street at the far northern end of East Midtown and to West Midtown and Downtown Manhattan. As part of this alternative, LIRR trains could continue through Downtown, over the Manhattan Bridge, and onto the Atlantic Branch of the LIRR via a new track connection to the LIRR Flatbush Avenue Terminal in Brooklyn. Regular NYCT subway service would continue to be provided along the Broadway line trains.

LIRR Port Washington Branch Connection to NYCT Sixth Avenue Line (Alternative 9B)

Similar to the above alternative, this alternative would run LIRR Port Washington Branch trains through the upper level of the 63rd Street tunnel to a stop at Lexington Avenue and East 63rd Street, and then along the IND Sixth Avenue line, with an option to continue service through the Rutgers Street tunnel and onto the Atlantic Branch via a new connection to the Flatbush Avenue Terminal.

LIRR Atlantic Branch Connection to NYCT Sixth Avenue Line (Alternative 9C)

This alternative proposed to connect the Atlantic Branch of the LIRR to the Rutgers Street tunnel in Downtown Brooklyn and the IND Sixth Avenue line. This option would have brought LIRR passengers directly into Manhattan and north along Sixth Avenue from West 4th Street to 57th Street and to the Lexington Avenue station at 63rd Street. A new crossover built just north of the 63rd Street station would have permitted trains in this service to reverse direction without conflicting with other trains that were operating along the 63rd Street line.

LIRR Atlantic Branch via Montague Street Tunnel—Clockwise Distribution Loop through Financial District (Alternative 9D)

This alternative offered a one-seat ride into the Financial District in Lower Manhattan. It would have connected the LIRR Atlantic Branch to the Montague Street tunnel (for inbound service into Manhattan) and the Manhattan Bridge (for loop service back to the Flatbush Avenue Station and points beyond), via the Nassau Street subway line.

LIRR Atlantic Branch over BMT Manhattan Bridge—Counter-Clockwise Distribution Loop Through Financial District via Montague Street Tunnel (Alternative 9E)

This alternative proposed similar service to Alternative 9D using the Nassau Street subway line, but in the opposite direction. LIRR trains were to use the Manhattan Bridge for service into Manhattan and either terminate at Chambers Street or Broad Street, or continue through the Montague Street tunnel back to Flatbush Avenue.

Connect LIRR Atlantic Branch to NYCT IND Fulton Street Line at East New York (Alternative 9F)

This alternative connected the LIRR Atlantic Branch to the IND Fulton Street and Eighth Avenue subway line at East New York, allowing for direct service through the Cranberry tunnel into Manhattan. In Manhattan, the LIRR switched to the Sixth Avenue line at West 4th Street for service to Midtown Manhattan.

Screening Summary

Like the other set of subway/LIRR alternatives, this set of alternatives failed to meet the basic study goal of providing improved service to East Midtown and thus did not pass the screening. All would have brought passengers onto West Side subway lines or to Downtown Manhattan. In addition, all posed issues of operational and technical feasibility, and raised institutional issues as well.

CONCLUSION OF LONG LIST ALTERNATIVES SCREENING

As discussed above and shown in Table A-1, the following alternatives passed the initial screening and were included on the “refined list” of alternatives for further evaluation:

- Bus/HOV Lane Alternative (Alternative 3);
- All East Side Terminal Alternatives (Alternatives 4A-4D);
- East Side Rail Station with New East River Tunnel Alternative (Alternative 6); and
- Long Island City Intermodal Transfer Station Alternative (Alternative 7D).

In addition, the No Action and TSM Alternatives were included in the more detailed evaluation as a basis of comparison.

C. EVALUATING THE REFINED LIST OF ALTERNATIVES

Once the initial screening was complete, the refined list of alternatives was subjected to more detailed evaluation aimed at identifying the most appropriate alternative(s) for consideration in the EIS. This stage of the evaluation established a set of quantitative and qualitative criteria for evaluating the refined list of alternatives. These criteria included issues of performance, cost, community effects, social equity, and environmental impact. The TSM Alternative was included in the evaluation for comparison purposes, and the No Action Alternative served as the baseline against which effects of candidate alternatives were measured.

EVALUATION CRITERIA

These evaluation criteria were developed to represent the full range of considerations that come into play when considering each alternative: what would it cost to build and operate, how would it affect the community and the environment, how useful and effective would it be in solving identified problems, what would its economic impacts be, and would it adversely affect any portion of the population?

Information was developed for the following criteria: order-of-magnitude capital cost range; operating and maintenance costs; revenues, ridership, quality of service, economic impacts, community impacts, environmental impacts, and social equity impacts. Some of the criteria were assessed quantitatively using capital cost estimates. Quantitative assessments also used preliminary ridership forecasts for the year 2020; this gave information for each alternative on the trips it would generate, riders who would use new facilities, travel time savings, and reduction in

vehicle miles traveled (VMT). In other categories, where quantification was not available or inapplicable, alternatives were rated according to impacts (from +++ for the greatest positive impacts, to --- for the greatest negative impacts), as shown in Table A-2.

Table A-2
Evaluation Criteria

Symbol	O&M Cost Impacts	Impacts on LIRR and NYCT Revenue	Quality of Service		Economic Impacts	Community Impacts	Environmental Impacts	Equity Impacts (Impacts on Access to Transit)
			Travel Time Savings	Comfort and Convenience				
+++				Significant service improvement				Significant improvement
++	Significant decrease (20 percent or more)	Increased revenue for both LIRR and NYCT	15 or more minute reduction	Moderate service enhancement	Long-term positive	Very positive	Long-term positive	Moderate improvement
+	Moderate decrease (less than 20 percent)	Increased for one, no change for the other	0-14 minute reduction	Limited overall service improvement	Short-term positive	Positive	Short-term positive	Limited improvement
0	No change	Increased for one, decreased for the other or no change for both	No change		No change	Negligible or mixed	No change	No change from No Action
-	Moderate increase (less than 20 percent)	Decreased for one, no change for the other	0-14 minute increase		Short-term negative	Negative	Short-term negative	Disproportionate adverse impact
---	Significant Increase (20 percent or more)	Decreased revenue for both LIRR & NYCT			Long-term negative	Very Negative	Long-term negative	
Note: * The order-of-magnitude capital cost range and ridership impact criteria are not included in the table, as they were rated with numerical values, while the service quality and environmental impacts criteria are included, because they were rated with both qualitative matrix symbols (+/-) and numerical values.								

ORDER-OF-MAGNITUDE CAPITAL COST RANGE

How much would each alternative cost to build? This factor was key to the evaluation. Capital cost estimates were developed using a number of factors, including project facilities, support costs (such as design services, construction and project management, etc.), and contingencies. Information about facilities thought to be required for each alternative (including stations and parking, demolition, utilities, track work, structures, maintenance facilities, vehicles, traction power, and signals) was gathered. Support costs were added in as a percentage of construction costs. Finally, allowances for contingencies were added in as a percentage of construction costs (rolling stock at 5 percent of construction costs, track work at 10 percent, and other capital cost elements at 30 percent).

OPERATION AND MAINTENANCE (O & M) COSTS

In addition to how much each alternative would cost to build, another key factor was how much each alternative would cost to operate and maintain. Since actual dollar amounts for each alternative were not available, the alternatives were rated according to broad estimations of how much more or less they would cost to operate and maintain than the No Action Alternative. If a project reduced transportation costs by 20 percent or more, it was given the highest rating (■■■), if it increased costs by 20 percent or more, it was given the lowest rating (■■■).

REVENUE IMPACT

A complete picture of the total costs of each alternative requires an understanding of new revenue sources generated by the project. By providing new service options and generating new riders and trips, all alternatives, except for the No Action Alternative (which is the base against which they are compared), would increase either NYCT or LIRR revenues, or both. These revenue streams, when offset by capital plus operation and maintenance costs, resulted in a net cash flow estimate for the TSM and Build Alternatives under consideration.

RIDERSHIP IMPACT

Who would use the new service? One measure of a viable alternative is the number of riders and trips it would attract. Using a ridership forecasting model developed for the MIS, ridership potential in the year 2020 was assessed for each alternative and reported as incremental new riders and trips, compared with the 2020 No Action Alternative. Increments ranged from a low of less than 17,000 weekday riders using new facilities (Long Island City Intermodal) to a high of almost 180,000 (East Side Terminal: GCT via the Main Line).

QUALITY OF SERVICE

The quality of service criterion was intended to measure two things: the comfort and convenience of the service, and the time it would save travelers in their daily commutes. Comfort and convenience were assigned only positive ratings (since, as a requirement to pass the initial screening, all alternatives had to improve comfort and convenience). Travel time savings, measured quantitatively, was also rated. Alternatives that saved 15 minutes or more on trips from Long Island to East Midtown Manhattan were given the highest ratings, and those that increased travel time were given the lowest ratings.

ECONOMIC IMPACTS

The effect of each alternative on the local and regional economy was considered. This qualitative evaluation rated each alternative based on how much it would help or hurt the area's economy. It assigned differing weights to impacts, based on their time frame (long- versus short-term) and their scope (regional versus local). For example, greater weight was given to potential long-term lowering of property values due to changing traffic patterns, while less weight was given to the relocation of individual businesses during construction. Similarly, greater weight was given to improving commuting times from Nassau and Suffolk into Manhattan, then to improving access to businesses on one particular block.

COMMUNITY IMPACTS

While financial, ridership and economic considerations are key to gauging an alternative's feasibility and economic viability, they do not give a full picture of an alternative's effects. The alternatives were also evaluated for their community impacts, environmental impacts, and social equity impacts during both construction and operation. Community impacts were assessed using information gathered through the project's public outreach program. The assessment of each alternative emphasized potential impacts during both construction and operation of each alternative.

ENVIRONMENTAL IMPACTS

Each alternative was assessed for its potential environmental effects. In general, these included the potential for property acquisition, relocations and displacement, land use changes, noise and vibration, community disruption, air quality, traffic and pedestrian impacts. Reductions in auto travel, defined as VMTs, were also considered. The impacts were rated for their potential severity and long-term significance.

SOCIAL EQUITY IMPACTS

The equity impact evaluation focused on the extent to which each alternative could affect population groups that are disadvantaged due to low income, race, or inadequate access to public transportation. A primary concern was the extent to which the alternative could improve access to jobs for these disadvantaged groups, and if those improvements outweighed any negative impacts as a result of the alternative. Ratings here included the proximity of the alternative to residential areas where disadvantaged groups lived, the location of potential jobs for these groups in relation to the location of the alternative, and the ease of travel for disadvantaged persons (e.g., transfers en route, reverse commutation, frequency of service).

EVALUATING THE ALTERNATIVES

The decision to retain or eliminate an alternative in the reduced long list was based upon the evaluation results as shown in Table A-3, and discussed below.

TSM (ALTERNATIVE 2)

The TSM Alternative, as defined in the MIS, was evaluated along with all other alternatives in the refined list. The TSM ratings provide a basis for identifying the degree to which the other Build alternatives offer improvements for their higher costs.

Capital Cost Range

By definition, the TSM Alternative is a lower-cost option than the Build alternatives. All of its components, as outlined in the MIS, were estimated to cost approximately \$300 million (1997 dollars).

Impact on Operation and Maintenance Costs

While economic to construct, TSM components required funding for operations and maintenance. Components that would carry with them increased O&M costs included an increase in the number of rail cars in the peak hour on selected LIRR branches, and additional train service to the Long Island City and Hunterspoint Avenue stations. These costs were limited, but still resulted in a rating of moderate increase in O&M costs compared with the No Action Alternative.

Table A-3
Refined Long List Alternatives Evaluation Summary

Alternative	Impact on O&M Costs	Capital Cost Range (billions of 1997 dollars)	2020 Average Weekday Incremental LIRR Linked Trips (vs. No Action)	2020 Average Weekday Incremental Riders Using New Facility (vs. No Action)	Impact on Travel Time	Travel Time Savings (Person-Hours/Day vs. No Action)	Comfort and Convenience	Revenue Impacts	Community Impacts	Economic Impacts	Environmental Impacts	Automobile Vehicle Miles Traveled (Average Daily Reduction vs. No Action)	Impacts on Social Equity
1. No Action	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2. Transportation System Management	■	0.30	3,680	8,554	+	2,646	+	+	0	+	+	88,333	0
3. Bus/HOV Lane	■	0.3	8,456	11,800	■	4,712	■	■	■	+	■	22,584	0
4. LIRR East Side Terminal:													
A. GCT via Main Line	■	2.8-3.0	23,909	179,257	++	10,801	+++	+	■	++	+	293,473	++
B. GCT via Montauk Branch	■	3.7-4.4	20,434	167,895	+	5,960	+	+	■	++	■	254,875	++
C. Third Avenue Terminal via Main Line	■	3.3-3.9	16,893	137,933	++	6,498	++	+	■	++	■	209,813	+
D. Third Avenue Terminal via Montauk Branch	■	4.2-5.0	13,905	131,352	+	2,410	+	+	■	++	■	179,475	++
6. New East River Tunnel and East Side Rail Station	■	2.8-3.0	15,364	174,759	++	12,612	++	+	■	++	■	232,524	+
7D. Long Island City Intermodal Transfer Station	■	0.4	2,008	16,662	+	3,914	+	++	+	++	0	33,455	++
Notes:													
* Costs are presented in 1997 dollars; NA = not applicable in this analysis. +++ = Substantial benefit. ++ = Moderate benefit. + = Slight benefit. 0 = No change, little impact.													
■ = Moderate adverse impact potential. ■ = High to very high adverse impact potential.													

Revenue Impacts

The components of the TSM that resulted in additional LIRR passengers—longer trains on certain branches and additional trains to Long Island City and Hunterspoint Avenue Stations—would increase LIRR revenues. In addition, because the TSM would bring more commuters to Hunterspoint Avenue, transfers to the Flushing line No. 7 train into Manhattan would also increase NYCT revenues. As such, the TSM was rated as improving revenues moderately.

Ridership Impacts

The TSM demonstrates a moderate attraction of new riders (approximately 3,700) and an attendant moderate decrease in automobile VMTs (approximately 88,000 fewer daily vehicle miles). These ridership figures range from approximately 5 percent to 50 percent of the ridership figures for the Build alternatives (discussed below).

Quality of Service

Many of the TSM's components would decrease travel time between Long Island and the Queens side of the East River. Similarly, by improving transfers between the LIRR and subways/ferries into Manhattan, the TSM improved comfort and convenience of travel slightly.

Economic Impacts

Economic impacts are closely related to an alternative's ability to improve the overall transportation network, and therefore improve the efficiency of doing business in the New York Metropolitan Area. For the TSM, moderate travel time savings, new riders, and comfort improvements resulted in moderately positive economic impacts.

Community Impacts

Since all TSM components involve adjusting existing transportation systems, extremely few community impacts were anticipated, as reflected in the neutral rating.

Environmental Impacts

The TSM would reduce daily automobile VMTs on the regional highway network somewhat—an environmental benefit. Construction and operational impacts were minimal. For this reason, it was determined to be of moderate environmental benefit.

Impacts on Social Equity

While the TSM would improve commuter trips into Manhattan, it would have had little positive impact on the extent to which disadvantaged residents could access transit, and was so rated.

Summary of Evaluation

The TSM Alternative did not meet project needs and goals as well as the Build alternatives. However, it is retained for comparison purposes in the FEIS, updated to reflect recently completed railroad improvements and the latest future planning assumptions.

EXPRESS BUS/HOV (ALTERNATIVE 3)

Capital Cost Range

The Express Bus/HOV Alternative had costs similar to the TSM, approximately \$300 million. It too, was a low-cost improvement to the transportation system.

Impact on O&M Costs

Moderate costs to operate new express bus service into Manhattan are reflected in its “slight increase in costs” rating.

Revenue Impacts

While express bus service would have generated revenue in the form of fares from new passengers, new riders would be drawn off of both LIRR trains and NYCT subways. Since both LIRR and NYCT revenues would therefore decrease marginally, this alternative received a (■) negative rating.

Ridership Impacts

This alternative generated the fewest number of new transit riders among all alternatives other than the TSM, because the majority of its passengers would be drawn from a relatively narrow market corridor centered on the LIE. As such, it would not permit the LIRR to reduce peak hour trains to Penn Station and thereby would not relieve congestion there.

Quality of Service

While travel time data generated by preliminary ridership forecasts indicate potentially significant savings, these savings would vary widely, depending on conditions on the LIE, in Manhattan, and over the Queensboro Bridge in PM peak periods. Data indicate that eastbound trip times would be approximately 25 minutes longer than westbound trip times, nullifying much of the travel time savings gained in the inbound commute from Nassau and Suffolk. Given small overall travel time savings and a generally comfortable, one-seat ride in motor coaches, quality of service was rated as slightly beneficial as compared with the No Action Alternative.

Economic Impacts

The new express bus service may facilitate some short-term retail and/or residential economic development around park-and-ride lots on Long Island. It would not, however, have large-scale positive impacts on economic development in the region.

Community Impacts

The increased traffic and noise due to additional express buses on local streets in Manhattan were considered adverse community impacts, as was the increased congestion at existing express bus loading and unloading stops in Manhattan. The extent of concerns raised about these issues resulted in the Express Bus/HOV Alternative receiving a rating of highly adverse community impact.

Environmental Impacts

While the Express Bus/HOV Alternative would have resulted in a modest decrease in daily automobile VMTs of approximately 23,000, this slight environmental benefit would be more than offset by the alternative’s adverse impacts, including increased traffic congestion (and related pollutant emissions) on other LIE lanes due to the taking of highway space to build HOV lanes in Manhattan, on the Queensboro Bridge, and on Queens Boulevard.

Impacts on Social Equity

This alternative would primarily serve those workers who live on Long Island, commute into Midtown Manhattan, and have access to cars with which they can drive to park-and-ride lots.

The alternative would not provide reverse-peak service to allow city residents to access jobs on Long Island. As such, the alternative would have been of little benefit to disadvantaged residents.

Summary of Evaluation

The Express Bus/HOV Alternative did not meet one of the project's essential screening criteria, in that it did not draw enough riders away from the LIRR to relieve train traffic congestion in Penn Station. This alternative was also suspected of being operationally infeasible as well, because of its potential impacts on vehicular traffic congestion in Manhattan. It was included for further evaluation, however, because it was a non-rail build alternative, one that attempted to use a companion mass transit travel system to meet project objectives. The more detailed evaluation did not enhance this alternative, but instead revealed a number of additional problems. Although it showed certain very moderate economic, travel time savings, and ridership benefits, the alternative also evinced a number of adverse effects, including:

- Community impacts, including a conflict with New York City policy to discourage additional express buses on Midtown streets, since they would exacerbate very congested conditions already occurring there, and a related impact on neighborhoods along the travel routes that are already burdened by very heavy traffic.
- Environmental impacts, primarily noise and air pollution associated with bus travel and increased traffic congestion in Midtown Manhattan.
- Social equity, in that this alternative favored the Long Island resident with access to a car, but provided no reverse commute or other improvement to public transportation for lower-income and other disadvantaged workers and residents.

The alternative was therefore eliminated from further consideration. However, portions of this alternative (e.g., extending the existing exclusive bus and taxi lane) are now included in the TSM Alternative presented in this FEIS.

EAST SIDE TERMINAL (ALTERNATIVES 4A-4D)

These four alternatives, all of which proposed to bring riders to a new LIRR terminal on the East Side, were each found to have high construction costs, but to offer a combination of good ridership demand and travel time savings, along with fiscal benefits, such as positive revenue impacts and economic effects. The level of benefit varied, however, among the alternatives, as did the potential for adverse effects in other areas, as discussed below.

Capital Cost Range

Capital costs for the four alternatives ranged from a low of \$2.8 billion to a high of \$4.4 billion (in 1997 dollars). Major cost items for each of the four alternatives included procurement of electric rolling stock, construction of new tunnels in Manhattan and Queens, and construction of new LIRR facilities. Alternatives that included connections from the Montauk Branch in Queens (4B and 4D) had the highest capital costs, due to significant added costs of upgrading signal systems, building an elevated structure, and electrifying the Montauk Branch west of Jamaica to its connection to the 63rd Street tunnel. Costs of alternatives that would build a new LIRR terminal under Third Avenue (4C and 4D) were also slightly higher than those that would utilize GCT, due to the more extensive construction needed. Appropriately, Third Avenue via

the Montauk Branch carried the highest capital costs, as it included both the Montauk connection and the Third Avenue Terminal.

Impact on O&M Costs

All East Side Terminal alternatives were determined to have high adverse impacts on O&M costs. This is not surprising, as they all required the construction of new infrastructure and fleet expansion, which would require major increases in operations and maintenance activities.

Revenue Impacts

Each of the four alternatives had similar revenue impacts: increased LIRR revenue due to additional riders attracted to the new service, and marginal decreases in NYCT revenues due to the relatively small number of riders who would switch from subways to the LIRR.

Ridership Impacts

Of the four alternatives, GCT via the Main Line showed the strongest ridership projections in every category: approximately 24,000 new trips, 180,000 total riders, and a reduction in daily automobile VMT of over 290,000. With few exceptions, GCT via Montauk ranked second in all ridership categories, Third Avenue Terminal via the Main Line third, and Third Avenue via Montauk ranked fourth. One factor that contributed to the strong performance of GCT via the Main Line was the speed with which trains could get from the Main Line to East Midtown (reducing travel times, attracting new and current riders, and subsequently reducing daily VMTs) as compared with using the Montauk Branch to access East Midtown. Another factor was the proximity to the subway and to place of work provided by a terminal at GCT (also reducing travel times, attracting new and current riders, and subsequently reducing daily VMTs). These two factors accounted for much of this alternative's superiority to the ridership evaluation.

Quality of Service

As mentioned above, alternatives that save travel time tend to be more popular with commuters, generating higher ridership numbers. Appropriately, GCT via the Main Line saved the most person-hours each day (almost 11,000) compared with the other three alternatives (from 2,400 to 6,500 person-hours). As such, it was ranked highest in "Impact on Travel Time," along with the Third Avenue Terminal via the Main Line, which would also have saved more than 15 minutes on a one-way commute.

In terms of comfort and convenience, GCT via the Main Line again ranked highest, for two reasons. First, it would provide a direct link to East Midtown for all LIRR customers, including those at stations along the Main Line west of Jamaica, whereas the Montauk Branch alternatives would have required passengers west of Jamaica to transfer to Port Washington Branch trains at Woodside to access the new service. Second, it would provide direct access to subway service from GCT in Manhattan, whereas Third Avenue Terminal alternatives would have required passengers to travel farther to transfer to the subway.

Economic Impacts

Because of their overall ability to meet all study goals, each of the four alternatives would have significantly improved the region's transportation system. In addition to generating short-term construction jobs, all four alternatives could have been expected to spur long-term economic activity, and were rated highly in this measure.

Community Impacts

Community concerns for all four alternatives centered around the disruption associated with constructing a large-scale transportation project—noise and vibration, street closings, and truck traffic. However, the two Third Avenue Terminal alternatives would have engendered more intensive community concerns due to the added disruption of constructing an entirely new terminal under a major thoroughfare. As such, the GCT options were given moderate adverse impact ratings while the Third Avenue Terminal alternatives were given highly adverse impact ratings.

Environmental Impacts

GCT via the Main Line was the only alternative of the four rated that compared favorably in terms of environmental benefits. All four alternatives would have had negative traffic and pedestrian effects in the area of the new terminal, potential increases in noise levels due to additional trains running along LIRR lines (especially the Montauk Branch, which is not currently heavily used), and temporary environmental impacts due to construction. However, it was determined that the substantial offsetting positive regional environmental impacts of GCT via the Main Line (i.e., reductions in VMTs and associated pollutants) were sufficient to give it a positive rating. While the other alternatives would have also had somewhat offsetting positive impacts, it was determined that these impacts would not have been sufficient to warrant a positive rating.

Impacts on Social Equity

Each alternative would enable disadvantaged residents in Manhattan (in neighborhoods along the Lexington Avenue subway line in East Harlem and the Lower East Side) to access jobs on Long Island, and also residents on Long Island to access jobs in the Sunnyside area of Queens. As such, all alternatives were rated as offering moderate benefits.

SUMMARY OF EVALUATION

The net rating for the GCT via the Main Line Alternative (4A) was clearly positive. It had the highest ridership of the four, reflecting significant travel time savings to East Midtown. These plus factors gave rise to another important positive impact: long-term economic activity. The costs, while relatively high, were at least half a billion dollars less than in the three other East Side Terminal options. The alternative's potential negative community and environmental effects were generally limited to the construction phase. As with the other three alternatives, social equity effects were moderately beneficial.

The GCT via the Montauk Branch (4B) merited more mixed ratings, lower than those of GCT via the Main Line. Costs were predicted to be considerably (\$1.1 billion) higher, and ridership was lower. The smaller diversion of auto users to the train reduced the air quality benefit of this alternative, so that its overall rating on environmental concerns was slightly negative, compared to the GCT via the Main Line's overall beneficial rating.

Both of the Third Avenue Terminal alternatives (4C and 4D) also did not show the benefits of the GCT via the Main Line alternative. They cost more (especially the Third Avenue Terminal via the Montauk Branch [4D]) and their ridership was lower. With lower ridership, they did not merit a positive overall environmental rating. These alternatives were also distinguished from the GCT options by the more serious community and related noise impacts during construction of the terminal beneath Third Avenue.

In short, GCT via the Main Line (4A) was found to be clearly superior to its three similar options, and the three were therefore dropped from further consideration.

EAST RIVER TUNNEL WITH EAST SIDE RAIL STATION (ALTERNATIVE 6)

Capital Cost Range

Costs for this alternative, while not quite as high as for the East Side Terminal alternatives, would have approached \$3 billion. This reflects the capital cost of constructing an entirely new tunnel under the East River, continuing it under 31st Street more than halfway across Manhattan into Penn Station, constructing new facilities in the southern half of Penn Station, and constructing an underground station in East Midtown.

Impact on O&M Costs

As for the East Side Terminal alternatives, O&M costs were expected to rise by at least 20 percent. Costs included maintaining an additional right-of-way and operating and maintaining a new station in East Midtown.

Revenue Impacts

Like the East Side Terminal alternatives, an east side station would draw substantial additional new transit riders to the LIRR and reduce subway ridership only slightly, resulting in a positive impact on LIRR revenues and no impact on NYCT revenues.

Ridership Impacts

This alternative would have generated more total riders than any other alternatives (approximately 180,000 per day) and a significant number of new transit riders (almost 24,000). Accordingly, it would have reduced daily VMT by more than 290,000.

Quality of Service

Creating a new east side rail station would save more travel time than any other alternative and retained a one-seat ride into East Midtown for many LIRR riders. While subway connections from the east side station would be limited to local service, congestion at the 33rd Street/Lexington Avenue station would be serious, and fewer employees would be within walking distance of offices closer to GCT, the convenience of this new station outweighed these factors and the alternative was highly rated in regard to quality of service to East Midtown. However, it would actually degrade service to Penn Station by requiring that all trains stop at the new station, thus increasing travel time for all trains to that terminal and reducing hourly capacity. Thus, it failed to meet a basic project objective.

Economic Impacts

Similar to the East Side Terminal alternatives, the East Side Station with East River Tunnel Alternative would significantly improve the transportation system in the New York Metropolitan Area. It would ease passenger congestion at Penn Station and through the East River tunnels and provide convenient access to East Midtown. These extensive transportation benefits could be expected to generate long-term benefits to economic development, especially in the vicinity of the new East Side Station.

Community Impacts

This alternative was expected to generate severe impacts on local communities, mostly due to construction requirements. Large areas of cut-and-cover construction would be required between Fifth and Seventh Avenues, as well as demolition and displacement of residential and commercial properties along the proposed route. In addition, constructing a new rail station adjacent to and above the existing East River tunnel approaches to Penn Station, while maintaining full service to Penn Station, would require elaborate construction staging, including the closure of streets and sidewalks for extended periods of time.

Environmental Impacts

Environmental impacts of this alternative were found to be predominantly negative. It would have substantial impacts during construction, including waterfront effects, impacts on the East River, noise and vibration from substantial tunneling including cut-and-cover methods, and community disruption from cut-and-cover construction between Madison and Third Avenues along 32nd or 33rd Streets. Long-term impacts during operation include potential effects on the 33rd Street subway station on the No. 6 line, which is a designated New York City Landmark (NYCL), and additional traffic and pedestrian congestion in the vicinity of that station.

Impacts on Social Equity

While this alternative would not create a new station in Long Island City, it would improve reverse commuting from the East Side of Manhattan to Long Island, improving the capacity of disadvantaged residents on the East Side of Manhattan to get to jobs.

Summary of Evaluation

The East River Tunnel with East Side Train Station Alternative did not meet one of the project's essential screening criteria, in that it would not be operationally feasible if the study objective to relieve train traffic congestion at Penn Station was to be met. It was included for further evaluation, however, to better understand its operational possibilities and its benefits. The more detailed evaluation did not enhance this alternative, but confirmed the screening conclusions. Level of service at Penn Station would actually decrease, because the operating plan found that all trains would have to stop at the new station. This would add to travel times and limit the number of trains per hour that could approach Penn Station. The cost of the alternative was equivalent to that of the GCT via the Main Line Alternative and not as high as some of the East Side Terminal alternatives, but its overall benefits were lower. The alternative involved serious community disruption during construction of the station beneath the street and provided a connection only to a local subway station, which is an NYCL station of limited capacity. Because it did not meet basic criteria and the additional evaluation only revealed additional problems, this option was dropped from further consideration.

LONG ISLAND CITY INTERMODAL TRANSFER STATION (ALTERNATIVE 7D)

Capital Cost Range

Capital costs of approximately \$400 million would be required for construction of the subway extension from the upper level of the 63rd Street tunnel, the new intermodal subway/LIRR terminal, and a new bus terminal above the railroad facilities.

Impact on O&M Costs

O&M costs were expected to be minor in this alternative. They would encompass operating and maintaining the new intermodal station and the modest subway extension.

Revenue Impacts

Both LIRR and NYCT revenues were projected to increase as a result of this alternative. A limited number of additional LIRR passengers would use the intermodal terminal to transfer to the subway. However, the fact that revenues for both carriers would only have increased slightly over the No Action Alternative (due to the relatively few additional riders) led to a downgrading of the rating from **++** to **+**.

Ridership Impacts

The intermodal terminal was determined to generate the fewest new riders of any alternative other than the No Action Alternative (fewer than even the TSM). Additionally, fewer than 17,000 people in total would use the new facility on a daily basis—approximately one-tenth the number of riders using other new terminal or station alternatives.

Quality of Service

Since the subway connection envisioned in this alternative would have required passengers to transfer in Manhattan at Lexington Avenue and 63rd Street to the Lexington Avenue local train to reach many East Midtown destinations, its ability to reduce travel times was minimal. Only the TSM reduced travel times to a lesser extent than this alternative, which would improve service over the No Action level; however, those improvements would be minimal.

Economic Impacts

Most of the positive economic impacts of this alternative were related to its potential for spurring development in the Sunnyside/Long Island City area of Queens, an area envisioned by planners as a possible fourth Central Business District of New York City.

Community Impacts

Very few community impacts would be expected under this alternative. No construction in Manhattan and unobtrusive construction in a rail yard in Queens would impact few local residents. Accordingly, this was the only alternative that was rated as positive in regard to community impacts.

Environmental Impacts

Overall environmental impacts would be neutral, since the alternative would create impacts during construction, but would also generate a minor reduction in VMT and traffic congestion.

Impacts on Equity

This alternative performed well in providing access to jobs in the Long Island City area for disadvantaged residents of New York City and Long Island. In addition to providing rail access to the area, convenient bus transfers would support those who do not own cars. This alternative would not, however, improve access to jobs in Nassau and Suffolk Counties.

Summary of Evaluation

In summarizing the evaluation of the Intermodal Transfer Station Alternative, the most significant measure was the very limited number of new LIRR riders projected to use the station, a major deficiency. Even though the option achieved some positive ratings, its failure to improve quality of service and reduce travel time between Long Island and East Midtown was found to be an overriding limitation. The alternative was thus dropped from further consideration.

However, the idea of a station in the vicinity of the Sunnyside Yard enhanced the City's plans for economic growth in Long Island City and was very well received within the community. In support of development in this area of Queens, LIRR agreed to include a rail station at Sunnyside near Queens Boulevard as part of the Preferred Alternative.

CONCLUSIONS OF THE REFINED LIST ALTERNATIVES EVALUATION

The evaluation of the refined list of alternatives resulted in the selection of GCT via the Main Line Alternative 4A as the Preferred Alternative. Each of the other alternatives was judged to be inferior to GCT via the Main Line for the following reasons, as detailed above:

- The primary reason for eliminating the Express Bus/HOV Alternative (3) was that it would not have drawn enough riders to alleviate congestion at Penn Station. Secondly, it would have adverse impacts on local communities, the environment, and social equity.
- The three other East Side Terminal Alternatives (4B, 4C, and 4D) would all have cost considerably more than GCT via the Main Line, while drawing significantly fewer riders. Accordingly, 4B, 4C, and 4D would reduce automobile VMT by less than GCT via the Main Line and would be less beneficial to the environment.
- The East River Tunnel with East Side Train Station Alternative (6) was fatally flawed in that it would not have relieved train traffic at Penn Station. Further analysis showed that it actually would have negative effects on train traffic at Penn Station and would have disrupted the community significantly during construction.
- Similar to the Express Bus/HOV alternative, the Intermodal Transfer Station Alternative (8D) would not draw enough riders to warrant its selection. Furthermore, it would not improve quality of service or reduce travel times significantly.

D. EVALUATION OF OTHER ALTERNATIVES

APPLE CORRIDOR

In June of 1996, The Committee for Better Transit published Apple Corridor, a proposal for a one-seat rail link between GCT and John F. Kennedy International Airport (JFK). The link would route trains from GCT, through new and existing tunnels to LIRR tracks at Harold Interlocking adjacent to Sunnyside Yard, to Rego Park along current LIRR tracks, and on to JFK along a Rockaway Beach LIRR branch restored to service and newly constructed tracks. Key to the Apple Corridor proposal was a LIRR connection to GCT similar to MIS Alternative 4A: GCT via Main Line, which was identified as the Preferred Alternative (as described above). The Apple Corridor proposal, however, called for a slightly different means of access to GCT than did Alternative 4A.

A number of components of the Apple Corridor proposal led to the decision to retain the core components of GCT via Main Line, rather than those of Apple Corridor, for the ESA Project:

USE OF UPPER-LEVEL METRO-NORTH TRACKS

Apple Corridor called for the use of the five westernmost tracks (38-42) of the upper level of GCT for both LIRR service and airport access service. This would have had a number of adverse impacts on Metro-North, would not have been sufficient to handle projected LIRR passenger volumes, and would have been more costly to construct than originally envisioned:

The use of these five upper level tracks would have provided LIRR and Airport Access service at the expense of existing and future Metro-North service. On the contrary, GCT via Main Line would use existing, predominantly non-revenue trackage in the lower level to preserve Metro-North's current operations and maintain space for future Metro-North growth. While GCT via Main Line would use four Metro-North passenger tracks from the lower-level, it would not use upper level tracks, which are currently heavily used by Metro North and accommodate 12-car trainsets. In addition, use of the five westernmost upper level tracks would have completely taken away Metro-North's access to the upper level loop track—severely constraining Metro-North operations.

CREATING CAPACITY FOR LIRR AND AIRPORT ACCESS

The Apple Corridor proposal would not have created sufficient capacity to handle LIRR peak hour service. Track and platform alignments would have accommodated only 18 trains/hour (versus GCT via Main Line's 24 trains/hour), and would have utilized existing platforms of insufficient width to accommodate large LIRR commuter crowds. Moreover, Apple Corridor's proposed simplified track configuration on approach to GCT would not have permitted parallel train moves: just a single track in and a single track out—insufficient to handle LIRR and Airport Access service concurrently. The same shortcomings were apparent in the vicinity of Sunnyside Yard in Queens, where the Apple Corridor proposal did not address the need for midday storage of LIRR trains. Finally, Apple Corridor would require all LIRR passengers heading to or from GCT to transfer at Jamaica.

COST ESTIMATES

Apple Corridor's cost estimate, which was significantly lower than that of GCT via Main Line, did not include key elements that would have brought its costs into line with those of GCT via Main Line, including throughput connections at Harold Interlocking; mitigation for loss of Metro-North tracks, platforms and upper loop; design and construction of additional exits and cross passageways at GCT; real estate/easement costs; mitigation of Lexington Avenue subway impacts; and midday train storage, among others.

For the above reasons, Alternative 4A: GCT via Main Line, was retained as the Preferred Alternative for East Side Access.

E. SELECTION OF A LOCALLY PREFERRED ALTERNATIVE

On June 25, 1998, a NYMTC resolution affirmed that the Long Island Transportation Corridor MIS study was completed and the GCT via the Main Line Alternative was the Locally Preferred Alternative. The GCT via the Main Line Alternative is called the Preferred Alternative, and together with the No Action and TSM Alternatives, is evaluated further in this FEIS. ❖