

A. INTRODUCTION

The New York State Environmental Quality Review Act (SEQRA) and its implementing regulations require the consideration of alternatives to the Proposed Project. Part 617.9(5)(v) of SEQRA regulations requires that a DEIS describe and evaluate “the range of reasonable alternatives to the action that are feasible, considering the objectives and capabilities of the project sponsor.” SEQRA also requires analysis of a “No Action” alternative, under which the Proposed Project would not be constructed. This chapter includes a discussion of the alternatives that were retained for further analysis based on their reasonableness and feasibility, and those alternatives that were initially considered but then dismissed from further analysis. It also compares the potential significant adverse environmental impacts of the No Action Alternative and other alternatives that were determined to be feasible and that could meet the project’s Purpose and Need.

B. ALTERNATIVES DEVELOPMENT

During the early project planning stages, LIRR evaluated the viability of project alternatives. To be viable, an alternative must be both feasible, i.e., physically able to be engineered and constructed; and reasonable, which requires that an alternative satisfy the project’s Purpose and Need. In addition, if an alternative is judged to have significantly more impacts, or to cost substantially more than the Proposed Project, it is not considered further. Any alternative that does not meet the Purpose and Need is not considered reasonable. The Purpose and Need of the Proposed Project, which sets the standard that any alternative should meet in order to be considered, is reflected in the project’s goals and objectives:

- Reduce delays to commuters from Main Line congestion and rippling effects
 - Improve on-time performance on all branches
 - Add resiliency and accelerate recovery time from unplanned service disruptions
 - Reduce train delays due to roadway incidents or accidents near grade crossings
- Add operational flexibility eastbound and westbound
 - Improve mobility with additional intra-Island service
 - Improve mobility with additional reverse peak service
 - Facilitate scheduled and unscheduled maintenance
- Provide additional track capacity to accommodate projected system-wide service growth
- Improve public safety and roadway conditions
 - Eliminate Main Line grade crossings
 - Enhance north-south vehicular and pedestrian connectivity in communities along the Main Line

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- Reduce traffic delays due to grade crossings
- Reduce noise and improve neighborhood quality-of-life
 - Reduce noise from train horns
 - Reduce noise from crossing-gate warning bells

As stated in Chapter 1, “Project Description,” input solicited during the public scoping period was used to inform and guide the alternatives development process. During the public scoping period, several commenters requested analysis of additional project alternatives. The Final Scoping Document identified the following alternatives to be evaluated in the DEIS, in addition to the Proposed Project:

- No Action Alternative—This alternative assumes the Proposed Project does not proceed, and that no improvements are made within the Project Corridor except those associated with other LIRR initiatives, implemented as part of routine maintenance, or as part of independent projects proposed by others. The No Action Alternative serves as the baseline condition against which the potential benefits and impacts of the Proposed Project are evaluated. As set forth in greater detail in Chapter 1, “Project Description,” several ongoing, separate LIRR projects are assumed to continue in the No Action Alternative, including:
 - East Side Access Project
 - Double Track Project from Farmingdale to Ronkonkoma
 - Jamaica Capacity Improvements Project
 - Mid-Suffolk Yard Project
 - Addition of pocket tracks along the Port Washington and Babylon Branches
 - Huntington/Port Jefferson Branch Yard Site Selection
 - Hicksville Station and North Track Siding Improvements
 - Post Avenue Railroad Bridge Replacement
- Reconfigured Grade Crossings Alternative—Like the Proposed Project, this alternative would include the closure of roadways at up to two of the eliminated grade crossings: Main Street and South 12th Street. As with the Proposed Project, the remaining five grade crossings to be eliminated would be converted to grade-separated configurations. The construction of the third track, station improvements, and related railroad infrastructure modifications would be the same as for the Proposed Project. This alternative is included in the overall analysis of the Proposed Project and is not considered as a separate alternative to the Proposed Project.
- Transportation System Management Alternative—This alternative would include a combination of operational and equipment modifications (e.g., bus rapid transit, extended platforms, double-decker trains, limited rail passing sidings) in lieu of the Proposed Project.
- Upgrade Switches and Signals Only Alternative—This alternative would include upgrading of existing railroad switches and signals to improve rail operation efficiency. No third track would be installed, no station or platform improvements would be implemented, and no changes to the existing grade crossing configurations would be made.

Several additional alternatives were suggested during the public Scoping period, including a “Grade Crossing Only Alternative” and an “Implement Other LIRR Capital Projects Only.” These alternatives were determined to not fulfill the purpose and need for the project, which is intended to significantly enhance system reliability and enable intra-Island peak service at times

when such service is currently not feasible due to lack of track capacity. Accordingly, they have not been included in this DEIS for further consideration.

In addition to the alternatives presented above, multiple options for each grade crossing location were analyzed during the Scoping period, through extensive coordination with each community. Many of these options, such as roadway overpasses, would have required substantial residential property acquisitions and may have resulted in adverse visual and community character impacts. As a result of such impacts, many grade crossing options were eliminated during the Scoping process. A summary of the alternatives evaluated and discarded for each grade crossing location was presented in the Final Scoping Document.

C. ALTERNATIVES CONSIDERED AND DISCARDED

A number of alternatives to the Proposed Project were considered but eliminated from further analysis because they were found to not be reasonable. These alternatives are described below:

MAIN LINE CORRIDOR IMPROVEMENTS PROJECT ALTERNATIVE

Beginning in 2005, the “Main Line Corridor Improvements Project,” a project similar in intent to the Proposed Project but with a substantially greater number of property acquisitions and other impacts, was considered. Referred to herein as the “Main Line Corridor Improvements Project Alternative,” this alternative would include the installation of a third track between Queens Village and Hicksville within a significantly widened ROW. The third track would be located to the north of the existing Main Line tracks in some locations and to the south in other locations. It would include grade-separation of up to five grade crossings, but would require a large number of residential and commercial acquisitions and community disruption. The Main Line Corridor Improvements Project Alternative has been eliminated from further consideration, since it would require an excessive number of full commercial and residential property acquisitions and multiple partial property acquisitions to accommodate a widened ROW, and a lengthy construction schedule within village shopping areas. These factors make this alternative unreasonable.

NORTH ALIGNMENT ONLY ALTERNATIVE

As stated above, the Main Line Corridor Improvements Project Alternative would have installed a new third track to the north of the existing track alignment in some locations and to the south in other locations. As part of early conceptual engineering efforts, LIRR evaluated the potential for a “north only” alignment, where in a new third track would be installed only to the north of the existing Main Line tracks. This alternative has been eliminated from further consideration because it would entail an excessive number of full commercial and residential property acquisitions and multiple partial property acquisitions to accommodate a widened ROW. For this reason, the alternative is unreasonable.

SOUTH ALIGNMENT ONLY ALTERNATIVE

Similar to the North Alignment Only Alternative, LIRR evaluated the potential for a “south only” alignment, wherein a new third track would be installed only to the south of the existing Main Line tracks. This alternative has been eliminated from further consideration because it would entail an excessive number of full commercial and residential property acquisitions and

multiple partial property acquisitions to accommodate a widened ROW. For this reason, the alternative is unreasonable.

ELEVATED NEW HYDE PARK SEGMENT ALTERNATIVE

Three of the seven existing grade crossings (Covert Avenue, South 12th Street, and New Hyde Park Road) are located within the Village of New Hyde Park. The Proposed Project includes grade-separation or elimination of these crossings. During the course of the robust community coordination efforts, the Village of New Hyde Park requested that LIRR evaluate the feasibility of constructing an elevated rail segment throughout its downtown area. Representatives of the Village of New Hyde Park indicated two key goals:

- Enable through-streets to remain at their current elevation, passing underneath the new three-track railroad and operating freely without obstructions (similar to Downtown Floral Park); and
- Promote the development of an urban shopping area in the space under the new elevated railroad.

In response to this request, LIRR performed a detailed and comprehensive analysis of two conceptual alternatives that would raise the vertical profile of this segment of the Main Line while still accommodating the planned third track. Two conceptual designs were developed—referred to as the “Raised Alternative Option 1” and “Raised Alternative Option 2.” Both options would entail a three-track viaduct with elevated tracks (approximately 20 feet high) above street level from a point just west of Covert Avenue to a point just east of New Hyde Park Road. The approaches connecting the elevated segment to the adjacent at-grade segments would slope at a one percent grade and extend into the neighboring communities of Floral Park and Garden City.

It should be noted that MTA policy does not permit the siting of non-railroad occupancy under new viaducts and bridges because it presents unacceptable safety risks. Because of this risk, the suggested placement of retail establishments under a new New Hyde Park viaduct is not prudent.

RAISED ALTERNATIVE OPTION 1

As stated in Chapter 1, the portion of the Main Line passing through New Hyde Park supports multiple LIRR branches and is an essential component of the region’s transportation network. It would therefore not be possible to shut down the Main Line during the construction period. It would also not be practical, efficient, or safe to build a new viaduct over an operating passenger railroad. As a result, Raised Alternative Option 1 would require temporary detour tracks to re-route trains next to the Main Line. Because of the highly developed nature of the area and the narrow railroad right-of-way, the detour tracks and the temporary station platform would be located in the center of Second Avenue. This would require the acquisition and demolition of a substantial number of residential and commercial properties and thus be extremely disruptive to the Village of New Hyde Park (as well as Floral Park and Garden City) throughout the multi-year construction period. Unlike the Proposed Project, which would be constructed in smaller segments in New Hyde Park, Option 1 would require that the entire work area from Floral Park to Garden City be subjected to intense construction during the entire project duration. The temporary detour tracks would also eliminate access to multiple driveways and loading zones, and reduce parking. The construction period is estimated to be more than double that of the Proposed Project with substantially more impacts to the community. While the Raised Alternative Option 1 is technically feasible, it is not reasonable due to significant community impact and cost considerations and thus was eliminated from further consideration.

RAISED ALTERNATIVE OPTION 2

Raised Alternative Option 2 was conceived to entail a staged construction approach, which would lessen property impacts but extend the construction period. It would retain more of the construction activity within the existing railroad right-of-way, but require a much more complicated and risky construction approach in terms of schedule, railroad operations, safety, and cost. As with Option 1, detour tracks would be required, although Option 2 would build the detour tracks closer to the existing Main Line tracks. The temporary detour tracks would require the demolition of many residential and commercial buildings, eliminate access to multiple driveways and loading zones, and reduce parking. Similar to Option 1, this option would be extremely disruptive to the Village of New Hyde Park (as well as Floral Park and Garden City) due to the property acquisitions as well as a longer multi-year construction period. Unlike the Proposed Project, which would be constructed in smaller segments in New Hyde Park, Option 2 would require that the entire work area from Floral Park to Garden City be subjected to intense construction during the entire project duration. Weekend railroad operations would be reduced to single-track operations for at least one year. The constrained construction zone would result in substantial construction safety risks that render this option unacceptable. The construction period would be longer than Option 1 and more than double the length of the Proposed Project, and the cost is estimated to be substantially more than the Proposed Project. While the Raised Alternative Option 2 is technically feasible, it is not considered reasonable because of significant community impact, and therefore was eliminated from further analysis.

D. ALTERNATIVES EVALUATED

The remaining alternatives were subjected to further study, including an assessment of construction and engineering feasibility, and a comparative evaluation of each alternative's potential environmental impacts.

PROPOSED PROJECT

The Proposed Project, as described in Chapter 1, would satisfy the Purpose and Need and the goals and objectives listed above. The potential environmental impacts of the Proposed Project are set forth in the resource-specific chapters of this DEIS.

NO ACTION ALTERNATIVE

The No Action Alternative would not satisfy the Purpose and Need. Nonetheless, SEQRA requires analysis of the No Action Alternative as a baseline for environmental impact comparison purposes. The No Action Alternative therefore was advanced to the detailed screening, and its potential environmental impacts are set forth in **Table 18-1** below.

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**Table 18-1
Comparison of Proposed Project with Alternatives**

	Proposed Project	No Action Alternative	Reconfigured Grade Crossings Alternative	Transportation Systems Management Alternative	Upgrade Switches & Signals Only Alternative
Meets purpose and need?	Yes	No	Yes	No	No
Satisfies all goals and objectives?	Yes	No	Yes	No	No
Feasible engineering & construction?	Yes	Yes	Yes	Yes	Yes
Environmental Impacts *					
	See Chapter	No Action Alternative	Reconfigured Grade Crossings Alternative	Transportation Systems Management Alternative	Upgrade Switches & Signals Only Alternative
Land Use, Community Character, and Public Policy	2	No benefits or adverse impacts	Similar to Proposed Project	Land needed for bus pick-up/drop-off locations and expanded HOV lanes; Similar to Proposed Project	Fewer impacts
Socioeconomic Conditions	3	No benefits or adverse impacts	Similar to Proposed Project	More impacts to businesses due to multiple parking locations	No benefits or adverse impacts
Environmental Justice	4	No benefits or adverse impacts	Similar to Proposed Project	Similar to Proposed Project	No adverse impacts
Visual and Aesthetic Resources	5	No benefits or adverse impacts	Similar to Proposed Project	Similar to Proposed Project	Fewer impacts
Historic and Archaeological Resources	6	No benefits or adverse impacts	Similar to Proposed Project	Unknown. Site selection for infrastructure would determine potential impacts	Fewer impacts
Natural Resources	7	No benefits or adverse impacts	Similar to Proposed Project	Unknown. Site selection for infrastructure would determine potential impacts	Fewer impacts
Contaminated Materials	8	No benefits or adverse impacts	Similar to Proposed Project	Reduced impacts on LIRR ROW; may introduce additional off-site concerns	Fewer impacts
Infrastructure and Utilities	9	No benefits or adverse impacts	Similar to Proposed Project	Reduced impacts on LIRR ROW; may introduce additional off-site concerns	Fewer benefits and adverse impacts
Transportation	10	No benefits or adverse impacts	Similar to Proposed Project	Fewer benefits. Additional congestion on LIE and local roadways	Fewer benefits and adverse impacts
Air Quality	11	No benefits or adverse impacts	Similar to Proposed Project	Worse adverse impacts due to LIE and local congestion and greater use of diesel trains for bi-level train cars	Fewer benefits and adverse impacts
Noise and Vibration	12	No benefits or adverse impacts	Similar to Proposed Project	Potentially greater impacts due to new Bus Rapid Transit (BRT) system	Greater impacts as a result of increased train service and no sound attenuation walls
Construction	13	No benefits or adverse impacts	Similar to Proposed Project	Potentially greater impacts from BRT station infrastructure construction	Fewer impacts
Cumulative and Secondary Impacts	14	No benefits or adverse impacts	Similar to Proposed Project	Fewer beneficial impacts due to lack of connectivity with other planned rail projects	Fewer impacts
Safety and Security	15	No benefits or adverse impacts	Similar to Proposed Project	Potentially greater impacts from BRT system, which would not operate on existing rail ROW	Similar to Proposed Project
Electromagnetic Fields	16	No benefits or adverse impacts	Similar to Proposed Project	Fewer impacts	Similar to Proposed Project
Climate Change/Sustainability	17	No benefits or adverse impacts	Similar to Proposed Project	Potentially fewer beneficial impacts from failure to reduce emissions as much as the Proposed Project	Fewer beneficial impacts
Note: * For environmental impacts of the Proposed Project, see individual resource chapters, numbered as shown					

TRANSPORTATION SYSTEMS MANAGEMENT ALTERNATIVE

During the public scoping period, some commenters suggested a variety of actions that are considered components of the Transportation Systems Management Alternative. Transportation Systems Management (TSM) includes a set of potential operating strategies that may reduce congestion, improve transportation system capacity, and enhance efficiency of the system. For the LIRR Expansion Project, commenters suggested that LIRR use such TSM components as double-decker trains, longer trains, and longer station platforms to accommodate more cars and thus increase capacity in lieu of the Proposed Project. These suggestions were evaluated as part of the Transportation Systems Management Alternative, along with modifications such as bus rapid transit and enhanced use of existing rail sidings. Various combinations of these items were also evaluated.

LONGER TRAINS AND LONGER PLATFORMS

LIRR's rail network has been built to accommodate up to 12-car trains. Use of longer trains (longer than 12 cars) is not considered feasible as it would have adverse impacts to passenger loading and trains interfering with switches at Penn Station and other terminal locations. LIRR currently operates mostly 12-car passenger trains along the Main Line. However, many stations along the Main Line have platforms that only accommodate 10-car trains. This situation requires customers to use fewer train doors to board the train and to walk through cars to the nearest exit, delaying the boarding and detraining process and adding time to the schedule. As part of the Proposed Project, Main Line station platforms would be lengthened to 12-car platforms. Constructing longer platforms to accommodate trains that are longer than 12 cars would require a substantial system-wide investment, beyond just the Main Line stations, that would likely be infeasible in many locations due to ROW and clearance limitations.

Furthermore, many switches and platform lengths at terminal platforms would not accommodate a 14-car train. Trains interfering with switches due to overall length would delay train movement into and out of the terminal, particularly Penn Station, which would reduce capacity, reduce the number of peak period trains, and could lead to overcrowding on many trains.

BI-LEVEL TRAINS

Double-decker (or "bi-level") trains were also evaluated at the request of several comments received during the Scoping period. Although bi-level trains can operate on most¹ branches of the LIRR, clearance limitations prohibit this equipment from being utilized for East Side Access service to Grand Central Terminal. The purchase of additional bi-level train cars would thus not meet the needs of this planned service improvement. Purchasing a substantial number of new bi-level trains as a way to enhance capacity would reduce operational flexibility and make it more difficult for LIRR to manage its fleet. Since bi-level trains are hauled by diesel locomotives through the corridor, their increased use would also result in less favorable air quality and greater noise than the Proposed Project.

¹ Bi-level train cars are currently restricted from being utilized on the Atlantic Branch (serving Atlantic Terminal, Brooklyn), and must be hauled by a dual-mode locomotive into and out of Penn Station, of which the LIRR currently operates a limited number.

BUS SERVICE AND BUS RAPID TRANSIT

Bus Rapid Transit (BRT) was also considered as part of this evaluation. BRT systems involve specialized infrastructure such as dedicated bus lanes, stations, and intersection treatments, along with faster, frequent service and off-board fare collection. One scenario for BRT would entail adding express bus service to the eastbound and westbound high-occupancy vehicle (HOV) lanes on the Long Island Expressway. While this could provide an additional commuting option for peak-direction commuters, it would burden the capacity of the Long Island Expressway with more vehicles and exacerbate existing roadway congestion, and would be unlikely to get commuters to their destinations in a travel time period comparable to rail travel as the current HOV lanes merge with regular travel lanes in New York City and do not extend into Manhattan. More significantly, in order to achieve a travel time period that attracts commuters, a comprehensive BRT system would require construction of additional exclusive HOV lanes and designated pick-up and drop-off facilities separate from existing rail stations and closer to the Long Island Expressway, which would entail additional property acquisition, construction, and potential impacts to local roadways. These facility locations would not be proximate to existing Main Line rail stations and it is not practical to expect current LIRR commuters to treat a separately located BRT system as a viable alternative to commutation via the LIRR. This alternative also would not meet the project Purpose and Need because it would fail to reduce rail delays, provide operational flexibility on the LIRR system, or provide additional track capacity.

Although BRT could theoretically provide service for reverse peak commuters, as noted, it would present property acquisition issues with regard to additional HOV lanes, pick-up and drop-off facilities, and require commuters accustomed to arriving at LIRR rail stations, located centrally in village shopping districts, to travel to new yet-to-be-determined locations.

ENHANCED USE OF RAIL SIDINGS

Some commenters suggested that in lieu of a continuous third track, the LIRR modify existing rail sidings and switches to create “passing lanes” to increase service flexibility and reliability. This alternative has extremely limited points of applicability, and its usefulness in addressing service disruptions would depend on an incident occurring in close proximity to the siding. Given the significant volume of trains in the corridor, attempting to run additional service under this scenario would require a degree of scheduling precision that is totally impractical and not viable given the size of the LIRR system. In sum, this alternative would do little to address the Proposed Project’s Purpose and Need, particularly operational flexibility and reliability.

COMBINATION

In combination, several components of the Transportation Systems Management Alternative would result, to a degree, in benefits in terms of improvement of mobility and enhanced commuting flexibility; however, it would not satisfy the project’s overall Purpose and Need. It would not provide additional rail capacity, reduce rail delays, or improve rail reliability, and it would not result in any change to the existing two-track bottleneck along this segment of the Main Line.

UPGRADE SWITCHES & SIGNALS ONLY ALTERNATIVE

During the public Scoping period, some commenters stated the switches and signal systems are the reason for reliability problems and the cause of existing delays, and requested that the Proposed Project be cancelled in favor of upgrading these systems without the installation of a

continuous third track. Separate from the Proposed Project, LIRR continues to make improvements to Main Line infrastructure through an on-going program of maintenance and system upgrades. LIRR has been upgrading the signal systems along the Main Line Corridor over the past several capital programs as follows: Nassau (1996), Divide (2000), and Queens (2008). Crossovers in the corridor are currently “high speed” with those at Nassau rated for 60 mph and the crossovers at Queens rated for 80 mph. The track and signal systems in the corridor are considered as reliable and in a state of good repair.

A new signal technology, such as a “moveable block” system, increases capacity by permitting trains to run closer together. Such a system, however, would be an exceedingly complex and costly measure that would not significantly improve railroad capacity along the corridor because numerous factors influence overall capacity, including number of station stops, maximum authorized speed (MAS), braking distance of equipment, safety factors, necessity to cross trains between tracks, etc. While a movable block system could modestly increase capacity by permitting trains to run closer together, it would not affect time needed for station stops, a significant capacity-limiting factor, and it would not increase reverse peak operations.

The Upgrade Signals and Switches Only Alternative would, in some locations, avoid property-related impacts and the need to construct retaining walls, and may reduce existing noise from older switches. In terms of reducing delays, however, it would not measurably improve LIRR’s on-time performance. Aside from infrastructure issues (such as broken rail), other causes of delay in the corridor are attributed to equipment (fleet) malfunctions, police activity, and other incidents such as bridge strikes. Improved signals and switches (while beneficial) would not allow for better flexible movements around such delays than exists today. Without additional track capacity, improved switches and signals could not adequately reduce rail delays along the LIRR Main Line. This alternative would also fail to provide additional operational flexibility, provide bi-directional or intra-Island service, or accommodate projected system-wide service growth. It would also leave the seven grade crossings in place along the corridor, and the resultant challenges that they present to railroad operations, traffic flow, and pedestrian safety. It would not result in any change to the existing two-track bottleneck along this segment of the Main Line, and would not meet the project Purpose and Need.

E. COMPARISON OF ALTERNATIVES

The Reconfigured Grade Crossings Alternative, Transportation Systems Management Alternative, and Upgrade Switches & Signals Only Alternative have been analyzed to a level of detail sufficient to allow a reasonable comparison of potential environmental and community impacts. As required by SEQRA, the No Action Alternative is used as a baseline for impact comparison.

F. CONCLUSION

Several potentially viable alternatives were eliminated because they were determined to result in significantly greater adverse environmental impacts than the Proposed Project or otherwise determined to be infeasible and/or inconsistent with project goals. Besides the Proposed Project, which also encompassed what had been previously identified in the Final Scoping Document as the Reconfigured Grade Crossing Alternative, the DEIS considered the No Action Alternative, referred to in the DEIS as the “Future Without the Proposed Project,” which is retained as a baseline against which to compare potential impacts. The Future Without the Proposed Project is not considered a reasonable alternative because it also does not satisfy the Purpose and Need *