A. INTRODUCTION

Indirect or secondary effects are generally defined as those induced or "caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 CFR §§ 1500-1508). Indirect effects can occur within the full range of analysis areas, such as changes in land use, economic vitality, or neighborhood character. Indirect effects can be beneficial and support the project goals and objectives, or they can be adverse. Unlike in other Environmental Impact Statement (EIS) analyses, the terms effect and impact are used interchangeably in Council for Environmental Quality (CEQ) regulations. The Federal Highway Administration (FHWA) also does not distinguish between indirect and secondary effects.

Cumulative impacts result "from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). The cumulative impacts of an action may be undetectable when viewed in the individual context, but when added to other actions can eventually lead to a measurable environmental change. Cumulative impacts can be direct or indirect, beneficial or adverse. A cumulative impact typical of large transportation projects can be changes in traffic congestion, which, when coupled with impacts from other projects in the study area, can create associated impacts on air quality and noise.

As described throughout this EIS, since Tier I of the EIS does not include conceptual design of the alternatives or detailed service plans but only a high-level determination of modes, alignments, and termini for the viable alternatives, a detailed determination of indirect and cumulative impacts is not possible at this time. Therefore, in accordance with CEQ guidance, this chapter makes a good faith effort to identify the effects that are not definitely known at this time, but are "reasonably foreseeable" (40 CFR 1508.8). The chapter provides an overview of the potential for secondary and cumulative effects of the project, as based on operational information available at this time and discusses the methodology for detailed analyses during any subsequent Tier II studies.

B. METHODOLOGY

INDIRECT EFFECTS ANALYSIS

A 2002 report by the National Cooperative Highway Research Program (NCHRP)—*Report 466, Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects*[1]—provides an eight-step approach for evaluating indirect effects that has been widely accepted by FHWA and state Departments of Transportation (DOTs) throughout the U.S.

1. Identify the study area boundaries and the timeframe for the analysis.
2. Identify the study area's development trends and goals.

[1] http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_466.pdf

3. Identify the study area's notable features, such as any special natural resources.
4. Identify the components of the proposed project that may cause substantial effects on the identified resources.
5. Identify the potential indirect effects.
6. Analyze the magnitude of the identified effects.
7. Evaluate the analysis results.
8. Determine the consequences of the results and develop mitigation measures.

Since, as mentioned previously, the Tier I EIS includes only high-level conceptual design and operations planning, it is anticipated that the eight-step approach will be conducted in full in subsequent Tier II documentation. The discussion presented below addresses indirect effects generally, by identifying elements of the proposed project that may result in indirect effects in the study area (i.e., Step 4).

For the purposes of this analysis, the study area will continue to follow the study areas presented in other chapters of the EIS. The timeframe for analysis is the year 2035, a widely used planning horizon in the New York/New Jersey region and the analysis year for the project's economic impacts. The study area's existing conditions and development trends have been presented in Chapters 6.1, "Land Use, Neighborhood Character, and Social Conditions," and 6.2, "Economic Conditions and Effects."

CUMULATIVE EFFECTS ANALYSIS

The methodology for considering cumulative effects under NEPA is laid out broadly in CEQ's *Considering Cumulative Effects Under the National Environmental Policy Act* (January 1997).[1] A detailed, eleven-step process for determining impacts is outlined, however the methodology can be summarized in three steps more appropriate for a high level look in a tiered EIS:

- **Scoping**, where geographic scope and time frame for the analysis are established, resources of concern are selected, and other foreseeable projects are identified.
- **Describing the affected environment**, where resources of concern identified in scoping are characterized in terms of their response to change, the stresses affecting these resources are also characterized, and a baseline condition for the resources is defined. Much of this work has been done throughout this EIS in specific technical analyses.
- **Determining environmental consequences**, where cause-and-effect relationships between the types of actions being taken and the stresses on resources are defined, the magnitude of impacts are determined, alternatives or mitigation to avoid adverse cumulative impacts are proposed, and the cumulative effects of the selected alternative are monitored.

Because of the limited design and operational detail available in Tier I of this EIS, the analysis below is carried through the first two steps, with the expectation that a full cumulative effects analysis would be conducted during any subsequent Tier II studies.

[1] http://ceq.hss.doe.gov/nepa/ccenepa/ccenepa.htm

C. POTENTIAL INDIRECT EFFECTS OF THE PROJECT ALTERNATIVES

WATERBORNE ALTERNATIVES

ENHANCED RAILCAR FLOAT ALTERNATIVE

Operational

Land Use and Social Conditions

As described in Chapter 6.1, land acquisition and the resultant potential for direct effects to land use are expected at 65th Street Yard, Oak Point Yard, Fresh Pond Yard, and Maspeth Yard under this alternative. Direct effects may include displacement of existing businesses and employees; however, because detailed engineering of the project's potential facilities is not available in Tier I, a determination of displacement impacts would be undertaken in subsequent Tier II review, when the facility expansion boundaries are better defined.

The effects of establishing these freight handling facilities or expanding new facilities are discussed for each alternative throughout the various components of Chapter 6, "Environmental Effects." Much like the other Build Alternatives, the Enhanced Railcar Float Alternative would involve the expansion of existing facilities and/or reactivation of existing alignments (e.g., the Bay Ridge Branch), and therefore potential indirect effects would be limited. Most of the freight facilities proposed under this Build Alternative are located in industrial areas or in areas where railroad uses have existed historically. Therefore, with the Enhanced Railcar Float Alternative, these yards would continue to function as rail and freight-handling facilities and consequently no indirect changes to land use patterns or development trends (and resultant effects to neighborhood character) in the vicinity would be expected.

In terms of the growth-inducing aspects of this alternative, areas near proposed facilities in Brooklyn and Queens may attract new activity in warehousing and distribution and may create local jobs in the vicinity of the freight handling facilities. These jobs, created by business attraction and retention, would be concentrated near the proposed freight handling facilities. Most of the development induced by the project alternatives (e.g., new or expanded warehouse space, supporting businesses such as restaurants, etc.) would be located near proposed facilities for this alternative to take advantage of proximity to these facilities. Therefore, these new uses would be consistent with the overall land use and zoning of the area would not result in any effects to neighborhood character.

Traffic and Related Effects

As noted in Chapter 5, "Transportation," the Enhanced Railcar Float Alternative would increase the number of trucks locally around the facilities required to support this alternative and on the regional highway network, as well as increase the number of trains traveling on the Bay Ridge Branch and other rail segments in the study area (see Figures 5-8 and 5-9). The resultant potential noise and vibration and air quality effects of these increases are discussed in Chapters 6.7, "Noise," and 6.6, "Air Quality," respectively.

In addition, the aforementioned induced development could result in potential indirect environmental effects, including local increases in traffic, noise levels, and air emissions not directly accounted for in the technical analyses of this EIS, which build on explicit freight traffic increases along the project alignment and at rail yards and local truck traffic increases near the various freight facilities required to support the Build Alternatives. However, quantifying specific environmental impacts related to induced development would be speculative and imprecise at this

point in the tiered EIS process. Furthermore since the induced business growth would develop over time, any potential effects would be spread out as well. Subsequent Tier II investigations will provide a more in-depth analysis to determine any adverse effects from the growth that may be induced by this alternative.

Construction

The construction of this and other Build Alternatives would affect the regional economy by employing workers in the construction industry and procuring supplies and services from regional businesses. Increased demand of certain key construction materials (e.g., concrete) would stimulate activity in local suppliers and the increased output, employment, and income to these businesses would be considered an indirect benefit from the construction of this and other Build Alternatives.

Based on the program elements for this alternative known in Tier I, the Enhanced Railcar Float Alternative would not result in intense and wide-ranging construction activity. In addition, these construction activities would take place in existing industrial areas and would be substantially buffered from commercial and residential areas. While there may be some temporary impacts that may result from the construction of this alternative (as discussed in the various components of Chapter 6), the construction of this alternative would not be prolonged enough to result in secondary land use and neighborhood character effects. A detailed analysis of potential construction effects would be undertaken in Tier II.

TRUCK FERRY ALTERNATIVE

Operational

Land Use and Social Conditions

As discussed in Chapter 6.1, the Truck Ferry Alternative is not expected to result in substantial changes to land use. Each terminus of this alternative would be located in established industrial areas that can accommodate terminal facilities needed to support this alternative. Land acquisition and the resultant potential for direct effects to land use may occur if existing facilities have to be transformed from their current or future uses or expanded to accommodate the infrastructure required for this alternative. The effects of establishing or expanding the freight handling facilities required for this alternative are discussed for each alternative throughout the various components of Chapter 6.

As described in Chapter 5, this alternative would result in a modest diversion of truck traffic and is not expected to induce development near its facilities or result in associated indirect impacts.

Traffic and Related Effects

As with the Enhanced Float Alternative, the Truck Ferry Alternative would increase the number of trucks locally, around the facilities required to support this alternative (see Figure 5-10). The resultant potential noise and vibration and air quality effects of these increases are discussed in Chapters 6.7 and 6.6, respectively.

Because this alternative is not expected to induce substantial economic development, no associated indirect impacts, related to traffic, noise, and air quality, would be expected at this time.

Construction

As with the Enhanced Railcar Float Alternative above, the construction of this alternative would stimulate activity in local suppliers and the increased output, employment, and income to these businesses would be considered an indirect benefit from the construction of this and other Build Alternatives.

While there may be some temporary impacts that may result from the construction of this alternative, they would be limited to existing freight handling facilities (i.e., buffered from nearby commercial or residential land uses) and limited in duration, and therefore would not affect the character of surrounding communities. A detailed analysis of potential construction effects would be undertaken in Tier II.

TRUCK FLOAT ALTERNATIVE

Operational

Land Use and Social Conditions

As discussed in Chapter 6.1, potential effects of the Truck Float Alternative are nearly identical to the Truck Ferry Alternative. As discussed in Chapter 6.1, the Truck Float Alternative is not expected to result in substantial changes to land use. Each terminus of this alternative would be located in established industrial areas that can accommodate terminal facilities needed to support this alternative. Land acquisition and the resultant potential for direct effects to land use may occur if existing facilities have to be transformed from their current or future uses or expanded to accommodate the infrastructure required for this alternative. The effects of establishing or expanding the freight handling facilities required for this alternative are discussed for each alternative throughout the various components of Chapter 6.

As described in Chapter 5, this alternative would result in a modest diversion of truck traffic and is not expected to induce development near its facilities or result in associated indirect impacts.

Traffic and Related Effects

As with the Enhanced Float Alternative, the Truck Float Alternative would increase the number of trucks locally around the facilities required to support this alternative (see Figure 5-10). The resultant potential noise and vibration and air quality effects of these increases are discussed in Chapters 6.7 and 6.6, respectively.

Because this alternative is not expected to induce substantial economic development, no associated indirect impacts, related to traffic, noise, and air quality, would be expected at this time.

Construction

As with the Enhanced Railcar Float Alternative above, the construction of this alternative would stimulate activity in local suppliers and the increased output, employment, and income to these businesses would be considered an indirect benefit from the construction of this and other Build Alternatives.

While there may be some temporary impacts that may result from the construction of this alternative, they would be limited to existing freight handling facilities (i.e., buffered from nearby commercial or residential land uses) and limited in duration, and therefore would not affect the character of surrounding communities. A detailed analysis of potential construction effects would be undertaken in Tier II.

LIFT ON-LIFT OFF (LOLO) CONTAINER BARGE ALTERNATIVE

Operational

Land Use and Social Conditions

As discussed in Chapter 6.1, much like the Truck Ferry and Truck Float Alternatives, this alternative is not expected to result in substantial changes to land use. Each terminus of this alternative would be located in established industrial areas that can accommodate terminal facilities needed to support this alternative. Direct effects to land use may occur if existing facilities have to be transformed from their current or future uses or expanded to accommodate the infrastructure required for this alternative. However, because detailed engineering of the project's potential facilities is not available in Tier I, a determination of any potential displacement impacts would be undertaken in subsequent Tier II review, when the facility expansion boundaries are better defined.

The LOLO Container Barge Alternative has some, although limited, potential to induce development near these facilities. This development would be related to processing (i.e., breaking down) the containerized cargo that would be transferred by this alternative and associated warehousing requirements. Any such development would be clustered around the alternative's termini to take advantage of proximity to the termini and existing industrial and commercial properties. Therefore, these new uses would be consistent with the overall land use and zoning of the area would not result in any effects to neighborhood character.

Traffic and Related Effects

As with other Waterborne Alternatives, this alternative would increase the number of trucks locally, around the facilities required to support this alternative (see Figure 5-11); however the increase would be limited, as compared to the other Waterborne Alternatives. The resultant potential noise and vibration and air quality effects of these increases are discussed in Chapters 6.7 and 6.6, respectively.

While this alternative is expected to be accommodated within or near existing freight handling facilities, some induced growth may result from the establishment of facilities to process containerized cargo. Increased traffic from and to these facilities may result in indirect noise and air quality impacts.

Construction

As with other Waterborne Alternatives, the construction of this alternative would stimulate activity in local suppliers and the increased output, employment, and income to these businesses would be considered an indirect benefit from the construction of this and other Build Alternatives. While there may be some temporary impacts that may result from the construction of this alternative (as discussed in the various components of Chapter 6), the construction of this alternative would not be prolonged enough to result in secondary land use and neighborhood character effects. A detailed analysis of potential construction effects would be undertaken in any future Tier II documentation.

ROLL ON-ROLL OFF (RORO) CONTAINER BARGE ALTERNATIVE

Operational

Land Use and Social Conditions

As discussed in Chapter 6.1, potential land use-related effects of the RORO Container Barge Alternative would be identical to the LOLO Container Barge Alternative.

As with the LOLO Container Barge Alternative, this alternative has some, although limited, potential to induce development near these facilities. This development would be related to processing (i.e., breaking down) the containerized cargo that would be transferred by this alternative and associated warehousing requirements. Any such development would be clustered around the alternative's termini to take advantage of proximity to the termini and existing industrial and commercial properties. Therefore, these new uses would be consistent with the overall land use and zoning of the area would not result in any effects to neighborhood character.

Traffic and Related Effects

As with other Waterborne Alternatives, this alternative would increase the number of trucks locally around the facilities required to support this alternative (see Figure 5-11); however the increase would be limited, as compared to the other Waterborne Alternatives. The resultant potential noise and vibration and air quality effects of these increases are discussed in Chapters 6.7 and 6.6, respectively.

While this alternative is expected to be accommodated within or near existing freight handling facilities, some induced growth may result from the establishment of facilities to process containerized cargo. Increased traffic from and to these facilities may result in indirect noise and air quality impacts.

Construction

As with other Waterborne Alternatives, the construction of this alternative would stimulate activity in local suppliers and the increased output, employment, and income to these businesses would be considered an indirect benefit from the construction of this and other Build Alternatives. While there may be some temporary impacts that may result from the construction of this alternative (as discussed in the various components of Chapter 6), the construction of this alternative would not be prolonged enough to result in secondary land use and neighborhood character effects. A detailed analysis of potential construction effects would be undertaken in Tier II.

RAIL TUNNEL ALTERNATIVES

RAIL TUNNEL ALTERNATIVE

Operational

Land Use and Social Conditions

As described in Chapter 6.1, land acquisition and the resultant potential for direct effects to land use are expected at Oak Island Yard, East New York, Fresh Pond Yard, 65th Street Yard, 51st Street Yard, Oak Point Yard, and Maspeth. For this and all other Rail Tunnel Alternatives, the tunnel portals would be in Greenville Yard and along the Bay Ridge Branch, as described in Chapter 4. Direct effects from land acquisition may include displacement of existing businesses and employees; however, because detailed engineering of the project's potential facilities is not available in Tier I, a determination of displacement impacts would be undertaken in subsequent Tier II review, when the facility expansion boundaries are better defined.

The effects of establishing these freight handling facilities or expanding new facilities are discussed for each alternative throughout the various components of Chapter 6 and would be similar to the Enhanced Railcar Float Alternative, in terms of the kind of effects than may be expected. This and other Build Alternatives would involve the expansion of existing facilities and/or reactivation of existing alignments (e.g., the Bay Ridge Branch), and therefore potential indirect effects would be limited. Most of the freight facilities proposed under this Build Alternative are located in industrial areas or in areas where railroad uses have existed historically.

Therefore, as with the Enhanced Railcar Float Alternative, these facilities would continue to function as rail and freight-handling facilities and consequently no indirect changes to land use patterns or development trends (and resultant effects to neighborhood character) would be expected, with the exception of East New York.

As discussed in Chapter 6.1, while a filet/toupee facility to handle double-stacked containers are under this alternative would likely be established in Oak Island Yard, the facility may also be established in East New York, which would require the expansion of the East New York site outside of the existing right-of-way, either to the west or to the east of the existing right-of way. While the expansion would comprise existing industrial facilities—e.g., metal scrap yards and automotive facilities, parking, and vacant lots—these industrial uses currently act as a buffer between the Bay Ridge Branch right-of-way and residential uses along Junius Street to the west and Snediker Avenue to the east. As discussed in Chapter 6.1, while the expanded facility would install appropriate fencing and employ appropriate measures to minimize any noise, air quality, or visual impacts, such proximity may affect marketability and enjoyment of residential properties, and the potential noise or air quality effects associated with yard activity may affect residences, businesses and community facilities and result in a change in neighborhood character. Furthermore, if the design of this facility would require the closure of some west-east streets in the area, the resulting dead-end streets may also affect movement through the neighborhood and therefore neighborhood character.

In terms of the growth-inducing aspects of this alternative, as with the Enhanced Railcar Float Alternative, areas near proposed facilities in Brooklyn and Queens may attract new activity in warehousing and distribution and may create local jobs in the vicinity of the freight handling facilities. The magnitude of this induced growth would be greater with this and other Rail Tunnel Alternatives than the Waterborne Alternatives, since these alternatives would attract more demand for freight handling. The jobs related to this induced growth would be concentrated near the proposed freight handling facilities. Most of the development induced by this and other alternatives (e.g., new or expanded warehouse space, supporting businesses such as restaurants to serve workers, etc.) would be located near proposed facilities for this alternative, such as Maspeth Yard, to take advantage of proximity to these facilities. Therefore, these new uses would be consistent with the overall land use and zoning of the area would not result in any adverse effects to neighborhood character. In East New York, induced industrial development may result in an overall indirect benefit to the surrounding community due to the development of underutilized and vacant industrial properties in the area.

Traffic and Related Effects

As noted in Chapter 5, the Rail Tunnel Alternative would increase the number of trucks locally (around the facilities required to support this alternative) and on the regional highway network, as well as increase the number of trains traveling on the Bay Ridge Branch and other rail segments in the study area (see Figure 5-12). The resultant potential noise and vibration and air quality effects of these increases are discussed in Chapters 6.7 and 6.6 respectively.

As with the Enhanced Railcar Float Alternative, the aforementioned induced development could result in additional indirect environmental effects—including local increases in traffic, noise levels, and air emissions—not directly accounted for in the technical analyses of this EIS. However, quantifying specific environmental impacts related to induced development would be speculative and imprecise at this point in the tiered EIS process. Furthermore since the induced business growth would develop over time, any potential effects would be spread out as well.

Subsequent Tier II investigations will provide a more in depth analysis to determine any adverse effects from the growth that may be induced by this alternative.

Construction

The construction of this and other Build Alternatives would affect the regional economy by employing workers in the construction industry and procuring supplies and services from regional businesses. Increased demand of certain key construction materials (e.g., concrete) would stimulate activity in local suppliers and the increased output, employment, and income to these businesses would be considered an indirect benefit from the construction of this and other Build Alternatives.

The construction activities required to establish or expand the facilities required for this alternative would take place in existing industrial areas and would be substantially buffered from commercial and residential areas. The most intense construction activities associated with this and other Rail Tunnel Alternatives would be at the tunnel shaft sites, at Greenville Yard for the west-of-Hudson portal and at approximately 8th/9th Avenue in Brooklyn, along the Bay Ridge Branch. While there may be some temporary impacts that may result from the construction of this alternative (as discussed in the various components of Chapter 6), with the level of detail available in the Tier I EIS, the EIS determines at this time that the construction of this alternative would not be prolonged enough to result in secondary land use and neighborhood character effects such as residential or commercial disinvestment. A detailed analysis of potential construction effects would be undertaken in Tier II.

RAIL TUNNEL WITH SHUTTLE SERVICE ALTERNATIVE

Operational

Land Use and Social Conditions

In addition to potential impacts described in Chapter 6.1, for the Rail Tunnel Alternative, this alternative would utilize Maspeth Yard for the transfer of intermodal freight and as an eastern terminus for the shuttle service. The Rail Tunnel with Shuttle Service Alternative provides a service option for the Rail Tunnel Alternative, therefore land acquisition requirements are similar, except that Maspeth Yard, would be expanded by an additional 10 acres. The effects of establishing the freight handling facilities or expanding new facilities for this alternative would also be similar to the Rail Tunnel Alternative. New and expanded facilities would continue to function as rail and freight-handling facilities and consequently no indirect changes to land use patterns or development trends (and resultant effects to neighborhood character) would be expected, with the exception of East New York, as described above under the Rail Tunnel Alternative.

In terms of the growth-inducing aspects of this alternative, this alternative may also attract new activity in warehousing and distribution and may create local jobs in the vicinity of the freight handling facilities. Since the Rail Tunnel with Shuttle Alternative would result in a diversion of short-haul truck traffic (in addition to the diversion potential for the Rail Tunnel Alternative), it may result in the growth of additional facilities around its terminus in Maspeth, however, overall this alternative's potential for inducing growth (and resultant effects) is similar to the Rail Tunnel Alternative. Any new uses would be consistent with the overall land use and zoning of the area would not result in any adverse effects to neighborhood character, except as discussed above for East New York.

Traffic and Related Effects

As noted in Chapter 5, this Rail Tunnel Alternative would increase the number of trucks locally (around the facilities required to support this alternative) and on the regional highway network, as well as increase the number of trains traveling on the Bay Ridge Branch and other rail segments in the study area (see Figure 5-13). The resultant potential noise and vibration and air quality effects of these increases are discussed in Chapters 6.7, "Noise," and 6.6, "Air Quality," respectively.

As with many of the Build Alternatives, the aforementioned induced development could result in additional indirect environmental effects—including local increases in traffic, noise levels, and air emissions—not directly accounted for in the technical analyses of this EIS. However, quantifying specific environmental impacts related to induced development would be speculative and imprecise at this point in the tiered EIS process. Furthermore since the induced business growth would develop over time, any potential effects would be spread out as well. Subsequent Tier II investigations will provide a more in depth analysis to determine any adverse effects from the growth that may be induced by this alternative.

Construction

The construction of this and other Build Alternatives would affect the regional economy by employing workers in the construction industry and procuring supplies and services from regional businesses. Increased demand of certain key construction materials (e.g., concrete) would stimulate activity in local suppliers and the increased output, employment, and income to these businesses would be considered an indirect benefit from the construction of this and other Build Alternatives.

The construction activities required to establish or expand the facilities required for this alternative are nearly identical to the Rail Tunnel Alternative, in that they would take place in existing industrial areas and would be substantially buffered from commercial and residential areas. The most intense construction activities associated with this and other Rail Tunnel Alternatives would be at the tunnel shaft sites, as discussed above. While there may be some temporary impacts that may result from the construction of this alternative (as discussed in the various components of Chapter 6), the construction of this alternative would not be prolonged enough to result in secondary land use and neighborhood character effects such as residential or commercial disinvestment. A detailed analysis of potential construction effects would be undertaken in Tier II.

RAIL TUNNEL WITH CHUNNEL SERVICE ALTERNATIVE

Operational

Land Use and Social Conditions

In addition to potential impacts described in Chapter 6.1, for the Rail Tunnel Alternative, this alternative would also utilize Oak Island Yard as the western terminus and East New York the eastern terminus for the chunnel service. The Rail Tunnel with Chunnel Service Alternative provides a service option for the Rail Tunnel Alternative; therefore, land acquisition requirements are similar, except that Oak Island Yard would be expanded by an additional 20 acres. The effects of establishing the freight handling facilities or expanding new facilities for this alternative would also be similar to the Rail Tunnel Alternative. New and expanded facilities would continue to function as rail and freight-handling facilities and consequently no indirect changes to land use patterns or development trends (and resultant effects to neighborhood character) would be expected, with the exception of East New York, as described above under the Rail Tunnel Alternative. Neighborhood character effects at East New York would be more pronounced with this alternative since trucks using the chunnel service would exit and enter the Bay Ridge Branch

right-of-way under this alternative and travel through the surrounding neighborhood to access Linden Avenue.

In terms of the growth-inducing aspects of this alternative, this alternative may also attract new activity in warehousing and distribution and may create local jobs in the vicinity of the freight handling facilities. The Rail Tunnel with Chunnel Service Alternative would result in a larger diversion of short-haul truck traffic than the Rail Tunnel with Shuttle Service—approximately 2.4 million more tons per year than the Rail Tunnel Alternative (see Table 5-4). Therefore, this alternative may result in the growth of additional facilities around its termini to serve this short-haul traffic. However, overall this alternative's potential for inducing growth (and resultant effects) is similar to the Rail Tunnel Alternative in that any new uses would be consistent with the overall land use and zoning of the area would not result in any adverse effects to neighborhood character, except as discussed above for East New York. As with the Rail Tunnel Alternative, induced industrial development in East New York may actually result in an overall indirect benefit to the surrounding community due to the development of underutilized and vacant industrial properties in the area.

Traffic and Related Effects

As noted in Chapter 5, this Rail Tunnel Alternative would increase the number of trucks locally (around the facilities required to support this alternative) and on the regional highway network, as well as increase the number of trains traveling on the Bay Ridge Branch and other rail segments in the study area (see Figure 5-14). These increases would be even more pronounced than the Rail Tunnel and Rail Tunnel with Shuttle Service Alternatives. The resultant potential noise and vibration and air quality effects of these increases are discussed in Chapters 6.7 and 6.6, respectively.

As with many of the Build Alternatives, the aforementioned induced development could result in additional indirect environmental effects—including local increases in traffic, noise levels, and air emissions—not directly accounted for in the technical analyses of this EIS. As noted above, quantifying specific environmental impacts related to induced development would be speculative and imprecise at this point in the tiered EIS process. Furthermore since the induced business growth would develop over time, any potential effects would be spread out as well. Subsequent Tier II investigations will provide a more in depth analysis to determine any adverse effects from the growth that may be induced by this alternative.

Construction

The construction of this and other Build Alternatives would affect the regional economy by employing workers in the construction industry and procuring supplies and services from regional businesses. Increased demand of certain key construction materials (e.g., concrete) would stimulate activity in local suppliers and the increased output, employment, and income to these businesses would be considered an indirect benefit from the construction of this and other Build Alternatives.

The construction activities required to establish or expand the facilities required for this alternative are nearly identical to the Rail Tunnel Alternative, in that they would take place in existing industrial areas and would be substantially buffered from commercial and residential areas. Construction of the East New York facility under this alternative may be more intense than with the other Rail Tunnel Alternatives due to the construction of the truck access and egress from the Bay Ridge Branch right-of-way. While there may be some temporary impacts that may result from the construction of this alternative (as discussed in the various components of Chapter 6,

"Environmental Effects"), with the design information available at this time, the Tier I EIS determines that the construction of this alternative would not be prolonged enough to result in secondary land use and neighborhood character effects such as residential or commercial disinvestment. A detailed analysis of potential construction effects would be undertaken in Tier II.

RAIL TUNNEL WITH AUTOMATED GUIDED VEHICLE (AGV) TECHNOLOGY SERVICE ALTERNATIVE

Operational

Land Use and Social Conditions

As described in Chapter 4, the Rail Tunnel with AGV Technology Alternative would utilize Greenville Yard as the western terminus for the alternative (as a tunnel portal and as an AGV operating area) and new facility at East New York Yard as the eastern terminus, and therefore the land acquisition required for this alternative is similar to the Rail Tunnel with Chunnel Service Alternative described above. The effects of establishing the freight handling facilities or expanding new facilities for this alternative would also be similar. New and expanded facilities would continue to function as rail and freight-handling facilities and consequently no indirect changes to land use patterns or development trends (and resultant effects to neighborhood character) would be expected, with the exception of East New York, as described above under the Rail Tunnel Alternative. Neighborhood character effects at East New York would be similar to those described under the Rail Tunnel Alternative.

The ability of this alternative to induce economic development would be similar to the Rail Tunnel with Shuttle Service Alternative since the two alternatives would result in similar freight diversions (see Table 5-4). As with the other Build Alternatives, this alternative may also attract new activity in warehousing and distribution and may create local jobs in the vicinity of the freight handling facilities. Any new uses would be consistent with the overall land use and zoning of the area and would not result in any adverse effects to neighborhood character, except as discussed above for East New York. As with the Rail Tunnel Alternative, induced industrial development in East New York may actually result in an overall indirect benefit to the surrounding community due to the development of underutilized and vacant industrial properties in the area.

Traffic and Related Effects

As noted in Chapter 5, "this Rail Tunnel Alternative would increase the number of trucks locally (around the facilities required to support this alternative) and on the regional highway network, as well as increase the number of trains traveling on the Bay Ridge Branch and other rail segments in the study area (see Figure 5-15). The resultant potential noise and vibration and air quality effects of these increases are discussed in Chapters 6.7, "Noise," and 6.6, "Air Quality," respectively.

As with many of the Build Alternatives, the aforementioned induced development could result in additional indirect environmental effects—including local increases in traffic, noise levels, and air emissions—not directly accounted for in the technical analyses of this EIS. As noted above, quantifying specific environmental impacts related to induced development would be speculative and imprecise at this point in the tiered EIS process. Furthermore since the induced business growth would develop over time, any potential effects would be spread out as well. Subsequent Tier II investigations will provide a more in depth analysis to determine any adverse effects from the growth that may be induced by this alternative.

Construction

The construction of this and other Build Alternatives would affect the regional economy by employing workers in the construction industry and procuring supplies and services from regional businesses. Increased demand of certain key construction materials (e.g., concrete) would stimulate activity in local suppliers and the increased output, employment, and income to these businesses would be considered an indirect benefit from the construction of this and other Build Alternatives.

The construction activities required to establish or expand the facilities required for this alternative are nearly identical to the Rail Tunnel Alternative, in that they would take place in existing industrial areas and would be substantially buffered from commercial and residential areas. While there may be some temporary impacts that may result from the construction of this alternative (as discussed in the various components of Chapter 6, "Environmental Effects"), with the design information available at this time, the Tier I EIS determines that the construction of this alternative would not be prolonged enough to result in secondary land use and neighborhood character effects such as residential or commercial disinvestment. A detailed analysis of potential construction effects would be undertaken in Tier II.

RAIL TUNNEL WITH TRUCK ACCESS ALTERNATIVE

Operational

Land Use and Social Conditions

The effects of establishing the freight handling facilities or expanding new facilities for this alternative would also be similar to all other Rail Tunnel Alternatives. New and expanded facilities would continue to function as rail and freight-handling facilities and consequently no indirect changes to land use patterns or development trends (and resultant effects to neighborhood character) would be expected, with the exception of East New York, similar to what is described above under the Rail Tunnel Alternative. Neighborhood character effects at East New York would be the most pronounced under this alternative since trucks would exit and enter the Bay Ridge Branch right-of-way under this alternative to connect to Linden Boulevard (see Chapter 4, "Alternatives").

In terms of the growth-inducing aspects of this alternative, this alternative may also attract new activity in warehousing and distribution and may create local jobs in the vicinity of the freight handling facilities, as with the other Rail Tunnel Alternatives. Any new uses would be consistent with the overall land use and zoning of the area and would not result in any adverse effects to neighborhood character, except as discussed above for East New York. As with the Rail Tunnel Alternative, induced industrial development in East New York may actually result in an overall indirect benefit to the surrounding community due to the development of underutilized and vacant industrial properties in the area.

Traffic and Related Effects

As noted in Chapter 5, "Transportation," this Rail Tunnel with Truck Access Alternative would increase the number of trucks locally (around the facilities required to support this alternative) and on the regional highway network, as well as increase the number of trains traveling on the Bay Ridge Branch and other rail segments in the study area (see Figure 5-16). These increases would be pronounced for this alternative, particularly in East New York where nearly 5,400 trucks would enter and exit the Bay Ridge Branch right-of-way each day as a result of this alternative. The resultant potential noise and vibration and air quality effects of these increases are discussed in Chapters 6.7, "Noise," and 6.6, "Air Quality," respectively.

As with many of the Build Alternatives, the aforementioned induced development could result in additional indirect environmental effects—including local increases in traffic, noise levels, and air emissions—not directly accounted for in the technical analyses of this EIS. As noted above, quantifying specific environmental impacts related to induced development would be speculative and imprecise at this point in the tiered EIS process. Furthermore since the induced business growth would develop over time, any potential effects would be spread out as well. Subsequent Tier II investigations will provide a more in depth analysis to determine any adverse effects from the growth that may be induced by this alternative.

Construction

The construction of this and other Build Alternatives would affect the regional economy by employing workers in the construction industry and procuring supplies and services from regional businesses. Increased demand of certain key construction materials (e.g., concrete) would stimulate activity in local suppliers and the increased output, employment, and income to these businesses would be considered an indirect benefit from the construction of this and other Build Alternatives.

The construction activities required to establish or expand the facilities required for this alternative are nearly identical to the Rail Tunnel Alternative, in that they would take place in existing industrial areas and would be substantially buffered from commercial and residential areas. Construction of the East New York facility under this alternative may be more intense than with the other Rail Tunnel Alternatives due to the construction of the truck access and egress from the Bay Ridge Branch right-of-way. While there may be some temporary impacts that may result from the construction of this alternative (as discussed in the various components of Chapter 6, "Environmental Effects"), with the design information available at this time, the Tier I EIS determines that the construction of this alternative would not be prolonged enough to result in secondary land use and neighborhood character effects such as residential or commercial disinvestment. A detailed analysis of potential construction effects would be undertaken in Tier II.

D. POTENTIAL CUMULATIVE EFFECTS OF THE PROJECT ALTERNATIVES

Following CEQ guidance, an analysis of cumulative impacts considers what resources could be affected by the proposed project cumulatively (i.e., in combination with other foreseeable actions). This Tier I analysis considers the effects of each alternative in combination with other infrastructure projects that already exist or have been committed to within regional transportation plans, agency capital plans, or those projects that are otherwise likely to be implemented by public or private investment (also referred to as planned projects and reasonably foreseeable projects). This list of projects, generally considered to be part of the No Action alternative, was initially compiled in 2009 and published with the project's Draft Scope of Work in 2010. These projects comprised a list of rail projects in New York and New Jersey, highway and bridge projects in New York, and some projects related to the Port of New York and New Jersey. As the definition of the project alternatives, Tier I EIS methodology, and PANYNJ long term planning goals has been refined throughout the environmental review process, certain planned projects and reasonable foreseeable actions have begun to emerge as having the most potential to result in cumulative impacts when taken in combination with the CHFP. The operational and construction impacts (or lack thereof) of the CHFP in combination with these projects are described below.

Cumulative impacts may vary in scope and intensity. Certain projects, such as other PANYNJ projects in the harbor, may result in regional cumulative impacts; others may result in local cumulative impacts from construction traffic or noise, particularly near the existing or proposed rail yards.

OPERATIONAL EFFECTS

- **Greenville Yard Master Plan** – In the past few years, PANYNJ has begun planning for the redevelopment of Greenville Yard into several adjacent but independent multi-modal freight facilities. As mentioned under the No Action Alternative, one of these facilities is the New York New Jersey Rail (NYNJR) railcar float operation which will be upgraded to a modern operating standard and will serve as the basis for the Enhanced Railcar Float Alternative. NYNJR will be located adjacent to an Intermodal Container Transfer Facility on the Greenville peninsula, to be built in support of the nearby Global Marine Container Terminal, which will transfer international shipping containers from truck to rail. An existing tenant in the area, a Tropicana orange juice distribution facility, will remain to the north of the NYNJR operation. Greenville Yard is also a proposed site for a containerized municipal solid waste (CMSW) transloading facility, which would transfer New York City CMSW in sealed containers arriving at Greenville by barge directly onto rail cars for shipment of the waste to landfills.

  All of the components of the Greenville Yard Master Plan, together with the CMSW transloading facility if it is built, will use the same rail infrastructure: the Conrail A Yard, Lehigh Valley Railroad Bridge, and the National Docks Secondary line. The activation of the components of the Greenville Yard Master Plan would substantially increase rail traffic through the aforementioned rail facilities, with associated cumulative effects to local air quality and from increased noise.

- **Global Marine Terminal** – Global Marine Terminal has several expansion measures under way, including automation of the container cranes, addition of 900 feet of dock, and an increase of the terminal's acreage from 98 to 170 acres. Increased traffic from this expanded facility may result in cumulative traffic, air quality, and/or noise effects in the local study area.
- **65th Street Yard** – PANYNJ is working with the New York City Economic Development Corporation and the Norfolk Southern Corporation (NS) to develop an operating agreement for a transloading facility on the northern portion of 65th Street Yard. Cumulative traffic from both facilities may result in air quality and/or noise effects in the local study area.

CONSTRUCTION PERIOD EFFECTS

Cumulative construction effects from the proposed project may occur when the construction of the project alternatives would overlap with other large infrastructure projects in New York or New Jersey. Because the construction of the project alternatives would not begin for 5 to 10 years, this Tier I EIS cannot fully evaluate potential cumulative effects beyond effects related to projects known to occur within the next few years. Furthermore, detailed designs available during any subsequent Tier II evaluations would include staging plans, schedules, equipment and materials estimates (i.e., components of project design that would be necessary for a full evaluation of cumulative construction effects).

Table 7-1 below illustrates the summary of potential operational and cumulative effects, as well as summarizing direct adverse effects discussed throughout the Tier I EIS. Cumulative effects would be evaluated to a greater level of detail for any and all alternatives carried forward into Tier II.

Table 7-1
Summary of Potential Cumulative Effects

Resources	Potential Adverse Effects[1]	Potential Adverse Cumulative Effects
Transportation	Local traffic impacts near existing and proposed rail facilities; potential impacts near Rail Tunnel with Chunnel Service Alternative and Rail Tunnel with Truck Access alignment access points.	Construction and operational truck traffic effects. Operational effects on National Docks Secondary and other rail facilities in the vicinity of Greenville Yard.
Land Use	Property acquisition for yard expansion, particularly in East New York.	No cumulative effects known at this time. No known additional public or private actions are proposed that would add to proposed property acquisition.
Economic Conditions	Displacement and relocation of businesses due to the expansion of project facilities.	No cumulative effects known at this time. No known additional public or private actions are proposed that would add to displacement and relocation effects.
Cultural Resources	Indirect adverse operational effects from rail traffic due to increased noise and vibration along several architectural APEs. Potential effects to Morris Canal in the New Jersey.	No cumulative effects known at this time.
Visual and Aesthetic Resources	No potential adverse effects determined in Tier I.	No cumulative effects known at this time.
Air Quality	Potential effects determined in Tier I EIS to be unlikely. More detailed and updated analysis of emissions from the yards that are very close to sensitive uses would be needed in any Tier II documentation.	Potential local cumulative effects during construction and operations.
Energy and Climate Change	No adverse effects. Increase in local emissions is offset by regional reductions.	No cumulative effects known at this time.
Noise	Moderate to severe impacts in certain locations along the alignment.	Potential local cumulative effects during construction and operations.
Natural Resources	No potential adverse effects determined in Tier I.	Potential cumulative effects from construction on aquatic resources.
Water Resources	No potential adverse effects determined in Tier I.	No cumulative effects known at this time.
Hazardous Materials	No potential adverse effects determined in Tier I.	No cumulative effects known at this time.
Environmental Justice	No potential adverse effects determined in Tier I.	No cumulative effects known at this time.
Coastal Zone Management	No potential adverse effects determined in Tier I.	No cumulative effects known at this time.

Notes: [1] Technical analyses and potential adverse effects are presented in greater detail in each of the EIS chapters.

- **Harbor Deepening Project** – PANYNJ is working with the U.S. Army Corps of Engineers (USACE) to deepen the harbor to accommodate larger, deeper-draft vessels. The project consists of deepening channels in New York Harbor to the 50-foot depth necessary to accept Panamax and Post-Panamax ships. Dredging for most harbor channels has been completed; the Arthur Kill channel will be completed by late 2014. Therefore, Harbor Deepening Project will not result in cumulative construction impacts when taken in combination with the CHFP construction in the harbor.
- **Tappan Zee Hudson River Crossing Project** – The Tappan Zee Bridge Replacement Project will result in a new bridge crossing of the Hudson River between Rockland and Westchester Counties, consisting of two parallel structures to the north of the existing bridge. To conform to highway design standards, including widths and grades, the Replacement Bridge Alternative would result in new structures and modifications to Interstate 87/287 between South Broadway in Nyack and Interchange 9 (Route 9) in Tarrytown. The 2012 FEIS determined that upland construction-related impacts are specific to localized effects at staging sites and along this portion of the existing highway; therefore construction period traffic cumulative impacts on regional highways would not be expected. The construction of the replacement bridge will involve dredging the Hudson River near the Tappan Zee Bridge; however, the

dredging program for that project is currently taking place and would not overlap with the construction of any CHFP alternatives.

- **Bayonne Bridge Navigational Clearance Program** – The Bayonne Bridge spans Kill Van Kull between Bayonne and Staten Island. The 151-foot air draft restriction posed by the air deck of the bridge is an obstacle for larger ships accessing marine terminals west of the bridge at Port Newark and Port Elizabeth in New Jersey and at Howland Hook on Staten Island. Ships accessing the port currently already experience the clearance restriction; in the future even larger ships will be prevented from calling the port after the expansion of the Panama Canal in 2015. PANYNJ's preferred alternative to resolving the clearance restriction, the "Raise the Roadway Alternative," will raise the bridge's roadway by 64 feet to 215 feet overall. This portion of the project, resolving the clearance restriction, will be completed in time for the expanded Panama Canal in late 2015. Therefore, in the near term, any construction related impacts related to the CHFP are not expected to overlap with the construction of Bayonne Bridge.
- **New Jersey Turnpike Interchange 14A and Newark Bay-Hudson County Bridge** – Interchange 14A of Route 440 in Bayonne will be reconstructed and enlarged. The interchange connects to the Newark Bay-Hudson County Bridge, whose deck will be replaced in two phases. Phase One has been completed; Phase Two will be completed by 2015. If implemented, Phase Three would include replacement of the ramps to the bridge between 2016 and 2017. While construction will be performed in stages and during off-peak hours to maintain existing traffic lanes through the construction work zone, cumulative construction impacts may result from this project and the construction of the project alternatives at Greenville Yard.
- **Goethals Bridge** – PANYNJ is replacing the Goethals Bridge, which links Staten Island to Elizabeth, New Jersey. A Final EIS and Record of Decision were completed and plans for the project were approved in January 2011. PANYNJ has indicated that the project will be completed by 2017. The Environmental Impact Statement completed for the project identified no substantial adverse impacts from project construction. According to PANYNJ, construction will involve minimal delays and closures, most of which will occur during the transition from the existing bridge to the new bridge. Therefore this project is not expected to result in cumulative construction impacts in combination with the CHFP.
- **Kosciuszko Bridge –** The Kosciuszko Bridge spans Newtown Creek between Brooklyn and Queens and carries the Brooklyn-Queens Expressway (I-278). The New York State Department of Transportation published a Final Environmental Impact Statement in December of 2008, identifying a preferred alternative to replace the bridge. The project is expected to begin construction in 2014. The replacement of the bridge is expected to last approximately 6 years; therefore, it may overlap with the construction of the Waterborne Alternatives, which may be implemented sooner than the Rail Tunnel Alternatives.

E. TIER II ANALYSIS AND POTENTIAL MITIGATION MEASURES

Detailed project designs that would be available during future Tier II environmental review would allow for quantitative analyses of potential cumulative effects. For example, detailed operational design for each alternative would inform traffic studies, which usually incorporate potential cumulative impacts from other projects in the local study area. Detailed traffic studies would in turn allow for micro- and meso-scale air quality impact studies. The aforementioned projects have also undertaken and will undertake their own environmental review, which would be used to guide future cumulative impacts analyses. ✷