EXECUTIVE SUMMARY

ES.1 INTRODUCTION

The following discussion presents a summary of the findings and conclusions of the Draft Environmental Impact Statement (DEIS), which has been prepared to assess the environmental impacts of The Port Authority of New York and New Jersey's (Port Authority) proposed Goethals Bridge Replacement (GBR) Project, also referred to as the "Proposed Project." The DEIS has been prepared to comply with the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended. As the Proposed Project requires a United States Coast Guard (USCG) Bridge Permit for the construction of a bridge across the Arthur Kill, a navigable water of the United States, such action constitutes a major federal action triggering compliance with the requirements of NEPA, with the USCG, part of the Department of Homeland Security (DHS), serving as the lead Federal agency for the NEPA process.

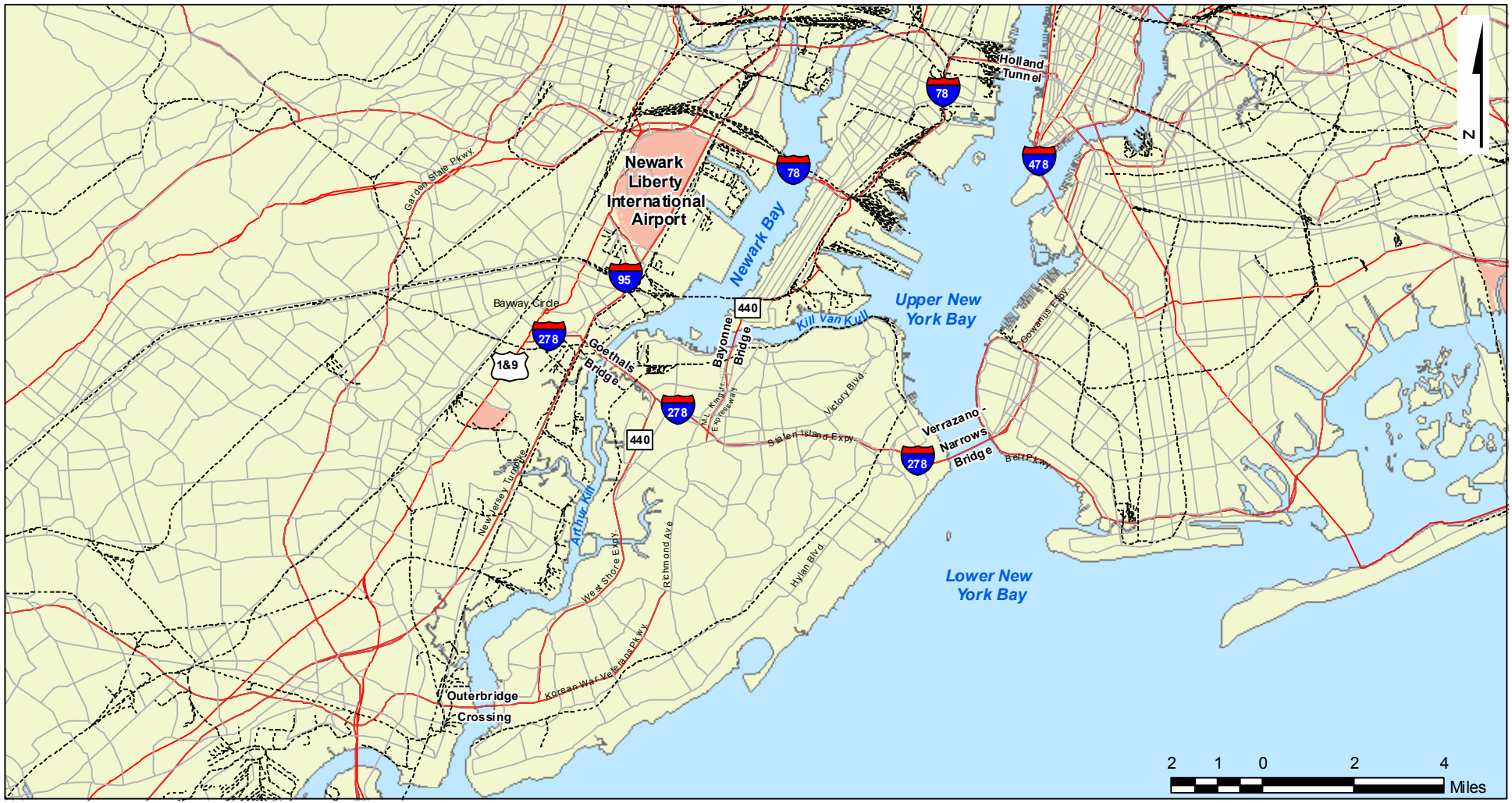
The DEIS examines the proposed transportation improvements associated with replacement of the Goethals Bridge and addresses the social, economic, cultural, environmental and transportation impacts associated with the No-Build Alternative and four Build Alternatives. Since the Proposed Project will involve actions (i.e., changes to the New York City Map and disposition of City-owned land) that require approvals of the City of New York (City) under the City's Uniform Land Use Review Procedure (ULURP), this DEIS has been prepared to also satisfy the requirements set forth under the New York State Environmental Quality Review Act (SEQRA) and the New York City Environmental Quality Review (CEQR).

ES.2 BACKGROUND

The Goethals Bridge provides a direct connection between the Borough of Staten Island, New York and the City of Elizabeth, New Jersey and is a crucial link in the Port Authority's bi-state system of bridges and tunnels, as well as the entire New York / New Jersey metropolitan area's regional highway network. The Goethals Bridge is a primary path of travel that serves as a link along Interstate 278, which begins at U.S. Route 1/9 in Linden, New Jersey and continues across northern Staten Island as the Staten Island Expressway, and then continues into Brooklyn and Queens, before it eventually terminates at I-95 in the Bronx. It also provides a direct connection to the New Jersey Turnpike (Interstate 95) at Interchange 13 in New Jersey and access via I-278 to the West Shore Expressway, the major north-south highway on Staten Island. Figure ES.1-1 depicts the regional location of the Goethals Bridge within the New York / New Jersey metropolitan area.

Built in the 1920s and completed in 1928, the Goethals Bridge was originally designed to accommodate increasing bi-state automobile and truck traffic following World War I. Initially, neither the Goethals Bridge, nor the Outerbridge Crossing, which opened to traffic on the same day in 1928, were heavily used, as they primarily facilitated movements between New Jersey and Staten Island. However, the opening of the Verrazano-Narrows Bridge in 1964 created a highly used travel corridor from New Jersey through Staten Island to Brooklyn, Queens, and the rapidly developing counties of Nassau and Suffolk on Long Island. As a result, the Verrazano-Narrows Bridge led to marked growth in traffic volumes on the Goethals Bridge.

By the mid-1980s, the Port Authority recognized that the bridge had become functionally and physically obsolete as original design features based on codes and standards of the 1920s no longer met current standards. In addition, deteriorated traffic conditions and relatively higher accident levels on the Goethals Bridge in comparison to other Staten Island Bridges were attributed to ever-increasing traffic volumes, and such conditions were projected to continue to worsen in future years. In the early 1990s, the Port Authority undertook an alternatives analysis of potential improvements for the Staten Island Bridges, and an environmental review of the alternatives that appeared to best address identified needs at that time.



Legend

Roads

- Highways
- Secondary Roads
- Airports
- Railroad

Goethals Bridge Replacement EIS

FIGURE ES. 1-1
Regional Location

United States Coast Guard

As a result of those studies, the Port Authority proposed the construction of a parallel bridge operating in conjunction with the existing bridge to enhance the bridge's capacity to meet the future transportation needs of the region as well as the bridge's obsolescence. This proposal became known as the Staten Island Bridges Program – Modernization and Capacity Enhancement Project. A Notice of Intent (NOI) was published in the *Federal Register* by the USCG for a proposed twinning of the Goethals Bridge. Subsequently, a DEIS was completed in 1995 and a Final Environmental Impact Statement (FEIS) was completed in 1997. However, a Record of Decision (ROD) for the project was not issued by the USCG due to various unresolved issues.

Although the project was postponed for several years, the need for modernization of the Goethals Bridge continued. The Port Authority reassessed the condition of the existing Goethals Bridge, its operational constraints and improvement needs. In addition to the various needs that had been identified during the early 1990s, the Port Authority determined that rehabilitation of the existing bridge, which is necessary to enhance structural integrity, would incur increasing life-cycle costs associated with long-term maintenance and repair.

Based on this determination, the Port Authority wished to seek a total replacement of the existing Goethals Bridge in order to best meet the need and associated goals for the bridge modernization. Preliminary discussions with the USCG then led to a USCG determination that a new EIS should be prepared for the Proposed Project. A Notice of Intent (NOI) to prepare an EIS for the proposed replacement of the Goethals Bridge was published in the *Federal Register* on August 10, 2004.

Following issuance of the NOI, the USCG held one agency scoping meeting and two public scoping meetings in the Fall of 2004. These meetings served to initiate the public involvement process for the DEIS by seeking comments on the Proposed Project's purpose and need, the preliminary alternatives and the method for selection of alternatives to be evaluated in the DEIS, the definition of study areas, the technical disciplines and methods addressed in the DEIS, and an overview of the public participation and agency coordination program. Prior to the agency scoping meeting, a Draft Scoping Document was prepared and distributed to federal, state, and local agencies. A Public Scoping Information Packet was also prepared and distributed to public libraries and individuals on a project mailing list prior to the two sets of public scoping meetings.

In addition to the scoping meetings, the USCG conducted a public participation program to further solicit input from the affected agencies as well the general public. The main goals of the program were to establish an ongoing forum of communication with stakeholders, agencies, and the general public; to educate the public on the environmental review process and the role of government, stakeholders, and the general public; and to elicit input regarding the environmental analyses and documentation.

ES.3 PROJECT PURPOSE AND NEED

The importance of the Goethals Bridge within the regional roadway network grew substantially with the opening in 1964 of the Verrazano-Narrows Bridge. The two bridges, connected by the Staten Island Expressway (part of I-278), became elements of an increasingly busy travel corridor between and including New Jersey, Staten Island, and geographic Long Island (i.e., Brooklyn, Queens, and Nassau and Suffolk counties).

The opening of the Verrazano-Narrows Bridge and the resultant rapid population growth on Staten Island had a substantial impact on traffic patterns and volumes across Staten Island. Traffic across the Goethals Bridge increased an average of 33 percent annually between 1964 and 1973. Total weekday peak-period traffic volumes for both directions have increased from 7,100 to 36,600 vehicles between 1964 and 2004.

The ratio of truck traffic to overall traffic also increased as the Goethals Bridge became a critical component in the regional network of expressways. For example, in 1953, trucks represented less than

two percent of all traffic across the bridge, and tractor-trailers constituted only one-tenth of all truck traffic. In contrast, existing (2004) traffic data show the highest truck volumes reaching 15 percent of total traffic in the AM peak hour (i.e., 7:30 - 8:30 AM) in the eastbound direction.

In addition, recent national trends toward increased motor vehicle heights, widths, and lengths, have limited truck movements through the Lincoln and Holland Tunnels (Port Authority, *Interstate Goods Movement Study*, 1992). Post-9/11 restrictions imposed by the Port Authority for purposes of security bans tractor-trailers and larger trucks in classes 4, 5 and 6 (four, five and six-axle trucks) from the Holland Tunnel in both directions and at all times. Due to these various restrictions in the tunnels, the Port Authority's interstate bridges, including the Goethals Bridge, have taken on increased importance as routes for goods movement in the New York/New Jersey metropolitan region.

As traffic volumes have grown, travel conditions have become increasingly congested and traffic flows on the Goethals Bridge have begun to operate below acceptable service levels during peak travel periods.

In the years since the 1997 Staten Island Bridges Program (SIBP) Final Environmental Impact Statement (FEIS), the project purpose and need have evolved, reflecting physical and operational changes to the Goethals Bridge, existing and future transportation needs, and enhanced focus on needs for system redundancy and improved security. The Port Authority also determined that due to the age and condition of the bridge, there is an ongoing need to enhance its structural integrity and to reduce life-cycle costs associated with long-term bridge maintenance, repair and rehabilitation. The Port Authority commenced the Proposed Project to address this expanded purpose and need for modernizing the Goethals Bridge since the SIBP studies, as well as to reassess the operational constraints identified in earlier analyses.

The Proposed Project seeks to provide for a modernized Goethals Bridge crossing that will:

- address design deficiencies that make the existing span functionally obsolete;
- enhance structural integrity and reduce life-cycle cost concerns with the existing bridge;
- provide transportation system redundancy;
- improve traffic service on the bridge and its approaches;
- provide safer operating conditions and reduce accidents on the bridge;
- provide for safe and reliable truck access for regional goods movements; and
- provide for potential future transit in the corridor.

Need to Address Design Deficiencies – As the Goethals Bridge was designed and constructed in the 1920s for narrower vehicles and significantly lower traffic volumes than currently exist, several of the existing bridge's physical features are now functionally obsolete. These deficiencies contribute to the reduction of traffic efficiency, traffic service levels, and safety conditions on the bridge, resulting in diminished traffic performance, driver safety, and heightened operational concerns.

Need to Enhance Structural Integrity and Reduce Life-Cycle Costs – While the existing bridge structure is currently in overall good to satisfactory condition, total expenditures of almost $121 million for maintenance and repairs have been made by the Port Authority to extend the structure's effective life span until 2015. An analysis was also conducted to assess life cycle costs associated with future rehabilitation and maintenance requirements during an additional 100-year service life. These life cycle costs are estimated at approximately $804 million in 2007 dollars, including a major rehabilitation in 2015 at an estimated cost of $276 million for a complete deck replacement with seismic retrofit, security upgrades, and other related repairs in order to keep the bridge in service., These costs would be encountered without the benefit of addressing the bridge's fundamental functional obsolescence and related traffic service, safety, emergency response and system redundancy needs.

Need to Provide Transportation System Redundancy – In the post-9/11 era, operational redundancy of the region's transportation network, including the system of bridges serving Staten Island and providing bi-state access, is a critical need. The increasing recognition of the importance of transportation-system redundancy in the New York/New Jersey metropolitan region reinforces the need for improvements to the existing bridge. It underscores the need for a solution that provides adequate operational flexibility and safe travel conditions in the Goethals Bridge corridor in order to accommodate traffic diverting from other transportation facilities during closure incidents in other corridors.

Need to Improve Traffic Service – Based on a detailed traffic data collection program conducted for the Proposed Project in 2004, current traffic conditions operate at a level of service (LOS) E, which is below the threshold of acceptable traffic conditions. Population and employment forecasts prepared by the New York Metropolitan Transportation Council, the Port Authority, and other entities indicate that the regional economy and population will continue to grow in the foreseeable future, resulting in worsening traffic conditions operating at a LOS F in the AM peak hour and E in the PM peak hour.

The Need to Provide Safer Operating Conditions and Reduce Accidents – An analysis of crash (accident) characteristics and trends for the entire Goethals Bridge structure was conducted for the years 2000 through 2007. During the 8-year period, approximately 55 percent (more than 2,400) of the total crashes recorded for the Port Authority's three Staten Island bridges occurred at the Goethals Bridge. Nearly 85 percent of the crashes occurred in good weather, with dry roadway pavement, which indicates that the crashes were related to Bridge conditions and were not weather-related. The annual crash rate at the Goethals Bridge over the 8-year period was consistently above 2 crashes per million vehicle miles (mvm); in comparison, annual crash rates at the Outerbridge Crossing were all well below 2 per mvm during every year between 2000 and 2007. The higher annual crash rates at the Goethals Bridge may be attributable to the Bridge's steeper grade, sharper geometry, and higher truck volumes than exist at the Outerbridge Crossing.

Need to Provide for Safe and Reliable Truck Access for Regional Goods Movement – The Goethals Bridge serves as a key freight link with several roles: serving Staten Island and nearby New Jersey consumer and business needs; connecting distribution centers in New Jersey with businesses and consumers in Brooklyn, Queens, and the Long Island suburbs; and connecting the New York Container Terminal in Staten Island with the mainland interstate highway system through a direct connection with the New Jersey Turnpike. Significant growth in cargo volume is forecast for the entire Port of New York and New Jersey, including at the New York Container Terminal where the majority of inbound or outbound trucks are using the Goethals Bridge. However, truck traffic on the Goethals Bridge is constrained by its physically obsolete configuration (i.e., narrow lanes, no emergency shoulder, and substandard approach span horizontal curvature). Slow-moving truck traffic further exacerbates inefficient traffic service on the span by affecting passenger vehicle flows, as autos queue behind trucks navigating the narrow lanes. Forecasted increases in truck-based goods movement to/from the New York Container Terminal and within and through the region will be increasingly constrained in the Goethals Bridge corridor.

Need to Provide for Potential Future Transit in the Corridor – The existing configuration of the Goethals Bridge precludes consideration of accommodating a transit system or priority lane treatment for transit/ridesharing vehicles on the structure in the future, should travel patterns and ridership forecasts indicate that these would be feasible transportation options in the Goethals Bridge corridor. The existing structure's overall narrow width and its limited number of lanes for vehicular travel do not provide any excess space that could be dedicated for a transit system. Although the New York/New Jersey region's transit network has grown during the past 10 to 15 years (e.g., implementation of the Hudson-Bergen light-rail transit system in New Jersey) and further transit system improvements have been studied, the constrained design of the existing Goethals Bridge does not offer a viable option to further enhance the region's transit goals.

ES.4 PROJECT DESCRIPTION AND ALTERNATIVES

ES.4.1 SELECTION OF ALTERNATIVES

The project alternatives evaluated in this DEIS were selected through a screening evaluation process designed to systematically consider a wide range of potentially reasonable and feasible options for achieving the project's goals. The alternatives screening comprised two distinct phases of analysis:

1) an initial, qualitative screening of preliminary alternatives; and
2) a comparative, quantitative screening of intermediate alternatives advanced from the initial screening, on the basis of which, project alternatives were selected for detailed evaluation in this DEIS.

A set of preliminary alternatives were identified on the basis of several factors, including: input received during the agency and public scoping process; review of past studies of the Goethals Bridge corridor and the region served by the three Staten Island Bridges; and consideration of projected traffic and transportation conditions in the Goethals Bridge corridor. In addition to a "no-action" alternative, four categories of "build" alternatives were identified in the qualitative screening encompassing New Crossing Alternatives, Transit Alternatives, Travel Demand Management Alternatives, and Freight Management Alternatives. A total of 15 preliminary alternatives were then evaluated against a set of criteria consistent with the project's goals and objectives.

Following completion of the initial screening, the results were presented and discussed at meetings of the Study's Technical Advisory Committee (TAC), Environmental Task Force (ETF), and Stakeholder Committee (SC) in March 2005. With the Goethals Bridge eligible for listing in the National Register of Historic Places, such screening was also conducted in consultation with the respective state historic preservation offices (SHPOs) for the consideration of rehabilitation alternatives and pursuant to Section 106 of the National Historic Preservation Act (NHPA) in order to avoid, minimize, or mitigate potential impacts to historic resources. Based on comments received at the Study committees' meetings and on the screening results, the following four intermediate alternatives were identified for further development and subsequent comparative screening:

- ***6-Lane Bridge Replacement South*** – A new bridge would be designed and constructed south of, and roughly parallel to the existing structure, and the existing Goethals Bridge would be demolished. The new 6-lane bridge would provide: 12-foot-wide lanes, three in each direction; a 12-foot-wide right shoulder and a 5-foot-wide left shoulder in each direction; adequate overall bridge width to accommodate a 10-foot-wide walkway/bikeway and potential transit service.
- ***6-Lane Bridge Replacement North*** – Improvements with this alternative are similar to the 6-Lane Bridge Replacement South, above, but the new bridge would be designed and constructed north of, and roughly parallel to the existing structure.
- ***Twin Replacement Bridges South*** – Two 3-lane replacement bridges would be designed and constructed, one south of, and roughly parallel to the existing structure for eastbound traffic, and the second in the right-of-way of the existing Goethals Bridge for westbound traffic, following demolition of the existing structure. Each of the bridges would provide 12-foot-wide lanes and 12- and 5-foot-wide right and left shoulders, respectively. The westbound bridge would also include a 10-foot-wide walkway/bikeway, and the two bridges would together provide sufficient width to accommodate potential transit service.
- ***Twin Replacement Bridges North*** – This alternative is similar to the Twin Replacement Bridges South, above, but with the first 3-lane bridge north of, and roughly parallel to the existing structure for westbound traffic, and the second in the right-of-way of the existing Goethals Bridge for eastbound traffic, following demolition of the existing structure. The 10-foot-wide walkway/bikeway would be on the eastbound bridge.

These intermediate alternatives were further defined at a concept level of detail sufficient for estimating their relative performance against each of the following comparative screening criteria: :

1) an alternative should enhance mobility on the Goethals Bridge and its approaches in the future analysis year;
2) an alternative should not result in deterioration of traffic conditions at other crossings or in the region in the future analysis year;
3) an alternative should enhance non-single-occupant-vehicle (SOV) commutation opportunities;
4) an alternative should seek to minimize potential adverse environmental effects; and
5) an alternative should be capable of being constructed without extraordinary techniques, with feasible maintenance of existing transportation services during construction, and at reasonable cost comparable to other alternatives with similar benefits.

Based on the results and findings of the comparative screening, it was determined that all four bridge-replacement alternatives be advanced for detailed evaluation in the DEIS. The results of the comparative screening were presented and discussed at meetings of the Study's TAC, ETF, and SC, as well as at two public open-house meetings in June 2006.

ES.4.2 ALTERNATIVES ADVANCED FOR EVALUATION IN THE DEIS

Following completion of the alternatives screening process, input obtained during the agency coordination and public outreach efforts resulted in the Port Authority making refinements to the four bridge replacement alternatives that had been identified and selected for further study via the screening process. The refinements to the project alternatives were precipitated by the bridge's proximity to Newark Liberty International Airport, which is located approximately 3 miles north of the bridge. The FAA identified a potential concern with the 350-foot high towers originally proposed for the replacement bridge. As a result of the Port Authority's aeronautical studies and consultation process with the FAA and airport stakeholders, a maximum tower height of 272 feet above mean sea level (MSL) was established for the proposed bridge to avoid conflict with flight departures from the airport.

Design studies that were undertaken to address the effects of the tower height decrease on the previously prepared conceptual bridge-replacement designs determined that the 272-feet maximum tower height required refinements to the bridge-replacement alternatives' alignments. The new design studies, while still conceptual, further determined that a single bridge configuration containing two decks separated by a set of bridge towers would be suitable for the alignments of all four build alternatives, instead of the two separate design concepts that had been advanced during the alternatives screening process (i.e., single replacement bridge south or north of the existing bridge's alignment, and twin replacement bridges within and directly south or north of the existing bridge's alignment). Therefore, the twin replacement-bridge alternatives north and south of the existing Goethals Bridge were eliminated from further consideration. However, since the conceptual alignments of the refined alternatives remain largely the same as those of the intermediate alternatives that were assessed during the comparative screening phase of study, with generally similar impacts to those identified for the intermediate alternatives, it was concluded that the refinements to the project alternatives did not alter the screening process outcome.

The results of such design refinements were presented and discussed at a combined Study's TAC/ ETF meeting, which was held in September 2007 specifically for this purpose. The following alternatives have been advanced for detailed evaluation in the DEIS:

- ***No-Build Alternative*** – This alternative assumes that the Goethals Bridge is not replaced as proposed, and represents the future baseline against which the potential impacts resulting from each of the Build Alternatives are compared. This alternative also assumes that operation and maintenance of the Goethals Bridge and its approaches would continue in order to maintain this

critical crossing in the interstate highway network, and that an increase in vehicle weights would continue to adversely affect the condition of the riding surface, deck slab and deck joints of the structure. As a result, the existing structure would require, at minimum, a full deck replacement and retrofit procedures for seismic upgrade within the next 7 – 10 years. This alternative also assumes that other projects and actions within the region that are programmed and committed will be implemented by 2034, the analysis year considered in the EIS.

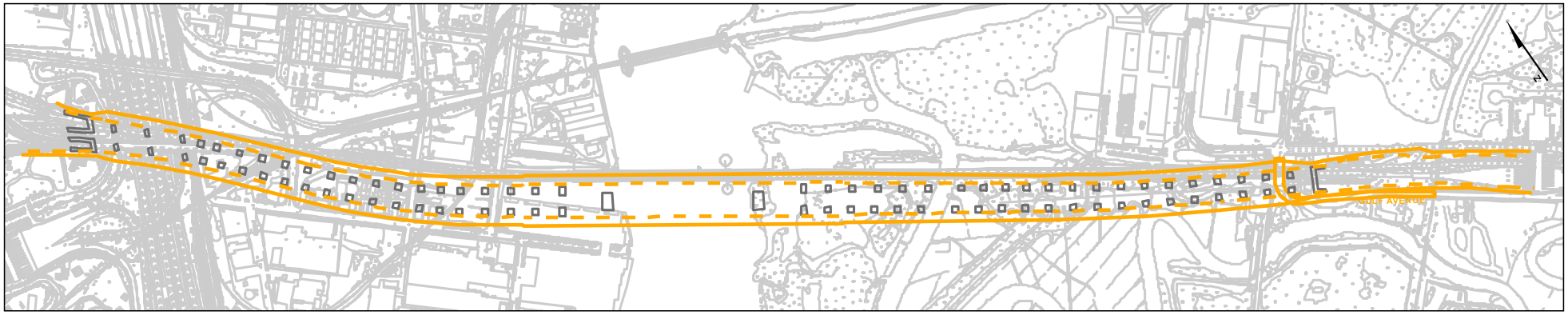
- ***New Alignment South*** – This alternative assumes replacement of the Goethals Bridge with a new six-lane structure directly and entirely south of the existing structure's alignment. The new bridge would be constructed in its entirety, after which the existing bridge would be demolished.
- ***New Alignment North*** – This alternative assumes replacement of the Goethals Bridge with a new six-lane structure directly and entirely north of the existing structure's alignment. The new bridge would be constructed in its entirety, after which the existing bridge would be demolished.
- ***Existing Alignment South*** – This alternative assumes replacement of the Goethals Bridge with a new six-lane structure, one-half of which (i.e., the northern deck) would essentially be within the existing Goethals Bridge's alignment, with the second half (i.e., the southern deck) adjacent to the existing alignment. The southern half of the new bridge would be constructed first, and then would temporarily accommodate both directions of traffic during demolition of the existing bridge and construction of the northern half of the new bridge within the existing span's alignment. Following completion of all construction, each roadway deck would carry three lanes of traffic.
- ***Existing Alignment North*** – This alternative assumes replacement of the Goethals Bridge with a new six-lane structure, one-half of which (i.e., the southern deck) would essentially be within the existing Goethals Bridge's alignment, with the second half (i.e., the northern deck) adjacent to the existing alignment. The northern half of the new bridge would be constructed first, and then would temporarily accommodate both directions of traffic during demolition of the existing bridge and construction of the southern half of the new bridge within the existing span's alignment. Following completion of all construction, each roadway deck would carry three lanes of traffic.

Figures ES.4-1 and ES.4-2 depict the locations of the two New Alternatives (i.e., New Alignment South and New Alignment North) and the two Existing Alternatives (i.e., Existing Alignment South and Existing Alignment North), respectively. Further details of the concept design and the various design components of the Proposed Project, which are applicable to all of the four Build Alternatives, are presented below.

ES.4.3 DESCRIPTION OF THE PROPOSED PROJECT

The Proposed Project consists of a new cable-stayed bridge to replace the existing bridge, as well as removal of the existing bridge. Potentially, the new bridge would consist of the following components:

- six 12-foot-wide travel lanes, three on each roadway deck (i.e., one roadway for eastbound traffic and one roadway for westbound traffic);
- a 12-foot-wide outer shoulder on each roadway;
- a 5-foot-wide inner shoulder on each roadway;
- a minimum 10-foot-wide sidewalk/bikeway along the northern edge of the westbound roadway; and
- a central area to be maintained between the eastbound and westbound decks to accommodate the provision of future transit service, should future conditions warrant inclusion of such service during the service life of the bridge.



Legend

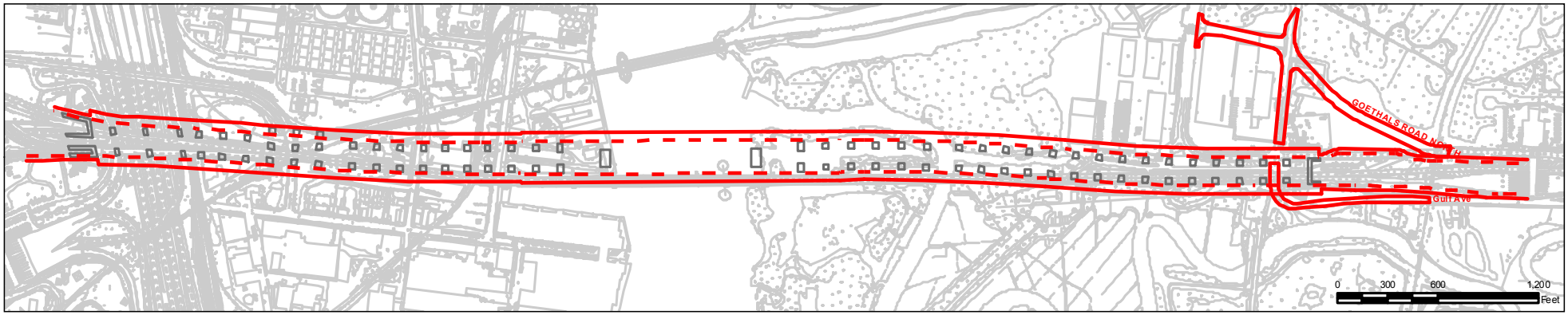
Alignments

- Buffer / Right - of - Way - New Alignment South
- Edge of Structure - New Alignment South

Bridge Structures

- Pier/Tower

New Alignment South



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Alignments

- Buffer / Right - of - Way - New Alignment North
- Edge of Structure - New Alignment North

Bridge Structures

- Pier/Tower

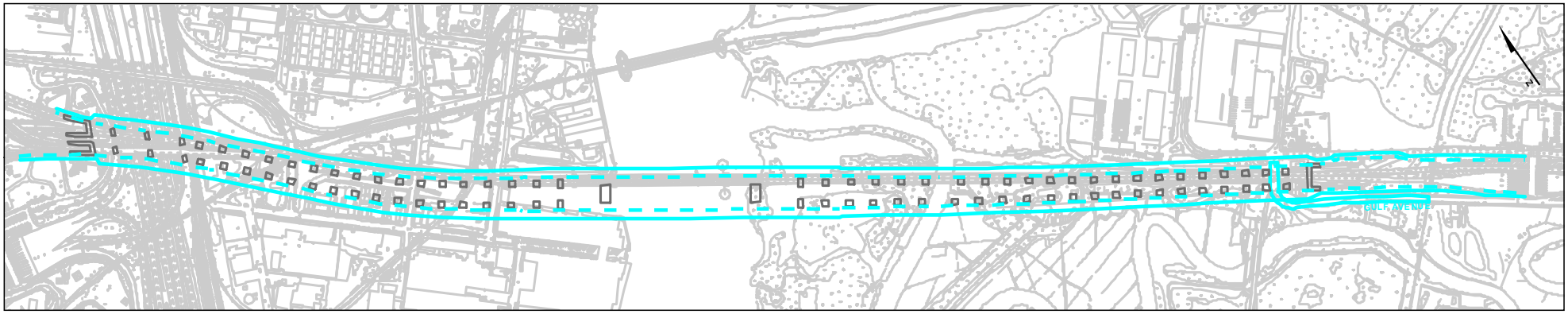
New Alignment North

Goethals Bridge Replacement EIS

FIGURE ES. 4-1

Proposed New Alignment Alternatives
(New Alignment South and
New Alignment North)

United States Coast Guard



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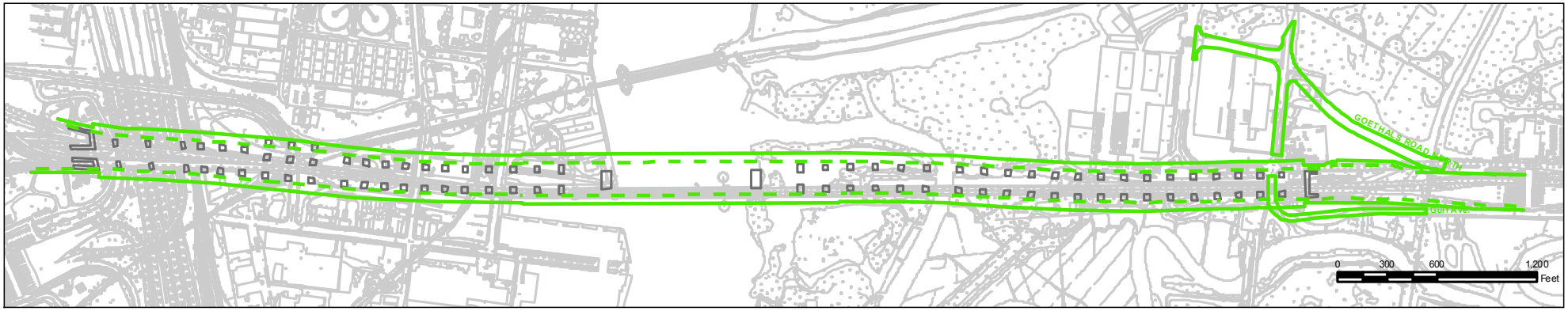
Alignments

- Buffer / Right - of - Way - Existing Alignment South
- Edge of Structure - Existing Alignment South

Bridge Structures

- Pier/Tower

Existing Alignment South



Legend

Alignments

- Buffer / Right - of - Way - Existing Alignment North
- Edge of Structure - Existing Alignment North

Bridge Structures

- Pier/Tower

Existing Alignment North

Goethals Bridge Replacement EIS

FIGURE ES. 4-2

Proposed Existing Alignment Alternatives
(Existing Alignment South and
Existing Alignment North)

United States Coast Guard

Navigational vertical clearance under the new bridge is proposed to be a minimum of 135 feet above mean high water (MHW), which is unchanged from the clearance of the existing bridge. Navigational horizontal clearance is proposed to be increased from the existing 617 feet between the main piers to a total of 900 feet between the main piers, thereby removing all structures from the Arthur Kill and its navigable channel. The top elevation of the two bridge towers is proposed to be 272 feet above mean sea level (MSL), which is an overall increase in top elevation from the current 238 feet above MSL at the apex of the existing trusswork. Other elements of the Proposed Project would include:

- new approach spans with similar roadway dimensions as the bridge itself on both the New Jersey and the New York ends of the new bridge;
- a 50-foot wide buffer on both sides of the replacement bridge and its approach spans;
- permanent right-of-way fencing at ground level along both sides of the proposed replacement bridge approach spans, located 25 feet from the outside edge of the bridge structure;
- a permanent access road located generally below the proposed replacement bridge approach spans for purposes of construction, maintenance and security;
- replacement of the Travis Branch railroad bridge over I-278 in Staten Island in order to accommodate the proposed widening of the roadway;
- relocation and/or realignment of either or both, Goethals Road North and Gulf Avenue in Staten Island, depending on the alignment alternative to be selected; and
- construction staging areas of approximately five acres on each side of the Arthur Kill, which are required for storage of the materials, pre-assembly activities and office space for the construction effort.

The Port Authority anticipates that the construction period for the new bridge and demolition of the existing bridge would range between 52 and 78 months, depending on the specific alignment alternative and the type of construction.

ES.5 ENVIRONMENTAL IMPACTS

ES.5.1 THE STUDY AREA

The overall Goethals Bridge Study Area encompasses a portion of the industrial waterfront in New Jersey, principally in the City of Elizabeth, with a smaller portion in the City of Linden, as well as some less-developed areas in the northwestern portion of Staten Island. More specifically, the Primary Study Area parallels the existing Goethals Bridge and its approach alignments and comprises the area within 500 feet (north and south) from the centerline of existing I-278 and the Goethals Bridge. The Secondary Study Area, within which indirect, or secondary, project-related impacts may occur, extends approximately one-half mile in all directions from the Goethals Bridge and its approach alignments.

Several other study areas were also considered for specific resource analyses. More specifically, a Regional Study Area was established for identifying and evaluating traffic, transportation and air quality impacts. The Regional Study Area extends well beyond the Goethals Bridge Study Area, encompassing all or portions of the seven counties in New York and New Jersey that have the greatest potential to be affected by the Proposed Project. The Regional Study Area was also used to evaluate the Proposed Project's potential cumulative impacts, as well as other major transportation and development projects in the Goethals Bridge Corridor's vicinity and region. In addition, a Goethals Transportation Model (GTM) Study Area was established to forecast future travel demand within the Regional Study Area. In order to identify potential historic and archaeological resources, an Area of Potential Effect (APE) was also established.

ES.5.2 FINDINGS

Table ES.5-1 provides a summary of the environmental impacts by resource, as well as engineering considerations for the No-Build Alternative and the four Build Alternatives. As applicable, this table presents a summary of the environmental consequences that would result from both the construction and operation of each alternative. Although not specifically presented in the table, proposed mitigation measures will help to offset project impacts for many of the environmental resources, and will help to satisfy applicable regulatory agency requirements. Even with the inclusion of such mitigation measures, however, the Proposed Project will result in several unavoidable adverse impacts, including:

- Displacements of local residential and/or business properties, which in turn will result in the relocation of local residents and/or business operations and employees.
- An adverse effect on three historic properties, including the demolition of the Goethals Bridge, as well as visual impacts to the Staten Island Railroad Historic District in Elizabeth and the Staten Island Railway Lift Truss Bridge over the Arthur Kill (also commonly referred to as the Arthur Kill Lift Bridge).
- Combined permanent loss of upland and wetland habitat ranging from 6.14 to 7.65 acres, including the specific loss of wetlands/open waters/mudflats ranging from 5.19 to 5.51 acres
- Two traffic locations in New Jersey (in the New Jersey Turnpike Interchange 13 complex) and seven in New York (along the Staten Island Expressway between the proposed Goethals Bridge and Richmond Avenue) would exhibit LOS conditions that are worse than the No-Build condition in 2034, even with mitigation.

As part of this DEIS preparation, a number of issues have been raised during the project's continuous public participation program. During this public outreach process, which includes Section 106 consultation, opportunities for participation by stakeholders, agencies and the general public resulted in the following issue discussions:

- Overall need for the project, notably a bridge replacement compared to a bridge rehabilitation;
- Demolition of the existing bridge;
- Potential transit improvements as an option to satisfy the project purpose and need;
- Potential traffic increases on some local roadways;
- Impacts to wetlands, upland ecosystems, and wildlife;
- Property Impacts, including displacements of specific residential and/or commercial properties.

Further decisions, actions and technical analyses related to outstanding issues will be made following the release of the DEIS and associated public meetings, and will be documented in the FEIS or the Record of Decision (ROD). These activities include the following, which may be expanded subsequent to the review of comments received in response to this DEIS:

- Identification of the preferred alternative;
- The Port Authority's permit applications to the USCG, the U.S. Army Corps of Engineers, the New Jersey Department of Environmental Protection, and the New York State Department of Environmental Conservation; as well as coastal consistency reviews with the New York State Department of State and the New York City Department of City Planning;
- Development of a Wetland Mitigation Plan and associated concepts;

- Analysis of future traffic conditions (No-Build, Build and Build with Mitigation) for the anticipated operation year of 2014, so as to satisfy New York City's environmental review requirements under CEQR;
- Detailed construction-phase noise and air quality analyses for the preferred alternative and associated construction schedule;
- USCG General Conformity Determination following the detailed construction-phase air quality analysis for the preferred alternative and associated construction schedule;
- Execution of a Memorandum of Agreement (MOA) in consultation with the state historic preservation offices, pursuant to Section 106 of the National Historic Preservation Act.

ES.6 REQUIRED PERMITS AND APPROVALS

The Proposed Project will require a Bridge Permit from the U.S. Coast Guard pursuant to the General Bridge Act of 1946, as amended, as well as a Section 404 Permit pursuant to the Clean Water Act, as amended, and a Section 10 Permit pursuant to the Rivers and Harbors Act of 1899, both from the U.S. Army Corps of Engineers. The Proposed Project will also require a variety of environmental permits and approvals from the states of New Jersey and New York, including: Section 401 water quality certifications; coastal zone consistency determinations; multiple permits and approvals related to affected waters and wetlands; land conveyances for tidelands (New Jersey) or underwater lands (New York); and approvals related to contamination investigations and remediation design; among others. At a local level, the primary approval required is related to New York City's Uniform Land Use Review Procedure (ULURP), due to proposed changes to the City Map and disposition of City-owned property attributed to the project.

Table ES.5-1
Summary of Environmental Impacts and Engineering Considerations for the No-Build and Build Alternatives

RESOURCE	No-Build Alternative	New Alignment South	Existing Alignment South	New Alignment North	Existing Alignment North
Land Use and Zoning					
Total Parcel Acquisitions (All Land Use Types)	None	12 partial/29 full takes (30.6 acres)	17 partial/30 full takes (28.0 acres)	21 partial/7full takes (25.8 acres)	24 partial/14 full takes (31.8 acres)
Commercial Parcel Acquisitions	None	2 partial/5 full takes (15.0 acres)	4 partial/5 full takes (15.0 acres)	5 partial/4 full takes (8.8 acres)	5 partial/6 full takes (16.3 acres)
Residential Parcel Acquisitions	None	18 full takes (1.6 acres)	18 full takes (1.6 acres)	None	6 full takes (0.5 acres)
Socioeconomic Conditions					
Business Displacements/Relocated Structures	None	8 business displacements/ 4 relocated structures	8 business displacements/ 4 relocated structures	3 business displacements/ 6 relocated structures	4 business displacements/ 6 relocated structures
Residential Unit Displacements	None	51 dwellings (130 persons)	51 dwellings (130 persons)	None	11 dwellings (29 persons)
Maximum Real Estate Tax Loss (2007 dollars)	None	$325,027(Eliz.) / $48,578(SI)	$329,310(Eliz.) / $36,468(SI)	$165,390(Eliz.) / $22,348(SI)	$194,111(Eliz.) / $54,919(SI)
Construction and Related Jobs	None	484 annual construction jobs / 5,567 total jobs in region	410 annual construction jobs / 5,899 total jobs in region	483 annual construction jobs / 5,555 total jobs in region	411 annual construction jobs / 5,906 total jobs in region
Environmental Justice	None	None	None	None	None
Community Facilities	None	None	None	None	None
Parklands and Recreational Facilities	None	None, except possible temporary access disruptions at Old Place Creek public access site during construction	None, except possible temporary access disruptions at Old Place Creek public access site during construction	None, except possible temporary access disruptions at Old Place Creek public access site during construction	None, except possible temporary access disruptions at Old Place Creek public access site during construction
Historic Resources					
Goethals Bridge	None	Demolition results in Adverse Effect	Demolition results in Adverse Effect	Demolition results in Adverse Effect	Demolition results in Adverse Effect
Staten Island Railroad Historic District	None	Adverse Visual Effect	Adverse Visual Effect	Adverse Visual Effect	Adverse Visual Effect
Staten Island Railway Lift Truss Bridge over Arthur Kill	None	Adverse Visual Effect	Adverse Visual Effect	Adverse Visual Effect	Adverse Visual Effect
Archaeological Resources	None	None	None	None	None
Visual Quality and Shadow Impacts					
New Bridge Structure	None	Visual impact at Bay Way / Krakow Street; minimal impact at other locations	Visual impact at Bay Way / Krakow Street; minimal impact at other locations	Minimal visual impacts	Visual impact at Bay Way / Krakow Street; minimal impact at other locations
Shadows	No additional impact	No impacts to residences or parks	No impacts to residences or parks	Limited impact to homes on Amboy Ave and Bay Way during morning hours; no impacts to parks	Limited impact to homes on Amboy Ave and Bay Way during morning hours; no impacts to parks
Topography, Geology and Soils	None	Potential impacts to soils during construction	Potential impacts to soils during construction	Potential impacts to soils during construction	Potential impacts to soils during construction
Water Resources					
Surface Water Quality	Untreated stormwater runoff would continue to be discharged into Arthur Kill and Old Place Creek	21.3 additional acres of impervious surface area; increase of contaminants entering Arthur Kill and Old Place Creek during construction; increased stormwater runoff during operation	21.1 additional acres of impervious surface area; increase of contaminants entering Arthur Kill and Old Place Creek during construction; increased stormwater runoff during operation	23.1 additional acres of impervious surface area; increase of contaminants entering Arthur Kill and Old Place Creek during construction; increased stormwater runoff during operation	24.5 additional acres of impervious surface area; increase of contaminants entering Arthur Kill and Old Place Creek during construction; increased stormwater runoff during operation
Groundwater Quality	Continued untreated runoff carrying pollutants infiltrating groundwater	Potential contamination from spills and unprotected storage piles over permeable soils during construction and operation	Potential contamination from spills and unprotected storage piles over permeable soils during construction and operation	Potential contamination from spills and unprotected storage piles over permeable soils during construction and operation	Potential contamination from spills and unprotected storage piles over permeable soils during construction and operation
Floodplains	None	None	None	None	None

Table ES.5-1 (Continued)

RESOURCE	No-Build Alternative	New Alignment South	Existing Alignment South	New Alignment North	Existing Alignment North
Biotic Communities					
Aquatic Communities	None	Most adverse effects limited to period of construction; reduction in habitat quality in interpier basin	Most adverse effects limited to period of construction; reduction in habitat quality in interpier basin	Adverse effects limited to period of construction	Adverse effects limited to period of construction
Essential Fish Habitat	None	Short-term habitat losses during construction; Permanent reduction in habitat quality in interpier basin	Short-term habitat losses during construction; Permanent reduction in habitat quality in interpier basin	Short-term habitat losses during construction	Short-term habitat losses during construction
Upland Habitats	None	2.14 acres	1.31 acres	0.88 acres	0.68 acres
Wetland Habitats	None	5.51 acres	5.19 acres	5.49 acres	5.46 acres
Regulated Wetlands (permanent impact)	None	5.51 acres (0.41 in NJ / 5.10 in NY)	5.19 acres (0.62 in NJ / 4.57 in NY)	5.49 acres (0.04 in NJ / 5.45 in NY)	5.46 acres (0.17 in NJ / 5.29 in NY)
Regulated Wetlands (temporary impact)	None	0.27 acres	0.27 acres	0.20 acres	0.24 acres
Threatened and Endangered Species	None	Construction impacts to peregrine falcon minimal and short-lived; some loss of northern harrier foraging habitat; minor turbidity impacts to river herring during construction	Construction impacts to peregrine falcon minimal and short-lived; some loss of northern harrier foraging habitat; minor turbidity impacts to river herring during construction	Construction impacts to peregrine falcon minimal and short-lived; some loss of northern harrier foraging habitat; minor turbidity impacts to river herring during construction	Construction impacts to peregrine falcon minimal and short-lived; some loss of northern harrier foraging habitat; minor turbidity impacts to river herring during construction
Coastal Zone Management	N/A	Consistent with the Coastal Zone Management Programs for the States of New Jersey and New York and for the City of New York	Consistent with the Coastal Zone Management Programs for the States of New Jersey and New York and for the City of New York	Consistent with the Coastal Zone Management Programs for the States of New Jersey and New York and for the City of New York	Consistent with the Coastal Zone Management Programs for the States of New Jersey and New York and for the City of New York
Navigation and Airspace					
Navigation	NY Main Pier & protective dolphins to remain within open waters, adjacent to Navigation Channel.	Construction barges/equipment placed outside navigation channel, short duration channel closures to be coordinated with USCG to minimize impacts; long-term improved horizontal clearances and removal of all structural obstacles from navigation channel	Construction barges/equipment placed outside navigation channel, short duration channel closures to be coordinated with USCG to minimize impacts; long-term improved horizontal clearances and removal of all structural obstacles from navigation channel	Construction barges/equipment placed outside navigation channel, short duration channel closures to be coordinated with USCG to minimize impacts; long-term improved horizontal clearances and removal of all structural obstacles from navigation channel	Construction barges/equipment placed outside navigation channel, short duration channel closures to be coordinated with USCG to minimize impacts; long-term improved horizontal clearances and removal of all structural obstacles from navigation channel
Airspace	None	Potential for construction-related equipment to impact airspace, advanced notifications to FAA required to prevent/minimize airspace obstructions	Potential for construction-related equipment to impact airspace, advanced notifications to FAA required to prevent/minimize airspace obstructions	Potential for construction-related equipment to impact airspace, advanced notifications to FAA required to prevent/minimize airspace obstructions	Potential for construction-related equipment to impact airspace, advanced notifications to FAA required to prevent/minimize airspace obstructions
Solid Waste	None	Negligible	Negligible	Negligible	Negligible

Table ES.5-1 (Continued)

RESOURCE	No-Build Alternative	New Alignment South	Existing Alignment South	New Alignment North	Existing Alignment North
Infrastructure					
Water Supply	None	None	None	Relocation of 12-inch water main located within Goethals Rd North may result in temporary service impacts during construction period in New York	Relocation of 12-inch water main located within Goethals Rd North may result in temporary service impacts during construction period in New York
Sanitary and Storm Sewers	None	None	None	None	None
Communication and Electric Utilities	None	No impacts in New Jersey, in New York the Port Authority' s fiber optic cable from Teleport Business Park would need to be relocated to new bridge	No impacts in New Jersey, in New York the Port Authority' s fiber optic cable from Teleport Business Park would need to be relocated to new bridge	No impacts in New Jersey, in New York the Port Authority' s fiber optic cable from Teleport Business Park would need to be relocated to new bridge, relocation of Goethals Rd North would cause relocation of Con Edison electric lines above and below ground potentially resulting in temporary service impacts during construction	No impacts in New Jersey, in New York the Port Authority' s fiber optic cable from Teleport Business Park would need to be relocated to new bridge, relocation of Goethals Rd North would cause relocation of Con Edison electric lines above and below ground potentially resulting in temporary service impacts during construction
Petroleum and Natural Gas Pipelines	None	None	None	No impacts in New Jersey, in New York minor property acquisition at Texas Eastern/KeySpan gas metering station may be required, but facility's operation would not be adversely impacted	No impacts in New Jersey, in New York minor property acquisition at Texas Eastern/KeySpan gas metering station may be required, but facility's operation would not be adversely impacted
Railroads	None	No Impacts in New Jersey, In New York weekend service along Travis Branch of Staten Island Railroad impacted during construction, construction of a longer-span Travis Branch Railroad Bridge would require longer period to roll-in and install	No Impacts in New Jersey, In New York weekend service along Travis Branch of Staten Island Railroad impacted during construction, construction of a longer-span Travis Branch Railroad Bridge would require longer period to roll-in and install	No Impacts in New Jersey, In New York weekend service along Travis Branch of Staten Island Railroad impacted during construction, construction of a longer-span Travis Branch Railroad Bridge would require longer period to roll-in and install	No Impacts in New Jersey, In New York weekend service along Travis Branch of Staten Island Railroad impacted during construction, construction of a longer-span Travis Branch Railroad Bridge would require longer period to roll-in and install
Contaminated Materials (Potential Areas of Concern)	None	6 sites (NJ) / 7 sites (NY)	6 sites (NJ) / 7 sites (NY)	6 sites (NJ) / 8 sites (NY)	6 sites (NJ) / 8 sites (NY)
Energy					
Direct Energy Consumption	N/A	4.6% decrease from No-Build in 2034	4.6% decrease from No-Build in 2034	4.6% decrease from No-Build in 2034	4.6% decrease from No-Build in 2034
Construction Energy	N/A	4.65×10^{12} BTUs	4.99×10^{12} BTUs	4.64×10^{12} BTUs	4.93×10^{12} BTUs
Maintenance Energy	N/A	2.84×10^{9} BTUs	2.84×10^{9} BTUs	2.82×10^{9} BTUs	2.84×10^{9} BTUs

Table ES.5-1 (Continued)

RESOURCE	No-Build Alternative	New Alignment South	Existing Alignment South	New Alignment North	Existing Alignment North
Traffic and Transportation					
New Jersey Locations (2034)	On I-278, traffic generally at LOS D or better, except in NJ Tpke Interchange 13, with volumes at or above capacity; in Bay Way Circle/Bayway Avenue corridor, 21 intersections at LOS E or F.	Significant Impacts: on I-278 mainline & ramps/New Jersey Tpke. Interchange 13, 4 impacted locations in AM, 4 in PM; in Bay Way Circle/Bayway Avenue corridor, 3 in AM, 4 in PM; LOS F Impacts: in Bay Way Circle/Bayway Avenue corridor, 8 impacted locations in AM, 7 in PM.	Significant Impacts: on I-278 mainline & ramps/New Jersey Tpke. Interchange 13, 4 impacted locations in AM, 4 in PM; in Bay Way Circle/Bayway Avenue corridor, 3 in AM, 4 in PM; LOS F Impacts: in Bay Way Circle/Bayway Avenue corridor, 8 impacted locations in AM, 7 in PM.	Significant Impacts: on I-278 mainline & ramps/New Jersey Tpke. Interchange 13, 4 impacted locations in AM, 4 in PM; in Bay Way Circle/Bayway Avenue corridor, 3 in AM, 4 in PM; LOS F Impacts: in Bay Way Circle/Bayway Avenue corridor, 8 impacted locations in AM, 7 in PM.	Significant Impacts: on I-278 mainline & ramps/New Jersey Tpke. Interchange 13, 4 impacted locations in AM, 4 in PM; in Bay Way Circle/Bayway Avenue corridor, 3 in AM, 4 in PM; LOS F Impacts: in Bay Way Circle/Bayway Avenue corridor, 8 impacted locations in AM, 7 in PM.
New York Locations (2034)	On Staten Island Expressway, 15 mainline sections, 8 merger/diverge, and 2 weaving sections at LOS E or F; in HHMT vicinity, 3 locations at LOS F in AM, 2 in PM; in Verrazano-Narrows Bridge vicinity, 4 locations at LOS F in AM, 6 in PM.	Significant Impacts: on Staten Island Expressway mainline, ramps, and weaving sections, 9 impacted locations in AM, 10 in PM; LOS F Impacts: on Staten Island Expressway, 3 impacted locations in AM, 6 in PM; in HHMT vicinity, 2 locations in AM, 1 in PM; in Verrazano-Narrows Bridge vicinity, 3 locations in AM, 5 in PM.	Significant Impacts: on Staten Island Expressway mainline, ramps, and weaving sections, 9 impacted locations in AM, 10 in PM; LOS F Impacts: on Staten Island Expressway, 3 impacted locations in AM, 6 in PM; in HHMT vicinity, 2 locations in AM, 1 in PM; in Verrazano-Narrows Bridge vicinity, 3 locations in AM, 5 in PM.	Significant Impacts: on Staten Island Expressway mainline, ramps, and weaving sections, 9 impacted locations in AM, 10 in PM; LOS F Impacts: on Staten Island Expressway, 3 impacted locations in AM, 6 in PM; in HHMT vicinity, 2 locations in AM, 1 in PM; in Verrazano-Narrows Bridge vicinity, 3 locations in AM, 5 in PM.	Significant Impacts: on Staten Island Expressway mainline, ramps, and weaving sections, 9 impacted locations in AM, 10 in PM; LOS F Impacts: on Staten Island Expressway, 3 impacted locations in AM, 6 in PM; in HHMT vicinity, 2 locations in AM, 1 in PM; in Verrazano-Narrows Bridge vicinity, 3 locations in AM, 5 in PM.
Impacts with Mitigation (Managed Use Lane & TSM)	N/A	All but 2 impacts in the New Jersey Turnpike Interchange 13 complex and 7 impacts along the SIE between the GBR and Richmond Avenue in New York would be fully mitigated to No-Build LOS.	All but 2 impacts in the New Jersey Turnpike Interchange 13 complex and 7 impacts along the SIE between the GBR and Richmond Avenue in New York would be fully mitigated to No-Build LOS.	All but 2 impacts in the New Jersey Turnpike Interchange 13 complex and 7 impacts along the SIE between the GBR and Richmond Avenue in New York would be fully mitigated to No-Build LOS.	All but 2 impacts in the New Jersey Turnpike Interchange 13 complex and 7 impacts along the SIE between the GBR and Richmond Avenue in New York would be fully mitigated to No-Build LOS.
Air Quality					
Microscale (localized) CO	Within 8-hour CO NAAQS	Within 8-hour CO NAAQS	Within 8-hour CO NAAQS	Within 8-hour CO NAAQS	Within 8-hour CO NAAQS
Mesoscale (regional) CO, NOx, VOCs, and PM2.5	Pollutant emissions from 0.6% to 1.3% higher than with Proposed Project	No significant impacts as pollutants emitted from study area roadways would decrease	No significant impacts as pollutants emitted from study area roadways would decrease	No significant impacts as pollutants emitted from study area roadways would decrease	No significant impacts as pollutants emitted from study area roadways would decrease
PM2.5	Within PM2.5 NAAQS	Would not cause, worsen, or contribute to a violation of the PM2.5 NAAQS	Would not cause, worsen, or contribute to a violation of the PM2.5 NAAQS	Would not cause, worsen, or contribute to a violation of the PM2.5 NAAQS	Would not cause, worsen, or contribute to a violation of the PM2.5 NAAQS
Greenhouse Gas Emissions	Greenhouse gas emissions during project's operation phase would be 4.6% higher than with Build alternatives.	Operations-phase CO2 emissions would decrease by 4.6% in 2034; total of 4.9 thousand tons/year of CO2 emissions generated during project construction period.	Operations-phase CO2 emissions would decrease by 4.6% in 2034; total of 5.2 thousand tons/year of CO2 emissions generated during project construction period.	Operations-phase CO2 emissions would decrease by 4.6% in 2034; total of 4.9 thousand tons/year of CO2 emissions generated during project construction period.	Operations-phase CO2 emissions would decrease by 4.6% in 2034;total of 5.2 thousand tons/year of CO2 emissions generated during project construction period.
Noise	Noise levels predicted to range between 63 and 70 dBA during AM peak hour at Elizabeth receptors and between 68 and 73 dBA at Staten Island receptors	Impacts at most locations predicted to occur beyond project limits and/or are not attributed to the Proposed Project; residences along Bay Way / Krakow Street would be acquired and would not be impacted	Impacts at most locations predicted to occur beyond project limits and/or are not attributed to the Proposed Project; residences along Bay Way / Krakow Street would be acquired and would not be impacted	Impacts at most locations predicted to occur beyond project limits and/or are not attributed to the Proposed Project; noise level reductions at many residences along Bay Way / Krakow Street	Impacts at most locations predicted to occur beyond project limits and/or are not attributed to the Proposed Project; noise level reductions at many residences along Bay Way / Krakow Street
Engineering Considerations (***The information presented below includes the ancillary construction activities related to the demolition of the existing Goethals Bridge, local roadway modifications, and the replacement of the Travis Branch Railroad overpass***)					
Construction Duration	N/A	52 to 60 months	65 to 78 months	52 to 60 months	65 to 78 months
Construction Cost (in 2007 U.S. Dollars)	$804 million (*for rehabilitation and maintenance of the existing GB for another 100 years*)	$755 million	$804 million	$754 million	$802 million
Construction Complexity	N/A	Medium	Medium	Medium	Medium