DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
EASTERN REGION

WRITTEN REEVALUATION AND RECORD OF DECISION FOR THE ENVIRONMENTAL ASSESSMENT FOR THE CENTRAL TERMINAL BUILDING REDEVELOPMENT PROGRAM AT LAGUARDIA AIRPORT

QUEENS, NEW YORK

DECEMBER 30, 2015

INTRODUCTION

In November 2015, the Port Authority of New York and New Jersey (PANYNJ) requested that the Federal Aviation Administration (FAA) approve proposed changes to the design of the Central Terminal Building (CTB) at LaGuardia Airport (LGA), located in New York City, New York; the Federal Aviation Administration (FAA) had previously prepared and issued an Environmental Assessment (EA) and a Finding of No Significant Impact/Record of Decision (FONSI/ROD) approving the original CTB Redevelopment in December 2014. In response to the PANYNJ request the FAA reviewed and analyzed the December 2015 Technical Report: Proposed Design Changes to the Central Terminal Building Redevelopment Program at LaGuardia Airport (Technical Report), which analyzed and compared potential impacts associated with the proposed design changes as compared to the potential impacts of the original 2014 design approved in the 2014 FONSI/ROD. This Written Reevaluation and Record of Decision (WR/ROD) of the 2014 EA was prepared to evaluate the potential environmental impacts associated with the new CTB design. This WR/ROD also identifies FAA decisions and Federal Actions associated with the proposed CTB design changes.

BACKGROUND

The FAA issued a FONSI/ROD on December 10, 2014, which approved demolition of the existing central passenger terminal building, central parking garage, and three historic hangars as well as the design and construction of a new terminal building; redesign of the terminal airside apron; and redesign of the landside roadways and the parking garage within the central terminal area of LaGuardia Airport (LGA), Queens, New York. The FONSI/ROD followed a November 2014 Environmental Assessment (EA). Copies of both documents are available at the FAA Eastern Regional Office, 1 Aviation Plaza, Jamaica, New York (718-553-2511) and at the New York Airports District Office, 1 Aviation Plaza, Jamaica, New York (718-995-5777).

The CTB Redevelopment Program that was evaluated in the EA and depicted on the approved 2014 LGA Airport Layout Plan Pen-and-Ink Change #12, included: the demolition of the existing central passenger terminal building and design and construction of a new terminal building; redesign of the terminal airside apron; and redesign of the landside roadways and the parking garage within the LGA central terminal area. The demolished facilities and project components that involve redesign were to have been replaced by new facilities designed to function more efficiently. Additionally, facilities were to be located to meet the most current standards for airport safety and security and to accommodate forecast passenger demand. The number of aircraft gates was to remain at 35; forecasts demonstrated that the number of aircraft operations would not increase as a result of the proposed development. The CTB was to be designed specifically to accommodate larger sized aircraft with increased seating capacity that would accommodate the expected increase in passenger demand. The CTB Redevelopment Program included support projects such as the demolition of some existing buildings, relocation of utilities, and other miscellaneous improvements and changes needed to complete the Program. The project in the 2014 EA did not involve changes to the airfield runways or taxiways, National Airspace System (NAS) facilities (also known as air navigation facilities), or aircraft flight procedures. The project described above is referred to in this WR/ROD as the 2014 Design.

In July 2015, New York's Governor Cuomo was joined by Vice President Joe Biden to unveil the vision for the comprehensive redesign of LGA. The redesign seeks to transform LGA to provide a single, structurally unified main terminal with expanded transportation access, significantly increased taxiway space and best-in-class passenger amenities. Construction on the first half of the new unified terminal was announced as a $4 billion project that creates 8,000 direct jobs and 10,000 indirect jobs.[1] This announcement coincided with the award of the competitive solicitation for both the 2014 Design and the Governor's comprehensive redesign of LGA to LaGuardia Gateway Partners (LGP), a Public Private Partnership (PPP) selected to design, construct, and operate the new CTB portion of the overall comprehensive redesign, also known as Terminal B.

In November 2015, the PANYNJ approached FAA seeking approval to modify the 2014 Design of the CTB. LGP advanced a revised terminal design that changes the building geometry of the 2014 Design while lowering overall costs and allowing for a faster construction phasing and project delivery. While preliminary planning efforts are underway to consider the other components of the transformational redesign, the CTB redevelopment component represents a concrete specified design. The other components are pending consideration in the capital plans of the PANYNJ and other entities and have not yet been the subject of sufficiently specific planning work to enable accurate and relevant NEPA analysis. Therefore, the nature, extent, and design of these other components are not determinable or reasonably foreseeable at the present time. In the event that these other components become ripe for decision, they will be subject to their own appropriate NEPA analyses that will be required to consider the cumulative impacts of the CTB redevelopment program.

The PANYNJ has proposed changes from the approved CTB Design in the FAA's 2014 FONSI/ROD. The basis for FAA's WR is the December 2015 Technical Report: "Proposed Design Changes to the Central Terminal Building Redevelopment Program at LaGuardia Airport" (Technical Report) prepared by the PANYNJ, that analyzes and compares potential impacts associated with the proposed design changes as compared to the potential impacts of the 2014 Design approved in the 2014 FONSI ROD. A copy of the Technical Report and its Attachments can be found in Appendix A and are incorporated herein, by reference.

FAA WRITTEN REEVALUATIONS

To ensure full compliance with the National Environmental Policy Act (NEPA) where there are proposed changes to approved projects, the FAA evaluates the potential change in environmental impacts, in order to determine if a supplemental Environmental Assessment is required. This WR/ROD is based on guidance provided by FAA Environmental Orders 1050.1F and 5050.4B. Both Orders reference re-evaluating NEPA documents when there are new circumstances or information relevant to environmental concerns that come to light after the FAA has issued a ROD.

FAA Orders 1050.1F and 5050.4B provide guidance as to the circumstances under which it is necessary to supplement an EA. FAA Order 1050.1F, paragraph 9-2 provides that where there

[1] https://www.governor.ny.gov/news/governor-cuomo-unveils-vision-transformative-redesign-laguardia-airport

are changes in the proposed action, or new information relevant to environmental concerns, the FAA may prepare a written evaluation that will either conclude the contents of previously prepared environmental documents remain valid or that significant changes require the preparation of a supplement or new EA.

FAA Order 1050.1F, paragraph 9-2(c) states "A new or supplemental EA or EIS need not be prepared if a written re-evaluation indicates that:

> (1) The proposed action conforms to plans or projects for which a prior EA and FONSI have been issued or a prior EIS has been filed and there are no substantial changes in the action that are relevant to environmental concerns;
>
> (2) Data and analyses contained in the previous EA and FONSI or EIS are still substantially valid and there are no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts; and
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> (3) Pertinent conditions and requirements of the prior approval have been, or will be, met in the current action."

Per FAA Order 5050.4B, paragraph 1402 (b): A supplement to the Final EA for a project is required if:

> "(1) The airport sponsor or FAA makes substantial changes in the proposed action that could affect the action's environmental effects; or
>
> (2) Significant new changes, circumstances or information relevant to the proposed action, its affected environment, or its environmental impacts becomes available."

SUMMARY OF THE PROPOSED DESIGN CHANGES

The PANYNJ's proposed design changes consist of a reconfigured headhouse and two midfield concourses connected to the headhouse by means of pedestrian bridges. The gross floor area is 1,457,657 square feet, which is a 9.51% increase from the 2014 Design. Due to the addition of a fourth floor within the terminal, the footprint of the redesigned CTB is smaller than the 2014 Design even though it offers more square footage. The Technical Report states that the benefits of the proposed design changes are: the ability to meet the original project purpose and need while realizing a savings of approximately $250 million and 7 months of construction time compared to the 2014 Design and a staging plan that requires only one move per airline rather than several moves. This is a result of the headhouse being constructed all at once while the existing headhouse remains in service. This is accomplished by limiting the headhouse footprint to be wholly within the footprint of existing Parking Garage 2, which was not contemplated in the 2014 design.

As in the 2014 Design, the proposed design changes do not involve changes to the airfield runways or taxiway intersections or aircraft flight procedures to or from the airport. However, the proposed design changes will involve changes to NAS facilities and changes to the access and egress points between the taxilanes serving the terminal gates and the taxiway network.

DETAILED DESCRIPTION OF THE PROPOSED DESIGN CHANGES

The proposed design changes redefine the overall configuration of the terminal elements and consist of a reconfigured headhouse and two midfield concourses (Fig 1), rather than the 2014 Design of a headhouse directly connected to two pier concourses (Fig 2). The two midfield concourses are connected back to the headhouse by means of pedestrian bridges spanning over taxilanes. The gross floor area of the proposed design change is 1,457,697 square feet, representing a 9.51% increase from the 2014 Design. Due to the addition of a fourth floor within the terminal, the footprint of the redesigned CTB is smaller than the 2014 Design even though it offers more square footage. The building height of the redesign CTB is higher than what was proposed in the 2014 EA; however, as design advanced following the 2014 FONSI/ROD, the 2014 Design would actually have been slightly higher than what is now proposed for the redesigned building. The design changes are overlaid on the 2014 Design in Fig 3.

The revised CTB layout has two individual 'L' shaped islands joined to a single headhouse via pedestrian bridges. The island on the western portion of the CTB apron is Concourse A with 17 gates and the one on the eastern portion is Concourse B with 18 gates. The proposed layout offers the same number of gates as the 2014 Design. Of these 35 gates, four gates will be dedicated to handle Airplane Design Group[2] (ADG) IV airplanes (including, but not limited to Boeing 767-400ER) and 31 will be dedicated to handle ADG III airplanes (including, but not limited to Boeing 737-900) independently. This provides the same apportionment of gates to accommodate a similar fleet mix as in the 2014 Design. The proposed design changes provide independent full-length dual Group III aircraft taxilanes between Concourses A and B and partial dual Group IIIA[3] aircraft taxilanes in the area south-west of Concourse A. A single Group IIIA aircraft taxilane will serve gates in the remaining section of Concourse A and on the east and south sides of Concourse B. Also included on the apron are 20 independent remote parking positions for Group III aircraft.

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[2] Airplane Design Group is defined in FAA Advisory Circular (AC) 150/5300-13A, Airport Design, as a means of classifying aircraft based on wingspan and tail height. The larger the wingspan or tail height, the larger the group designation, so ADG IV airplanes are larger than ADG III airplanes. According to Table 1-2 of the Advisory Circular, ADG III airplanes have tail heights between 30'to 45' and wingspans between 79' to 118'. ADG IV airplanes have tail heights between 45' to 60' and wingspans between 118' to 171'. ADG III airplanes are commonly referred to as narrow-body airplanes and ADG IV airplanes are commonly referred to as wide-body airplanes.

[3] Airplane Design Group IIIA refers to a new category recommended for consideration by the Airport Cooperative Research Program (ACRP) in their publication ACRP Report 25-Airport Passenger Terminal Planning and Design, Volume 1: Guidebook. The category was recommended to account for Boeing 757 Series aircraft which has a wingspan of 135', which is wider than Group III aircraft and requires it to be classified as Group IV, per FAA AC 150/5300-13A. However, the wingspan of the Boeing 757 Series aircraft is substantially less than a typical ADG IV aircraft and it has more characteristics in common with a typical ADG III aircraft from a terminal planning perspective (similar gate and holdroom requirements). A Group IIIA taxilane as discussed in the Technical Report and this WR/ROD is a taxilane that has slightly wider separation to accommodate the extra wingspan associated with the Boeing 757; however, it would not be wide enough to accommodate ADG IV operations. The Boeing 757 Series Aircraft would operate out of gates identified as ADG III in the Technical Report.

The proposed design changes would cause the terminal frontage to shift 30 feet to the south which necessitates the following changes:

• Landside Terminal B frontages (High-Occupancy Vehicles (HOV), Arrivals, & Departures levels) shifted approximately 30' south to support connection to Terminal C and reconfigured headhouse.
• Roadway changed to support the shifting of the Terminal B frontages to accommodate dual aircraft taxilanes airside between Concourse A and the reconfigured headhouse.
• Terminal B Arrivals and Departures exit ramp alignment changed to accommodate dual aircraft taxilanes airside between Concourse A and the reconfigured headhouse.
• Access to West Parking Garage and intersection changed.
• Access to FAA ATCT parking lot and shipping/receiving facility changed.

Construction Phasing
The overall project schedule from initiation to full completion is 68 months and is portrayed fully in the Technical Report. This represents a decrease of seven months of construction activities from the 2014 Design; the 2014 Design called for 75 months of construction activities. Assuming construction initiation in 2Q 2016, the terminal would be open by the end of 2021. The headhouse would open in Mid-2019 (37 months). These timeframes represent the balance of construction that has not already started as part of the 2014 Design activities consistent with the 2014 FONSI/ROD. The demolition of Hangars 2 and 4 and other site work began in 2014 and is continuing apace. Hangars 2 and 4 were demolished during the summer of 2015 in accordance with the Memorandum of Agreement (MOA) entered into during the development of the 2014 EA to address the project impacts on historic resources. The New York State Historic Preservation Officer (NYSHPO) has reviewed the Port's proposal for redesign of the LGA CTB and stated in its December 17, 2015, letter that there is no need to amend the MOA.

National Airspace System Facilities
The proposed design changes will necessitate the relocation of one of the Low Level Windshear Alert System (LLWAS) remote sensor stations. An area of relocation has been identified adjacent to the southeast side of the East Parking Garage. This option has to be evaluated further to determine if it will allow continued full functionality of the LLWAS. The proposed design changes and associated construction may also impact the Airport Surface Detection Equipment, Model-X (ASDE-X), the Remote Transmitter Receiver (RTR), and the Low Density Radio Communications Link (LDRCL). Additional discussion of the potential impacts to these NAS Facilities is located in the Impacts of the Proposed Design Changes to National Airspace System Facilities Section below.

PROPOSED AGENCY ACTIONS

The FAA actions involved in the implementation of the proposed redesign of the LGA CTB include the following:

a. Unconditional Approval of a revised ALP for the Proposed Design Changes to the Central Terminal Building Redevelopment Program at LaGuardia Airport as described above and submitted for approval on LaGuardia ALP Pen-and-Ink Change #13, pursuant to 49 U.S.C. §40103(b) and §47107(a)(16) to include the redesign of the CTB as described in the Technical Report; and determination and approval of the effects of this project upon the safe and efficient utilization of navigable airspace pursuant to 14 CFR Parts 77 and 157 and 49 U.S.C. §44718;

b. Determination under 49 U.S.C. §40101(d)(1) and §47105(b)(3) as to whether the Proposed Design Changes meet applicable design and engineering standards set forth in FAA Advisory Circulars;

c. Environmental determinations concerning potential funding through the Federal grant-in-aid program authorized by the Airport and Airway Improvement Act of 1982, as amended (recodified at 49 U.S.C. §47107) and/or approval of an application to use Passenger Facility Charges (PFCs) under 49 U.S.C. §40117 (neither the 2014 FONSI/ROD nor this WR/ROD determines eligibility or availability of potential funds);

d. Determination under 49 U.S.C. §44502 (b) concerning the acquisition, establishment, improvement, operations and maintenance of air navigation facilities and that the subject airport development is reasonably necessary for use in air commerce or in the interests of national defense;

e. Continued close coordination with the PANYNJ and appropriate FAA program offices, as required, to maintain safe, efficient use of and preservation of the navigable airspace during all aspects of project construction and demolition, in accordance with 14 CFR Part 77; and

f. Approval of appropriate amendments to the LGA Airport Certification Manual (ACM), as required, pursuant to 49 U.S.C. §44706.

SUMMARY OF CHANGES TO ENVIRONMENTAL IMPACTS AND MITIGATION

This section describes any changes to the affected environment and anticipated impacts associated with the Proposed Design Changes. Additional mitigation requirements are explained where applicable.

Affected Environment
The 2014 EA described the existing environment and conditions. No changes to the Affected Environment are associated with the Proposed Design Changes. It should be noted that since the issuance of the 2014 FONSI/ROD, the FAA has updated its Order that determines the process to conduct environmental reviews of proposed Federal Actions. FAA Order 1050.1F, Environmental Impacts: Policies and Procedures as well as a 1050.1F Desk Reference were issued on July 16, 2015. It included Climate as a new impact category of analysis; however, the applicable guidance to the other environmental resource categories contained within the Technical Report remained relatively unchanged. An analysis of climate impacts associated with the Proposed Design Changes is included in the Technical Report and summarized below.

Additionally, on January 30, 2015, President Obama issued Executive Order (EO) 13690 that amends EO 11988, the EO that established national policy for avoiding and reducing impacts to and development within floodplains. EO 13690 established the Federal Flood Risk Management Standard (FFRMS) and directed Federal agencies to develop guidance to meet this new standard. A discussion of the applicability of the new EO is contained in the Floodplains Section below.

Environmental Consequences of the Proposed Design Changes

The potential impacts associated with the Proposed Design Changes are presented in Chapter 5 of the attached Technical Report. The following provides highlights of the more thorough analyses presented in the Technical Report.

Coastal Resources: The layout of the terminal and airside facilities within the coastal zone would change as a result of the proposed design changes, however, the level of impact to coastal resources would not change. The New York State Department of State concurred on December 2, 2015 and again via e-mail on December 28, 2015[4] that the proposed design changes remain consistent with the approved state and local coastal zone management programs. Therefore, the findings of no significant impact to coastal resources from the 2014 FONSI/ROD remain valid and can be applied to the Proposed Design Changes as well.

DOT, Section 4(f) and Historical, Architecture, Archaeological and Cultural Resources: Under all of the scenarios examined during the 2014 Design analysis, there were adverse effects to historic resources. All scenarios examined required the demolition of Hangars 1, 2, and 4. West Garage Design refinements under the proposed design changes result in a shift to the footprint of the West Garage roughly 35 feet to the west and a reduction of the footprint to the north by roughly 40 feet. These design refinements bring the West Garage slightly further away from the remaining historic Hangar 3. The garage remains substantially similar in size and location. Additionally, as stated previously, the demolition of Hangars 2 and 4 has already been completed as approved in the 2014 FONSI/ROD and MOA. Hangar 1 is scheduled for demolition in 2019.

Based on FAA's review of the Technical Report, the FAA concludes that the proposed design changes do not alter the APE or the mitigation measures agreed to in the MOA. Given that the impacts to historic resources and the agreed upon mitigation measures are not changed by the proposed design changes, additional coordination is not required under Section 106 of the National Historic Preservation Act (NHPA) nor is amendment to the MOA needed. The New York State Office of Historic Preservation concurred with this conclusion via a letter dated December 17, 2015. This letter is included in Attachment 10 of the Technical Report. Because no changes to the MOA are required, the analysis of impacts depicted in the 2014 EA, as approved in the 2014 FONSI/ROD, remains valid with respect to the Proposed Design Changes.

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[4] Clarification of the original concurrence dated December 2, 2015 was requested regarding the relocation of a Low Level Windshear Alert System antenna as this was not included in the original project description provided to the New York State Department of State (DOS) for concurrence. Follow on communications between the PANYNJ and DOS clarified the additional project component and the DOS concurred via e-mail on December 28, 2015 that "[t]he proposed change does not appear to result in any change in potential coastal effects. As such, no additional review by DOS is required or allowed and our original concurrence still applies."

Floodplains: For the proposed design changes, 88 percent of the project site is still located within the limits of the coastal (tidal) floodplain (see Figure 5-6b), consequently, the proposed design changes would similarly affect the same flood-prone area of the Airport.

EO 11988 was originally issued on May 24, 1977, and established a national policy requiring federal agencies to avoid, to the extent possible, the long and short term adverse impacts associated with the occupancy and modification of floodplains. On January 30, 2015, the President issued EO 13690 that amends EO 11988, and established the FFRMS and a process for public input prior to implementation of the FFRMS. However, in Guidelines issued on October 8, 2015, federal agencies were directed not to apply the new requirements until after the agencies adopt new or revised regulations governing the proper implementation of EO 13690 and the FFRMS. The Guidelines state that Federal agencies will continue to comply with the requirements of the 1977 version of EO 11988 until they update their regulations and procedures to incorporate the amendments from EO 13690. These regulations and procedures will describe an agency's schedule for applying any new requirements as well as how it will apply the new requirements. The new requirements of EO 11988 will not be applied retroactively. As of the date of this WR, the US Department of Transportation has not yet updated the regulations and procedures to incorporate the requirements of EO 13690.

Therefore, the criteria for analysis of impacts to floodplains have not changed since the issuance of the 2014 FONSI/ROD. Due to the smaller footprint associated with the Proposed Design Changes to the CTB in comparison to the 2014 Design, the analysis of floodplain impacts in the 2014 EA, as approved by the 2014 FONSI/ROD, remains valid and no changes to floodplain impacts are expected from the Proposed Design Changes to the CTB.

Lighting: Under the proposed design changes, there would be nighttime demolition activity for a 5.5 month period primarily during the second quarter of 2017. The activities would be limited to demolition on the Airport and would not be visible to the neighborhoods across the Grand Central Parkway. No heavy construction activities such as paving or pile driving will occur at night. The only additional lighting that would be needed for this airside demolition work will be temporary low mast (max height 15') lights on wheels. The lights would be submitted for FAA tower approval prior to use to ensure no glare impedes vision from the tower. The lights would not exceed the height of any of the terminal or parking structures in place at the time of use nor would they exceed the height of the berm alongside Runway 13/31. It is unlikely that the lights used for nighttime demolition activities would be visible off the airfield or in the surrounding communities.

Operational: The 2014 Design incorporated dual taxilanes serving all 35 contact gates in the CTB. The Proposed Design Changes provide independent full-length dual Group III taxilanes between Concourses A and B and partial dual Group IIIA taxilanes in the area south-west of Concourse A. A single Group IIIA taxilane will serve gates in the remaining section of Concourse A and on the east and south sides of Concourse B. This design change was analyzed with the Total Airport and Airspace Model (TAAM) to determine if it significantly affected the operation and flexibility of the CTB complex. TAAM analysis demonstrated a decrease of 0.1 minute per operation compared to the 2014 Design. Therefore, the benefits to the airlines and public from reduced taxiing times and the reduction in aircraft fuel consumption would remain consistent with those included in the 2014 EA as approved by the 2014 FONSI/ROD.

Climate Change: The change to the construction schedule associated with the Proposed Design Changes would result in an increase in emissions of Carbon Dioxide Equivalents (CO2e) in comparison to the 2014 Design. The 2014 Design construction period was from 2014 to 2022 and would generate a total of 17,762.24 tons of CO2e, with the peak year being 2015 with 5,232.23 tons of CO2e generated. Under the Proposed Design Changes, the construction period would be from 2016 to 2022 and a total of 28,532.60 tons of CO2e would be generated, an increase of approximately 60%. Additionally, the peak year of emissions would be 2017, with 8198.51 tons of CO2e, an increase to peak year emissions of approximately 56%. These increases are in line with anticipated aggregate increases from other pollutants analyzed in the air quality section. The increase is attributable to a more robust construction analysis performed in the Technical Report based on more detailed construction scheduling and estimates in comparison to the inputs used in the 2014 EA. Additional planning for construction associated with the Proposed Design Changes showed that construction equipment usage would increase from the 391,000 hours estimated in the 2014 EA to 557,000 hours. This is an increase in usage of approximately 42% and, when combined with the changes to construction scheduling, accounts for the increase to CO2e emissions as well as those contained in the air quality analysis below.

Since there would be only minor changes to operational conditions at the Airport as a result of the proposed design changes, no additional analysis of future carbon dioxide emissions was performed. The minor changes include overall aircraft taxi time decrease of 0.1 minute. The greenhouse gas emissions described in the 2014 FONSI/ROD are still valid.

FAA Order 1050.1F (July 2015) established Climate as a new Environmental Impact Category. While no significance thresholds have been determined for Climate, the Order requires an evaluation of climate impacts from Proposed Actions. The final project will minimize its individual impact on climate through efficient building design, aircraft apron and taxiway design, and commitment to meeting Leadership in Energy & Environmental Design (LEED) Silver or higher standards for construction. In addition, the Port Authority's Sustainable Building Guidelines, which the redesigned CTB is required to comply with, require projects to achieve energy cost decreases of 30% over American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 90.1-1999. Finally, the use of electric baggage tugs, belt loaders, and push back tugs along with the deployment of 400-hertz gate power and pre-conditioned air at every gate will reduce greenhouse gas emissions from aircraft support activities. Since the Proposed Design Changes to the CTB would be required to meet LEED Silver or higher standards for construction, the operation of the CTB in comparison to the current building will result in a reduced carbon footprint in spite of the increased CO2e emissions associated with the construction of the Proposed Design Changes. No thresholds have been established for determining significant impacts to climate under FAA Orders and. Therefore, no significant impacts to climate are expected associated with the Proposed Design Changes to the CTB.

Traffic and Transportation: The baseline year used for the traffic analysis conducted for the proposed design changes is 2014; the traffic analysis for the 2014 Design was 2012. The baseline data was updated with 2014 data because conditions have changed in and around the airport since 2012, with higher levels of passenger traffic and vehicular traffic. Because of the change in project schedule, it was considered prudent to include the best available data as related to traffic impacts, given the change in activity between 2012 and 2014.

When compared with the 2014 EA and FONSI/ROD, the overall Level of Service (LOS) under the proposed design changes during the peak construction period of early 2017 would remain the same or improve for 18 intersections. During the peak construction period, there would be a minor, temporary decrease in LOS at the following three intersections:

•Astoria Boulevard North Service Road/79th Street/23rd Avenue: During the weekday morning peak hour, the overall average delay is projected to increase by 5.2 seconds/vehicle, from 19.5 seconds/vehicle (LOS "B") from the 2014 EA to 24.7 seconds/vehicle (LOS "C") under the proposed design changes. During the weekday afternoon peak hour, the overall average delay is projected to increase by 11.4 seconds/vehicle, from 14.9 seconds/vehicle (LOS "B") from the 2014 EA to 26.3 seconds/vehicle (LOS "C") under the proposed design changes. The LOS "B"/"C" threshold for signalized intersections is 20.0 seconds/vehicle.

•Astoria Boulevard North/Grand Central Parkway Westbound Off-Ramp/82nd Street/Ditmars Boulevard: During the weekday morning peak hour, the overall average delay is projected to increase by 14.0 seconds/vehicle, from 28.4 seconds/vehicle (LOS "C") from the 2014 EA to 42.4 seconds/vehicle (LOS "D") under the proposed design changes. The LOS "C"/"D" threshold is 35.0 seconds/vehicle.

•Bowery Bay Boulevard/Runway Drive//Marine Terminal Road: During the weekday morning peak hour, the overall average delay is projected to increase by 7.8 seconds/vehicle, from 34.4 seconds/vehicle (LOS "C") from the 2014 EA to 42.2 seconds/vehicle (LOS "D") under the proposed design changes. The LOS "C"/"D" threshold is 35.0 seconds/vehicle.

There would also be minor changes to the on-airport roadway layout as a result of the proposed design changes:

•Terminal B frontages (HOV, Arrivals, & Departures levels) shifted approximately 30' south to support connection to Terminal C and reconfigured headhouse.
• Roadway changed to support the shifting of the Terminal B frontages to accommodate dual taxilanes in front of Concourse A.
•Terminal B Arrivals and Departures exit ramp alignment changed to accommodate dual taxilanes in front of Concourse A.
•Access to West Parking Garage and intersection changed.
•Access to FAA and shipping/receiving facility changed.

Under the Proposed Design Changes, the capacity of the proposed West garage would increase from 2,900 to 3,100 spaces. The garage was originally presented as a five level garage; however, that level count did not include the roof or the ground floor. The revision to the West Garage to accommodate the additional 200 spaces would be through an expansion of parking available on the roof level to full utilization of the space, as opposed to the partial utilization contained in the 2014 Design. The height of the garage remains the same and the full roof would be covered by shading structures to meet security requirements. Design refinements since the 2014 Design shifted the garage's footprint approximately 35 feet to the west and reduced the footprint to the north by roughly 40 feet; however, the garage is substantially similar in size and location.

To address the effects of these changes, a variety of temporary improvements, including traffic signal installation, traffic signal controller upgrade, signal timing adjustments, curbside parking prohibitions, lane widening/restriping, and the use of construction flaggers would be needed at a total of 11 intersections to accommodate the increased traffic volumes occurring during construction of the proposed design changes. With these improvements, the overall intersection LOS would remain the same or improve with the proposed design changes compared to the 2014 EA, with the exception of three intersections where a minor, temporary decrease in LOS would occur. Incorporating the minor changes to the recommended transportation improvements that were described above, the LOS at these intersections would remain at LOS D or above, which is considered an acceptable level of congestion. No significant traffic impacts are anticipated associated with the changes from the 2014 Design.

Air Quality: Construction emissions associated with the proposed design changes were calculated using the same methodology used for the 2014 EA, with modifications to the inputs based on the changes to the construction schedule, and other factors associated with the changes to the design.

The model results from the changes to the 2014 Design indicate that 2017 would be the construction year resulting in the maximum annual construction emissions. In the 2014 Design, 2015 was the peak year for construction emissions. A comparison of criteria pollutants in the peak years for construction emissions from the 2014 Design to the Proposed Design changes shows that Volatile Organic Compounds (VOC) increase from 2.71 tons to 4.16 tons, an increase of approximately 53%; Nitrogen Oxides increase from 34.94 tons to 44.98 tons, an increase of approximately 29%; Carbon Monoxide increases from 11.89 tons to 32.23 tons, an increase of approximately 171%; Particulate Matter of 2.5 Micrometers increases from 1.45 tons to 2.39 tons, an increase of approximately 65%; and Sulfur Dioxide decreases from 1.23 tons to 0.10 tons, a decrease of approximately 92%. The National Ambient Air Quality Standard thresholds for the pollutants are 50 tons for VOCs and 100 tons for the remaining four. The emissions from the peak year for construction emissions for the year of 2017 under the Proposed Design Changes are significantly below the de minimis levels for each pollutant; therefore, the Proposed Design Changes have minimal air quality impact and are determined to conform to the State Implementation Plan (SIP).

A hot spot dispersion impact analysis of the peak year construction condition was performed for carbon monoxide (CO) at the same five off-Airport intersections that were analyzed in the 2014 EA. The predicted CO concentration levels for the Proposed Design Changes would be higher than the concentrations predicted for the 2014 Design, with the levels between 4.3 and 5.4 ppm for a 1-hour CO average and between 2.6 and 3.2 ppm for a 8-hour CO average under the Proposed Design Changes. Concentrations are higher due to the compressed construction schedule and nighttime demolition work that occurs during the peak construction period in 2017. These levels are still well below the CO NAAQS of 35 ppm for a 1-hour average and 9 ppm for an 8-hour average. Therefore, the mobile source CO impacts during construction would not be significant.

Engineering estimates of vehicle traffic and equipment operations were updated for each component of the construction process based on the revised construction phasing and schedule. The results of the air quality analysis show the peak emissions year for all criteria pollutants is Year 2, or 2017, which is consistent with the activities proposed in the construction schedule. The construction emissions are less than half of the applicable de minimis threshold levels; therefore, federal guidelines indicate that no significant air quality impact would occur during the construction period. Other major Airport projects assumed to be underway at the same time as the CTB Redevelopment Program in the 2014 FONSI/ROD would be completed prior to the peak year of construction and would not result in cumulative air emissions.

Since there would be only minor changes to operational conditions at the Airport as a result of the proposed design changes, no additional analysis of future air emissions was performed. The operational air emissions analyses in the 2014 FONSI/ROD are still valid.

Altogether, the Proposed Design Changes result in higher emissions during the shortened construction period; however, none of the higher levels of emissions for any of the criteria pollutants approach the respective de minimis levels. Additionally, cumulative air quality impacts anticipated in the 2014 EA would no longer occur due to the shift in the construction schedule under the Proposed Design Changes. The operational conditions under the Proposed Design Changes are essentially similar to those described in the 2014 EA and approved in the 2014 FONSI/ROD. Therefore, the findings of no significant impact to air quality from the 2014 FONSI/ROD remain valid and can be applied to the Proposed Design Changes as well.

Construction Impacts:

The Proposed Design Changes envision an overall reduction in the construction schedule in comparison to the 2014 Design. Construction is now anticipated to be completed in 68 months, commencing in June 2016 whereas it was anticipated to last 75 months under the 2014 Design. The Proposed Design Changes show the substantive completion date for construction in late 2021, with demobilization activities continuing into early 2022. The reduction is due to simplified phasing, locating the entire CTB headhouse within the existing Parking Garage 2 footprint, and the ability for limited demolition work to take place overnight for approximately 5.5 months centered around the second quarter of 2017. Nighttime demolition activities will include demolishing airside apron and utility infrastructure. There will be no construction activity during these overnight hours, such as paving or pile driving.

The change to the construction schedule will result in a change to the workforce scheduling for a 5.5 month period centered on the peak quarter. All construction activities are expected to take place during three construction shifts for the peak period. The first shift would occur from approximately 6:00 AM to approximately 2:00 PM and comprise approximately 40 percent of the total construction personnel workforce. The second shift would occur from approximately 7:00 AM to approximately 3:00 PM and comprise approximately 40 percent of the total construction personnel workforce. The third shift would occur from approximately 10:00 PM to approximately 6:00 AM and comprise approximately 20 percent of the total construction personnel workforce. Outside of the peak period, workers would arrive in two shifts of 6:00AM to 2:00PM and 7:00 AM to 3:00PM.

The Technical Report states that no adverse environmental impacts from a compressed construction schedule are anticipated for the following reasons:

(1) As a result of the proposed change in the implementation schedule, there will no longer be cumulative impacts from some of the originally anticipated concurrent projects in the 2014 EA and FONSI/ROD. Projects, including the Runway Safety Area (RSA) improvements, the east garage, and east end substation either are or will be complete, therefore there will be fewer cumulative impacts when compared to the 2014 EA and FONSI/ROD.

(2) The construction phasing which streamlines the construction activity, results in fewer moves and temporary passenger accommodations. Redevelopment of the CTB would take place over a period of under six years (68 months), beginning in the second quarter of 2016 and continuing through the end of 2021 (followed by 4 months of demobilization activities).

Additionally, the increases in impacts associated with the Proposed Design Changes do not result in any overall project impacts exceeding significance levels established by FAA Order 1050.1F. Therefore, the findings of no significant impact from construction associated with the 2014 FONSI/ROD remain valid and can be applied to the Proposed Design Changes as well.

Noise:

Construction Equipment Noise:

An updated construction schedule and construction equipment inventory was developed for the proposed design changes, itemizing the various construction equipment that would be utilized during both demolition and construction activities. According to this schedule, 2017 would be the peak construction year for noise, resulting in the maximum number of construction activities and equipment on site. Baseline conditions established in the 2014 EA were used for comparison with the construction noise from the proposed design changes. Four noise-sensitive sites were selected for typical weekday 24-hour noise monitoring, implemented in January 2013 (M1, M2, M3 and M5). The FHWA-approved Roadway Construction Noise Model (RCNM) was used to predict construction noise levels from the on-site construction equipment at each of the four off-site monitoring locations.

RCNM predicted peak daytime noise levels were calculated for each year of construction and projected noise exposure during the nighttime hours (7 PM to 6 AM) was calculated for the peak construction year (2017). Construction equipment noise was compared with existing background levels at four noise sensitive sites. The proposed design changes would likely result in noticeable noise increases that range from 5 to 8 dBA above existing daytime background levels at two of the four monitoring sites—M2 and M3. The relatively high noise increases would occur during early construction stages (between 2016 and 2018).

The highest noise level exposure is projected to occur in 2016, because the greatest pile driving activities would be clustered in 2016. Construction noise at Sites M1, Ditmars Boulevard between 93rd and 94th Streets, and M5, Ditmars Boulevard and 81st Street at Marine Terminal Road, are expected to be 68 dBA and 60 dBA, which is below the respective measured levels of 72-73 dBA and 64-67 dBA. Therefore, noise from construction will not contribute measurably to the neighborhood ambient levels. The construction equipment noise levels are predicted to be 72 dBA at Site M2, Overlook Park and 71 at Site M3, 100th Street and Ditmars Boulevard. Noise levels from demolition at night may contribute several decibels to the background level for the 5.5 months during which nighttime demolition would occur at sites M2 and M3. However, these increases in noise levels are well below the NYSDOT criteria of 85 dBA for exposure. Interior noise levels inside residential properties represented by sites M2 and M3 are not expected to be affected by construction noise because the NYSDOT criteria is not exceeded. The peak noise levels from construction equipment anticipated under the Proposed Design Changes are lower than the respective levels during peak construction periods from the 2014 EA by 3dBA at both sites. This is due to the sequence of construction allowing for the construction of portions of Concourse B and the terminal headhouse being completed prior to the nighttime demolition of the apron areas effectively buffering the noise from the demolition activities. The nighttime demolition does not include any building demolition.[5]

Construction Traffic: The mid-block Passenger Car Equivalent (PCE) volumes along the roadway immediately adjacent to the noise sensitive receptors were calculated for each of the peak traffic periods (morning and afternoon) during the peak year of construction (2017). The maximum incremental noise predicted for each roadway link within the project-related traffic network was calculated. There would be no incremental increase of 3 dBA; therefore, traffic related noise impacts of the construction of the proposed design changes would not be significant and no further analysis is required.

Since the increases to noise from construction equipment associated with the Proposed Design Changes are less than those predicted for the 2014 EA and the construction traffic noise increases are not significant, the findings of no significant impact to noise from the 2014 FONSI/ROD remain valid and can be applied to the Proposed Design Changes as well.

Conclusion:
Impacts, or changes, to all other resources will remain essentially the same as what was presented in the 2014 EA and FONSI/ROD. Any resources experiencing an increase to impacts from the Proposed Design Changes still do not experience significant impacts from the project. As such, the updated information presented in this WR/ROD does not paint a dramatically different picture of the CTB Redevelopment Program or its impacts compared to those presented in the 2014 EA and FONSI/ROD and the findings and determinations made based on those analyses remain valid when applied to the Proposed Design Changes.

[5] E-mail from Nathaniel Kimball of the Port Authority of New York and New Jersey to Andrew Brooks of the Federal Aviation Administration, December 29, 2015 at 2:37PM in response to a request to clarify nighttime demolition activities.

IMPACTS OF THE PROPOSED DESIGN CHANGES TO NATIONAL AIRSPACE SYSTEM FACILITIES

This section presents a summation of impacts the Proposed Design Changes and associated construction may have to FAA NAS facilities at LGA. The level of design presented in the Technical Report is not refined enough to determine the full extent of potential impacts to the operation of these facilities. Where specific impacts are known, they are stated as such; however, the majority of the impacts are uncertain at this time and will warrant additional study, review, and concurrence by the FAA in accordance with the normal course of coordination between the FAA and an airport sponsor.

Airport Traffic Control Tower (ATCT)
The PANYNJ and LGP provided the FAA with a basic Line of Sight analysis that showed Concourse A falling under Line of Sight from the ATCT to the necessary visible movement area by only 1'. Additionally, it is currently unknown if additional Line of Sight issues with other aspects of the Proposed Design Changes would exist, because the basic study conducted only considered a straight line of visibility from the ATCT to a single point on the airfield, rather than a full viewshed analysis. A detailed Line of Sight analysis will be completed by the FAA to provide more understanding of how the Proposed Design Changes would potentially impact the view of the ATCT to the entire airfield. This analysis will determine if building redesign will be required to maintain current movement areas . It is uncertain what affect this would have on the way the ATCT operates the airfield at LGA.

Glare to the ATCT controllers and pilots from building and construction materials used has also been identified as a concern. The Port Authority and LGP would seek to incorporate building and roofing materials that would reduce glare to the controllers and pilots to the greatest extent practicable. Additional studies, including a glare analysis, and FAA review of construction plans may be needed to determine the best way to reduce the potential of glare throughout construction and once the building is complete.

ATCT Staff was not provided the opportunity to review the TAAM modeling used to assess the benefits associated with the redesigned CTB prior to the submittal of the modeling results in conjunction with the Tech Report. Concern has been raised that TAAM model analysis provided does not provide sufficient detail to adequately assess the new design. The new design lacks dual taxiways and the additional parking of the previous design. Operational personnel would require time to work with the modelers to address concern over the lack of dual taxiways and plans for when an aircraft or a gate is disabled in that vicinity of the single taxiway area. Additional review of the TAAM modeling and refinement of inputs to reach concurrence on the proposed operation of the airfield will be required prior to the commencement of construction.

The construction of PANYNJ's Proposed Design Changes requires closure of the ATCT Parking Lot for 18 months. The Port Authority proposes to mitigate this by relocating parking to a dedicated spot in the East Garage for 16 months followed by a dedicated spot in the to-be-constructed West Garage for 2 months. However, not enough information regarding the parking plan has been provided to enable the necessary FAA Offices to concur. The Proposed Design

Changes impact on parking is a departure from a previous agreement to provide parking at the base of the tower during construction. Additional issues have been raised regarding allowing for deliveries of equipment and materials during the 18-month parking lot closure and allowing for parking for government-use vehicles including trucks, hitches, bucket trucks, portable engines, and trailers used at various times for construction/upkeep of facilities overnight. Construction activity, including pile driving and compacting, may impact the air traffic control cab. Minor compacting activities have caused noise within the cab. Also, overall, we do not yet know how dust, noise, and vibrations immediately adjacent to the ATCT will affect ATC and Technical Operations. A long-term solution to these issues that allows for the continued necessary maintenance and operation of the ATCT has yet to be developed by LGP. Additional analysis on this issue will be needed and any future plan will need to be reviewed and approved by the ATCT and its support staff.

Finally, with respect to the ATCT, there has not been any physical security analysis conducted, including ATCT setbacks, surveillance, and protection requirements. This is a concern both during construction and following the commencement of operations at the proposed redesigned facility. Incorporation of appropriate security measures into the design could impact the footprint of the new CTB. The PANYNJ and LGP will need to continue coordination with the FAA to ensure that all Federal safety requirements can be met.

National Airspace System Facilities

Airport Surface Detection Equipment, Model-X (ASDE-X): The Line of Sight and glare issues identified for the ATCT also apply to the ASDE-X, which is located on top of the ATCT cab. Additional concerns specific to the ASDE-X are with relation to glare and reflectivity of building materials used in the Redesigned CTB. Depending on the material used, the reflections could generate a Multipath return to the ASDE-X that would indicate multiple taxiway and runway positions for a single aircraft. The ASDE-X also houses the logic for the Runway Status Lights at LGA and multipath returns to the ASDE-X have the potential to greatly affect the functionality of these lights by indicating an occupied runway when no plane is present. Additional studies are necessary to determine the ultimate effect that materials used in construction and building design would have on the ASDE-X. The FAA's preference is the CTB to be constructed in a way that would not impact the ASDE-X and Runway Status Lights. The additional studies determining the impact to the ASDE-X and all construction plans will require review by the FAA with respect to this concern.

Remote Transmitter Receiver (RTR): The RTR site provides ATC communications for both LGA ATCT and the New York Terminal Radar Approach Control in Garden City, NY. The potential for the Proposed Design Changes to the CTB to impact the RTR has been identified. The design of the aerial walkways between the terminal and the concourses may interfere with the RTR signal. Additional study of this issue will be required in order to determine if there is an impact and what it may be, as any impact to the ability of the RTR to send and receive signals will also impact the frequencies used by the facility. A more detailed construction plan needs to be developed because the line of sight issues could be present during the construction time-frame as cranes and other construction equipment may block the transmitter site. It should be noted that, prior to the development of the Proposed Design Changes for CTB, the PANYNJ has entered into a reimbursable agreement with the FAA to study the relocation of the RTR to accommodate aircraft parking. However, if the construction of the redesigned CTB impacts the RTR, emergency measures to maintain communications would be required and these measures are not included in the current reimbursable agreement.

Low Level Windshear Alert System (LLWAS): It has been determined that the redesign of the CTB requires the relocation of one LLWAS antenna. A proposed site has been identified near the East Parking Garage on previously developed property, as discussed in the Technical Report. The LLWAS station will need to be moved prior to the culmination of the project in order to avoid impacts to the coverage it provides. Additional study will be needed to determine if construction cranes would interfere with radio communication to off-airport LLWAS sites.

Low Density Radio Communications Link (LDRCL): The LDRCL, which provides radar and voice communications to the New York TRACON, may be impacted by crane activity in a similar fashion as the other NAS facilities. Additional study of construction plans will be required to determine what, if any, impact to the LDRCL may occur.

MITIGATION MEASURES

As discussed above, the level of design presented in the Technical Report is not refined enough to determine the full extent of potential impacts to the operation of FAA NAS facilities at LGA from the CTB itself or the construction. The Technical Report contains analysis to the extent that impacts are known and required mitigation or relocation of facilities has been identified. However, for those impacts that are still uncertain, additional technical analyses will need to be conducted to determine if impacts to certain facilities from the CTB itself or its construction, do in fact occur.

Therefore, the final design of the building and any construction plans will need to be altered to avoid impacts to these facilities. Specifically, impacts to the ATCT and associated parking, ASDE-X, RTR, LLWAS, LDRCL, Terminal Instrument Procedure (TERPS) Surfaces, and facility security requirements will need to be avoided to the extent practicable. Should additional technical analyses indicate impacts to these facilities, the building design or any construction plans will be altered to mitigate impacts. This mitigation may occur via several methods, including, but not limited to, lowering of building heights; using non-reflective materials during construction, and changes to the building design within the currently identified footprint. These design mitigation measures will be subject to future FAA technical analyses, review, and concurrence.

If more substantial mitigation is required, such as altering the building design to encompass areas outside of the currently identified footprint, or if mitigation cannot be identified and relocation of the NAVAIDs or facilities potentially affected would be required, those measures would be subject to additional FAA Review. This potentially includes additional environmental analysis.

The FAA will continue to review current and future design analyses (including TAAM) and construction plans for potential effects to the FAA facilities and operation at LGA, including, but not limited to the ATCT (for construction, Line of Sight, and security concerns), ASDE-X, RTR, LLWAS, LDRCL, and for the protection of all TERPS Surfaces to determine if additional mitigation to offset potential impacts to these NAS facilities is required. The Port Authority will submit all additional proposals for mitigation of these potential issues to the FAA for consideration prior to commencement of construction. The FAA will determine, pursuant to applicable laws and regulations, if additional environmental analysis is required prior to issuing concurrence.

To the extent that the project impacts are known, specific mitigation measures have been developed and proposed in the Technical Report. The following measures are in addition to those identified in the 2014 EA and FONSI/ROD or are changed from the 2014 EA and FONSI/ROD. Implementation of the Proposed Design Changes requires completion of the following commitments presented in the Technical Report:

1. Conduct all construction activities during the daytime whenever possible (note that this will not be possible for a 5.5 month period around the 2nd Quarter of 2017, when demolition work will occur on the airside between 10:00PM and 6:00AM);

2. Require special permits for all construction within a specified distance and a specified time period for residential zones during the night and weekends;

3. Use construction equipment with effective noise-suppression devices;

4. Use noise control measures as necessary, such as enclosures and noise barriers, to protect the public and achieve compliance with all City noise ordinances; and

5. Conduct all operations in a manner that will minimize, to the greatest extent feasible, disturbance to the public in areas adjacent to the construction activities and to occupants of nearby buildings through the use of Best Management Plans.

6. Make temporary improvements as recommended at 11 roadway intersections based on the updated traffic analysis. These improvements are detailed in the Technical Report, Section 6.1.

7. The traffic monitoring program initiated as mitigation in response to requirements in the 2014 FONSI/ROD must be updated in coordination with NYCDOT according to the new information presented in the Technical Report regarding changes to the construction period and associated scheduling and traffic volumes.

Consistent with the FAA's 2014 FONSI/ROD and planning efforts that have resulted in this WR/ROD, the FAA understands that the PANYNJ will undertake the necessary actions to ensure that all conditions and/or specific mitigation measures outlined in this WR/ROD are undertaken and that the PANYNJ will monitor the implementation and effectiveness of such measures. In some instances, the above conditions/mitigation measures are required as a result of coordination and agreement; they do not necessarily reflect environmental impacts that require mitigation to meet FAA standards pursuant to FAA Orders or Guidance.

PUBLIC INVOLVEMENT/AGENCY COORDINATION

A Notice of Public Availability of the Technical Report was made in the following publications on or during the week of November 30, 2015: *Daily News (Queens Edition), Newsday, Queens Chronicle, Queens Gazette, Queens Times Ledger, Queens Ledger, El Especialito, The National Herald, Sing Tao Daily, Queens Courier, Queens Tribune, Newark Star Ledger, and Bergen Record.* The document was also made available to the public via the internet at http://www.panynj.gov/about/pdf/TechReport-With-Attachments-11252015.pdf. The Technical Report was made available to the public and agencies for review through December 14, 2015.

During this period, one comment was received from the Environmental Protection Agency. The comment requested text from the 2014 EA regarding sustainability issues be incorporated into the Technical Report. However, the Technical Report only addresses areas where analysis or language has changed from the 2014 EA. The Technical Report also states that all language from the 2014 EA that doesn't change remains valid and is incorporated by reference, including the text on sustainability. Therefore, this comment was considered and has been adequately addressed.

CONCLUSION

In response to the PANYNJ request, the FAA reviewed and analyzed the December 2015 Technical Report and its Attachments: Proposed Design Changes to the Central Terminal Building Redevelopment Program at LaGuardia Airport (Technical Report), that analyzed and compared potential impacts associated with the proposed design changes as compared to the potential impacts of the original 2014 design approved in the 2014 FONSI/ROD. The FAA also prepared this WR/ROD.

Based on FAA Order 1050.1F, paragraph 9-2(c), the FAA concludes that a new or supplemental EA need not be prepared since this WR/ROD indicates that:

> "(1) The proposed action conforms to plans or projects for which a prior EA and FONSI have been issued and there are no substantial changes in the action that are relevant to environmental concerns;
>
> (2) Data and analyses contained in the previous EA and FONSI are still substantially valid and there are no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts; and
>
> (3) Pertinent conditions and requirements of the prior approval have been, or will be, met in the current action."

Based on FAA Order 5050.4B, paragraph 1402 (b), FAA concludes that a supplement to the EA for this project is not required since the airport sponsor did not make substantial changes in the proposed action that could affect the action's environmental effects and that there are no significant new changes, circumstances or information relevant to the proposed action, its affected environment, or its environmental impacts.

Therefore, as discussed above and in accordance with FAA Order 1050.1F, *Policies and Procedures for Assessing Environmental Impacts*, and FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, preparation of a new or Supplemental EA is not required.

FEDERAL AGENCY FINDINGS

The 2014 FONSI/ROD contained eight findings pertaining to the Project that was approved. As this WR/ROD for the Proposed Design Changes demonstrates, there are no substantial changes relevant to environmental concerns to the Project that was the subject of the 2014 EA. Additionally, the design changes do not result in any significant new circumstances or information relevant to environmental concerns addressed in findings D through H of the 2014 FONSI/ROD. Therefore, the eight findings (Findings A through H) of the 2014 FONSI/ROD remain valid and no changes to any of the findings are required.

DECISION AND ORDER

This WR/ROD was prepared pursuant to FAA Orders 1050.1F, Environmental Impacts: Policies and Procedures, and 5050.4B, National Environmental Policy Act Implementing Instructions for Airport Actions, Paragraph 1401. This WR/ROD along with the FAA's December 2014 FONSI/ROD constitute the FAA's decisions with regards to the CTB Redevelopment Program at LGA. The FAA has independently evaluated the information contained in the 2014 EA and the 2015 Technical Report and takes full responsibility for the scope and content that addresses the FAA actions.

I have carefully and thoroughly considered the facts contained in the 2014 EA and FONSI/ROD, 2015 Technical Report and its Attachments, and this Written Reevaluation of the 2014 EA and FONSI/ROD. Based on that information, I find the proposed Federal Actions are consistent with existing national environmental policies and objectives of Section 101(a) of the *National Environmental Policy Act of 1969* (NEPA). I also find the proposed Federal Actions with the required mitigation referenced above will not significantly affect the quality of the human environment or include any condition requiring any consultation pursuant to Section 102(2)(C) of NEPA.

This document amends only the identified portions of the FAA's 2014 FONSI/ROD. If not addressed in this document, the statements and findings in the 2014 FONSI/ROD remain the same.

Accordingly, pursuant to the authority delegated to me by the Administrator of the FAA, I find that the actions summarized in this WR/ROD are reasonably supported and approved. I hereby direct that action be taken together with the necessary related and collateral actions, to carry out the agency actions noted above. Specifically:

a. Unconditional Approval of a revised ALP for the Proposed Design Changes to the Central Terminal Building Redevelopment Program at LaGuardia Airport as described above and submitted for approval on LaGuardia ALP Pen-and-Ink Change #13, pursuant to 49 U.S.C. §40103(b) and §47107(a)(16) to include the redesign of the CTB as described in the Technical Report; and determination and approval of the effects of this project upon the safe and efficient utilization of navigable airspace pursuant to 14 CFR Parts 77 and 157 and 49 U.S.C. §44718;

b. Determination under 49 U.S.C. §40101(d)(1) and §47105(b)(3) that the Proposed Design Changes, with appropriate mitigation discussed above, meet applicable design and engineering standards set forth in FAA Advisory Circulars;

c. Determination concerning funding through the Federal grant-in-aid program authorized by the Airport and Airway Improvement Act of 1982, as amended (recodified at 49 U.S.C. §47107) and/or approval of an application to use Passenger Facility Charges (PFCs) under 49 U.S.C. §40117 (neither the 2014 FONSI/ROD nor this WR/ROD determines eligibility or availability of potential funds);

d. Determination under 49 U.S.C. §44502 (b) concerning the acquisition, establishment, improvement, operations and maintenance of air navigation facilities and that the subject airport development is reasonably necessary for use in air commerce or in the interests of national defense, recognizing the need for incorporation of appropriate mitigation discussed above;

e. Continued close coordination with the PANYNJ and appropriate FAA program offices, as required, to maintain safe, efficient use of and preservation of the navigable airspace during all aspects of project construction and demolition for the Proposed Design Changes, in accordance with 14 CFR Part 77; and

f. Approval of appropriate amendments to the LGA ACM to reflect the Proposed Design Changes, as required, pursuant to 49 U.S.C. §44706.

APPROVED: Carmine Gallo (signature) 12/30/2015

Carmine Gallo
Regional Administrator
Federal Aviation Administration
Eastern Region

Date

DISAPPROVED: ______________________ ______________

Carmine Gallo
Regional Administrator
Federal Aviation Administration
Eastern Region

Date

Right of Appeal

This ROD presents the Federal Aviation Administration's final decisions and approvals for the actions identified, including those taken under the provisions of Title 49 of the United States Code, Subtitle VII, Parts A and B. This decision constitutes a final order of the Administrator subject to review by the Courts of Appeals of the United States in accordance with the provisions of 49 U.S.C. §46110.

Any party seeking to stay the implementation of this ROD must file an application with the FAA prior to seeking judicial relief, as provided in Rule 18(a) of the Federal Rules of Appellate Procedure.

Figure 1
Proposed CTB Redesign

Figure 2
2014 Design

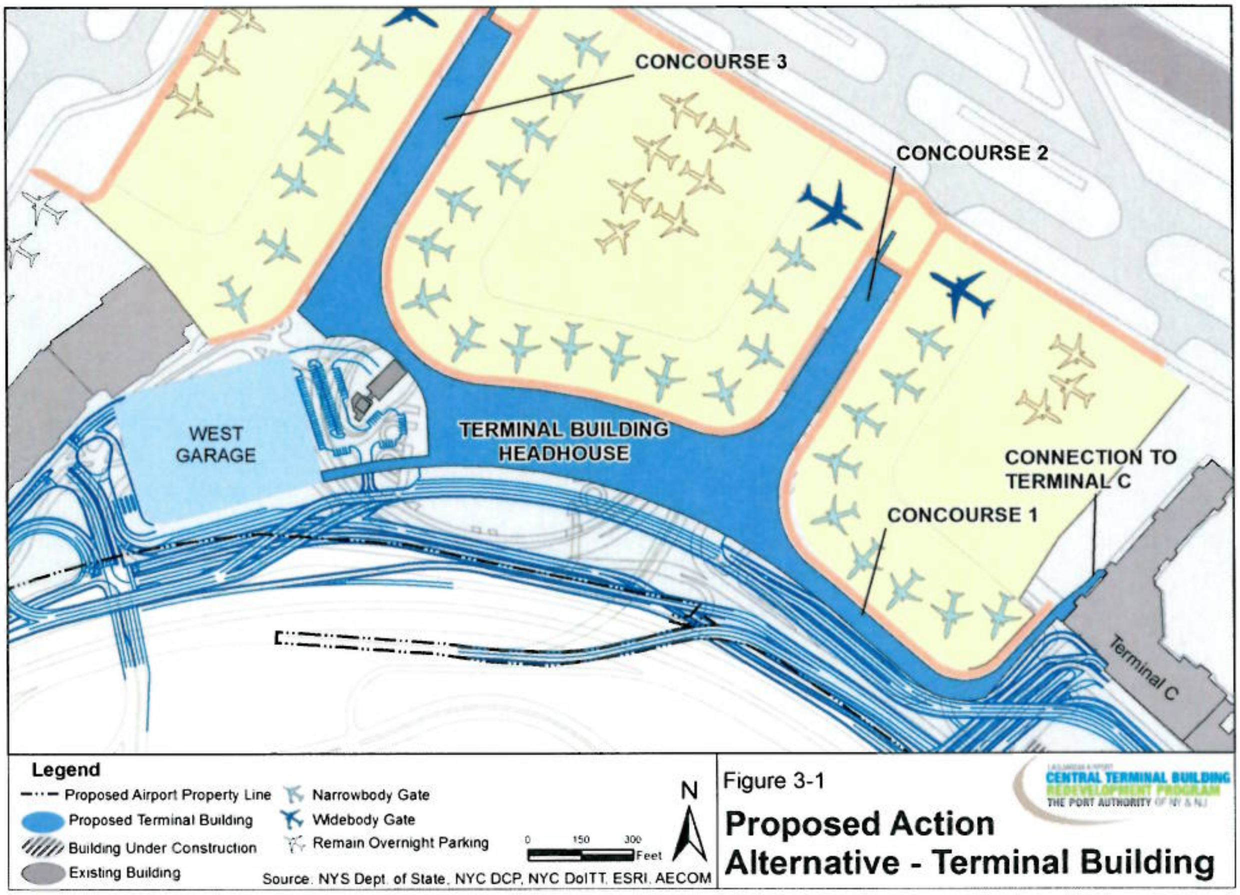
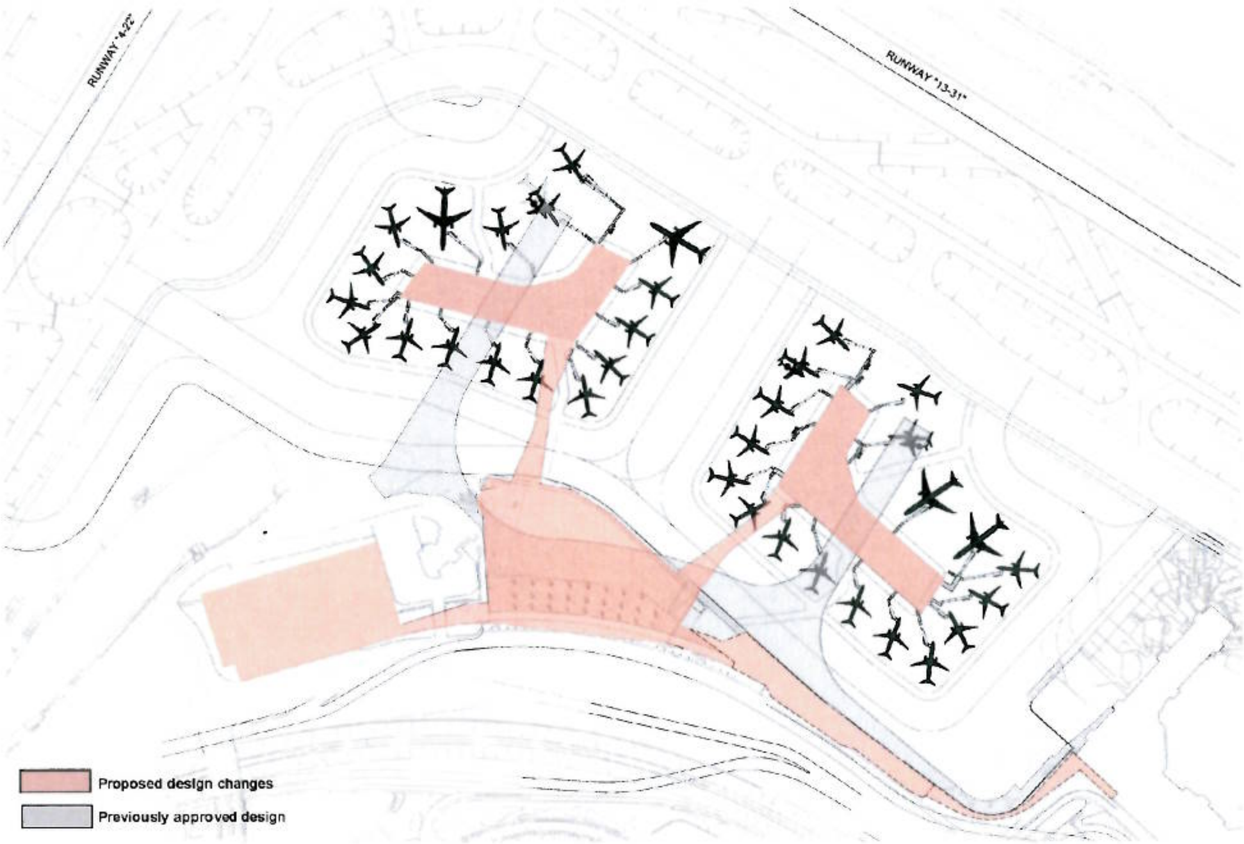


Figure 3
Overlay of Proposed Design Changes and 2014 Design



Appendix A
December 2015 Technical Report

December 2015 Technical Report: Proposed Design Changes to the Central Terminal Building Redevelopment Program at LaGuardia Airport

Prepared for
U.S. Department of Transportation
Federal Aviation Administration

Sponsored by
The Port Authority of NY & NJ

December 2015

Table of Contents

Appendices

The appendices have not changed from the November 2014 EA and are not restated in this document. The 2014 EA is published in its entirety, including appendices, at http://www.panynj.gov/about/studies-reports.html

Attachments

i. Preface

This technical report was written to examine the design changes that have taken place within LaGuardia Airport's Central Terminal Building (CTB) Redevelopment Program since the Environmental Assessment (EA) was conducted in 2014. Much of the language in the technical report is from the 2014 EA, because the purpose and need of the CTB Redevelopment Program remains the same, and the design changes represent an updated approach that remains within the scope of the project and still meets the purpose and need defined in the EA.

Given that the Proposed Action in the EA was approved through issuance of a Finding of No Significant Impact/Record of Decision (FONSI/ROD) in December 2014, the following format is followed throughout the document:

- *Underlined and italicized text represent changes to statements made in the 2014 EA.*
- ~~Strikethrough text represents language from the 2014 EA that no longer applies.~~
- If a section from the 2014 EA is not included, no design change has occurred.
- If there is no underline, italic, or strikethrough, language remains the same as 2014 EA.
- The following terms are used:
  - Previously approved design (2014): The terminal building design approved in the 2014 EA
  - Proposed design changes: changes to the "previously approved design (2014)"
  - Proposed Action: Reference to analysis completed during the 2014 EA process that applies to both the previously approved design and the proposed design changes.
  - CTB Redevelopment Program: Reference to program elements of the previously approved design and proposed design changes that remain consistent. Used in context to the full CTB Redevelopment Program.

1 Introduction

The Port Authority of New York and New Jersey (PANYNJ) is proposing to redevelop the existing passenger terminal, airside apron, landside roadways, and parking lot within LaGuardia Airport's central terminal area. The Federal Aviation Administration (FAA) issued a Finding of No Significant Impact/Record of Decision (FONSI/ROD) for the original ("previously approved (2014)") design in December 2014, which encompasses the replacement of the existing Central Terminal Building (CTB) (also referred to as Terminal B), parking lot "P2", landside roadways, and airside apron and taxiway systems serving the CTB. The project approved under the 2014 FONSI/ROD replaces existing facilities with new facilities that are more efficiently designed and located to both meet the latest federal standards for airport safety and security and to accommodate forecast passenger demand at acceptable levels of service.

Since the issuance of the 2014 FONSI/ROD, the Port Authority initiated the CTB Redevelopment Program site preparation by demolishing Hangars 2 and 4 in the summer of 2015 in accordance with the Memorandum of Agreement (MOA) established pursuant to Section 106 of the National Historic Preservation Act, and performed utility relocation and boring work. The MOA outlines the proposed conditions for demolition of the hangars (see ***Appendix D of the 2014 EA****).*[1] *The MOA was signed by PANYNJ, FAA and the New York State Historic Preservation Office, and concurred on by Consulting Parties. Through competitive solicitation, the Port Authority selected a preferred proposer for a Public Private Partnership (PPP) that will design, construct, and operate the new Terminal B. The selection was made by the Port Authority's Board of Commissioners on May 28, 2015*[2]*. The PPP has advanced a revised terminal design ("proposed design changes") that changes the building geometry, but does not alter the project Purpose and Need, the project footprint, the accommodation of forecasted demand, number of gates, or level of service to passengers. This document provides a review of the original building design and corresponding change to the ALP to determine whether any of the design changes would significantly alter the environmental concerns related to those addressed in the December 2014 Final Environmental Assessment (EA), and to determine if the original findings are still valid. As in the previously approved (2014) design, the proposed design changes do not involve changes to the airfield runways or taxiway intersections or aircraft flight procedures to or from the Airport. The proposed design*

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[1] *As discussed in Section 5.10, Historic, Architectural, Archaeological and Cultural Resources, and* ***Appendix D: Evaluation of Historic Resources of the 2014 EA****, demolition of Hangars of 1, 2, and 4 cannot be avoided; therefore, the adverse effect could be mitigated by recording the NRHP-eligible Hangars 1, 2, 3, 4, and 5, as well as 7, to Level III Historical Architectural Building Survey and Historic American Engineering Record (HABS/HAER) standards of the National Park Service (NPS), which includes photographic documentation and submission into the archives maintained by New York State, developing an interpretive display of the Airport's history to be prominently placed within a public section of the Airport, and maintaining Hangars 3 and 5 in a state-of-good repair for the foreseeable future. In addition, select excavation and trenching activities within a designated area of archaeological sensitivity (in the vicinity of the proposed West Garage) would be performed in accordance with an archaeological monitoring protocol that requires cultural resource staff to be present during specified construction activities and identifies the procedures to be followed if potentially significant archaeological deposits or features are discovered.*

[2] *The PPP has been selected as the Port Authority's preferred proposer. The PPP is referred to as LaGuardia Gateway Partners (LGP) in this technical report. LaGuardia Gateway Partners is led by Vantage Airport Group Ltd. Construction firms Skanska and Walsh Construction, and Meridiam, an equity investment firm, also are part of the consortium, along with a design joint venture made up of HOK, Parsons Brinkerhoff and partners. This technical report references many of the partners, and supporting technical analysis was in some cases prepared by the partners. Should the PPP change in the future for any reason, the Port Authority expects the analysis prepared to remain pertinent and relevant to the overall Program.*

changes incorporate mitigation measures originally identified in the 2014 FONSI/ROD, along with additional mitigation measures for construction traffic impacts and nighttime construction.

The PPP advanced the proposed design changes in order to present a project that offered lower overall costs than the previously approved (2014) design from the 2014 EA and allowed for quicker construction phasing and project delivery. To these points, the overall construction schedule has decreased by seven months, and cost savings of approximately $250 million versus the previously approved (2014) design. It is also important to note that while the construction schedule of the whole program has decreased by seven months from start to finish, the start date for the program is later than originally contemplated in the 2014 EA. Therefore, the substantive completion date of late 2021 remains substantially similar to the completion date in the 2014 EA, with demobilization activities continuing into early 2022. The schedule reduction is due to simplified phasing, the ability to wholly locate the new CTB headhouse within the footprint of existing Parking Garage 2, and the ability for limited demolition work to take place during overnight (10PM-6AM) hours for approximately 5.5 months centered around the 2nd quarter of 2017. Nighttime demolition activities will include demolishing airside apron and utility infrastructure. There will be no construction activity during these overnight hours, such as paving or pile driving.[3] Only demolition and material removal will happen during these overnight hours. Nighttime demolition work is required to maintain consistency with overall project phasing as well as to avoid conflicts with aircraft operations during daytime operating hours. As the airport operator, the Port Authority verified that the operational and environmental benefits of the previously approved (2014) design were preserved in the proposed design changes, and that the terminal was capable of fulfilling the original purpose and need. The analysis supporting these conclusions is provided in this document.

The public announcement of the Port Authority's selection of a preferred proposer for the CTB redevelopment project coincided with New York State Governor Andrew M. Cuomo's announcement of his goal for a transformational redesign of LaGuardia Airport, which would include replacement of Terminals C and D, as well as the potential construction of an AirTrain, hotel, and other support facilities on airport, as recommended by the Governor's airport design panel. While preliminary planning efforts are underway to consider the other components of the transformational redesign, the CTB Redevelopment component represents a concrete specified design, a project that received approval from the Port Authority's board on May 28, 2015 and will shortly be presented to the Board for final approval. The other components of the new design are still pending consideration in the capital plans of the PANYNJ and other entities, and have not yet been the subject of sufficiently specific planning work to enable accurate and relevant NEPA analysis. Therefore, the nature, the extent, and the design of these other components are not determinable or reasonably foreseeable at the present time. In the event that these projects do become ripe for decision, they will be subject to their own appropriate NEPA analyses and those analyses will be required to look back on the CTB Redevelopment Program as a past project and to consider it in future project analysis of cumulative impacts.

1.1 Need for Action

It is imperative that the replacement of the CTB proceed in an expeditious manner. The FAA was originally notified of the intent to replace the CTB in a 2005 Passenger Facility Charge (PFC) application for a feasibility study to replace the facility. The proposed design changes reduce the CTB construction

[3] *For the purposes of this document, demolition work includes dismantling existing facilities and removing material from the airport. Construction work includes any development of new facilities, transportation of material into the airport, and activities to support the development of new facilities such as pile driving.*

schedule by seven months and require airlines and their employees and passengers to move only once. The PPP accomplishes this through more efficient construction phasing. The proposed design changes maintain the same or higher levels of passenger service and operational efficiency as the previously approved (2014) design. PANYNJ has revisited the 2014 EA and analyzed changes to environmental impact categories and project design, which are described in this technical report.

The proposed design changes consist of a reconfigured headhouse and two midfield concourses. The concourses are connected back to the headhouse by means of pedestrian bridges over one of the leasehold area dual taxi lanes. The gross floor area is 1,457,657 square feet, representing a 9.51% increase from the previously approved (2014) design[4]. The design is overlaid on the previously approved (2014) design in Attachment 1. The building height is comparable (within two feet of the previously approved (2014) design).

The benefits of the proposed design changes include:

- *The ability to meet the original purpose and need of the project while realizing savings of approximately $250 million and 7 months of construction time compared to the previously approved (2014) design.*
- *A staging plan that requires only one move per airline, rather than several moves. This is a result of the headhouse being constructed all at once, while the original headhouse remains in service. This is accomplished by limiting the headhouse footprint to be wholly within the footprint of existing Parking Garage 2, which was not originally contemplated. The schedule reduction is due to simplified phasing, the ability to wholly locate the new CTB headhouse within the footprint of existing Parking Garage 2, and the ability for limited demolition work to take place during overnight (10PM-6AM) hours for approximately 5.5 months.*

1.2 NEPA Requirement

The Federal Actions described in the November 2014 EA were:

- FAA approval of revisions to the ALP and the implementation of changes to the originally approved design as depicted in **Figure 1-1**;
- FAA approval for PANYNJ to establish eligibility to participate in the funding through the use of PFCs for eligible airport development, assuming the independent requirements of the PFC program are met.

These federal actions are reviewed within this technical report. Additional federal actions, such as relocation of FAA Navigational Aids (Navaids), may be required as part of this project.

Subject to FAA's decision on this technical report and ALP approval, construction is expected to begin on the proposed design changes in the second quarter of 2016. Construction is ongoing on parts of the project that are part of the previously approved design (2014).

1.3 Proposed design changes

[4] *The November 2014 EA stated that the previously approved design of the CTB would be "approximately 1.3 million square feet of total space" (Section 1.4, Page 1-10 of the November 2014 EA). This estimate was refined to 1,331,060 square feet as the previously approved design progressed. The total square footage of the proposed design changes is 1,457,657 square feet, a 9.51% increase.*

In its December 2014 FONSI/ROD, the FAA approved the CTB Redevelopment Program at LGA. The PPP selected to design, build and operate the new terminal has advanced the design and refined elements of the project that resulted in changes to the previously approved (2014) design. As with the previously approved (2014) design, the updated design does not involve the airfield runways or taxiways, or other terminals or facilities at LaGuardia Airport.

The proposed design changes that are the subject of this technical report are as follows:

Overall Building Design

The proposed design changes redefine the overall configuration of the terminal elements and consists of a reconfigured headhouse and two midfield concourses, rather than a headhouse directly connected to pier concourses. The concourses are connected back to the headhouse by means of pedestrian bridges over one of the leasehold area taxi lanes. The gross floor area is 1,457,697 square feet, representing a 9.51% increase from the previously approved (2014) design. The design is overlaid on the previously approved (2014) design in Attachment 1.

The benefits of the proposed design changes include:

- *The ability to meet the original purpose and need of the project while realizing savings of approximately $250 million and 7 months of construction time compared to the previously approved (2014) design.*
- *A staging plan that requires only one move per airline, rather than several moves. This is a result of the headhouse being constructed all at once, while the original headhouse remains in service. This is accomplished by limiting the headhouse footprint to be wholly within the footprint of existing Parking Garage 2, which was not originally contemplated.*
- *A passenger connection to Terminals C and D that integrates public and sterile corridors for seamless connections between airlines and terminals.*

Concourses

The proposed design changes include double-sided concourses that are approximately 20' wider than the previously approved (2014) design to provide ultimate flexibility in seating type and configuration over time, as well as the ability to absorb delayed passengers.

Water and Energy Savings

The proposed design changes include innovative water management strategies. Rainwater will be collected and stored in underground tanks below the headhouse. The tanks have been sized for 75,000 gallon capacity. The harvested water will be used for irrigation of the site at the headhouse. In addition to water efficient plumbing, there will be solar water collectors at the headhouse and concourses to provide hot water to the restrooms. These design elements lend to a more fully integrated sustainability strategy than the previously approved (2014) design.

Roadways

Accommodation of dual airside taxilanes and the new headhouse configuration have caused the frontages to shift 30' south. Attachment 7 illustrates the differences between the two. Overall, the *roadway changes are minimal and the analysis shows that the changes do not affect vehicle circulation on-airport.*

The following differences have been identified:

1. *CTB frontages (HOV, Arrivals, & Departures levels) shifted approximately 30' south to support connection to Terminal C and reconfigured headhouse.*
2. *Roadway changed to support the shifting of the CTB frontages to accommodate dual taxilanes in front of Concourse A.*
3. *CTB Arrivals and Departures exit ramp alignment changed to accommodate dual taxilanes in front of Concourse A.*
4. *Access to West Parking Garage and intersection changed.*
5. *Access to FAA Air Traffic Control Tower (ATCT) changed.*
6. *Access to shipping/receiving facility changed.*

Airside

The revised CTB layout has two individual 'L' shaped islands joined to a single headhouse via bridges. The island on the western portion of the CTB apron is Concourse A and the one on the eastern portion is Concourse B. The proposed layout offers the same number of gates as the previously approved (2014) design (35): (a) 17 Gates on Concourse A; and (b) 18 Gates on Concourse B. Of these 35 gates, four gates will be dedicated to handle B767-400ERs (ADG Group IV) and 31 will be dedicated to handle B737-900s (ADG Group III) independently. This represents the same fleet mix accommodated in the previously approved (2014) design. The proposed design changes provide independent full-length dual Group III taxilanes between Concourses A and B and partial dual Group IIIA taxilanes in the area south-west of Concourse A. A single Group IIIa taxilane will serve gates on the east and south sides of Concourse B. Also included on the apron are 20 independent remote parking positions for Group III aircraft. Please see Attachment 2-September 2015 LGA CTB Total Aircraft and Airfield Model (TAAM) Analysis report as well as Figure 1-1b for airside diagrams.

Construction Phasing

The overall project schedule from initiation to full completion is 68 months and is portrayed fully in Attachment 3. This represents a decrease of seven months of construction activities from the previously approved (2014) design (75 months) analyzed in the 2014 EA. The schedule reduction is due to simplified phasing, the ability to wholly locate the new CTB headhouse within the footprint of existing Parking Garage 2, and the ability for limited demolition work to take place during overnight (10PM-6AM) hours for approximately 5.5 months. Assuming construction initiation in 2Q 2016, the terminal would be open by the end of 2021. The headhouse would open in Mid-2019 (37 months). These timeframes represent the balance of construction that has not already started as part of the previously approved (2014) design. Activities consistent with the November 2014 EA, such as the demolition of Hangars 2 and 4 and other site work, began in 2014 and is continuing apace. Hangars 2 and 4 were demolished during the summer of 2015 in accordance with the Memorandum of Agreement (MOA), in place to mitigate adverse effects to the Hangars, which are considered historic resources. The Port Authority analysis demonstrates no adverse environmental impacts from a compressed construction schedule for the following reasons: (1) cumulative impacts from originally anticipated concurrent projects, including the runway deck Runway Safety Area (RSA) improvements and the east garage and east end substation will not exist, due to change in schedule; (2) the phasing results in fewer moves and temporary passenger *accommodations, streamlining the construction activity. The public announcement of the Port Authority's selection of a preferred proposer for the CTB redevelopment project coincided with New York State Governor Andrew M. Cuomo's announcement of his goal for a transformational redesign of LaGuardia Airport, which would include replacement of Terminals C and D, as well as the potential construction of an AirTrain, hotel, and other support facilities on airport, as recommended by the Governor's airport design panel. While preliminary planning efforts are underway to consider the other components of the transformational redesign, the CTB Redevelopment component represents a concrete specified design, a project that received approval from the Port Authority's board on May 28, 2015 and will shortly be presented to the Board for final approval. The other components of the new design are still pending consideration in the capital plans of the PANYNJ and other entities, and have not yet been the subject of sufficiently specific planning work to enable accurate and relevant NEPA analysis. Therefore, the nature, the extent, and the design of these other components are not determinable or reasonably foreseeable at the present time. In the event that these projects do become ripe for decision, they will be subject to their own appropriate NEPA analyses and those analyses will be required to look back on the CTB Redevelopment Program as a past project and to consider it in future project analysis of cumulative impacts.*

1.3.1 Terminal Building

Under the Previously approved (2014) design, the existing CTB would be demolished and replaced with a new terminal building designed and constructed to meet the latest Federal standards for airport safety and security, to accommodate forecast passenger demand, and to do so at acceptable levels of service (see **Figure 3-1**). The new terminal would be both functional and flexible with a building layout and environment that supports the highest level of passenger service and facilities within the available budget for a building of this size. The new terminal would be certified under the Leadership in Energy and Environmental Design (LEED) program, striving towards a Gold rating, with a minimum acceptable rating of Silver.[5]

~~The headhouse would have three levels, with Departures/Ticketing on upper Level 3, Arrivals/Baggage Claim on middle Level 2, and Ground Transportation and airport/airline operations on ground Level 1. On the airside, concourses would interface with the preferred concept for the terminal airside apron; on the landside, all three building levels would interface with the preferred concept for landside roadways and parking. The CTB Redevelopment Program includes the following terminal building projects:~~

Change: Figure 3-1b depicts the modified terminal building, taxiways, RON positions, and landside roadways consistent with the proposed design changes. The Headhouse has four levels, with Concessions on the upper Level 4, Departures/Ticketing and passenger screening on Level 3, Arrivals/Baggage Claim and in-line baggage screening on Level 2, and airline baggage makeup and high occupancy Ground Transportation on ground Level 1. On the airside there are two island concourses separated by a dual taxi-lane and connected by overhead pedestrian bridges across the taxilanes to the Headhouse. On the

[5] LEED is a green building certification program that recognizes best-in-class building strategies. It is a nationally accepted benchmark for the design, construction and operation of high performance green buildings. A point system is used to rate projects that satisfy requirements based on the following categories: sustainability, water efficiency, energy and atmosphere, materials and resources used, indoor environmental quality, innovation in design and regional priority. The rating system and their corresponding point levels are: Certified (40-49 points), Silver (50-59 points), Gold (60-79 points) and Platinum (80 points and above). Projects receiving a higher rating level are deemed more environmentally responsible. http://www.usgbc.org/Docs/Archive/General/Docs3330.pdf

landside the HOV, Arrivals, and Departures building levels would interface with the preferred concept for landside roadways and parking.

The CTB Redevelopment Program includes the following terminal building projects:

- Headhouse and Concourses. ~~The Program would provide for a compact bar-shaped headhouse with double-sided concourses and a smaller single-sided concourse to the east.~~ The facilities are planned in the context of the Airport-wide demand of 34 MAP and the new terminal is designed to accommodate over half that demand—17.5 MAP—at LOS C. ~~The proposed building would total approximately 1.3 million square feet, including the concourses and a connector to the adjacent Terminal C.~~ There would be space for over 200 passenger check-in positions, 22 TSA screening lines, nine (9) baggage claim devices, and allowances for concessions, airline clubs, airport/airlines offices, with sufficient space for the building's support systems.

  Change: The proposed design changes would provide for a reconfigured Headhouse wholly located within the footprint of existing Parking Lot 2, and two concourses connected to the headhouse by overhead pedestrian bridges. The headhouse would centralize ticketing, baggage pickup and drop off, and security functions. All gates would be located on the island concourses. The proposed building would total approximately 1,457,697 square feet, including the concourses and a connector to adjacent Terminal C. Passenger check in positions, TSA screening lines, baggage claim devices, and allowances for ancillary space do not change.

  - *Level 4. The upper level would house the primary concessions mall. The maximum height of this fourth level would remain below the maximum height of the three level originally approved design. The concessions level would be reached from the post security side of the passenger security screening checkpoint via escalators and elevators and would serve as the transition to the Concourses via the overhead pedestrian bridges. A post security connector to Terminal C would originate at this level of the Headhouse.*

  - Level 3. The upper level would house the Check-In Hall and Passenger Security Screening Checkpoints. It would be served by a high elevated level (departures level) roadway and a ~~30-~~foot wide sidewalk for departures drop off. ~~The Passenger Security Screening Checkpoints would match the layout of the concourses. After checking-in, passengers would proceed down to Level 2 by way of escalators, elevators or stairs.~~

    Change: Level 3 would house the Check-In Hall and Passenger Security Screening Checkpoints. It would be served by an elevated level (departures level) roadway and a 40-foot wide sidewalk for departures drop off. The central Passenger Security Screening Checkpoint is situated in a location where it will serve both Concourses, providing for greater flexibility for the TSA. Airline ticket offices would be located on this level. After checking-in and passing through the security checkpoint, passengers would proceed up to Level 4 by way of escalators, elevators or stairs.

  - Level 2. ~~On the middle level, departing passengers would follow signage to their departure gate. Some gates would be located on the north side of the terminal headhouse.~~ Most gates, however, would be located on one of the concourses. ~~Level 2 would provide access to the airline lounges and concessions—a mix of retail and food and beverage offerings.~~ Arriving passengers would follow signage to the Baggage Claim Hall. The area of bag claim carousels would be flanked by restrooms, concessions and airline service offices. ~~Multiple vestibules would provide access to the elevated Arrivals Roadway and Curb, with taxi stands located at each end of the curb.~~

Change: Arriving passengers would transition from the Level 4 Pedestrian Bridges through the Concessions mall to escalators and elevators down to the Baggage Claim Hall located on Level 2. The bag claim hall carousels would be flanked by restrooms, concessions and airline service offices. Multiple vestibules would provide access to the elevated Arrivals Roadway and Curb, with taxi stands located at each end of the curb. The outbound baggage in-line screening rooms (Checked Baggage Inspection Rooms/Checked Baggage Reconciliation Areas) are located on this level directly behind the baggage claim hall. The outbound baggage enters the screening area from the ticket counter and curbside conveyors above, and once cleared is transported to the baggage sortation and makeup area directly below the screening area. Major mechanical and electrical equipment (MEP) rooms are located on this level.

- Level 1. The ground level of the new terminal would house the in-line baggage screening devices, major mechanical, electrical and plumbing (MEP) spaces, and the Ground Transportation lobby and curb in front.

  Change: The ground level of the new terminal Headhouse would house the baggage sortation and makeup devices, the baggage claim stripping conveyors, the loading dock and storage facilities, employee screening devices, airline and building offices, and the Ground Transportation lobby and curb in front.

- All concourses would have two principal levels and a partial third level where they meet the terminal headhouse. The main passenger level of each concourse would house the gate holdrooms and central circulation corridors. The lower level would house the baggage make up areas, utilities, as well as airline and ground handling support services.

  Change: The two island concourses included in the proposed design changes consist of two primary levels, the Apron level housing airline ramp level operations and ground handling support areas, and the Departures Level with gate holdrooms, concessions, and central circulation spaces. Directly above the Departures Level is a partial mezzanine housing Airline Clubs and Mechanical, Electrical, and Plumbing (MEP) rooms. Passengers access the Concourse mezzanine level club rooms and departures level holdrooms via escalators and elevator banks from the overhead pedestrian bridges connecting the Concourses to the Headhouse.

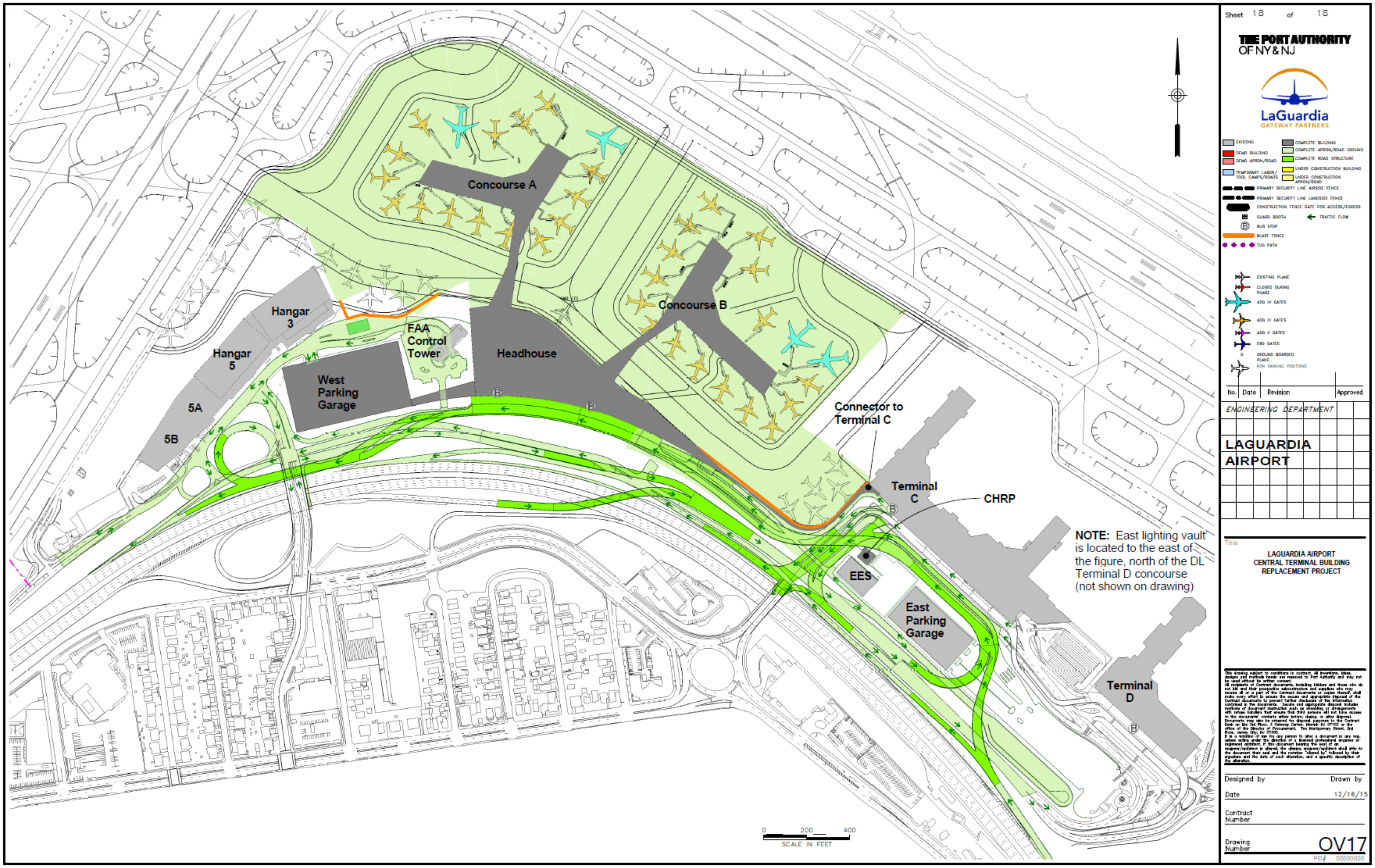

Figure 3-1b: Depiction of Proposed Design Changes

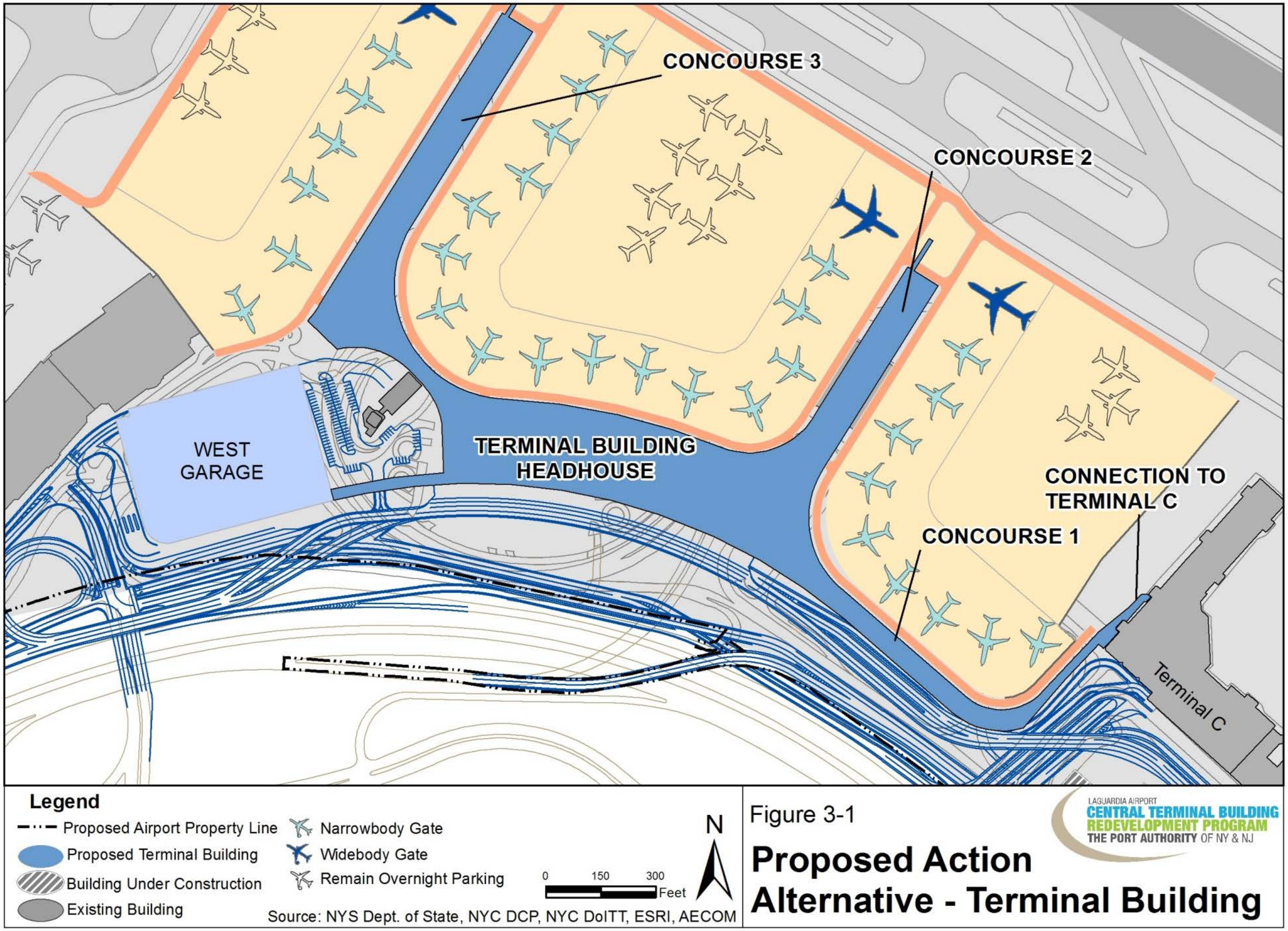

Figure 3-1
Proposed Action Alternative - Terminal Building

1.3.2 Airside Apron and Parking Area

The terminal apron and taxilanes would be reconfigured to maximize airside efficiency and operational safety, and to enable the airlines to provide cost-effective and acceptable levels of service. As shown in **Figure 3-2**, the proposed layout would provide 35 contact gate positions (the same number as the current terminal) associated with the preferred terminal concept including ~~dual parallel taxilanes for maintaining unimpeded taxi flow both to and from the aircraft gates.~~ There would be adequate separation between the taxilanes to accommodate the appropriate design airplane based on the aviation demand forecast. The remaining airside components would also be designed using current FAA guidelines for the design aircraft. The use of these planning guidelines would provide for adequate wingtip and obstacle clearance, thereby resolving numerous deficiencies associated with the current configuration. The CTB Redevelopment Program includes the following airside elements:

Change: The requirement for dual taxilanes was included in the 2014 EA as a way to reduce airside delay. The benefit of the dual taxilane design in the previously approved (2014) design was substantiated through TAAM modeling. TAAM modeling completed for the proposed design changes demonstrates that the design changes perform as well or better as the airside design in the 2014 EA under VFR conditions. Therefore, the Visual Flight Rules (VFR) TAAM performance in the previously approved (2014) design was selected as the performance benchmark against which any deviation from the performance criteria would be measured. This criteria was chosen because a VFR TAAM model had been completed for the previously approved (2014) design, and therefore a direct "apples to apples" comparison was possible. The performance criteria ensures that any design change to the terminal would preserve the airside design benefits of the dual taxilanes provided under the previously approved (2014) design. Under the proposed design changes, dual taxilanes cannot be incorporated around the entirety of each concourse due to the geometry of the island concourses and the need to (1) remove the existing Modification of Standard (MOS) between the Restricted Vehicle Service Road (RVSR) and Taxiway "A" and allow for adequate wingtip separation between each jetbridge.

- **35-Gate Layout Plan.** The Program would provide 31 contact gate positions for narrow-body aircraft with wingspans up to and including the B737-900W, plus four contact positions for widebody aircraft with wingspans up to and including the B767-400. To accommodate a wide range of aircraft types, powered passenger boarding bridges would be provided at each gate, and each bridge would be equipped with a ground power unit, a preconditioned air unit, and a potable water cabinet. Each gate would also be equipped with a visual guidance docking system (VGDS) to assist pilots attempting to maneuver an aircraft into its parking position. To support the airlines' use of electric ground service equipment (eGSE), including baggage tugs, belt loaders, and pushback tractors, recharging stations would be located at approximately every other gate position along the face of the building.

  Change: None

- **Dual Parallel Taxilane Configuration**. ~~The Program would provide dual taxilanes or entry/exit points to the taxiways for each ramp area.~~ The taxilane system would be designed to provide the most advantageous layout for each of the terminal areas. The west side configuration would include one taxilane for B757-200W aircraft, provide two points of entry/exit, and support eight gates. ~~The central area configuration would include three parallel taxilanes for B757-200W aircraft, provide three points of entry/exit, and support 17 gates.~~ The east side taxilane configuration would ~~include two taxilanes for B757-200W aircraft,~~ provide two points of entry/exit, and support ten gates. The full extent of apron construction would be to the edge of Taxiway A to permit the construction of new taxiway entry/exit points. This layout plan complies with [FAA *Advisory Circular 150/5300-13A: Airport Design*], including all applicable clearance standard dimensions for aircraft as well as ground service vehicles and equipment. There are no proposed modifications of airport design standards associated with this plan and, importantly, one existing Modification of Standard (MOS) would be eliminated.

Change: The proposed design changes would provide dual taxilanes between Concourse A and Concourse B, with an additional dual taxilane between the to the south of Concourse A opening onto Taxiway B adjacent to Runway 4/22. The taxilane system would be designed to provide the most advantageous layout for each of the terminal areas. Each gate area will have dual entry/exit points, and two out of three gate areas retain a dual taxilane. One gate area (Concourse B) is restricted to a single taxilane but maintains dual entry/exit points. TAAM analysis shows an average improvement of 0.1 minute per operation, and performance criteria is met. The performance criteria set required achievement of identical level of average VFR delay per operation to the previously approved (2014) design, as modeled in TAAM. The full extent of apron construction would be to the edge of Taxiway A to permit the construction of new taxiway entry/exit points.

- **Remain Overnight (RON) Aircraft Parking.** The Program would provide ~~20 RON~~ positions for parking aircraft within or close to the terminal ramp. Almost all RON positions would operate independently and maintain 25-foot wingtip clearances for B737-900W aircraft. Adequate capacity for RON parking improves airline flight scheduling and efficiency by allowing aircraft to be parked overnight at the same airport where they are needed for their first flight in the morning.

  Change: The proposed design changes include 19 RON positions that accommodate B737-900W aircraft with 25 foot wingtip separation, and 1 additional RON position accommodating a E175 aircraft, which meets the RON requirements of the 2030 design day schedule.

- ***Low Level Windshear Alert System (LLWAS).*** *The existing LLWAS, a FAA weather facility, is mounted on a tower in parking lot 3. Parking lot 3 will be removed as part of the proposed design revisions and its footprint will accommodate a taxilane serving future Concourse B as well as a blast fence and portions of the connection to terminal C and frontage roadways. For this reason, the LLWAS will need to be moved on the airport. This topic was discussed at a November 30, 2015 technical coordination meeting between FAA and LaGuardia Gateway Partners. Staff representing FAA Engineering, FAA NY Metro Area Planning, and FAA ATCT Staff were present. A replacement location will be determined in close consultation with FAA, LaGuardia Gateway Partners, and Port Authority staff. The current location being considered is in the vicinity of the new East Parking Garage (P4), likely on the eastern edge of the garage.*

- **Ramp Control Tower.** The Program would provide a replacement airline-operated ramp control tower for monitoring and controlling aircraft entering and exiting the terminal apron area and gate parking positions.[6] The ~~70-foot high tower would be centrally-located atop the west concourse~~ and would have ~~two operating levels~~ totaling 3,400 square feet of floor space. Providing a ramp control tower improves airline efficiency and operational safety by enhancing controller line-of-sight of aircraft, vehicles, and ground service equipment maneuvering around the airside terminal apron area.

Change: The ramp control operations center will be located on the third level of the headhouse to provide sight lines under the passenger bridges connecting to the concourses. There will be real-time camera systems to provide sightlines to the gates on the far side of the concourses.

- **Underground Hydrant Lines and Hydrant Pits.** The Program would provide the portion of the underground hydrant fuel system that lies beneath the reconstructed apron, including hydrant fuel pits (manholes) at each gate position and hydrant fuel lines leading to each pit. No action would be taken to complete the hydrant fuel system, which involves installing a buried fuel transfer line somewhere between the fuel storage tanks and the terminal apron.[7]
The location of hydrant fuel pits, and the hydrant fuel lines leading to each pit, is fixed by function and construction would be straightforward. The future location of the fuel transfer line has not been determined because the fuel storage tanks are located on the west side of the Airport and alternative routings must either cross under or go around Runway 4-22. There are numerous buried utilities associated with Runway 4-22 including conduits for electric power and control cables used for navigational aids and airfield lighting. The identification and evaluation of feasible alternatives is not expected to be complete for several years. There are no known environmental resources in the vicinity that would be affected by the installation of a fuel transfer line; therefore, no long-term or permanent environmental impacts are anticipated. During construction, there would be short-term increases in air, noise, and water pollution. These impacts would be temporary and minor, and the effects would diminish as the project nears completion.

  *Change: none. **Attachment 9-Hydrant Lines and Hydrant Pits** layout provides an overview of the layout of the lines and pits around the gate areas in the proposed design changes.*

- **Deicing Containment System.** The Program would provide a deicing containment system within the apron storm drainage that would allow for isolation of spent aircraft deicing fluid and pumping out of the fluid so that it may be properly disposed of in accordance with the Airport's State Pollutant Discharge Elimination System (SPDES) permit.

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[6] A ramp control tower is different from the FAA's Airport Traffic Control Tower, which is operated by FAA personnel responsible for directing aircraft through controlled airspace to and from the airport and for directing aircraft maneuvering on runways, taxiways, and designated airside apron areas. When a ramp control tower is in use, responsibility for controlling aircraft on the ground would transition at a line of demarcation between the terminal apron and the nearest active taxiway. The proposed Ramp Control Tower would be designed with input from the FAA and in accordance with appropriate line-of-sight requirements, height restrictions, clearance standard dimensions, and other applicable siting criteria.

[7] This Final EA focuses on the near-term portion of the project that is "ripe for decision" and excludes from consideration the long-term portion of the project that could take years to develop into a proposal. If and when there is a proposal to fund and install the fuel transfer line needed to complete the underground hydrant fuel system, PANYNJ would prepare and submit the appropriate NEPA document for FAA environmental consideration including an assessment of the potential cumulative effects of both phases of the project.

Change: None

1.3.3 Landside Roadways and Parking

The terminal area roadways would be reconfigured to accommodate free flowing traffic movements through the entire terminal area complex, including the new terminal and existing Terminals C and D, for up to 34 MAP, while minimizing impacts on the Grand Central Parkway to the extent practicable. Generally, the roadway improvements include: at-grade frontage roadways and ramps; elevated and high-elevated frontage roadways and ramps; connecting roadways to the West Garage; connecting roadways to the Grand Central Parkway (East and West); reconstruction of portions of the 94th Street and 102nd Street bridges to the Airport; four signalized intersections; and roadway signage (see **Figure 3-3b.** *Changes to Roadway LayoutChange: Figure 3-3b highlights the minor changes that have taken place to the roadway network versus Figure 3-3 (previously approved design). The revisions are as follows:*

1. *CTB frontages (HOV, Arrivals, & Departures levels) shifted approximately 30' south to support connection to Terminal C and reconfigured headhouse.*
2. *Roadway changed to support the shifting of the CTB frontages to accommodate dual taxilanes in front of Concourse A.*
3. *CTB Arrivals and Departures exit ramp alignment changed to accommodate dual taxilanes in front of Concourse A.*
4. *Access to West Parking Garage and intersection changed.*
5. *Access to FAA Air Traffic Control Tower (ATCT) changed.*
6. *Access to shipping/receiving facility changed.*

The CTB Redevelopment Program includes the following landside projects:

- Frontage Roadway Layout Plan. Generally, the proposed roadways are categorized by elevation. At the new terminal, a high-elevated roadway would serve Level 3 (Departures); an elevated roadway would serve Level 2 (Arrivals); and an at-grade frontage roadway would serve Level 1 (Ground Transportation). At Terminals C and D, an elevated roadway would serve Level 2 (Departures) and an at-grade road would serve Level 1 (Arrivals). At all three terminals, the Arrivals and Departures frontage roadways would consist of four traffic lanes – one drop-off/pick-up lane, one maneuvering lane and two bypass lanes. At the new terminal, the ground level frontage roadway would consist of one drop-off/pick-up lane, two bypass lanes, a striped 3-foot median and one high occupancy vehicle (HOV) bypass lane. Amenities would include canopies, curb-side check-in facilities, taxi booths, bus stops, and access to at-grade parking and the East and West Garages.

  Change: None

- Connecting Bridges and Roadways. Two bridges and a flyover ramp to the Airport would be modified in order to connect existing public roadways to the new roadway configuration. The north side of the 94th Street bridge would be connected to a new at-grade intersection near the West Garage; the north side of the 102nd Street bridge would be connected to elevated roadways near Terminal C; and the Grand Central Parkway eastbound flyover entrance to the Airport would be realigned to direct traffic into the newly constructed terminal frontage roadways.

There would be no new points of access or egress to the Parkway—only a modification to the existing flyover ramp from the Grand Central Parkway.

Change: None

- Intersections. There are four signalized intersections in the new terminal roadway network—one intersection on Runway Drive, two intersections on 94th Street, and one intersection on 102nd Street (see **Figure 3-3**).
  - Intersection 1 would be located at Runway Drive and Recirculation Road. This would be a means for accessing Runway Drive Westbound to the Marine Air Terminal and the west side of the Airport, as well as Runway Drive Eastbound towards the West Garage.
  - Intersection 2 would be at 94th Street and the Collector-Distributor (C-D) Road. This would be the key Airport access/egress point on 94th Street.
  - Intersection 3 would be at 94th Street and Runway Drive/Parking Garage. This intersection would connect 94th Street to Runway Drive and to the West Garage access roadway.
  - Intersection 4 would be located on the north side of the 102nd Street bridge at the Westbound Recirculation Road and Outbound Terminal C Arrivals. This intersection would serve as a key node to accommodate outbound traffic from Terminals C and D Arrivals to 102nd Street Southbound/Grand Central Parkway Eastbound and East End Terminal recirculation, as well as HOVs from Terminals C and D to the proposed terminal.

  Change: None

- Signage. New signs for roadways and pedestrian wayfinding through the proposed terminal area facilities would be implemented in accordance with PANYNJ's *Airport Signing Standards Manual* which provides for uniform and consistent application of wayfinding best practices and design criteria. This includes the following areas: on-Airport roadways, parking, curbside/ground transportation, and within the terminal building, including concourses/gates, ticketing/check-in, security checkpoints and baggage claim.

- Curb Frontage. A three-level curbside roadway would provide approximately 2,700 linear feet of terminal curb in front of the new terminal—900 feet on each terminal level (i.e., arrivals, departures, and ground transportation) where vehicles can stop to drop-off or pick-up airline passengers and their baggage. Adding a separate roadway and curb for ground transportation (taxis, buses, shuttle and other HOVs) would improve roadway operations by increasing the total length of curb frontage available and by allocating the curb frontage more efficiently.

  Change: None

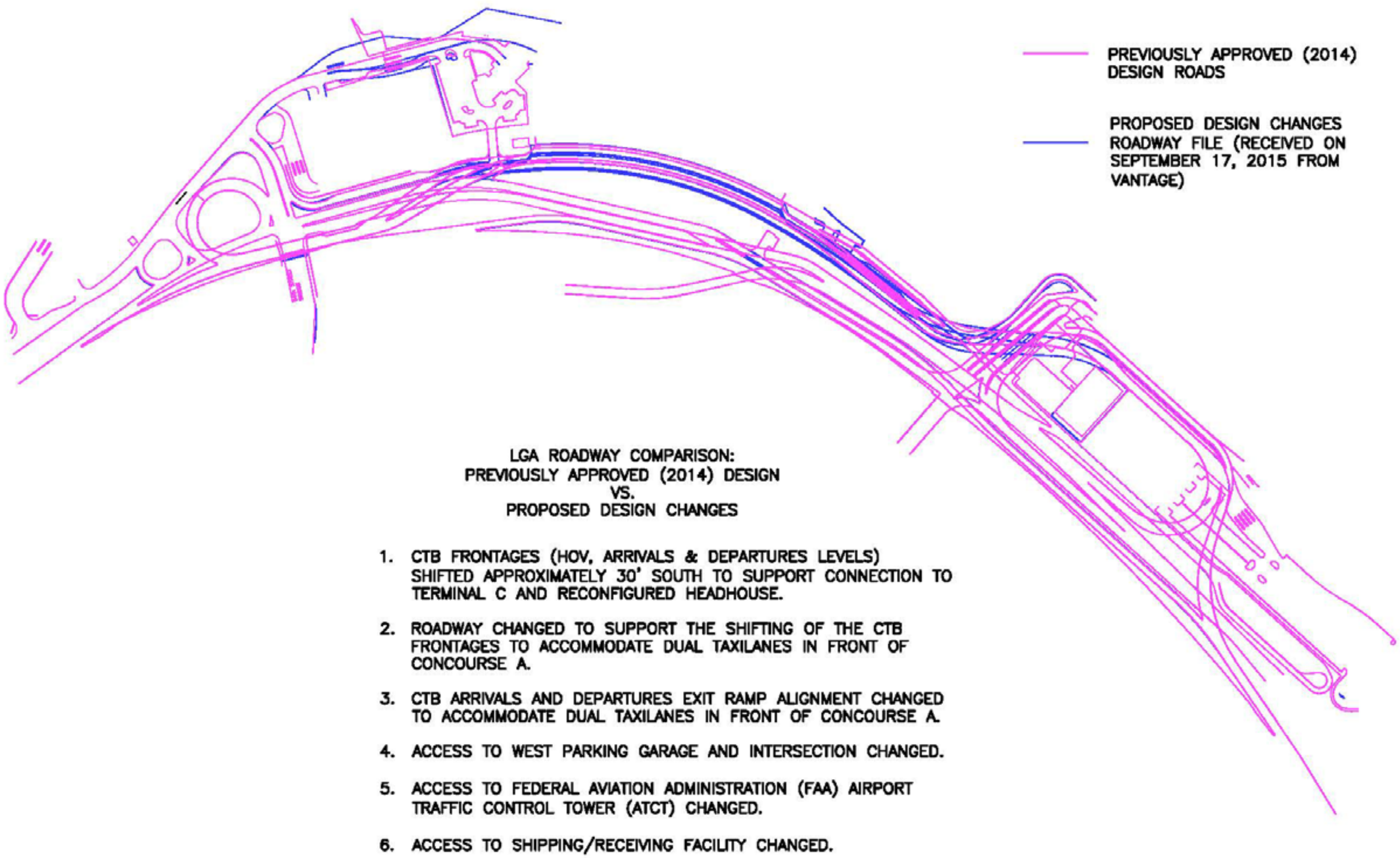
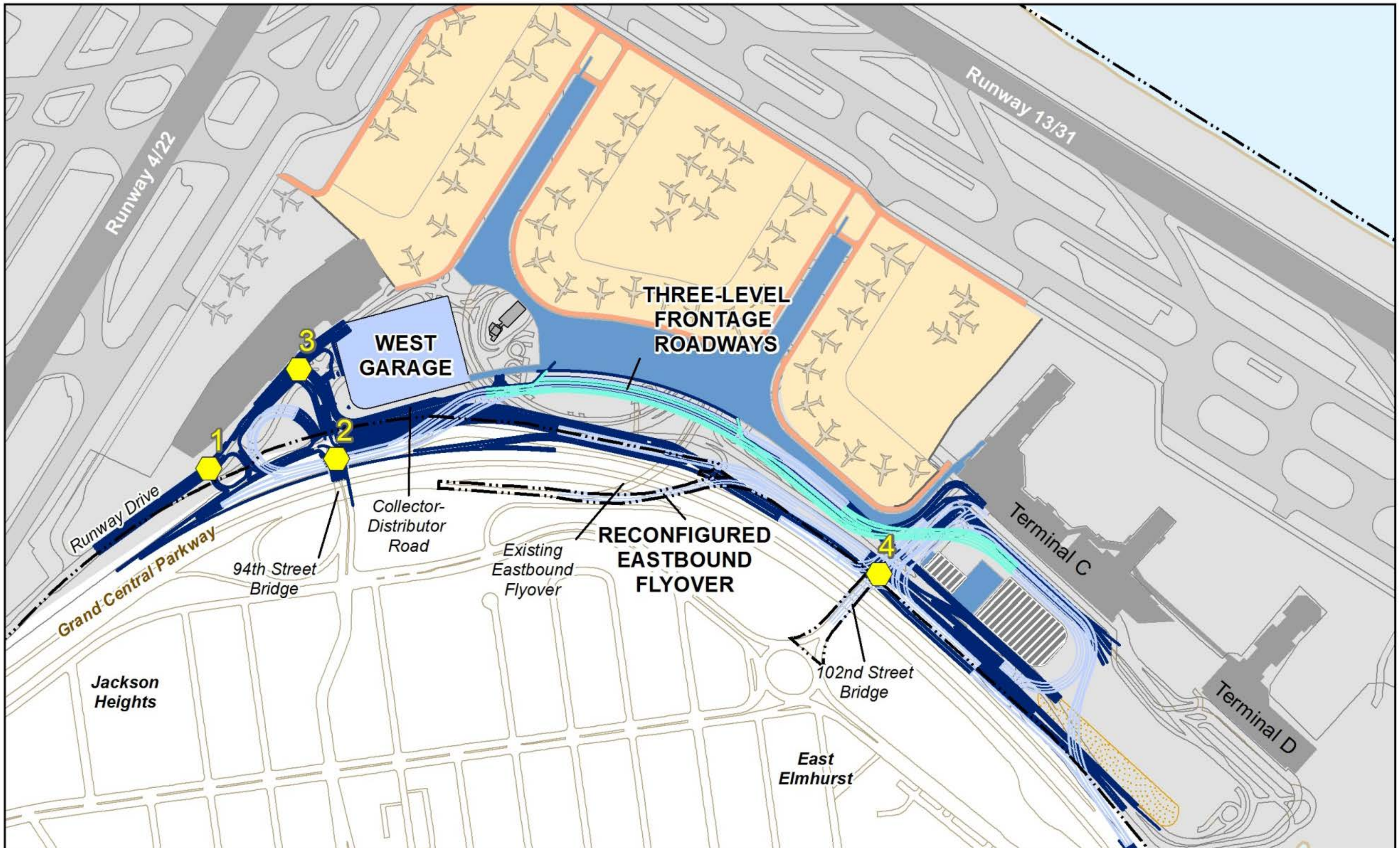


Figure 3-3b. Changes to Roadway Layout



Legend

- Proposed Intersection
- Proposed Garage
- Proposed Airport Property Line
- High Elevated Roads
- Elevated Roads
- At-Grade Roads

0 250 500 Feet

N

Source: NYS Dept. of State, NYC DCP, NYC DoITT, ESRI, AECOM

Figure 3-3

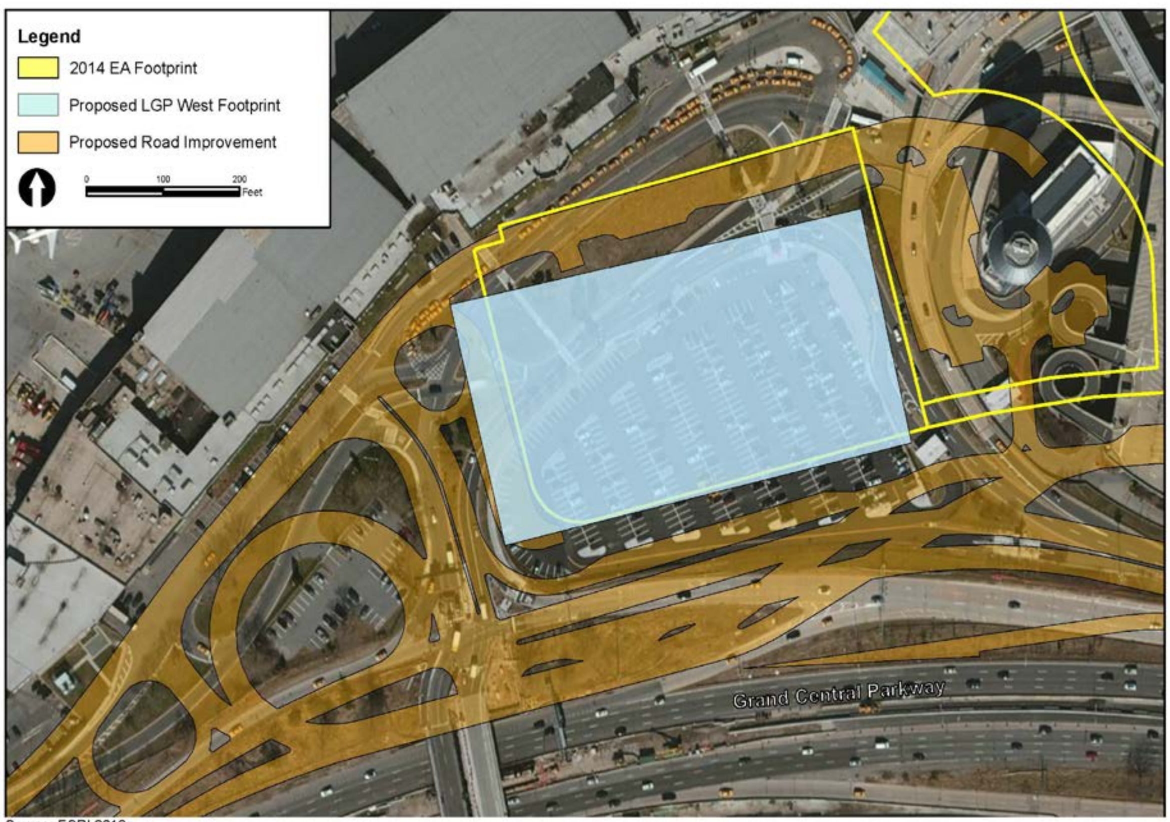
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING REDEVELOPMENT PROGRAM
THE PORT AUTHORITY OF NY & NJ

Proposed Action Alternative - Landside Roadways and Parking

2014 EA Graphic

- Parking Garage. The existing CTB parking garage (2,700 spaces) would be demolished and replaced by a new six level West Garage with 2,900 parking spaces and a pedestrian connection to the terminal. The proposed West Garage would complete PANYNJ's plan to "right size" parking offerings at the Airport.

  Change: The new West Garage now provides 3,100 spaces on 7 levels based on additional information on parking demand gathered since the 2014 FONSI/ROD and the need to accommodate parking spaces displaced by the new taxi hold lot (discussed below). The garage was originally presented as a five level garage. There are five levels of elevated parking in the garage as well as parking on the roof and ground floors, for a total of seven levels of parking. The height of the garage remains the same (83 feet above ground level). The increase in 200 spaces is a result of full utilization of rooftop parking, as opposed to partial utilization of rooftop parking in the previously approved (2014) design. The rooftop parking would be shaded to meet security requirements. Design refinements since the 2014 EA was released shifted the garage's footprint roughly 35 feet to the west and reduced the footprint to the north by roughly 40 feet. The garage remains substantially similar in size and location, as demonstrated in Figure 3-4.



Source: ESRI 2013a

Figure 3-4. Updated West Garage Footprint (in comparison to 2014 EA)

1.3.4 Support Projects

The CTB Redevelopment Program includes the following required ancillary projects**:**

- Demolish Hangars 1, 2, and 4
  Three large but outmoded aircraft maintenance hangars would be removed to make way for constructing the proposed terminal. All three buildings, which have not been used for aircraft maintenance in many years, are leased to various tenants for offices, operations, shop space, baggage sorting and storage areas. The buildings—antiquated and obsolete—are eligible for listing on the National Register of Historic Places but have exceeded their useful life and are in need of extensive repairs, which are not planned. PANYNJ is working with the existing tenants to relocate the building functions so they can be removed in the near future. Pursuant to Section 106 of the National Historic Preservation Act, a Memorandum of Agreement (MOA) has been prepared that outlines the proposed conditions for demolition of the hangars (see **Appendix D of the 2014 EA**). The MOA was signed by PANYNJ, FAA and the New York State Historic Preservation Office, and concurred on by Consulting Parties.

  Change: None

- Relocate the Central Heating and Refrigeration Plant (CHRP)

  The existing CHRP, located within the existing CTB, has reached the end of its useful life and would be demolished and the equipment removed, and a new CHRP would be constructed. Designed and constructed specifically for the new terminal, the proposed CHRP would include four cooling towers as part of the overall plant facility. As with the new terminal, the proposed CHRP would be certified under LEED, striving towards a Gold rating, with a minimum acceptable rating of Silver. The CHRP is required to be located near the new terminal to minimize heating/cooling losses that would occur over longer distances, but away from the airport traffic control tower (ATCT) to avoid any potential for steam plumes from the cooling towers to interfere with site lines from the ATCT. The proposed location is currently being used temporarily as open space for contractor parking and material lay down for construction of the East End Substation (EES) and the East Garage.[8]

  The CHRP is an occupied building (24 hours per day/7 days per week), therefore provisions including offices, circulation, access/egress, storage and support space, as well as visitor and staff parking, would be provided. Adequate space would also be provided for truck maneuvering in order to allow maintenance workers to service large equipment including the chillers and boilers. The CHRP would be connected to existing utilities, including natural gas and electric service lines that run immediately adjacent to the project site. No new or additional utilities or services are needed to support the proposed CHRP. For emergency power, the project includes a diesel generator that would be placed above the base flood elevation and two 35,000-gallon tanks to store backup (diesel) fuel. Design would include flood-proofing measures to the degree practicable, with special emphasis on critical equipment.

  Change: None

- Relocate the East Field Lighting Vault

[8] Finding of No Significant Impacts (FONSI) for East End Substation and East Garage at LaGuardia Airport signed by FAA on February 5, 2013.

The existing East Lighting Vault, located in Concourse D of the existing CTB near the base of the old ATCT, would also be demolished and the equipment removed; the preferred location for its replacement is on the east side of the Airport near Terminal D. The East Lighting Vault services the Runway 13-31 lighting systems, associated taxiways, and signage. It also powers two FAA 4160-Volt feeders serving FAA Navigational Aids and Visual Aids on the Airport. The lighting vault is essential for safe airport operations. The proposed scenario is to construct a new East Field Lighting Vault within vacant airside space near Parking Lot 5; no existing facilities would be removed or relocated to accommodate the proposed vault. Design would include flood-proofing measures to the degree practicable, with special emphasis on critical equipment.
The proposed East Field Lighting Vault project would include constructing a one-story building (approximately 2,650 square feet), constructing and wiring new ductbanks and manholes to existing manholes, and reconnecting new wiring from the new vault. The standalone building and all electrical equipment would be new. Existing field lighting circuits currently supplied by the existing vault would be transferred to the new vault; no new circuits would be added or transferred from other facilities. PANYNJ has been coordinating with the local utility (Consolidated Edison) to ensure ample power supply is available (see letter dated August 21, 2013 in **Appendix G of the 2014 EA**). Once the new vault is commissioned, the existing vault can be decommissioned and removed without impacting airport operations or phased development of the proposed terminal.

Change: None

- Relocate the Taxi Hold Lot
The existing CTB taxi hold areas would also be displaced by construction of the new terminal. The various taxi hold areas around the CTB have a combined capacity of approximately 220 vehicles. The relocated, consolidated taxi hold area would be located on the southeast side of Parking Lot 4 and achieve the required goals of the Program by reducing re-circulating traffic volumes and vehicle emissions associated with the current configuration. The access road to the proposed taxi hold area would be a dedicated road reached from the main access road via a slip ramp that would bring taxis directly into the taxi hold area without requiring the vehicles to circulate through the east end of the Airport, alleviating substantial traffic volume from those roadways. Access from the taxi hold area to the proposed arrivals frontage roadway would also be a direct route. Taxis would come out of the hold area at grade and climb a short ramp to the terminal frontage road. The ramp is designed with two lanes, providing a holding pocket with direct access to the terminal frontage roads without using the terminal frontage itself by allowing taxis to queue on the ramp while maintaining bypass capability. The proposed Taxi Hold Lot would accommodate 300 vehicles, representing an increase of 80 spaces as compared to the existing conditions. The other taxi hold area, situated between and serving Terminals C and D, would not be affected. Public parking spaces currently located in Parking Lot 4 and displaced by the proposed Taxi Hold Lot would be accommodated by other on-Airport parking.

Change: None, although the accommodation of spaces displaced by the taxi hold lot will be accommodated in the new West Garage, necessitating the increase in size of the West Garage from 2,900 to 3,100 spaces.
Change: The new West Garage now provides 3,100 spaces on 7 levels based on additional information on parking demand gathered since the 2014 FONSI/ROD and the need to accommodate parking spaces displaced by the new taxi hold lot. The garage was originally presented as a five level garage. There are five levels of elevated parking in the garage as well as

parking on the roof and ground floors, for a total of seven levels of parking. The height of the garage remains the same (83 feet above ground level). The increase in 200 spaces is a result of full utilization of rooftop parking, as opposed to partial utilization of rooftop parking in the previously approved (2014) design. The rooftop parking would be covered by a shading structure to meet security requirements. Design refinements since the 2014 EA was released shifted the garage's footprint roughly 35 feet to the west and reduced the footprint to the north by roughly 40 feet. The garage remains substantially similar in size and location, as demonstrated in Figure 3-4.

- Provide for New In-Ground Utilities

  All the utilities needed to implement the CTB Redevelopment Program are available within the Airport and are included in the Program; no off-Airport improvements, other than those planned under separate actions, are proposed. There are provisions for electricity, natural gas, sanitary sewer, potable water, storm drainage, and communications. Existing systems would be used to the greatest extent practicable; where it is not practicable, existing systems would be modified and new equipment installed as needed to meet the requirements of the Program, including all applicable permits, certifications, and approvals.

  - *Electricity*. Any high or medium voltage lines that are within or adjacent to new construction would be relocated or replaced as needed to provide electric service to the proposed terminal building and ancillary facilities. The electrical load demand would be provided by the existing West End Substation (WES) and the new EES, which is now under construction.[9] Concrete encased duct banks would be used to enclose cables emanating from the WES and the EES. The existing Central Electric Substation (CES) will be decommissioned as part of the EES project, upon completion of the EES and connection to electric service.
  - *Natural Gas*. High pressure gas lines including valves, meters, and regulators, would be installed to provide natural gas to the proposed terminal building and ancillary facilities. Each gas line would be designed for the total load of the building(s) and all underground coated steel gas piping would use a cathodically protected system to prevent corrosion.
  - *Sanitary Sewer*. Sanitary waste would flow through a force main system consisting of sanitary sewers, cross-connections and booster pumps, with provisions for sewerage ejectors and sump pumps, as needed to meet the requirements of the Program (see Section 5.16 for detailed discussion). The sanitary sewers for the proposed terminal would connect to the on-Airport system. The on-Airport system connects to a NYC box culvert, which is not being replaced. The new system would be reviewed and approved by New York City Department of Environmental Protection (NYCDEP) once design has progressed. The proposed layout would be along the landside perimeter of the site parallel to the Grand Central Parkway with a connection to the existing force main located near Hangars 3 and 5. The location of trenches for sanitary sewers in relationship to trenches for potable water mains would adhere to applicable requirements for separation.
  - *Water*. Domestic water supply is available to meet projected demands, including low pressure and high pressure water for building systems ranging from basic plumbing to fire suppression, respectively. Layout of new water mains would be along the landside

[9] Finding of No Significant Impacts (FONSI) for East End Substation and East Garage at LaGuardia Airport signed by FAA on February 5, 2013. *Note that since the 2014 FONSI/ROD, construction on the new EES is substantially complete.*

perimeter of the site, within the Airport boundaries, parallel to the Grand Central Parkway with connections to existing low and high pressure water mains near Hangars 3 and 5.

- o *Storm Drainage*. The existing drainage system would be retained to the degree practicable. Existing storm drainage pipes would only be removed to accommodate construction of the terminal building or other permanent airside or landside facilities. New, relocated, or modified storm drainage systems would be designed to accommodate a 10-year storm, new and existing storm trunk lines would be interconnected to relieve overloaded conditions, and all storm drain pipes would be checked to verify they can handle existing and proposed peak discharges. Added measures would be taken to minimize risks associated with flooding. Roof drainage from the new terminal would be collected into a proposed closed drainage system to reclaim water for non-potable uses such as toilet flushing.

  Change: None

- Improve Key Intersections in the Vicinity of the Airport
  In order to ensure no significant traffic impacts would occur as a result of the construction or operations of the CTB Redevelopment Program, minor improvements would be implemented at several local intersections near the Airport. During construction, improvements such as signal timing adjustments, widening and restriping of lanes, curbside parking prohibitions, installation of a traffic signal, a traffic signal controller upgrade, and use of construction flaggers may be required. Those improvements would be temporary, to reduce delays at those intersections during periods of peak construction activity. Permanent reallocations of green time at three local intersections—coupled with lane restriping, curbside prohibitions and minor reallocations of green time at a fourth intersection—may be required to maintain the intersection levels-of-service under the projected passenger demand. All transportation improvements on local roadways are subject to review and approval by NYCDOT. See Section 5.1 and **Appendix A of the 2014 EA** for a more detailed description of the improvements.

  Change: Attachment 4 details new analysis and revised mitigation measures during construction. Note that these changes are not precipitated by the design, which produces minimal roadway changes from the previously approved (2014) design, but later than anticipated project initiation drove the need to work from a new baseline traffic condition. The original baseline conditions modeled were for 2012 traffic, whereas the updated construction conditions traffic analysis considers a 2014 baseline. Traffic conditions have changed in and around the airport since 2012 as there has been general growth in vehicle traffic off airport, as well as an increase in passenger activity at the airport.

1.3.5 Construction Phasing

Construction activities would be expected to begin in the ~~third quarter of 2014 (pending environmental approvals) and~~ continue through the year 2021. As shown in **Figure 3-5**, the CTB Redevelopment Program is divided into multiple major construction phases during which time existing facilities would be demolished and replaced with new facilities. The Airport would remain open during construction; therefore, each phase must be sequenced to maximize passenger levels of service while minimizing potential impacts on airline operations.

In general, the roadways and bridges must be relocated to interface with the new terminal building and parking garage. The West Garage would be constructed early in the process. The demolition of Hangars

2 and 4 would allow the new terminal to be constructed, beginning with the structure to the east and working westward as the new building components become operational. Portions of the existing CTB would be demolished and new facilities constructed in stages. Construction of the airside apron and landside roadways would be staged to correspond to construction of the new terminal elements.
As part of the construction phasing plan, temporary facilities may be needed to maintain safe and secure airport and airline operations, to facilitate the transfer of passengers and baggage, and to accommodate displaced parking spaces. This is a normal part of the construction process. Demolition of the CTB Garage would not begin until the East Garage is completed.[10] Temporary facilities would include, but not necessarily be limited to, building spaces, enclosed walkways, roads, utilities, and surface parking lots. It is assumed that all temporary facilities would be accommodated on existing Airport property. No off-Airport facilities or services are anticipated.

During construction, workers would park their personal vehicles at the Ingraham's Mountain Construction Staging Area located on the west side of the Airport near the intersection of 19th Avenue and 45th Street.[11] Shuttle buses would transport workers to and from the construction site. Heavy construction work is expected to occur on weekdays between the hours ~~of 7:00 AM and 3:00 PM~~. Minimal work would occur between 3:00 PM to ~~11:00 PM~~, and would mainly involve accepting materials deliveries. No construction work is expected to occur ~~late at night or~~ on weekends.

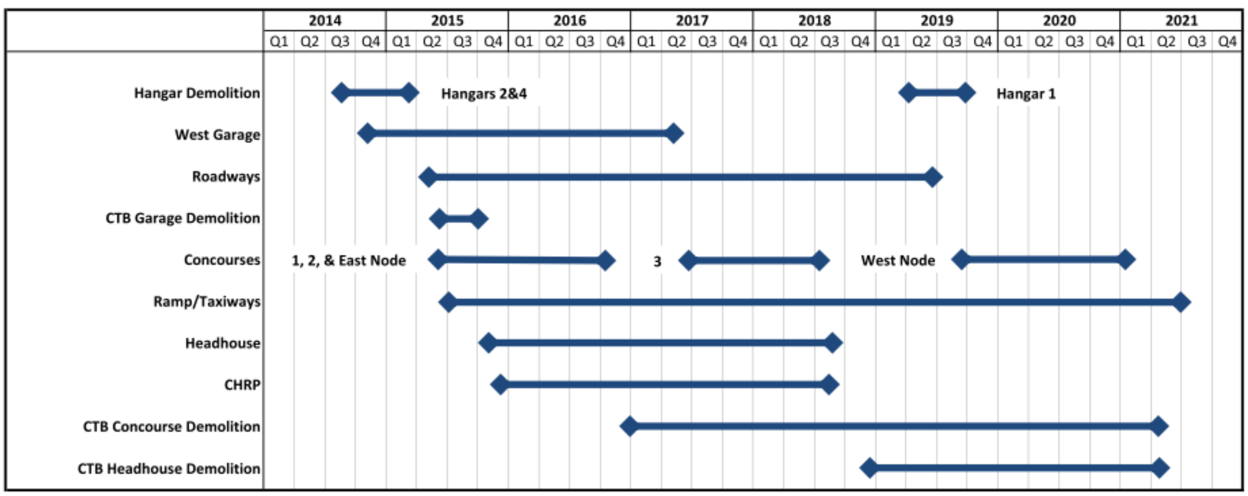


Figure 3-5. Construction Schedule- 2014 EA Graphic

Change:

Construction activities would be expected to begin in the second quarter of 2016 (pending FAA approval and obtaining necessary permits) and continue through the first quarter of 2022 (including demobilization activities), with opening at the end of 2021. As shown in ***Figure 3-5b****, the CTB Redevelopment Program is divided into multiple major construction phases during which time existing facilities would be demolished and replaced with new facilities. Activities consistent with the November*

[10] East Garage construction is a separate action; FONSI signed by FAA on February 5, 2013.

[11] The Ingraham's Mountain Construction Staging Area was developed as part of the Runway Safety Area (RSA) Enhancements Project, which is separate from the CTB Redevelopment Program (FONSI signed by FAA on December 31, 2013).

2014 EA, such as the demolition of Hangars 2 and 4 and other site work, began in 2014 and is continuing apace. Hangars 2 and 4 were demolished during the summer of 2015 in accordance with the MOA.

Attachment 3, LGA CTB Phasing Plan 2016-2022*, provides programmatic details of each phase of construction. The narrative of these phases is below.*

Phase 1A
Dates: Third Quarter 2016
Activities

- *Demolition of P2 parking garage*
- *Site work and foundations construction for West Parking Garage*
- *Temporary roadways under construction*
- *Start foundation work and laydown area for CHRP construction*
- *Fence off portion of AOA between east apron of existing Pier A to Terminal C apron area; begin underground utility work on airside*
- *Begin demolition of apron east of existing Pier A*

Phase 1B
Dates: Fourth Quarter 2016
Activities:

- *Move taxi hold to temporary taxi hold area between Grand Central Parkway and Hangar 5B*
- *Begin foundation work for headhouse and Concourse B*
- *Begin construction of new CHRP*
- *Begin construction of arrivals and departures roadways for new CTB*

Phase 1C
Dates: Fourth Quarter 2016-First Quarter 2018
Activities:

- *Construction continues on headhouse, Concourse B, West Parking Garage, Departures level roadways, Bridge from 102nd Street, CHRP.*
- *Construction begins on temporary pedestrian ramp from existing CTB headhouse to new Concourse B*
- *Selected demolition activities occur during nighttime hours (10:00PM-6:00AM) for 5.5 months centered around the second quarter of 2017. This includes utility and apron demolition on the east side of the existing CTB.*

Phase 2A
Dates: First Quarter 2018
Activities:

- *New CHRP and partial New Concourse B (13 gates) open; pedestrian bridge from existing headhouse to new Concourse B is open*
- *New West Garage open*
- *Begin demolition of existing Pier A and east side of existing Pier B.*
- *Continue construction on remainder of new Concourse B*

Phase 2B
Dates: Second Quarter 2018
Activities:

- *Demolition of existing CHRP*
- *Continue construction on taxiway/apron area and utility work between new Concourse B and Existing Pier B.*
- *Continue construction of headhouse and arrivals/departures roadways.*

Phase 2C
Dates: Second-Third Quarter 2018
Activities:

- *Begin construction of permanent connection bridge from new headhouse to Concourse B*
- *Begin construction of permanent pedestrian access bridge from new headhouse to new West Garage*

Phase 3A
Dates: Third Quarter 2018
Activities:

- *Demolish remainder of existing Pier B and taxiway apron east of Pier C.*
- *Open remainder of interior portion of new Concourse B, and build out apron area and jetbridge infrastructure for remaining gates*
- *Construct temporary pedestrian bridge from new headhouse to existing CTB headhouse, to allow access to existing Piers C and D.*
- *Access roadway and headhouse construction continues*

Phase 3B
Dates: Fourth Quarter 2018
Activities:

- *Demolish east side of existing Pier C and remaining apron between existing Pier C and Concourse B*
- *Airside apron area west of Concourse B opens*

Phase 3C
Dates: Fourth Quarter 2018-Fourth Quarter 2019
Activities:

- *Begin construction of new Concourse A west*
- *Continue construction of new headhouse, pedestrian bridges, access roadways*
- *Headhouse opens in month 37 along with permanent pedestrian bridge to Concourse B and temporary pedestrian bridge to existing CTB headhouse*

Phase 4A
Dates: Fourth Quarter 2019
Activities:

- *Begin demolition of east side of existing CTB headhouse and Hangar 1*
- *West Garage pedestrian bridge connection to CTB headhouse open*
- *New frontage road and departures and High Occupancy Vehicle (HOV) levels open to the public; begin construction of arrivals level frontage roadways following existing loop road demolition*
- *Begin construction of new taxi hold lot in existing Parking lot 4*

Phase 4B
Dates: Fourth Quarter 2019-Second Quarter 2020

Activities:

- *Begin construction of pedestrian bridge from new headhouse to new Concourse A*
- *Begin construction of permanent parking for FAA staff/control tower*

Phase 5A
Dates: Second-Third Quarters 2020
Activities:

- *FAA staff/control tower parking complete*
- *West side of new Concourse A (6 gates) open, connected via temporary pedestrian bridges to existing CTB headhouse and new headhouse*
- *Taxi apron on west side of new Concourse A open*
- *Demolition of remainder of Existing Pier C and partial existing Pier D*
- *Permanent taxi hold lot in existing Parking Lot 4 open; temporary taxi hold lot demolished*
- *Arrivals level roadway opens*

Phase 5B
Dates: Third-Fourth Quarters 2020
Activities:

- *Construction of connection to Terminal C from new headhouse begins*
- *Pedestrian bridge from new headhouse to new Concourse A opens*
- *Demolition of existing CTB headhouse portion connecting to new Concourse A and temporary pedestrian bridge*
- *Constructon of remainder of new Concourse A begins*
- *Demolition of one gate on existing Pier D*
- *Construction of westbound connector surface roads begins*

Phase 5C
Dates: Fourth Quarter 2020-Third Quarter 2021
Activities:

- *Construction of Westbound connector surface roads continues*
- *Construction of remainder of new Concourse A and apron areas, utilities, and trunklines continues*

Phase 6A
Dates: Third Quarter 2021
Activities:

- *New Concourse A west interior opens; construction of apron areas and jetbridges continues*
- *Demolition of remainder of existing CTB headhouse, temporary pedestrian bridge, and existing Pier D.*
- *All frontage roadways complete and open*

Phase 6B
Dates: Fourth Quarter 2021-First Quarter 2022
Activities:

- *Complete build out of west side aircraft apron and taxilanes and jetbridges on west side of new Concourse A.*
- *Construct remainder of connection to Terminal C. Terminal fully open fourth quarter 2021*
- *Demobilization activities continue until first quarter 2022*

As part of the construction phasing plan, temporary facilities may be needed to maintain safe and secure airport and airline operations, to facilitate the transfer of passengers and baggage, and to accommodate displaced parking spaces. Temporary facilities would include, but not necessarily be limited to, enclosed walkways, roads, utilities, and parking lots. It is assumed that all temporary facilities would be accommodated on existing Airport property. No off-Airport facilities or services are anticipated.

The existing FAA parking lot (about 40 spaces), located just west of the 94th Street entrance to LGA, will be closed to progress road and bridge construction in this area at the start of construction. Prior to this parking lot closing, an equal number of parking spaces will be provided on airport within the East Garage. Air Traffic Control Tower (ATCT) staff can either walk to the ATCT from the East Garage or take the LGA Employee Shuttle, which will drop them off outside the secure perimeter of the ATCT. Upon opening the new West Garage, anticipated in month 16 of the Program, FAA staff will be provided parking in this location, which is very convenient to the ATCT, until construction around the ATCT is complete, which includes a new/permanent FAA parking lot at the base of the tower.

Heavy construction work is expected to occur on weekdays between the hours of 6:00 AM and 3:00 PM. Plans call for work between 3:00 PM to 11:00 PM to be minimized, and would mainly involve accepting materials deliveries. Because staff are not scheduled to be on shift between 3:00PM and 11:00PM, any activity during these hours would be confined to staff working overtime and would not be a regular occurrence. In order to expedite the accommodation of passengers in the new concourses, it was concluded that demolition work on the airside apron will need to occur between 10:00 PM and 6:00 AM for approximately 5.5 months during the second quarter of 2017. No heavy construction activity will happen overnight, and no work will occur overnight on the landside.

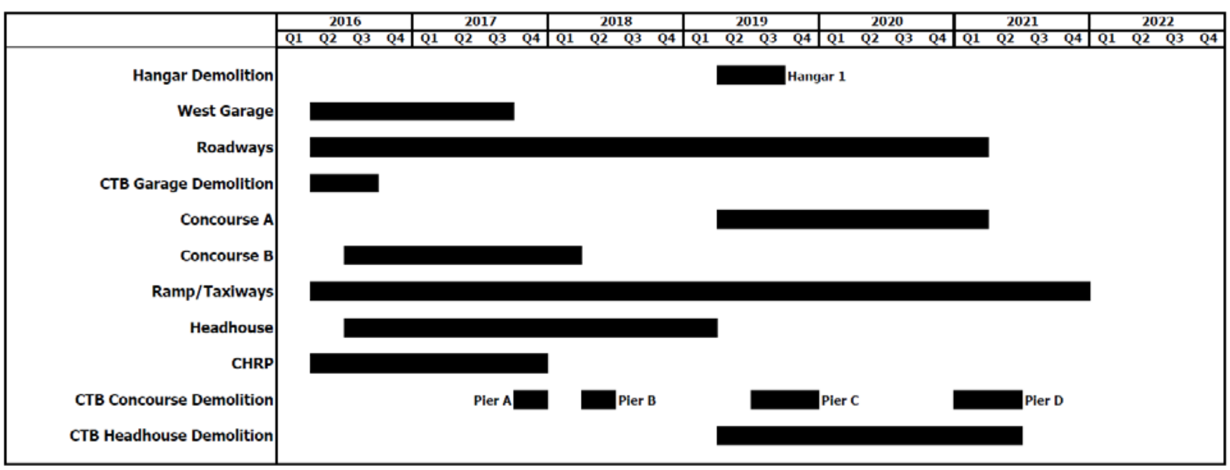


Figure 3-5b. Construction Schedule

During construction, many of the phases require construction lay-down and staging areas adjacent to gate areas, the AOA, and other airside elements. The following precautions will be taken to avoid conflicts between construction activity and air operations:

Construction areas will be separated from the air side by means of TSA inspected and approved chain-link fencing properly secured at grade with barbed wire at the top to create a non-AOA work area. Construction workers will access the site from landside. No materials, vehicles, or construction trailers will be located within 10' of the AOA fence nor shall they encumber line of sight from the ATCT to the RSR *road, taxilanes, or aircraft parking apron. Gates from the non-AOA work area onto the AOA will be staffed with approved security personal. All deliveries to or from the work sites that enter the AOA (after airfield operating hours) using the RSR will be inspected and escorted using approved escort personnel and properly signed and identified vehicles. In addition, 7460 Crane permits will be submitted for each crane type, height, location, and phase.*

LGP will develop a project specific FOD Management Program per the guidelines identified in U.S. Department of Transportation/Federal Aviation Administrant Advisory Circular No. 150/2510-24 and any subsequent revisions thereof. LGP will review the current PA FOD Program for LGA and incorporate current PA requirements and develop our program around the following elements:

- *Prevention*
- *Detection*
- *Removal*
- *Evaluation*

The FOD Management Program will be administered jointly by the LGP Operations Team and the Skanska Walsh Joint Venture on-site safety team.

Dust will be continuously monitored and controlled using water sprayed during demolition of apron, taxilanes, and buildings. Subsurface utility and foundation work will be closely monitored to ensure that dust generated is controlled. Skanska Walsh will maintain a fleet of water trucks, sprayers, and sweeper trucks throughout the construction phase and the Skanska Walsh site superintendent will maintain direct communications with the PA and FAA to ensure that dust control is maintained at all times.

Site access phase by phase is envisioned from both landside (during airfield operating hours) and via the AOA from Gate 1 using the RSR roadway (during no-airfield operating hours). Truck access and egress for material and equipment deliveries and removal of debris will be scheduled to limit impact on passenger traffic during peak operating hours and coordinated with the PA Airport Operations staff. Site access during non-operating hours will be coordinated and cleared through a predetermined process approved by the FAA. All trucks used to remove demolition and other debris from the site will be covered. See Attachment 10-Logistics Site Plan

Construction fencing to create non-airside work areas will be identified in the phase by phase logistic plans submitted for approval by the JHA. These plans will identify fence locations and detail designs, and locate construction trailers and other fixed equipment in locations that do not impact line of site from the ATCT to the RSR. As stated above, 7460 Crane Permit documentation will establish crane location zones.

1.4 Summary

Chapters 2-7 detail specific changes to design criteria between the originally approved design and the proposed design changes. The technical report organized according to the Chapter Format of the November 2014 EA.

2 Purpose and Need

The LGA CTB EA Purpose and Need chapter provided a statement of purpose and need for the CTB Redevelopment Program. PANYNJ has reviewed the proposed design changes to ensure that they continue to meet the purpose and need defined in the EA. There is no change in the purpose and need as part of this Technical Report.

Statement of Purpose and Need

The CTB Redevelopment Program is needed because:

- The existing CTB and ancillary facilities are already severely constrained and unable to adequately handle current air service or future passenger demand.
- Faced with higher air passenger demand and the need to switch to larger aircraft to meet those demands, the CTB would incur substantially worsened levels of delay throughout the day while being unable to meet the projected changes in aircraft and their large passenger loads.

The purpose of the Redevelopment Program is to efficiently enable the CTB to safely and effectively accommodate forecasted increases in aircraft size and passenger demand at acceptable levels of service by:

- Improving airline efficiency and operational safety on the airside apron in order to handle the transition to larger aircraft;
- Improving passenger throughput capacity and convenience throughout the terminal;
- Improving parking operations and traffic circulation and flow along the terminal's landside roadways.

Implementation of the Redevelopment Program would serve the public interest by meeting the air transportation needs of the FAA, Transportation Security Administration (TSA), PANYNJ, LaGuardia Airport, the airlines, and passengers.

Change: There is no change to the purpose and need of the project.

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3 Alternatives

The 2014 CTB EA identified and evaluated all potential adverse impacts on the human and natural environments that are expected to result from the implementation of the CTB Redevelopment Program and No-Build/No-Action Alternatives. Numerous other alternatives were considered during the planning phases of the project, but were eliminated from further detailed environmental review. One of the alternatives that was considered and rejected in the November 2014 EA was the "island" concept ("Concept B"). While not identical it is a similar concept to the proposed design changes. The reasons for rejecting Concept B included perceived difficulties in construction phasing and higher overall project cost. The proposed design changes have addressed these deficiencies as detailed in this section. The proposed design changes utilize dual islands, rather than the single island envisioned in Concept B, and provide for a headhouse that can be built wholly within the footprint of existing Parking Garage 2. Compared to Concept B, the proposed design changes allow for more efficient phasing and substantial cost savings as compared to the preferred alternative from the 2014 EA as well as Concept B.

The November 2014 EA stated "for early phase planning and evaluation purposes, because Concepts A, B, and C occur within a given project site where the same basic facility requirements are met with each concept and virtually no natural resources exist within the almost entirely developed project site, it was assumed that the potential for long-term development impacts on the affected resources would be essentially the same regardless of the concept selected. However, temporary air, noise, and traffic impacts would vary based on the duration of construction phase activities."

For this reason, impacts on air, noise, and traffic are fully examined in Chapter 5, given the change in duration of construction phase activities. Deficiencies identified in the original alternative analysis are examined in Table 3-2.

The original alternatives section from the previously approved (2014) design is included below for reference.

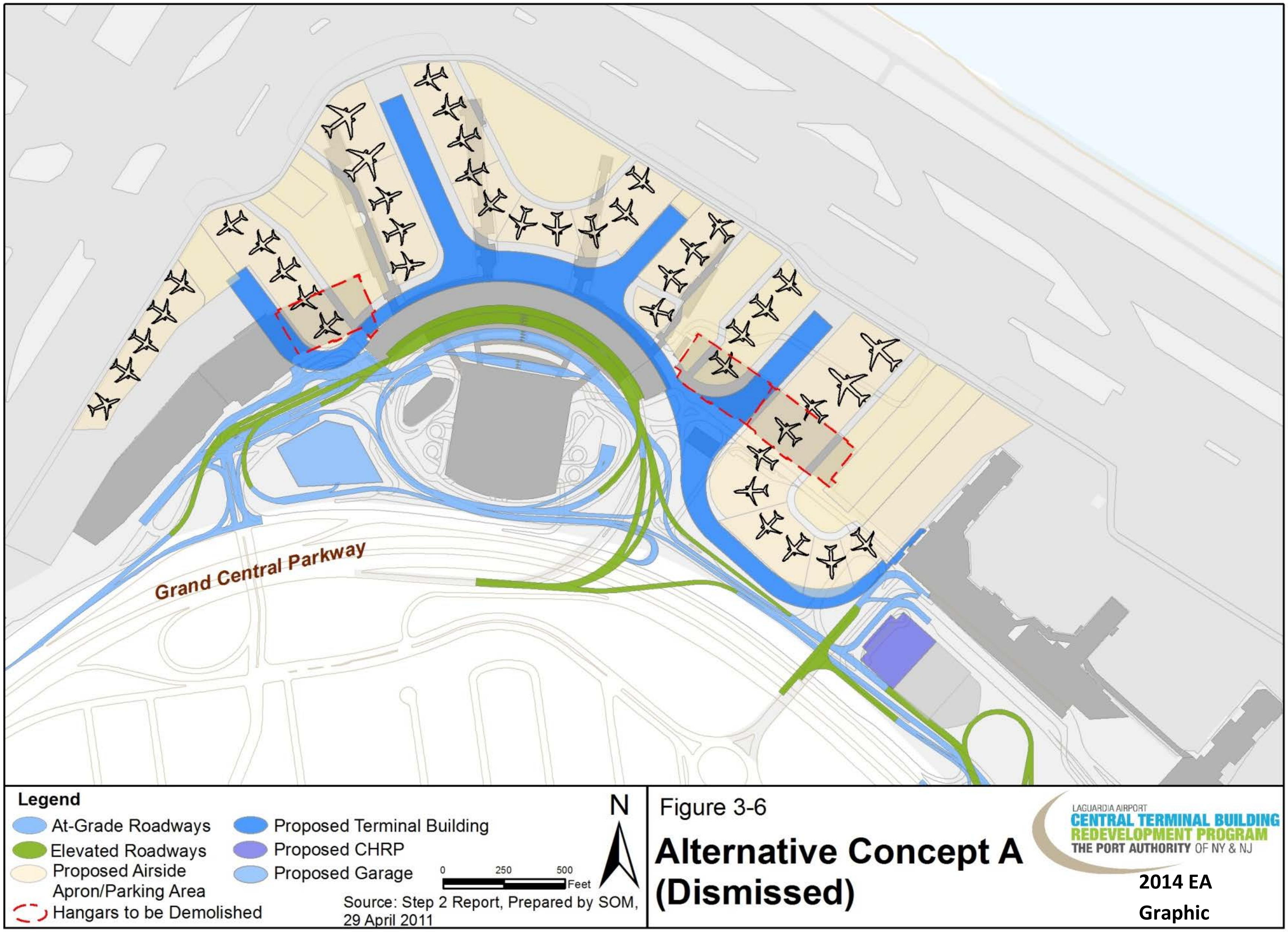
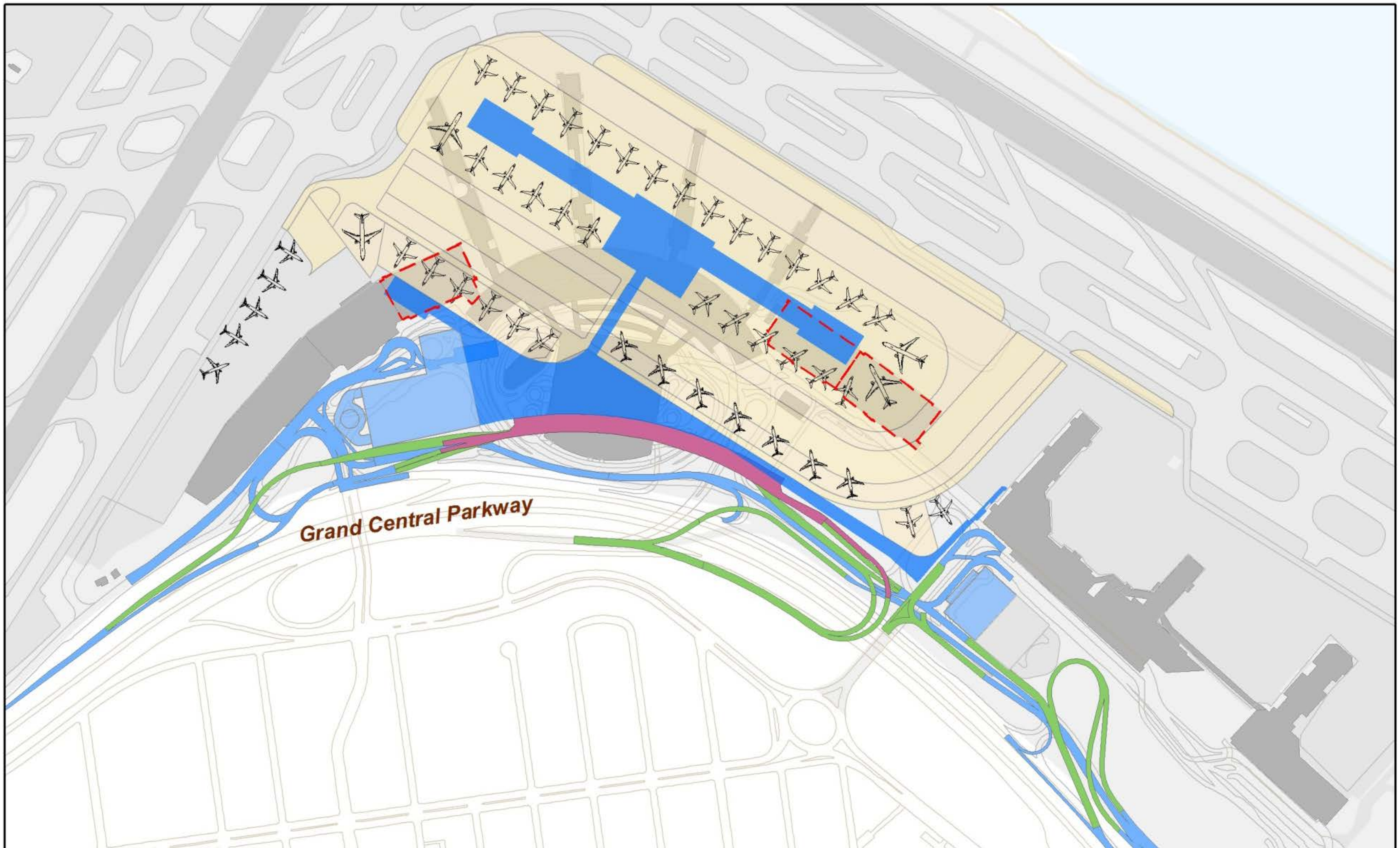


Figure 3-6
Alternative Concept A (Dismissed)



Legend
- Departures Roadways
- Arrival Level Roadways
- At-Grade Roadways
- Hangars to be Demolished
- Proposed Terminal Building
- Proposed Garage/CHRP
- Proposed Airside Apron/Parking Area

0 250 500 Feet

N

Source: Step 2 Report, Prepared by SOM, 29 April 2011

Figure 3-7

Alternative Concept B (Dismissed)

LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REDEVELOPMENT PROGRAM
THE PORT AUTHORITY OF NY & NJ

2014 EA Graphic

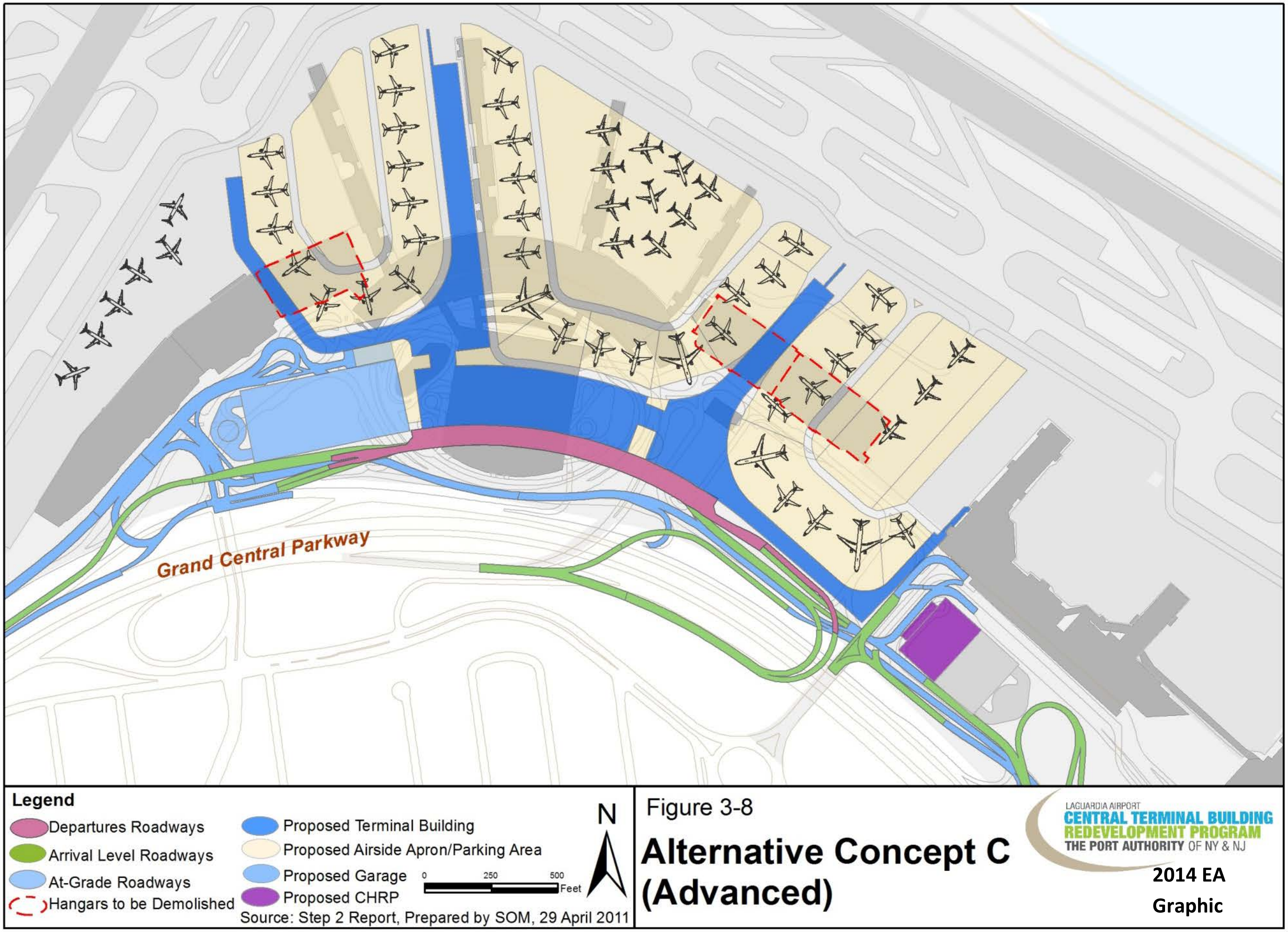


Figure 3-8

Alternative Concept C (Advanced)

Airside Differentiators

On the airside, all three concepts meet the basic requirements for contact gate positions but have notable differences in the provision of other airside facilities.

- Concept A has the greatest number of deficiencies relative to the other concepts. Given the number of single taxilanes and the lack of aircraft maneuvering area, it appears Concept A would function only marginally better than the existing condition—albeit with more spacious and regular aircraft parking positions.

- Concept B offers superior aircraft circulation within the site but is compromised by conflicting vehicle service roads and GSE movements. The apron is also limited in terms of entry exit points and does little to improve the interaction of aircraft movements from the CTB with those on the airport common taxiways.

- Concept C has the best stand capacity of the three concepts, both contact and remote, and is operationally superior in some aspects of aircraft maneuvering (number of entry/exits points, taxiway throats). The capacity to accommodate longer and wider aircraft than the current B737 design aircraft is notable. There is also considerable flexibility in the central and eastern sectors (the one shared with Terminal C).

Overall, Concept C offers the richest complement and best balance of airside facilities. It provides the largest aircraft parking apron and is the only concept with the flexibility to accommodate the current aircraft parking requirements and the capability to gate the larger next-generation aircraft. Concept C also provides the most RON/hardstand positions and the most general use apron area for GSE and other airport/airline operations.

Terminal Building Differentiators

All three concepts meet the terminal facility requirements but present three very different terminal configurations with varying performance capabilities.

- Concept A would forever be constrained by the structural grid and floor-to-floor dimensions of the existing CTB structure, which impedes the development of modern processing spaces, sight lines, way finding, and building systems integration.

- Concept B, as a new facility, should present the opportunity for optimal building planning and design, but the constraints of the site and the nature of the concept distort the east half of the landside terminal, making it inflexible and irregular.

- Concept C, also a new facility, is the most regular plan and has the most potential to be optimized for contemporary processing and future flexibility. It also has the shortest overall average walking distances and the fewest floor level changes.

Overall, Concept C has the lowest gross terminal floor area, yet it is more efficient due to the fact that it is a single building without duplication of certain plant and operations spaces (unlike Concept B) and is new construction, tailored to the facilities program (unlike Concept A). This area efficiency would translate into ease of operation and maintenance, especially in comparison to Concept B, where airline staff would need to operate in two separate buildings, one for airside and one for landside buildings.

Landside Differentiators

All three concepts can be developed to meet the landside facility requirements, but the locations of the major facilities (roadways, garages, etc.) reflect the differences.

- Concept A retains, refurbishes, and augments the existing two level roadway system. Because the terminal is not moved further south, Concept A has more landside area, which translates into more room to allow for the weaving and circulation of vehicles.

- Concepts B and C provide nearly identical roadway systems with few notable differences between them. The most significant difference is the relationship between the curb frontages and the terminal building at both the arrivals and departures level. While several hundred feet of curb frontage along the east end of Concept B forces passenger service areas to the west end of the building, curb frontages in Concept C are evenly disturbed along the entire face of the building.

Overall, the terminal area roads and the general provision of landside area in Concept A are superior to Concepts B and C, but the parking and future rail provisions of Concepts B and C are superior and more convenient to those of Concept A. Concept C is superior to Concept B due to the closer alignment of the principle frontage roads with the terminal building. On balance, the landside does not appear to determine the relative ranking of the three concepts.

Construction Schedule and Cost Comparison

Using a conservative methodology that assigns industry standard construction durations and uniform costs to different project elements, the duration of the construction period and total project cost for each concept was estimated for assessment and comparison. As shown in **Table 3-1**, Concept C was determined to have the shortest construction duration and lowest total development cost among the three alternatives considered.

Table 3-1: Estimated Construction Schedule and Cost for Preliminary Concepts

	Concept A	Concept B	Concept C
Construction Duration	8-9 years	8-9 years	6-7 years
Estimated Total Cost	$4.37 billion	$4.65 billion	$4.23 billion

Source: *LaGuardia Central Terminal Building Modernization Program, Alternative Concept Development* (PANYNJ/SOM, 2011) 2014 EA Table

Environmental Impacts

For early phase planning and evaluation purposes, because Concepts A, B, and C occur within a given project site where the same basic facility requirements are met with each concept and virtually no natural resources exist within the almost entirely developed project site, it was assumed that the potential for long-term development impacts on the affected resources would be essentially the same regardless of the concept selected. However, temporary air, noise, and traffic impacts would vary based on the duration of construction phase activities. Therefore, Concept C appeared to be the environmentally-preferable alternative because the evaluation demonstrated that Concept C could be constructed and opened for use in 1 to 2 years less time, thereby reducing the potential for construction-related air, noise, and water pollution, and traffic impacts, when compared to Concepts A or B.

Summary

After detailed analysis and careful consideration, Concept C was selected as the preferred concept to carry through the Phase II planning processes. Concept C consistently emerged with the most advantages and the fewest disadvantages. It provided a robust, flexible, suitable, and balanced set of facilities best able to serve LaGuardia Airport on opening day and well into the future. No potentially-significant environmental impacts were identified, and it is technologically and economically feasible to implement. Concepts A and B were eliminated from further consideration because they did not perform as well as in comparative analysis and they would take longer and cost more to construct, resulting in 1 to 2 years of additional construction-related effects on the environment. Concept C was further developed into the previously approved (2014) design; therefore, Concept C in its original form was eliminated from further consideration.

The PPP refined the idea of an "island" scheme (see Figure 3-7b), and addressed the deficiencies identified in the 2014 FONSI/ROD as depicted in the following table:

Table 3-2: Differentiators Between Preferred Alternative and Alternative B

Criteria	*Page Reference*	*New Design Differences from Alternative B*	*Environmental Concerns*
Airside differentiator: limited entry exit points	*3-20*	*Alternative Concept B only had two entry and exit points into the concourse area. The new design provides six points of entry or exit into the concourse area, and splits the original single island into two concourses that provide further room for aircraft maneuvering.*	*None*
Airside differentiator: conflicting vehicle service roads and GSE movements	*3-20*	*Upon basic review, the design team speculated that there could be conflicting vehicle and GSE movements. After further investigation, it was determined that some of the busiest airports in the country, including Atlanta-Hartsfield Jackson International Airport, Washington-Dulles International Airport, Detroit-Metro Wayne County International Airport and Seattle Tacoma International Airport have established protocols for GSE movements that cross active taxilanes in the terminal area. Vantage Airport Group has compiled lessons learned from each of these operations for deployment at LGA.*	*None*

Criteria	*Page Reference*	*New Design Differences from Alternative B*	*Environmental Concerns*
Terminal Building differentiator: distortion of east half of terminal building, making it inflexible	*3-20*	*Splitting the island concourse into two concourses allows for more flexibility for the landside terminal, which is constructed completely within the footprint of existing parking garage 2. The landside terminal does not have contact gates, and allows for complete separation of landside and airside functions, unlike Alternative Concept B. The east side of the headhouse is thinner than the west side of the headhouse, but not to the degree presented in alternative Concept B. The headhouse design in the proposed design changes allows for a central security checkpoint, consolidated check in positions, and the same curbside frontage as the previously approved (2014) design.*	*None*
Landside differentiator: several hundred feet of curb frontage along the east end of Concept B forces passenger service areas to the west end of the building	*3-21*	*The curb frontage for the new design is evenly distributed along the entire frontage of the landside terminal, providing comparable level of service to the original preferred alternative.*	*None*
Construction Schedule	*3-21*	*Due to refinements in design, the construction schedule for the proposed design changes has shortened to 68 months, well below any of the alternatives discussed in the EA.*	*None*
Cost	*3-21*	*The cost estimate is $4.0 billion, well below $4.65 billion contemplated for Alternative Concept B and the $4.23 billion for the preferred alternative. This saving was achieved through more efficient construction phasing.*[12]	*None*

Change: Table 3-2 details how the changes in design have addressed the differentiators between the originally considered alternatives, and some of the advantages of the proposed design changes versus original Alternative Concept B.

[12] *On May 28, 2015, The Port Authority's Board of Commissioners selected LaGuardia Gateway Partners (LGP) as the preferred proposer for the CTB Redevelopment Project. It is anticipated that as the Design-Build-Operate-Maintain partner in the project, LGP will contribute more than $2 billion of its own capital to the project, while the remainder of the capital expenses related to the project will be financed either by the Port Authority or through the use of Passenger Facility Charges (PFCs), subject to FAA approval.*

Overall building efficiency and concerns about duplication of staff and functional areas presented by an island concept are discussed below.

The proposed design changes create significant opportunities for the airlines to manage customer service issues with reduced management staff by:

- *For passengers, the distance between the furthest aircraft gates and the ticket lobby in the proposed design changes is 100 feet shorter than the distance from the furthest gate to the ticket lobby in the originally approved (2014) design.*
- *Staffing of gates for aircraft departures and arrivals are the same for both concepts. However, the concourse layout in the proposed design changes provides improved passenger level of service by creating spacious holdrooms (average holdroom size for the originally approved (2014) design is 2,178 SF and the average holdroom size for the proposed design changes is 2,429 SF), while at the same time providing direct visual contact between gate podium clusters of between 4 and 7 gates each. This significantly improves airline customer service supervision of the boarding and deplaning process.*
- *The Airlines will provide breakroom and support space at both the concourse (aircraft enplaning and deplaning) and the headhouse (ticketing/baggage service) for "above the wing" under both the originally approved (2014) design (Concept C) and the proposed design changes. There is no additional space requirement or excess duplication of space and function.*
- *Below the wing support space including break rooms, locker rooms, and ready rooms will be located on the apron level of the concourses in both concepts with no duplication of facilities.*
- *The single combined baggage makeup room designed in the proposed design changes provides a number of significant improvements from an operations and maintenance and airline utilization perspective over the multiple baggage makeup rooms identified in the originally approved (2014) design (Concept C) including:*
    - *The compact nature (stacked within the headhouse) of the proposed design revision Baggage Handling System (BHS) significantly reduces the response time to clear faults and jams within the system should they occur.*
    - *The overall number of drive units required for the proposed design changes is 60% of the number required for the split baggage makeup room identified in the originally approved (2014) design. This factor alone significantly reduces O&M costs for the BHS.*
    - *The modeled baggage delivery time from the makeup device to the tail of the aircraft is similar in both concepts. The average delivery times from the CBIS to the aircraft based on the following assumptions:*
        - *baggage handler time to move the bag from the makeup device to the bag cart is assumed to be similar in all cases*
        - *in the originally approved (2014) design, assume that a bag is directed from the west screening area to one of two west baggage makeup room and from the east screening area to one of two east baggage makeup room*
        - *High speed delivery conveyors are used from the screening area to the baggage makeup sortation loops in the originally approved (2014) design due to the extended distances and are not necessary in the proposed design changes*

      Based on the above parameters the delivery time to the average gate in the originally approved (2014) design is 5.05 minutes and in the proposed design changes the time to deliver is 5.16 minutes.
    - *The central bag room in the proposed design changes provides significantly more utilization flexibility in the common use scenario than split baggage makeup rooms as*

  - *there is not a scenario where a single airline may operate from time to time from two separate baggage makeup rooms due to capacity constraints.*
  - *The island concept does not impact airline baggage handling staff requirements.*
- *From an airside perspective, the ability to have start up positions at each gate reduces ground crew resources required, due to eliminating the need for aircraft to start up on active taxilanes.*
- *The airside efficiency gains as demonstrated in Attachment 2 reduce delay for passengers and provide an enhanced experience.*

The benefits to the Transportation Security Administration (TSA) provided by the proposed design changes are significant. The TSA Federal Security Director (FSD), Daniel Ronan, at a meeting with the TSA and LaGuardia Gateway Partners on November 4, 2015, stated that the TSA much prefers the single Security Screening Checkpoint (SSCP) in the proposed design changes over the previously approved (2014) design. The preference was based on the single SSCP providing access from the headhouse to both Concourses as compared to the split SSCP found in the previously approved (2014) design (Concept C). There will be a reduction in the supervision required to staff the single checkpoint to access both concourses. The location of the in-line screening rooms (CBIS/CBRA) and the location of the On-Screen Resolution (OSR) directly below the SSCP provide the ability to transfer TSA staff between the SSCP and checked baggage inspection areas quickly and efficiently.

From a passenger perspective, the proposed design changes enhance the way-finding with fewer and simpler decision points. A departing passenger will encounter only two left-right decision points: at the bridge level and at the concourse. Arriving passengers do not have to make a directional decision until at the baggage claim hall. The proposed design changes also provide shorter walking distances as the average walking distance from curb to gate is reduced versus the previously approved (2014) design configuration, it eliminates the need for moving walks in the Concourses, provides full accessibility to common functions, and the flexibility to change the layout over time.

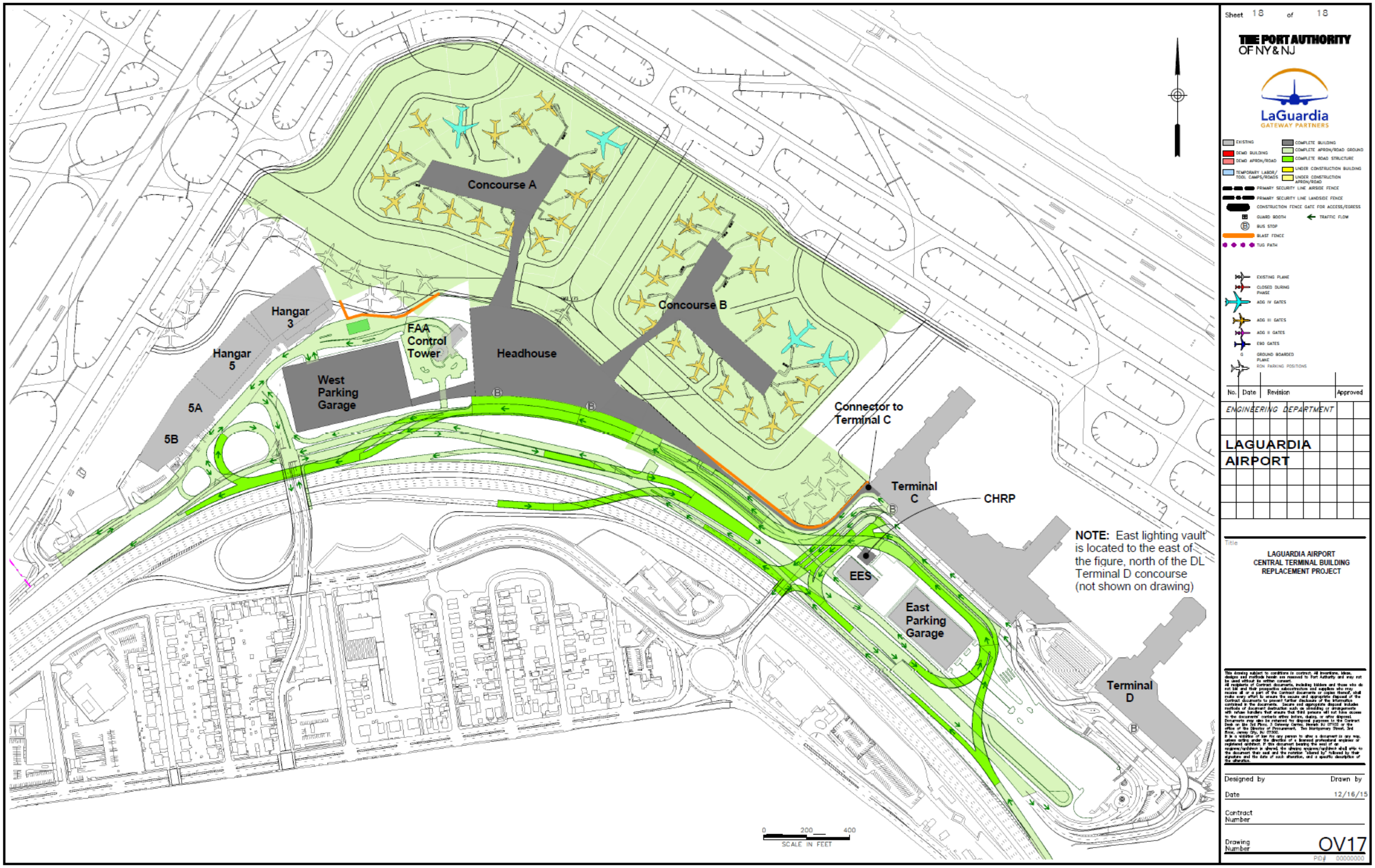


Figure 3-7b. Alternative Concept Advanced in Technical Report

4 Affected Environment

Change: The LGA CTB EA Affected Environment chapter provided a description of the existing environmental conditions in and around the vicinity of LGA. PANYNJ has determined the data collected for the EA baseline are still relevant and reasonably representative of existing conditions at the time of this Technical Report because conditions have not changed substantially in and around the vicinity of LGA, other than for the traffic analysis as discussed in Section 4.2.1.

This section briefly describes the project's location and setting beginning with New York City and ending with the project site. This is followed by discussions of the resources potentially impacted by the CTB Redevelopment Program. The following resources are introduced in this section:

- Traffic and Transportation
- Air Quality
- Coastal Resources
- Compatible Land Use
- U.S. DOT Act, Section 4(f) Resources
- Fish, Wildlife and Plants
- Floodplains
- Historic and Archaeological Resources
- Noise
- Water Resources

The other resource categories typically considered in a NEPA EA are not discussed in this section; however, Chapter 5, Environmental Consequences includes a discussion about all of the resource categories, whether there are impacts in those categories or not.

4.1 Project Location and Setting

New York City is located in downstate New York and consists of five boroughs connected by an expansive network of roadways, bridges, tunnels, and ferries used to cross a series of inland and coastal waterways that make up one of the largest natural harbors in the world. The five boroughs—The Bronx, Brooklyn, Manhattan, Queens, and Staten Island—were consolidated into a single city in 1898. With more than 8 million residents living within 300 square miles, New York is the most populous city in the United States and the most densely populated. A global power city, New York exerts a significant impact upon commerce, finance, media, art, fashion, research, technology, education, and entertainment. For this reason, people from across the U.S. and around the world travel to New York City and most use one of its three major airports.

LaGuardia Airport is located in the northern portion of the Borough of Queens, eight miles east of midtown Manhattan, and is New York City's primary airport for domestic travelers. Queens is the easternmost of the five boroughs, the largest in land area, and the second largest in population. With 2.2 million residents, approximately half of which are foreign born, Queens is one of the most culturally diverse urban areas in the world. Known for tight-knit ethnic communities influenced primarily by Asian and Hispanic cultures, there are residents from over 100 foreign countries speaking over 138 different languages.[13] With the second largest economy of the five boroughs, the diversity of Queens's population is reflected in its employment sectors, which is spread evenly across health care, retail trade,

[13] http://www.newyork.com/ny/nyc/queens/ (retrieved November 3, 2014)

manufacturing, construction, transportation, and film and television production. Queens is well served by all modes of transportation including two of New York City's three major airports—JFK and LaGuardia—for which citywide public transit for arriving and departing passengers is offered.

LaGuardia Airport consists of 680 acres bordered by Flushing Bay and Bowery Bay to the north and the Grand Central Parkway to the south. North and east of the Airport, the Riker's Island correctional facility is located across Riker's Island Channel and the College Point neighborhood is across Flushing Bay. South and west of the Airport are the neighborhoods of Astoria (Steinway), Jackson Heights, and East Elmhurst. Surrounding land uses are densely developed with commercial strips and light industrial complexes situated along arterial roadways that pass through established communities and residential areas. **Figure 4-1** is an aerial photograph of LaGuardia Airport and the surrounding area.

The Airport's property is almost entirely built out. Approximately 95 percent of the property is covered by the airfield, buildings, roadways, and parking lots. Vegetation is limited to landscaped and vacant areas consisting of trees, foundation plantings, and turf grasses. Two undeveloped parcels are located on Airport property west of the terminal area—Ingraham's Mountain is vegetated and the Elmjack Little League ball fields are covered with grass and a parking lot. Tidal wetlands are present where some bay areas border the Airport, but there are no wetlands or other water resources located inland.

The project site, bounded by the airfield to the north and the Grand Central Parkway to the south, is similarly developed and covered with buildings and pavement interspersed with landscaped areas consisting of trees, shrubs, and grasses that offer little or no habitat value for any species of concern (see **Figure 4-2**).

4.2 Resources Potentially Affected

FAA Order 5050.4B states that the affected environment section of an EA should succinctly describe only those environmental resources the CTB Redevelopment Program and its reasonable alternatives are likely to affect. The amount of information on a potentially affected resource should be based on the extent of the expected impact and be commensurate with the importance of the impact. The resources introduced below include traffic and transportation, air quality, coastal resources, compatible land use, Section 4(f) resources, fish, wildlife and plants, floodplains, historic and archaeological resources, noise, and water resources.

4.2.1 Traffic and Transportation

The CTB Redevelopment Program has the potential to reduce the level of service (LOS) on local roads serving LaGuardia Airport and the surrounding community, more so during the construction phase and less so during the operational phase. On-Airport roadways would be substantially altered, including ramp configurations and connections to the Grand Central Parkway. There would be no permanent changes to off-Airport roadways or local transportation patterns as a result of the project. The assessment of impacts on traffic and transportation is discussed in Section 5.1 and detailed results are provided in **Appendix A of the 2014 EA.**

*Change: Revised traffic analysis as presented in **Attachment 4: Technical Memorandum – Updated Traffic Analysis for Construction Conditions** and in Chapter 5 was conducted using updated baseline conditions due to the change in project schedule. The original baseline conditions modeled were for 2012 traffic, whereas the updated construction conditions traffic analysis considers a 2014 baseline. Traffic conditions have changed in and around the airport since 2012 as there has been general growth in vehicle traffic off airport, as well as an increase in passenger activity at the airport. Due to the change in* *project schedule, it was considered prudent to include the best available data as related to traffic impacts, given the change in activity between 2012 and 2014.*

On-Airport Roadways

The Airport's internal roadway network includes several one-way loop roads that connect the terminals and parking facilities. Frontage roads to the arrivals and departures levels of the CTB and Terminals C and D allow for passenger drop-off and pick-up. LaGuardia Access Road runs parallel to the Grand Central Parkway to the north and provides access to the Parkway and local roads. Runway Drive curves around the Runway 4 end to connect the main terminals with the Airport facilities on the west side of the property, including the Marine Air Terminal (Terminal A serving the Delta Shuttle).

Grand Central Parkway

The Grand Central Parkway is an eight-lane roadway that handles approximately 180,000 vehicles per day through western Queens.[14] The Parkway runs along the northern part of western Queens, past the southern border of LaGuardia Airport, before turning south to central Queens and intersecting with I-495 (Long Island Expressway). It connects to I-278 (Brooklyn-Queens Expressway) to the west of the Airport and I-678 (Van Wyck Expressway and Whitestone Expressway) to the east via Northern Boulevard.

Eastbound entry to the Airport from the Grand Central Parkway is available via two exit ramps (94th Street and the "flyover"), and there is one exit from the Airport via the loop ramp from the 94th Street bridge (see **Figure 4-3**). Westbound entry to the Airport from the Parkway is available via the LaGuardia Access Road and two ramp connections (near Terminals C/D and the CTB). Airport exits are provided via two on-ramps from the frontage road (near the 94th Street Interchange).

Analysis of the existing conditions on the Parkway near the Airport using the Freeway Evaluation (FREEVAL) model indicate that the eastbound flows are satisfactory during the weekday morning and evening peak periods (LOS C or D), but westbound flows are at a failing LOS at those times (i.e., oversaturated).[15] Eastbound movements reflect recent improvements by NYSDOT to the weaving sections and ramps near 94th Street.

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[14] http://www.nycroads.com/roads/grand-central/

[15] FREEVAL is a deterministic traffic model that is the official computational engine for the analysis of freeway facilities in accordance with the procedures of the 2010 *Highway Capacity Manual* (HCM). FREEVAL is supported and maintained by the Transportation Research Board's (TRB) Highway Capacity and Quality of Service (HCQS) Committee.

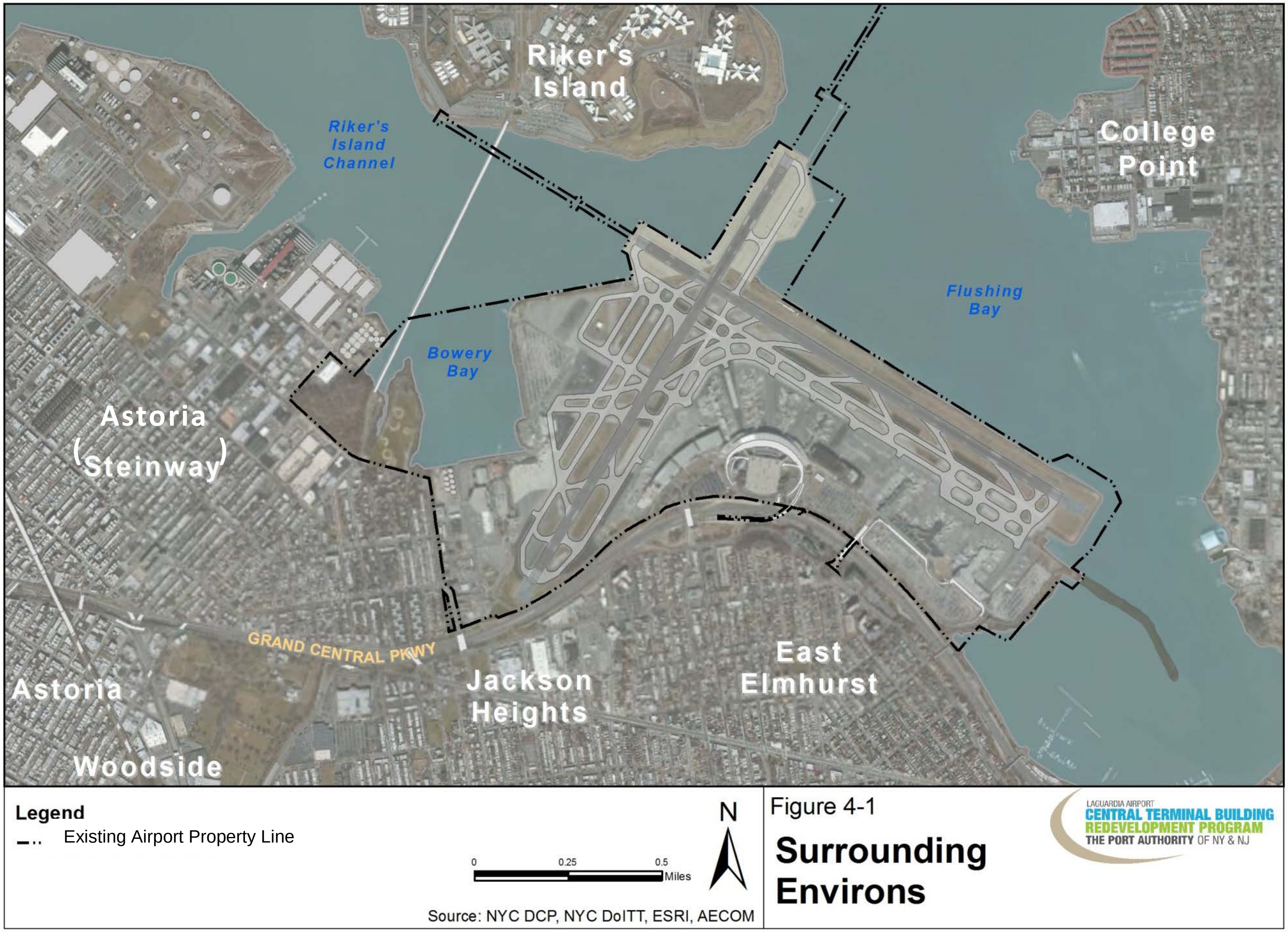

Figure 4-1
Surrounding Environs

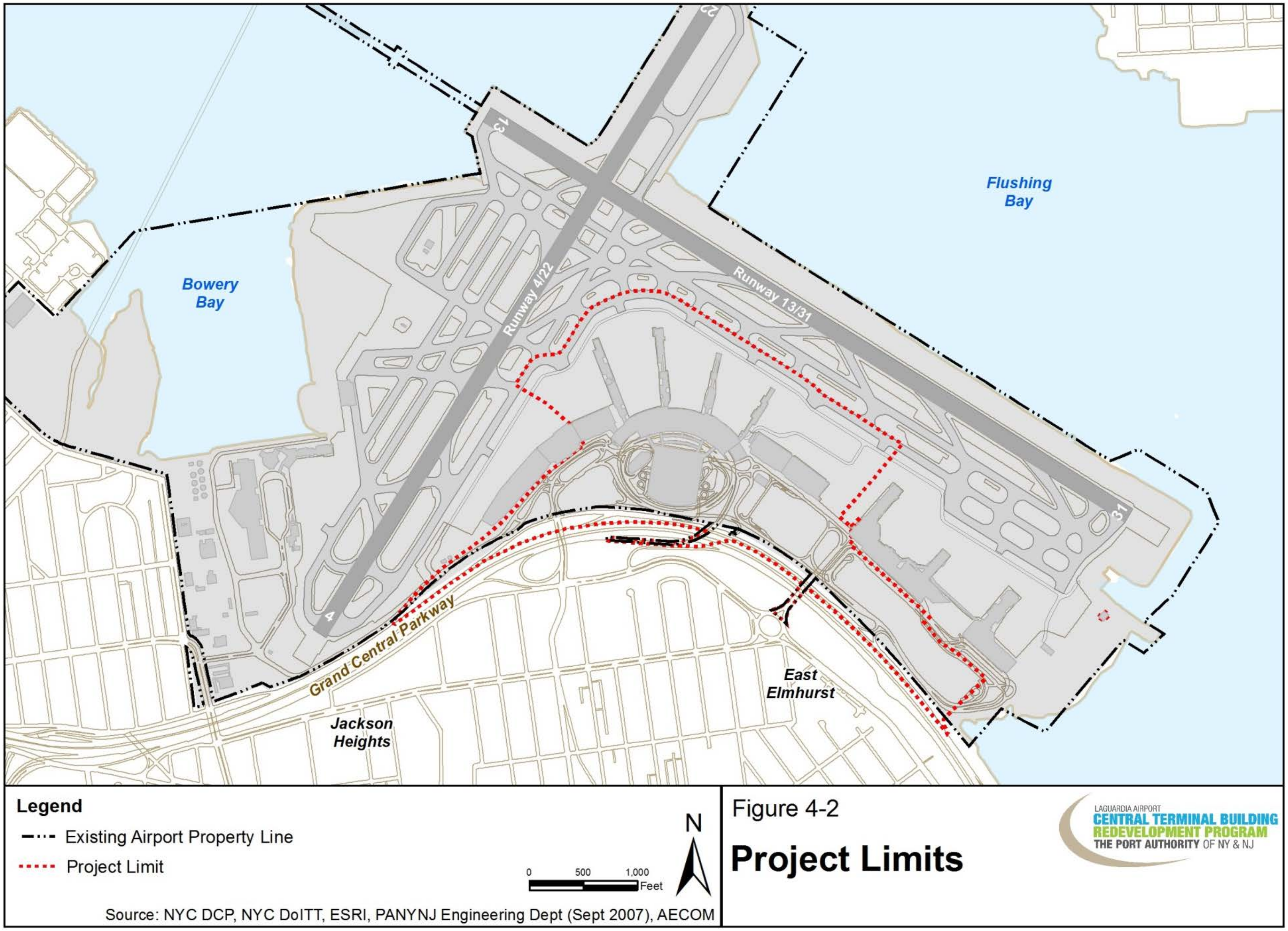

Figure 4-2

Project Limits

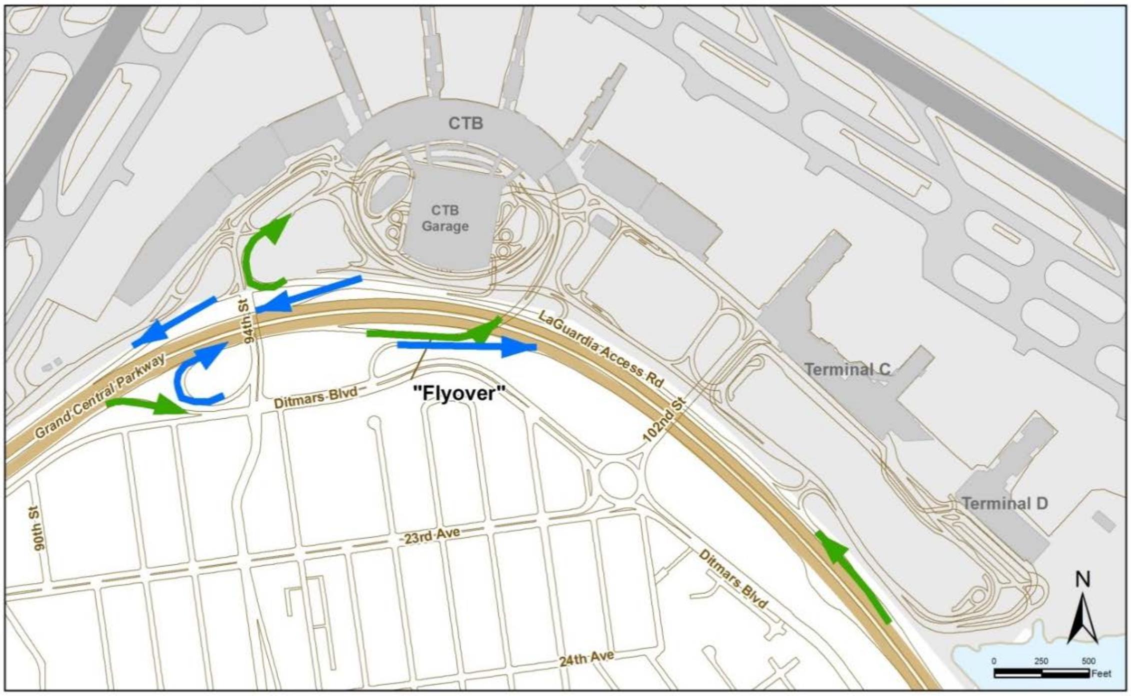

Figure 4-3. Airport Access To/From the Grand Central Parkway

Local Roads

Connections between the Airport and the communities south of the Grand Central Parkway are via bridges at 82nd, 94th and 102nd Streets over the Parkway, intersecting with Ditmars Boulevard and 23rd Avenue. Ditmars Boulevard is a surface street following the Grand Central Parkway to the south, but elevated significantly above the Parkway. Astoria Boulevard is a principal east-west arterial through the East Elmhurst neighborhood. Analysis of existing intersections in the vicinity of the Airport using data collected in 2012 and the Highway Capacity Manual (HCM) methodology indicate that *most* turning movements operate at LOS “D” or better during weekday morning and evening peak hours.

Since commercial traffic is not allowed on the Grand Central Parkway, all construction vehicles must utilize local roads. Construction vehicles will arrive and depart the site via NYCDOT-established truck routes. In the vicinity of the Airport, Astoria Boulevard serves as a major through truck route and 94th Street; 19th Avenue and a portion of 23rd Avenue and Ditmars Boulevard are also established local truck routes.

Public Transportation

Although there is no direct rail access to LaGuardia Airport, five Metropolitan Transportation Authority (MTA) bus lines serve the Airport. The M60, Q47, Q48, Q72 and new Q70 express service routes connect Airport passengers and employees to Queens and Manhattan. The bus routes include stops at various Airport terminals and administrative buildings. Private operator express bus service is also provided between the Airport and various Manhattan locations, as well as to and from JFK International Airport.

4.2.2 Air Quality

Air quality in the New York City metropolitan area only exceeds National Ambient Air Quality Standards (NAAQS) a few days of the year. Areas of the country where air pollution concentrations persistently exceed NAAQS are designated "nonattainment." Areas that had a history of nonattainment but are now meeting NAAQS are designated as "maintenance." According to the Environmental Protection Agency's (EPA) Green Book, Queens County in New York is a designated nonattainment area for two criteria pollutants—ozone and fine particulates—and a designated maintenance area for carbon monoxide.[16] LaGuardia Airport is located in Queens County, which means project-related air emissions would occur within an EPA-designated nonattainment or maintenance area. These emissions and pollution concentrations are subject to review under the federal Clean Air Act and its amendments, and under the jurisdiction of EPA regulations. The assessment of impacts on the air environment is discussed in Section 5.2 and **Appendix B of the 2014 EA**.

4.2.3 Coastal Resources

LaGuardia Airport and much of the surrounding area is located within the Coastal Zone Boundary of New York. Under the Coastal Zone Management Act of 1972, all federal actions within the coastal zone must comply with the "enforceable policies" of the New York Coastal Management Program. The New York State Department of State (NYSDOS) administers the program and the process by which the State decides whether a project or action meets its enforceable policies is called a consistency review. In addition, New York City has established a coastal zone under the Local Waterfront Revitalization Program (LWRP). Administered by the NYC Department of City Planning (NYCDCP), the LWRP establishes the City's policies for the development and use of the waterfront and provides the framework for evaluating the consistency of all discretionary actions in the coastal zone.

The CTB Redevelopment Program involves redeveloping existing built land within the coastal zone. As such, a coastal zone consistency determination is required from the NYSDOS and NYCDCP. The assessment of impacts on the coastal zone is discussed in Section 5.3.

There are no coastal barriers or any areas subject to the Coastal Barriers Resources Act of 1982 or the Coastal Barriers Improvement Act of 1990 in the vicinity of LaGuardia Airport.

4.2.4 Compatible Land Use

The Grand Central Parkway is an eight-lane divided highway separating the Airport from the East Elmhurst and Jackson Heights neighborhoods. Land uses south of the Grand Central Parkway are densely developed and consist mostly of residential areas with retail stores, commercial buildings, and office space concentrated along Ditmars Boulevard, 23rd Avenue, and Astoria Boulevard. Other notable land uses in the vicinity of the project site include Vaughn College of Aeronautics and Technology and Overlook Park.

Airport property is zoned for Manufacturing, Light Industrial (M1-1). Zoning around the Airport is primarily residential and mixed-used development (General Residence, R3-2, and Regional Commercial Center, C4-2). The assessment of impacts on surrounding land uses is discussed in Section 5.4**.**

[16] EPA list of currently designated nonattainment and maintenance areas for all criteria pollutants as of March 30, 2012.

4.2.5 U.S. DOT Act, Section 4(f) Resources

The U.S. Department of Transportation Act (U.S. DOT Act) of 1966 included a special provision, Section 4(f), which protects the use of land from publicly-owned parks, recreation areas, wildlife and waterfowl refuge areas of national, state or local significance, and public and private historical sites. The CTB Redevelopment Program has the potential to directly and/or indirectly affect NYC Parks and Public Lands, as well as historic resources that are eligible for listing on the National Register of Historic Places (NRHP).

NYC Parks and Public Lands near LaGuardia Airport include Overlook Park, located on the south side of the Grand Central Parkway along Ditmars Boulevard between 97th and 100th Streets; Planeview Park, located at 23rd Avenue between 85th Street and Ditmars Boulevard; LaGuardia Landing Lights, which is a park situated in several lots that follow the flight path leading to Runway 4, stretching from 78th Street and 25th Avenue to the Grand Central Parkway; World's Fair Marina, a public boat dock located east of the Airport on the north side of the Parkway; and the Grand Central Parkway Extension, a promenade along the waterfront between World's Fair Marina and the Airport.[17] The CTB Redevelopment Program avoids the use of land from any of these parks.

Section 4(f) also applies to historic resources of national, state, or local significance. In consultation with the New York State Historic Preservation Office (SHPO), the FAA has determined that five airplane hangars (circa 1940) that are eligible for listing on the NRHP would be adversely affected by the CTB Redevelopment Program. Hangars 1, 2, and 4 would be directly affected by removal of the buildings, while Hangars 3 and 5 would be indirectly affected by the removal of adjoining Hangar 1 and obstruction of views from the Grand Central Parkway as a result of construction of the West Garage. Terminal A (the NHRP-listed Marine Air Terminal, circa 1940) is located on the west side of the Airport and is beyond the area of potential effect.

The assessment of impacts on Section 4(f) resources is discussed in Section 5.5 and **Appendix C of the 2014 EA**.

4.2.6 Fish, Wildlife and Plants

Biotic communities directly affected by the CTB Redevelopment Program would be limited to urban landscaping located along roadway medians and shoulders that lie between LaGuardia Airport and the Grand Central Parkway. Typical of a busy highway corridor, the landscaped features consists of grass-covered verges interspersed with shrub patches and trees. The grass is mowed regularly and the trees and shrubs are actively managed in order to maintain a safe roadway operating environment and discourage birds. Low habitat value is indicated due to small size, active management, a high degree of fragmentation, close proximity to busy roads, and barrier effects of the roads on wildlife migration.

The landscaped area affected by the CTB Redevelopment Program is located within the Coastal Zone Boundary of New York, and most of the area is also located within the 100-year (tidal) floodplain. However, the limits of the project site consist only of upland vegetation; there are no wetlands, water

[17] The unpaved portion of the Grand Central Parkway right-of-way along the southern boundary of the Airport is under the jurisdiction of the New York City Department of Parks and Recreation (NYCDPR); however, it is not designated nor intended for public access or recreation. The City of New York has reviewed the Proposed Action and has determined that the affected area was originally acquired for "park and parkway purposes," which is distinct from a designation of the area as parkland. The access improvements to and from the Parkway are a legislatively authorized use of the land. See Section 5.5.2 for additional discussion.

resources, or aquatic habitat within the landscaped area. No federal- or state-listed species, or habitat for federal- or state-listed species, would be affected.

The assessment of impacts on fish, wildlife and plants is discussed in Section 5.7 of the 2014 EA**,** which cross-references other sections as needed to address the presence/absence of biotic communities associated with land uses and cover types related to other resources affected by the CTB Redevelopment Program, such as coastal resources.

4.2.7 Floodplains

LaGuardia Airport is located on the waterfront of Flushing Bay and Bowery Bay. According to the current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) and the recently released Preliminary FIRM, the majority of LaGuardia Airport lies within a tidal floodplain, some portions of which are designated a coastal flood zone with velocity hazard (see Figure 5-6).[18] Tidal floodplains consist of areas subject to coastal or tidal flooding by high tides, hurricanes, tropical storms, and steady on-shore winds. Coastal high hazard areas consist of coastal shorelines subject to high velocity wind and wave action in addition to tidal flooding. The 100-year tidal floodplain extends to the southern edge of LaGuardia Road and in some areas south of the Grand Central Parkway. The coastal flood zone generally follows the shoreline, except where it extends within Parking Lot 5 at the eastern side of the Airport.

Pursuant to Executive Order 11988, Floodplain Management, all Federal agencies are required to avoid impacts on floodplains to the degree practicable and minimize impacts that cannot be avoided. The CTB Redevelopment Program involves redeveloping land within the FEMA 100-year floodplain. Because the vast majority of the Airport's property lies within the floodplain, measures to minimize harm will be included in the project (see Section 2a of EO 11988, Floodplain Management, dated May 24, 2977; 42 FR 26951). Therefore, the layout of the proposed project would be designed to minimize impacts on the floodplain, and the risks associated with flooding, to the greatest extent practicable. The assessment of impacts on floodplains is discussed in Section 5.8.

On January 30, 2015, the President issued EO 13690 that amends EO 11988, and established the Federal Flood Risk Management Standard ("FFRMS") and a process for public input prior to implementation of the FFRMS. EO 13690 at §1. However, in Guidelines issued on October 8, 2015, federal agencies were directed not to apply the new requirements until after the agencies adopt new or revised regulations governing the proper implementation of EO 13690 and the FFRMS. EO 13690 at §3; Guidelines for Implementing Executive Order 11988, Floodplain Management, and Executive Order 13690, Establishing a Federal Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input, October 8, 2015 ("Guidelines"). The Guidelines state that agencies will continue to comply with the requirements of the 1977 version of E.O. 11988 until they update their regulations and procedures to incorporate the amendments from E.O. 13690. These regulations and procedures will describe an agency's schedule for applying any new requirements as well as how it will apply the new requirements. Id. at 5, 18. The new requirements of EO 11988 will not be applied retroactively. Id. at 18. The DOT has not issued implementing orders to date.

[18] Preliminary FIRMs have been developed by FEMA for certain communities in New York and New Jersey affected by Superstorm Sandy.

4.2.8 Historic and Archaeological Resources

Historical and cultural resources affected by the CTB Redevelopment Program are federally-regulated under the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), and other applicable laws and regulations intended to protect historic properties. Section 106 of the NHPA requires Federal agencies to take into account the effects of their actions on historic properties, to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment, and include an opportunity for consultation with all interested parties. Historic properties include any prehistoric or historic district or site that is listed or eligible for listing in the National Register of Historic Places. In addition, NYC's Landmarks Preservation Commission (LPC) may designate properties as NYC Landmarks.

Prior to undertaking any airport project or action, the PANYNJ, in consultation with the FAA, must determine if the CTB Redevelopment Program has the potential to affect historic properties. As the lead federal agency, the FAA is responsible for consulting with the SHPO—in this case, the New York State Office of Parks, Recreation and Historic Preservation (OPRHP)—and for making a determination about the effects of the project on historic properties. The process by which the FAA decides whether a project or action affects historic properties is called a Section 106 review per NHPA.

Two NRHP-listed sites have been identified in the vicinity of the project. The nearest NRHP-listed historic site is Terminal A (the Marine Air Terminal) located approximately one-half mile west of the project site. The property is also an interior and exterior landmark designated by LPC. The other is the Lent Homestead and Cemetery located between 19th Road and 19th Street in East Elmhurst. Both sites are located west of the CTB Redevelopment Program and beyond the designated area of potential effect (APE). In addition, the LPC-eligible Malcolm X House is located south of the Airport, outside of the APE.

The FAA has determined that five historic airplane hangars (circa 1940) would be adversely affected by the CTB Redevelopment Program. Hangars 1, 2, and 4 would be directly affected by removal of the buildings, while Hangars 3 and 5 would be indirectly affected by the removal of adjoining Hangar 1 and construction of the West Garage, blocking views from the Grand Central Parkway. These hangars are part of the original Airport and have remained relatively unaltered; therefore, the buildings are eligible for listing in the NRHP. The existing CTB (circa 1964) has been significantly altered over the years and, as a result, the SHPO has determined that the terminal building is not eligible for listing. In addition, according to the New York State Preservation Historical Information Network Exchange (SPHINX) system mapping tool, the western portion of the project site falls within an area of archaeological sensitivity. Supplemental analysis indicates that construction activities would have the potential to disturb intact soil horizons located beneath existing roads in the vicinity of the existing Parking Lot 1.

The assessment of impacts on historic resources is discussed in Section 5.10 and **Appendix D of the 2014 EA**. Because the CTB Redevelopment Program would adversely affect NRHP-eligible properties, a Section 4(f) Evaluation must also be prepared. The assessment of impacts on Section 4(f) resources is discussed in Section 5.5 and **Appendix C of the 2014 EA**.

4.2.9 Noise

Before moving forward with the CTB Redevelopment Program, analysis must determine if the construction and operation of the project has the potential to cause or contribute to increased noise levels in the vicinity of the Airport. Construction activities could generate noise levels in excess of those typically found in the project environs. Noise levels at a construction site vary relative to the particular activities in progress, and the potential effects depend in large part on the distance between the source of the noise and a sensitive receptor, such as a church, school, hospital, or residence (see Section 5.13.1.1 and **Appendix E of the 2014 EA**). After construction, project-induced changes in ambient noise levels may occur due to a) increasing vehicular traffic volumes, and b) the airlines' transition into newer, larger, more efficient, and higher capacity aircraft. Full detailed noise analysis showing that there is no significant impact from aircraft as a result of the CTB Redevelopment Program can be found in Section 5.13.1.2 and **Appendix E of the 2014 EA**.

The FAA must adhere to federal regulations for evaluating the compatibility of aircraft noise with land uses surrounding airports. In addition, NYC-specific rules for evaluating the effects of construction noise as well as noise from traffic operations were evaluated. The assessment of project-related noise impacts on the affected environment is discussed in Section 5.13 and **Appendix E of the 2014 EA.**

4.2.10 Water Resources

The project study area includes surface and groundwater resources. There is also a network of drainage basins, conveyances, and control mechanisms in place to help reduce the risk of flooding while minimizing the effects of airport activities on the quality and quantity of storm runoff. The following paragraphs identify the water resources and management systems affected by the CTB Redevelopment Program. The assessment of impacts on water resources is discussed in Section 5.16.

Surface Water

LaGuardia Airport is surrounded on three sides by surface waters, including Flushing Bay to the east/northeast, Riker's Island Channel to the north/northwest, and Bowery Bay to the west.[19] These surface water features are adjacent bay areas located off of the main stem of the East River as it flows north of the Airport, eventually discharging into Long Island Sound. Importantly, no surface waters are present within the interior of the Airport or within the project limits.

Flushing Bay is surrounded by a heavily urbanized region containing a very high population density (Borough of Queens) and is fed by Flushing Creek, which defines a heavily urbanized watershed. Flushing Bay is a saline surface water classified in New York State Department of Conservation (NYSDEC) Regulations as a Class I water suitable for secondary contact recreation and fishing.[20] Class I waters are suitable for fish propagation and survival but are the next to last level of classification for saline surface waters, indicative of water quality impairment.

The water quality of Flushing Bay in the vicinity of the Airport is reported by the NYCDEP to be somewhat impaired, although water quality has improved over the last decade or so. The Flushing Bay ecosystem has been degraded as a result of fill activities, bulk-heading, dredging, landfills, sewage discharges and combined sewer overflow (CSO) discharges. In highly modified and developed watersheds such as Flushing Bay, it is presumed that water quality and aquatic habitat characteristics will always be less than optimal due to irreversible changes to the watershed, as suggested by its

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[19] Flushing Bay generally includes the sub-waters Riker's Island Channel and Bowery Bay; therefore, the identified classification and description included herein considers these waters as a single, combined resource, as the exact boundaries of these waters relative to each other are somewhat ambiguous.

[20] New York Codes, Rules and Regulations (NYCRR), Chapter X – Division of Water, Subchapter A: General, Article 2: Classes and Standards of Quality and Purity, Part 701: Classifications-Surface Waters and Groundwaters (6 NYCRR § 701.13)

classification as a Class I waterway. Flushing Bay is not designated as a Protected Water under the Protection of Waters Program administered by NYSDEC.[21]

New York State has been delegated by the EPA to implement the federal National Pollutant Discharge Elimination System (NPDES) program through the State Pollutant Discharge Elimination System (SPDES) program administered by NYSDEC. LaGuardia Airport holds a New York SPDES permit for the discharge of stormwater (Permit No. NY 0008133). In addition to regulating stormwater discharges, the SPDES permit requires the Airport to track and report any noncompliance with the permit, such as planned releases and unanticipated releases (spills and leaks).

Groundwater

Groundwater resources in the project study area are part of the Brooklyn-Queens Aquifer System, which is part of the Long Island aquifer system underlying all of Nassau, Suffolk, Kings and Queens Counties, and is listed by the EPA as a Sole Source Aquifer.[22] The upper glacial aquifer is the uppermost hydrogeological unit on Long Island and is found in nearly all of Kings and Queens Counties.[23] Ranging in thickness from 0 to 300 feet below the surface, this aquifer consists mainly of till deposits (clay, silt, sand, gravel, and boulders) along the north shore and outwash deposits (mostly sand, gravel and clay) to the south. The local water table is within the upper glacial aquifer throughout most of Kings and Queens Counties and, according to the U.S. Geological Survey (USGS), the average water-level measurement ranges from 9 to 19 feet below sea level.[24]

The water table beneath LaGuardia Airport is generally near the surface. Soil and ground water data developed for the CTB Redevelopment Program indicates that the depth to water ranges from 3.79 to 10.42 feet below the surface of the project site.[25] Groundwater is not withdrawn or otherwise used for any airport purposes. NYC drinking water is delivered from large upstate reservoirs—some more than 125 miles from the City. There are no public water supply wells or drinking water resources in the vicinity of the Airport. The nearest groundwater supply system is located in southwestern Queens, most of which has not operated in more than 10 years.

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[21] Article 15 pursuant to Chapter V – Resource Management Services, Subchapter D: Water Regulation, Part 608: Use and Protection of Waters (6 NYCRR § 608).

[22] Although the Brooklyn-Queens aquifer is not utilized as the sole source of drinking water for the area, the counties are the recharge zone for the aquifers underlying the southeastern portion of Queens County and the streamflow source zone for aquifers underlying parts of Nassau County. Since Nassau County is under sole source protection, the sole source aquifer designation extends to encompass the Boroughs of Brooklyn and Queens (EPA, Region 2 Water, Brooklyn-Queens Aquifer System Support Document, December 1983).

[23] For the purpose of this EA, the affected environment does not extend to the lower aquifer units (i.e., Jameco, Mogathy, Lloyd Aquifers) because groundwater below the water table would not be affected by the Proposed Action.

[24] Water-Table Altitude in Kings and Queens Counties, New York in March 1997. Fact Sheet FS 134-97 prepared by USGS.

[25] PANYNJ, *Interim Environmental Conditions Report, LaGuardia Airport, Central Terminal Replacement Project*, March 4, 2013.

Stormwater

Runways, taxiways, buildings, aprons, roadways, and parking lots, cover approximately 95 percent of the Airport property. These man-made impervious surfaces generate storm runoff, which is managed by the Airport's drainage system. The drainage system consists of nine drainage basins with two inflow and 17 outfall locations. All outfalls drain into Flushing Bay, Riker's Island Channel, or Bowery Bay. Runoff is collected in seven of the drainage basins and conveyed via underground pipes to outfall locations. No collection system is identified with the two smallest basins, where the northern end of each runway is supported by piers that extend into the Riker's Island Channel.

Water quality best management practices are in place to reduce or prevent pollution of surface and groundwater resources. In compliance with the requirements of the SPDES program, the *LaGuardia Airport Best Management Practices Plan* (BMPP, July 2009) is used by PANYNJ and its tenants and contractors to provide consistent and effective management of stormwater runoff quality.[26] The BMPP describes the drainage system, discusses airport activities and potential pollutant sources, identifies existing stormwater management controls and best management practices (BMPs), and addresses how BMPs are used to reduce or eliminate pollutants from entering the surrounding surface waters.

[26] www.panynj.gov/airports/pdf/LGA-BMPP-2011.pdf

5 Environmental Consequences

The environmental consequences of the proposed design changes have been reviewed to determine if the data and the analysis in the 2014 FONSI/ROD are still substantially valid and to determine whether there are any new significant circumstances or information requiring additional NEPA analysis. The 2014 FONSI/ROD was prepared in accordance with FAA Order 1050.1E, Environmental Impacts: Policies and Procedures. In July 2015, FAA issued Order 1050.1F. This technical report of environmental consequences maintained the organization from Order 1050.1E but considered the significance thresholds from the updated Order 1050.1F.

5.1 Environmental Categories Where No Changes Occur

The study area and the limits of disturbance are the same as in the 2014 FONSI/ROD and the types of construction and development are similar in type and character to those for the previously approved (2014) design. Based on this review, there is no change in environmental impacts associated with the proposed design changes for the following resource categories:

- *Coastal Resources*
- *Compatible Land Use*
- *Department of Transportation, Section 4(f)*
- *Farmlands*
- *Fish, Wildlife and Plants*
- *Hazardous Materials, Pollution Prevention and Solid Waste*
- *Historical, Architectural, Archaeological, and Cultural Resources*
- *Secondary (Induced) Impacts*
- *Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks*
- *Water Quality*
- *Wetlands*
- *Wild and Scenic Rivers*
- *Climate*

Coastal Resources – Although the layout of the terminal and airside facilities within a coastal zone would change as a result of the proposed design changes, the level of impact to coastal resources would not change. Consultation with New York City Department of City Planning and New York State Department of State is underway to demonstrate that the proposed design changes remain consistent with the approved state and local coastal zone management programs. Copies of correspondence with each agency are included in Attachment 10.

DOT, Section 4(f) and Historical, Architecture, Archaeological and Cultural Resources – The terminal design and apron/taxilane layout was not a point of discussion for the consulting parties when evaluating the adverse effects on the historic resources as part of the original CTB Redevelopment Program. The requirements in the Memorandum of Agreement that the consulting parties concurred with (see Appendix D of the 2014 EA) will still be met under the proposed design changes. There were no scenarios examined as part of the original alternatives analysis or the 4(f) analysis where adverse effects to historic resources did not occur. All scenarios examined required the demolition of Hangars 1, 2, and 4. Under the proposed design changes, the location of the West Garage will shift slightly and the headhouse design for the terminal has changed. The impacts of these changes on the viewshed are expected to be minimal and are discussed further in Section 5.2.4.2-Visual Impacts.

5.2 *Environmental Categories Where a Change in Impacts May Occur*

The resource categories where environmental consequences could potentially differ from those disclosed in the 2014 FONSI/ROD are addressed in the following sections.

5.2.1 *Traffic and Transportation*

Traffic impacts on local surface transportation facilities are typically addressed in the Socioeconomic Impacts section (see Section 5.15). However, because this is such an important technical area in this Technical report, it is presented first in a stand-alone section. This summary describes the assumptions, findings, and recommendations related to traffic on surface transportation facilities. For the detailed analysis of the previously approved design (2014) see ***Appendix A: Transportation of the 2014 EA****.*

This summary describes the assumptions, findings, and recommendations related to traffic on surface transportation facilities. For the detailed analysis for the proposed design changes see ***Attachment 4: Technical Memorandum – Updated Traffic Analysis for Construction Conditions.*** *The analysis focused on the changes in construction traffic as a result of the changes to the construction schedule, phasing, and worker shifts under the proposed design changes.*

The assessment required the development of an estimation of construction trip generation and assignments. The average daily number of construction workers and construction trucks were calculated for each calendar quarter during construction of the proposed design changes. Trucks were converted to passenger car equivalents (PCEs) and the total of workers and truck PCEs were used to identify the peak construction quarter as Q2 of 2017. In order to estimate peak hour construction-related vehicle trips, transportation planning factors such as personnel shifts and truck delivery schedule were established. For the proposed design changes, it is assumed that there would be three personnel shifts and trucks would arrive/depart the site throughout the entire day with slightly higher deliveries during the day time. Table 3 of Attachment 4 presents the estimated peak hour construction trip generation characteristics during the peak construction quarter. The construction trip distribution patterns for trucks assumes that staging and queuing areas would be at Ingraham's Mountain, Marina East Gate 14, and the NY Times Facility, with an average queue time of 20 to 30 minutes. Truck routes would be based on the NYCDOT "local" and "through" truck routes including Astoria Boulevard and 94th Street-Junction Boulevard. Construction trips generated during the peak construction conditions for each of the 21 analyzed intersections are presented in Table 5 of Attachment 4.

The operational analysis first established the existing conditions each of the 21 intersections. As 2014 traffic data are available for some of the intersections as part of the LGA 2014 Data Collection Program, the base year was revised from the 2014 FONSI/ROD, which assumed a base year of 2012. For locations without 2014 traffic data, the 2012 traffic volumes from the 2014 FONSI/ROD were utilized after applying a compound background growth rate of 1.0 percent. A capacity analysis of existing conditions was performed during the peak morning and afternoon hours at each intersection (v/c, delay and level of service; see Table 7 of Attachment 4).

A compounded total growth rate of 1.51 percent was applied to the existing traffic volumes to establish the Future Without Construction traffic volumes in 2017 (see Table 8 of Attachment 4). Volumes did not include construction traffic from the Runway Safety Area Enhancements project since construction is expected to be completed at the end of 2016.

Next, construction trips generated during the peak construction period were added to the 2017 Future Without Construction Condition to develop traffic volumes under the proposed design changes condition.

In accordance with CEQR Technical Manual criteria, the results of the Future Without Construction and proposed design changes conditions were compared in order to identify any critical changes in the projected traffic operations, as well as any transportation improvements that would be required to ensure acceptable traffic operations. Transportation improvements were recommended for 11 of the 21 analyzed intersections (see Table 9 of Attachment 4). Some of the improvements were adjusted or eliminated from the list of those proposed in the 2014 FONSI/ROD. A comparison of the weekday morning and afternoon peak hour intersection capacity analysis for the Future Without Construction and proposed design changes with the recommended improvements (see Table 10 of Attachment 4) shows that there would be no significant traffic impacts projected as a result of the construction of the proposed design changes.

5.2.1.1 As documented in the 2014 FONSI/ROD, a traffic monitoring program, in coordination with NYCDOT, will be implemented annually or at an agreed-upon frequency throughout the duration of the construction period.Transportation Planning Assumptions

As part of the CTB Redevelopment Program, a variety of improvements and modifications are planned to the vehicular access and internal traffic circulation within LaGuardia Airport. These include the reconfiguration of ramps to and from the Grand Central Parkway and significant modifications to the Airport's roadway system to improve internal traffic circulation and reduce queuing, double-parking, and congestion on Airport premises.

Future increases in Airport passenger traffic are expected to occur over time, regardless of the CTB Redevelopment Program, due to general demand for air travel into New York City. PANYNJ estimates that *without* the CTB Redevelopment Program projected passenger travel at LaGuardia Airport will increase from 23.6 million annual passengers (MAP) in 2010 to 30.1 MAP—an increase of 6.5 MAP—by 2030.

The CTB Redevelopment Program is projected to result in an additional increase in Airport passenger traffic beyond the 30.1 MAP. PANYNJ estimates that the CTB Redevelopment Program would accommodate an increase in passenger travel at LaGuardia Airport from 30.1 MAP to 34.0 MAP—a change of 3.9 MAP—by 2030. The CTB Redevelopment Program is not projected to result in any net increase in airport employment. Although some increase in employees is expected to result from enhanced facilities (e.g., increased concession space) at the new terminal, this increase is expected to be offset by new technologies and associated operational efficiencies that reduce existing labor requirements.

Throughout the preparation of the 2014 EA, the project team coordinated closely with representatives from both the New York State Department of Transportation (NYSDOT; see **Appendix G of the 2014 EA** for letter from the Region 11 Director dated April 4, 2014) and the New York City Department of Transportation (NYCDOT; see Section A.8 of **Appendix A of the 2014 EA**) to ensure that the analyses conducted met the technical and procedural expectations of both agencies. The analyses were also conducted in accordance with the guidance in the *New York City Environmental Quality Review (CEQR) Technical Manual*.

The baseline year for the traffic analysis is ~~2012~~. As such, the existing conditions analyses were based on data collected in the field in ~~2012~~. This data includes peak hour and daily (24-hour) traffic volumes, roadway and intersection lane configurations and geometric parameters, traffic control devices, traffic signal timing parameters, and other data. In selected instances where no 2012 data were available, supplemental traffic volume data were provided by the PANYNJ for the year 2010 and were increased by the appropriate growth factors in the *CEQR Technical Manual* to estimate year 2012 traffic volumes.

Change: The baseline year for the traffic analysis conducted for the proposed design changes is 2014. As such, the existing conditions analyses were based on data collected in the field as part of the LGA 2014 Data Collection Program. For locations without 2014 traffic data, the 2012 traffic volumes from the 2014 FONSI/ROD were utilized and a compound background growth rate of 1.0 percent (0.5 percent per year) was applied to establish the 2014 baseline conditions. It was important to update the baseline with 2014 data because conditions have changed in and around the airport since 2012, with higher levels of passenger traffic and vehicular traffic. Due to the change in project schedule, it was considered prudent to include the best available data as related to traffic impacts, given the change in activity between 2012 and 2014.

The proposed CTB Redevelopment Program is expected to be completed and fully operational by the end of 2021. However, the future analysis year for full operation of the new terminal is 2030, because it is projected to take approximately nine years following the opening of the terminal to fully realize all of the associated forecast passenger growth. The future analysis period for construction conditions was the ~~fourth quarter of 2015~~, the period of anticipated peak construction traffic activity.

Change: The construction phasing plan for the proposed design changes keeps the completion date of the CTB at the end of 2021; therefore the future analysis year for full operation of the new terminal remains 2030. The future analysis period for construction conditions was the second quarter of 2017, the revised period of anticipated peak construction traffic activity. It is also important to note that while the construction schedule of the whole program has decreased by seven months from start to finish, the start date for the program is later than originally contemplated in the 2014 EA. Therefore, the substantive completion date of late 2021 remains similar to the completion date in the 2014 EA. Demobilization activities continue into early 2022.

A comprehensive and detailed discussion of the range of transportation analyses conducted as part of the 2014 EA is provided in **Appendix A: Transportation of the 2014 EA**. In short, the primary quantitative analyses include the following:

- **Construction conditions** – The construction conditions analyses examined the operational effects of traffic associated with construction-related vehicles traveling to and from the Airport during the peak period of construction (i.e., the ~~fourth quarter of 2015~~) at key intersections in the vicinity of the Airport. Construction-related vehicles include both construction personnel traveling to and from the designated contractor parking site via passenger vehicles and shuttle buses, as well as trucks hauling material and equipment to and from the project site via established New York City truck routes. The construction conditions analyses examined traffic conditions during the weekday morning and afternoon peak hours of construction. Based on the anticipated construction shift times, the peak hours for worker-generated vehicle trips (6:00 to 7:00 AM and 3:00 to 4:00 PM) would not overlap with the weekday morning and afternoon peak hours for traffic on the local street network (i.e., 7:30 to 8:30 AM and 4:00 to 5:00 PM), and would overlap by 15 minutes with the weekday morning peak hour of the Airport (i.e., 6:45 to 7:45 AM). The construction analyses include ~~year 2012~~ existing conditions, year ~~2015 No-Action Conditions~~, and year ~~2015 Proposed Action Conditions~~.

  Change: The peak period of construction would be the second quarter of 2017 with the proposed design changes. The construction analyses include year 2014 existing conditions, year 2017 No-Action Conditions, and year 2017 Proposed Action Conditions.

- **Operation conditions** – The operation conditions analyses examined the operational effects of additional traffic generated by the normal operation of LaGuardia Airport in the year 2030, when passenger forecasts associated with the CTB Redevelopment Program are expected to be fully realized. Traffic conditions on both surface streets and on the Grand Central Parkway are analyzed for the weekday morning and afternoon peak hours. The analyses include year 2012 existing conditions, year 2030 No-Action Conditions (*without* the CTB Redevelopment Program) and year 2030 Proposed Action Conditions (*with* the CTB Redevelopment Program).

5.2.1.2 Proposed Action- CTB Redevelopment Program

5.2.1.2.1 Construction

Redevelopment of the CTB is assumed to take place over an eight-year period, ~~beginning in 2014 and~~ continuing through 2021. Construction traffic associated with the CTB Redevelopment Program would consist of passenger vehicles generated by construction personnel (including laborers, managers, and administrative staff), as well as construction trucks associated with the movement of materials and equipment traveling directly to the CTB construction site via established New York City truck routes.

Change: Redevelopment of the CTB would take place over a period of under six years (68 months), beginning in the second quarter of 2016 and continuing through the end of 2021 (followed by 4 months of demobilization activities).

It is anticipated that daily parking for construction personnel would be accommodated at the Ingraham's Mountain site, a PANYNJ-owned parcel located in the northeast quadrant of the 19th Avenue/45th Street intersection. A portion of the top of Ingraham's Mountain site will be cleared as part of the Runway Safety Area (RSA) Enhancements project, a separate project preceding the redevelopment of the CTB. In order to minimize construction traffic on City streets, all construction personnel parking at Ingraham's Mountain would be transported by a private shuttle bus operator to and from work at the construction site. The shuttle buses would utilize off-Airport roadways (e.g., 45th Street and 19th Avenue), as well as on-Airport roadways (e.g., Bowery Bay Boulevard, Marine Terminal Road, and Runway Drive/LaGuardia Road), to travel between Ingraham's Mountain and the construction site (see **Figure 5-1**).

Change: In addition to the Ingraham's Mountain site, Marina East Gate 14 and the NY Times Facility, located east of the CTB, would be used for truck staging and queuing. Figure 5-1 has been updated to reflect the additional staging sites (see Figure 5-1b).

For each month of the construction schedule, the total number of daily construction personnel and daily construction trucks were forecast using industry standards for the building sizes, material quantities, man-power rates, and other factors. These calculated numbers of workers and trucks were then aggregated to estimate the average daily number of construction workers and trucks projected to travel to the site in each calendar quarter. The proposed construction schedule assumes construction-related vehicle trips would peak in the fourth quarter of 2015. During this quarter, an average of approximately ~~704 construction personnel vehicles, approximately 40 shuttle buses, and approximately 128 trucks~~ would travel to and from the Ingraham's Mountain and construction sites, respectively, on a daily basis. For construction personnel, travel by means other than single-occupant vehicle will be encouraged and supported by the PANYNJ through specific contract arrangements with contractors. LaGuardia Airport is served by the M60, Q47, Q48, Q72, and the new Q70 express service bus lines which also provide connections to subway stations in Manhattan and Queens and can accommodate travel for construction personnel.

Change: The revised construction schedule assumes construction-related vehicle trips would peak in the second quarter of 2017. During this quarter, an average of approximately 817 construction personnel vehicles, approximately 20 shuttle buses, and approximately 192 trucks would travel to and from the Ingraham's Mountain, Marina East Gate 14, NY Times Facility and construction sites on a daily basis.

Transportation planning factors presented in Table A.7-2 of the 2014 EA were used to estimate peak hour construction related vehicle trips with the exception of shifts of construction personnel and hourly construction truck trip distribution. Same as the 2014 EA, an average auto occupancy rate of 1.50 and an auto mode share of 75 percent were assumed for construction personnel. The same passenger car equivalent (PCE) assumptions of 1.0 PCE per auto, 1.5 PCEs per shuttle bus, and 2.0 PCES per truck were also used for the Revised Design.

All construction activities are expected to take place during ~~two~~ construction shifts. ~~The first shift would occur from approximately 7:00 AM to approximately 3:00 PM and comprise approximately 90 percent of the total construction personnel workforce. The second shift would occur from approximately 3:00 PM to approximately 11:00 PM and comprise approximately 10 percent of the total construction personnel workforce.~~ Given these construction hours, worker trips would largely be concentrated during off-peak hours and would not represent a substantial increment during peak travel periods in the vicinity of the Airport.

Change: For a 5.5 month period centered around the peak quarter (second quarter of 2017), all construction activities are expected to take place during three construction shifts. The first shift would occur from approximately 6:00 AM to approximately 2:00 PM and comprise approximately 40 percent of the total construction personnel workforce. The second shift would occur from approximately 7:00 AM to approximately 3:00 PM and comprise approximately 40 percent of the total construction personnel workforce. The third shift would occur from approximately 10:00 PM to approximately 6:00 AM and comprise approximately 20 percent of the total construction personnel workforce.

The PANYNJ will coordinate with contractors to establish a daily schedule of goods deliveries that ensures on-time deliveries by minimizing truck travel during peak traffic periods, which can result in delays in transporting materials to and from the site. Construction truck trips to and from the site would generally be made between the hours of 4:00 AM and 10:00 PM. Truck arrivals are expected to be generally uniform throughout this time period with slightly higher numbers of trips during the late morning and midday hours (8:00 AM to 1:00 PM) when on-site work activities are expected to peak. Some truck deliveries would also be made early in the morning, during off-peak times, to ensure that materials are on-site prior to the start of the first shift. Trucks would typically remain on-site for relatively short durations (one hour or less). All trucks would be required to use NYCDOT-established truck routes (see **Figure 5-1**).

Change: Truck arrivals and departures are expected to be throughout the 24-hour day with slightly higher numbers from 4:00AM to 5:00PM. An average of ten inbound and ten outbound truck trips per hour would occur from 4:00AM to 5:00PM in the peak quarter, and an average of six inbound and six outbound truck trips would occur between 5:00PM and 4:00AM during this period. Outside of the 5.5 months where airside demolition work will occur from 10:00PM-6:00AM, there will be much less overnight traffic due to the removal of the overnight construction shift.

The construction traffic analysis examined the potential operational effects of additional construction-related vehicle trips generated at key intersections in the vicinity of the Airport during the peak calendar quarter of the entire construction duration (i.e., the fourth quarter of 2015). **Figure 5-1** illustrates the study intersections analyzed for construction conditions. All traffic impact analyses were conducted in accordance with the guidance published in the *CEQR Technical Manual*, including the determination of potential significant traffic impacts for each intersection.

Change: The peak quarter of the entire construction duration would be the second quarter of 2017.

The following is a list of the recommended transportation improvements for construction conditions. Because the peak construction period is a temporary condition, these improvements are recommended as temporary measures to reduce delays at these intersections and ensure the most efficient traffic signal operations during periods of peak construction activity. The signal timing adjustments noted below are subject to review and approval by the NYCDOT. The locations are highlighted in **Figure 5-1** *(Figure 5-1b reflects the recommended improvements for the proposed design changes)*.

- **Northern Boulevard/Junction Boulevard** – During the weekday morning peak hour, reallocate one (1) second of green time from the east-west phase to the north-south phase. During the weekday afternoon peak hour, reallocate two (2) seconds of green time from the east-west phase to the north-south phase.

  Change: Mitigation no longer needed.

- **Astoria Boulevard North Service Road/79th Street/23rd Avenue** – During the weekday morning peak hour, reallocate five (5) seconds of green time from the northwest-bound phase (i.e., Astoria Boulevard North Service Road) to the northeast-bound phase (i.e., 23rd Avenue).

  Change: Additional six (6) seconds of green time adjustment.

- **Astoria Boulevard/Astoria Boulevard North Service Road** – During the weekday afternoon peak hour, reallocate seven (7) seconds of green time from the northwest-bound phase to the westbound phase. *No change*

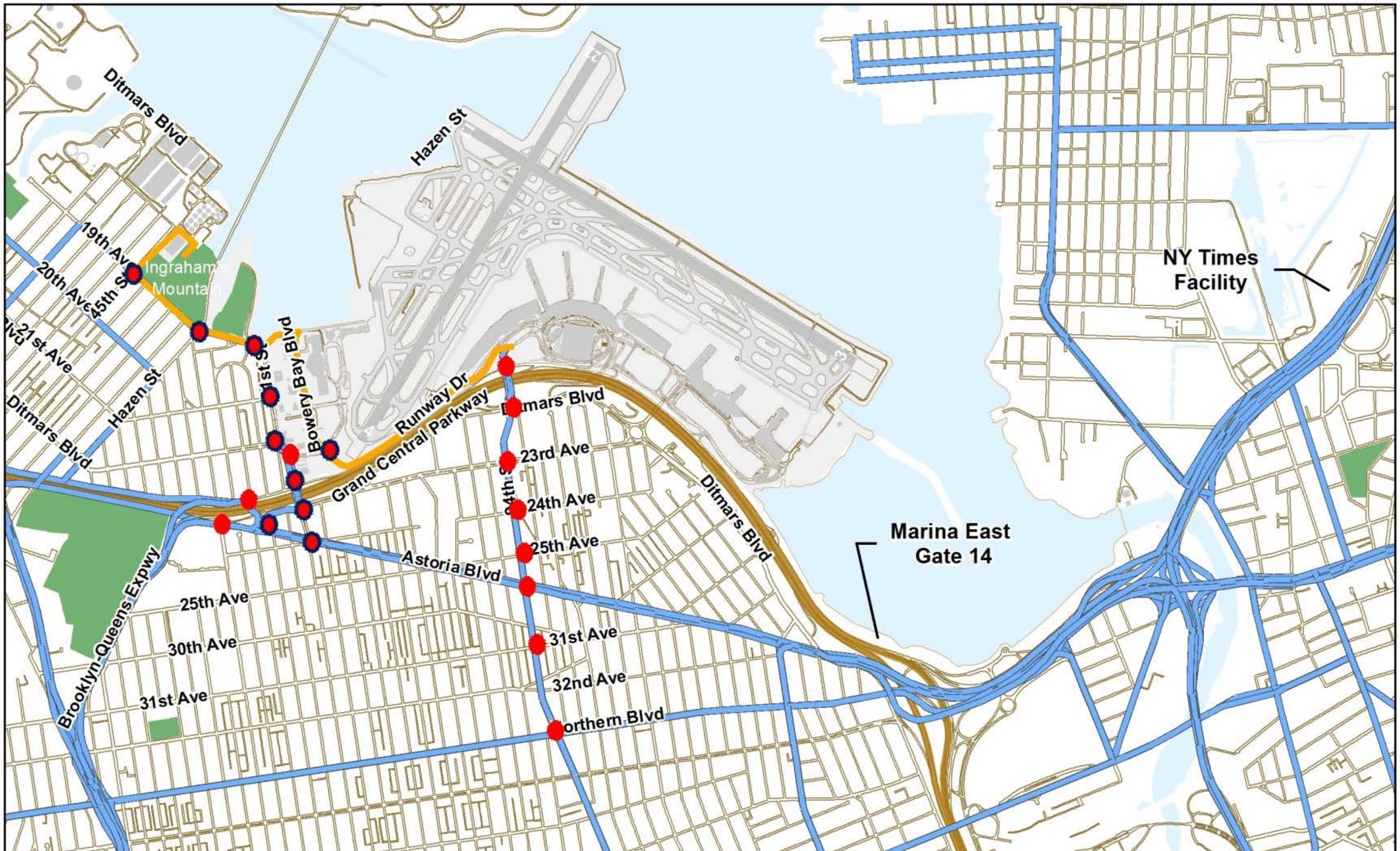

Figure 5-1b
Construction Conditions Study Intersections and Traffic Improvements

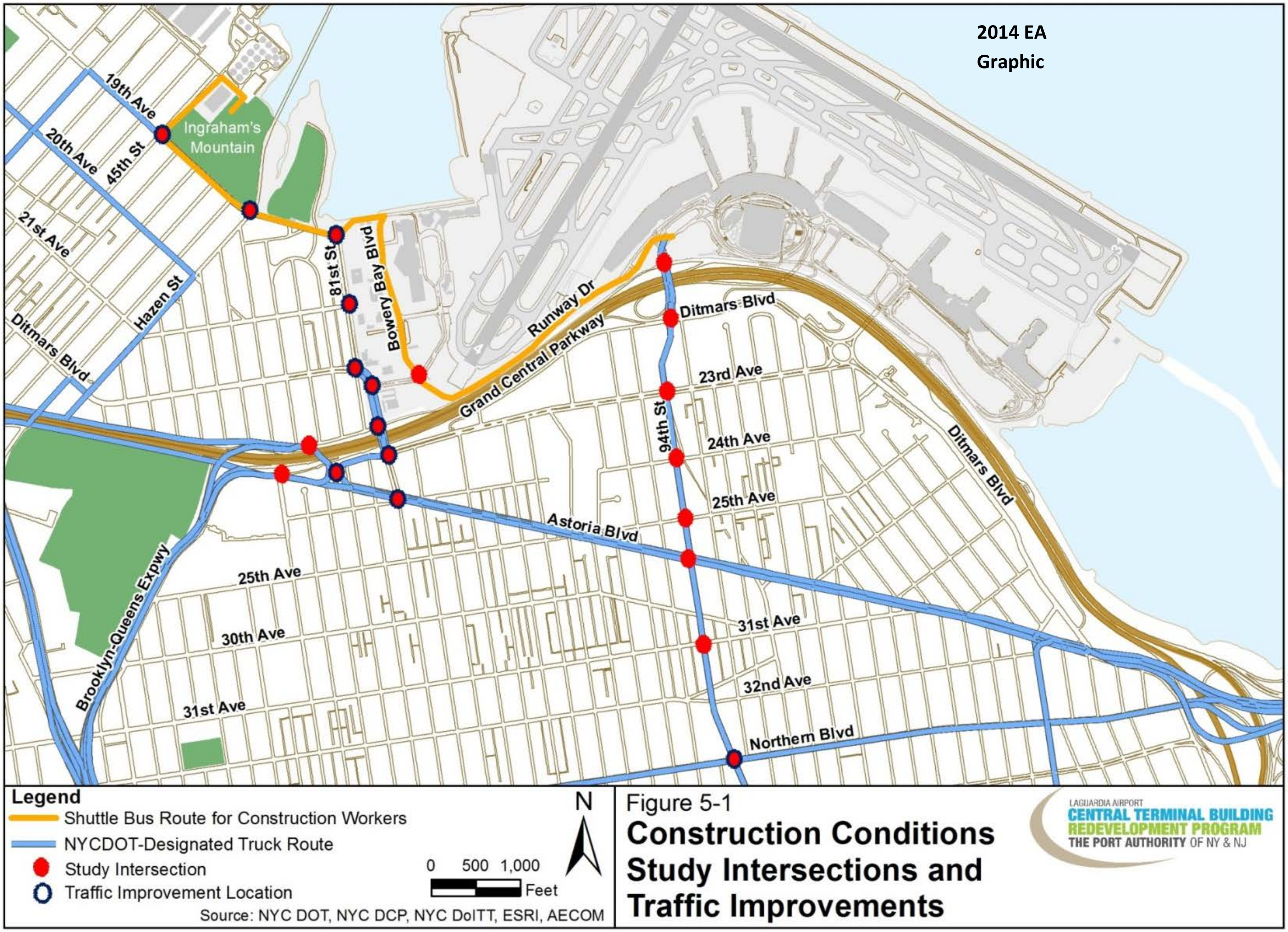

Figure 5-1
Construction Conditions Study Intersections and Traffic Improvements

- **Astoria Boulevard North/Grand Central Parkway westbound off-ramp/82nd Street/Ditmars Boulevard** – Restripe the westbound approach to create two exclusive right-turn lanes and one shared through/left-turn lane, and install corresponding advance lane use signs. During the weekday afternoon peak hour, reallocate four (4) seconds of green time from the westbound phase to the north-south phase.

  Change: No geometry changes needed. During the weekday morning peak hour, reallocate four (4) seconds of green time from the north-south phase to the westbound phase. During the weekday afternoon peak hour, reallocate three (3) seconds of green time from the westbound phase to the north-south phase.

- **23rd Avenue/82nd Street** – During the weekday morning peak hour, reallocate nine (9) seconds of green time from the north-south phase, plus one (1) second from the southbound phase, to the east-west phase (i.e., a total of 10 seconds).

  Change: None

- **Astoria Boulevard/82nd Street/24th Avenue** – During the weekday afternoon peak hour, reallocate one (1) second of green time from the east-west phase to the southbound phase.

  Change: None

- **Ditmars Boulevard/Marine Terminal Drive** – During the weekday morning peak hour, reallocate one (1) second of green time from the westbound phase to the north-south phase.

  Change: Mitigation no longer needed.

- **Ditmars Boulevard/81st Street** – Restripe the westbound approach to accommodate two exclusive right-turn lanes and one shared through/left-turn lane and install corresponding advance lane use signs. During the weekday afternoon peak hour, reallocate eight (8) seconds of green time from the east-west phase to the southbound phase.

  Change: None

- **21st Avenue/81st Street** – During the weekday morning peak hour, reallocate eight (8) seconds of green time from the eastbound phase to the north-south phase.

  Change: None

- **19th Avenue/Hazen Street** – Install a new traffic signal controller in accordance with NYCDOT design guidance. Eliminate the “48 Hour Parking, Detached Trailers” parking regulation on the north side of 19th Avenue for a distance of approximately 200 feet west of Hazen Street, and restripe a 14-foot exclusive right-turn lane and a 12-foot shared through/left-turn lane on the eastbound approach.[27] During the weekday morning peak hour, reallocate four (4) seconds of green time from the southbound leading phase to the east-west phase. During the weekday afternoon peak hour, reallocate seven (7) seconds of green time from the southbound leading phase and five (5) seconds from the north-south phase to the east-west phase.

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[27] This regulation change would eliminate curbside parking spaces for approximately four detached trailers. Field observations of existing trailer parking utilization along this curbside revealed approximately one to two trailers present on weekdays. The north curb along 19th Avenue between Hazen Street and 45th Street is largely under-utilized for trailer parking, and sufficient curbside space exists to accommodate the displaced trailers.

Change: None

- **19th Avenue/45th Street** – Install a traffic signal at the intersection, remove the "48 Hour Parking, Detached Trailers" parking regulation on the east side of 45th Street, and extend the "No Standing Anytime" parking regulation on both sides of 45th Street for approximately 275 feet north of 19th Avenue, to accommodate two lanes on the southbound approach, as well as one northbound receiving lane. In addition, prohibit standing with a "No Standing Anytime" parking regulation on the west side of 45th Street for approximately 80 feet south of 19th Avenue, to allow for transition to the southbound through lane on 45th Street and on the south side of 19th Avenue for approximately 25 feet east of 45th Street, to accommodate the turning paths for shuttle buses turning from 45th Street southbound to 19th Avenue eastbound.[28,29]

  Change: Reallocate 10 seconds green time from Eastbound/Westbound to Northbound/Southbound compared to above.

- **Construction-only access driveway at 19th Avenue/81st Street[30]** – Continue to coordinate with NYCDOT staff concerning the proposed driveway (curb cut) that is currently being designed as part of the RSA Enhancements project. The improvements proposed at this intersection include:
  - Modify the channelization striping along 19th Avenue, west of the proposed driveway, to accommodate an exclusive left-turn lane in the eastbound direction.
  - Prohibit southbound "left-turn out" movements from the driveway onto 81st Street southbound via striping and posted "No Left Turn" signs.
  - Restrict entry into the driveway to authorized construction traffic only via posted "Authorized Vehicles Only: No Public Access" signs, or similar signs as approved by NYCDOT.
  - Institute the use of a construction flagger to accommodate turning movements by construction vehicles during all times that the gate is open.[31] When not in use for construction purposes, the driveway would be gated and the eastbound left-turn movement prohibited using construction barrels or a related device as approved by NYCDOT.

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[28] Weekday field observations revealed no (zero) vehicles parked in any of the three locations requiring parking prohibitions. This intersection is located in a low-density industrial area with little on-street parking demand. On-street parking spaces are widely available elsewhere along 45th Street and 19th Avenue, as well as on other City streets in the vicinity.

[29] Traffic signal warrants from the *Manual on Uniform Traffic Control Devices* (MUTCD) were analyzed at a planning-level at this intersection. This analysis indicated that Warrant #3 (Peak Hour Warrant) would be met based on the high volume of projected future traffic on the southbound approach (i.e., 45th Street) during the weekday afternoon construction peak hour and the corresponding high delays that would otherwise be incurred by vehicles under its current stop-controlled configuration.

[30] It should be noted that this driveway will provide for ingress and egress to and from the Airport for construction-related traffic only. It will not provide access to the Airport for the general public.

[31] This intersection was analyzed as a traffic signal-controlled location for capacity analysis purposes, to approximate the operations of a flagger during peak periods.

Change: ***Marine Terminal Road/Bowery Bay Boulevard*** *– During the weekday morning peak hour, reallocate four (4) seconds of green time from the westbound phase to the northbound/southbound phase.*

With these improvements in place, subject to review and approval by NYCDOT, no significant traffic impacts are projected to occur in accordance with the *CEQR Technical Manual* criteria. In addition, PANYNJ would implement a traffic monitoring program in coordination with NYCDOT throughout the duration of the construction period. This monitoring program would quantify the volume of construction workers' vehicles parked at the Ingraham's Mountain site and the need for and timing of implementation of the identified improvements. These monitoring efforts should be conducted annually, or at an agreed-upon frequency to be determined as part of on-going coordination efforts between PANYNJ and NYCDOT during the construction period.

Of the 21 study intersections, the overall level-of-service (LOS) under the Previously approved (2014) design conditions would remain the same or improve upon the Future No-Action Condition for 15 intersections. There would be a minor, temporary decrease in LOS at the following six intersections:

- **Astoria Boulevard/94th Street** – During the weekday morning peak hour, the overall average delay is projected to increase by 1.7 seconds/vehicle, from 34.7 seconds/vehicle (LOS "C") under Future No-Action Conditions to 36.4 seconds/vehicle (LOS "D") under Previously approved (2014) design conditions. The LOS "C"/"D" threshold for signalized intersections is 35.0 seconds/vehicle.
- **Ditmars Boulevard/Marine Terminal Road** – During the weekday afternoon peak hour, the overall average delay is projected to increase by 4.2 seconds/vehicle, from 17.9 seconds/vehicle (LOS "B") under Future No-Action Conditions to 22.1 seconds/vehicle (LOS "C") under Previously approved (2014) design conditions. The LOS "B"/"C" threshold for signalized intersections is 20.0 seconds/vehicle.
- **21st Avenue/81st Street** – During the weekday morning peak hour, the overall average delay is projected to increase by 18.2 seconds/vehicle, from 22.1 seconds/vehicle (LOS "C") under Future No-Action Conditions to 40.3 seconds/vehicle (LOS "D") under Previously approved (2014) design conditions. The LOS "C"/"D" threshold for signalized intersections is 35.0 seconds/vehicle.
- **19th Avenue/Hazen Street** – During the weekday afternoon peak hour, the overall average delay is projected to increase by 17.7 seconds/vehicle, from 34.4 seconds/vehicle (LOS "C") under Future No-Action Conditions to 52.1 seconds/vehicle (LOS "D") under Previously approved (2014) design conditions. The LOS "C"/"D" threshold for signalized intersections is 35.0 seconds/vehicle.
- **Construction-only access driveway at 19th Avenue/81st Street** – During the weekday morning peak hour, the average delay for westbound movements (81st Street to 19th Avenue) is projected to increase by 34.6 seconds/vehicle, from 5.2 seconds/vehicle (LOS "A") under Future No-Action Conditions to 39.8 seconds/vehicle (LOS "D") under Previously approved (2014) design conditions.
- **19th Avenue/45th Street** – During the weekday morning peak hour, the average delay for westbound movements is projected to increase by 35.7 seconds/vehicle, from 7.5 seconds/vehicle (LOS "A") under Future No-Action Conditions to 43.2 seconds/vehicle (LOS "D") under Previously approved (2014) design conditions. During the weekday afternoon peak hour:

- o The average delay for eastbound movements is projected to increase by 33.5 seconds/vehicle, from 8.2 seconds/vehicle (LOS “A”) under Future No-Action Conditions to 41.7 seconds/vehicle (LOS “D”) under Previously approved (2014) design conditions.
- o The average delay for westbound movements is projected to increase by 35.4 seconds/vehicle, from 8.2 seconds/vehicle (LOS “A”) under Future No-Action Conditions to 43.6 seconds/vehicle (LOS “D”) under Previously approved (2014) design conditions.
- o The average delay for southbound left-turn movements is projected to increase by 19.0 seconds/vehicle, from 24.5 seconds/vehicle (LOS “C”) under Future No-Action Conditions to 43.5 seconds/vehicle (LOS “D”) under Previously approved (2014) design conditions.

Change: The overall LOS under the peak construction period under the proposed design changes would remain the same or improve for all 21 study intersections. When compared with the 2014 FONSI/ROD, the LOS under the proposed design changes would remain the same or improve for 18 intersections. During the peak construction period, there would be a minor, temporary decrease in LOS at the following three intersections:

- ***Astoria Boulevard North Service Road/79th Street/23rd Avenue-*** *During the weekday morning peak hour, the overall average delay is projected to increase by 5.2 seconds/vehicle, from 19.5 seconds/vehicle (LOS “B”) under the proposed design changes in the 2014 EA to 24.7 seconds/vehicle (LOS “C”) under the proposed design changes. During the weekday afternoon peak hour, the overall average delay is projected to increase by 11.4 seconds/vehicle, from 14.9 seconds/vehicle (LOS “B”) under the Proposed design changes in the 2014 EA to 26.3 seconds/vehicle (LOS “C”) under the proposed design changes. The LOS “B”/”C” threshold for signalized intersections is 20.0 seconds/vehicle.*
- ***Astoria Boulevard North/Grand Central Parkway Westbound Off-Ramp/82nd Street/Ditmars Boulevard*** *– During the weekday morning peak hour, the overall average delay is projected to increase by 14.0 seconds/vehicle, from 28.4 seconds/vehicle (LOS “C”) under the proposed design changes in the 2014 EA to 42.4 seconds/vehicle (LOS “D”) under the proposed design changes. The LOS “C”/”D” threshold is 35.0 seconds/vehicle.*
- ***Bowery Bay Boulevard/Runway Drive//Marine Terminal Road*** *– During the weekday morning peak hour, the overall average delay is projected to increase by 7.8 seconds/vehicle, from 34.4 seconds/vehicle (LOS “C”) under the proposed design changes in the 2014 EA to 42.2 seconds/vehicle (LOS “D”) under the proposed design changes. The LOS “C”/”D” threshold is 35.0 seconds/vehicle.*

Incorporating the minor changes to the recommended transportation improvements that were described above, the LOS at these intersections would remain at LOS D or above, which is considered an acceptable level of congestion. *No significant traffic impacts are projected to occur in accordance with the CEQR Technical Manual criteria.*

5.2.1.2.2 Operations

The analysis of future traffic operations included conditions on local surface streets surrounding the Airport, as well as on the Grand Central Parkway. In addition, a brief evaluation of impacts to parking, transit, pedestrians and safety was performed.

Since there would be no significant changes to the roadway layout or trip generation as a result of the proposed design changes, no additional analysis is required for the operational traffic conditions.

Surface Street Intersections

The analysis of surface street intersections for both construction and operations conditions was performed in consultation with NYCDOT staff (see correspondence in **Section A.8** of **Appendix A: Transportation of the 2014 EA**). This analysis includes year 2012 existing conditions, year 2030 Future No-Action Conditions (*without* the CTB Redevelopment Program) and year 2030 Proposed Action Conditions (*with* the CTB Redevelopment Program) at the intersections shown in **Figure 5-2**.

Existing Conditions

The year 2012 existing conditions analysis forms the basis for all future conditions analyses and was based on observed traffic counts conducted in the field at key intersections in the vicinity of the Airport that are expected to be most affected by additional traffic generated by the CTB Redevelopment Program. The weekday morning and afternoon peak hours for traffic on the roadway network in the study area were determined to be 7:30 to 8:30 AM and 4:00 to 5:00 PM, respectively.[32]

Future No-Action Conditions

The Future No-Action Condition includes anticipated future increases in traffic volumes unrelated to the CTB Redevelopment Program, including regional background traffic growth, projected growth associated with the 6.5 MAP at LaGuardia Airport by 2030 (unrelated to the CTB Redevelopment Program), and traffic volumes associated with the proposed Willets Point Development District.[33]

In addition, the Future No-Action and Proposed Action traffic analyses include:

- A series of improvements undertaken by NYSDOT involving: a) reconfiguration of the eastbound ramps to and from the Grand Central Parkway in the vicinity of the 94th Street interchange, b) signalization of the Ditmars Boulevard/Grand Central Parkway eastbound on-ramp intersection,

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[32] These peak hours are for street traffic outside LaGuardia Airport and partially overlap with the identified peak hours for traffic within the Airport (i.e., 6:45 to 7:45 am and 4:45 to 5:45 pm). The 7:30 to 8:30 am and 4:00 to 5:00 pm peak hours represent reasonable worst-case conditions for the off-Airport street system during weekday morning and evening periods.

[33] *The Willets Point Development District is a redevelopment effort led by the City of New York that will transform a 23-acre site adjacent to CitiField, currently occupied by auto parts shops, into a mixed used retail, entertainment and housing complex. A school, hotel and open space are also contemplated. The project completed a NEPA Environmental Impact Statement (EIS) in August 2013. However, the project has been enjoined by the Supreme Court, Appellate Division First Department. A full accounting is below:*
On February 10, 2014, State Senator Tony Avella, among other petitioners, sought declaratory and injunctive relief from the City Council's approval of Queens' Development Group's planned 10-story, 200 room hotel, and 30,000 square foot mall complex on Willets Point West, the former location of Shea Stadium. This site was once the north end of Flushing Meadow Park until the state legislation approved the stadium's construction in 1961. While the site had been used as parking for Shea Stadium it was still classified as parkland. Avella sought a declaration that the City in approving the development violated the public trust doctrine. The Supreme Court in Manhattan found that the development fell within the state legislation authorizing Shea Stadium and use of the parkland. Petitioners filed an appeal with the First Department.

On July 2, 2015, the Supreme Court, Appellate Division First Department issued a decision and order overturning the lower court's decision and enjoined progress of the development. Justice Mazzarelli, writing for the panel, found the enumerated purposes in the state legislation permitted use of the parkland for Shea stadium including improvement of trade and commerce were intended to be considered in conjunction with operating a stadium and did not include the proposed development.

c) modification of the lane configurations on the eastbound, westbound, and southbound approaches to the Ditmars Boulevard/94th Street intersection, and d) widening of the 82nd Street westbound off-ramp from the Grand Central Parkway from two to three lanes at its approach to 82nd Street-Ditmars Boulevard. As of August 2014, these improvements have been completed. Improvements anticipated to be made to the Bowery Bay Boulevard/Runway Drive/Marine Terminal Road intersection as part of the RSA Enhancements project at LaGuardia Airport to be implemented prior to the peak time period for construction (i.e., the fourth quarter of 2015).[34]

Traffic Conditions under the CTB Redevelopment Program

The CTB Redevelopment Program Condition traffic analysis includes the projected future annual passenger increase of 3.9 MAP associated with the proposed CTB Redevelopment Program. The CTB Redevelopment Program is projected to generate approximately 322 additional vehicle trips (160 inbound trips and 162 outbound trips) during the weekday morning peak hour and approximately 383 additional vehicle trips (190 inbound trips and 193 outbound trips) during the weekday afternoon peak hour.

To reduce intersection delays and ensure the most efficient traffic signal operations under the CTB Redevelopment Program, minor reallocations of the green time displays allocated to particular phases at traffic signals in the area may be required at the following intersections, illustrated in **Figure 5-2**:[35]

- Bowery Bay Boulevard/Runway Drive/Marine Terminal Road
- Ditmars Boulevard/Marine Terminal Road
- Astoria Boulevard North-Grand Central Parkway westbound off-ramp/82nd Street-Ditmars Boulevard
- Astoria Boulevard/82nd Street-24th Avenue

In addition, at the Astoria Boulevard/82nd Street-24th Avenue intersection, the following geometric improvements would be required:

- Restriping of the northbound (24th Avenue) approach to accommodate one 12-foot exclusive left-turn lane and one 12-foot shared through/right-turn lane.
- Changing the “No Parking Anytime” parking regulation to a “No Standing Anytime” parking regulation on the north side of 24th Avenue.
- Implementing a “No Standing Anytime” regulation for 100 feet (i.e., approximately four passenger car lengths) on the south side of 24th Avenue, south of Astoria Boulevard.[36]
- Implementing a “No Standing Anytime” parking regulation on the east side of 82nd Street for approximately 50 feet south of Astoria Boulevard.[37]

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[34] See Section 5.11 (starting page 5-45) and Appendix D of the *LaGuardia Airport Runway Safety Area Enhancements Final Environmental Assessment* dated December 2013 (FONSI signed by FAA on 12/31/2013).

[35] All traffic impact analyses were conducted in accordance with the guidance published in the *CEQR Technical Manual*, including the determination of potential significant traffic impacts for each intersection.

[36] Field observations of parking utilization levels in the vicinity of this intersection indicate sufficient available parking on the local streets south of Astoria Boulevard to accommodate up to four displaced passenger cars.

[37] This section of the street largely overlaps with an existing driveway serving a gas station (i.e., no on-street parking is allowed) so there is effectively no change in parking capacity or utilization as a result of this regulation change.

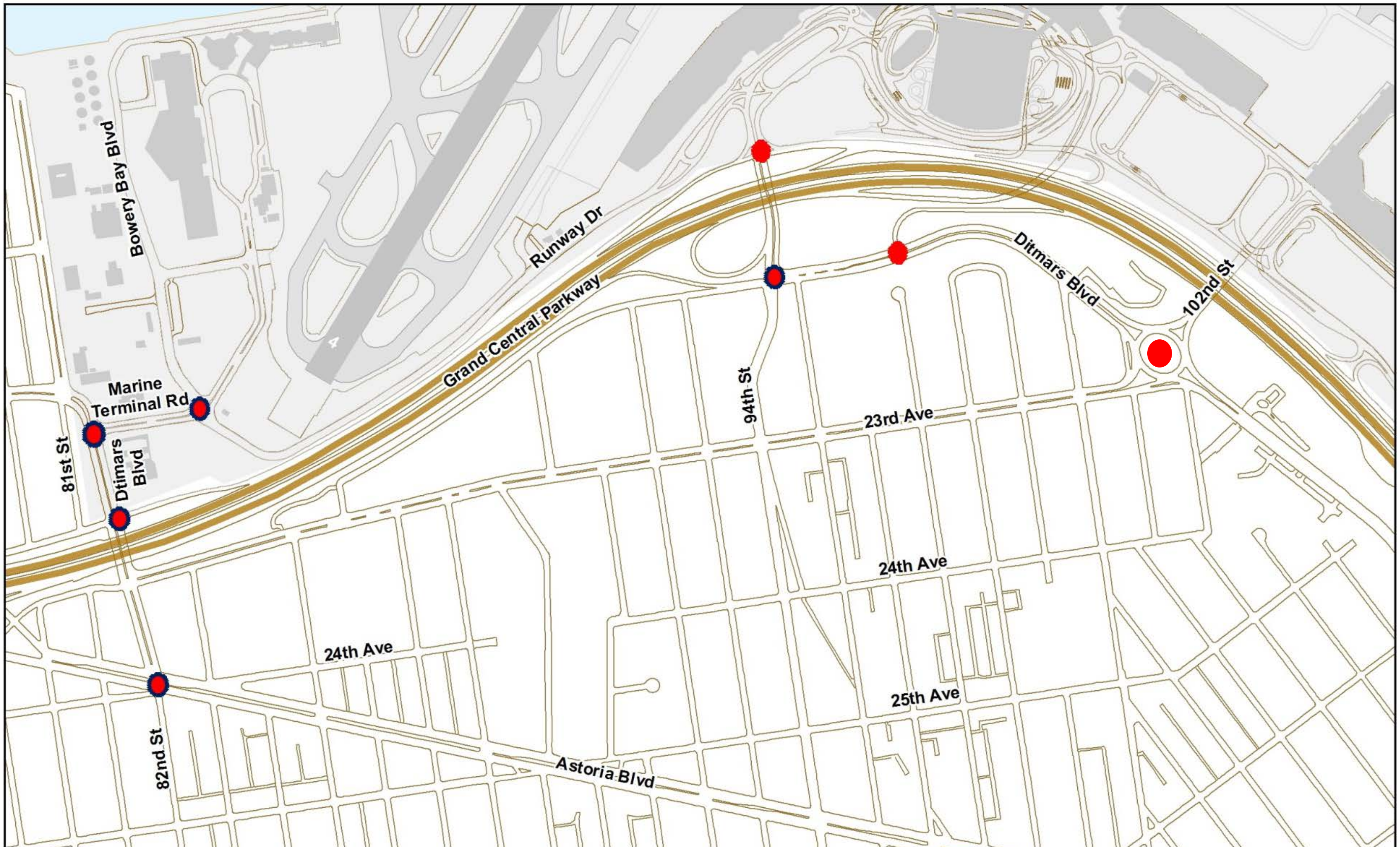


Figure 5-2
Operations Conditions Study Intersections and Traffic Improvements

LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REDEVELOPMENT PROGRAM
THE PORT AUTHORITY OF NY & NJ

With these improvements in place, no significant traffic impacts are projected to occur in accordance with the *CEQR Technical Manual* criteria. Furthermore, the overall intersection levels-of-service that are projected under the Future No-Action Condition are projected to remain the same—or improve—under the CTB Redevelopment Program.

The improvements noted above are subject to review and approval by the NYCDOT. Following the opening of the new terminal in 2021, PANYNJ would continue the traffic monitoring program initiated during construction, in coordination with NYCDOT. This monitoring program would involve the collection and evaluation of traffic data at locations where improvements were recommended to determine the need for and timing of implementation of the identified improvements. In addition, the westbound Grand Central Parkway between the 94th Street entrance ramp and the 82nd Street exit ramp would be included among the locations to be monitored. These monitoring efforts would be conducted at least annually, or at a frequency and duration to be determined as part of future coordination efforts between PANYNJ and NYCDOT.

Grand Central Parkway

The analysis of the Grand Central Parkway mainline for the future operating conditions was performed in consultation with NYCDOT and NYSDOT staff (see correspondence in **Section A.8** of **Appendix A: Transportation of the 2014 EA**). Traffic operations analysis was conducted for both directions of the Parkway mainline and associated ramps under year 2012 existing conditions, year 2030 Future No-Action Conditions, and year 2030 Proposed Action Conditions, during both the weekday morning and afternoon peak periods. The traffic operations analysis of the Parkway mainline and associated ramps in both the eastbound and westbound directions was conducted using FREEVAL-2010 (version 2).[38] The analysis was conducted for the peak three hours of a typical weekday morning peak period (5:45 to 8:45 am) and the peak three hours of a typical weekday afternoon peak period (3:45 to 6:45 pm). The existing conditions traffic volumes used in the analysis were year 2012 hourly volumes that were projected from 2010 hourly traffic volumes provided by the PANYNJ and increased by the applicable *CEQR Technical Manual* growth factor to estimate 2012 conditions.

The proposed design of the future roadway geometry under the Future With-Action Condition (see **Figure 5-3**) aims to address existing operational deficiencies on the westbound Parkway, as well as address significant existing and projected on-Airport circulation and traffic operations deficiencies. With respect to the westbound Parkway, the proposed design would generally retain the same basic ramp arrangement on the westbound Parkway: one exit ramp (Exit 7) followed by two consecutive entrance ramps from the reconfigured collector-distributor road and from 94th Street, followed by the exit ramp to 82nd Street. Under the CTB Redevelopment Program, the spacing between the two entrance ramps would be increased by approximately 210 feet.

Change: There would be minor changes to the on-airport roadway layout as a result of the proposed design changes (see Figure 5-3b).:

- *Terminal B frontages (HOV, Arrivals, & Departures levels) shifted approximately 30' south to support connection to Terminal C and reconfigured headhouse.*

[38] FREEVAL is a deterministic traffic model supported and maintained by the Transportation Research Board's (TRB) Highway Capacity and Quality of Service (HCQS) Subcommittee and is the official computational engine that implements procedures in the 2010 HCM.

- *Roadway changed to support the shifting of the Terminal B frontages to accommodate dual taxilanes in front of Concourse A.*
- *Terminal B Arrivals and Departures exit ramp alignment changed to accommodate dual taxilanes in front of Concourse A.*
- *Access to West Parking Garage and intersection changed.*
- *Access to FAA and shipping/receiving facility changed.*

With respect to the eastbound Parkway, the proposed roadway geometry builds upon the recent improvements implemented by NYSDOT in the vicinity of 82nd Street and 94th Street. These improvements were initiated independent of any plans for the CTB Redevelopment Program and consisted of the elimination of the weave between the entrance ramp from southbound 94th Street and the exit ramp to the CTB, the consolidation of the entrance ramps from 94th Street and Ditmars Boulevard, the addition of a third lane at the 82nd Street exit ramp, and the addition of a fifth lane on the eastbound Parkway from the gore of these consolidated ramps. Under the CTB Redevelopment Program, the eastbound Parkway flyover to the CTB would be realigned and reconfigured as a counter-clockwise loop that would extend to the east and merge with other inbound roadways (including the exit ramp from westbound Parkway at Exit 7) to provide access to Terminals C and D on the eastern section of the Airport, to the CTB and the parking garage (West Garage; to be relocated closer to 94th Street) in the central terminal area, to Terminal A on the western section of the Airport. The proposed roadway design would also involve significant on-Airport roadway modifications that would change current traffic patterns, improve on-Airport traffic operations and circulation, and alleviate on-Airport congestion (see description in Section 3.1.3).

Traffic operations on the Grand Central Parkway in both directions under the Proposed Action Conditions were compared with those for Future No-Action Conditions based on impact criteria from the *CEQR Technical Manual* for highway sections and current NYCDOT practices for significant impact determination. Comparisons of the Future No-Action Condition with the Proposed Action Condition analysis results indicate that CEQR impact thresholds would not be exceeded on any Parkway segment in either direction as a result of the 3.9 MAP traffic growth projected in connection with redevelopment of the CTB.

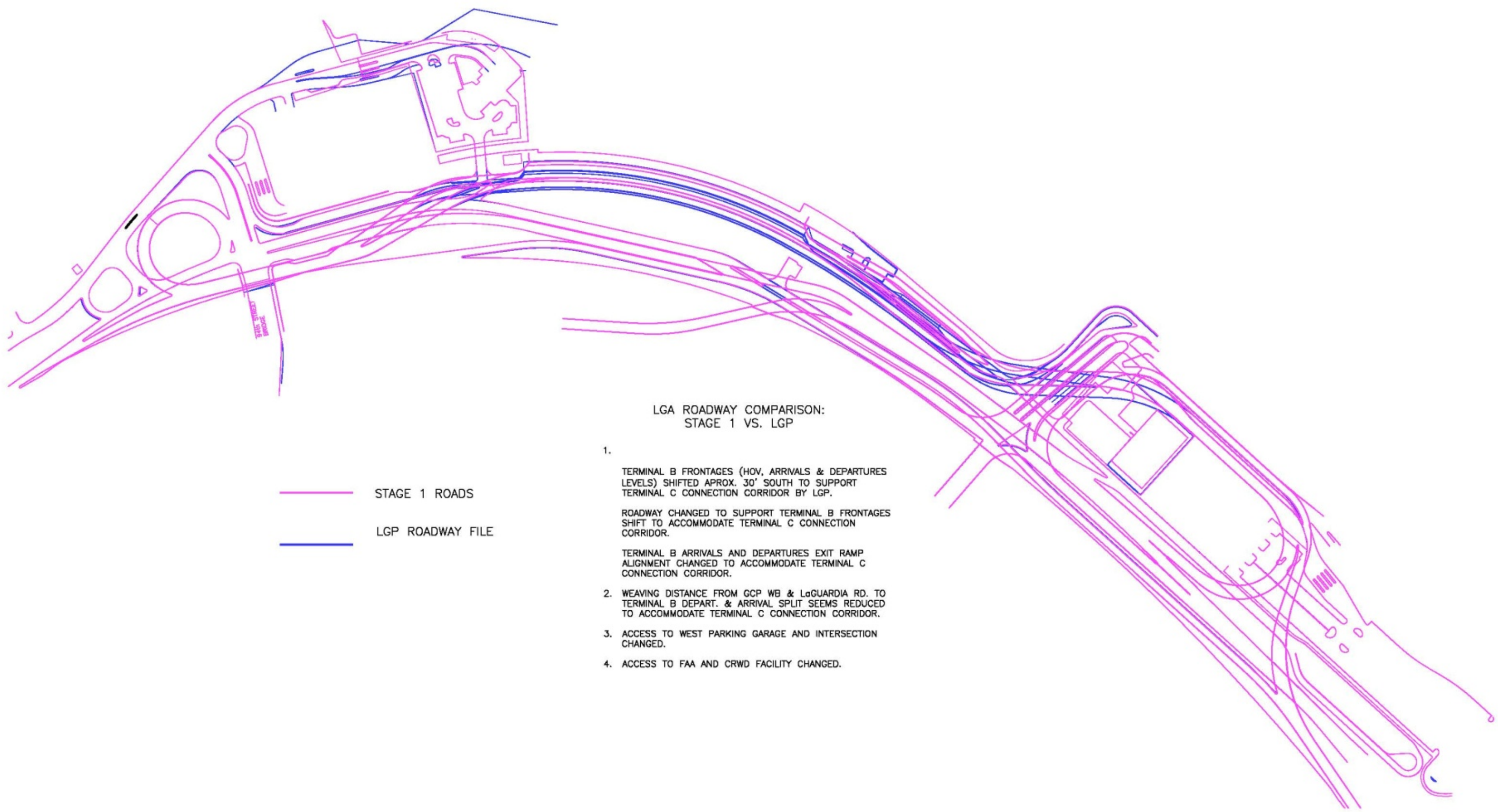
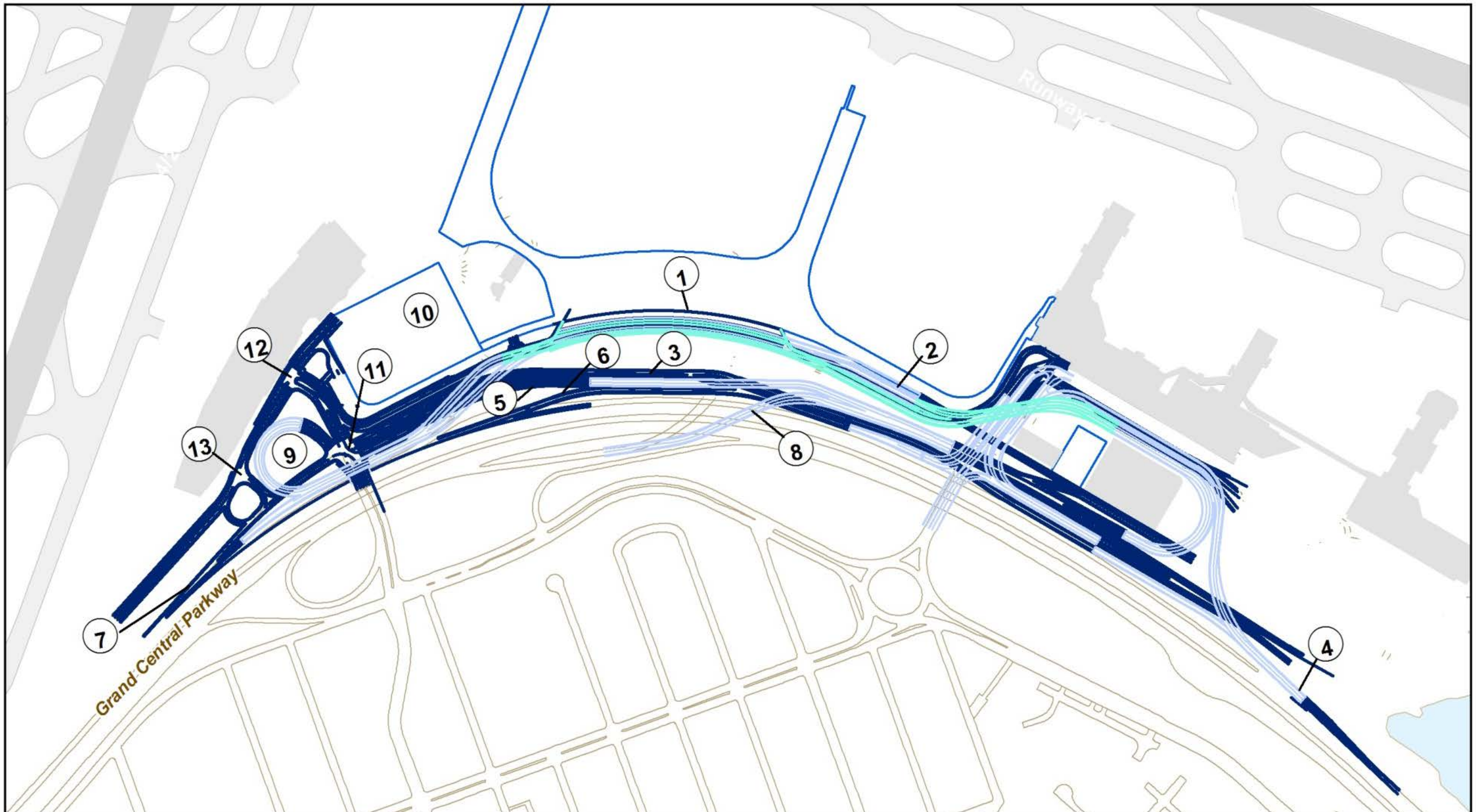


Figure 5-3b. Proposed Roadway Design for the proposed design changes



Legend

1. CTB Departure Roadway
2. CTB Arrival Roadway
3. Collector-Distributor (C-D) Road
4. Exit 7 (Westbound)
5. Inbound/Recirculation Roadway (Eastbound)
6. C-D Road Entrance Ramp (Westbound)
7. 94th Street Entrance Ramp (Westbound)
8. CTB Eastbound Flyover (Exit 7 Eastbound)
9. Helix Ramp
10. Parking Garage
11. Intersection of Runway Drive/C-D Road
12. Intersection of Runway Drive / 94th Street
13. Intersection of Runway Drive/Helix Ramp Terminus

High Elevated Roads
Elevated Roads
At-Grade Roads

N

0 250 500 Feet

Source: PANYNJ, NYC DCP, NYC DoITT, ESRI, AECOM

Figure 5-3

Proposed Roadway Design

LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REDEVELOPMENT PROGRAM
THE PORT AUTHORITY OF NY & NJ

2014 EA Graphic

Parking

There are currently six surface parking lots and a parking garage that serve passengers at LaGuardia Airport and a new parking garage is under construction. The CTB Redevelopment Program will rationalize the proposed parking supply with projected future parking demands within the Airport through a reallocation of parking facilities throughout the Airport. An objective of this rationalization process is to ensure that vehicles generated under the CTB Redevelopment Program are entirely accommodated on-site in new and/or reconfigured parking facilities at the Airport. Therefore, no off-site demand for parking is expected to occur on city streets in the vicinity of the Airport. Because all parking demand is projected to be accommodated on-site, a parking assessment is not warranted for the CTB Redevelopment Program.

Change: Under the proposed design changes, the capacity of the proposed West Garage would increase from 2,900 to 3,100 spaces. The garage was originally presented as a five level garage. There are five levels of elevated parking in the garage as well as parking on the roof and ground floors, for a total of seven levels of parking. The increase in parking is a result of full utilization of rooftop parking, as opposed to partial utilization of rooftop parking in the previously approved (2014) design. The height of the garage (83 feet above ground level) remains the same. The rooftop parking would be covered by a shading structure to meet security requirements. Design refinements since the 2014 EA was released shifted the garage's footprint roughly 35 feet to the west and reduced the footprint to the north by roughly 40 feet. The garage remains substantially similar in size and location, as demonstrated in Figure 3-4 (page 1-19).

Transit

LaGuardia Airport is not directly accessible via subway, and no modifications to subway service are proposed under the CTB Redevelopment Program; however, the terminal and roadway design does not preclude subway access in the future. Several MTA bus lines serve the Airport. Based on the estimated trip generation, the CTB Redevelopment Program is not projected to increase public bus ridership by more than 200 new person-trips during any one peak hour. Therefore, detailed subway and bus analyses are not warranted for the CTB Redevelopment Program, as per the *CEQR Technical Manual, Chapter 16, Section 300, Assessment Methods*. It is expected that private bus carriers would continue to serve the Airport under the CTB Redevelopment Program and provide more frequent service as needed to accommodate the projected increase in passenger demand under both the future No-Action and Proposed Action conditions. These projected increases in private bus traffic are reflected in the vehicle trip generation estimates for the Proposed Action Condition traffic analysis.

Pedestrians

Although an increase in *on-site* (within the Airport) pedestrian activity is expected, the CTB Redevelopment Program is not projected to generate more than 200 external pedestrian trips at any *off-site* locations (outside the Airport). Therefore, a pedestrian assessment is not warranted for the CTB Redevelopment Program as per the *CEQR Technical Manual, Chapter 16, Section 300, Assessment Methods*.

Safety Assessment

Crash data compiled by the NYCDOT for the most recent available three-year period (i.e., 2010 to 2012) was reviewed to identify the crash history at the study intersections. The total numbers of crashes at each study intersection were found to be well below the 48-crash per 12-month period CEQR threshold for a “high-crash location.” Also, none of the study intersections meet the “high-crash location” *CEQR* threshold of five or more pedestrian/bicyclist crashes during any 12-month period. The NYCDOT data also indicates that there were no fatal crashes at the study intersections during the three-year period. Therefore, none of the study intersections are classified as “high-crash locations” as defined in the *CEQR Technical Manual*.

5.2.1.3 No-Action Alternative

The Future No-Action Condition traffic analysis identifies how the study area’s transportation system is projected to operate in the future horizon year *without* the CTB Redevelopment Program. The Future No-Action Condition traffic analysis includes anticipated future increases in background traffic volumes, but does not include the traffic generated by—nor the transportation improvements proposed by—the CTB Redevelopment Program.

Without the proposed redevelopment of the CTB, passenger travel at LaGuardia Airport is still projected to continue to increase over time. The PANYNJ estimates that without the CTB Redevelopment Program projected passenger travel at LaGuardia Airport will increase by 6.5 MAP by the year 2030. In addition, without the project there would be no further change to the geometry of the Grand Central Parkway mainline or the associated ramps, nor would there be any improvements made to the on-Airport roadway infrastructure. Therefore, the existing on-Airport roadway network—along with its associated traffic operations and circulation issues—would remain into the future.

Relative to year 2012 existing conditions, the following intersections would experience worsening overall levels-of-service due to increased overall delays under year 2030 Future No-Action Conditions:

- **Astoria Boulevard North/Grand Central Parkway westbound off-ramp/82nd Street/Ditmars Boulevard** – During the weekday afternoon peak hour, the overall average delay is projected to increase by 11.0 seconds/vehicle, from 32.7 seconds/vehicle (LOS “C”) under existing conditions to 43.7 seconds/vehicle (LOS “D”) under Future No-Action Conditions.

- **Astoria Boulevard/82nd Street/24th Avenue** – During the weekday morning peak hour, the overall average delay is projected to increase by 12.6 seconds/vehicle, from 31.4 seconds/vehicle (LOS “C”) under existing conditions to 44.0 seconds/vehicle (LOS “D”) under Future No-Action Conditions. During the weekday afternoon peak hour, the overall average delay is projected to increase by 37.3 seconds/vehicle, from 45.3 seconds/vehicle (LOS “D”) under existing conditions to 82.6 seconds/vehicle (LOS “F”) under Future No-Action Conditions.

- **LaGuardia Access Road/94th Street** – During the weekday morning peak hour, the overall average delay is projected to increase by 49.0 seconds/vehicle, from 27.8 seconds/vehicle (LOS “C”) under existing conditions to 76.8 seconds/vehicle (LOS “E”) under Future No-Action Conditions. During the weekday afternoon peak hour, the overall average delay is projected to increase by 52.2 seconds/vehicle, from 32.5 seconds/vehicle (LOS “C”) under existing conditions to 84.7 seconds/vehicle (LOS “F”) under Future No-Action Conditions.

- **Ditmars Boulevard/23rd Avenue/LaGuardia Airport access road (unsignalized rotary intersection)** – During the weekday morning peak hour, the average delay for the southbound through movement leaving the Airport is projected to increase by 13.2 seconds/vehicle, from 34.3 seconds/vehicle (LOS “D”) under existing conditions to 47.5 seconds/vehicle (LOS “E”) under Future No-Action Conditions. During the weekday afternoon peak hour, the average delay for this same movement is projected to increase by 5.1 seconds/vehicle, from 20.9

seconds/vehicle (LOS "C") under existing conditions to 26.0 seconds/vehicle (LOS "D") under Future No-Action Conditions.

- **Ditmars Boulevard/Marine Terminal Road** – During the weekday afternoon peak hour, the overall average delay is projected to increase by 8.0 seconds/vehicle, from 17.7 seconds/vehicle (LOS "B") under existing conditions to 25.7 seconds/vehicle (LOS "C") under Future No-Action Conditions.

- **Ditmars Boulevard/94th Street** – During the weekday morning peak hour, the overall average delay is projected to increase by 8.1 seconds/vehicle, from 14.2 seconds/vehicle (LOS "B") under existing conditions to 22.3 seconds/vehicle (LOS "C") under Future No-Action Conditions. During the weekday afternoon peak hour, the overall average delay is projected to increase by 10.1 seconds/vehicle, from 17.2 seconds/vehicle (LOS "B") under existing conditions to 27.3 seconds/vehicle (LOS "C") under Future No-Action Conditions.

- **Bowery Bay Boulevard/Runway Drive/Marine Terminal Road** – During the weekday morning peak hour, the overall average delay is projected to increase by 24.8 seconds/vehicle, from 36.3 seconds/vehicle (LOS "D") under existing conditions to 61.1 seconds/vehicle (LOS "E") under Future No-Action Conditions.

5.2.1.4 Summary of Impacts

A variety of temporary improvements—including a traffic signal installation, a traffic signal controller upgrade, signal timing adjustments, curbside parking prohibitions, lane widening/restriping, and the use of construction flaggers—would be required at a total of ~~12 intersections~~ to accommodate the increased traffic volumes occurring during construction of the CTB Redevelopment Program (see Section 5.1.2.1). Those improvements were based on analysis of projected traffic patterns during the peak hours of the peak quarter of construction (~~the fourth quarter of 2015~~). Decisions concerning the extent to which these temporary improvements will be implemented, the timing of implementation, and the duration that the improvements will be retained during non-peak periods of construction, fall under the purview of the NYCDOT and will be determined in coordination with NYCDOT's Office of Construction Management and Coordination (OCMC).

Change: A variety of temporary improvements—including a traffic signal installation, a traffic signal controller upgrade, signal timing adjustments, curbside parking prohibitions, lane widening/restriping, and the use of construction flaggers—would be required at a total of 11 intersections to accommodate the increased traffic volumes occurring during construction of the proposed design changes (see Section 5.2.1.2.1). Those improvements were based on analysis of projected traffic patterns during the peak hours of the peak quarter of construction (the second quarter of 2017).

With these improvements, the overall intersection levels-of-service that are projected under the Future No-Action Conditions would remain the same—or improve—under the Proposed Action Conditions, with the exception of ~~six intersections (Astoria Boulevard/94th Street, Ditmars Boulevard/Marine Terminal Road, 21st Avenue/81st Street, 19th Avenue/Hazen Street, the construction access driveway/19th Avenue/81st Street, and 19th Avenue/45th Street)~~ where the change does not constitute significant adverse traffic impacts according to *CEQR Technical Manual* criteria.

Change: With these improvements, the overall intersection LOS that are projected under the Future No-Action Conditions would remain the same—or improve—with the proposed design changes versus conditions contemplated in the 2014 EA, with the exception of three intersections where a minor, *temporary decrease in LOS would occur, as detailed on page 5-13. The change does not constitute significant adverse traffic impacts according to CEQR Technical Manual criteria.*

In the year 2030, with fully realized passenger demand, improvements at four signalized intersections may be required to accommodate the traffic volumes associated with the 3.9 MAP increase. These improvements include minor reallocations of green time at all four intersections, plus lane restriping and curbside parking prohibitions at one of the four intersections. With these improvements in place, no significant traffic impacts are projected to occur in accordance with the *CEQR Technical Manual* criteria. Furthermore, the overall intersections LOS that are projected under the Future No-Action Condition would remain the same—or improve—under the Proposed Action Condition.

Decisions concerning the implementation of any traffic improvements fall under the purview of the NYCDOT. Coordination with the pertinent divisions within NYCDOT (Traffic Planning, Highway Design, Signals, etc.) is on-going and will continue as the project advances to construction. PANYNJ would implement a traffic monitoring program in coordination with NYCDOT throughout the duration of the construction period and continuing after the construction of the new terminal in 2021, as needed. The monitoring program would determine the need for and timing of implementation of the identified improvements.

Change: The construction schedule for the proposed design changes anticipates completion of the new terminal in late 2021.

No significant adverse impacts are projected with respect to off-Airport parking availability, transit facilities, or pedestrian facilities. None of the study intersections are classified as "high-crash locations" as defined in the *CEQR Technical Manual*.

Without the proposed redevelopment of the CTB, passenger travel at LaGuardia Airport is still projected to increase up to 30.1 MAP. Without the Redevelopment Program, there would be no additional change to the geometry of the Grand Central Parkway mainline or the associated ramps, nor would there be any improvements made to the on-Airport roadway infrastructure. Therefore, the existing on-Airport roadway network—along with its associated traffic operations and circulation issues—would remain into the future. Relative to year 2012 existing conditions, seven intersections would experience worsening overall levels-of-service under year 2030 Future No-Action Conditions.

5.2.2 Air Quality

The Clean Air Act and its amendments (CAAA) is the comprehensive federal law that regulates air emissions from mobile and stationary sources. This law authorizes the Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants (HAP). Areas of the country where air pollution levels persistently exceed the NAAQS are designated "nonattainment areas." Areas that have a history of nonattainment but are now meeting NAAQS are designated "maintenance areas." According to the EPA's Green Book[39], Queens County in New York is a designated nonattainment area for two criteria pollutants—ozone *and* fine particulates–and a designated maintenance area for carbon monoxide.

[39] *The Green Book Nonattainment Areas for Criteria Pollutants* (as of July 31, 2013) is available online at http://www.epa.gov/oaqps001/greenbk/.

LaGuardia Airport is located in Queens County, which means project-related air emissions would occur within EPA-designated nonattainment and maintenance areas. The CTB Redevelopment Program is not exempt from the Clean Air Act nor is the project presumed to conform[40] to the State Implementation Plan (SIP).[41] Therefore, the EPA's General Conformity Rule (40 CFR Part 93, §93.153)[42] applies to the project and an air quality analysis must be prepared. The purpose of the General Conformity Rule is to ensure that federal activities do not cause or contribute to new violations of the NAAQS, increase the frequency or worsen existing violations of the NAAQS, or delay attainment of the NAAQS.

This report section, supplemented by the analysis and discussion contained in **Appendix B: Air Quality Technical Report of the 2014 EA**, provides the information, materials, and evidence needed to demonstrate compliance pursuant to the CAAA, EPA regulations, and NEPA.

Attachment 5: Technical Memorandum – Updated Air Quality Analysis for the Construction Condition *and* ***Attachment 8: LGA CTB CO Hot Spot Analysis*** *provide supplemental analysis and discussion on the air quality impacts from the proposed design changes. The changes do not trigger any general conformity or CEQR Technical Handbook significance levels and therefore do not raise additional environmental concerns as related to the previously approved design.*

Construction emissions associated with the proposed design changes were calculated using the same methodology used for the 2014 FONSI/ROD, with modifications to the inputs based on the changes to the construction schedule, updated construction equipment usage data (diesel- and gas-powered demolition and construction equipment), and revised construction traffic analysis (trucks transporting construction materials and concrete, construction worker vehicles) (see ***Attachment 4: Technical Memorandum – Updated Traffic Analysis for Construction Conditions****).*

Construction equipment emissions for the proposed design changes were estimated using the NONROAD model for activity during each construction year. Construction equipment data (equipment type, horsepower, and load factor) for the proposed design changes are presented in ***Attachment 5****. As with the 2014 FONSI/ROD, the non-road category for all equipment was conservatively assumed to meet Tier 2 emissions standards, even though the industry is transitioning to cleaner Tier 4 standards and upgrading fleets. Tier 2 emissions standards refer to the 40 Code of Federal Regulations (CFR) Part 89 Subpart E, Tier 2 Vehicle and Gasoline Sulfur Program; and Tier 4 emissions standards refer to 40 CFR Part 1039-Tier 4 Emissions Standards and Certification Requirements. The estimated hours of operation for each type of equipment were calculated for each year of construction (2016 to 2021). The NONROAD model estimated operational emissions for VOC, NO_x, CO, PM_{10}, $PM_{2.5}$, SO_2, and CO_2 resulting from construction equipment for each year of construction of the proposed design changes (see Table B.4-3B in Attachment 5).*

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[40] The FAA has designated a list of actions whose emissions are typically below EPA's thresholds of significance (*de minimis*) for the various criteria pollutants. These actions, known as "presumed to conform actions" typically do not require air emissions analysis. For more information, see Federal Register/Vol. 72, No. 145 [FR Doc. 07-3695 Filed 7-25-07].

[41] Under the Clean Air Act, states must develop SIPs that outline how they will control air pollution in designated nonattainment and maintenance areas. A SIP is a collection of regulations, programs, and policies an individual state will use to attain and maintain the NAAQS.

[42] Under the Clean Air Act (§176(c)(4)) General Conformity Rule, federal agencies must work with state, tribal and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the air quality plans established in the applicable state or tribal implementation plan.

Using trip forecasts for on-road construction vehicles (concrete trucks, material delivery and haul trucks), worker's personal commuting vehicles, and shuttle bus operations, on-road construction emissions were calculated. MOVES emission factor model-predicted emissions factors were applied to the cumulative annual vehicle miles traveled by the on-road vehicles to determine annual vehicular emissions for each construction year (see Table B.4-4B in Attachment 5).

Under General Conformity requirements, total annual emissions resulting from the proposed project must be compared to the applicable de minimis levels. The sum of emissions from construction equipment and on-road vehicles for each year of construction are presented in Table B.4-5B in Attachment 5. The results indicate that 2017 would be the worst-case construction year for the proposed design changes, resulting in the maximum annual construction emissions. Those maximum emissions are significantly below the de minimis levels for each pollutant; therefore, the proposed design changes have minimal air quality impact and are determined to conform to the State Implementation Plan (SIP).

As described in ***Attachment 8****, a hot spot dispersion impact analysis of the peak year construction condition was performed for carbon monoxide (CO) at the same five off-Airport intersections that were analyzed in the 2014 FONSI/ROD. USEPA's MOVES program was used to predict vehicle CO emission factors using NYSDOT-provided model inputs and a free flow travel speed of five miles per hour (mph) was conservatively assumed. Geometric models of the roadway network within a 1,000-foot radius of each of the selected five intersections were developed (same models used in the 2014 FONSI/ROD). Dispersion modeling was performed using USEPA's CAL3QHC computer model, with various modeling parameters recommended in the CEQR Technical Manual for Queens County and traffic parameters for each intersection, such as signal timing data and turning volumes, from* ***Attachment 4****. Receptors were placed along sidewalks around each intersection, representing the worst-case locations given their close proximity to the center of each congested intersection where vehicles would idle.*

The predicted worst-case CO concentration levels (1-hour and 8-hour) at the selected five worst-case intersections are summarized in ***Attachment 8****. Although CO concentration levels under the proposed design changes would be higher than the concentrations predicted for the Future Proposed Action condition in the 2014 FONSI/ROD, the levels are still well below the CO NAAQS of 35 ppm for a 1-hour average and 9 ppm for an 8-hour average. Concentrations are higher due to the compressed construction schedule and nighttime work that occurs during the peak construction period associated with the proposed design changes. Additionally, the baseline year changed from 2012 to 2014 and therefore baseline CO levels are higher than in the 2014 EA. Concentrations range between 4.3 and 5.4 ppm for a 1-hour CO average and between 2.6 and 3.2 ppm for a 8-hour CO average. Therefore, the mobile source CO impacts during construction would not be significant.*

5.2.2.1 General Conformity Review

According to the General Conformity Rule, if the total direct and indirect emissions from the CTB Redevelopment Program do not exceed established screening criteria emission rates known as *de minimis* thresholds, a General Conformity Determination[43] is not required. "Direct emissions" occur at the same time and place as the project, such as construction site emissions. "Indirect emissions" are reasonably foreseeable emissions that may occur later in time and/or are farther removed from the project, such as emissions from aircraft operations and vehicular traffic. Per federal guidelines, other

[43] A Conformity Determination is the formal process and documentation required when the emissions from the proposed project or action in a non-attainment or maintenance area are at or above *de minimis* levels and are not otherwise exempt or presumed to conform.

emissions at the airport that are not associated with the project are part of the background emissions and are not included in the analysis.

Using forecast airport activity information and appropriate emission factors, emissions inventories were prepared for the previously approved (2014) design and No-Action Alternative (see **Appendix B of the 2014 EA**). An "emissions inventory" is a database that lists, by source, the amount of air pollutants discharged into the atmosphere of a community during a specified period of time (e.g., tons per year). In evaluating "project-related emissions," the **net** emissions are determined by subtracting future emissions without the project (the No-Action Alternative) from the future emissions with the project (the previously approved (2014) design). If project-related emissions are estimated to exceed the EPA's *de minimis* threshold levels, then a Conformity Determination must be prepared.

5.2.2.1.1 Emission Reduction Strategies

In accordance with PANYNJ's *Sustainable Infrastructure Guidelines*, the CTB Redevelopment Program would incorporate a series of measures to reduce project-related emissions during and after construction. This is a normal part of the design process; therefore, these emissions reductions are included in the net emissions for the total direct and indirect emissions for the CTB Redevelopment Program. For example, during construction, contractors would be required to use ultra-low sulfur diesel (ULSD) fuel; all off-road equipment would be required to be retrofitted with emission control devices using Best Available Technology (BAT); and use of diesel-powered generators would be limited to situations where commercial electric power may not readily be available.

After construction, the CTB Redevelopment Program also includes component projects designed to reduce emissions from aircraft and ground support equipment (GSE). For example, a 400Hz power unit would be installed at each gate to deliver standby power for aircraft operating systems and pre-conditioned air (PCAir) devices would be installed to provide heated/cooled air as needed to maintain a comfortable cabin temperature between flights. Using 400Hz power and PCAir devices reduces the amount of time aircraft are otherwise required to operate their auxiliary power units (APUs), which burn aircraft fuel and generate exhaust emissions while the aircraft is parked at the gate. In addition, all tenant airlines using the new terminal would be required to use electric bag tractors, belt loaders, and pushback tractors that run on batteries, which require periodic recharging. Unlike conventional GSE which burn gasoline and diesel fuel, it is anticipated that the electric GSE would generate no on-site emissions as they are electrically-powered vehicles.

5.2.2.1.2 Construction Phase (Direct Emissions)

Construction-related air emissions would be generated by on-road vehicles and non-road equipment. On-road sources of emissions include private automobiles used by construction workers commuting to and from work each day, shuttle buses used to transfer workers between the parking lot and the project site, and contractor vehicles certified to operate on local roadways, such as tractor trailers, cement mixers, etc. Non-road sources consist of contractor vehicles and equipment used on-site and would include a wide variety of engine types ranging from portable generators to heavy-duty pieces of equipment such as cranes, excavators, asphalt pavers, etc.

Engineering estimates of vehicle traffic and equipment operations were prepared for each component of the construction process in the previously approved design (2014)(see **Appendix A: Transportation** and **Appendix F: Supporting Data of the 2014 EA**). Assuming an eight-year construction schedule beginning in 2014 and ending in 2021, EPA-approved simulation software and modeling techniques were used to prepare emissions inventories for each calendar year (see **Appendix B of the 2014 EA**). The results of the air quality analysis are presented in **Table 5-1: Annual Emissions Inventory—Construction Phase.** ~~As shown, the peak emissions year for all criteria pollutants is Year 2, or 2015, which is consistent with the activities proposed in the construction schedule~~. As shown in **Table 5-1**, the construction emissions are less than half of the applicable *de minimis* threshold levels; therefore, federal guidelines indicate that no significant air quality impact would occur during the construction period. As discussed in Section 5.20.3, the cumulative air emissions for the previously approved design (2014) and other Airport projects anticipated to be underway at the same time, would also be under the *de minimis* threshold levels.

*Change: Engineering estimates of vehicle traffic and equipment operations were updated for each component of the construction process based on the revised construction phasing and schedule (see **Attachment 4** and **Attachment 5**). Assuming a five and three-quarter-year construction schedule beginning in 2016 and ending in 2021, the NONROAD model and MOVES simulation software were used to prepare emissions inventories for each calendar year (see **Attachment 5**). The results of the air quality analysis are presented in **Table 5-1b.** As shown, the peak emissions year for all criteria pollutants is Year 2, or 2017, which is consistent with the activities proposed in the construction schedule. As shown in **Table 5-1b**, the construction emissions are less than half of the applicable de minimis threshold levels; therefore, federal guidelines indicate that no significant air quality impact would occur during the construction period. Other major Airport projects assumed to be underway at the same time as the CTB Redevelopment Program in the 2014 FONSI/ROD would be completed by the peak year of construction and would not result in cumulative air emissions.*

5.2.2.1.3 Operations Phase (Indirect Emissions)

After construction, day-to-day airport and airline operations would continue to generate emissions of criteria pollutants. "Mobile source" air pollution is emitted from aircraft, vehicles, and equipment that can be moved from one location to another. Mobile source emissions from airside operations include aircraft engines, aircraft APUs and GSE. On the landside, mobile source emissions are generated by ground access vehicles on the roadways and in parking lots, including personal automobiles and commercial vehicles such as taxis, limousines, shuttle buses, delivery trucks, etc. A "stationary source" of air pollution refers to an emissions source that does not move, also known as a point source. The Airport's central heating and refrigeration plant (CHRP) is a stationary source of emissions that result from heating and cooling the central terminal building.

Emissions inventories for the future year 2030 were prepared for mobile and stationary sources with and without the project (see **Appendix B of the 2014 EA**). The assessment demonstrates that the emissions resulting from the CTB Redevelopment Program would be only marginally different, and in most instances less, than the emissions from the No-Action Alternative. This is a reasonable conclusion because, under the CTB Redevelopment Program, the existing terminal building, airside apron, landside roadways, and parking facilities would be removed and replaced with new facilities that are designed to accommodate forecast passenger activity and vehicular traffic volumes at higher levels of efficiency than would otherwise be achieved if no action is taken. For example:

- The CTB Redevelopment Program would be designed to accommodate larger aircraft while, at the same time, reducing aircraft congestion and gate-wait delays in and around the aircraft parking apron. Although aircraft emissions would potentially increase due to the use of larger aircraft, in this case, the emissions increase would be offset or minimized by a corresponding decrease in emissions due to the reduction in aircraft taxi time-in-mode.

Change: The aircraft parking apron design was changed by the proposed design changes. A Total Airport and Airspace Modeler (TAAM) simulation of the 2012 baseline airfield conditions show an average annual taxi time-in-mode of 26.1 minutes per operation. The Proposed Action conditions in the 2014 FONSI/ROD generated a reduction in taxi time of 4.9 minutes for an average taxi time of 21.2 minutes per operation. The revised apron layout using the same design day schedule that was developed for the approved project demonstrated that the average taxi time-in-mode would be 21.1 minutes per operation, a decrease of 0.1 minutes compared to the approved design (see Attachment 2). It is assumed that this would further reduce aircraft emissions.

- The CTB Redevelopment Program would also be designed to accommodate additional traffic volumes while, at the same time, reducing traffic congestion and delay on the terminal area roadways. As a result, up to 1.1 million additional round trips would be accommodated annually with no appreciable increase in tailpipe emissions.

  Change: Under the proposed design changes, the changes to the roadway configuration are so minor that there would be no impact to LOS for arriving or departing vehicles and tailpipe emissions would not increase.

PANYNJ has evaluated the airside and landside operations with and without the project and identified the benefits of the CTB Redevelopment Program. These benefits include reduced aircraft congestion and delay on the terminal airside apron, reduced traffic congestion and delay on the terminal area roadways, and reduced use of aircraft APUs and conventional GSE; which, for the purpose of this discussion, translate into reduced fuel consumption and, by extension, fewer air emissions.

Since there would be only minor changes to operational conditions at the Airport as a result of the proposed design changes, no additional analysis of future air emissions was performed. The minor changes include overall aircraft taxi time decrease of 0.1 minute, discussed in Attachment 2-September 2015 LGA CTB Total Aircraft and Airfield (TAAM) Analysis. The operational air emissions analyses in the 2014 FONSI/ROD are still valid.

Table 5-2 shows that the difference between CTB Redevelopment Program and No-Action (net) emissions would be below the applicable *de minimis* thresholds (see **Appendix B of the 2014 EA**). In fact, the CTB Redevelopment Program would result in a net decrease in emissions of volatile organic compounds (VOCs), carbon monoxide (CO), fine particulate matter (PM_{10} and $PM_{2.5}$) and sulfur dioxide (SO_2), while limiting the net increase of nitrogen oxides (NO_X) emissions (25.17 tons per year) to a level that is well below the NAAQS threshold (100 tons per year). Because the CTB Redevelopment Program (both construction and operations) would not result in emissions above the applicable *de minimis* thresholds, no further analysis is required under the General Conformity Rule. **Appendix B of the 2014 EA** provides more detail on the approach, methodology, input data, and results for the emissions inventory analysis.

5.2.2.2 Traffic Intersection "Hot Spot" Analysis

A dispersion analysis was conducted to determine whether carbon monoxide and particulate matter emissions due to future traffic volumes would result in unacceptably high concentration levels in public areas. The project-level "hot-spot" analysis found that the previously approved design (2014) would not create a new violation of any NAAQS, delay the attainment of any NAAQS, nor increase the frequency or severity of any existing violations of the NAAQS. Similarly, analysis shows no exceedances of the CEQR

Technical Manual criteria would occur in the vicinity of congested intersections. **Appendix B of the 2014 EA** provides more detail on the methodology, input data, and results, for the hot spot analysis.

Change: Attachment 8, Memorandum – LGA CTB CO Hot Spot Analysis, presents results from the carbon monoxide hot spot analysis associated with off-site mobile source activities during the worst-case year for construction under the revised construction phasing and schedule. All predicted levels are well below the NAAQS; therefore, the mobile source CO impacts from the proposed design changes would not be significant. Note that, as described in Appendix B of the 2014 EA, a screening of the intersections indicated that no additional analysis for $PM_{2.5}$ would be required.

5.2.2.3 Greenhouse Gas Emissions

Currently, there are no federal standards for reporting greenhouse gas (GHG) emissions from aviation sources, as well as no significance thresholds. As directed by the *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas* (CEQ, February 2010), the focus of this GHG analysis was to only disclose emissions from the CTB Redevelopment Program.

Most of the EPA tools that are widely used for NEPA study purposes (e.g., NONROAD emission factor model) do not provide emission factors for equivalent emissions of carbon dioxide (CO_2e). The recent EPA inventory report demonstrates that the GHG contribution from methane and nitrous oxide is less than one percent of the total CO_2e for fossil fuel combustion sources.[44] Given such small contributions from other GHG equivalents compared to carbon dioxide, for the purposes of the 2014 EA, CO_2e levels were predicted in terms of carbon dioxide levels only.

A quantitative analysis of carbon dioxide emissions was conducted for operations under the No Action and Proposed Action Alternatives, focusing on the contributions from aircraft, on-road vehicles, and the CHRP. The greenhouse gas assessment presented in **Table 5-3** demonstrates that implementation of the CTB Redevelopment Program would not cause an increase in GHG emissions when compared to the No-Action Alternative. In fact, cumulative GHG emissions are predicted to decrease over three percent. Pursuant to FAA Order 1050.1E, *Guidance Memo #3*[45] and *CEQR Technical Manual* criteria, no further analysis of GHGs is necessary.

Since there would be only minor changes to operational conditions at the Airport as a result of the proposed design changes, no additional analysis of future carbon dioxide emissions was performed. The minor changes include overall aircraft taxi time decrease of 0.1 minute, discussed in Attachment 2-Stepmber 2015 LGA CTB Total Aircraft and Airfield (TAAM) Analysis. The greenhouse gas emissions described in the 2014 FONSI/ROD are still valid.

FAA Order 1050.1F (July 2015) established Climate as a new Environmental Impact Category. While no significance thresholds have been determined for Climate, the Order requires an evaluation of climate impacts from Proposed Actions. LGA has a long history of proactively initiating projects that reduce GHG emissions from aircraft, buildings, and vehicles, including, comprehensive energy efficiency retrofit programs in its buildings, use of biodiesel in Port Authority vehicles, among many other actions. This

[44] EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007*, April 15, 2009.

[45] FAA Order 1050.1E, Change 1, Guidance Memo #3. To: FAA Lines of Business and Managers with NEPA Responsibilities. From: Julie Marks, Manager, Environmental Policy and Operations, AEE-400. Subject: Considering Greenhouse Gases and Climate Under the National Environmental Policy Act (NEPA): Interim Guidance (January 12, 2012).

project will minimize its individual impact on climate through efficient building design, aircraft apron and taxiway design, and commitment to meeting LEED Silver or higher standards for construction. In addition, the Port Authority's Sustainable Building Guidelines require projects to achieve energy cost decreases of 30% over ASHRAE 90.1-1999. Finally, the use of electric baggage tugs, belt loaders, and push back tugs along with the deployment of 400hz gate power and pre-conditioned air at every gate will reduce greenhouse gas emissions from aircraft support activities.

Air Quality Analysis completed in this section was also analyzed for Carbon Dioxide (CO2) emissions impacts, which are expressed in terms of CO2 and CO2e in Attachment 5 and Tables 5-1 through 5-3 of this technical report. Overall greenhouse gas impacts are expressed in terms of CO2 equivalence, or CO2e, which adds the greenhouse gas effects of methane, nitrous oxide, and other pollutants that contribute to global warming, expressed in CO2 equivalence relative to their global warming potential.

5.2.2.4 Summary of Impacts

Implementation of the CTB Redevelopment Program would result in no emissions increase or an emissions increase that is clearly *de minimis*. The air quality assessment (**Appendix B of the 2014 EA**) demonstrates that the CTB Redevelopment Program conforms to the New York SIP and the Clean Air Act because the CTB Redevelopment Program would not exceed the *de minimis* thresholds established by the EPA for the criteria pollutants. In addition, the hot spot analysis found that the CTB Redevelopment Program would not contribute to new violations of the NAAQS, increase the frequency or severity of existing violations of the NAAQS, or delay attainment of the NAAQS. Consequently, no adverse impact on local or regional air quality is expected to occur as a result of the CTB Redevelopment Program. No further analysis or reporting is required under the Clean Air Act or NEPA.

Table 5-1a: Annual Emissions Inventory—Construction Phase (2014 FONSI/ROD)

Pollutant	Construction Year Emissions (tons per year)								Maximum	*NAAQS Threshold*	De Minimis?
	2014	2015	2016	2017	2018	2019	2020	2021			
Volatile Organic Compounds (VOC)	0.71	2.71	2.20	1.38	0.79	0.81	0.40	0.19	**2.71**	*50*	**Yes**
Nitrogen Oxides (NO_X)	9.76	34.94	27.42	17.24	9.78	10.35	5.12	2.52	**34.94**	*100*	**Yes**
Carbon Monoxide (CO)	2.98	11.89	9.78	6.57	3.60	3.62	2.12	0.77	**11.89**	*100*	**Yes**
Particulate Matter 10 micrometers (PM_{10})	0.41	1.56	1.23	0.78	0.48	0.49	0.25	0.13	1.56	-	**Exempt**
Particulate Matter 2.5 micrometers ($PM_{2.5}$)	0.38	1.45	1.15	0.73	0.42	0.44	0.23	0.11	**1.45**	*100*	**Yes**
Sulfur Dioxide (SO_2)	0.35	1.23	1.00	0.63	0.30	0.33	0.18	0.07	**1.23**	*100*	**Yes**
Carbon Dioxide (CO_2)	1,429.16	5,180.43	3,991.37	2,487.88	1,627.94	1,654.74	757.43	457.44	**5,180.43**	-	**N/A**
Carbon Dioxide Equivalents (CO_2e)*	1,443.45	5,232.23	4,031.28	2,512.76	1,644.22	1,671.29	765.00	462.01	**5,232.23**	-	**N/A**

Source: EPA MOVES/2010b; EPA NONROAD reference document-provided model emissions factor inputs (Table A-4) for Tier 2 engines, which corresponds to the 2008a version model; AECOM Analysis (2013).
* Based on EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007* (April 15, 2009) for fossil fuel combustion sources, CO_2e calculated as 101% of CO_2 emissions.

Table 5-1b: Annual Emissions Inventory—Construction Phase for proposed design changes

Pollutant	Construction Year Emissions (tons per year)							Maximum	*NAAQS Threshold*	De Minimis?
	2016	2017	2018	2019	2020	2021	2022			
Volatile Organic Compounds (VOC)	1.33	4.16	3.71	3.03	0.90	0.99	0.54	**4.16**	*50*	**Yes**
Nitrogen Oxides (NO_X)	15.22	44.98	40.41	33.03	8.68	10.10	6.16	**44.98**	*100*	**Yes**
Carbon Monoxide (CO)	10.31	32.23	27.19	20.98	8.71	7.25	2.43	**32.23**	*100*	**Yes**
Particulate Matter 10 micrometers (PM_{10})	0.85	2.66	2.33	1.90	0.55	0.65	0.32	2.66	-	**Exempt**
Particulate Matter 2.5 micrometers ($PM_{2.5}$)	0.77	2.39	2.11	1.74	0.50	0.57	0.31	**2.39**	*100*	**Yes**
Sulfur Dioxide (SO_2)	0.03	0.10	0.08	0.06	0.02	0.02	0.01	**0.10**	*100*	**Yes**

Source: EPA MOVES/2010b; EPA NONROAD reference document-provided model emissions factor inputs (Table A-4) for Tier 2 engines, which corresponds to the 2008a version model; Parsons Brinckerhoff Analysis (2015). Table from Attachment 5.

Table 5-2: Annual Emissions Inventory—Operations Phase-from 2014 EA

Emission Sources	Annual Operations Emissions (tons per year)					
	VOC	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**
2030 Proposed Action	164.31	1,692.07	1,371.02	23.75	23.32	168.29
2030 No-Build/No-Action	184.55	1,666.90	1,586.35	27.72	27.34	178.30
Net Emissions	-20.24	25.17	-215.33	-3.97	-4.02	-10.01
NAAQS Threshold	*50*	*100*	*100*	-	*100*	*100*
De Minimis?	**Yes**	**Yes**	**Yes**	**Exempt**	**Yes**	**Yes**

Total emissions may not sum exactly due to rounding.
Source: EDMS/5.1.3; US EPA MOVES/2010b; US EPA AP-42 emission factors; AECOM Analysis (2013).

Table 5-3: Annual Carbon Dioxide Emissions Inventory—Operations Phase-from 2014 EA

Emissions Source	**2030 No-Build/ No Action**		**2030 Proposed Action**		**Net Emissions**		**Percent Change**
	Annual Operations Conditions (tons per year)						
	CO_2	CO_2e	CO_2	CO_2e	CO_2	CO_2e	
Aircraft	396,479.03	400,443.82	382,103.83	385,924.87	-14,375.21	-14,518.95	-3.6%
On-Road Vehicles	4,330.00	4,373.30	4,917.30	4,966.47	587.30	593.17	13.6%
CHRP	3,358.49	3,392.07	4,719.88	4,767.08	1,361.39	1,375.01	40.5%
Total	**404,167.52**	**408,209.19**	**391,741.01**	**395,658.42**	**-12,426.52**	**-12,550.77**	**-3.1%**

Note: Based on EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007* (April 15, 2009) for fossil fuel combustion sources, CO_2e calculated as 101% of CO_2 emissions.

5.2.3 Floodplains

Floodplains are defined in Executive Order 11988, *Floodplain Management*, as "the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding on any given year" as depicted on approved flood maps prepared by the Federal Emergency Management Agency (FEMA). The term commonly used for this low lying area subject to a one percent chance of flooding is the "100-year floodplain." Pursuant to Executive Order 11988, all Federal agencies are required to avoid impacts on floodplains to the degree practicable and to minimize impacts that cannot be avoided. When it is not practicable to avoid developing within a floodplain, the USDOT Order 5650.2, *Floodplain Management and Protection*, prescribes policies and procedures to implement Executive Order 11988[46].

Both the CTB Redevelopment Program and the No-Action alternatives would result in major construction activities within a FEMA-designated floodplain. NEPA regulations that address floodplains are discussed in FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, and FAA Order 1050.1E, Change 1, Appendix A.9.

No Practicable Alternative

According to the recently released Preliminary Flood Insurance Rate Maps (FIRMs) for LaGuardia Airport and the surrounding area, 85 percent of the Airport property, and 88 percent of the project site, are located within the limits of the coastal (tidal) floodplain (see **Figure 5-6**).[47] PANYNJ examined alternatives that would locate the CTB Redevelopment Program outside the floodplain and determined that no practicable alternative exists. As discussed in Section 3.3, Alternatives Eliminated from Further Consideration, there is no vacant space or other suitable property located within or adjacent to the Airport to accommodate the CTB Redevelopment Program, and there is no practicable alternative that would locate the project elsewhere. The CTB Redevelopment Program and No-Action alternatives are the only viable options, and both alternatives affect the same flood-prone area of the Airport. *For the proposed design changes, 88 percent of the project site is still located within the limits of the coastal (tidal) floodplain (see Figure **5-6b**), consequently, the proposed design changes would similarly affect the same flood-prone area of the Airport.*

[46] *EO 11988 was originally issued on May 24, 1977, and established a national policy requiring federal agencies to avoid, to the extent possible, the long and short term adverse impacts associated with the occupancy and modification of floodplains. On January 30, 2015, the President issued EO 13690 that amends EO 11988, and established the Federal Flood Risk Management Standard ("FFRMS") and a process for public input prior to implementation of the FFRMS. EO 13690 at §1. However, in Guidelines issued on October 8, 2015, federal agencies were directed not to apply the new requirements until after the agencies adopt new or revised regulations governing the proper implementation of EO 13690 and the FFRMS. EO 13690 at §3; Guidelines for Implementing Executive Order 11988, Floodplain Management, and Executive Order 13690, Establishing a Federal Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input, October 8, 2015 ("Guidelines"). The Guidelines state that agencies will continue to comply with the requirements of the 1977 version of E.O. 11988 until they update their regulations and procedures to incorporate the amendments from E.O. 13690. These regulations and procedures will describe an agency's schedule for applying any new requirements as well as how it will apply the new requirements. Id. at 5, 18. The new requirements of EO 11988 will not be applied retroactively. Id. at 18.*

[47] Preliminary FIRMs dated December 5, 2013.

5.2.3.1 The CTB Redevelopment Program

Because it is not practical to locate the CTB Redevelopment Program outside the floodplain, PANYNJ has identified and incorporated flood hazard mitigation strategies into the design of the CTB Redevelopment Program. These strategies focus on the use of specific design criteria to minimize impacts on human safety and minimize future damages or costs to equipment, facilities, and structures to the degree practicable. Flood hazard mitigation has been a priority for the CTB Redevelopment Program because of the geography of its location with elevations just above sea level. These efforts intensified after Superstorm Sandy in 2012 and the release of revised FEMA flood maps in 2013.[48]

[48] Prior to Superstorm Sandy (September 2012), FEMA was studying areas of the New York and New Jersey coastlines to update the FIRMs originally developed more than 25 years ago (with some revisions), however the maps have not yet been updated. In order to quickly support reconstruction efforts and ensure current base elevations are used in decision-making, near-term Advisory Base Flood Elevations (ABFE) were developed based on partially completed flood studies. Subsequently FEMA began releasing Preliminary Work Maps for certain communities, which include the full results of the coastal flood study. Preliminary FIRMs are in the process of being released and will be finalized after the public review/appeal process. Communities are encouraged to use the Preliminary FIRMs (where released) as the most recent coastal flood hazard information and the best available data from FEMA.

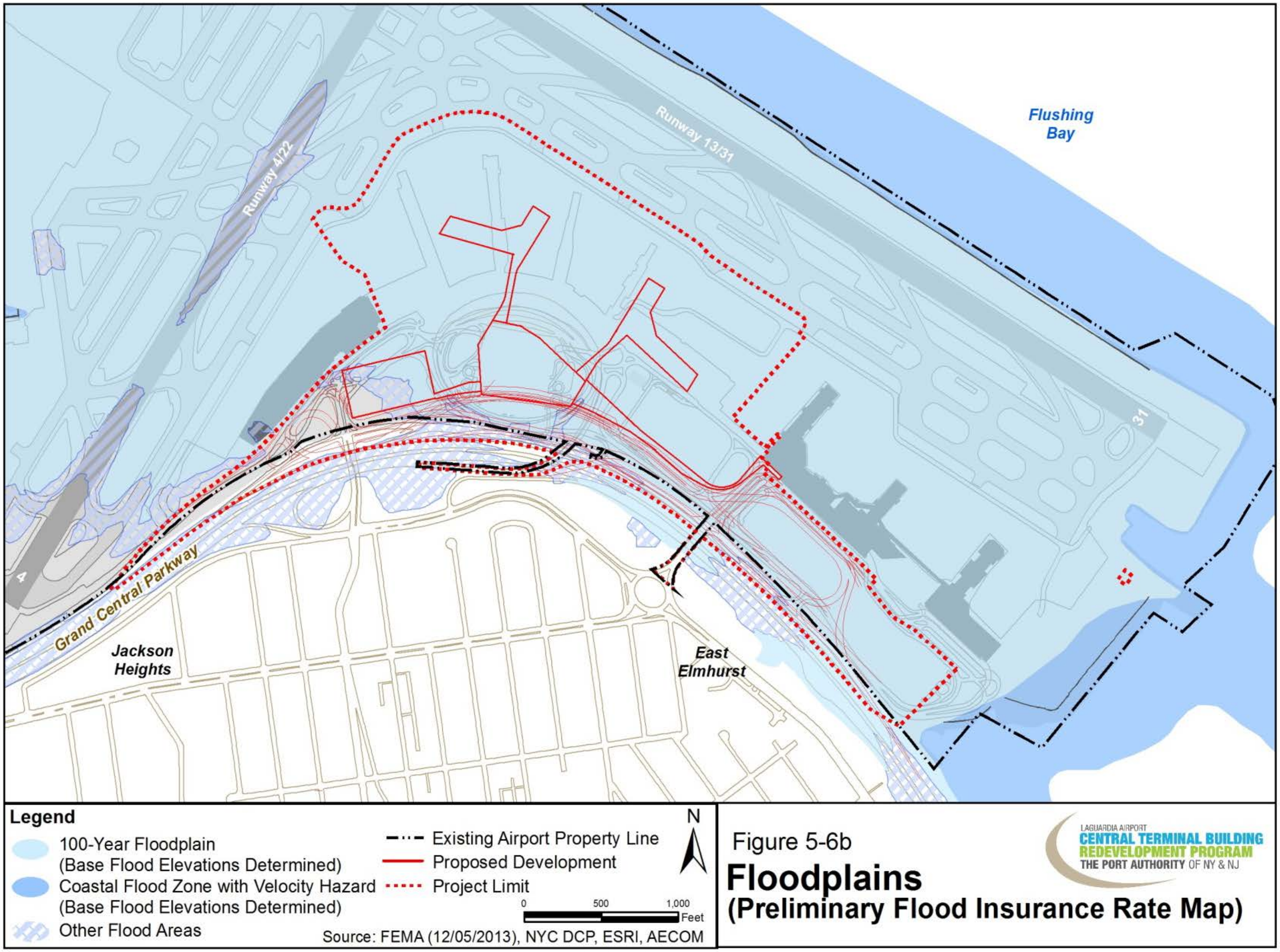
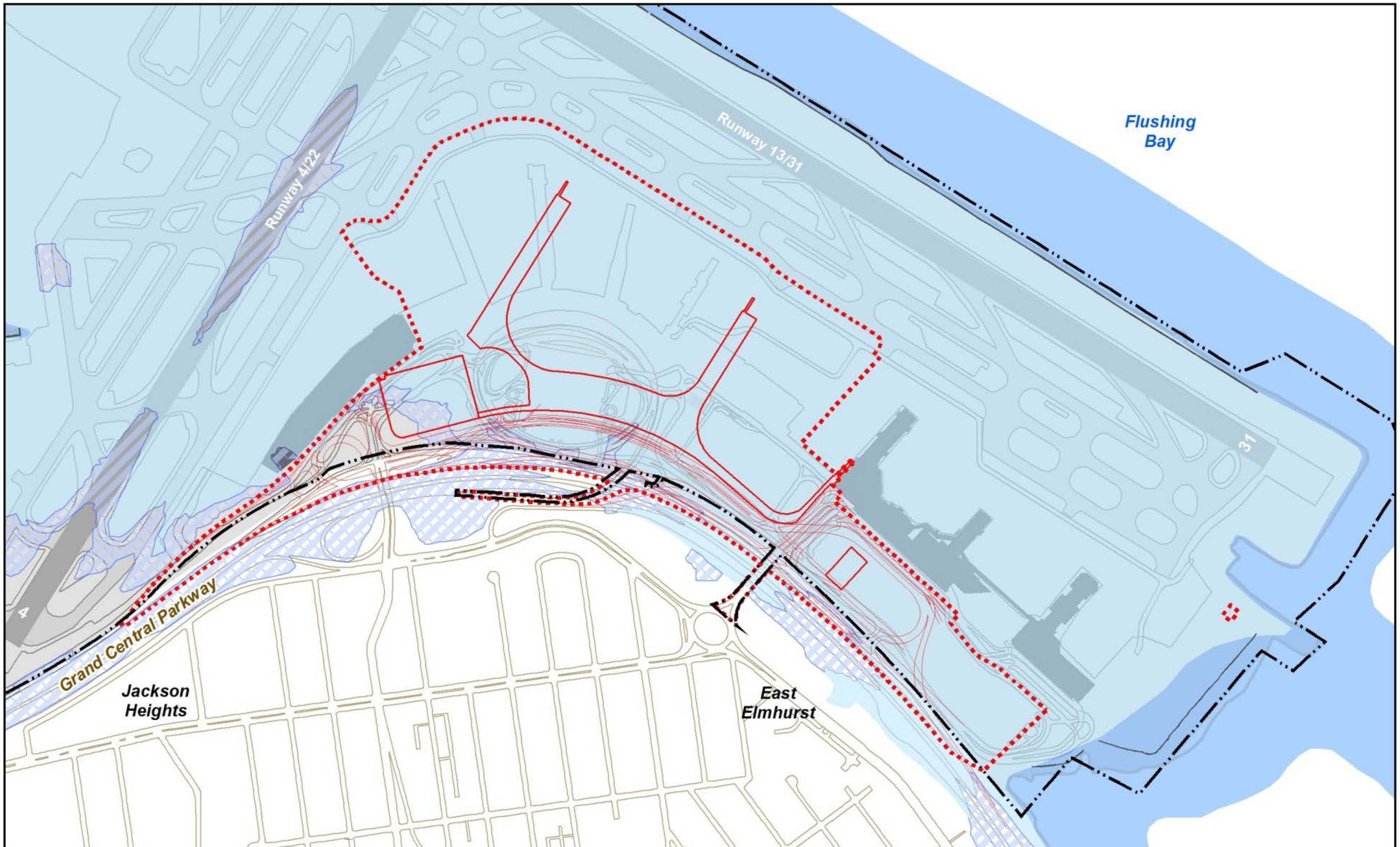


Figure 5-6b
Floodplains
(Preliminary Flood Insurance Rate Map)



Legend

- 100-Year Floodplain (Base Flood Elevations Determined)
- Coastal Flood Zone with Velocity Hazard (Base Flood Elevations Determined)
- Other Flood Areas
- Existing Airport Property Line
- Proposed Development
- Project Limit

N

0 500 1,000 Feet

Source: FEMA (12/05/2013), NYC DCP, ESRI, AECOM

Figure 5-6

2014 EA Graphic

LAGUARDIA AIRPORT CENTRAL TERMINAL BUILDING REDEVELOPMENT PROGRAM THE PORT AUTHORITY OF NY & NJ

Floodplains (Preliminary Flood Insurance Rate Map)

The following documents establish the criteria that would be applicable to the design and construction of the CTB Redevelopment Program in the floodplain:

- *NYC Building Code Appendix G: Flood-Resistant Construction, 2008*
- *PANYNJ Memorandum, Project Design Evaluation - Climate Change Projections, June 19, 2009*

Change: The PANYNJ Memorandum has been updated to be consistent with the NYC Building Code ("Code") and adds specification of cost-benefit analysis and freeboard based on useful asset life. The PANYNJ Design Guidelines – Climate Resilience (January 2015) are the updated standard for construction at PANYNJ facilities and establish more rigorous standards that those assumed in the 2014 FONSI/ROD. The table below sets forth the flood protection levels (building elevation levels) designated in the Code and the flood protection elevation levels that will be applied by the PANYNJ Design Guidelines. The PANYNJ Design Guidelines are more rigorous because they also adjust the building levels for the predicted Sea Level Rise ("Sea Level Rise Adjustment"), thus requiring that, taking into account the life of the asset, buildings within the floodplain that will be subject to that Sea Level Rise, be constructed at an elevation higher than the Code requirement.

Flood Protection Levels						
	Non Critical Assets			Critical Assets		
Asset Design Life	Code Requirement	Sea Level Rise Adjustment	Final Flood Protection Elevation	Code Requirement	Sea Level Rise Adjustment	Final Flood Protection Elevation
Up to 2020	12"	6"	FEMA 1% Elevation + 18"	24"	6"	FEMA 1% Elevation + 30"
2021-2050	12"	16"	FEMA1% Elevation + 28"	24"	16"	FEMA1% Elevation + 40"
2051-2080	12"	28"	FEMA1% Elevation + 40"	24"	28"	FEMA1% Elevation + 52"
2080+	12"	36"	FEMA1% Elevation + 48"	24"	36"	FEMA1% Elevation +60"

Figure 5-7 PANYNJ Design Guidelines-Climate Resilience Flood Protection Level

Source: PANYNJ Design Guidelines-Climate Resilience, 2015[49]

Compliance with the National Flood Insurance Program (NFIP) is mandatory for all jurisdictions in New York State pursuant to the NYS Environmental Conservation Law. As a result, many of the provisions contained in Appendix G of the NYC Building Code are necessary to meet the federal and state requirements. Appendix G references the current FEMA flood maps and the American Society of Civil Engineers (ASCE) 24 Standard for Flood Resistant Design and Construction.[50] ASCE 24 specifies the

[49] *PANYNJ Design Guidelines-Climate Resilience. http://www.panynj.gov/business-opportunities/pdf/discipline-guidelines/climate-resilience.pdf*

[50] *ASCE 24: Flood Resistant Design and Construction* is a referenced standard in the *International Building Code (IBC)*. Any building or structure that falls within the scope of the IBC that is proposed in a flood hazard area is to

minimum requirements and expected performance for the design and construction of buildings and structures in FEMA-designated flood hazard areas. For example, ASCE 24 provides for “dry flood-proofing” critical areas, i.e., those for which a disruption of service would result in significant impacts to facility operations. A dry flood-proofed structure is made watertight below the level that needs flood protection to prevent floodwaters from entering. ASCE 24 also adds a 1-foot “freeboard” to the design flood elevation. Freeboarding is elevating a building’s lowest floor above predicted flood elevations to compensate for unknown variables that could contribute to flood levels greater than predicted, such as high velocity wave action from coastal storm events.

In addition, climate change projections provided to the City of New York by the Columbia Center for Climate Change Systems Research predict that by the 2080’s the mean sea level (MSL) elevation is anticipated to increase 18 inches over the current mean high water (MHW) conditions. As an added measure of protection against future coastal flooding, PANYNJ issued a Climate Change Projections Memo in 2009 establishing a policy that all new construction (and major rehabilitation projects) be evaluated based on the predicted MSL elevation. Accordingly, PANYNJ stipulates a design elevation that is 18 inches *over and above* the current 1-foot freeboard elevation required by ASCE 24 (i.e., current FEMA 100-year flood level plus 2.5 feet) for all project elements. Where prohibiting factors preclude the application of these design criteria to all project elements, focus should be centered on critical project elements.

Using the design criteria as described above, a comprehensive flood hazard mitigation plan with freeboard elevations and flood-proofing measures would be implemented to the degree practicable, with special emphasis on critical equipment associated with the terminal building, the Central Heating and Refrigeration Plant (CHRP), the West Garage, and the East Field Lighting Vault.[51] The same measures have already been applied to other projects at LaGuardia Airport, including the East End Substation (EES) and the East Garage. As discussed in Section 5.3, Coastal Resources, the New York State Department of State (NYSDOS) has concurred with PANYNJ’s coastal zone consistency determination, which considers potential impacts to the coastal floodplain.

Probable impacts on the floodplain would be limited to the redevelopment of existing facilities and built land; no secondary or induced development has been identified that would cause or contribute to indirect or cumulative effects on the floodplain. Approximately 88 percent of the project site would be located within the 100-year tidal floodplain as delineated in the Preliminary FIRMs released by FEMA in December 2013. Only the extreme eastern portion of the project limits encroaches upon the coastal high hazard area (see **Figure 5-6**) where taxis and passenger vehicles would normally be parked within Parking Lot #5 (and would not normally be parked in the event of a 100-year storm). Some of the proposed roadway reconfiguration and a portion of the West Garage would be located along the southern fringe or outside of the 100-year floodplain.

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be designed in accordance with ASCE 24. Buildings designed according to ASCE 24 are better able to resist flood loads and flood damage.

[51] Functional constraints of the existing landside and airside facilities limited the feasibility of constructing the new terminal at levels above the required elevation established by design criteria. Existing elevations of the runways and taxiways are established and code requirements prohibit sloping towards the terminal above a maximum grade. Similarly, the roadways on the Grand Central Parkway and in front of Terminals C and D are at a fixed elevation and the proposed connecting roadways must meet design criteria for slopes, curves and vertical clearance.

Land use cover types associated with the CTB Redevelopment Program were compared to the Existing/No-Build condition. Under the CTB Redevelopment Program, impervious cover within the 100-year floodplain would increase by approximately four acres and the area displaced by buildings would decrease by approximately four acres. Regardless, the 100-year floodplain surrounding LaGuardia Airport is controlled by coastal storm surges and tidal flooding; therefore, the CTB Redevelopment Program would have no effect on the FEMA designated 100-year flood elevation.

Significant Impact Threshold

When it is not practicable to avoid the floodplain, DOT Order 5650.2 establishes the criteria used to determine if a "significant encroachment" would occur. Based on DOT's policy, a significant encroachment on the floodplain would *not* occur for the following reasons:

- The probability of the loss of human life is low. There are no residences within the floodplain boundary; therefore, the human population would be limited to building occupancy consisting of passengers, visitors, and employees. As previously discussed, all new buildings and facilities would comply with NYC Building Code and life safety requirements, including general provisions for flood hazard design and construction. In addition, coastal storms are predictable, and PANYNJ has the authority to cease operations and to evacuate the Airport in the event of a coastal storm; in which case, access to and egress from the Airport is by roadways located outside the floodplain. In addition, the proposed terminal access roadways would be elevated, so emergency evacuation or recovery efforts would not be impeded.

- The CTB Redevelopment Program would be designed to avoid or minimize future extensive damage or costs, including damage that would interrupt Airport service. As previously discussed, NYC Building Code and PANYNJ policy prioritize setting the floor elevations and critical equipment higher than the design flood elevation and to dry flood-proof critical areas if it is impracticable to meet the design criteria. The existing airfield and navigational aids are not affected by the CTB Redevelopment Program, except for the East Field Lighting Vault, which would be constructed at-grade and contained in a dry flood-proofed room because it would be impracticable to elevate the structure or to locate the facility outside the floodplain.

- There would be no notable adverse impacts on the floodplain's natural and beneficial values. Project-related impacts on the floodplain would be limited to the redevelopment of existing facilities and built land. As discussed in other applicable sections of the 2014 EA, the CTB Redevelopment Program would have no adverse impacts on biotic communities, coastal resources, water quality, or wetlands.

Change: The proposed design changes would comply with the updated PANYNJ Memorandum that is consistent with the NYC Building Code ("Code") (which references the current FEMA Flood Insurance Rate Maps and the American Society of Civil Engineers (ASCE) 24 Standard for Flood Resistant Design and Construction) and adds specification of cost-benefit analysis and more rigorous freeboard (building elevation levels) based on useful asset life. The PANYNJ Design Guidelines – Climate Resilience are the updated standard for construction and establish more rigorous standards that those assumed in the 2014 FONSI/ROD. (See explanation and Table above) The Draft EA was advertised for public comment, referencing Executive Order 11988. During the public hearing in May 2014, there were no public comments received relating to the encroachment on the floodplain, nor were any written comments received. Applying the PANYNJ Design Guidelines and the Code, the proposed design changes do not *alter the previously approved (2014) encroachment on the floodplain. The conclusion in the EA does not change – a significant encroachment on the floodplain will not occur.*

Buildings located in FEMA designated floodplains must comply with the National Flood Insurance Program, the International Building Code, the American Society of Civil Engineers national reference standards, and with the NYC City Building Code. The CTB Redevelopment Program includes a flood hazard mitigation plan developed in compliance with applicable federal, state, and local laws and regulations for the protection of floodplains and with the referenced standards for flood resistant design and construction. Compliance with these requirements provides adequate assurance that project-related impacts on the floodplain would be less than significant. No additional mitigation measures are proposed.

5.2.3.2 No-Action Alternative

The No-Action Alternative would not avoid undertaking major improvements within the floodplain. As discussed in Section 3.2, No-Build/No-Action Alternative, if the CTB Redevelopment Program is not implemented, PANYNJ would have to renovate the existing CTB, investing up to $3 billion to modernize the entire facility. Because a major renovation would occur within the 100-year floodplain, the same flood-resistant design criteria that apply to the CTB Redevelopment Program would also apply to the No-Action Alternative.

However, unlike the CTB Redevelopment Program, which provides new facilities based on mitigation measures for flood hazard design and construction, under the No-Action Alternative the existing facilities would need to be modified or retrofitted to meet the same requirements and it may not be practicable to do so. For example, without new construction, it would not be possible to raise the lowest floor elevation of the terminal building or practical to relocate critical areas to a higher level. This would result in a greater need for dry flood-proofing critical areas to meet the design criteria.

The No-Action Alternative would not result in a significant encroachment on the floodplain. The probability of the loss of human life would still be low; the newly renovated facilities would be designed to avoid or minimize future extensive damage or costs to the degree practicable; and, there would be no notable adverse effects on the affected floodplain’s natural and beneficial values. Because the 100-year floodplain surrounding LaGuardia Airport is controlled by tidal flooding, the No-Action alternative would have no effect on the 100-year flood elevation.

5.2.4 Light Emissions and Visual Effects

This section provides an overview of the analysis of impacts from light emissions and visual effects from the components of the CTB Redevelopment Program. FAA requirements for addressing light emissions and visual impacts under NEPA are addressed in FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, and FAA Order 1050.1E, Change 1, Appendix A.12.

5.2.4.1 Light Emissions

Different types of lighting systems are associated with the airside, terminal, and landside areas of the Program. This section describes the location of light systems, provides information pertaining to their purpose, and considers the extent to which any lighting associated with the CTB Redevelopment Program would be recognizable to people in the vicinity or whether such lighting might potentially interfere with their normal activities.

Airside Lighting

On the airside, high-mast flood lighting of the aircraft parking apron would increase proportionately with the added size of the apron area, but these emissions would be shielded from the Grand Central Parkway and the community south of the Airport by the replacement terminal building. In-pavement and edge lighting within and around the aircraft parking apron would be replaced-in-kind and the emissions would not be expected to change appreciably. All airfield lighting and signage would comply with FAA standards and specifications for design, installation, and maintenance. No runway lighting would be involved, and there would be no change to lights associated with visual or electronic navigational aids.

Terminal Lighting

All exterior building lighting would be designed to comply with NYC Building Code, applicable industry standards, and *PANYNJ Sustainable Building Guidelines.* Narrow-beam, façade-grazing uplighting would illuminate architectural features of the proposed terminal building. Similar lighting would be integrated with the exterior screens of the proposed West Garage and the Central Heating and Refrigeration Plant (CHRP). The same lighting is already part of the design for unrelated projects under construction in the central terminal area, including the East End Substation (EES) and the East Garage. It is intended that the control of the exterior lighting of all buildings facing the Grand Central Parkway be linked to provide for a unified nighttime appearance, dimmed during late night hours to conserve energy, and complemented by a roadway lighting system using a similar source color.

Landside Lighting

Roadway lighting and other public lighting including surface parking areas, curbs, and sidewalks would be designed to produce quick, accurate, and comfortable seeing at night that would safeguard and facilitate vehicular and pedestrian traffic. All roadway lighting and associated signage would be designed to comply with applicable codes, DOT regulations, and standards, which specify the use of industrial high mast area lamps pointed downward to illuminate only the surfaces below. Although the terminal area roadways would be reconfigured within the project site, there would be no changes to roadways or other public areas beyond the project site. Therefore, the lighting required for roadways and parking would be replaced in-kind and the emissions would not be expected to change.

Relationship to the Community

LaGuardia Airport is located within a densely developed urban area and the Grand Central Parkway provides a wide buffer between the project site and the nearest neighborhoods. The Parkway is an eight-lane divided highway and is illuminated in the area of the Airport, as is the eastbound flyover ramp and the bridges located at 94th Street and 102nd Street. Given the nature and extent of existing development within this area, including existing lighting, it is highly unlikely that airport-related light emissions would affect nearby homes or businesses.

Summary of Impacts

Light emissions from the construction and operation of the CTB Redevelopment Program would not be expected to cause or contribute to off-site annoyance or present a possible danger to persons living or driving in the vicinity of Airport. ~~No nighttime construction is planned; however, if nighttime construction were to occur, the~~ light emissions would be temporary. In addition, there are means and methods available to reduce or minimize potential lighting impacts such as shielding or angular adjustment of lights, or alternative placement of lighting sources consistent with operational requirements.

Change: Under the proposed design changes, there would be nighttime demolition activity for a 5.5 month period centered around the second quarter of 2017. The activities would be limited to demolition on the Airport and would not be visible to the neighborhoods across the Grand Central Parkway. No heavy construction activities such as paving or pile driving will occur. The only additional lighting that would be needed for this airside demolition work will be temporary low mast (max height 15') lights on wheels. The lights would be submitted for FAA tower approval prior to use to ensure no glare impeding vision from the tower.

After construction, ambient light emissions associated with the operation of the CTB Redevelopment Program would not be expected to be appreciably different than existing conditions. The CTB Redevelopment Program would reconfigure the terminal building, airside apron, landside roadways, and parking garage within the project site, while the No-Action Alternative involves rehabilitating and renovating existing facilities without moving their location. In either scenario, the types of lighting systems required for safe and efficient evening and nighttime airport operations and the light emissions they generate would be essentially the same.

The CTB Redevelopment Program and No-Action Alternative would not be expected to create an annoyance to residents or businesses in the vicinity of the Airport or interfere with their normal activities. No new light emissions would be introduced into a previously unaffected area. Compliance with applicable building codes and highway design standards provides adequate assurance that any potential short-term or long-term impacts associated with project-related lighting would be less than significant. No mitigation measures are proposed.

5.2.4.2 Visual Impacts

This section examines the visual relationship between the CTB Redevelopment Program and specific elements of its surroundings, the degree of contrast likely to occur, and whether jurisdictional agencies or the public consider the contrast to be objectionable.

Under the CTB Redevelopment Program, the existing central terminal building, airside apron, landside roadways, and parking garage, would be reconfigured within the project site. Three existing airline maintenance hangars would be removed and the CHRP would be relocated. The terminal area roadways and connections to the Grand Central Parkway would be reconfigured but no off-site roadways would be affected. The CTB Redevelopment Program would occur within existing land use and zoning envelopes and would not result in physical changes in urban design beyond the project site. Therefore, assessment of visual impacts is limited to the viewshed from key vantage points located along the south side of the Airport.

The construction and operation of the CTB Redevelopment Program would be seen by people driving east and west along the Grand Central Parkway, by drivers and pedestrians looking north from Ditmar's Boulevard, and by employees and guests of the LaGuardia Airport Marriott hotel, which is located on north side of Ditmar's Boulevard near the 102nd Street entrance to the Airport. With the exception of Overlook Park along 22nd Drive, and views from multi-story buildings in the vicinity, there are few if any vantage points of the project site from businesses and residences south of Ditmar's Boulevard west of 94th Street or east of 102nd Street.

Visually distinct landscape units within the viewshed include roadways and ramps associated with the Grand Central Parkway and existing Airport buildings located within the central terminal area. During the construction period, many of these features would change. People in the vicinity would see the existing parking garage and Hangars 1, 2, and 4 being removed to make space for the new three-level terminal building, which would replace the garage as the closest and most prominent Airport feature adjacent to the Grand Central Parkway. There would be no major changes to the Parkway's main line roadways, although the eastbound flyover ramp to the Airport would be realigned to feed into the reconfigured terminal area roadway system. Construction activities would be temporary and the visual impacts during construction would diminish as the project nears completion.

Degree of Contrast

Assessing the degree of contrast using before-and-after images of the project site is highly subjective and would be determined in large part by the community's perception of the project. The current image is a row of aging and obsolete airport buildings separated from the Grand Central Parkway by a large parking garage and several surface parking lots. The proposed image is a row of modern airport buildings with complementary architecture that unifies and organizes the entire Airport campus. The new terminal building would be designed to have a strong civic presence along the Grand Central Parkway and to be in clear line of sight for customers approaching from either direction. The position and placement of the new terminal would permit views to the New York City skyline, underscoring the terminal's role as the principle air gateway to the City and the region. At a Public Open House on December 12, 2012 and Public Information Session and Public Hearing on May 8, 2014, renderings of the proposed terminal were presented and discussed with the public.

Change: The layout of the terminal building has been revised under the proposed design changes; however the assumptions in the 2014 FONSI/ROD (modern buildings with complementary architecture, strong civic presence along the Grand Central Parkway, views to the New York City skyline) will still be applicable.

The visual impact of the CTB Redevelopment Program on the viewshed would be determined in large part by the height of the proposed terminal building as well as its relationship to the Grand Central Parkway and the nearby community. Under the No-Action Alternative, the roof elevation would not change, remaining at 72 feet above ground level. Under the CTB Redevelopment Program, the roof elevation of the new terminal would be the same or higher. The proposed roof elevation depends on the ultimate vertical clearance between the upper-level, departures/ticketing roadway and the canopy over the road. Vertical clearance could range from 20 feet up to 50 feet. Therefore, depending on final design, ~~the height of the proposed terminal would be approximately 70 to 100 feet above ground level~~.

Change: The total height of the terminal building in the proposed design changes would be 112 feet above ground level. Although this would be higher than assumed in the 2014 FONSI/ROD, the increased height would not significantly alter the viewshed.

PANYNJ conducted two comprehensive visual impact assessments of the proposed terminal building—one examines the terminal from the community located on the south side of the Grand Central Parkway, while the other looks at the presence of the terminal from the Parkway. **Figure 5-8, Community Viewshed Impacts**, illustrates the proposed height and setback of the new terminal building in relation to the Grand Central Parkway and the community. As shown, the proposed terminal would be setback ~~200 feet farther from the Parkway~~ than the existing parking garage. Also, as shown, the proposed terminal and the adjacent West Garage would have a minimal impact on the view from the community when compared to the No-Action Alternative. Using a rendering of the proposed terminal, **Figure 5-9** further demonstrates that the view of the Airport from the community would not be appreciably different with the CTB Redevelopment Program.

*Change: The revised **Figure 5-8b, Community Viewshed Impacts,** illustrates the proposed height and setback of the new terminal building in relation to the Grand Central Parkway and the community (based on the proposed design changes). As shown, the proposed terminal would be setback 170 feet further from the Parkway than the existing parking garage. A change of 30 feet versus the previously approved (2014) design (which was set back 200 feet from the Parkway versus the existing parking garage) would not be appreciably noticeable to pedestrians or drivers on the Grand Central Parkway and the terminal would still be setback further than the existing garage. Using a rendering of the proposed terminal, **Figure 5-9b** further demonstrates that the view of the Airport from the community would not be appreciably different with the proposed design changes.*

The second study assessed the presence of the proposed terminal from the Grand Central Parkway. Using the architect's rendition of the proposed terminal and West Garage, **Figure 5-10** illustrates a driver's perspective view of the proposed development from an eastbound lane, exiting the Parkway to the Airport, and **Figure 5-11** illustrates a westbound view of the proposed buildings. As shown, visually distinct units within the viewshed would change, but the CTB Redevelopment Program would have a minimal impact on a driver's view when compared to the No-Action Alternative.

City Environmental Quality Review (CEQR) Screening

According to the *CEQR Technical Manual*, an urban design assessment is needed when the project may have effects on one or more of the elements (arrangement, appearance, and functionality of the built environment) that contribute to the pedestrian experience. Further analysis is needed when the project partially or totally blocks a view corridor or a natural or built visual resource and that resource is rare in the area or considered a defining feature of the neighborhood; or when the project changes urban design features so that the context of a natural or built visual resource is altered.

The CTB Redevelopment Program would change the look of the Airport, views of which can be observed by pedestrians from the streets south of the Grand Central Parkway. A Community Impact Study analyzed photographs of the existing views from those streets, overlaid with the expected rooflines of the proposed buildings. The CTB Redevelopment Program would not partially or totally block a view corridor or a natural or built visual resource that is rare in the area or considered a defining feature of the neighborhood (i.e., Flushing Bay), nor would it change urban design features so that the context of a natural or built visual resource is altered. Therefore, further analysis of visual resources would not be required under CEQR.

In addition, a preliminary shadow analysis was performed on the proposed structures (Terminal and West Garage), in accordance with the *CEQR Technical Manual* and found that there would be no incremental shadows cast on sunlight-sensitive resources as a result of the CTB Redevelopment Program.

Figure 5-8b. Community Viewshed Impacts (Proposed design changes)

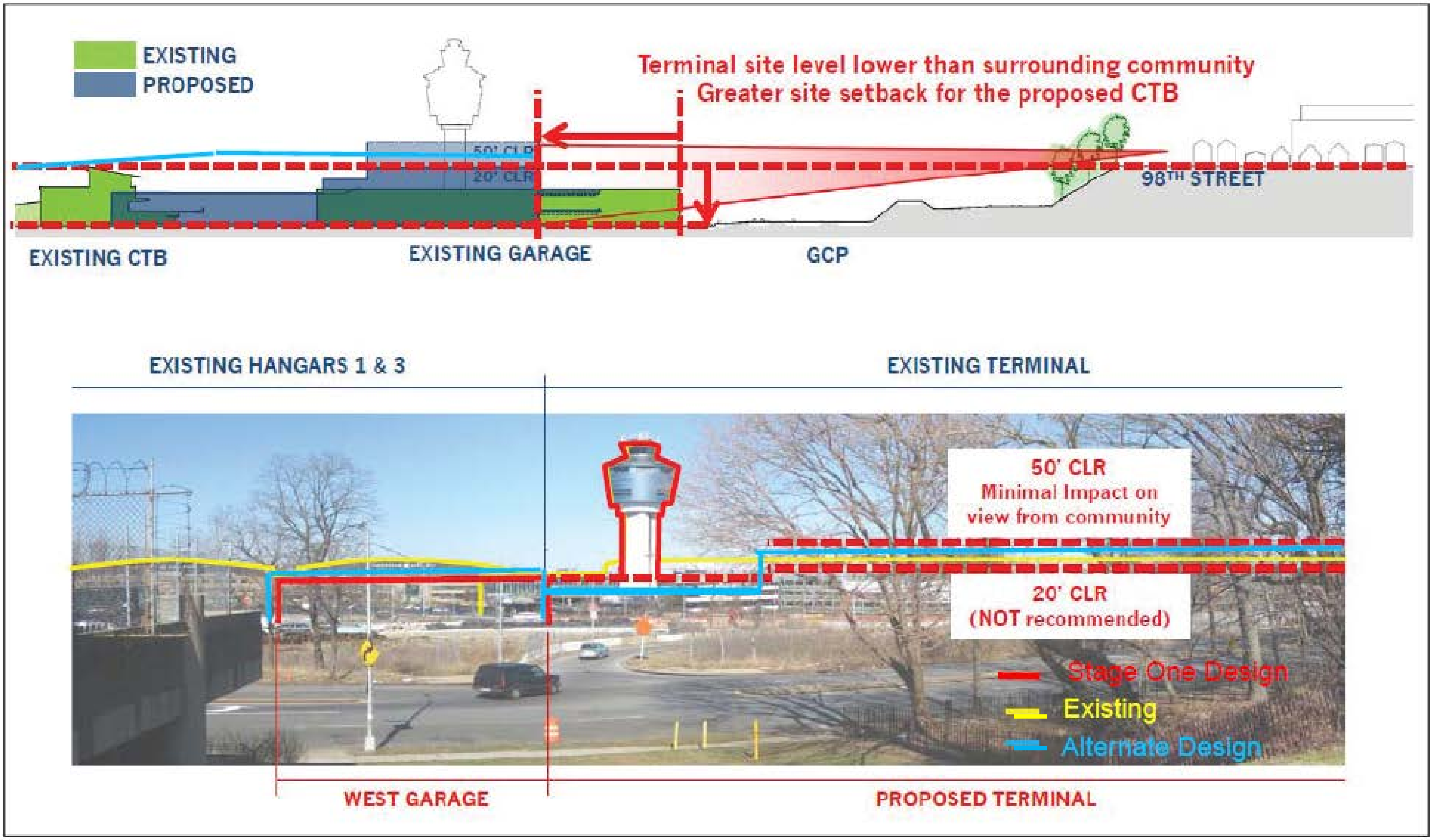

Figure 5-8a. Community Viewshed Impacts-Previously Approved Design (2014 EA)

Source: LaGuardia Gateway Partners

Figure 5-9b. Community Viewshed Impacts – View from East Elmhurst (Proposed design changes)

Figure 5-9a. Community Viewshed Impacts – Views from East Elmhurst-Previously Approved Design (2014 EA)

Figure 5-10. View from Grand Central Parkway (Eastbound) with the Previously Approved Design- 2014 EA

Figure 5-11. View from Grand Central Parkway (Westbound) with the Previously Approved Design- 2014 EA

Summary

Under the No-Action Alternative, existing light emissions and visual impacts would not change; under the CTB Redevelopment Program, changes to lighting and visual impacts would not create an annoyance or contrast with the existing environment.

5.2.5 Natural Resources, Energy Supply and Sustainable Design

The operation of an airport requires energy in the form of electricity, natural gas, aviation fuel, diesel fuel, and gasoline to power, cool, heat, and provide lighting. Energy requirements associated with airport development generally fall into two categories: those for stationary facilities (e.g., terminal buildings) and those for engines (e.g., aircraft, ground service equipment [GSE], and vehicles). Natural resources such as sand, gravel, water, wood, and steel are typically consumed during airport construction projects.

According to FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies and Procedures*, the use of natural resources other than for fuel need be examined only if the project or action involves a need for unusual materials or those in short supply. The construction of the CTB Redevelopment Program would not require any scarce or unusual building materials and the volume of consumable materials would be available from local or regional suppliers. As a result, this analysis focuses on energy demand with and without the CTB Redevelopment Program.

5.2.5.1 Construction

During construction, additional gasoline and diesel fuel would be consumed by contractors and their employees traveling to and from the project site as well as the on-road vehicles and non-road construction equipment required to build the project. There would also be a nominal increase in electricity consumed as construction trailers and other stationary facilities would be connected to the Airport's power grid. These increases would be temporary and are expected to diminish as the project nears completion.

Change: The construction schedule and phasing would be altered under the proposed design changes; however, the fuel and electricity consumed during construction would be nominal and temporary and would not have a significant impact on energy supply.

As discussed later in this section, the terminal and CHRP would be constructed to achieve a LEED rating (striving for Gold but a minimum acceptable rating of Silver). As part of PANYNJ's sustainability initiatives, during construction, preference would be given to materials and products with a high percentage of recycled content and those that have been harvested, extracted, and manufactured locally.

5.2.5.2 Operations

Fuel consumption is not expected to be appreciably different with or without the project. If the CTB Redevelopment Program is implemented, potential increases in fuel consumption associated with the use of larger aircraft and/or additional traffic volumes would be offset by decreases in fuel consumption resulting from efficiencies associated with the airside, terminal, and landside elements of the plan. For example:

- Average daily aircraft fuel (Jet A) consumed by aircraft activity would not increase appreciably because (1) the 34 MAP forecast would be achieved with minimal increase in aircraft operations (takeoffs and landings); (2) the 35-gate plan with ~~dual (two-way) taxilanes~~ reduces aircraft taxi times; and (3) equipping each gate with 400 Hz ground power and pre-conditioned air (PCAir) reduces the use of the aircraft's auxiliary power units (APUs), which also consume aircraft fuel.[52]

Change: Under the proposed design changes, two out of three gates areas would retain a dual taxilane. One gate area (concourse A) is restricted to a single taxilane but would maintain dual entry/exit points. However, TAAM analysis demonstrated a decrease of 0.1 minute per operation compared to the previously approved design (2014); therefore, the benefits to aircraft fuel consumption would remain. *As discussed in Section 5.2, Air Quality, there would either be no emissions increase or an emissions increase that is clearly de minimis.*

- Average daily gasoline and diesel fuel consumed by conventional bag tractors, belt loaders, and push-back tractors would be reduced by approximately half because comparable electric ground support equipment (eGSE) would be used exclusively at the new terminal building, which accounts for half the aircraft parking positions (gates) serviced by these types of equipment.

- Average daily gasoline and diesel fuel consumed by arriving and departing vehicles would not change appreciably due to improved levels of service on the terminal area roadways.

The benefits of the CTB Redevelopment Program in terms of fuel efficiency are demonstrated in the results of the air quality analysis. As discussed in Section 5.2, Air Quality, there would be no emissions increase or an increase that is clearly *de minimis*. Assuming that engine emissions correspond to fuel consumption, it is reasonable to conclude that any project-related increase/decrease in average daily fuel consumed would be modest when compared to the No-Action Alternative.

The CTB Redevelopment Program would not cause or contribute to a significant increase in the demand for electricity or natural gas. Consolidated Edison (ConEdison) provides electricity to the Airport using high voltage (feeder) lines leading to two separate substations owned and operated by PANYNJ – the Central Electrical Substation (CES) and the West End Substation (WES). A new East End Substation (EES) is currently under construction (as a separate action) and will replace the aging CES whether or not the CTB Redevelopment Program is implemented. Capacity of the WES is 12 Megavolt Ampere (MVA) and capacity of the new EES is 24 MVA. The total capacity (36 MVA) is capable of meeting the projected overall Airport load of 32 MVA, which PANYNJ has calculated based on existing Airport loading analysis, anticipated load expansion, and a reasonable allowance for an unanticipated peak load increase. PANYNJ has coordinated with ConEdison and determined that there is ample supply and sufficient infrastructure to deliver the energy required to meet the foreseeable needs of the project (see letter dated August 21, 2013 in **Appendix G of the 2014 EA**). No upstream/off-Airport infrastructure improvements would be required to accommodate the CTB Redevelopment Program.

Sustainability

With regard to sustainable design, White House Executive Order 13123, *Greening the Government Through Efficient Energy Management*, encourages each federal agency to expand the use of renewable energy in its facilities and for its actions.[53] Further, FAA policy directs a review of a federal action to discern the conservation of resources, use of pollution prevention measures, minimization of aesthetic effects, and address public (both local and traveling) sensitivity to these concerns.

[52] Aircraft size would increase as result of upgauging, requiring some additional fuel.

[53] 64 FR 30851 (June 8, 1999) available online at http://www.gpo.gov/fdsys/pkg/FR-1999-06-08/pdf/99-14633.pdf.

PANYNJ is committed to developing a design for the CTB Redevelopment Program that results in the construction and operation of the Airport in a sustainable manner through conservation of natural resources and protection of the environment. To this end, a *Sustainability Design Plan* has been prepared and would be implemented, as shown in **Table 5-4**. In addition, the requirements of Executive Order No. 111 on energy use and goals of the New York State Climate Action Plan on greenhouse gas reduction and mitigation of environmental impacts have been acknowledged and identified as project goals.

PANYNJ would pursue LEED certification through the U.S. Green Building Council's (USGBC) *Application Guide for Multiple Buildings and On-Campus Projects*. The proposed terminal and CHRP would be registered separately under LEED for New Construction[54] and strive towards a Gold Rating (a Silver Rating must be achieved). The remaining sub-projects, including the West Garage, roadways, and utilities, are not appropriate for LEED certification, but their design and construction would still comply with *PANYNJ's Policy on Sustainable Design* and implementing strategies outlined in *PANYNJ Sustainable Design Project Manual* or *PANYNJ Sustainable Infrastructure Guidelines*. To achieve LEED certification, and to comply with PANYNJ sustainable guidelines as applicable, key design strategies for the CTB Redevelopment Program include, but are not necessarily limited to, the following:

- Optimized building envelope components, high performance HVAC systems, and building automation and control systems partnered to meet a 30 percent reduction in energy cost as compared to baseline conditions;[55]
- Purchase of green power through Renewable Energy Certificates to meet the LEED goal of providing 35 percent of the project's electricity from renewable sources;
- Water efficient plumbing fixtures, stormwater harvesting, and gray water reuse to reduce potable water for sewage conveyance by 50 percent and potable water use in the building by more than 40 percent;

  Change: In addition to water efficient plumbing, solar water collectors at the headhouse and concourses would be installed to provide hot water to the restrooms. Rainwater harvesting, stored in underground tanks below the headhouse, will be used for irrigation at the site

- Replacement of the existing non-pervious salt splash pavers with pervious pavement to enhance percolation rates as well as protect the vegetation and lawn areas.

As per PANYNJ policy and guidelines, the CTB Redevelopment Program would be designed to comply with established environmental goals for emissions reductions, energy and water efficiency, and waste reduction. These environmental goals have targets to be met by 2050 and beyond. In addition, the design and construction of the proposed terminal would be targeted for LEED Gold certification for New Construction. Thus, the CTB Redevelopment Program would meet PANYNJ's and FAA's goals for promoting sustainable design. Under the No-Action Alternative, the existing CTB and ancillary facilities would be renovated in their existing locations and in compliance PANYNJ sustainability guidelines to the

[54] Version 3.0 / 2009

[55] American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1-2007 Baseline; http://www.ashrae.org/standards-research--technology/standards-interpretations/interpretation-for-standard-90-1-2007 ; *Change: ASHRAE 90.1-2010 will be used as the baseline.*

degree practicable. LEED certification for New Construction cannot be achieved without the CTB Redevelopment Program.

Table 5-4: Sustainable Design Goals

CTB Redevelopment Program	PANYNJ Sustainable Design Project Manual	PANYNJ Sustainable Infrastructure Guidelines	LEED New Construction	Target Achievement Level
Terminal Building	Mandatory	N/A	Registered Project	Gold
Central Heating & Refrigeration Plant (CHRP)	Mandatory	N/A	Registered Project	Gold
West Parking Garage	Mandatory	N/A	Contributes to LEED pursuit for the CTB	Meet PANYNJ Guidelines
Roadways	N/A	Mandatory	N/A	Meet PANYNJ Guidelines
Utilities	N/A	Mandatory	N/A	Meet PANYNJ Guidelines

Source: PANYNJ/SOM (2013).

Note: The terminal and the CHRP will target a Gold rating with a minimum acceptable rating of Silver under either LEED NC v3.0 or LEED NC v4, whichever is current at the time of registration with the Green Building Certification Institute.

5.2.6 Noise

Airport development actions have the potential to cause or contribute to changes in community noise levels. Changes in aircraft noise may be attributable to differences in aircraft types, approach and/or departure procedures, and the frequency of flights. Ambient noise levels may also be affected by re-aligned airport access roads, increased automobile and truck traffic, and increased vehicle speeds. In addition, construction activities typically generate noise impacts that are short-term or temporary in nature and the effects diminish as the project nears completion.

Pursuant to FAA guidelines for preparing NEPA documents, aircraft noise impacts in the vicinity of airports must be assessed using the Integrated Noise Model (INM).[56] Surface transportation-related noise assessments are typically evaluated in accordance with the Federal Highway Administration's (FHWA) *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 CFR 772), and the FHWA-approved Roadway Construction Noise Model (RCNM) is used to predict construction noise levels from on-site construction equipment. NEPA regulations that address noise are discussed in FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, and FAA Order 1050.1E, Change 1, Appendix A.14.

A detailed Noise Technical Report (**Appendix E of the 2014 EA**) has been prepared and the findings are summarized below. The analysis is divided into the three sources of noise attributable to the CTB Redevelopment Program—aircraft, on-road vehicles (during construction and subsequent operation of the project), and on-site construction equipment. The report includes detailed discussions about the fundamentals of noise, methodologies for assessing the different types of noise impacts, noise

[56] The INM is a quantitative model for predicting aircraft noise exposure around airports and is the responsibility of the FAA's Office of Environment and Energy (AEE-100). INM Version 7.0d is the most recent release.

monitoring for determining baseline conditions, the impact analysis and assessment, and mitigation measures to reduce the effects of noise on the surrounding environment.

Aircraft noise received special attention during the preparation of the 2014 EA. PANYNJ commissioned a stand-alone aircraft noise analysis and assessment of effects that is included as Attachment 1 to **Appendix E of the 2014 EA**. In addition, on October 27, 2014, PANYNJ announced the award of a contract to conduct formal Airport Noise Compatibility Planning through a Part 150 study for LaGuardia Airport. Since April 2014, PANYNJ has also been collaborating with stakeholders to formulate a formal Aviation Roundtable for airport noise issues in communities surrounding the Airport.

5.2.6.1 CTB Redevelopment Program

The noise impact analysis considers the potential changes in noise levels that would be expected to occur as a result of the construction and operation of the CTB Redevelopment Program. *An updated noise analysis (**Attachment 6, Technical Memorandum – Updated Noise Analysis for the Construction Conditions**) has been prepared and the findings are summarized below. The analysis focuses only on the noise attributable to construction of the proposed design changes – from on-road vehicles and on-site construction equipment.*

Construction Equipment Noise

An updated construction schedule and construction equipment inventory was developed for the proposed design changes, itemizing the various construction equipment that would be utilized during both demolition and construction activities. According to this schedule, 2017 would be the worst-case construction year, resulting in the maximum number of construction activities and equipment on site.

Baseline conditions established in the 2014 EA were used for comparison with the construction noise from the proposed design changes. Four noise-sensitive sites were selected for typical weekday 24-hour noise monitoring, implemented in January 2013 (M1, M2, M3 and M5). The FHWA-approved Roadway Construction Noise Model (RCNM) was used to predict construction noise levels from the on-site construction equipment at each of the four off-site monitoring locations. The analysis conservatively assumed that all equipment would be operated at the same time at the construction project site. Since the selected monitoring sites are the closest receptor locations to the proposed construction activities, the predicted noise impacts are expected to be representative of the worst-case conditions. RCNM-predicted peak daytime noise levels were calculated for each year of construction and projected noise exposure during the nighttime hours (7 PM to 6 AM) was calculated for the peak construction year (2017).

*Construction equipment noise was compared with existing background levels at four noise sensitive sites (see **Table 5-6b**). The proposed design changes would likely result in noticeable noise increases that range from 5 to 8 dBA above existing daytime background levels at two of the four monitoring sites—M2 and M3. The relatively high noise increases would occur during early construction stages (between 2016 and 2018). The highest noise level exposure is projected to occur in 2016, because the greatest pile driving activities would be clustered in 2016. The construction equipment noise levels are predicted to be well below the 85 dBA criterion established by NYSDOT in all cases. At site M1, the incremental noise from construction activities would not be noticeable given the high background noise primarily caused by the adjacent Grand Central Parkway traffic. At site M5, construction activity would have negligible noise impacts given the distance between the sources and receptors. Noise levels from construction at night may contribute several decibels to the background level for up to a period of six months at sites M2 and M3. However, these increases in noise levels are well below the NYSDOT 85 dBA criteria. Additionally,* *interior noise levels inside residential properties represented by sites M2 and M3 would not be affected by construction noise.*

Construction Traffic

The methodology for predicting future on-road traffic noise levels assumes that existing noise levels are dominated by, and are a function of, existing traffic volumes. Since different types of vehicles (cars, trucks, buses, etc.) generate different noise levels, the CEQR Technical Manual recommends using Passenger Car Equivalents (PCE) to create a common unit of measurement to conservatively estimate noise from traffic. According to the CEQR Technical Manual, a significant impact during daytime hours is an exceedance of 65 dBA; therefore, a 3 dBA increase over the future No Action condition is considered an indicator of noise impact when the noise level is at or above 62 dBA.

The mid-block PCE volumes along the roadway immediately adjacent to the noise sensitive receptors were calculated for each of the peak traffic periods (morning and afternoon) during the peak year of construction (2017), under both the No Action and proposed design change conditions. The project-generated vehicle mix during the peak construction period was used to calculate the incremental traffic-related PCEs under the proposed design changes condition. For the No Action condition, the vehicle mix data for corresponding roadway types was used to calculate the future PCE volumes (based on information provided by NYSDOT). If the proposed design changes would double PCE volumes at a given intersection, it is assumed that noise levels would increase by 3 dBA and thereby exceed the CEQR threshold for significant noise impact (for both nighttime and daytime periods for which the No Action levels exceed 62 dBA). The maximum incremental noise predicted for each roadway link within the project-related traffic network was calculated. There would be no incremental increase of 3 dBA; therefore, traffic noise impacts of the construction of the proposed design changes would not be significant and no further analysis is required.

5.2.6.1.1 Construction

Construction-related noise would be generated by on-site equipment and by increased traffic (from trucks and construction worker vehicles) using local streets in the vicinity of the Airport.

Construction Equipment

A wide range of construction equipment would be required for demolition and construction phase activities. In order to assess the construction noise impacts from on-site equipment operations, the loudest projected hourly noise level in any given month was predicted by assuming that all likely equipment would be operating within the same hour.[57] These cumulative noise levels were then adjusted based on applicable usage factors. RCNM was used to predict construction noise levels from the on-site construction equipment. Based on the equipment type, the distance between the work zone, and the selected receptor, the RCNM computes the maximum noise (L_{max}) and/or equivalent sound level (L_{eq})[58] at each receptor location. The RCNM does not account for excess ground attenuation or the rate of atmospheric absorption that would help shield the sound made by the construction noise, so the resulting predicted noise levels are higher than would actually be perceived.

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[57] Estimates of construction equipment usage were generated for the CTB Redevelopment Program using preliminary designs and assumptions based on standard industry practices (see **Appendix F**).

[58] L_{eq} is used to describe the sound energy for fluctuating noise heard over a specific time period by averaging these values and representing them as a steady, unchanging sound over that time period.

Predicted levels of construction noise were compared with existing background levels at four noise monitoring sites near the CTB Redevelopment Program. In accordance with the *CEQR Technical Manual*, typical weekday 24-hour noise monitoring was conducted to determine the existing (baseline) conditions. The selected monitoring sites are listed in **Table 5-5** below and depicted in Figure E-2.1 in **Appendix E of the 2014 EA**.

Since these selected monitoring sites are the closest noise sensitive receptor locations to the proposed construction activities, the predicted noise impacts are expected to be representative of the worst-case conditions. According to NYSDOT's *Noise Analysis Policy and Procedures*, in New York City an impact to any sensitive receptor from construction noise would only occur when levels are above 85 dB. In *Assessing and Mitigating Noise Impacts* (policy dated February 2, 2001), the NYSDEC identified an increase of 10 dB above background levels as deserving consideration of avoidance and mitigation measures.

Table 5-5: Noise Monitoring Sites (Baseline Conditions)

Site	Location	Land Use	Measured Background (DNL)	Existing CEQR Noise Exposure Classification
M1	Ditmars Blvd. between 93rd St. and 94 St.	Residential	73.2	Marginally Unacceptable
M2	Overlook Park	Park	64.4	Marginally Acceptable
M3	100th St. and Ditmars Blvd	Residential	64.3	
M5	Ditmars Blvd and 81st St. (at Marine Terminal Road)	Residential	72.6	

Notes:

1. Monitoring site M4 is a traffic intersection (94th St. and Ditmars) that was used as a control point; it is *not* a noise sensitive receptor.
2. DNL is the day/night average sound level over a 24-hour period.
3. CEQR Noise Exposure Guidelines are presented in Table E-1.2 in Appendix E.
4. 24-hour noise monitoring was conducted on January 16, 17, 29, and 30, 2013.

Table 5-6 presents the current noise levels and the expected increase in noise levels at each noise sensitive receptor location during the construction period. According to the results of the analysis, the previously approved design (2014) would likely result in noticeable noise increases that range from 5 to ~~10 dBA~~ above existing background levels at two of the four monitoring sites—M2 and M3. These two sites are located immediately south of the Grand Central Parkway near Ditmars Boulevard, between 98th St and 101st St. The relatively high noise increases would occur during early construction stages (between ~~2014 and 2017~~) corresponding with the pile driving activities. The construction equipment noise levels are predicted to be well below the 85 dBA criterion established by NYSDOT in all cases.

*Change: **Table 5-6b** presents the current noise levels and the expected increase in noise levels at each noise sensitive receptor location during the construction period. According to the results of the analysis, the proposed design changes would likely result in noticeable noise increases that range from 5 to 8 dBA above existing daytime background levels at two of the four monitoring sites—M2 and M3. The noise increases would occur during early construction stages (between 2016 and 2018). The highest noise level exposure is projected to occur in 2016, because the greatest pile driving activities would be clustered in 2016. The construction equipment noise levels are predicted to be well below the 85 dBA criterion established by NYSDOT in all cases.*

Table 5-6b *also provides a summary of projected noise exposure during the nighttime hours (7:00 PM to 6:00 AM) during 2017 when the major demolition activities are scheduled to occur. Noise levels from construction at night may contribute several decibels to the background level for up to a period of six months at sites M2 and M3. However, these increases in noise levels are well below the NYSDOT 85 dBA criteria. Additionally, interior noise levels inside residential properties represented by sites M2 and M3 would not be affected by construction noise.*

Table 5-6b: Predicted RCNM L_{eq}(1) Noise Levels at Select Monitoring Sites (Proposed design changes)

Site	Weekday Peak Hour	Leq Noise Level (dBA)								
		Measured Background L_{eq}	Daytime							Night-time
			2016	2017	2018	2019	2020	2021	2022	2017
M1 - Ditmars Blvd. between 93rd St. and 94th St.	AM	73	68	66	66	62	65	64	59	58
	Mid Day	73								
	PM	72								
M2 - Overlook Park	AM	65	72	70	69	64	69	68	61	63
	Mid Day	64								
	PM	65								
M3 - 100th St. and Ditmars Blvd.	AM	64	71	69	69	65	68	67	61	61
	Mid Day	66								
	PM	66								
M5 - Ditmars Blvd. and 81st St. at Marine Terminal Rd.	AM	67	60	59	58	55	57	57	51	50
	Mid Day	67								
	PM	64								

Table 5-6a: Predicted RCNM Daytime L_{eq}(1) Noise Levels at Select Monitoring Sites (2014 FONSI/ROD)

Site	Weekday Peak Hour	Leq Noise Level (dBA)								
		Measured Background L_{eq}	2014	2015	2016	2017	2018	2019	2020	2021
M1 - Ditmars Blvd. between 93rd St. and 94th St.	AM	73	72	70	70	70	64	64	61	59
	Mid Day	73								
	PM	72								
M2 - Overlook Park	AM	65	73	75	75	75	69	69	65	63
	Mid Day	64								
	PM	65								
M3 - 100th St. and Ditmars Blvd.	AM	64	71	74	74	74	68	68	64	62
	Mid Day	66								
	PM	66								
M5 - Ditmars Blvd. and 81st St. at Marine Terminal Rd.	AM	67	62	62	61	62	56	56	53	51
	Mid Day	67								
	PM	64								

Note: Shading indicates time periods when noise from construction equipment expected to exceed background level by 10 dBA or more. Table from 2014 EA

Construction activities would require a construction Noise Control Plan (NCP) to minimize construction noise as mandated in Chapter 28, Title 15 of the City of New York Administrative Code, *Citywide Construction Noise Mitigation.* The NCP would incorporate various noise control measures in accordance with the New York City *Citywide Construction Noise Mitigation* policy and to demonstrate compliance with the City's *Noise Control Code* (Local Law No. 113 of 2005) (see Chapter 6, Mitigation). The following noise control measures are recommended to minimize these potentially adverse effects in the community:

- Reduce the impact sound of the ram hitting the pile cap by placing a resilient pad in the anvil chamber;
- Reduce the discharge sound of the hammer's air exhaust by installing a rectangular steel enclosure lined with acoustically-absorptive material to provide both sound absorption and a limp mass noise barrier;
- Reduce the "ringing" noise of the steel piles by utilizing acoustical paint across the web of each pile at 4 to 6-foot intervals; and
- Prohibit pile driving at night.

Construction Traffic

There would be a temporary increase in truck and vehicle traffic during the construction period. Trucks would be limited to local roads in the vicinity of LaGuardia Airport due to NYSDOT restrictions on the Grand Central Parkway. Due to space limitations within the central terminal area, construction workers would park at Ingraham's Mountain (PANYNJ property located just west of the Airport) and commute to and from the construction site via shuttle buses (see **Figure 5-1**).

Per the *CEQR Technical Manual*, the methodology for predicting future on-road traffic noise levels assumes that existing noise levels are dominated by existing traffic volumes. Changes in future noise levels can be estimated by evaluating the proportional increase in traffic as a result of a given project. A doubling of traffic volume would increase noise levels by approximately 3 dBA (the minimum change in sound level that an average human ear can detect and the equivalent of doubling a sound's intensity). Passenger Car Equivalents (PCE) can be used to create a common unit of measurement for different types of vehicles (cars, trucks, buses, etc.) to conservatively estimate noise from traffic. If the CTB Redevelopment Program would double PCE traffic and thus result in a 3 dBA increase in noise level, a more detailed analysis should be performed; however, if the increase is less than double the existing PCE, it is assumed that the CTB Redevelopment Program would not cause a significant adverse vehicular noise impact.

The mid-block PCE volumes along the roadway immediately adjacent to the noise sensitive receptors were calculated for each of the peak traffic periods (morning and afternoon) for which construction traffic was predicted (see traffic analysis in **Appendix A of the 2014 EA**). The peak period with the highest incremental PCEs was selected for the analysis. The analyses determined that the maximum incremental noise predicted for each roadway link within the project-related traffic network was below 3 dBA in all cases. Therefore, traffic noise impacts from construction of the CTB Redevelopment Program would not be significant and no mitigation measures related to construction traffic are warranted to comply with CEQR guidelines*. Change: The construction traffic noise for the proposed design changes was analyzed using the updated construction traffic in Attachment 4. Results are presented in Attachment 6. The analyses determined that the maximum incremental noise predicted for each roadway link was below 3 dBA in all cases.*

5.2.6.1.2 Operations

The CTB Redevelopment Program would accommodate 34 MAP compared to 30.1 MAP for the No-Action Alternative—an incremental increase in passenger demand of 3.9 MAP. As a result, noise may increase due to changes in the aircraft fleet mix and increased vehicular traffic. All other operations at the Airport would remain similar to existing conditions and have no impact on noise.

Since there would be no changes to the operational conditions compared to the previously approved design (2014) (i.e., no increase in passenger demand, no change in aircraft fleet mix, and only minor changes to the on-Airport roadway design), no further analysis of aircraft noise or future operational on-road vehicle noise was performed.

Aircraft Noise

An aircraft noise analysis was performed using the FAA-required INM, Version 7.0d. The noise contours calculated by the INM for an airport are a function of several factors including the number of aircraft operations during the period evaluated, the types of aircraft flown, the time of day when they are flown, how frequently each runway is used for arrivals and departures, the routes of flight used to and from the runways, and the operating weight of the aircraft. The noise analysis in **Appendix E of the 2014 EA** describes the methodology, assumptions, and the detailed results of the aircraft noise analysis that was conducted to assess the effects that the CTB Redevelopment Program would have on noise exposure in the communities surrounding LaGuardia Airport. The existing noise exposure contours were based on sample radar data compiled from April 2012 through March 2013, as it was the latest data available at the time of analysis.[59] [60] The data reflect the most recent arrival and departure procedures to and from the Airport, including the TNNIS climb departure procedure recently implemented by FAA.

The INM produces day-night average sound level (DNL) noise contours. The DNL metric represents the cumulative noise level in an area over a 24-hour period. Noise produced by all aircraft events during a 24-hour period are added together, with an extra 10 dB weight added to nighttime operations (between 10:00 PM and 6:59 AM). If any noise sensitive land uses within the DNL 65 dB noise contour would experience increases in noise of DNL 1.5 dB or greater as a result of the CTB Redevelopment Program, a significant noise impact would occur.

Aircraft operations (takeoffs and landings) are not expected to change with, or without, the CTB Redevelopment Program. As previously discussed, slot-controls are in place to help the FAA manage congestion at LaGuardia Airport by limiting the number of takeoffs and landings that may occur per hour. Instead of adding flights, forecast passenger demand would be accommodated through the use of larger aircraft with increased passenger loads (“upgauging”). The existing runway configuration, arrival or departure procedures, and runway use percentages would remain the same. Therefore, the aircraft noise analysis focuses specifically on the aircraft fleet mix change.

DNL noise exposure contours were prepared for the opening year (2021) and the horizon year (2030) for the CTB Redevelopment Program and No-Action Alternatives (see Attachment 1 of **Appendix E of the 2014 EA**). The larger aircraft accommodated by the CTB Redevelopment Program would result in an

[59] Radar data from PANYNJ’s Airport Noise and Operations Management System (ANOMS).

[60] The baseline year (April 2012 to March 2013) ensures the results incorporate the most recent flight procedures implemented for the Airport, but differs from the Vehicle Traffic base year of 2012, which was based on data collected in the field that year.

increase of 0.2 square miles of the DNL 65-70 dB contour between the No-Action and CTB Redevelopment Program scenarios for 2030 (see **Figure 5-12**). The DNL 65 dB contour for the CTB Redevelopment Program, compared to the No-Action contour, increases only slightly along the primary approach and departure corridors. Based on this analysis, no areas within the DNL 65 dB contour beyond Airport property would experience an increase in noise of DNL 1.5 dB or greater as a result of the CTB Redevelopment Program.

The CTB Redevelopment Program would result in an increase to the number of noise-sensitive land uses located within the DNL 65 dB noise contour (see **Appendix E of the 2014 EA**, Attachment 1, Table 9); however, there would not be a 1.5 dB increase within the DNL 65 dB noise contour (FAA's threshold of significance) over noise-sensitive land uses (see Section 5.13 and **Appendix E of the 2014 EA**). The Monsignor McClancy Memorial High School, Our Lady of Fatima School, and Korean Church of Queens, all located within the Jackson Heights and East Elmhurst neighborhoods, would experience a noise increase of 0.5 dB, while all other noise-sensitive land uses would experience an increase of less than 0.5 dB.

- Although not required since the noise increase would be less than 1.5 dB, additional analysis to determine the extent of the potential increase in noise was conducted for disclosure purposes only.
- A review of areas of noise increase less than 1.5 dB within the DNL 65 dB contour for the CTB Redevelopment Program indicates that there are no areas off-Airport property that would experience a noise increase of 1.0 dB or more.
- A review of areas of noise increase less than 1.0 dB within the DNL 65 dB contour for the CTB Redevelopment Program indicates a 0.5 dB increase would occur near the south side of the Airport. As shown in **Figure 5-13,** the area of noise increase would occur over neighborhoods within the Jackson Heights and Steinway communities, between the Brooklyn Queens Expressway and the approach end of Runway 4. The area of noise increase occurs over residential areas as well as other types of land uses and includes one place of worship and two schools. No libraries, hospitals, or nursing homes have been identified within the area of noise increase.
- No other communities or neighborhoods within the DNL 65 dB contour located north, east, or west of LaGuardia Airport would be expected to experience a noise increase of 0.5 dB or more.

Per FAA guidance, noise increases below 1.5 dB within the DNL 65 dB contour are not considered significant effects; therefore, the CTB Redevelopment Program is not expected to result in any significant impacts in noise-sensitive land uses around the Airport.

Traffic Noise

Operational traffic noise impacts were predicted based on PCE comparisons using the same method of proportionate traffic increases estimating future sound levels as construction traffic (see Section 5.13.1.1). The CTB Redevelopment Program scenario assumes the proposed roadway improvements are made and an additional 3.9 MAP utilize the Airport (beyond the background traffic increase assumed under the No-Action scenario). Analysis of future traffic conditions in the year 2030 under the Proposed Action conditions was performed based on the traffic analysis for forecast passenger demand (see **Appendix A of the 2014 EA**).

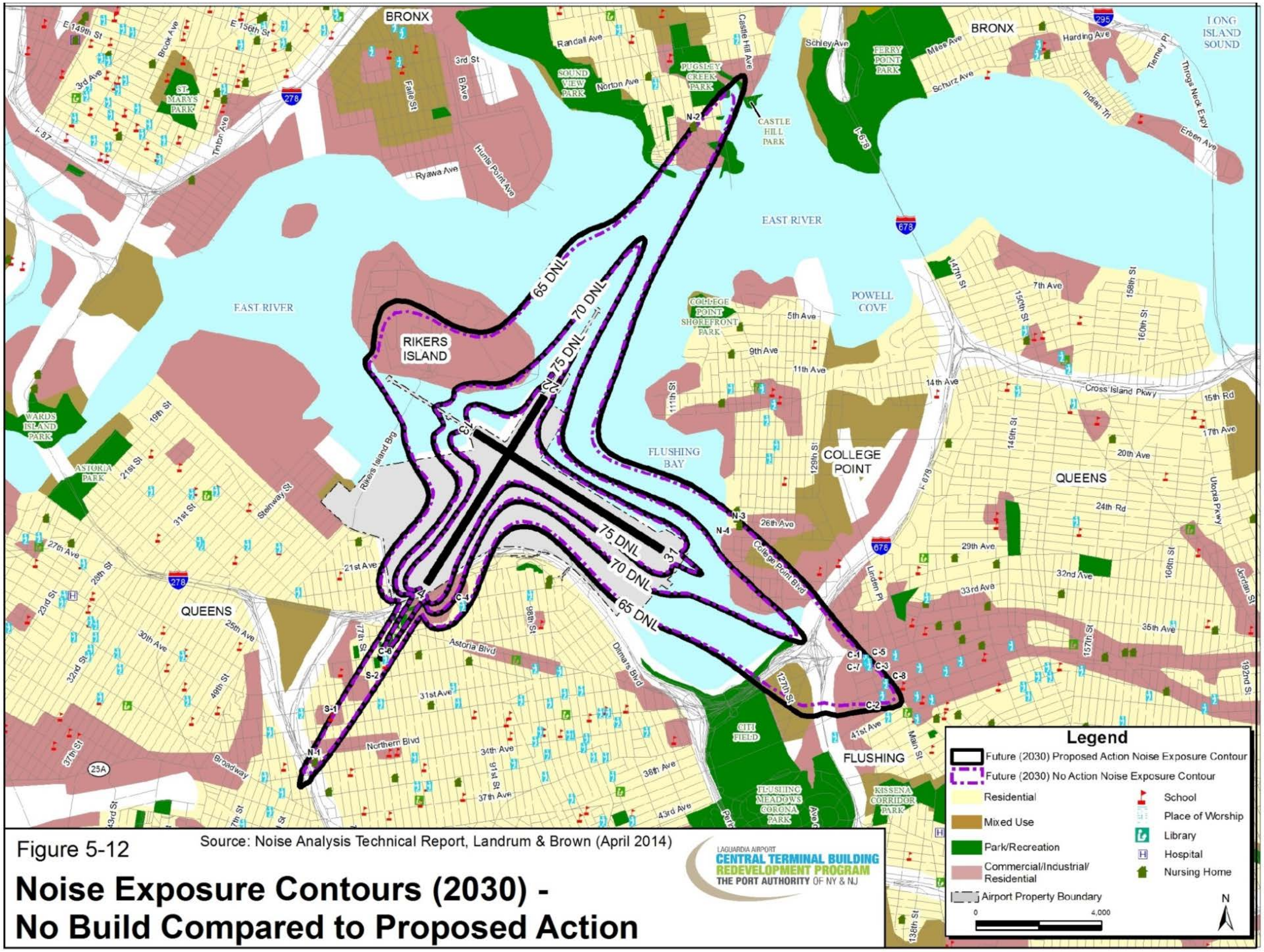

Figure 5-12

Source: Noise Analysis Technical Report, Landrum & Brown (April 2014)

Noise Exposure Contours (2030) - No Build Compared to Proposed Action

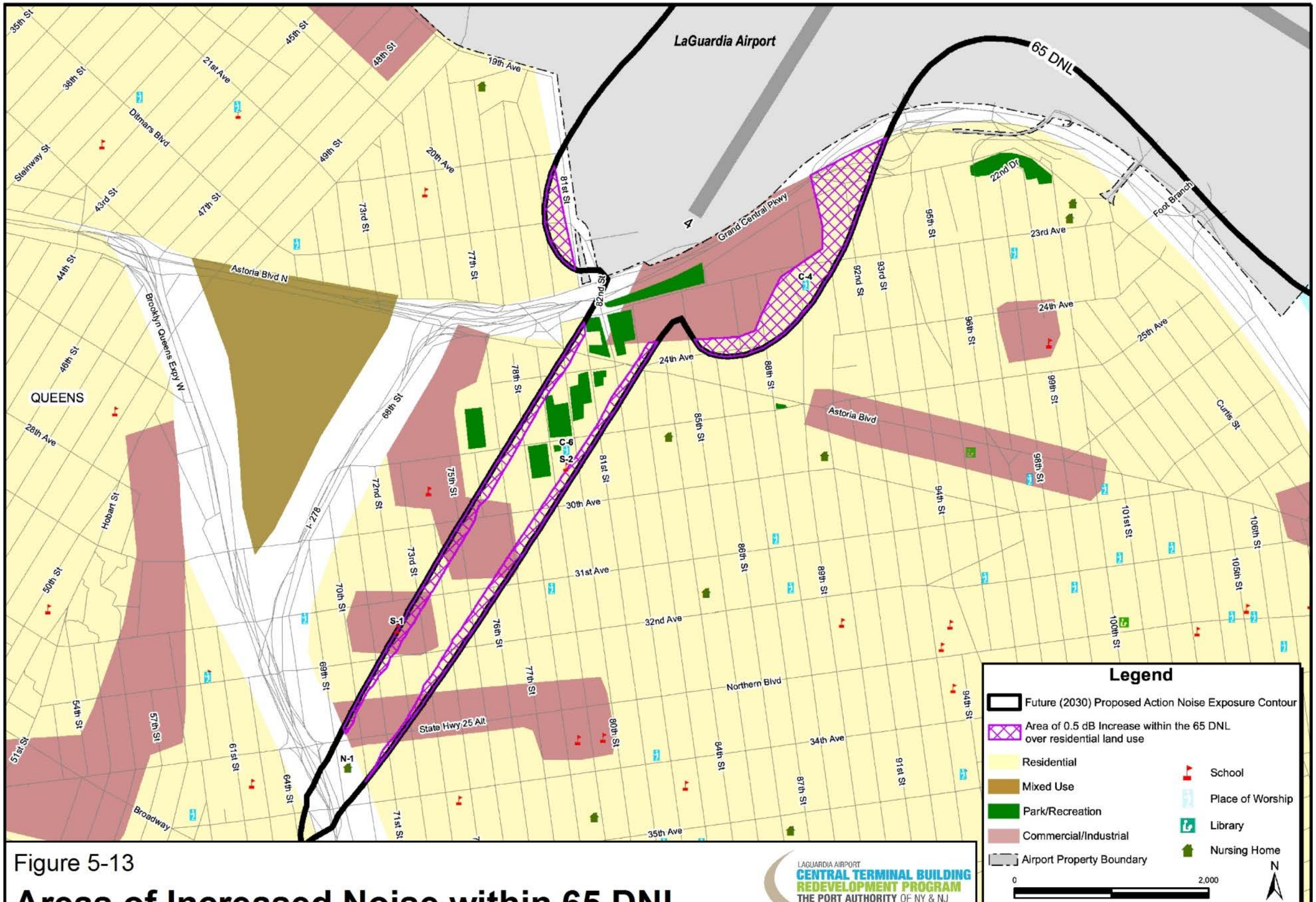

Figure 5-13

Areas of Increased Noise within 65 DNL

Source: Noise Analysis Technical Report, Landrum & Brown (April 2014)

NOTE: There are no 1.5 dB or 1.0 dB increases within the 65 DNL off airport-owned properties.

Assuming completion of the CTB Redevelopment Program and realization of the full forecasted passenger levels, the peak hour noise within the project traffic network during operations in the year 2030 is not predicted to be greater than 3 dBA for any study intersection. Therefore, traffic noise impacts from the CTB Redevelopment Program under the operational condition would not be significant. No mitigation measures related to operational traffic are warranted to comply with CEQR guidelines.

5.2.6.1.3 Summary of Impacts

The area around LaGuardia Airport has high existing background noise levels. With the exception of pile-driving activities during the first few years of construction, the noise generated during construction activities would not be discernible from the normal background noise levels in the area. Mitigation measures would be implemented and a noise control plan drafted to minimize the potential for adverse effects on the community. The temporary increase in vehicular traffic due to construction traffic would not result in noise impacts to residential or other sensitive land uses due to the distance between the construction site and the receptor. After construction, noise levels from aircraft and vehicular traffic would be expected to increase; however, the noise increase is predicted to be well below the 1.5 dB threshold established by the FAA.

5.2.6.2 No-Action Alternative

Under the No-Action Alternative, PANYNJ would renovate the existing buildings in their current locations, investing up to $3 billion to modernize the entire facility. Unlike the CTB Redevelopment Program, the scope of construction would not include roadway improvements or require pile-driving activities; therefore, it can be assumed that the construction-related noise levels would be consistent with background noise levels and that no adverse noise impacts would occur.

Without the CTB Redevelopment Program, forecasted passengers at LaGuardia Airport would still increase to 30.1 MAP by 2030—a 6.5 MAP increase over the 2010 baseline condition. That increase in demand would be achieved by a modest increase in the number of aircraft operations at the Airport and through upgauging of the fleet mix (although to a lesser degree than the CTB Redevelopment Program) resulting in a small increase in the size of the noise contours even without the CTB Redevelopment Program. In addition, passenger vehicle traffic would increase – although the increment would not be noticeable above background growth over that same time period, as described in Section 5.1. Therefore, though there would be an increase in noise in and around LaGuardia Airport under the No-Action Alternative, according to federal guidance, the increase would not result in a significant noise impact to sensitive receptors.

5.2.7 Construction Impacts

This section discusses the potential for adverse impacts on the environment due to construction. These are impacts caused by and confined to the construction period. Consequently, they are temporary in nature, terminating with the completion of construction activities and restoration of the project site. Many of the specific types of impacts that could occur and the permits or approvals that may be required are covered in the descriptions of the other appropriate impact categories, i.e., traffic, air quality, noise, etc. To avoid repeating information included in the other sections of this chapter, this section summarizes, for each environmental consequence, the impacts related specifically to the construction phase of the CTB Redevelopment Program as well as the corresponding mitigation measures that could be taken to avoid or minimize environmental harm. Construction-period mitigation measures, if necessary, are also discussed in Chapter 6, Mitigation.

The CTB Redevelopment Program is divided into multiple construction phases that would take approximately eight years to complete, beginning in 2014 and continuing through 2021.

Change: The construction schedule and phasing for the proposed design changes has been reduced to 68 months, beginning in 2016 and continuing until the end of 2021.

More detailed information about the construction phase activities is provided in **Appendix F: Supporting Data of the 2014 EA**. The CTB Redevelopment Program is described in Section 3.1, Proposed Action Alternative. The descriptions of the proposed project, the work to be performed, and the estimated quantities provide the foundation for assessing the following construction impacts:

- Construction-related traffic on local roadways
- Air pollution, including engine exhaust emissions and fugitive dust
- Habitat degradation and loss, including tree removal and replacement
- Impacts on historic resources, including buildings and a potential archaeological site
- Demolition and construction waste, including hazardous materials
- Noise pollution, including construction-related traffic and equipment noise
- Water pollution, including soil erosion and sedimentation

If the CTB Redevelopment Program is implemented, the project specifications would follow the provisions of FAA Advisory Circular 150/5370-10F, *Standards for Specifying Construction of Airports*. This Advisory Circular (AC) outlines the FAA's guidelines and specifications for materials and methods used in the construction of airports. The use of this AC is mandatory for all projects funded with federal grant monies through the Airport Improvement Program (AIP) or with revenue from the Passenger Facility Charge (PFC) Program.[61]

In addition, as referenced throughout this section, the CTB Redevelopment Program would comply with PANYNJ *Sustainable Design Guidelines* to the degree practicable.[62] These guidelines, which include Sustainable Building Guidelines (Part 1, for projects inside the building envelope) and Sustainable Infrastructure Guidelines (Part 2, for projects outside the building envelope), aim to optimize infrastructure project design through sustainable engineering practice, with the goal of cost savings, extending the lifecycle of a project and, in some cases, a reduction in operational costs.

5.2.7.1 Traffic and Transportation

During the construction period, temporary traffic impacts would be limited to increased traffic volumes on neighborhood roads, which may cause or contribute to increased traffic congestion and increased travel times for drivers—most of which would be expected to occur during off-peak times of the day. There are no proposed road closures, traffic detours, or other foreseeable disruptions of local surface

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[61] See Grant Assurance No. 34, "Policies, Standards, and Specifications," and PFC Assurance No. 9, "Standards and Specifications."

[62] On July 13, 2006, the PANYNJ issued Administrative Instruction 45-2 (AI 45-2) "to reduce adverse environmental impacts of the design, construction, operation and maintenance and occupancy or leasing of new or substantially renovated buildings and facilities, reconstruction projects, and programs." AI 45-2 referenced creation of sustainable design guidelines and an accompanying compliance framework, which were incorporated into the *Sustainable Design Guidelines* (formerly the *Sustainable Design Project Manual*, August 2007).

transportation patterns in the community surrounding the Airport. As such, there would be little to no impact to the traveling public and access by emergency vehicles would not be impeded. The Port Authority Police Department would regularly coordinate with the New York City Police and Fire Departments during construction. Traffic impacts during the construction-period are assessed in Section 5.1, Traffic and Transportation, and in **Appendix A: Transportation of the 2014 EA**.

Change: Traffic impacts during construction for the proposed design changes are assessed in Attachment 1: Updated Traffic Analysis for Construction Conditions.

Construction-induced traffic impacts cannot be avoided but the effects would be minimized using temporary measures to reduce delays such as adjusting signal timing at the study intersections, as discussed below.

Construction-Related Vehicles on Local Roadways

Construction activities would generate additional traffic on the local roadways. The incremental increase in traffic volumes associated with the CTB Redevelopment Program would consist of construction-related vehicles. Construction-related vehicles include both construction workers traveling to and from the designated contractor parking area via passenger vehicles and shuttle buses, as well as trucks hauling material and equipment to and from the construction site via established New York City truck routes. The designated contractor parking area is a site to be developed on Airport property along the north side of 19th Avenue between 45th Street and Hazen Street/Riker's Island Bridge.[63] Workers would be transported to and from the contractor parking area and the construction site using shuttle buses. As shown in **Figure 5-1**, the shuttle buses would use local roadways (e.g., 45th Street and 19th Avenue) to connect to a programmed construction-only access driveway (19th Avenue and 81st Street); the remainder of the shuttle bus route would utilize on-Airport roadways (e.g., Bowery Bay Boulevard, Marine Terminal Road, and Runway Drive/LaGuardia Road). Given the proposed construction shifts (~~7:00 am to 3:00 pm and 3:00 pm to 11:00 pm~~), worker trips would be concentrated during off-peak hours and would not represent a substantial increment during peak travel periods in the vicinity of the Airport.

Change: For a 5.5 month period centered around the peak quarter (second quarter of 2017), all construction activities are expected to take place during three construction shifts. The first shift would occur from approximately 6:00 AM to approximately 2:00 PM and comprise approximately 40 percent of the total construction personnel workforce. The second shift would occur from approximately 7:00 AM to approximately 3:00 PM and comprise approximately 40 percent of the total construction personnel workforce. The third shift would occur from approximately 10:00 PM to approximately 6:00 AM and comprise approximately 20 percent of the total construction personnel workforce. The peak hours for worker-generated vehicle trips (6:00 to 7:00 AM and 3:00 to 4:00 PM) would not overlap with the weekday morning and afternoon peak hours for traffic on the local street network (i.e., 7:30 to 8:30 AM and 4:00 to 5:00 PM) and would overlap by 15 minutes with the weekday morning peak hour of the Airport (i.e., 6:45 to 7:45 AM). Outside of the peak period, workers would arrive in two shifts: 6:00AM to 2:00PM and 7:00AM to 3:00PM.

[63] It is anticipated that daily parking for construction personnel would be accommodated at the Ingraham's Mountain site—a PANYNJ-owned parcel that would be developed for contractor parking associated with the LaGuardia Airport RSA Enhancements project, which is separate from and expected to precede the CTB Redevelopment Program.

Construction truck trips to and from the site would generally be made between the hours ~~of 4:00 AM and 10:00 PM~~ in accordance with an approved materials staging and construction access plan that specifies hours of operation, haul routes, and similar controls. Truck arrivals are expected to be generally uniform throughout this time period with slightly higher numbers of trips during the late morning and midday hours (~~8:00 AM to 1:00 PM~~) when on-site activities are expected to peak.

Change: Truck arrivals and departures are expected to be throughout the 24-hour day with slightly higher numbers during the day time (4:00 AM to 5:00 PM).

Some truck deliveries would also be made early in the morning, during off-peak times, to ensure that materials and equipment are on-site prior to the start of the first shift. Trucks would typically remain on-site for relatively short durations (typically one hour or less). All trucks are required to use NYCDOT-established truck routes, as shown in **Figure 5-1**.

To reduce the effects of the proposed project on the local traffic network, the Proposed Action includes a list of temporary transportation improvements during the construction period. As discussed in Section 5.1 and in **Appendix A of the 2014 EA**, these improvements, at a total of ~~12 intersections~~, include a traffic signal installation, a traffic signal controller upgrade, signal timing adjustments, curbside parking prohibitions, lane widening/restriping, and the use of construction flaggers.

Change: The updated traffic analysis for construction of the proposed design changes indicates that a total of 11 intersections would require temporary improvements (see Attachment 4). The changes are referenced in Table 6-1, Below.

Intersection	2014 FONSI/ROD	Proposed Design Changes
Northern Boulevard/Junction Boulevard	During the weekday morning peak hour, reallocate one (1) second of green time from the east-west phase to the north-south phase. During the weekday afternoon peak hour, reallocate two (2) seconds of green time from the east-west phase to the north-south phase.	~~During the weekday morning peak hour, reallocate one (1) second of green time from the east-west phase to the north-south phase.~~ During the weekday afternoon peak hour, reallocate two (2) seconds of green time from the east-west phase to the north-south phase.
Astoria Boulevard North Service Road/79th Street/23rd Avenue	During the weekday morning peak hour, reallocate ~~five (5) seconds~~ of green time from the northwest-bound phase (i.e., Astoria Boulevard North Service Road) to the northeast-bound phase (i.e., 23rd Avenue).	During the weekday morning peak hour, reallocate *eleven (11)* seconds of green time from the northwest-bound phase (i.e., Astoria Boulevard North Service Road) to the northeast-bound phase (i.e., 23rd Avenue).
Astoria Boulevard/Astoria Boulevard North Service Road	During the weekday afternoon peak hour, reallocate seven (7) seconds of green time from the northwest-bound phase to the westbound	During the weekday afternoon peak hour, reallocate seven (7) seconds of green time from the northwest-bound phase to the westbound

Intersection	2014 FONSI/ROD	Proposed Design Changes
	phase.	phase.
Astoria Boulevard North/Grand Central Parkway westbound off-ramp/82nd Street/Ditmars Boulevard	Restripe the westbound approach to create two exclusive right-turn lanes and one shared through/left-turn lane, and install corresponding advance lane use signs. During the weekday afternoon peak hour, reallocate ~~four (4) seconds~~ of green time from the westbound phase to the north-south phase.	~~Restripe the westbound approach to create two exclusive right-turn lanes and one shared through/left-turn lane, and install corresponding advance lane use signs.~~ *During the weekday morning peak hour, reallocate four (4) seconds of green time from the north-south phase to the westbound phase.* During the weekday afternoon peak hour, reallocate *three (3) seconds* of green time from the westbound phase to the north-south phase.
23rd Avenue/82nd Street	During the weekday morning peak hour, reallocate nine (9) seconds of green time from the north-south phase, plus one (1) second from the southbound phase, to the east-west phase (i.e., a total of 10 seconds).	During the weekday morning peak hour, reallocate nine (9) seconds of green time from the north-south phase, plus one (1) second from the southbound phase, to the east-west phase (i.e., a total of 10 seconds).
Astoria Boulevard/82nd Street/24th Avenue	During the weekday afternoon peak hour, reallocate one (1) second of green time from the east-west phase to the southbound phase.	During the weekday afternoon peak hour, reallocate one (1) second of green time from the east-west phase to the southbound phase
Ditmars Boulevard/Marine Terminal Drive	During the weekday morning peak hour, reallocate one (1) second of green time from the westbound phase to the north-south phase.	~~During the weekday morning peak hour, reallocate one (1) second of green time from the westbound phase to the north-south phase.~~
Ditmars Boulevard/81st Street	Restripe the westbound approach to accommodate two exclusive right-turn lanes and one shared through/left-turn lane and install corresponding advance lane use signs. During the weekday afternoon peak hour, reallocate eight (8) seconds of green time from the east-west phase to the southbound phase.	Restripe the westbound approach to accommodate two exclusive right-turn lanes and one shared through/left-turn lane and install corresponding advance lane use signs. During the weekday afternoon peak hour, reallocate eight (8) seconds of green time from the east-west phase to the southbound phase.

Intersection	2014 FONSI/ROD	Proposed Design Changes
21st Avenue/81st Street	During the weekday morning peak hour, reallocate eight (8) seconds of green time from the eastbound phase to the north-south phase.	During the weekday morning peak hour, reallocate eight (8) seconds of green time from the eastbound phase to the north-south phase.
19th Avenue/Hazen Street	Install a new traffic signal controller in accordance with NYCDOT design guidance. Eliminate the "48 Hour Parking, Detached Trailers" parking regulation on the north side of 19th Avenue for a distance of approximately 200 feet west of Hazen Street, and restripe a 14-foot exclusive right-turn lane and a 12-foot shared through/left-turn lane on the eastbound approach. During the weekday morning peak hour, reallocate four (4) seconds of green time from the southbound leading phase to the east-west phase. During the weekday afternoon peak hour, reallocate seven (7) seconds of green time from the southbound leading phase and five (5) seconds from the north-south phase to the east-west phase.	Install a new traffic signal controller in accordance with NYCDOT design guidance. Eliminate the "48 Hour Parking, Detached Trailers" parking regulation on the north side of 19th Avenue for a distance of approximately 200 feet west of Hazen Street, and restripe a 14-foot exclusive right-turn lane and a 12-foot shared through/left-turn lane on the eastbound approach. During the weekday morning peak hour, reallocate four (4) seconds of green time from the southbound leading phase to the east-west phase. During the weekday afternoon peak hour, reallocate seven (7) seconds of green time from the southbound leading phase and five (5) seconds from the north-south phase to the east-west phase.
19th Avenue/45th Street	Install a traffic signal at the intersection with 90 second cycle length: ~~60 seconds of green for EB/WB approaches, 20 seconds of green for NB/SB approaches,~~ and 10 seconds for yellow and all red. Remove the "48 Hour Parking, Detached Trailers" parking regulation on the east side of 45th Street, and extend the "No Standing Anytime" parking regulation on both sides of 45th Street for approximately 275 feet north of 19th Avenue, to accommodate two lanes on the southbound approach, as well as one northbound receiving	Install a traffic signal at the intersection with 90 second cycle length: *50 seconds of green for EB/WB approaches, 30 seconds of green for NB/SB approaches,* and 10 seconds for yellow and all red. Remove the "48 Hour Parking, Detached Trailers" parking regulation on the east side of 45th Street, and extend the "No Standing Anytime" parking regulation on both sides of 45th Street for approximately 275 feet north of 19th Avenue, to accommodate two lanes on the southbound approach, as well as one northbound receiving

Intersection	2014 FONSI/ROD	Proposed Design Changes
	lane. In addition, prohibit standing with a "No Standing Anytime" parking regulation on the west side of 45th Street for approximately 80 feet south of 19th Avenue, to allow for transition to the southbound through lane on 45th Street and on the south side of 19th Avenue for approximately 25 feet east of 45th Street, to accommodate the turning paths for shuttle buses turning from 45th Street southbound to 19th Avenue eastbound.	lane. In addition, prohibit standing with a "No Standing Anytime" parking regulation on the west side of 45th Street for approximately 80 feet south of 19th Avenue, to allow for transition to the southbound through lane on 45th Street and on the south side of 19th Avenue for approximately 25 feet east of 45th Street, to accommodate the turning paths for shuttle buses turning from 45th Street southbound to 19th Avenue eastbound.

Table 6-1. Comparison of Recommended Transportation Improvements for Construction Conditions

The improvements would be recommended as temporary measures to reduce delays at the study intersections and ensure the most efficient traffic signal operations during periods of construction activity.[64] The need for and timing of implementation of the improvements would be determined by the evaluation of data collected through a monitoring program by PANYNJ (in coordination with NYCDOT) throughout the construction period. With these improvements in place, no significant construction traffic impacts are projected to occur in accordance with the CEQR *Technical Manual* criteria. Therefore, no additional traffic improvements or mitigation measures are proposed.

5.2.7.2 Air Quality

Construction activities would have a temporary effect on local air quality. Air pollution during the construction period would be caused primarily by emissions from construction-related vehicles and equipment and by fugitive dust from demolition and construction activities. Construction-related air emissions cannot be avoided but the effects would be minimized using air quality best management practices (BMPs) and control measures to reduce emissions from the construction site to the degree practicable, as discussed below.

Emissions from Vehicles and Equipment

Construction traffic associated with the Proposed Action would consist of on-road vehicles generated by construction personnel (laborers, managers, and administrative staff) and by construction trucks associated with the transport of materials and equipment to and from the construction site via established New York City truck routes. In addition to the tailpipe emissions from construction traffic, exhaust emissions would be generated by diesel-fired engines used to operate non-road machinery and equipment. These construction-induced air emissions are assessed in Section 5.2, Air Quality, and in **Appendix B of the 2014 EA**. *Change: An updated construction-induced air emissions assessment for the*

[64] All transportation improvements on local roadways are subject to review and approval by NYCDOT.

proposed design changes can be found in Attachments 5 and 8. *Emissions remain below de minimis levels.*

Emissions from construction vehicles and equipment would be reduced through the use of ultra-low sulfur diesel fuel, by requiring that heavy-duty equipment be retrofitted with best available technology (BAT) devices targeted primarily for particulate matter and secondarily toward the reduction of nitrogen oxides (NO_X), and by minimizing the use of diesel-powered generators when electric power is available at the site. While the air quality analysis demonstrated that emissions from construction vehicles and equipment would not exceed any applicable standard, PANYNJ's *Sustainable Infrastructure Guidelines*[65] contain additional emission reduction strategies that could be implemented, if necessary. For example, trade contractors could be required to submit and comply with an Engine Idling Control Plan that requires operators to turn engines off after a specified period of non-activity.

Fugitive Dust

Construction is a source of dust emissions that could have an impact on air quality. "Dust" is particulate matter (PM), solid particles composed mainly of soil elements. "Fugitive" dust is small airborne PM that becomes suspended in the air and transported by the wind. Building demolition and construction activities which would produce fugitive dust include: land clearing, grading, and excavation with heavy equipment; truck travel into and out of the work area; aggregate storage piles; and loading and unloading demolition debris and building materials.

A wide array of BMPs and control measures are available to help prevent or reduce fugitive dust emissions from construction sites. These generally involve watering exposed soil surfaces, covering trucks transporting dust-producing material entering or leaving the project site, reducing construction vehicle speeds on unpaved surfaces, and using windbreaks or source enclosures to minimize wind erosion. Many situations require one or more methods to be used in combination, and several methods may be used to handle the variety of situations.[66]

The potential for fugitive dust emissions would be greatest during demolition activities, when large concrete structures such as the CTB parking garage are being removed, and during site preparation for the proposed new roadways. Although the exact method or combination of methods for abatement of erosion and emissions has not been determined at this time, at a minimum, contractors would be required to submit a proposed method of erosion and dust control together with a plan for the disposal of waste materials in accordance with FAA's *Standards for Specifying Construction of Airports.*[67]

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[65] PANYNJ, Sustainable Infrastructure Guidelines, IC-4, Utilize Green Construction Equipment (March 23, 2011).

[66] At The World Trade Center Memorial site, where dust prevention is an important aspect of construction, multiple tactics were employed. Stormwater collected in sedimentation tanks at the site is used for controlling fugitive dust. Strategies to minimize pollution include regular sweeping and wetting of dust and dry soils, use of approved sprayed suppression agents, wheel washing in designated truck wash-off areas, as well as wetting and covering of stockpiled materials to prevent erosion, when applicable.

[67] FAA, Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control, AC 150-5370-10A (September 30, 2011).

Additional strategies to minimize air pollution from dust and particulate matter at the construction site are contained in PANYNJ's *Sustainable Infrastructure Guidelines.*[68] Adherence to the aforementioned BMP and control measures would be expected to effectively reduce air pollution during the construction period. No mitigation measures are proposed.

5.2.7.3 Fish, Wildlife and Plants

Local species of wildlife would be temporarily displaced by earth disturbance and tree removal associated with site preparation such as clearing/grubbing and by earth moving for grading, drainage, etc. After construction, trees would be replaced and landscaped areas would be re-established with shrubs and grasses, thereby allowing displaced wildlife to return. Of the approximately 270 trees located between the Airport and the Grand Central Parkway, it is estimated that approximately 200 would be removed (63 of which would be off Airport property) and that the remaining trees would be avoided and protected. Where NYC Tree Removal cannot be avoided, tree replacement would comply with *NYC Rules Governing Tree Replacement*.[69] No impacts would occur to any NYC Trees without the applicable NYCDPR *Construction and Forestry Permit* and a mitigation plan approved by NYCDPR. In addition, all new or replacement landscaping would be required to comply with FAA standards and practices for wildlife hazard management.[70] For more information, see Section 5.7, Fish, Wildlife and Plants.

5.2.7.4 Hazardous Materials and Solid Waste

Demolition and construction waste would be generated by the CTB Redevelopment Program. The majority of the waste material would result from the demolition of the terminal building, parking garage, hangars, roadways, and other paved areas. Prior to demolition, environmental site assessments would be prepared for each structure to determine the presence of asbestos, lead, PCBs, or other hazardous materials.[71] All necessary precautions for the safe removal of hazardous materials and wastes would be coordinated with the appropriate state and local permitting agencies.

All construction waste would be disposed of in accordance with applicable federal, state, and local regulations. Clean construction debris (concrete, asphalt, etc.) may be recycled and used as fill material on the Airport and off-site, as needed, in accordance with present practices. The disposal of demolition and construction debris would be coordinated between PANYNJ, terminal tenants, the construction manager, and licensed waste haulers.

In addition, contaminated soils and/or groundwater may be encountered during excavation and dewatering associated with the installation of utilities, removal of underground storage tanks, and construction of foundations. Construction protocols would be in place to identify and manage the environmental issues that arise due to the discovery of soil and/or groundwater contamination at the construction site.

If hazardous materials are expected to be encountered or are otherwise discovered during construction, PANYNJ would implement appropriate safety procedures and remediation strategies as needed to

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[68] PANYNJ, Sustainable Infrastructure Guidelines, IC-1, Minimize Pollution from Construction Activity (March 23, 2011).

[69] Title 56 of the New York City Rules and Regulations, Chapter 5 entitled "Rules Governing Tree Replacement."

[70] FAA Advisory Circular (AC) 150/520-33C, *Hazardous Wildlife Attractants On or Near Airports* (December 7, 2012).

[71] See PANYNJ, Sustainable Infrastructure Guidelines, Appendix 05-Toxic and/or Hazardous Materials (March 23, 2011).

protect human health and the environment. The following preventative measures are appropriate for construction activities associated with each of the hazardous materials identified above.

- Asbestos would be removed from existing buildings prior to any demolition or construction work. Removal protocols, established by PANYNJ, the City, and the State would be followed, thereby minimizing potential risks to human health and the environment. These procedures would also address issues of noise and dust control, and thereby protect the public and workers from exposure to hazardous materials. The asbestos waste generated during the abatement process would be disposed of according to state (NYSDEC) regulatory requirements.

- Materials coated with lead-based paint would be removed from the buildings during demolition and the waste would be recycled or disposed of as appropriate. Construction protocols would ensure that dust is minimized and contained. Workers would be provided with protection from lead dust. Local and state permitting and notification would apply to the removal, transportation, recycling, and/or disposal of lead-containing materials.

- PCB-containing ballasts would be incinerated, recycled or disposed of in an approved landfill, subject to local, state and federal regulations. Transformers containing PCBs would be incinerated or recycled at approved facilities, also subject to local, state, and federal regulations. Incineration and recycling are more protective of the environment.

- Mercury-containing lamps would be removed prior to demolition in accordance with federal and state hazardous waste requirements. Removal protocols would ensure that lamps are protected from breakage and that waste lamps handled by qualified waste handlers and transporters are directed to appropriate recycling or disposal facilities. Mercury and lead in elemental form, such as thermostats, thermometers, switches, and solders, would be removed and disposed of or recycled at approved facilities in accordance with federal and state hazardous waste requirements.

- Construction activities may expose contaminated soils and/or groundwater. Soils from excavation would be tested and disposed of either as solid waste or petroleum contaminated soil in accordance with NYSDEC requirements. Groundwater from the dewatering process would also be tested for pollution concentration levels, treated if necessary, and disposed in accordance with NYSDEC requirements.

As discussed in Section 5.9, Hazardous Materials, Pollution Prevention and Solid Waste, adherence to the aforementioned BMPs and control measures would be expected to effectively reduce potential risks to human health and the environment. No additional mitigation measures are proposed.

5.2.7.5 Historic Resources

Demolition activities associated with the CTB Redevelopment Program would have an adverse effect on historic resources, while select earthwork and construction activities might impact an area of potential archaeological sensitivity. For this reason, mitigation measures would be implemented to reduce the effects of the CTB Redevelopment Program on historic resources at the Airport.

Adverse Effects on Historic Properties

As discussed in Section 5.10, Historic, Architectural, Archaeological and Cultural Resources, and **Appendix D: Evaluation of Historic Resources of the 2014 EA**, demolition of Hangars of 1, 2, and 4 cannot be avoided; therefore, the adverse effect could be mitigated by recording the NRHP-eligible Hangars 1, 2, 3, 4, and 5, as well as 7, to Level III Historical Architectural Building Survey and Historic American Engineering Record (HABS/HAER) standards of the National Park Service (NPS), which includes photographic documentation and submission into the archives maintained by New York State, developing an interpretive display of the Airport's history to be prominently placed within a public section of the Airport, and maintaining Hangars 3 and 5 in a state-of-good repair for the foreseeable future. In addition, select excavation and trenching activities within a designated area of archaeological sensitivity (in the vicinity of the proposed West Garage) would be performed in accordance with an archaeological monitoring protocol that requires cultural resource staff to be present during specified construction activities and identifies the procedures to be followed if potentially significant archaeological deposits or features are discovered.

Change: The HABS/HAER documentation of the hangars has been completed and submitted to NPS. Hangars 2 and 4 were demolished in the summer of 2015, in accordance with the MOA. Hangar 1 will be demolished during the fourth quarter of 2019, as reflected in the phasing plans in Attachment 3.

Memorandum of Agreement

As discussed in Chapter 6, Mitigation, the nature and extent of the impacts on Hangars 1, 2, 3, 4, and 5, and the mitigation measures to reduce potential harm, have been documented in a Memorandum of Agreement (MOA) signed by PANYNJ, FAA, and the New York State Office of Parks, Recreation, and Historic Preservation, and concurred on by three Consulting Parties. The MOA is a result of the consultation process pursuant to Section 106 of the NHPA (see Section 5.10). A copy of the signed MOA is included in **Appendix D** of the 2014 EA. This ensures that mitigation measures will be implemented and demolition and construction activities will be carried out in such a manner as to minimize, to the greatest extent possible, the unavoidable adverse effects of the CTB Redevelopment Program on historic and cultural resources.

5.2.7.6 Noise

Construction activities would have a temporary effect on ambient noise levels. Noise impacts during the construction period would be caused primarily by construction vehicles and equipment operating at the construction site and to a lesser degree by increased traffic on local roads in the vicinity of the Airport. As discussed below, construction-related noise cannot be avoided, but the effects would be reduced and/or minimized to the degree practicable.

Construction Equipment Noise

Construction activities would generate noise levels in excess of those typically found in the project environs. Typical activities (and sources of noise) would include earthmoving (front loaders, backhoes, tractors, graders, pavers, trucks); materials handling (concrete mixers, concrete pumps, cranes); stationary sources (pumps, generators, compressors); impact equipment (pneumatic wrenches, jackhammers, pile drivers); and other miscellaneous activities and pieces of equipment.

Noise from construction activity differs from noise from other major sources for two reasons. First, it is caused by many different types of vehicles and equipment, as described above. Second, the resulting adverse effects are temporary because the individual activities are relatively short-term, in keeping with the construction schedule. In addition, since construction usually occurs during the day, there is minimal potential for sleep interference.

Construction-related noise levels are assessed in Section 5.13, Noise**,** and in **Appendix E: Noise Technical Report of the 2014 EA**.

Change: Attachment 6 presents an updated assessment of noise for the construction of the Proposed design changes.

While the analysis demonstrated that noise from construction vehicles and equipment would not exceed any applicable standard, a Noise Control Plan (NCP) would be prepared to minimize construction noise in accordance with New York City rules[72] and to demonstrate compliance with the City's Noise Code.[73] To minimize construction noise, the Noise Code mandates that all construction be conducted in accordance with a noise mitigation plan that specifies the construction activities to be performed and when, lists the different types of construction equipment to be used at the site, and identifies the noise reduction method(s) for reducing the adverse impact of construction noise on the surrounding community. The Noise Code also establishes authorized work hours, sets standards for noise levels created by handling containers and construction material on public streets, and sets forth rules for mitigating noise from different categories of equipment.

The noisiest construction task would be pile driving. A *pile driver* is a mechanical device used to drive piles into soil to provide foundation support for buildings or other structures. The impact of the hammer hitting the pile creates a loud "ringing" sound. Because pile driving would be occurring during the early phases of construction, the following noise control measures are recommended:

- Reduce the impact sound of the ram hitting the pile by placing a resilient pad in the anvil chamber;
- Reduce the discharge sound of the hammer's air exhaust by installing a rectangular steel enclosure lined with acoustically-absorptive material to provide both absorption and a limp mass noise barrier;
- Reduce the "ringing" noise of the steel piles by utilizing acoustical paint across the web of each pile at 4- to 6-foot intervals; and
- Prohibit pile driving at night.

Federal, state, and local rules and regulations for minimizing noise from construction vehicles and equipment provide adequate assurance that the temporary and unavoidable noise levels during construction would be less than significant. Additional strategies to minimize noise from the construction site are contained in PANYNJ's *Sustainable Infrastructure Guidelines.*[74] Adherence to these guidelines would be expected to further reduce noise pollution to the degree practicable.

Traffic Noise

Construction-related traffic noise along local roads in the vicinity of the Airport is discussed in Section 5.13, Noise, and in **Appendix E: Noise Technical Report of the 2014 EA.** The results of the analysis

[72] Title 15 Rules of the City of New York–RCNY Chapter 28, Citywide Construction Noise Mitigation.

[73] City of New York Local Law No. 113 of 2005—Noise Control Code.

[74] PANYNJ, Sustainable Infrastructure Guidelines, IC-5, Reduce Noise and Vibration During Construction (March 23, 2011).

indicate that the maximum incremental increase in noise predicted for each roadway link is below screening thresholds per the CEQR *Technical Manual*. No mitigation measures are proposed.

Change: Attachment 6 demonstrates that the maximum incremental increase in noise predicted for each roadway link is below the screening threshold for construction of the Proposed design changes. No noise mitigation is therefore required.

5.2.7.7 Water Resources

The potential for soil erosion and degradation of water quality is greatest during the construction period when topsoil is exposed, thereby making it more susceptible to erosion that can contribute to increased sediment loading on downstream receiving waters. In addition, when stormwater flows over a construction site, it can pick up other pollutants such as debris, chemicals, concrete wash-out, etc., and transport them to nearby water bodies. As discussed in Section 5.16, Water Quality, stormwater runoff from the Airport is discharged into Flushing Bay under a State Pollutant Discharge Elimination System (SPDES) permit issued by the NYSDEC. Compliance with the SPDES permit requires minimal impacts to stormwater from airport activities, including construction.

Stormwater runoff during construction would be covered by the Airport's individual SPDES permit, which requires the implementation of a Stormwater Pollution Prevention Plan (SWPPP) to reduce or prevent stormwater contamination during construction activities, and also requires the submission of a completed Notice of Intent (NOI) advising NYSDEC and the public of PANYNJ's request for additional permit coverage for construction phase activities. Under the SPDES permit process, water quality BMPs would be recommended to deal with sedimentation and erosion control, containment of construction materials (hydraulic fluids, fuel, etc.), washing of construction vehicles, cleaning of concrete mixers, etc. These BMPs would be incorporated into the project's construction documents and become an obligation of the contractor. PANYNJ would monitor compliance with these practices and assure that the stormwater management systems are protected.

All contractors would be required to comply with applicable federal, state, and local laws and regulations, including FAA guidance contained in AC 150/5370-10F, *Standards for Specifying Construction of Airports*, including Item P-156 *Temporary Air and Water Pollution, Soil Erosion and Siltation Control*; AC 150/5320-15A, *Management of Airport Industrial Waste*; and AC 150/5320-5C (including Change 1) *Subsurface Drainage Design*. No construction activity would occur within any regulated wetland or surface water body; no Clean Water Act, Section 404 permit would be required.

5.2.7.8 Summary of Impacts

Under the CTB Redevelopment Program, construction activities would cause or contribute to a temporary increase in air, noise, and water pollution, or traffic on local roadways; tree removal and the loss of urban landscaped area; removal of three hangars eligible for listing in the NRHP and excavation of a potential archaeological site; and the need to dispose of hazardous materials and construction waste including contaminated soils and groundwater. Therefore, implementation of the CTB Redevelopment Program would include various means and measures to minimize the potential for adverse environmental impacts, including, but not necessarily limited to, the following: best management practices and control measures for reducing air, noise and water pollution; temporary improvements to local roadway intersections; an airport-compatible landscape plan including tree replacement; recordation of the NRHP-eligible hangars and cultural resource monitoring during excavation of the potential archaeological site; and, adherence to health and safety plans for the removal and disposal of hazardous waste. Compliance with applicable federal, state, and local rules and regulations, as well as environmental commitments including mitigation measures, best management practices, and PANYNJ sustainability guidelines, would ensure that unavoidable construction impacts are reduced to the degree practicable.

If No-Action is taken, the CTB Redevelopment Program would not be implemented and the above-listed construction impacts on the environment would not occur. However, as discussed in Section 3.2, No Build/No-Action Alternative, the existing terminal facilities cannot remain in the current condition for an extended period of time. PANYNJ would have no choice but to undertake another terminal modernization program in order to bring the CTB and ancillary facilities into a state of good repair. Although the larger scale development impacts may be avoided by taking No-Action, some degree of construction impacts, such as increased traffic and traffic-related air and noise pollution, would still be expected to occur.

5.2.8 Cumulative Impacts

Council on Environmental Quality (CEQ) regulations require that all federal agencies consider the cumulative effects of proposed actions. Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions." Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. This cumulative impact analysis was conducted to comply with the intent of FAA Order 1050.1E, DOT Order 5610.1C, and the January 1997 CEQ guidance.

The cumulative impacts resulting from the implementation of the CTB Redevelopment Program have been assessed for projects on and off the Airport. Since the CTB Redevelopment Program is a major project with environmental consequences due to both construction and the operation of the project, the scope of this analysis is broader than that of a smaller project with fewer effects over a shorter period of time. Accordingly, PANYNJ considers all the projects in geographical or temporal proximity to each other. The geographic boundary of the analysis varies by resource but generally includes the existing Airport property, adjacent properties including Flushing Bay to the north and the Grand Central Parkway to the south, and the Queens neighborhoods of Ditmars/Steinway, Jackson Heights, East Elmhurst, and College Point. The temporal boundary (timeframe) for the analysis also varies by resource but the time limits generally extend ~~five years into the past (2008-2013)~~ and into the future through the aviation activity forecast period (2013-2030).

Change: For the purposes of this technical report, the time limits extend seven years into the past (2008-2015) and into the future through the aviation activity forecast period (2016-2030).

If the Proposed Action would not cause direct or indirect impacts on a resource, then it may be concluded that it will not contribute to a cumulative impact on the resource. As identified in prior sections of Chapter 5, Environmental Consequences, the CTB Redevelopment Program is likely to have an adverse, but not significant, effect on the following impact categories:

- Traffic
- Air Quality
- Section 4(f) Resources
- Fish, Wildlife and Plants
- Historic and Cultural Resources
- Noise
- Water Quality

Although these impacts may not be significant themselves, cumulative impacts from one or more projects can result in the degradation of important resources. The other projects included in the analysis occur in the same proximate geographical location as the CTB Redevelopment Program, and may occur in the past, present, or reasonably foreseeable future.

5.2.8.1 Past, Present and Reasonably Foreseeable Future Projects

This section identifies the past, on-going, and reasonably foreseeable future projects, within the defined geographic area and timeframe that could affect the same environmental resources as the CTB Redevelopment Program and result in a larger cumulative effect on these resources.

Past Projects

Airport projects and upgrades to existing facilities necessary for maintaining the Airport in a state-of-good repair are typically excluded from the need for further analysis under NEPA. These projects are by definition minor projects which do not individually or collectively have a significant impact on the environment; therefore, no further analysis is required for categorically excluded projects. Over the past five years, FAA has allowed for categorical exclusion after review of the following projects at the Airport:

- Perimeter Fence Strengthening (categorical exclusion or “CATEX” signed 07/30/2007)
- Rehabilitation of CTB Concourse Alleyway Pavements (CATEX signed 04/21/2011)
- Vaughn College Soundproofing (CATEX signed 07/21/2010)[75]
- Rehabilitation of Taxiways R, S, P, and G (CATEX signed 06/07/2012)
- *Change: Delta C/D Connector Bridge (CATEX signed 03/10/2010)- project complete*
- *Change: Rehabilitation of Taxiways A, M, ZA, and B (CATEX signed 06/07/2012) – project complete*
- *Change: Pump House 4 Upgrades (CATEX 06/07/2012) - project complete*
- *Change: East End Road Pavement Rehabilitation – project complete*

The only major development projects at LaGuardia Airport in recent years were the new *Airport Traffic Control Tower (ATCT)* and the *Police Emergency Garage/Emergency Fire Pump Station*. PANYNJ prepared EAs for both projects and the FAA issued a Finding of No Significant Impact (FONSI) for each of them.

- *Air Traffic Control Tower Replacement*: This FAA-sponsored project resulted in a new Airport Traffic Control Tower (ATCT) and an administrative base building to replace the previous ATCT

[75] The completed project entailed the soundproofing of various rooms used for instructional purposes at Vaughn College of Aeronautics and Technology located south of LaGuardia Airport. The soundproofing work consisted of replacing and/or upgrading the windows and doors, adding mass to the walls and roofs as needed to decrease the transmission of noise from airport operations, and installing central air conditioning in the affected areas. The work required limited on-road construction equipment. The school is also performing some interior renovations on the main building.

(built 1964).[76] Project-related environmental impacts addressed in the EA include changes to the visual setting and the need to demolish a historically-important, but not significant, building on the Airport. FAA commissioned the new ATCT in 2010.

- *Police Emergency Garage/Emergency Fire Pump Station*: PANYNJ undertook the following miscellaneous projects to upgrade, replace, or improve existing operating systems: a new Police Emergency Garage, a new Emergency Fire Pump Station, and Roadway Improvements West of the CTB.[77] No adverse impacts to the affected environment were identified in the EA that was prepared for these projects.

- *Change: East End Substation/East Garage: This project involved the construction and operation of a new electrical substation within Parking Lot 4 in front of Terminal C, including the installation of buried duct banks for commercial electric service feeder lines (provided by ConEdison) underneath the Grand Central Parkway.[78] The project also involved the development of a parking garage for passengers using Terminals C and D. Project-related impacts on the affected environment include, but are not necessarily limited to, temporary construction impacts such as air, noise, and water pollution, and earth disturbance/tree removal along landscaped sections of the Grand Central Parkway. A FONSI was signed by FAA in February 2013 and construction was completed in 2015.*

One off-Airport project within close proximity to LaGuardia was recently completed:

- *NYSDOT Grand Central Parkway/94th Street Interchange Improvements*: This state highway project implemented operational and capacity improvements by eliminating the weaving section between the eastbound entrance ramp from 94th Street/Ditmars Boulevard and the Exit 7 ramp to LaGuardia Airport. The project included resurfacing existing pavements and improving signage. Project-related environmental impacts included, but were not necessarily limited to, temporary construction impacts. NYSDOT prepared an EA for this project and no significant impacts were identified.

- *Change: North Shore Marine Transfer Station: The NYC Department of Sanitation reopened a closed facility located approximately two miles east of LaGuardia Airport along the North Shore of Flushing Bay in College Point, Queens Borough.[79] The fully enclosed building was designed for the transfer of municipal solid waste from collection vehicles into sealed, leak-proof containers for export by barge and rail. The station was completed in November 2014 and opened in early 2015.*

Ongoing Projects

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[76] *Environmental Assessment Re-Evaluation for the LaGuardia Airport Air Traffic Control Tower Replacement Project* (FAA, September 2004) based on the Finding of No Significant Impact and Final Environmental Assessment (FAA, October 1996).

[77] Environmental Evaluation Form C (Short Environmental Assessment) for Upgrades and Replacements at LaGuardia Airport (PANYNJ, 2002); FONSI signed February 2002; Written Re-Evaluation prepared in July 2006.

[78] Final Environmental Assessment for the East End Substation and East Garage at LaGuardia Airport (PANYNJ, February 2013); FONSI signed February 5, 2013.

[79] Solid Waste Management Plan, Final Environmental Impact Statement (NYC Department of Sanitation, April 2005).

Six categorical exclusion projects are currently underway at LaGuardia Airport and one more significant project is under construction:

- Fillet Improvements (Taxiways AA, BB, and CY) (CATEX signed 08/16/2010)
- Terminal D Extension for Inline Baggage Handling System (CATEX signed 12/15/2011)
- Delta C/D Connector Bridge (CATEX signed 03/10/2010)
- Bollard Protection Terminal Frontages (CATEX signed 10/14/2009)
- Rehabilitation of Taxiways A, M, ZA, and B (CATEX signed 06/07/2012)
- Pump House 4 Upgrades (CATEX 06/07/2012)
- *East End Substation/East Garage*: This project involves the construction and operation of a new electrical substation within Parking Lot 4 in front of Terminal C, including the installation of buried duct banks for commercial electric service feeder lines (provided by ConEdison) underneath the Grand Central Parkway.[80] The project also involves the development of a parking garage for passengers using Terminals C and D. Project-related impacts on the affected environment include, but are not necessarily limited to, temporary construction impacts such as air, noise, and water pollution, and earth disturbance/tree removal along landscaped sections of the Grand Central Parkway. A FONSI was signed by FAA in February 2013 and construction is scheduled to be complete in 2015.

~~One off-Airport project within close proximity to LaGuardia is also under construction:~~

- ~~*North Shore Marine Transfer Station:* The NYC Department of Sanitation is re-opening a closed facility located approximately two miles east of LaGuardia Airport along the North Shore of Flushing Bay in College Point, Queens Borough.[81] New construction includes a fully enclosed building designed for the transfer of municipal solid waste from collection vehicles into sealed, leak-proof containers for export by barge and rail. The transfer station is under construction and scheduled to be complete by the end of 2014.~~

Change: Eight projects are currently underway at LaGuardia Airport and one major project is nearing completion:

- *Fillet Improvements (Taxiways AA, BB, and CY) (CATEX signed 08/16/2010)- to be completed summer 2016*
- *Bollard Protection Terminal Frontages (CATEX signed 10/14/2009)- ongoing project*
- *Runway Deck Runway Deck Structural Rehabilitation-ongoing project*
- *Taxiway Paving and Lighting Rehabilitations- ongoing project*

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[80] Final Environmental Assessment for the East End Substation and East Garage at LaGuardia Airport (PANYNJ, February 2013); FONSI signed February 5, 2013.

[81] Solid Waste Management Plan, Final Environmental Impact Statement (NYC Department of Sanitation, April 2005).

- *Taxiway Rehabilitation (ZA, A, B, west of Runway 4-22)- to be completed summer 2016*
- *Runway 13-31 Rehabilitation- to be completed summer 2016*
- *Barrier Replacement (3 locations)- ongoing work*
- *Runway Safety Area (RSA) Enhancements: The project involves improving the RSA at the Runway 4 and Runway 31 ends by extending the existing decks further into Flushing Bay, constructing a new section of restricted vehicle service road (RSVR) south of the Runway 22 end, and establishing a construction staging area at Ingraham's Mountain to support the development of the RSA and RSVR project elements.*[82] *FAA signed the FONSI on December 31, 2013 and construction was initiated in 2014 and is expected to conclude in 2016, with the RSA portion completed by the end of 2015.*[83]

The Terminal D Extension for Inline Baggage Handling System is no longer a project at the airport.

Reasonably Foreseeable Projects

Within the next five years, in addition to the CTB Redevelopment Program, PANYNJ plans to undertake several state-of-good repair projects at LaGuardia Airport, as well as the *Runway Safety Area (RSA) Enhancements* project. The anticipated projects include the following:

- Runway Deck Structural Rehabilitation
- Taxiway Paving and Lighting Rehabilitations
- East End Road Pavement Rehabilitation
- Taxiway Rehabilitation (ZA, A, B, west of Runway 4-22)
- Barrier Replacement (3 locations)
- Runway 13-31 Rehabilitation
- *Runway Safety Area (RSA) Enhancements*: PANYNJ has prepared a separate EA for this project.[84] The proposal is to: improve the RSA at the Runway 4 and Runway 31 ends by extending the existing decks further into Flushing Bay, construct a new section of restricted vehicle service road (RSVR) south of the Runway 22 end, and establish a construction staging area at Ingraham's Mountain to support the development of the RSA and RSVR project elements.[85] FAA

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[82] At the completion of the proposed RSA Enhancements project, the construction staging area (referred to as the Ingraham's Mountain site) would continue to be used for contractor parking in support of the proposed CTB Redevelopment Program.

[83] LaGuardia Airport Runway Safety Area Enhancements, Final Environmental Assessment (PANYNJ, December 2013).

[84] LaGuardia Airport Runway Safety Area Enhancements, Final Environmental Assessment (PANYNJ, December 2013).

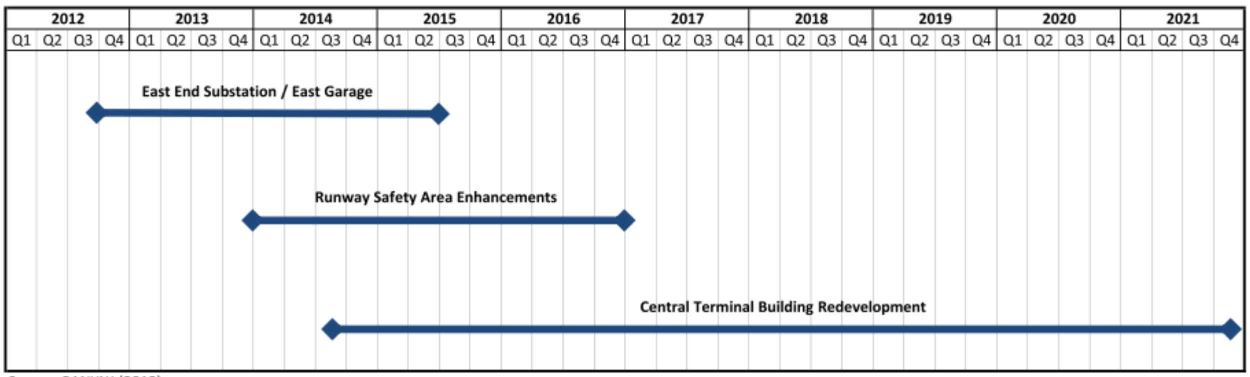
[85] At the completion of the proposed RSA Enhancements project, the construction staging area (referred to as the Ingraham's Mountain site) would continue to be used for contractor parking in support of the proposed CTB Redevelopment Program.

signed the FONSI on December 31, 2013 and construction was initiated in 2014 and is expected to conclude in 2016, with the RSA portion completed by the end of 2015. [on schedule]

Change: Runway 13-31 Rehabilitation and Taxiway Rehabilitation (ZA, A, B West of 4-22) are underway and will both be completed by mid-2016.

Change: The planning process is underway for the relocation of the Remote Transmitter/Receiver (RTR), an FAA Navaid. This is a reasonably foreseeable future project and will be subject to its own NEPA analysis.

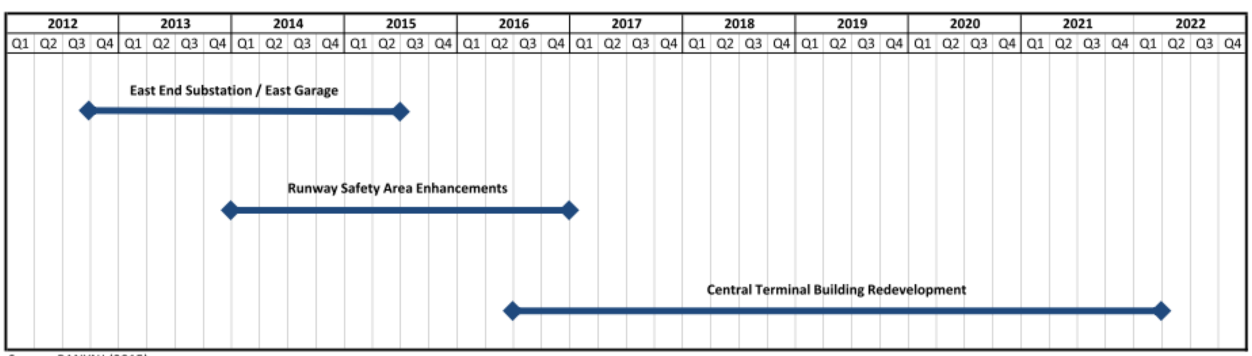
Figure 5-16a shows the proposed construction schedule for projects at the Airport, including the *East End Substation/East Garage*, the *RSA Enhancements*, and the *CTB Redevelopment Program*. No other major Airport development projects are planned or proposed at this time.



Source: PANYNJ (2013)

Figure 5-16a. Cumulative Construction Schedule for Major Projects at LaGuardia Airport- 2014 EA

Change: Construction for the proposed design changes would not begin until Second Quarter 2016; therefore, there would be minimal overlap with construction of other major projects at the Airport (see Figure 5-16b).



Source: PANYNJ (2015)

Figure 5-16b. Cumulative Construction Schedule for Major Projects at LaGuardia Airport (Revised Scheduled for Proposed design changes)

On October 20, 2014, New York State Governor Andrew Cuomo announced a design competition for John F. Kennedy International and LaGuardia Airports. Submissions are expected to be due in early 2015. Currently, it is not possible to assess the impact of any submitted design concept to the CTB Redevelopment Program. To the extent any design submissions are further advanced and are determined to impact the CTB Redevelopment project or other program elements, an appropriate analysis and review will be undertaken at that time.

Change: The public announcement of the Port Authority's selection of a preferred proposer for the CTB redevelopment project coincided with New York State Governor Andrew M. Cuomo's announcement of his goal for a transformational redesign of LaGuardia Airport, which would include replacement of Terminals C and D, as well as the potential construction of an AirTrain, hotel, and other support facilities on airport, as recommended by the Governor's airport design panel. While preliminary planning efforts are underway to consider the other components of the transformational redesign, the CTB Redevelopment component represents a concrete specified design, a project that received approval from the Port Authority's board on May 28, 2015 and will shortly be presented to the Board for final approval. The other components of the new design are still pending consideration in the capital plans of the PANYNJ and other entities, and have not yet been the subject of sufficiently specific planning work to enable accurate and relevant NEPA analysis. Therefore, the nature, the extent, and the design of these other components are not determinable or reasonably foreseeable at the present time. In the event that these projects do become ripe for decision, they will be subject to their own appropriate NEPA analyses and those analyses will be required to look back on the CTB Redevelopment Program as a past project and to consider it in future project analysis of cumulative impacts.

Finally, the following off-Airport projects may have the potential to affect environmental resources also affected by the CTB Redevelopment Program.

- *Environmental Dredging of Flushing Bay*: NYCDEP is proposing to dredge approximately 16.8 acres of Flushing Bay near two combined sewer overflow (CSO) outfalls located east of the Airport, near the World's Fair Marina.[86] The proposed project is needed to remove accumulated sediment mounds exposed at low tide and to reduce associated nuisance odors. The dredging project also includes the removal of deteriorated timber piles and the restoration of wetlands along the shoreline to further improve the aesthetics of the bay. The project is planned to be initiated in 2014 and completed by 2016.

- *Willets Point Redevelopment*: The Office of the Deputy Mayor for Economic Development acting as lead agency proposes to rezone, create an urban renewal area, and implement the Willets Point Development Plan in Willets, Queens.[87] The proposed plan's main goal is to transform a largely underutilized site with substandard conditions and substantial environmental degradation into a lively, mixed-use, sustainable community and regional destination. The approximately 61-acre Willets Point Development District would be redeveloped with residential, retail, hotel, convention center, entertainment, commercial office, community facility, open space, and parking uses at a cost of approximately $3 billion. In addition, the proposed plan would connect the Van Wyck Expressway with the District. Although groundbreaking has occurred for off-site infrastructure improvements, other aspects of the project have been delayed pending additional environmental reviews. A Notice of Completion per CEQR was issued by the Office of the Deputy Mayor for Economic Development on August 9, 2013. According to the recently completed *Final Supplemental Environmental Impact Statement*, the District would be redeveloped in several phases over a period of approximately 19 years.

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[86] For more information: www.nyc.gov/html/dep/html/environmental_reviews/flushing_bay_environmental_dredging.shtml

[87] For more information: www.nycedc.com/project/willets-point-development

- *National Tennis Center Strategic Vision Project*: NYCDPR, in coordination with the U.S. Tennis Association National Tennis Center (NTC), proposes to improve and expand the facilities at the NTC located in Flushing Meadows in Corona Park, Queens.[88] The 41-acre NTC is one of the world's largest public recreation tennis facilities and is host to the U.S. Open. The proposed project would improve the NTC site plan, circulation, amenities, and landscaping, and would include construction of two new stadiums to replace the two existing stadiums (Stadiums 2 and 3) as well as possible improvements to Arthur Ashe Stadium (Stadium 1). A Notice of Completion per CEQR was issued by the NYC Department of Parks and Recreation on May 10, 2013. If implemented, the project is expected to be completed by 2019.

The following sections discuss the results of the cumulative effects analysis for the CTB Redevelopment Program on each affected environmental resource in turn.

5.2.8.2 Traffic and Transportation

The assessment of project-related impacts on traffic and transportation is discussed in Section 5.1 and **Appendix A of the 2014 EA**. The traffic analyses conducted for this project were conducted in accordance with the guidelines and methodologies described in the *New York City Environmental Quality Review (CEQR) Technical Manual*. In accordance with CEQR guidelines, all traffic analyses—including those conducted for year ~~2015 construction conditions~~ and year 2030 operation conditions—are cumulative in nature, in that they reflect both projected future traffic volumes associated with future regional growth over time and other planned and approved development projects, as well as planned transportation improvements for the CTB Redevelopment Program that are anticipated to be in place by the projected future horizon year(s).

Change: Traffic and transportation related to the proposed design changes are discussed in Section 5.2.1 and Attachment 4 of this technical report. Revised traffic analyses were conducted for year 2017 construction conditions.

Specifically, all traffic volumes used in future conditions analyses are established from a baseline of existing (field-observed) traffic volumes. Once these baseline traffic volumes are established, future traffic volumes are projected from the baseline volumes to reflect cumulative future traffic growth from a variety of contributing factors, including:

- Incremental traffic volumes associated with regional background growth that is anticipated to occur over time;
- Incremental traffic volumes projected to be generated by the construction and operation of other planned or approved development projects through the future horizon years;
- Incremental traffic volumes associated with project passenger growth at LaGuardia Airport without the CTB Redevelopment Program;
- Incremental traffic volumes as a direct result of the CTB Redevelopment Program, including construction vehicles for peak year construction conditions (~~2015~~) and project-induced traffic for year 2030 operation conditions.

[88] For more information: www.nycgovparks.org/park-features/fmcp/usta-ntc-strategic-vision-project

Change: Peak year construction conditions under the proposed design changes would be in 2017.

The sum of the traffic increases associated with the individual factors described above and the existing baseline traffic volumes yields the projected future cumulative traffic volumes. Furthermore, all future conditions traffic analyses also include planned transportation improvements that are anticipated to be in place through each of the horizon years (i.e., year 2015 for construction conditions and year 2030 for operation conditions). These improvements include the recent work by NYSDOT on lanes and ramps to and from the Grand Central Parkway in the vicinity of 82^{nd} Street and 94^{th} Street, as well as future improvements to the Bowery Bay Boulevard/Runway Drive/Marine Terminal Road intersection as part of the RSA Enhancements project at the Airport.

Change: The horizon year for construction was shifted to 2017 for the proposed design changes. The revised construction traffic analysis incorporated the improvements to the Grand Central Parkway lanes and ramps and the Bowery Bay Boulevard/Runway Drive/Marine Terminal Road intersection that were completed since the 2014 FONSI/ROD.

Construction Traffic Analysis

The construction conditions traffic analyses from the previously approved design (2014) identify how the study area's transportation system is projected to operate in the fourth quarter of 2015 – the peak time period for construction activity at the CTB – accounting for the cumulative effects of construction traffic generated by the CTB, background traffic growth, and traffic generated by other projects planned for the study area. Both the future No-Action and Proposed Action Construction analyses include the NYSDOT improvements to the Grand Central Parkway in the vicinity of 82^{nd} Street and 94^{th} Street, as well as projected future traffic volumes associated with construction of the *Willets Point Redevelopment* and the *RSA Enhancements* project at LaGuardia Airport. In addition, between 2012 and 2015, it is expected that existing traffic volumes in the study area will increase due to regional growth over time. In order to forecast future traffic demands, a compounded annual growth rate of 1.51 percent was calculated through the ~~2015~~ horizon year and applied to the existing traffic volumes, in accordance with the growth rate recommendations for Queens described in the *CEQR Technical Manual*.

Change: The construction conditions traffic analyses for the proposed design changes identify how the study area's transportation system is projected to operate in the second quarter of 2017 – the peak time period for construction activity at the CTB. Since the RSA Enhancements project at LaGuardia Airport would be completed by late 2016, construction analyses did not include construction traffic for that project. In addition, between 2014 and 2017, it is expected that existing traffic volumes in the study area will increase due to regional growth over time. In order to forecast future traffic demands, a compounded annual growth rate of 1.0 percent was calculated through the 2017 horizon year and applied to the existing traffic volumes.

The traffic volumes associated with construction of the *Willets Point Redevelopment* and *RSA Enhancements* projects were then added to the baseline volumes, compounded with the regional growth factor, to yield the adjusted volumes for the future No-Action traffic volumes. The future Proposed Action Construction condition analyses from the previously approved design (2014) builds upon the No-Action traffic volumes by adding the incremental vehicular traffic generated by trucks and construction personnel attributable the proposed redevelopment of the CTB.

Change: Since the peak construction year was shifted to 2017, after the completion of the RSA Enhancements project, the future construction condition analyses for the proposed design changes did not add construction volumes associated with that project as part of the No-Action traffic volume.

The results of the traffic analyses for construction conditions indicate that a variety of transportation system improvements may be necessary to provide for acceptable traffic operations, and would be implemented as indicated by traffic monitoring throughout the construction period. These improvements could include a traffic signal installation, a traffic signal controller upgrade, signal timing adjustments, curbside parking prohibitions, lane widening/restriping, and instituting the use of construction flaggers.

Operations Traffic Analysis

With or without the CTB Redevelopment Program, passenger travel at LaGuardia Airport is projected to continue to increase over time. PANYNJ estimates that, without the CTB Redevelopment Program, projected passenger travel at LaGuardia Airport would increase by 6.5 MAP by 2030. Therefore, the projected increase in vehicular traffic associated with this background passenger growth of 6.5 MAP was included in the year 2030 future No-Action (and Proposed Action) traffic volumes.

The operations traffic analyses accounts for the cumulative effects of background traffic growth and other projects planned in the study area up to the design year of 2030. As noted previously, the proposed redevelopment of LaGuardia Airport is anticipated to be fully completed and operational by 2021. However, because it is projected to take approximately nine years following the opening of the CTB to fully realize all of the forecast passenger growth associated with the redevelopment, the future study year for the future No-Action and Proposed Action conditions traffic analyses is 2030. Therefore, future conditions operations analyses included traffic increases as a result of projects anticipated to be completed by the year 2030, as well as traffic growth projections to the year 2030.

Change: The construction phasing plan for the proposed design changes have shifted the completion date of the CTB to the end of 2021; however, the future analysis year for full operation of the new terminal remains 2030.

The operations analyses include analyzing the effects of a series of recent or planned improvements in the vicinity of the Airport. Recent NYSDOT improvements include the reconfiguration of the eastbound ramps to and from the Grand Central Parkway in the vicinity of the 94th Street interchange, signalization of the Ditmars Boulevard/Grand Central Parkway eastbound on-ramp intersection, modification of the land configurations on the eastbound, westbound, and southbound approaches to the Ditmars Boulevard/94th Street intersection, and widening of the 82nd Street westbound off-ramp from the Parkway from two to three lanes at its approach to 82nd Street-Ditmars Boulevard. In addition, ~~anticipated~~ improvements to the Bowery Bay Boulevard/Runway Drive/Marine Terminal Road intersection as part of the RSA Enhancements project were included in all year 2030 future conditions traffic analyses (i.e., No-Action and Proposed Action conditions).

Change: Improvements to the Bowery Bay Boulevard/Runway Drive/Marine Terminal Road intersection were already completed as part of the RSA Enhancements project.

The *Willets Point Redevelopment* project, with a mix of residential, retail, office, community facility and institutional uses, and the *National Tennis Center Strategic Vision Project*, an expansion of an existing recreational use, are expected to be fully developed by the 2030 horizon year for the CTB Redevelopment Program. Traffic volumes associated with the *Willets Point Redevelopment* project were also included in the year 2030 No-Action and Proposed Action conditions analyses. The projected increase in attendance at the annual U.S. Open tennis tournament as a result of the *NTC Strategic Vision Project* is expected to have a negligible effect on the traffic analysis for the CTB Redevelopment Program. The tournament constitutes a special event condition (i.e., operating only two weeks of the year) and is not projected to generate a significant volume of traffic to the west, through the traffic study area.

In addition, between 2012 and 2030, it is expected that existing traffic volumes in the study area will increase due to regional growth over time. In order to forecast future traffic demands without the CTB Redevelopment Program, a total growth rate of 5.91 percent was calculated for the 2030 horizon year and applied to the existing traffic volumes, in accordance with the growth rate recommendations for Queens described in the *CEQR Technical Manual*.

The traffic volumes associated with the 6.5 MAP growth at LaGuardia Airport, as well as the *Willets Point Redevelopment* project, were added to these adjusted volumes to arrive at the year 2030 future No-Action condition traffic volumes.

The future Proposed Action condition traffic analysis from the 2014 EA identifies how the study area's transportation system would operate in the 2030 horizon year with the addition of vehicular traffic generated by the CTB Redevelopment Program (i.e., an additional 3.9 MAP). As part of the proposed improvements to LaGuardia Airport, background traffic patterns at the study intersections can be expected to be different due to the proposed roadway and ramp reconfigurations. As such, the future CTB Redevelopment Program traffic volumes accounted for the reassignment of traffic associated with these planned modifications to the roadway and ramp network. The projected peak hour vehicle trips associated with the CTB Redevelopment Program (i.e., 3.9 MAP) were added to the reassigned future No-Action condition traffic volumes to arrive at projected future CTB Redevelopment Program condition traffic volumes.

The results of the traffic analyses for the operation condition indicate that re-timing of traffic signals at several public street intersections in the vicinity of LaGuardia Airport may be necessary to ensure acceptable traffic operations according to *CEQR Technical Manual* guidelines. These intersections are:

- Bowery Bay Boulevard/Runway Drive/Marine Terminal Road
- Ditmars Boulevard/Marine Terminal Road
- Astoria Boulevard North-Grand Central Parkway westbound off-ramp/82nd Street-Ditmars Boulevard
- Astoria Boulevard/82nd Street-24th Avenue

In addition, restriping of the Astoria Boulevard/82nd Street-24th Avenue intersection and various parking restrictions along portions of 24th Avenue and 82nd Street are recommended. Traffic improvements would be coordinated with NYCDOT and implemented as indicated by traffic monitoring.

5.2.8.3 Air Quality

The CTB Redevelopment Program would occur within an EPA-designated nonattainment/maintenance area; therefore, the air emissions resulting from the construction and operation of the CTB Redevelopment Program are subject to review under the EPA's Clean Air Act. The full assessment of project-related impacts on air quality is discussed in Section 5.2 and **Appendix B of the 2014 EA**. ***Attachment 5: Technical Memorandum – Updated Air Quality Analysis for the Construction Condition*** *and* ***Attachment 8: LGA CTB CO Hot Spot Analysis*** *provide supplemental analysis and discussion on the air quality impacts from the proposed design changes.*

Construction Phase

Under the CTB Redevelopment Program, construction-related air emissions would be generated by on-road vehicles and non-road equipment. Emission inventories have been prepared for each construction year, ~~beginning in 2014~~ and concluding in 2021. According to **Table 5-1**, the peak emissions year for all criteria pollutants ~~is Year 2, or 2015~~, and the emissions are less than half the applicable *de minimis* thresholds; therefore, no significant air quality impacts would result from the construction of the CTB Redevelopment Program.

Change: Under the proposed design changes the peak emissions year for all criteria pollutants is Year 2, or 2017. ***Table 5-1b*** *presents the updated emissions total per year for the revised construction schedule. The emissions are still less than half the applicable de minimis thresholds.*

If the CTB Redevelopment Program is constructed, two other PANYNJ construction projects at LaGuardia Airport are expected to contribute to additional air emissions:

- *East End Substation/East Garage (under construction)*
- *Runway Safety Area Enhancements (under construction)*

PANYNJ has quantified the emissions from both of these construction projects as well, and the results are presented in **Tables 5-9** and **5-10**, respectively. As shown, the construction-related air emissions for each project are clearly *de minimis* (and there are zero emissions associated with the operations phase of either project). By definition, incremental impacts that are so small as to be *de minimis* do not contribute to significant impacts. Nevertheless, if all three airport construction projects were to be considered together, the combined emissions during the peak emissions year for each criteria pollutant would still be substantially less than the *de minimis* threshold levels.[89] Therefore, it is reasonable to conclude that the incremental increase in construction-related air emissions attributable to the CTB Redevelopment Program would not contribute to a significant adverse impact on the air environment.

Change: Since the construction schedule has shifted, the construction of the East End Substation/East Garage would be complete before construction of the proposed design changes would start and the RSA Enhancements project would be substantially complete, not overlapping with the peak year of emissions for the CTB Redevelopment. Therefore, the incremental impacts to air emissions would be less than originally assumed.

Table 5-9: Construction Emissions for the East End Substation/East Garage (tons per year)

Pollutant	2012	2013	2014	2015	2016
Carbon Monoxide (CO)	6.35	9.39	11.9	1.95	--
Nitrogen Oxides (NO_X)	18.9	30.4	31.2	4.45	--
Particulate Matter 10 micrometers (PM_{10})	0.64	1.06	1.08	0.16	--
Particulate Matter 10 micrometers ($PM_{2.5}$)	0.62	1.02	1.03	0.15	--

[89] Accumulating total air emissions from independent construction projects at LaGuardia Airport is for demonstration only; under the EPA's General Conformity Rule, individual projects that have been determined to have *de minimis* emissions do not contribute to significant impacts.

Volatile Organic Compounds	0.95	1.71	1.71	0.29	--

Source: PANYNJ *East End Substation and East Garage at LaGuardia Airport, Environmental Assessment/Finding of No Significant Impact* (February 2013).
Note: *De minimis* levels for CO, NO_X, and $PM_{2.5}$ are 100 tpy; and 50 tpy for VOCs.

Table 5-10: Construction Emissions for the RSA Enhancements (tons per year)

Pollutant	**2012**	**2013**	**2014**	**2015**	**2016**
Carbon Monoxide (CO)	--	0.37	29.9	22.4	9.87
Nitrogen Oxides (NO_X)	--	0.29	31.5	22.3	9.94
Particulate Matter 10 micrometers (PM_{10})	--	1.06	24.3	10.4	8.46
Particulate Matter 10 micrometers ($PM_{2.5}$)	--	0.12	4.21	2.21	1.39
Sulfur Dioxide (SO_2)		<0.01	0.10	0.06	0.03
Volatile Organic Compounds	--	0.03	3.16	2.43	1.33

Source: PANYNJ *LaGuardia Airport Runway Safety Area Enhancements, Final Environmental Assessment* (December 2013)
Note: *De minimis* levels for CO, NO_X, SO_2, and $PM_{2.5}$ are 100 tpy; and 50 tpy for VOCs.

Other major construction projects in the vicinity of the Airport that are proposed to be underway at approximately the same time include:

- *Environmental Dredging of Flushing Bay by NYC*
- *Willets Point Redevelopment*
- *National Tennis Center Strategic Vision Project*

All three projects have been evaluated by the respective City agencies and determined to have no significant adverse air quality impacts. Construction of the *NYSDOT 94th Street Interchange Improvements* along the Grand Central Parkway was recently completed, and construction of the *North Shore Marine Transfer Station* in College Point is expected to be complete soon; no incremental emissions would result from those projects. *Change: The North Shore Marine Transfer Station has been completed.* *Operations Phase*After construction, day-to-day airport and airline operations would continue to generate emissions of criteria pollutants. Emissions inventories were prepared for the future year 2030 for mobile and stationary sources with and without the project. The assessment demonstrates that the emissions resulting from the CTB Redevelopment Program would be only marginally different, and in most cases less, than the emissions from the No-Action Alternative. Because the CTB Redevelopment Program would result in no emissions increase or an increase that is clearly *de minimis*, it can be concluded that the incremental emissions resulting from the future operation of the CTB Redevelopment Program would not contribute to a significant adverse impact on the air environment.

5.2.8.4 Climate

The cumulative impact of the CTB Redevelopment Program on the global climate when added to other past, present, and reasonably foreseeable future actions is not currently scientifically predictable. Aviation has been calculated to contribute approximately three percent of global carbon dioxide (CO_2) emissions; this contribution may grow to five percent by 2050. Actions are underway within the U.S. and by other nations to reduce aviation's contribution through such measures as new aircraft technologies to reduce emissions and improve fuel efficiency, renewable alternative fuels with lower carbon footprints, more efficient air traffic management, market based measures and environmental regulations including an aircraft CO_2 standard. The U.S. has ambitious goals to achieve carbon-neutral growth for aviation by 2020 compared to a 2005 baseline, and to gain absolute reductions in GHG emissions by 2050. At present there are no calculations of the extent to which measures individually or cumulatively may affect aviation's CO_2 emissions. The EPA issued an Advance Notice of Proposed Rulemaking on June 1, 2015 to provide an overview of and seek input on a variety of issues related to setting an international CO_2 standard for aircraft at the International Civil Aviation Organization (ICAO). The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e. g., NASA, NOAA, EPA, and DOE), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions, with quantified uncertainties for current and projected aviation scenarios under changing atmospheric conditions.[90] LGA has a long history of proactively initiating projects that reduce GHG emissions from aircraft, buildings, and vehicles, including, comprehensive energy efficiency retrofit programs in its buildings, use of biodiesel in Port Authority vehicles, among many other actions. This project will minimize its individual impact on climate through efficient building design, aircraft apron and taxiway design, and commitment to meeting LEED Silver or higher standards for construction.

The Port Authority conducts annual greenhouse gas inventories for its facilities, and will continue to do so once the CTB is constructed. The proposed design changes do not substantively change the project with regards to aircraft operations, passenger forecasts, and vehicle movements from attracted travel sources, as compared to the previously approved (2014) design. The CO2e estimates for the operation of the previously approved (2014) design are stated below in Table 5-11.

Table 5-11: Annual Carbon Dioxide Emissions Inventory—Operations Phase-from 2014 EA

Emissions Source	**2030 No-Build/ No Action**		**2030 Proposed Action**		**Net Emissions**		**Percent Change**
	Annual Operations Conditions (tons per year)						
	CO_2	CO_2e	CO_2	CO_2e	CO_2	CO_2e	
Aircraft	396,479.03	400,443.82	382,103.83	385,924.87	-14,375.21	-14,518.95	-3.6%
On-Road Vehicles	4,330.00	4,373.30	4,917.30	4,966.47	587.30	593.17	13.6%
CHRP	3,358.49	3,392.07	4,719.88	4,767.08	1,361.39	1,375.01	40.5%
Total	**404,167.52**	**408,209.19**	**391,741.01**	**395,658.42**	**-12,426.52**	**-12,550.77**	**-3.1%**

[90] Nathan Brown, et. al. The U.S. Strategy for Tackling Aviation Climate Impacts, (2010). 27th International Congress of the Aeronautical Sciences.

Note: Based on EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007* (April 15, 2009) for fossil fuel combustion sources, CO_2e calculated as 101% of CO_2 emissions.

5.2.8.5 Coastal Resources and Floodplains

The area affected by the CTB Redevelopment Program is located within the Coastal Zone of New York, which includes the FEMA-designated 100-year tidal floodplain. PANYNJ has determined that the CTB Redevelopment Program is consistent with the State's Coastal Management Program (CMP) and the Local Waterfront Revitalization Program (WRP), and the NYS Department of State has concurred with PANYNJ's consistency determination. No adverse impacts to coastal resources would occur as a result of the CTB Redevelopment Program; therefore, it would not contribute to cumulative impacts on the resource. Other major development projects affecting coastal areas in the vicinity of the airport include:

- *North Shore Marine Transfer Station (substantially complete)*

  <u>*Change: North Shore Marine Transfer Station (recently completed)*</u>

- *East End Substation/East Garage (under construction)*

  <u>*East End Substation/East Garage (recently completed)*</u>

- *Runway Safety Area Enhancements (under construction)*
- *Environmental Dredging of Flushing Bay (proposed)*

These projects have also been evaluated by the NYSDOS and determined to not result in potential significant adverse impacts to coastal resources. Development actions along the City's waterfront are strictly regulated. Compliance with applicable state and local coastal policies and programs for the protection of coastal resources provides adequate assurance that no significant individual or cumulative impacts would occur.

5.2.8.6 Fish, Wildlife and Plants

During construction, local species of wildlife would be temporarily displaced by earth disturbance and tree removal associated with site preparation activities. After construction, trees would be replaced and landscaped areas would be re-established in accordance with *New York City Rules Governing Tree Replacement* and FAA Advisory Circular 150/5200-33C, *Hazardous Wildlife Attractants On or Near Airports*. No federal- or state-listed species of fish, wildlife, plants, or critical habitat would be affected by the project.

Impacts to Upland Habitats

As discussed in Section 5.7, the CTB Redevelopment Program would result in the net loss of approximately four acres of urban landscaping located between the Airport and the Grand Central Parkway, which accounts for less than three percent of the project site and less than one percent of the Airport site. The various trees, shrubs, and mowed grasses associated with the landscaped medians between the roadways provide highly fragmented habitat with little or no value. Other listed projects affecting upland habitats on or near LaGuardia Airport include:

- *East End Substation/East Garage*: Less than one acre of upland vegetation will be disturbed during construction of a buried utility ductbank crossing the Grand Central Parkway. The construction impacts are localized, temporary, and minor, and the site will be restored to its original condition at the completion of the project. As part of the project, 32 trees will be removed in compliance with a NYCDPR *Construction and Forestry Permit* including mitigation pursuant to *NYC Rules Governing Tree Replacement.*

- *Runway Safety Area (RSA) Enhancements*: According to the Final EA for this project, approximately nine acres of upland habitat, including numerous trees, would be removed for site preparation and development of the Ingraham's Mountain Construction Staging Area. The remaining upland habitat within perimeter areas of the same property would be left undisturbed, along with the associated vegetation at Ingraham's Mountain, during and after construction.

Upland habitats located on and in the vicinity of the Airport consist of trees, shrubs, and turf grasses that are either maintained as urban landscaping or left untended within small parcels of open space and undeveloped land. These areas support a limited variety of common wildlife species that have adapted to the surrounding developed urban community. PANYNJ has conducted natural resource assessments for all three Airport projects discussed above, and no potential for significant impacts to upland resources has been identified. Furthermore, no other off-Airport project has been identified as having a potentially significant impact on upland resources. Therefore, the CTB Redevelopment Program, including mitigation for tree removal, would not be expected to cause or contribute to significant adverse impacts to upland species or habitats.

5.2.8.7 DOT Act, Section 4(f)

As discussed in Section 5.5 of the 2014 EA, the CTB Redevelopment Program would not impact any publicly-owned park, recreation area, or wildlife or waterfowl refuge area of national, state or local significance. However, the CTB Redevelopment Program would require the use of historic resources, which are also regulated under Section 4(f) of the DOT Act. The assessment of cumulative impacts on historic resources is discussed in the following section. If the CTB Redevelopment Program would not cause or contribute to a significant adverse impact on historic resources, then it is reasonable to conclude that there would be no significant cumulative impacts on Section 4(f) resources.

5.2.8.8 Historic Resources

The FAA has determined that the CTB Redevelopment Program, including the demolition of Hangars 1, 2 and 4, which are eligible for listing on the NRHP, would adversely affect historic resources at LaGuardia Airport. The assessment of project-related impacts on historic resources is discussed in Section 5.10 and **Appendix D** of the 2014 EA.

Improvements and changes to LaGuardia Airport over the past 73 years of operation have been necessary to achieve and maintain the highest levels of airport safety and efficiency while keeping pace with changes in the U.S. airline industry, such as increasing passenger volumes, larger aircraft, new technologies, and more stringent federal regulations. As older buildings face the challenge of age and obsolescence, PANYNJ and FAA are under pressure to provide new facilities within the limited space available. As decades have passed, in order to accommodate the growing demand for passenger terminals and support facilities, buildings have been removed from LaGuardia Airport.

Today, the remaining original airport buildings include Hangars 1, 3, and 5; Hangars 2 and 4; Hangar 7; and the Marine Air Terminal (Terminal A)—all of which were constructed between 1939 and 1940. Of these remaining buildings, the CTB Redevelopment Program would directly impact Hangars 1, 2, and 4, which would indirectly impact the remaining Hangars 3 and 5. There would be no direct or indirect adverse effects to the Marine Air Terminal—located on the west side of the Airport. There are no other ongoing or reasonably foreseeable projects or impacts to consider.

PANYNJ and FAA have strived to balance the need for new facilities at LaGuardia Airport with the need to preserve its historic resources. For example, the Marine Air Terminal has been designated a New York City Landmark (Landmarks Preservation Commission, 1980), and it is listed on the National Register of Historic Places (National Register, 1982). When the FAA removed the second generation Airport Traffic Control Tower, mitigation measures included HABS/HAER recordation as well as a booklet that chronicles LaGuardia Airport's history and accomplishments with photographs of original buildings, vintage aircraft, key persons, and important events created collaboratively by the FAA and PANYNJ (FAA, 2011).

When an adverse effect to historic properties cannot be avoided, the Section 106 participants identify measures to mitigate the individual and cumulative effects of the project. Mitigation is the public benefit that balances the loss (or diminishment) of the historic resource. Under the CTB Redevelopment Program, the unavoidable adverse effects of removing NRHP-eligible Hangars 1, 2, and 4 would be reduced through standard mitigation measures, including photographic documentation and HABS/HAER recordation of Hangars 1, 3, and 5, Hangars 2 and 4, and Hangar 7, thereby establishing a permanent public record of all six airport buildings. Under the Section 106 process, mitigation measures needed to reduce the effects of the CTB Redevelopment Program to a level of non-significance are stipulated in the signed MOA included in **Appendix D** of the 2014 EA.

Compliance with the Section 106 process, including an executed MOA, provides adequate assurance that the incremental adverse effects of the CTB Redevelopment Program have been considered and that the CTB Redevelopment Program, with mitigation measures, would not cause or contribute to a significant adverse cumulative impact on historic resources at the Airport.

The terminal design and apron/taxilane layout was not a point of discussion for the consulting parties when evaluating the adverse effects on the historic resources as part of the original CTB Redevelopment Program. The requirements in the Memorandum of Agreement that was concurred upon by the consulting parties (see Appendix D) will still be met under the proposed design changes. There were no scenarios examined as part of the original alternatives analysis or the 4(f) analysis where adverse effects to historic resources did not occur. All scenarios examined required the demolition of Hangars 1, 2, and 4 in accordance with the MOA. The proposed design changes slightly modify the footprint of the West Garage and move it roughly 35 feet further away from Hangars 3 and 5. This design change has been highlighted to the New York State Historic Preservation Office, and details of discussions about the design changes are reflected in Attachment 10.

5.2.8.9 Noise

The assessment of project-related noise impacts on the surrounding community is discussed in Section 5.13 and **Appendix E** of the 2014 EA.

Construction Phase

Cumulative noise impacts during construction may result from two conditions:

- Multiple construction activities occurring simultaneously in proximity to the same noise receptor, such that the total construction noise level from the multiple sources exceeds the impact threshold.

- Multiple construction activities occurring during non-overlapping but consecutive time periods proximate to the same noise receptor.

Regarding the second condition, the cumulative effect is an extension of the exposure period of an activity as it relates to sensitive sites. For example, one project may allow pile driving at night while another allows pile driving during the day, thereby exposing the receiver to an extended period of noise. Alternatively, one project may result in pile driving from January to March, while another project may result in pile driving from March or April to May, thereby also extending the period of exposure.

As discussed in Section 5.19, Construction Impacts, the CTB Redevelopment Program is divided into multiple construction phases that would take approximately eight years to complete, beginning in 2014 and continuing through 2021. Heavy construction work is expected to occur on weekdays between the hours of 7:00 AM and 3:00 PM. Minimal work would occur between 3:00 PM to 11:00 PM, and mainly involves accepting materials deliveries. No construction work is expected to occur late at night or on weekends.

Change: The construction schedule for the proposed design changes would take under 68 months to complete, beginning in 2016 and continuing until the end of 2021. Heavy construction work is expected to occur on weekdays during two overlapping shifts between the hours of 6:00 AM and 3:00 PM. For a period of approximately 5.5 months centered on the peak construction period (the second quarter of 2017), there would be nighttime demolition activities occurring on the airside of the airport. Nighttime demolition activities will include demolishing airside apron and utility infrastructure. There will be no construction activity during these overnight hours, such as paving or pile driving. Only demolition and material removal will happen during these overnight hours. Nighttime demolition work is required to maintain consistency with overall project phasing as well as to avoid conflicts with aircraft operations during daytime operating hours.

During construction of the CTB Redevelopment Program, pile driving is anticipated to be the worst-case noise activity. The highest noise levels would occur during the early construction phases (~~between 2014 and 2017~~) corresponding with the pile driving activities.

Change: The highest noise levels would occur during the early construction phases (between 2016 and 2018).

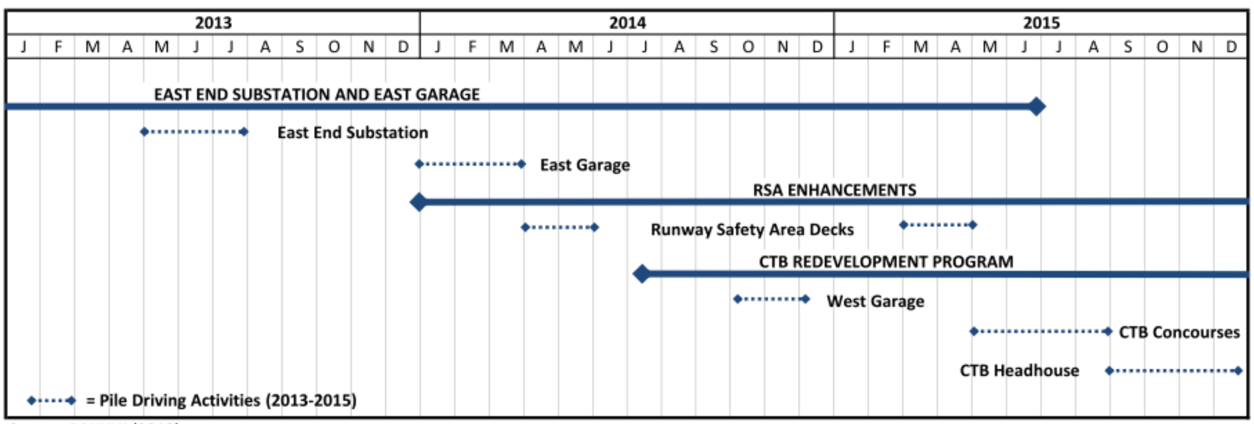
A construction noise analysis was performed (see **Appendix E of the 2014 EA**), and it was determined that distance from residences would attenuate noise from the construction site, including pile driving, to levels that are well below established noise thresholds for construction phase activities.

At the Airport, two reasonably foreseeable projects may be under construction at the same time as the CTB Redevelopment Program. However, because pile-driving for the *East End Substation/East Garage* is already underway and will have already been completed, only one other project would potentially involve pile-driving during construction of the CTB Redevelopment Program.

- *Runway Safety Area Enhancements:* This PANYNJ project involves placing additional piles in the water to support the deck extensions further into Flushing Bay. As part of implementation of the project, there would be a temporary and localized increase in noise during pile-driving activities. No pile driving is associated with construction of the other elements of this project – site preparation for the Ingraham's Mountain Construction Staging Area and construction related to the realignment of Runway Drive and the RVSR. A construction noise analysis was performed for the *RSA Enhancements* project; no significant noise impacts are anticipated.

As shown in **Figure 5-17**, pile driving for the previously approved design (2014) and for the proposed *RSA Enhancements* project would be ~~staggered such that there do not appear to be any instances where the separate and distinct programs (CTB and RSA) are performing pile driving operations concurrently or continuously. RSA deck construction is expected to occur from April to May of 2014 and from March to April of 2015. During this time, there would be no pile driving from the proposed CTB Redevelopment Program. Pile driving associated with construction of the proposed West Garage is expected to occur between October and November 2014, which would not overlap with pile driving associated with the RSA deck extensions. All other pile driving activities associated with the Proposed Action would not be expected to begin until after scheduled completion of the RSA deck extensions (April 2015). The extended time periods of pile driving activities from multiple individual projects would not cause a significant noise impact. Further, as pile driving for the Proposed Action and for the RSA deck extensions would be proximate to different noise receptors, a cumulative noise impact is not expected to result from the non-overlapping pile driving activities.~~

Change: Due to the revisions in the construction schedule as a result of the proposed design changes, the pile driving activities associated with the RSA Enhancements project will be complete before the CTB Redevelopment Program is initiated. Figure 5-17 is no longer applicable. There would be no cumulative noise impact as a result of overlapping or sequential pile-driving activities. Pile driving activities for the RSA Enhancements project are complete.



Source: PANYNJ (2013)

Figure 5-17. On-Airport Construction Projects with Pile-Driving Activities- 2014 EA

As part of the *RSA Enhancements* project, peak construction of the Ingraham's Mountain Construction Staging Area would occur from January 2014 to June 2014, which would be complete or nearly complete prior to implementing the CTB Redevelopment Program. Construction related to the realignment of Runway Drive and the RVSR would commence in June 2014 with peak construction anticipated in September and October 2014. As previously stated, no pile driving is associated with site preparation for the Ingraham's Mountain Construction Staging Area or construction of Runway Drive and the RVSR.

No off-Airport projects are scheduled to be under construction at the same time and in approximately the same location as the Proposed Action. The *94th Street Interchange Improvements* ~~is currently under construction~~ and scheduled to be complete before the Proposed Action would begin. Other nearby projects in Queens Borough, including the ~~*North Shore Marine Transfer Station,*~~ *Environmental Dredging of Flushing Bay*, *Willets Point Redevelopment*, and the *National Tennis Center Strategic Vision Project*, may be underway at the same time as the CTB Redevelopment Program but those projects are located further away. The distance between these simultaneous projects translates to no cumulative impact to the noise receptors that would be affected by construction noise resulting from the CTB Redevelopment Program.

Change: The 94th Street Interchange Improvements and North Shore Marine Transfer Station are complete.

Operations Phase

The potential for project related noise impacts on the surrounding community is discussed in Section 5.13 and **Appendix E of the 2014 EA**. An aircraft noise analysis was conducted and the results indicate that the CTB Redevelopment Program would result in a minor, but not significant, increase in noise levels in the vicinity of the airport. The changes would not begin to occur until after 2021 and would not reach predicted levels until 2030. The noise analysis was prepared using FAA-required methodology and the most current input data available from the Airport and the FAA, including aircraft operations forecasts, aircraft types, day-night distributions, runway use percentages, and flight tracks based on the latest published arrival and departures procedures.

Past, ongoing, and reasonably foreseeable future projects and/or actions were considered to determine if there is potential for cumulative exposure of individuals to aircraft noise in areas surrounding the Airport. The only major development projects at LaGuardia Airport in recent years were two infrastructure projects—the new *Airport Traffic Control Tower (ATCT)* and the *Police Emergency Garage/Emergency Fire Pump Station*—and neither project had any effect on the airport noise exposure contours. The *East End Substation/East Garage* project currently under construction is another Airport infrastructure project that will have no effect on Airport noise. In the future, if the *Runway Safety Area Enhancements* project is implemented, there would be no effect on aircraft noise because there would no change to runway length, touchdown points, or aircraft operations. Finally, no off-Airport projects—past, present or future—would have any effect on aircraft operations or noise levels in the vicinity of the Airport. On this basis, it can be concluded that no past, on-going, or reasonably foreseeable project undertaken by PANYNJ would combine with the noise impacts of the CTB Redevelopment Program to result in significant cumulative noise impacts for the operations phases of these projects.

Other federal actions involving airspace and air traffic control also have the potential to affect noise levels in the community. For this reason, the aircraft noise analysis (**Appendix E of the 2014 EA**) focuses on how the CTB Redevelopment Program would change the cumulative noise exposure of individuals to aircraft noise in areas surrounding the Airport. For example, the FAA recently implemented a departure procedure known as the TNNIS (pronounced "tennis") climb.[91] To ensure that the most recent flight procedures have been considered, flights tracks used for the aircraft noise analysis of existing and future conditions include the use of the TNNIS climb departure procedure, and the results indicate that, as defined by federal guidelines and requirements, no significant noise impacts would occur. No other changes to flight procedures are proposed at this time. In the future, no significant changes to flight track locations or track dispersions are expected to occur between operations years 2021 and 2030 as a result of the CTB Redevelopment Program.

5.2.8.10 Water Quality

As discussed in Chapter 4, Affected Environment, LaGuardia Airport is surrounded on three sides by surface waters associated with Flushing Bay; however, no surface waters are present within the project

[91] The FAA conducted an environmental review pursuant to NEPA and determined that the use of this procedure will not produce significant environmental impacts and issued a Categorical Exclusion (October 2012).

site. For this reason, incremental effects would be limited to potential changes in the quantity and quality of storm runoff during and after construction, and the effects are expected to be minor.

Construction Phase

Past and ongoing projects undertaken by PANYNJ at LaGuardia Airport may have had temporary construction-period effects, but have not adversely affected water quality in the long term. No other past or ongoing construction projects in the cumulative impacts study area are known to have had an adverse impact on water resources associated with Flushing Bay. Two reasonably foreseeable actions that could affect water quality during construction of the CTB Redevelopment Program include:

- ~~*Runway Safety Area Enhancements at LaGuardia Airport*. This PANYNJ project involves placing additional piles in the water to support the deck extensions further into Flushing Bay. If constructed, there would be a localized and temporary increase in suspended sediment levels during pile-driving. No long-term impacts or changes are expected to occur after the construction period.~~ *Change: The in-water work for this project is complete.*

- *Environmental Dredging of Flushing Bay*. This project, to be undertaken by NYCDEP, would also result in temporary increases in suspended sediment levels during dredging operations, but is anticipated to have only localized, temporary, and minor adverse effects on water quality. BMPs and restrictions required by the U.S. Army Corps of Engineer permits would ensure water quality is maintained. The dredging project is intended to improve overall water quality within the area after construction is complete.

The assessment of impacts on water resources is discussed in Section 5.16, Water Quality and Section 5.19, Construction Impacts. The CTB Redevelopment Program does not involve in-water construction like the projects listed above; therefore, potential impacts on Flushing Bay would be limited to storm runoff from the construction site. Storm runoff during construction would be regulated by the NYSDEC under the SPDES program, which mandates implementation of a Storm Water Pollution Prevention Plan (SWPPP) to prevent storm water contamination during the construction period. The SWPPP would describe all the construction site operator's activities to prevent storm water contamination, control sedimentation and erosion, and comply with the SPDES permit. Compliance with the SPDES permit, including the SWPPP for construction, provides adequate assurance that the CTB Redevelopment Program would avoid or minimize incremental increases in storm runoff pollution and that the limited discharges of sediment from the construction site would not cause or contribute to a significant adverse impact on the receiving waters associated with Flushing Bay.

Operations Phase

The CTB Redevelopment Program, when considered with other past, present, and reasonably foreseeable actions, would not have a significant adverse impact on surface waters adjacent to the Airport. As discussed in Section 5.16, the overall impact on storm runoff is expected to be a positive one due to the installation of new water quality devices and the implementation of BMPs and control measures to reduce the quantity and improve the quality of storm runoff from the Airport.

6 Mitigation

This chapter identifies the mitigation measures PANYNJ proposes to reduce or minimize the environmental impacts identified in the 2014 EA. The following explanations describe each measure's benefits by noting how the measure would avoid or reduce the adverse environmental effects.

Building Design: non-reflective roofing materials will be selected to avoid glare impacts to the Air Traffic Control Tower and pilots.

6.1 Traffic Levels-of-Service

As per *CEQR Technical Manual* criteria and NYCDOT guidelines, improvements and changes needed to maintain or improve traffic levels-of-service during and after construction are included in the design of the CTB Redevelopment Program. As discussed in Section 5.1, Traffic and Transportation, and in **Appendix A of the 2014 EA**, these improvements at a total of ~~12 intersections~~—including a traffic signal installation, a traffic signal controller upgrade, signal timing adjustments, curbside parking prohibitions, lane widening/restriping, and the use of construction flaggers—are recommended as temporary measures to reduce delays at the study intersections and to ensure the most efficient traffic signal operations during periods of construction activity.

Change: Based on the updated traffic analysis in Attachment 4, temporary improvements are recommended at 11 intersections for the proposed design changes. *See table 6-1 below.*

Intersection	2014 FONSI/ROD	Proposed Design Changes
Northern Boulevard/Junction Boulevard	During the weekday morning peak hour, reallocate one (1) second of green time from the east-west phase to the north-south phase. During the weekday afternoon peak hour, reallocate two (2) seconds of green time from the east-west phase to the north-south phase.	~~During the weekday morning peak hour, reallocate one (1) second of green time from the east-west phase to the north-south phase.~~ During the weekday afternoon peak hour, reallocate two (2) seconds of green time from the east-west phase to the north-south phase.
Astoria Boulevard North Service Road/79th Street/23rd Avenue	During the weekday morning peak hour, reallocate ~~five (5) seconds~~ of green time from the northwest-bound phase (i.e., Astoria Boulevard North Service Road) to the northeast-bound phase (i.e., 23rd Avenue).	During the weekday morning peak hour, reallocate *eleven (11)* seconds of green time from the northwest-bound phase (i.e., Astoria Boulevard North Service Road) to the northeast-bound phase (i.e., 23rd Avenue).
Astoria Boulevard/Astoria Boulevard North Service Road	During the weekday afternoon peak hour, reallocate seven (7) seconds of green time from the northwest-bound phase to the westbound phase.	During the weekday afternoon peak hour, reallocate seven (7) seconds of green time from the northwest-bound phase to the westbound phase.

Intersection	2014 FONSI/ROD	Proposed Design Changes
Astoria Boulevard North/Grand Central Parkway westbound off-ramp/82nd Street/Ditmars Boulevard	Restripe the westbound approach to create two exclusive right-turn lanes and one shared through/left-turn lane, and install corresponding advance lane use signs. During the weekday afternoon peak hour, reallocate ~~four (4) seconds~~ of green time from the westbound phase to the north-south phase.	~~Restripe the westbound approach to create two exclusive right-turn lanes and one shared through/left-turn lane, and install corresponding advance lane use signs.~~ *During the weekday morning peak hour, reallocate four (4) seconds of green time from the north-south phase to the westbound phase.* During the weekday afternoon peak hour, reallocate *three (3) seconds* of green time from the westbound phase to the north-south phase.
23rd Avenue/82nd Street	During the weekday morning peak hour, reallocate nine (9) seconds of green time from the north-south phase, plus one (1) second from the southbound phase, to the east-west phase (i.e., a total of 10 seconds).	During the weekday morning peak hour, reallocate nine (9) seconds of green time from the north-south phase, plus one (1) second from the southbound phase, to the east-west phase (i.e., a total of 10 seconds).
Astoria Boulevard/82nd Street/24th Avenue	During the weekday afternoon peak hour, reallocate one (1) second of green time from the east-west phase to the southbound phase.	During the weekday afternoon peak hour, reallocate one (1) second of green time from the east-west phase to the southbound phase
Ditmars Boulevard/Marine Terminal Drive	During the weekday morning peak hour, reallocate one (1) second of green time from the westbound phase to the north-south phase.	~~During the weekday morning peak hour, reallocate one (1) second of green time from the westbound phase to the north-south phase.~~
Ditmars Boulevard/81st Street	Restripe the westbound approach to accommodate two exclusive right-turn lanes and one shared through/left-turn lane and install corresponding advance lane use signs. During the weekday afternoon peak hour, reallocate eight (8) seconds of green time from the east-west phase to the southbound phase.	Restripe the westbound approach to accommodate two exclusive right-turn lanes and one shared through/left-turn lane and install corresponding advance lane use signs. During the weekday afternoon peak hour, reallocate eight (8) seconds of green time from the east-west phase to the southbound phase.
21st Avenue/81st Street	During the weekday morning peak hour, reallocate eight (8) seconds of green time from the eastbound phase to the north-south phase.	During the weekday morning peak hour, reallocate eight (8) seconds of green time from the eastbound phase to the north-south phase.

Intersection	2014 FONSI/ROD	Proposed Design Changes
19th Avenue/Hazen Street	Install a new traffic signal controller in accordance with NYCDOT design guidance. Eliminate the “48 Hour Parking, Detached Trailers” parking regulation on the north side of 19th Avenue for a distance of approximately 200 feet west of Hazen Street, and restripe a 14-foot exclusive right-turn lane and a 12-foot shared through/left-turn lane on the eastbound approach. During the weekday morning peak hour, reallocate four (4) seconds of green time from the southbound leading phase to the east-west phase. During the weekday afternoon peak hour, reallocate seven (7) seconds of green time from the southbound leading phase and five (5) seconds from the north-south phase to the east-west phase.	Install a new traffic signal controller in accordance with NYCDOT design guidance. Eliminate the “48 Hour Parking, Detached Trailers” parking regulation on the north side of 19th Avenue for a distance of approximately 200 feet west of Hazen Street, and restripe a 14-foot exclusive right-turn lane and a 12-foot shared through/left-turn lane on the eastbound approach. During the weekday morning peak hour, reallocate four (4) seconds of green time from the southbound leading phase to the east-west phase. During the weekday afternoon peak hour, reallocate seven (7) seconds of green time from the southbound leading phase and five (5) seconds from the north-south phase to the east-west phase.
19th Avenue/45th Street	Install a traffic signal at the intersection with 90 second cycle length: ~~60 seconds of green for EB/WB approaches, 20 seconds of green for NB/SB approaches,~~ and 10 seconds for yellow and all red. Remove the “48 Hour Parking, Detached Trailers” parking regulation on the east side of 45th Street, and extend the “No Standing Anytime” parking regulation on both sides of 45th Street for approximately 275 feet north of 19th Avenue, to accommodate two lanes on the southbound approach, as well as one northbound receiving lane. In addition, prohibit standing with a “No Standing Anytime” parking regulation on the west side of 45th	Install a traffic signal at the intersection with 90 second cycle length: *50 seconds of green for EB/WB approaches, 30 seconds of green for NB/SB approaches,* and 10 seconds for yellow and all red. Remove the “48 Hour Parking, Detached Trailers” parking regulation on the east side of 45th Street, and extend the “No Standing Anytime” parking regulation on both sides of 45th Street for approximately 275 feet north of 19th Avenue, to accommodate two lanes on the southbound approach, as well as one northbound receiving lane. In addition, prohibit standing with a “No Standing Anytime” parking regulation on the west side of 45th

Intersection	2014 FONSI/ROD	Proposed Design Changes
	Street for approximately 80 feet south of 19th Avenue, to allow for transition to the southbound through lane on 45th Street and on the south side of 19th Avenue for approximately 25 feet east of 45th Street, to accommodate the turning paths for shuttle buses turning from 45th Street southbound to 19th Avenue eastbound.	Street for approximately 80 feet south of 19th Avenue, to allow for transition to the southbound through lane on 45th Street and on the south side of 19th Avenue for approximately 25 feet east of 45th Street, to accommodate the turning paths for shuttle buses turning from 45th Street southbound to 19th Avenue eastbound.

Table 6-1. Comparison of Recommended Transportation Improvements for Construction Conditions

With these improvements in place, no significant construction traffic impacts as defined by *CEQR Technical Manual* criteria are projected to occur. After construction, minor reallocations of green time at three signalized intersections – coupled with lane restriping, curbside parking prohibitions, and minor reallocations of green time at a fourth intersection – would be required to accommodate traffic volumes associated with the CTB Redevelopment Program. All transportation improvements on local roadways are subject to review and approval by NYCDOT. PANYNJ would implement a traffic monitoring program in coordination with NYCDOT throughout the duration of the construction period and continuing after the construction of the new terminal in 2021, as needed.

Change: Construction of the new terminal is expected to be substantially complete at the end of 2021.

The monitoring program would determine the need for and timing of implementation of the identified improvements. With these improvements and monitoring program in place, no significant traffic impacts are projected to occur in accordance with the *CEQR Technical Manual* criteria. No additional traffic improvements or mitigation measures are proposed.

6.2 Air Pollution

To reduce the potential for adverse effects on air quality, the following best management practices, control measures, and emission reduction strategies are included in the design of the CTB Redevelopment Program:

- During construction, in accordance with PANYNJ's *Sustainable Infrastructure Guidelines,* contractors would be required to implement the following recommended strategies to minimize all airborne pollutants generated by diesel powered vehicles and equipment:
  - Use ultra-low sulfur diesel fuel in all diesel-powered construction equipment
  - Use diesel equipment retrofitted with emission control devices using Best Available Technology (BAT) targeted primarily for reducing particulate matter (PM) and secondarily for the reduction of nitrogen oxides (NO_X)
  - Limit idling times on diesel engines to three minutes
  - Use electric power in lieu of diesel powered generators when electric power is available at the site
- In addition, the following component projects/actions would be implemented to reduce emissions from aircraft auxiliary power units (APUs) and ground support equipment (GSE):

- Install 400Hz ground power and pre-conditioned air (PCAir) units at each gate position
- Require exclusive use of electric bag tractors, belt loaders and push-back tractors at each gate position

As discussed in Section 5.2, Air Quality and **Appendix B of the 2014 EA**, the CTB Redevelopment Program is designed to reduce aircraft congestion and delay on the terminal apron and traffic congestion and delay on the terminal area roadways, thereby reducing fuel consumption and, by extension, air pollution. In addition, the strategies listed above are included in the design of the CTB Redevelopment Program in an effort to further reduce emissions to the degree practicable. As a result, the CTB Redevelopment Program would result in no emissions increase or an increase that is clearly *de minimis.* No additional mitigation measures are proposed.

6.3 Impacts on Section 4(f) Resources

Of the resources protected by Section 4(f) of the U.S. DOT Act, only historic properties have been identified as affected by the CTB Redevelopment Program. Adverse effects to historic properties and mitigation measures needed to resolve adverse effects are addressed separately in Section 6.7.

6.4 Tree Removal and Replacement

Where NYC Tree removal cannot be avoided, tree replacement would comply with a NYCDPR *Construction and Forestry Permit* and a mitigation plan approved by NYCDPR. As discussed in Section 5.7, Fish, Wildlife and Plants, the number of trees needed to replace the trees approved for removal would be determined in consultation with NYCDPR and in accordance with *NYC Rules Governing Tree Replacement.* PANYNJ has committed to develop a plan with NYCDPR to address local impacts to NYC Trees, including provisions for restitution for the loss of those trees (see letter dated June 2, 2014 in **Appendix G of the 2014 EA**).

6.5 Floodplain Development

Where development within the coastal floodplain cannot be avoided, the CTB Redevelopment Program would comply with federal, state, and local laws and regulations for the protection of floodplains as well as the referenced standards for flood resistant design and construction to the degree practicable. As discussed in Section 5.8, Floodplains, the CTB Redevelopment Program includes a flood hazard mitigation plan developed in accordance with the National Flood Insurance Program, the International Building Code, the American Society of Civil Engineers national reference standards, and the New York City Building Code.

Adherence to these requirements provides adequate assurance that project-related development impacts on the tidal floodplain would be less than significant. No additional mitigation measures are proposed.

6.6 Hazardous Materials and Pollution Prevention

Where hazardous materials and waste cannot be avoided, PANYNJ would implement appropriate safety procedures and remediation strategies as needed to protect human health and the environment. As discussed in Section 5.9, Hazardous Materials, Pollution Prevention and Solid Waste, these procedures would include removal protocols for regulated hazardous substances including, but not necessarily limited to, the following: contaminated soils and/or groundwater; asbestos containing materials; lead-containing paint; and universal wastes such as light fixtures, PCB ballasts, thermostats, batteries, refrigerants, etc.

After construction, PANYNJ would update the *Spill Prevention Control and Countermeasures (SPCC) Plan for LaGuardia Airport.* The current SPCC plan would be revised to reflect changes in the use, handling, and storage of hazardous materials and wastes associated with day-to-day operation and maintenance of the CTB Redevelopment Program.

6.7 Adverse Effects to Historic Properties

Where adverse impacts to historic properties cannot be avoided, implementation of the CTB Redevelopment Program would include the following mitigation measures as stipulated in the signed Memorandum of Agreement that was developed by the FAA in consultation with SHPO, PANYNJ, and other Consulting Parties:

- Recordation. Level III Historical Architectural Building Survey/Historic American Engineering Record (HABS/HAER) recordation of Hangars 1, 3, and 5, Hangars 2 and 4, and Hangar 7. *Change: This action has been completed and submitted to NPS. Hangars 2 and 4 were demolished during the summer of 2015 in accordance with the MOA. The mitigation measures detailed herein will continue to be followed. The proposed design changes were provided to SHPO, and details of discussions with agencies about the design changes are reflected in Attachment 10.*

- Archaeological Monitoring of Areas of Sensitivity. Construction phase monitoring of select earthwork and excavation in the vicinity of the West Garage in accordance with a monitoring protocol approved by SHPO.

- Demolition/Construction Management Plan. Implementation of procedures to ensure that potential adverse effects to Hangars 3 and 5 are avoided to the greatest extent practicable during all phases of demolition and construction associated with the CTB Redevelopment Program.

- Maintenance Plan. Implementation of procedures to ensure that Hangars 3 and 5 are maintained in a state of good repair for the foreseeable future.

- Interpretive Display on the History of LaGuardia Airport. Preparation of a public display illustrating the significance of the 1939 and 1964 Central Terminal Buildings and Hangars 1, 2, 3, 4, 5 and 7.

As discussed in Section 5.10, Historical, Architectural, Archaeological, and Cultural Resources, a copy of the signed Memorandum of Agreement is included with **Appendix D of the 2014 EA**. A fully executed Memorandum of Agreement verifies that the unavoidable adverse effects to historic properties have been resolved and that the Section 106 process is complete.

6.8 Noise

Though construction equipment noise levels are expected to be well below applicable significance thresholds, PANYNJ would require the contractor to prepare a Construction Noise Mitigation Plan, which would include various noise control measures and alternatives for contractors to continue their important construction tasks while having less noise impact on the surrounding environment.

Change: Those measures include the following:

- *Conduct all construction activities during the daytime whenever possible (note that this will not be possible for a 5.5 month period around the 2nd Quarter of 2017, when demolition work will* *occur on the airside between 10:00PM and 6:00AM; this is discussed in Section 5.2.7- Construction Impacts);*

- *Require special permits for all construction within a specified distance and a specified time period for residential zones during the night and weekends;*
- *Use construction equipment with effective noise-suppression devices;*
- *Use noise control measures as necessary, such as enclosures and noise barriers, to protect the public and achieve compliance with all City noise ordinances; and*
- *Conduct all operations in a manner that will minimize, to the greatest extent feasible, disturbance to the public in areas adjacent to the construction activities and to occupants of nearby buildings.*

As discussed in Section 5.13, Noise and **Appendix E of the 2014 EA**, the highest noise levels would be associated with pile-driving activities; therefore, the following pile-driving noise attenuation measures are recommended:

- Reduce the impact sound of the ram hitting the pile cap by placing a resilient pad in the anvil chamber;
- Reduce the discharge sound of the hammer's air exhaust by installing a rectangular steel enclosure lined with acoustically-absorptive material to provide both sound absorption and a limp mass noise barrier;
- Reduce the "ringing" noise of the steel piles by utilizing acoustical paint across the web of each pile at 4- to 6-foot intervals; and
- Prohibit pile driving at night.

Additional strategies to reduce noise and vibration during construction are provided in PANYNJ's *Sustainable Infrastructure Guidelines*. They include:

- Require all debris conveyors and containers to be lined or covered with sound absorbing materials;
- Require all pneumatic support equipment to have intake and exhaust mufflers recommended by the manufacturer;
- Require all impact devices to be equipped with acoustically attenuating shields or shrouds recommended by the manufacturer;
- Require all internal combustion equipment to have mufflers and shield paneling recommended by the manufacturer;
- Require idling time for both on-road and off-road equipment and vehicles to be limited to 3 minutes;
- Minimize the use of equipment that generates more than 80 db(A) of noise, and use such equipment only during daylight hours (i.e. not at night in residential areas);

- Limit vibration resulting from construction equipment when work is close to tunnels, utilities or other sensitive structures and closely monitor peak particle velocity compliance through seismograph readings;
- Utilize an approved sound level meter for self-monitoring and proactively correct conditions where the noise generated by specific pieces of equipment exceeds allowable levels; and
- Utilize noise barriers to contain noise where practicable.

After construction, no additional noise mitigation measures are proposed.

6.9 Water Quality

Construction activities would comply with applicable NYSDEC water quality standards and permit requirements including preparing a Storm Water Pollution Prevention Plan (SWPPP) and filing a Notice of Intent. In accordance with the airport's State Pollutant Discharge Elimination System (SPDES) permit, PANYNJ would implement appropriate water quality measures to minimize erosion and sedimentation during construction as described in the *LaGuardia Airport Best Management Practices Plan*. These measures include, but are not necessarily limited to, the following:

- Prepare spill prevention and erosion control plans;
- Stabilize construction entrances;
- Install slope drains;
- Install inlet filters at all drainage inlet structures;
- Use perimeter erosion and sedimentation controls consisting of staked hay bales, filter fence, and silt fence;
- Use water or suppressing agents to control dust; and
- Sweep clean paved construction roads at the end of each day.

After construction, all the improvements and changes needed for airport operations to comply with applicable NYSDEC water quality standards and permit requirements are included in the design of the CTB Redevelopment Program. As discussed in Section 5.16, Water Quality, the overall impact on storm runoff would be a positive one due the installation of manufactured treatment devices, bio-filtration swales, and a system to harvest rainwater for beneficial re-use—BMPs that are not in place today and could not be reasonably implemented without new construction, for example:

- Subsurface oil/water separators would be installed to slow the rate of runoff from the aircraft park apron and to ensure that pollutants are captured and collected during and after rainfall events;
- A deicing containment system would be installed as part of the apron storm drainage to allow spent aircraft deicing fluid to be isolated, pumped out, and properly disposed, preventing the discharge of contaminants to surrounding waters;

- Vegetative swales would be designed to channel storm runoff away from the roadways and parking lots to be infiltrated or otherwise processed through oil/water separator before being discharged.

In addition, the *Sustainable Design Plan* identifies water efficiency measures to be incorporated into the design of the new terminal building. For instance, the terminal roof would be designed to collect and store rainwater for graywater applications (i.e., flush fixtures, landscape irrigation, etc.).

Change: Rainwater harvesting, stored in underground tanks below the headhouse, will be used for irrigation at the site.

In sum, the CTB Redevelopment Program includes more than adequate means and measures to reduce the quantity and to improve the quality of storm runoff during and after construction, and sustainability measures are also included in the design of the new terminal in order to achieve the benefits of green building and LEED certification. With these provisions in place, no additional mitigation measures are needed to reduce the impacts of the CTB Redevelopment Program below applicable significance thresholds.

7 Public Involvement

The public involvement section from the 2014 EA is restated below. Since the 2014 FONSI/ROD additional outreach has occurred with the following agencies and organizations: The Offices of Senator Jose Peralta and Congressman Joe Crowley, Queens Community Board #3, the United Civic Community Association, the New York City Economic Development Corporation, New York State Department of Transportation, New York City Department of Transportation, New York State Department of State, and New York City Department of City Planning, the Federal Aviation Administration (FAA), the Queens Borough President (Melinda Katz) and the Transportation Security Administration (TSA). Details on specific outreach conducted as a result of the proposed design changes are included in Attachment 10.

In accordance with NEPA and the CEQ regulations, PANYNJ has and will continue to involve the public in the decision-making process for the CTB Redevelopment Program. PANYNJ is committed to ensuring that stakeholders are informed about the CTB Redevelopment Program and its benefits and potential impacts. The Draft EA's public review and comment period also served the public involvement requirements of the special purpose laws triggered by the Proposed Action – U.S. DOT Act of 1966 Section 4(f), Section 106 of the National Historic Preservation Act, and Executive Order 11988, *Floodplain Management*.

The Port Authority is making this Technical Report available to the public electronically on its website and physically at its World Trade Center, New York, NY and LaGuardia Airport, Flushing, NY Offices. The Technical Report was also made available at the Jackson Heights and Flushing branches of the Queens Borough Public Library. Notice of availability will be published in the Daily News (Queens edition), Newsday, Queens Courier, Queens Chronicle, Queens Gazette, Queens Tribune, Queens Times Ledger, Queens Ledger, El Especialito, The National Herald, Sing Tao Daily, Newark Star Ledger, and Bergen Record between November 30 and December 4, 2015. The document was made publicly available for 15 days from publication (until December 14, 2015). The proofs of the notice of availability are included in Attachment 10.

Scoping and Agency Consultation

Efforts to address the redevelopment of the Central Terminal Building date back to 2004. Senior management from the Airport and Aviation Headquarters at PANYNJ has worked closely with the Airport tenants and the local community on the development of the terminal plan. The plan has evolved significantly since that time and their input at every stage of development of the plan has helped to shape and improve the final proposal.

During that time staff held multiple briefing and workshops for the Queens Borough President, federal, state and local elected officials, the surrounding Community Boards, the Queens Borough President's Aviation Advisory Council, NYCEDC and other City agencies, as well as a variety of community and business groups and civic associations. In addition, PANYNJ met frequently with the air carriers and other Airport tenants. They conducted airside and landside tours for the aforementioned groups, and included information about the planning project on PANYNJ's website.

In 2004, PANYNJ sought FAA approval to use Passenger Facility Charge (PFC) fees to fund the Feasibility Study for the CTB. This required a presentation to the air carriers, as well as a formal notification in the Federal Register and other local notifications seeking public comment. Six years later, PANYNJ sought to use additional PFCs for the Planning and Engineering Study for the CTB. Staff conducted two formal presentations for the carriers, and published the PFC application on the PANYNJ website seeking public comment.

PANYNJ has continued to perform outreach to the community as part of the EA process. A project website has been in place since 2012. Ongoing communication and stakeholder involvement is planned throughout the construction period.

As part of the planning process for the CTB Redevelopment EA, PANYNJ has met with many State and local agencies and presented the progress to-date on the Program and NEPA process, and discussed the agencies' concerns. Those agencies included the following:

- NYC Department of Transportation, Division of Traffic Planning
- New York State Department of Transportation
- Metropolitan Transportation Authority
- NYC Department of Parks and Recreation
- NYC Economic Development Corporation

NYC Mayor's Office of Environmental Coordination *Section 106 Consultation*

Section 106 of the National Historic Preservation Act requires that the lead agency seek input from Consulting Parties. As part of that process, FAA invited six organizations with interest in the history of the local area and aviation to participate in multiple meetings. The parties were sent the *Cultural Resources Technical Memorandum*. The first Consulting Parties meeting was held on September 26, 2013 at PANYNJ offices in Manhattan (225 Park Avenue South) and attended by representatives from PANYNJ, FAA, SHPO, New York Landmarks Conservancy, and the Queens Borough President's Office. At that meeting a presentation describing the Proposed Action and Purpose and Need was given and a discussion of the adverse impacts to the historic hangars was initiated. A second meeting was held on October 29, 2013 at LaGuardia Airport, attended by representatives from PANYNJ, FAA, SHPO and the Municipal Art Society. Participants were given a tour of the NRHP-eligible hangars. Afterwards, mitigation options were discussed. Having reached a conclusion that no feasible alternative would avoid impacts to the historic resources, it was agreed that a memorandum of agreement (MOA) should be developed. Further negotiation of the MOA and discussion among the Section 106 participants regarding mitigation measures continued through the comment period for the Draft EA. A Final MOA has been signed by the required signatories and concurring consulting parties (see **Appendix D of the 2014 EA**), indicating that the Section 106 process is complete.

Public Comment

A website has been established to introduce the Program and keep the public updated on its progress (http://www.panynj.gov/lgactb). The public can email questions about the Program at any time to lgactb@panynj.gov. In addition, there were two opportunities for in-person public input – the Public Information Open House and the Public Information Session/Public Hearing.

The Public Information Open House was held on December 12, 2012 at the LaGuardia Airport Marriott (located across from the Airport at 102-05 Ditmars Boulevard) to introduce the Central Terminal Building Redevelopment Program and Environmental Assessment. The meeting took place from 3:00 PM to 5:00 PM and 6:00 PM to 8:00 PM to allow ample opportunity for interested parties to attend. Email and/or hard copy letters of invitation were sent to over 260 individuals and organizations and notices were placed in 10 local newspapers. PANYNJ and consultant staff was available to present the need for and considerations in the development of plans to improve LaGuardia Airport. A series of story boards were on display that addressed the following topics: Welcome, History of the CTB, Airport Community and Context, Purpose and Need, Concepts for Redevelopment, Environmental Assessment Process, and Next Steps. A total of 51 people were in attendance. The presentation materials and detailed summary of the open house can be found in **Appendix H of the 2014 EA**.

The Public Information Session and Public Hearing were held at the LaGuardia Airport Marriott on May 8, 2014. Email and/or hard copy letters of invitation were sent to over 800 individuals and organizations and notices were placed in 13 local newspapers. A total of 53 people were in attendance, between the two sessions. At the Public Information Session (3:00 PM to 6:00 PM), PANYNJ staff were available to answer questions regarding the CTB Redevelopment Program and the Draft EA. At the Public Hearing (from 7:00 PM to 9:00 PM), individuals were given the opportunity publicly comment on the Draft EA and comments were recorded by a stenographer. The Hearing Officer described the regulatory background and hearing guidelines. PANYNJ gave a brief presentation on the CTB Redevelopment Program and Draft EA findings. Only one individual (representing the Global Gateway Alliance) gave testimony at the hearing. The presentation materials and hearing transcript can be found in **Appendix H of the 2014 EA**.

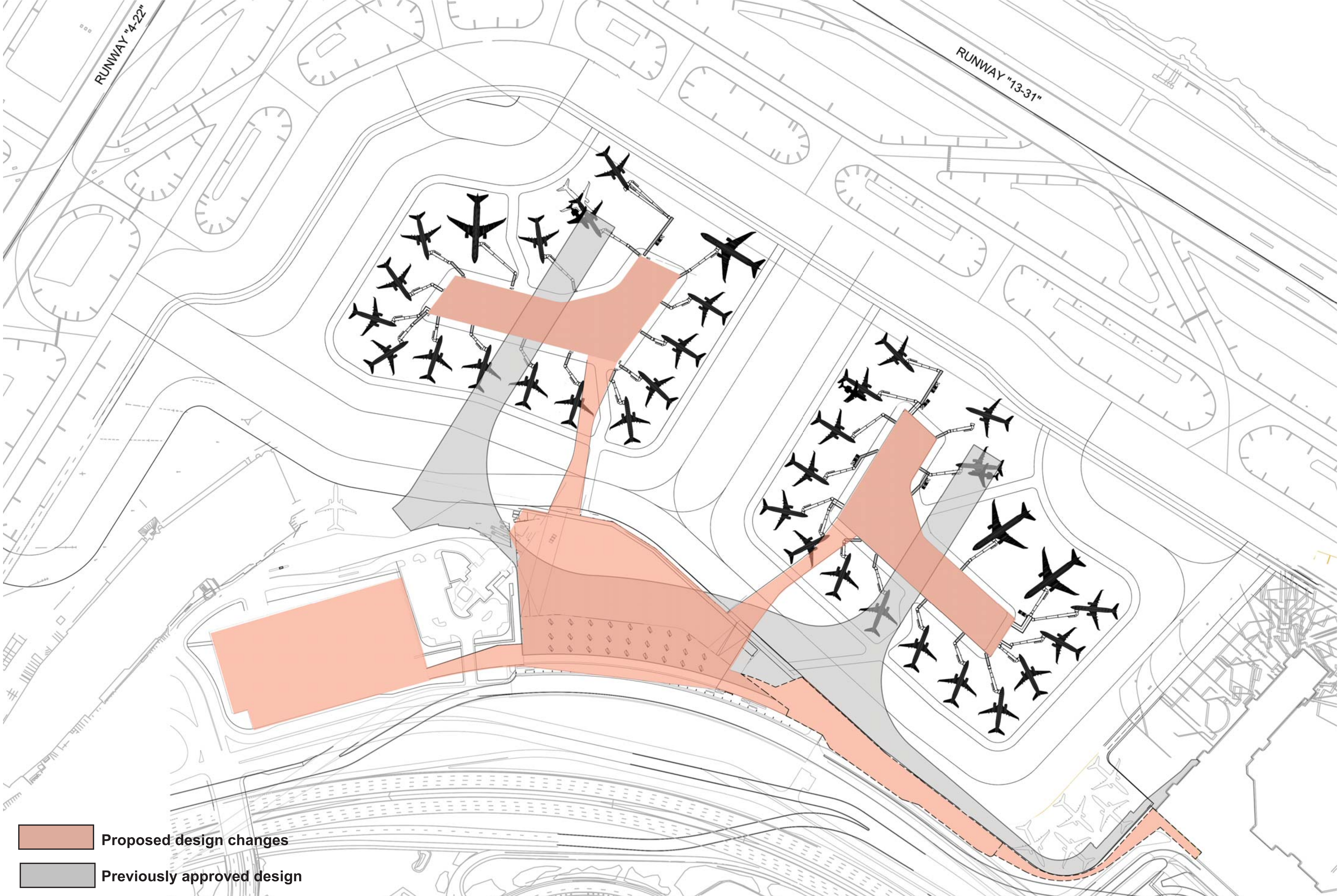
The Draft EA and Draft DOT Section 4(f) Evaluation were available for public comment for 45 days from April 9 to May 23, 2014. An announcement was printed in the *Daily News (Queens edition), Newsday, Queens Chronicle, Queens Gazette, Queens Times Ledger, Queens Ledger, El Especialito, The National Herald, Sing Tao Daily, Queens Courier*, *Queens Tribune, Newark Star Ledger, and Bergen Record* newspapers. The document was available at the PANYNJ's Administration Building at LaGuardia Airport, PANYNJ's office in Manhattan (225 Park Avenue South) and two branches of the Queens Borough Public Library (35-81 81st Street in Jackson Heights and 41-17 Main Street in Flushing). In addition, the Draft EA was posted on the PANYNJ website (http://www.panynj.gov/about/pdf/lga-ctb-redevelopment-environmental-assessment.pdf). The public was able to provide comments on the Draft EA by submitting comment cards, emails or other written testimony throughout the public comment period. On May 18, 2014, approximately 1,200 comment cards were distributed at Flushing Meadow Park. The Draft EA's public review and comment period served as the public involvement requirements of the special purpose laws triggered by the Proposed Action – U.S. DOT Act of 1966 Section 4(f), Section 106 of the National Historic Preservation Act, and Executive Order 11988, *Floodplain Management*.

All comments received during the public comment period are compiled in **Appendix H of the 2014 EA** along with a response, as appropriate. All comments have been addressed in the 2014 EA.

All feedback received during the public availability period for the Technical Report is included in Attachment 10. One comment relating to sustainable design was received and addressed by the Port Authority.

Attachment 1

Overlay of New CTB Layout and Previously Approved Layout



RUNWAY "4-22"
RUNWAY "13-31"
Proposed design changes
Previously approved design

Attachment 2
December 2015 LGA CTB Total Aircraft and Airfield Model (TAAM) Analysis

CENTRAL TERMINAL BUILDING REDEVELOPMENT TAAM ANALYSIS

LAGUARDIA AIRPORT

PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Prepared by:
Landrum & Brown

November 2015

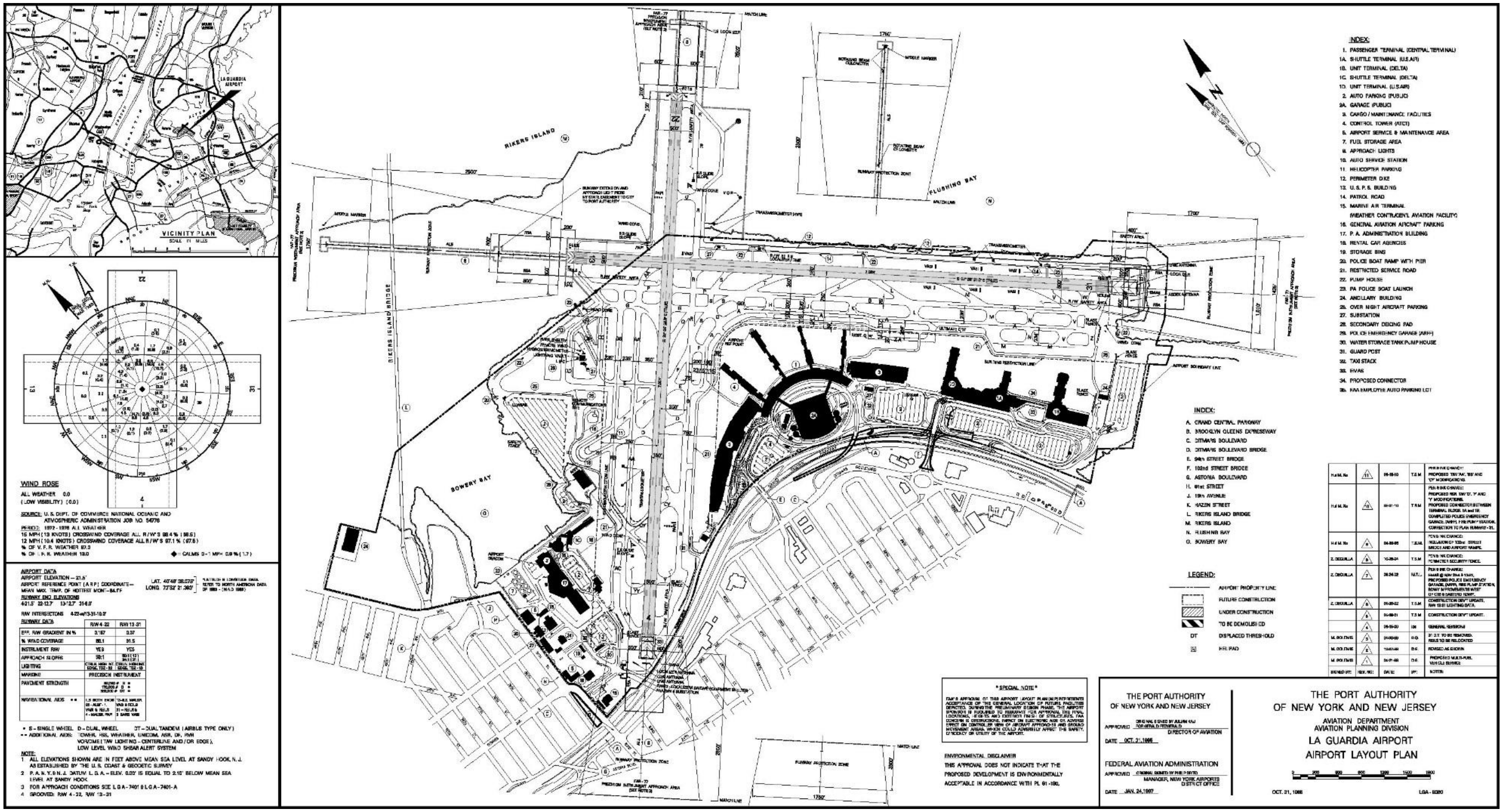
1. INTRODUCTION

LaGuardia Airport (LGA) is one of three large-hub airports[1] for the New York/New Jersey Metropolitan region. In 2012, LGA was the third largest airport of the region in terms of passengers and in terms of aircraft operations. Indeed, LGA accommodated 25 million passengers or 23.3 percent of the region's total passenger traffic and 375,949 aircraft operations or 30.9 percent of the region's traffic in 2012.

LGA accommodates domestic and precleared international traffic with regional commuter, narrow-body, and some wide-body commercial passenger aircraft. LGA's airfield includes two runways: one runway oriented in a northeast/southwest direction (Runway 04/22) and one runway oriented in a northwest/southeast direction (Runway 13/31). Runway 04/22 is 7,001 feet in length and 150 feet wide, while Runway 13/31 is 7,003 feet long and 150 feet wide. Runway 04/22 intersects Runway 13/31 approximately 2,110 feet southwest of the Runway 22 threshold. Runway 13/31 intersects Runway 04/22 approximately 1,220 feet southeast of the Runway 13 threshold. LGA also has four passenger terminals, known as Marine Air Terminal (Terminal A), Central Terminal Building (Terminal B), Delta Terminal (Terminal C), and Delta Terminal (Terminal D). **Figure 1-1** presents LGA's current layout plan.

[1] Federal Aviation Administration, *National Plan of Integrated Airport Systems*.

Figure 1-1: LGA Existing Airport Layout Plan



Source: The Port Authority of New York and New Jersey.

2. STUDY OBJECTIVES AND APPROACH

Forecasts prepared by the Port Authority of New York and New Jersey (PANYNJ) project that passenger demand at LaGuardia Airport (stated as million annual passengers or "MAP") will increase from approximately 23.6 MAP in 2010 to 34 MAP by approximately 2030. Of these, approximately 17.5 MAP, or roughly half, of this future passenger demand would need to be accommodated at the CTB in 2030 compared to approximately 13 MAP under present, already congested conditions.

The PANYNJ is proposing to redevelop the existing passenger terminal, airside apron, landside roadways, and parking garage within LaGuardia Airport's central terminal area. These facilities would be demolished and replaced with new facilities more efficiently designed and located to meet the latest federal standards for airport safety and security and to accommodate forecast passenger demand at acceptable levels of service. The proposed developments do not involve changes to the airfield runways or taxiways, air navigation aids, or aircraft flight procedures to or from the airport.

The Draft Environmental Assessment (EA) dated April 2014 identified and described the reasonably foreseeable environmental consequences of the Proposed Action and No-Action Alternatives. Numerous other alternatives were considered during the planning phases of the project, but were not included from further detailed environmental review as stated in the EA report. The EA identified the concourse/pier concept as being the preferred development alternative for the CTB. In the EA, this proposed alternative was referred to as Stage 1 concept.

This new analysis was conducted based on a new satellite concept CTB layout. The analysis presented herein includes a description of the new CTB concept as well as the various assumptions and methodology used to simulate traffic at LGA at the 34MAP level. The results of this TAAM simulation are compared against the original TAAM results used in the EA and included at the end of this report.

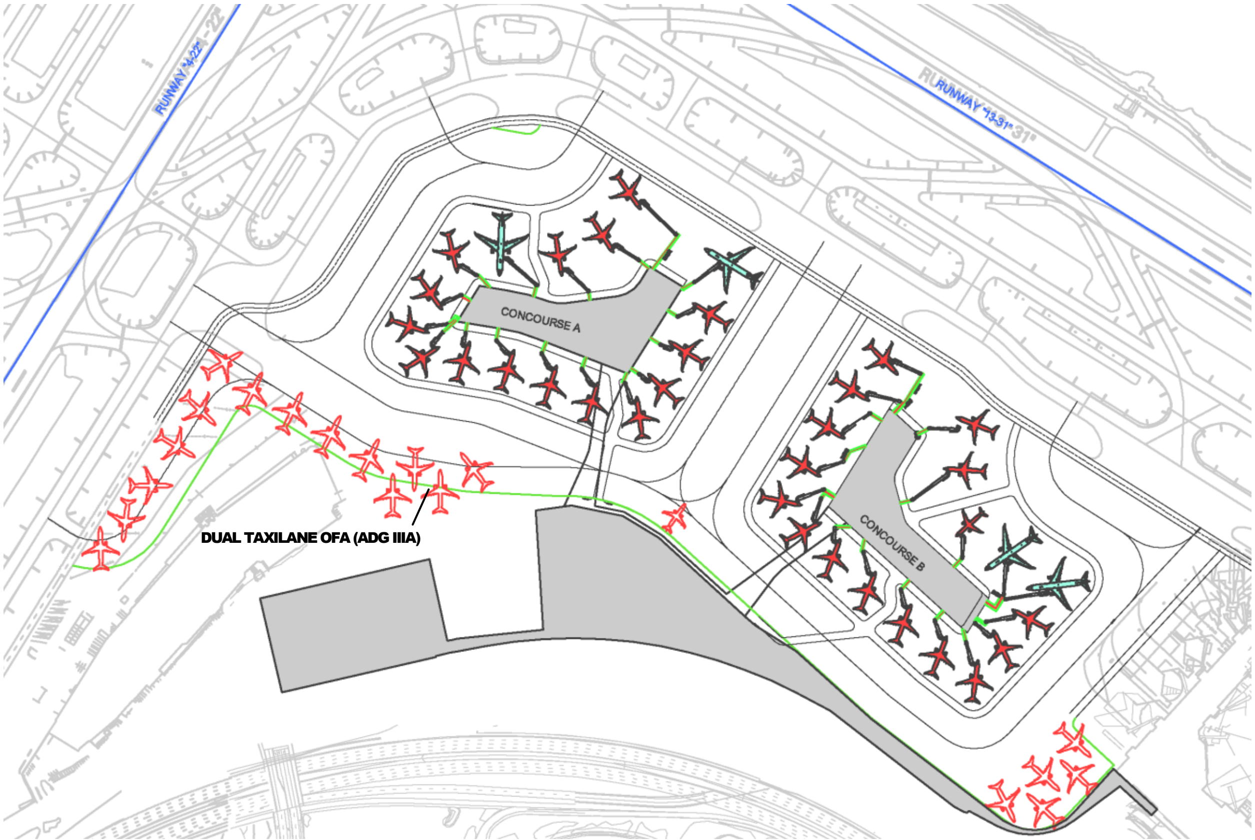
3. PROPOSED CTB LAYOUT

The proposed satellite CTB layout has two individual 'L' shaped islands joined to a single headhouse via bridges. The island on the western portion of the CTB apron is Concourse A and the one on the eastern portion is Concourse B. The proposed layout offers 35 gates: (a) 17 Gates on Concourse A; and (b) 18 Gates on Concourse B. Of these 35 gates, 4 gates will be dedicated to handle B767-400ERs and 31 will be dedicated to handle B737-900s independently.

This layout provides independent full-length dual Group III taxilanes between Concourses A and B and partial dual Group IIIA taxilanes in the area south-west of Concourse A. A single Group III taxilane will serve gates on the east and south sides of Concourse B. Also included on the apron are 20 remote parking positions for Group III aircraft.

Figure 3-1 shows the proposed satellite CTB layout.

Figure 3-1: Proposed Satellite CTB Layout



Source: The Port Authority of New York and New Jersey.

4. PROJECTED DEMAND

4.1 2012 Baseline Design Day Schedule

In the original development of the LGA TAAM model, a baseline design day schedule was developed for year 2012. Data from the *Official Airline Guide* (OAG) was used as a basis for the development of this schedule, supplemented with data from the Port Authority's AirScene database to evaluate the amount of general aviation and military activity. This schedule included major changes in the airlines' scheduling practices that occurred due to the Delta/US Airways slot swap. August 16, 2012 was selected as the new Peak Month Average Week Day (PMAWD) for the TAAM model update. The PMAWD is a busy day at the airport, but not the busiest day, and is the industry standard for analyzing airfield capacity and delay. Inputs from both Delta Air Lines and US Airways were provided in order to appropriately reflect the changes in operations at LGA. Interim and end-state flight schedules were obtained from Delta Airlines while US Airways provided flight schedules reflecting their traffic levels at LGA following the slot swap. The remaining operations were collected from OAG data while general aviation and military operations were collected from the Port Authority's AirScene database. This 2012 baseline schedule was used for the baseline TAAM model calibration process as presented in the TAAM Baseline Model Development Report dated April 2013.

4.2 34MAP Design Day Schedule

To simulate future traffic conditions at LGA, a 34MAP design day schedule was developed. According to the FAA approved forecasts, LGA traffic is expected to reach 34MAP around 2030. It is assumed that about half of the annual passenger traffic will be handled in the CTB.

The 34MAP schedule used for this analysis is the same as the one used for the Stage 1 layout in the EA report. **Table 4-1** presents the fleet mix associated with the 34MAP schedule.

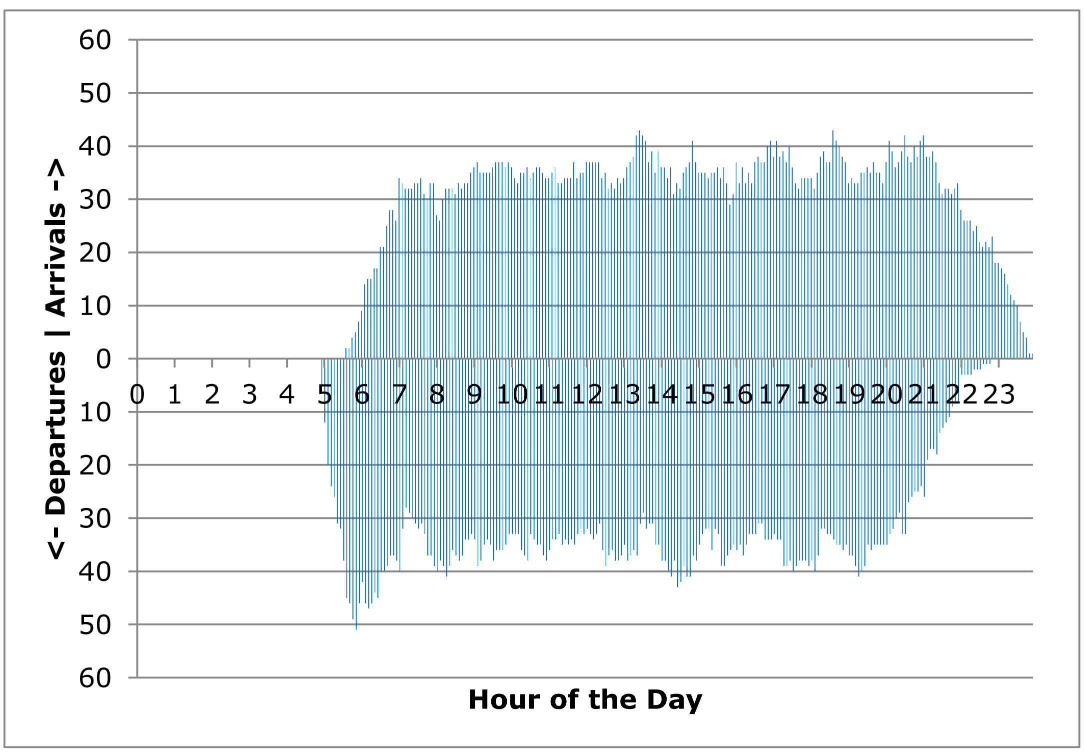
Table 4-1: LGA 34MAP Design Day Fleet Mix

Aircraft		Arr	Dep	Total	% of Tot.
Wide-Body	B764	38	38	76	6.5%
Narrow-Body	A319	56	56	112	9.6%
	A320	55	55	110	9.4%
	A321	20	20	40	3.4%
	B738	57	57	114	9.7%
	B739	68	68	136	11.6%
	B73G	47	47	94	8.0%
	E190	36	36	72	6.2%
	Total	339	339	678	57.9%
Regional Jet	CRJ7	14	14	28	2.4%
	CRJ9	21	21	42	3.6%
	E175	84	84	168	14.4%
	Total	119	119	238	20.3%
Turboprop	Q300	18	18	36	3.1%
	Q400	71	71	142	12.1%
	Total	89	89	178	15.2%
Total		585	585	1,170	100.0%

Source: Landrum & Brown analysis.

Figure 4-1 presents the hourly profile for the 34MAP schedule.

Figure 4-1: LGA 34MAP Design Day Schedule Hourly Profile



Source: Landrum & Brown analysis.

5. RUNWAY OPERATING CONFIGURATIONS

There are seven runway operating configurations used at LGA. These runway configurations are defined by the airspace used for approaching the arrival runways. The runway operating configuration used most frequently consists of arrivals on Runway 22 and departures on Runway 13. **Table 5-1** lists each runway configuration with the percent usage. This analysis focuses on the top four configurations as illustrated in **Figure 5-1**.

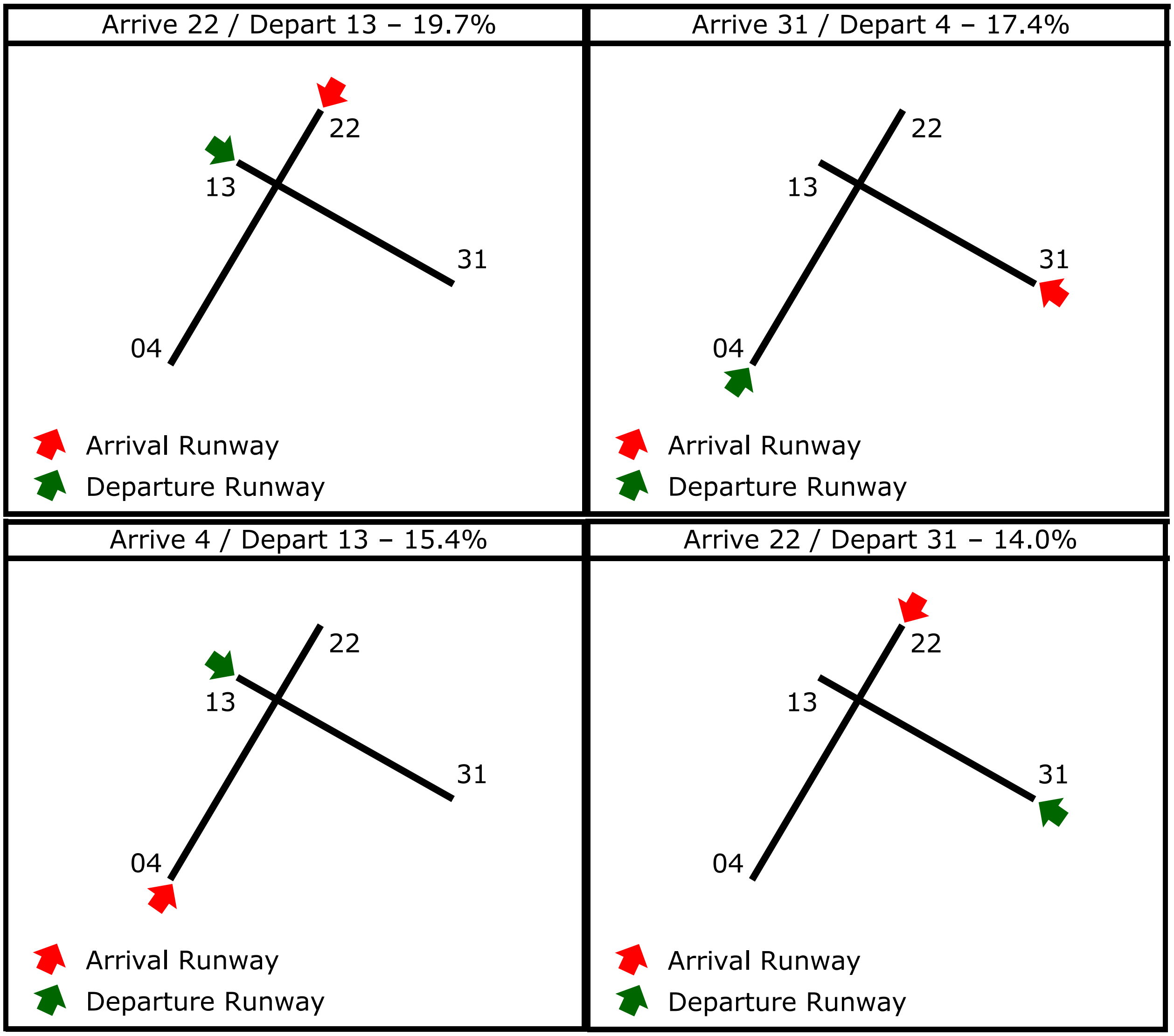
The top four runway configurations accounted for 67 percent to 72 percent of traffic over the 2005-2009 period. The usage of these four configurations is fairly evenly distributed. The 22/13 configuration has historically been the most used configuration despite a decline in usage from 27 percent in 2005 to about 20 percent in 2009. The 22/13 configuration (if all climbs are available) is the highest arrival and departure capacity at LGA. The 22/31, 31/4 and 4/13 configurations are the other configurations that are frequently used at LGA. In addition to these four configurations, LGA is sometimes forced to use a single runway configuration (mostly ILS 13/13) in IFR weather which is a low capacity and high delay configuration. LGA may also use a single runway configuration (mostly 31/31) during times of construction and low traffic periods such as all-day Saturday, Sunday mornings, or early mornings on weekdays.

Table 5-1: LGA Historical Runway Configuration Usage

	Percent of Time				
Configuration	2005	2006	2007	2008	2009
Arr 22/Dep 13	27.0%	25.3%	23.9%	22.9%	19.7%
Arr 31/Dep 04	15.3%	18.1%	16.5%	18.2%	17.4%
Arr 04/Dep 13	14.7%	12.5%	12.1%	12.0%	15.4%
Arr 22/Dep 31	15.0%	15.0%	19.2%	18.7%	14.0%
Arr 31/Dep 31	4.4%	5.2%	7.4%	9.4%	12.4%
Other Single Rwy	12.4%	12.0%	9.6%	7.6%	6.3%
Other	11.2%	11.9%	11.3%	11.4%	14.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Sources: FAA Aviation System Performance Metrics (ASPM); Landrum & Brown analysis

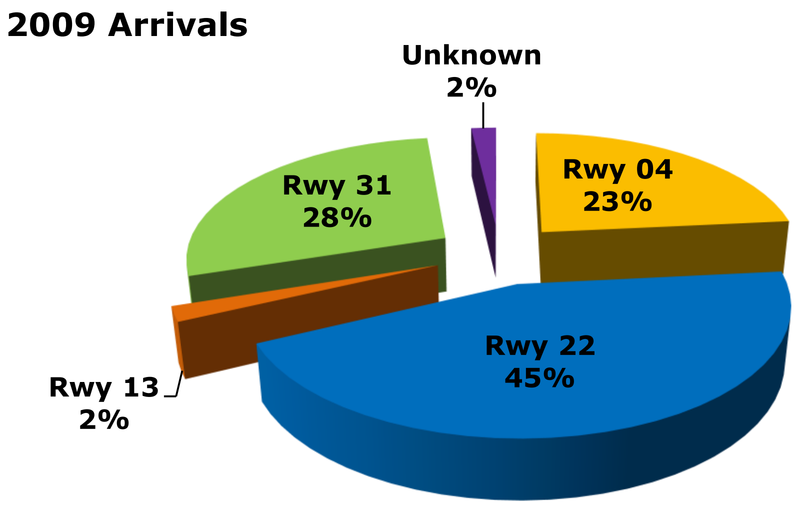
Figure 5-1: LGA Top Airport Runway Configurations – Year 2009 Usage

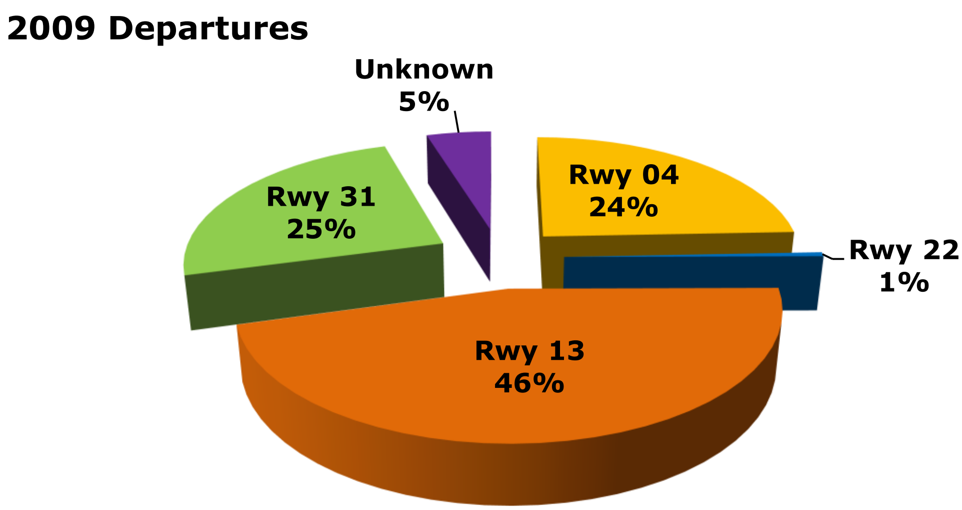


Note: Percent usage calculated based on total aircraft operations.
Sources: Port Authority of New York and New Jersey, eCater data; Landrum & Brown analysis.

All runways are fairly evenly used across the year as shown in **Figure 5-2**. Nevertheless, Runway 22 is the primary arrival runway while Runway 13 is the primary departure runway. These runways accounted for over 45 percent of arrivals and departures, respectively, in 2009.

Figure 5-2: LGA Runway Usage – Year 2009





Note: Percent usage calculated based on total aircraft operations.
Sources: Port Authority of New York and New Jersey, eCater data; Landrum & Brown analysis.

6. TAXI FLOWS

The PANYNJ team conducted several meetings and conference calls to ensure that the CTB operations were modeled exactly as envisioned by LaGuardia Gateway Partners (LGP). The PANYNJ team also consulted with former LGA ATCT Controller Bill Neuendorf and the PANYNJ LGA Operation Manager to ensure that the model inputs and assumptions provided by LGP were realistic and would not have an adverse impact on the airport.

This section describes the taxilane flows within the project boundaries exactly as proposed and simulated in the TAAM models. **Figure 6-1** below shows the location of the entrance and exit points for the proposed satellite layout. It is anticipated that the handoff of arriving and departing aircraft between LGA Ground Control and CTB Ramp Control will occur at or close to these points. The points have been numbered, and this numbering is used to describe taxilane flows for all runway configurations.

Figure 6-1: Entrance and Exit Points for Proposed Satellite CTB Layout

Source: The Port Authority of New York and New Jersey.

The following provide a description of the taxi flows around the proposed satellite CTB layout.

<u>Across all scenarios:</u>

- Category IV aircraft on Gate A2 will arrive and depart through Point 5
- Category IV aircraft on Gate B1 will arrive through Point 5 or Point 6 and will depart through Point 6

<u>Mode A (see Figures 6-2 and 6-3)</u>

Mode A taxilane flows will be used when the airport is using the following runway configurations:

- Arr 22 / Dep 31
- Arr 22 / Dep 13

Arrivals

Point 2 will be used for arrivals to:

- Gates A15, A17, A16, A14, A12, A10, A8, A6, A4 and A2 (if not assigned to a Cat IV aircraft)
- Gates A13 and A11
- Gates B3, B5, B7, B9, B11, B13, B15, B17, B18, B16 and B1 (if not assigned to a Cat IV aircraft)

Point 3 will be used for arrivals to:

- Gates A9, A7, A5, A3, A1

Point 7 will be used for arrivals to:

- Gates B2, B4, B6, B8

Point 8 will be used for arrivals to:

- Gates B10, B12, B14

Departures

Point 4 will be used for departures from:

- Gates A13, A11, A9, A7, A5, A3, A1

Point 5 will be used for departures from:

- Gates A15, A17, A16, A14, A12, A10, A8, A6, A4 and A2

Point 6 will be used for departures from:

- Gates B9, B7, B5, B3 and B1

Point 8 will be used for departures from:

- Gates B11, B13, B15, B17, B18, B16, B14, B12, B10, B8, B6, B4 and B2

Other rules

- For arrivals through Point 2: if the queue extends beyond gate A15 and the RON positions on the taxilane to its south are unoccupied, then new arriving aircraft will use this parallel taxilane through Point 1.
- Departures from gates A15, A17, A16, A14, A12 and A10 use the taxilane in the center alley that has the fewest aircraft on it.

Mode B (see Figures 6-4 and 6-5)

Mode B taxilane flows will be used when the airport is using the following configurations:

- Arr 04 / Dep 13 (VFR)
- Arr 04 / Dep 13 (IFR)
- Arr 31 / Dep 04

Arrivals

Point 4 will be used for arrivals to:

- Gates A1, A3, A5, A7, A9, A11, A13

Point 5 will be used for arrivals to:

- Gates B1, B3, B5, B7
- Gates A2, A4, A6, A8, A10, A12, A14, A16, A17, A15

Point 8 will be used for arrivals to:

- Gates B2, B4, B6, B8, B10, B12, B14, B16, B18, B17, B15, B13, B11, B9

Departures

Point 2 will be used for departures from:

- Gates A11, A13, A15, A17, A16, A14, A12, A10, A8, A6, A4 and A2 (if not Cat IV)
- Gates B9, B11, B13, B15, B17, B18, B16, B14, B12, B10 (if not Cat IV)

Point 3 will be used for departures from:

- Gates A1, A3, A5, A7, A9

Point 6 will be used for departures from:

- Gates B1, B3, B5, B7, B9

Point 7 will be used for departures from:

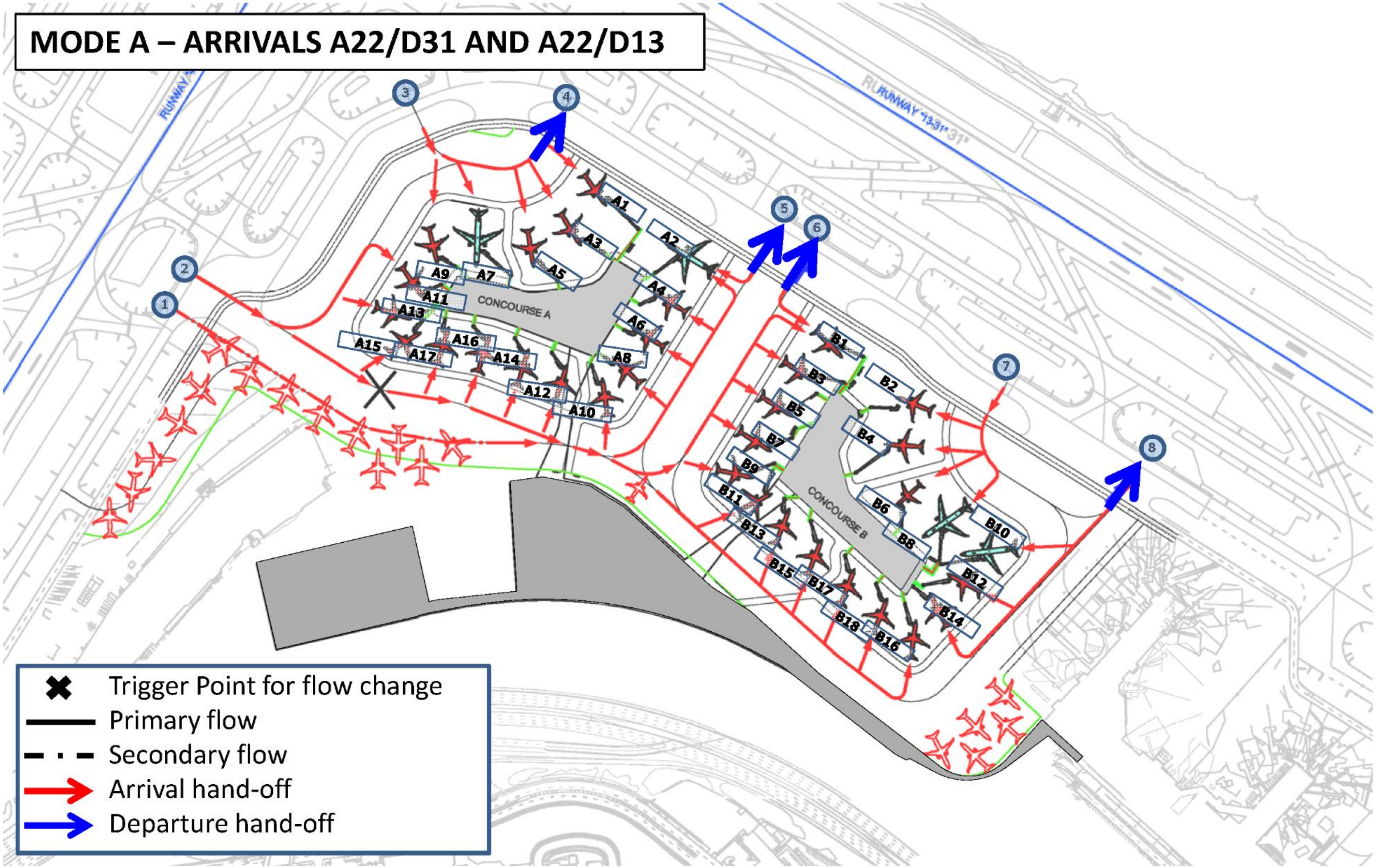
- Gates B2, B4, B6, B8 and B10 (if Cat IV)

Other rules

If the departure queue towards point 2 backs up to Gate A15:

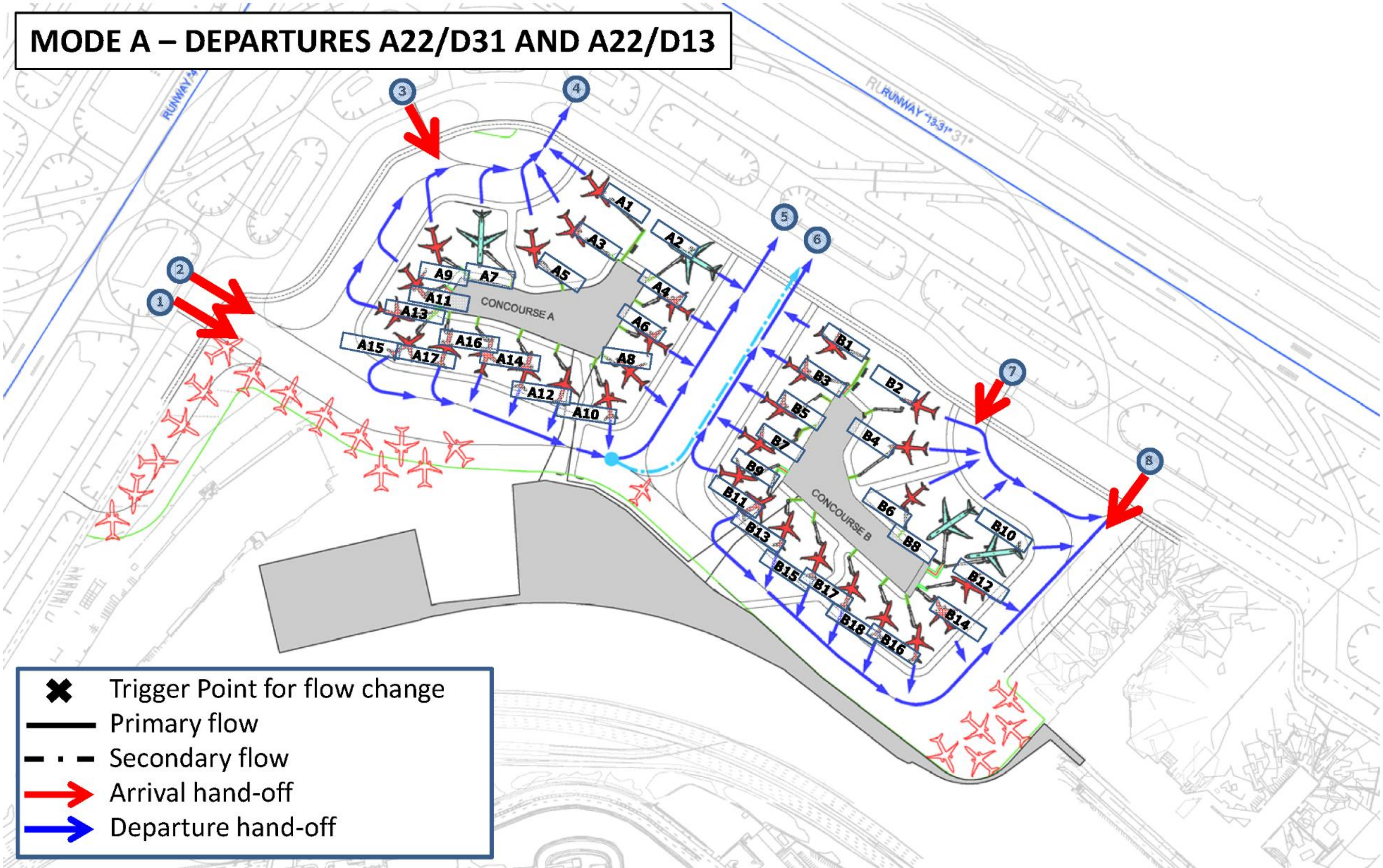
- The departures from gate A2 (if not assigned to a CatIV aircraft), A4, A6, A8, A10, A12, A14, A16 and A17 can exit via Point 1 if the RON's on new dual taxilane to its south are cleared.
- Then departures from B11, B13, B15, B17, B18, B16, B14, B12, B10 will be redirected towards Point 6

Figure 6-2: Proposed Satellite CTB Layout – Mode A Arr 22/Dep 31 and Arr 22/Dep 13 – Arrival Taxi Flows



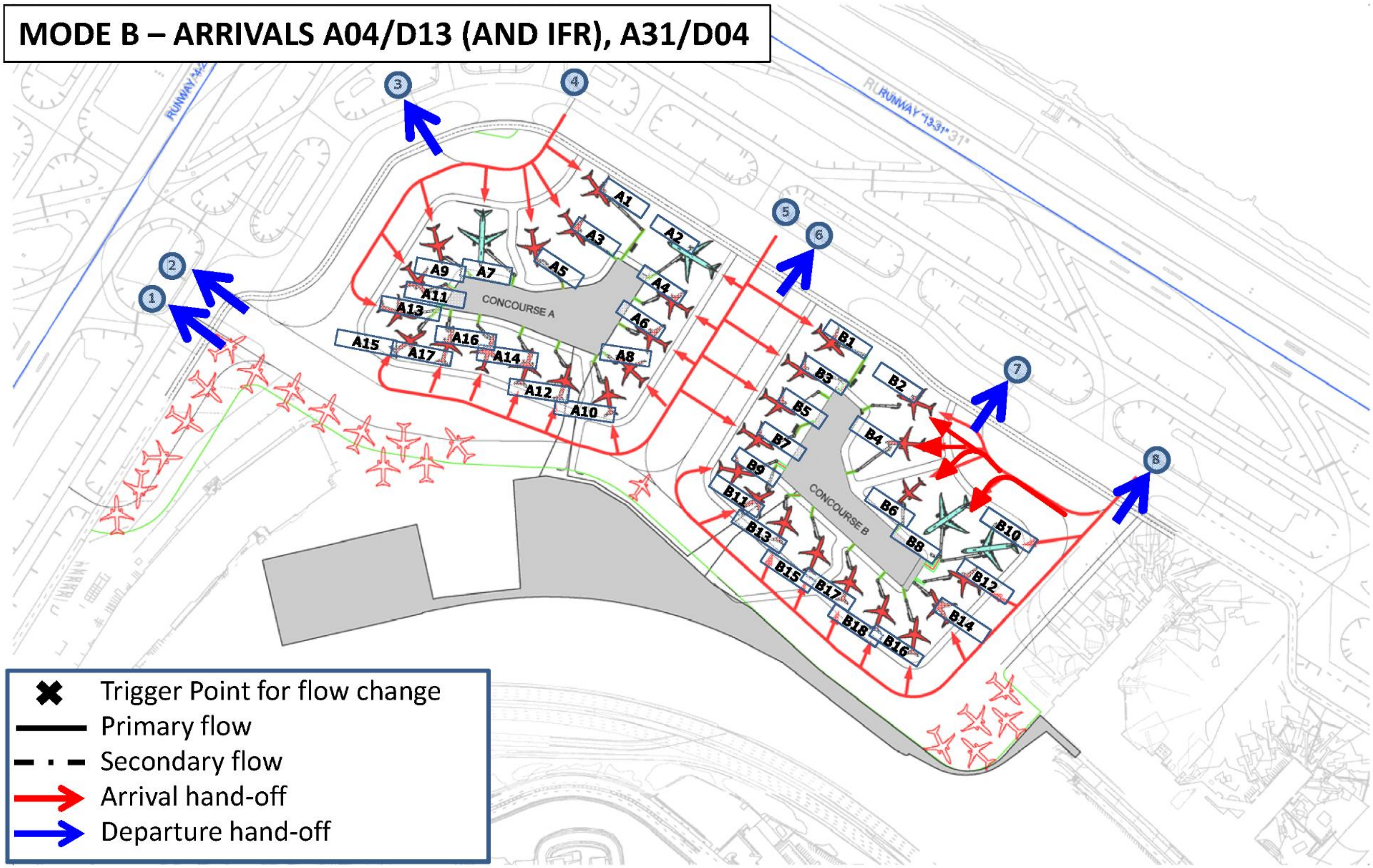
Source: The Port Authority of New York and New Jersey.

Figure 6-3: Proposed Satellite CTB Layout – Mode A Arr 22/Dep 31 and Arr 22/Dep 13 – Departure Taxi Flows



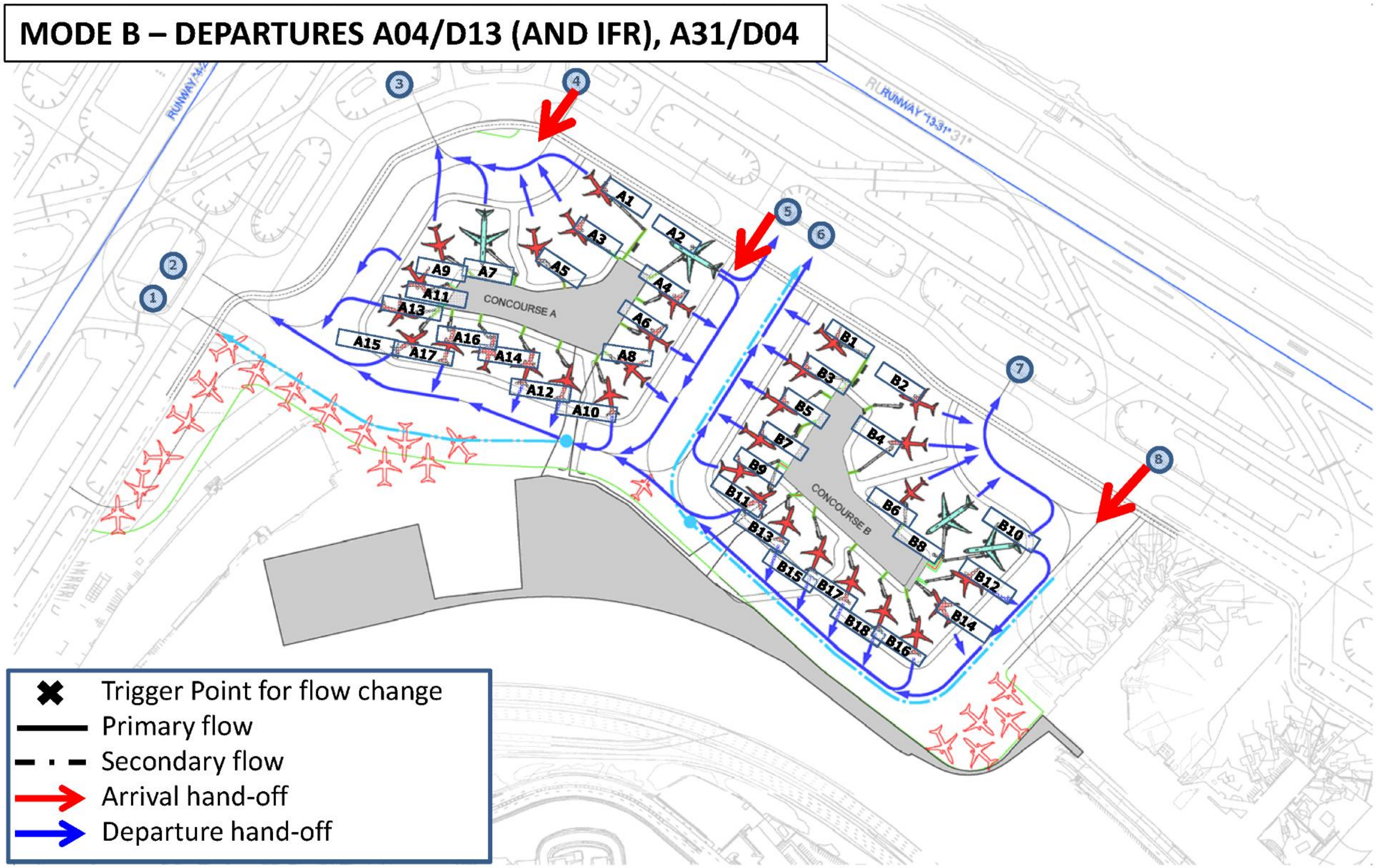
Source: The Port Authority of New York and New Jersey.

Figure 6-4: Proposed Satellite CTB Layout – Mode B Arr 04/Dep 13 and Arr 31/Dep 04 – Arrival Taxi Flows



Source: The Port Authority of New York and New Jersey.

Figure 6-5: Proposed Satellite CTB Layout – Mode B Arr 04/Dep 13 and Arr 31/Dep 04 – Departure Taxi Flows



Source: The Port Authority of New York and New Jersey.

7. TAAM MODEL OVERVIEW AND CALIBRATION

Airside simulation models use a description of the airport's facilities and operating environment as input, simulate air traffic movements through the defined environment, and provide as output the two critical measures that are used to determine airside capacity--throughput and delay. The analysis involved the simulation of the airfield and airspace system to quantify performance metrics associated with forecast demand. The airside includes the aircraft parking positions, apron area, taxiways, runways and all other aircraft movement areas of the Airport. The airspace system modeled included all the arrival and departure fixes. This analysis reflected input from air traffic controllers, airlines, Port Authority and airport staff. Mr. Bill Neuendorf, the PANYNJ LGA Operation Manager and LGP were regularly consulted throughout the simulation study to ensure acceptance of the input assumptions, methodology, results and recommendations.

Jeppesen's Total Airport and Airspace Modeler, referred to as TAAM®, is a computer simulation modeling tool that models airspace and airports to facilitate planning, analysis and decision making. TAAM was used to model and evaluate the proposed airfield concepts as part of this study. It presents a realistic 4D representation of airspace and airports to quantify performance and address "what-if" questions about changes in demand, airspace, airfield layout, and related air traffic control procedures. Accordingly, this model is a valuable tool that facilitates decision support, planning, and analysis. TAAM can simulate:

- Aircraft movements in detail;
- A full individual airfield (including runways, taxiways, and apron areas);
- An airfield and its associated terminal airspace;
- A regional system of airports and the associated airspace or a regional volume of airspace.

TAAM can produce detailed statistics for each aircraft operation simulated and high quality animations of the simulation. Outputs include, but are not limited to: aircraft en route travel times; airport movements, operations on taxiways and runways, runway occupancy; airspace operation metrics such as usage of routes, sectors, fixes and coordination; throughput capacity per unit of time; delays by time of day and location on the airfield or in airspace, along with the reason for each delay; fuel consumption and potential conflicts.

The model is calibrated to reflect the real-world operating environment as closely as possible. Simulation models are not designed to replicate all aspects of the real-world operating environment, but the models must reflect the logic applied by pilots and air traffic controllers to the greatest extent possible. A critical aspect of any simulation analysis is the process by which the characteristics of the future operating environment are defined and established as input to the model. The interpretation of the simulation results is equally important, and it requires an in-depth understanding of the model itself as well as the real-world air traffic control system.

This analysis relies on the calibrated, validated TAAM Baseline Model developed by the PANYNJ. Simulation inputs and calibration process are presented in TAAM Baseline Model Development Report dated April 2013 (See Appendix).

The following present assumptions related to pushback operations, taxi speed and airline allocation used to simulate traffic flows in the new proposed satellite CTB layout.

Pushback Operations

An aircraft pushback operation can be split into 5 different phases: (a) actual push-back; (b) pull-forward; (c) detach tug; (d) start engines and (e) get clearance to taxi. Several factors influence the time required to complete an aircraft pushback operation. Some of the factors that have a direct impact on the pushback times are listed below:

- Aircraft size: Larger aircraft require more time to complete the pushback operation;
- Ramp congestion: Pushback operations generally require more time during peak hours due to possible ramp congestion;
- Congestion on movement areas: During peak hours, the air traffic controllers may choose to hold aircraft on the apron to alleviate congestion on the taxiway system;
- Pushback distance: The pushback time increases with the distance the aircraft needs to be pushed back and / or towed.

The time required to complete the first two phases of the pushback operation (actual pushback and pull-forward - if any) is directly proportional to the distance between the gate and the engine-start position and inversely proportional to the speed. These speed values are shown **Table 7-1**.

Table 7-1: Pushback and Taxi Speeds on the Apron

Phase	Speed (kts)
Pushback (tug)	3
Pull-forward (tug)	3
Taxi on apron (aircraft engines)	5

Source: The Port Authority of New York and New Jersey.

The other three phases (detach tugs, start engines and clearance-to-taxi) are not directly influenced by the terminal / apron layout. The time required for these three phases of pushback operations were modeled using pushback pauses. A pushback pause is applied at the end of the pushback/pull-forward to simulate the time taken to detach the tug, start engines and get clearance to taxi. These pushback pauses are based on actual observations at the airport and are validated by the LGA Air Traffic Control tower staff. **Table 7-2** shows the pushback pauses used in the simulation models.

Table 7-2: Pushback Pauses by Aircraft Category

Aircraft Category	Representative Aircraft	Pushback Pause (minutes)
Turbo Props	Q300, Q400	2.0
Group II (Small RJs)	CRJ-200	2.0
Group III (Large RJs)	CRJ-900	2.5
Group III (Narrow-body jets)	A320, B737	3.0
Group IIIA	B757	3.5
Group IV	B767-400 ER	5.0

Source: The Port Authority of New York and New Jersey.

Taxiing Speed

The maximum taxiing speed on the taxiway system (movement areas) is set at 15 kts. Aircraft will taxi at this speed when on the movement areas of the airfield. Aircraft will taxi slower when there are other aircraft in the vicinity.

Airline Allocations

The airline allocations for the proposed satellite CTB (Terminal B) layout assume that all airlines will stay on their current terminals. American Airlines' and US Airways' operations were not consolidated. It was assumed that American Airlines will stay on Terminal B and US Airways on Terminal C. Airline allocations as used in this study are as shown **Table 7-3**. In this table, generic names have been inserted in lieu of actual airline names.

Table 7-3: Airline – Terminal / Gate Allocations

Airline	Terminal / Concourse	Gates
C01	Terminal B / Concourse A	A01 through A16
C02	Terminal B / Concourse B	B1, B2, B3, B5, B6, and B8 through B13
C03	Terminal B / Concourse B	B11, B13, B15, B17, and B18
C05	Terminal B / Concourse B	B11
C06	Terminal B / Concourse B	B11, B12, B13, B14, B16, and B18
C07	Terminal B / Concourse A	A13 and A14
C08	Terminal B / Concourse A	A02, A16, and A17
C09	Terminal B / Concourse B	B10, B12, B14, B17, and B18
C10	Terminal B / Concourse B	B14, and B18
C14	Terminal B / Concourse B	B02 through B09

Source: The Port Authority of New York and New Jersey.

8. TAAM RESULTS

In order to conduct a thorough review, it is necessary to study the performance of the proposed concepts for all the predominant runway configurations and operating conditions at the airport. LGA has four predominant runway/flow configurations (22/13, 31/4, 4/13, and 22/31). All four configurations were modeled under Visual Flight Rules (VFR).

The key parameters used to measure the performance the proposed satellite CTB layout are as follows:

- Unimpeded Flight / Taxi Times - Delay and travel time is reported throughout the 24-hour period for different phases of the operation. Therefore, operational performance characteristics for each phase of operation can be easily identified. Unimpeded travel time represents the time it would take an aircraft to travel from Point A to Point B if it were the only aircraft in the system. Ground travel time is comprised of unimpeded ground time and delay time and is influenced by the taxi speed and the travel distance between the runway and the gate. On the other hand, flight time is the sum of the unimpeded flight time and airspace delay:
  - Avg. Taxi Time = Unimpeded Avg. Taxi Time + Avg. Taxi Delay
  - Avg. Flight Time = Unimpeded Avg. Flight Time + Avg. Airspace Delay
- Delay - Delay is the operating time attributable to any impediment to the free flow of aircraft through the system. Delay increases the total travel time from Point A to Point B as a result of interactions with other aircraft. As a result, total delay for any given aircraft is the difference between the actual time it takes the aircraft to get from Point A to Point B while interacting with other aircraft and the unimpeded time it would theoretically take the aircraft to get from Point A to Point B without other aircraft in the system.
  - Arrival ground delay is incurred between the runway exit and the gate as a result of taxiway congestion, and runway crossings.
  - Arrival gate delay is incurred when an arriving fight cannot pull into its gate due to the unavailability of the gate.
  - Arrival airspace delay time is incurred between the arrival fix and runway exit due to aircraft sequencing or holding.
  - Departure ground delay is incurred between the time the aircraft is cleared for push-back from its assigned gate and the time it is released for runway departure.
  - Departure ground delay includes runway crossings, airfield congestion and departure queue delay.
  - Departure gate delay is incurred due to gate push-back blocking.
  - Departure airspace delay is incurred after takeoff until the aircraft reach the departure fix.

All results in this section reflect operating conditions at all terminals, and not just at Terminal B. Table 8-1 presents the taxi time and delay results related to each runway configuration.

Table 8-1: TAAM Results for Proposed Satellite CTB Layout by Runway Configuration (in minutes per flight)

	A04 / D13		A22 / D13		A22 / D31		A31 / D04	
	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
Avg. Taxi Time	5.4	15.1	6.0	14.2	6.2	13.1	4.9	19.5
Avg. Ground Delay	0.4	5.4	0.5	4.2	0.5	5.4	0.4	9.9
Avg. Gate Delay	0.0	1.5	0.0	1.5	0.0	2.1	0.0	2.4
Avg. Air Delay	4.3	0.0	1.4	0.0	3.1	0.0	11.8	0.0

Source: Port Authority of New York and New Jersey.

In order to annualize the taxi time and delay results for each scenario, the runway configuration usage was normalized to focus on the four configurations considered in the study as shown in **Table 8-2**.

Table 8-2: LGA Normalized Runway Configuration Usage

Actual Runway Configuration Usage from FAA ASPM

Configuration	2005	2006	2007	2008	2009
Arr 22/Dep 13	27.0%	25.3%	23.9%	22.9%	19.7%
Arr 31/Dep 04	15.3%	18.1%	16.5%	18.2%	17.4%
Arr 04/Dep 13	14.7%	12.5%	12.1%	12.0%	15.4%
Arr 22/Dep 31	15.0%	15.0%	19.2%	18.7%	14.0%
Other (Single Rw / Weekend etc.)	28.0%	29.1%	28.3%	28.2%	33.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Normalized Runway Configuration Usage for 4 Main Configurations

Configuration	2005	2006	2007	2008	2009	Avg.
Arr 22/Dep 13	37.5%	35.7%	33.3%	31.9%	29.6%	33.6%
Arr 31/Dep 04	21.3%	25.5%	23.0%	25.3%	26.2%	24.3%
Arr 04/Dep 13	20.4%	17.6%	16.9%	16.7%	23.2%	19.0%
Arr 22/Dep 31	20.8%	21.2%	26.8%	26.0%	21.1%	23.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sources: FAA Aviation System Performance Metrics (ASPM); Landrum & Brown analysis

This analysis used the normalized runway configuration usage percentages averaged over the five-year period to determine the average annual taxi times and delays. This historical runway configuration usage average was used in order to be consistent with the Stage 1 model. The resulting average annual taxi times and delays are presented in **Table 8-3**. Annual taxi times using the proposed satellite CTB layout considered in the analysis average 21.1 minutes per flight. Average annual delays are estimated at 6.5 minutes per flight for ground delays, 1.8 minutes per flight for gate delays, and 4.9 minutes per flight for air delays.

Table 8-3: TAAM Results Summary for Proposed Satellite CTB Layout

Rwy Config	% Usage	Arr	Dep	Total
Avg. Taxi Time				
22|13	33.6%	6.0	14.2	20.3
31|04	24.3%	4.9	19.5	24.4
04|13	19.0%	5.4	15.1	20.5
22|31	23.2%	6.2	13.1	19.2
Annual Average		5.7	15.4	21.1
Avg. Ground Delay				
22|13	33.6%	0.5	4.2	4.7
31|04	24.3%	0.4	9.9	10.3
04|13	19.0%	0.4	5.4	5.9
22|31	23.2%	0.5	5.4	5.9
Annual Average		0.5	6.1	6.5
Avg. Gate Delay				
22|13	33.6%	0.0	1.5	1.5
31|04	24.3%	0.0	2.4	2.4
04|13	19.0%	0.0	1.5	1.5
22|31	23.2%	0.0	2.1	2.1
Annual Average		0.0	1.8	1.8
Avg. Air Delay				
22|13	33.6%	1.4	0.0	1.4
31|04	24.3%	11.8	0.0	11.8
04|13	19.0%	4.3	0.0	4.3
22|31	23.2%	3.1	0.0	3.1
Annual Average		4.9	0.0	4.9

Source: Port Authority of New York and New Jersey.

For comparison purposes with previous TAAM modeling, the taxi time results of this analysis are compared against the 2012 baseline model results and the TAAM modeling results presented in the EA for the Stage 1 layout (see **Table 8-4**). The 2012 baseline model shows average annual taxi times of 26.1 minutes per flight. In the EA, the CTB stage 1 layout would generate a reduction in taxi times of 4.9 minutes per flight with an average taxi time of 21.2 minutes per flight. The proposed satellite CTB layout generates a reduction in taxi times of 5.0 minutes per flight compared to 2012 levels with an average taxi time of 21.1 minutes per flight.[2]

[2] The CTB Modernization (Build Scenario) – 2030 TAAM (Satellite Layout) model reflects current airspace conditions at LGA.

Table 8-4: TAAM Taxi Time Results Comparison

Scenario	Taxi-In Time (in min)	Taxi-Out Time (in min)	Total Taxi Time (in min)
Baseline / Existing Conditions - 2012	5.7	20.4	26.1
EA Future CTB Modernization (Stage 1 Layout)	4.7	16.5	21.2
Future CTB Modernization (Satellite Layout)	5.7	15.4	21.1

Source: Port Authority of New York and New Jersey.

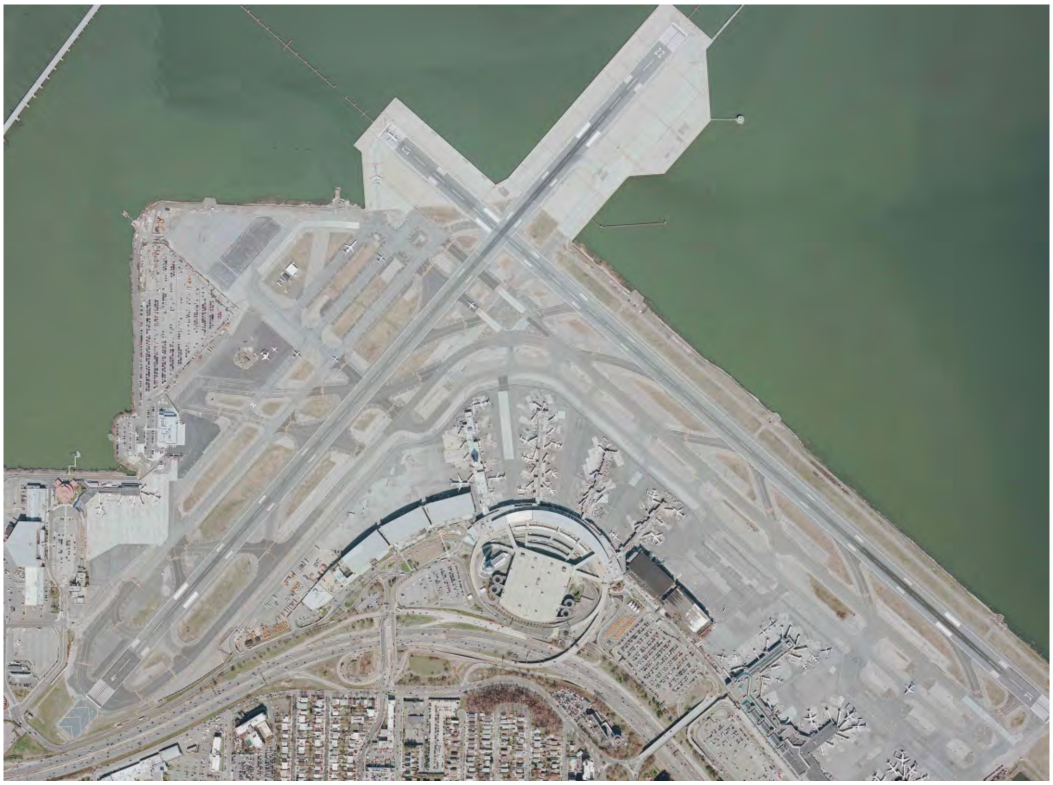
9. CONCLUSIONS

The same 34MAP design day flight schedule and same aircraft fleet mix are used as demand inputs in both the CTB Modernization (Build Scenario) – 2030 TAAM (Stage 1 Layout) model that was developed for the EA and was included in the EA submission, and the CTB Modernization (Build Scenario) – 2030 TAAM (Satellite Layout) model. The modeling results for the two cases in terms of total taxi times are very close (0.1 minute difference)l.

APPENDIX

TAAM BASELINE MODEL DEVELOPMENT

NEW YORK LA GUARDIA AIRPORT



PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Prepared by:

PA Aviation Planning Department / Landrum & Brown
April 2013

INPUTS AND ASSUMPTIONS

1. AIRPORT OVERVIEW

Airside simulation models use a description of the airport's facilities and operating environment as input, simulate air traffic movements through the defined environment, and provide as output the two critical measures that are used to determine airside capacity--throughput and delay. The analysis involved the simulation of the airfield and airspace system to quantify performance metrics associated with forecast demand. The airside includes the aircraft parking positions, apron area, taxiways, runways and all other aircraft movement areas of the Airport. The airspace system modeled included all the arrival and departure fixes. This analysis reflected input from air traffic controllers, airlines, Port Authority and airport staff. Key stakeholders were regularly consulted throughout the simulation study to ensure acceptance of the input assumptions, methodology, results and recommendations.

Jeppesen's Total Airspace and Airport Modeler (TAAM) is a simulation tool used to assess airport and airspace operations. It is capable of conducting large scale, detailed, fast-time simulations for modeling of entire air traffic systems. TAAM is a four-dimensional flight path simulation. TAAM also produces high quality animations of the simulation. TAAM can be used to simulate aircraft movement in detail: a full individual airfield (including runways, taxiways and apron areas); an airfield and its associated terminal airspace; a regional system of airports and the associated airspace; or, a regional volume of airspace. It can produce detailed statistics on each aircraft operation simulated. Outputs include, but are not limited to: aircraft en route travel times; airport movements, operations on taxiways and runways, runway occupancy; airspace operation metrics such as usage of routes, sectors, fixes and coordination; throughput capacity per unit of time; delays by time of day and location on the airfield or in airspace, along with the reason for each delay; fuel consumption and potential conflicts.

It should be noted that airspace/airfield simulation modeling is not designed to produce an exact replication of all aspects of the real-world operating environment. To be effective, however, the model must reflect the logic applied by pilots and air traffic controllers to the greatest extent possible, and produce representative performance metrics associated with the most likely future operating conditions.

LaGuardia Airport (LGA) is one of three large-hub airports[1] for the New York/New Jersey Metropolitan region. In 2009, LGA was the third largest airport of the region in terms of passengers and in terms of aircraft operations. Indeed, LGA accommodated 22.2 million passengers or 21.7 percent of the region's total passenger traffic and processed 354,388 aircraft operations or 26 percent of the region's traffic in 2009.

[1] Federal Aviation Administration, *National Plan of Integrated Airport Systems*.

LGA's current airfield consists of two runways: one runway oriented in a northwest/southeast direction (Runway 13/31) and one runway oriented in a northeast/southwest direction (Runway 04/22). Runway 04/22 is 7,001 feet in length and 150 feet wide, oriented along a northeast to southwest alignment. Runway 04/22 intersects Runway 13/31 approximately 2,110 feet southwest of the Runway 22 threshold.

Currently the airport hosts 10 domestic airlines and one international airline[2]. Terminals are usually dominated by one carrier. Delta and US Airways have their own terminal while other airlines are accommodated in the Central Terminal Building (CTB). LGA has four passenger terminals, known as Marine Air Terminal (Terminal A), Central Terminal Building (Terminal B), US Air / Delta Terminal (Terminal C), and Delta Terminal (Terminal D).

The following sections provide the background analyses used to develop and calibrate the baseline TAAM model for LGA.

2. AIR TRAFFIC DEMAND

In the original development of the LGA TAAM model, a baseline design day schedule was developed for year 2010. Data from the *Official Airline Guide* (OAG) was used as a basis for the development of this schedule, supplemented with data from the Port Authority's AirScene database to evaluate the amount of general aviation and military activity. August 11, 2010 was selected as the Peak Month Average Weekday (PMAWD) for this original analysis. The PMAWD is a busy day at the airport, but not the busiest day, and is the industry standard for analyzing airfield capacity and delay.

In 2012, major changes in the airlines' scheduling practices occurred due to the Delta/US Airways slot swap. It was therefore decided to update the LGA TAAM model to reflect the latest operation levels at the airport following the slot swap. August 16, 2012 was selected as the new PMAWD for the TAAM model update. Inputs from both Delta Air Lines and US Airways were provided in order to appropriately reflect the changes in operations at LGA. Interim and end-state flight schedules were obtained from by Delta Airlines while US Airways provided flight schedules reflecting their traffic levels at LGA following the slot swap. The remaining of the operations were collected from OAG data while general aviation and military operations were collected from the Port Authority's AirScene database. Changes expected after the slot swap are as follows:

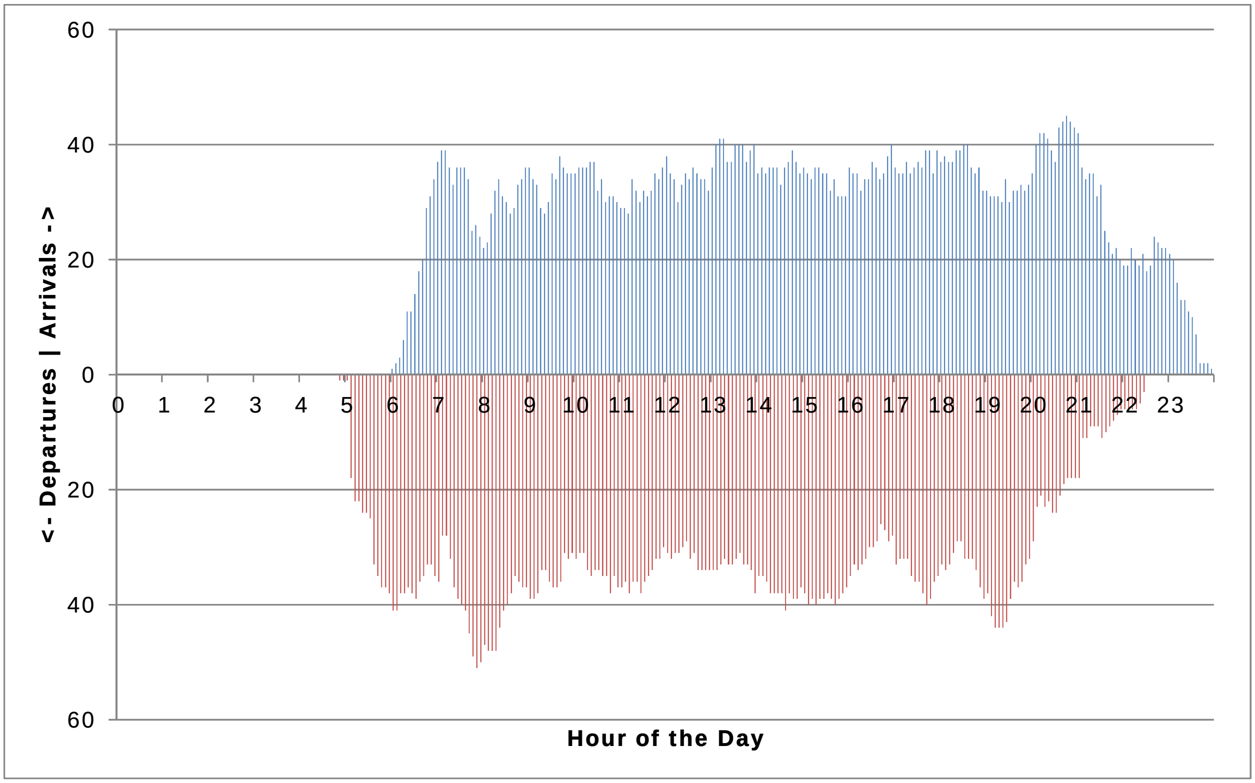
- US Airways will give up 132 daily pairs. US Airways will continue shuttle service to BOS and DCA. US Airways will also continue service to CLT, PHL, and PIT. US Airways will retain 6 gates and 3 hardstands on Terminal C.
- Delta will add 116 daily pairs to their existing operation. Delta will get 16 gates on Terminal C.
- JetBlue will add 8 daily pairs to their existing operation. JetBlue will get an additional gate on CTB. JetBlue will operate out of gates A3 and A4.

[2] Based on Airport website.

- WestJet will launch new service at LGA with 8 daily pairs. WestJet will get one gate on Terminal C.
- United and Continental will consolidate most of their operations on CTB Concourse. C. The combined airline will retain gates A1 and A2, but will give up gates A3 and A4 on CTB Concourse A.

Figure 2-1, *LGA 2012 Baseline Design Day Schedule Hourly Profile*, presents the hourly aircraft operations profile for LGA 2012 baseline design day schedule.

Figure 2-1: LGA 2012 Baseline Design Day Schedule Hourly Profile



Source: Landrum & Brown analysis.

3. WEATHER PATTERNS

Generally, according to FAA definition, instrument meteorological conditions (IMC) occur when pilots can no longer see each other in the airspace and maintain visual separation from each other. The FAA sets cloud ceiling and visibility minimums in order to establish limits for VMC (visual meteorological conditions) and IMC. These IMC minimums vary between airports. At LGA, this FAA definition is a cloud ceiling of less than 3,200 feet and visibility of less than four statute miles.

These conditions occurred 14 percent to 17 percent of the time over the 2005 to 2009 period (24-hour observation days) as shown in **Table 3-1, *LGA Weather Analysis - IMC***. Overall, 2009 had the second highest amount of IMC weather in the period. The amount of IMC weather varies considerably from month to month. The causes of IMC weather vary seasonally, with winter IMC events being caused by longer and more predictable rain or snow storms, while summer events are caused by more unpredictable thunderstorms.

Table 3-1: LGA Weather Analysis - IMC

MONTH	PERCENT OF TIME				
	2005	**2006**	**2007**	**2008**	**2009**
January	34.9%	26.3%	22.6%	11.4%	16.4%
February	18.8%	10.6%	13.2%	28.6%	7.7%
March	22.0%	6.0%	14.4%	19.2%	19.6%
April	20.6%	13.3%	26.9%	28.2%	22.2%
May	15.1%	25.8%	8.5%	16.1%	30.8%
June	23.1%	26.5%	11.1%	14.4%	33.8%
July	28.9%	11.2%	17.1%	14.2%	18.4%
August	14.2%	16.4%	21.0%	5.5%	17.3%
September	10.4%	15.6%	11.8%	19.4%	15.0%
October	40.6%	15.5%	31.7%	9.7%	24.9%
November	12.2%	33.2%	19.6%	25.1%	23.8%
December	17.3%	15.6%	33.3%	28.6%	18.8%
TOTAL	**21.6%**	**18.0%**	**19.3%**	**18.3%**	**20.8%**

Note: IMC corresponds to a ceiling lower than 3,200 feet and a visibility of less than 4 miles. Percent of Time calculated for a 24-hour day.
Sources: FAA Aviation System Performance Metrics (ASPM); Landrum & Brown analysis.

4. AIRSPACE RELATED ASSUMPTIONS

4.1 DESCRIPTION OF AIRSPACE FLOWS

The airports, airways, arrival and departure procedures, navigation aids (navaids), equipment, and thousands of other component parts of the aviation system make up the National Airspace System (NAS) of the United States. It is one of the most complex aviation systems in the world and enables safe and expeditious air travel in the U.S. and over large parts of the world's oceans. The New York metropolitan area, (New York Metroplex[3]), currently supports between 15 and 20 percent of the NAS daily activity, making it the busiest corner of the system and the most congested airspace in the world.[4] The four major Port Authority airports, JFK, LGA, EWR, and TEB, are located within ten miles of central Manhattan and support thousands of aircraft operations a day. Proximity of the airports to one another and the unique level of operations present significant challenges that have been compounded as air traffic flows have increased over the years.

In order to handle the increased volumes of traffic, the FAA has developed system structure that separates traffic flows as much as possible from one another. This structure allows traffic to transition to and from the high altitude enroute structure to the airports in the New York Metroplex with low risk of crossing or conflicting with other traffic flows. The standard arrival and departure routes in the New York Metroplex are published by the FAA as Standard Terminal Arrival Routes (STARs) and Standard Instrument Departures (SIDs). Aircraft arriving to the New York Metroplex transition from the enroute environment on a published STAR procedure, while departing aircraft transition from the runways to the enroute environment on a published SID procedure. STARs and SIDs may be categorized as “classic” or “RNAV” (Area Navigation) procedures:

- “Classic” procedures are designed for aircraft that are not RNAV capable using headings and references to ground-based navigational aids (NAVAIDS); usually low or high altitude VORs. A VOR is a “Very High Frequency Omni-directional Range” transmitter that is located on a known position on the ground. VORs transmit a signal of 360 “radials” that correspond to the magnetic compass rose. Aircraft with VOR receivers can tell which radial they are on pointing to or from the VOR. If an aircraft determines its position from the intersection of two or more radials from different VORs, its position can be precisely determined. These intersections are often referred to as a “Fix”.
- RNAV systems are self-contained navigation systems that reside on the aircraft and may be calibrated based on known position reference provided from a number of different sources, such as automated global positioning system (GPS) update, manual crew update at a known position or Distance Measuring Equipment (DME) cross-reference. Once the RNAV system is

[3] Used in the *FAA 2012 NextGen Implementation Plan*
[4] *New York / New Jersey / Philadelphia (NY/NJ/PHL) Metropolitan Area Airspace Redesign,* Congressional Update Project Status Revised Stages 3 & 4 Schedule, Robert Novia, Project Manager, March 16, 2012

calibrated to a known position, it can be used to navigate without constant reference to ground-based NAVAIDS.

Due to the proximity of JFK's and EWR's airspace, LGA's airspace is one of the world's most difficult airspace to control as it forms a narrow band in a northeast to southwest orientation between JFK's and EWR's airspace. As a result, arrivals bound to LGA from the western fixes are routed around EWR's airspace before turning north or south on a direct route to LGA. Arrivals from the north are designed to remain clear of arriving flows to TEB and EWR and the long island airspace used for JFK's arrival traffic.

LGA has five charted arrival flows:

- The HAARP TWO ARRIVAL (classic) used by turbojets arriving from the north;
- The NOBBI FIVE ARRIVAL (classic) used by turboprops arriving from the north;
- The MILTON FOUR ARRIVAL (classic) for aircraft arriving from the west;
- The KORRY THREE ARRIVAL (classic) used by turbojets arriving from the south; and,
- The GATBY ONE ARRIVAL (classic) used by turboprops arriving from the south.

LGA uses Runways 13/31 and 04 for all departures with the exception of few rare occasions when winds force a single runway operation. LGA uses Runway 04 approximately 18-20 percent of the time for departures. The rest of the time, LGA is evenly split using Runway 13 or Runway 31 for departure, although, in IFR conditions, Runway 13 is predominantly used (according to FAA ASPM data). LGA's traffic shares departure fixes with JFK and EWR and has six SIDs, five of which are RNAV procedures. The five RNAV procedures are used to help mitigate noise and relieve operation constraints caused by LGA's proximity with JFK and are runway-specific for departures from Runway 13 and Runway 22.

LGA has six departure procedures, five of them being RNAV procedures. LGA has three departure procedures when using Runway 13:

- The TNNIS FOUR DEPARTURE (RNAV) procedure;
- The NTHNS TWO DEPARTURE (RNAV) procedure; and,
- The GLDMN FOUR DEPARTURE (RNAV) procedure.

LGA also has two departure procedures for departures from Runway 22:

- The HOPEA ONE DEPARTURE (RNAV) procedures; and,
- The JUTES TWO DEPARTURE (RNAV) procedure.

The last LGA SID is a classic DP that covers departures from all four runways at LGA.

4.2 APPROACH AND TAKEOFF SEPARATIONS

Data from the Port Authority AirScene database for the months of June and July 2010 were analyzed in order to evaluate current aircraft wake turbulence separations at LGA (see **Table 4-1, *LGA Aircraft Approach Separations – 22/13 Configuration***, **Table 4-2, *LGA Aircraft Approach Separations – 31/4 Configuration***, **Table 4-3, *LGA Aircraft Approach Separations – 4/13 Configuration***, **Table 4-4, *LGA Aircraft Approach Separations – 22/31 Configuration***). These statistics were compared to the FAA standard aircraft separations presented in **Table 4-5, *Aircraft Approach Separations – FAA ATC Regulation***. It revealed that FAA ATCT at the airport usually adds a buffer of 0.5 to 1.0 nautical miles to standard FAA aircraft separations for two consecutive arrivals. However, it should be noted that consecutive arrivals or departures only occur 30 percent of the time at LGA. Indeed, LGA ATCT controllers usually insert one or two departures between successive arrivals in order to maximize hourly airfield capacity. According to FAA data, this operational practice affects about 70 percent of the traffic at LGA. Further interviews with LGA FAA ATCT personnel corroborated these findings. For purposes of this simulation study, the actual separations obtained from the data analysis were used in the TAAM model to more closely reflect actual operations at the airport and surrounding airspace.

Table 4-1: LGA Aircraft Approach Separations (in Nautical Miles) – 22/13 Configuration

Arrival followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	HEAVY	B757	LARGE	SMALL
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	3.9-4.1	4.3-4.5	4.2-4.6
Large	n.a.	n.a.	3.0-3.2	2.4-2.8	2.6-3.0
Small	n.a.	n.a.	3.0-3.2	2.4-2.8	2.5-2.6

Arrival followed by Departure followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	HEAVY	B757	LARGE	SMALL
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	4.7-4.8	3.7-3.9	3.9-4.1
Large	n.a.	n.a.	3.1-3.6	2.8-3.2	2.7-3.1
Small	n.a.	n.a.	3.0-3.3	2.7-3.0	2.9-3.3

Arrival followed by Departure followed by Departure followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	HEAVY	B757	LARGE	SMALL
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	4.5-4.7	4.3-4.4	3.9-4.2
Large	n.a.	n.a.	3.3-3.6	3.4-3.6	3.5-3.6
Small	n.a.	n.a.	3.8-3.9	3.8-4.0	3.7-3.9

Note: Data analyzed for the months of June and July 2010.
Sources: Port Authority of New York and New Jersey, AirScene data; Landrum & Brown analysis.

Table 4-2: LGA Aircraft Approach Separations (in Nautical Miles) – 31/4 Configuration

Arrival followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	**HEAVY**	**B757**	**LARGE**	**SMALL**
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	3.6-3.8	4.1-4.4	3.8-4.1
Large	n.a.	n.a.	2.7-2.9	2.4-3.1	2.5-2.9
Small	n.a.	n.a.	2.2-2.3	2.3-2.7	2.5-2.7

Arrival followed by Departure followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	**HEAVY**	**B757**	**LARGE**	**SMALL**
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	4.0-4.4	4.1-4.3	4.1-4.2
Large	n.a.	n.a.	3.0-3.2	2.7-3.2	2.9-3.3
Small	n.a.	n.a.	2.7-2.8	2.8-3.0	2.8-3.0

Arrival followed by Departure followed by Departure followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	**HEAVY**	**B757**	**LARGE**	**SMALL**
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	4.4-4.6	4.4-4.5	4.5-4.7
Large	n.a.	n.a.	3.9-4.0	3.7-4.1	3.9-4.2
Small	n.a.	n.a.	4.0-4.2	3.4-3.7	3.7-3.9

Note: Data analyzed for the months of June and July 2010.
Sources: Port Authority of New York and New Jersey, AirScene data; Landrum & Brown analysis.

Table 4-3: LGA Aircraft Approach Separations (in Nautical Miles) – 4/13 Configuration

Arrival followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	HEAVY	B757	LARGE	SMALL
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	3.9-4.1	4.3-4.7	4.1-4.2
Large	n.a.	n.a.	3.0-3.2	2.7-3.2	3.0-3.4
Small	n.a.	n.a.	3.0-3.3	2.8-3.0	2.4-2.6

Arrival followed by Departure followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	HEAVY	B757	LARGE	SMALL
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	3.8-4.0	4.0-4.2	4.1-4.4
Large	n.a.	n.a.	3.3-3.5	2.8-3.5	3.0-3.5
Small	n.a.	n.a.	2.8-3.0	2.7-3.1	2.5-2.7

Arrival followed by Departure followed by Departure followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	HEAVY	B757	LARGE	SMALL
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	4.3-4.7	4.4-4.6	5.2-5.4
Large	n.a.	n.a.	3.9-4.1	3.7-3.9	3.9-4.0
Small	n.a.	n.a.	3.5-3.6	3.7-3.8	3.7-3.8

Note: Data analyzed for the months of June and July 2010.
Sources: Port Authority of New York and New Jersey, AirScene data; Landrum & Brown analysis.

Table 4-4: LGA Aircraft Approach Separations (in Nautical Miles) – 22/31 Configuration

Arrival followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	**HEAVY**	**B757**	**LARGE**	**SMALL**
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	4.2	4.2-4.5	3.6-3.8
Large	n.a.	n.a.	2.4-2.7	2.3-2.5	2.5-2.6
Small	n.a.	n.a.	2.2-2.3	2.5-2.8	2.7-2.9

Arrival followed by Departure followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	**HEAVY**	**B757**	**LARGE**	**SMALL**
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	4.0-4.3	3.8-4.0	4.0-4.2
Large	n.a.	n.a.	3.0-3.3	2.7-3.1	2.9-3.3
Small	n.a.	n.a.	2.8-3.0	3.0-3.2	3.0-3.3

Arrival followed by Departure followed by Departure followed by Arrival

LEADING AIRCRAFT	TRAILING AIRCRAFT				
	A380	**HEAVY**	**B757**	**LARGE**	**SMALL**
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	n.a.	n.a.	n.a.	n.a.	n.a.
B757	n.a.	n.a.	4.4	4.4-4.6	4.9-5.1
Large	n.a.	n.a.	3.4-3.5	3.2-3.5	3.4-3.5
Small	n.a.	n.a.	3.8-4.0	3.4-3.6	3.7-3.9

Note: Data analyzed for the months of June and July 2010.
Sources: Port Authority of New York and New Jersey, AirScene data; Landrum & Brown analysis.

Table 4-5: Aircraft Approach Separations – FAA ATC Regulation (in Nautical Miles)

LEADING AIRCRAFT	TRAILING AIRCRAFT			
	HEAVY	**B757**	**LARGE**	**SMALL**
Heavy	4	5	5	6
B757	4	4	4	5
Large	3	3	3	4
	2.5	2.5	2.5	3
Small	3	3	3	3
	2.5	2.5	2.5	2.5

Source: FAA ATC Order JO 7110.

Concerning departures, the FAA regulation dealing with separations between departing aircraft was adopted for purposes of this simulation study (see **Table 4-6, *Aircraft Takeoff Separations – FAA ATC Regulation***). The capability of using various departure headings will be taken into consideration as part of this simulation. Aircraft departing from Runway 13 departures will either take-off heading 134^{O} or 180^{O} off the runway end. If two consecutive departures are using different headings on take-off, the tower will separate them by 3.0 nm at the runway end. However, if two consecutive departures are using the same heading on take-off, the LGA tower requires a higher (3.5 to 4.0 nm) separation at the runway end. LGA tower will always try to stage departing traffic in such a way to minimize occurrences of consecutive departures using the same heading off the runway end. This helps increase the departure through-put rates at the airport. The airport will also use two separate headings when departing Runway 04 or 31.

The following table lists the minimum separations (in seconds) as mandated by the FAA.

Table 4-6: Aircraft Takeoff Separations – FAA ATC Regulation (in Seconds)

LEADING AIRCRAFT	TRAILING AIRCRAFT			
	HEAVY	B757	LARGE	SMALL
Heavy	90	120	120	120
B757	90	90	90	120
Large	60	60	60	60
Small	45	45	45	45

Source: FAA ATC Order JO 7110.

4.3 APPROACH SPEEDS

Data from the Port Authority AirScene database for the months of June and July 2010 were analyzed to evaluate the average approach speed of inbound aircraft at LGA. Based on **Table 4-7, *LGA Average Approach Speed by Runway***, approach speed does not vary significantly between runways.

Table 4-7: LGA Average Approach Speed by Runway

AIRCRAFT TYPE	AIRCRAFT SPEED ON APPROACH (IN KNOTS)				
	RWY 04	RWY 13	RWY 22	RWY 31	AVG.
A380	n.a.	n.a.	n.a.	n.a.	n.a.
Heavy	119.5	n.a.	130.1	120.0	124.0
B757	120.5	121.4	125.6	120.4	123.0
Large	120.0	123.1	128.4	121.3	124.8
Small	122.6	124.8	123.6	121.8	122.8

Note: Data analyzed for the months of June and July 2010.
Sources: Port Authority of New York and New Jersey, AirScene data; Landrum & Brown analysis.

In addition to approach speeds, various taxi speeds were assumed and used as inputs in the TAAM simulation. Due to the lack of data (and more particularly, access to Sensis' Aerobahn database), actual taxi speeds for various areas of the airfield were not readily available for this analysis. As such, the following taxi speed assumptions reflective of different phases of flight as well as ground constraints were considered (see **Table 4-8, *LGA Aircraft Speed Assumptions***):

- Apron Area - 5.0 knots
- Push-Back/Taxi-In - 3.0 knots
- Taxiways - 10.0 to 22.0 knots depending on the taxiway, taxi distance covered and the level of congestion in the area considered

Concerning approach speeds, actual speed by aircraft type were used in the TAAM simulation rather than aircraft group averages.

Table 4-8: LGA Aircraft Speed Assumptions

		AVERAGE SPEED (IN KNOTS)
Approach		
	A380	n.a.
	Heavy	124.0
	B757	123.0
	Large	124.8
	Small	122.8
Apron Area		5.0
Push-Back/Taxi-In		3.0
Taxiways		10.0-22.0

Sources: Port Authority of New York and New Jersey, AirScene data; Landrum & Brown analysis.

4.4 ARRIVAL AND DEPARTURE FIXES

As stated in Section 4.1, aircraft use fixes in order to determine their position in the airspace and follow the arrival and departure path provided by the STARs and SIDs at LGA. In order for the TAAM model to function properly, an arrival and a departure fix has to be assigned to each origin and destination airport included in the August 2012 design day schedule (presented in Section 2). The Port Authority of New York and New Jersey eCater database was used in order to provide accurate information on LGA airspace fixes.

Table 4-9, *LGA Arrival Fix Allocation*, provides the allocation of arrival fix to each origin airport. **Table 4-10, *LGA Departure Fix Allocation***, presents the allocation of their corresponding departure fix.

Table 4-9: LGA Arrival Fix Allocation

IATA	ICAO	RWY 04	RWY 13	RWY 22	RWY 31
ACK	KACK	IIA	IIA	IIA	IIA
ALB	KALB	VAL	VAL	VAL	VAL
APA	KAPA	NAN	NAN	NAN	NAN
ATL	KATL	RBV	RBV	RBV	RBV
AVL	KAVL	RBV	RBV	RBV	RBV
BGR	KBGR	VAL	VAL	VAL	VAL
BHM	KBHM	RBV	RBV	RBV	RBV
BNA	KBNA	RBV	RBV	RBV	RBV
BOS	KBOS	VAL	VAL	VAL	VAL
BTV	KBTV	CAS	CAS	CAS	CAS
BUF	KBUF	VAL/CAS	VAL/CAS	VAL/CAS	VAL/CAS
BWI	KBWI	RBV	RBV	RBV	RBV
CAE	KCAE	RBV	RBV	RBV	RBV
CAK	KCAK	NAN	NAN	NAN	NAN
CHO	LCHO	RBV	RBV	RBV	RBV
CHS	KCHS	RBV	RBV	RBV	RBV
CLE	KCLE	NAN	NAN	NAN	NAN
CLT	KCLT	RBV	RBV	RBV	RBV
CMH	KCMH	NAN	NAN	NAN	NAN
CRW	KCRW	NAN	NAN	NAN	NAN
CVG	KCVG	NAN	NAN	NAN	NAN
DAY	KDAY	NAN	NAN	NAN	NAN
DCA	KDCA	RBV	RBV	RBV	RBV
DEN	KDEN	NAN	NAN	NAN	NAN
DFW	KDFW	NAN/RBV	NAN/RBV	NAN/RBV	NAN/RBV
DSM	KDSM	NAN	NAN	NAN	NAN
DTW	KDTW	NAN	NAN	NAN	NAN
FLL	KFLL	RBV	RBV	RBV	RBV
FMH	KFMH	VAL	VAL	VAL	VAL
GRR	KGRR	NAN	NAN	NAN	NAN
GSO	KGSO	RBV	RBV	RBV	RBV
GSP	KGSP	RBV	RBV	RBV	RBV
HYA	KHYA	VAL	VAL	VAL	VAL
IAD	KIAD	RBV	RBV	RBV	RBV
IAH	KIAH	NAN/RBV	NAN/RBV	NAN/RBV	NAN/RBV
ILM	KILM	RBV	RBV	RBV	RBV
IND	KIND	NAN	NAN	NAN	NAN
ITH	KITH	CAS	CAS	CAS	CAS
JAX	KJAX	RBV	RBV	RBV	RBV
LEX	KLEX	RBV	RBV	RBV	RBV
LWB	KLWB	RBV	RBV	RBV	RBV
MCI	KMCI	NAN	NAN	NAN	NAN
MCO	KMCO	RBV	RBV	RBV	RBV
MDW	KMDW	NAN	NAN	NAN	NAN
MEM	KMEM	RBV/NAN	RBV/NAN	RBV/NAN	RBV/NAN
MHT	KMHT	IIA	IIA	IIA	IIA
MIA	KMIA	RBV	RBV	RBV	RBV

Table 4-9: LGA Arrival Fix Allocation (Cont.)

IATA	ICAO	RWY 04	RWY 13	RWY 22	RWY 31
MKE	KMKE	NAN	NAN	NAN	NAN
MSN	KMSN	NAN	NAN	NAN	NAN
MSP	KMSP	NAN	NAN	NAN	NAN
MSY	KMSY	RBV	RBV	RBV	RBV
MTN	KMTN	RBV	RBV	RBV	RBV
MVY	KMVY	IIA	IIA	IIA	IIA
MYR	KMYR	RBV	RBV	RBV	RBV
NAS	MYNN	RBV	RBV	RBV	RBV
OMA	KOMA	NAN	NAN	NAN	NAN
ORD	KORD	NAN	NAN	NAN	NAN
ORF	KORF	RBV	RBV	RBV	RBV
PBI	KPBI	RBV	RBV	RBV	RBV
PHF	KPHF	RBV	RBV	RBV	RBV
PHL	KPHL	RBV	RBV	RBV	RBV
PIT	KPIT	NAN	NAN	NAN	NAN
PVD	KPVD	HFD	HFD	HFD	HFD
PWM	KPWM	VAL	VAL	VAL	VAL
RDU	KRDU	RBV	RBV	RBV	RBV
RIC	KRIC	RBV	RBV	RBV	RBV
ROA	KROA	RBV	RBV	RBV	RBV
ROC	KROC	CAS	CAS	CAS	CAS
RSW	KRSW	RBV	RBV	RBV	RBV
SAT	KSAT	NAN/RBV	NAN/RBV	NAN/RBV	NAN/RBV
SAV	KSAV	RBV	RBV	RBV	RBV
SDF	KSDF	RBV	RBV	RBV	RBV
STL	KSTL	NAN	NAN	NAN	NAN
SUA	KSUA	RBV	RBV	RBV	RBV
SYR	KSYR	CAS/VAL	CAS/VAL	CAS/VAL	CAS/VAL
TPA	KTPA	RBV	RBV	RBV	RBV
TYS	KTYS	RBV	RBV	RBV	RBV
XNA	KXNA	NAN	NAN	NAN	NAN
YHZ	CYHZ	VAL	VAL	VAL	VAL
YOW	CYOW	VAL	VAL	VAL	VAL
YUL	CYUL	VAL	VAL	VAL	VAL
YYZ	CYYZ	VAL	VAL	VAL	VAL

Sources: Port Authority of New York and New Jersey, Aerobahn and eCater data; Landrum & Brown analysis.

Table 4-10: LGA Departure Fix Allocation

IATA	ICAO	RWY 04	RWY 13	RWY 22	RWY 31
ACK	KACK	BAY	BAY	BAY	BAY
ADS	KADS	PAR	PAR	PAR	PAR
ALB	KALB	SOA	SOA	SOA	SOA
ATL	KATL	LAN	LAN	LAN	LAN
AVL	KAVL	BIG	BIG	BIG	BIG
BGR	KBGR	GRE/MER	GRE/MER	GRE/MER	GRE/MER
BHB	KBHB	GRE	GRE	GRE	GRE
BHM	KBHM	LAN	LAN	LAN	LAN
BNA	KBNA	PAR	PAR	PAR	PAR
BOS	KBOS	MER	MER	MER	MER
BTV	KBTV	BDR	BDR	BDR	BDR
BUF	KBUF	NEI/COA	NEI/COA	NEI/COA	NEI/COA
BWI	KBWI	BIG	BIG	BIG	BIG
CAE	KCAE	BIG	BIG	BIG	BIG
CAK	KCAK	EL6	EL6	EL6	EL6
CHO	LCHO	BIG	BIG	BIG	BIG
CHS	KCHS	WHI	WHI	WHI	WHI
CLE	KCLE	EL6	EL6	EL6	EL6
CLT	KCLT	BIG	BIG	BIG	BIG
CMH	KCMH	EL8	EL8	EL8	EL8
CRW	KCRW	PAR	PAR	PAR	PAR
CVG	KCVG	PAR	PAR	PAR	PAR
DAY	KDAY	EL8	EL8	EL8	EL8
DCA	KDCA	BIG	BIG	BIG	BIG
DEN	KDEN	EL6	EL6	EL6	EL6
DFW	KDFW	PAR	PAR	PAR	PAR
DSM	KDSM	EL6/COA	EL6/COA	EL6/COA	EL6/COA
DTW	KDTW	GAY	GAY	GAY	GAY
FLL	KFLL	WHI	WHI	WHI	WHI
FMH	KFMH	MER	MER	MER	MER
GRR	KGRR	COA	COA	COA	COA
GSO	KGSO	BIG	BIG	BIG	BIG
GSP	KGSP	BIG	BIG	BIG	BIG
IAD	KIAD	PAR	PAR	PAR	PAR
IAH	KIAH	LAN	LAN	LAN	LAN
ILM	KILM	WHI	WHI	WHI	WHI
IND	KIND	ELI	ELI	ELI	ELI
ITH	KITH	HAA	HAA	HAA	HAA
JAX	KJAX	WHI	WHI	WHI	WHI
LEX	KLEX	PAR	PAR	PAR	PAR
LWB	KLWB	LAN	LAN	LAN	LAN
MCI	KMCI	EL8	EL8	EL8	EL8
MCO	KMCO	WHI	WHI	WHI	WHI
MDW	KMDW	EL6	EL6	EL6	EL6
MEM	KMEM	PAR	PAR	PAR	PAR
MHT	KMHT	MER	MER	MER	MER
MIA	KMIA	WHI	WHI	WHI	WHI

Table 4-10: LGA Departure Fix Allocation (Cont.)

IATA	ICAO	RWY 04	RWY 13	RWY 22	RWY 31
MKE	KMKE	COA	COA	COA	COA
MSN	KMSN	COA	COA	COA	COA
MSP	KMSP	GAY/COA	GAY/COA	GAY/COA	GAY/COA
MSY	KMSY	LAN	LAN	LAN	LAN
MTN	KMTN	BIG	BIG	BIG	BIG
MVY	KMVY	MAD/BAY	MAD/BAY	MAD/BAY	MAD/BAY
MYR	KMYR	WHI	WHI	WHI	WHI
NAS	MYNN	WHI	WHI	WHI	WHI
OMA	KOMA	EL6	EL6	EL6	EL6
ORD	KORD	COA	COA	COA	COA
ORF	KORF	WHI	WHI	WHI	WHI
PBI	KPBI	WHI	WHI	WHI	WHI
PHF	KPHF	WHI	WHI	WHI	WHI
PHL	KPHL	SAX/CYN	SAX/CYN	SAX/CYN	SAX/CYN
PIT	KPIT	EL8	EL8	EL8	EL8
PVD	KPVD	BAY	BAY	BAY	BAY
PWM	KPWM	GRE	GRE	GRE	GRE
RDU	KRDU	WHI	WHI	WHI	WHI
RIC	KRIC	WHI	WHI	WHI	WHI
ROA	KROA	LAN	LAN	LAN	LAN
ROC	KROC	HAA/NEI	HAA/NEI	HAA/NEI	HAA/NEI
RSW	KRSW	BIG	BIG	BIG	BIG
SAV	KSAV	WHI	WHI	WHI	WHI
SDF	KSDF	PAR	PAR	PAR	PAR
STL	KSTL	EL8	EL8	EL8	EL8
SYR	KSYR	HAA/NEI	HAA/NEI	HAA/NEI	HAA/NEI
TPA	KTPA	BIG	BIG	BIG	BIG
TYS	KTYS	LAN	LAN	LAN	LAN
XNA	KXNA	PAR	PAR	PAR	PAR
YHZ	CYHZ	GRE	GRE	GRE	GRE
YOW	CYOW	GRE	GRE	GRE	GRE
YUL	CYUL	GRE	GRE	GRE	GRE
YYZ	CYYZ	GAY	GAY	GAY	GAY

Sources: Port Authority of New York and New Jersey, Aerobahn and eCater data; Landrum & Brown analysis.

5. AIRFIELD RELATED ASSUMPTIONS

5.1 RUNWAY FLOWS

There are seven runway operating configurations used at LGA. The seven runway configurations used at LGA are defined by the airspace used for approaching the arrival runways. The runway operating configuration used most frequently consists of arrivals on Runway 22 and departures on Runway 13. **Table 5-1, *LGA Historical Runway Configuration Usage***, lists each runway configuration with the percent usage. The top four configurations are also illustrated in **Figure 5-1, *LGA Top Airport Runway Configurations – Year 2009 Usage***.

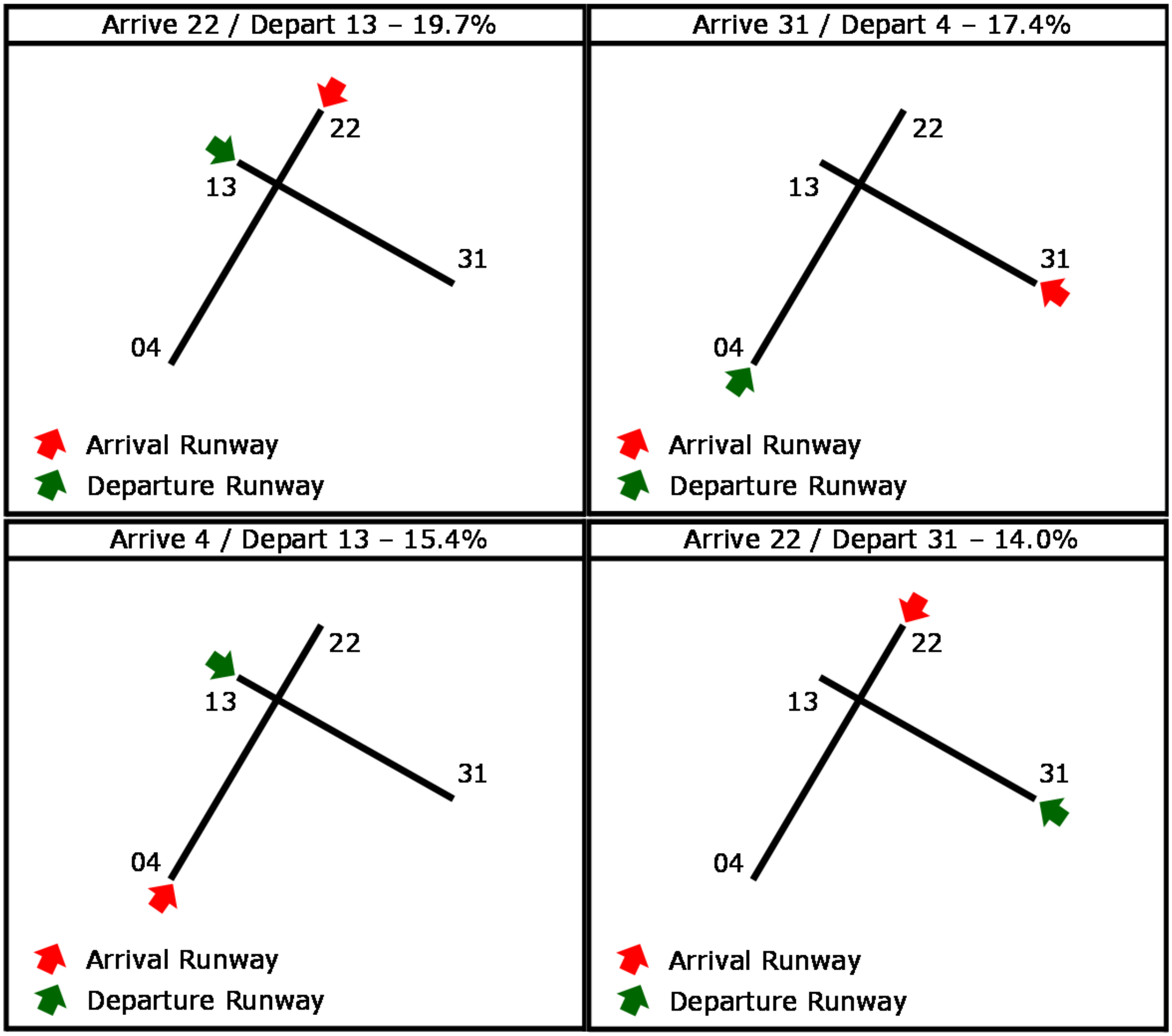
The top five runway configurations were used 78.9 percent of the time in 2009. The usage of these five configurations is fairly evenly distributed. However, it is worth noting an increase in the use of the runway configuration 31|31 over the past five years to the detriment of 22|13. The 22/13 configuration has historically been the most used configuration over the past five years despite a decline in usage from 27 percent in 2005 to about 20 percent in 2009. The 22/13 configuration (if all climbs are available) is the highest arrival and departure capacity at LGA. The 22/31, 31/4 and 4/13 configurations are the other configurations that are frequently used at LGA. All together, the top four configurations accounted for 67 percent to 72 percent of traffic over the past five years. In addition to these four configurations, LGA is sometimes forced to use a single runway configuration (mostly ILS 13/13) in IFR weather which is a low capacity and high delay configuration. LGA may also use a single runway configuration (mostly 31/31) during low traffic periods such as all-day Saturday, Sunday mornings, or early mornings on weekdays.

Table 5-1: LGA Historical Runway Configuration Usage

FLOW	**PERCENT OF TIME**				
	CY2005	**CY2006**	**CY2007**	**CY2008**	**CY2009**
Arr 22/Dep 13	27.0%	25.3%	23.9%	22.9%	19.7%
Arr 31/Dep 4	15.3%	18.1%	16.5%	18.2%	17.4%
Arr 4/Dep 13	14.7%	12.5%	12.1%	12.0%	15.4%
Arr 22/Dep 31	15.0%	15.0%	19.2%	18.7%	14.0%
Arr 31/Dep 31	4.4%	5.2%	7.4%	9.4%	12.4%
Other Single Rwy	12.4%	12.0%	9.6%	7.6%	6.3%
Other	11.2%	11.9%	11.3%	11.4%	14.8%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Sources: FAA Aviation System Performance Metrics (ASPM); Landrum & Brown analysis

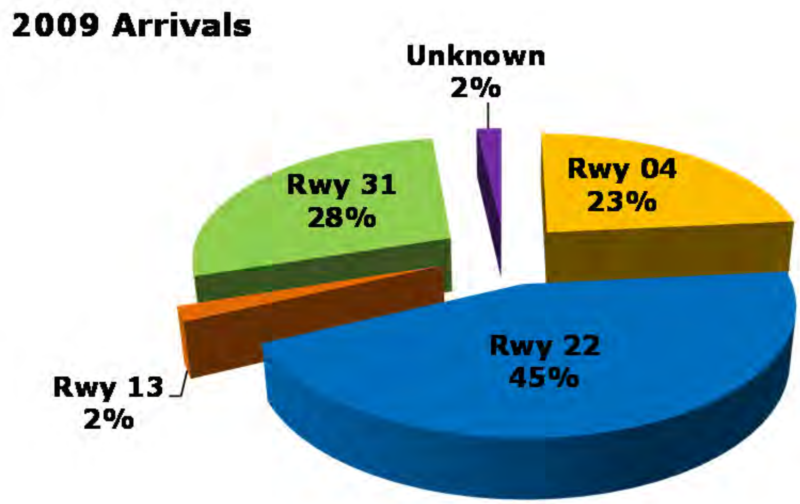
Figure 5-1: LGA Top Airport Runway Configurations – Year 2009 Usage

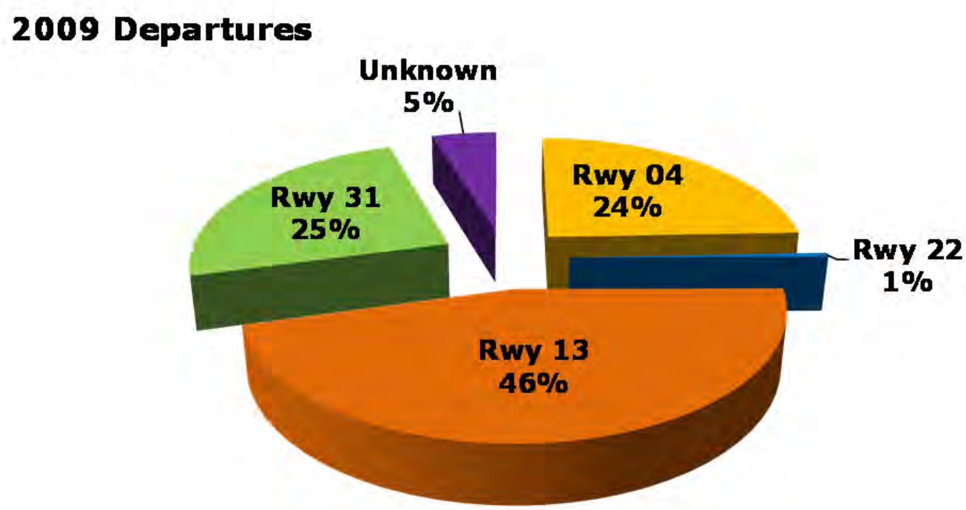


Note: Percent usage calculated based on total aircraft operations.
Sources: Port Authority of New York and New Jersey, eCater data; Landrum & Brown analysis.

All runways are fairly evenly used across the year as shown in **Figure 5-2, *LGA Runway Usage – Year 2009***. Nevertheless, Runway 22 is the primary arrival runway while Runway 13 is the primary departure runway. These runways accounted for over 45 percent of arrivals and departures, respectively, in 2009.

Figure 5-2: LGA Runway Usage – Year 2009





Note: Percent usage calculated based on total aircraft operations.
Sources: Port Authority of New York and New Jersey, eCater data; Landrum & Brown analysis.

5.2 RUNWAY EXITS

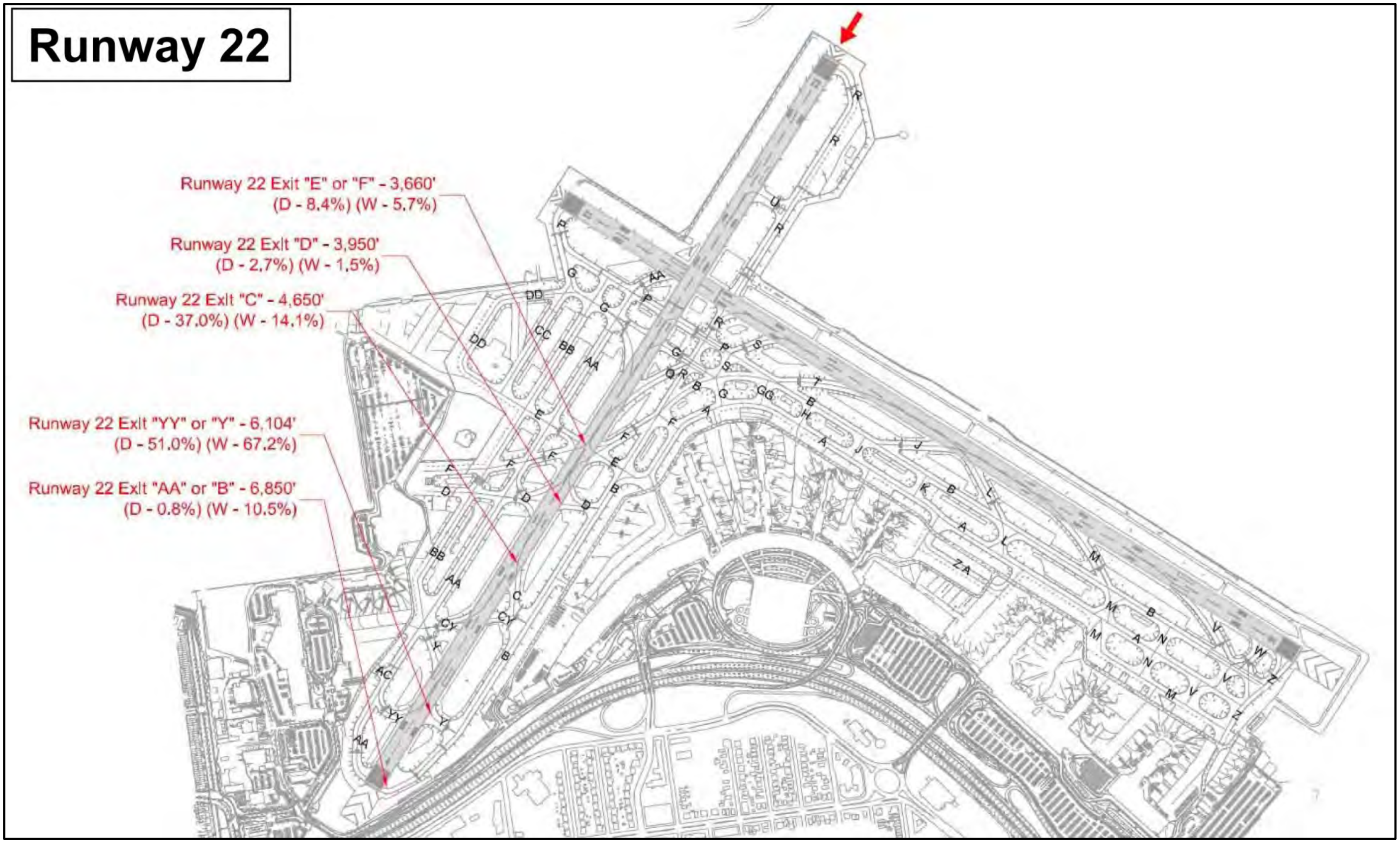
In order to properly calibrate the TAAM model, an analysis of runway exits and runway occupancy time was conducted for year 2009 at LGA using the FAA Runway Exit Design Interactive Model (REDIM). As shown in **Figure 5-3, *Runway Exit Utilization – Runway 22***, **Figure 5-4, *Runway Exit Utilization – Runway 31***, and **Figure 5-5, *Runway Exit Utilization – Runway 4***, twelve runway exits are available on Runway 4/22 (six exits in each flow direction) and six runway exits can be used for arrivals on Runway 31. The 2009 fleet mix presented in **Table 5-2, *LGA 2009 Fleet Mix for REDIM***, was used as inputs in the REDIM model. The model was calibrated and adjusted based on the inputs received from the LGA tower.

Table 5-2: LGA 2009 Fleet Mix for REDIM

AIRCRAFT TYPE	PERCENT OF TOTAL
CRJ-200	12.0%
DHC-8	6.0%
Do-328	1.0%
EMB145	23.0%
SAAB-340	6.0%
A320-200	15.0%
B717-200	2.0%
B737-300	2.0%
B737-800	8.0%
B757-200	8.0%
DC-9-32	1.0%
MD-83	16.0%
Total	100.0%

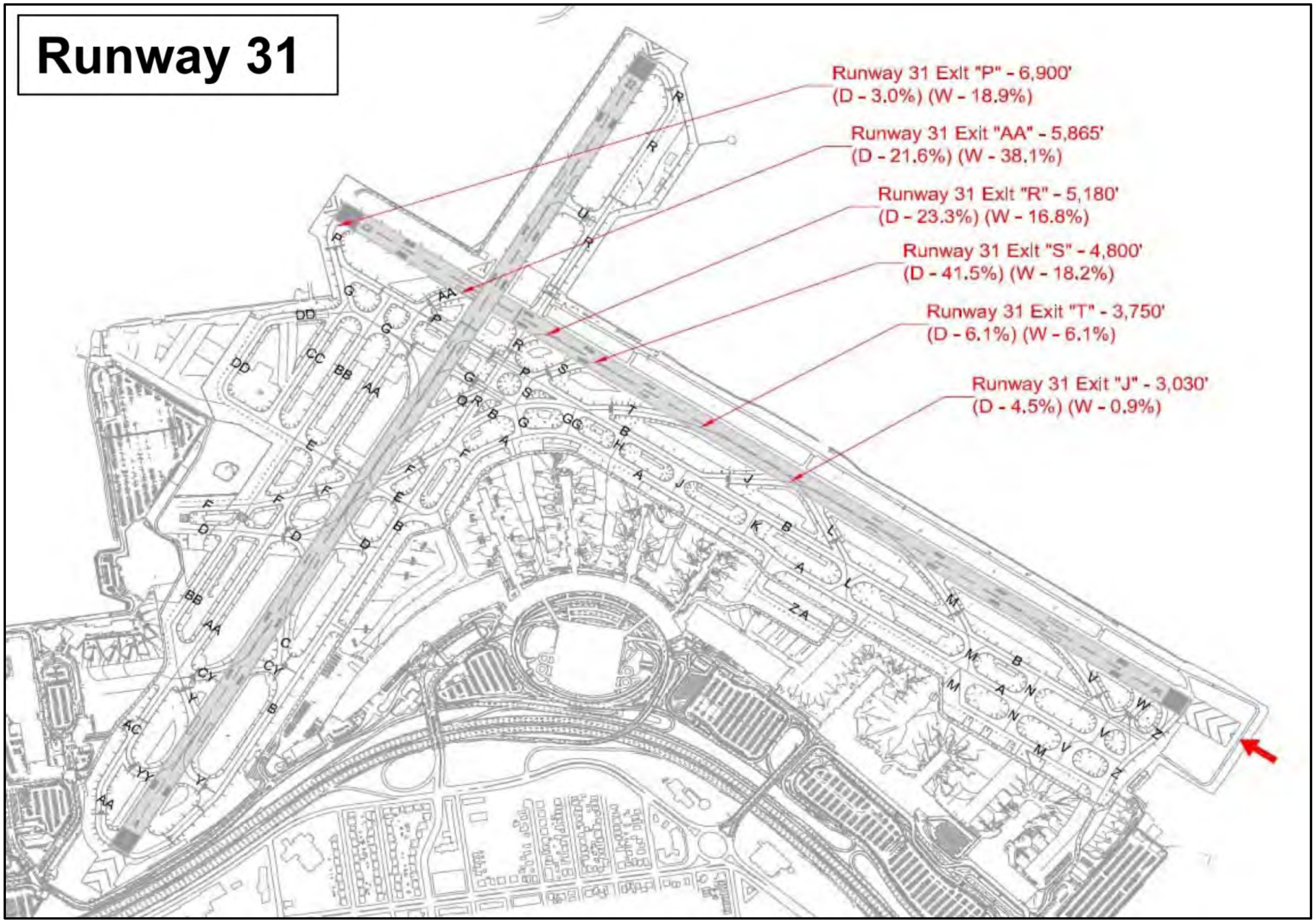
Source: Port Authority of New York and New Jersey.

Figure 5-3: LGA Runway Exit Utilization – Runway 22



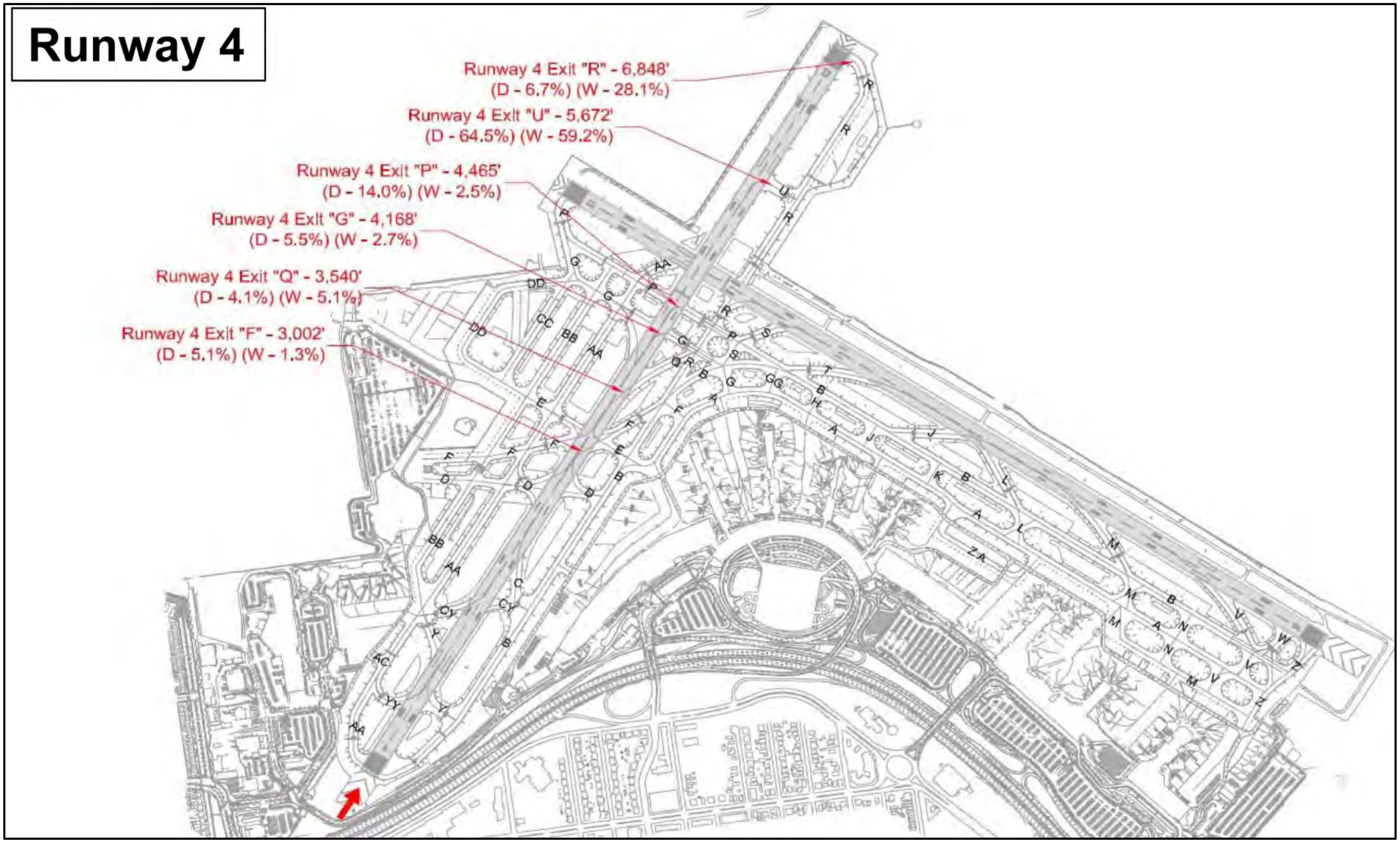
Sources: Port Authority of New York and New Jersey; Landrum & Brown analysis.

Figure 5-4: LGA Runway Exit Utilization – Runway 31



Sources: Port Authority of New York and New Jersey; Landrum & Brown analysis.

Figure 5-5: LGA Runway Exit Utilization – Runway 04



Sources: Port Authority of New York and New Jersey; Landrum & Brown analysis.

5.3 TAXI FLOWS

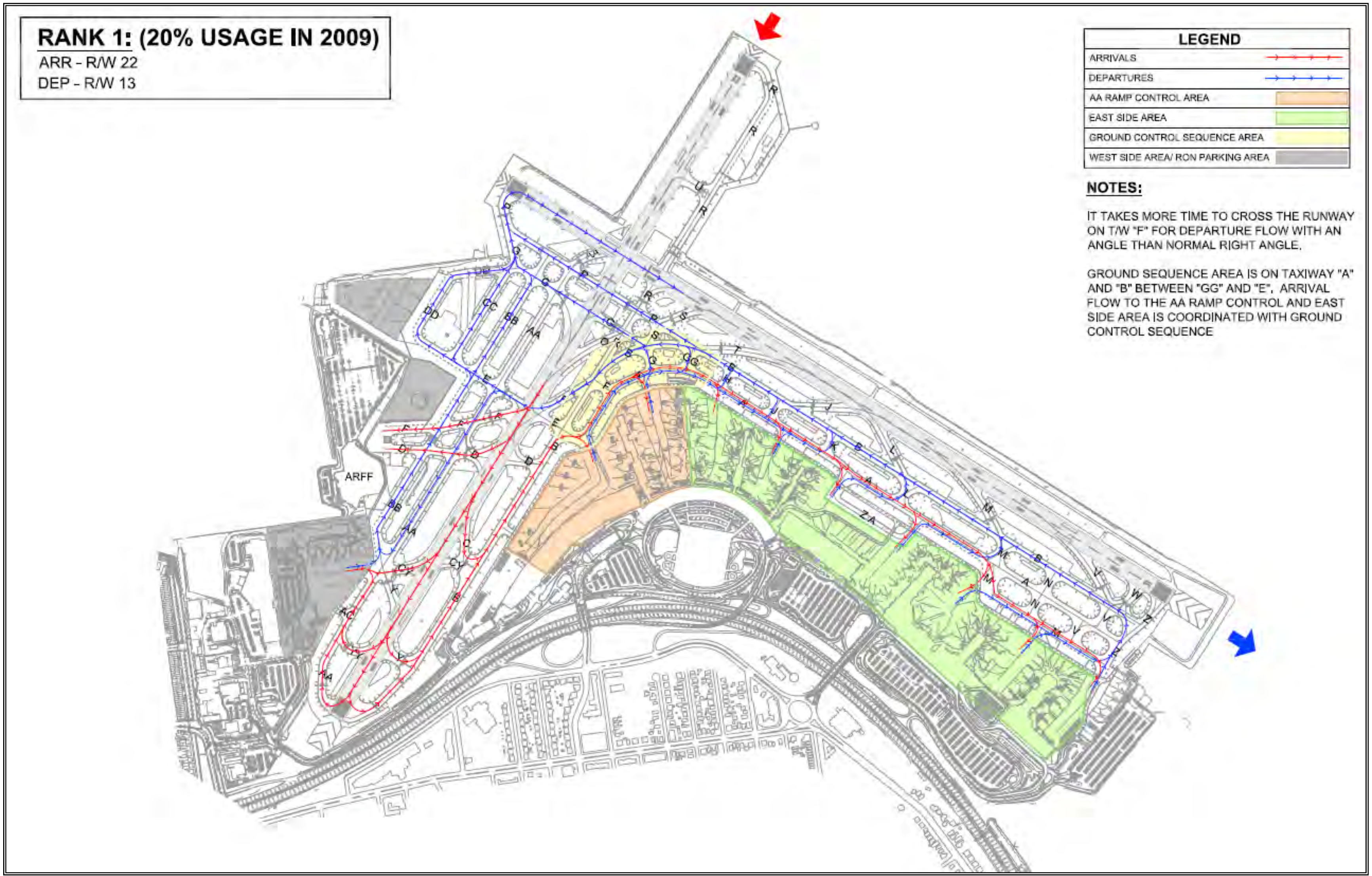
Due to the real estate constraints, LGA has a limited taxiway network. The runways are separated from the terminal area by two taxiways, Taxiways A and B, which provide most of the taxiway flow between the gate apron areas and the runways. In most runway configurations, Taxiways A and B have to be used in opposite directions.

In addition to the taxiway structure in the terminal area, LGA has the following key taxiways:

- Taxiways P and G which extend beyond Taxiways B and A, respectively, are used to queue departures on Runway 13.
- Taxiways AA, BB, and CC which parallel the north side of Runway 04/22 and provide connections to the west area of the airfield. In addition, these taxiways provide queuing space for Runway 13 departures.
- Taxiway R is the only taxiway used to access Runway 22 for departures.

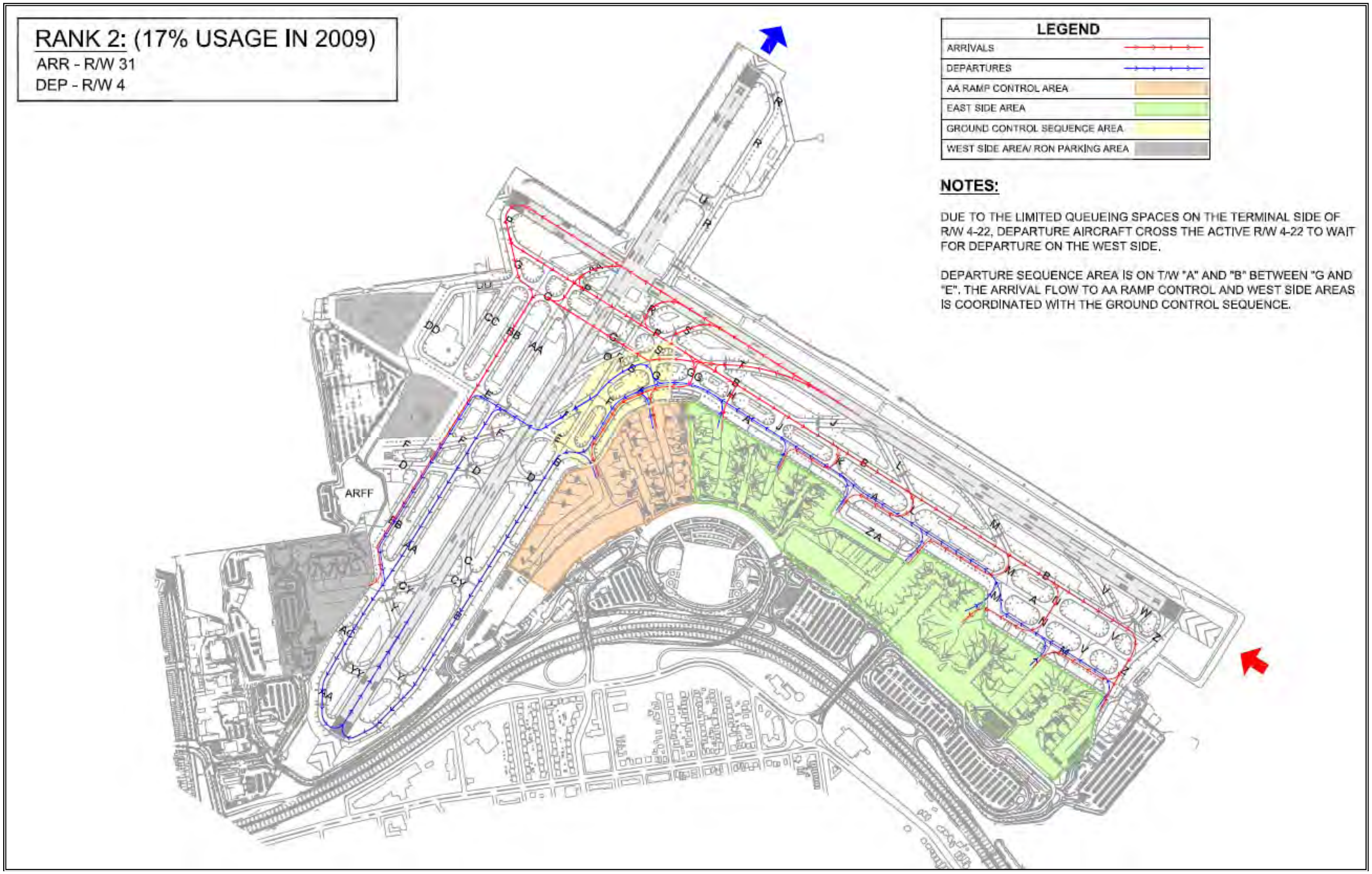
Figure 5-6, *Taxiway Flow Pattern – 22/13 Configuration*, **Figure 5-7, *Taxiway Flow Pattern – 31/4 Configuration***, **Figure 5-8, *Taxiway Flow Pattern – 4/13 Configuration***, and **Figure 5-9, *Taxiway Flow Pattern – 22/31 Configuration***, present the taxi routes used by arriving and departing aircraft under each operating flow at LGA.

Figure 5-6: Taxiway Flow Pattern – 22/13 Configuration



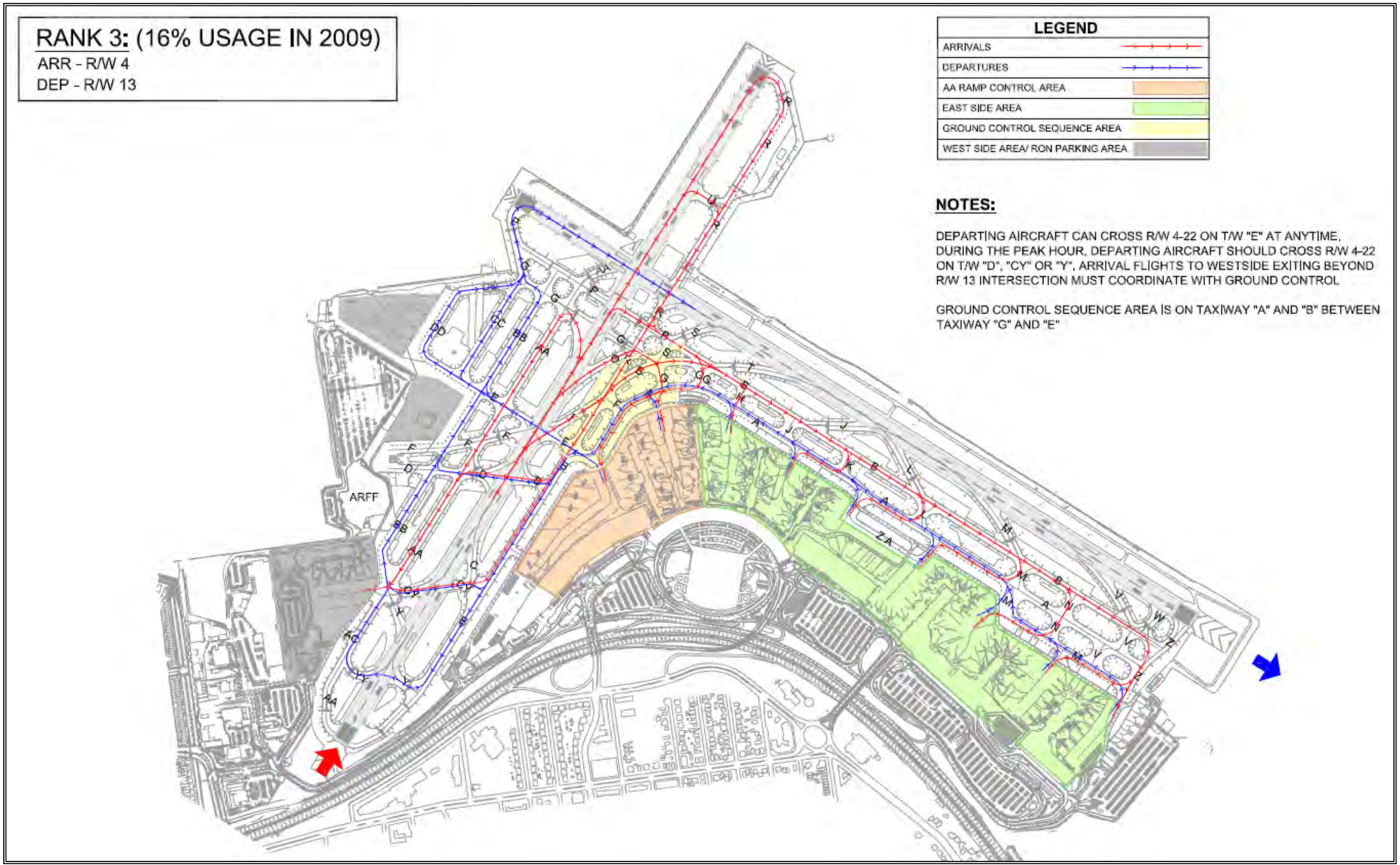
Source: Landrum & Brown analysis.

Figure 5-7: Taxiway Flow Pattern – 31/4 Configuration



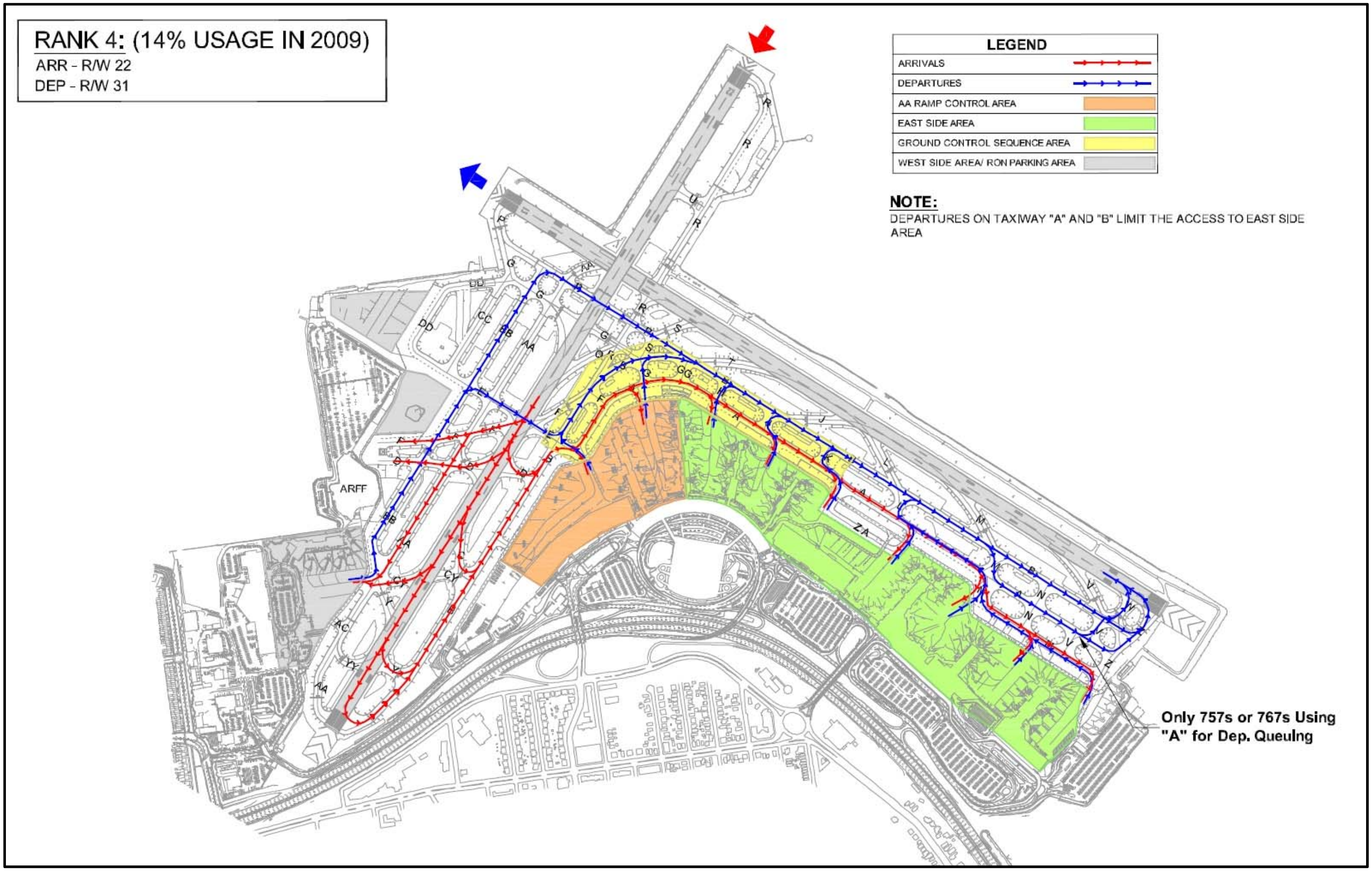
Source: Landrum & Brown analysis.

Figure 5-8: Taxiway Flow Pattern – 4/13 Configuration



Source: Landrum & Brown analysis.

Figure 5-9: Taxiway Flow Pattern – 22/31 Configuration



Source: Landrum & Brown analysis.

22/13 Configuration

Arrivals on Runway 22 would use the following taxi routes to their respective terminal:

- Rwy 22 → Rwy Exit F or D or CY or YY or AA → Twy AA → Terminal A
- Rwy 22 → Rwy Exit E or C or Y or B → Twy B → Twy E → Twy A → Terminal B/Terminal C
- Rwy 22 → Rwy Exit E or C or Y or B → Twy B → Twy E → Twy A (or Twy M) → Terminal D

The taxi routes for departures on Runway 13 are as follows:

- Terminal A → Twy BB → Twy CC (or Twy BB or Twy DD) → Twy G → Twy P → Rwy 13
- Terminal B/Terminal C → Twy B → Twy F → Twy E → Twy CC (or Twy BB or Twy DD) → Twy G → Twy P → Rwy 13
- Terminal D → Twy M → Twy B → Twy F → Twy E → Twy CC (or Twy BB or Twy DD) → Twy G → Twy P → Rwy 13

31/4 Configuration

The taxi routes used by arrivals on Runway 31 are as follows depending on the terminal they are destined to:

- Rwy 31 → Rwy Exit T or S or R → Twy P → Twy BB → Terminal A
- Rwy 31 → Rwy Exit T or S or R or AA → Twy P → Twy B → Terminal B/Terminal C
- Rwy 31 → Rwy Exit T or S or R or AA → Twy P → Twy B → Twy M → Terminal D

Departures can taxi to Runway 4 using one the following taxi routes:

- Terminal A → Twy BB (or Twy AA) → Twy AA → Rwy 4
- Terminal B/Terminal C → Twy A → Twy E (or Twy G or Twy F) → Twy B (or Twy E or Twy AA) → Rwy 4
- Terminal D → Twy M → Twy A → Twy E (or Twy G or Twy F) → Twy B (or Twy E or Twy AA) → Rwy 4

4/13 Configuration

Arrivals on Runway 4 can be segregated into three groups based on the terminal they are destined to:

- Rwy 4 → Rwy Exit E or G or P → Twy AA → Terminal A
- Rwy 4 → Rwy Exit F or Q or G or P or U or R → Twy B → Terminal B/Terminal C
- Rwy 4 → Rwy Exit F or Q or G or P or U or R → Twy B → Twy M → Terminal D

Departures on Runway 13 use the following taxi routes to reach the runway threshold:

- Terminal A → Twy BB → Twy CC (or Twy BB or Twy DD) → Twy G → Twy P → Rwy 13
- Terminal B/Terminal C → Twy A → Twy E (or Twy D) → Twy CC (or Twy BB or Twy DD) → Twy G → Twy P → Rwy 13
- Terminal D → Twy M → Twy A → Twy E (or Twy D) → Twy CC (or Twy BB or Twy DD) → Twy G → Twy P → Rwy 13

22/31 Configuration

The taxi routes used by arrivals on Runway 22 are as follows:

- Rwy 22 → Rwy Exit F or D or CY or YY or AA → Twy AA → Terminal A
- Rwy 22 → Rwy Exit E or C or Y or B → Twy B → Twy E → Twy A → Terminal B/Terminal C
- Rwy 22 → Rwy Exit E or C or Y or B → Twy B → Twy E → Twy A (or Twy M) → Terminal D

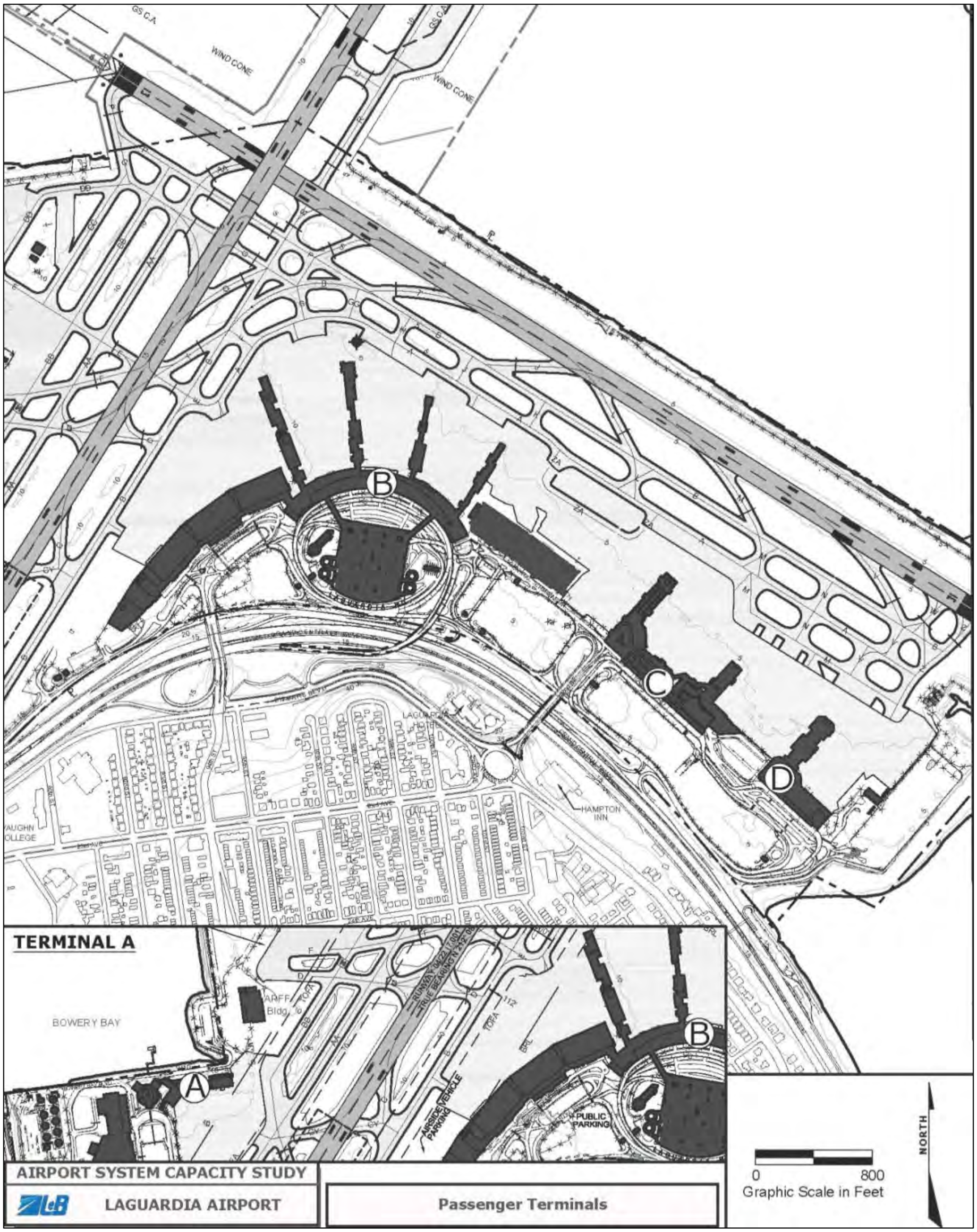
Departures can taxi to Runway 31 using one the following taxi routes:

- Terminal A → Twy BB → Twy E (or Twy P) → Twy B → Rwy 31
- Terminal B → Twy B → Rwy 31
- Terminal B (B757s and B767s) → Twy B → Twy M → Twy A → Twy Z → Rwy 31
- Terminal C → Twy B → Rwy 31
- Terminal D → Twy M → Twy B → Rwy 31
- Terminal D (B757s and B767s) → Twy M → Twy A → Twy Z → Rwy 31

6. TERMINAL RELATED ASSUMPTIONS

Figure 6-1, *LGA Passenger Terminals*, presents the current terminal area at LGA.

Figure 6-1: LGA Passenger Terminals



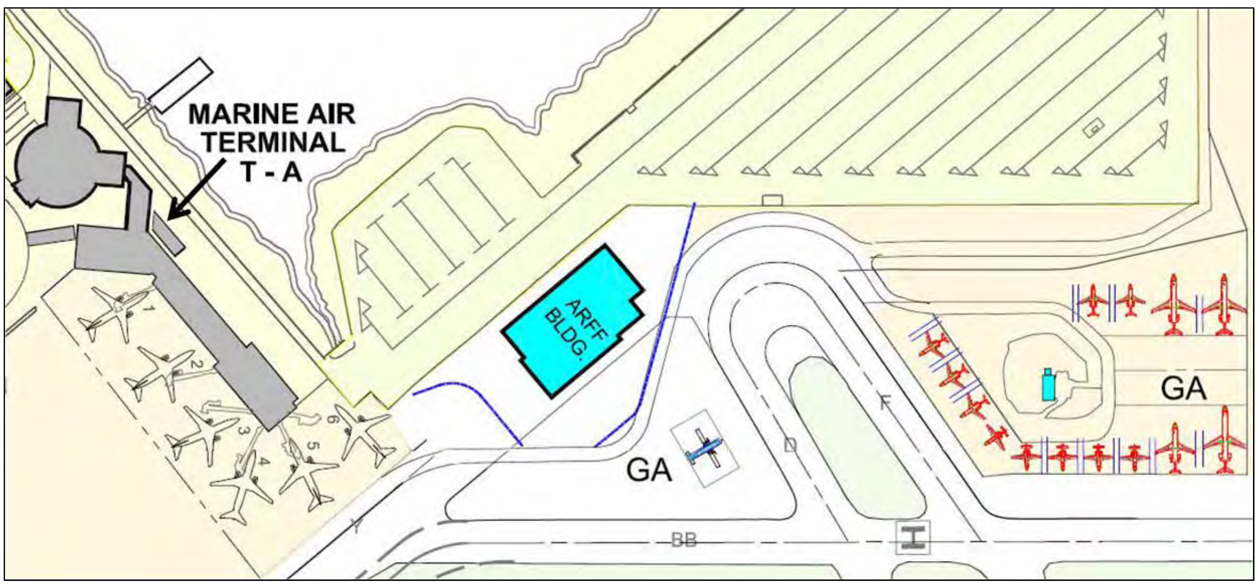
Source: Landrum & Brown analysis.

The physical layout, gate configuration and space summaries for each of the current terminal facilities at LGA are discussed in this section. A review of the gates, their size, and the terminal frontage space is reported for each terminal along with a review of the current airline terminal assignment. These terminal-related analyses will be used as main inputs in the development of the TAAM model.

6.1 EXISTING GATE LAYOUTS

Marine Air Terminal (Terminal A) serves only Delta Air Lines from six contact gates (see **Figure 6-2, *LGA Terminal A***). The six contact gates are capable of accommodating six ADG III type aircraft, producing a wingspan frontage of approximately 700 linear feet. Passenger boarding bridges serve all of Terminal A's contact gates. There are no hardstands available in close proximity to Terminal A.

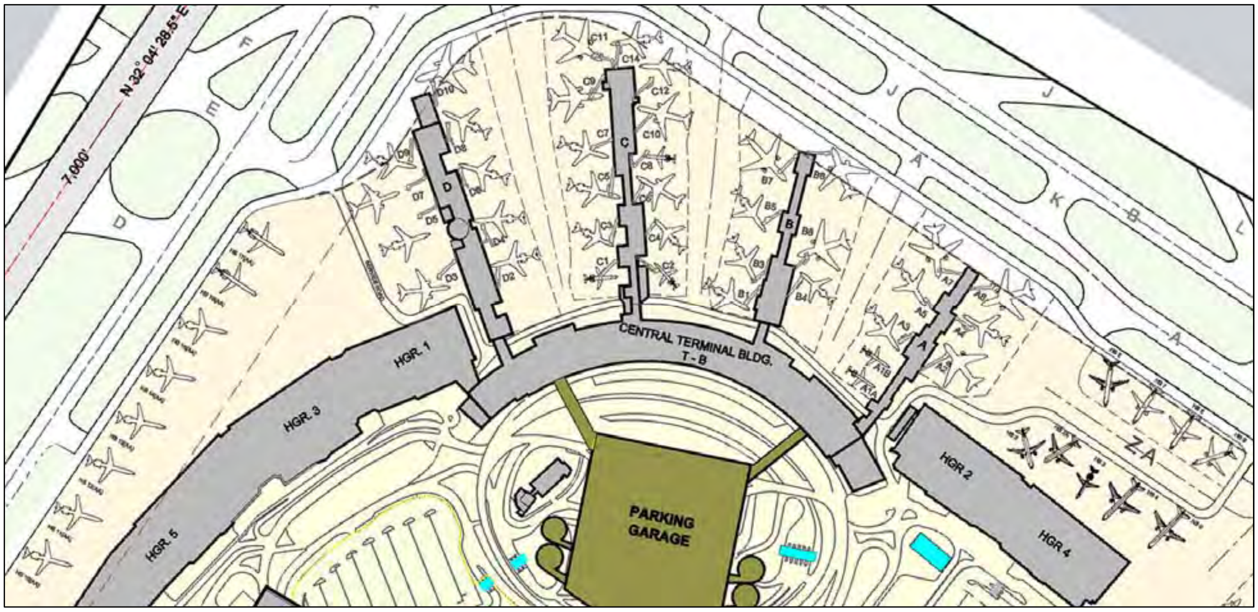
Figure 6-2: LGA Terminal A



Sources: Port Authority of New York and New Jersey, Landrum & Brown analysis.

Central Terminal Building (Terminal B) (see **Figure 6-3, *LGA Terminal B***), serves seven domestic airlines from 37 gates (35 contact and 2 ground-loaded) along 4 concourses designated from east to west as Concourse A (A1A-A1B and A2-A7), Concourse B (B1 and B3-B8), Concourse C (C1-C12 and C14), and Concourse D (D2-D10), respectively. Concourse A's eight gates are capable of accommodating four ADG III type aircraft and two ADG IV type aircraft from contact gates and two ADG II type aircraft from ground loading positions, producing a wingspan frontage of approximately 900 linear feet. Concourse B's seven contact gates are capable of accommodating five ADG III and two ADG IV type aircraft, producing a wingspan frontage of approximately 900 linear feet. Concourse C's 13 contact gates are capable of accommodating five ADG II, five ADG III, and three ADG IV type aircraft, producing a wingspan frontage of approximately 1,400 linear feet. Finally, Concourse D has nine gates that are capable of accommodating six ADG III and three ADG IV type aircraft from contact gates, producing a wingspan frontage of approximately 1,100 linear feet. Gate D1 was recently taken out of service.

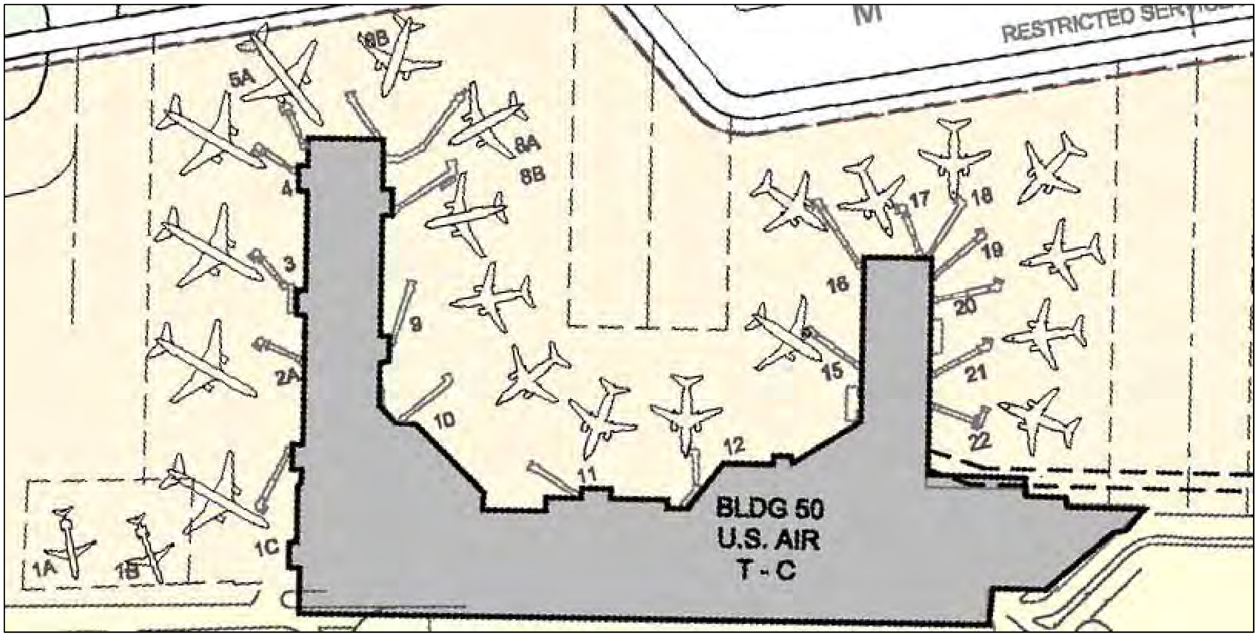
Figure 6-3: LGA Terminal B



Sources: Port Authority of New York and New Jersey, Landrum & Brown analysis.

Delta /US Air Terminal (Terminal C) (see **Figure 6-4, *LGA Terminal C***), serves domestic flight operations for Delta Airlines and US Airways, including Express and Shuttle services, from 20 contact gates along two concourses and the terminal headhouse. The west concourse gates are numbered 1 through 10, the two gates located on the terminal headhouse are numbered 11 and 12, and the east concourse gates are numbered 15 through 22. There are no CBP or FIS facilities provided for international arriving passengers at Terminal C. The west concourse's ten contact gates can accommodate five ADG III and five ADG IV type aircraft and produce a wingspan frontage of approximately 1,200 linear feet. The east concourse's eight contact gates and the two terminal headhouse contact gates can accommodate a total of ten ADG III type aircraft and produce a wingspan frontage of approximately 1,200 linear feet. Two additional regional jet (ADG II) hardstands are provided adjacent to Gate 1. The apron area surrounding Gates 1 through 8 on the west concourse can alternately accommodate 13 regional jets (ADG II) and turbo-prop (ADG III) aircraft. As a result, the ten bridge-equipped gates in the west concourse can provide 15 designated aircraft parking positions. In 2012, US Airways and Delta Airlines entered into an agreement whereby Delta exchanged slots with US Airways at Washington Reagan National Airport for slots at LGA. The agreement has resulted in a large increase in Delta flight activity at LGA, with connections between Terminal C and Terminal D eventually shifting from secure shuttle bus service to a future secure connector bridge, currently under construction as of April 2013.

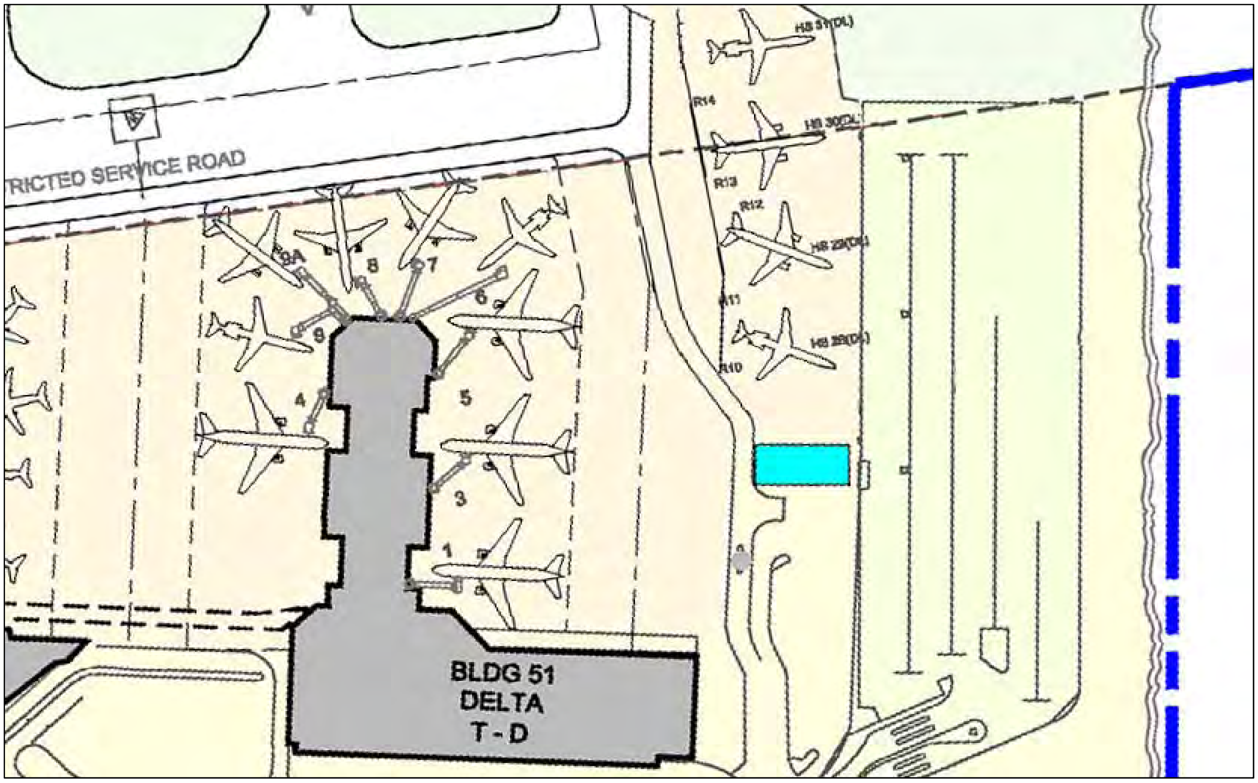
Figure 6-4: LGA Terminal C



Sources: Port Authority of New York and New Jersey, Landrum & Brown analysis.

Delta Terminal (Terminal D) (see **Figure 6-5, *LGA Terminal D***), serves domestic flight operations for Delta Airlines including its regional carriers from nine numbered contact gates (1, 3-9, 9A). A single double-loaded concourse extending from the western end of the building can accommodate two ADG III and seven ADG IV type aircraft parking positions. Generally, the larger ADG IV aircraft parking positions are located along the sides of the concourse, while the northeastern end of the concourse serves the smaller narrow-body aircraft in the Delta fleet including some large regional jets. Passenger boarding bridges serve all of Terminal D's contact gates. Gate D2 is not currently being used to service aircraft, but serves as a secure transfer point for shuttle buses transporting passengers to/from Delta Terminal C. Additional hardstand/remote parking capacity is located along the blast fence and provides two ADG III and two ADG IV parking positions at the southeast edge of the terminal ramp. The four existing hardstand positions can alternately accommodate six smaller ADG II aircraft in place of the four larger aircraft.

Figure 6-5: LGA Terminal D



Sources: Port Authority of New York and New Jersey, Landrum & Brown analysis.

6.2 AIRLINE GATE ASSIGNMENTS

Table 6-1, *LGA Airline Terminal Assignment*, presents the current airline terminal assignment at LGA.

Table 6-1: LGA Airline Terminal Assignment

AIRLINE	TERMINAL
Air Canada	Terminal B - Concourse A
AirTran Airways	Terminal B - Concourse B
American Airlines	Terminal B - Concourse D
American Eagle	Terminal B - Concourse C
Continental Airlines	Terminal B - Concourse A
Delta Airlines	Terminals C, D
Delta Connection	Terminals C, D, East Blast Fence
Delta Shuttle	Terminal A
Frontier Airlines	Terminal B - Concourse B
JetBlue Airways	Terminal B - Concourses A/B
Southwest Airlines	Terminal B - Concourse B
Spirit Airlines	Terminal B - Concourse B
United Airlines	Terminal B - Concourse C
US Airways/US Shuttle	Terminal C
WestJet Airlines	Terminal C

Source: Landrum & Brown analysis.

All commercial passenger flights in the design day schedule were gated in each of the four terminals using a Gate Management System (GMS) and inputs from airlines and Port Authority staff. GMS is a network-based software system that allows an airport authority to plan, operate, manage, and document the usage of terminal ramp facilities. GMS consists of interconnected functional modules that together encompass all of the operations required in a gate management system. GMS manages gate, ticket counter, and bag claim resources under airport control. At the same time, leased resource activity can be captured by means of an on-line connection to the airport Flight Information Display System. In addition to the functional modules, the GMS application includes scenario creation, report wizard, report activation, login security, and over four dozen standard reports and graphs. Even specialized reports are easy to produce using the system's report wizard capability to extract data to a spreadsheet. **Figure 6-6, *LGA Design Day Gated Schedule***, presents the Gantt chart generated by GMS.

Figure 6-6: LGA Design Day Gated Schedule

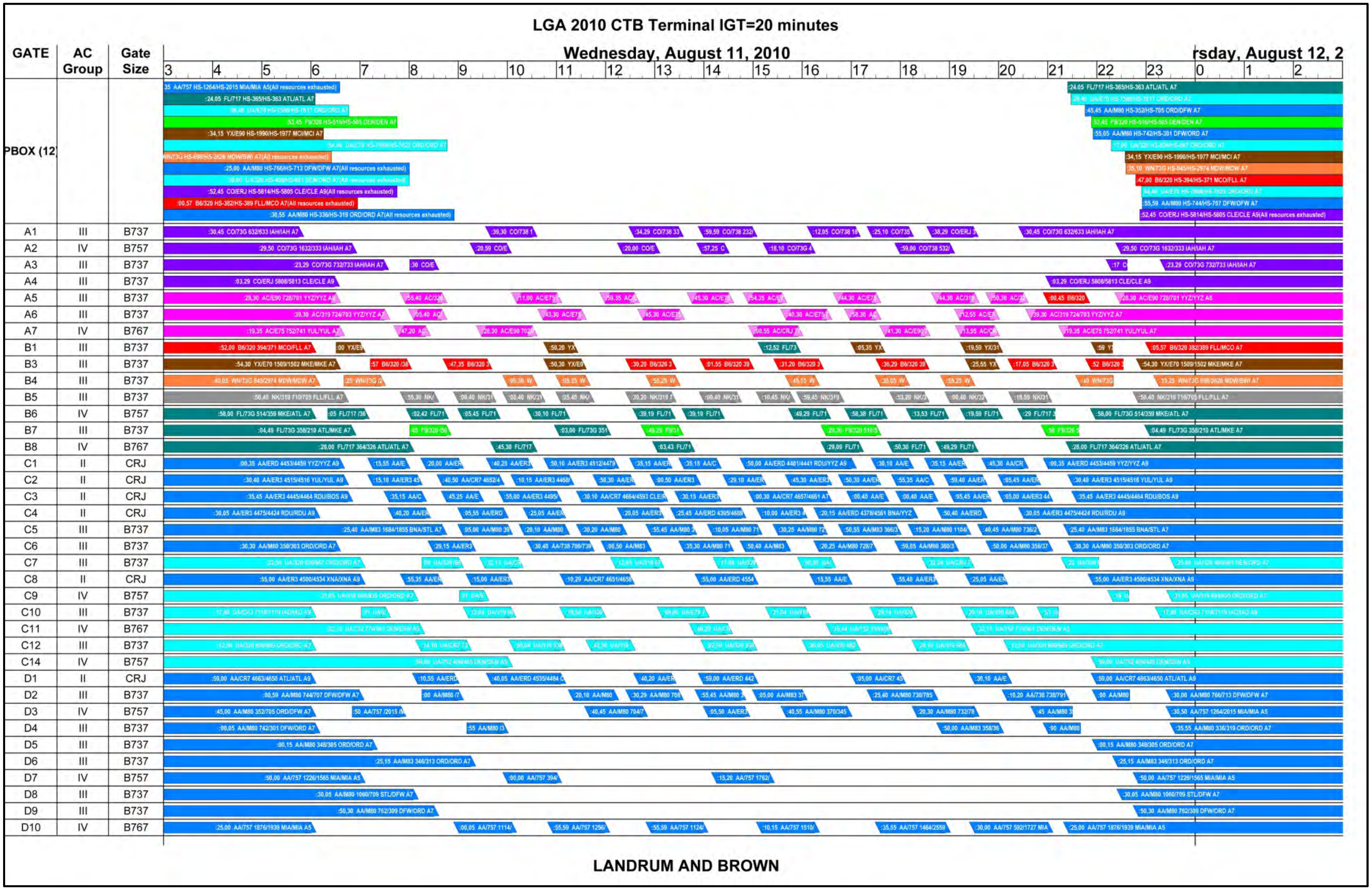
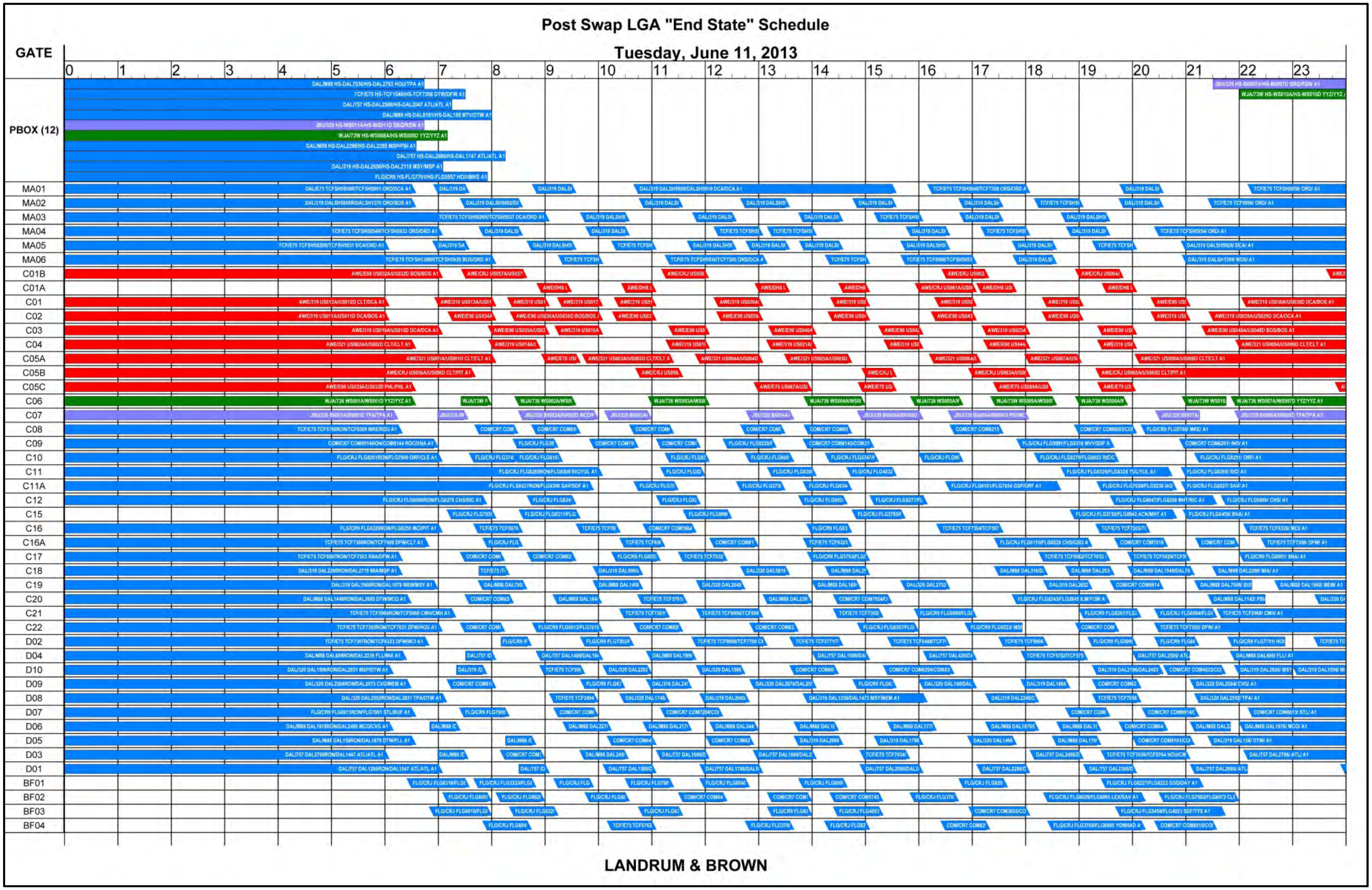


Figure 6-6: LGA Design Day Gated Schedule (Cont.)



Source: Landrum & Brown analysis.

6.3 OTHER TERMINAL-RELATED ASSUMPTIONS

6.3.1 Aircraft Pushback Operations

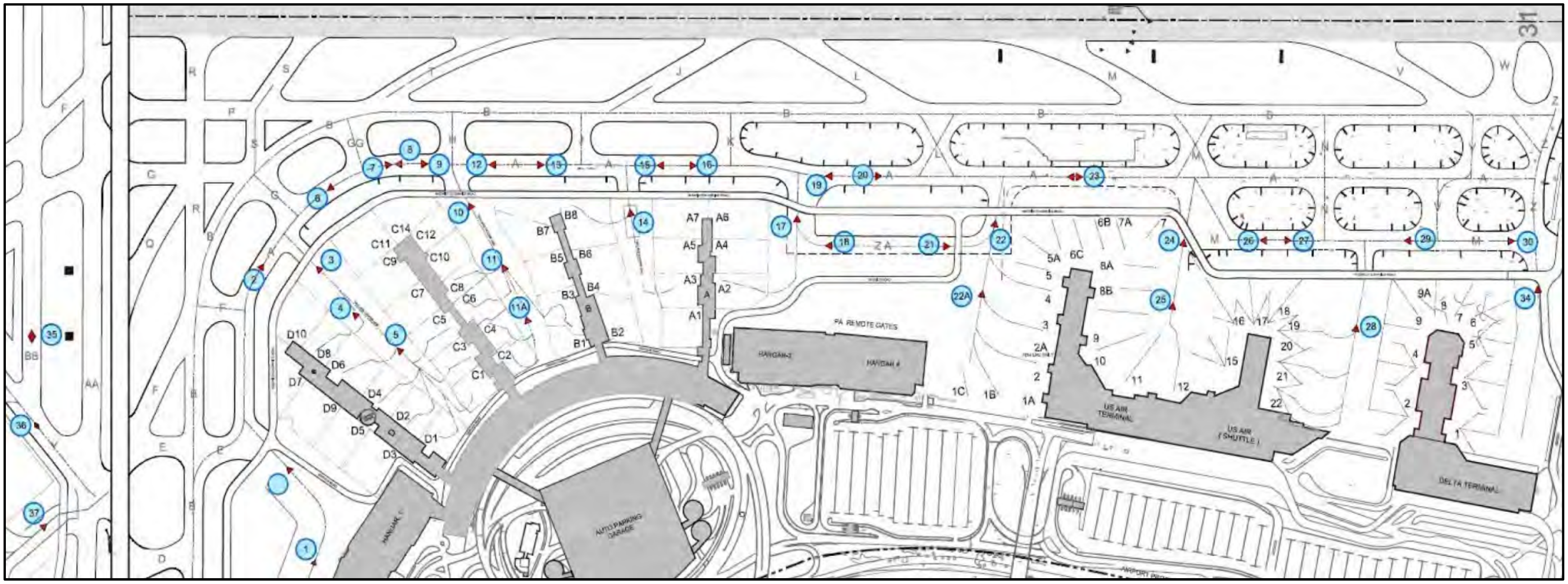
An Aircraft pushback operation can be split into five different phases: (a) actual push-back; (b) pull-forward; (c) detach tug; (d) start engines and (e) get clearance to taxi. Aircraft pushback operations were timed for each phase of the operation for CTB and the Delta Terminal at LGA. Due to the configuration of the terminals at LGA, several factors influence the time required to complete an aircraft pushback operation. It can take anywhere between 7 and 15 minutes for a single operation. Some of the factors that have a direct impact on the pushback times are listed below:

- Gate location: generally speaking, the closer the gate is to the passenger terminal, the longer it takes for the aircraft to pushback;
- Aircraft size: larger aircraft require more time to complete the pushback operation;
- Adjacent gates: the time required for a pushback operation depends on whether the adjacent gates are occupied or not and the size of the aircraft using the adjacent gates;
- Time of day: pushback operations generally require more time during peak hours due to possible ramp congestion; and,
- Pushback distance: the pushback time increases with the distance the aircraft needs to be pushed back and/or towed before the aircraft engines can be turned on.

6.3.2 Aircraft Engine Start Positions

Due to proximity to the terminal building and very limited apron space, all aircraft departing from LGA are required to be pushed-back and/or towed to one of the engine-start (ES) positions marked on the airfield (see **Figure 6-7, *Engine Start Positions***), before the engines can be turned on. Using the ES positions on active taxiways (A, M, etc.) can lead to taxiway congestion and airfield gridlock issues. As a result, the use of the ES positions on active taxiways is generally avoided. Several adjacent ES positions at LGA are inter-dependent. This further complicates pushback operations at LGA. All these pushback operations rules, restrictions and ES positions have been incorporated in the LGA baseline models.

Figure 6-7: Engine Start Positions



Sources: Port Authority of New York and New Jersey, Landrum & Brown analysis.

7. TAAM MODEL CALIBRATION

7.1 PERFORMANCE METRICS DEFINITIONS

The key parameters used to measure the performance of an airport system are as follows:

- ***Peak Hour Throughput:*** This is a measure of the practical capacity of an airport system during periods of constant demand. Throughput is reported for each 60-minute interval in a 24-hour period for a given operating scenarios.
- ***Unimpeded Departure Taxiing Time:*** This is the time required for a departing aircraft to reach the departure runway after it begins to taxi from its departure gate and taxies at the default taxiing speed without any interruption. This does not include the time required for aircraft pushback and to detach the tug.
- ***Unimpeded Arrival Taxiing Time:*** This is the time required for an arriving aircraft to reach the arrival gate after it exits the arrival runway and taxies at the default taxiing speed without any interruption.
- ***Average Departure Queuing Delay:*** This is the average delay incurred by a departing aircraft due to excess time spent while waiting in the runway line-up queue for its turn to take-off.
- ***Average Arrival Sequencing Delay:*** This is the average delay incurred by an arriving aircraft because the aircraft had to hold or adjust its speed in order to maintain safe separations from other arriving aircraft.
- ***Average Taxiing Delay:*** This is the average delay incurred by an aircraft while taxiing. The delay reported in this metric is incurred due to aircraft taxiing at lower-than-default speeds or stopping-and-starting on the taxiways due to the presence of other aircraft in the vicinity.
- ***Average Gate Delay:*** Average gate delay includes delays incurred due to gates being unavailable and/or due to impediments that delay timely pushback from gates.
- ***Average Overall Taxiing Time:*** Average overall taxiing time is the combination of average unimpeded taxiing time and average taxiing delay.
- ***Average Overall Delay:*** Average overall delay includes all delays incurred by an aircraft during each phase of flight. These delays include excess travel times associated with the presence of other aircraft in the simulations. Delays included in this metric were incurred because aircraft had to wait on the gate or taxiway, had to hold, adjust their speed, or adjust the distance they flew in order to maintain safe separations from other aircraft in the simulation. These delays do not include pre-departure delay, airline scheduling delay, en-route arrival delays incurred due to bad weather, inefficient gate allocation strategies, etc.

7.2 TAAM MODEL DEVELOPMENT AND CALIBRATION

This section provides a summary of the TAAM simulation results. It includes a discussion of the calibration of the model followed by a presentation of the results for the various runway operating configurations at LGA.

7.2.1 Methodology

The TAAM model development and calibration process involved the following important steps:

- Meetings with LGA Staff to collect relevant operations data on October 6, 2010 and October 20, 2010. Attendees included Tom Bosco, Warren Kroeppel, Roy Caspe, Lisa Board, April Gasparri, Jack Martini, Terry Kiter, Doug Stearns, Michael Moran, Joe Soave, Kent Turner, Hui Xu, Bruce Hu and Ani Kane.
- Visit to the LGA Air Traffic Control Tower and discussions with LGA ATCT staff on 10/20/2010, 11/23/2010, and 2/8/2011. Attendees included Leon Prusak (ATCT), Bill Neuendorf (ATCT), Matt Lee (L&B), Hui Xu (PA) and Ani Kane (PA). The visits to the tower were supplemented by another visit on November 23, 2010 to collect additional data for the development of the TAAM model.
- Visit to Delta Airlines' Ramp Tower and discussions with Ramp Tower staff on November 23, 2010. Attendees included Hui Xu (PA) and Ani Kane (PA).
- Visit to New York TRACON and discussions with NY TRACON staff on September 2, 2010. Attendees included Ralph Tamburro (NY TRACON), Kiran Merchant (PA), Peter Bellini (PA), Hui Xu (PA) and Ani Kane (PA).
- Meeting with LGA ATCT and LGA Staff to review updated LGA baseline models on March 12, 2012. Attendees included Ed McKenna (ATCT), Bill Neuendorf (ATCT), Laura Stensland (ATCT), Andy Chiurazzi, Doug Stearns, Kiran Merchant, Michael Moran, Bruce Hu, Michael Gernant, Hui Xu and Ani Kane.
- Detailed statistical analysis.

7.2.2 TAAM Calibration

An initial step in the simulation process is to develop inputs to the TAAM simulation models for each runway operating configuration. Simulation assumptions were based upon various data that were collected and analyzed in order to better understand the current operational procedures at LGA. The data collected were presented in detail in previous sections and include:

- Historical weather conditions
- Airspace geometry and routings
- Aircraft speed at takeoff and final approach
- Aircraft wake turbulence separation rules
- Runway usage rules and procedures
    - Aircraft to runway assignment rules
    - Departure queue balancing techniques
    - Arrival rate balancing techniques
    - Runway crossing procedures
    - Runway coordination/dependencies
    - Landing and take-off roll (runway occupancy)
    - Runway exit utilization

- Aircraft taxi procedures including taxi routing, taxi speed limit, and aircraft safe taxi distance
- Gate definitions and usage procedures
  - Aircraft stand dimensions and characteristics
  - Airline gate allocation plans
  - Aircraft push-back procedures
  - Time required between stand uses
  - Long-term parking positions
  - Aircraft holding bays

The Port Authority of New York and New Jersey, the airlines, and FAA ATCT were very cooperative in providing the data required for this analysis. Various Port Authority and FAA databases were used such as the Port Authority AirScene and eCater databases, FAA Aviation System Performance Metrics (ASPM), and FAA Air Traffic Activity Data System (ATADS).

The air traffic demand used as input in computer simulation analyses normally consists of a schedule of arrivals and departures for a 24-hour period. These flight schedules represent activity for a "design day" (planning level) of a given annual level of aircraft operations. A daily profile of aircraft activity is a key input to the simulation models because performance can be directly affected by the characteristics of aircraft demand. For this analysis, the August 2012 design day schedule presented in Section 2 was used. All commercial passenger flights in the design day schedule were gated in each of the four terminals using GMS and inputs from airlines and Port Authority staff (see section 6.2). Arrivals and departures were assigned to an arrival or departure fix based on their origin/destination airport. Data from the Port Authority AirScene database was used to determine what fix is currently used for each airport served to/from LGA.

The calibration process was conducted for the following runway flow configurations:

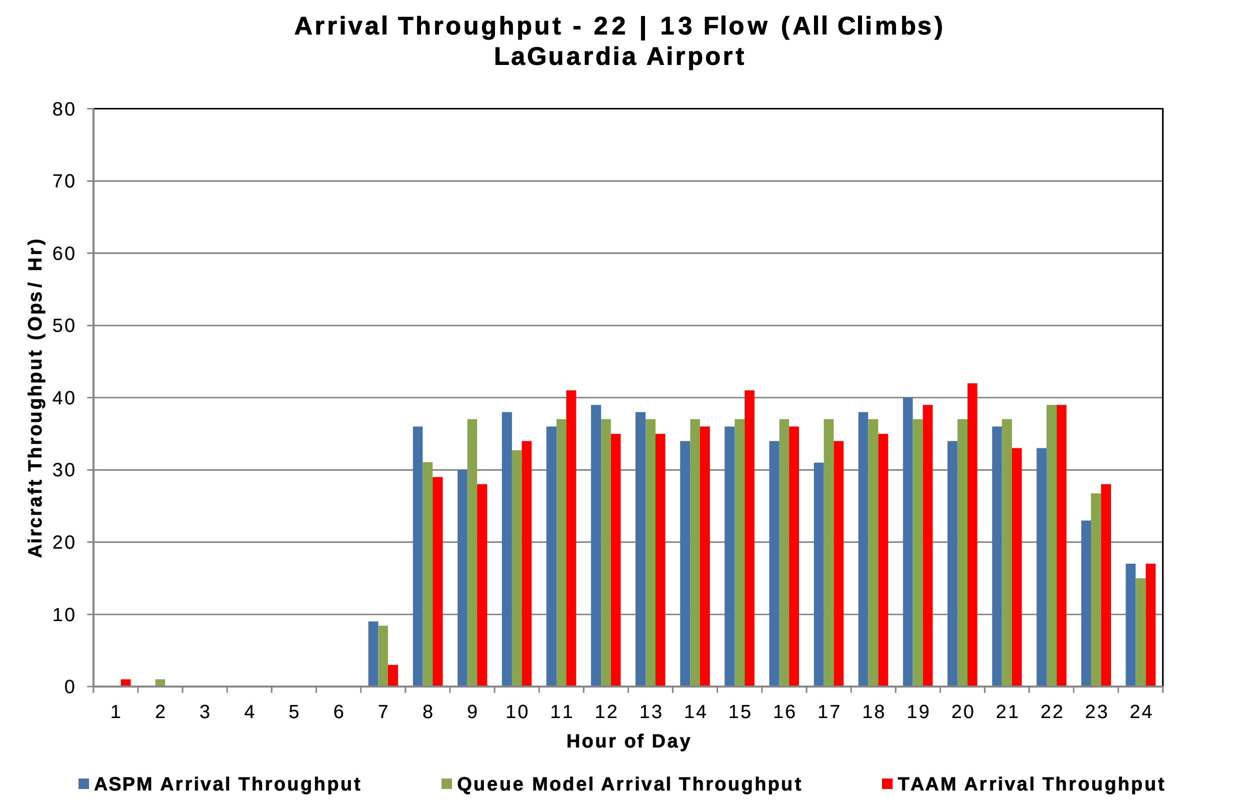
- 22/13 Configuration - All Climbs
- 22/13 Configuration - All Whitestone Climbs
- 31/4 Configuration
- 4/13 Configuration
- 22/31 Configuration

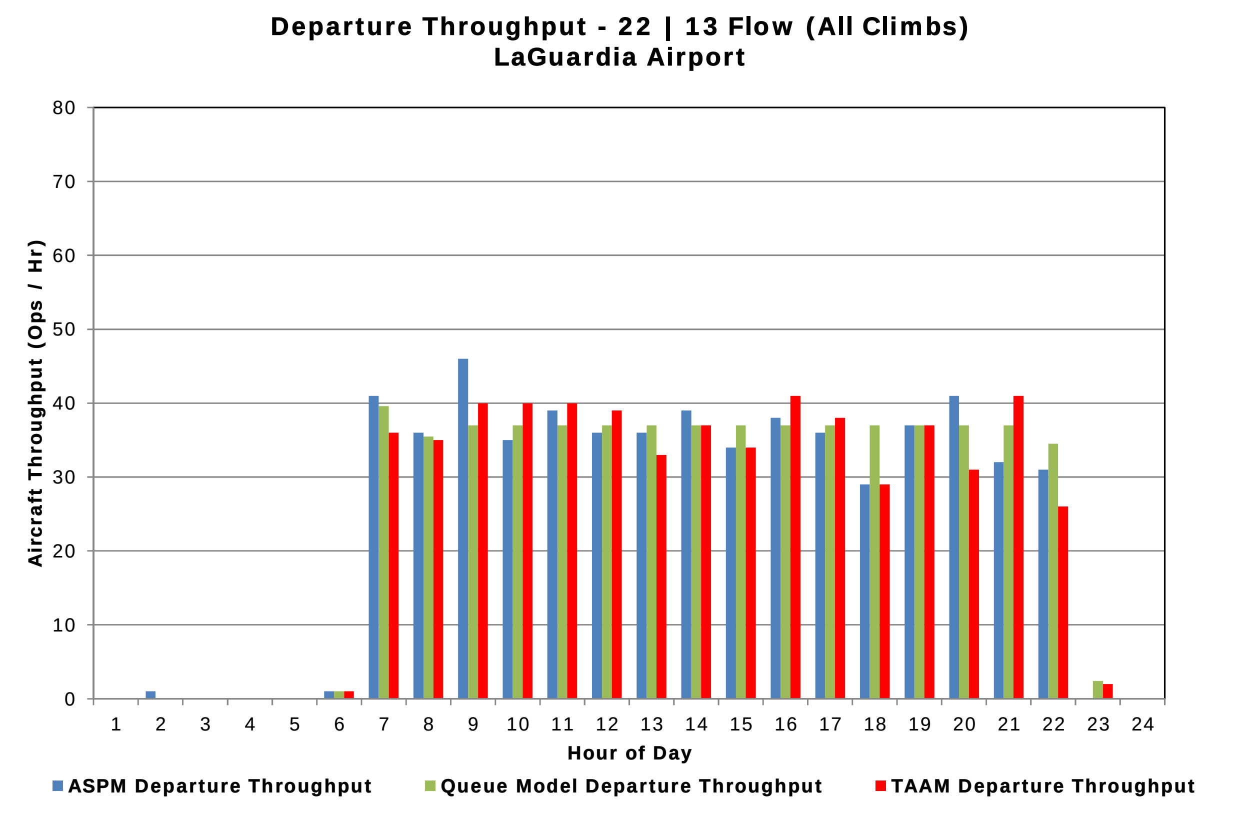
The existing airside runway flows LGA were first evaluated using queue models based on the data about runway operating flows and weather conditions presented previous sections. Queue models that relate throughput rates to aircraft runway delays were developed for each of the runway flow and weather condition scenarios identified. The queue models were calibrated against FAA ASPM data to ensure that they can produce throughput and delay values that reflect existing airport conditions. The calibration processes resulted in some minor differences between modeled and observed throughput rates and delays. Once calibrated, the queue models along with FAA ASPM data were used to calibrate the TAAM model for LGA.

The detailed results of the calibration for the flows modeled at LGA are provided in **Figure 7-1, *LGA TAAM Calibration – 22/13 All Climbs***, **Figure 7-2, *LGA TAAM Calibration – 22/13 All Whitestone Climbs***, **Figure 7-3, *LGA TAAM***

Calibration – 31/4 Configuration, **Figure 7-4,** ***LGA TAAM Calibration – 4/13 Configuration***, and **Figure 7-5,** ***LGA TAAM Calibration – 22/31 Configuration***.

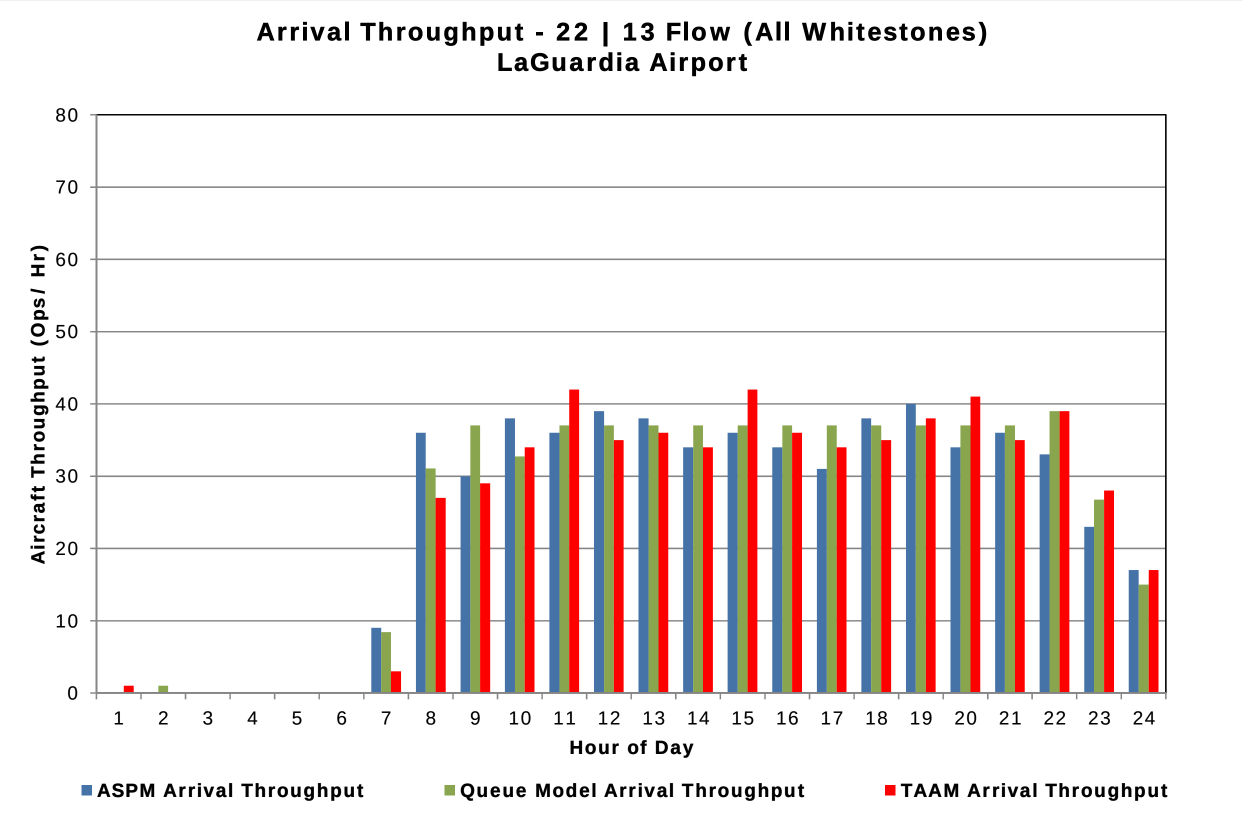
Figure 7-1: LGA TAAM Calibration – 22/13 All Climbs

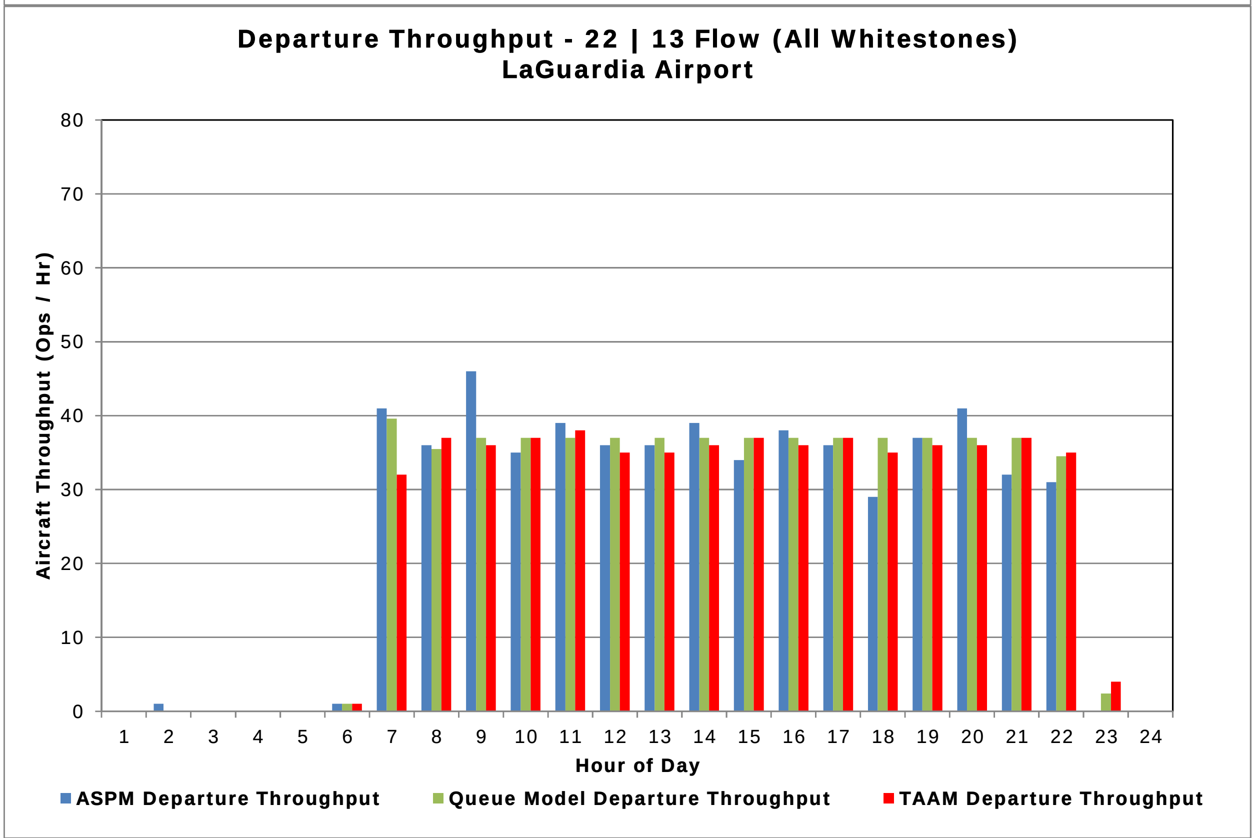




Source: Landrum & Brown analysis.

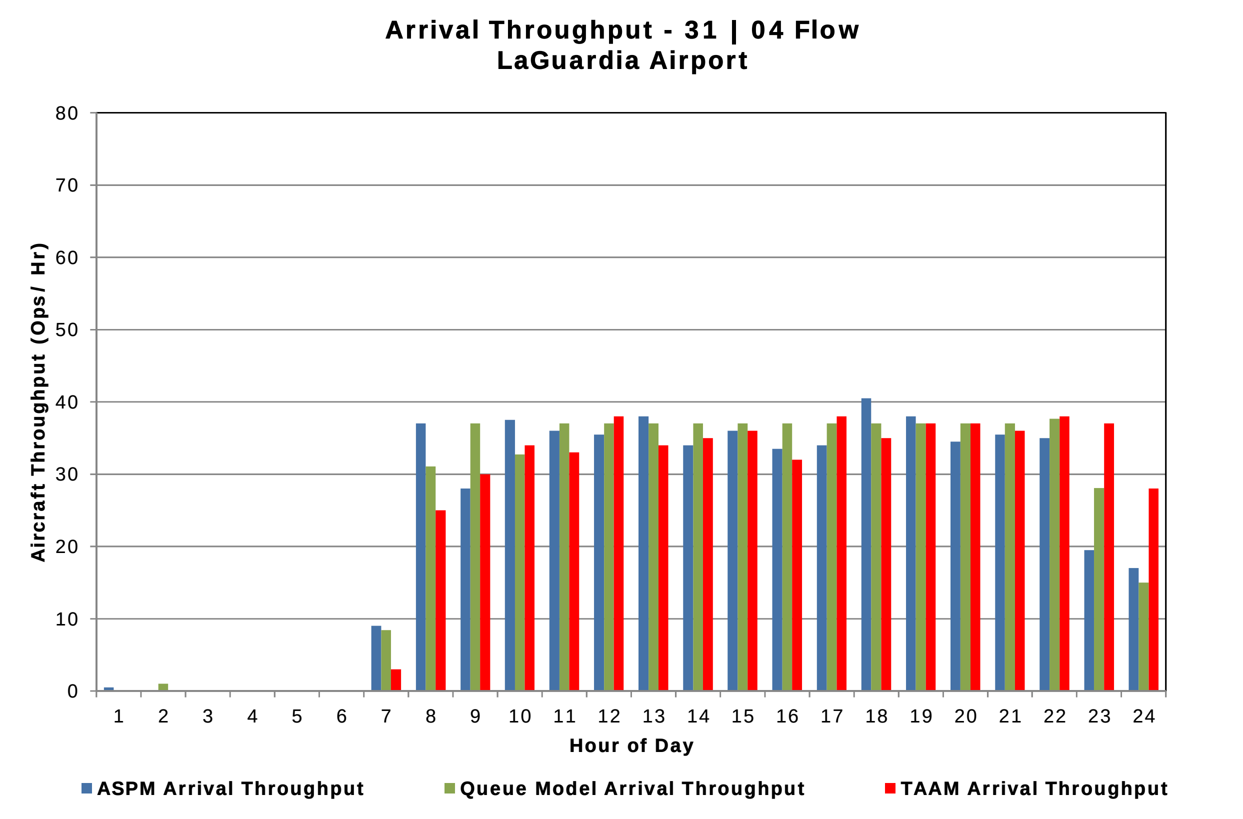
Figure 7-2: LGA TAAM Calibration – 22/13 All Whitestone Climbs

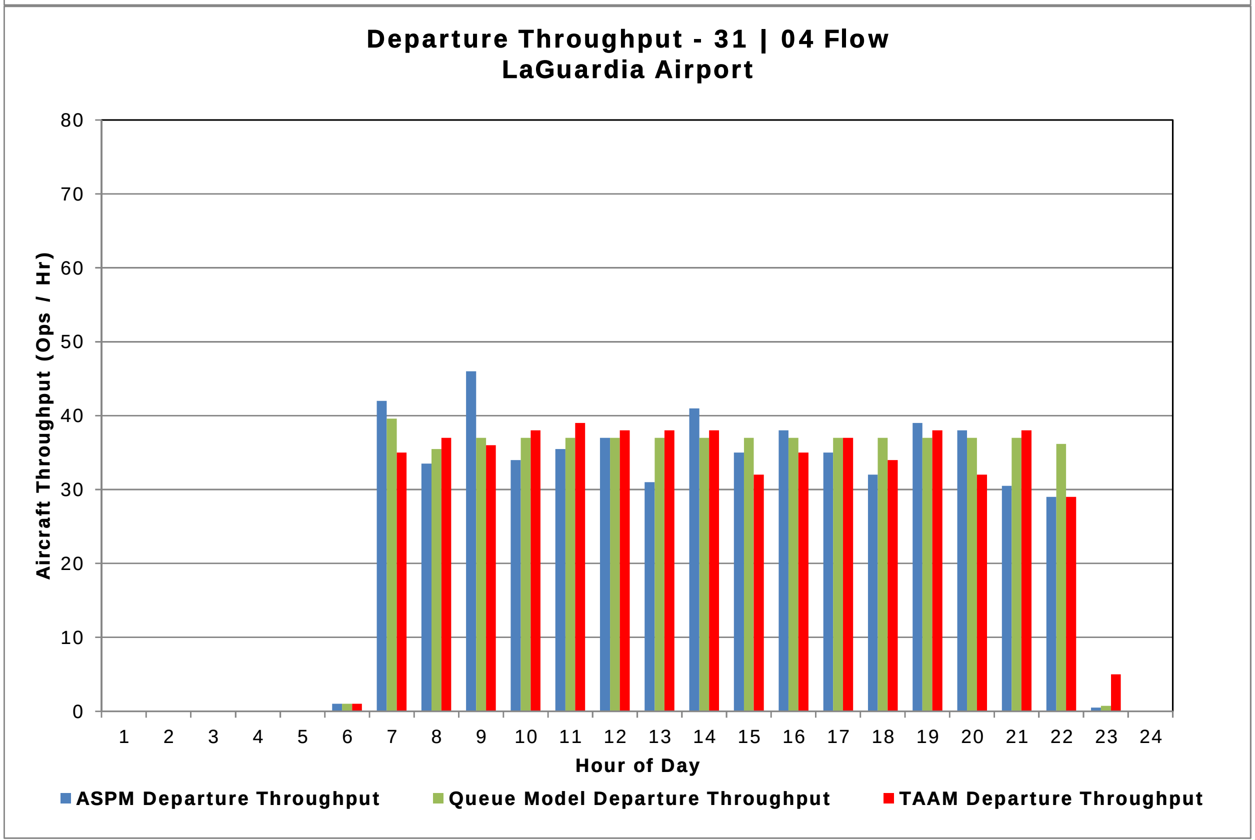




Source: Landrum & Brown analysis.

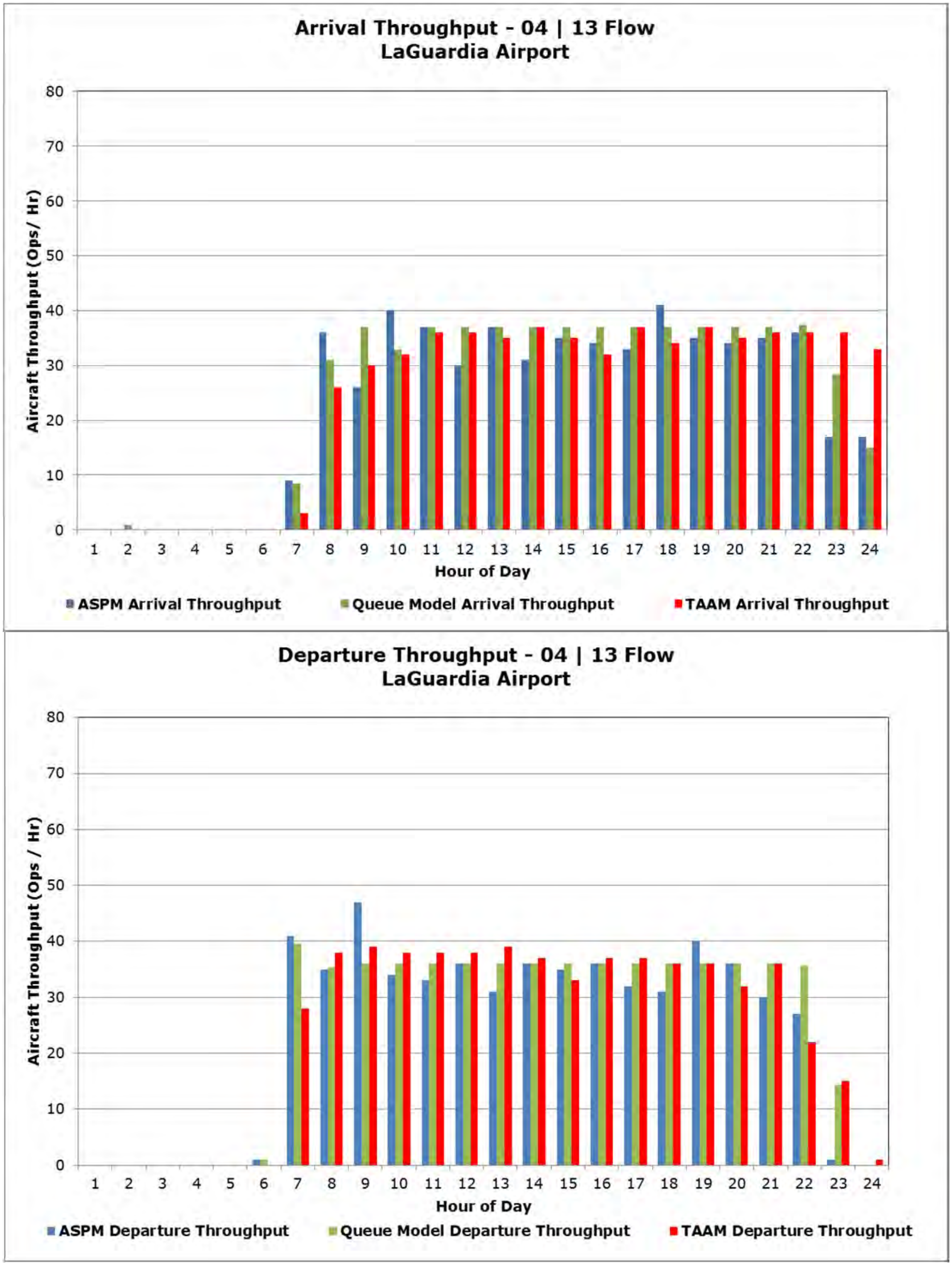
Figure 7-3: LGA TAAM Calibration – 31/4 Configuration





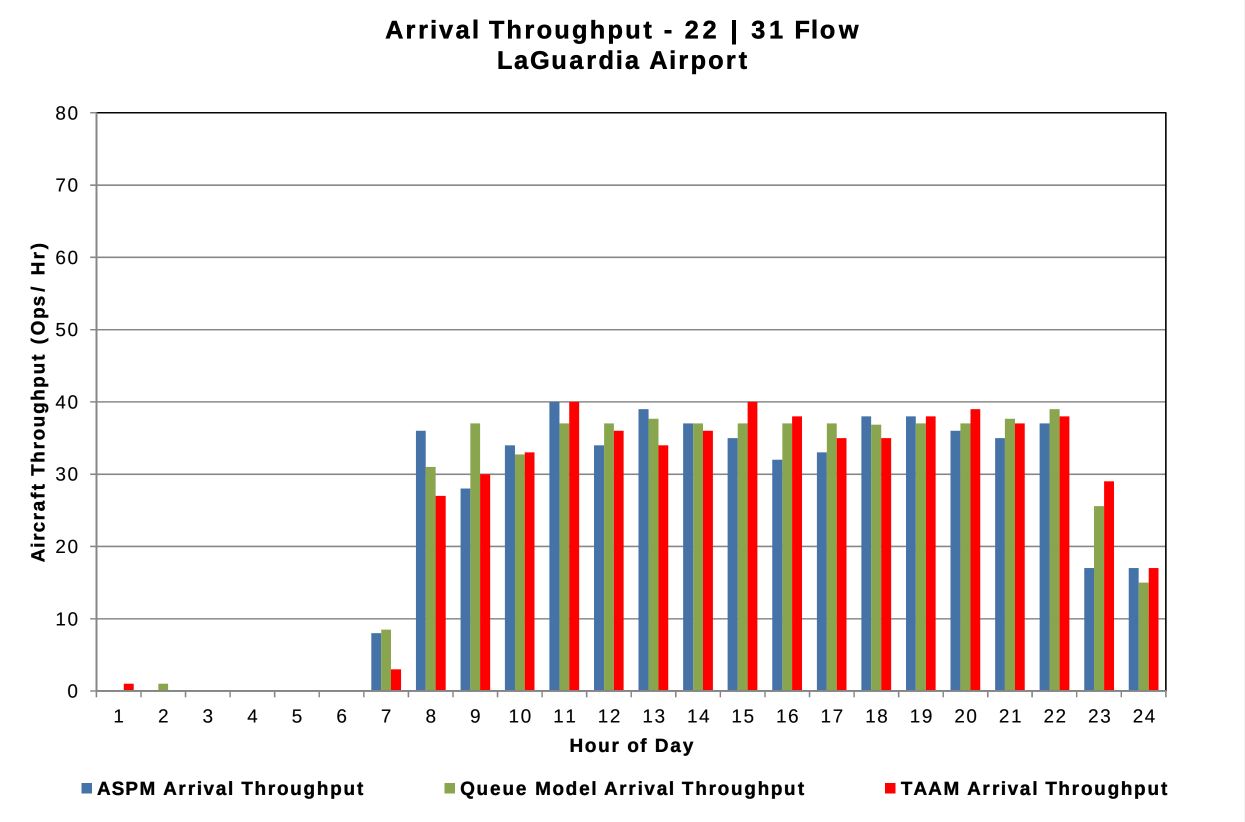
Source: Landrum & Brown analysis.

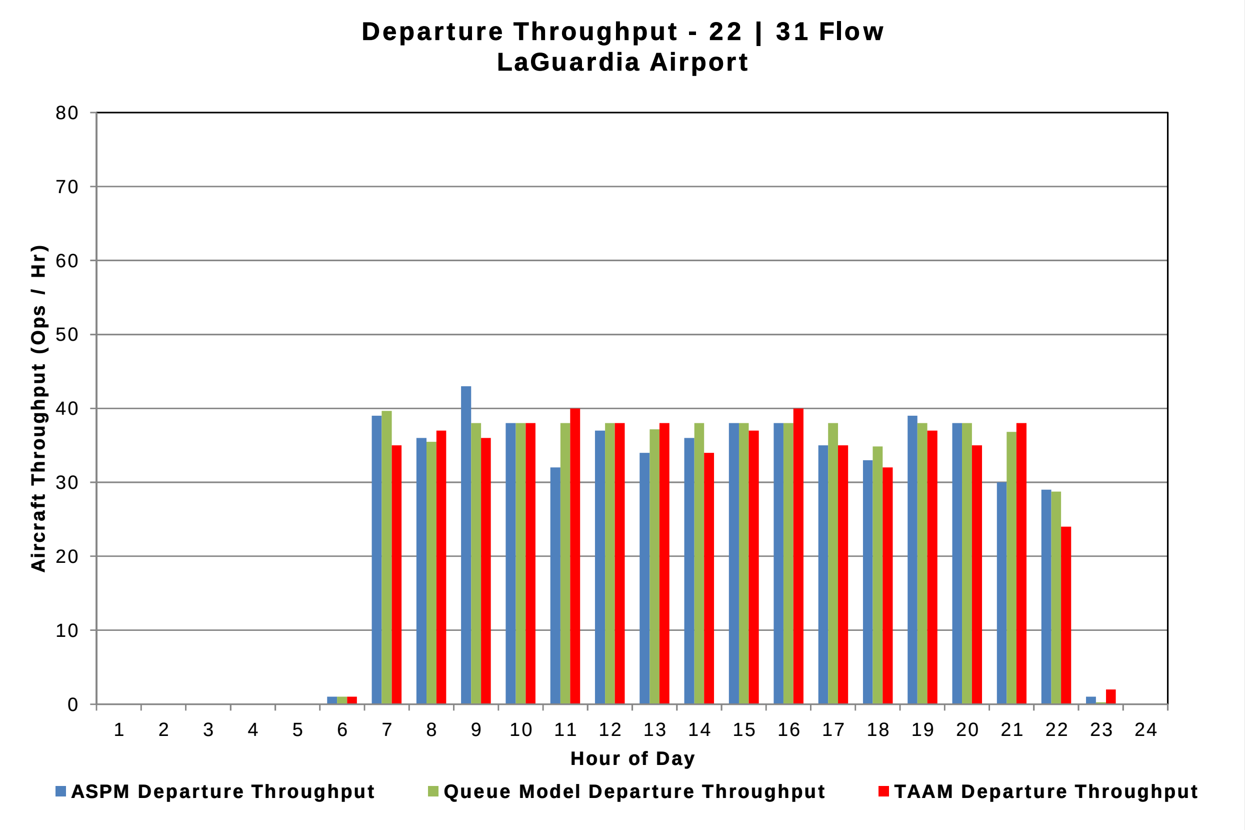
Figure 7-4: LGA TAAM Calibration – 4/13 Configuration



Source: Landrum & Brown analysis

Figure 7-5: LGA TAAM Calibration – 22 / 31 Configuration

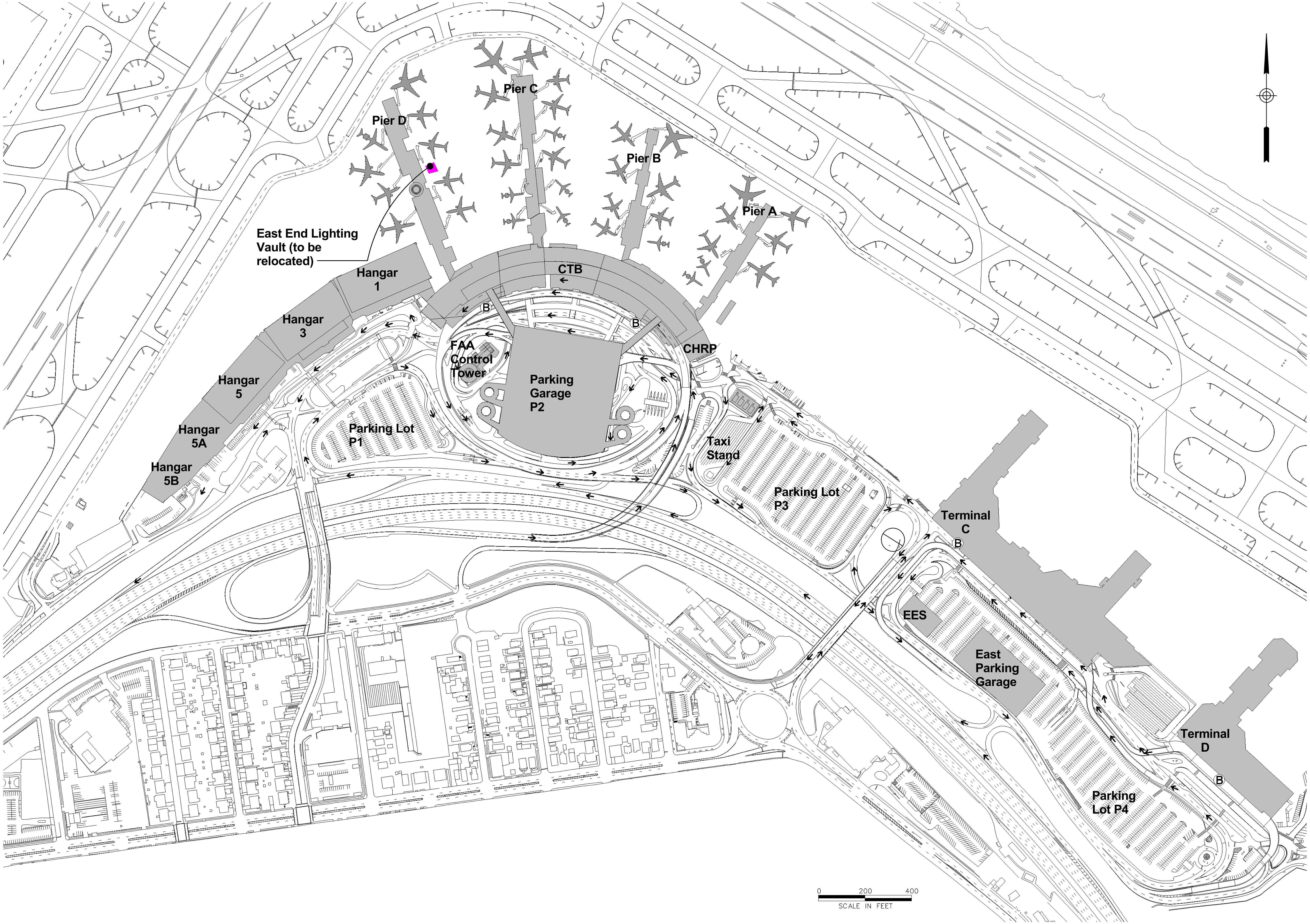




Source: Landrum & Brown analysis.

Attachment 3

LGA CTB Phasing Plan 2016-2022



THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

- EXISTING
- DEMO BUILDING
- DEMO APRON/ROAD
- TEMPORARY LABOR/ TOOL CAMPS/ROADS
- COMPLETE BUILDING
- COMPLETE APRON/ROAD GROUND
- COMPLETE ROAD STRUCTURE
- UNDER CONSTRUCTION BUILDING
- UNDER CONSTRUCTION APRON/ROAD
- PRIMARY SECURITY LINE AIRSIDE FENCE
- PRIMARY SECURITY LINE LANDSIDE FENCE
- CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
- GUARD BOOTH
- TRAFFIC FLOW
- BUS STOP
- BLAST FENCE
- TUG PATH
- EXISTING PLANE
- CLOSED DURING PHASE
- ADG IV GATES
- ADG III GATES
- ADG II GATES
- E90 GATES
- G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

EXISTING CONDITIONS

Title

LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL

Designed by | Drawn by

Date 12/16/15

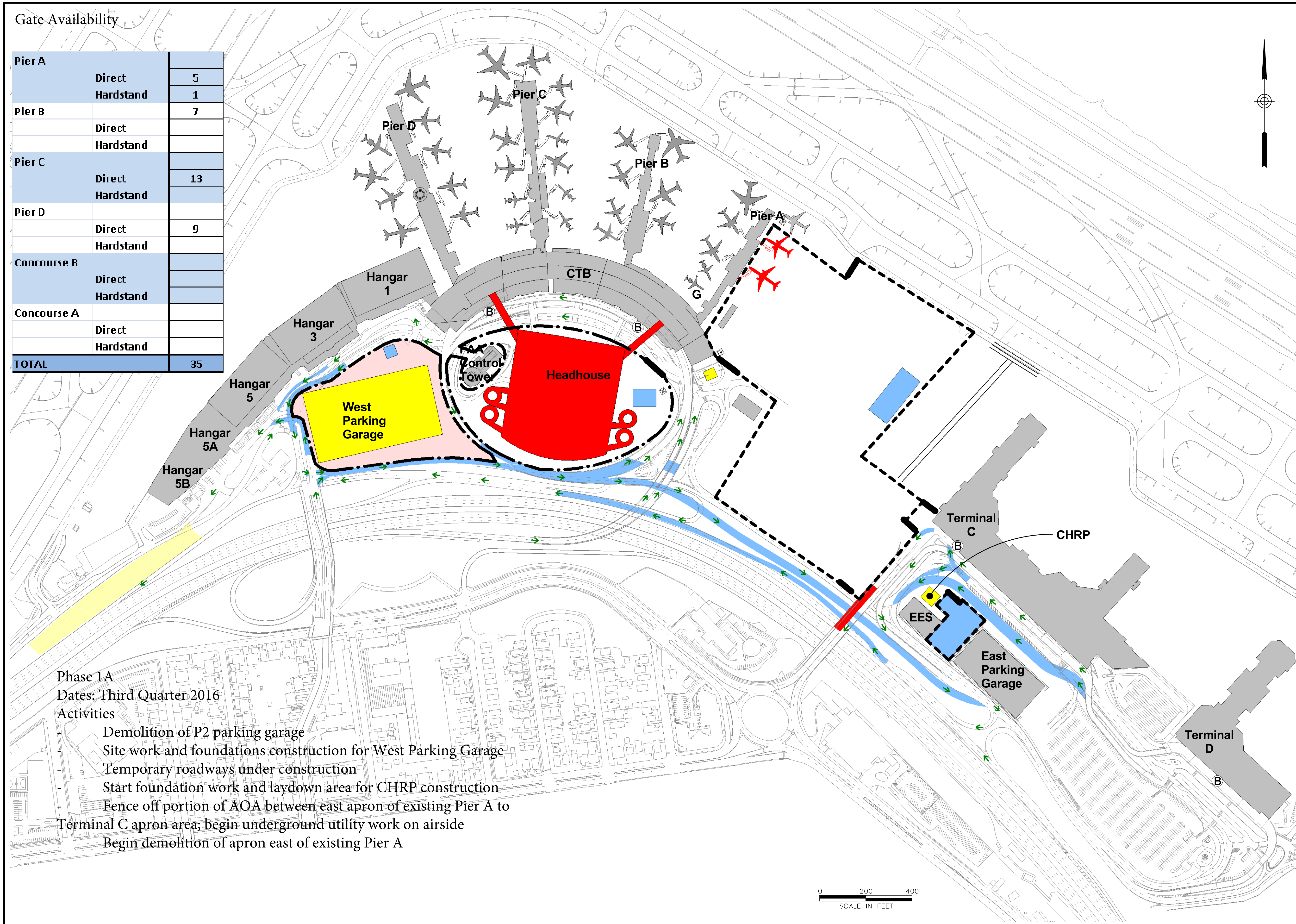
Contract Number

Drawing Number OV01

PID# 00000000

Gate Availability

Pier A		
	Direct	5
	Hardstand	1
Pier B		7
	Direct	
	Hardstand	
Pier C		
	Direct	13
	Hardstand	
Pier D		
	Direct	9
	Hardstand	
Concourse B		
	Direct	
	Hardstand	
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 1A
Dates: Third Quarter 2016
Activities
- Demolition of P2 parking garage
- Site work and foundations construction for West Parking Garage
- Temporary roadways under construction
- Start foundation work and laydown area for CHRP construction
- Fence off portion of AOA between east apron of existing Pier A to Terminal C apron area; begin underground utility work on airside
- Begin demolition of apron east of existing Pier A

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH
EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

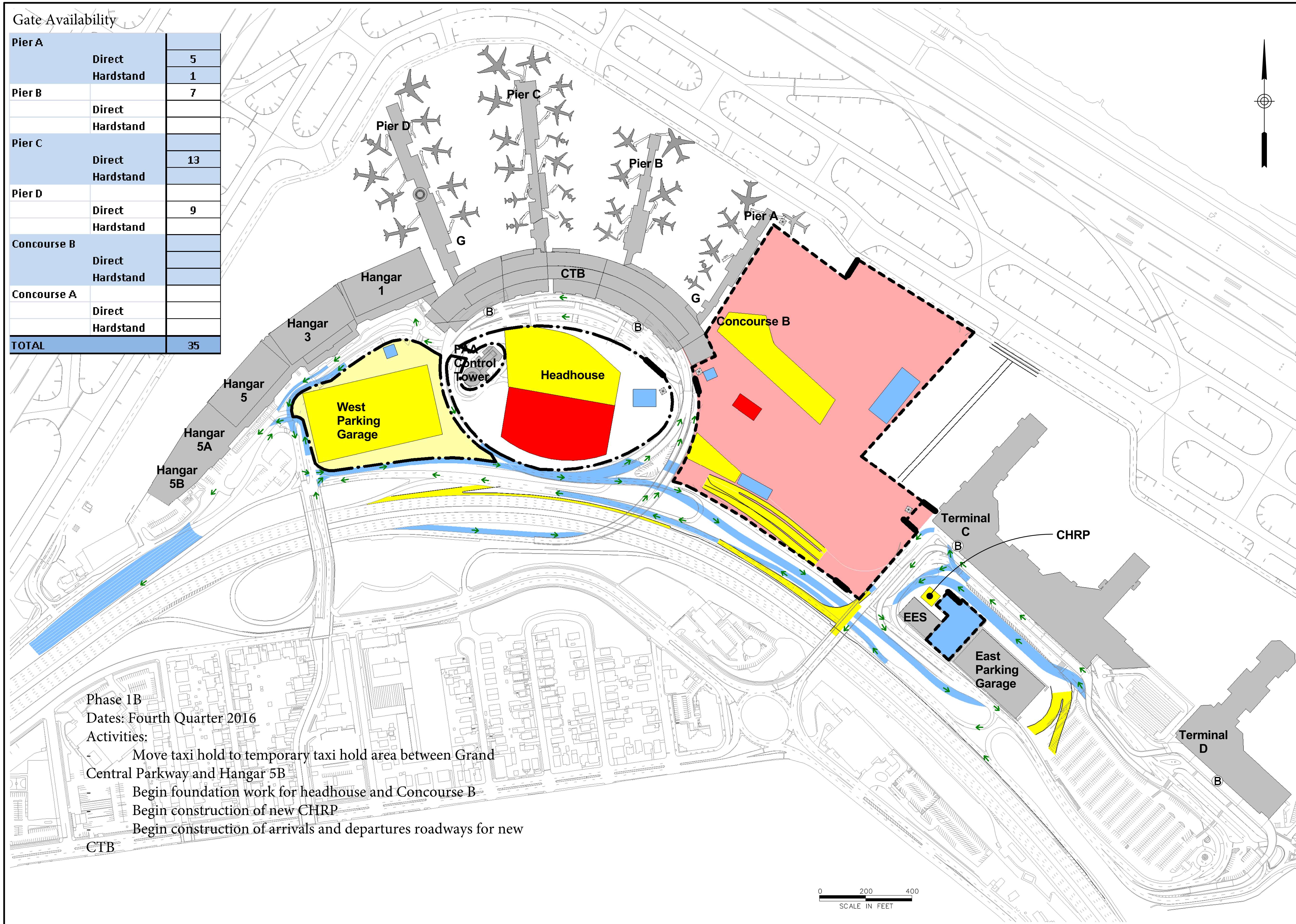
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 1A

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV02

Gate Availability

Pier A		
	Direct	5
	Hardstand	1
Pier B		7
	Direct	
	Hardstand	
Pier C		
	Direct	13
	Hardstand	
Pier D		
	Direct	9
	Hardstand	
Concourse B		
	Direct	
	Hardstand	
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 1B

Dates: Fourth Quarter 2016

Activities:

- Move taxi hold to temporary taxi hold area between Grand Central Parkway and Hangar 5B
- Begin foundation work for headhouse and Concourse B
- Begin construction of new CHRP
- Begin construction of arrivals and departures roadways for new CTB

Sheet 3 of 18

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

- EXISTING
- DEMO BUILDING
- DEMO APRON/ROAD
- TEMPORARY LABOR/ TOOL CAMPS/ROADS
- COMPLETE BUILDING
- COMPLETE APRON/ROAD GROUND
- COMPLETE ROAD STRUCTURE
- UNDER CONSTRUCTION BUILDING
- UNDER CONSTRUCTION APRON/ROAD
- PRIMARY SECURITY LINE AIRSIDE FENCE
- PRIMARY SECURITY LINE LANDSIDE FENCE
- CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
- GUARD BOOTH
- TRAFFIC FLOW
- BUS STOP
- BLAST FENCE
- TUG PATH
- EXISTING PLANE
- CLOSED DURING PHASE
- ADG IV GATES
- ADG III GATES
- ADG II GATES
- E90 GATES
- G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 1B

Designed by | Drawn by

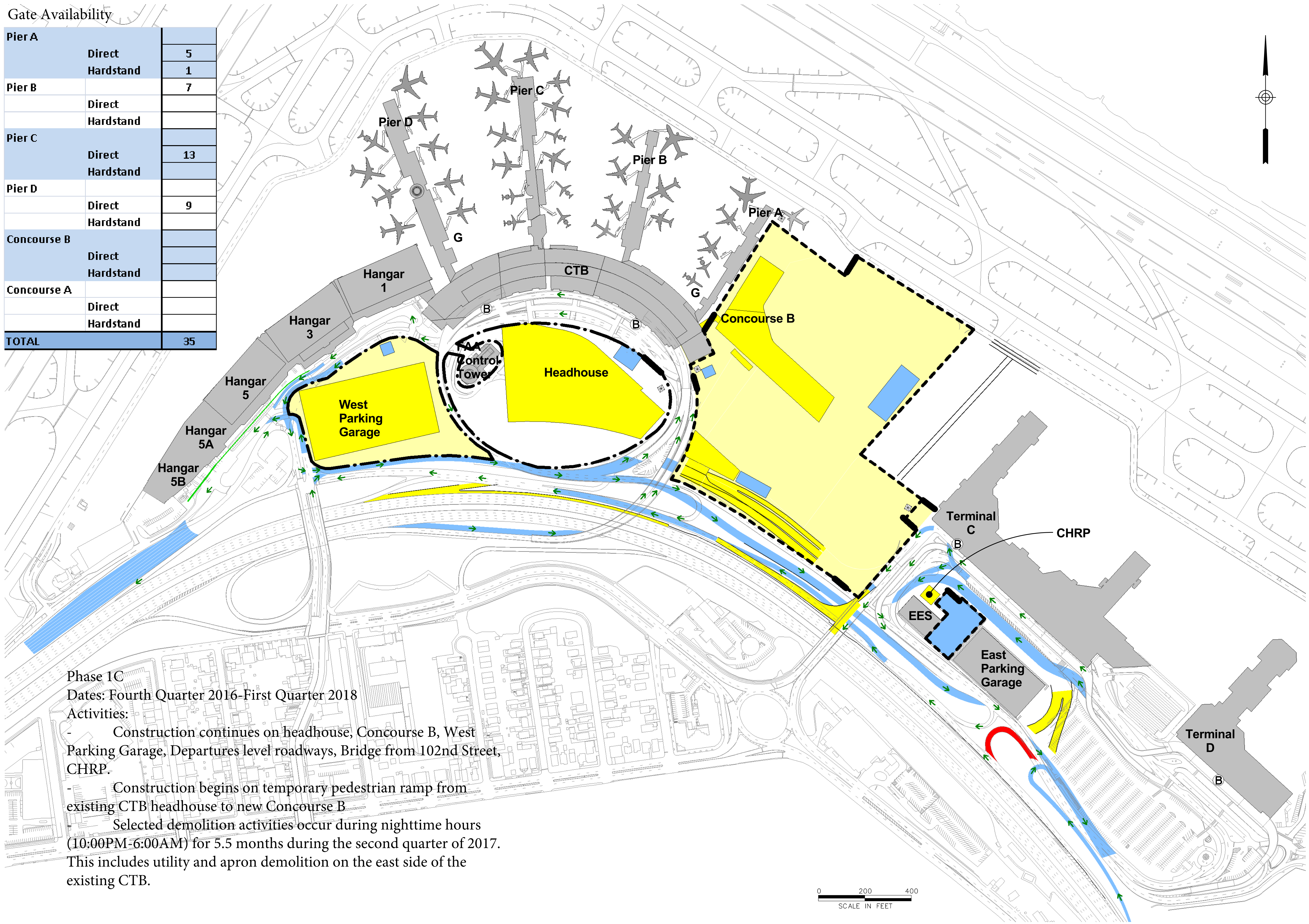
Date 12/16/15

Contract Number

Drawing Number OV03

Gate Availability

Pier A		
	Direct	5
	Hardstand	1
Pier B		7
	Direct	
	Hardstand	
Pier C		
	Direct	13
	Hardstand	
Pier D		
	Direct	9
	Hardstand	
Concourse B		
	Direct	
	Hardstand	
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 1C
Dates: Fourth Quarter 2016-First Quarter 2018
Activities:
- Construction continues on headhouse, Concourse B, West Parking Garage, Departures level roadways, Bridge from 102nd Street, CHRP.
- Construction begins on temporary pedestrian ramp from existing CTB headhouse to new Concourse B
- Selected demolition activities occur during nighttime hours (10:00PM-6:00AM) for 5.5 months during the second quarter of 2017. This includes utility and apron demolition on the east side of the existing CTB.

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH

EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

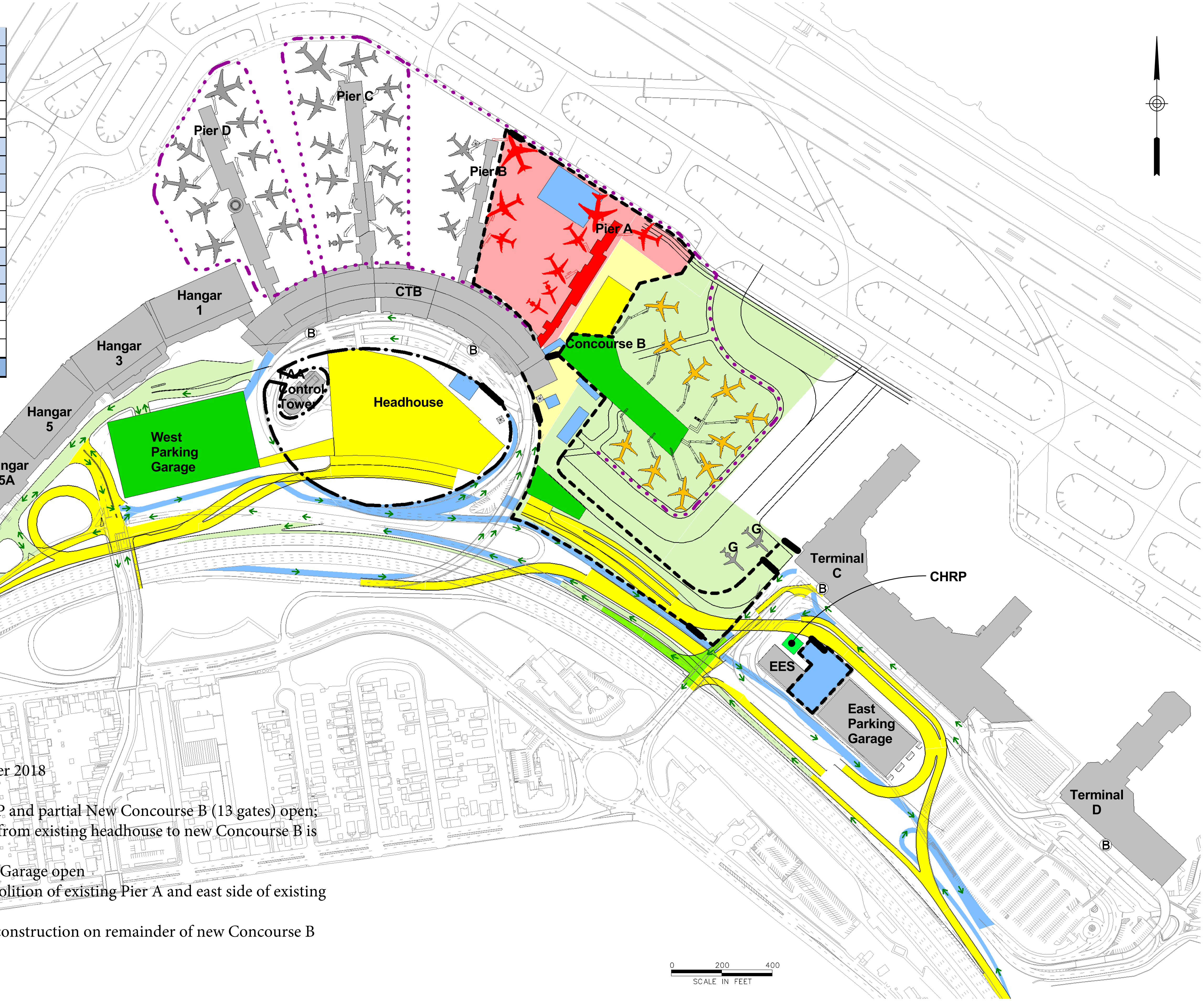
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 1C

Designed by Drawn by
Date 12/16/15
Contract Number
Drawing Number OV04
PID# 00000000

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		3
	Direct	
	Hardstand	
Pier C		
	Direct	13
	Hardstand	
Pier D		
	Direct	9
	Hardstand	
Concourse B		
	Direct	10
	Hardstand	
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 2A
Dates: First Quarter 2018
Activities:

- New CHRP and partial New Concourse B (13 gates) open; pedestrian bridge from existing headhouse to new Concourse B is open
- New West Garage open
- Begin demolition of existing Pier A and east side of existing Pier B.
- Continue construction on remainder of new Concourse B

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/ TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH

EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

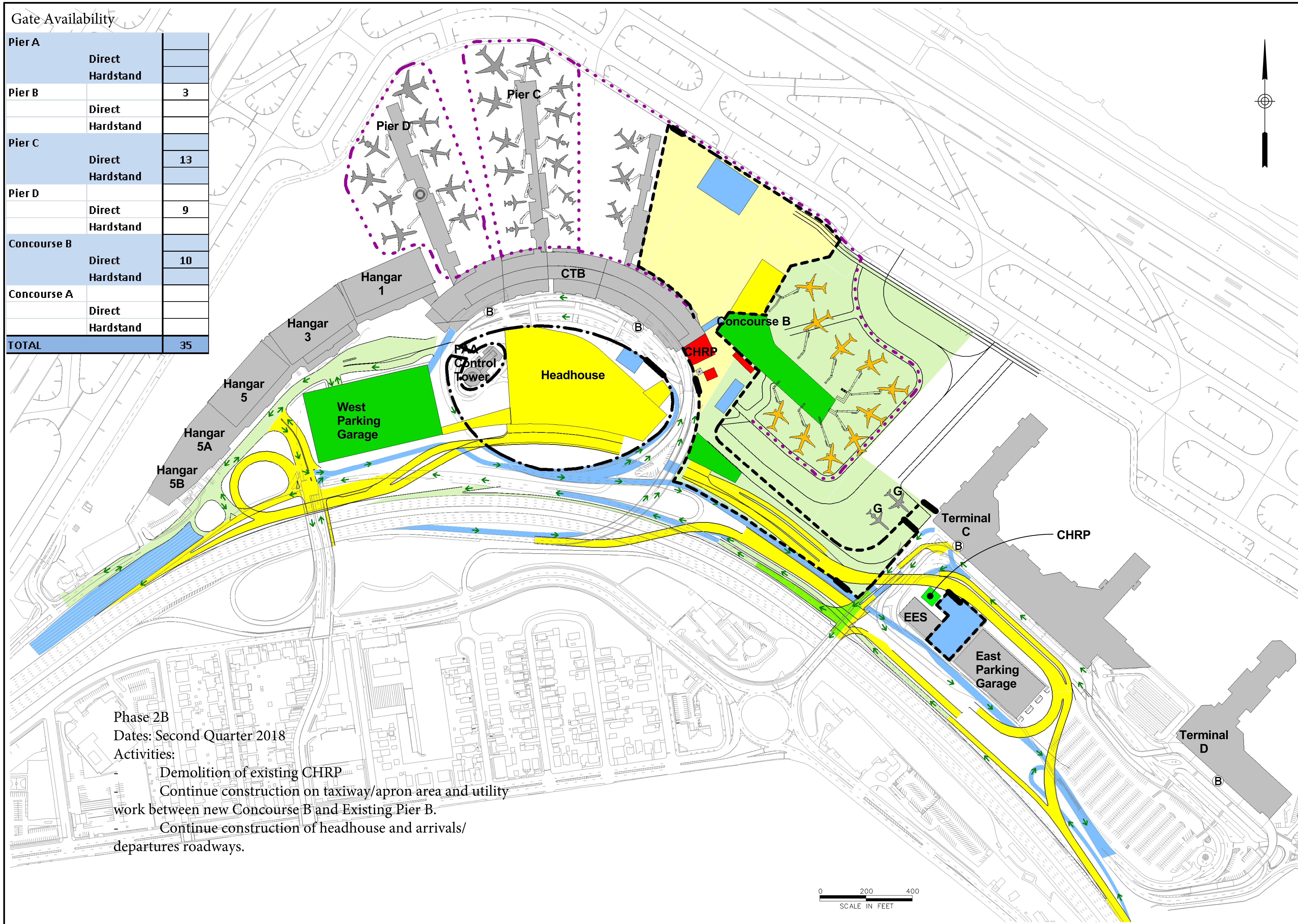
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 2A

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV05

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		3
	Direct	
	Hardstand	
Pier C		
	Direct	13
	Hardstand	
Pier D		
	Direct	9
	Hardstand	
Concourse B		
	Direct	10
	Hardstand	
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 2B
Dates: Second Quarter 2018
Activities:
- Demolition of existing CHRP
- Continue construction on taxiway/apron area and utility work between new Concourse B and Existing Pier B.
- Continue construction of headhouse and arrivals/ departures roadways.

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THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/ TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH
EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

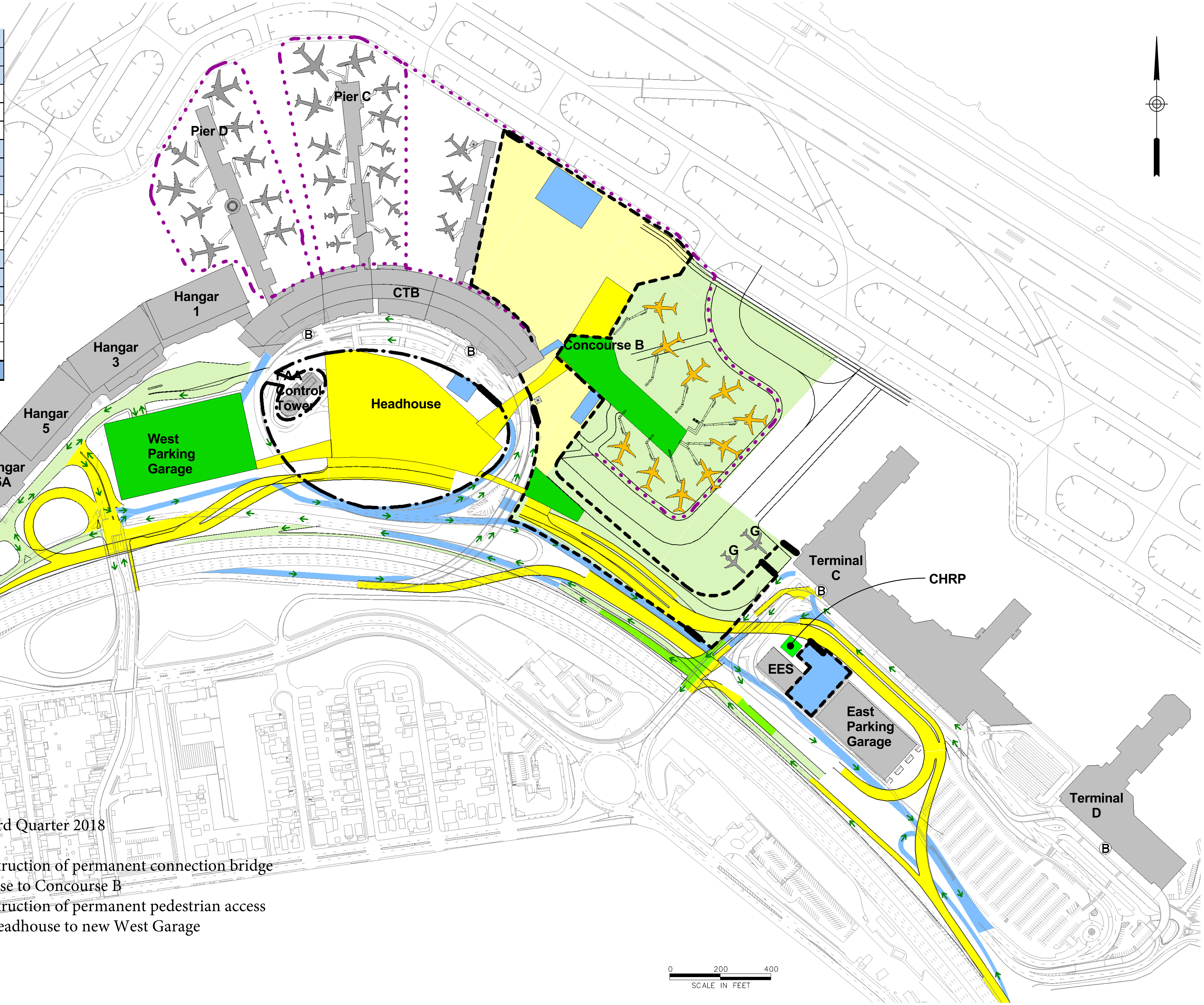
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 2B

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV06

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		3
	Direct	
	Hardstand	
Pier C		
	Direct	13
	Hardstand	
Pier D		
	Direct	9
	Hardstand	
Concourse B		
	Direct	10
	Hardstand	
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 2C
Dates: Second-Third Quarter 2018
Activities:
- Begin construction of permanent connection bridge from new headhouse to Concourse B
- Begin construction of permanent pedestrian access bridge from new headhouse to new West Garage

Sheet 7 of 18

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/ TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH
EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

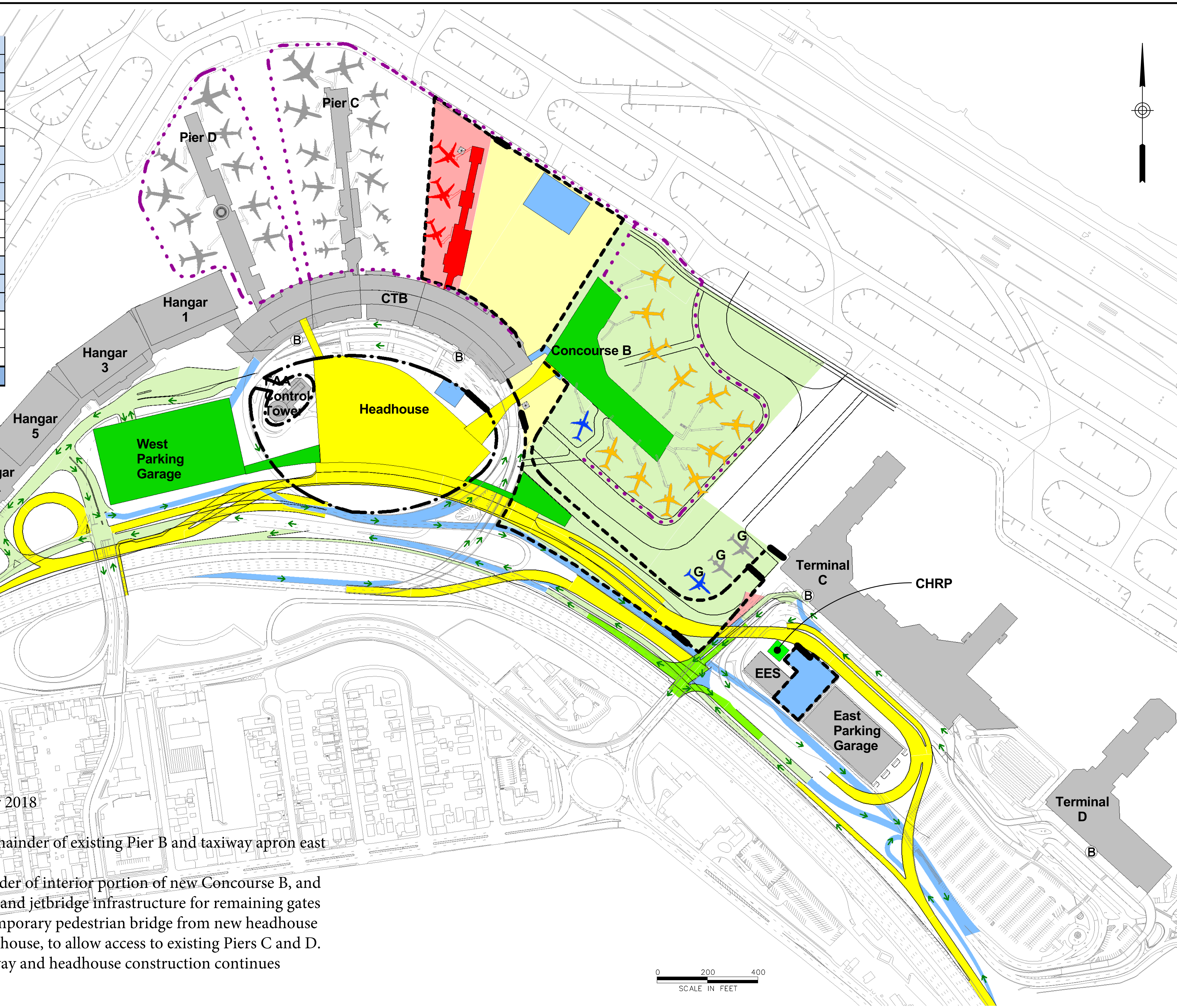
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 2C

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV07

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		
	Direct	
	Hardstand	
Pier C		
	Direct	13
	Hardstand	
Pier D		
	Direct	9
	Hardstand	
Concourse B		
	Direct	12
	Hardstand	1
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 3A
Dates: Third Quarter 2018
Activities:
- Demolish remainder of existing Pier B and taxiway apron east of Pier C.
- Open remainder of interior portion of new Concourse B, and build out apron area and jetbridge infrastructure for remaining gates
- Construct temporary pedestrian bridge from new headhouse to existing CTB headhouse, to allow access to existing Piers C and D.
- Access roadway and headhouse construction continues

Sheet 8 of 18

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/ TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH

EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

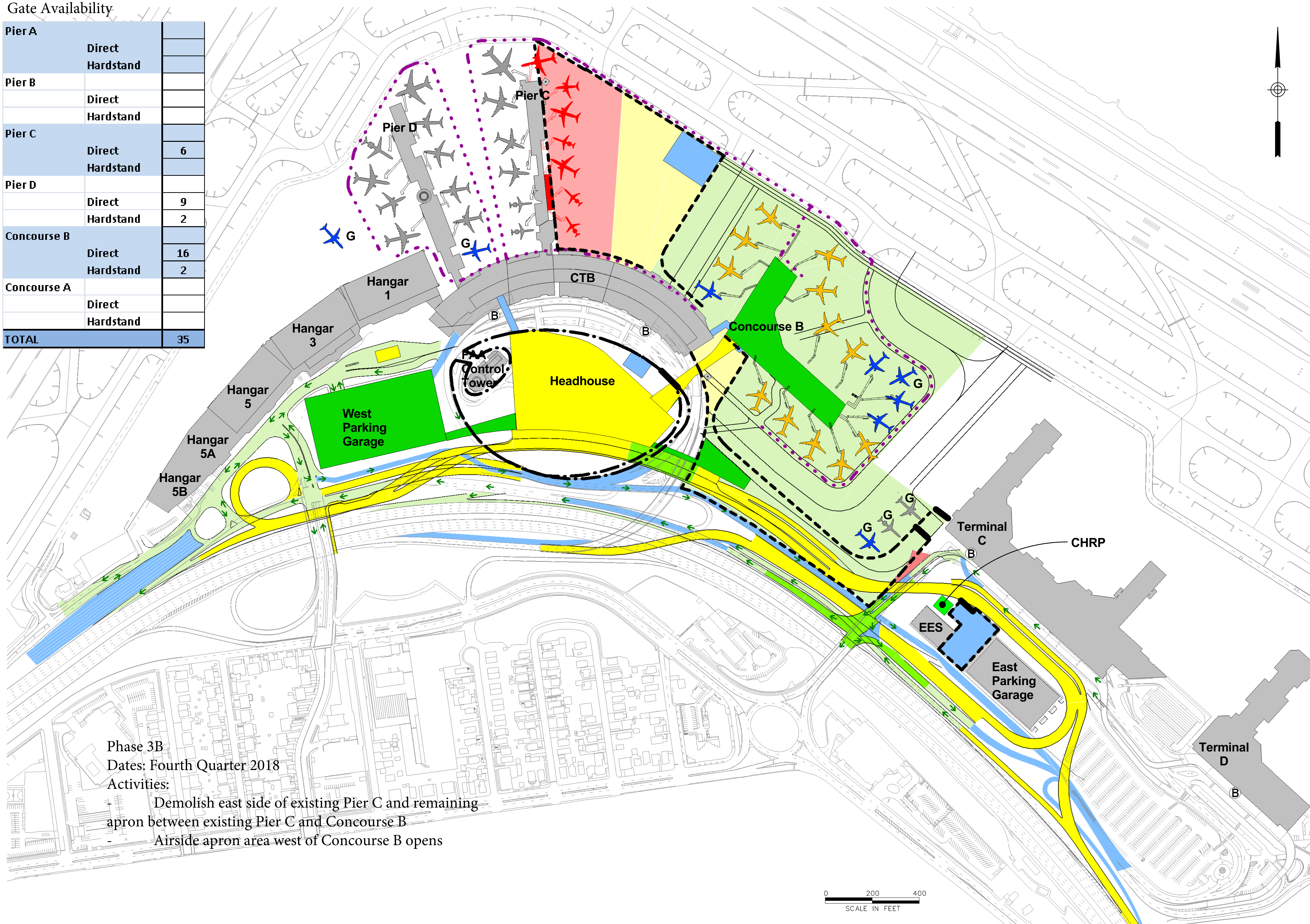
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 3A

Designed by | Drawn by
Date 12/16/15
Contract Number
Drawing Number OV08

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		
	Direct	
	Hardstand	
Pier C		
	Direct	6
	Hardstand	
Pier D		
	Direct	9
	Hardstand	2
Concourse B		
	Direct	16
	Hardstand	2
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 3B
Dates: Fourth Quarter 2018
Activities:
- Demolish east side of existing Pier C and remaining apron between existing Pier C and Concourse B
- Airside apron area west of Concourse B opens

Sheet 9 of 18

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

EXISTING	COMPLETE BUILDING
DEMO BUILDING	COMPLETE APRON/ROAD GROUND
DEMO APRON/ROAD	COMPLETE ROAD STRUCTURE
TEMPORARY LABOR/ TOOL CAMPS/ROADS	UNDER CONSTRUCTION BUILDING
	UNDER CONSTRUCTION APRON/ROAD

PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH

EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

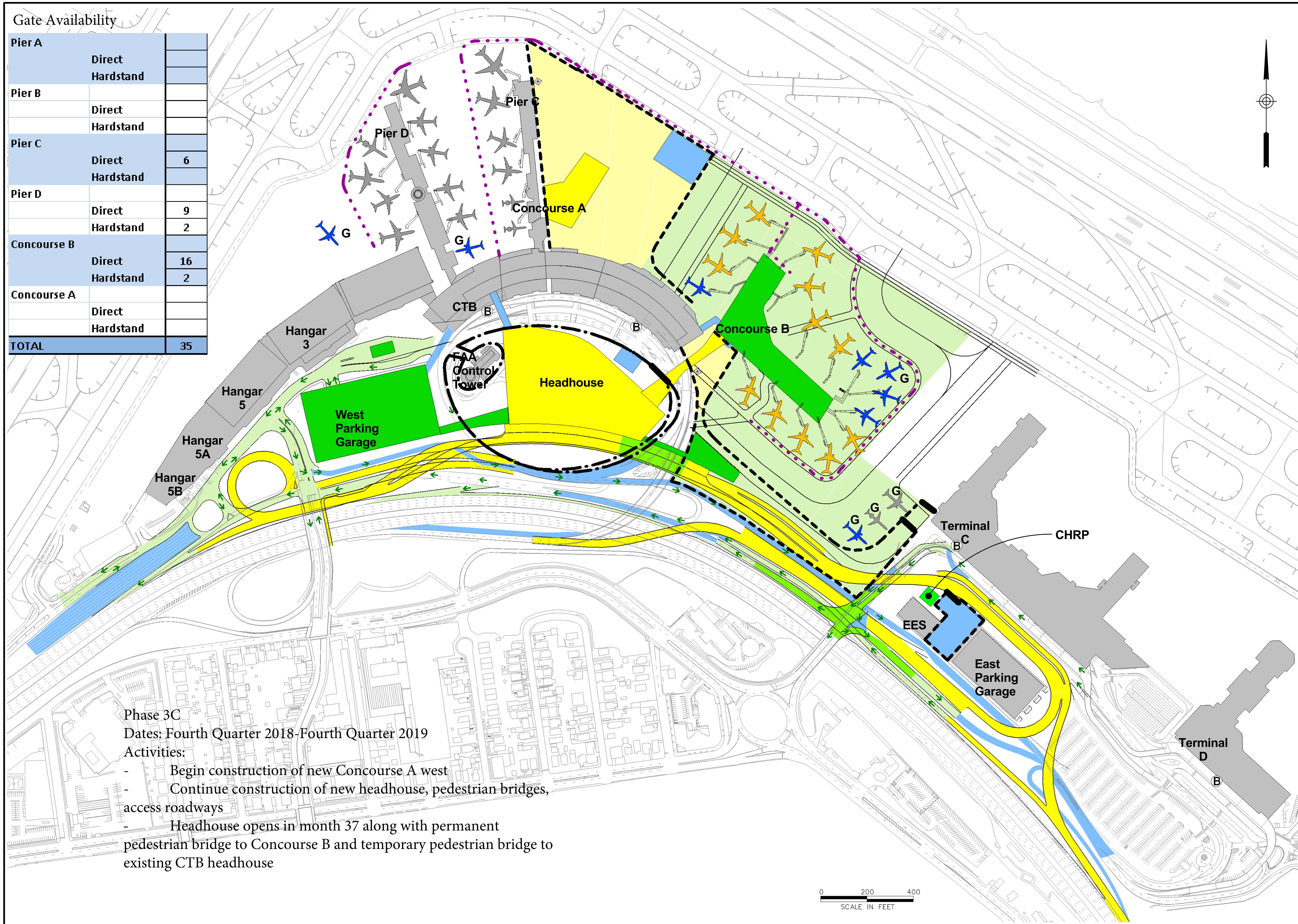
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 3B

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV09

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		
	Direct	
	Hardstand	
Pier C		
	Direct	6
	Hardstand	
Pier D		
	Direct	9
	Hardstand	2
Concourse B		
	Direct	16
	Hardstand	2
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 3C
Dates: Fourth Quarter 2018-Fourth Quarter 2019
Activities:

- Begin construction of new Concourse A west
- Continue construction of new headhouse, pedestrian bridges, access roadways
- Headhouse opens in month 37 along with permanent pedestrian bridge to Concourse B and temporary pedestrian bridge to existing CTB headhouse

Sheet 10 of 18

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

EXISTING	COMPLETE BUILDING
DEMO BUILDING	COMPLETE APRON/ROAD GROUND
DEMO APRON/ROAD	COMPLETE ROAD STRUCTURE
TEMPORARY LABOR/TOOL CAMPS/ROADS	UNDER CONSTRUCTION BUILDING
	UNDER CONSTRUCTION APRON/ROAD

PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH

EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 3C

Designed by | Drawn by

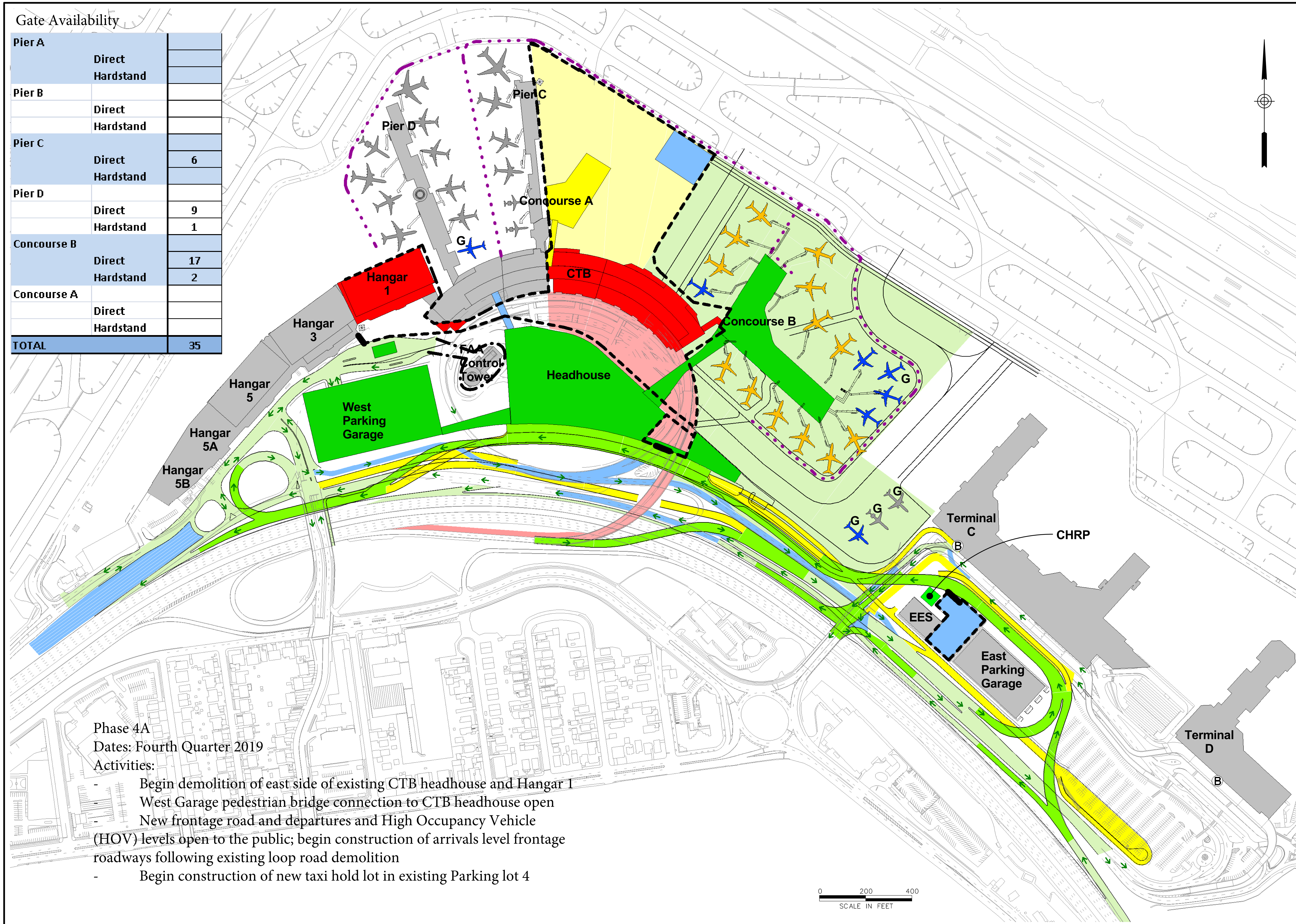
Date 11/23/2015

Contract Number

Drawing Number OV09A

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		
	Direct	
	Hardstand	
Pier C		
	Direct	6
	Hardstand	
Pier D		
	Direct	9
	Hardstand	1
Concourse B		
	Direct	17
	Hardstand	2
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 4A
Dates: Fourth Quarter 2019
Activities:

- Begin demolition of east side of existing CTB headhouse and Hangar 1
- West Garage pedestrian bridge connection to CTB headhouse open
- New frontage road and departures and High Occupancy Vehicle (HOV) levels open to the public; begin construction of arrivals level frontage roadways following existing loop road demolition
- Begin construction of new taxi hold lot in existing Parking lot 4

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

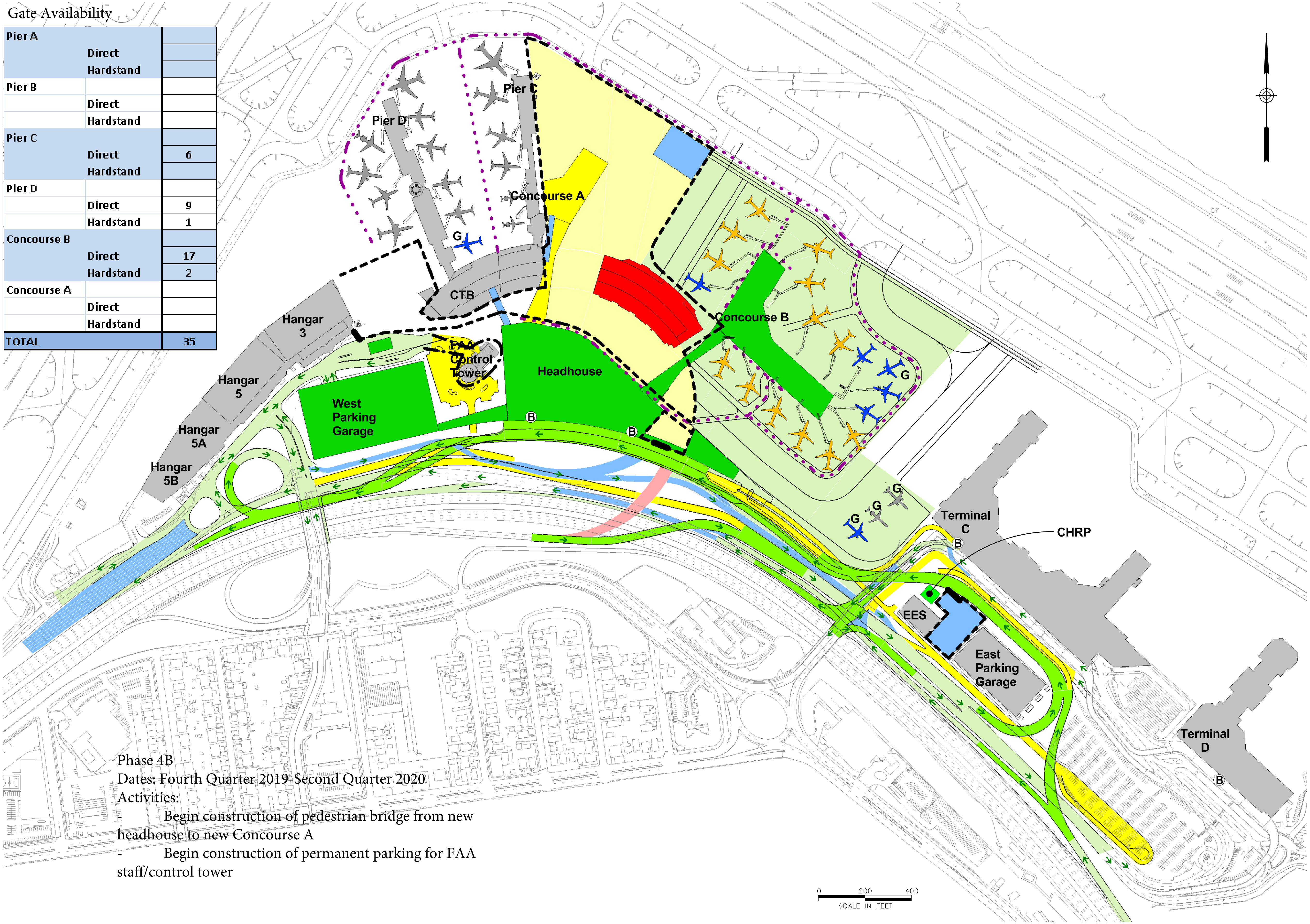
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 4A

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV10

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		
	Direct	
	Hardstand	
Pier C		
	Direct	6
	Hardstand	
Pier D		
	Direct	9
	Hardstand	1
Concourse B		
	Direct	17
	Hardstand	2
Concourse A		
	Direct	
	Hardstand	
TOTAL		35



Phase 4B
Dates: Fourth Quarter 2019-Second Quarter 2020
Activities:
- Begin construction of pedestrian bridge from new headhouse to new Concourse A
- Begin construction of permanent parking for FAA staff/control tower

Sheet 12 of 18

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH
EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

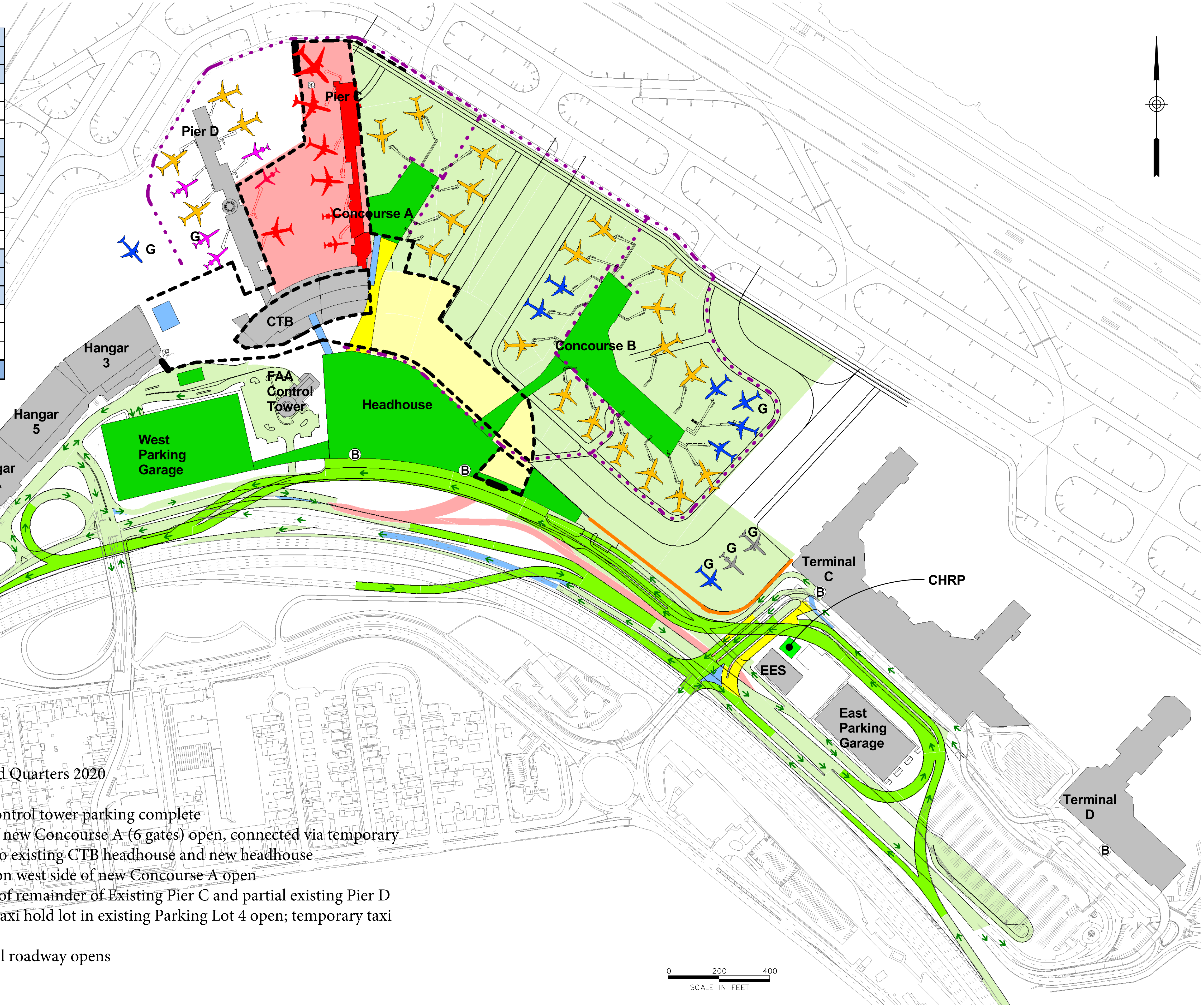
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 4B

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV11

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		
	Direct	
	Hardstand	
Pier C		
	Direct	
	Hardstand	
Pier D		
	Direct	7
	Hardstand	2
Concourse B		
	Direct	18
	Hardstand	2
Concourse A		
	Direct	6
	Hardstand	
TOTAL		35



Phase 5A
Dates: Second-Third Quarters 2020
Activities:

- FAA staff/control tower parking complete
- West side of new Concourse A (6 gates) open, connected via temporary pedestrian bridges to existing CTB headhouse and new headhouse
- Taxi apron on west side of new Concourse A open
- Demolition of remainder of Existing Pier C and partial existing Pier D
- Permanent taxi hold lot in existing Parking Lot 4 open; temporary taxi hold lot demolished
- Arrivals level roadway opens

THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

EXISTING	COMPLETE BUILDING
DEMO BUILDING	COMPLETE APRON/ROAD GROUND
DEMO APRON/ROAD	COMPLETE ROAD STRUCTURE
TEMPORARY LABOR/ TOOL CAMPS/ROADS	UNDER CONSTRUCTION BUILDING
	UNDER CONSTRUCTION APRON/ROAD

PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH

EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

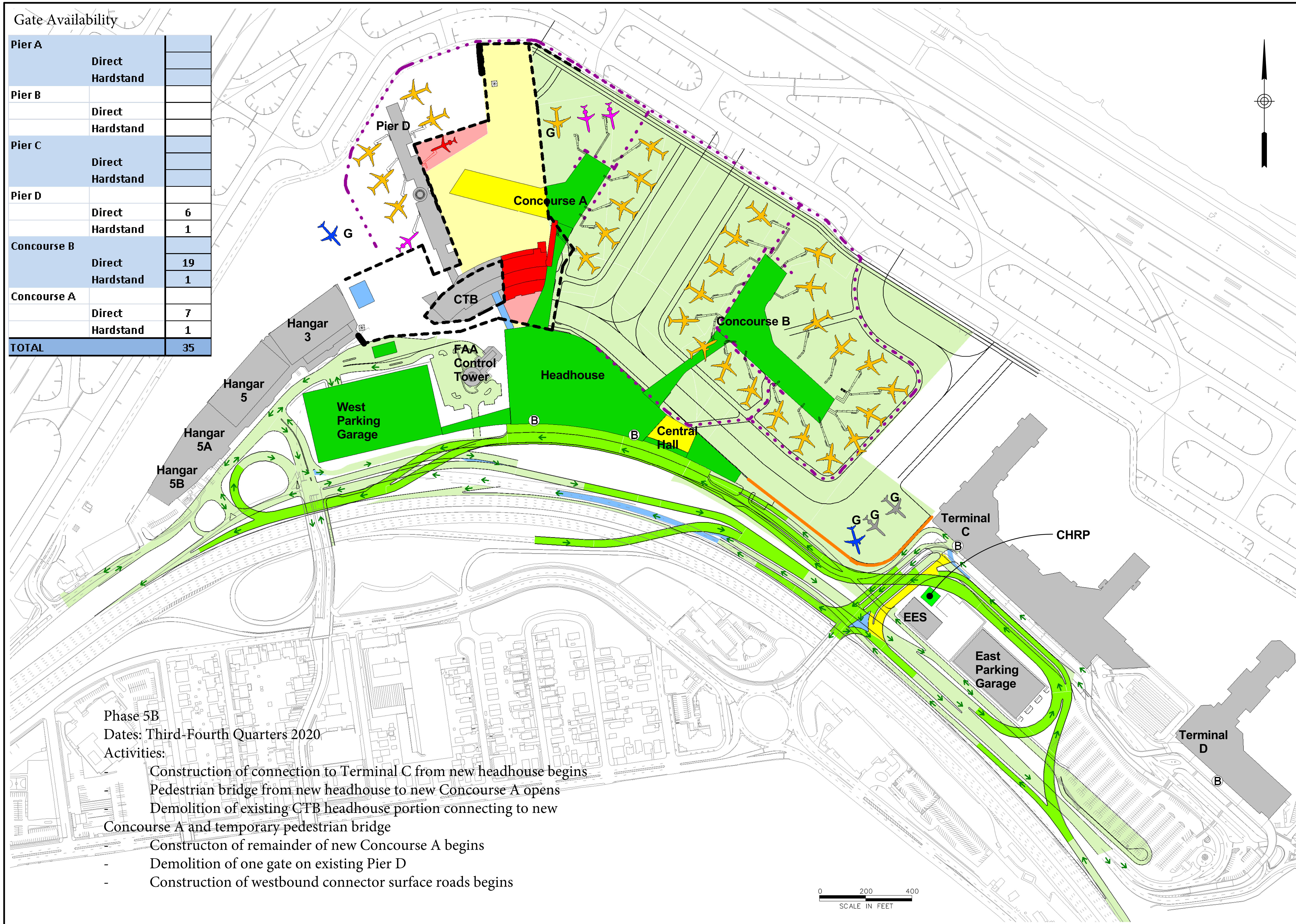
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 5A

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV12

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		
	Direct	
	Hardstand	
Pier C		
	Direct	
	Hardstand	
Pier D		
	Direct	6
	Hardstand	1
Concourse B		
	Direct	19
	Hardstand	1
Concourse A		
	Direct	7
	Hardstand	1
TOTAL		35



Phase 5B
Dates: Third-Fourth Quarters 2020
Activities:
- Construction of connection to Terminal C from new headhouse begins
- Pedestrian bridge from new headhouse to new Concourse A opens
- Demolition of existing CTB headhouse portion connecting to new Concourse A and temporary pedestrian bridge
- Constructon of remainder of new Concourse A begins
- Demolition of one gate on existing Pier D
- Construction of westbound connector surface roads begins

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LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/ TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH
EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

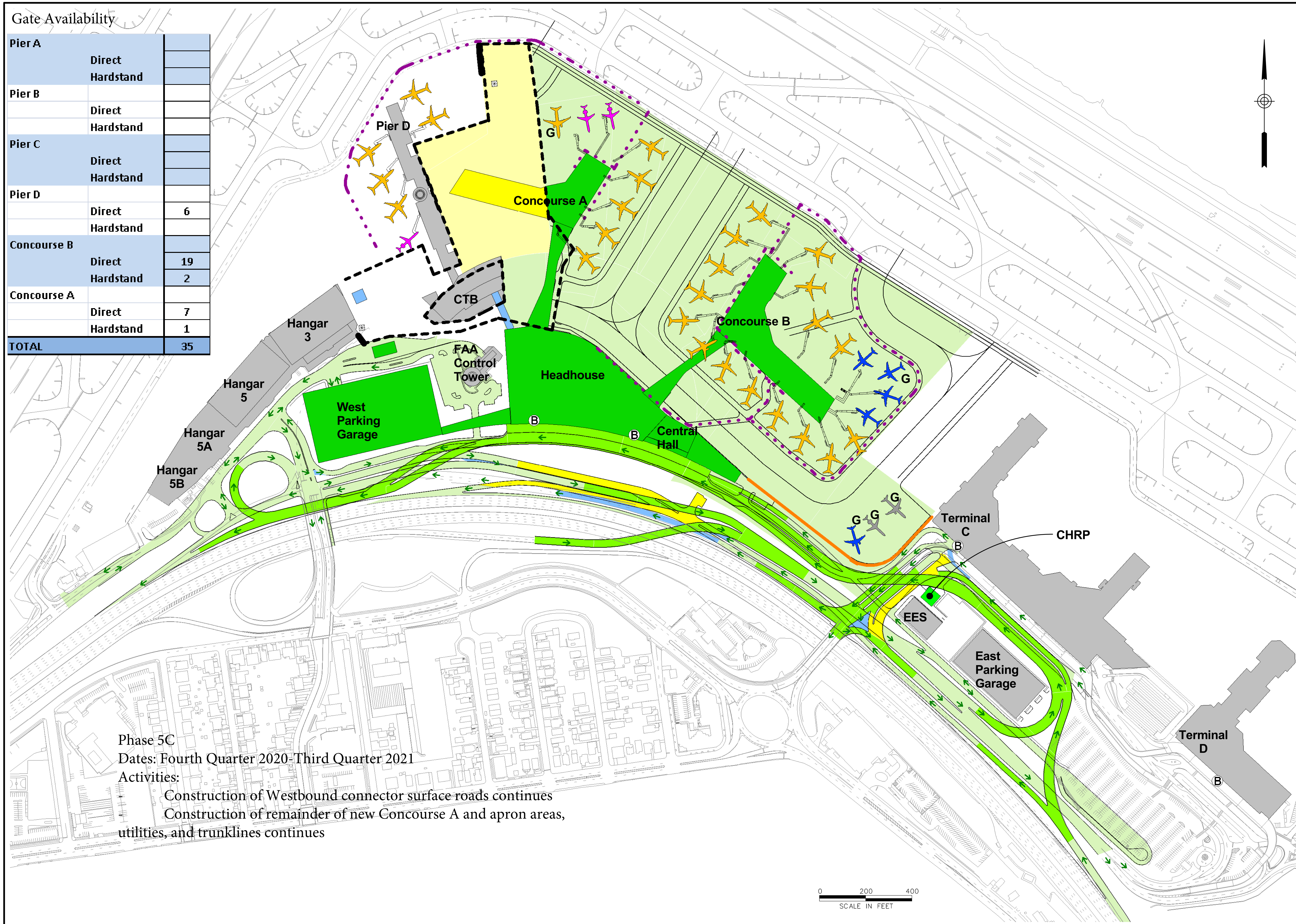
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 5B

Designed by | Drawn by
Date 12/16/15
Contract Number
Drawing Number OV13
PID# 00000000

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		
	Direct	
	Hardstand	
Pier C		
	Direct	
	Hardstand	
Pier D		
	Direct	6
	Hardstand	
Concourse B		
	Direct	19
	Hardstand	2
Concourse A		
	Direct	7
	Hardstand	1
TOTAL		35



Phase 5C
Dates: Fourth Quarter 2020-Third Quarter 2021
Activities:
- Construction of Westbound connector surface roads continues
- Construction of remainder of new Concourse A and apron areas, utilities, and trunklines continues

Sheet 15 of 18

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LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH

EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

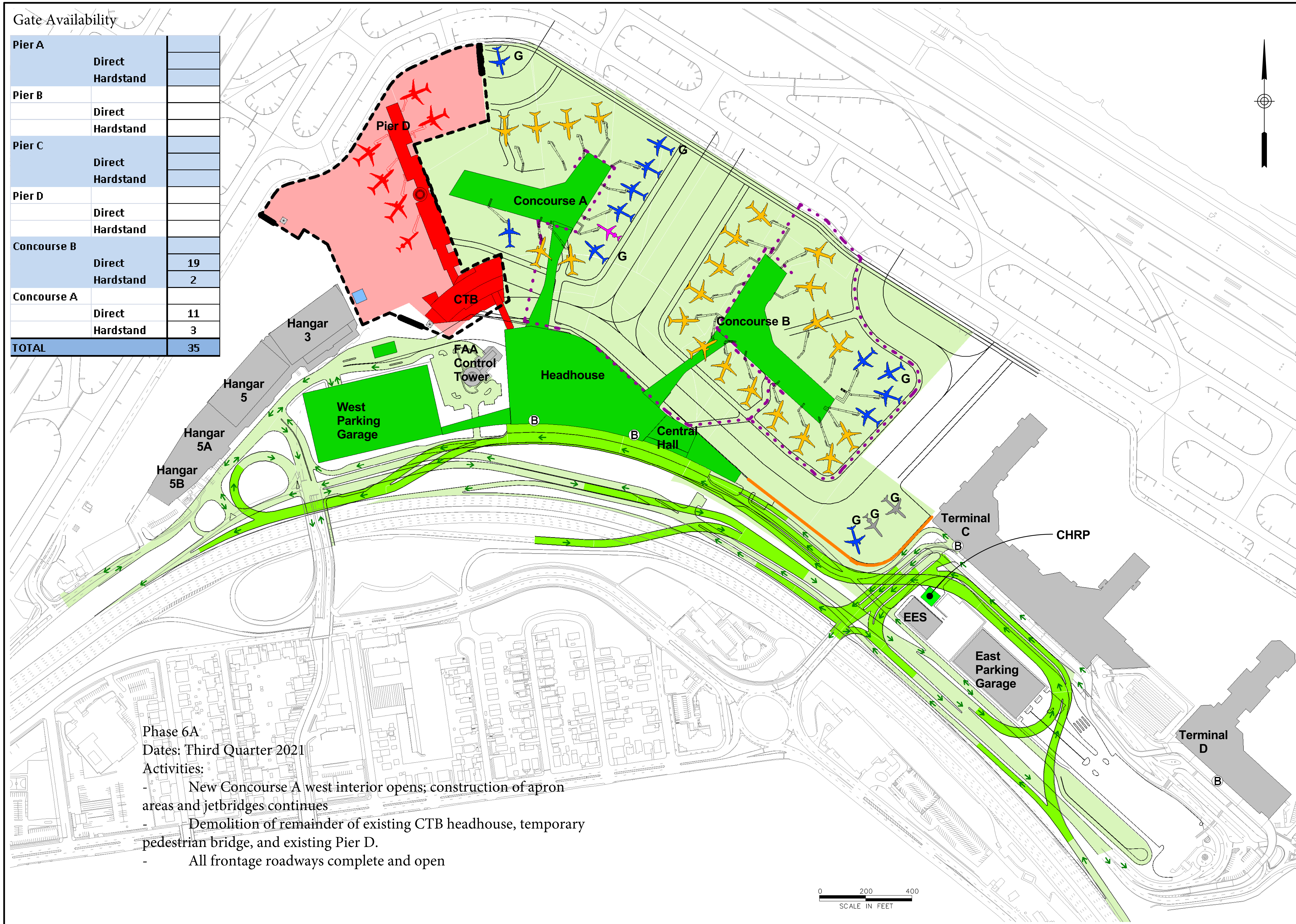
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 5C

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV14

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		
	Direct	
	Hardstand	
Pier C		
	Direct	
	Hardstand	
Pier D		
	Direct	
	Hardstand	
Concourse B		
	Direct	19
	Hardstand	2
Concourse A		
	Direct	11
	Hardstand	3
TOTAL		35



Phase 6A
Dates: Third Quarter 2021
Activities:
- New Concourse A west interior opens; construction of apron areas and jetbridges continues
- Demolition of remainder of existing CTB headhouse, temporary pedestrian bridge, and existing Pier D.
- All frontage roadways complete and open

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LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/ TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH

EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

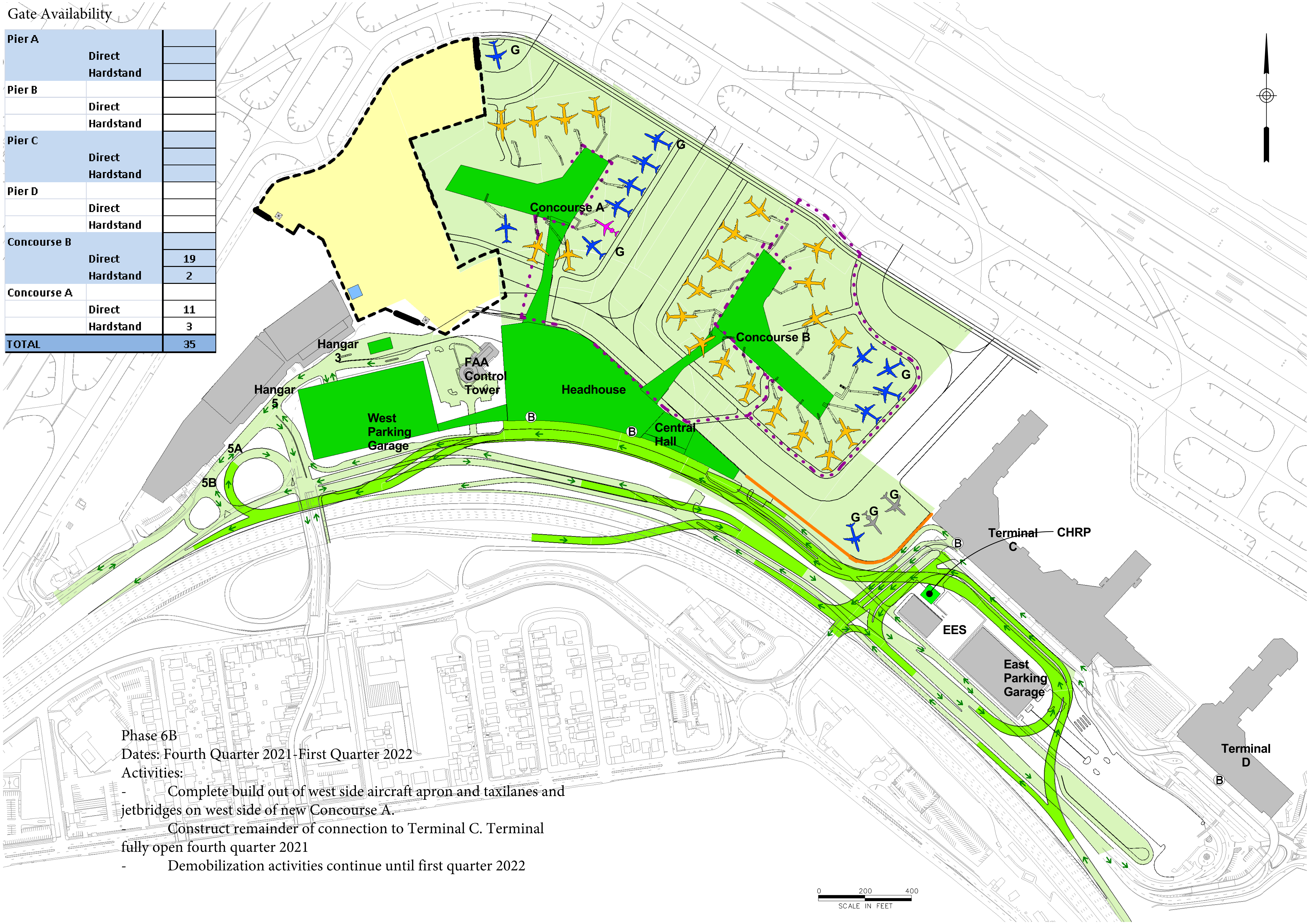
LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 6A

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV15

Gate Availability

Pier A		
	Direct	
	Hardstand	
Pier B		
	Direct	
	Hardstand	
Pier C		
	Direct	
	Hardstand	
Pier D		
	Direct	
	Hardstand	
Concourse B		
	Direct	19
	Hardstand	2
Concourse A		
	Direct	11
	Hardstand	3
TOTAL		35



Phase 6B
Dates: Fourth Quarter 2021-First Quarter 2022
Activities:
- Complete build out of west side aircraft apron and taxilanes and jetbridges on west side of new Concourse A.
- Construct remainder of connection to Terminal C. Terminal fully open fourth quarter 2021
- Demobilization activities continue until first quarter 2022

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LaGuardia GATEWAY PARTNERS

EXISTING
DEMO BUILDING
DEMO APRON/ROAD
TEMPORARY LABOR/TOOL CAMPS/ROADS
COMPLETE BUILDING
COMPLETE APRON/ROAD GROUND
COMPLETE ROAD STRUCTURE
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH

EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
GROUND BOARDED PLANE

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

OVERALL
PHASE 6B

Designed by
Drawn by
Date 12/16/15
Contract Number
Drawing Number OV16

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LaGuardia GATEWAY PARTNERS

EXISTING
COMPLETE BUILDING
DEMO BUILDING
COMPLETE APRON/ROAD GROUND
DEMO APRON/ROAD
COMPLETE ROAD STRUCTURE
TEMPORARY LABOR/ TOOL CAMPS/ROADS
UNDER CONSTRUCTION BUILDING
UNDER CONSTRUCTION APRON/ROAD
PRIMARY SECURITY LINE AIRSIDE FENCE
PRIMARY SECURITY LINE LANDSIDE FENCE
CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
GUARD BOOTH
TRAFFIC FLOW
BUS STOP
BLAST FENCE
TUG PATH

EXISTING PLANE
CLOSED DURING PHASE
ADG IV GATES
ADG III GATES
ADG II GATES
E90 GATES
G GROUND BOARDED PLANE
RON PARKING POSITIONS

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT

Title

LAGUARDIA AIRPORT CENTRAL TERMINAL BUILDING REPLACEMENT PROJECT

OVERALL PHASE 6C

Designed by   Drawn by

Date 12/16/15

Contract Number

Drawing Number OV17

PID# 00000000

Attachment 4

Technical Memorandum – Updated Traffic Analysis for Construction Conditions

SKANSKA WALSH
DESIGN-BUILD JOINT VENTURE

LaGuardia CTB Replacement Project
Updated Traffic Analysis for Construction Conditions- Proposed Design Changes

---

FROM: Denise Huang, WSP/Parsons Brinckerhoff
TO: Nathaniel Kimball, PANYNJ
DATE: November 02, 2015
SUBJECT: Technical Memorandum – Updated Traffic Analysis for Construction Conditions-Proposed Design Changes-LaGuardia CTB Replacement Project

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INTRODUCTION

This memo addresses the potential traffic impacts of the proposed design changes put forward in the Port Authority's Technical Report and compares these to the impacts identified for the 2014 LGA CTA Redevelopment EA/FONSI/ROD dated December 10, 2014 (2014 EA). The traffic analysis covers a study area encompassing 8 existing intersections for the operational conditions and 21 intersections for construction conditions. Since there are no significant changes to the roadway layout and trip generation projects for the new design concept under the operational conditions compared to the 2014 EA, no additional analysis is required for the operational conditions. This memo focuses on the analysis of the construction conditions as construction schedule, phasing, and worker shifts have changed since the completion of the 2014 EA.

A.7 Construction Traffic

The initial work for the reassessment was to develop an estimation of construction trip generation and assignments. It then provides an assessment of existing traffic conditions (2014) in the traffic study area, and future conditions without construction, as well as an assessment of construction traffic conditions with the proposed design changes in place. The capacity analysis results and proposed transportation improvements for the construction conditions were compared to the 2014 EA to determine the potential effect of the construction condition for the proposed design changes.

A.7.1 Construction Parking and Travel Plan

As documented in the 2014 EA, the Ingraham's Mountain location will be used for construction personnel parking as well as truck staging/queuing area. Shuttle buses will be provided to transfer personnel between Ingraham's Mountain and the CTB construction site. For the proposed design changes, two additional sites east of the CTB, at Marina East Gate 14 and the NY Times Facility, will also be used for truck staging and queuing areas.

A.7.2 Construction Trip Generation

A.7.2.1 Average Daily Construction trips per Calendar Quarter (Page A-107 in 2014 EA)

The construction schedule and phasing, as well as work force and truck trip assumptions, have changed since the completion of the 2014 EA. A comparison of the average daily construction workers and trucks for each construction quarter between the 2014 EA and the Proposed design changes is presented in **Table 1**. The peak construction period has changed from the 4th Quarter of 2015 in the 2014 EA to the 2nd Quarter of 2017 for the Current Project with an increase of 352 average daily Passenger Car Equivalents (PCEs) (225 worker PCEs and 127 Truck PCEs) .

Table 1: Average Daily Number of Construction Workers and Construction Trucks, Per Calendar Quarter

Quarter/Year	2014 EA [1]			2015 Estimations [2]		
	Average Workers	Truck (PCEs)	Total PCEs	Average Workers	Truck (PCEs)	Total PCEs
Q1 2014	270	31	**301**	-	-	-
Q2 2014	282	103	**385**	-	-	-
Q3 2014	308	48	**356**	-	-	-
Q4 2014	416	78	**494**	-	-	-
Q1 2015	554	166	**720**	-	-	-
Q2 2015	822	327	**1,149**	-	-	-
Q3 2015	1,206	318	**1,524**	-	-	-
Q4 2015	1,408	257	**1,665**	-	-	-
Q1 2016	1,497	161	**1,658**	-	-	-
Q2 2016	1,463	97	**1,560**	472	56	**528**
Q3 2016	1,278	109	**1,387**	626	121	**747**
Q4 2016	1,144	163	**1,307**	857	98	**955**
Q1 2017	1,183	116	**1,299**	1,247	188	**1,435**
Q2 2017	1,313	100	**1,413**	1,633	384	**2,017**
Q3 2017	1,420	59	**1,479**	1,636	377	**2,013**
Q4 2017	1,250	53	**1,303**	1,562	198	**1,760**
Q1 2018	1,010	189	**1,199**	1,314	177	**1,491**
Q2 2018	496	149	**645**	1,300	358	**1,658**
Q3 2018	290	177	**467**	1,147	322	**1,469**
Q4 2018	201	116	**317**	1,037	166	**1,203**
Q1 2019	153	137	**290**	1,021	154	**1,175**
Q2 2019	159	201	**360**	1,118	280	**1,398**
Q3 2019	196	188	**384**	572	202	**774**
Q4 2019	290	41	**331**	547	108	**655**
Q1 2020	358	41	**399**	594	116	**710**
Q2 2020	345	52	**397**	575	232	**807**
Q3 2020	273	33	**306**	469	266	**735**
Q4 2020	133	33	**166**	381	109	**490**
Q1 2021	34	32	**66**	302	98	**400**
Q2 2021	18	110	**128**	259	168	**427**
Q3 2021	15	105	**120**	378	146	**524**
Q4 2021	-	0	-	226	120	**346**

Source: 1) 2014 EA Table A.7-1 on page A-107
2) Construction Workers & Trucks by Quarter provided by LGP Team, October 2015.

A.7.2.2 Peak Hour Construction Trips during the Peak Quarter

Transportation planning factors presented in Table A.7-2 of the 2014 EA were used to estimate peak hour construction related vehicle trips with the exception of shifts of construction personnel and hourly construction truck trip distribution. A comparison of construction personnel shifts between the 2014 EA assumptions and the proposed design changes are presented in **Table 2**.

Table 2: Comparison of Shifts of Construction Personnel

Personnel Shifts	2014 EA (1)			2015 Assumptions (2)		
	Percentage of Daily Personnel	Time Start	Time End	Percentage of Daily Personnel	Time Start	Time End
1st Shift	90%	7:00 AM	3:00 PM	40%	6:00 AM	2:00 PM
2nd Shift	10%	3:00 PM	11:00 PM	40%	7:00 AM	3:00 PM
3rd Shift	-	-	-	20%	10:00 PM	6:00 AM

Source: 1) 2014 EA Table A.7-2 on page A-109
2) Provided by LGP Team, October 2015.

The 2014 EA assumed truck trips would uniformly arrive/depart the site between the hours of 4:00 AM and 10:00 PM with slightly higher numbers of trips during the midday hours between 8:00 AM to 1:00 PM. For the proposed design changes, it is expected that trucks will arrive/depart the site throughout out the entire day with slightly higher numbers during the day time, as shown in **Table 3**. Based on these assumptions, the peak hour construction traffic was estimated for the 2nd Quarter of 2017. The total vehicle trips per hour shown in Table A.7-2 of the 2014 EA were updated and are presented in **Table 3**.

A comparison of the peak hour construction trips for the peak construction quarter is presented in **Table 4**. It is expected that the proposed design changes would generate 163 more outbound auto trips during the AM peak hours, and four more truck trips during both the AM and PM peak hours. However, inbound auto trips during the AM peak hour and outbound auto trips during the PM peak hours would be reduced by 213 vehicles. The shuttle buses would decrease as well due to reduction in personnel during the peak hours. Overall, the proposed design changes are expected to generate 54 fewer vehicles during the AM peak hour and 217 fewer vehicles during the PM peak hour when compared to the 2014 EA.

Table 3: Estimated Peak Hour Construction Trip Generation Characteristics for CTB Redevelopment during Peak Construction Quarter (2nd Quarter of 2017)

Average Daily Number of Construction Personnel during Peak Construction Quarter[1] =	1633	Personnel in peak quarter
Percentage of Daily Construction Personnel Working First Shift[1] =	**80%**	
Percentage of Daily Construction Personnel Working Second Shift[1] =	20%	
Construction Personnel Auto-Occupancy[2] =	1.50	
Construction Personnel Auto Mode Split[2] =	75%	
Construction Personnel Transit Mode Split[2] =	25%	
Average Daily Number of Construction Driving during Peak Construction Period[1] =	817	
PCE for Shuttle buses with 2 axies[3] =	1.5	passenger car equivalents/bus
Estimated passenger capacity per shuttle bus =	54	passenger/bus

Average Number of Daily Trucks during Peak Construction Period[4] =	192	trucks in peak quarter
PCE for construction trucks[3] =	2.0	passenger car equivalents/truck

Hour of Day	Tempora Distribution[5]						Auto Trips(Personnel): 1st Shift			Auto Trips(Personnel): 2nd Shift			Shuttle Bus Trips(Personnel): 1st Shift		
	Auto/Bus IN: 1st Shift	Auto/Bus OUT: 1st Shift	Auto/Bus IN: 2nd Shift	Auto/Bus OUT: 2nd Shift	Truck IN	Truck OUT	In	Out	Total	In	Out	Total	In	Out	Total
12-1AM	0%	0%	0%	0%	3%	3%	0	0	0	0	0	0	0	0	0
1-2AM	0%	0%	0%	0%	3%	3%	0	0	0	0	0	0	0	0	0
2-3AM	0%	0%	0%	0%	3%	3%	0	0	0	0	0	0	0	0	0
3-4AM	0%	0%	0%	0%	3%	3%	0	0	0	0	0	0	0	0	0
4-5AM	5%	0%	0%	0%	5%	5%	33	0	33	0	0	0	1	0	1
5-6AM	45%	0%	0%	0%	5%	5%	295	0	295	0	0	0	8	8	16
6-7AM	45%	0%	0%	100%	5%	5%	294	0	294	0	163	163	8	8	16
7-8AM	5%	0%	0%	0%	5%	5%	33	0	33	0	0	0	1	1	2
8-9AM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0
9-10AM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0
10-11AM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0
11AM-12PM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0
12-1PM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0
1-2PM	0%	5%	0%	0%	5%	5%	0	33	33	0	0	0	0	1	1
2-3PM	0%	45%	0%	0%	5%	5%	0	295	295	0	0	0	8	8	16
3-4PM	0%	45%	0%	0%	5%	5%	0	294	294	0	0	0	8	8	16
4-5PM	0%	5%	0%	0%	5%	5%	0	33	33	0	0	0	1	1	2
5-6PM	0%	0%	0%	0%	4%	4%	0	0	0	0	0	0	0	0	0
6-7PM	0%	0%	0%	0%	4%	4%	0	0	0	0	0	0	0	0	0
7-8PM	0%	0%	0%	0%	3%	3%	0	0	0	0	0	0	0	0	0
8-9PM	0%	0%	0%	0%	3%	3%	0	0	0	0	0	0	0	0	0
9-10PM	0%	0%	100%	0%	3%	3%	0	0	0	163	0	163	0	0	0
10-11PM	0%	0%	0%	0%	3%	3%	0	0	0	0	0	0	0	0	0
12PM-12AM	0%	0%	0%	0%	3%	3%	0	0	0	0	0	0	0	0	0
TOTAL=	100%	100%	100%	100%	100%	100%	655	655	1,310	163	163	326	35	35	70

Hour of Day	Shuttle Bus Trips(Personnel): 2nd Shift			Truck Trips			Truck and Bus (PCE) Trips			Total Vehicle Trips			Total Vehicle Trips (PCEs)		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
12-1AM	0	0	0	6	6	12	12	12	24	6	6	12	12	12	24
1-2AM	0	0	0	6	6	12	12	12	24	6	6	12	12	12	24
2-3AM	0	0	0	6	6	12	12	12	24	6	6	12	12	12	24
3-4AM	0	0	0	6	6	12	12	12	24	6	6	12	12	12	24
4-5AM	0	0	0	10	10	20	22	20	42	44	10	54	55	20	75
5-6AM	0	0	0	10	10	20	32	32	64	313	18	331	327	32	359
6-7AM	0	0	0	10	10	20	32	32	64	312	181	493	326	195	521
7-8AM	0	0	0	10	10	20	22	22	44	44	11	55	55	22	77
8-9AM	0	0	0	10	10	20	20	20	40	10	10	20	20	20	40
9-10AM	0	0	0	10	10	20	20	20	40	10	10	20	20	20	40
10-11AM	0	0	0	10	10	20	20	20	40	10	10	20	20	20	40
11AM-12PM	0	0	0	10	10	20	20	20	40	10	10	20	20	20	40
12-1PM	0	0	0	10	10	20	20	20	40	10	10	20	20	20	40
1-2PM	0	0	0	10	10	20	20	22	42	10	44	54	20	55	75
2-3PM	0	0	0	10	10	20	32	32	64	18	313	331	32	327	359
3-4PM	0	0	0	10	10	20	32	32	64	18	312	330	32	326	358
4-5PM	0	0	0	10	10	20	22	22	44	11	44	55	22	55	77
5-6PM	0	0	0	8	8	16	16	16	32	8	8	16	16	16	32
6-7PM	0	0	0	8	8	16	16	16	32	8	8	16	16	16	32
7-8PM	0	0	0	6	6	12	12	12	24	6	6	12	12	12	24
8-9PM	0	0	0	6	6	12	12	12	24	6	6	12	12	12	24
9-10PM	5	0	5	6	6	12	20	12	32	174	6	180	183	12	195
10-11PM	0	0	0	6	6	12	12	12	24	6	6	12	12	12	24
12PM-12AM	0	0	0	6	6	12	12	12	24	6	6	12	12	12	24
TOTAL=	5	-	5	200	200	400	462	454	916	1,058	1,053	2,111	1,280	1,272	2,552

Note:
1 = From Port Authority planning and construction staff estimates.
2 = Estimated based on discussions with Port Authority planning and construction staff.
3 = Based on *CEQR Technical Manual* , Table 16-3, page 16-11.
4 = Based on *LGA_TrucksByMonth_Table_27Dec2012Rev* document prepared by AECOM. This document contains detailed construction truck projections, by month, over the course of the entire construction schedule.
5 = Based on proposed construction personnel shifts as of October 2015.

Table 4: Comparison of Peak Construction peak hour trips

Vehicle Type	Direction	2015 Construction Condition (2014 EA) (1)		2017 Construction Condition (2)		Net Change	
		AM (6-7AM)	PM (3-4PM)	AM (6-7AM)	PM (3-4PM)	AM (6-7AM)	PM (3-4PM)
Auto (Personnel)	In	507	0	294	0	-213	0
	Out	0	507	163	294	163	-213
Trucks	In	6	6	10	10	4	4
	Out	6	6	10	10	4	4
Buses	In	14	14	8	8	-6	-6
	Out	14	14	8	8	-6	-6
Total		**547**	**547**	**493**	**330**	**-54**	**-217**

Source: 1) 2014 EA Table A.7-2 on page A-109
2) WSP/Parsons Brinckerhoff.

A.7.2.3 Construction Trip Distribution

Construction trip distribution patterns for personnel vehicles and shuttle buses are expected to be the same as for the previously approved (2014) design, presented in Figure 1. An average auto occupancy rate of 1.50 and an auto mode share of 75 percent were assumed for construction personnel. The same passenger car equivalent (PCE) assumptions of 1.0 PCE per auto, 1.5 PCEs per shuttle bus, and 2.0 PCES per truck were also used for the proposed design changes.

For trucks, the 2014 EA assumed all trucks would enter the construction site and staging and queuing areas would be at the airfield near construction sites. For the proposed design changes, three off-site trailer staging and queuing areas are proposed at Ingrahams Mountain, Marina East Gate 14, and the NY Times Facility. The truck origin/destination assumptions remain the same as those in the previously approved (2014) design: 35% from/to the BQE and points west, 35% from/to the Northern Blvd and Van Wyck Expressway, and 30% from/to The Northern Blvd and LIE. These trucks will be evenly distributed to the three staging/queuing areas: 34% to Ingraham's Mountain, 33% to Marina East Gate 14, and 33% to the NY Times Facility. The average queue time at the staging areas will be 20 to 30 minutes. Trucks will then leave the staging/queuing areas and travel to the construction site within the same hour. As with the previously approved (2014) design, the truck trip distribution are based on the NYCDOT "local" and "through" truck routes including Astoria Boulevard and 94th Street-Junction Boulevard.

A.7.2.4 Construction Trip Assignment

A comparison of construction trips generated during the peak construction conditions for each of the 21 analyzed intersections are presented in **Table 5**.

Table 5: Comparison of Peak Hour Trip Assignment

		6:00 - 7:00 AM									3:00 - 4:00 PM								
		2015 Trip Assignment			2017 Trip Assignment			Net Change			2015 Trip Assignment			2017 Trip Assignment			Net Change		
INTERSECTION	APP.	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
94th St & GCP Onramp/LaGuardia Access Rd	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	5	0	0	53	0	0	48	0	0	148	0	0	90	0	0	-58	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	5	0	0	7	0	0	2	0	0	5	0	0	7	0	0	2	0
94th St & Ditmars Blvd	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	5	0	0	7	46	0	2	46	0	5	0	0	7	83	0	2	83
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	5	0	0	7	0	0	2	0	0	5	0	0	7	0	0	2	0
94th St & 23rd Ave	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	5	0	0	7	0	0	2	0	0	5	0	0	7	0	0	2	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	5	0	0	7	0	0	2	0	0	5	0	0	7	0	0	2	0
94th St & 24th Ave	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	5	0	0	7	0	0	2	0	0	5	0	0	7	0	0	2	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	5	0	0	7	0	0	2	0	0	5	0	0	7	0	0	2	0
94th St & 25th Ave	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	5	0	0	7	0	0	2	0	0	5	0	0	7	0	0	2	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	5	0	0	7	0	0	2	0	0	5	0	0	7	0	0	2	0
94th St & Astoria Blvd	EB	1	0	0	0	8	10	-1	8	10	1	20	30	0	14	18	-1	-6	-12
	SB	2	2	1	4	3	0	2	1	-1	2	2	1	4	3	0	2	1	-1
	WB	0	20	2	0	13	7	0	-7	5	0	0	2	0	1	7	0	1	5
	NB	30	2	0	19	0	0	-11	-2	0	0	2	0	1	0	0	1	-2	0
94th Street @ 31st Ave	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	2	0	0	13	0	0	11	0	0	32	0	0	21	0	0	-11	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	32	0	0	19	0	0	-13	0	0	2	0	0	1	0	0	-1	0
Junction Blvd/94th St & Northern Blvd	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	2	0	0	13	0	0	11	0	0	32	0	0	21	0	0	-11	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	32	0	0	19	0	0	-13	0	0	2	0	0	1	0	0	-1	0
82nd Street & Astoria Blvd & 24th Ave	EB	0	1	0	0	2	0	0	1	0	0	1	0	0	2	0	0	1	0
	SB	0	0	0	16	0	0	16	0	0	51	0	0	30	0	0	-21	0	0
	WB	0	1	51	0	0	31	0	-1	-20	0	1	0	0	0	2	0	-1	2
	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82nd Street & GCP Service Rd S/23rd Avenue	EB	314	0	0	183	0	0	-131	0	0	1	0	0	1	0	0	0	0	0
	SB	0	0	0	0	16	0	0	16	0	0	51	0	0	30	0	0	-21	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	51	0	0	31	0	0	-20	0	0	0	0	0	2	0	0	2	0
82nd Street/Ditmars Blvd & GCP North Service Road/GCP WB Offramp	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	0	1	0	16	90	0	16	89	0	51	270	0	30	160	0	-21	-110
	WB	0	0	143	0	0	83	0	0	-60	0	0	0	0	0	0	0	0	0
	NB	0	365	0	0	214	0	0	-151	0	0	1	0	0	3	0	0	2	0
Ditmars Blvd & Marine Terminal Rd	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	0	0	0	103	0	0	103	0	0	320	0	0	186	0	0	-134	0
	WB	1	0	0	4	0	0	3	0	0	1	0	0	4	0	0	3	0	0
	NB	0	507	1	0	297	0	0	-210	-1	0	0	1	0	3	0	0	3	-1

Table 5: Comparison of Peak Hour Trip Assignment (Cond't)

		6:00 - 7:00 AM									3:00 - 4:00 PM								
		2015 Trip Assignment			2017 Trip Assignment			Net Change			2015 Trip Assignment			2017 Trip Assignment			Net Change		
INTERSECTION	APP.	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
Marine Terminal Rd & Runway Dr/Bowery Bay Blvd	EB	0	0	1	0	0	0	0	0	-1	0	0	11	0	0	0	0	0	-11
	SB	0	14	0	0	57	0	0	43	0	0	157	0	0	94	0	0	-63	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	1	14	0	4	8	0	3	-6	0	1	14	0	4	8	0	3	-6	0
81st Street @ Ditmars Blvd	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	0	0	103	0	0	103	0	0	320	0	0	186	0	0	-134	0	0
	WB	0	0	507	0	0	297	0	0	-210	0	0	0	0	0	3	0	0	3
	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81st Street @ 21st Ave	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	0	0	0	103	0	0	103	0	0	320	0	0	186	0	0	-134	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	507	0	0	297	0	0	-210	0	0	0	0	0	3	0	0	3	0
19th Ave & Hazen St	EB	0	14	0	0	160	0	0	146	0	0	477	0	0	279	0	0	-198	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	521	0	0	305	0	0	-216	0	0	14	0	0	11	0	0	-3	0
	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19th Ave & 45th St (unsignalized)	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	14	0	0	160	14	0	146	14	0	477	44	0	279	26	0	-198	-18	0
	WB	0	0	521	0	0	305	0	0	-216	0	0	14	0	0	11	0	0	-3
	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Astoria Blvd N/Astoria Blvd (GCP Overpass) & 79th St (GCP Service Rd S)	EB	0	314	0	0	183	0	0	-131	0	0	1	0	0	1	0	0	0	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	1	0	0	0	0	0	-1	0	0	1	0	0	0	0	0	-1	0
Astoria Blvd (GCP Overpass) & Astoria Blvd N (North Service Rd)	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	1	0	0	90	0	0	89	0	0	270	0	0	160	0	0	-110	0
	NB	1	0	0	0	0	0	-1	0	0	1	0	0	0	0	0	-1	0	0
Astoria Blvd S & 77th Street	EB	0	315	0	0	186	0	0	-129	0	0	2	0	0	4	0	0	2	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81st Street @ 19th Ave	EB	14	1	0	57	103	0	43	102	0	157	320	0	94	186	0	-63	-134	0
	SB	0	0	22	0	0	8	0	0	-14	0	0	14	0	0	8	0	0	-6
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	506	0	0	297	0	0	-209	0	0	1	0	0	3	0	0	2	0	0

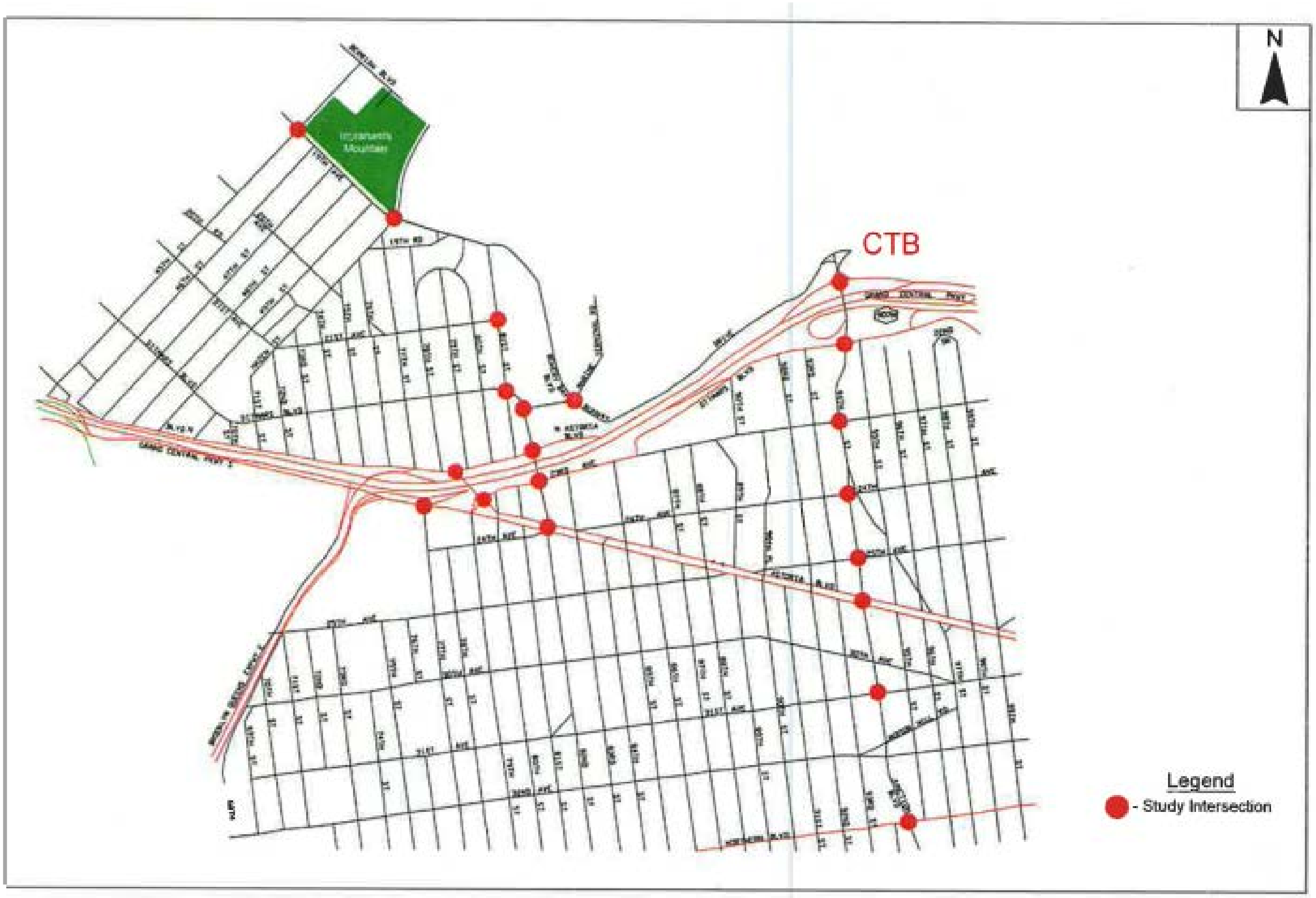
A.7.6 Operations Analyses

A.7.6.1 Existing Conditions

As presented in **Figure 1**, a total of 21 intersections (20 existing intersection plus one newly construction intersection during the peak construction condition) were analyzed during the 6:00-7:00 AM and 3:00-4:00 PM peak hours for the Construction Conditions- previously approved (2014) design scenario. These same intersections were analyzed during the same peak hours for the proposed design changes. As 2014 traffic data are available for some of the intersections as part of the LGA 2014 Data Collection Program, the base year for this analysis changes from 2012 Existing Condition in the previously approved (2014) design to the 2014 Existing Condition for the proposed design changes. As presented in **Table 6**, the LGA 2014 Data Collection Program (2014 Counts) were used to establish the 2014 Existing Condition. For locations without available 2014 traffic data, the 2012 traffic volumes from the 2014 EA were utilized. A compound background growth rate of 1.0 percent (0.5 percent per year) was applied to the 2012 data to establish the 2014 Existing Conditions. A copy of the traffic volume comparison tables for the Existing Conditions is provided in **Exhibit A**.

Traffic improvements have been implemented at two of the analyzed intersections since the 2014 EA was prepared and these improvements were reflected in the 2014 existing analysis for the proposed design changes. These improvements included the lane modification at the Ditmars Blvd/94th St intersection and the widening of the 82nd St Westbound Off-Ramp. A comparison of the capacity analysis results are presented in **Table 7**.

Figure 1: Traffic Study Intersections for the Construction Conditions-Proposed design changes



Source: Figure A.7-5 of 2014 EA (Page A115)

Table 6: Traffic Study Area and Data Source for the Construction Conditions-Proposed design changes

Int. #	Intersections	Construction Condition	
		6:00 - 7:00 AM	3:00 - 4:00 PM
1	94th St & GCP Onramp/LaGuardia Access Rd	2014 LGA Data	2014 LGA Data
2	94th St & Ditmars Blvd	2014 LGA Data	2014 LGA Data
3	94th St & 23rd Ave	2014 LGA Data	2014 LGA Data
4	94th St & 24th Ave	2012 AECOM Data	2012 AECOM Data
5	94th St & 25th Ave	2012 AECOM Data	2012 AECOM Data
6	94th St & Astoria Blvd	2012 AECOM Data	2012 AECOM Data
7	94th St & 31st Ave	2012 AECOM Data	2012 AECOM Data
8	Junction Blvd/94th St & Northern Blvd	2012 AECOM Data	2012 AECOM Data
9	82nd Street & Astoria Blvd & 24th Ave	2012 AECOM Data	2012 AECOM Data
10	82nd Street & GCP Service Rd S/23rd Avenue	2014 LGA Data	2014 LGA Data
11	82nd Street/Ditmars Blvd & GCP North Service Road/GCP WB Offramp	2014 LGA Data	2014 LGA Data
12	Ditmars Blvd & Marine Terminal Rd	2014 LGA Data	2014 LGA Data
13	Marine Terminal Rd & Runway Dr/Bowery Bay Blvd	2014 LGA Data	2014 LGA Data
14	Ditmars Blvd & 81st St	2012 AECOM Data	2012 AECOM Data
15	21st Ave & 81st St	2012 AECOM Data	2012 AECOM Data
16	19th Ave & Hazen St	2012 AECOM Data	2012 AECOM Data
17	19th Ave & 45th St (unsignalized)	2012 AECOM Data	2012 AECOM Data
18	Astoria Blvd N/Astoria Blvd (GCP Overpass) & 79th St (GCP Service Rd S)	2012 AECOM Data	2012 AECOM Data
19	Astoria Blvd (GCP Overpass) & Astoria Blvd N (North Service Rd)	2012 AECOM Data	2012 AECOM Data
20	Astoria Blvd S & 77th Street	2012 AECOM Data	2012 AECOM Data
21 (New)	19th Ave and 81st St (Construction Condition Only)	2012 AECOM Data	2012 AECOM Data

Table 7: Existing Level of Service Comparison: 2012 vs. 2014

			AM Peak Hour						PM Peak Hour					
			2012 Existing (2014 EA)			2014 Existing			2012 Existing (2014 EA)			2014 Existing		
Intersection	App.	Move-ment	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
SIGNALIZED INTERSECTIONS														
LaGuardia Access Road / 94th Street	WB	L	1.05	84.3	E	1.05	65.6	E	1.05	63.5	E	1.05	63.9	E
		LT	0.55	18.1	B	0.21	13.7	B	0.12	12.9	B	0.43	16.3	B
		R	0.68	16.1	C	0.66	15.4	C	0.47	12.4	B	0.80	23.3	C
	NB	L	0.39	13.0	B	0.39	13.1	B	0.48	15.3	B	0.79	29.4	C
		T	0.24	10.1	B	0.22	9.9	A	0.39	11.3	B	0.47	12.1	B
	SB	T	0.20	9.7	A	0.21	9.8	B	0.29	10.3	B	0.33	10.7	B
		R	0.16	12.8	B	0.08	9.1	A	0.51	14.1	B	0.60	13.9	B
	Overall		*****	**32.2**	**C**		**30.8**	**C**	*****	**26.6**	**C**		**28.7**	**C**
Ditmars Boulevard / 94th Street	EB	L	0.34	15.3	B	0.22	14.0	B	0.41	16.5	B	0.47	17.5	B
		TR	0.30	14.3	B	0.35	14.7	B	0.79	22.6	C	0.80	22.9	C
	WB	L	0.15	13.8	B	0.24	15.1	B	0.39	23.4	C	0.72	46.9	D
		R	0.20	13.5	B	0.24	13.9	B	0.27	14.1	B	0.35	15.0	B
	NB	TR	0.20	9.9	A	0.20	9.8	A	0.32	10.8	B	0.38	11.4	B
	SB	L	0.42	13.8	B	0.30	11.3	B	0.52	17.0	B	0.61	19.6	B
		T	0.25	10.2	B	0.58	15.4	B	0.33	10.8	B	0.85	27.5	C
	Overall		**0.38**	**12.7**	**B**		**13.7**	**B**	**0.64**	**16.9**	**B**		**21.1**	**C**
23rd Avenue / 94th Street	EB	LTR	0.36	17.6	B	0.40	18.2	B	1.04	63.7	E	0.93	40.5	D
	WB	LTR	0.49	18.4	B	0.41	17.5	B	0.49	19.3	B	0.65	22.4	C
	NB	L	0.08	7.8	A	0.06	7.5	A	0.11	8.1	A	0.15	9.0	A
		TR	0.26	9.1	A	0.30	9.5	A	0.36	10.1	B	0.49	11.9	B
	SB	L	0.05	7.3	A	0.11	7.8	A	0.15	8.1	A	0.21	8.8	A
		TR	0.56	12.9	B	0.60	13.5	B	0.62	14.0	B	0.85	23.4	C
	Overall		**0.53**	**14.8**	**B**		**14.5**	**B**	**0.78**	**34.7**	**C**		**25.8**	**C**
24th Avenue / 94th Street	EB	LTR	0.17	15.8	B	0.17	15.8	B	0.18	15.9	B	0.18	15.9	B
	WB	LTR	0.18	15.8	B	0.18	15.8	B	0.15	15.5	B	0.15	15.5	B
	NB	LTR	0.30	9.3	A	0.30	9.4	A	0.39	10.2	B	0.39	10.3	B
	SB	LTR	0.28	9.0	A	0.28	9.0	A	0.54	12.2	B	0.55	12.3	B
	Overall		**0.25**	**10.6**	**B**		**10.6**	**B**	**0.4**	**12.0**	**B**		**12.1**	**B**
25th Avenue / 94th Street	EB	LTR	0.25	16.6	B	0.25	16.6	B	0.22	16.3	B	0.22	16.3	B
	WB	LTR	0.29	17.1	B	0.29	17.2	B	0.28	16.9	B	0.28	16.9	B
	NB	LTR	0.18	8.2	A	0.19	8.2	A	0.39	10.1	B	0.40	10.2	B
	SB	LTR	0.34	9.6	A	0.34	9.7	A	0.49	11.5	B	0.50	11.6	B
	Overall		**0.32**	**11.8**	**B**		**11.9**	**B**	**0.41**	**12**	**B**		**12.2**	**B**
Astoria Boulevard / 94th Street	EB	L	0.26	37.1	D	0.27	37.7	D	0.27	16.7	B	0.28	17.0	B
		TR	0.24	20.1	C	0.24	20.1	C	-	-	-	-	-	-
		T	-	-	-	-	-	-	0.85	28.2	C	0.86	28.7	C
		R	-	-	-	-	-	-	0.17	9.8	B	0.17	19.8	B
	WB	L	0.09	10.5	B	0.09	10.5	B	0.26	35.9	D	0.27	36.3	D
		T	0.95	36.6	D	0.96	38.0	D	-	-	-	-	-	-
		R	0.07	18.4	B	0.07	18.4	B	-	-	-	-	-	-
		TR	-	-	-	-	-	-	0.4	22.3	C	0.41	22.3	C
	NB	L	0.24	33.3	C	0.24	33.4	C	0.66	55.6	E	0.68	57.7	E
		TR	0.23	32.4	C	0.23	32.4	C	0.64	43.6	D	0.65	44.1	D
	SB	L	0.15	31.2	C	0.15	31.2	C	0.3	34.9	C	0.31	35.2	D
		TR	0.42	35.6	D	0.43	35.7	D	0.64	41.5	D	0.65	41.9	D
	Overall		**0.73**	**33.3**	**C**		**34.2**	**C**	**0.75**	**29.7**	**C**		**30.1**	**C**

Table 7: Existing Level of Service Comparison: 2012 vs. 2014 (Cont'd)

			AM Peak Hour						PM Peak Hour					
Intersection	App.	Move-ment	2012 Existing (2014 EA)			2014 Existing			2012 Existing (2014 EA)			2014 Existing		
			v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
31st Avenue / 94th Street	EB	LTR	0.21	11.9	B	0.21	11.9	B	0.63	18.5	B	0.64	18.6	B
	WB	LTR	0.21	12.0	B	0.21	12.0	B	0.22	11.9	B	0.22	12.0	B
	NB	LTR	0.25	12.3	B	0.25	12.4	B	0.36	13.7	B	0.37	13.7	B
	SB	LTR	0.41	14.4	B	0.42	14.5	B	0.49	25.5	C	0.49	15.6	B
	Overall		**0.31**	**13.0**	**B**		**13.0**	**B**	**0.56**	**15.8**	**B**		**15.8**	**B**
Northern Boulevard / Junction Boulevard	EB	L	0.08	16.1	B	0.08	16.5	B	0.12	13.7	B	0.12	13.8	B
		TR	0.31	15.1	B	0.31	15.2	B	0.77	17.9	B	0.78	18.1	B
	WB	L	0.18	9.6	A	0.18	9.7	A	0.34	24.9	C	0.35	25.7	C
		TR	0.81	19.3	B	0.82	19.7	B	0.57	19.1	B	0.57	19.2	B
	NB	L	0.27	41.5	D	0.27	41.6	D	0.50	55.2	E	0.50	56.2	E
		TR	0.57	48.0	D	0.58	48.1	D	0.89	78.0	E	0.90	79.4	E
	SB	L	0.28	40.6	D	0.28	40.6	D	0.59	57.3	E	0.60	58.3	E
		TR	0.55	45.7	D	0.55	45.8	D	0.77	57.8	E	0.79	59.0	E
	Overall		**0.64**	**23.1**	**C**		**23.3**	**C**	**0.75**	**28.2**	**C**		**28.6**	**C**
Astoria Boulevard / 77th Street	EB	T1	0.42	10.7	B	0.42	10.8	B	0.10	7.6	A	0.10	7.5	A
		T2	0.46	10.5	B	0.46	10.6	B	1.05	49.6	D	1.05	50.8	D
	NB	R1	0.44	40.2	D	0.44	40.3	D	0.84	57.8	E	0.86	60.7	E
		R2	0.18	35.8	D	0.18	35.8	D	1.02	97.2	F	1.04	105.2	F
	Overall		**0.45**	**14.1**	**B**		**14.1**	**B**	**1.04**	**52.9**	**D**		**54.7**	**D**
Astoria Boulevard North Service Road / 79th Street / 23rd Avenue	NEB	T	0.49	39.7	D	0.92	59.1	E	0.45	39.0	D	0.84	51.8	D
	NWB	T	0.60	5.6	A	0.60	5.7	A	0.28	3.8	A	0.29	3.8	A
	Overall		**0.57**	**12.2**	**B**		**21.9**	**C**	**0.33**	**14.9**	**B**		**25.8**	**C**
Astoria Boulevard / Astoria Boulevard North Service Road	WB	T	0.62	36.0	D	0.62	36.2	D	0.84	44.8	D	0.85	45.4	D
	NWB	L	0.50	9.5	A	0.51	9.6	A	0.34	8.3	A	0.35	8.3	A
	Overall		**0.54**	**17.2**	**B**		**17.3**	**B**	**0.52**	**24.7**	**C**		**24.9**	**C**
Astoria Boulevard North / Grand Central Parkway westbound off-ramp / 82nd Street / Ditmars Boulevard	WB	LTR	1.05	56.3	E	-	-	-	0.99	41.5	D	-	-	-
		LT	-	-	-	0.48	14.5	B	-	-	-	0.56	16.8	B
		R	-	-	-	1.05	66.2	E	-	-	-	0.59	19.0	B
	NB	DefL	-	-	-	-	-	-	1.05	141.5	F	0.96	116.5	F
		T	-	-	-	-	-	-	0.29	19.5	B	0.41	21.0	C
		LT	0.61	23.8	C	0.66	24.7	C	-	-	-	-	-	-
	SB	TR	0.35	20.1	C	0.34	19.9	B	0.87	31.5	C	0.91	34.5	C
	Overall		**0.88**	**40.7**	**D**		**32.6**	**C**	**1.01**	**37.2**	**D**		**27.3**	**C**
23rd Avenue / 82nd Street	EB	LTR	0.54	32.2	C	0.50	31.5	C	0.59	33.2	C	0.50	31.4	C
	WB	L	0.40	37.9	D	0.49	41.9	D	0.93	95.4	F	0.75	58.7	E
		R	0.63	39.8	D	0.85	56.4	E	0.35	31.1	C	0.57	37.0	D
	NB	TR	0.18	12.1	B	0.20	12.2	B	0.11	11.5	B	0.12	11.6	B
	SB	L	0.45	10.9	B	0.47	11.5	B	0.98	42.4	D	1.00	49.8	D
		LT	0.15	6.5	A	0.16	6.5	A	0.55	10.8	B	0.69	13.8	B
	Overall		**0.70**	**20.4**	**C**		**23.4**	**C**	**0.97**	**33.0**	**C**		**33.7**	**C**
Astoria Boulevard / 82nd Street / 24th Avenue	EB	L	0.27	31.8	C	0.28	32.8	C	0.16	20.1	C	0.16	20.2	C
		TR	0.26	21.7	C	0.27	21.8	C	0.95	33.9	C	0.96	35.3	D
	WB	L	0.07	14.6	B	0.07	14.6	B	0.37	46.6	D	0.38	47.4	D
		TR	0.90	24.4	C	0.92	25.8	C	0.38	14.3	B	0.38	14.4	B
	NB (24th Ave)	L	0.23	48.9	D	0.23	49.0	D	0.61	71.2	E	0.62	71.8	E
		TR	0.09	46.7	D	0.09	46.7	D	0.31	57.9	E	0.31	57.9	E
	SB	L	0.43	45.8	D	0.47	47.1	D	0.6	50.2	D	0.73	56.8	E
		T	0.49	47.1	D	0.54	48.7	D	1.04	105.5	F	1.05	104.3	F
		R	0.22	41.9	D	0.24	42.4	D	0.66	56.9	E	0.80	68.9	E
	Overall		**0.70**	**27.2**	**C**		**28.5**	**C**	**0.86**	**39.3**	**D**		**42.1**	**D**

Table 7: Existing Level of Service Comparison: 2012 vs. 2014 (Cont'd)

			AM Peak Hour						PM Peak Hour					
Intersection	App.	Move-ment	2012 Existing (2014 EA)			2014 Existing			2012 Existing (2014 EA)			2014 Existing		
			v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Ditmars Boulevard / Marine Terminal Road	WB	L	0.73	38.5	D	0.62	33.9	C	0.78	41.8	D	0.94	61.8	E
		R	0.53	30.8	C	0.56	31.8	C	0.34	26.5	C	0.50	29.8	C
	NB	T	0.84	19.5	B	0.84	19.6	B	0.30	9.7	A	0.36	10.2	B
		R	0.53	13.6	B	0.61	15.3	B	0.44	12.1	B	0.42	11.9	B
	SB	T	0.16	8.6	A	0.17	8.7	A	0.71	15.2	B	0.71	15.4	B
	Overall		**0.80**	**20.6**	**C**		**20.1**	**C**	**0.73**	**17.6**	**B**		**21.2**	**C**
Bowery Bay Boulevard / Runway Drive / Marine Terminal Road	EB	LTR	0.78	46.7	D	0.95	63.6	E	0.56	39.6	D	0.56	39.4	D
	WB	LTR	0.38	28.1	C	0.40	28.4	C	0.38	28.2	C	0.50	30.3	C
	NB	DefL	0.59	36.5	D	0.71	42.4	D	0.33	29.5	C	0.76	47.6	D
		T	0.56	34.5	C	0.53	33.7	C	0.39	30.7	C	0.47	32.6	C
		R	0.14	6.0	A	0.15	6.1	A	0.05	5.4	A	0.14	6.0	A
	SB	LT	0.29	28.2	C	0.38	29.7	C	0.29	28.0	C	0.35	29.0	C
		R	0.05	9.9	A	0.05	9.8	A	0.10	10.2	B	0.13	10.5	B
	Overall		**0.56**	**33.7**	**C**		**40.9**	**D**	**0.43**	**29.7**	**C**		**31.6**	**C**
Ditmars Boulevard / 81st Street	EB	LTR	0.09	7.3	A	0.10	7.3	A	0.27	8.5	A	0.27	8.5	A
	WB	LT	0.15	7.7	A	0.16	7.7	A	0.19	7.9	A	0.23	8.2	A
		R	1.05	55.1	E	1.05	58.2	E	0.35	8.4	A	0.44	9.5	A
	SB	LTR	0.28	26.3	C	0.30	26.5	C	1.05	74.5	E	1.05	75.1	E
	Overall		**0.19**	**39.4**	**D**		**40.9**	**D**	**0.53**	**40.1**	**D**		**38.2**	**D**
21st Avenue / 81st Street	EB	LR	0.23	21.3	C	0.24	21.5	C	0.42	24.4	C	0.42	24.5	C
	NB	LT	0.83	22.6	C	0.84	23.3	C	0.28	12.0	B	0.35	12.8	B
	SB	TR	0.09	10.4	B	0.10	10.5	B	0.50	14.4	B	0.50	14.4	B
	Overall		**0.59**	**21.4**	**C**		**21.9**	**C**	**0.47**	**15.2**	**B**		**15.3**	**B**
19th Avenue / Hazen Street	EB	LTR	0.29	14.5	B	0.30	14.6	B	1.05	94	F	1.05	96.6	F
	WB	LT	0.43	15.7	B	0.43	15.8	B	0.66	42.3	D	0.70	45.4	D
		R	0.89	23.7	C	0.90	24.7	C	0.22	9.7	A	0.22	9.8	A
	NB	LTR	1.03	85.0	F	1.04	88.4	F	0.61	31.4	C	0.60	30.8	C
	SB	L	0.15	21.6	C	0.15	21.5	C	0.70	13.5	B	0.69	13.0	B
		TR	0.03	16.5	B	0.03	16.5	B	0.33	6.3	A	0.33	6.0	A
	Overall		**0.93**	**34.1**	**C**		**35.4**	**D**	**0.67**	**33.2**	**C**		**32.7**	**C**
UNSIGNALIZED INTERSECTIONS														
19th Avenue / 45th Street	EB	LTR	0.02	8.1	A	0.02	8.2	A	0.01	8.2	A	0.01	8.2	A
	WB	LTR	0.01	7.5	A	0.01	7.5	A	0.02	8.2	A	0.02	8.2	A
	NB	LTR	0.12	15.0	B	0.13	15.2	C	0.11	14.9	B	0.11	15.0	B
	SB	LTR	0.08	14.3	B	0.08	14.4	B	0.44	21.7	C	0.51	24.3	C

A.7.6.2 Future Without Construction Conditions

A compounded total growth rate of 1.51 percent was applied to the 2014 existing traffic volumes to establish the Future Without Construction traffic volumes in 2017. It should be noted that the 2014 EA included the Runway Safety Area Enhancement (RSAE) project in the 2015 peak construction condition. The runway project started in 2014 and is expected to be completed at the end of 2016. Since the peak construction year for the proposed design changes is expected to occur in the 2nd quarter of 2017, vehicle trips associated with the RSAE project were not included in the 2017 peak construction condition. A copy of the traffic volume comparison tables for the Future Without Construction Conditions is provided in **Exhibit A**.

A comparison of LOS for the Future Without Construction Conditions is presented in **Table 8** for the AM and PM Peak Hours.

Table 8: Future without Construction Condition Level of Service Comparison: 2015 (previously approved (2014) design) vs. 2017 (proposed design changes)

			AM Peak Hour						PM Peak Hour					
			2015 Without Construction (2014 EA)			2017 Without Construction			2015 Without Construction (2014 EA)			2017 Without Construction		
Intersection	App.	Move-ment	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
SIGNALIZED INTERSECTIONS														
LaGuardia Access Road / 94th Street	WB	L	1.42	230.2	F	1.43	234.1	F	1.42	229.4	F	1.42	231.0	F
		LT	0.73	38.3	D	0.27	26.7	C	0.16	25.2	C	0.58	32.6	C
		R	0.69	16.4	C	0.67	15.7	C	0.48	12.5	B	0.82	24.7	C
	NB	L	0.24	9.4	A	0.24	9.5	A	0.28	11.8	B	0.44	16.5	B
		T	0.18	7.9	A	0.17	7.8	A	0.30	8.8	A	0.37	9.4	A
	SB	T	0.28	22.0	C	0.29	22.2	C	0.39	23.4	C	0.46	24.4	C
		R	0.17	12.9	B	0.09	9.1	A	0.52	14.3	B	0.61	14.1	B
	Overall		*	83.4	F		89.7	F	*	74.9	E		72.4	E
Ditmars Boulevard / 94th Street	EB	L	0.32	20.6	C	0.21	19.1	B	0.39	21.8	C	0.44	22.8	C
		TR	0.29	19.6	B	0.34	20.2	C	0.68	25.6	C	0.69	25.8	C
	WB	L	0.15	18.9	B	0.25	20.7	C	0.51	38.5	D	0.92	97.5	F
		R	0.12	7.1	A	0.14	7.3	A	0.16	7.4	A	0.21	7.7	A
	NB	TR	0.37	28.6	C	0.35	28.3	C	0.57	32.2	C	0.68	35.3	D
	SB	L	0.37	34.9	C	0.34	34.5	C	0.36	34.6	C	0.43	35.8	D
		T	0.48	17.2	B	0.55	18.6	B	0.55	18.5	B	0.73	24.0	C
	Overall		0.41	20.9	C		20.7	C	0.61	24.3	C		27.7	C
23rd Avenue / 94th Street	EB	LTR	0.38	17.9	B	0.41	18.3	B	1.06	69.2	E	0.95	43.5	D
	WB	LTR	0.49	18.5	B	0.42	17.6	B	0.50	19.6	B	0.67	23.0	C
	NB	L	0.08	7.8	A	0.06	7.6	A	0.11	8.2	A	0.15	9.1	A
		TR	0.26	9.2	A	0.30	9.6	A	0.37	10.2	B	0.50	12.1	B
	SB	L	0.05	7.3	A	0.12	7.8	A	0.15	8.1	A	0.21	8.9	A
		TR	0.57	13.1	B	0.61	13.8	B	0.63	14.2	B	0.86	24.3	C
	Overall		0.54	15.0	B		14.6	B	0.79	37.1	D		27.1	C
24th Avenue / 94th Street	EB	LTR	0.17	15.8	B	0.17	15.8	B	0.18	15.9	B	0.18	15.9	B
	WB	LTR	0.18	15.8	B	0.18	15.8	B	0.15	15.5	B	0.15	15.5	B
	NB	LTR	0.30	9.4	A	0.30	9.4	A	0.40	10.3	B	0.40	10.3	B
	SB	LTR	0.28	9.0	A	0.29	9.1	A	0.55	12.3	B	0.55	12.4	B
	Overall		0.25	10.6	B		10.7	B	0.41	12.1	B		12.2	B
25th Avenue / 94th Street	EB	LTR	0.25	16.7	B	0.25	16.7	B	0.22	16.3	B	0.22	16.3	B
	WB	LTR	0.29	17.2	B	0.29	17.2	B	0.28	16.9	B	0.28	16.9	B
	NB	LTR	0.19	8.2	A	0.19	8.3	A	0.40	10.2	B	0.40	10.3	B
	SB	LTR	0.34	9.7	A	0.35	9.8	A	0.50	11.6	B	0.51	11.7	B
	Overall		0.32	11.9	B		11.9	B	0.42	12.2	B		12.3	B
Astoria Boulevard / 94th Street	EB	L	0.27	37.8	D	0.27	38.2	D	0.28	17.1	B	0.28	17.3	B
		TR	0.24	20.2	C	0.24	20.1	C	-	-	-	-	-	-
		T	-	-	-	-	-	-	0.86	28.9	C	0.87	29.4	C
		R	-	-	-	-	-	-	0.17	19.8	B	0.18	19.9	B
	WB	L	0.10	10.6	B	0.10	10.6	B	0.27	36.4	D	0.27	36.8	D
		T	0.96	38.7	D	0.97	40.5	D	-	-	-	-	-	-
		R	0.07	18.4	B	0.07	18.4	B	-	-	-	-	-	-
		TR	-	-	-	-	-	-	0.41	22.3	C	0.41	22.4	C
	NB	L	0.25	33.5	C	0.25	33.5	C	0.69	58.2	E	0.71	60.7	E
		TR	0.23	32.4	C	0.24	32.5	C	0.65	44.2	D	0.65	44.5	D
	SB	L	0.16	31.2	C	0.16	31.2	C	0.31	35.2	D	0.32	35.4	D
		TR	0.43	35.8	D	0.44	35.9	D	0.65	42.0	D	0.65	42.2	D
	Overall		0.73	34.7	C		35.9	D	0.76	30.3	C		30.7	C

Table 8: Future without Construction Condition Level of Service Comparison: 2015 vs. 2017 (Cont'd)

			AM Peak Hour						PM Peak Hour					
			2015 Without Construction (2014 EA)			2017 Without Construction			2015 Without Construction (2014 EA)			2017 Without Construction		
Intersection	App.	Move-ment	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
31st Avenue / 94th Street	EB	LTR	0.21	11.9	B	0.21	11.9	B	0.64	18.8	B	0.65	18.9	B
	WB	LTR	0.21	12.1	B	0.21	12.1	B	0.22	12.0	B	0.22	12.0	B
	NB	LTR	0.25	12.4	B	0.25	12.4	B	0.37	13.7	B	0.37	13.7	B
	SB	LTR	0.43	14.6	B	0.42	14.5	B	0.5	15.7	B	0.50	15.7	B
	Overall		**0.32**	**13.1**	**B**		**13.1**	**B**	**0.57**	**15.9**	**B**		**16.0**	**B**
Northern Boulevard / Junction Boulevard	EB	L	0.08	16.6	B	0.08	16.9	B	0.12	14.0	B	0.12	14.1	B
		TR	0.31	15.2	B	0.32	15.3	B	0.78	18.3	B	0.79	18.5	B
	WB	L	0.19	9.8	A	0.19	9.9	A	0.35	26.1	C	0.36	26.8	C
		TR	0.82	19.8	B	0.83	20.2	C	0.57	19.3	B	0.58	19.4	B
	NB	L	0.28	42.0	D	0.27	41.8	D	0.51	56.9	E	0.53	58.0	E
		TR	0.58	48.4	D	0.59	48.7	D	0.90	80.8	F	0.92	83.1	F
	SB	L	0.29	41.0	D	0.30	41.1	D	0.61	58.7	E	0.62	59.8	E
		TR	0.57	46.6	D	0.56	46.2	D	0.79	59.2	E	0.80	60.0	E
	Overall		**0.65**	**23.6**	**C**		**23.7**	**C**	**0.78**	**28.9**	**C**		**29.3**	**C**
Astoria Boulevard / 77th Street	EB	T1	0.44	11.1	B	0.43	10.9	B	0.10	7.6	A	0.10	7.5	A
		T2	0.47	10.6	B	0.47	10.7	B	1.06	55.4	E	1.07	56.7	E
	NB	R1	0.45	40.4	D	0.45	40.4	D	0.85	59.1	E	0.87	62.2	E
		R2	0.19	35.9	D	0.19	35.9	D	1.03	101.9	F	1.06	110.4	F
	Overall		**0.46**	**14.2**	**B**		**14.2**	**B**	**1.06**	**58.1**	**E**		**60.1**	**E**
Astoria Boulevard North Service Road / 79th Street / 23rd Avenue	NEB	T	0.50	39.8	D	0.93	61.2	E	0.45	39.1	D	0.85	52.6	D
	NWB	T	0.61	5.7	A	0.61	5.8	A	0.29	3.8	A	0.29	3.8	A
	Overall		**0.58**	**12.3**	**B**		**22.6**	**C**	**0.34**	**14.9**	**B**		**26.2**	**C**
Astoria Boulevard / Astoria Boulevard North Service Road	WB	T	0.63	36.3	D	0.63	36.4	D	0.86	45.7	D	0.87	46.3	D
	NWB	L	0.51	9.6	A	0.51	9.7	A	0.35	8.3	A	0.35	8.3	A
	Overall		**0.55**	**17.3**	**B**		**17.4**	**B**	**0.53**	**25.1**	**C**		**25.4**	**C**
Astoria Boulevard North / Grand Central Parkway westbound off-ramp / 82nd Street / Ditmars Boulevard	WB	LT	0.42	13.9	B	0.50	14.8	B	0.46	15.5	B	0.59	17.3	B
		R	1.35	188.4	F	1.11	85.5	F	1.10	86.1	F	0.57	18.6	B
	NB	DefL	-	-	-	-	-	-	1.05	145.2	F	0.98	119.9	F
		T	-	-	-	-	-	-	0.29	19.5	B	0.42	21.1	C
		LT	0.63	24.1	C	0.67	24.9	C	-	-	-	-	-	-
	SB	TR	0.36	20.2	C	0.34	20.0	B	0.88	32.3	C	0.93	36.0	D
	Overall		**1.03**	**72.5**	**E**		**38.1**	**D**	**1.08**	**42.3**	**D**		**28.1**	**C**
23rd Avenue / 82nd Street	EB	LTR	0.55	32.3	C	0.51	31.7	C	0.60	33.4	C	0.50	31.5	C
	WB	L	0.40	38.4	D	0.52	43.5	D	0.96	103.5	F	0.77	60.8	E
		R	0.64	40.1	D	0.86	58.1	E	0.36	31.2	C	0.58	37.4	D
	NB	TR	0.19	12.1	B	0.20	12.2	B	0.11	11.5	B	0.12	11.6	B
	SB	L	0.46	11.2	B	0.48	11.7	B	1.00	47.0	D	1.02	55.3	E
		LT	0.15	6.5	A	0.16	6.5	A	0.56	10.9	B	0.70	14.1	B
	Overall		**0.72**	**20.5**	**C**		**23.8**	**C**	**0.99**	**35.3**	**D**		**36.1**	**D**
Astoria Boulevard / 82nd Street / 24th Avenue	EB	L	0.27	31.8	C	0.28	32.8	C	0.16	20.3	C	0.17	20.3	C
		TR	0.27	21.8	C	0.27	21.8	C	0.96	36.1	D	0.97	37.8	D
	WB	L	0.07	14.6	B	0.07	14.7	B	0.38	47.6	D	0.38	48.1	D
		TR	0.91	25.5	C	0.93	27.2	C	0.38	14.4	B	0.39	14.4	B
	NB (24th Ave)	L	0.23	48.9	D	0.24	49.2	D	0.62	71.5	E	0.63	72.3	E
		TR	0.09	46.7	D	0.09	46.7	D	0.31	57.2	E	0.31	57.9	E
	SB	L	0.46	46.8	D	0.48	47.3	D	0.61	50.6	D	0.74	57.6	E
		T	0.50	47.5	D	0.55	49.1	D	1.05	109.6	F	1.06	108.7	F
		R	0.23	42.0	D	0.25	42.5	D	0.67	57.7	E	0.81	70.3	E
	Overall		**0.71**	**28.1**	**C**		**29.6**	**C**	**0.88**	**40.9**	**D**		**44.0**	**D**

Table 8: Future without Construction Condition Level of Service Comparison: 2015 vs. 2017 (Cont'd)

			AM Peak Hour						PM Peak Hour					
			2015 Without Construction (2014 EA)			2017 Without Construction			2015 Without Construction (2014 EA)			2017 Without Construction		
Intersection	App.	Move-ment	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Ditmars Boulevard / Marine Terminal Road	WB	L	0.74	39.2	D	0.63	34.2	C	0.79	42.7	D	0.96	65.2	E
		R	0.53	30.9	C	0.58	32.2	C	0.34	26.6	C	0.50	29.9	C
	NB	T	0.85	20.2	C	0.85	20.3	C	0.31	9.7	A	0.37	10.3	B
		R	0.54	13.8	B	0.62	15.6	B	0.44	12.2	B	0.43	12.0	B
	SB	T	0.17	8.7	A	0.17	8.7	A	0.72	15.5	B	0.72	15.7	B
	Overall		**0.81**	**21.0**	**C**		**20.6**	**C**	**0.74**	**17.9**	**B**		**21.8**	**C**
Bowery Bay Boulevard / Runway Drive / Marine Terminal Road	EB	LTR	0.79	47.2	D	0.96	66.1	E	0.57	39.7	D	0.56	39.6	D
	WB	LTR	0.38	28.2	C	0.40	28.5	C	0.39	28.3	C	0.51	30.4	C
	NB	DefL	0.60	36.9	D	0.72	43.3	D	0.34	29.7	C	0.78	49.2	D
		T	0.57	34.9	C	0.54	33.9	C	0.4	30.9	C	0.48	32.8	C
		R	0.14	6.0	A	0.16	6.1	A	0.05	5.4	A	0.14	6.0	A
	SB	LT	0.30	28.2	C	0.38	29.8	C	0.29	28.1	C	0.35	29.1	C
		R	0.05	9.9	A	0.05	9.8	A	0.10	10.2	B	0.13	10.5	B
	Overall		**0.56**	**34.0**	**C**		**42.0**	**D**	**0.44**	**29.8**	**C**		**32.0**	**C**
Ditmars Boulevard / 81st Street	EB	LTR	0.09	7.3	A	0.10	7.3	A	0.27	8.5	A	0.28	8.6	A
	WB	LT	0.16	7.7	A	0.16	7.7	A	0.19	7.9	A	0.24	8.3	A
		R	1.39	199.2	F	1.13	86.2	F	0.38	8.7	A	0.47	9.9	A
	SB	LTR	0.30	26.5	C	0.30	26.6	C	1.07	80.1	F	1.07	81.0	F
	Overall		**0.20**	**134.4**	**F**		**58.5**	**E**	**0.53**	**42.5**	**D**		**40.7**	**D**
21st Avenue / 81st Street	EB	LR	0.23	21.4	C	0.24	21.5	C	0.43	24.6	C	0.43	24.7	C
	NB	LT	0.85	23.5	C	0.86	24.0	C	0.28	12.1	B	0.36	12.9	B
	SB	TR	0.10	10.5	B	0.10	10.5	B	0.51	14.4	B	0.51	14.5	B
	Overall		**0.60**	**22.1**	**C**		**22.5**	**C**	**0.47**	**15.3**	**B**		**15.4**	**B**
19th Avenue / Hazen Street	EB	LTR	0.33	15.0	B	0.31	14.7	B	1.07	99.9	F	1.00	80.4	F
	WB	LT	0.44	16.0	B	0.44	15.8	B	0.67	42.8	D	0.67	42.7	D
		R	0.91	25.3	C	0.92	26.4	C	0.22	9.7	A	0.22	9.7	A
	NB	LTR	1.04	89.1	F	1.05	92.7	F	0.61	31.6	C	0.62	31.9	C
	SB	L	0.15	21.5	C	0.15	21.4	C	0.71	13.9	B	0.72	14.2	B
		TR	0.03	16.5	B	0.03	16.5	B	0.33	6.4	A	0.33	6.4	A
	Overall			**35.6**	**D**		**37.1**	**D**	**0.68**	**34.4**	**C**		**30.1**	**C**
UNSIGNALIZED INTERSECTIONS														
19th Avenue / 45th Street	EB	LTR	0.02	8.2	A	0.02	8.2	A	0.01	8.2	A	0.01	8.2	A
	WB	LTR	0.01	7.5	A	0.01	7.5	A	0.02	8.2	A	0.02	8.2	A
	NB	LTR	0.13	15.5	C	0.13	15.3	C	0.11	15.0	C	0.11	15.1	C
	SB	L	0.28	17.3	C	0.08	14.5	B	0.52	24.5	C	0.53	25.2	D
UNSIGNALIZED FLAGGER CONTROLLED INTERSECTIONS														
LGA New Access / 19th Avenue-81st Street	EB	LT	0.11	0.0	A	0.11	0.0	A	0.57	0.5	A	0.57	0.5	A
	WB	TR	0.71	5.2	A	0.71	5.2	A	0.21	1.8	A	0.21	1.8	A
	SB	LR	0.18	39.8	D	0.18	39.8	D	0.00	39.2	D	0.00	39.2	D

A.7.6.3 Future With Construction Conditions - Proposed design changes

Construction trips generated during the peak construction period for the proposed design changes (**Table 5**) were added to the 2017 Future Without Condition to develop traffic volumes for the 2017 Future With Construction Conditions-proposed design changes. A copy of the traffic volume comparison tables for the Future Without Construction Conditions is provided in **Exhibit A**.

Intersection capacity analysis was conducted for the same 21 intersections for the 2017 Future With Construction Conditions. The results of the Future Without Construction and Future With Construction conditions were then compared in accordance with CEQR Technical Manual criteria. This was done to identify any critical changes in projected traffic operations associated with construction of the proposed design changes, as well as any transportation improvements that would be required to ensure acceptable traffic operations with the addition of construction traffic during peak construction peak time periods. As shown in the 2014 EA, transportation improvements were recommended for 12 of the 21 analyzed intersections. Some of these improvements were adjusted or eliminated to reflect projected traffic conditions during the peak construction condition in 2017 and are documented in **Table 9**.

Table 10 compares the weekday AM and PM peak hour intersection capacity analysis results for the Future Without Construction with those under the Future With Construction Condition with the transportation improvements identified in **Table 9**. With these improvements in place, no significant impacts are projected during the construction period in accordance with the CEQR Technical Manual criteria. A comparison of the construction capacity analysis results for the 2014 EA and the proposed design changes are presented in **Table 11**.

Table 9: Comparison of Proposed Transportation Improvements

AM Peak Hour		
Intersection	**Improvements in 2014 EA**	**Improvements for Current Project**
Astoria Blvd N / GCP WB off-ramp / 82nd Street / Ditmars Blvd	Restripe WB Geometry to include one shared left-thru and two right turn only lanes.	Proposed geometry change is not needed. Instead, only shift 4 sec Green Time from NB/SB to WB.
Ditmars Blvd / Marine Terminal Road	Shift 1 sec Green Time from WB to NB/SB.	Mitigation no longer needed.
Marine Terminal Rd / Bowery Bay Blvd	n/a	Shift 4 sec Green Time from WB to NB/SB.
Northern Blvd / Junction Blvd	Shift 1 sec Green Time from EB/WB to NB/SB.	Mitigation no longer needed.
Astoria Blvd N SR / 79th Street / 23rd Ave	Shift 5 sec Green Time from NWB to NEB.	Same as 2014 EA with additional 6 sec green time adjustment.
23rd Avenue / 82nd Street	Shift 9 sec Green Time from NB/SB, plus 1 sec Green Time from SB, (10 sec total) to EB/WB.	Same as 2014 EA
Ditmars Blvd / 81st Street	Restripe WB Geometry to include one shared left-thru and two right turn only lanes.	Same as 2014 EA
21st Ave / 81st Street	Shift 8 sec Green Time from EB to NB/SB.	Same as 2014 EA
19th Ave / Hazen Street	Add right turn bay to Eastbound approach, original lane restriped as shared left-thru. Shift 4 sec Green Time from SB to EB/WB.	Same as 2014 EA
19th Ave / 45th Street	Add Traffic Signal. Add SB exclusive left turn lane by prohibit parking.	Same as 2014 EA with green time adjustment.
New LGA Access / 19th Ave / 81st Street	See new geometry coordinated with NYCDOT.	Same as 2014 EA
PM Peak Hour		
Astoria Blvd / 82nd Street / 24th Ave	Shift 1 sec Green Time from EB/WB to SB.	Same as 2014 EA
Astoria Blvd N / GCP WB off-ramp / 82nd Street / Ditmars Blvd	Restripe WB Geometry to include one shared left-thru and two right turn only lanes (same as AM). Shift 4 sec Green Time from WB to NB/SB.	Proposed geometry change is not needed. Instead, only shift 3 sec Green Time from WB to NB/SB.
Northern Blvd / Junction Blvd	Shift 2 sec Green Time from EB/WB to NB/SB.	Same as 2014 EA
Astoria Blvd / Astoria Blvd N SR	Shift 7 sec Green Time from NWB to WB.	Same as 2014 EA
Ditmars Blvd / 81st Street	Shift 8 sec Green Time from EB/WB to SB.	Same as 2014 EA
19th Ave / Hazen Street	Add right turn bay to Eastbound approach, original lane restriped as shared left-thru. Shift 7 sec Green Time from SB, plus 5 sec from NB/SB, (12 sec total) to EB/WB.	Same as 2014 EA
19th Ave / 45th Street	Add Traffic Signal. Add SB exclusive left turn lane by prohibit parking.	Same as 2014 EA
New LGA Access / 19th Ave / 81st Street	See new geometry coordinated with NYCDOT.	Same as 2014 EA

Table 10: Level of Service - 2017 Future Construction Condition - Proposed design changes

Intersection	App.	Move-ment	2017 No Action			2017 With Construction & Improvements			Impact?	2017 No Action			2017 With Construction & Improvements			Impact?
			v/c	Delay	LOS	v/c	Delay	LOS		v/c	Delay	LOS	v/c	Delay	LOS	
SIGNALIZED INTERSECTIONS																
LaGuardia Access Road / 94th Street	WB	L	1.43	234.1	F	1.43	234.1	F		1.42	231.0	F	1.42	231.0	F	
		LT	0.27	26.7	C	0.27	26.7	C		0.58	32.6	C	0.58	32.6	C	
		R	0.67	15.7	C	0.67	15.8	C		0.82	24.7	C	0.82	25.1	D	
	NB	L	0.24	9.5	A	0.25	10.5	B		0.44	16.5	B	0.47	19.7	B	
		T	0.17	7.8	A	0.18	7.9	A		0.37	9.4	A	0.37	9.4	A	
	SB	T	0.29	22.2	C	0.35	23.0	C		0.46	24.4	C	0.55	25.9	C	
		R	0.09	9.1	A	0.09	9.1	A		0.61	14.1	B	0.61	14.1	B	
	Overall			**89.7**	**F**		**88.0**	**F**			**72.4**	**E**		**71.5**	**E**	
Ditmars Boulevard / 94th Street	EB	L	0.21	19.1	B	0.21	19.1	B		0.44	22.8	C	0.44	22.8	C	
		TR	0.34	20.2	C	0.31	19.7	B		0.69	25.8	C	0.69	25.8	C	
	WB	L	0.25	20.7	C	0.25	20.7	C		0.92	97.5	F	0.92	97.5	F	
		R	0.14	7.3	A	0.14	7.2	A		0.21	7.7	A	0.21	7.7	A	
	NB	TR	0.35	28.3	C	0.37	28.5	C		0.68	35.3	D	0.70	35.7	D	
	SB	L	0.34	34.5	C	0.31	33.9	C		0.43	35.8	D	0.43	35.8	D	
		T	0.55	18.6	B	0.51	17.5	B		0.73	24.0	C	0.74	24.5	C	
	Overall			**20.7**	**C**		**20.3**	**C**			**27.7**	**C**		**27.9**	**C**	
23rd Avenue / 94th Street	EB	LTR	0.41	18.3	B	0.41	18.3	B		0.95	43.5	D	0.95	43.5	D	
	WB	LTR	0.42	17.6	B	0.42	17.6	B		0.67	23.0	C	0.67	23.0	C	
	NB	L	0.06	7.6	A	0.06	7.6	A		0.15	9.1	A	0.15	9.2	A	
		TR	0.30	9.6	A	0.32	9.8	A		0.5	12.1	B	0.52	12.3	B	
	SB	L	0.12	7.8	A	0.12	7.9	A		0.21	8.9	A	0.22	8.9	A	
		TR	0.61	13.8	B	0.62	14.0	B		0.86	24.3	C	0.87	25.1	C	
	Overall			**14.6**	**B**		**14.7**	**B**			**27.1**	**C**		**27.3**	**C**	
24th Avenue / 94th Street	EB	LTR	0.17	15.8	B	0.17	15.8	B		0.18	15.9	B	0.18	15.9	B	
	WB	LTR	0.18	15.8	B	0.18	15.8	B		0.15	15.5	B	0.15	15.5	B	
	NB	LTR	0.30	9.4	A	0.32	9.5	A		0.40	10.3	B	0.41	10.5	B	
	SB	LTR	0.29	9.1	A	0.30	9.2	A		0.55	12.4	B	0.56	12.6	B	
	Overall			**10.7**	**B**		**10.7**	**B**			**12.2**	**B**		**12.3**	**B**	
25th Avenue / 94th Street	EB	LTR	0.25	16.7	B	0.25	16.7	B		0.22	16.3	B	0.22	16.3	B	
	WB	LTR	0.29	17.2	B	0.29	17.2	B		0.28	16.9	B	0.28	16.9	B	
	NB	LTR	0.19	8.3	A	0.20	8.3	A		0.40	10.3	B	0.41	10.4	B	
	SB	LTR	0.35	9.8	A	0.36	9.9	A		0.51	11.7	B	0.52	11.8	B	
	Overall			**11.9**	**B**		**11.9**	**B**			**12.3**	**B**		**12.3**	**B**	
Astoria Boulevard / 94th Street	EB	L	0.27	38.2	D	0.27	38.7	D		0.28	17.3	B	0.29	17.5	B	
		TR	0.24	20.1	C	0.26	20.3	C		-	-	-	-	-	-	
		T	-	-	-	-	-	-		0.87	29.4	C	0.88	29.8	C	
		R	-	-	-	-	-	-		0.18	19.9	B	0.22	20.5	C	
	WB	L	0.10	10.6	B	0.10	10.8	B		0.27	36.8	D	0.27	37.0	D	
		T	0.97	40.5	D	0.98	42.2	D		-	-	-	-	-	-	
		R	0.07	18.4	B	0.08	18.6	B		-	-	-	-	-	-	
		TR	-	-	-	-	-	-		0.41	22.4	C	0.42	22.5	C	
	NB	L	0.25	33.5	C	0.35	36.1	D		0.71	60.7	E	0.72	62.7	E	
		TR	0.24	32.5	C	0.24	32.5	C		0.65	44.5	D	0.65	44.5	D	
	SB	L	0.16	31.2	C	0.18	31.6	C		0.32	35.4	D	0.35	36.2	D	
		TR	0.44	35.9	D	0.44	36.1	D		0.65	42.2	D	0.66	42.4	D	
	Overall			**35.9**	**D**		**36.9**	**D**			**30.7**	**C**		**31.0**	**C**	

Table 10: Level of Service - 2017 Future Construction Condition (Cont'd)

Intersection	App.	Move-ment	2017 No Action v/c	2017 No Action Delay	2017 No Action LOS	2017 With Construction & Improvements v/c	2017 With Construction & Improvements Delay	2017 With Construction & Improvements LOS	Impact?	2017 No Action v/c	2017 No Action Delay	2017 No Action LOS	2017 With Construction & Improvements v/c	2017 With Construction & Improvements Delay	2017 With Construction & Improvements LOS	Impact?
SIGNALIZED INTERSECTIONS																
31st Avenue / 94th Street	EB	LTR	0.21	11.9	B	0.21	11.9	B		0.65	18.9	B	0.65	18.9	B	
	WB	LTR	0.21	12.1	B	0.21	12.1	B		0.22	12.0	B	0.22	12.0	B	
	NB	LTR	0.25	12.4	B	0.30	12.8	B		0.37	13.7	B	0.37	13.8	B	
	SB	LTR	0.42	14.5	B	0.45	15.0	B		0.5	15.7	B	0.54	16.4	B	
	Overall			**13.1**	**B**		**13.4**	**B**			**16.0**	**B**		**16.2**	**B**	
Northern Boulevard / Junction Boulevard	EB	L	0.08	16.9	B	0.08	16.9	B		0.12	14.1	B	0.12	15.6	B	
		TR	0.32	15.3	B	0.32	15.3	B		0.79	18.5	B	0.82	21.1	C	
	WB	L	0.19	9.9	A	0.19	9.9	A		0.36	26.8	C	0.37	30.5	C	
		TR	0.83	20.2	C	0.83	20.2	C		0.58	19.4	B	0.60	20.9	C	
	NB	L	0.27	41.8	D	0.29	42.7	D		0.53	58.0	E	0.51	55.0	E	
		TR	0.59	48.7	D	0.67	52.7	D		0.92	83.1	F	0.86	70.6	E	
	SB	L	0.30	41.1	D	0.32	42.2	D		0.62	59.8	E	0.56	52.5	D	
		TR	0.56	46.2	D	0.61	47.9	D		0.80	60.0	E	0.80	57.5	E	
	Overall			**23.7**	**C**		**24.6**	**C**			**29.3**	**C**		**29.9**	**C**	
Astoria Boulevard / 77th Street	EB	T1	0.43	10.9	B	0.43	10.9	B		0.10	7.5	A	0.10	7.5	A	
		T2	0.47	10.7	B	0.54	11.6	B		1.07	56.7	E	1.07	57.3	E	
	NB	R1	0.45	40.4	D	0.45	40.4	D		0.87	62.2	E	0.87	62.2	E	
		R2	0.19	35.9	D	0.19	35.9	D		1.06	110.4	F	1.06	110.4	F	
	Overall			**14.2**	**B**		**14.5**	**B**			**60.1**	**E**		**60.6**	**E**	
Astoria Boulevard North Service Road / 79th Street / 23rd Avenue	NEB	T	0.93	61.2	E	0.86	44.4	D		0.85	52.6	D	0.85	52.8	D	
	NWB	T	0.61	5.8	A	0.71	13.9	B		0.29	3.8	A	0.29	3.8	A	
	Overall			**22.6**	**C**		**24.7**	**C**			**26.2**	**C**		**26.3**	**C**	
Astoria Boulevard / Astoria Boulevard North Service Road	WB	T	0.63	36.4	D	0.72	38.9	D		0.87	46.3	D	0.86	41.0	D	
	NWB	L	0.51	9.7	A	0.51	9.7	A		0.35	8.3	A	0.39	12.7	B	
	Overall			**17.4**	**B**		**18.9**	**B**			**25.4**	**C**		**26.5**	**C**	
Astoria Boulevard North / Grand Central Parkway westbound off-ramp / 82nd Street / Ditmars Boulevard	WB	LT	0.50	14.8	B	0.46	12.2	B		0.59	17.3	B	0.63	19.9	B	
		R	1.11	85.5	F	1.12	86.5	F		0.57	18.6	B	0.61	21.5	C	
	NB	DefL	-	-	-	-	-	-		0.98	119.9	F	0.98	118.4	F	
		T	-	-	-	-	-	-		0.42	21.1	C	0.39	18.8	B	
		LT	0.67	24.9	C	0.91	38.2	D		-	-	-	-	-	-	
	SB	TR	0.34	20.0	B	0.39	24.4	C		0.93	36.0	D	0.97	40.7	D	
	Overall			**38.1**	**D**		**42.4**	**D**			**28.1**	**C**		**31.3**	**C**	
23rd Avenue / 82nd Street	EB	LTR	0.51	31.7	C	0.53	24.8	C		0.50	31.5	C	0.51	31.6	C	
	WB	L	0.52	43.5	D	0.46	32.9	C		0.77	60.8	E	0.77	61.6	E	
		R	0.86	58.1	E	0.59	29.3	C		0.58	37.4	D	0.58	37.4	D	
	NB	TR	0.20	12.2	B	0.27	18.0	B		0.12	11.6	B	0.12	11.6	B	
	SB	L	0.48	11.7	B	0.59	22.1	C		1.02	55.3	E	1.03	56.8	E	
		LT	0.16	6.5	A	0.21	11.4	B		0.70	14.1	B	0.73	15.1	B	
	Overall			**23.8**	**C**		**21.6**	**C**			**36.1**	**D**		**36.7**	**D**	
Astoria Boulevard / 82nd Street / 24th Avenue	EB	L	0.28	32.8	C	0.28	32.8	C		0.17	20.3	C	0.17	21.1	C	
		TR	0.27	21.8	C	0.27	21.8	C		0.97	37.8	D	0.99	42.6	D	
	WB	L	0.07	14.7	B	0.07	14.7	B		0.38	48.1	D	0.38	49.1	D	
		TR	0.93	27.2	C	0.96	30.8	C		0.39	14.4	B	0.40	15.0	B	
	B (24th Av	L	0.24	49.2	D	0.24	49.2	D		0.63	72.3	E	0.63	72.3	E	
		TR	0.09	46.7	D	0.09	46.7	D		0.31	57.9	E	0.31	57.9	E	
	SB	L	0.48	47.3	D	0.55	49.6	D		0.74	57.6	E	0.77	58.6	E	
		T	0.55	49.1	D	0.55	49.1	D		1.06	108.7	F	1.03	95.8	F	
		R	0.25	42.5	D	0.25	42.5	D		0.81	70.3	E	0.78	65.4	E	
	Overall			**29.6**	**C**		**32.3**	**C**			**44**	**D**		**45.1**	**D**	

Table 10: Level of Service - 2017 Future Construction Condition (Cont'd)

Intersection	App.	Move-ment	2017 No Action v/c	Delay	LOS	2017 With Construction & Improvements v/c	Delay	LOS	Impact?	2017 No Action v/c	Delay	LOS	2017 With Construction & Improvements v/c	Delay	LOS	Impact?
SIGNALIZED INTERSECTIONS																
Ditmars Boulevard / Marine Terminal Road	WB	L	0.63	34.2	C	0.65	34.7	C		0.96	65.2	E	0.97	67.7	E	
		R	0.58	32.2	C	0.58	32.2	C		0.50	29.9	C	0.50	29.9	C	
	NB	T	0.85	20.3	C	0.92	25.4	C		0.37	10.3	B	0.37	10.3	B	
		R	0.62	15.6	B	0.62	15.6	B		0.43	12	B	0.43	12.0	B	
	SB	T	0.17	8.7	A	0.24	9.2	A		0.72	15.7	B	0.83	19.3	B	
	Overall			**20.6**	**C**		**23.1**	**C**			**21.8**	**C**		**23.6**	**C**	
Bowery Bay Boulevard / Runway Drive / Marine Terminal Road	EB	LTR	0.96	66.1	E	0.96	66.1	E		0.56	39.6	D	0.56	39.6	D	
	WB	LTR	0.40	28.5	C	0.45	32.3	C		0.51	30.4	C	0.63	37.7	D	
	NB	DefL	0.72	43.3	D	0.83	47.9	D		0.78	49.2	D	0.84	53.2	D	
		T	0.54	33.9	C	0.51	29.8	C		0.48	32.8	C	0.42	26.8	C	
		R	0.16	6.1	A	0.16	6.1	A		0.14	6.0	A	0.14	6.0	A	
	SB	LT	0.38	29.8	C	0.53	29.7	C		0.35	29.1	C	0.48	27.4	C	
		R	0.05	9.8	A	0.04	8.1	A		0.13	10.5	B	0.12	7.8	A	
	Overall			**42.0**	**D**		**42.2**	**D**			**32.0**	**C**		**33.2**	**C**	
Ditmars Boulevard / 81st Street	EB	LTR	0.10	7.3	A	0.10	7.3	A		0.28	8.6	A	0.33	12.9	B	
	WB	LT	0.16	7.7	A	0.29	8.9	A		0.24	8.3	A	0.51	16.0	B	
		R	1.13	86.2	F	0.82	15.9	B		0.47	9.9	A	0.27	7.3	A	
	SB	LTR	0.30	26.6	C	0.50	29.3	C		1.07	81	F	0.97	46.1	D	
	Overall			**58.5**	**E**		**16.7**	**B**			**40.7**	**D**		**28.4**	**C**	
21st Avenue / 81st Street	EB	LR	0.24	21.5	C	0.32	28.7	C		0.43	24.7	C	0.43	24.7	C	
	NB	LT	0.86	24.0	C	0.93	24.7	C		0.36	12.9	B	0.39	13.3	B	
	SB	TR	0.10	10.5	B	0.16	7.3	A		0.51	14.5	B	0.62	16.2	B	
	Overall			**22.5**	**C**		**22.5**	**C**			**15.4**	**B**		**16.5**	**B**	
19th Avenue / Hazen Street	EB	LT	-	-	-	0.74	24.8	C		-	-	-	0.80	33.7	C	
		R	-	-	-	0.03	9.6	A		-	-	-	0.15	21.2	C	
		LTR	0.31	14.7	B	-	-	-		1.00	80.4	F	-	-	-	
	WB	LT	0.44	15.8	B	0.68	18.4	B		0.67	42.7	D	0.52	28.1	C	
		R	0.92	26.4	C	0.92	26.2	C		0.22	9.7	A	0.20	7.3	A	
	NB	LTR	1.05	92.7	F	1.05	92.7	F		0.62	31.9	C	0.75	42.8	D	
	SB	L	0.15	21.4	C	0.21	25.2	C		0.72	14.2	B	0.96	43.0	D	
		TR	0.03	16.5	B	0.04	19.1	B		0.33	6.4	A	0.42	12.8	B	
	Overall			**37.1**	**D**		**34.8**	**C**			**30.1**	**C**		**30.5**	**C**	
NEWLY SIGNALIZED INTERSECTIONS																
19th Avenue / 45th Street	EB	LTR	0.02	8.2	A	0.21	10.6	B		0.01	8.2	A	0.65	36.4	D	
	WB	LTR	0.01	7.5	A	0.83	24.5	C		0.02	8.2	A	0.71	42.1	D	
	NB	LTR	0.13	15.3	C	0.13	21.7	C		0.11	15.1	C	0.35	43.8	D	
	SB	LTR	0.08	14.5	B	-	-	-		0.53	25.2	D	-	-	-	
		L	-	-	-	0.81	41.9	D		-	-	-	0.59	11.4	B	
		TR	-	-	-	0.08	20.9	C		-	-	-	0.10	5.9	A	
	Overall			-	-		**27.2**	**C**			-	-		**24.0**	**C**	
NEWLY SIGNALIZED INTERSECTIONS																
LGA New Access / 19th Avenue-81st Street1	EB	L	-	-	-	0.50	5.1	A		-	-	-	0.29	0.5	A	
		T	-	-	-	0.20	0.1	A		-	-	-	0.70	1.4	A	
	WB	TR	-	-	-	0.91	13.7	B		-	-	-	0.27	2.2	A	
	SB	LR	-	-	-	0.18	39.8	D		-	-	-	0.18	39.8	D	
	Overall			-	-	**0.00**	**11.4**	**B**			-	-	**0.00**	**1.8**	**A**	

Table 11: Future Construction Condition LOS Comparison: 2015 vs. 2017

			AM Peak Hour						PM Peak Hour					
			2015 With Construction (2014 EA)			2017 With Construction			2015 With Construction (2014 EA)			2017 With Construction		
Intersection	App.	Move-ment	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
SIGNALIZED INTERSECTIONS														
LaGuardia Access Road / 94th Street	WB	L	1.42	230.2	F	1.43	234.1	F	1.42	229.4	F	1.42	231.0	F
		LT	0.73	38.3	D	0.27	26.7	C	0.16	25.2	C	0.58	32.6	C
		R	0.69	16.5	B	0.67	15.8	C	0.48	12.6	B	0.82	25.1	D
	NB	L	0.24	9.5	A	0.25	10.5	B	0.31	15.3	B	0.47	19.7	B
		T	0.19	7.9	A	0.18	7.9	A	0.31	8.8	A	0.37	9.4	A
	SB	T	0.29	22.1	C	0.35	23.0	C	0.55	25.6	C	0.55	25.9	C
		R	0.17	12.9	B	0.09	9.1	A	0.52	14.3	B	0.61	14.1	B
	Overall			**83.2**	**F**		**88.0**	**F**		**72.5**	**E**		**71.5**	**E**
Ditmars Boulevard / 94th Street	EB	L	0.32	20.5	C	0.21	19.1	B	0.39	21.8	C	0.44	22.8	C
		TR	0.26	19.2	B	0.31	19.7	B	0.68	25.6	C	0.69	25.8	C
	WB	L	0.15	18.9	B	0.25	20.7	C	0.51	38.5	D	0.92	97.5	F
		R	0.12	7.1	A	0.14	7.2	A	0.16	7.4	A	0.21	7.7	A
	NB	TR	0.38	28.8	C	0.37	28.5	C	0.58	32.4	C	0.70	35.7	D
	SB	L	0.34	34.2	C	0.31	33.9	C	0.36	34.6	C	0.43	35.8	D
		T	0.44	16.3	B	0.51	17.5	B	0.56	18.7	B	0.74	24.5	C
	Overall			**20.5**	**C**		**20.3**	**C**		**24.3**	**C**		**27.9**	**C**
23rd Avenue / 94th Street	EB	LTR	0.38	17.9	B	0.41	18.3	B	1.06	69.2	E	0.95	43.5	D
	WB	LTR	0.49	18.5	B	0.42	17.6	B	0.50	19.6	B	0.67	23.0	C
	NB	L	0.08	7.8	A	0.06	7.6	A	0.12	8.2	A	0.15	9.2	A
		TR	0.27	9.3	A	0.32	9.8	A	0.38	10.3	B	0.52	12.3	B
	SB	L	0.05	7.3	A	0.12	7.9	A	0.15	8.2	A	0.22	8.9	A
		TR	0.58	13.2	B	0.62	14.0	B	0.64	14.3	B	0.87	25.1	C
	Overall			**15.0**	**B**		**14.7**	**B**		**37.1**	**D**		**27.3**	**C**
24th Avenue / 94th Street	EB	LTR	0.17	15.8	B	0.17	15.8	B	0.18	15.9	B	0.18	15.9	B
	WB	LTR	0.18	15.8	B	0.18	15.8	B	0.15	15.5	B	0.15	15.5	B
	NB	LTR	0.31	9.5	A	0.32	9.5	A	0.40	10.4	B	0.41	10.5	B
	SB	LTR	0.29	9.1	A	0.30	9.2	A	0.55	12.4	B	0.56	12.6	B
	Overall			**10.7**	**B**		**10.7**	**B**		**12.2**	**B**		**12.3**	**B**
25th Avenue / 94th Street	EB	LTR	0.25	16.7	B	0.25	16.7	B	0.22	16.3	B	0.22	16.3	B
	WB	LTR	0.29	17.2	B	0.29	17.2	B	0.28	16.9	B	0.28	16.9	B
	NB	LTR	0.19	8.3	A	0.20	8.3	A	0.41	10.3	B	0.41	10.4	B
	SB	LTR	0.35	9.8	A	0.36	9.9	A	0.51	11.7	B	0.52	11.8	B
	Overall			**11.9**	**B**		**11.9**	**B**		**12.3**	**B**		**12.3**	**B**
Astoria Boulevard / 94th Street	EB	L	0.27	38.3	D	0.27	38.7	D	0.28	17.2	B	0.29	17.5	B
		TR	0.24	20.2	C	0.26	20.3	C	-	-	-	-	-	-
		T	-	-	-	-	-	-	0.87	29.5	C	0.88	29.8	C
		R	-	-	-	-	-	-	0.25	20.9	C	0.22	20.5	C
	WB	L	0.10	10.6	B	0.10	10.8	B	0.27	36.4	D	0.27	37.0	D
		T	0.97	41.1	D	0.98	42.2	D	-	-	-	-	-	-
		R	0.07	18.5	B	0.08	18.6	B	-	-	-	-	-	-
		TR	-	-	-	-	-	-	0.41	22.4	C	0.42	22.5	C
	NB	L	0.40	37.6	D	0.35	36.1	D	0.59	59.3	E	0.72	62.7	E
		TR	0.24	32.5	C	0.24	32.5	C	0.65	44.5	D	0.65	44.5	D
	SB	L	0.17	31.4	C	0.18	31.6	C	0.32	35.6	D	0.35	36.2	D
		TR	0.44	36.0	D	0.44	36.1	D	0.65	42.2	D	0.66	42.4	D
	Overall			**36.4**	**D**		**36.9**	**D**		**30.6**	**C**		**31.0**	**C**

Table 11: Future Construction Condition LOS Comparison: 2015 vs. 2017 (Cont'd)

			AM Peak Hour						PM Peak Hour					
			2015 With Construction (2014 EA)			2017 With Construction			2015 With Construction (2014 EA)			2017 With Construction		
Intersection	App.	Move-ment	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
31st Avenue / 94th Street	EB	LTR	0.21	11.9	B	0.21	11.9	B	0.64	18.8	B	0.65	18.9	B
	WB	LTR	0.21	12.1	B	0.21	12.1	B	0.22	12.0	B	0.22	12.0	B
	NB	LTR	0.32	13.1	B	0.30	12.8	B	0.37	13.8	B	0.37	13.8	B
	SB	LTR	0.43	14.7	B	0.45	15.0	B	0.55	16.7	B	0.54	16.4	B
	Overall			**13.3**	**B**		**13.4**	**B**		**16.3**	**B**		**16.2**	**B**
Northern Boulevard / Junction Boulevard	EB	L	0.08	17.8	B	0.08	16.9	B	0.12	15.4	B	0.12	15.6	B
		TR	0.32	15.8	B	0.32	15.3	B	0.81	20.8	C	0.82	21.1	C
	WB	L	0.19	10.3	B	0.19	9.9	A	0.37	29.6	C	0.37	30.5	C
		TR	0.83	21.2	C	0.83	20.2	C	0.59	20.8	C	0.60	20.9	C
	NB	L	0.26	40.6	D	0.29	42.7	D	0.53	57.3	E	0.51	55.0	E
		TR	0.69	53.0	D	0.67	52.7	D	0.85	69.0	E	0.86	70.6	E
	SB	L	0.32	41.6	D	0.32	42.2	D	0.55	52.1	D	0.56	52.5	D
		TR	0.56	45.2	D	0.61	47.9	D	0.82	59.2	E	0.80	57.5	E
	Overall			**25.2**	**C**		**24.6**	**C**		**29.9**	**C**		**29.9**	**C**
Astoria Boulevard / 77th Street	EB	T1	0.44	11.1	B	0.43	10.9	B	0.10	7.6	A	0.10	7.5	A
		T2	0.59	12.3	B	0.54	11.6	B	1.06	55.6	E	1.07	57.3	E
	NB	R1	0.45	40.4	D	0.45	40.4	D	0.85	59.1	E	0.87	62.2	E
		R2	0.19	35.9	D	0.19	35.9	D	1.03	101.9	F	1.06	110.4	F
	Overall			**14.9**	**B**		**14.5**	**B**		**58.3**	**E**		**60.6**	**E**
Astoria Boulevard North Service Road / 79th Street / 23rd Avenue	NEB	T	0.77	43.9	D	0.86	44.4	D	0.46	39.1	D	0.85	52.8	D
	NWB	T	0.65	9.0	A	0.71	13.9	B	0.29	3.8	A	0.29	3.8	A
	Overall			**19.5**	**B**		**24.7**	**C**		**14.9**	**B**		**26.3**	**C**
Astoria Boulevard / Astoria Boulevard North Service Road	WB	T	0.63	36.3	D	0.72	38.9	D	0.94	49.2	D	0.86	41.0	D
	NWB	L	0.51	9.6	A	0.51	9.7	A	0.39	12.7	B	0.39	12.7	B
	Overall			**17.3**	**B**		**18.9**	**B**		**31.4**	**C**		**26.5**	**C**
Astoria Boulevard North / Grand Central Parkway westbound off-ramp / 82nd Street / Ditmars Boulevard	WB	LT	0.78	23.5	C	0.46	12.2	B	0.94	42.1	D	0.63	19.9	B
		R	0.89	29.6	C	1.12	86.5	F	0.89	22.8	C	0.61	21.5	C
	NB	DefL	-	-	-	-	-	-	1.06	143.2	F	0.98	118.4	F
		T	-	-	-	-	-	-	0.26	16.7	B	0.39	18.8	B
		LT	0.89	33.1	C	0.91	38.2	D	-	-	-	-	-	-
	SB	TR	0.36	20.2	C	0.39	24.4	C	0.99	44.3	D	0.97	40.7	D
	Overall			**28.4**	**C**		**42.4**	**D**		**38.7**	**D**		**31.3**	**C**
23rd Avenue / 82nd Street	EB	LTR	0.69	28.2	C	0.53	24.8	C	0.60	33.5	C	0.51	31.6	C
	WB	L	0.51	40.7	D	0.46	32.9	C	0.96	103.5	F	0.77	61.6	E
		R	0.44	25.2	C	0.59	29.3	C	0.36	31.2	C	0.58	37.4	D
	NB	TR	0.27	17.9	B	0.27	18.0	B	0.11	11.5	B	0.12	11.6	B
	SB	L	0.58	21.3	C	0.59	22.1	C	1.00	47.0	D	1.03	56.8	E
		LT	0.19	11.2	B	0.21	11.4	B	0.51	12.0	B	0.73	15.1	B
	Overall			**22.6**	**C**		**21.6**	**C**		**35.1**	**D**		**36.7**	**D**
Astoria Boulevard / 82nd Street / 24th Avenue	EB	L	0.27	31.8	C	0.28	32.8	C	0.17	21.0	C	0.17	21.1	C
		TR	0.27	21.8	C	0.27	21.8	C	0.98	40.3	D	0.99	42.6	D
	WB	L	0.07	14.7	B	0.07	14.7	B	0.38	48.5	D	0.38	49.1	D
		TR	0.98	30.7	C	0.96	30.8	C	0.39	15.0	B	0.40	15.0	B
	NB (24th Ave)	L	0.23	48.9	D	0.24	49.2	D	0.62	71.8	E	0.63	72.3	E
		TR	0.09	46.7	D	0.09	46.7	D	0.31	57.9	E	0.31	57.9	E
	SB	L	0.46	48.8	D	0.55	49.6	D	0.71	54.6	D	0.77	58.6	E
		T	0.50	47.5	D	0.55	49.1	D	1.01	96.3	F	1.03	95.8	F
		R	0.23	42.0	D	0.25	42.5	D	0.55	54.9	D	0.78	65.4	E
	Overall			**31.8**	**C**		**32.3**	**C**		**42.2**	**D**		**45.1**	**D**

Table 11: Future Construction Condition LOS Comparison: 2015 vs. 2017 (Cont'd)

			AM Peak Hour						PM Peak Hour					
			2015 With Construction (2014 EA)			2017 With Construction			2015 With Construction (2014 EA)			2017 With Construction		
Intersection	App.	Move-ment	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS
Ditmars Boulevard / Marine Terminal Road	WB	L	0.77	42.4	D	0.65	34.7	C	0.79	42.8	D	0.97	67.7	E
		R	0.56	32.4	C	0.58	32.2	C	0.34	26.6	C	0.50	29.9	C
	NB	T	1.02	42.0	D	0.92	25.4	C	0.31	9.7	A	0.37	10.3	B
		R	0.53	13.1	B	0.62	15.6	B	0.45	12.3	B	0.43	12.0	B
	SB	T	0.17	8.2	A	0.24	9.2	A	0.90	23.6	C	0.83	19.3	B
	Overall			**34.7**	**C**		**23.1**	**C**		**22.1**	**C**		**23.6**	**C**
Bowery Bay Boulevard / Runway Drive / Marine Terminal Road	EB	LTR	0.79	47.4	D	0.96	66.1	E	0.57	39.8	D	0.56	39.6	D
	WB	LTR	0.38	26.2	C	0.45	32.3	C	0.39	28.3	C	0.63	37.7	D
	NB	DefL	0.62	38.0	D	0.83	47.9	D	0.57	40.7	D	0.84	53.2	D
		T	0.61	36.4	D	0.51	29.8	C	0.45	32.0	C	0.42	26.8	C
		R	0.14	6.0	A	0.16	6.1	A	0.05	5.4	A	0.14	6.0	A
	SB	LT	0.35	29.1	C	0.53	29.7	C	0.67	37.7	D	0.48	27.4	C
		R	0.05	9.9	A	0.04	8.1	A	0.10	10.2	B	0.12	7.8	A
	Overall			**34.4**	**C**		**42.2**	**D**		**32.8**	**C**		**33.2**	**C**
Ditmars Boulevard / 81st Street	EB	LTR	0.09	7.3	A	0.10	7.3	A	0.32	12.8	B	0.33	12.9	B
	WB	LT	0.28	8.9	A	0.29	8.9	A	0.4	14.3	B	0.51	16.0	B
		R	1.14	85.4	F	0.82	15.9	B	0.21	6.9	A	0.27	7.3	A
	SB	LTR	0.30	26.5	C	0.50	29.3	C	1.08	75.5	E	0.97	46.1	D
	Overall			**66.1**	**E**		**16.7**	**B**		**46.2**	**D**		**28.4**	**C**
21st Avenue / 81st Street	EB	LR	0.31	28.5	C	0.32	28.7	C	0.43	24.6	C	0.43	24.7	C
	NB	LT	1.02	43.8	D	0.93	24.7	C	0.31	12.4	B	0.39	13.3	B
	SB	TR	0.09	6.9	A	0.16	7.3	A	0.69	17.7	B	0.62	16.2	B
	Overall			**40.3**	**D**		**22.5**	**C**		**17.4**	**B**		**16.5**	**B**
19th Avenue / Hazen Street	EB	LT	0.80	40.7	D	0.74	24.8	C	1.12	96.7	F	0.80	33.7	C
		R	0.03	9.6	A	0.03	9.6	A	0.15	21.2	C	0.15	21.2	C
		LTR	-	-	-	-	-	-	-	-	-	-	-	-
	WB	LT	0.91	31.3	C	0.68	18.4	B	0.77	44.6	D	0.52	28.1	C
		R	0.91	25.0	C	0.92	26.2	C	0.20	7.3	A	0.20	7.3	A
	NB	LTR	1.04	89.1	F	1.05	92.7	F	0.74	42.4	D	0.75	42.8	D
	SB	L	0.21	25.3	C	0.21	25.2	C	0.94	40.8	D	0.96	43.0	D
		TR	0.04	19.1	B	0.04	19.1	B	0.41	12.8	B	0.42	12.8	B
	Overall			**38.8**	**D**		**34.8**	**C**		**52.1**	**D**		**30.5**	**C**
NEWLY SIGNALIZED INTERSECTIONS														
19th Avenue / 45th Street	EB	LTR	0.20	9.2	A	0.21	10.6	B	0.73	41.7	D	0.65	36.4	D
	WB	LTR	0.98	43.2	D	0.83	24.5	C	0.74	43.6	D	0.71	42.1	D
	NB	LTR	0.25	34.9	C	0.13	21.7	C	0.19	30.9	C	0.35	43.8	D
	SB	L	0.31	25.9	C	0.59	11.4	B	0.99	43.5	D	0.59	11.4	B
		TR	0.06	22.8	C	0.10	5.9	A	0.13	6.1	A	0.10	5.9	A
	Overall			36.7	D		**24.0**	**C**		**40.2**	**D**		**24.0**	**C**
NEWLY SIGNALIZED INTERSECTIONS														
LGA New Access / 19th Avenue-81st Street	EB	L	0.14	1.9	A	0.50	5.1	A	0.46	0.7	A	0.29	0.5	A
		T	0.11	0.0	A	0.20	0.1	A	0.78	2.7	A	0.70	1.4	A
	WB	TR	1.03	39.8	D	0.91	13.7	B	0.21	1.8	A	0.27	2.2	A
	SB	LR	0.50	44.2	D	0.18	39.8	D	0.37	43.2	D	0.18	39.8	D
	Overall			-	-		**11.4**	**B**		-	-		**1.8**	**A**

A.7.6.4 Conclusion

Based on the traffic analysis conducted for the peak construction period for the proposed design changes in the 2nd Quarter of 2017, it was determined that the potential traffic impact as a result of the proposed design changes is comparable to, or less than the peak construction condition analyzed in the 2014 EA for the previously approved (2014) design. The findings of the traffic analysis results indicate that no additional unmitigated impacts are identified under the peak construction condition for the proposed design changes, when compared with the peak construction condition for the project analyzed in the 2014 EA.

As stated in the 2014 EA (pages A-131 and A-135), the proposed improvements are subject to review and approval by the New York City Department of Transportation (NYCDOT). A traffic monitoring program, in coordination with NYCDOT, was recommended throughout the duration of the construction period and the monitoring program efforts should be conducted annually, or at an agreed-upon frequency to be determined as part of on-going coordination efforts between the Port Authority and NYCDOT during the construction period. The NYCDOT reviews and approvals, the traffic monitoring, and other coordination will still take place for the proposed design changes.

Exhibit A – Traffic Volume Comparison Tables

Exhibit 1: Comparison of Traffic Volumes for the Existing Conditions

6:00 - 7:00 AM

INTERSECTION	APP.	2012 Existing (2014 EA) L	2012 Existing (2014 EA) T	2012 Existing (2014 EA) R	2014 Existing L	2014 Existing T	2014 Existing R	Net Change L	Net Change T	Net Change R
94th St & GCP Onramp/LaGuardia Access Rd	EB	0	0	0	0	0	0	0	0	0
	SB	0	217	65	0	224	58	0	7	-7
	WB	680	218	626	697	72	613	17	-146	-13
	NB	135	266	0	134	248	0	-1	-18	0
94th St & Ditmars Blvd	EB	165	199	61	109	252	57	-56	53	-4
	SB	126	270	0	116	308	0	-10	38	0
	WB	29	0	120	43	0	142	14	0	22
	NB	0	116	65	0	131	46	0	15	-19
94th St & 23rd Ave	EB	49	85	9	54	93	12	5	8	3
	SB	21	162	177	47	183	178	26	21	1
	WB	11	246	37	16	210	11	5	-36	-26
	NB	28	95	20	18	112	20	-10	17	0
94th St & 24th Ave	EB	11	13	18	11	13	18	0	0	0
	SB	5	155	22	5	157	22	0	2	0
	WB	19	17	4	19	17	4	0	0	0
	NB	17	128	10	17	130	10	0	2	0
94th St & 25th Ave	EB	12	37	15	12	37	15	0	0	0
	SB	7	170	15	7	172	15	0	2	0
	WB	9	52	19	9	53	19	0	1	0
	NB	3	124	12	3	126	12	0	2	0
94th St & Astoria Blvd	EB	61	240	52	62	242	53	1	2	1
	SB	36	111	47	36	113	47	0	2	0
	WB	24	1420	27	24	1434	27	0	14	0
	NB	49	51	13	49	52	13	0	1	0
94th Street @ 31st Ave	EB	15	56	19	15	57	19	0	1	0
	SB	8	155	16	8	157	16	0	2	0
	WB	10	47	9	10	47	9	0	0	0
	NB	6	97	7	6	98	7	0	1	0
Junction Blvd/94th St & Northern Blvd	EB	12	361	44	12	365	44	0	4	0
	SB	44	104	42	44	105	42	0	1	0
	WB	73	1063	42	74	1074	42	1	11	0
	NB	19	82	47	19	83	47	0	1	0
82nd Street & Astoria Blvd & 24th Ave	EB	15	256	14	16	259	14	1	3	0
	SB	101	118	36	111	130	39	10	12	3
	WB	29	1270	271	29	1283	283	0	13	12
	NB	43	8	3	44	8	3	1	0	0
82nd Street & GCP Service Rd S/23rd Avenue	EB	319	37	4	286	48	2	-33	11	-2
	SB	255	219	0	260	235	0	5	16	0
	WB	32	0	145	43	0	195	11	0	50
	NB	0	291	20	0	326	17	0	35	-3
82nd Street/Ditmars Blvd & GCP North Service Road/GCP WB Offramp	EB	0	0	0	0	0	0	0	0	0
	SB	0	320	155	0	328	134	0	8	-21
	WB	154	473	934	167	631	941	13	158	7
	NB	60	695	0	64	743	0	4	48	0
Ditmars Blvd & Marine Terminal Rd	EB	0	0	0	0	0	0	0	0	0
	SB	0	241	0	0	261	0	0	20	0
	WB	234	0	160	201	0	171	-33	0	11
	NB	0	1228	401	0	1232	452	0	4	51

3:00 - 4:00 PM

INTERSECTION	APP.	2012 Existing (2014 EA) L	2012 Existing (2014 EA) T	2012 Existing (2014 EA) R	2014 Existing L	2014 Existing T	2014 Existing R	Net Change L	Net Change T	Net Change R
94th St & GCP Onramp/LaGuardia Access Rd	EB	0	0	0	0	0	0	0	0	0
	SB	0	375	331	0	438	478	0	63	147
	WB	647	46	330	772	81	529	125	35	199
	NB	157	421	0	234	507	0	77	86	0
94th St & Ditmars Blvd	EB	197	734	78	225	739	81	28	5	3
	SB	151	347	0	180	459	0	29	112	0
	WB	34	0	176	62	0	233	28	0	57
	NB	0	205	117	0	283	100	0	78	-17
94th St & 23rd Ave	EB	113	498	25	97	387	42	-16	-111	17
	SB	53	278	128	65	341	196	12	63	68
	WB	35	132	43	41	223	38	6	91	-5
	NB	32	166	38	28	248	36	-4	82	-2
94th St & 24th Ave	EB	23	19	10	23	19	10	0	0	0
	SB	19	306	13	19	310	13	0	4	0
	WB	16	17	9	16	17	9	0	0	0
	NB	16	204	30	16	206	30	0	2	0
94th St & 25th Ave	EB	11	41	19	11	41	19	0	0	0
	SB	14	290	28	14	294	28	0	4	0
	WB	13	73	7	13	74	7	0	1	0
	NB	10	232	51	10	234	52	0	2	1
94th St & Astoria Blvd	EB	117	1576	70	118	1592	71	1	16	1
	SB	52	201	69	53	203	70	1	2	1
	WB	58	623	51	59	629	52	1	6	1
	NB	86	125	70	87	126	71	1	1	1
94th Street @ 31st Ave	EB	39	224	21	39	226	21	0	2	0
	SB	13	183	34	13	185	34	0	2	0
	WB	4	103	5	4	104	5	0	1	0
	NB	26	150	20	26	152	20	0	2	0
Junction Blvd/94th St & Northern Blvd	EB	36	1132	55	36	1143	56	0	11	1
	SB	68	167	56	69	169	57	1	2	1
	WB	86	770	31	87	778	31	1	8	0
	NB	41	116	69	41	117	70	0	1	1
82nd Street & Astoria Blvd & 24th Ave	EB	14	1713	47	14	1730	47	0	17	0
	SB	181	295	116	221	360	141	40	65	25
	WB	61	621	118	62	627	119	1	6	1
	NB	73	18	6	74	18	6	1	0	0
82nd Street & GCP Service Rd S/23rd Avenue	EB	170	205	2	201	100	7	31	-105	5
	SB	1000	496	0	992	621	0	-8	125	0
	WB	94	0	108	94	0	177	0	0	69
	NB	0	137	40	0	179	28	0	42	-12
82nd Street/Ditmars Blvd & GCP North Service Road/GCP WB Offramp	EB	0	0	0	0	0	0	0	0	0
	SB	0	1286	191	0	1335	210	0	49	19
	WB	210	483	486	278	673	431	68	190	-55
	NB	72	343	0	66	491	0	-6	148	0
Ditmars Blvd & Marine Terminal Rd	EB	0	0	0	0	0	0	0	0	0
	SB	0	1219	0	0	1232	0	0	13	0
	WB	258	0	111	313	0	164	55	0	53
	NB	0	494	335	0	597	325	0	103	-10

Exhibit 1: Comparison of Traffic Volumes for the Existing Conditions (Cond't)

		6:00 - 7:00 AM									3:00 - 4:00 PM								
		2012 Existing (2014 EA)			2014 Existing			Net Change			2012 Existing (2014 EA)			2014 Existing			Net Change		
INTERSECTION	APP.	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
Marine Terminal Rd & Runway Dr/Bowery Bay Blvd	EB	125	215	28	208	226	18	83	11	-10	108	146	61	88	188	49	-20	42	-12
	SB	0	85	33	5	94	29	5	9	-4	1	116	74	1	140	98	0	24	24
	WB	102	172	9	114	183	5	12	11	-4	111	169	3	162	210	4	51	41	1
	NB	142	171	97	160	163	108	18	-8	11	77	122	43	169	146	116	92	24	73
81st Street @ Ditmars Blvd	EB	3	120	7	3	130	7	0	10	0	19	385	18	19	389	18	0	4	0
	SB	121	17	4	131	17	4	10	0	0	834	145	15	843	146	15	9	1	0
	WB	10	256	1122	10	259	1134	0	3	12	8	282	315	10	355	396	2	73	81
	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81st Street @ 21st Ave	EB	41	0	47	41	0	50	0	0	3	8	0	166	8	0	168	0	0	2
	SB	0	95	11	0	102	11	0	7	0	0	828	24	0	836	24	0	8	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	75	1050	0	76	1061	0	1	11	0	41	293	0	50	365	0	9	72	0
19th Ave & Hazen St	EB	48	50	7	48	51	7	0	1	0	13	294	35	13	297	35	0	3	0
	SB	30	9	2	30	9	2	0	0	0	527	295	37	532	298	37	5	3	0
	WB	8	310	768	8	313	776	0	3	8	11	163	151	11	165	153	0	2	2
	NB	9	351	4	9	355	4	0	4	0	21	199	17	21	201	17	0	2	0
19th Ave & 45th St (unsignalized)	EB	14	89	8	14	90	8	0	1	0	8	248	10	8	250	10	0	2	0
	SB	11	5	3	11	5	3	0	0	0	62	33	9	63	33	9	1	0	0
	WB	8	232	56	8	234	57	0	2	1	16	159	26	16	161	26	0	2	0
	NB	6	17	3	6	17	3	0	0	0	5	16	13	5	16	13	0	0	0
Astoria Blvd N/Astoria Blvd (GCP Overpass) & 79th St (GCP Service Rd S)	EB	333	382	0	336	386	0	3	4	0	305	355	0	308	359	0	3	4	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	1304	0	0	1317	0	0	13	0	0	814	0	0	822	0	0	8	0
Astoria Blvd (GCP Overpass) & Astoria Blvd N (North Service Rd)	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	638	0	0	644	0	0	6	0	0	914	0	0	923	0	0	9	0
	NB	1637	0	0	1653	0	0	16	0	0	1119	0	0	1130	0	0	11	0	0
Astoria Blvd S & 77th Street	EB	436	1179	0	440	1191	0	4	12	0	90	3670	0	91	3707	0	1	37	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	144	45	0	145	45	0	1	0	0	311	301	0	314	304	0	3	3
81st Street @ 19th Ave	EB	0	106	0	0	113	0	0	7	0	0	852	0	0	860	0	0	8	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	1091	0	0	1102	0	0	11	0	0	301	0	0	373	0	0	72	0	0

Exhibit 2: Comparison of Traffic Volumes for the Future Without Construction Conditions

		6:00 - 7:00 AM									3:00 - 4:00 PM								
		2015 Future Without Construction (2014 EA)			2017 Future Without Construction			Net Change			2015 Future Without Construction (2014 EA)			2017 Future Without Construction			Net Change		
INTERSECTION	APP.	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
94th St & GCP Onramp/LaGuardia Access Rd	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	220	66	0	227	59	0	7	-7	0	381	336	0	445	485	0	64	149
	WB	690	221	635	708	73	622	18	-148	-13	657	47	335	784	82	537	127	35	202
	NB	137	270	0	136	252	0	-1	-18	0	159	427	0	238	515	0	79	88	0
94th St & Ditmars Blvd	EB	167	202	62	111	256	58	-56	54	-4	200	745	79	228	750	82	28	5	3
	SB	128	274	0	118	313	0	-10	39	0	153	352	0	183	466	0	30	114	0
	WB	29	0	122	44	0	144	15	0	22	35	0	179	63	0	238	28	0	59
	NB	0	118	69	0	133	47	0	15	-22	0	208	119	0	287	102	0	79	-17
94th St & 23rd Ave	EB	53	86	9	55	94	12	2	8	3	115	506	25	98	393	43	-17	-113	18
	SB	21	164	180	48	186	181	27	22	1	54	282	130	66	346	199	12	64	69
	WB	11	250	38	16	213	11	5	-37	-27	36	134	44	42	226	39	6	92	-5
	NB	28	96	20	18	114	20	-10	18	0	32	169	39	28	252	37	-4	83	-2
94th St & 24th Ave	EB	11	13	18	11	13	18	0	0	0	23	19	10	23	19	10	0	0	0
	SB	5	157	22	5	161	22	0	4	0	19	311	13	19	315	13	0	4	0
	WB	19	17	4	19	17	4	0	0	0	16	17	9	16	17	9	0	0	0
	NB	17	130	10	17	132	10	0	2	0	16	207	30	16	210	30	0	3	0
94th St & 25th Ave	EB	12	38	15	12	38	15	0	0	0	11	42	19	11	42	19	0	0	0
	SB	7	173	15	7	176	15	0	3	0	14	294	28	14	299	28	0	5	0
	WB	9	53	19	9	54	19	0	1	0	13	74	7	13	75	7	0	1	0
	NB	3	126	12	3	128	12	0	2	0	10	236	52	10	238	53	0	2	1
94th St & Astoria Blvd	EB	62	246	57	63	246	54	1	0	-3	119	1600	71	120	1616	72	1	16	1
	SB	37	113	48	37	115	48	0	2	0	53	204	70	54	206	71	1	2	1
	WB	24	1441	27	24	1456	27	0	15	0	59	632	52	60	638	53	1	6	1
	NB	50	52	13	50	53	13	0	1	0	87	127	71	88	128	72	1	1	1
94th Street @ 31st Ave	EB	15	57	19	15	58	19	0	1	0	40	227	21	40	229	21	0	2	0
	SB	8	161	16	8	159	16	0	-2	0	13	186	35	13	188	35	0	2	0
	WB	10	48	9	10	48	9	0	0	0	4	105	5	4	106	5	0	1	0
	NB	6	98	7	6	99	7	0	1	0	26	152	20	26	154	20	0	2	0
Junction Blvd/94th St & Northern Blvd	EB	12	366	45	12	371	45	0	5	0	37	1149	56	37	1160	57	0	11	1
	SB	45	110	43	45	107	43	0	-3	0	69	170	57	70	172	58	1	2	1
	WB	74	1079	43	75	1090	43	1	11	0	87	782	31	88	790	31	1	8	0
	NB	19	83	48	19	84	48	0	1	0	42	118	70	42	119	71	0	1	1
82nd Street & Astoria Blvd & 24th Ave	EB	15	260	14	16	263	14	1	3	0	14	1739	48	14	1756	48	0	17	0
	SB	109	121	37	113	132	40	4	11	3	184	299	118	224	365	143	40	66	25
	WB	29	1289	275	29	1302	287	0	13	12	62	630	120	63	636	121	1	6	1
	NB	43	8	3	45	8	3	2	0	0	74	18	6	75	18	6	1	0	0
82nd Street & GCP Service Rd S/23rd Avenue	EB	324	38	4	290	49	2	-34	11	-2	173	208	2	204	102	7	31	-106	5
	SB	262	229	0	264	239	0	2	10	0	1015	503	0	1009	630	0	-6	127	0
	WB	32	0	147	44	0	198	12	0	51	95	0	110	95	0	180	0	0	70
	NB	0	295	20	0	331	17	0	36	-3	0	139	41	0	182	28	0	43	-13
82nd Street/Ditmars Blvd & GCP North Service Road/GCP WB Offramp	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	335	157	0	333	136	0	-2	-21	0	1305	194	0	1357	213	0	52	19
	WB	156	480	948	170	641	956	14	161	8	213	490	493	282	683	437	69	193	-56
	NB	61	705	0	65	754	0	4	49	0	73	348	0	67	499	0	-6	151	0
Ditmars Blvd & Marine Terminal Rd	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	255	0	0	265	0	0	10	0	0	1237	0	0	1252	0	0	15	0
	WB	238	0	162	204	0	174	-34	0	12	262	0	113	318	0	166	56	0	53
	NB	0	1247	407	0	1251	459	0	4	52	0	501	340	0	606	330	0	105	-10

Exhibit 2: Comparison of Traffic Volumes for the Future Without Construction Conditions (Cond't)

		6:00 - 7:00 AM									3:00 - 4:00 PM								
INTERSECTION	APP.	2015 Future Without Construction (2014 EA)			2017 Future Without Construction			Net Change			2015 Future Without Construction (2014 EA)			2017 Future Without Construction			Net Change		
		L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
Marine Terminal Rd & Runway Dr/Bowery Bay Blvd	EB	127	218	28	211	230	18	84	12	-10	110	148	52	89	191	50	-21	43	-2
	SB	0	86	33	5	95	29	5	9	-4	1	118	75	1	142	99	0	24	24
	WB	104	175	9	116	187	5	12	12	-4	113	172	3	164	213	4	51	41	1
	NB	144	174	98	162	165	110	18	-9	12	78	124	44	172	148	118	94	24	74
81st Street @ Ditmars Blvd	EB	3	122	7	3	132	7	0	10	0	19	391	18	20	395	18	1	4	0
	SB	133	17	4	133	18	4	0	1	0	847	147	15	857	148	15	10	1	0
	WB	10	260	1139	10	264	1151	0	4	12	8	286	320	10	360	402	2	74	82
	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81st Street @ 21st Ave	EB	42	0	48	42	0	51	0	0	3	8	0	169	8	0	171	0	0	2
	SB	0	106	11	0	104	11	0	-2	0	0	841	24	0	849	24	0	8	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	76	1066	0	77	1077	0	1	11	0	42	297	0	51	371	0	9	74	0
19th Ave & Hazen St	EB	49	61	7	49	52	7	0	-9	0	13	298	36	13	301	36	0	3	0
	SB	30	9	2	30	9	2	0	0	0	535	299	38	540	302	38	5	3	0
	WB	8	323	780	8	318	788	0	-5	8	11	165	153	11	167	155	0	2	2
	NB	9	356	4	9	360	4	0	4	0	21	202	17	21	204	17	0	2	0
19th Ave & 45th St (unsignalized)	EB	14	90	8	14	91	8	0	1	0	8	252	10	8	254	10	0	2	0
	SB	41	10	7	11	5	3	-30	-5	-4	63	33	9	64	33	9	1	0	0
	WB	8	236	65	8	238	58	0	2	-7	16	161	26	16	163	26	0	2	0
	NB	6	17	3	6	17	3	0	0	0	5	16	13	5	16	13	0	0	0
Astoria Blvd N/Astoria Blvd (GCP Overpass) & 79th St (GCP Service Rd S)	EB	0	388	0	341	392	0	341	4	0	0	360	0	313	364	0	313	4	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	1324	0	0	1337	0	0	13	0	0	826	0	0	834	0	0	8	0
Astoria Blvd (GCP Overpass) & Astoria Blvd N (North Service Rd)	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	648	0	0	654	0	0	6	0	0	928	0	0	937	0	0	9	0
	NB	1662	0	0	1678	0	0	16	0	0	1136	0	0	1147	0	0	11	0	0
Astoria Blvd S & 77th Street	EB	463	1197	0	447	1209	0	-16	12	0	91	3725	0	92	3763	0	1	38	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	146	46	0	147	46	0	1	0	0	316	306	0	319	309	0	3	3
81st Street @ 19th Ave	EB	0	117	0	0	115	0	0	-2	0	0	865	0	0	873	0	0	8	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	1108	0	0	1119	0	0	11	0	0	305	0	0	379	0	0	74	0	0

Exhibit 3: Comparison of Traffic Volumes for the Future With Construction Conditions

		6:00 - 7:00 AM									3:00 - 4:00 PM								
		2015 Future With Construction (2014 EA)			2017 Future With Construction			Net Change			2015 Future With Construction (2014 EA)			2017 Future With Construction			Net Change		
INTERSECTION	APP.	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
94th St & GCP Onramp/LaGuardia Access Rd	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	225	66	0	280	59	0	55	-7	0	529	336	0	535	485	0	6	149
	WB	690	221	635	708	73	622	18	-148	-13	657	47	335	784	82	537	127	35	202
	NB	137	275	0	136	259	0	-1	-16	0	159	432	0	238	522	0	79	90	0
94th St & Ditmars Blvd	EB	167	202	62	111	256	58	-56	54	-4	200	745	79	228	750	82	28	5	3
	SB	128	279	0	118	320	0	-10	41	0	153	357	0	183	473	0	30	116	0
	WB	29	0	122	44	0	144	15	0	22	35	0	179	63	0	238	28	0	59
	NB	0	123	69	0	140	47	0	17	-22	0	213	119	0	294	102	0	81	-17
94th St & 23rd Ave	EB	53	86	9	55	94	12	2	8	3	115	506	25	98	393	43	-17	-113	18
	SB	21	169	180	48	193	181	27	24	1	54	287	130	66	353	199	12	66	69
	WB	11	250	38	16	213	11	5	-37	-27	36	134	44	42	226	39	6	92	-5
	NB	28	101	20	18	121	20	-10	20	0	32	174	39	28	259	37	-4	85	-2
94th St & 24th Ave	EB	11	13	18	11	13	18	0	0	0	23	19	10	23	19	10	0	0	0
	SB	5	162	22	5	168	22	0	6	0	19	316	13	19	322	13	0	6	0
	WB	19	17	4	19	17	4	0	0	0	16	17	9	16	17	9	0	0	0
	NB	17	135	10	17	139	10	0	4	0	16	212	30	16	217	30	0	5	0
94th St & 25th Ave	EB	12	38	15	12	38	15	0	0	0	11	42	19	11	42	19	0	0	0
	SB	7	178	15	7	183	15	0	5	0	14	299	28	14	306	28	0	7	0
	WB	9	53	19	9	54	19	0	1	0	13	74	7	13	75	7	0	1	0
	NB	3	131	12	3	135	12	0	4	0	10	241	52	10	245	53	0	4	1
94th St & Astoria Blvd	EB	63	246	57	63	254	64	0	8	7	120	1620	101	120	1630	90	0	10	-11
	SB	39	115	49	41	118	48	2	3	-1	55	206	71	58	209	71	3	3	0
	WB	24	1461	29	24	1469	34	0	8	5	59	632	54	60	639	60	1	7	6
	NB	80	54	13	69	53	13	-11	-1	0	87	129	71	89	128	72	2	-1	1
94th Street @ 31st Ave	EB	15	57	19	15	58	19	0	1	0	40	227	21	40	229	21	0	2	0
	SB	8	163	16	8	172	16	0	9	0	13	218	35	13	209	35	0	-9	0
	WB	10	48	9	10	48	9	0	0	0	4	105	5	4	106	5	0	1	0
	NB	6	130	7	6	118	7	0	-12	0	26	154	20	26	155	20	0	1	0
Junction Blvd/94th St & Northern Blvd	EB	12	366	45	12	371	45	0	5	0	37	1149	56	37	1160	57	0	11	1
	SB	45	112	43	45	120	43	0	8	0	69	202	57	70	193	58	1	-9	1
	WB	74	1079	43	75	1090	43	1	11	0	87	782	31	88	790	31	1	8	0
	NB	19	115	48	19	103	48	0	-12	0	42	120	70	42	120	71	0	0	1
82nd Street & Astoria Blvd & 24th Ave	EB	15	261	14	16	265	14	1	4	0	14	1740	48	14	1758	48	0	18	0
	SB	109	121	37	129	132	40	20	11	3	235	299	118	254	365	143	19	66	25
	WB	29	1290	326	29	1302	318	0	12	-8	62	631	120	63	636	123	1	5	3
	NB	43	8	3	45	8	3	2	0	0	74	18	6	75	18	6	1	0	0
82nd Street & GCP Service Rd S/23rd Avenue	EB	638	38	4	473	49	2	-165	11	-2	174	208	2	205	102	7	31	-106	5
	SB	262	229	0	264	255	0	2	26	0	1015	554	0	1009	660	0	-6	106	0
	WB	32	0	147	44	0	198	12	0	51	95	0	110	95	0	180	0	0	70
	NB	0	346	20	0	362	17	0	16	-3	0	139	41	0	184	28	0	45	-13
82nd Street/Ditmars Blvd & GCP North Service Road/GCP WB Offramp	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	335	158	0	349	226	0	14	68	0	1356	464	0	1387	373	0	31	-91
	WB	156	480	1091	170	641	1039	14	161	-52	213	490	493	282	683	437	69	193	-56
	NB	61	1070	0	65	968	0	4	-102	0	73	349	0	67	502	0	-6	153	0
Ditmars Blvd & Marine Terminal Rd	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	255	0	0	368	0	0	113	0	0	1557	0	0	1438	0	0	-119	0
	WB	239	0	162	208	0	174	-31	0	12	263	0	113	322	0	166	59	0	53
	NB	0	1754	408	0	1548	459	0	-206	51	0	501	341	0	609	330	0	108	-11

Exhibit 3: Comparison of Traffic Volumes for the Future With Construction Conditions (Cond't)

LaGuardia CTB Replacement Project
Updated Traffic Analysis for the Construction Conditions

		6:00 - 7:00 AM									3:00 - 4:00 PM								
INTERSECTION	APP.	2015 Future With Construction (2014 EA)			2017 Future With Construction			Net Change			2015 Future With Construction (2014 EA)			2017 Future With Construction			Net Change		
		L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
Marine Terminal Rd & Runway Dr/Bowery Bay Blvd	EB	127	218	29	211	230	18	84	12	-11	110	148	63	89	191	50	-21	43	-13
	SB	0	100	33	5	152	29	5	52	-4	1	275	75	1	236	99	0	-39	24
	WB	104	175	9	116	187	5	12	12	-4	113	172	3	164	213	4	51	41	1
	NB	145	188	98	166	173	110	21	-15	12	79	138	44	176	156	118	97	18	74
81st Street @ Ditmars Blvd	EB	3	122	7	3	132	7	0	10	0	19	391	18	20	395	18	1	4	0
	SB	133	17	4	236	18	4	103	1	0	1167	147	15	1043	148	15	-124	1	0
	WB	10	260	1646	10	264	1448	0	4	-198	8	286	320	10	360	405	2	74	85
	NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81st Street @ 21st Ave	EB	42	0	48	42	0	51	0	0	3	8	0	169	8	0	171	0	0	2
	SB	0	106	11	0	207	11	0	101	0	0	1161	24	0	1035	24	0	-126	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	76	1573	0	77	1374	0	1	-199	0	42	297	0	51	374	0	9	77	0
19th Ave & Hazen St	EB	49	75	7	49	212	7	0	137	0	13	775	36	13	580	36	0	-195	0
	SB	30	9	2	30	9	2	0	0	0	535	299	38	540	302	38	5	3	0
	WB	8	844	780	8	623	788	0	-221	8	11	179	153	11	178	155	0	-1	2
	NB	9	356	4	9	360	4	0	4	0	21	202	17	21	204	17	0	2	0
19th Ave & 45th St (unsignalized)	EB	14	90	8	14	91	8	0	1	0	8	252	10	8	254	10	0	2	0
	SB	55	10	7	171	19	3	116	9	-4	540	77	9	343	59	9	-197	-18	0
	WB	8	236	586	8	238	363	0	2	-223	16	161	40	16	163	37	0	2	-3
	NB	6	17	3	6	17	3	0	0	0	5	16	13	5	16	13	0	0	0
Astoria Blvd N/Astoria Blvd (GCP Overpass) & 79th St (GCP Service Rd S)	EB	0	702	0	341	575	0	341	-127	0	0	361	0	313	365	0	313	4	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	1325	0	0	1337	0	0	12	0	0	827	0	0	834	0	0	7	0
Astoria Blvd (GCP Overpass) & Astoria Blvd N (North Service Rd)	EB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	649	0	0	744	0	0	95	0	0	1198	0	0	1097	0	0	-101	0
	NB	1663	0	0	1678	0	0	15	0	0	1137	0	0	1147	0	0	10	0	0
Astoria Blvd S & 77th Street	EB	463	1512	0	447	1395	0	-16	-117	0	91	3727	0	92	3767	0	1	40	0
	SB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	0	146	46	0	147	46	0	1	0	0	316	306	0	319	309	0	3	3
81st Street @ 19th Ave	EB	14	118	0	57	218	0	43	100	0	157	1185	0	94	1059	0	-63	-126	0
	SB	0	0	22	0	0	8	0	0	-14	0	0	14	0	0	8	0	0	-6
	WB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NB	1614	0	0	1416	0	0	-198	0	0	306	0	0	382	0	0	76	0	0

Attachment 5

Technical Memorandum – Updated Air Quality Analysis for the Construction Condition

FROM: Alice Lovegrove & Edward Tadross, WSP/Parsons Brinckerhoff
TO: Nathaniel Kimball, PANYNJ
DATE: December 15, 2015
SUBJECT: Technical Memorandum – Updated Air Quality Analysis for the Construction Conditions-Proposed Design Changes

INTRODUCTION

The purpose of this Air Quality Technical Memo is to provide an update of the construction emission burdens associated with the LaGuardia Airport Central Terminal Building based on the proposed design changes advanced in the Port Authority's Technical Report. In addition, this tech memo will compare the emissions estimates with those from the June 2014 *Air Quality Technical Report,* which was included in the 2014 EA for the previously approved (2014) design. This memo only analyzes the construction emission burdens of the proposed design changes, as there are no operational changes associated with the project since issuance of the 2014 EA; as such, the operational analyses in the June 2014 *Air Quality Technical Report* are still valid. The below sections have been numbered to coordinate with the relevant section in the June 2014 *Air Quality Technical Report*.

B.2.1. Construction Emissions

There are no changes in the methodology to determine construction emissions since issuance of the 2014 EA; as such, the methodology described in this section of the 2014 *Air Quality Technical Report* is still valid.

B.4.1 General Conformity Analysis (Emissions)

Increased direct and indirect NOx, VOC, $PM_{2.5}$, CO and SO_2 emissions from the proposed construction activities associated with the proposed design changes would result from:

<u>Direct</u>

- Use of diesel- and gas-powered demolition and construction equipment
- Movement of trucks transporting construction materials and concrete
- Construction workers' commutes

<u>Indirect</u>

- Change in aircraft and ground support equipment
- Change in on-road vehicle trips to and from the airport
- Replacement of the Central Heating and Refrigeration Plant (CHRP)

B.4.1.1 Construction Emissions (Direct)

Construction equipment emissions in the *June 2014 Air Quality Technical Report* were estimated using the NONROAD model with the activity date predicted based on standards applied in RSMeans tools in conjunction with the construction schedule (see Appendix F of the 2014 Final EA, Supporting Data). According to the 2014 EA activity schedule, 2015 was the worst-case construction year resulting in the maximum annual construction emissions.

An updated construction schedule has been developed for the proposed design changes. According to this schedule, 2017 would be the worst-case construction year resulting in the maximum annual construction emissions.

Table B.4-1A presents the construction equipment data used in the June 2014 *Air Quality Technical Report*, such as horsepower, load factor, and emissions tier based on data within the NONROAD model. **Table B.4-1B** presents the updated equipment data used for the proposed design changes. As with the 2014 analysis, all equipment was assumed to be Tier 2 equipment. However, it was assumed that all equipment would use Ultra-Low Sulfur Diesel (15PPM), whereas the analysis in the 2014 EA assumed Low Sulfur Diesel (500PPM). Ultra Low Sulfur Diesel became standard across the United States for non-road applications in December 2014.

Table B.4-1A: Construction Equipment Data-Previously Approved (2014) Design (June 2014 Air Quality Technical Report)

Construction Equipment Type	Horsepower (HP)	% Load Factor	Non-Road Category
Asphalt Paver, 130 HP	130	59	Tier 2
Centrifugal water pump, 6"	57	43	Tier 2
Compressor, 160 cfm	80	43	Tier 2
Compressor, 250 cfm	78	43	Tier 2
Concrete pump, small	53	43	Tier 2
Crane, 90-ton	225	43	Tier 2
Crane, 150-ton	284	43	Tier 2
Crane, Hydraulic, 33-ton	330	43	Tier 2
Diesel hammer, 41k ft-lb	101	43	Tier 2
Drill rig & augers	176	43	Tier 2
Dozer, 300 HP	300	59	Tier 2
Front end loader, 1.5 cy, crl	97	21	Tier 2
Front end loader, TM, 2.5 cy	124	21	Tier 2
Gas engine vibrator	8	55	Tier 2
Gas welding machine	66	68	Tier 2
Grader, 30,000 lb	193	59	Tier 2
Hydraulic excavator, 3.5 cy	148	59	Tier 2
Paving machinery & equipment	70	59	Tier 2
Pneumatic wheel roller	99	59	Tier 2
Roller, vibratory	137	59	Tier 2
Tandem roller, 10 ton	137	59	Tier 2

Source: AECOM, Air Quality Technical Report, June 2014

Table B.4-1B: Construction Equipment Data (Proposed design changes)

Construction Equipment Type	Horsepower (HP)	% Load Factor	Non-Road Category
Asphalt Paver, 130 HP	130	59	Tier 2
Backhoe/Loader, 450	127	21	Tier 2
Centrifugal water pump, 6"	57	43	Tier 2
Cherry picker, 45-ton	233	43	Tier 2
Cherry picker, 65-ton	225	43	Tier 2
Compressor, 160 cfm	80	43	Tier 2
Compressor, 250 cfm	78	78	Tier 2
Compressor, 400 cfm	122	43	Tier 2
Compressor, 900 cfm	300	43	Tier 2
Concrete pump, large	190	43	Tier 2
Concrete pump, small	53	43	Tier 2
Crane, 100-ton	332	43	Tier 2
Crane, 150-ton	284	43	Tier 2
Crane, 200-ton	340	43	Tier 2
Crane, 300-ton	500	43	Tier 2
Crane, 400-ton	500	43	Tier 2
Crane, 90-ton	225	43	Tier 2
Crane, Hydraulic, 100-ton	267	43	Tier 2
Crane, Hydraulic, 150-ton	267	43	Tier 2
Crane, Hydraulic, 200-ton	544	43	Tier 2
Crane, Hydraulic, 300-ton	603	43	Tier 2
Crane, Hydraulic, 33-ton	330	43	Tier 2
Crane, Hydraulic, 500-ton	680	43	Tier 2
Demo robot, Brokk 250	Electric	43	Tier 2
Diesel hammer, 41k ft-lb	101	43	Tier 2
Dozer, 300 HP	300	59	Tier 2
Drill rig & augers	176	43	Tier 2
Excavator, 324	182	59	Tier 2
Excavator, 328	221	59	Tier 2
Excavator, 345	350	59	Tier 2
Forklift, 5-ton	74	59	Tier 2
Front end loader, 1.5 cy, crl	97	21	Tier 2
Front end loader, TM, 2.5 cy	124	21	Tier 2
Gas engine vibrator	8	55	Tier 2
Gas welding machine	66	68	Tier 2
Generator, diesel, 75 Kw	15	43	Tier 2
Grader, 30,000 lb	193	59	Tier 2
Hydraulic auger	190	43	Tier 2
Hydraulic excavator, 3.5 cy	148	59	Tier 2
Hydraulic hammer	50	43	Tier 2
Hydraulic Shear, MP30	40	43	Tier 2
Lift, articulating boom type	67	21	Tier 2
Lift, scissor type	Electric	21	Tier 2
Paving machinery & equipment	70	59	Tier 2
Pneumatic wheel roller	99	59	Tier 2
Roller, Cs56	157	59	Tier 2
Roller, vibratory	137	59	Tier 2

Construction Equipment Type	Horsepower (HP)	% Load Factor	Non-Road Category
Asphalt Paver, 130 HP	130	59	Tier 2
Skid Steer, <50 hp	50	21	Tier 2
Sweeper truck	200	43	Tier 2
Tandem roller, 10 ton	137	59	Tier 2
Water truck	300	59	Tier 2
Welder, 250 amp	Electric	21	Tier 2
Welder, 400 amp	64	21	Tier 2
Welder, 6-pack	Electric	21	Tier 2
Wheeled Excavator, M315	137	21	Tier 2

Source: LGP 2015

Table B.4-2A presents the types of construction equipment and the estimated hours of operation by year for all previously approved (2014) design construction activities, as presented in the June 2014 *Air Quality Technical Report.* **Table B.4-2B** presents the updated equipment and estimated hours of operation used for the proposed design changes.

Table B.4-2A: Construction Equipment and Hours of Operation - Previously Approved (2014) Design (June 2014 Air Quality Technical Report)

Construction Equipment Type	Hours of Operation per Year							
	2014	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*
Asphalt Paver, 130 HP	80	480	240	80	360	360	0	160
Centrifugal water pump, 6"	0	0	40	80	40	40	80	40
Compressor, 160 cfm	4,360	18,920	18,160	13,640	5,960	2,600	5,200	880
Compressor, 250 cfm	0	2,560	7,000	7,440	4,200	6,640	5,920	600
Concrete pump, small	2,120	9,560	5,400	2,880	840	1,040	520	0
Crane, 90-ton	7,240	27,480	25,960	15,240	4,280	4,840	2,320	0
Crane, 150-ton	0	0	280	400	280	200	400	80
Crane, Hydraulic, 33-ton	2,960	4,400	400	400	880	1,480	400	880
Diesel hammer, 41k ft-lb	2,880	6,080	6,720	2,960	40	0	0	0
Drill rig & augers	0	0	40	80	40	40	80	40
Dozer, 300 HP	80	360	200	80	280	280	0	120
Front end loader, 1.5 cy, crl	80	360	200	80	280	280	0	120
Front end loader, TM, 2.5 cy	2,960	4,400	400	400	880	1,440	400	880
Gas engine vibrator	1,760	4,440	4,680	2,320	280	480	240	0
Gas welding machine	6,240	33,400	26,000	16,800	6,240	7,960	4,080	80
Grader, 30,000 lb	80	1,160	520	80	1,080	920	0	440
Hydraulic excavator, 3.5 cy	160	360	360	200	40	80	0	0
Paving machinery & equipment	0	800	320	0	800	640	0	320
Pneumatic wheel roller	80	480	240	80	360	360	0	160
Roller, vibratory	80	360	200	80	280	280	0	120
Tandem roller, 10 ton	80	480	240	80	360	360	0	160

Source: AECOM, Air Quality Technical Report, June 2014

Table B.4-2B: Construction Equipment and Hours of Operation (Proposed design changes)

Construction Equipment Type	Hours of Operation per Year						
	2016	2017	2018	2019	2020	2021	2022
Asphalt Paver, 130 HP	-	450	768	600	200	299	75
Backhoe/Loader, 450	1,040	6,000	4,160	778	140	80	20
Centrifugal water pump, 6"	3,000	6,450	5,224	7,750	4,200	3,807	3,200
Cherry picker, 45-ton	5,000	8,500	20,000	24,500	4,250	4,500	7,547
Cherry picker, 65-ton	-	-	152	-	-	-	-
Compressor, 160 cfm	-	-	-	-	-	-	-
Compressor, 250 cfm	-	-	-	-	-	-	-
Compressor, 400 cfm	400	1,250	1,184	1,734	-	-	-
Compressor, 900 cfm	650	4,800	3,288	1,893	334	-	-
Concrete pump, large	1,500	4,775	1,519	2,076	950	300	93
Concrete pump, small	100	189	-	-	-	-	-
Crane, 100-ton	80	160	120	77	-	-	-
Crane, 150-ton	-	257	356	244	-	-	-
Crane, 200-ton	1,250	690	367	478	416	-	-
Crane, 300-ton	1,800	1,300	1,400	1,521	-	-	-
Crane, 400-ton	-	1,270	-	-	-	90	-
Crane, 90-ton	-	-	-	-	-	-	-
Crane, Hydraulic, 100-ton	308	308	308	290	226	-	-
Crane, Hydraulic, 150-ton	276	150	100	50	-	-	-
Crane, Hydraulic, 200-ton	272	-	-	-	-	-	-
Crane, Hydraulic, 300-ton	-	75	81	75	-	-	-
Crane, Hydraulic, 33-ton	-	-	-	-	-	-	-
Crane, Hydraulic, 500-ton	-	-	-	-	29	-	-
Demo robot, Brokk 250	752	-	-	-	-	-	-
Diesel hammer, 41k ft-lb	614	-	-	-	-	-	-
Dozer, 300 HP	1,750	2,080	1,500	1,051	-	-	-
Drill rig & augers	1,100	6,500	5,416	3,232	675	650	411
Excavator, 324	2,500	11,350	10,036	6,680	3,009	3,606	3,000
Excavator, 328	950	1,000	430	-	-	62	-
Excavator, 345	800	4,160	4,160	1,514	-	180	60
Forklift, 5-ton	-	-	360	-	-	-	-
Front end loader, 1.5 cy, crl	2,700	11,500	2,080	1,540	800	1,700	1,145
Front end loader, TM, 2.5 cy	2,700	11,450	2,080	-	-	1,250	1,052
Gas engine vibrator	-	-	-	-	-	-	-
Gas welding machine	-	-	-	-	-	-	-
Generator, diesel, 75 Kw	1,040	1,850	396	-	-	130	100
Grader, 30,000 lb	520	1,950	2,080	1,040	425	300	200
Hydraulic auger	176	-	-	-	-	-	-
Hydraulic excavator, 3.5 cy	-	-	-	-	-	-	-
Hydraulic hammer	1,040	573	492	-	384	384	-
Hydraulic Shear, MP30	363	-	-	-	-	-	-
Lift, articulating boom type	5,700	36,750	41,600	38,950	18,500	19,120	1,078
Lift, scissor type	-	-	552	-	-	-	-
Paving machinery & equipment	850	4,350	2,587	2,532	1,432	500	416
Pneumatic wheel roller	-	-	-	-	-	-	-
Roller, Cs56	600	3,850	2,568	2,080	520	520	750
Roller, vibratory	-	-	-	-	-	-	-
Skid Steer, <50 hp	288	-	-	-	-	-	-

Construction Equipment Type	Hours of Operation per Year						
	2016	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*
Sweeper truck	800	3,080	1,080	440	-	120	120
Tandem roller, 10 ton	800	4,750	4,160	4,160	1,400	1,951	-
Water truck	100	480	480	480	480	224	140
Welder, 250 amp	750	7,500	6,240	5,150	1,080	950	1,994
Welder, 400 amp	-	6,500	8,320	3,600	980	600	393
Welder, 6-pack	200	2,800	800	-	750	-	-
Wheeled Excavator, M315	-	201	-	-	-	-	-

Source: LGP 2015

The estimated equipment operational emissions from the previously approved (2014) design from the June 2014 *Air Quality Technical Report* are presented in **Table B.4-3A**. The estimated equipment operational emissions from the proposed design changes are presented in **Table B.4-3B**.

Table B.4-3A: Construction Equipment Emissions (tons)
(June 2014 Air Quality Technical Report)

Year	VOC	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CO_2e
2014	0.61	8.81	2.51	0.35	0.33	0.34	1,153.82	1,165.36
2015	2.31	31.06	10.09	1.29	1.25	1.22	4,067.81	4,108.49
2016	1.95	25.09	8.39	1.06	1.03	0.99	3,293.05	3,325.98
2017	1.24	15.98	5.58	0.68	0.66	0.63	2,090.00	2,110.90
2018	0.56	7.50	2.58	0.32	0.31	0.29	975.84	985.60
2019	0.61	8.31	2.81	0.35	0.34	0.33	1,083.24	1,094.07
2020	0.34	4.53	1.80	0.20	0.20	0.18	584.94	590.79
2021	0.11	1.64	0.45	0.06	0.06	0.06	212.71	214.84

Source: AECOM, Air Quality Technical Report, June 2014

Table B.4-3B: Construction Equipment Emissions (tons)
(Current Analysis)

Year	VOC	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CO_2e
2016	1.03	13.54	5.32	0.70	0.67	0.02	1,818.38	1,836.57
2017	3.11	38.73	16.37	2.13	2.05	0.05	5,214.54	5,266.68
2018	2.84	35.07	14.52	1.89	1.82	0.04	4,737.31	4,784.69
2019	2.43	29.23	12.32	1.59	1.53	0.04	3,960.16	3,999.77
2020	0.69	7.95	3.92	0.47	0.45	0.01	1,075.60	1,086.36
2021	0.68	7.80	3.81	0.47	0.45	0.01	1,055.79	1,066.35
2022	0.54	6.16	2.43	0.32	0.31	0.01	844.77	853.22

Source: LGP 2015

Various construction trucks (e.g., concrete and material delivery and haul trucks), workers' commuting vehicles, and shuttle bus operations would also result in indirect emissions during construction periods. The trip forecasts from the *Updated Traffic Analysis for the Construction Conditions* (October 2015) were used for the on-road construction emissions analysis. These on-road construction related vehicles are assumed to:

- Travel at an average speed of 25 miles per hour;

- Take a 20-mile round trip for each truck or commuting vehicle trip;
- Take 4-mile round trip for each shuttle bus trip.

MOVES emission factor model-predicted emission factors were applied to the cumulative annual vehicle miles traveled by on-road vehicles to determine vehicular annual emissions as summarized in **Table B.4-4A** for the June 2014 *Air Quality Technical Report* for the previously approved (2014) design and **Table B.4-4B** for the proposed design revisons.

**Table B.4-4A: On-Road Vehicle Emissions during Construction (tons)
(June 2014 Air Quality Technical Report)**

Year	VOC	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CO_2e
2014	0.10	0.95	0.47	0.068	0.049	0.0023	275.34	278.09
2015	0.40	3.88	1.79	0.276	0.199	0.0090	1,112.61	1,123.74
2016	0.25	2.34	1.39	0.168	0.120	0.0063	698.32	705.30
2017	0.14	1.26	0.98	0.092	0.065	0.0040	397.88	401.86
2018	0.23	2.28	1.02	0.162	0.117	0.0052	652.10	658.62
2019	0.20	2.03	0.81	0.144	0.104	0.0044	571.50	577.22
2020	0.06	0.58	0.32	0.042	0.030	0.0015	172.50	174.23
2021	0.09	0.88	0.32	0.062	0.045	0.0018	244.73	247.18

Source: AECOM, Air Quality Technical Report, June 2014

**Table B.4-4B: On-Road Vehicle Emissions during Construction (tons)
(Current Analysis)**

Year	VOC	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CO_2e
2016	0.30	1.68	4.99	0.15	0.09	0.02	868.46	877.15
2017	1.04	6.25	15.86	0.52	0.34	0.05	2,983.98	3,013.82
2018	0.86	5.34	12.67	0.44	0.29	0.04	2,470.05	2,494.75
2019	0.60	3.80	8.67	0.31	0.21	0.03	1,725.25	1,742.50
2020	0.21	0.73	4.79	0.08	0.04	0.01	619.85	626.05
2021	0.31	2.29	3.43	0.18	0.12	0.01	875.95	884.71
2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: LGP 2015

Under the General conformity Requirements, total annual emissions resulting from proposed federal actions must be compared to the applicable *de minimis* levels on an annual basis. As defined by the rule, if the emissions of a nonattainment or maintenance pollutant (or its precursors) do not exceed the *de minimis* level, the federal action has minimal air quality impact and is determined to conform to the SIP for the criteria pollutants under consideration. No further analysis is necessary. Conversely, if the total direct and indirect emissions of a pollutant are above the *de minimis* level, a formal general conformity determination is required for that pollutant.

As shown in **Table B.4-5A** and **Table B.4-5B**, the expected annual increases in construction emissions under the Proposed Action would be below the applicable *de minimis* criteria under both the June 2014 *Air Quality Technical Report* and with the proposed design changes.

Table B.4-5A: Total Construction Year Annual Emissions (tons)
(June 2014 Air Quality Technical Report)

Year	VOC	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CO_2e
2014	0.71	9.76	2.98	0.41	0.38	0.35	1,429.16	1,443.45
2015	2.71	34.94	11.89	1.56	1.45	1.23	5,180.43	5,232.23
2016	2.20	27.42	9.78	1.23	1.15	1.00	3,991.37	4,031.28
2017	1.38	17.24	6.57	0.78	0.73	0.63	2,487.88	2,512.76
2018	0.79	9.78	3.60	0.48	0.42	0.30	1,627.94	1,644.22
2019	0.81	10.35	3.62	0.49	0.44	0.33	1,654.74	1,671.29
2020	0.40	5.12	2.12	0.25	0.23	0.18	757.43	765.00
2021	0.19	2.52	0.77	0.13	0.11	0.07	457.44	462.01
Annual de minimis Levels	50	100	100	n/a	100	100	n/a	n/a

Source: AECOM, Air Quality Technical Report, June 2014

Table B.4-5B: Total Construction Year Annual Emissions (tons)
(Current Analysis)

Year	VOC	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CO_2e
2016	1.33	15.22	10.31	0.85	0.77	0.03	2,686.85	2,713.71
2017	4.16	44.98	32.23	2.66	2.39	0.10	8,198.51	8,280.50
2018	3.71	40.41	27.19	2.33	2.11	0.08	7,207.37	7,279.44
2019	3.03	33.03	20.98	1.90	1.74	0.06	5,685.41	5,742.27
2020	0.90	8.68	8.71	0.55	0.50	0.02	1,695.45	1,712.40
2021	0.99	10.10	7.25	0.65	0.57	0.02	1,931.75	1,951.06
2022	0.54	6.16	2.43	0.32	0.31	0.01	844.77	853.22
Annual de minimis Levels	50	100	100	n/a	100	100	n/a	n/a

Source: LGP 2015

Therefore, since the cumulative emissions predicted during construction (including the peak year of 2017) are estimated to be well below the *de minimis* limits, the air quality impacts can be assumed to be negligible and not significant; therefore, a formal conformity determination is not required. Emissions compared to the previously approved (2014) design are higher due to the compressed construction schedule and nighttime work that occurs during the peak construction period associated with the proposed design changes. Reductions in SO_2 are the result of the switch to Ultra Low Sulfur Diesel in the model runs for the proposed design changes.

B.4.1.2 Operational Emissions (Indirect)

There are no operational changes associated with the project since issuance of the 2014 EA; as such, the operation analyses in the June 2014 *Air Quality Technical Report* are still valid.

Attachment 6

Technical Memorandum – Updated Noise Analysis for the Construction Conditions

LaGuardia CTB Replacement Project

Updated Noise Analysis for the Construction Conditions

FROM: Arthur Morrone, WSP/Parsons Brinckerhoff
TO: Nathaniel Kimball, PANYNJ
DATE: December 15, 2015
SUBJECT: Technical Memorandum – Updated Air Quality Analysis for the Construction Conditions

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INTRODUCTION

As part of the Port Authority of New York and New Jersey's (PANYNJ) proposed redevelopment of the Central Terminal Building (CTB) at LaGuardia Airport, a reevaluation of the Environmental Assessment (EA, November 2014) traffic and construction related noise analysis were completed in accordance with federal, state, and local requirements. This updated analysis was conducted and completed in accordance with the National Environmental Policy Act (NEPA), the Federal Aviation Administration (FAA) guidance, the New York City Environmental Quality Review (CEQR) guidance and the New York State Environmental Quality Review Act (SEQRA).

The noise re-assessment was limited to the temporary construction related activities. There are no operational changes associated with the project since issuance of the 2014 EA; as such, the operation analyses in the June 2014 *Noise Technical Report (Appendix E)* are still valid.

E.1. Noise Fundamentals and Evaluation Criteria

E.1.1 Noise Fundamentals

Noise can be defined as any unwanted sound. Sound is all around, but becomes noise when it interferes with normal activities such as sleep and conversation. The principal human response to noise is perceived annoyance. Human response can vary according to the type and source of the noise, the distance between the source and the human receptor, the perceived importance of the noise, its appropriateness in the setting, and the sensitivity of the person receiving the noise (receptor).

The measurement of the human perception of sound results from its three basic physical characteristics: intensity, frequency, and duration. Intensity is a measure of the acoustic energy of the sound vibrations and is expressed in terms of sound pressure. As sound pressure increases, the energy carried by the sound increases, and the perception of loudness of that sound increases as well. Frequency is the number of times per second the air vibrates or oscillates. Low frequency sounds are characterized as rumbles or roars, while sirens or screeches typify high frequency sounds. Duration is the length of time the sound can be detected.

The loudest sounds that can be detected without pain by the human ear have intensities that are a trillion times higher than those of sounds that can barely be detected. Because of this vast range, a logarithmic unit known as the decibel (dB) is used to represent the intensity of a sound. Such a representation is called a sound level. The logarithmic nature of the dB unit does not allow sound levels to be arithmetically added or subtracted. However, some simple rules can be used to understand sound levels. If a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. For example:

60 dB + 60 dB = 63 dB

80 dB + 80 dB = 83 dB

Second, the total sound level produced by two sounds of different levels is usually only slightly more than the greater of the two. For example:

60 dB + 70 dB = 70.4 dB

The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. On average, a person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness, and this relation holds true for loud and quiet sounds. A decrease in sound level of 10 dB actually represents a 90% decrease in sound intensity, but only a 50% decrease in perceived loudness because of the nonlinear response of the human ear. Noise measurements assessed relative to human exposure are usually expressed using an "A-weighted" scale that filters out very low and very high frequencies in order to replicate human sensitivity. It is common to add the letter "A" to the unit of measurement (dBA) in order to identify that the measurement has been made with this filtering process. Human hearing ranges from approximately 30 dBA (the threshold of hearing) to between 130 and 140 dBA (the threshold of pain). **Table E-1** summarizes typical noise levels from common sources and **Table E-2** provides a summary of human perceptibility of changes in noise levels.

Since the dBA noise metric describes a noise level at just one moment, and very few noises are constant, other ways of describing noise over extended periods are needed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period as if it had been a steady, unchanging sound. For this condition, a descriptor called the equivalent sound level (or L_{eq}) can be computed. The L_{eq} descriptor is the constant sound level that, in a given situation and time period (e.g., one-hour L_{eq}, or 24-hour L_{eq}), conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors, such as L_1, L_{10}, L_{50} and L_{90} are also sometimes used to indicate noise levels which are exceeded 1, 10, 50 and 90 percent of the time, respectively. The descriptors of the maximum and minimum noise during a noise event are L_{max} and L_{min}, respectively. Among these descriptors, the one-hour L_{eq} (or simply $L_{eq}(1)$) is considered a standard metric for evaluating traffic noise impact by the Federal Highway Administration (FHWA) and is also a common metric for all sources by the City of New York as per the *City Environmental Quality Review (CEQR) Technical Manual.*

TABLE E-1: Common Noise Levels

Sound Source	dBA
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 1,500 feet	100
Train horn at 100 feet	90
Busy city street, loud shout	80
Highway traffic at 50 feet	70
Predominantly industrial area	60
Background noise in an office	50
Public library	40
Soft whisper at 15 feet	30

Note: A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.
Source: Cowan, James P. *Handbook of Environmental Acoustics.* Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.

TABLE E-2: Average Ability to Perceive Changes in Noise Levels

Change (dBA)	Human Perception of Sound
2-3	Barely perceptible
5	Readily noticeable
10	A doubling or halving of the loudness of sound
20	A dramatic change
40	Difference between a faintly audible sound and a very loud sound

Source: Bolt Beranek and Neuman, Inc., Fundamentals and Abatement of Highway Traffic Noise, Report No. PB-222-703. Prepared for Federal Highway Administration, June 1973

E.1.2 Noise Analysis Methodology and Evaluation Criteria

E.1.2.1 On-Road Construction Related Mobile Sources

The *CEQR Technical Manual* contains noise exposure guidelines for use in a New York City environmental impact review. As shown in **Table E-3**, noise exposure is classified into four categories: (1) Acceptable, (2) Marginally Acceptable, (3) Marginally Unacceptable and (4) Clearly Unacceptable. The *CEQR Technical Manual* criteria are based on maintaining an interior noise level for the worst-case hour L_{10} less than or equal to 45 dBA and assumes typical construction techniques provide a minimum of 20 dBA of noise attenuation from outdoor to indoor areas.

According to the noise impact assessment guidelines provided in the *CEQR Technical Manual*, a significant impact during daytime hours is an exceedance of 65 dBA L_{eq}(1). Therefore, a three decibel (3 dBA) increase in L_{eq}(1) over the future No Action condition (although just barely perceptible to most listeners) is considered an indicator of noise impact significance when the daytime level is at or above 62 dBA. These assessment guidelines were used to assess noise impacts from on-road mobile sources from operations as well as during construction under the Proposed Action.

The methodology for predicting future on-road traffic noise levels assumes that existing noise levels are dominated by, and are a function of, existing traffic volumes. Changes in future noise levels can therefore be determined by the proportional increase in traffic on the adjacent roadways as a result of a given project. For example, if the existing traffic volume at an intersection is 100 vehicles per hour (vph) and the future traffic volume increases by 50 vph (to 150 vph), the noise levels would increase by approximately 1.8 decibels (dBA). For an increase of 100 vph (a doubling of traffic volume or a total of 200 vehicles per hour), noise levels would increase by 3 dBA. However, as different types of vehicles (cars, trucks, buses, etc.) generate different noise levels, *CEQR Technical Manual* recommends using Passenger Car Equivalents (PCE) to create a common unit of measurement to conservatively estimate noise from traffic.

The PCE conversion factors are as follows:

Description	PCE
Automobile or Light Truck	1
Medium Truck	13
Bus	18
Heavy Truck	47

If the Proposed Action would double PCE traffic, a more detailed analysis should be performed; however, if the increase is less than double the existing PCE, it is assumed that the Proposed Action would not cause a significant adverse vehicular noise impact. The simple PCE calculation can be used where traffic noise at a location comes primarily from a single adjacent roadway (with no nearby higher- volume roadways). At locations where traffic noise from multiple roadways substantially contributes to ambient sound levels, the simple PCE comparison for traffic on the nearest roadway does not account for ambient noise levels generated by those other roadways. In these cases, a refined noise analysis using the FHWA Traffic Noise Model (TNM version 2.5) can be conducted to predict the true project-generated incremental traffic noise along the immediately adjacent road.

Even though traffic noise surrounding LaGuardia Airport comes from multiple roadways, the PCE method was utilized as a conservative approach using mid-block peak-hour traffic forecasts to determine whether a significant traffic noise impact would occur. This approach is conservative because it assumes a lower ambient (existing) noise level than truly occurs and, therefore, a lower criteria for increasing the noise level by 3 dBA or more. This approach was applied to the 2017 peak construction phase movements along the major affected travel routes.

TABLE E-3: NOISE EXPOSURE STANDARDS FOR USE IN CITY ENVIRONMENTAL QUALITY REVIEW

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Exposure	Marginally Acceptable General External Exposure	Airport[3] Exposure	Marginally Unacceptable General External Exposure	Airport[3] Exposure	Clearly Unacceptable General External Exposure	Airport[3] Exposure
1. Outdoor area requiring serenity and quiet[2]		$L_{10} \le 55$ dBA							
2. Hospital, Nursing Home		$L_{10} \le 55$ dBA	------------$L_{dn} \le 60$ dBA------------	$55 < L_{10} \le 65$ dBA	------------$L_{dn} \le 65$ dBA------------	$65 < L_{10} \le 80$ dBA	------------(I) $L_{dn} \le 70$ dBA------------ ------------(II) $L_{dn} \le 75$ dBA------------	$L_{10} > 80$ dBA	------------$L_{dn} > 75$ dBA------------
3. Residence, residential hotel or motel	7 AM–10 PM	$L_{10} \le 65$ dBA		$65 < L_{10} \le 70$ dBA		$70 < L_{10} \le 80$ dBA		$L_{10} > 80$ dBA	
	10 PM–7 AM	$L_{10} \le 55$ dBA		$55 < L_{10} \le 70$ dBA		$70 < L_{10} \le 80$ dBA		$L_{10} > 80$ dBA	
4. School, museum, library, court, house of worship or transient hotel or motel, public meeting room, auditorium, out-patient public health facility		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)	
5. Commercial or office		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)		Same as Residential Day (7 AM–10 PM)	
6. Industrial, public areas only[4]	Note[4]	Note[4]		Note[4]		Note[4]		Note[4]	

Source: New York Department of Environmental Protection (adopted policy 1983).

Notes:

(i) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more.

1 Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries, as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.

2 Tracts of land where serenity and quiet are extraordinarily important and serve an important public need and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients requiring special qualities of serenity and quiet and residents of sanitariums and old-age homes.

3 One may use the FAA-approved L_{dn} contours supplied by the Port Authority of New York and New Jersey, or the noise contours may be computed from the federally approved INM Computer Model using data supplied by the Port Authority of New York and New Jersey.

4 External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

E.1.2.2 Stationary Construction Equipment (Non-Road Mobile Sources)

On-site construction noise is generally short in duration and its effects are temporary. Unlike operational impacts, there is a lack of specific impact criteria on a federal, state, or city level. However, according to the New York State Department of Transportation (NYSDOT) *Noise Analysis Policy and Procedures (4.4.18)*, there would be no impact from construction noise at any sensitive receptor when levels are under 85 dBA of $L_{eq}(1)$ in New York City. In addition, in *Assessing and Mitigating Noise Impacts* (policy dated February 2, 2001) New York State Department of Environmental Conservation (DEC) identifies an increase of 10 dBA as deserving consideration of avoidance and mitigation measures.

To assess the construction noise impacts from on-site equipment operations for the Proposed Action, the loudest projected hourly noise level in any given month was predicted assuming that all likely equipment would be operating within the same hour. These cumulative noise levels were then adjusted based on applicable usage factors.

The Federal Highway Administration (FHWA)-approved Roadway Construction Noise Model (RCNM, version 1.1) was used to predict construction noise levels from on-site construction equipment. RCNM was released for public use in 2006 after several years of development stemming from an earlier version used at the Central Artery/Third Harbor Tunnel Project in Boston. Noise emission levels for generic types of heavy equipment are contained in a database in the model. The equipment noise emission reference levels, which were all measured under actual field conditions, are expressed as A-weighted L_{max} levels at 50 feet.

Based on the equipment type, the distance between the work zone and the selected receptor, the RCNM computes the L_{max} and/or $L_{eq}(1)$ levels at each receptor location. Adjustments are also applied to reflect any additional shielding factors such as the noise reduction expected from noise barriers. The model automatically accesses a database of equipment usage factors to compute the equipment noise levels over any period of interest. The RCNM model does not account for excess ground attenuation or atmospheric absorption, so the resulting predicted noise levels are higher than would actually be perceived.

E.2 Existing Conditions

Noise levels at and around LaGuardia Airport are affected both by the setting of the Airport, which includes an urban area close to a major highway (the Grand Central Parkway), and the aircraft operations taking place on the airfield. Vehicle traffic on and off the Airport is a mostly steady source of ambient noise while aircraft operations make a more intermittent but significant contribution to existing noise levels. A total of four noise-sensitive sites were selected for typical weekday 24-hour noise monitoring to determine current baseline conditions.[1] **Figure E-1** shows these selected sites in the context of the surrounding land uses. ·

The monitoring program was implemented on the January 16, 17, 29, and 30, 2013. Noise monitoring was conducted per the procedures described in the *CEQR Technical Manual* using two Brüel & Kjær Type 1 sound level meters, Models 2250 and 2238. During each sampling event, a sound signal was obtained by an outdoor microphone positioned five feet above the ground and was transferred to the noise analyzer. The sound level meters, then converted the incoming signal to A-weighting, sound statistics, including $L_{eq}(1)$, L_{10}, and L_{90}. A wind screen was used to minimize wind noise across the face of the microphone.

The predominant source of noise at each monitoring location is highway and local roadway vehicular traffic. Aircraft noise also contributes to the monitored levels, but to a lesser extent. The monitored hourly noise levels summarized in **Table E-4** indicate that:

- The L_{10} noise levels at Monitoring Site 1 (M1) which is close and exposed to the Grand Central Parkway traffic, is classified Marginally Unacceptable under the City's noise exposure guidelines presented in **Table E-4**.
- The L_{10} noise levels at the rest of the sensitive sites (M2, M3, and M5) are classified as "Marginally Acceptable."[2]
- The day-night (Ldn) level at M3 is only slightly below 65 dBA, the threshold of noise incompatibility with residential land uses.
- The day-night (Ldn) levels recorded at sites M1 and M5 are above 65 dBA, the threshold of noise incompatibility with residential land uses. These levels are primarily due to vehicular traffic, although some portion of the noise could be attributable to aircraft overflights as they are located on the edges of the day-night (Ldn) 65 dB noise contour for the existing aircraft modeling (see Exhibit 9 in 2014 EA Appendix E). Ambient noise levels shown in **Table E-4** would be considered Marginally Unacceptable for CEQR General External Exposure criteria.

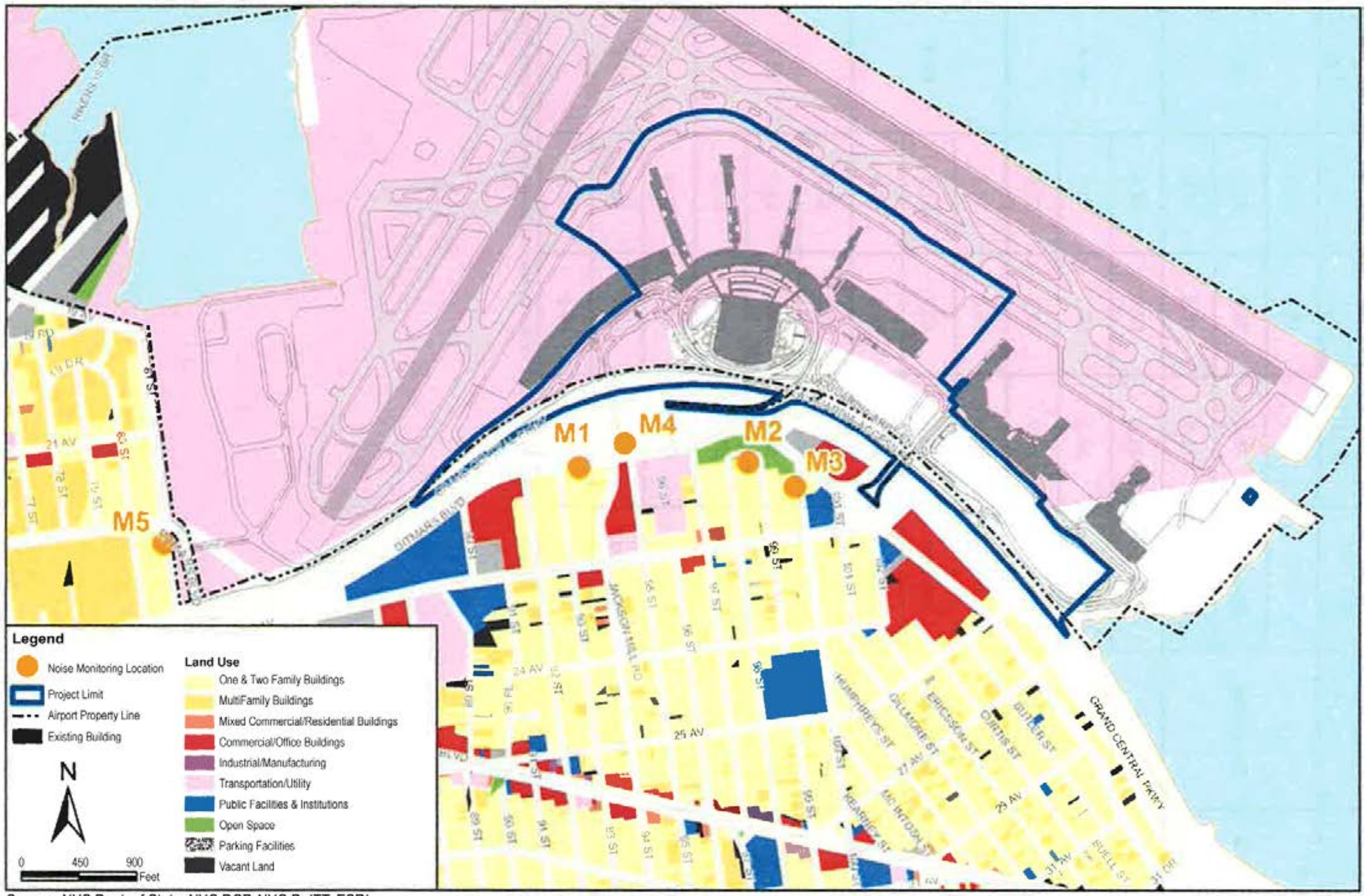
[1] An additional control site (M4) was selected by PANYNJ adjacent to the Airport near the Grand Central Parkway ramp. However this site is not evaluated for impact because it is located away from any noise sensitive areas.

[2] M2 is located at Overlook Park and recorded L_{10} levels between 66.1 and 67.3 dBA. The "Acceptable General External Exposure" for an 'outdoor area requiring serenity and quiet' is $L_{10} \leq 55$ dBA; however, quiet is not a primary attribute of the park. Overlook Park is located south of Ditmars Boulevard, at an elevation that provides a full view of LaGuardia Airport, allowing visitors to observe the airport activities.

Table E-4 Existing Ambient Noise Monitoring Results

Site	Location	Land Use	Weekday Peak Hour	Noise Level (dBA)			
				Leq (1hr)	L10	L90	Ldn
M1	Ditmars Blvd. Between 93rd St. & 94th St.	Residential	AM	73.0	75.6	66.6	73.2
			Mid-Day	73.2	76.0	66.2	
			PM	71.9	73.8	67.0	
M2	Overlook Park	Recreational	AM	64.6	67.3	60.4	64.4
			Mid-Day	64.3	66.1	59.9	
			PM	64.5	67.1	60.6	
M3	100th St.& Ditmars Blvd.	Residential	AM	63.5	66.0	58.1	64.3
			Mid-Day	63.6	65.7	57.9	
			PM	63.7	65.9	58.5	
M4	94th St. & Ditmars Northeast Corner	Non-sensitive	AM	71.3	71.8	63.0	72.3
			Mid-Day	66.2	68.4	61.9	
			PM	65.5	67.6	62.0	
M5	Ditmars Blvd.& 81st St. at Marine Terminal Rd.	Residential	AM	67.3	69.5	60.0	72.6

Figure E-1 Noise Monitoring and Impact Assessment Receptor Sites



Source: NYS Dept. of State, NYC DCP, NYC DoITT, ESRI
Prepared by: AECOM

E.3 Environmental Consequences

Potential noise impacts from the CTB Redevelopment Project were assessed for the projected annual peak construction phase, with the greatest of these activities occurring in the 2016 to 2018 time period. There are no operational changes associated with the project since issuance of the 2014 EA; as such, the operation analyses in the June 2014 *Noise Technical Report (Appendix E)* are still valid.

E.3.1 Construction

E.3.1.1 Construction Equipment Noise

Construction of the CTB Redevelopment Project would involve multiple phases over eight years (2015 to 2022). An updated construction schedule has been developed for the current analysis. According to this schedule, 2017 would be the worst-case construction year, resulting in the maximum number of construction activities and equipment on site. Various construction equipment would be utilized during both demolition and construction activities. Based on the predicted monthly equipment usage data, the month with the highest activity (based on the greatest number of equipment pieces utilized) was selected as the worst-case condition for each year. A summary of the equipment inventory is presented in **Table E-5.**

Construction equipment noise was compared with existing background levels at four noise sensitive sites (Sites M1, M2, M3, and M5). The analysis conservatively assumed that all equipment would be operated at the same time at the construction project site. Since these selected monitoring sites are the closest receptor locations to the proposed construction activities, the predicted noise impacts are expected to be representative of the worst-case conditions.

The FHWA-approved Roadway Construction Noise Model (RCNM) was used to predict construction noise levels from the on-site construction equipment. **Table E-6** shows RCNM-predicted peak daytime noise levels from each phase of construction at the four off-site monitoring locations generated from the combined effects of both mobile and stationary related construction activities near these receptor sites. The CTB Redevelopment Program construction activity would likely result in noticeable noise increases that range from 5 to 8 dBA above existing daytime background levels in areas around sites M2 and M3. The relatively high noise increases would occur during early construction stages (between 2016 and 2018). The highest noise level exposure is projected to occur in 2016 because the greatest number of pile driving activities are clustered in 2016. The construction equipment noise levels are predicted to be well below the 85 dBA criterion established by NYSDOT in all cases. At site M1, the incremental noise from construction activities would not be noticeable given the high background noise primarily caused by the adjacent Grand Central Parkway traffic. At site M5, construction activity would have negligible noise impacts given the distance between the sources and receptors.

Table E-7 provides a summary of projected combined mobile and stationary noise exposure during the nighttime hours (10 PM to 7 AM) during 2017, when the major demolition activities are scheduled to occur. Measured nighttime Leq noise levels within the project study area vary from 49 to 60 dBA, with a 9 hour average of 54 dBA. Noise levels from construction activities at night may contribute several decibels to the background level for a period of approximately six months, at sites M2 and M3. However, these increases in noise levels are well below the NYSDOT 85 dBA criteria. Additionally, interior noise levels inside residential properties represented by sites M2, M3 and M5 will not be affected by construction noise and are below levels that would cause annoyance.

Table E-5 Construction Equipment Inventory Database

Type of Equipment	Hourly Maximum per Year						
	2016	2017	2018	2019	2020	2021	2022
Asphalt Paver, 130 HP	-	1	1	1	1	1	1
Centrifugal water pump, 6"	2	3	3	4	3	3	2
Compressor, 160 cfm	-	-	-	-	-	-	-
Compressor, 250 cfm	-	-	-	-	-	-	-
Compressor, 400 cfm	1	1	1	1	-	-	-
Compressor, 900 cfm	1	2	2	1	1	-	-
Concrete pump, large	1	3	1	1	1	1	1
Concrete pump, small	1	1	-	-	-	-	-
Crane, 90-ton	-	-	-	-	-	-	-
Crane, 100-ton	1	1	1	1	-	-	-
Crane, 150-ton	-	1	1	1	-	-	-
Crane, 200-ton	1	1	1	1	1	-	-
Crane, 300-ton	1	1	1	1	-	-	-
Crane, 400-ton	-	1	-	-	-	1	-
Crane, Hydraulic, 33-ton	-	-	-	-	-	-	-
Crane, Hydraulic, 100-ton	1	1	1	1	1	-	-
Crane, Hydraulic, 150-ton	1	1	1	1	-	-	-
Crane, Hydraulic, 200-ton	1	-	-	-	-	-	-
Crane, Hydraulic, 300-ton	-	1	1	1	-	-	-
Crane, Hydraulic, 500-ton	-	-	-	-	1	-	-
Cherry picker, 45-ton	3	5	10	12	3	3	4
Cherry picker, 65-ton	-	-	1	-	-	-	-
Diesel hammer, 41k ft-lb	1	-	-	-	-	-	-
Drill rig & augers	1	4	3	2	1	1	1
Dozer, 300 HP	1	2	1	1	-	-	-
Excavator, 324	2	7	5	4	2	2	2
Excavator, 328	1	1	1	-	-	1	-
Excavator, 345	1	2	2	1	-	1	1

Type of Equipment	Hourly Maximum per Year						
	2016	2017	2018	2019	2020	2021	2022
Backhoe/Loader, 450	1	3	2	1	1	1	1
Wheeled Excavator, M315	-	1	-	-	-	-	-
Forklift, 5-ton	-	-	1	-	-	-	-
Front end loader, 1.5 cy, crl	2	6	2	1	1	1	1
Front end loader, TM, 2.5 cy	2	6	1	-	-	1	1
Gas engine vibrator	-	-	-	-	-	-	-
Gas welding machine	-	-	-	-	-	-	-
Generator, diesel, 75 Kw	1	1	1	-	-	1	1
Grader, 30,000 lb	1	1	2	1	1	1	1
Hydraulic excavator, 3.5 cy	-	-	-	-	-	-	-
Hydraulic auger	1	-	-	-	-	-	-
Hydraulic hammer	1	1	1	-	1	1	-
Hydraulic Shear, MP30	1	-	-	-	-	-	-
Lift, articulating boom type	3	18	20	19	9	10	1
Demo robot, Brokk 250	1	-	-	-	-	-	-
Paving machinery & equipment	1	2	2	2	1	1	1
Pneumatic wheel roller	-	-	-	-	-	-	-
Roller, vibratory	-	-	-	-	-	-	-
Roller, Cs56	1	2	2	2	1	1	1
Skid Steer, <50 hp	1	-	-	-	-	-	-
Sweeper truck	1	2	1	1	-	1	1
Tandem roller, 10 ton	1	3	3	3	1	1	-
Water truck	1	1	1	1	1	1	1
Welder, 250 amp	1	4	4	3	1	1	1
Welder, 400 amp	-	3	4	2	1	1	1
Welder, 6-pack	1	1	1	-	1	-	-
On-Road Equipment							
Attenuator truck	1	2	2	1	1	1	-
Automobile, sedan	14	32	32	26	15	9	2
Boom truck	-	1	1	-	-	-	-
Transit bus	1	2	2	1	1	-	-
10-wheel dump truck	1	1	-	-	-	-	-
Flat truck	1	2	2	2	2	1	-
Mechanics truck	2	3	3	3	3	2	-
Pickup truck	13	31	31	25	15	9	2
Rack truck, stake body	-	-	1	-	-	-	-
Truck tractor	2	3	3	3	3	1	1
Van	5	6	6	6	4	2	2

Table E-6 Predicted Daytime Construction Related Combined Mobile and Stationary Noise Levels (L_{eq} (1) dBA) at Select Monitoring Sites

Site	Weekday Peak Hour	L_{eq} Noise Level (dBA)									
		Measured Background L_{eq}	2014	2015	2016	2017	2018	2019	2020	2021	2022
M1 - Ditmars Blvd. Between 93rd St. & 94th St.	AM	73	(72)	(70)	68 (70)	66 (70)	66 (64)	62 (64)	65 (61)	64 (59)	59 (NA)
	Mid-Day	73									
	PM	72									
M2 - Overlook Park	AM	65	(73)	(75)	72 (75)	70 (75)	69 (69)	64 (69)	69 (65)	68 (63)	61 (NA)
	Mid-Day	64									
	PM	65									
M3 - 100th St.& Ditmars Blvd.	AM	64	(71)	(74)	71 (74)	69 (74)	69 (68)	65 (68)	68 (64)	67 (62)	61 (NA)
	Mid-Day	66									
	PM	66									
M5 - Ditmars Blvd. & 81st St. at Marine Terminal Rd.	AM	67	(62)	(62)	60 (61)	59 (62)	58 (56)	55 (56)	57 (53)	57 (51)	51 (NA)

Note: Numbers in parentheses represent those from the 2014 EA.

Table E-7 Predicted Night-time Construction Related Combined Mobile and Stationary Noise Levels (L_{eq} (1) dBA) at Select Monitoring Sites

Site	Weekday Overnight	L_{eq} Noise Level (dBA) Night-time									
		Measured Background L_{eq}	2014	2015	2016	2017	2018	2019	2020	2021	2022
M1 - Ditmars Blvd. Between 93rd St. & 94th St.	10pm – 7am*	49-60 (54)*	NA	NA	NA	58	NA	NA	NA	NA	NA
M2 - Overlook Park			NA	NA	NA	63	NA	NA	NA	NA	NA
M3 - 100th St.& Ditmars Blvd.			NA	NA	NA	61	NA	NA	NA	NA	NA
M5 - Ditmars Blvd. & 81st St. at Marine Terminal Rd.			NA	NA	NA	50	NA	NA	NA	NA	NA

*Data supplied by PA collected at 25-38 78th St. Jackson Heights, NY. Data shows nighttime noise measurement min/max range and 9 hour average.

The project would require a construction noise control plan (NCP) to minimize construction noise as mandated in Chapter 28, Title 15 of the City of New York Administrative Code, *Citywide Construction Noise Mitigation*. The NCP would incorporate various noise control measures in accordance with the New York City *Citywide Construction Noise Mitigation* policy and to demonstrate compliance with the City's Noise Code (Local Law No. 113 of 2005). See **Section E-4** for specific mitigation recommendations.

E.3.1.2 Construction Traffic Noise

The mid-block PCE volumes along the roadway immediately adjacent to the noise sensitive receptors were calculated for each of the peak traffic periods (morning and afternoon) for which construction traffic was predicted (*Updated Traffic Analysis for the Construction Conditions*, October 2015). For the No Action condition, the vehicle mix data for corresponding roadway types was used to calculate the future PCE volumes (based on information provided by NYSDOT). The project-generated vehicle mix during the peak construction period was used to calculate the incremental traffic-related PCEs under the Proposed Action condition. The peak period with the highest incremental PCEs was selected for this analysis. If the Proposed Action would double PCE volumes at a given intersection, it is assumed that noise levels would increase by 3 dBA and thereby exceed the NYC CEQR threshold for a significant noise impact. This applies to both nighttime and daytime periods provided the No Action levels exceed 62 dBA.

The maximum incremental noise predicted for each roadway link within the project-related traffic network is summarized in **Table E-8**. Since no incremental increase of 3 dBA was predicted, traffic noise impacts of the construction of the Proposed Action would not be significant. Therefore, no mitigation measures related to construction traffic are warranted to comply with CEQR guidelines.

Table E-8
Peak-Year 2017 Construction Mid-Block Traffic PCEs Comparison Between (2014 EA and 2015 Study)

Location	2017 Worst-case Peak Hour Condition			Significant Traffic Noise Impact? 2015 (2014 EA)
	2017 No Action PCE 2015 (2014 EA)	2017 Incremental With Action PCE 2015 (2014 EA)	Noise Increment (dBA) 2015 (2014 EA)	
South of Bowery Bay Boulevard / Runway Drive / Marine Terminal Road	1,646 (1,332)	663 (741)	1.5 (1.9)	No (No)
North of Bowery Bay Boulevard / Runway Drive / Marine Terminal Road	1,194 (1,065)	512 (647)	1.6 (2.1)	No (No)
West of Bowery Bay Boulevard / Runway Drive / Marine Terminal Road	2,011 (1,594)	188 (94)	0.4 (0.2)	No (No)
East of Bowery Bay Boulevard / Runway Drive / Marine Terminal Road	1,614 (1,493)	0 (0)	0 (0.0)	No (No)
South of Ditmars Boulevard / Marine Terminal Road	5,385 (5,305)	726 (601)	0.5 (0.5)	No (No)
North of Ditmars Boulevard / Marine Terminal Road	4,176 (4,112)	538 (507)	0.5 (0.5)	No (No)
East of Ditmars Boulevard / Marine Terminal Road	2,011 (1,767)	188 (94)	0.4 (0.2)	No (No)

Location	2017 Worst-case Peak Hour Condition			Significant Traffic Noise Impact? 2015 (2014 EA)
	2017 No Action PCE 2015 (2014 EA)	2017 Incremental With Action PCE 2015 (2014 EA)	Noise Increment (dBA) 2015 (2014 EA)	
South of Astoria Boulevard North / 82nd Street / Ditmars Boulevard	3,267 (3,106)	368 (411)	0.5 (0.5)	No (No)
North of Astoria Boulevard North / 82nd Street / Ditmars Boulevard	5,385 (5,301)	725 (601)	0.5 (0.5)	No (No)
West of Astoria Boulevard North / 82nd Street / Ditmars Boulevard	2,380 (1,871)	344 (316)	0.6 (0.7)	No (No)
East of Astoria Boulevard North / 82nd Street / Ditmars Boulevard	4,366 (3,914)	83 (143)	0.1 (0.2)	No (No)
South of 23rd Avenue / 82nd Street	1,564 (1,310)	139 (98)	0.4 (0.3)	No (No)
North of 23rd Avenue / 82nd Street	3,267 (2,983)	368 (458)	0.5 (0.6)	No (No)
West of 23rd Avenue / 82nd Street	843 (904)	229 (360)	1.0 (1.5)	No (No)
East of 23rd Avenue / 82nd Street	1,4133 (1,233)	0(0)	0.0 (0.0)	No (No)
South of Astoria Boulevard / 82nd Street / 24th Avenue	571 (539)	0 (0)	0 (0.0)	No (No)
North of Astoria Boulevard / 82nd Street / 24th Avenue	1,473 (1,438)	139 (51)	0.4 (0.2)	No (No)
West of Astoria Boulevard / 82nd Street / 24th Avenue	4,151 (4,391)	94 (94)	0.1 (0.1)	No (No)
East of Astoria Boulevard / 82nd Street / 24th Avenue	4,935 (5,231)	233 (145)	0.2 (0.1)	No (No)
South of Astoria Boulevard North / 79th Street	4,147 (3,153)	0 (47)	0 (0.1)	No (No)
West of Astoria Boulevard North / 79th Street	5,150 (5,446)	344 (363)	0.3 (0.3)	No (No)
East of Astoria Boulevard North / 79th Street	1,616 (2,293)	274 (316)	0.7 (0.6)	No (No)
South of Astoria Boulevard North / 23rd Avenue	3,304 (2,387)	0 (47)	0 (0.1)	No (No)
North of Astoria Boulevard North / 23rd Avenue	4,147 (3,153)	0 (47)	0 (0.1)	No (No)
West of Astoria Boulevard North / 23rd Avenue	1,811 (1,794)	229 (360)	0.5 (0.8)	No (No)
East of Astoria Boulevard North / 23rd Avenue	969 (959)	229 (360)	0.9 (1.4)	No (No)
South of Astoria Boulevard / 77th Street	477 (474)	0 (0)	0 (0.0)	No (No)
North of Astoria Boulevard / 77th Street	1,468 (1,505)	0 (0)	0 (0.0)	No (No)
West of Astoria Boulevard / 77th Street	4,092 (4,302)	551 (407)	0.4 (0.4)	No (No)
East of Astoria Boulevard / 77th Street	3,101 (3,272)	370 (407)	0.5 (0.5)	No (No)
South of LaGuardia Access Road / 94th Street	3,269 (4,013)	704 (613)	0.8 (0.6)	No (No)
North of LaGuardia Access Road / 94th Street	2,866 (3,655)	704 (613)	1.0 (0.7)	No (No)
West of LaGuardia Access Road / 94th Street	662 (1,048)	0 (0)	0 (0.0)	No (No)
East of LaGuardia Access Road / 94th Street	3,467 (3,820)	0 (0)	0 (0.0)	No (No)
South of Ditmars Boulevard / 94th Street	1,470 (1,364)	658 (470)	1.6 (1.3)	No (No)
North of Ditmars Boulevard / 94th Street	3,269 (1,999)	704 (470)	0.8 (0.9)	No (No)
West of Ditmars Boulevard / 94th Street	4,053 (1,065)	83 (0)	0.1 (0.0)	No (No)
East of Ditmars Boulevard / 94th Street	1,505 (1,359)	0 (0)	0 (0.0)	No (No)
South of 23rd Avenue / 94th Street	904 (811)	658 (470)	2.4 (2.0)	No (No)
North of 23rd Avenue / 94th Street	1,470 (1,364)	658 (470)	1.6 (1.3)	No (No)

Location	2017 Worst-case Peak Hour Condition			Significant Traffic Noise Impact? 2015 (2014 EA)
	2017 No Action PCE 2015 (2014 EA)	2017 Incremental With Action PCE 2015 (2014 EA)	Noise Increment (dBA) 2015 (2014 EA)	
West of 23rd Avenue / 94th Street	1,416 (1,497)	0 (0)	0 (0.0)	No (No)
East of 23rd Avenue / 94th Street	993 (1,053)	0 (0)	0 (0.0)	No (No)
South of 24th Avenue / 94th Street	882 (867)	658 (470)	2.4 (1.9)	No (No)
North of 24th Avenue / 94th Street	828 (813)	658 (470)	2.5 (2.0)	No (No)
West of 24th Avenue / 94th Street	242 (242)	0 (0)	0 (0.0)	No (No)
East of 24th Avenue / 94th Street	168 (168)	0 (0)	0 (0.0)	No (No)
South of 25th Avenue / 94th Street	848 (835)	658 (470)	2.5 (1.9)	No (No)
North of 25th Avenue / 94th Street	882 (870)	658 (470)	2.4 (1.9)	No (No)
West of 25th Avenue / 94th Street	339 (336)	0 (0)	0 (0.0)	No (No)
East of 25th Avenue / 94th Street	343 (341)	0 (0)	0 (0.0)	No (No)
South of Astoria Boulevard / 94th Street	764 (764)	216 (218)	1.1 (1.1)	No (No)
North of Astoria Boulevard / 94th Street	848 (838)	658 (470)	2.5 (1.9)	No (No)
West of Astoria Boulevard / 94th Street	4,737 (5,061)	234 (144)	0.2 (0.1)	No (No)
East of-Astoria Boulevard / 94th Street	4,455 (4,774)	676 (208)	0.6 (0.2)	No (No)
South of 31st Avenue / 94th Street	741 (744)	216 (218)	1.1 (1.1)	No (No)
North of 31st Avenue / 94th Street	756 (759)	216 (218)	1.1 (1.1)	No (No)
West of 31st Avenue / 94th Street	400 (398)	0 (0)	0 (0.0)	No (No)
East of 31st Avenue / 94th Street	346 (343)	0 (0)	0 (0.0)	No (No)
South of Northern Boulevard / 94th Street	934 (937)	216 (218)	0.9 (0.9)	No (No)
North of Northern Boulevard / 94th Street	825 (830)	216 (218)	1.0 (1.0)	No (No)
West of Northern Boulevard / 94th Street	3,904 (4,542)	0 (0)	0 (0.0)	No (No)
East of Northern Boulevard / 94th Street	4,132 (4,767)	0 (0)	0 (0.0)	No (No)
South of GCP eastbound on-ramp / 94th Street	3,269 (1,999)	0 (470)	0 (0.9)	No (No)
North of GCP eastbound on-ramp / 94th Street	3,269 (1,999)	0 (470)	0 (0.9)	No (No)
West of GCP eastbound on-ramp / 94th Street	3,151 (944)	0 (143)	0 (0.6)	No (No)
South of 81st Street/Ditmars Boulevard	86 (84)	0 (0)	0 (0.0)	No (No)
North of 81st Street/Ditmars Boulevard	3,235 (3,203)	538(507)	0.5 (0.6)	No (No)
West of 81st Street/Ditmars Boulevard	1,013 (979)	0 (0)	0 (0.0)	No (No)
East of 81st Street/Ditmars Boulevard	4,176 (4,112)	538 (507)	0.5 (0.5)	No (No)
South of 81st Street/21st Avenue	3,235 (3,203)	538 (507)	0.7 (0.6)	No (No)
North of 81st Street/21st Avenue	3049 (3,027)	538 (507)	0.7 (0.7)	No (No)
West of 81st Street/21st Avenue	447 (437)	0 (0)	0 (0.0)	No (No)
South of New LGA access driveway/19th Ave./81st St.	3049 (3,027)	0 (0)	0 (0.0)	No (No)
North of New LGA access driveway/19th Ave./81st St.	2,943 (1,448)	512 (647)	0.7 (1.6)	No (No)
West of New LGA access driveway/19th Ave./81st St.	3,049 (2,894)	1,013 (967)	1.2 (1.3)	No (No)
East of New LGA access driveway/19th Ave./81st St.	3,049 (3,027)	538 (507)	0.7 (0.7)	No (No)

Location	2017 Worst-case Peak Hour Condition			Significant Traffic Noise Impact? 2015 (2014 EA)
	2017 No Action PCE 2015 (2014 EA)	2017 Incremental With Action PCE 2015 (2014 EA)	Noise Increment (dBA) 2015 (2014 EA)	
South of Hazen Street/19th Avenue	981 (971)	0 (0)	0 (0.0)	No (No)
North of Hazen Street/19th Avenue	3,059 (3,030)	0 (0)	0 (0.0)	No (No)
East of Hazen Street/19th Avenue	2,965 (2,980)	1,013 (1,011)	1.3 (1.3)	No (No)

E.4 Mitigation Measures

Based on the results of the noise analysis, pile driving activities during 2016 to 2018 of the construction of the Proposed Action would result in an increase of up to 8 decibels over background noise measured at two monitoring sites off Airport property. DEC recommends consideration of avoidance and mitigation measures at that level. As a result, the following noise control measures are recommended to minimize these potentially adverse effects in the community:

- Reduce the impact sound of the ram hitting the pile cap by placing a resilient pad in the anvil chamber;
- Reduce the discharge sound of the hammer's air exhaust by installing a rectangular steel enclosure lined with acoustically-absorptive material to provide both sound absorption and a limp mass noise barrier; and,
- Reduce the “ringing” noise of the steel piles by utilizing acoustical paint across the web of each pile at 4-6 foot intervals.

The project would require a construction noise control plan (NCP) to minimize construction noise as mandated in Chapter 28, Title 15 of the City of New York Administrative Code, *Citywide Construction Noise Mitigation.* The NCP would incorporate various noise control measures in accordance with the New York City *Citywide Construction Noise Mitigation* policy and to demonstrate compliance with the City's *Noise Code* (Local Law No. 113 of 2005). Those measures include the following:

- Conduct construction activities during the daytime whenever possible;
- Require special permits for all construction within a specified distance and a specified time period for residential zones during the night and weekends;
- Use construction equipment with effective noise-suppression devices;
- Use noise control measures as necessary, such as enclosures and noise barriers, to protect the public and achieve compliance with all City noise ordinances; and,

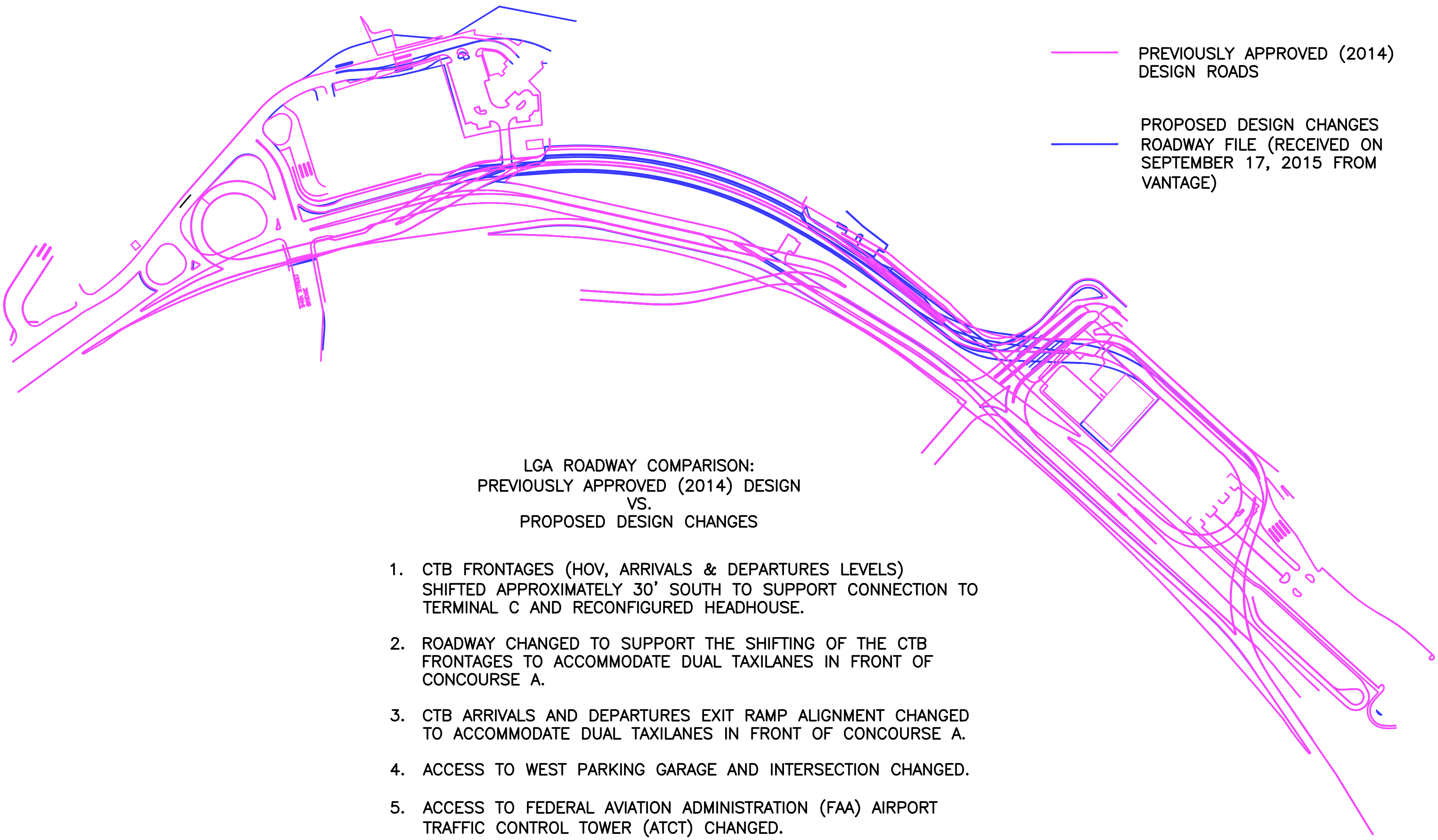
- Conduct all operations in a manner that will minimize, to the greatest extent feasible, disturbance to the public in areas adjacent to the construction activities and to occupants of nearby buildings.

E.5 Summary

The noise re-assessment was limited to the temporary construction related activities. There are no operational changes associated with the project since issuance of the 2014 EA; as such, the operation analyses in the June 2014 *Noise Technical Report (Appendix E)* are still valid. Construction activities would include use of equipment on-site as well as construction traffic in the surrounding area. The increased construction traffic would result in only minor noise increments. Use of construction equipment on-site (particularly pile-driving) would likely result in noticeable noise increases above existing background levels in a couple of areas (representative receptor sites M2 and M3) around the construction site during the early stages (2016 to 2018) of the project. Mitigation measures would be implemented and a noise control plan drafted to minimize the adverse effects on the community.

Attachment 7

Comparison – New CTB Roadway Layout and Previously Approved Layout



LGA ROADWAY COMPARISON:
PREVIOUSLY APPROVED (2014) DESIGN
VS.
PROPOSED DESIGN CHANGES

1. CTB FRONTAGES (HOV, ARRIVALS & DEPARTURES LEVELS) SHIFTED APPROXIMATELY 30' SOUTH TO SUPPORT CONNECTION TO TERMINAL C AND RECONFIGURED HEADHOUSE.

2. ROADWAY CHANGED TO SUPPORT THE SHIFTING OF THE CTB FRONTAGES TO ACCOMMODATE DUAL TAXILANES IN FRONT OF CONCOURSE A.

3. CTB ARRIVALS AND DEPARTURES EXIT RAMP ALIGNMENT CHANGED TO ACCOMMODATE DUAL TAXILANES IN FRONT OF CONCOURSE A.

4. ACCESS TO WEST PARKING GARAGE AND INTERSECTION CHANGED.

5. ACCESS TO FEDERAL AVIATION ADMINISTRATION (FAA) AIRPORT TRAFFIC CONTROL TOWER (ATCT) CHANGED.

6. ACCESS TO SHIPPING/RECEIVING FACILITY CHANGED.

Attachment 8

Technical Memorandum – LGA CTB CO Hot Spot Analysis

AECOM
125 Broad Street
New York, NY
10004
www.aecom.com

212 377 8728 tel
212 377 8410 fax

Memorandum

To	Nate Kimball, PANYNJ	Page	1
CC	Scott Feldman, Walsh Group		
Subject	LGA CTB CO Hot Spot Analysis		
From	Fang Yang, Nicole Weymouth, AECOM		
Date	October 27, 2015 [revised November 20, 2015]		

AECOM analyzed the carbon monoxide (CO) hot spot air quality impacts associated with off-site mobile source activities during the worst-case year for construction of the Central Terminal Building (CTB) at LaGuardia Airport given the updated construction assumptions provided by LaGuardia Gateway Partners (LGP). Those construction assumptions include a shortened construction schedule (from 75 to 68 months) and a shift in the construction start time (from early 2015 to mid-2016) that resulted in a change in traffic parameters for each intersection, such as signal timing data and turning volumes (as calculated in Technical Memorandum – Updated Traffic Analysis for Construction Conditions). The peak year of construction has been updated to 2017 (from 2015). The results the CO analysis were compared to those presented in the Final Environmental Assessment and Section 4(f) Evaluation signed by the Federal Aviation Administration (FAA) in December 2014. All predicted levels are well below the National Ambient Air Quality Standard (NAAQS) of 35 ppm for an 1-hour average and 9 ppm for an 8-hour average; therefore, the mobile source CO impacts from the proposed design changes would not be significant.

Methodology

The hot spot dispersion impact analysis was performed for CO at the same five intersections that were analyzed in the 2014 EA. The following intersections would have the worst-case level of service (LOS) (D or worse) combined with the highest traffic volume and/or incremental traffic volume:

- Ditmars Boulevard & Marine Terminal Road
- Astoria Boulevard North & 82nd Street / Ditmars Boulevard
- 81st Street & Ditmars Boulevard
- 81st Street & 21st Avenue
- Hazen Street & 19th Avenue

The same methodology used in the 2014 EA were used for the hot spot analysis of the updated construction conditions. USEPA’s MOVES program was used to predict vehicle CO emission factors using NYSDOT-provided model inputs. A free flow travel speed of five miles per hour (mph) for both No Action and Proposed Action conditions was conservatively used to predict the CO emission factors using MOVES. The USEPA-provided MOVES post processer was used to generate the free flow emission factor in grams of pollutant per mile. Idle emission rates in grams per vehicle hour were established in accordance with the guidance provided in *Using MOVES in Project-Level Carbon Monoxide Analyses* (USEPA 2010).

Geometric models developed for the 2014 EA for the roadway network within a 1,000-foot radius of each selected intersection were used to predict CO concentrations. The geometric layout of each modeled intersection is shown in Figures 1 and 2 (from Appendix B of the 2014 EA).

The dispersion modeling was performed using USEPA's CAL3QHC computer model (USEPA 1992) in association with various modeling parameters recommended in the *CEQR Technical Manual* applicable to Queens County (NYCDEP 2014). Updated traffic parameters for each intersection, such as signal timing data and turning volumes, were provided by LGP. The peak year of construction has been updated to 2017, instead of 2015, as assumed in the 2014 EA. Receptors were placed along sidewalks around each intersection. These receptors are considered the worst-case locations given their close proximity to the center of each congested intersection where vehicles would idle.

CO Concentration Prediction

Table 1 summarizes the CAL3QHC-predicted worst-case CO concentration levels at the selected worst-case intersections, comparing predictions from the 2014 EA and the updated analysis. For comparison purposes, the levels under the Future No-Action Condition were also predicted. Although the CO concentration levels under the proposed design changes would be higher than the concentrations predicted for the Future Proposed Action condition in the 2014 EA, the levels are still well below the CO NAAQS. Furthermore, the predicted incremental CO concentration levels as a result of the proposed design changes would be well below the CEQR CO *de minimis* criteria. Therefore, the mobile source CO impacts from the proposed design changes would not be significant.

AECOM
125 Broad Street
New York, NY
10004
www.aecom.com

212 377 8728 tel
212 377 8410 fax

Memorandum

Table 1
Comparison of Predicted Highest CO Concentrations at Selected Signalized Intersections

Intersection	Final EA (Nov 2014)	Proposed Design Changes*	Final EA (Nov 2014)	Proposed Design Changes*	Final EA (Nov 2014)	Proposed Design Changes*	Final EA (Nov 2014)	Proposed Design Changes*
	CO 1-hour Concentration (ppm)		CO 8-hour Concentration (ppm)		CO 1-hour Concentration (ppm)		CO 8-hour Concentration (ppm)	
	Future No-Action Condition				Future Proposed Action Condition			
Ditmars Boulevard & Marine Terminal Road	4.4	4.1	3.0	2.8	4.0	4.5	2.7	3.1
Astoria Boulevard North & 82nd Street / Ditmars Boulevard**	4.6	5.5	3.1	3.8	4.7	5.4	3.2	3.7
81st Street & Ditmars Boulevard	4.4	4.1	3.0	2.8	4.0	4.5	2.7	3.1
81st Street & 21st Avenue	3.8	3.9	2.6	2.6	3.8	4.3	2.6	2.9
Hazen Street & 19th Avenue	4.1	4.5	2.8	3.1	4.0	5.0	2.7	3.4

*CO levels include background levels of 1.7 ppm for 1-hour average and 1.1 ppm for 8-hour average.

** For the Proposed Design Changes, CO levels for Future Proposed Action condition slightly lower than for Future No-Action condition due to improved level of service and specific interactions between the movements at that intersection.

Note: All predicted levels are well below the NAAQS of 35 ppm for an 1-hour average and 9 ppm for an 8-hour average.

AECOM

Source: NYS Dept. of State, NYC DCP, NYC DoITT, ESRI
Prepared by: AECOM

Figure 1

CTB Redevelopment Program
Environmental Assessment
LaGuardia Airport
THE PORT AUTHORITY OF NY & NJ

Construction Year – CO Hot Spot Modeling Diagram #1

AECOM

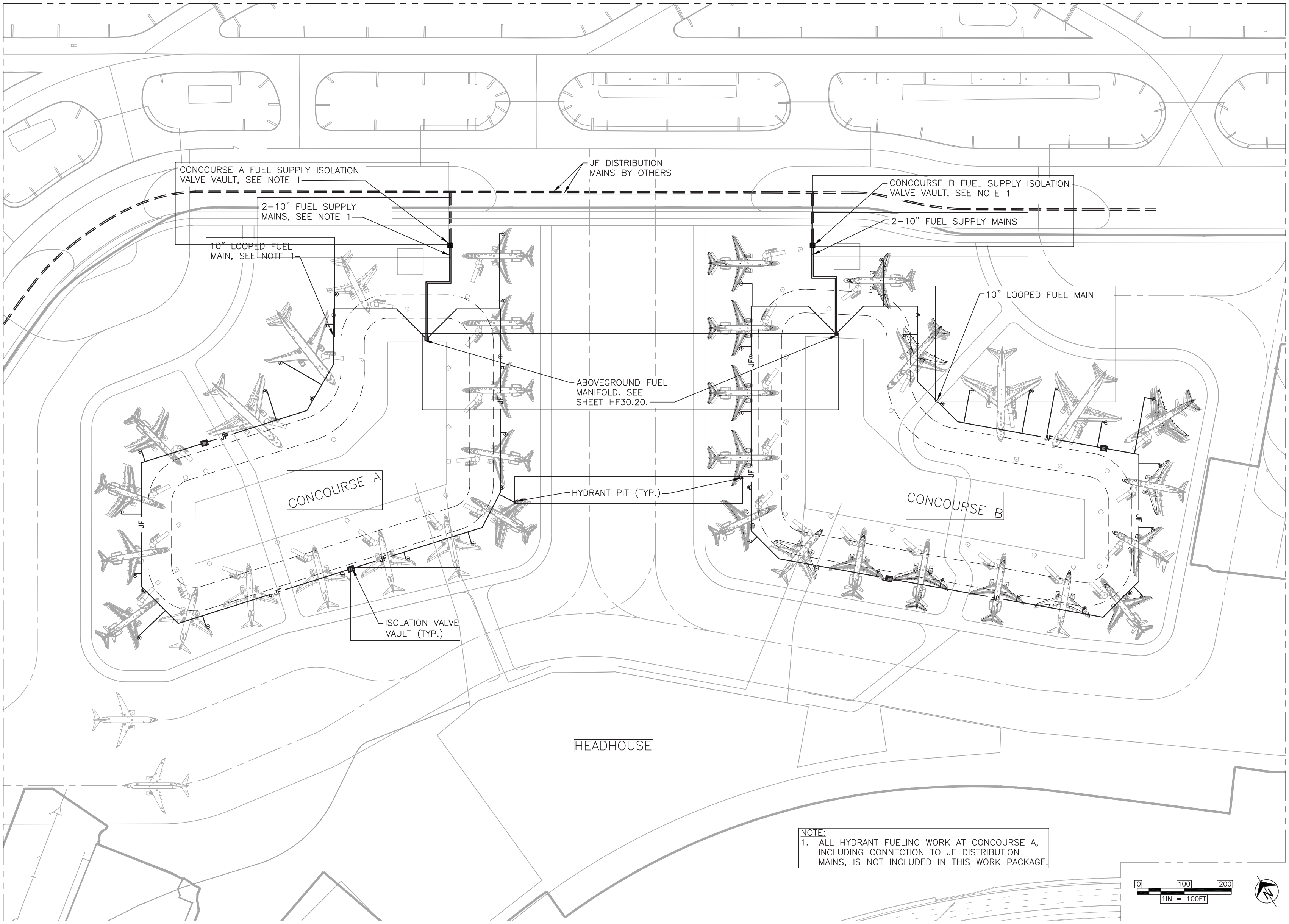
Source: NYS Dept. of State, NYC DCP, NYC DoITT, ESRI
Prepared by: AECOM

Figure 2

CTB Redevelopment Program
Environmental Assessment
LaGuardia Airport
THE PORT AUTHORITY OF NY & NJ

Construction Year – CO Hot Spot Modeling Diagram #2

Attachment 9
Hydrant Fuel Lines and Pits



THE PORT AUTHORITY OF NY & NJ

LaGuardia GATEWAY PARTNERS

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

LAGUARDIA AIRPORT CONCOURSE B

Title

LAGUARIDA AIRPORT
CENTRAL TERMINAL BUILDING
REPLACEMENT PROJECT

HYDRANT FUELING OVERALL PLAN

Designed by	JMT
Drawn by	JMT
Checked by	JRD
Date	10/30/2015
Contract Number	FAC-XXX.XXX
Drawing Number	HF10.00
PID#	NUMBER

Attachment 10

Public Involvement

The following Notice of Availability

THE PORT AUTHORITY OF NY & NJ

NOTICE OF AVAILABILITY

Technical Report For Design Revisions to the Central Terminal Building Redevelopment Program, LaGuardia Airport, Flushing New York

Notice is hereby given that copies of the Port Authority's Technical Report of design revisions to the Central Terminal Building Redevelopment Program at LaGuardia Airport, examining design changes since issuance of the December 2014 Federal Aviation Administration Finding of No Significant Impact/Record of Decision (FONSI/ROD), DOT Section 4(f) Evaluation, which included documentation of compliance with Section 106 of the National Historic Preservation Act and Federal Executive Order 11988: Floodplain Management are available. The report provides additional planning and environmental analysis for the design revisions to the Central Terminal Building Redevelopment Program. Copies are available for public review at the following locations:

The Port Authority of NY &NJ
Aviation Department
4WTC
150 Greenwich Street, 18th Floor
New York, NY 10006
Attn: Edward Knoesel
Hours: 9:00 am to 5:00 pm

The Port Authority of NY & NJ
CTB Redevelopment Program
LaGuardia Airport
Hangar 7, 3rd Floor (Marine Air Terminal area)
Flushing, NY 11371
Attn: Rosie Pabon
Hours: 8:00 am to 4:00 pm

Queens Borough Public Library
35-51 81st Street
Jackson Heights, NY 11372
Hours: Check with library branch

Queens Borough Public Library
41-17 Main Street
Flushing, NY 11355
Hours: Check with library branch

The technical report document for this project will be available at these locations until December 14, 2015. In addition, a copy of this document may be viewed online at: http://www.panynj.gov/about/studies-reports.html

Any questions can be sent to lgactbtechreport@panynj.gov

was published in the following publications on November 30, December 1, and December 2, 2015.

Daily News (Queens edition), Newsday, Queens Courier, Queens Chronicle, Queens Gazette, Queens Tribune, Queens Times Ledger, Queens Ledger, El Especialito, The National Herald, Sing Tao Daily, Newark Star Ledger, and Bergen Record.

The Port Authority received confirmation that the Notice of Availability appeared in the publications listed above on each of the three specified days (Nov. 1 –Dec. 2).

In addition, on December 3 the Port Authority sent emails to the following entities and to notify them of the Notice of Availability, with instructions on how to access the Technical Report.

LGA Technical Report Stakeholder Outreach Nov. 30, 2015

Dear LaGuardia Airport Stakeholder,

We thank you for your continued interest and involvement in the Port Authority's proposed Central Terminal Building Replacement Program, which will replace the existing sixty year old terminal with a modern and efficient gateway to New York City.

The Port Authority has released a report to the public (see attachment) that examines design changes made to the Central Terminal Building since the FAA's approval of the Environmental Assessment for the project in 2014. Since 2014, changes have been made to the design of the Terminal that provide the same level of service to passengers during and after construction, but deliver the project eight months quicker than the original design. The changes are examined in the Port Authority's Technical Report, which is available to the public until December 14, 2015. Any questions can be directed to lgactbtechreport@panynj.gov.

The Port Authority's Technical Report of Proposed Design Changes to the CTB Redevelopment Program has been posted to their public website:

http://www.panynj.gov/about/pdf/TechReport-With-Attachments-11252015.pdf

Thank you,

LGA CTB Redevelopment Program

Recipients:

- Queens Quiet Skies (Warren Schrieber)
- Eastern Queens Alliance (Barbara Brown)
- The Town-Village Aircraft Noise and Safety Committee: TVASNAC (Kendall Lampkin)
- Queens Community Board 1
- Queens Community Board 3
- Queens Community Board 7
- Queens Community Board 11
- Global Gateway Alliance – Steve Sigmund (only person to make a statement at the LGA CTB Draft EA public hearing)
- New York State Historic Preservation Office - download to CRIS and email Beth Cumming
- New York City Economic Development Corporation (David Hopkins)
- New York City Department of Transportation (Naim Rasheed)
- New York State Department of Transportation (Uchenna Madu)
- New York State Department of State, jzappier@dos.state.ny.us
- New York City Planning azaretsky@planning.nyc.gov; MMarrella @planning.nyc.gov

- Environmental Protection Agency (Grace Mucimeni)
- Federal Department of Interior nr_reference@nps.gov
- New York City Parks (Alyssa Cobb)
- Mayor's Office Deputy Mayor (Anthony Shorris)
- New York CityLandmarks Conservancy (Peg Breen, Alex Herrera)
- Queens Borough President Melinda Katz, Elisa Velazquez (Melinda Katz sent out the link to the Technical Report to over 20,000 persons subscribed to her weekly newsletter)

The Port Authority received the following comment in response to the Notice of Avialability,

---

From: Poetzsch, Michael <Poetzsch.Michael@epa.gov>
Sent: Thursday, December 10, 2015 8:56 AM
To: LGACTBTECHREPORT
Cc: Musumeci, Grace; Carpenter, Dale; Bergstein, Joseph
Subject: Fw: LaGuardia Airport Central Terminal Building Redevelopment Technical Report

Please see attached comment regarding sustainability for this project. Any questions feel free to call Mike Poetzsch at 212-637-4147. Thank you.

From: Poetzsch, Michael
Sent: Wednesday, December 9, 2015 9:53 AM
To: Musumeci, Grace; Bergstein, Joseph
Cc: Knutson, Lingard; Carpenter, Dale
Subject: RE: LaGuardia Airport Central Terminal Building Redevelopment Technical Report

Section 10.0 of the October 26, 2012 document at the following link (https://www.panynj.gov/business-opportunities/pdf/project-briefing-book.pdf) addressed sustainability. Comment: Where is this section on sustainability contained in the November 2015 document?; it should still be included in the recent November 2015 technical report.

The Port Authority sent the following response to the above comment (the only comment received):

From: LGACTBTECHREPORT
Sent: Thursday, December 10, 2015 8:40 PM
To: Poetzsch, Michael
Cc: Musumeci, Grace; Carpenter, Dale; Bergstein, Joseph
Subject: Re: LaGuardia Airport Central Terminal Building Redevelopment Technical Report

Mr. Poetzsch,

Thank you for your inquiry. There have been no changes to Chapter 10 of the 2012 Project Briefing Book with regards to sustainability. All of the 2012 requirements remain in effect, along with the commitments made in the 2014 EA. We would like to direct you to the following references and discussion relating to sustainability components in the November 2015 Technical Report:

Page 1-5 discusses the LEED Certification targets for the project, which have not changed.

Pages 5-53 through 5-55 describe the sustainable design strategy, which has not changed.

Page 6-9 further discusses the sustainable design components of the terminal.

Please let us know if you have any additional questions.

Sincerely,

LGA CTB Redevelopment

The following meetings were held to discuss the proposed design changes:

1. *New York City Economic Development Corporation and New York City Department of City Planning, August 10, 2015: Port Authority Aviation Department Staff met with David Hopkins of the EDC, Hardy Adasko of City Planning, and Nathan Grey of the EDC to discuss proposed design changes.*

2. *New York City Department of Transportation: Two meetings were held with NYC DOT on November 30, 2015 and on December 17, 2015. Port Authority's Traffic Engineering Division met with Naim Rasheed, Shakil Ahmed, Shuzuan Li, and Michele Samuelsen of NYC DOT. The Technical Report was discussed in detail, along with Attachment 4 of the Technical Report. The Traffic Monitoring Plan was the main focus of each meeting. Based on feedback, the Port Authority will be presenting and discussing the Traffic Monitoring Plan with NYC DOT in mid-January 2016.*

3. *New York State Department of Transportation: meetings were held at NYS DOT on November 20, 2015 and on December 2, 2015 to discuss the specific mitigation components of the Technical Report and 2014 EA. The Port Authority Aviation Department met with Phil Eng and Sonia Pichardo. An additional meeting was held on December 17, 2015.*

Finally, the Port Authority pursued revised Coastal Zone Management Consistency concurrences from the New York State Department of State and New York City Waterfront Revitalization Program. Transmittals to both agencies, and their responses, are included on the following pages.

THE PORT AUTHORITY OF NY & NJ

UPS OVERNIGHT DELIVERY

November 20, 2015

Mr. Jeffrey Zappieri
Supervisor, Consistency Review Unit
New York State Department of State
Division of Coastal Resources
1 Commerce Plaza, Suite 1010
Albany, NY 12231-0001

SUBJECT: LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING REDEVELOPMENT PROGRAM
REQUEST FOR REVISED CONCURRENCE

Dear Mr. Zappieri:

By letter dated November 15, 2013 (copy attached), the New York State Department of State (NYSDOS) concurred with the certification of the Port Authority of New York & New Jersey (Port Authority) that the replacement of the existing Central Terminal Building (CTB) at LaGuardia Airport (LGA) would comply with the policies of the New York State Coastal Zone Management Program (CZMP).

Subsequent to the issuance of the CZMP concurrence in order to fulfill its requirements under the National Environmental Policy Act (NEPA), the Federal Aviation Administration (FAA) completed an Environmental Assessment for the project and issued a Finding of No Significant Impact and Record of Decision (FONSI/ROD) (copy attached).

To advance the project, the Port Authority determined that a Public Private Partnership (PPP) was the most effective, cost efficient mechanism for design, construction, and operation of the new terminal. On July 23, 2015, the Port Authority's Board of Commissioners selected its preferred team to implement the PPP and move the program forward.

Since its selection, the PPP team has proposed a revised design that changes the building footprint but does not alter the accommodation of forecasted demand, number of gates, or level of service to passengers.

The revised design does not involve changes to the airfield runways or taxiways, air navigation aids, or aircraft flight procedures to or from the Airport.

However, the FAA has request that the Port Authority obtain a modified concurrence from NYSDOS as they evaluate the changes to the project.

Engineering Department
4 World Trade Center, 150 Greenwich Street
New York, NY 10006

Based on the foregoing, the Port Authority requests that NYSDOS issue a modified concurrence letter as the revised design of the CTB would not have different effects on coastal resources than the originally reviewed project.

A diagram comparing the proposed and originally reviewed footprint of the CTB is enclosed to assist in your determination.

Please note that as the only change is the CTB design, no authorizations are required from the U.S. Army Corps of Engineers or the New York State Department of Environmental Conservation.

Thank you for your assistance in this matter. If you have any questions or require additional information, please contact the undersigned by e-mail at mhelman@panynj.gov or by telephone at (212) 435 – 6112.

Very truly yours,

Marc Helman

Marc Helman
Supervisor, Permits and Governmental Approvals
Environmental Engineering Unit

Enclosures:

1) NYSDOS Concurrence Letter dated November 15, 2013
2) FAA FONSI/ROD
3) Diagram comparing originally and currently proposed CTB layouts

cc: Michael Marrella, NYCDCP

THE PORT AUTHORITY OF NY & NJ

UPS OVERNIGHT DELIVERY

November 20, 2015

Mr. Michael Marrella
Director, Waterfront and Open Space Division
New York City Department of City Planning
22 Reade Street
New York, NY 10007-1216

**SUBJECT: LAGUARDIA AIRPORT
CENTRAL TERMINAL BUILDING REDEVELOPMENT PROGRAM
REQUEST FOR REVISED CONSISTENCY DETERMINATION**

Dear Mr. Marrella:

By e-mail dated December 6, 2013 (copy attached), the New York City Department of City Planning (NYCDCP) determined that the LaGuardia Airport (LGA) Central Terminal Building (CTB) Redevelopment Program was consistent with the policies of the New York City Waterfront Revitalization Program (WRP).

Subsequent to the receipt of this consistency determination, the Federal Aviation Administration (FAA), in order to fulfill its requirements under the National Environmental Policy Act (NEPA), completed an Environmental Assessment for the project and issued a Finding of No Significant Impact and Record of Decision (FONSI/ROD) (copy attached).

To advance the project, the Port Authority determined that a Public Private Partnership (PPP) was the most effective, cost efficient mechanism for design, construction, and operation of the new terminal. On July 23, 2015, the Port Authority's Board of Commissioners selected its preferred team to implement the PPP and move the program forward.

Since its selection, the PPP team has proposed a revised design that changes the building footprint but does not alter the accommodation of forecasted demand, number of gates, or level of service to passengers.

The revised design does not involve changes to the airfield runways or taxiways, air navigation aids, or aircraft flight procedures to or from the Airport.

However, the FAA has requested that the Port Authority obtain a modified consistency determination as they evaluate changes to the project.

Based on the foregoing, Port Authority requests that NYCDCP issue a modified consistency determination as the revised design of the CTB would not have different effects on achieving any WRP policies than the originally reviewed project.

*Engineering Department
4 World Trade Center, 150 Greenwich Street
New York, NY 10006*

A diagram comparing the proposed and originally reviewed footprint of the CTB is enclosed to assist in your determination.

Note also that because the only change is the CTB design, no authorizations are required from the U.S. Army Corps of Engineers or the New York State Department of Environmental Conservation.

Thank you for your assistance in this matter. If you have any questions or require additional information, please contact the undersigned by e-mail at mhelman@panynj.gov or by telephone at (212) 435 – 6112.

Very truly yours,

Marc Helman

Marc Helman
Supervisor, Permits and Governmental Approvals
Environmental Engineering Unit

Enclosures:

1) NYCDCP Consistency Determination dated December 6, 2013
2) FAA FONSI/ROD
3) Diagram comparing originally and currently proposed CTB layouts

cc: Jeffrey Zappieri, NYSDOS

STATE OF NEW YORK
DEPARTMENT OF STATE
ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001
WWW.DOS.NY.GOV

ANDREW M. CUOMO
GOVERNOR

CESAR A. PERALES
SECRETARY OF STATE

December 2, 2015

Marc Helman, Supervisor
Port Authority of NY & NJ
4 World Trade Center
150 Greenwich Street, 20th Floor
New York, New York 10007

RE: F-2013-0650(FA)
U.S. Army Corps of Engineers/New York District Permit Application - Port Authority of New York & New Jersey
LaGuardia Airport Central Terminal Building Redevelopment
Replace existing terminal building, roadways, and parking garage.
LaGuardia Airport, Queens County
General Concurrence - Modification to Previously Reviewed Activity

Dear Mr. Helman:

The Department of State received your proposed modification of the above-referenced activity on 11/20/2015. The Department previously reviewed the original proposal and concurred with a consistency certification for it, or otherwise indicated it had no objection to authorization of the proposed activity.

The proposed modification involves changes in the footprint of the terminal building and do not include any changes to runways, taxiways, or air navigation aids.

The Department of State has determined that this modification of the activity previously reviewed by this Department would not result in coastal zone effects that would be substantially different than those originally reviewed by the Department, and that the modified proposal meets the Department's general consistency concurrence criteria. Therefore, further Department of State review of this modification to the previously reviewed activity, and the Department's concurrence with an individual consistency certification for the proposed activity, are not required.

This General Concurrence is without prejudice to and does not obviate the need to obtain all other applicable licenses, permits, or other forms of authorization or approval that may be required pursuant to existing State statutes. Specifically, it appears that you may require authorization from the New York State Department of Environmental Conservation (DEC). Please contact the DEC region 2 office to determine if their authorization is required.

When communicating with us regarding this matter, please contact Jeffrey Zappieri at (518) 474-6000 (e-mail: Jeffrey.Zappieri@dos.ny.gov) and refer to our file #F-2013-0650(FA).

Sincerely,

Jeffrey Zappieri
Supervisor, Consistency Review Unit
Office of Planning and Development

JZ/dc
cc: COE/New York District – Christopher Mallery
DEC/Region 2 – Steven Watts

From: Mary Kimball (DCP) [mailto:MKIMBALL@planning.nyc.gov]
Sent: Tuesday, December 08, 2015 10:44 AM
To: Helman, Marc
Cc: Michael Marrella (DCP)
Subject: RE: LaGuardia Airport Central Terminal Building - WRP #13-089

Dear Marc –

We have completed the review of the revised project as described below for consistency with the policies and intent of the New York City Waterfront Revitalization Program (WRP).

LaGuardia Airport Central Terminal Building Redevelopment Program

Revised design to building footprint for the redevelopment of the LaGuardia Airport Central Terminal Building project.

Based on the information submitted, the Waterfront Open Space Division, on behalf of the New York City Coastal Commission, having reviewed the waterfront aspect of this action, finds that the actions will not substantially hinder the achievement of any Waterfront Revitalization Program (WRP) policy and hereby provides its finding to the New York State Department of State (DOS) that this action is consistent with the WRP policies and the local program. Please note that the proposed action(s) are subject to consistency review and approval by the New York State Department of State (DOS) in accordance with the New York State Coastal Management Program.

This finding is only applicable to the information received and the current proposal. Any additional information or project modifications would require an independent consistency review.

For your records, this project has been assigned WRP # 13-089. If there are any questions regarding this review, please contact me.

MARY KIMBALL

PROGRAM MANAGER, RESILIENT NEIGHBORHOODS • WATERFRONT AND OPEN SPACE DIVISION

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December 17, 2015

Ms. Marie Jenet
Environmental Specialist
Federal Aviation Administration
159-30 Rockaway Blvd, Suite 111
Jamaica, NY 11434

Re: FAA
Central Terminal Building at LaGuardia Airport
LaGuardia Airport
12PR05127

Dear Ms. Jenet:

Thank you for continuing to consult with the New York State Historic Preservation Office (SHPO). We have reviewed the provided documentation in accordance with Section 106 of the National Historic Preservation Act of 1966 and the Memorandum of Agreement (MOA) in place for this project. These comments are those of the SHPO and relate only to Historic/Cultural resources.

As requested we have reviewed the MOA in place for this project and Technical Report dated November 2015 which proposes project design changes. Based upon this review, we understand that the West Garage is now slightly further away from the historic Hanger 3. The impacts to historic resources and agreed upon mitigation measures in the MOA are not changed due to the proposed design modification. As such, we concur there is no need to amend the MOA.

If you have any questions, I can be reached at (518) 268-2181.

Sincerely,

Beth A. Cumming
Senior Historic Site Restoration Coordinator
e-mail: beth.cumming@parks.ny.gov

via e-mail only

List of Errata:

1. Page 1-11, First Change Sentence under 1.3.2, Airside Apron and parking area, add red text: *The requirement for dual taxilanes was included in the 2014 EA as a way to reduce airside delay. The benefit of the dual taxilane design in the previously approved (2014) design was substantiated through Total Airspace and Airport (TAAM) modeling, which simulates 4D models of airspace and airports to facilitate decision support, planning, and analysis. TAAM modeling produces estimates of operational performance and aircraft delay under proposed changes to an airport's configuration or airline schedules, and allows comparison between design alternatives when planning airport facilities.*

2. Page 1-12, Low Level Windshear Alert System paragraph, strikethrough and red text indicates changed sentence: *This topic was discussed at a November 30, 2015 technical coordination meeting between FAA and ~~LaGuardia Gateway Partners~~ the Port Authority.*

3. Pages 4-9, Change Language under 4.2.7, and Page 5-34, Footnote 46, strikethrough and red text indicates changed language: *On January 30, 2015, the President issued EO 13690 that amends EO 11988, and established the Federal Flood Risk Management Standard ("FFRMS") and a process for public input prior to implementation of the FFRMS. ~~EO 13690 at §1~~. However, in Guidelines issued on October 8, 2015, federal agencies were directed not to apply the new requirements until after the agencies adopt new or revised regulations governing the proper implementation of EO 13690 and the FFRMS~~. EO 13690 at §3;~~ , as per Guidelines for Implementing Executive Order 11988, Floodplain Management, and Executive Order 13690, Establishing a Federal Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input, October 8, 2015 ("Guidelines"). The Guidelines state that agencies will continue to comply with the requirements of the 1977 version of E.O. 11988 until they update their regulations and procedures to incorporate the amendments from E.O. 13690. These regulations and procedures will describe an agency's schedule for applying any new requirements as well as how it will apply the new requirements~~. Id. at 5, 18.~~ The new requirements of EO 11988 will not be applied retroactively. ~~Id. at 18.~~ The DOT has not issued implementing orders to date.*

4. Page 5-31, Last sentence before 5.2.2.4, Summary of Impacts, red text indicates changed language, *Overall greenhouse gas impacts are expressed in terms of CO2 equivalence, or CO2e, which adds the greenhouse gas effects of methane, nitrous oxide, and other pollutants that contribute to global warming, expressed in CO2 equivalents relative to their global warming potential.*

5. Page 5-32, Figure 5-1b excluded CO2 and CO2e emissions estimates. They are stated below and are additions to figure 5-1b.

Year	CO_2 (Tons)	CO_2e (Tons)

2016	2,686.85	2,713.71
2017	8,198.51	8,280.50
2018	7,207.37	7,279.44
2019	5,685.41	5,742.27
2020	1,695.45	1,712.40
2021	1,931.75	1,951.06
2022	844.77	853.22

6. Page 5-84, Second Change Paragraph, strikethrough and red text indicates changed language: *The planning process is underway for the relocation of the Remote Transmitter/Receiver (RTR)~~,~~ ~~an FAA NAVAID~~. This is a reasonably foreseeable future project and will be subject to its own NEPA analysis should the planning identify a site or sites for relocation.*

7. On Page 6-1, the following language, *Building Design: non-reflective roofing materials will be selected to avoid glare impacts to the Air Traffic Control Tower and pilots.*

   Should be the first line in new section 6-10, Airport Operations.

   The language is expanded to read as follows: *Building Design: non-reflective roofing materials will be selected to avoid glare impacts to the Air Traffic Control Tower and pilots. As building design progresses, materials will be chosen in consultation with the FAA.*

8. Page 6-6, the first change under Section 6.7, red text indicates added language: Recordation. Level III Historical Architectural Building Survey/Historic American Engineering Record (HABS/HAER) recordation of Hangars 1, 3, and 5, Hangars 2 and 4, and Hangar 7. *Change: This action has been completed and submitted to NPS. Hangars 2 and 4 were demolished during the summer of 2015 in accordance with the MOA. The mitigation measures detailed herein will continue to be followed. The proposed design changes were provided to SHPO, and details of discussions with agencies about the design changes are reflected in Attachment 10. The SHPO confirmed on December 17, 2015 that no change to the MOA would be required as a result of the design changes. The letter is included in Attachment 10.*

9. Page 7-3, the final change paragraph (and final paragraph of the document), red text indicates added language: *All feedback received during the public availability period for the Technical Report is included in Attachment 10. One comment relating to sustainable design was received from the Environmental Protection Agency and addressed by the Port Authority.*

10. Attachment 10, Meeting summaries, is changed: 1. *New York City Economic Development Corporation and New York City Department of City Planning, August 10, 2015: Port Authority Aviation Department Staff met with David Hopkins of the EDC, Hardy Adasko of EDC, and Nathan Grey of the EDC to discuss proposed design changes.*