East Side Reconfiguration at LaGuardia Airport

Final Environmental Assessment Appendices

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

Sponsored by
Port Authority of NY & NJ

Prepared by
AECOM WSP

May 2017

Appendices

Appendix A – Agency Consultation

Appendix B – Total Airspace and Airport Modeler (TAAM) Report

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Appendix A.
Agency Consultation

Appendix A. Agency Consultation

A.1 Federal Agencies

Federal Aviation Administration

Ms. Marie Jenet
Environmental Specialist
New York Airports District Office
159-30 Rockaway Boulevard, Suite 111
Jamaica, NY 11434

U.S. Department of Commerce

Mr. Mark Murray-Brown
Section 7 Coordinator for Protected Resources Division
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Region
55 Great Republic Drive
Gloucester, MA 01930-2276

U.S. Environmental Protection Agency

Ms. Grace Musumeci, Chief
U.S. Environmental Protection Agency
Region 2
290 Broadway
New York, NY 10007-1866

Fish and Wildlife Service

U.S. Department of the Interior
Fish and Wildlife Service
Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967

A.2 State and Regional Agencies

New York State Historic Preservation Office

Mr. Phillip Perazio
Historic Preservation Program Analyst – Archaeology Unit
New York State Office of Parks, Recreation and Historic Preservation
Peebles Island Resource Center
P.O. Box 189
Waterford, NY 12188-0189

New York State Department of Conservation

Mr. Nicholas B. Conrad
Information Resources Coordinator
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor
Albany, NY 12233-4757

Mr. Stephen Watts, Regional Permit Administrator
Lisa Horowitz, Tidal Wetlands
New York Department of Conservation
Region 2, Long Island City Office
1 Hunter's Point Plaza
47-40 21st Street
Long Island City, NY 11101-5401

New York State Department of State

Mr. Jeffrey Zappieri
Manager, Consistency Review Unit
New York State Department of State
Division of Coastal Resources
1 Commerce Plaza, Suite 1010
Albany, NY 12231-0001

New York State Department of Transportation

Ms. Sonia A. Pichardo, P.E.
Regional Director, Region 11
New York State Department of Transportation
47-40 21st Street
Long Island City, NY 11101

A.3 Local Agencies (County and Municipality)

New York City Department of City Planning

Mr. Michael Marrella
Director, Waterfront and Open Space Division
New York City Department of City Planning
22 Reade Street
New York, NY 10007-1216

New York City Department of Transportation

Mr. Shakil Ahmed
New York City Department of Transportation
Traffic Planning – CEQR
55 Water Street, 6th Floor
New York, NY 10041

Ms. Shuzuan Li
New York City Department of Transportation
Traffic Engineering and Planning
55 Water Street, 6th Floor
New York, NY 10041

New York City Landmarks Preservation Commission

Ms. Gina Santucci
Environmental Review Coordinator
NYC Landmarks Preservation Commission
1 Centre Street
9th Floor North
New York, NY 1007

AECOM
125 Broad Street
New York, NY 10004
www.aecom.com

212 377 8400 tel
212 377 8410 fax

January 29, 2016

United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Region
55 Great Republic Drive
Gloucester, MA 01930-2276

Re: LaGuardia Airport
Delta Air Lines Reconfiguration Project
Borough of Queens
Queens County, New York

Dear Sir/Madam:

As part of Governor Cuomo's vision for the comprehensive redesign of LaGuardia Airport, Delta Air Lines proposes to reconfigure the existing Terminals C and D. Under Delta's reconfiguration project, a single, four-concourse terminal would be constructed, creating dual taxiways between the concourses. The on-airport roadways in front of the existing terminals would be reconfigured and an extension added to the East Garage.

AECOM would like to obtain a complete list of all significant habitats, critical environmental areas, and/or federally listed threatened and endangered species reported within the immediate vicinity of the referenced project. A copy of the appropriate USGS map (Central Park and Flushing NY topographic quadrangles) is attached for your use.

We need this information to fulfill the requirements for an Environmental Assessment compliance with the National Environmental Policy Act of 1969 (NEPA). No proprietary location data will be published without your consent.

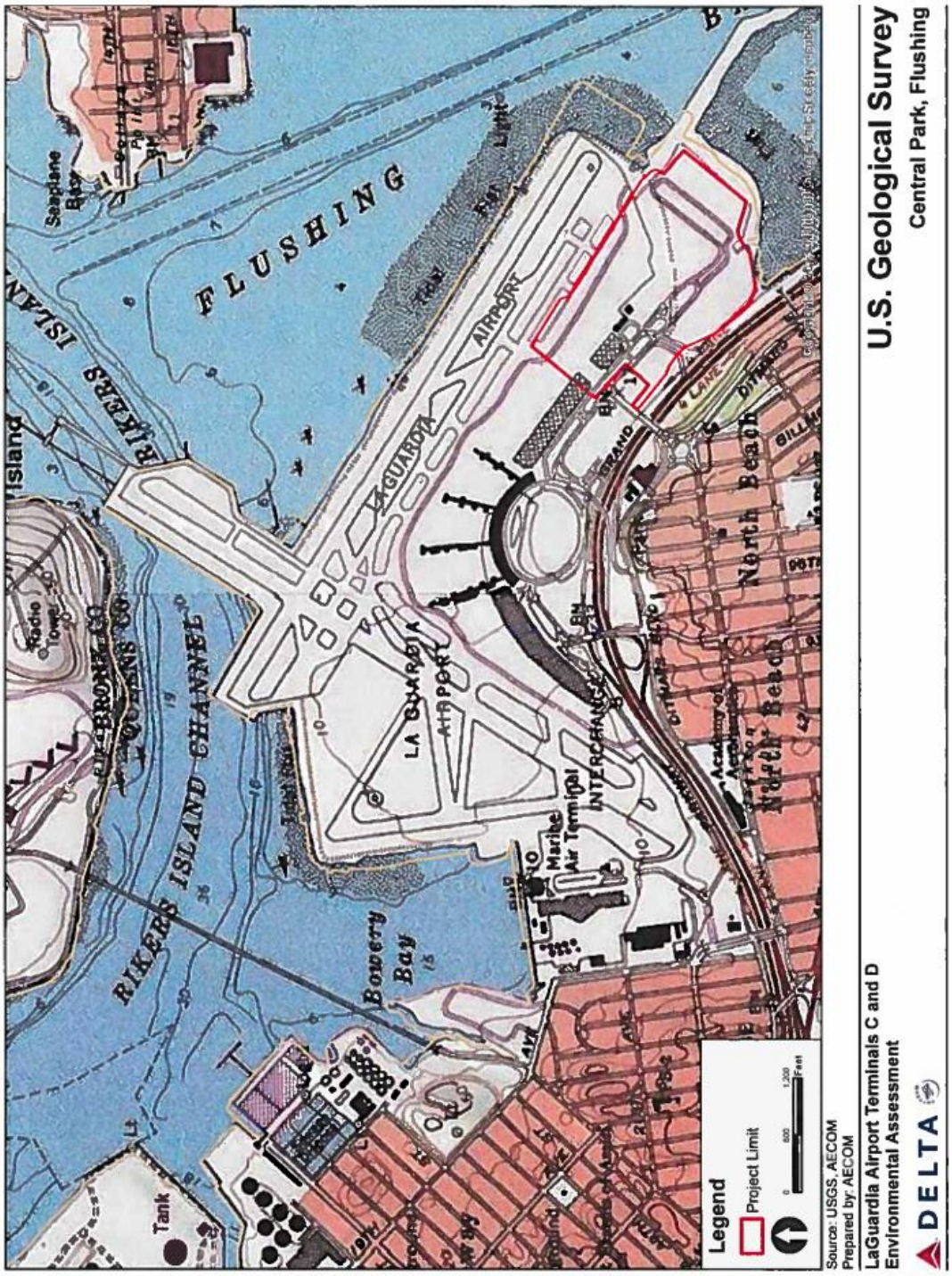
Please contact Eileen Loftus at (732) 564-3237 if you have any questions regarding this request. Thank you for your assistance.

Sincerely,

Nicole Weymouth

Enclosure

cc: Eileen Loftus, AECOM
Jim Tiefenthaler, Delta Air Lines


FLUSHING
RIKERS ISLAND
RIKERS ISLAND CHANNEL
LA GUARDIA AIRPORT
LAGUARDIA AIRPORT
Bowery Bay
North Beach
Marine Air Terminal
INTERCHANGE
Legend
Project Limit
Source: USGS, AECOM
Prepared by: AECOM
U.S. Geological Survey
Central Park, Flushing
LaGuardia Airport Terminals C and D
Environmental Assessment
DELTA

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

FEB 12 2016

Nicole Weymouth
AECOM
125 Broad Street
New York, NY 10004

Re: LaGuardia Airport, Delta Air Line Reconfiguration Project, ESA-listed species request

Dear Ms. Weymouth,

We received your letter dated January 29, 2016, regarding proposed construction activities at LaGuardia Airport, in Queens, New York. In your letter, you request a list of any Endangered Species Act (ESA) listed threatened or endangered species under the jurisdiction of NOAA's National Marine Fisheries Service (NMFS).

Although shortnose sturgeon and Atlantic sturgeon originating from five listed Distinct Population Segments (DPS) are known to occur in the East River, based on the activities associated with the project, and that no in-water work is being proposed, we believe that ESA-listed species under our jurisdiction will not be exposed to any direct or indirect effects of the action. Based on this, we do not believe a consultation in accordance with section 7 of the ESA is necessary. As such, no further coordination on this activity with the NMFS Protected Resources Division is necessary at this time. Should project plans change or new information become available that changes the basis for this determination, further coordination should be pursued. Please contact Dan Marrone of my staff (978-282-8465 or Daniel.Marrone@Noaa.gov), should you have any questions regarding these comments.

Sincerely,

Mark Murray-Brown
Section 7 Coordinator
for Protected Resources Division

File H:\Section 7 Team\Section 7\Non-Fisheries\Tech Assist_States_Private Firms\2016\Delta Air Lines LaGuardia Airport
EC: Marrone, NMFS

WSP | PARSONS BRINCKERHOFF

One Penn Plaza
New York, NY 10119
(o) 212-760-5792
(f) 212-465-5584

March 31, 2017

Ms. Grace Musumeci
Chief of NEPA Section
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

RE: Draft EA for East Side Reconfiguration at LaGuardia Airport

Dear Ms. Musumeci:

On behalf of the Port Authority of New York and New Jersey (PANYNJ), I am enclosing the Draft Environmental Assessment for the East Side Reconfiguration at LaGuardia Airport for your review. Delta Air Lines has been working with PANYNJ to reconfigure the east side terminals as part of Governor Andrew Cuomo's goal to transform LaGuardia Airport into a modern, more efficient transportation facility. This reconfiguration will improve aircraft operations, reduce delays, improve customer service, and provide greater gating flexibility for airlines operation at Terminals C and D at the airport.

This Draft EA was prepared in accordance with Federal Aviation Administration (FAA) policies and procedures for implementing the National Environmental Policy Act of 1969. We are initiating consultation with you since the project site is located on the Brooklyn-Queens Aquifer System, listed by U.S. EPA as a sole source aquifer. The public comment period is open until 5:00 p.m. on May 15, 2017.

If you have any comments on the Draft EA, please respond to Jane Herndon, Manager, Environmental Programs, Aviation Department at PANYNJ (jherndon@panynj.gov or 4 World Trade Center, 150 Greenwich Street, 18th Floor, New York, NY 10007).

Sincerely,

Nicole L. Weymouth, AICP

Enclosures

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

MAY 10 2017

Jane Herndon
Manager, Environmental Programs
Aviation Department
Port Authority of New York and New Jersey
4 World Trade Center
150 Greenwich Street, 18th Floor
New York, NY 10007

RE: Draft Environmental Assessment, East Side Reconfiguration at LaGuardia Airport

Dear Ms. Herndon:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Assessment (EA) dated March 2017 on the proposed East Side Reconfiguration at LaGuardia Airport, located in Queens County, New York. The EA, prepared for the Federal Aviation Administration, describes the proposed action as a series of projects; a reconfiguration of the airside apron around Terminals C and D, the construction of a new single terminal headhouse with four concourses, new landside roadways and parking, and the consolidation of Delta Air Lines at the new terminal. In general, this project will increase efficiency of aircraft movements on the airport.

EPA finds that the EA supports a finding of no significant impact.

In addition, EPA has also evaluated the project in accordance with Section 1424(e) of the Safe Drinking Water Act (SDWA) as the project is located on the Nassau-Suffolk sole source aquifer designated by EPA on June 21, 1978. EPA has the following comments.

If pumps are used in the discharge of stormwater into Flushing Bay and if they are powered by fuel stored in either aboveground or underground storage tanks, then those tanks must be double-walled and equipped with interstitial leak detection and overfill alarms. Above ground tanks should also have secondary containment that could capture the contents of the tank in the event of a catastrophic spill or leak. Underground tanks should have adequate corrosion protection.

If a well is employed for dewatering purposes, then the well should be constructed in accordance with New York State Department of Health requirements found at:
https://www.health.ny.gov/regulations/nycrr/title_10/part_5/appendix_5b.htm#b3

Internet Address (URL) • http://www.epa.gov
Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 50% Postconsumer content)

The oil layer present in oil/water separators that collect runoff from the aircraft parking apron should be drawn off and disposed of safely. Particular care should be taken to capture any ethylene glycol-based deicing fluid before it dissolves in aqueous runoff.

In the excavation for the terminal building, construction vehicles should be re-fueled off site and a spill prevention, control and containment plan should be in place and, ideally, developed with active input from the project's workers.

Provided the precautions above are taken, it is anticipated that this project will not pose a significant threat to public health or ground water resources and complies with Section 1424(e) of the SDWA.

If you have any questions, please contact Lingard Knutson at (212) 637-3747 or knutson.lingard@epa.gov.

Sincerely,

Lingard Knutson

Grace Musumeci, Chief
Environmental Review Section

jr

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967
Phone: (631) 286-0485 Fax: (631) 286-4003

In Reply Refer To: May 21, 2017
Consultation Code: 05E1LI00-2016-SLI-0204
Event Code: 05E1LI00-2017-E-01079
Project Name: Delta Air Lines Reconfiguration at LaGuardia Airport

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the

human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967
(631) 286-0485

Project Summary

Consultation Code: 05E1LI00-2016-SLI-0204

Event Code: 05E1LI00-2017-E-01079

Project Name: Delta Air Lines Reconfiguration at LaGuardia Airport

Project Type: DEVELOPMENT

Project Description: In an effort to improve aircraft operations, reduce delays and improve reliability, Delta proposes to reconfigure the apron area around Terminals C and D. The plan calls for the creation of dual taxiways between the concourses. Due to the desire to create dual taxilanes by widening the distance between the three (3) existing concourses to the east, and given the constraints of the airport boundaries, the Proposed Action necessitates pushing the headhouse to the south to create additional aeronautical operations areas. Subject to FAA's decision on this EA, appropriate State and City approvals, ALP approval, and funding approvals, construction is expected to begin by the Spring of 2017 and last approximately 106 months.

Project Location:

Approximate location of the project can be viewed in Google Maps:
https://www.google.com/maps/place/40.770305613342884N73.862558654097W

Counties: Queens, NY

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Birds

NAME	STATUS
Piping Plover *(Charadrius melodus)* Population: except Great Lakes watershed There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *(Calidris canutus rufa)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern *(Sterna dougallii dougallii)* Population: northeast U.S. nesting pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Flowering Plants

NAME	STATUS
Seabeach Amaranth *(Amaranthus pumilus)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8549	Threatened

Critical habitats

There are no critical habitats within your project area.

JFK International Airport
Terminal 4 Trailer Complex
Jamaica, NY 11430
(718) 751-3575

March 9, 2016

Ms. Ruth Pierpont
Deputy Commissioner for Historic Preservation
New York State Office of Parks, Recreation and Historic Preservation
P.O. Box 189
Waterford, NY 12188-0189

Re: Section 106 Consultation Initiation for
Delta Air Lines Reconfiguration Project at LaGuardia Airport
Queens, New York

Dear Ms. Pierpont:

As part of Governor Cuomo's vision for the comprehensive redesign of LaGuardia Airport, Delta Air Lines proposes to reconfigure the existing Terminals C and D. Under Delta's reconfiguration project, a single, four-concourse terminal would be constructed, creating dual taxiways between the concourses. The on-airport roadways in front of the existing terminals would be reconfigured and an extension added to the East Garage.

The lead federal agency for the project is the Federal Aviation Administration (FAA) because the agency must approve changes to the Airport Layout Plan (ALP); federal funds may be granted; and the approval to collect and use Passenger Facility Charges (PFCs) may be sought to implement the project. Therefore, an Environmental Assessment (EA) is being prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended.

With respect to cultural resources, the undertaking must also comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, which requires federal agencies, or entities undertaking federally funded, licensed, or permitted projects to take into account the effects of their actions on historic properties, and plan to minimize harm to adversely affected properties. This letter initiates the Section 106 consultation process with your agency.

I. Background Information – Central Terminal Building Redevelopment Program

In preparation for undertaking a project to replace the Central Terminal Building (CTB) at LaGuardia Airport in 2012, the Port Authority of New York and New Jersey (PANYNJ) prepared a Statement of Purpose and Need for review and confirmation by the FAA that the project qualified for an EA under NEPA.

Following FAA confirmation, PANYNJ, through AECOM, proceeded with development of an EA to obtain a Finding of No Significant Impact (FONSI) and a Record of Decision (ROD) from the FAA. The Preferred Alternative, for the purpose of analysis in the EA, was the Stage 1 Conceptual Design (Stage 1 Design) developed by PANYNJ. In December 2014, the FAA approved the EA and signed a FONSI/ROD for the CTB Redevelopment Program at LaGuardia Airport.

Subsequently, LaGuardia Gateway Partners (LGP) was designated the Preferred Proposer in response to the Request for Proposals (RFP) issued by PANYNJ for the CTB Redevelopment Program, seeking competitive Proposals for a Design, Build, Finance, Operate and Maintain (DBFOM) form of project delivery. The proposal put forth by LGP advocated an Alternative Concept to PANYNJ's Stage 1 Design. In December 2015, PANYNJ submitted the *Technical Report: Proposed Design Changes to the Central Terminal Building Redevelopment Program at LaGuardia Airport*, which analyzed and compared potential impacts associated with the proposed design changes as compared to the potential impacts of the original design. FAA concluded that a new or supplemental EA need not be prepared and signed a Written Reevaluation and Record of Decision (WR/ROD) that confirmed the validity of the findings in the 2014 FONSI/ROD.

As part of the 2014 CTB Redevelopment Program EA, AECOM prepared a Cultural Resources Technical Memorandum and Phase IA Archaeological Assessment and Addendum in 2013. A summary of findings is provided below.

Historic Architectural Assessment

The Area of Potential Effect (APE) for the historic architectural assessment encompassed the entire CTB area at LaGuardia Airport, from Flushing Bay to the north to Grand Central Parkway to the south, and from Flushing Bay to the east, to Runway 4-22 to the west **(Figure 1)**. The APE also included Terminals C and D, and adjacent areas.

Research conducted at the New York State Historic Preservation Office (SHPO) and New York City Landmarks Preservation Commission (LPC) in 2012 indicated that no historic properties listed in the National Register of Historic Places (NRHP) were located within the APE. Two NRHP-listed sites are located in the vicinity of the CTB outside the APE, but would not be affected by it. The Marine Air Terminal (built 1939) located on the west side of the Airport, and the Lent Homestead and Cemetery (est. 1654-56) located further west of the Airport, were beyond the designated APE. The FAA determined, and SHPO concurred, that the CTB Redevelopment would not affect any NRHP-listed properties (Tabachnick et al., July 26, 2013).

The Marine Air Terminal is also an interior and exterior landmark designated by LPC. In addition, south of the Airport outside the APE, the LPC-eligible Malcom X House (built 1925) was identified. There would be no impact to the LPC-designated properties as a result of the CTB Redevelopment.

Five existing aircraft hangars (built 1939-1940) within the APE were over 50 years old at the time of the survey, and met the age requirement for NRHP consideration. Hangars 1, 3, and 5, and Hangars 2 and 4, are part of the original LaGuardia Airport and have remained relatively unaltered over time. All five

hangars were evaluated using NRHP eligibility criteria and were recommended eligible based on their place in aviation history (Criterion A), and as representations of early twentieth century industrial design (Criterion C). According to SHPO, existing Central Terminal Building (circa 1964) does not meet NRHP criteria due to major alterations that occurred in the 1970s and the 1990s. No other potentially-eligible historic properties were identified for further evaluation (Howe, June 25, 2013).

Based on the findings, the FAA determined, and the SHPO concurred, that the surviving Hangars 1, 3, and 5, and Hangars 2 and 4, were eligible for listing in the NRHP as significant historical features of LaGuardia Airport. SHPO also determined that the existing CTB is not eligible for listing due to the major building alterations over time.

Working closely with the SHPO, the FAA determined that the CTB Redevelopment would have an adverse effect on Hangars 1, 3, and 5, and Hangars 2 and 4. Hangars 1, 2, and 4 would be directly affected by demolition; whereas, Hangars 3 and 5 would be indirectly affected by the demolition of the adjoining Hangar 1. In addition, the public's view of Hangars 3 and 5 would be obstructed by construction of the proposed West Garage. No other adverse effects were identified. FAA sent a notice of adverse effect to the ACHP on August 22, 2013.

To mitigate the adverse effect, a Memorandum of Agreement (MOA) was drafted and signed by FAA, SHPO, PANYNJ, the Airport sponsor, and three concurring parties, including the Queens Borough President, the New York Landmarks Conservancy, and the Chair of the NYC LPC. The MOA was fully executed on November 12, 2014, and included the following stipulations:

- Photographic documentation and Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) recordation of Hangars 1, 3, and 5, Hangars 2 and 4, and Hangar 7 (located outside the APE) thereby establishing a permanent public record of all remaining historic buildings on the Airport.

- Development of an interpretive display illustrating the history of the LaGuardia Airport and the historic hangars,

- Implementation of a demolition/construction management plan to ensure that adverse effects to the remaining Hangars 3 and 5 are avoided to the greatest extent practicable during construction, and

- Implementation of a maintenance plan to ensure that Hangars 3 and 5 are maintained in a state-of-good-repair for the foreseeable future.

Hangars 2 and 4 were demolished in early 2015.

Phase IA Archaeological Survey

The APE delineated for the Phase IA Archaeological Survey was defined by the footprint of direct impacts by permanent or temporary disturbances affected by implementation of the CTB Redevelopment Program (**Figure 1**).

The Phase IA Archaeological Survey Report (AECOM, June 2013) found that only the western portion of the APE (Areas 1, 2, and 3) and a section in the far southeastern corner of the APE (Area 4) were assessed to be sensitive for both prehistoric and historic archaeological resources. (Area 4 lies within the proposed APE for the Delta Terminals C and D Reconfiguration Program.) Supplemental analysis in the subsequent Phase IA Addendum Report (AECOM, August 2013) indicated that construction activities associated with the CTB Redevelopment Program would only have the potential to disturb potential intact soil horizons beneath existing roads in the vicinity of archaeologically sensitive Area 1 (outside the Delta Program project limits). To mitigate potential adverse effects caused by the CTB Redevelopment, the MOA stipulated that archaeological monitoring be conducted during construction phase activities in this area (**Figure 2**).

II. Description of Delta Terminals C and D Optimization Program

In July 2015, New York State Governor Andrew Cuomo announced 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 the airport, as recommended by the Governor's airport design panel. In conjunction with that goal, Delta Air Lines proposes to reconfigure Terminals C and D and the adjacent aircraft parking apron, landside roadways, and parking facilities on the eastern side of the Airport. These facilities would be demolished and replaced with new facilities designed and constructed to meet the latest federal standards for airport safety and security, and to accommodate improved levels of service. The Proposed Action does not involve the airfield runways or taxiways, or other terminals or facilities at LaGuardia Airport.

The Proposed Action includes a series of projects divided into three functional areas: (1) terminal building, (2) airside apron and parking area, and (3) landside roadways and parking.
The Proposed Action elements are depicted in **Figure 3**, and are described below:

Terminal Building:

- Demolish the existing Terminals C and D;
- Construct a single terminal headhouse and four concourses that can accommodate 37 contact gates;
- Construct a Central Heating and Refrigeration Plant (CHRP) within the terminal building.

Airside Apron and Parking Area:

- Reconfigure the airside apron in compliance with FAA geometric design standards and airline operating procedures, as applicable;

- Include dual parallel taxilanes or two points of entry;
- Provide 37 contact gate positions that provide the greatest flexibility for gating aircraft that range in size from Group II to Group V;
- Provide nine hardstand/deicing positions (three could be used concurrently).

Landside Roadways and Parking:

- Remove and replace the arrival and departure roadways serving the existing Terminals C and D;
- Connect roads to the Grand Central Parkway and western side of the Airport;
- Construct an extension to the East Garage (recently constructed in front of the existing Terminal C) to replace parking spaces taken up by construction within Parking Lot 5;
- Construct two pedestrian bridges from the East Garage and/or extension to the proposed terminal headhouse.

III. Historic Architectural Assessment

The proposed historic architectural APE for the Delta Terminals C and D Reconfiguration Program would be the same as the historic architectural APE developed for the CTB Redevelopment Program (**Figure 4**). The APE encompasses the eastern portion of the Airport, including Terminals C and D, and adjacent airside and landside areas (roadways and Parking Lot 5). These resources were constructed in recent times. Specifically, in 1983, Delta Air Lines constructed Terminal D at the eastern end of the airport, the east concourse of Terminal C was constructed in the early 1980s and in 1992, US Airways constructed the west concourse of Terminal C. In 2012, a new pedestrian bridge was opened that allows passengers to walk between Terminals C and D without having to reenter through security.

It is recommended that no additional survey and evaluation of historic architectural resources are required because of the following:

- Terminals C and D do not meet the 50 year age criterion to be considered for NRHP eligibility, and are unlikely to meet Criterion Consideration G – Properties that have Achieved Significance in the Past 50 Years because they are commonplace terminals that lack architectural distinction.
- Terminals C and D will be replaced with contemporary structures, and adjacent areas will be reconfigured.
- LaGuardia Airport will be reconfigured when the CTB, and NRHP-eligible Hangars 1, 2 and 4 are removed as part of the CTB Redevelopment Program, and this will change the context of Terminals C and D and the adjacent areas.
- The MOA has been fully executed in accordance with Section 106 to mitigate the adverse effect of implementation of the CTB Redevelopment Program, including removal of Hangar 1 and Hangars 2 and 4 located west of Terminals C and D, and Parking Lot 5.

Photos of the proposed historic architectural APE are included in **Attachment 1**.

Delta Air Lines seeks your concurrence with the APE for this project, and your concurrence that no additional survey and evaluation of historic architectural resources is required because an analysis of LaGuardia Airport was recently completed for the CTB Redevelopment Program.

IV. Archaeological Resources

The proposed archaeological APE for the CTB Redevelopment Program is defined as the Limits of Disturbance (LOD) of the proposed action (**Figure 4**). Areas of the proposed APE for the Delta Program that fall outside the APE for the CTB Redevelopment are limited to the current eastern shoreline of the LaGuardia Airport property and the two terminals.

The Phase IA Archaeological Survey (June 2013) and *Addendum* (August 2013) prepared for the CTB Redevelopment Program identified an area within the proposed APE for the Delta Program (Area 4) that was assessed to be sensitive to both prehistoric and historic archaeological resources. Delta is preparing a Phase IA Archaeological Survey Report for this project, which will define a vertical APE for the Proposed Action, assess the archaeological sensitivity of the APE outside the CTB project footprint and the potential of the Proposed Action to impact intact archaeological deposits. The report will be highly focused on assessing archaeological sensitivity and rely as appropriate on analyses, background research and reporting contained in the Phase IA Archaeological Survey Reports prepared for the CTB Redevelopment Program. Specific recommendations for additional archaeological investigations will be included, as necessary.

V. Conclusion

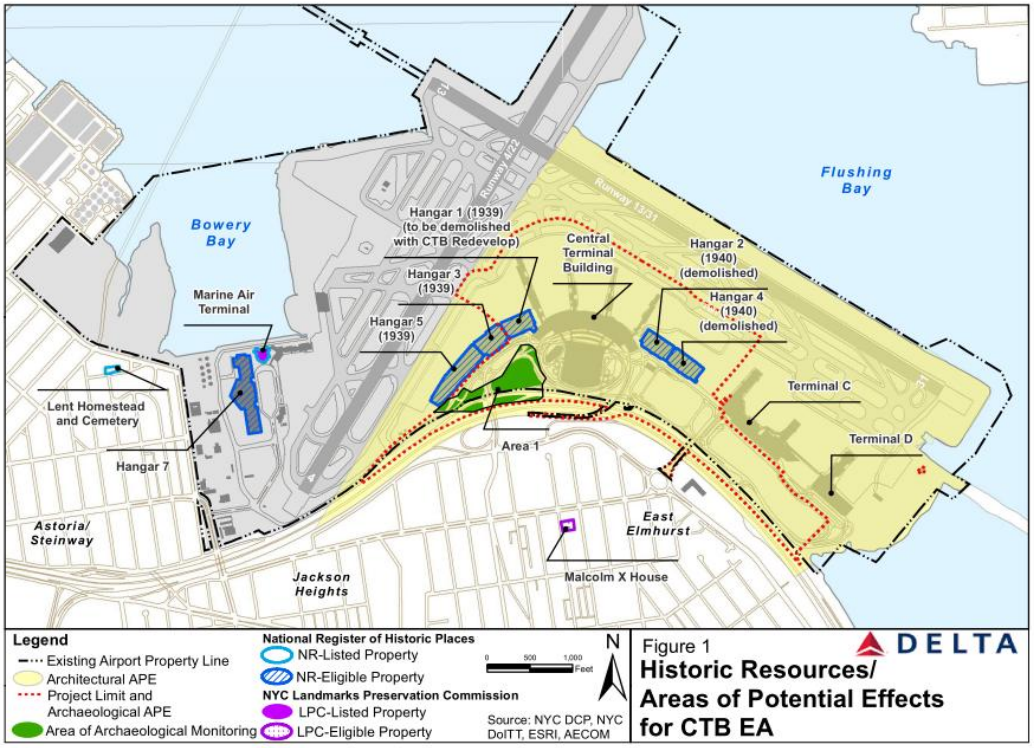
We look forward to receiving your concurrence on the proposed APEs and associated recommendations. Please feel free to contact our consultants, AECOM, if you have any questions – Allison Rachleff (Historic Architecture) at (212) 377-8723 or John Lawrence (Archaeology) at (609) 386-5444.

Sincerely,

Ryan Marzullo

Enclosures

cc: Meenakshi Srinivasan, NYCLPC
Marie Jenet, FAA
Nicole Weymouth, AECOM


Flushing Bay
Bowery Bay
Runway 4/22
Runway 13/31
Hangar 1 (1939) (to be demolished with CTB Redevelop)
Central Terminal Building
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Terminal C
Terminal D
Lent Homestead and Cemetery
Hangar 7
Area 1
Astoria/ Steinway
East Elmhurst
Jackson Heights
Malcolm X House
Legend
Existing Airport Property Line
Architectural APE
Project Limit and Archaeological APE
Area of Archaeological Monitoring
National Register of Historic Places
NR-Listed Property
NR-Eligible Property
NYC Landmarks Preservation Commission
LPC-Listed Property
LPC-Eligible Property
0 500 1,000 Feet
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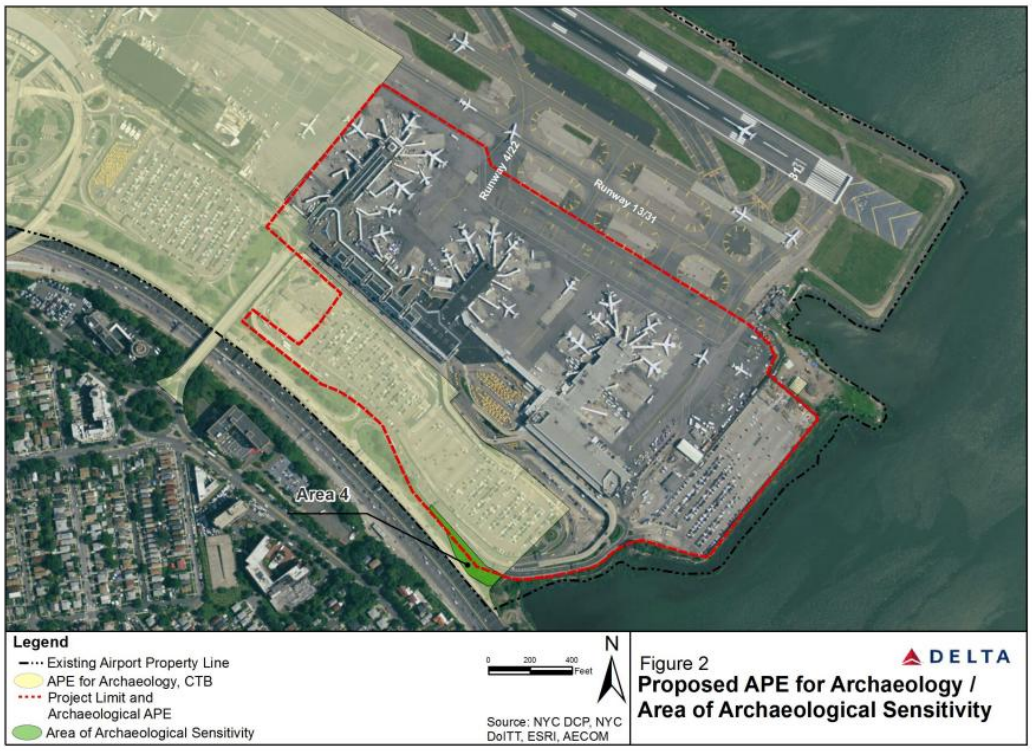
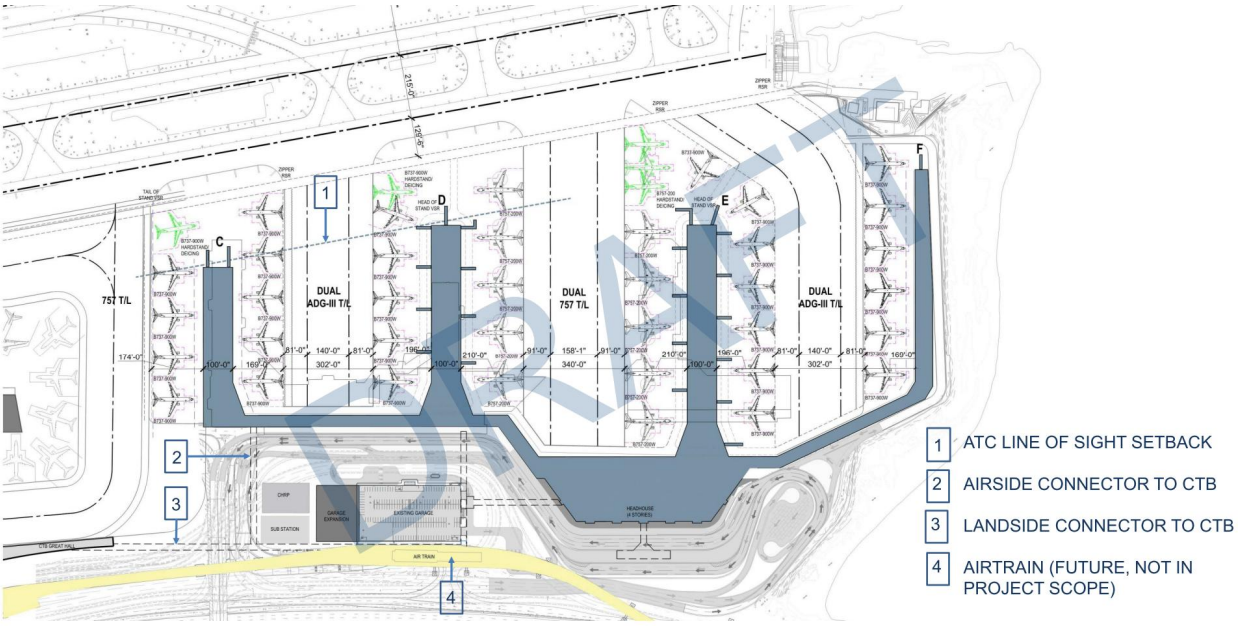
Source: NYC DCP, NYC DoITT, ESRI, AECOM
Figure 1
Historic Resources/ Areas of Potential Effects for CTB EA
DELTA

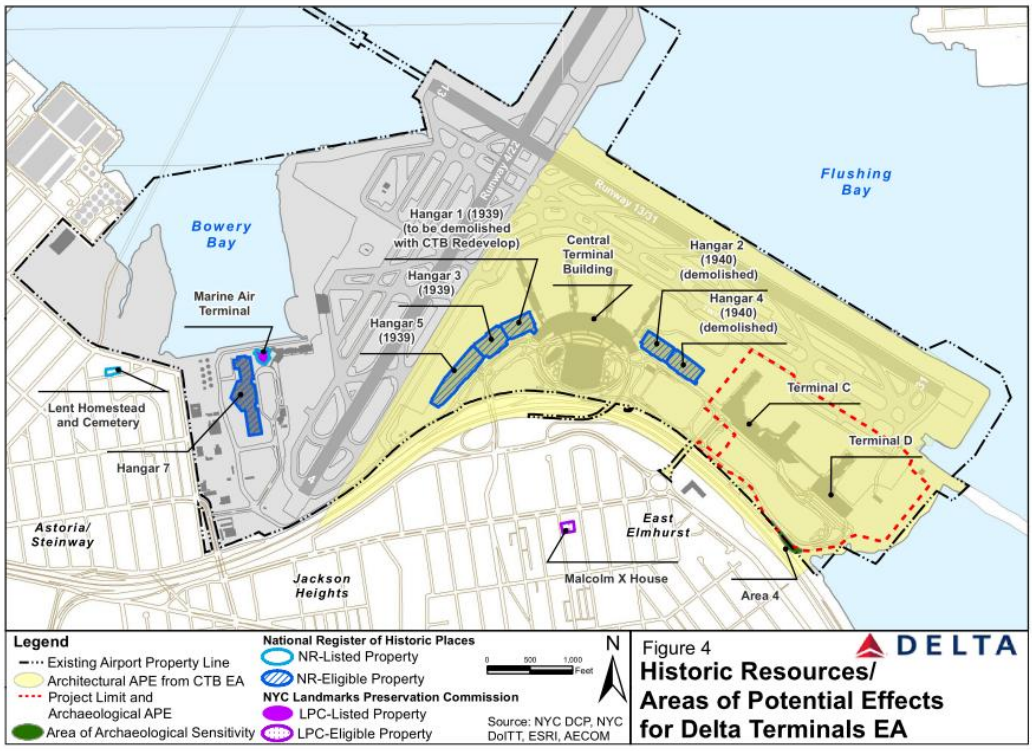




CURRENT SITE PLAN

Figure 3

01-19-2016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Source: NYC DCP, NYC DoITT, ESRI, AECOM
Figure 4
DELTA
Historic Resources/ Areas of Potential Effects for Delta Terminals EA

Attachment 1
Delta Terminals C and D Optimization

Photograph 1. Landside View of Terminal C (built 1992), Looking North (photo taken 6/8/2012, prior to construction of East Garage)

Photograph 2. Landside View of Terminal C (built 1992) and East Garage (built 2015), Looking West (photo taken 12/22/2015)

1

Attachment 1
Delta Terminals C and D Optimization

Photograph 3. Airside View of Terminal C (built 1992), Looking South (photo taken 6/8/2012)

Photograph 4. Airside View of Terminal C (built 1992), Looking South (photo taken 6/8/2012)

2

Attachment 1
Delta Terminals C and D Optimization

Photograph 5. Airside View of Terminal C (built 1992), Looking Southwest (photo taken 12/22/2015)

Photograph 6. Airside View of Terminal C (built 1992), Looking East (photo taken 12/22/2015)

Attachment 1
Delta Terminals C and D Optimization

Photograph 7. Airside View of Walkway Connecting Terminals C and D (built 2012), Looking West (photo taken 12/22/2015)

Photograph 8. Airside View of Terminals C (built 1992) and Terminal D (built 1983), Looking West (photo taken 12/22/2015)

Attachment 1
Delta Terminals C and D Optimization

Photograph 9. Landside View of Terminal D (built 1983), Looking North (photo taken 6/8/2012)

Photograph 10. Landside View of Walkway Connecting Terminals C and D (built 2012), Terminal D (built 1983) and Taxi Hold Lot, Looking Southeast (photo taken 12/22/2015)

5

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

March 21, 2016

Ms. Allison Rachleff
Sr. Architectural Historian
AECOM
125 Broad Street, 16th Floor
New York, NY 10004

Re: FAA
Delta Air Lines Reconfiguration Project at LaGuardia Airport
Terminals C and D, Queens, NY
16PR01506

Dear Ms. Rachleff:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

SHPO has reviewed the information submitted for this project (letter from Ryan Marzullo, Delta Air Lines, 9 March 2016). Please submit the Phase IA archaeological report referenced in the letter to this office for review and comment. We have no further concerns regarding standing buildings and structures.

If you have any questions please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via e-mail only

Division for Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • www.nysparks.com

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

April 29, 2016

Ms. Allison Rachleff
Sr. Architectural Historian
AECOM
125 Broad Street, 16th Floor
New York, NY 10004

Re: FAA
Delta Air Lines Reconfiguration Project at LaGuardia Airport
Terminals C and D, Queens, NY
16PR01506

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SHPO has reviewed the Phase IA archaeological report for this project – *Phase IA Archaeological Survey Report, Delta Air Lines Reconfiguration Project at LaGuardia Airport, Queens Borough, New York City* (AECOM, April 2016). Based on the information provided, we concur with the report's recommendation that Archaeological Potential Area 4 is archaeologically sensitive. We also concur that archaeological monitoring during construction is the most appropriate approach for field investigation. Please prepare and submit for review and comment a specific monitoring protocol which includes contingencies in case archaeological resources are encountered.

If you have any questions please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via e-mail only

cc: Amanda Sutphin, LPC; Daniel Pagano, LPC; Edward Knoesel, PANY/NJ; Gina Santucci, LPC; John Lawrence. AECOM; Marie Jenet, FAA; Nicole Weymouth, AECOM; Ryan Marzullo, Delta

Division for Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • www.nysparks.com

JFK International Airport
Terminal 4 Trailer Complex
Jamaica, NY 11430
(718) 751-3575

June 23, 2016

Ms. Ruth Pierpont
Deputy Commissioner for Historic Preservation
New York State Office of Parks, Recreation and Historic Preservation
P.O. Box 189
Waterford, NY 12188-0189

Re: PR No. 16PR01506
Ongoing Section 106 Consultation for
Delta Air Lines Reconfiguration Project at LaGuardia Airport
Proposed Construction of New West End Substation and Removal of Building 99
Queens, New York

Dear Ms. Pierpont:

As you are aware, Delta Air Lines (Delta) intends to reconfigure existing Terminals C and D at LaGuardia Airport (LGA) as part of Governor Cuomo's vision for the comprehensive redesign of the airport. This letter continues the Section 106 consultation process initiated on March 9, 2016 for PR No. 16PR01506. On March 21, 2016, SHPO indicated that the agency had no concerns about the project regarding standing buildings or structures. A Phase IA survey has also been prepared for the project, and is further described in this letter.

Since communicating with SHPO in March, Delta and the Port Authority of New York and New Jersey (PANYNJ) have determined that the existing electrical supply at LGA will also need to be augmented through replacement of the existing West End Substation (WES). In addition, to accommodate proposed airside elements near Terminal D, Building 99 would have to be removed.

The lead federal agency for the project is the Federal Aviation Administration (FAA) because the agency must approve changes to the Airport Layout Plan (ALP). Therefore, an Environmental Assessment (EA) is being prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended.

With respect to cultural resources, replacement of the WES and removal of Building 99 must comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, which requires federal agencies, or entities undertaking federally funded, licensed, or permitted projects to take into account the effects of their actions on historic properties, and plan to minimize harm to adversely affected properties.

NOTE: Subsequent to this letter, it was determined that additional electrical capacity would be met through construction of a new substation on the roof of the proposed East Side Terminal. Therefore, the West End Substation will not be replaced at this time.

I. Background Information – West End Substation

Additional terminal space and amenities are required for Delta's proposed reconfiguration of Terminals C and D as described in the *Draft Environmental Assessment for Delta Air Lines Reconfiguration at LaGuardia Airport* (AECOM, 2016). These include upgraded 400 Hertz (Hz) ground power and pre-conditioned air (PCAir) units at each gate, as well as the installation of electrical charging stations for patron vehicles in parking lots, and the full deployment of airport-wide electric ground service equipment (eGSE). These improvements would cause the total airport-wide electrical load for the build year (2023) to potentially exceed LGA's existing capacity.

PANYNJ has been working to meet the predicted electrical supply needs of LGA for the past five years. The 24 Mega Volt Amp (MVA) East End Substation (EES) was constructed in 2015 to replace the aging Central Electrical Substation, and meet the additional load from past airport infrastructure improvements. The Central Terminal Building (CTB) Redevelopment Program has incorporated energy-saving elements throughout the design in order to offset the increased demand from larger aircraft and additional passengers which are forecasted to use the airport in future years. The cumulative impacts to energy supply are being managed through airport-wide planning and sustainable design. Both the CTB Redevelopment and the Delta Reconfiguration projects would reduce fuel usage through efficiencies in the airside apron, charging stations for eGSE, and improvements in the airport roadways that will allow for free-flowing traffic.

Despite these efforts, the capacity of the EES cannot adequately handle the following loads that were not previously contemplated for Terminals B, C, and D:

(1) Need to accommodate electric charging stations in parking garages for patron vehicles;
(2) Full range of eGSE that would be used at new terminals; and
(3) Conversion of all existing hardstand gates to jetbridge-supported contact gates at new Delta Terminal.

PANYNJ expects continued customer adoption of electric vehicles (EV), as the five charging stations available on airport today are fully occupied several days per week. It is possible that in future years, once the new terminals are open and with the current pace of EV adoption, that 50 to 100 charging stations will be needed in patron parking garages. In addition, in accordance with New York City Local Law 130 of 2013, 20 percent of spaces in all new parking garages will be "charger ready," and support electric capacity so that 20 percent of all spaces could eventually accommodate electric chargers. This demand was not forecasted several years ago during the design of the EES, as market demand for EVs had not been firmly established yet, and Local Law 130 had not been enacted at the time that the East Garage was planned. Second, advances in eGSE technology have allowed airlines to use the equipment for almost all ground service equipment (GSE) applications, including push back tractors. The scale of the expected eGSE deployment was not anticipated. Both of these factors increase the demand for electricity, but ultimately result in improved air quality and reduced consumption of fossil fuels on airport, which PANYNJ supports.

The existing airport electrical capacity is 36 MVA (12 MVA provided by the WES, and 24 MVA provided by the EES). It is expected that the proposed terminal and the factors described above would potentially result in an exceedance of the airport-wide electrical load, increasing the risk of power outages. The existing WES cannot be upgraded since it would require the facility to go off-line during construction, and a continuous, reliable source of power is needed to maintain safe operations at the airport. Therefore, a new substation providing 24 MVA must be constructed to provide a total 48 MVA to the airport.

The existing WES would be replaced with a new 24 MVA substation, located just east of the existing WES near the fuel farm and other non-aeronautical facilities on the west side of the airport. The site measures approximately 210 feet long by 335 feet wide. Building 85 would be demolished, and GSE storage for United Airlines would be relocated to other buildings on the west side of the airport. After the new WES is completed, the existing WES would be decommissioned, but not demolished resulting in no direct impacts to hazardous materials. The new WES would likely be a two-story concrete structure sheathed in metal cladding on the exterior. It would be connected to ConEdison commercial service via multiple 27 Kilovolt (kV) feeders at an existing access point. Construction of the new WES would require the following activities:

- Trenching to relocate existing utilities
- Excavation for new duct banks
- Drainage upgrades
- Localized grading
- Installation of new feeders
- Pile driving for the building foundation
- Transformer delivery and installation

II. Background Information – Building 99

Building 99, located east of existing Terminal D within the Airport Operations Area (AOA), would be demolished to make room for proposed airside elements; it currently obstructs apron expansion associated with the reconfiguration of Terminals C and D. The building is used by American Airlines for GSE maintenance. That function would be relocated elsewhere on the airport property within an existing building.

III. Historic Architectural Assessment

III.a Historic Architectural Areas of Potential Effect

The proposed historic architectural areas of potential effect (APE) for the WES replacement and Building 99 removal consists of two non-contiguous shapes featured in **Figure 1**. The WES portion is described first, followed by the Building 99 portion.

The WES portion of the APE forms a rectangle around the existing WES which would be decommissioned; Building 85 which would be removed; and Building 34 which would remain intact. The rectangle is bound to the north by Building 28, a former air mail facility built in 1979, and several contemporary temporary structures situated between Buildings 28 and 85; the south by an area with pre-fabricated hazardous materials buildings and an east/west-oriented internal access road; the east by Bowery Bay Boulevard; and the west by the LGA lot line along 81st Street. Subsurface water, gas, and electric utilities traverse the western half of the property. No underground storage tanks are situated within the APE.

The Building 99 portion of the APE is the same as the APE that was developed and approved by SHPO on March 21, 2016 for the Delta Air Lines Reconfiguration Project (PR No. 16PR01506). It is also the same APE that SHPO approved for the CTB Redevelopment Project (PR No. 12PR05127). This portion of the APE encompasses the eastern segment of LGA, including Terminals C and D, and adjacent airside and landside areas (roadways and Parking Lot 5). These resources were constructed between the early 1980s and 1992.

III.b Principal Buildings Within Historic Architectural Areas of Potential Effect

The principal buildings and structures that may be impacted by the proposed actions are described below. Photographs are included in **Attachment 1**.

WES: The WES, also known as Building 125, is a 5,566 square foot building, and was constructed circa (ca.) 1990 on the west side of LGA. The high-bay, single-story, rectangular-plan tan brick building is constructed atop a concrete pad, topped by a flat roof. Four bays for electrical equipment are situated across the east façade. Each bay is protected by large-scale metal doors equipped with personnel doors to facilitate easy access to the equipment. Overhead doors provide access via the north and south facades; personnel doors are also located on the north façade.

Building 85: Building 85 encompasses 4,000 square feet, and was constructed on the west side of LGA in 1979 as a maintenance building. The single-story, rectangular plan, metal frame building is constructed atop a concrete pad, and is topped by a gable roof. The building facades and roof are sheathed in corrugated metal. Awnings supported by metal posts extend across the east and west facades. Loading docks and ramps are also located on these facades. The building is pierced by modern industrial windows and doors. Roll up doors pierce the east and west facades. A sliding chain link fence gate is located east of the building, and controls access.

Building 34: Building 34 encompasses 2,000 square feet, and is located southwest of Building 85 on the west side of LGA. It was constructed ca. 1990 as a vehicle service garage. The high-bay, single-story, L-plan, concrete block building is built atop a concrete pad, and is topped by a flat roof. Metal coping demarcates the roofline atop the parapet. Fenestration on the north façade consists of overhead roll-up doors, personnel doors topped by double-hung sash-type transoms, and triple windows set in aluminum surrounds.

Building 99: Building 99 encompasses 6,300 square feet, and is located northeast of existing Terminal D on the east side of LGA. It was constructed in 1990 as a GSE building for US Airways. The rectangular-plan, single-story building is built atop a concrete pad, and is topped by a gable roof. The building facades and roof are sheathed in corrugated metal. The north façade is pierced by roll-up doors, and the west façade is pierced by window openings and vents. Photos are included in **Attachment 1**.

III.c Section 106 Effects Analysis

Effects of replacement of the WES and removal of Building 99 are described below.

West End Substation

No buildings or structures over 50 years old are located within the WES portion of the APE. As described in Section I, the existing WES (ca. 1990) would be decommissioned, and Building 85 (1979) would be removed. The new WES would be constructed in the location of Building 85. The new structure would be up to two stories high, sheathed in metal cladding. The new WES would be built northeast of Building 34. The form, massing, and materials of the new WES would be consistent with Building 34 which is a high-bay, concrete block, single-story light industrial building.

The closest historically significant buildings are outside and northeast of the WES portion of the APE. These include National Register-eligible Hangar 7 located approximately 500 feet northeast, and National Register-listed/Landmarks Preservation Commission (LPC)-listed Marine Air Terminal located approximately 1,300 feet northeast. Hangar 7 is a light industrial building with two-story, rectangular-plan, brick administrative spaces that flank a central pentagonal aircraft hangar. The hangar portion was constructed in 1939-1940 for seaplanes, and the north and south administrative spaces were built in 1942-1943. The Marine Air Terminal is a two-and-a-half story, circular, brick passenger and administrative building constructed in 1939-1940. Both buildings are historically and architecturally significant for their association with the origins of LGA during the late 1930s and early 1940s, and exemplars of early 20th-century building techniques and styles.

Applying the Section 106 Criteria of Adverse Effect, the new WES would not result in physical damage, alteration, or removal of National Register-eligible buildings or structures, including Hangar 7 or the Marine Air Terminal. The new WES would not change the use or physical features within the setting of these buildings that contribute to their historic significance. The new WES would not introduce visual elements that diminish the integrity of significant historic features. As previously stated, no National Register-listed or eligible buildings would be removed within the WES portion of the APE. Hangar 7 and the Marine Air Terminal are far-removed from the existing WES, and would be far-removed from the new WES, and therefore, would not be visually impacted by the new WES. Finally, the new WES would not result in neglect, deterioration, or transfer, lease, or sale of National Register-listed or eligible buildings. In conclusion, the new WES would have No Adverse Effect on National Register-listed and eligible resources at LGA.

Building 99

Five National Register-eligible buildings are located within the portion of the APE where Building 99 (1990) is situated. These include Hangars 2 and 4 located approximately 2,500 feet west of Building 99 (demolished in 2015), and Hangars 1, 3, and 5, located approximately 4,460 feet west of Building 99. LGA is already undergoing reconfiguration as part of the CTB Redevelopment Program with the demolition of National Register-eligible Hangars 2 and 4 and the future removal of NR-eligible Hangar 1 and the CTB. In addition, Terminals C and D, which are less than 50 years old and situated just west of Building 99, are proposed to be replaced by Delta as part of the reconfiguration project.

In 2014, a Memorandum of Agreement (MOA) between PANYNJ, SHPO, and FAA was fully executed in accordance with Section 106 for the CTB Redevelopment Program. The purpose of the MOA was to mitigate the adverse effect of removal of Hangars 1, 2, and 4 within the APE where Building 99 is situated. Therefore, adverse effects of removal of National Register-eligible buildings in the vicinity of Building 99 have already been mitigated by implementation of the MOA.

Furthermore, at the time Building 99 is removed, the east side of LGA will be undergoing redevelopment with the majority of National Register-eligible hangars removed. Although Hangars 3 and 5 will be retained approximately 4,460 feet west of Building 99, the area near Building 99 will continue to be characterized by contemporary buildings, and lack historic feeling and association.

Applying the Criteria of Adverse Effect, removal of Building 99 would not result in physical damage, alteration or removal of National Register-eligible buildings. Removal of Building 99 would not change the use or physical features within the setting of these buildings that contribute to their historic significance. Removal of Building 99 would not introduce visual elements that diminish the integrity of significant historic features. Finally, removal of Building 99 would not result in neglect, deterioration, or transfer, lease, or sale of National Register-listed or eligible buildings. In conclusion, removal of Building 99 would have No Adverse Effect on National Register-eligible resources at LGA.

IV. Archaeological Resources

With respect to archaeological resources, Building 99 falls with the archaeological APE that was developed and approved by SHPO on March 21, 2016 for the Delta Air Lines Reconfiguration Project (PR No. 16PR01506) **(Figures 1)**. In a letter dated April 29, 2016, SHPO agreed that the only area of archaeological sensitivity is located at the southeast corner of the APE established at that time, well outside the footprint of Building 99. Delta is therefore of the opinion that no further archaeological investigations should be required at this location.

With respect to the new WES, the proposed archaeological APE is defined as the footprint of direct impacts by permanent or temporary disturbances affected by construction of the new substation (**Figure 2**). The total area measures 1.03 acres. The proposed APE may be modified in the future as design advances and additional areas of ground disturbance are identified. The SHPO will continue to be consulted regarding any proposed future changes to the APE for direct impacts.

Based on the mapping available on the Cultural Resource Information System (CRIS), the proposed site of the new WES falls within the Archaeologically Sensitive Area that buffers Museum Area LP 4533. Prior to residential development, this site was fast land, and based on late 19th and early 20th century maps, is situated on a north-facing toe of slope to a low hill. The property may have been developed in the 1920s for residential housing. It was acquired in 1939 for construction of LGA, and by 1947 a structure had been built in the present-day location of Building 85. The structure was eventually replaced when Building 85 was built in 1979, when the property took its current building configuration.

No geotechnical data are available with which to assess the integrity of the soils beneath the apron of asphalt that covers the archaeological APE. Given the sensitivity of the area to pre-contact archaeological resources, the historic topographic setting of the archaeological APE, and lack of evidence for comprehensive disturbance, we recommend conducting geomorphological testing of the APE, and the results included in a Phase IA archaeological survey. Four test locations are proposed, and testing will be conducted via GeoProbe technology (**Figure 2**). The Phase IA archaeological survey will contain a pre-contact and historic context for the APE and surrounding area, the results and interpretation of the geomorphological testing, an assessment of potential project impacts, and recommendations regarding further Section 106 consultation.

V. Conclusion

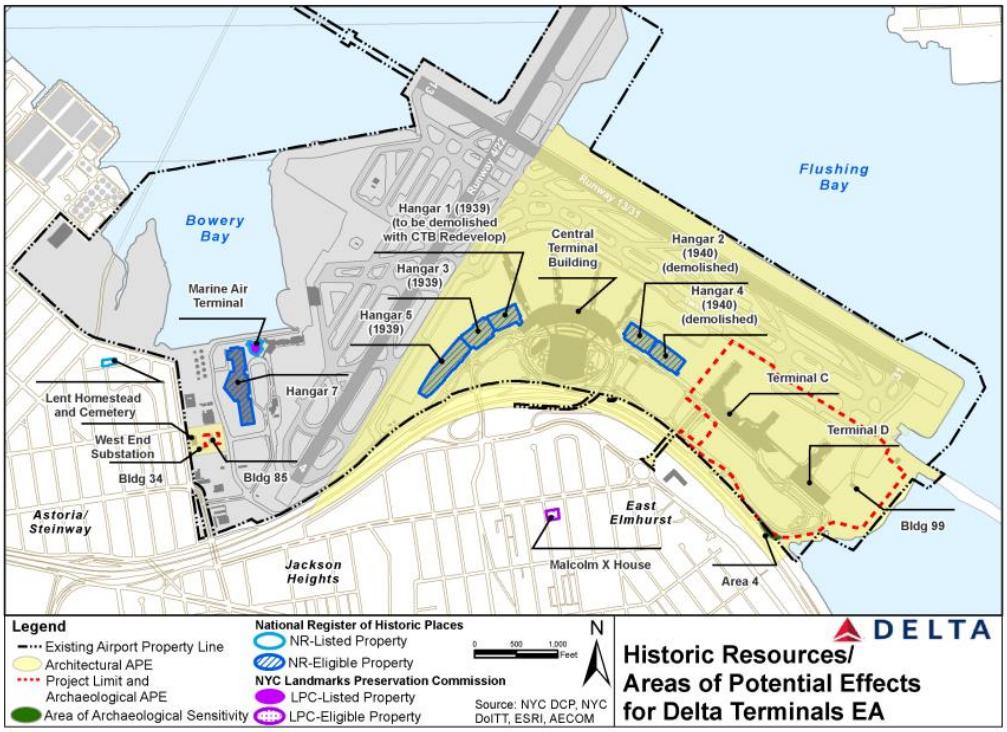
Delta Air Lines looks forward to receiving your concurrence on the proposed historic architectural and archaeological APEs and associated recommendations. Please feel free to contact our consultants, AECOM, if you have any questions – Allison Rachleff (Historic Architecture) at (212) 377-8723 or John Lawrence (Archaeology) at (518) 951-2287.

Sincerely,

Ryan Marzullo
Managing Director – Design & Construction, NY
Delta Air Lines

Enclosures

cc: Meenakshi Srinivasan, NYCLPC
Marie Jenet, FAA
Nicole Weymouth, AECOM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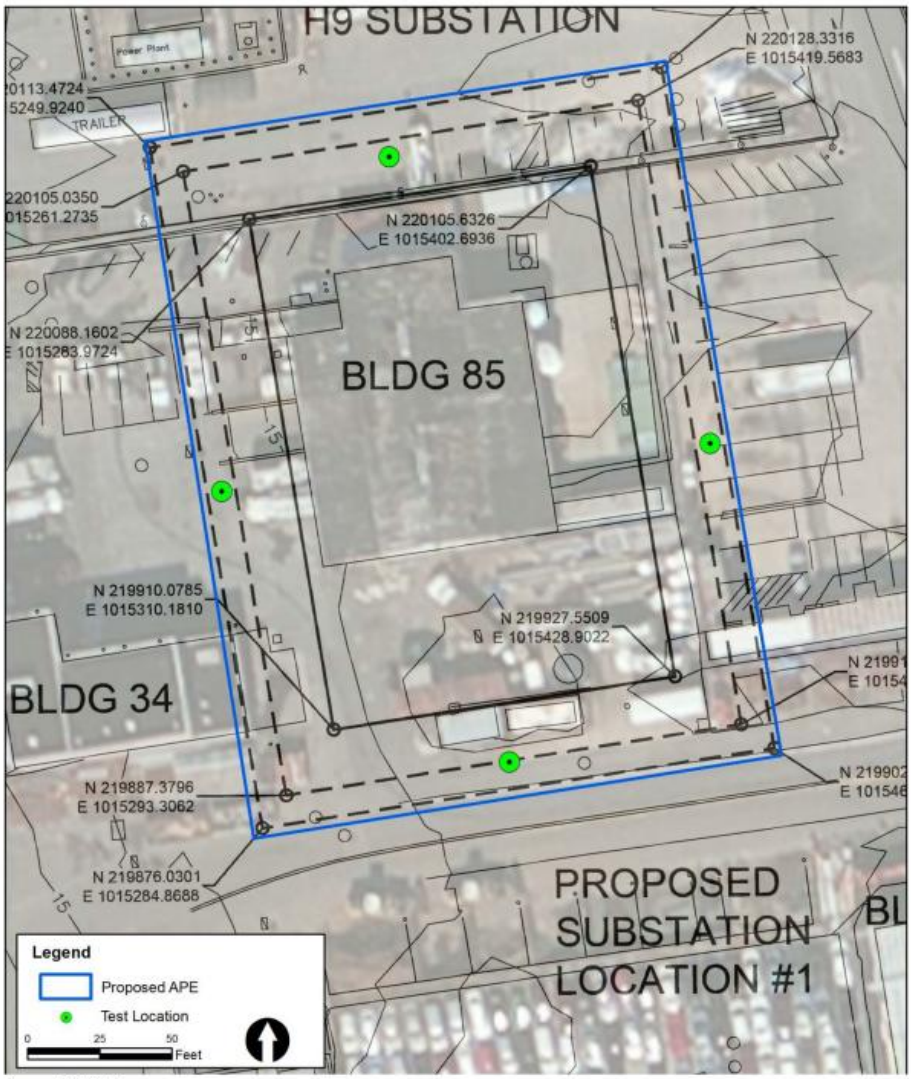
Source: NYC DCP, NYC DoITT, ESRI, AECOM
DELTA
Historic Resources/ Areas of Potential Effects for Delta Terminals EA

Figure 1



Source: ESRI 2015
Prepared by: AECOM 2016

Figure 2

LaGuardia Airport
Proposed West End Substation
DELTA

Proposed APE Direct Effects and Geomorphological Test Locations

Document Path: E:\Projects\DELTA La Guardia\DELTA\Figure 2 WestS.mxd

Photograph 1: Looking west toward existing WES.
(Source: Google Maps, 2016)

Photograph 2: Looking north toward existing WES
(Source: Google Maps, 2016)

Photograph 3: Looking east toward Building 85; note access ramp and awning supported by metal posts.

Photograph 4: Looking north toward Building 85; note corrugated metal siding.

Photograph 5: Looking west toward Building 85; note bus lot east of building.

Photograph 6: Looking southwest toward Building 34; note sash-type transoms.

Photograph 7: Looking west toward Building 34.

Photograph 8: Looking south toward Building 99; note roll-up doors.

Photograph 9: Looking south toward west façade of Building 99; note corrugated metal siding.

Photograph 10: Looking north toward Building 99.

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
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ROSE HARVEY
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July 06, 2016

Ms. Allison Rachleff
Sr. Architectural Historian
AECOM
125 Broad Street, 16th Floor
New York, NY 10004

Re: FAA
Delta Air Lines Reconfiguration Project at LaGuardia Airport
Terminals C and D, Queens, NY
16PR01506

Dear Ms. Rachleff:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

SHPO has reviewed the information regarding alterations the project's Area of Potential Effects (APE) for this project (Marzullo, 23 June 2016). Based on the information provided, we have no concerns regarding the demolition of Building 99. In addition, we concur with the proposal to conduct a Phase IA investigation, including geoarchaeology, of the proposed new location for the West End Substation WES).

SHPO has no concerns regarding buildings and structures with respect to this project modification.

If you have any questions please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via e-mail only

cc: Amanda Sutphin, Daniel Pagano, & Gina Santucci, LPC
Edward Knoesel, PANYNJ
John Lawrence & Nicole Weymouth, AECOM
Marie Jenet, FAA
Ryan Marzullo, Delta

Division for Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • www.nysparks.com

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

July 07, 2016

Ms. Allison Rachleff
Sr. Architectural Historian
AECOM
125 Broad Street, 16th Floor
New York, NY 10004

Re: FAA
Delta Air Lines Reconfiguration Project at LaGuardia Airport
Terminals C and D, Queens, NY
16PR01506

Dear Ms. Rachleff:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

SHPO has reviewed the proposed archaeological monitoring protocol for this project – *Archaeological Monitoring Protocol, Delta Air Lines Reconfiguration Project at LaGuardia Airport, Queens Borough, New York City* (AECOM, 14 June 2016). Please revise the document to address the following comments.

1. The area subject to monitoring may have to be expanded to encompass the proposed new location of the West End Substation (WES), depending on the results of the pending Phase IA investigation of that area.
2. Regarding the curation of any archaeological collection from National Register-eligible sites, if the New York State Museum declines to accept the collection, SHPO and LPC should be consulted to identify an appropriate alternate curation facility.
3. In case possible evidence of human remains or burial features is encountered, the SHPO Human Remains Discovery Protocol (attached) should be implemented.

If you have any questions please don't hesitate to contact me.

Division for Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • www.nysparks.com

Rachleff, 7 July 2016, page 2

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via e-mail only

Attachment

cc: Amanda Sutphin, Daniel Pagano, & Gina Santucci, LPC
Edward Knoesel, PANYNJ
John Lawrence & Nicole Weymouth, AECOM
Marie Jenet, FAA
Ryan Marzullo, Delta

Division for Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • www.nysparks.com

State Historic Preservation Office/
New York State Office of Parks, Recreation and Historic Preservation
Human Remains Discovery Protocol
(June 2015)

In the event that human remains are encountered during construction or archaeological investigations, the New York State Historic Preservation Office (SHPO) recommends that the following protocol is implemented:

- At all times human remains must be treated with the utmost dignity and respect. Should human remains or suspected human remains be encountered, work in the general area of the discovery will stop immediately and the location will be immediately secured and protected from damage and disturbance.

- Human remains or associated artifacts will be left in place and not disturbed. No skeletal remains or materials associated with the remains will be collected or removed until appropriate consultation has taken place and a plan of action has been developed.

- The SHPO, the appropriate Indian Nations, the involved state and federal agencies, the coroner, and local law enforcement will be notified immediately. Requirements of the corner and local law enforcement will be met. A qualified forensic anthropologist, bioarchaeologist or physical anthropologist will assess the remains *in situ* to help determine if the remains are Native American or non-Native American.

- If human remains are determined to be Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO and the Indian Nations. The involved agency will consult SHPO and appropriate Indian Nations to develop a plan of action that is consistent with the Native American Graves Protection and Repatriation Act (NAGPRA) guidance. Photographs of Native American human remains and associated funerary objects should not be taken without consulting with the involved Indian Nations.

- If human remains are determined to be non-Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO. Consultation with the SHPO and other appropriate parties will be required to determine a plan of action.

Delta Air Lines
Bulova Corporate Center
75-20 Astoria Blvd., Suite 230
East Elmhurst, NY 11370

April 25, 2017

Mr. Philip A. Perazio
Historic Preservation Program Analyst – Archaeology Unit
New York State Office of Parks, Recreation and Historic Preservation
Division for Historic Preservation
P.O. Box 189
Waterford, NY 12188-0189

Re: East Side Reconfiguration at LaGuardia Airport
Queens, New York
16PR01506

Dear Mr. Perazio,

This letter continues the Section 106 consultation process initiated on March 9, 2016 for PR No. 16PR01506. In response to your request in a letter dated July 7, 2016, please find the enclosed archaeological monitoring protocol for your review. This protocol would apply to the area of archaeological sensitivity at the southeast end of the APE for the project.

In addition, I would like to revise statements I made in a letter dated June 23, 2016 that indicated the project would include replacement of the West End Substation and demolition of Building 85 on the west side of the airport. Subsequent to that letter, it was determined that the additional electrical capacity required for the proposed East Terminal would be supplied by a substation constructed on the roof of the new Concourse G and connected to ConEdison commercial service at the 102nd Street Bridge on the south side of the Grand Central Parkway. Multiple 27kV feeders would access ConEdison through duct banks that were installed under the Parkway as part of the East End Substation construction, as well as three new duct banks to be installed south of the Grand Central Parkway and under the 102nd Street Bridge (see attached figure). Minor trenching off-airport would be required south of the Grand Central Parkway in the area previously disturbed for the installation of duct banks for the East End Substation connection (12PR02370). At this time, the West End Substation will remain in service and no replacement substation will be constructed on the west side of the airport; therefore, a supplemental Phase IA report will not be submitted and no archaeological monitoring will be required on the west side of the airport.

The Draft Environmental Assessment is currently available for public review and comment, through May 15, 2017. The document can be downloaded here: https://www.panynj.gov/about/studies-reports.html. A public information session and public hearing is scheduled for May 3rd at the Sheraton LaGuardia East Hotel in Flushing, NY.

Thank you for your assistance with this project. Please feel free to contact our consultant, AECOM, if you have any questions – Allison Rachleff at (212) 377-8723.

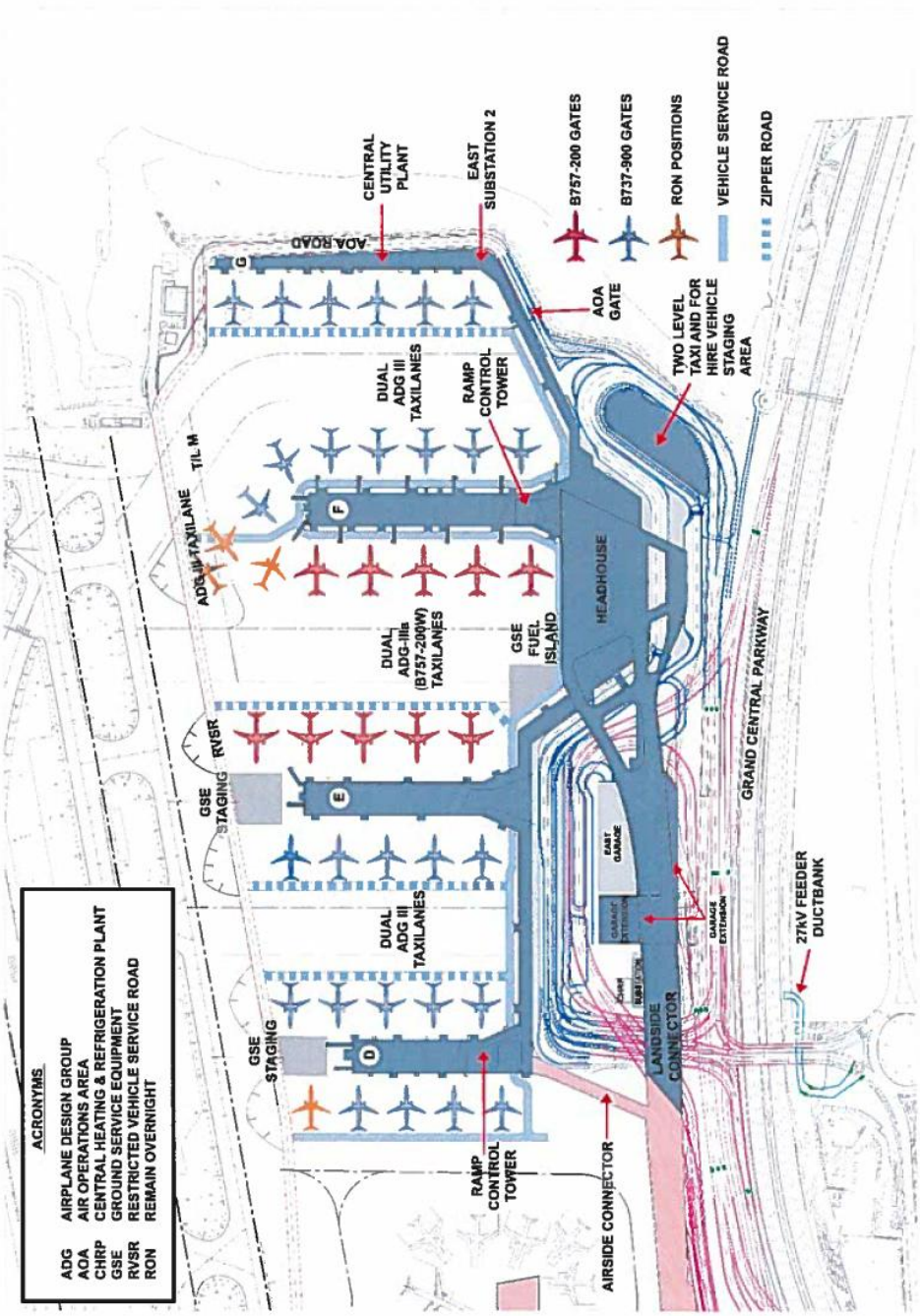
Sincerely,

Ryan Marzullo

Enclosure

cc: Meenakshi Srinivasan, NYCLPC
Marie Jenet, FAA
Jane Herndon, Port Authority of New York & New Jersey
Nicole Weymouth, WSP | Parsons Brinckerhoff

Page 3 of 3


CENTRAL UTILITY PLANT
EAST SUBSTATION 2
B757-200 GATES
B737-900 GATES
RON POSITIONS
VEHICLE SERVICE ROAD
ZIPPER ROAD
ADA ROAD
AOA GATE
TWO LEVEL TAXI AND FOR HIRE VEHICLE STAGING AREA
DUAL ADG III TAXILANES
RAMP CONTROL TOWER
TIL M
ADG III TAXILANE
HEADHOUSE
DUAL ADG-IIIa (B757-200W) TAXILANES
GSE FUEL ISLAND
RVSR
GSE STAGING
EAST GARAGE
GRAND CENTRAL PARKWAY
27kV FEEDER DUCTBANK
LANDSIDE CONNECTOR
AIRSIDE CONNECTOR
ACRONYMS
ADG AIRPLANE DESIGN GROUP
AOA AIR OPERATIONS AREA
CHRP CENTRAL HEATING & REFRIGERATION PLANT
GSE GROUND SERVICE EQUIPMENT
RVSR RESTRICTED VEHICLE SERVICE ROAD
RON REMAIN OVERNIGHT

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

May 01, 2017

Ms. Allison Rachleff
Sr. Architectural Historian
AECOM
125 Broad Street, 16th Floor
New York, NY 10004

Re: FAA
Delta Air Lines Reconfiguration Project at LaGuardia Airport
Terminals C and D, Queens, NY
16PR01506

Dear Ms. Rachleff:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources.

SHPO has reviewed the latest submission for this project – *Archaeological Monitoring Protocol, East Side Reconfiguration at LaGuardia Airport, Queens Borough, New York City* (AECOM, March 2017). We have the following comments.

1. Please note that affiliation with RPA by the principal investigator is not requested by this office.
2. The SHPO Human Remains Discovery Protocol has been revised. The October 2016 version is attached.
3. On page 3, the sentence regarding the resumption of construction after the completion of data recovery field work should be revised to indicate that alternate mitigative measures, aside from excavation may be agreed-upon. In such case, construction may resume as specified in the MOA.

If you have any questions please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via e-mail only

Attachment

cc: Amanda Sutphin, Daniel Pagano, Gina Santucci, and Jessica MacLean, LPC
Edward Knoesel and Katie Lamond, PANYNJ
John Lawrence & Nicole Weymouth, AECOM
Marie Jenet, FAA; Ryan Marzullo, Delta

Division for Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • www.nysparks.com

State Historic Preservation Office/
New York State Office of Parks, Recreation and Historic Preservation
Human Remains Discovery Protocol
(October 2016)

In the event that human remains are encountered during construction or archaeological investigations, the New York State Historic Preservation Office (SHPO) recommends that the following protocol is implemented:

- Human remains must be treated with the utmost dignity and respect at all times. Should human remains or *suspected* human remains be encountered, work in the general area of the discovery will stop immediately and the location will be secured and protected from damage and disturbance.

- If skeletal remains are identified and the archaeologist is not able to conclusively determine whether they are human, the remains and any associated materials must be left in place. A qualified forensic anthropologist, bioarchaeologist or physical anthropologist will assess the remains in situ to help determine if they are human.

- No skeletal remains or associated materials will be collected or removed until appropriate consultation has taken place and a plan of action has been developed.

- The SHPO, the appropriate Indian Nations, the involved state and federal agencies, the coroner, and local law enforcement will be notified immediately. Requirements of the corner and local law enforcement will be adhered to. A qualified forensic anthropologist, bioarchaeologist or physical anthropologist will assess the remains *in situ* to help determine if the remains are Native American or non-Native American.

- If human remains are determined to be Native American, they will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred option of the SHPO and the Indian Nations. The involved agency will consult SHPO and the appropriate Indian Nations to develop a plan of action that is consistent with the Native American Graves Protection and Repatriation Act (NAGPRA) guidance. Photographs of Native American human remains and associated funerary objects should not be taken without consulting with the involved Indian Nations.

- If human remains are determined to be non-Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred option of the SHPO. Consultation with the SHPO and other appropriate parties will be required to determine a plan of action.

- To protect human remains from possible damage, the SHPO recommends that burial information not be released to the public.

JFK International Airport
Terminal 4 Trailer Complex
Jamaica, NY 11430
(718) 751-3575

May 9, 2017

Mr. Philip A. Perazio
Historic Preservation Program Analyst – Archaeology Unit
New York State Office of Parks, Recreation and Historic Preservation
Division for Historic Preservation
P.O. Box 189
Waterford, NY 12188-0189

Re: East Side Reconfiguration at LaGuardia Airport
Queens, New York
16PR01506

Dear Mr. Perazio,

Thank you for your comments on the archaeological monitoring protocol submitted on April 21, 2017. We have revised the protocol as requested in your May 1, 2017 letter. Please find the revised version enclosed for your review.

If you have any questions, you may contact our consultant, Allison Rachleff (AECOM), at (212) 377-8723.

Sincerely,

Ryan Marzullo

Enclosure

cc: Meenakshi Srinivasan, NYCLPC
Marie Jenet, FAA
Jane Herndon, Port Authority of New York & New Jersey
Nicole Weymouth, WSP

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

May 15, 2017

Ms. Allison Rachleff
Sr. Architectural Historian
AECOM
125 Broad Street, 16th Floor
New York, NY 10004

Re: FAA
Delta Air Lines Reconfiguration Project at LaGuardia Airport
Terminals C and D, Queens, NY
16PR01506

Dear Ms. Rachleff:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources.

SHPO has reviewed the revised archaeological monitoring protocol for this project – *Archaeological Monitoring Protocol, East Side Reconfiguration at LaGuardia Airport, Queens Borough, New York City* (AECOM, May 2017). We concur with the revised protocol.

If you have any questions please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via e-mail only

cc: Amanda Sutphin, Daniel Pagano, Gina Santucci, and Jessica MacLean, LPC
Edward Knoesel and Katie Lamond, PANYNJ
John Lawrence & Nicole Weymouth, AECOM
Marie Jenet, FAA; Ryan Marzullo, Delta

Division for Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • www.nysparks.com

AECOM
125 Broad Street
New York, NY 10004
www.aecom.com

212 377 8400 tel
212 377 8410 fax

January 29, 2016

New York State Department of Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway
Albany, New York 12233-4757

Re: LaGuardia Airport
Delta Air Lines Reconfiguration Project
Borough of Queens
Queens County, New York

Dear Sir/Madam:

As part of Governor Cuomo's vision for the comprehensive redesign of LaGuardia Airport, Delta Air Lines proposes to reconfigure the existing Terminals C and D. Under Delta's reconfiguration project, a single, four-concourse terminal would be constructed, creating dual taxiways between the concourses. The on-airport roadways in front of the existing terminals would be reconfigured and an extension added to the East Garage.

AECOM would like to obtain data on endangered and threatened wildlife and plant species for the referenced project area. We would also like to obtain information on documented sightings within one half mile of the project area. A copy of the appropriate USGS map (Central Park and Flushing NY topographic quadrangles) is attached for your use. In addition, we would like to obtain a list of species occurring on the Central Park and Flushing NY topographic quadrangles and the most recent listing of Priority Sites and Generalized Natural Heritage Index maps in the vicinity of the project.

We need this information to fulfill the requirements for an Environmental Assessment compliance with the National Environmental Policy Act of 1969 (NEPA). No proprietary location data will be published without your consent.

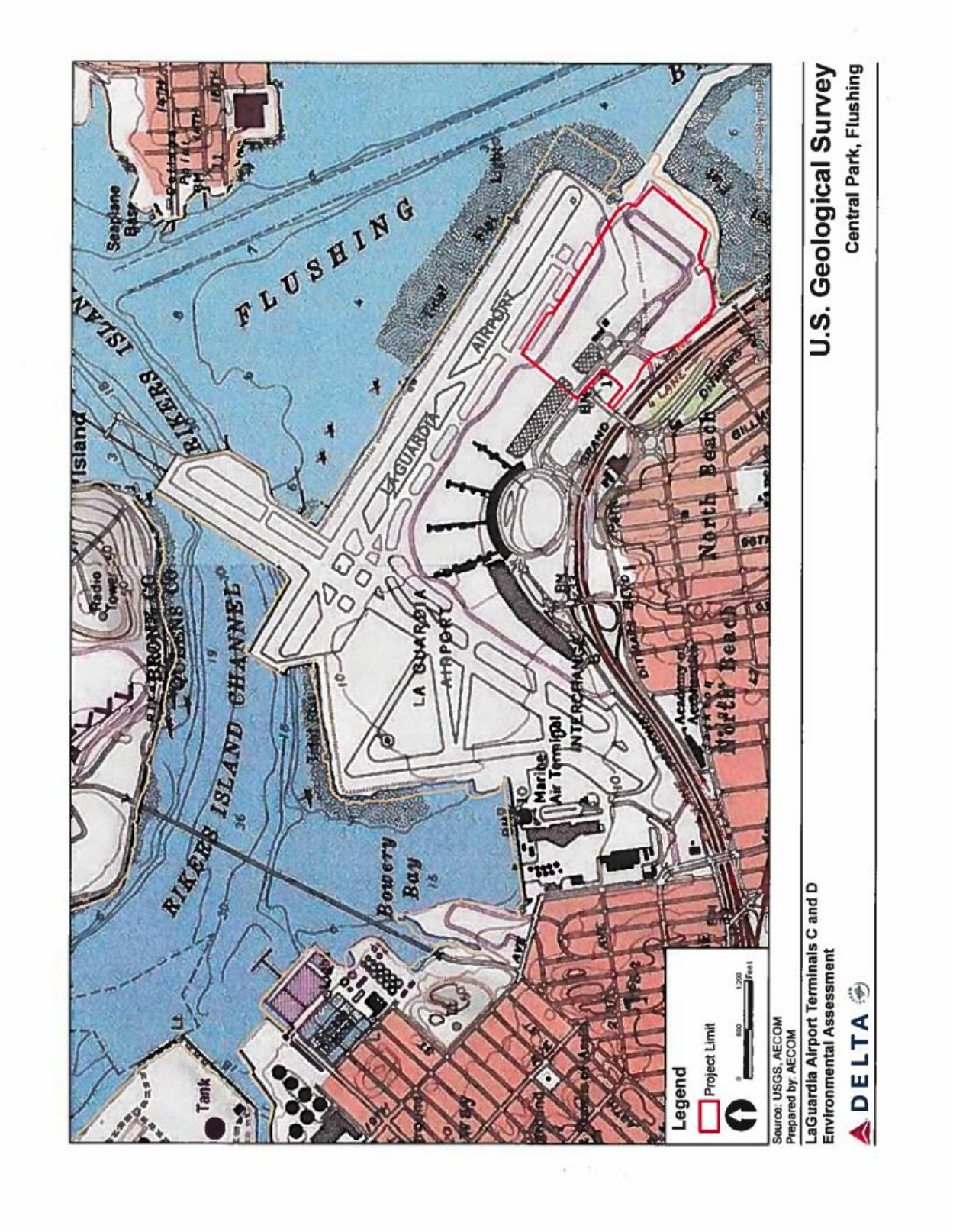
Please contact Eileen Loftus at (732) 564-3237 if you have any questions regarding this request. Thank you for your assistance.

Sincerely,

Nicole Weymouth

Enclosure

cc: Eileen Loftus, AECOM
Jim Tiefenthaler, Delta Air Lines


FLUSHING
RIKERS ISLAND
RIKERS ISLAND CHANNEL
LA GUARDIA AIRPORT
LAGUARDIA AIRPORT
Bowery Bay
North Beach
Marine Air Terminal
INTERCHANGE
Legend
Project Limit
Source: USGS, AECOM
Prepared by: AECOM
U.S. Geological Survey
Central Park, Flushing
LaGuardia Airport Terminals C and D
Environmental Assessment
DELTA

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

February 17, 2016

Nicole Weymouth
AECOM
125 Broad Street
New York, NY 10004

Re: Delta Airlines Terminals C and D Reconfiguration Project, La Guardia Airport
Town/City: City Of New York. County: Queens.

Dear Nicole Weymouth:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

We have no records of rare or state-listed animals or plants, or significant natural communities at your site or within .5 mile.

Enclosed is a report of the rare plants and animals in the Natural Heritage database documented since 1980 within the Central Park and Flushing USGS 7.5' topographic quadrangles.

New York Natural Heritage does maintains neither a listing of "Priority Sites" nor "Generalized Natural Heritage Index maps". We are not familiar with those terms.

For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other resources may be required to fully assess impacts on biological resources.

This response applies only to known occurrences of rare or state-listed animals and plants, significan natural communities, and other significant habitats maintained in the Natural Heritage Database. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Sincerely,

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

112

New York Natural Heritage Program

Report on Rare Animals, Rare Plants, and Significant Natural Communities

The following rare animals and rare plants have been documented since 1980 in the

Central Park and Flushing, New York, topographic quadrangles

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	HERITAGE CONSERVATION STATUS*
Birds			
Piping Plover *Breeding*	*Charadrius melodus*	Endangered *and Federally Listed as Threatened*	S3B
Peregrine Falcon *Breeding*	*Falco peregrinus*	Endangered	S3B
Barn Owl *Breeding*	*Tyto alba*	Protected Bird	S1S2
Glossy Ibis *Breeding*	*Plegadis falcinellus*	Protected Bird	S2
Yellow-crowned Night Heron *Breeding*	*Nyctanassa violacea*	Protected Bird	S2
Cattle Egret *Breeding*	*Bubulcus ibis*	Protected Bird	S2
Little Blue Heron *Breeding*	*Egretta caerulea*	Protected Bird	S2
Snowy Egret *Breeding*	*Egretta thula*	Protected Bird	S2S3
Animal Assemblages			
Colonial Waterbird Nesting Area			S3
Fish			
Shortnose Sturgeon	*Acipenser brevirostrum*	Endangered *and Federally Listed as Endangered*	S1
Atlantic Sturgeon	*Acipenser oxyrinchus*	No Open Season *and Federally Listed as Endangered*	S1
Moths			
An Ear Moth	*Amphipoea erepta ryensis*	Unlisted	S1
Dragonflies and Damselflies			
Seaside Dragonlet	*Erythrodiplax berenice*	Unlisted	S2
Bees			
Yellow Bumble Bee	*Bombus (Thoracobombus) fervidus*	Unlisted	S1

2/17/2016 Page 1 of 2

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	HERITAGE CONSERVATION STATUS*
Vascular Plants			
Yellow Giant-hyssop	*Agastache nepetoides*	Threatened	S2S3
Pale Duckweed	*Lemna valdiviana*	Endangered	S1
Northern Gama Grass	*Tripsacum dactyloides*	Threatened	S2
Globose Flatsedge	*Cyperus echinatus*	Endangered	S1
Short-fruit Rush	*Juncus brachycarpus*	Endangered	S1
Field Beadgrass	*Paspalum laeve*	Endangered	S1
Slender Spikerush	*Eleocharis tenuis* var. *pseudoptera*	Endangered	S1
False Lettuce	*Lactuca floridana*	Endangered	S1
Wild Pink	*Silene caroliniana* ssp. *pensylvanica*	Threatened	S2
Persimmon	*Diospyros virginiana*	Threatened	S2
Slender Blue Flag	*Iris prismatica*	Threatened	S2
Purple Milkweed	*Asclepias purpurascens*	Threatened	S2S3

* Conservation status in NYS as ranked by NY Natural Heritage Program on a 1 to 5 scale:
S1 = Critically imperiled
S2 = Imperiled
S3 = Rare or uncommon
S4 = Abundant and apparently secure
S5 = Demonstrably abundant and secure

B after one of the above ranks indicates the status rank is for breeding populations only.

N after one of the above ranks indicates the status rank is for nonbreeding wintering populations only.

For most sites, comprehensive field surveys have not been conducted; this report only includes records from our databases. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys.

2/17/2016 Page 2 of 2

AECOM
125 Broad Street
New York, NY 10004
www.aecom.com

212 377 8400 tel
212 377 8410 fax

March 2, 2016

Mr. Stephen Watts, Regional Permit Administrator
New York State Department of Environmental Conservation
Region 2 Long Island City Office
1 Hunter's Point Plaza
47-40 21st Street
Long Island City, New York 11101-5401

Re: LaGuardia Airport
Delta Air Lines Reconfiguration Project
Borough of Queens
Queens County, New York

Dear Mr. Watts:

As part of Governor Cuomo's vision for the comprehensive redesign of LaGuardia Airport, Delta Air Lines proposes to reconfigure the existing Terminals C and D. Under Delta's reconfiguration project, a single, four-concourse terminal would be constructed, creating dual taxiways between the concourses. The on-airport roadways in front of the existing terminals would be reconfigured and an extension added to the East Garage.

The proposed project site is located close to but not within State designated tidal wetlands along the east edge of the airport property (see enclosed figure). The construction of a restricted vehicle service road (RVSR), Concourse F of the proposed terminal, and the airport entrance road would take place on previously disturbed land that includes state-regulated 150-foot tidal wetland adjacent area. The remainder of the proposed work would take place in upland areas. Sheet piling forms a barrier between the airport and offsite tidal wetlands at the eastern end of the property, providing a confining feature that defines the limit of the landward side of the tidal wetland adjacent area. In addition, most of the land to be redeveloped is currently either a surface parking lot or a roadway and is, therefore, already graded and disturbed. Therefore, we do not anticipate that the proposed project would impact the nearby tidal wetland or adversely impact the tidal wetland adjacent area.

On behalf of Delta, AECOM is preparing an Environmental Assessment in compliance with the National Environmental Policy Act of 1969 (NEPA). I am writing to request guidance on further consultation, if any, that is required with regards to wetlands. If additional information is required or if you would like to have a conference call or meeting to discuss the project further, please contact me at (212) 377-8728 or nicole.weymouth@aecom.com or my colleague Eileen Loftus at (732) 564-3237 or eileen.loftus@aecom.com. Thank you for your assistance.

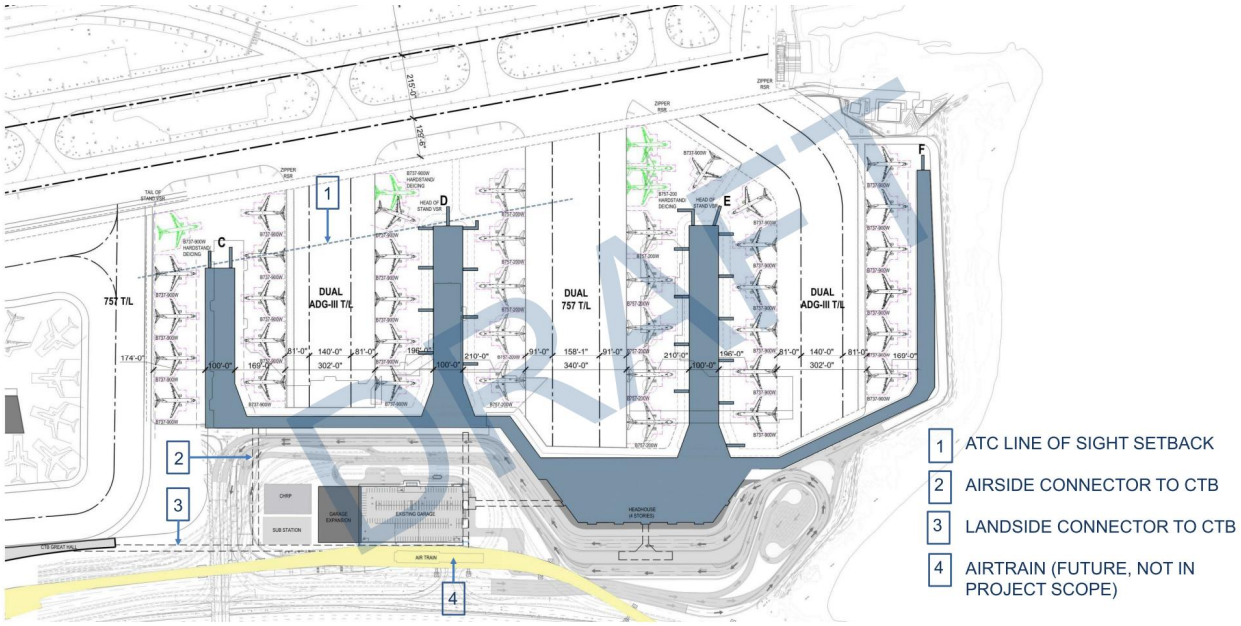
Sincerely,

Nicole Weymouth

Enclosures

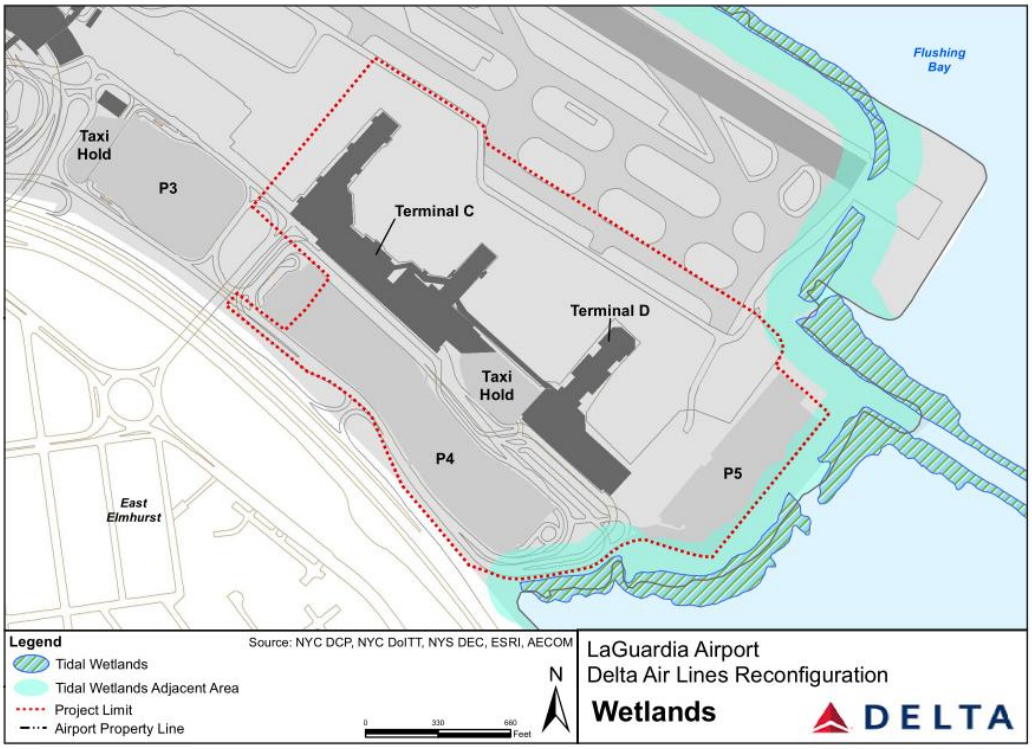
AECOM

cc: Steven Zahn, DEC
Eileen Loftus, AECOM
Jim Tiefenthaler, Delta Air Lines



CURRENT SITE PLAN

01-19-2016



AECOM

30 Knightsbridge Road, Piscataway, NJ 08854
T 732-564-3200 F 732-369-0120 www.aecom.com

Memorandum

From: Stacy Eastman
Date: April 13, 2016
Spoke To: Lisa Horowitz
Of: NYSDEC
Phone #: 718-482-4968
By: Telephone
Subject: Laguardia Airport

Ms. Horowitz was contacted regarding possible mitigation that would be required as a Tidal Wetland Permit was needed for the proposed project. She stated that mitigation was unlikely as there would be no direct impacts to wetlands or adjacent areas (i.e., fill). Projects that do have a direct impact on wetlands or adjacent areas require mitigation at a ratio of 1:1, 2:1, or 3:1 depending on the situation.

THE PORT AUTHORITY OF NY & NJ

UPS OVERNIGHT DELIVERY

March 10, 2016

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 – DELTA AIRLINES TERMINAL REDEVELOPMENT PROGRAM

Dear Mr. Zappieri:

Delta Airlines, a tenant of the Port Authority of NY & NJ (Port Authority) at LaGuardia Airport (LGA), is proposing to reconfigure the existing Terminals C and D as part of Governor Cuomo's comprehensive redesign program for the airport. Delta's reconfiguration project would involve construction of a single, four-concourse terminal with dual taxiways between the concourses. In addition, the on-airport roadways in front of the existing terminals would be reconfigured and an extension added to the East Garage. The purpose of the proposed action is to improve aircraft operations and reduce delays to enable Delta to meet passenger demand safely and effectively at acceptable levels of service. The proposed site for the Delta Reconfiguration project is located within the southeastern portion of LGA adjacent to Grand Central Parkway.

The proposed project involves a change in the airport layout plan that requires approval by the Federal Aviation Administration. The proposed project is similar in nature to redevelopment of the LGA Central Terminal Building, which was reviewed previously by your office and is currently in progress. Therefore, a determination was made that it would be appropriate for the Port Authority certify compliance with the New York State Department of State (NYSDOS) coastal zone policies and New York City Waterfront Revitalization Program (NYCWRP) coastal zone policies and to request a certification concurrence from each agency on behalf of its' tenant, Delta Airlines. The Port Authority has reviewed the project in light of the policies of each agency and determined that there would be no foreseeable adverse effects on coastal resources from this project.

To assist in your review of the proposed project, drawings showing the proposed terminal and the project limits, site photos, a completed Federal Consistency Assessment Form (FCAF) and policy evaluation, and a completed New York City Waterfront Revitalization Program Consistency Assessment Form (NYCWRPCAF) and policy evaluation are enclosed.

Engineering Department
4 World Trade Center, 150 Greenwich Street
New York, NY 10006

THE PORT AUTHORITY OF NY & NJ

The project site is located within a developed area that is inland of the shoreline and beyond the New York State Department of Environmental Conservation (NYSDEC) tidal wetland adjacent area. Therefore, permits from the U.S. Army Corps of Engineers and NYSDEC are not required. However, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared and submitted upon request to NYSDEC in accordance with the Port Authority's State Pollution Discharge Elimination System Permit (Permit No. NY 001 8138).

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) Project Drawings
2) Site Photos
3) FCAF and policy evaluation
4) NYC WRPCAF and policy evaluation

cc: Michael Marrella, NYCDCP

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM

Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP), shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. **APPLICANT** (please print)

1. Name: Port Authority of New York & New Jersey ATTN: Marc Helman
2. Address: 4 WTC, 150 Greenwich Street, 20th Floor New York, NY 10007
3. Telephone: Area Code ( ) 212 - 435-6112

B. **PROPOSED ACTIVITY:**

1. Brief description of activity:

See Attachment A.

2. Purpose of activity:

See Attachment A.

3. Location of activity:

Queens	Flushing 11369	LaGuardia Airport
County	City, Town, or Village	Street or Site Description

4. Type of federal permit/license required: FAA approval of change to ALP

5. Federal application number, if known: _____

6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application or permit number, if known:

SWPPP as required by LGA's SPDES Permit

C. **COASTAL ASSESSMENT** Check either "YES" or "NO" for each of these questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

1. Will the proposed activity result in any of the following:	YES	NO
a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43)		☑
b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44)	☑	
c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1)		☑
d. Reduction of existing or potential public access to or along coastal waters? (19, 20)		☑
e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9,10)		☑
f. Siting of a facility essential to the exploration, development and production of energy resources in coastal waters or on the Outer Continental Shelf? (29)		☑
g. Siting of a facility essential to the generation or transmission of energy? (27)		☑
h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15, 35)		☑
i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (8, 15, 35)		☑
j. Draining of stormwater runoff or sewer overflows into coastal waters? (33)	☑	
k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39)	☑	
l. Adverse effect upon land or water uses within the State's small harbors? (4)		☑

2. Will the proposed activity affect or be located in, on, or adjacent to any of the following:	YES	NO
a. State designated freshwater or tidal wetland? (44)	☑	
b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17)	☑	
c. State designated significant fish and/or wildlife habitat? (7)		☑
d. State designated significant scenic resource or area? (24)		☑
e. State designated important agricultural lands? (26)		☑
f. Beach, dune or Barrier Island? (12)		☑
g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3)		☑
h. State, county, or local park? (19, 20)	☑	
i. Historic resource listed on the National or State Register of Historic Places? (23)	☑	

3. Will the proposed activity require any of the following:	YES	NO
a. Waterfront site? (2, 21, 22)		☑
b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5)		☑
c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16)		☑
d. State water quality permit or certification? (30, 38, 40)		☑
e. State air quality permit or certification? (41, 43)		☑

4. Will the proposed activity occur within and/or affect an area covered by a State-approved local waterfront revitalization program, or State-approved regional coastal management program? (see policies in program document*)	YES	NO
	☑	

D. **ADDITIONAL STEPS**

1. If all of the questions in Section C are answered "NO", then the applicant or agency shall complete Section E and submit the documentation required by Section F.

2. If any of the questions in Section C are answered "YES", then the applicant or agent is advised to consult the CMP, or where appropriate, the local waterfront revitalization program document*. The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. On a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy; and, (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

E. **CERTIFICATION**

The applicant or agent must certify that the proposed activity is consistent with the State's CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program."

Contact
~~Applicant/Agent's~~ Name: Marc Helman

Address: 4 WTC, 150 Greenwich Street, 20th Fl., New York, NY 10007

Telephone: Area Code ( ) 212-435-6112

Contact
~~Applicant/Agent's~~ Signature: Marc Helman Date: 10 March 2016

F. **SUBMISSION REQUIREMENTS**

1. The applicant or agent shall submit the following documents to the **New York State Department of State, Office of Planning and Development, Attn: Consistency Review Unit, One Commerce Plaza-Suite 1010, 99 Washington Avenue, Albany, New York 12231.**

a. Copy of original signed form.
b. Copy of the completed federal agency application.
c. Other available information which would support the certification of consistency.

2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.

3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 474-6000.

*These state and local documents are available for inspection at the offices of many federal agencies, Department of environmental Conservation and Department of State regional offices, and the appropriate regional and county planning agencies. Local program documents are also available for inspection at the offices of the appropriate local government.

NEW YORK STATE DEPARTMENT OF STATE
COASTAL ZONE MANAGEMENT PROGRAM

Coastal Assessment Responses

1. **Will the proposed activity result in any of the following:**

   b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44)

   Policy 2: The proposed project is not a water-dependent use; however, it is consistent with the existing use of the site as an airport. Security and safety concerns limit the ability to develop the land along the shoreline within the LaGuardia Airport leaseline for any non-aviation use. The U.S. Department of Homeland Security has established a security exclusion zone around LaGuardia Airport that prohibits public access within 200 yards of the airport. Therefore, the proposed project is consistent with Policy 2.

   Policy 11: The proposed project would be located in the 100 year floodplain, with a portion of the project area along the shoreline within the coastal flood zone with velocity hazard. The project elements along the shoreline will be designed to not exacerbate erosion, with the concourse building set back from the shoreline a suitable distance to minimize damage from erosion. In addition, the design would involve implementation of various strategies to minimize and mitigate for potential flood hazards. The concourse would be sited landward of mean high tide. In addition, the Airport has disaster-preparedness measures in place to evacuate the facilities and protect human lives in the case of coastal storms. Therefore, the proposed project is consistent with Policy 11.

   Policy 12: There are no natural protective features (beaches, dunes, barrier islands or bluffs) located within the proposed project area that could be damaged by flooding and erosion potentially caused by the proposed project. Therefore, the policy is not applicable.

   Policy 28: Ice management practices at LGA would not change as a result of the proposed project. The Port Authority is prohibited from disposing snow into Flushing Bay and Bowery Bay, except under very limited emergency situations and with prior approval from NYSDEC. Snow is removed from runways and perimeter roads as soon as possible after it has fallen. Airfield anti-icing and de-icing is performed using sodium acetate on the runways and airfield roadways. Since sodium acetate dissolves completely once applied, this practice does not generate sediment and reduces the volume of waste material that must be managed by the stormwater collection system. Aviation-grade sand is sometimes used on the runways during storm events to increase friction. Snow management operations result in negligible impacts to water quality and are performed in accordance with the Airport's SPDES permit and Stormwater Pollution Prevention Plan. The current snow management practices would continue and the proposed project would not change existing snow removal operations and associated water quality.

The current practices would not interfere with hydroelectric power production, cause damage to significant fish and wildlife habitats, or increase shoreline erosion or flooding. The proposed project area does not have any hydroelectric power production nor are there any hydroelectric plants in the immediate vicinity. Similarly, the closest significant fish and wildlife habitat identified by the New York State Department of State is Meadow and Willow Lakes in Flushing Meadows Corona Park, which are over two miles from the proposed project site. Existing snow and ice management practices do not result in shoreline erosion or flooding. Therefore, the proposed project is consistent with Policy 28.

Policy 35: The proposed project does not involve any dredging and no fill materials would be placed coastal waters. Therefore, the policy is not applicable.

Policy 44: LaGuardia Airport is surrounded on three sides by State designated tidal wetlands. The proposed project site is located close to but not within the designated wetlands. The construction of a restricted vehicle service road (RVSR) and Concourse F at the far eastern edge of the airport, and the airport entrance road in the southeast corner of the airport, will take place within previously disturbed land that includes state-regulated 150-foot tidal wetland adjacent area. The tidal wetland adjacent area along the eastern edge of the project area encroaches on existing Parking Lot #5, Parking Lot #4 and the airport entrance road. Sheet piling forms a barrier between the airport and offsite tidal wetlands at the eastern end of the property, providing a confining feature that defines the limit of the landward side of the tidal wetland adjacent area. In addition, most of the land to be redeveloped is currently either a surface parking lot or a roadway and is, therefore, already graded and disturbed. Therefore, construction of the RVSR, Concourse F and airport entrance road would not impact the nearby tidal wetland or adversely impact the tidal wetland adjacent area.

The construction of the other concourses and roadways, the headhouse, and the garage extension would not cause physical alteration of the shoreline including land under water (i.e., littoral zone wetlands), any other tidal wetland areas, open coastal waters, or the tidal wetland adjacent area because the work will take place in upland areas. Therefore, the proposed project is consistent with Policy 44.

To summarize, based on the foregoing, the proposed project would be consistent with Policies 2, 11, 20, 28 and 40 and Policies 12 and 35 would not be applicable to the project.

j. Draining of stormwater runoff or sewer overflows into coastal waters? (33)
Stormwater at LaGuardia Airport does not flow directly into the outfalls except for some discharges on the west side of the airport. The stormwater is conveyed into holding areas and ultimately pump houses equipped with pumps with a high level indicator. When the water reaches a specified level in the pump house, the pumps are activated and the stormwater is discharged to an outfall. When stormwater is discharged from the pump house to the outfall, sampling, required by SPDES Permit No. NY 0008133 issued to the Port Authority, is conducted to ensure that water quality standards are not contravened. LGA also has BMPs in place for stormwater management – specifically BMP 7 (Elimination of Non-Storm Water Discharges to Storm Drains) and BMP 15 (Stormwater Pollution

Prevention Education). There are no combined sewer system overflows (CSOs) from LGA into receiving waters and wastewater from LGA is directed to a city-operated wastewater treatment plant (WWTP) and not a combined sewer system.

After completion of the project, stormwater will be managed in the same manner as described above and LGA will continue to comply with the requirements of the SPDES Permit.

The proposed project will ensure the control of stormwater and will not allow combined sewer overflow. Therefore, the project is consistent with Policy 33.

k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39)
The proposed project will generate solid waste (primarily excess soil and construction and demolition debris) that will be managed and disposed of in accordance with local, state and federal regulations and rules. An Environmental Management Plan that will include procedures for the proper handling of waste and a response plan for spills will be prepared and implemented during the proposed project. At no time will the filling of wetlands or littoral areas be allowed during the project.

The proposed project will have procedures in place to ensure the proper management and disposal of solid waste and hazardous materials. Therefore, the project is consistent with Policy 36 and Policy 39.

2. Will the proposed activity affect or be located in, on, or adjacent to any of the following:

a. State designated freshwater or tidal wetland? (44)
The proposed project is consistent with Policy 44. See previous response under Item 1.b.

b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17)
Portions of the project site (LaGuardia Airport) are below sea level and in a designated federal hazard area. The area of the proposed project would encroach on the flood hazard area subject to inundation by the 100-year storm. Almost all (99%) of the 79-acre project site is within the 100-year tidal floodplain identified in the Preliminary Flood Insurance Rate Map (FIRMs) published by the Federal Emergency Management Agency (FEMA). Within that area, 7.8 acres (10% of the project site) is designated coastal flood zone with velocity hazard.

The proposed project would involve implementation of various strategies to minimize and mitigate for potential flood hazards because it is not practical to locate the proposed project outside the floodplain. The project will comply with the NYC Building Codes, ASCE 24-14 *Flood Resistant Design and Construction Standards*, as well as the PANYNJ's *Design Guidelines: Climate Resilience* (last updated 1/22/2015). The Design Flood Elevation will be set to meet the ASCE 24 standards for a Class 3 building located in a Coastal Zone and the PANYNJ's Guidelines that adjust the flood protection levels for anticipated seal level rise based on the design life. The design life of the proposed project is assumed to be 40 years, requiring a +28 inch increase in flood level protection

for sea level rise. Therefore, in accordance with ASCE 24-14 Standards and the PANYNJ Design Guidelines, the proposed construction within the floodplain would meet a Design Flood Elevation of Base Flood Elevation (BFE) + 24" (Freeboard for class 3 structure) + 28" (PANYNJ sea level rise) or BFE + 52". In areas or facilities that cannot be raised above the flood protection elevation, the structures will be designed in accordance with ASCE 24-14 for structures within Coastal High Hazard Areas and Coastal A zones. However, because tidal flooding controls the 100-year floodplain surrounding LGA, the proposed project would not increase or decrease the 100-year flood elevation.

h. State, county, or local park? (19, 20)
A landscaped area identified by the New York City Department of Parks and Recreation as parkland serves as a buffer between the Grand Central Parkway and the Airport. The parkland is considered a transportation use and is not accessible to the public. The proposed project will construct Airport roadways and connections to the Grand Central Parkway but would not impact the parkland and will not change the current use.

Elmjack Field located adjacent to Flushing Bay is primarily used for recreational purposes and is within the airport leasehold. Elmjack Field is on the far west side of the airport property and the proposed project will not interfere with access to the park.

Overlook Park, a 2.33 acre publicly accessible park elevated to overlook the Airport and surrounding environments, is located approximately 0.1 miles away from the location of the proposed project. The proposed project will not impact Overlook Park.

The proposed project would not impact or alter public access to any of the parks; therefore, a Section 4(f) evaluation is not considered necessary. The project is consistent with Policy 19 and Policy 20.

i. Historic resource listed on the National or State Register of Historic Places? (23)
The proposed project is located approximately 1 mile east of the Marine Air Terminal, which was listed in the Register of Historic Places in 1982. The Area of Potential Effect (APE) for the project does not include the area of the Marine Air Terminal. Therefore, the Marine Air Terminal will not be affected by the proposed project either directly or indirectly.

Five hangars, located west of the proposed project, were found to be eligible to be listed on the National Register as per New York State Office of Parks, Recreation and Historic Preservation (NYSOPR&HP). The hangars are located within the APE for the project, but outside the proposed project limits. The two hangars located immediately adjacent to the proposed project (Hangars 2 and 4) were demolished in 2015 as part of the Central Terminal Building (CTB) Redevelopment Program. Hangar 1, located on the far side of the CTB, approximately 2,300 feet west the proposed project, will be demolished within the next 5 years. Hangars 3 and 5, located further west of Hangar 1, will remain in place. The Port Authority entered into a Memorandum of Agreement (MOA) with FAA, NYSOPR&HP and other consulting parties to identify proper mitigation measures for the adverse impact to Hangars 1, 2 and 4, which included maintenance of Hangars 3 and 5. There would be no direct adverse impact to the remaining hangars as a result of the proposed project. In

addition, Hangars 3 and 5 will be blocked from view from the proposed terminal due to the construction of the West Garage and new CTB that are part of the CTB Redevelopment Program. Therefore, Hangars 3 and 5 will not be affected by the proposed project either directly or indirectly.

There are known archaeologically-sensitive sites within a one-mile radius of the proposed project area. However, it is unlikely that any sites located within the project's APE will have a high potential for resource recovery. Due to the substantial amount of filling activities that have occurred in this location over the past 50 years, any intact soils would be significantly below grade. Thus the potential for impacts to occur overall is low but would be contingent upon the depth of construction. NYSOPR&HP will be consulted to determine if it would be appropriate to monitor the site for archaeological resources during construction. However, it is anticipated, based in part on the prior extent of filling, that the proposed project would have no or minimal impact to archaeological sites.

As the proposed project will not impact any listed sites and will minimize impacts to archaeological resources where practicable, this project is consistent with Policy 23.

4. Will the proposed activity occur within and/or affect an area covered by a State-approved local waterfront revitalization program, or State-approved regional coastal management program?

The proposed project will occur in New York City, which has an approved waterfront revitalization program. A copy of the New York City Waterfront Revitalization Program Consistency Assessment Form and responses to Policy Questions has been provided with this request of concurrence.

The proposed project is consistent with New York City's program. Therefore, the project would also be consistent with New York State's program, as there are no conflicts with any of the state policies.

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

ROSSANA ROSADO
ACTING SECRETARY OF STATE

May 16, 2016

Mr. Marc Helman, Supervisor
The Port Authority of NY & NJ
Permits and Governmental Approvals
4 WTC, 150 Greenwich Street, 20th Floor
New York, New York 10006

RE: F-2016-0241
U.S. Army Corps of Engineers/New York District Permit Application
Port Authority of NY & NJ (Delta Airlines Terminal Redev.)
Construction of a single, four-concourse terminal with dual taxiways between the concourses. In addition, the on-airport roadways in front of the existing terminals would be reconfigured and an extension added to the East Garage
Borough of Queens, Queens County
General Concurrence

Dear Mr. Helman:

The Department of State received your Federal Consistency Assessment Form and consistency certification and supporting information for this proposal on March 11, 2016.

The Department of State has determined that this proposal meets the Department's general consistency concurrence criteria. Therefore, further review of the proposed activity by the Department of State, 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, 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 us at (518) 474-6000 and refer to our file #F-2016-0241.

Sincerely,

Jeffrey Zappieri
Supervisor, Consistency Review Unit
Office of Planning and Development

JZ/RM/dc
cc: COE/New York District – Steve Ryba
DEC/Region – Stephen Watts

NEW YORK STATE OF OPPORTUNITY. Department of State

JFK International Airport
Terminal 4 Trailer Complex
Jamaica, NY 11430
(718) 751-3575

March 21, 2016

Ms. Sonia Pichardo
Regional Director
New York State Department of Transportation, Region 11
Hunters Point Plaza
47-40 21st Street
Long Island City, NY 11101

Re: Delta Air Lines Reconfiguration Project at LaGuardia Airport
Queens, New York

Dear Ms. Pichardo

Thank you for meeting with us today. We appreciated the opportunity to present Delta Air Lines' plans for reconfiguring the east side of LaGuardia Airport and to answer your questions. As you are aware, the Proposed Action would involve the reconfiguration of the airside apron associated with Terminals C and D, the construction of a new terminal building, expansion of the East Garage, and construction of pedestrian bridges connecting to the new terminal.

In an effort to improve aircraft operations, reduce delays and improve reliability, Delta proposes to reconfigure the apron area around Terminals C and D. There would be no increase in forecast operations or passenger demand as a result of the Proposed Action. The plan calls for the creation of dual taxiways between the concourses. Due to the desire to create dual taxilanes by widening the distance between the three (3) existing concourses to the east, and given the constraints of the airport boundaries, the Proposed Action necessitates pushing the headhouse to the south to create additional aeronautical operations areas. Under the Proposed Action, Terminals C and D would be consolidated into a single headhouse. The existing arrival and departure roadways directly in front of the new terminal would be reconfigured to support the shifting of the terminal building toward the Grand Central Parkway. (Note: All construction would occur within the existing airport lease line.) Proposed terminal frontage roads would connect to existing on-airport circulation and access roads or those designed as part of the Central Terminal Building (CTB) Redevelopment Program. Two-level terminal roadway frontage would be constructed (at-grade frontage at the arrivals level and elevated frontage at the departures level) with multiple drop-off/pick-up and bypass lanes for both private and commercial vehicles. Two 4-lane frontage areas in front of the headhouse would be separated by an island with provisions for curbside check-in. A pedestrian overpass from the island, up to the security level within the headhouse would reduce at-grade crosswalks. At extension to the East Garage would provide 520 spaces and two pedestrian bridges would connect the garage to the new terminal. A taxihold lot in the vicinity of the terminal would replace the existing taxihold between Terminals C and D.

Delta's Reconfiguration Project is independent of the CTB Redevelopment at LaGuardia Airport that was initially approved by the Federal Aviation Administration (FAA) in December 2014 and subsequently with a Written Reevaluation/Record of Decision in December 2015. The purpose and need of each project is not interconnected with the other and neither project facilitates, hinders, or limits the consideration of alternatives for the other.

The lead federal agency for the project is the FAA because the agency must approve changes to the Airport Layout Plan (ALP). Therefore, an Environmental Assessment (EA) is being prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended. We reached out to your office as an interested party to the NEPA process, due to the proximity of the project to the Grand Central Parkway. However, since there would be no impact to the Grand Central Parkway, any other SDOT facilities, or any SDOT right-of-way as a result of the Delta Reconfiguration Project, we request written concurrence that SDOT has no outstanding concerns with regard to the Proposed Action.

We appreciate your time and your support on this project. Please feel free to contact me at (718) 751-3575, if you have any concerns.

Sincerely,

Ryan Marzullo
Director – Design and Construction, NY
Delta Air Lines

cc: Patty Ornst, Delta Air Lines
Jim Tiefenthaler, Delta Air Lines
Ed Knoesel, PANYNJ
Nicole Weymouth, AECOM

THE PORT AUTHORITY OF NY & NJ

UPS OVERNIGHT DELIVERY

March 10, 2016

Mr. Michael Marrella
Director, Waterfront and Open Space Division
New York City Department of City Planning
120 Broadway, 31st Floor
New York, NY 10271

SUBJECT: LAGUARDIA AIRPORT – DELTA AIRLINES TERMINAL REDEVELOPMENT PROGRAM

Dear Mr. Marrella:

Delta Airlines, a tenant of the Port Authority of NY & NJ (Port Authority) at LaGuardia Airport (LGA), is proposing to reconfigure the existing Terminals C and D as part of Governor Cuomo's comprehensive redesign program for the airport. Delta's reconfiguration project would involve construction of a single, four-concourse terminal with dual taxiways between the concourses. In addition, the on-airport roadways in front of the existing terminals would be reconfigured and an extension added to the East Garage. The purpose of the proposed action is to improve aircraft operations and reduce delays to enable Delta to meet passenger demand safely and effectively at acceptable levels of service. The proposed site for the Delta Reconfiguration project is located within the southeastern portion of LGA adjacent to Grand Central Parkway.

The proposed project involves a change in the airport layout plan that requires approval by the Federal Aviation Administration. The proposed project is similar in nature to redevelopment of the LGA Central Terminal Building, which was reviewed previously by your office and is currently in progress. Therefore, a determination was made that it would be appropriate for the Port Authority certify compliance with the New York City Waterfront Revitalization Program (NYCWRP) coastal zone policies and New York State Department of State (NYSDOS) coastal zone policies and to request a certification concurrence from each agency on behalf of its' tenant, Delta Airlines. The Port Authority has reviewed the project in light of the policies of each agency and determined that there would be no foreseeable adverse effects on coastal resources from this project.

To assist in your review of the proposed project, drawings showing the proposed terminal and the project limits, site photos, a completed New York City Waterfront Revitalization Program Consistency Assessment Form (NYCWRPCAF) and policy evaluation, and a completed Federal Consistency Assessment Form (FCAF) and policy evaluation are enclosed.

Engineering Department
4 World Trade Center, 150 Greenwich Street
New York, NY 10006

THE PORT AUTHORITY OF NY & NJ

The project site is located within a developed area that is inland of the shoreline and beyond the New York State Department of Environmental Conservation (NYSDEC) tidal wetland adjacent area. Therefore, permits from the U.S. Army Corps of Engineers and NYSDEC are not required. However, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared and submitted upon request to NYSDEC in accordance with the Port Authority's State Pollution Discharge Elimination System Permit (Permit No. NY 001 8138).

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) Project Drawings
2) Site Photographs
3) NYC WRPCAF
4) FCAF

cc: Jeffrey Zappieri, NYSDOS

For Internal Use Only:
Date Received: _____

WRP no. _____
DOS no. _____

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM
Consistency Assessment Form

Proposed actions that are subject to CEQR, ULURP or other local, state or federal discretionary review procedures, and that are within New York City's designated coastal zone, must be reviewed and assessed for their consistency with the *New York City Waterfront Revitalization Program (WRP)*. The WRP was adopted as a 197-a Plan by the Council of the City of New York on October 13, 1999, and subsequently approved by the New York State Department of State with the concurrence of the United States Department of Commerce pursuant to applicable state and federal law, including the Waterfront Revitalization of Coastal Areas and Inland Waterways Act. As a result of these approvals, state and federal discretionary actions within the city's coastal zone must be consistent to the maximum extent practicable with the WRP policies and the city must be given the opportunity to comment on all state and federal projects within its coastal zone.

This form is intended to assist an applicant in certifying that the proposed activity is consistent with the WRP. It should be completed when the local, state, or federal application is prepared. The completed form and accompanying information will be used by the New York State Department of State, other state agencies or the New York City Department of City Planning in their review of the applicant's certification of consistency.

A. APPLICANT

1. Name: The Port Authority of New York & New Jersey ATTN: Marc Helman
2. Address: 4 WTC, 150 Greenwich Street, 20th Floor New York, NY 10007
3. Telephone: 212-435-6112 Fax: 212-435-6251 E-mail: mhelman@panynj.gov
4. Project site owner: The Port Authority of New York & New Jersey

B. PROPOSED ACTIVITY

1. Brief description of activity:
   See Attachment A.

2. Purpose of activity:
   See Attachment A.

3. Location of activity: (street address/borough or site description):
   LaGuardia Airport
   Queens County
   Flushing, NY 11369

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Proposed Activity Cont'd

4. If a federal or state permit or license was issued or is required for the proposed activity, identify the permit type(s), the authorizing agency and provide the application or permit number(s), if known:

   Federal Aviation Administration approval of Airport Layout Plan changes.

5. Is federal or state funding being used to finance the project? If so, please identify the funding source(s).

   N/A

6. Will the proposed project require the preparation of an environmental impact statement?
   Yes _____ No ✓ If yes, identify Lead Agency:

7. Identify **city** discretionary actions, such as a zoning amendment or adoption of an urban renewal plan, required for the proposed project.

   N/A

C. COASTAL ASSESSMENT

Location Questions:	**Yes**	**No**
1. Is the project site on the waterfront or at the water's edge?	✓	
2. Does the proposed project require a waterfront site?		✓
3. Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land underwater, or coastal waters?		✓

Policy Questions	**Yes**	**No**
The following questions represent, in a broad sense, the policies of the WRP. Numbers in parentheses after each question indicate the policy or policies addressed by the question. The new Waterfront Revitalization Program offers detailed explanations of the policies, including criteria for consistency determinations. Check either "Yes" or "No" for each of the following questions. For all "yes" responses, provide an attachment assessing the effects of the proposed activity on the relevant policies or standards. Explain how the action would be consistent with the goals of those policies and standards.		
4. Will the proposed project result in revitalization or redevelopment of a deteriorated or under-used waterfront site? (1)		✓
5. Is the project site appropriate for residential or commercial redevelopment? (1.1)		✓
6. Will the action result in a change in scale or character of a neighborhood? (1.2)		✓

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Policy Questions cont'd	Yes	No
7. Will the proposed activity require provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (1.3)		✓
8. Is the action located in one of the designated Significant Maritime and Industrial Areas (SMIA): South Bronx, Newtown Creek, Brooklyn Navy Yard, Red Hook, Sunset Park, or Staten Island? (2)		✓
9. Are there any waterfront structures, such as piers, docks, bulkheads or wharves, located on the project sites? (2)	✓	
10. Would the action involve the siting or construction of a facility essential to the generation or transmission of energy, or a natural gas facility, or would it develop new energy resources? (2.1)		✓
11. Does the action involve the siting of a working waterfront use outside of a SMIA? (2.2)		✓
12. Does the proposed project involve infrastructure improvement, such as construction or repair of piers, docks, or bulkheads? (2.3, 3.2)		✓
13. Would the action involve mining, dredging, or dredge disposal, or placement of dredged or fill materials in coastal waters? (2.3, 3.1, 4, 5.3, 6.3)		✓
14. Would the action be located in a commercial or recreational boating center, such as City Island, Sheepshead Bay or Great Kills or an area devoted to water-dependent transportation? (3)		✓
15. Would the proposed project have an adverse effect upon the land or water uses within a commercial or recreation boating center or water-dependent transportation center? (3.1)		✓
16. Would the proposed project create any conflicts between commercial and recreational boating? (3.2)		✓
17. Does the proposed project involve any boating activity that would have an impact on the aquatic environment or surrounding land and water uses? (3.3)		✓
18. Is the action located in one of the designated Special Natural Waterfront Areas (SNWA): Long Island Sound- East River, Jamaica Bay, or Northwest Staten Island? (4 and 9.2)		✓
19. Is the project site in or adjacent to a Significant Coastal Fish and Wildlife Habitat? (4.1)		✓
20. Is the site located within or adjacent to a Recognized Ecological Complex: South Shore of Staten Island or Riverdale Natural Area District? (4.1and 9.2)		✓
21. Would the action involve any activity in or near a tidal or freshwater wetland? (4.2)	✓	
22. Does the project site contain a rare ecological community or would the proposed project affect a vulnerable plant, fish, or wildlife species? (4.3)		✓
23. Would the action have any effects on commercial or recreational use of fish resources? (4.4)		✓
24. Would the proposed project in any way affect the water quality classification of nearby waters or be unable to be consistent with that classification? (5)		✓
25. Would the action result in any direct or indirect discharges, including toxins, hazardous substances, or other pollutants, effluent, or waste, into any waterbody? (5.1)		✓
26. Would the action result in the draining of stormwater runoff or sewer overflows into coastal waters? (5.1)	✓	
27. Will any activity associated with the project generate nonpoint source pollution? (5.2)		✓
28. Would the action cause violations of the National or State air quality standards? (5.2)		✓

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Policy Questions cont'd	Yes	No
29. Would the action result in significant amounts of acid rain precursors (nitrates and sulfates)? (5.2C)		✓
30. Will the project involve the excavation or placing of fill in or near navigable waters, marshes, estuaries, tidal marshes or other wetlands? (5.3)		✓
31. Would the proposed action have any effects on surface or ground water supplies? (5.4)		✓
32. Would the action result in any activities within a federally designated flood hazard area or state-designated erosion hazards area? (6)	✓	
33. Would the action result in any construction activities that would lead to erosion? (6)		✓
34. Would the action involve construction or reconstruction of a flood or erosion control structure? (6.1)		✓
35. Would the action involve any new or increased activity on or near any beach, dune, barrier island, or bluff? (6.1)		✓
36. Does the proposed project involve use of public funds for flood prevention or erosion control? (6.2)		✓
37. Would the proposed project affect a non-renewable source of sand ? (6.3)		✓
38. Would the action result in shipping, handling, or storing of solid wastes, hazardous materials, or other pollutants? (7)		✓
39. Would the action affect any sites that have been used as landfills? (7.1)		✓
40. Would the action result in development of a site that may contain contamination or that has a history of underground fuel tanks, oil spills, or other form or petroleum product use or storage? (7.2)	✓	
41. Will the proposed activity result in any transport, storage, treatment, or disposal of solid wastes or hazardous materials, or the siting of a solid or hazardous waste facility? (7.3)	✓	
42. Would the action result in a reduction of existing or required access to or along coastal waters, public access areas, or public parks or open spaces? (8)		✓
43. Will the proposed project affect or be located in, on, or adjacent to any federal, state, or city park or other land in public ownership protected for open space preservation? (8)		✓
44. Would the action result in the provision of open space without provision for its maintenance? (8.1)		✓
45. Would the action result in any development along the shoreline but NOT include new water-enhanced or water-dependent recreational space? (8.2)		✓
46. Will the proposed project impede visual access to coastal lands, waters and open space? (8.3)		✓
47. Does the proposed project involve publicly owned or acquired land that could accommodate waterfront open space or recreation? (8.4)		✓
48. Does the project site involve lands or waters held in public trust by the state or city? (8.5)		✓
49. Would the action affect natural or built resources that contribute to the scenic quality of a coastal area? (9)		✓
50. Does the site currently include elements that degrade the area's scenic quality or block views to the water? (9.1)		✓

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Policy Questions cont'd	Yes	No
51. Would the proposed action have a significant adverse impact on historic, archeological, or cultural resources? (10)		✓
52. Will the proposed activity affect or be located in, on, or adjacent to an historic resource listed on the National or State Register of Historic Places, or designated as a landmark by the City of New York? (10)	✓	

D. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with New York City's Waterfront Revitalization Program, pursuant to the New York State Coastal Management Program. If this certification cannot be made, the proposed activity shall not be undertaken. If the certification can be made, complete this section.

"The proposed activity complies with New York State's Coastal Management Program as expressed in New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program, and will be conducted in a manner consistent with such program."

~~Applicant/Agent~~ Contact Name: Marc Helman

Address: 4 World Trade Center, 150 Greenwich Street, 20th Floor

New York, Ny 10007 Telephone 212-435-6112

~~Applicant/Agent~~ Contact Signature: Marc Helman Date: 10 March 2016

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NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM

Location Question Responses

Location Question 1
Is the project site on the waterfront or at the water's edge?

The airport is located on a manmade peninsula surrounded on three sides by water (Flushing Bay/East River). The eastern edge of the project area is adjacent to the water's edge. However, the work would occur within an existing parking lot and would not occur in the waterway or at the water's edge.

Policy Question Responses

Policy Question 9 (Policy 2)
Are there any waterfront structures, such as piers, docks, bulkheads or wharves, located on the project sites?

There are piers present at LGA that are used for navigational aids and for mooring vessels involved in maintaining waterside security at the airport. The project will not change the current functions of these piers and the proposed project area is separate from the piers by buildings, runways, taxiways and roadways.

As the proposed project will not change the function of the existing waterfront structures, the proposed project is consistent with Policy 2.

Policy Question 21 (Policy 4.2)
Would the action involve any activity in or near a tidal or freshwater wetland?

LaGuardia Airport is surrounded on three sides by State designated tidal wetlands. The proposed project site is located close to but not within the designated wetlands. The construction of a restricted vehicle service road (RVSR) and Concourse F at the far eastern edge of the airport, and the airport entrance road in the southeast corner of the airport, will take place within previously disturbed land that includes state-regulated 150-foot tidal wetland adjacent area. The tidal wetland adjacent area along the eastern edge of the project area encroaches on existing Parking Lot #5, Parking Lot #4 and the airport entrance road. Sheet piling forms a barrier between the airport and offsite tidal wetlands at the eastern end of the property, providing a confining feature that defines the limit of the landward side of the tidal wetland adjacent area. In addition, most of the land to be redeveloped is currently either a surface parking lot or a roadway and is, therefore, already graded and disturbed. Therefore, construction of the RVSR, Concourse F and airport entrance road would not impact the nearby tidal wetland or adversely impact the tidal wetland adjacent area.

The construction of the other concourses and roadways, the headhouse, and the garage extension would not cause physical alteration of the shoreline including land under water (i.e., littoral zone

wetlands), any other tidal wetland areas, open coastal waters, or the tidal wetland adjacent area because the work will take place in upland areas. Therefore, the proposed project is consistent with Policy 4.2.

Policy Question 26 (Policy 5.1)
Would the action result in the draining of stormwater runoff or sewer overflows into coastal waters?

Stormwater at LaGuardia Airport does not flow directly into the outfalls except for some discharges on the west side of the airport. The stormwater is conveyed into holding areas and ultimately pump houses equipped with pumps with a high level indicator. When the water reaches a specified level in the pump house, the pumps are activated and the stormwater is discharged to an outfall. When stormwater is discharged from the pump house to the outfall, sampling, required by SPDES Permit No. NY 0008133 issued to the Port Authority, is conducted to ensure that water quality standards are not contravened. LGA also has BMPs in place for stormwater management – specifically BMP 7 (Elimination of Non-Storm Water Discharges to Storm Drains) and BMP 15 (Stormwater Pollution Prevention Education). There are no combined sewer system overflows (CSOs) from LGA into receiving waters and wastewater from LGA is directed to a city-operated wastewater treatment plant (WWTP) and not a combined sewer system.

After completion of the project, stormwater will be managed in the same manner as described above and LGA will continue to comply with the requirements of the SPDES Permit.

The water surrounding LGA Airport is currently brackish and the volume of fresh (storm) water being put into the brackish water is not sufficient to cause impact to the salinity or the fish habitat.

The proposed project will ensure the control of stormwater and will not allow combined sewer overflow. Therefore, the project is consistent with Policy 5.1.

Policy Question 32 (Policy 6)
Would the action result in any activities within a federally designated flood hazard area or state designated erosion hazards area?

Portions of the project site (LaGuardia Airport) are below sea level and in a designated federal hazard area. The area of the proposed project would encroach on the flood hazard area subject to inundation by the 100-year storm. Almost all (99%) of the 79-acre project site is within the 100-year tidal floodplain identified in the Preliminary Flood Insurance Rate Map (FIRMs) published by the Federal Emergency Management Agency (FEMA). Within that area, 7.8 acres (10% of the project site) is designated coastal flood zone with velocity hazard.

The proposed project would involve implementation of various strategies to minimize and mitigate for potential flood hazards because it is not practical to locate the proposed project outside the floodplain. The project will comply with the NYC Building Codes, ASCE 24-14 *Flood Resistant Design and Construction Standards*, as well as the PANYNJ's *Design Guidelines: Climate Resilience* (last updated

1/22/2015). The Design Flood Elevation will be set to meet the ASCE 24 standards for a Class 3 building located in a Coastal Zone and the PANYNJ's Guidelines that adjust the flood protection levels for anticipated seal level rise based on the design life. The design life of the proposed project is assumed to be 40 years, requiring a +28 inch increase in flood level protection for sea level rise. Therefore, in accordance with ASCE 24-14 Standards and the PANYNJ Design Guidelines, the proposed construction within the floodplain would meet a Design Flood Elevation of Base Flood Elevation (BFE) + 24" (Freeboard for class 3 structure) + 28" (PANYNJ sea level rise) or BFE + 52". In areas or facilities that cannot be raised above the flood protection elevation, the structures will be designed in accordance with ASCE 24-14 for structures within Coastal High Hazard Areas and Coastal A zones. However, because tidal flooding controls the 100-year floodplain surrounding LGA, the proposed project would not increase or decrease the 100-year flood elevation.

The U.S. Department of Transportation (USDOT) in Order 5650.2 sets criteria used to determine if there is a "significant encroachment" on the floodplain in those situations where it is not practicable to avoid it. A significant encroachment would not occur for the proposed project because: 1) there is a low probability of loss of human life, 2) the project has been designed to avoid or minimize future, extensive damage and costs (including damage that could interrupt service), and 3) there would be no notable adverse impacts on natural resources or on the floodplain's natural and beneficial values. Based on these criteria, the proposed project would not constitute a significant encroachment on the floodplain.

Based on the foregoing, the proposed project is consistent with Policy 6.

Policy Question 40 (Policy 7.2)
Would the action result in development of a site that may contain contamination or that has a history of underground fuel tanks, oil spills, or other form or petroleum product use or storage?

An underground storage tanks (UST) that contained petroleum was closed in place within the area of the proposed project. There are no other USTs within the project site. An Environmental Management Plan that will include procedures for working in the area of the UST and in potential spill areas will be prepared and implemented for the proposed project.

Any contamination that may be present in the project area will be addressed to the extent practicable prior to the start of the proposed project. Measures to be described in the Environmental Management Plan will be implemented to address contamination that may be discovered during construction activities. Therefore, the proposed project is consistent with Policy 7.2.

Policy Question 41 (Policy 7.3)
Will the proposed activity result in any transport, storage, treatment, or disposal of solid wastes or hazardous materials, or the siting of a solid or hazardous waste facility?

The proposed project will generate solid waste (primarily excess soil and construction and demolition debris) consistent with construction projects. The disposal of this solid waste will be managed in

accordance with local, state and federal regulations. An Environmental Management Plan that will be prepared for the project will include procedures for the management and disposal of solid and hazardous waste expected to be generated as part of the demolition of the existing Terminals C and D, including requirements for the transport of the solid waste to avoid coastal areas. At no time will a waste facility be created as part of this project. Therefore, the proposed project is consistent with Policy 7.3.

Policy Question 52 (Policy 10)
Will the proposed activity affect or be located in, on, or adjacent to an historic resource listed on the National or State Register of Historic Places, or designated as a landmark by the City of New York?

The proposed project is located approximately 1 mile east of the Marine Air Terminal, which was listed in the Register of Historic Places in 1982 and is a New York City Landmark. The proposed project limits and the Area of Potential Effect (APE) for the project does not include the area of the Marine Air Terminal. Therefore, the Marine Air Terminal will not be affected by the proposed project.

Five hangars, located west of the proposed project, were found to be eligible to be listed on the National Register as per New York State Office of Parks, Recreation and Historic Preservation (NYSOPR&HP). The hangars are located within the APE for the project, but outside the proposed project limits. The two hangars located immediately adjacent to the proposed project (Hangars 2 and 4) were demolished in 2015 as part of the Central Terminal Building (CTB) Redevelopment Program. Hangar 1, located on the far side of the CTB, approximately 2,300 feet west the proposed project, will be demolished within the next 5 years. Hangars 3 and 5, located further west of Hangar 1, will remain in place. The Port Authority entered into a Memorandum of Agreement (MOA) with FAA, NYSOPR&HP and other consulting parties to identify proper mitigation measures for the adverse impact to Hangars 1, 2 and 4, which included maintenance of Hangars 3 and 5. There would be no direct adverse impact to the remaining hangars as a result of the proposed project. In addition, Hangars 3 and 5 will be blocked from view from the proposed terminal due to the construction of the West Garage and new CTB that are part of the CTB Redevelopment Program. Therefore, Hangars 3 and 5 will not be affected by the proposed project either directly or indirectly.

There are known archaeologically-sensitive sites within a one-mile radius of the proposed project area. However, it is unlikely that any sites located within the project's APE will have a high potential for resource recovery. Due to the substantial amount of filling activities that have occurred in this location over the past 50 years, any intact soils would be significantly below grade. Thus the potential for impacts to occur overall is low but would be contingent upon the depth of construction. NYSOPR&HP will be consulted to determine if it would be appropriate to monitor the site for archaeological resources during construction. However, it is anticipated, based in part on the prior extent of filling, that the proposed project would have no or minimal impact to archaeological sites.

As the proposed project will not impact any listed sites and will minimize impacts to archaeological resources where practicable, this project is consistent with Policy 10.

NEW YORK STATE DEPARTMENT OF STATE
COASTAL ZONE MANAGEMENT PROGRAM

ATTACHMENT A

1. **Brief description of activity:**

In July 2015, New York State Governor Andrew Cuomo announced 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 the airport, as recommended by the Governor's airport design panel. In conjunction with that goal, Delta Air Lines proposes to reconfigure Terminals C and D and the adjacent aircraft parking apron, landside roadways, and parking facilities on the eastern side of the Airport. These facilities would be demolished and replaced with new facilities designed and constructed to meet the latest federal standards for airport safety and security, and to accommodate improved levels of service. The Proposed Action does not involve the airfield runways or taxiways, or other terminals or facilities at LaGuardia Airport.

The Proposed Action includes a series of projects divided into three functional areas: (1) terminal building, (2) airside apron and parking area, and (3) landside roadways and parking.

Terminal Building:

- Demolish the existing Terminals C and D;
- Construct a single terminal headhouse and four concourses that can accommodate 37 contact gates;
- Construct a Central Heating and Refrigeration Plant (CHRP) within the terminal building.

Airside Apron and Parking Area:

- Reconfigure the airside apron in compliance with Federal Aviation Administration (FAA) geometric design standards and airline operating procedures, as applicable;
- Include dual parallel taxilanes or two points of entry;
- Provide 37 contact gate positions that provide the greatest flexibility for gating aircraft that range in size from Group II to Group V;
- Provide 3 hardstand/deicing positions.

Landside Roadways and Parking:

- Remove and replace the arrival and departure roadways serving the existing Terminals C and D;
- Connect roads to the Grand Central Parkway and western side of the Airport;
- Construct an extension to the East Garage (recently constructed in front of the existing Terminal C) to replace parking spaces taken up by construction within Parking Lot 5;
- Construct two pedestrian bridges from the East Garage and/or extension to the proposed terminal headhouse.

2. Purpose of activity:

The Proposed Action is needed because:

- LaGuardia Airport has constant delays resulting poor passenger experience
- The current ramp layouts do not include dual taxiways, strategically located deicing operations or gating flexibility
- The Airport is surrounded by water to the north, east and west and the Grand Central Parkway to the south and has no room to expand

The purpose of the Proposed Action is to improve aircraft operations and reduce delays to enable Delta to safely and effectively meet passenger demand at acceptable levels of service by:

- Improving airline efficiency and operational safety on the airside apron in order to reduce delays and increase gating flexibility;
- Providing a modern terminal building with increased energy efficiency and passenger convenience;
- Improving parking operations and traffic circulation and flow along the terminal's landside roadways.

Implementation of the Proposed Action would serve the public interest by meeting the air transportation needs of the FAA, Port Authority of New York & New Jersey, LaGuardia Airport, Delta Air Lines, and passengers.

From: Mary Kimball (DCP) <MKIMBALL@planning.nyc.gov>
Sent: Wednesday, April 20, 2016 4:16 PM
To: Helman, Marc
Cc: Michael Marrella (DCP)
Subject: LGA Delta Terminals - WRP Review

We have completed the review of the project as described below for consistency with the policies and intent of the New York City Waterfront Revitalization Program (WRP).

LGA - Delta Terminals Redevelopment
Demolition and replacement of Terminals C and D, as well as the potential construction of an AirTrain, hotel and other support facilities on the airport.

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 # 16-039. If there are any questions regarding this review, please contact me.

MARY KIMBALL
SENIOR PLANNER • WATERFRONT AND OPEN SPACE DIVISION

NYC DEPT. OF CITY PLANNING
120 BROADWAY, 31ST FLOOR • NEW YORK, NY 10271
212-720-3623 I mkimball@planning.nyc.gov

Follow us on Twitter @NYCPlanning
http://www.nyc.gov/planning

From: Li, Shuzuan [mailto:sli@dot.nyc.gov]
Sent: Monday, June 13, 2016 12:14 PM
To: Sookram, Atma; Lorenz, Matthew
Cc: Ahmed, Shakil; Dantzler, Betty
Subject: FW: Delta Air Line EA

Hi Atma and Matt,
Please see below comments for the EA and traffic analysis and let's know if you have any question.

Exiting Traffic Volume network

1. Please verify the turning movement count (TMC) for the intersection of Astoria Blvd and 77th Street. TMC reflects the eastbound through and right turn movement and northbound through and right turn movements, however, there is no eastbound right turn and northbound through movements at this intersection.

2. Please verify traffic volumes at the following locations as they are significantly different from the volumes used in 2014 CTB EA.

Location	Period	2014 CTB EA	2016 Delta Air Line EA
Astoria Blvd and 77th Street	PM	NBR=304 NB2R=314	NBR=355
Astoria Blvd and 82nd Street	AM	WBR=283	WBR=110
	PM	EBL=14 EBT=1730 EBR=47	EBL= 95 EBT=875 EBR=190

1

		WBR=119	WBR=2
Astoria Blvd and 94th Street	PM	EBT= 1592	EBT =1160
Northern Blvd and Junction Boulevard	PM	EBT=1143	EBT=770
	AM	SBT=105	SBT=305

3. 82nd Street and Astoria Blvd- There are discrepancies between TMC and flow map (see below) during the weekday PM peak hour. In addition, please explain how the traffic volumes for the northbound 24th Avenue were determined as TMC shows zero vehicle.

	Flow map	TMC
EB (L,T, R)	95,875,190	25, 618, 7
WB (L,T, R)	10,620,2	189, 875, 96

4. Astoria Blvd. and 94th Street- Please check and verify the eastbound ATR volume (1356) as it's significantly different from TMC and flow map volumes (45/230/ 25 for left/through/ right) during the weekday AM peak Hour.

5. Northern Blvd and 114th Street – The TMC reflects 17/62/15 (left/through/ right) vehicles on the southbound approach but the flow map reflect 60/15/15 vehicles during the weekday PM peak hour, please verify the discrepancy.

Existing Traffic Analysis

6. Please modify the peak hour factor (PHF) in Synchro analysis as per the following guidelines:
The PHF for movement volumes should not be less than 0.80 nor higher than 0.95, unless:
   - For movement volumes less than or equal to 500 vehicles per hour (vph) with estimated PHF less than 0.80, use a 0.80 PHF, otherwise use the higher calculated value;
   - For movement volumes between 501 and 1,000 vph with estimated PHF less than 0.85, use a 0.85 PHF, otherwise use the higher calculated value;
   - For movement volumes between 1,001 and 2000 vph with estimated PHF less than 0.90, use a 0.90 PHF, otherwise use the higher calculated value;
   - For movement volumes greater than 2,000 vph with PHF less than 0.95, use a 0.95 PHF, otherwise use the higher calculated value.

7. Astoria Blvd and 82nd Street/24th Avenue:
   - Please code the intersection as a five-leg in Synchro to be consistent with the physical inventory.
   - Please remove the eastbound left turn lagging phase in Synchro analysis as it's not permitted according to the official signal timing.
   - Please utilize two 11-foot wide shared through-right lanes with parking permitted on the eastbound approach instead of three shared 11-foot wide through-right lanes in th weekday AM peak hour.
   - Please utilize three shared through-right lanes on the eastbound approach instead of three through-only lanes in the weekday PM peak hour.
   - Please show 3% heavy vehicle instead of zero on the southbound through movement during the weekday PM peak hour.

8. Please check and/or revise the heavy vehicle percentage for the northbound and southbound approaches at Shea Road and Boat Basin Place during the weekday PM peak hour as there is a discrepancy in TMC summary and Synchro analysis.

9. Please show the southbound approach with parking permitted at the intersection of Astoria Blvd. and 94th Street in all peak hours.

10. As the volume-to-capacity ratio doesn't exceed the permissible threshold of 1.05 at the following locations, please explain why the saturation flowrate was adjusted.

    - Northern Blvd and 126th Street: the westbound approach during the weekday AM peak hour.
    - 126th Street /Shea Road and 34th Street: the southbound approach during the weekday PM peak hour.

11. Junction Blvd/94th St and Northern Blvd- Please use 3.0 second of the yellow time for the westbound left turn in Synchro analysis during the weekday AM peak hour which is consistent with the official signal timing.

12. For the Grand Central Pkwy northeast-bound Ramp at Northern Blvd and 126th Street, the Synchro model was coded as one exclusive left-turn lane and one shared left-right lane to accommodate 10 left turns onto 126th Street and 740 right turns onto Northern Blvd East during the weekday PM peak hour. The Synchro model reflects the same coding for the weekday AM peak hour. Please verify the lane utilization and update the analysis accordingly.

13. Please revise the offset of the following intersections to make them consistent with the official signal timing:
    - Northern Blvd. and 126th Street in the weekday AM peak hour.
    - Astoria Blvd. and 94th Street in the weekday AM peak hour.
    - 24th Ave/82nd Street and Astoria Blvd in the weekday AM peak hour.

14. 126th Street /Shea Road and 34th Street:
    - Please uncheck the parking maneuver on the eastbound approach in the weekday PM peak hour analysis as there is "No Standing Anytime."
    - The physical inventory (PI) shows 126th street between 34th Avenue and Northern Blvd is one-way northbound street, but the Synchro modal reflects two- way street. Please verify the street direction and update the analysis accordingly.
    - The PI shows two 14-foot wide southbound off-ramps, but the Synchro modal reflects one 12-foot wide off-ramp. Please verify and update the analysis accordingly.

Thank you, Shu

Shuzuan Li
Traffic Engineering and Planning
NYC DOT-Division of Transportation Planning & Management
55 Water Street, 6th Fl, New York, NY 10041
P:212-839-7778 F:212-839-7777

AECOM
605 Third Avenue, New York, NY 10158
T 212.973.2900 F 212.973.3000 www.aecom.com

Memorandum

Date:	August 1, 2016
To:	Shuzuan Li NYCDOT Division of Transportation Planning & Management Traffic Engineering and Planning 55 Water Street, 6th Floor New York, NY 10041
From:	Atma Sookram, AICP, CTP, PP, PTP
Subject:	Environmental Assessment for Terminal C and D Reconfiguration at LaGuardia Airport – Response to NYCDOT Comments on draft Transportation Chapter
cc:	Naim Rasheed (NYCDOT) Shakil Ahmed (NYCDOT) Betty Dantzler (NYCDOT) Nicole Weymouth (AECOM)

The following is AECOM's response to your comments dated June 13, 2016 in connection with the Draft EA and associated Transportation Chapter that was submitted by AECOM as part of the Environmental Assessment for the Terminal C and D Reconfiguration at LaGuardia Airport. It should be noted that, based on the comments provided below, additional refinements to the traffic analysis have been made. Requested backup and analysis information, as well as a revised Transportation chapter, will be transmitted to you in a separate email. Your comments from June 13, 2016 are shown below in *italics*, with AECOM's responses following in regular type.

Existing Traffic Volume network

1. *Please verify the turning movement count (TMC) for the intersection of Astoria Blvd and 77th Street. TMC reflects the eastbound through and right turn movement and northbound through and right turn movements, however, there is no eastbound right turn and northbound through movements at this intersection.*

   The TMCs at the Astoria Boulevard/77th Street intersection were conducted in such a manner as to reflect which of the two departure legs were used by vehicles departing the intersection (i.e., vehicles are either destined to the eastbound lanes on Astoria Boulevard, or onto Grand Central Parkway [GCP] eastbound via the on-ramp on the north side of the intersection). For purposes of *data summary only*, the TMC summary sheets reflect this distinction with respect to these separate destinations for traffic movements leaving the intersection. Specifically, the "northbound through" volumes shown in the TMC summary sheets represent those vehicle volumes from 77th Street that were observed turning right onto the GCP on-ramp, whereas the "northbound right-turn" volumes in the TMC summary sheets represent those volumes from 77th Street that were observed making a true northbound right-turn onto the Astoria Boulevard eastbound lanes.

Similarly, the "eastbound through" volumes in the TMC summary sheets represent those volumes from Astoria Boulevard that were destined to the GCP on-ramp, whereas the "eastbound right-turn" volumes in the TMC summary sheets represent those volumes from Astoria Boulevard that were observed continuing onto the Astoria Boulevard eastbound lanes. This turning movement convention shown in the TMC summary sheets was used only for purposes of data collection and data summary.

2. *Please verify traffic volumes at the following locations as they are significantly different from the volumes used in 2014 CTB EA.*

Location	*Period*	*2014 CTB EA*	*2016 Delta Air Line EA*
Astoria Blvd and 77th Street	*PM*	*NBR=304 NB2R=314*	*NBR=355*
Astoria Blvd and 82nd Street	*AM*	*WBR=283*	*WBR=110*
	PM	*EBL=14 EBT=1730 EBR=47 WBR=119*	*EBL= 95 EBT=875 EBR=190 WBR=2*
Astoria Blvd and 94th Street	*PM*	*EBT= 1592*	*EBT =1160*
Northern Blvd and Junction Boulevard	*PM*	*EBT=1143*	*EBT=770*
	AM	*SBT=105*	*SBT=305*

The TMC summary volumes at Astoria Boulevard/77th Street, Astoria Boulevard/94th Street, and Northern Boulevard/Junction Boulevard—as well as the WBR volume at Astoria Boulevard/82nd Street/24th Avenue during the AM peak hour—were verified against the original count data as correct. It should be noted that the analysis volumes at Astoria Boulevard/94th Street and Northern Boulevard/Junction Boulevard were determined based on the average of two days of TMCs.

However, as noted below in the response to comment 3, there appeared to be a reversal in the directionality of the eastbound and westbound volumes at the intersection of Astoria Boulevard/82nd Street/24th Avenue during the weekday PM peak hour for construction (3:00 to 4:00 PM). Therefore, this intersection was re-counted in June 2016 during this hour. The June 2016 volumes more closely matched the order of magnitude and directionality of the CTB EA volumes and were thus used for purposes of revised traffic analyses for this intersection (i.e., Existing Conditions, Future Without Construction, and Future With Construction).

It should be noted that the TMCs conducted for the Central Terminal Building (CTB) EA were originally conducted in June 2012, whereas the TMCs for the Terminal C and D Reconfiguration at LaGuardia Airport (Delta) EA were conducted more than three years later, in November 2015 and March 2016. As noted in the *CEQR Technical Manual*, volume data that are more than three years old are generally inappropriate for use in traffic studies, particularly in areas that have undergone changes. During this three-plus year period, there were improvements made on eastbound Grand Central Parkway in the vicinity of LaGuardia Airport that may have been responsible for shifts in traffic patterns.

3. *82nd Street and Astoria Blvd- There are discrepancies between TMC and flow map (see below) during the weekday PM peak hour. In addition, please explain how the traffic volumes for the northbound 24th Avenue were determined as TMC shows zero vehicle.*

	Flow map	*TMC*
EB (L,T, R)	*95,875,190*	*25, 618, 7*
WB (L,T, R)	*10,620,2*	*189, 875, 96*

AECOM

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As noted above in the response to comment 2, the eastbound (EB) and westbound (WB) volumes noted above were mistakenly transposed. Due to concerns about the directionality and magnitude of these volumes, the turning movements on the EB and WB approaches were re-counted in June 2016 during the 3:00 to 4:00 PM hour for purposes of verification, and were found to more closely match the directionality and magnitude of those volumes counted as part of the CTB EA. The flow maps and Synchro analysis were updated to reflect these re-counted TMC volumes. The TMC summary sheet from the June 2016 counts will be transmitted in a separate email.

With respect to the northbound approach of 24th Avenue, there are two legs on the south side of the Astoria Boulevard/82nd Street/24th Avenue intersection: the easterly leg is southbound only (departing the intersection) and the westerly leg is northeast-bound only (entering the intersection). Therefore, there are four approaches to this intersection: eastbound (Astoria Boulevard), westbound (Astoria Boulevard), southbound (82nd Street), and northeast-bound (24th Avenue). As such, there are no true northbound traffic volumes. The northeast-bound volumes from 24th Avenue were not included in the original TMC summary sheets, but are now shown on corrected TMC summary sheets that will be transmitted in a separate email.

4. *Astoria Blvd. and 94th Street- Please check and verify the eastbound ATR volume (1356) as it's significantly different from TMC and flow map volumes (45/230/25 for left/through/right) during the weekday AM peak Hour.*

   We believe the ATR machine at this location was not calibrated properly and possibly malfunctioning. The AM and PM peak hour volumes used in the analysis of Astoria Boulevard/94th Street were based on a two-day average of TMCs conducted on Tuesday, November 17 and Wednesday, November 18, 2015. The individual turning movement volumes for both days were comparable in magnitude.

5. *Northern Blvd and 114th Street – The TMC reflects 17/62/15 (left/through/ right) vehicles on the southbound approach but the flow map reflect 60/15/15 vehicles during the weekday PM peak hour, please verify the discrepancy.*

   The volumes on the flow map and in the Synchro analysis were adjusted to correct a reversal of the left-turn and through volumes.

   Existing Traffic Analysis

6. *Please modify the peak hour factor (PHF) in Synchro analysis as per the following guidelines:*
   The PHF for movement volumes should not be less than 0.80 nor higher than 0.95, unless:
   - *For movement volumes less than or equal to 500 vehicles per hour (vph) with estimated PHF less than 0.80, use a 0.80 PHF, otherwise use the higher calculated value;*
   - *For movement volumes between 501 and 1,000 vph with estimated PHF less than 0.85, use a 0.85 PHF, otherwise use the higher calculated value;*
   - *For movement volumes between 1,001 and 2000 vph with estimated PHF less than 0.90, use a 0.90 PHF, otherwise use the higher calculated value;*
   - *For movement volumes greater than 2,000 vph with PHF less than 0.95, use a 0.95 PHF, otherwise use the higher calculated value.*

   The PHFs for all study intersections, for both weekday peak hour time periods, and for all scenarios (i.e., Existing Conditions, Future Without Construction Conditions, and Future With Construction Conditions) were modified in accordance with the guidance above provided by NYCDOT. The Synchro analyses and associated LOS tables were updated accordingly.

7. *Astoria Blvd and 82nd Street/24th Avenue:*
   - *Please code the intersection as a five-leg in Synchro to be consistent with the physical inventory.*

     As noted above in the response to comment 3, there are two legs on the south side of the Astoria Boulevard/82nd Street/24th Avenue intersection: the easterly leg is southbound only (departing the intersection) and the westerly leg is northeast-bound only (entering the intersection). Therefore, there are four approaches to this intersection: eastbound (Astoria Boulevard), westbound (Astoria Boulevard), southbound (82nd Street), and northeast-bound (24th Avenue). As such, we believe the intersection is modeled properly as a four-leg intersection (with split phasing for the northeast-bound and southbound approaches). Although this coding does not reflect the exact geometric layout of the intersection in the field, it accurately reflects the traffic signal operation at the intersection.

   - *Please remove the eastbound left turn lagging phase in Synchro analysis as it's not permitted according to the official signal timing.*

     The eastbound left-turn lagging phase was removed as recommended above. A *westbound* left-turn lagging phase was added, as reflected in the official signal timing plan. These corrections have been made to the Synchro analyses and associated LOS tables.

   - *Please utilize two 11-foot wide shared through-right lanes with parking permitted on the eastbound approach instead of three shared 11-foot wide through-right lanes in the weekday AM peak hour.*

     This change has been made to the Synchro analyses and associated LOS tables.

   - *Please utilize three shared through-right lanes on the eastbound approach instead of three through-only lanes in the weekday PM peak hour.*

     This change has been made to the Synchro analyses and associated LOS tables.

   - *Please show 3% heavy vehicle instead of zero on the southbound through movement during the weekday PM peak hour.*

     This change has been made to the Synchro analyses and associated LOS tables.

8. *Please check and/or revise the heavy vehicle percentage for the northbound and southbound approaches at Shea Road and Boat Basin Place during the weekday PM peak hour as there is a discrepancy in TMC summary and Synchro analysis.*

   Changes have been made to the heavy vehicle percentages in the Synchro analyses and associated LOS tables in accordance with the guidance above.

9. *Please show the southbound approach with parking permitted at the intersection of Astoria Blvd. and 94th Street in all peak hours.*

   This change has been made to the Synchro analyses and associated LOS tables for all peak hours.

10. *As the volume-to-capacity ratio doesn't exceed the permissible threshold of 1.05 at the following locations, please explain why the saturation flowrate was adjusted.*

- *Northern Blvd and 126th Street: the westbound approach during the weekday AM peak hour.*
- *126th Street /Shea Road and 34th Street: the southbound approach during the weekday PM peak hour.*

Following other analysis refinements made as a result of NYCDOT's comments, the saturation flow rate adjustments for these intersections were eliminated (i.e., the saturation flow rates for both intersections were restored to 1900 pcphgpl).

11. *Junction Blvd/94th St and Northern Blvd- Please use 3.0 second of the yellow time for the westbound left turn in Synchro analysis during the weekday AM peak hour which is consistent with the official signal timing.*

    This change has been made to the Synchro analyses and associated LOS tables.

12. *For the Grand Central Pkwy northeast-bound Ramp at Northern Blvd and 126th Street, the Synchro model was coded as one exclusive left-turn lane and one shared left-right lane to accommodate 10 left turns onto 126th Street and 740 right turns onto Northern Blvd East during the weekday PM peak hour. The Synchro model reflects the same coding for the weekday AM peak hour. Please verify the lane utilization and update the analysis accordingly.*

    A change has been made to lane configuration on the northeast-bound approach in the Synchro analyses to reflect one shared left-turn/through lane and one exclusive through lane. The associated LOS tables were updated accordingly.

13. *Please revise the offset of the following intersections to make them consistent with the official signal timing:*
    - *Northern Blvd. and 126th Street in the weekday AM peak hour.*
    - *Astoria Blvd. and 94th Street in the weekday AM peak hour.*
    - *24th Ave/82nd Street and Astoria Blvd in the weekday AM peak hour.*

    The traffic signal offsets at these locations have been changed in the Synchro analysis to reflect the guidance above and the associated LOS tables have been updated accordingly.

14. *126th Street /Shea Road and 34th Street:*

    - *Please uncheck the parking maneuver on the eastbound approach in the weekday PM peak hour analysis as there is "No Standing Anytime."*

      This change has been made to the Synchro analyses and associated LOS tables.

    - *The physical inventory (PI) shows 126th street between 34th Avenue and Northern Blvd is one-way northbound street, but the Synchro modal reflects two-way street. Please verify the street direction and update the analysis accordingly.*

      126th Street is indeed a one-way northbound roadway. The "southbound approach" shown in the Synchro model is merely intended to reflect the presence of easterly off-ramp, which—although not aligned parallel to 126th Street—does intersect Shea Road/34th Avenue as an approach in the southbound direction.

    - *The PI shows two 14-foot wide southbound off-ramps, but the Synchro modal reflects one 12-foot wide off-ramp. Please verify and update the analysis accordingly.*

      As noted in the response to the bullet above, the "southbound approach" reflects the easterly of the two off-ramps, whereas the fifth leg (southeast-bound approach) reflects

the westerly of the two off-ramps. The lane widths were verified in the PI as 14 feet, and were changed accordingly. The Synchro analyses and LOS tables were updated accordingly.

NYC Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ENVIRONMENTAL REVIEW

Project number: FEDERAL AVIATION AUTHORITY / 106-Q
Project: LAGUARDIA AIRPORT DELTA AIR LINES RECONFIGURATION
Address: 83-00 23 AVENUE, **BBL:** 4009260001
Date Received: 3/14/2016

[X] No architectural significance

[X] No archaeological significance

[ ] Designated New York City Landmark or Within Designated Historic District

[ ] Listed on National Register of Historic Places

[ ] Appears to be eligible for National Register Listing and/or New York City Landmark Designation

[ ] May be archaeologically significant; requesting additional materials

Cc: SHPO

Gina Santucci 3/21/2016

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 31300_FSO_DNP_03212016.doc

Appendix B.
TAAM Report

EAST SIDE RECONFIGURATION

TAAM ANALYSIS

NEW YORK LAGUARDIA AIRPORT

Prepared by:
Landrum & Brown
September 2016

Revised January 2017

1. INTRODUCTION

New York LaGuardia Airport (LGA) is one of three large-hub airports for the New York/New Jersey Metropolitan region. In 2015, LGA was the third largest airport of the region in terms of passengers and in terms of aircraft operations. LGA accommodated 28.4 million passengers and 360,274 aircraft operations.[1]

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 approved airport layout plan.[2] **Figure 1-2** presents LGA's future (The No Action Case for this analysis) gate layout for the Central Terminal Building and **Figure 1-3** presents the current gate layout for Terminals C and D. **Figure 1-4** presents the configuration of Terminal A, which does not change as a result of any of the terminal redevelopment projects described in this study.

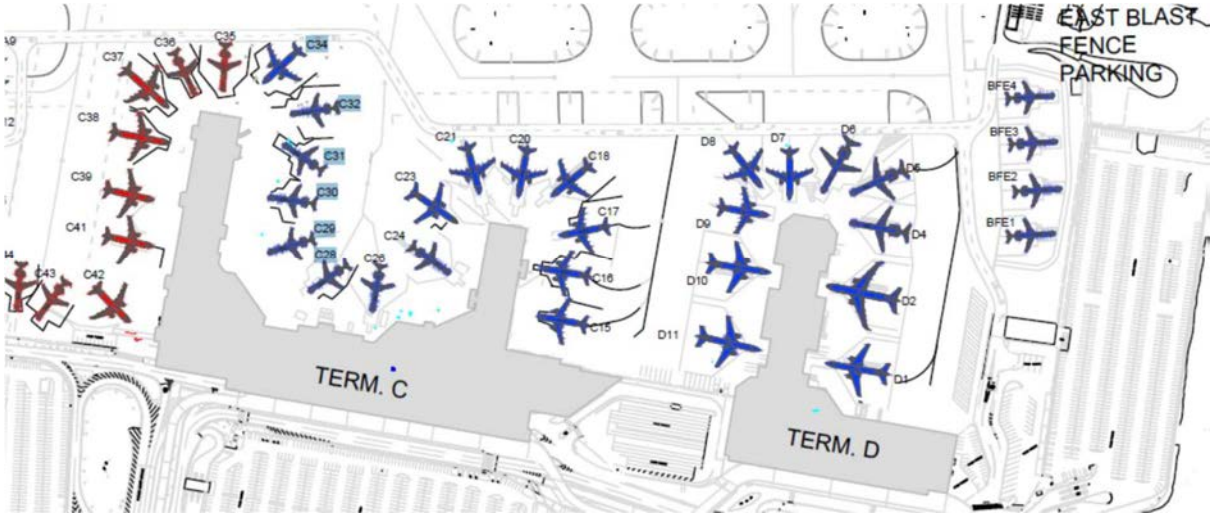
[1] Pen and Ink Change #13 of LaGuardia's ALP was approved on December 23, 2015, conditional on environmental approvals.
[2] Federal Aviation Administration, *National Plan of Integrated Airport Systems*.

Figure 1-1: LGA Approved Airport Layout Plan

Figure 1-2: LGA Future Central Terminal Building Aircraft Parking Plan

Source: The Port Authority of New York and New Jersey

Figure 1-3: LGA Existing Terminals C and D Aircraft Parking Plan



Source: Delta Air Lines

Figure 1-4: Existing Terminal A and West Remotes Aircraft Parking Plan

Source: The Port Authority of New York and New Jersey

2. STUDY OBJECTIVES AND APPROACH

This study uses the same forecast of future demand used for the assessment of the Central Terminal Building Forecasts that were prepared by the Port Authority of New York and New Jersey (PANYNJ). These forecasts project that passenger demand at LGA (stated as million annual passengers or "MAP") will increase from approximately 23.6 MAP in 2010 to 34 MAP by approximately 2030. The aircraft fleet mix was updated to reflect more recent aircraft fleet replacement plans, and service adjustments made since 2012. More detailed information about the aircraft fleet assumptions are presented in Section 4. In addition, this study provided an update to the calibration of the TAAM models used in the original TAAM analysis of the Redeveloped CTB. The analysis years of 2024 and 2029 were used, which are consistent with the Draft Environmental Assessment for the Redevelopment of Terminals C and D.

Table 2-1 shows the two scenarios evaluated at the 2024 and 2029 levels of aircraft activity. The "No Action" scenarios include only the redeveloped CTB. The "Full Build" scenario includes the redevelopment of the CTB and Terminals C and D.

Table 2-1: LGA Redevelopment Scenarios and Demand Levels Evaluated

Demand Level	Calibration	No Action	Full Build
	(Existing Airfield)		
2015	Yes		
2024		Yes	Yes
2029		Yes	Yes

2.1 Summary of Findings

The Full Build scenario reduces airfield congestion and results in lower ground delays for arriving and departing aircraft at LGA Airport when compared to the No Action scenario. Taxi and delay times are lower in the Full Build scenario versus the No Action scenario because of lower delays. In most cases, taxi time savings are less than the delay savings. This can be attributed to the following reasons:

- In the Full Build scenario, the Redeveloped Terminals C and D layout locates many gates farther east than the equivalent gate on the existing Terminal buildings. In flow configurations where departing aircraft have to travel to the west-end of the airport (A22/D13, A04/D13 and A31/D04), aircraft using these gates have to taxi longer distances.
- In the No Action and Full Build scenarios, the proposed layout of the CTB has a significantly larger apron and longer taxilanes. Aircraft taxi at lower speeds (5 knots) while on the apron, compared to up to 15 knots while on the taxiway system.

Dual taxilanes between concourses result in extremely efficient aprons. As a result, the aprons no longer 'meter' the flow of aircraft on to the taxiway system. In addition, larger gauge aircraft can be accommodated at all gates on the Full Build scenario. This eliminates inbound gate delays by preventing aircraft from having to wait for a proper sized gate to become available.

3. PROPOSED TERMINAL C AND D LAYOUT

The proposed Terminals C and D layout will replace the existing two terminals that have three concourses and 32 contact gates plus six remote stands. The proposed Terminals C and D will be a single four concourse terminal building with 27 Group III gates and 10 Group IIIa gates (37 total gates plus four remain overnight positions). Although the concourses will be named D though G from west to east (as shown in the Draft EA), the figures in this report show the concourses lettered A through D from east to west. The new terminal layout provides independent full-length dual Group III taxilanes between Concourses A and B and between Concourses C and D. This layout also provides independent full-length dual Group IIIa taxilanes between Concourses B and C and a single taxilane between Concourse D and the east satellite concourse of the new CTB.

Figure 3-1: Proposed Terminal C and D Layout

Source: Delta Air Lines

Figure 3-2: Future Central Terminal Building Layout

Source: The Port Authority of New York and New Jersey

4. PROJECTED DEMAND

This study evaluated alternative future configurations of the airside portion of the redeveloped LGA terminals at two different demand levels using a 2015 demand level to calibrate the TAAM models. This schedule was then used as the basis to create the 2024 and 2029 flight schedules for this analysis. The 2024 flight schedules were created by selectively up-gauging flights to provide sufficient seating capacity for the passenger volumes in the demand forecast. The number of aircraft operations in each flight schedule was constant since the forecast shows no substantial growth in aircraft operations.

4.1 2015 Design Day Schedule for TAAM Calibration and as a Basis for Developing of Future Design Day Flight Schedules

In the original development of the LGA TAAM model, a baseline design day schedule was developed for year 2012. That analysis was updated in this study to 2015 to reflect the latest available information on aircraft activity and air traffic control procedures. In March 2015, the FAA implemented revised aircraft separations under their Wake-RECAT program, which defined new categories of aircraft types for defining separations between successive arrivals to and departures from a runway.

Data from the Official Airline Guide (OAG) was used as a basis for developing a July 2015 aircraft activity schedule. This data was supplemented with data from the Port Authority's Aerobahn database to evaluate the amount of general aviation and military activity. July 20, 2015 was selected as the new Peak Month Average Weekday (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. More detailed information about the 2015 flight schedule and the model calibration results are presented in **Appendix A** to this report.

4.2 2024 and 2029 Design Day Flight Schedules

To simulate the future LGA traffic conditions, two design day flight schedules were developed. **Table 4-1** presents the fleet mix associated with the 2024 and the 2029 aircraft flight schedules. The schedules included both scheduled and non-scheduled activity with a total of 1,218 aircraft operations in each schedule.

Table 4-1: Aircraft Fleet Mix for 2024 and 2029 Design Day Flight Schedules

	Aircraft	2024	2029
Passenger	319	54	68
	320	122	136
	321	28	38
	717	102	140
	736	4	0
	738	103	107
	739	22	50
	752	16	16
	32B	2	2
	73G	9	9
	73H	22	30
	73W	56	44
	CR7	194	156
	CR9	88	88
	CRJ	18	6
	E70	86	88
	E75	130	130
	E90	60	58
	ERJ	44	20
	M88	26	0
	Total	**1,186**	**1,186**
GA	BBJ2	1	1
	C25B	1	1
	C560	4	4
	C56X	2	2
	C680	4	4
	C750	3	3
	CL30	1	1
	E135	1	1
	GLEX	1	1
	GLF3	1	1
	GLF4	1	1
	H25B	4	4
	LJ35	3	3
	LJ45	2	2
	LJ55	2	2
	LJ60	1	1
	Total	32	32
GRAND TOTAL		**1,218**	**1,218**

Source: Landrum & Brown Analysis

5. RUNWAY OPERATING CONFIGURATIONS

A total of eight runway operating configurations defined by the airspace for approaching the arrival runways are regularly used at LGA; four that use intersecting runways and four that use single runways. This study evaluated runway utilization statistics from the Port Authority's Aerobahn system between March and November of 2015. The results of this analysis are presented in **Table 5-1**. The most frequently used runway operating configuration consists of arrivals on Runway 22 and departures on Runway 13. This analysis focuses on the top four configurations as illustrated in **Figure 5-1**. These four configurations were used 83 percent of the time in 2015 versus 67 percent of the time in 2009. The remaining 17 percent of use in 2015 is predominantly single runway configurations. LGA may also use a single runway configuration (mostly 31/31) during times of construction and low traffic periods such as Saturday afternoons, Sunday mornings, or early mornings on weekdays.

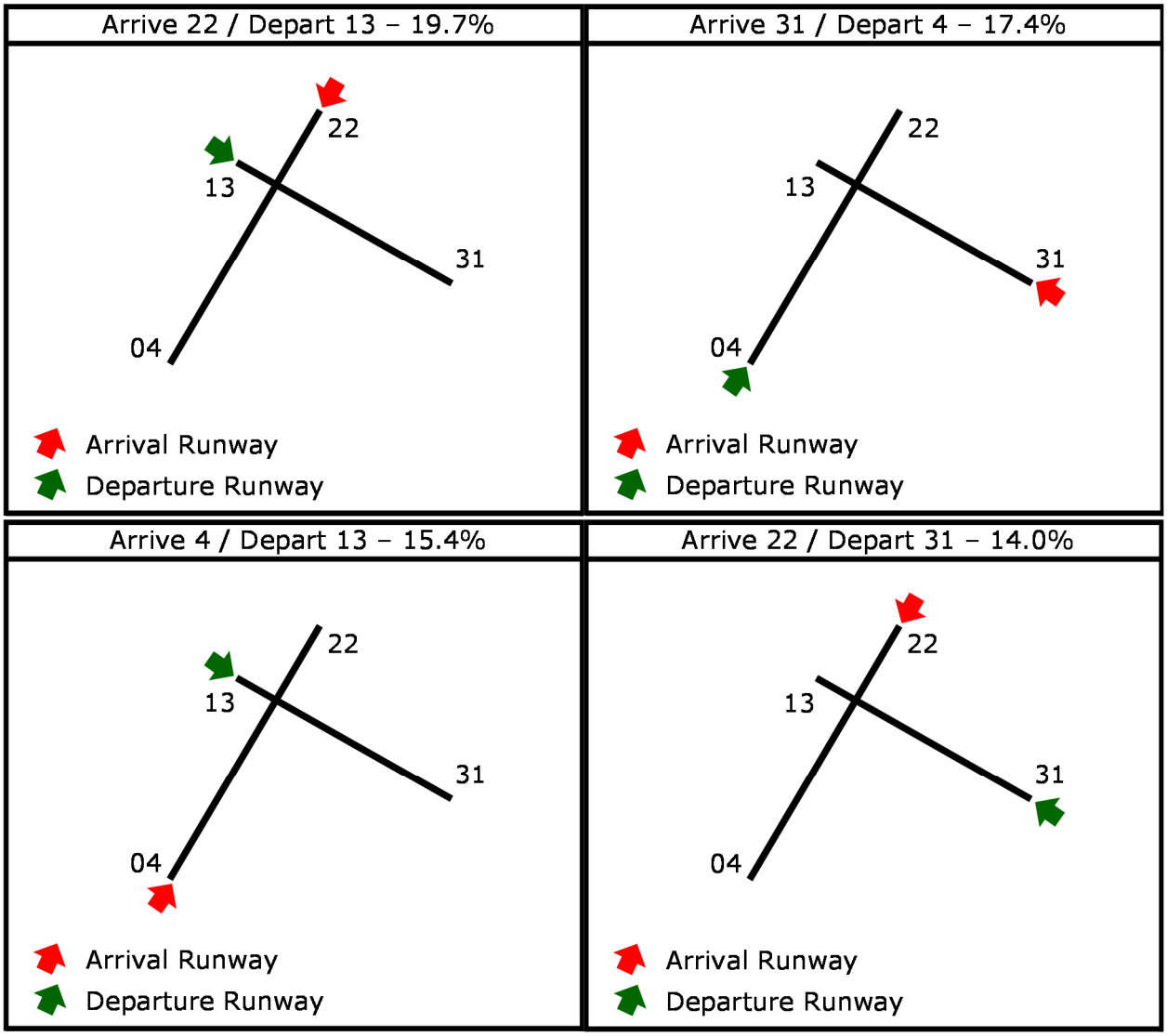
The 2015 utilization of runway configurations shown in Table 5-1 was the basis of computing annual airfield performance (presented in Section 8).

Table 5-1: LGA Historical Runway Configuration Usage

Runway Configuration	Weather	Aircraft Operations March-November 2015	Percent of Total
Arr. 22/Dep. 13	VMC	71,538	26.6%
Arr. 22/Dep. 31	VMC	47,681	17.7%
Arr. 31/Dep. 4	VMC	47,024	17.5%
Arr. 4/Dep. 13	VMC	30,886	11.5%
Arr. 22/Dep. 13	IMC	14,010	5.2%
Arr. 4/Dep. 13	IMC	12,264	4.6%
Other		45,294	16.9%
Total		**268,697**	**100.0%**

Sources: Port Authority Aerobahn System; 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.

6. TAXI FLOWS

The flows on named taxiways are virtually identical to those of the existing airport since these flows are dictated by the runway configuration. The flows in the taxilanes that support the Redeveloped CTB and Terminals C and D are dictated by the geometry of the buildings. The modeling uses previous analyses prepared by The Port Authority of the Redeveloped CTB to ensure that modeling results were consistent with past analyses. These modeling assumptions are presented in **Appendix B**. The flows for Terminals C and D are similar to the existing flows except for the following changes:

- Inbound aircraft use the taxilane that is closest to its gate unless that taxilane is blocked by opposite direction traffic. In that case, the inbound aircraft will cross over to the adjacent taxilane, if that taxilane is open. If the adjacent taxilane is not open all the way to its gate, the aircraft will wait on Taxiway A for the taxilane that is closest to its gate to clear.
- Outbound aircraft will always pushback to the taxilane that is closest to its gate. Once the aircraft is ready to taxi, it will taxi on the taxilane that is closest to its gate unless that taxilane is blocked by opposite direction traffic. In that case, the aircraft will cross over to the adjacent taxilane if it is open all the way to Taxiway A.

7. TAAM MODEL OVERVIEW AND CALIBRATION

Airside simulation models use a description of airport facilities and the operating environment as input to 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.

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 the TAAM Baseline Model Development Report dated April 2013. The 2013 validation and calibration effort is presented in **Appendix C**. The 2015 model calibration update is presented **Appendix A**.

The following presents the 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 five different phases: (a) actual pushback, (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 (knots)
Pushback (tug)	3
Pull-forward (tug)	3
Taxi on apron (aircraft engines)	5

Source: The Port Authority of New York and New Jersey.

The three other 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. **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)
Turboprops	Q300, Q400	2.0
Group II	CRJ-200	2.0
Group III (RJ)	CRJ-900	2.5
Group III (NB)	A320, B737	3.0
Group IIIa	B757	3.5
Group IV	B767	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 knots. 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.

8. TAAM RESULTS

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).

8.1 Summary of Performance Metrics

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. Thus, 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 pushback 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 pushback blocking.
- Departure airspace delay is incurred after takeoff until the aircraft reach the departure fix.

8.2 Simulation modeling results

8.2.1 Average Annual Taxi Times and Gate Delays

Table 8-1 shows the average annual inbound and outbound total taxi times (including ground delays) for both 2024 and 2029 for both the Full-Build scenario and for No Action scenario. In 2024, the Full Build scenario has average annual taxi times that are one minute lower inbound and two minutes lower outbound. In addition,

the outbound gate delays (not included in outbound taxi time) are one minute lower in the Full Build scenario. In the 2029 demand level, the inbound taxi time savings are virtually identical to the 2024 savings. However, the outbound savings are approximately one minute less. In 2029, the No Action scenario has inbound gate delays, which indicates that taxilane congestion is preventing inbound aircraft from reaching their gates. These delays are eliminated with the Full Build scenario.

Table 8-1: Summary of Average Annual Taxi Times and Gate Delays

	Count of Aircraft		Average Taxi In/Out Time (min.)			
	Arrivals	Departures	2024 No Action		2024 Full Build	
Total	688	688	5.5	17.2	4.9	15.8
	Count of Aircraft		**Average Taxi In/Out Time (min.)**			
	Arrivals	Departures	2029 No Action		2029 Full Build	
Total	688	688	5.6	16.7	5.0	15.7
	Count of Aircraft		**Avg. Arr./Dep. Gate Delay Time (min.)**			
	Arrivals	Departures	2024 No Action		2024 Full Build	
Total	688	688	-	1.8	-	0.8
	Count of Aircraft		**Avg. Arr./Dep. Gate Delay Time (min.)**			
	Arrivals	Departures	2029 No Action		2029 Full Build	
Total	688	688	0.8	1.7	-	1.0

Source: Landrum & Brown Analysis

8.2.2 Average Taxi Times and Delays by Configuration

Table 8-2 shows that 2024 inbound taxi times and delays are lower with the Full Build scenario than with the No Action scenario. All of the arrival delay savings are on the ground. The arrival delay savings are greater than the taxi time savings. This indicates that some of the delay savings are offset by longer unimpeded taxi times with the Full Build scenario. The Full Build scenario has larger aircraft aprons, which increases taxi distances. In addition, the increased taxi distance is traversed at a slower, apron taxi speed.

Table 8-2: 2024 Inbound Average Taxi Time and Arrival Air and Ground Delays by Configuration

Arrival Average Delay		
Configuration	**No Action**	**Full Build**
A04/D13 VMC	5.0	4.6
A22/D13 VMC	2.1	1.7
A22/D31 VMC	3.9	3.0
A31/D04 VMC	8.7	7.8
A04/D13 IMC	12.8	12.3
A22/D13 IMC	5.8	4.4
Arrival Average Taxi Time (Including Delay)		
Configuration	**No Action**	**Full Build**
A04/D13 VMC	4.8	4.6
A22/D13 VMC	6.4	5.3
A22/D31 VMC	6.1	5.1
A31/D04 VMC	4.4	4.2
A04/D13 IMC	4.6	4.5
A22/D13 IMC	5.7	5.3

Source: Landrum & Brown Analysis

Table 8-3 shows that 2024 outbound taxi times and delays are lower with the Full Build scenario than with the No Action scenario. All of the departure delay savings are on the ground. The departure delay savings are greater than the taxi time savings. This indicates that some of the delay savings are offset by longer unimpeded taxi times with the Full Build scenario. The Full Build scenario has larger aircraft aprons, which increases taxi distances. In addition, the increased taxi distance is traversed at a slower, apron taxi speed.

Table 8-3: 2024 Outbound Average Taxi Time and Ground Delays by Configuration

Departure Average Delay		
Configuration	**No Action**	**Full Build**
A04/D13 VMC	7.6	6.0
A22/D13 VMC	4.4	3.8
A22/D31 VMC	6.2	4.9
A31/D04 VMC	21.0	18.0
A04/D13 IMC	20.2	18.4
A22/D13 IMC	11.0	9.1
Departure Average Taxi Time (Including Delay)		
Configuration	**No Action**	**Full Build**
A04/D13 VMC	15.6	14.1
A22/D13 VMC	11.9	11.5
A22/D31 VMC	12.1	10.8
A31/D04 VMC	28.4	25.7
A04/D13 IMC	27.9	26.3
A22/D13 IMC	18.4	16.6

Source: Landrum & Brown Analysis

Table 8-4 shows that similar to 2024, 2029 inbound taxi times and delays are lower with the Full Build scenario than with the No Action scenario. All of the arrival delay savings are on the ground. The arrival delay savings are greater than the taxi time savings. This indicates that some of the delay savings are offset by longer unimpeded taxi times with the Full Build scenario. The Full Build scenario has larger aircraft aprons, which increases taxi distances. In addition, the increased taxi distance is traversed at a slower, apron taxi speed.

Table 8-5 shows that similar to 2024, 2029 outbound taxi times and delays are lower with the Full Build scenario than with the No Action scenario. All of the departure delay savings are on the ground. The departure delay savings are greater than the taxi time savings. This indicates that some of the delay savings are offset by longer unimpeded taxi times with the Full Build scenario. The Full Build scenario has larger aircraft aprons, which increases taxi distances. In addition, the increased taxi distance is traversed at a slower, apron taxi speed.

Table 8-4: 2029 Inbound Average Taxi Time and Arrival Air and Ground Delays by Configuration

Arrival Average Delay		
Configuration	**No Action**	**Full Build**
A04/D13 VMC	4.4	4.3
A22/D13 VMC	2.8	1.5
A22/D31 VMC	4.5	3.0
A31/D04 VMC	10.2	9.9
A04/D13 IMC	11.8	11.1
A22/D13 IMC	5.9	4.8
Arrival Average Taxi Time (Including Delay)		
Configuration	**No Action**	**Full Build**
A04/D13 VMC	4.8	4.6
A22/D13 VMC	6.5	5.2
A22/D31 VMC	6.2	5.2
A31/D04 VMC	4.2	4.6
A04/D13 IMC	4.7	4.6
A22/D13 IMC	5.7	5.2

Source: Landrum & Brown Analysis

Table 8-5: 2029 Outbound Average Taxi Time and Ground Delays by Configuration

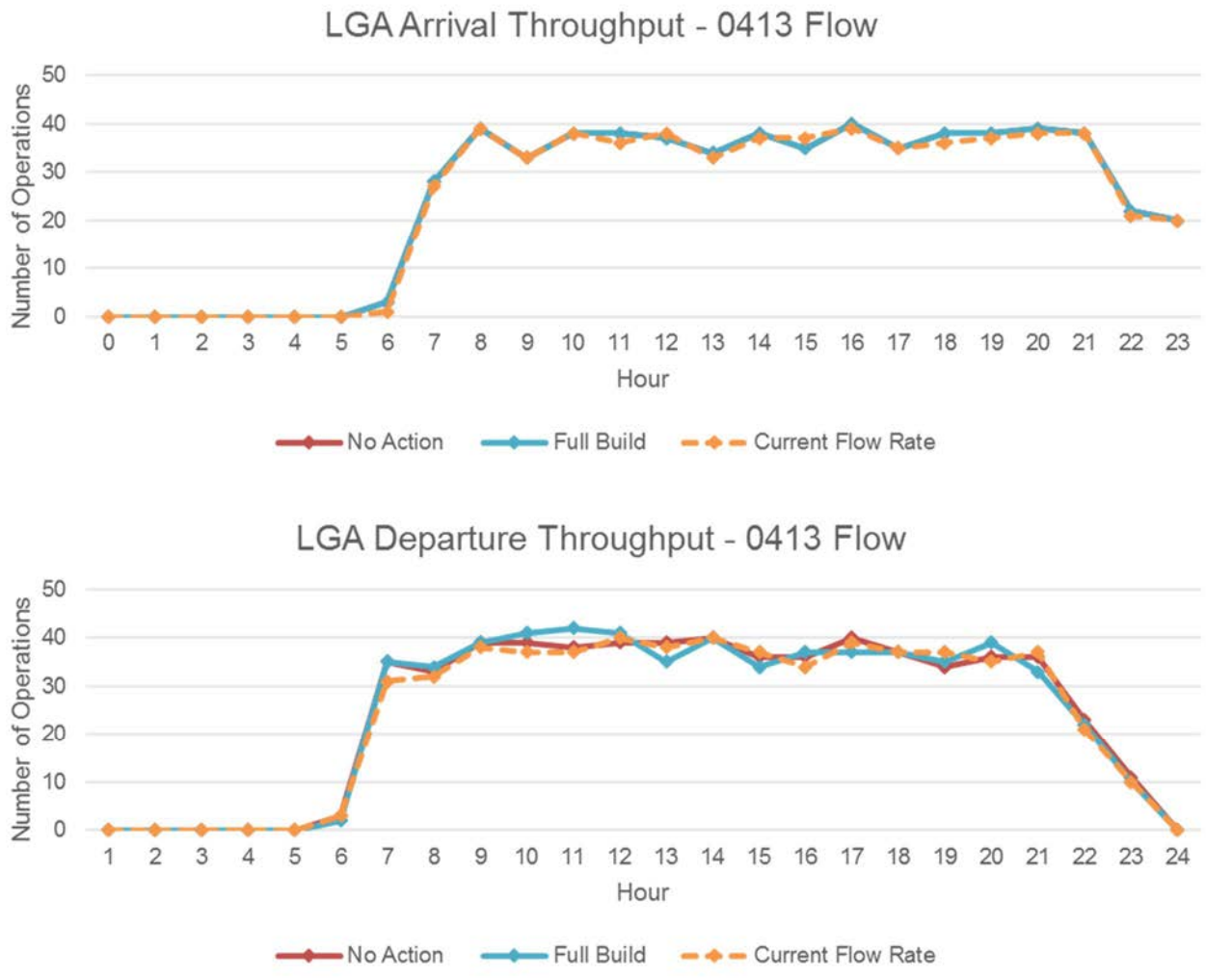
Departure Average Delay		
Configuration	**No Action**	**Full Build**
A04/D13 VMC	7.8	5.3
A22/D13 VMC	4.1	3.4
A22/D31 VMC	6.5	5.3
A31/D04 VMC	19.4	18.2
A04/D13 IMC	19.4	17.4
A22/D13 IMC	8.9	8.2
Departure Average Taxi Time (Including Delay)		
Configuration	**No Action**	**Full Build**
A04/D13 VMC	15.8	13.6
A22/D13 VMC	11.8	11.4
A22/D31 VMC	12.3	11.2
A31/D04 VMC	26.7	25.6
A04/D13 IMC	27.3	25.5
A22/D13 IMC	16.4	15.9

Source: Landrum & Brown Analysis

8.2.3 Hourly Arrival and Departure Runway by Configuration

Figure 8-1 shows a comparison of arrival and departure runway throughput for the No Action versus the Full Build scenarios. Also shown on the graphs are the 2015 runway throughput rates. The arrival runway throughput rates for the 2024 demand levels are identical for the two scenarios. This is to be expected because changes to the terminals do not affect the arrival airspace. These throughput rates are also very similar to the 2015 rates. The 2024 departure runway throughput rates are very similar between the two scenarios. This is also expected because the terminal configuration changes do not affect the runway performance other than to change the timing of aircraft entering the departure runway. A complete set of runway throughput graphs is available in **Appendix D**.

Figure 8-1: Comparison of 2024 Runway Throughput Rates for Arrivals on Runway 04 and Departures on Runway 13 during VMC



Source: Landrum & Brown Analysis

9.0 SENSITIVITY ANALYSIS – AIRLINE COLOCATION SCENARIO

Both Delta and American currently operate from multiple terminals at LaGuardia. Delta operates out of Terminals A, C & D with exclusive use of Terminal A. Each carrier now has the opportunity to consolidate its operation in its respective new terminal, American in Terminal B and Delta in its reconfigured terminal.

As part of these colocations it is expected that other carrier(s) would move their operations out of Terminal B and into Terminal A. Although at this point the identity of the airline(s) that would shift to Terminal A is unknown, in an effort to demonstrate there is no impact to the airfield associated with colocation activities, a sensitivity analysis has been performed using an airline with a flight schedule and passenger load that can operate in Terminal A as currently configured.

Table 9-1 shows the differences in annual delays with the Airline Colocation Scenario compared to the Current Gate Allocation used in the Full Build analysis.

Table 9-1: Summary of Average Annual Taxi Times

	Count of Aircraft		2024 Average Taxi In/Out Time (min.)			
	Arrivals	Departures	Current Gate Allocation		Airline Colocation Scenario	
Total	688	688	4.9	15.8	5.0	16.3
	Count of Aircraft		**2029 Average Taxi In/Out Time (min.)**			
	Arrivals	Departures	Current Gate Allocation		Airline Colocation Scenario	
Total	688	688	5.0	15.7	4.9	16.0

Source: Landrum & Brown Analysis

9.1 Sensitivity Analysis Conclusions

The results of this sensitivity analysis demonstrate that the airfield impacts of airline colocation in the new and reconfigured terminals are negligible when measured against the current multiple terminal operations by Delta and American.

- Arrival delays and arrival taxi times are fairly consistent between the Full Build and the Full Build Airline Colocation scenarios.
- Departure delays and departure taxi times for the Full Build scenario are slightly lower than the Full Build Airline Colocation scenario.

The results of this sensitivity analysis are further detailed in **Appendix D**.

Appendix A
2015 Simulation Modeling Calibration

TAAM Model Calibration
2015 Existing Conditions

New York LaGuardia Airport

TAAM Model Calibration

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New York LaGuardia Airport

Contents

- Runway Configurations
- Runway Throughput Rates and Aircraft Separations Analysis
  - Departure separations
  - Arrival separations
  - Arrival throughput rates
  - Departure throughput rates
- TAAM Model Calibration
- LGA Gating analysis
  - Terminal assignments
  - Gating issues
  - Gate charts & gate key

Runway Configurations

Runway Configurations

- The analysis focuses on the six main runway configuration/weather scenarios at LGA.

Runway Configuration	Weather	Mar-Nov2015 Operations	Percent of Total
22/13	VMC	71,538	26.6%
22/31	VMC	47,681	17.7%
31/4	VMC	47,024	17.5%
4/13	VMC	30,886	11.5%
22/13	IMC	14,010	5.2%
4/13	IMC	12,264	4.6%
Other		45,294	16.9%
Total		268,697	100.0%

Runway Throughput Rates and Aircraft Separations Analysis

Arrival Throughput

- Analyzed arrival runway throughput rates for each runway configuration/weather scenario.
- Data shows fairly consistent throughput over the various runway configurations.

Runway Configuration	Weather	Average Peak	Max Achieved
22/13	VMC	39	49
22/31	VMC	39	43
31/4	VMC	38	45
4/13	VMC	40	42
22/13	IMC	39	41
4/13	IMC	41	41
Other			
Total			

Arrival Aircraft Separations Analysis

Time

- Raw data indicates landing times
- Sorted by runway, aircraft type, hour
- Aircraft grouped by FAA wake RECAT categories
- Only included separation events up to 3.5 minutes

Speed

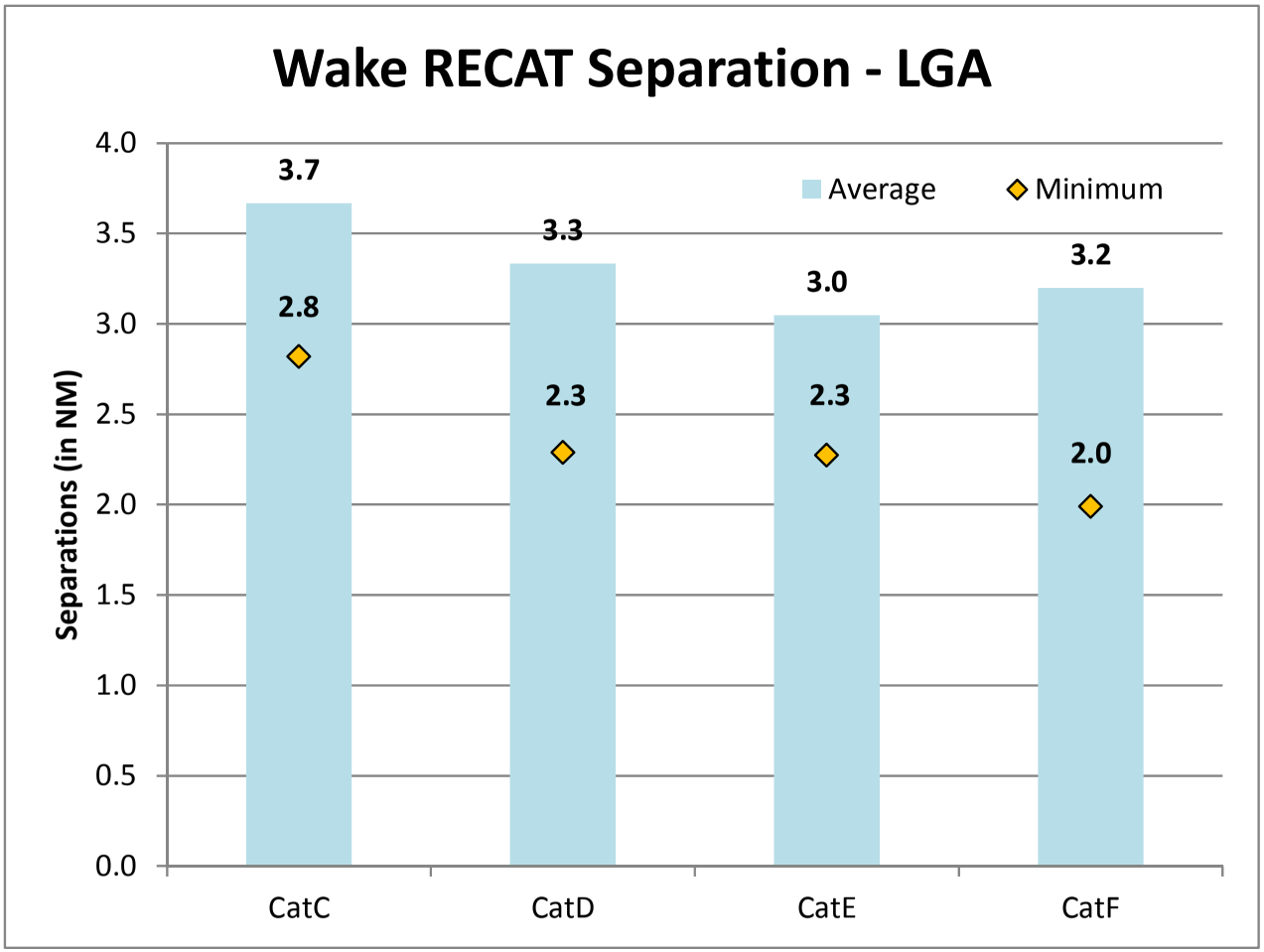
- Utilized average approach speed by runway
- Prior Landrum & Brown analysis provided speed data
  - Includes larger data sample size which is unlikely to change
  - Not used for any other aspects of the analysis

Distance

- Applied speed data to time data to determine average and minimum distance separations (see next slide)
- Analysis confirms the benefit of wake RECAT
  - B757 separations are now comparable to other narrowbody aircraft

**Source: PANYNJ, AirScene data; data analyzed for March through May and July through December, 2009*

Arrival Separation Analysis



Arrival Aircraft Separation Analysis

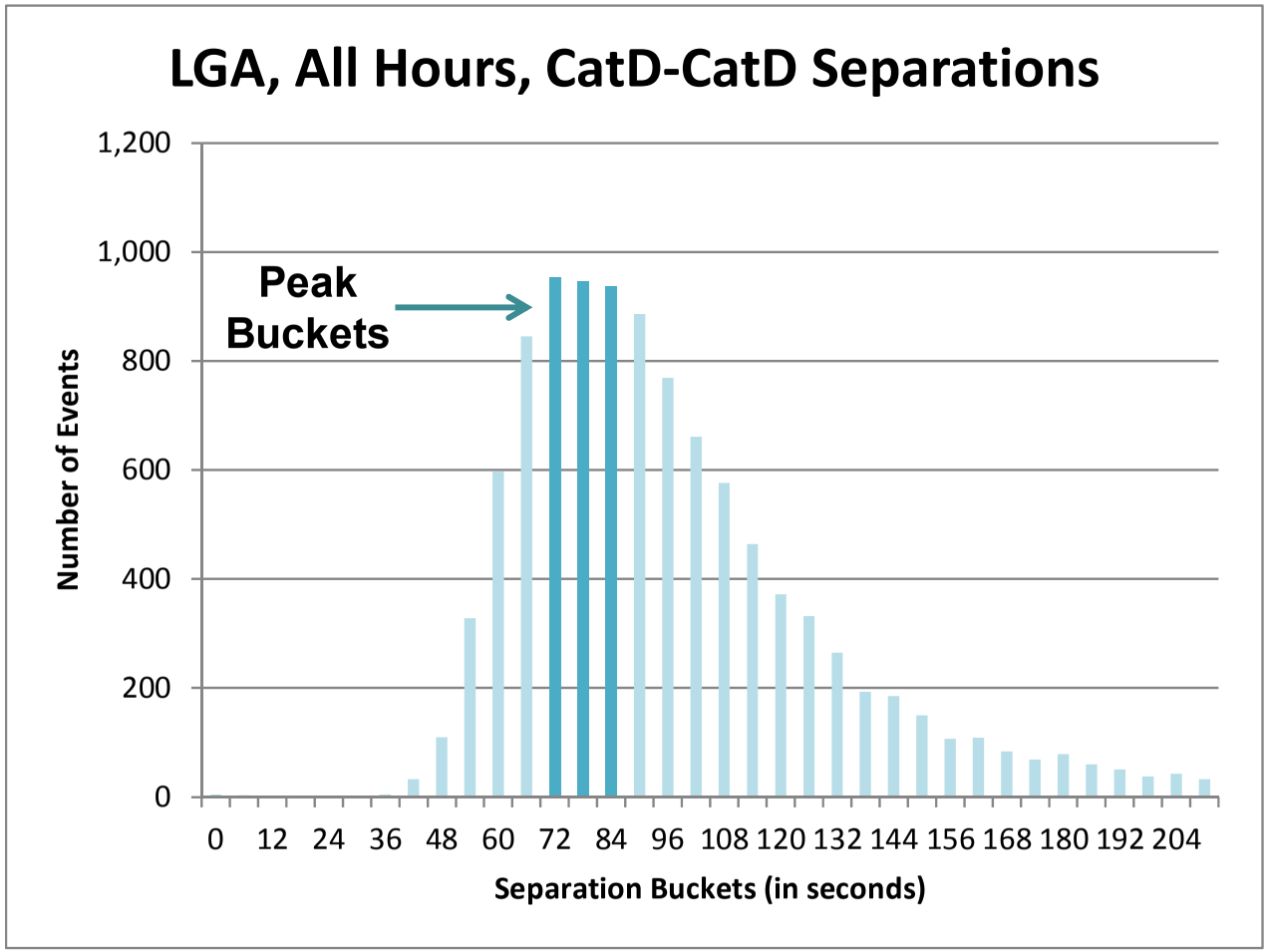
- Need to calculate weighted average approach speeds because TAAM only allows one value for approach speed per runway
- Each flight was categorized based on the FAA wake RECAT classification
- Average separation times were coupled with number of events for each runway to determine weighted average speeds for each runway

Weighted Average Speeds (knots)			
Runway 4	Runway 13	Runway 22	Runway 31
119.7	123.6	128.9	125.3

Distribution Analysis

- Input separations to be used in the model were determined by creating a histogram of observed separation events
  - Identifies most-common separation rather than average value
  - Reduces bias caused due to large separations
- Separation data organized into 10 second buckets
- All events organized by lead-trail aircraft combination
  - Example on the following slide shows “CatD-CatD” where a lead Category D aircraft is followed by a trailing Category D Aircraft
- Average speed used to convert time buckets into separations

Distribution Analysis



Arrival Separations

- Based on the average separation times, the arrival separations used in the calibration were:

Runway Configuration	Weather	A-D-A Separations (nm)
22/13	VMC	3.0
22/31	VMC	3.3
31/4	VMC	3.5
4/13	VMC	3.3
22/13	IMC	3.7
4/13	IMC	3.6

Departure Throughput

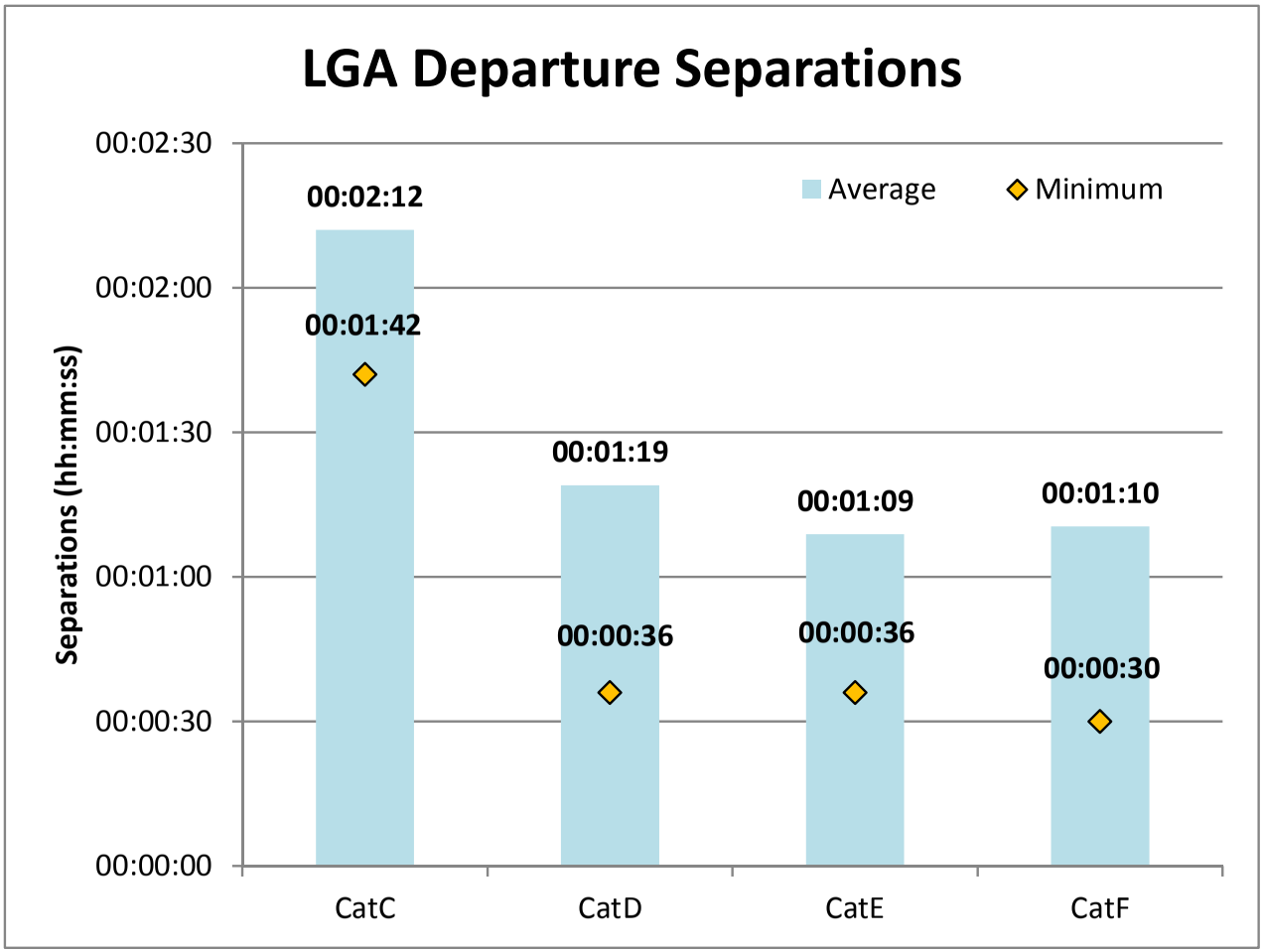
- Analyzed arrival rates for each runway configuration/weather scenario
- Data shows fairly consistent throughput over the various runway configurations.

Runway Configuration	Weather	Average Peak	Max Achieved
22/13	VMC	39	46
22/31	VMC	39	47
31/4	VMC	38	47
4/13	VMC	39	45
22/13	IMC	42	42
4/13	IMC	41	41
Other			
Total			

Departure Separation Analysis

- Unlike the arrival separation analysis, the departure separation analysis was completed with respect to time (not distance)
- All other aspects of the departure analysis mirrored the arrival analysis:
  - Aircraft grouped based on the FAA wake RECAT classification
  - Only included separation events up to 3.5 minutes

Departure Separation Analysis



Departure Separations

- Based on the average separation times, the departure separations used in the calibration were:

Runway Configuration	Weather	D-A-D Separations (seconds)
22/13	VMC	72
22/31	VMC	72
31/4	VMC	84
4/13	VMC	78
22/13	IMC	84
4/13	IMC	90

TAAM Model Calibration

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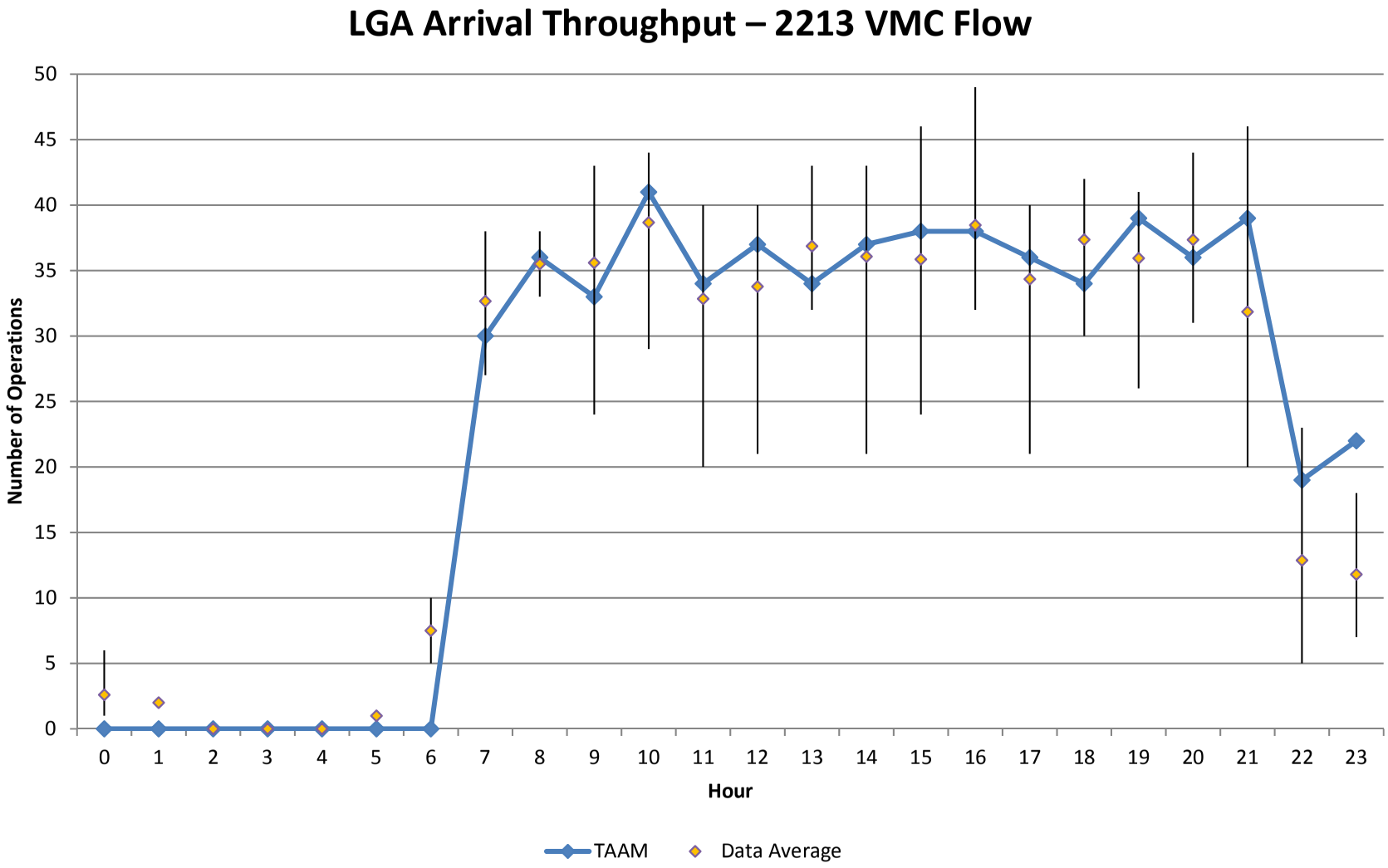
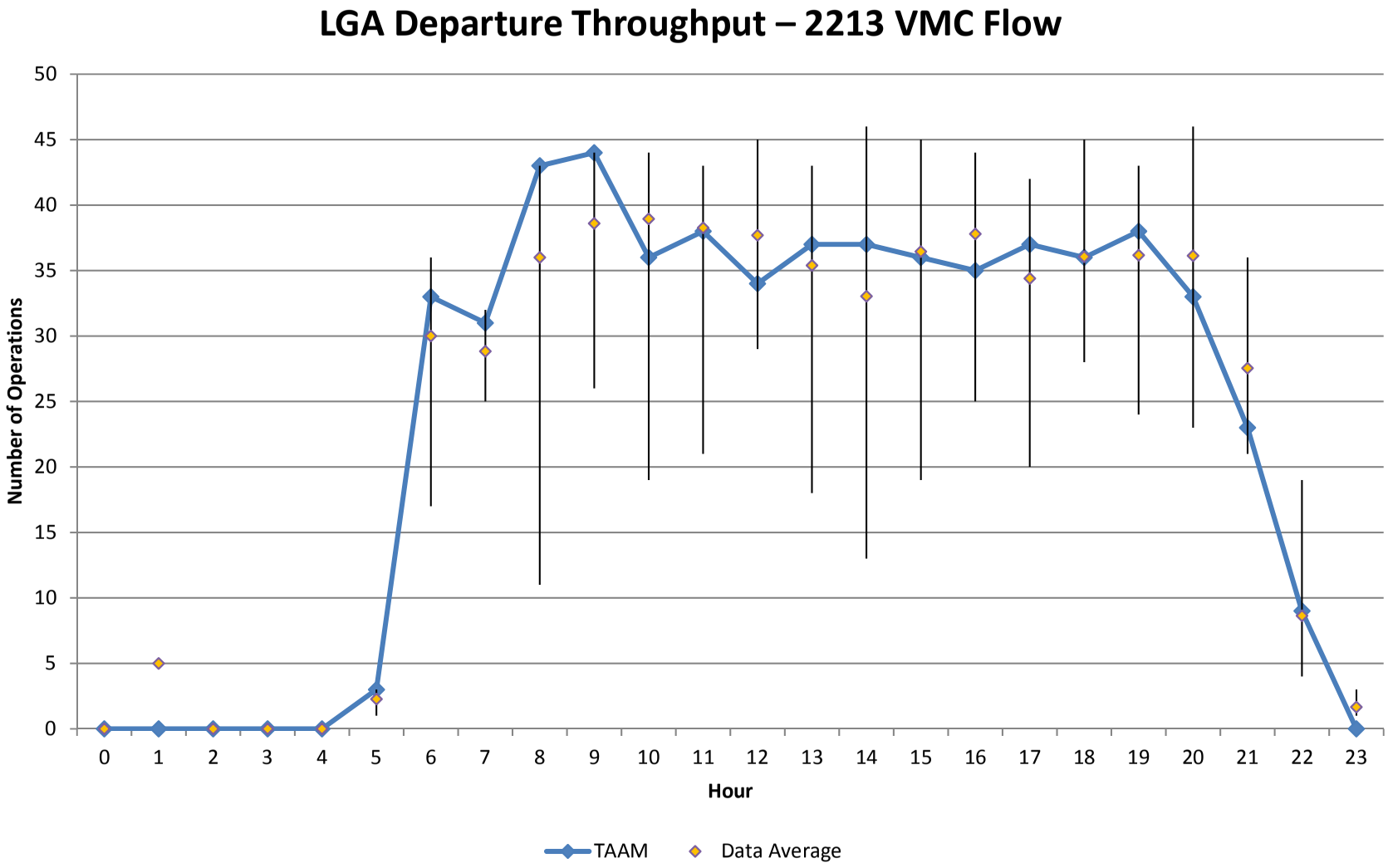
Simulation Calibration

- Simulation models are now calibrated
  - TAAM throughput rates are very similar, although slightly on the higher side, as compared to the average throughput rates obtained from the Aerobahn data
  - This is primarily because the models are simulating a summer schedule and we are trying to calibrate them using operations' data over a longer time period (March through November 2015)
  - The 22/13 simulation model assumes that all RNAV climbs (TNNIS, NTHNS and GLDMN) are available. In reality, only one or two climbs procedures (TNNIS and NTHNS) were available for simultaneous use from March through November 2015. As a result, the data shows slightly lower departure throughput rates than the simulation model

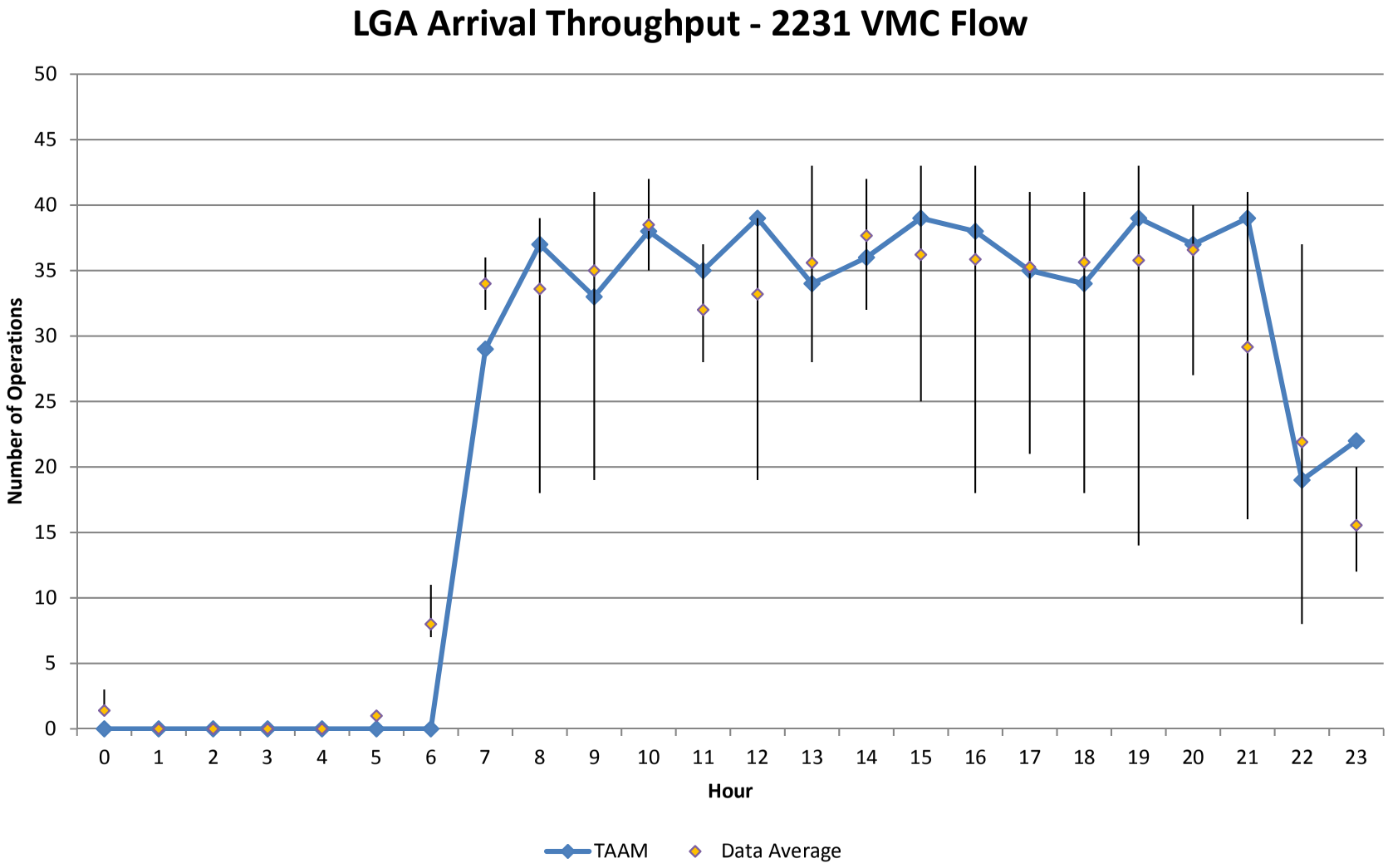
Simulation Calibration
22/13 VMC Flow - Arrivals



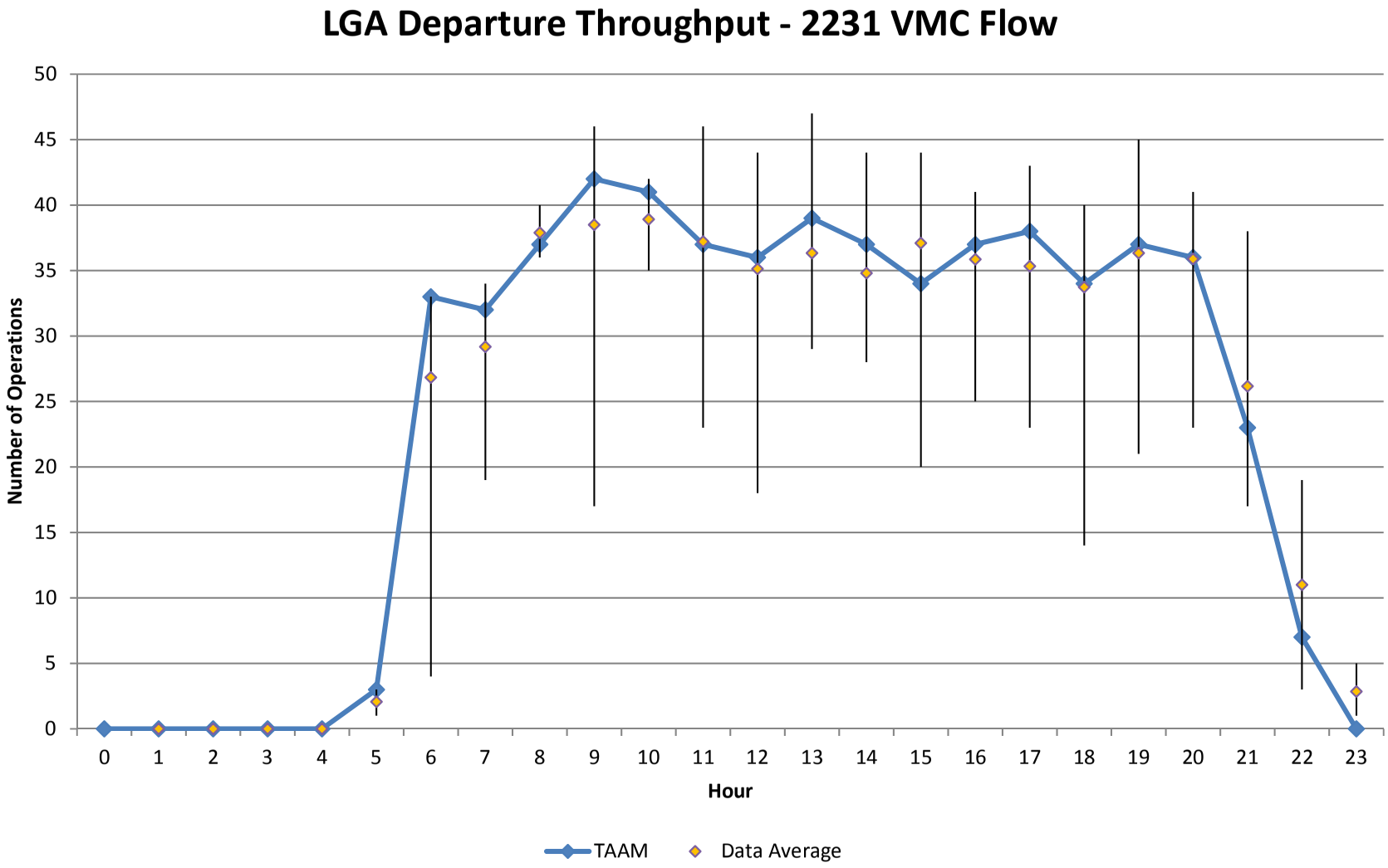
Simulation Calibration
22/13 VMC Flow - Departures



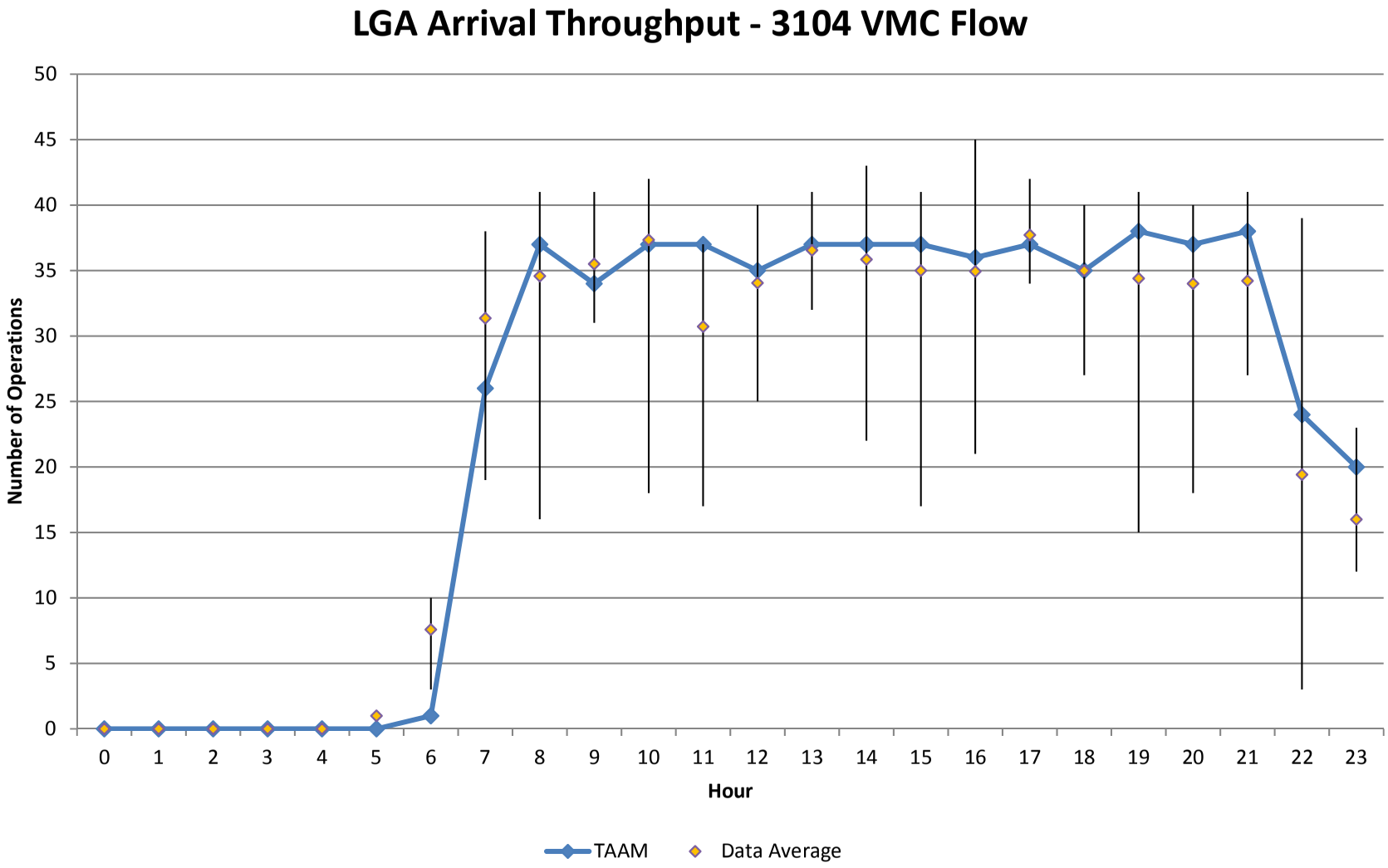
Simulation Calibration
22/31 VMC Flow - Arrivals



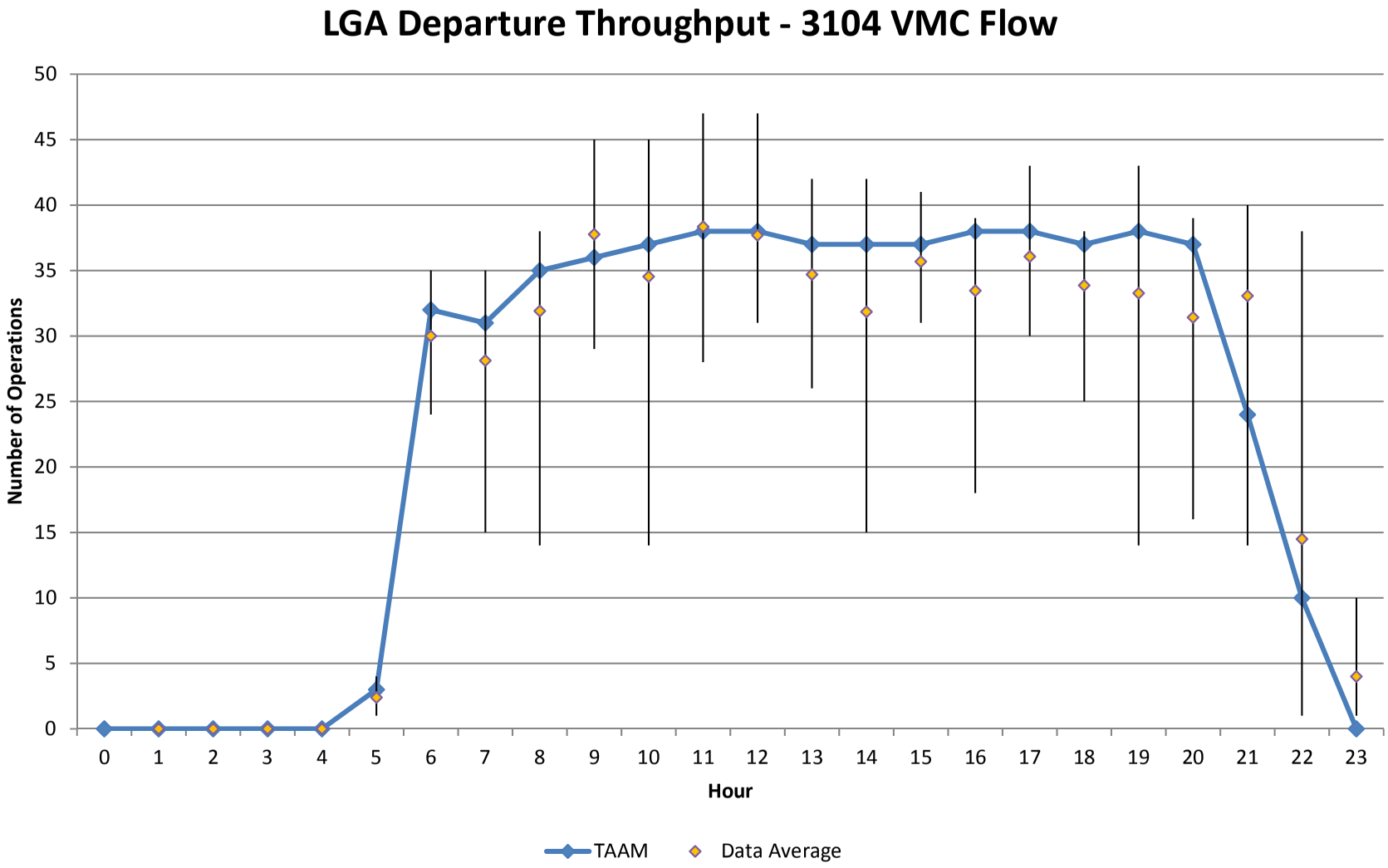
Simulation Calibration
22/31 VMC Flow - Departures



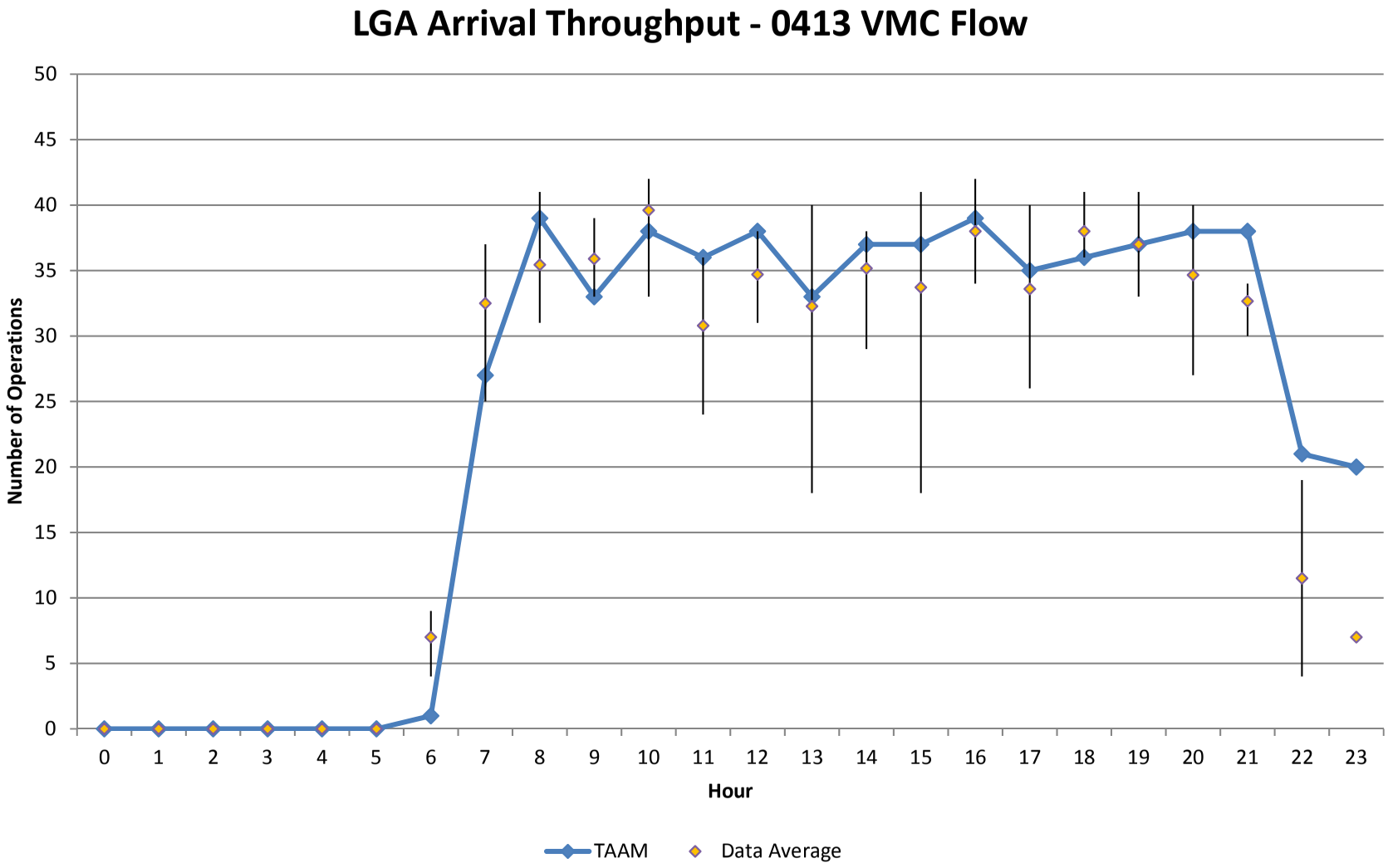
Simulation Calibration
31/04 VMC Flow - Arrivals



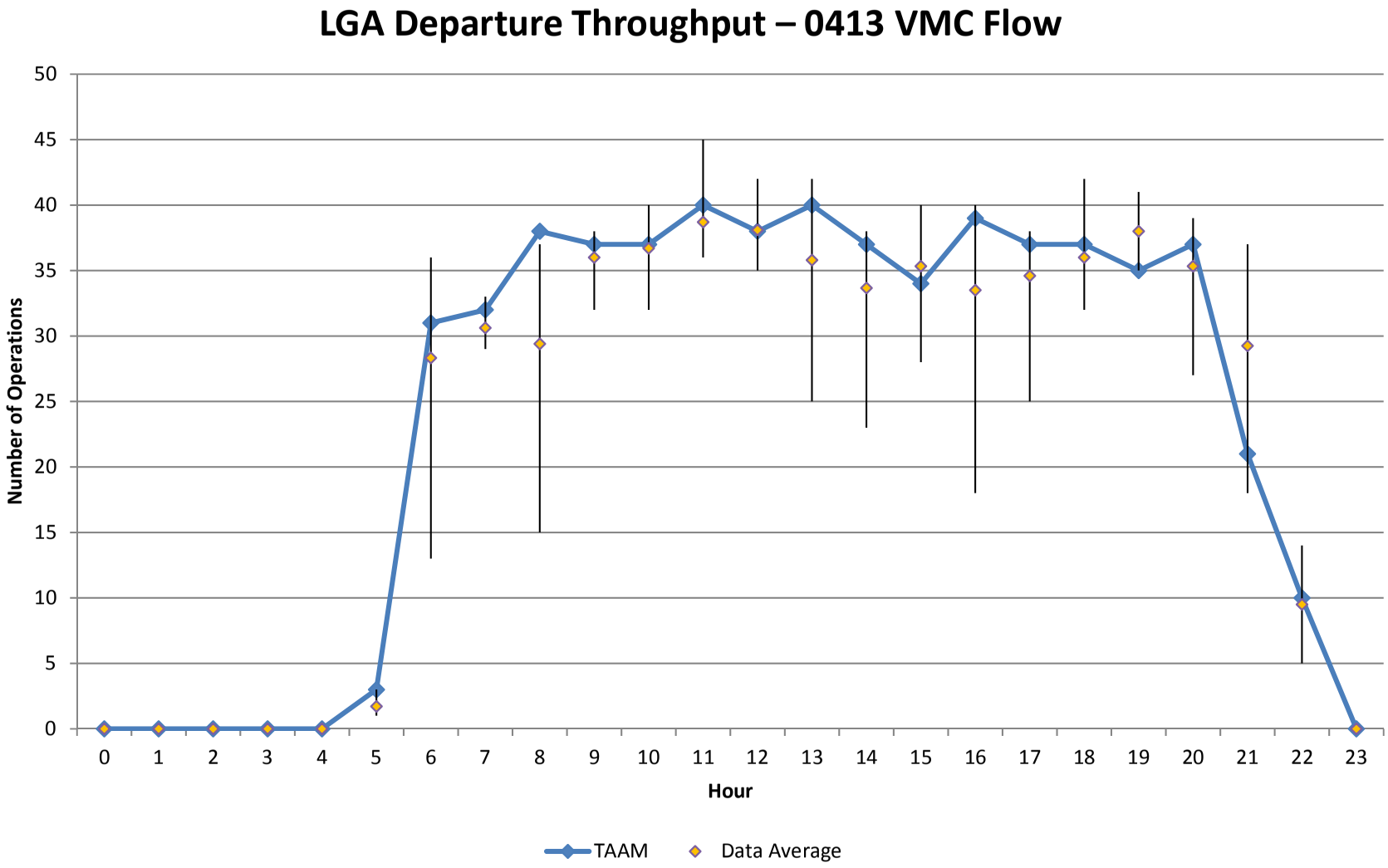
Simulation Calibration
31/04 VMC Flow - Departures



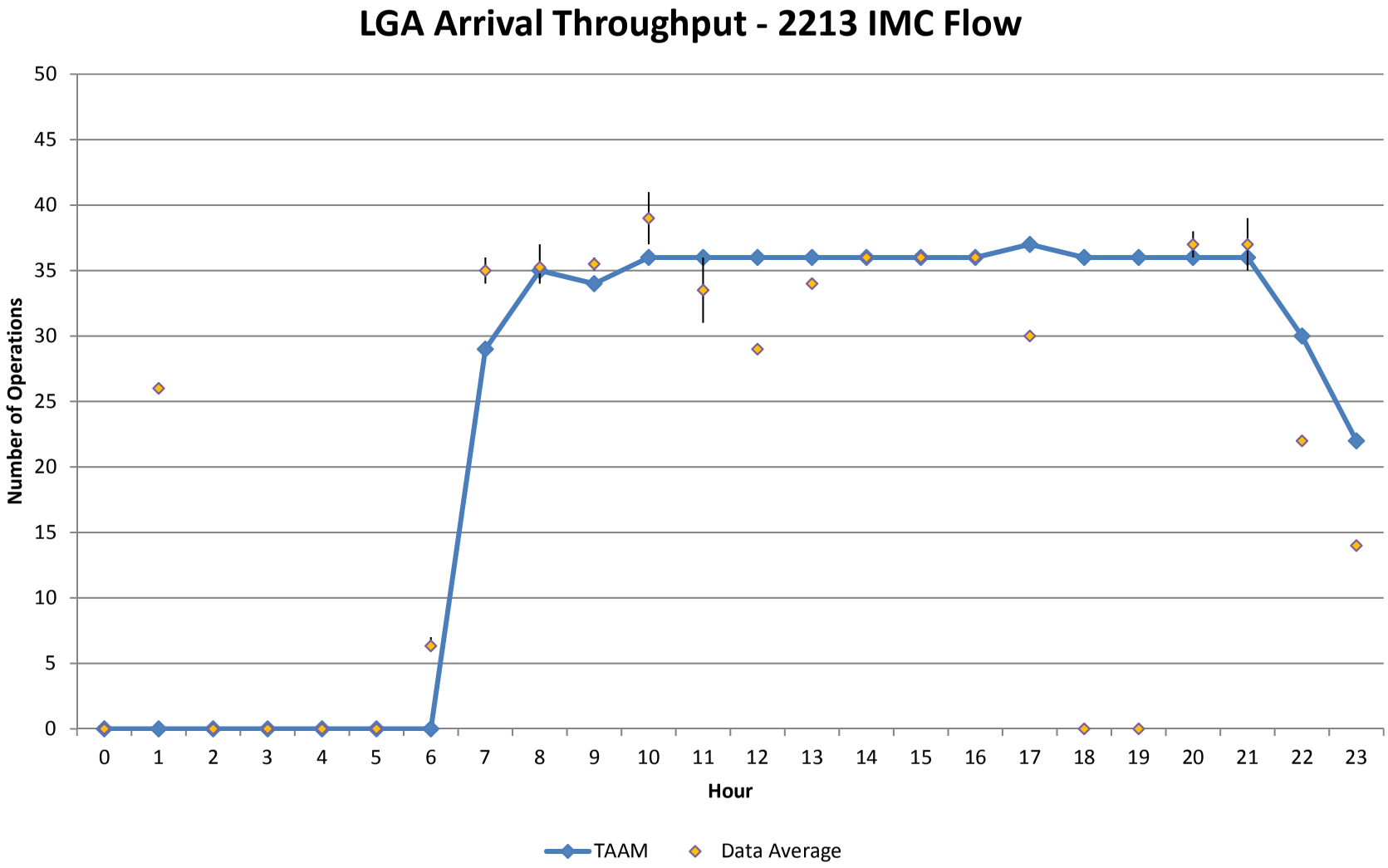
Simulation Calibration
04/13 VMC Flow - Arrivals



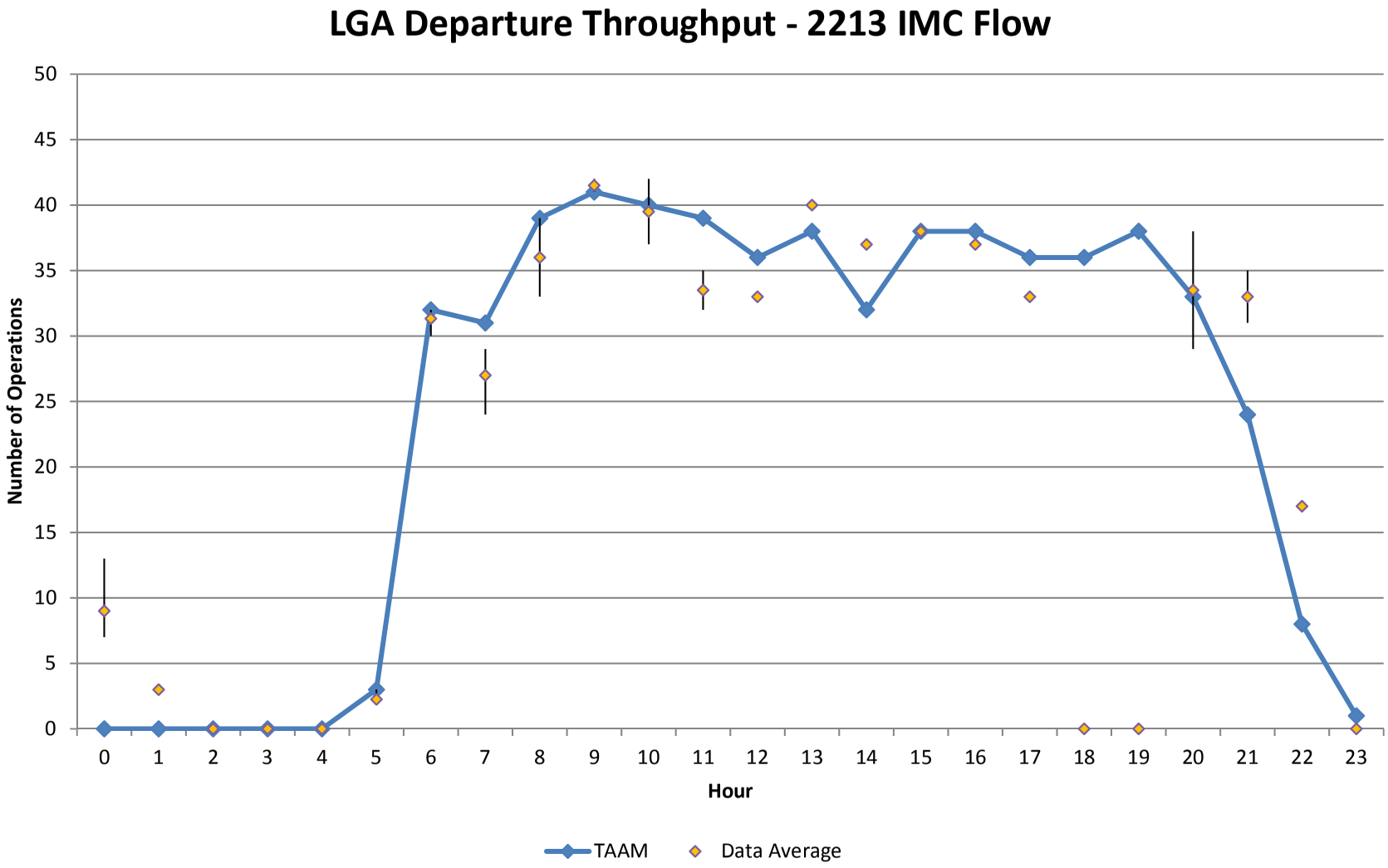
Simulation Calibration
04/13 VMC Flow - Departures



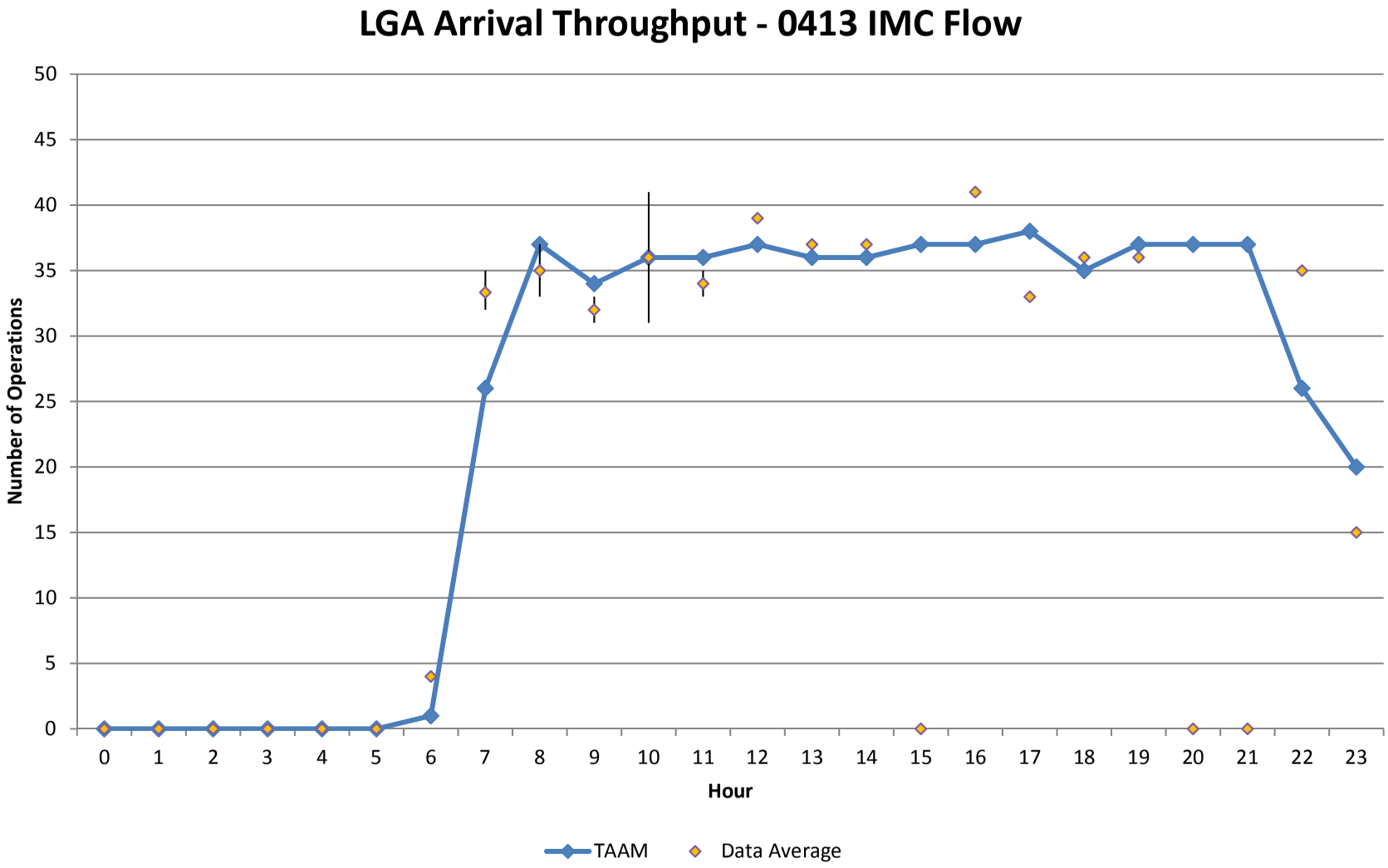
Simulation Calibration
22/13 IMC Flow - Arrivals



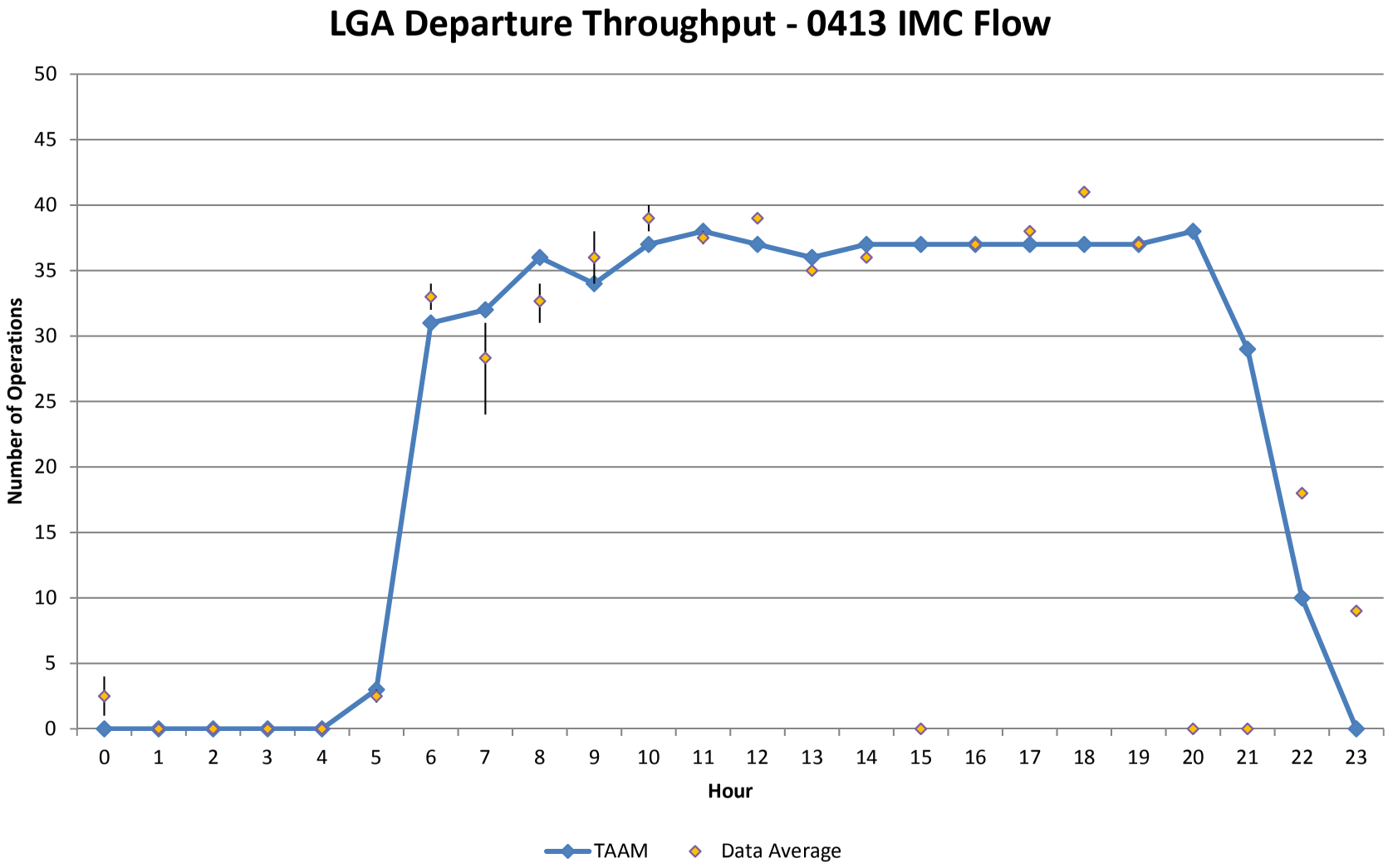
Simulation Calibration
22/13 IMC Flow - Departures



Simulation Calibration
04/13 IMC Flow - Arrivals



Simulation Calibration
04/13 IMC Flow - Departures



LGA Gating Analysis

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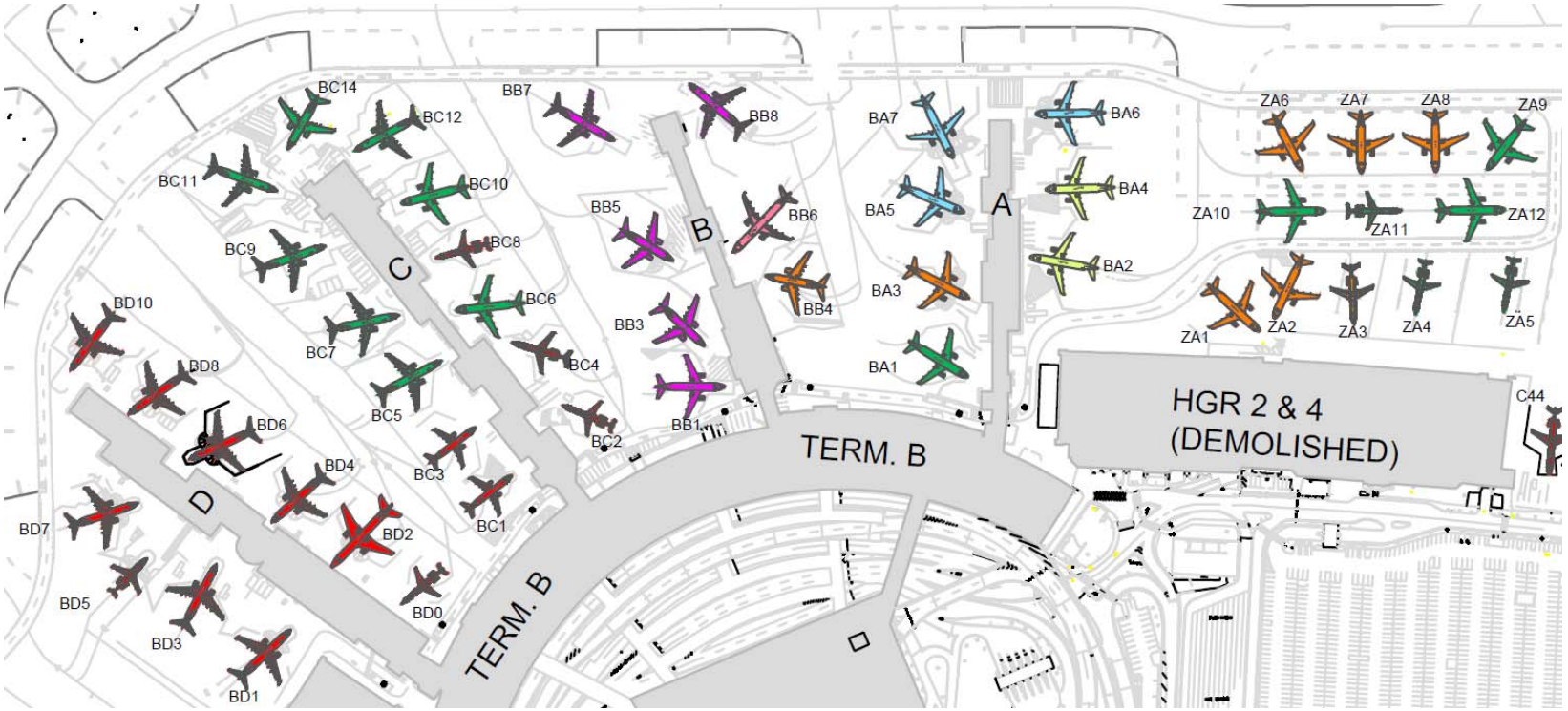
Marine Air & CTB

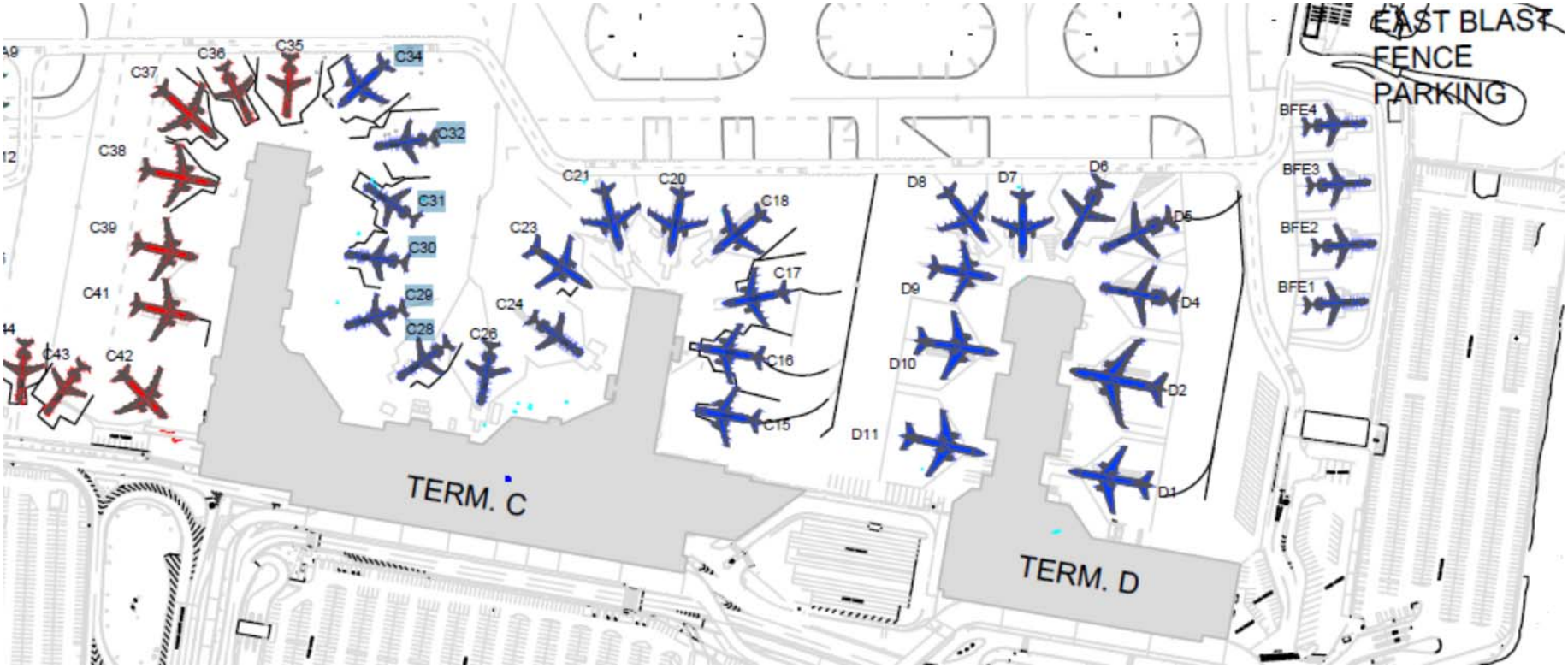


LEGEND:

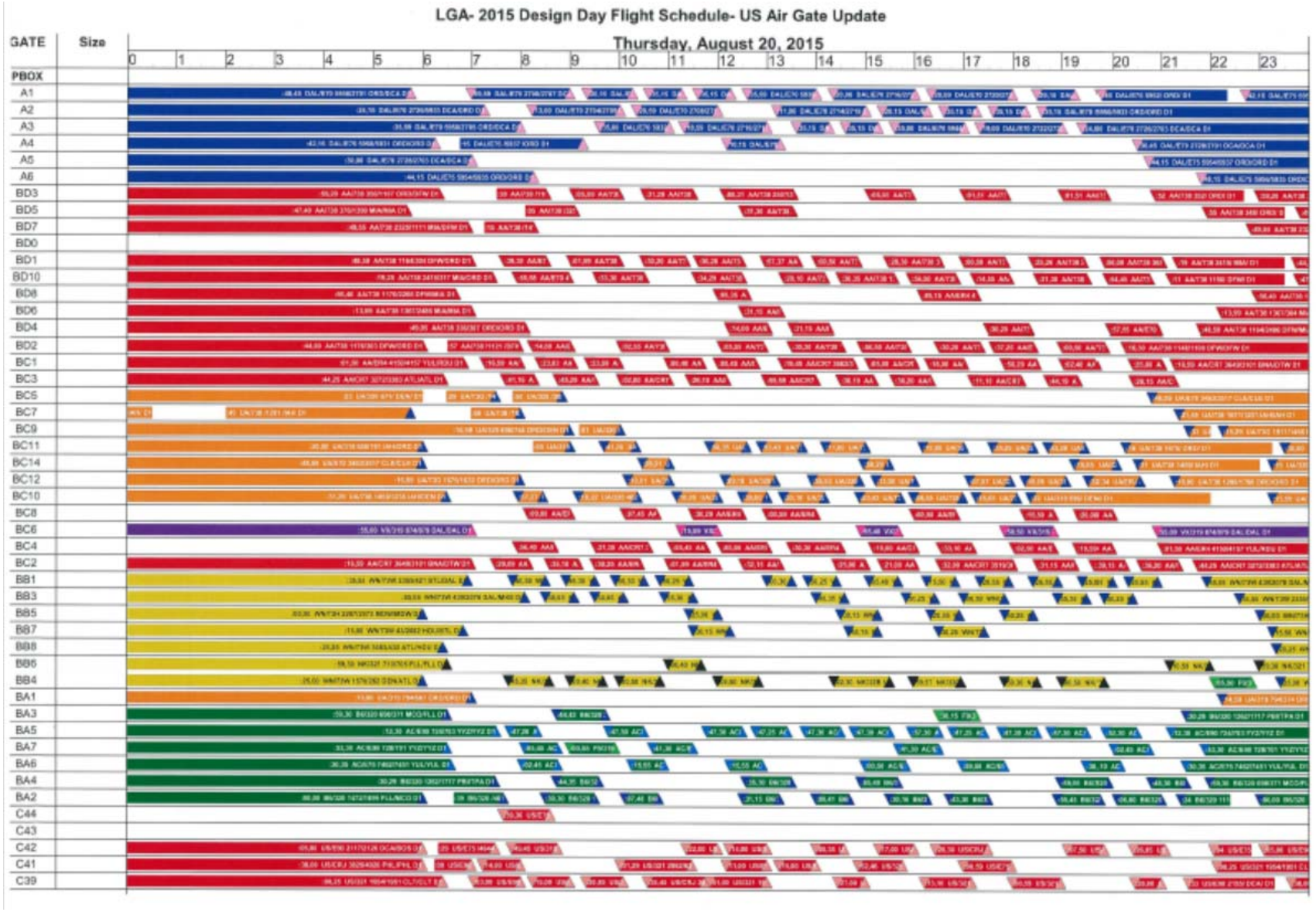
- AA (AMERICAN AIRLINES)
- DL (DELTA AIRLINES)
- UA (UNITED AIRLINES)
- JB (JET BLUE AIRWAYS)
- WN (SOUTHWEST AIRLINES)
- NK (SPIRIT AIRLINES)
- AC (AIR CANADA)
- PA (PORT AUTHORITY)

B-55

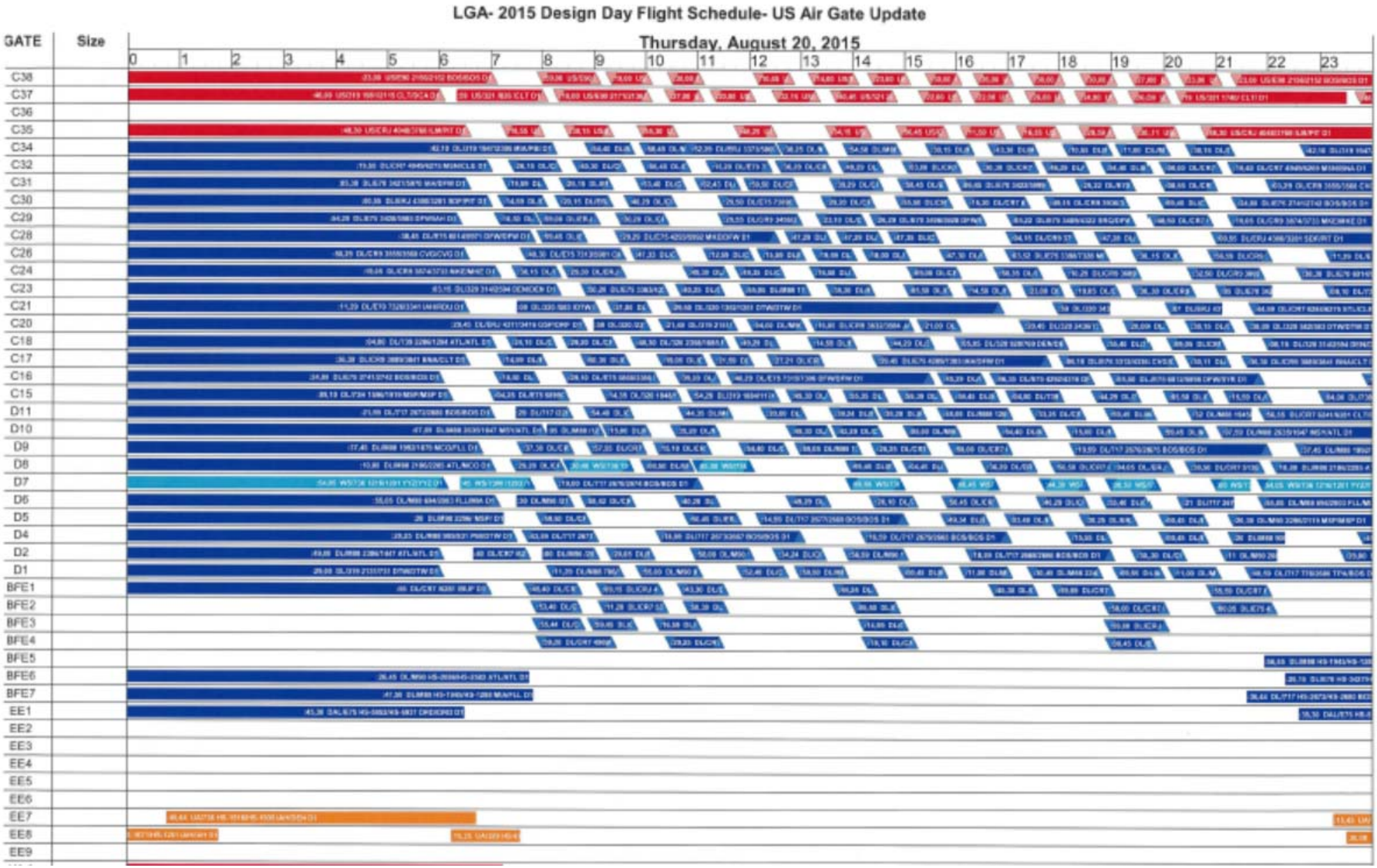
Terminal C/D Delta Terminal



Marine Air & CTB



Terminal C/D Gating



Appendix B

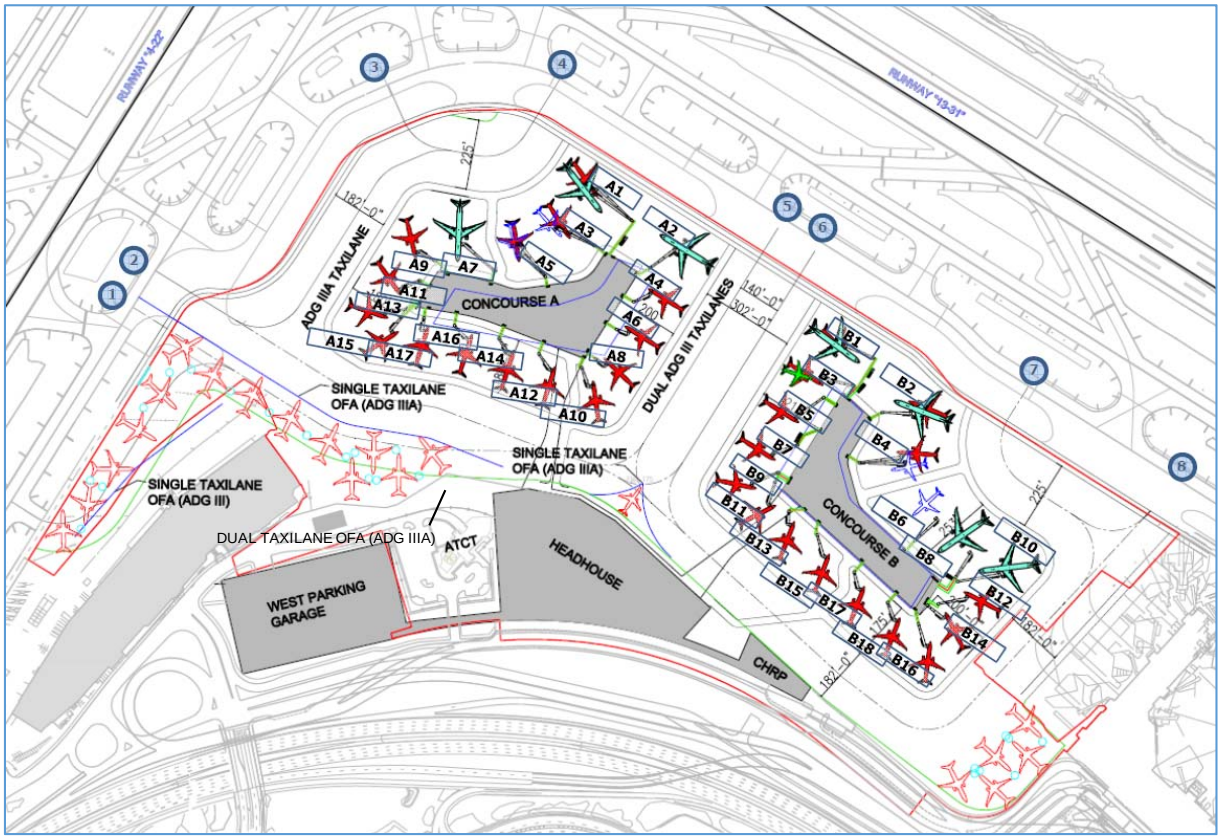
CTB Taxilane Flows

(from Port Authority TAAM Simulation Study of the Central Terminal Building Redevelopment)

6.1 CTB Modeling Assumptions

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 points provide a description of the taxi flows around the proposed satellite CTB layout:

Across all scenarios:

- 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

Mode A (see Figures 6-2 and 6-3)

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:

1. Arr 04 / Dep 13 (VFR)
2. Arr 04 / Dep 13 (IFR)
3. 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:

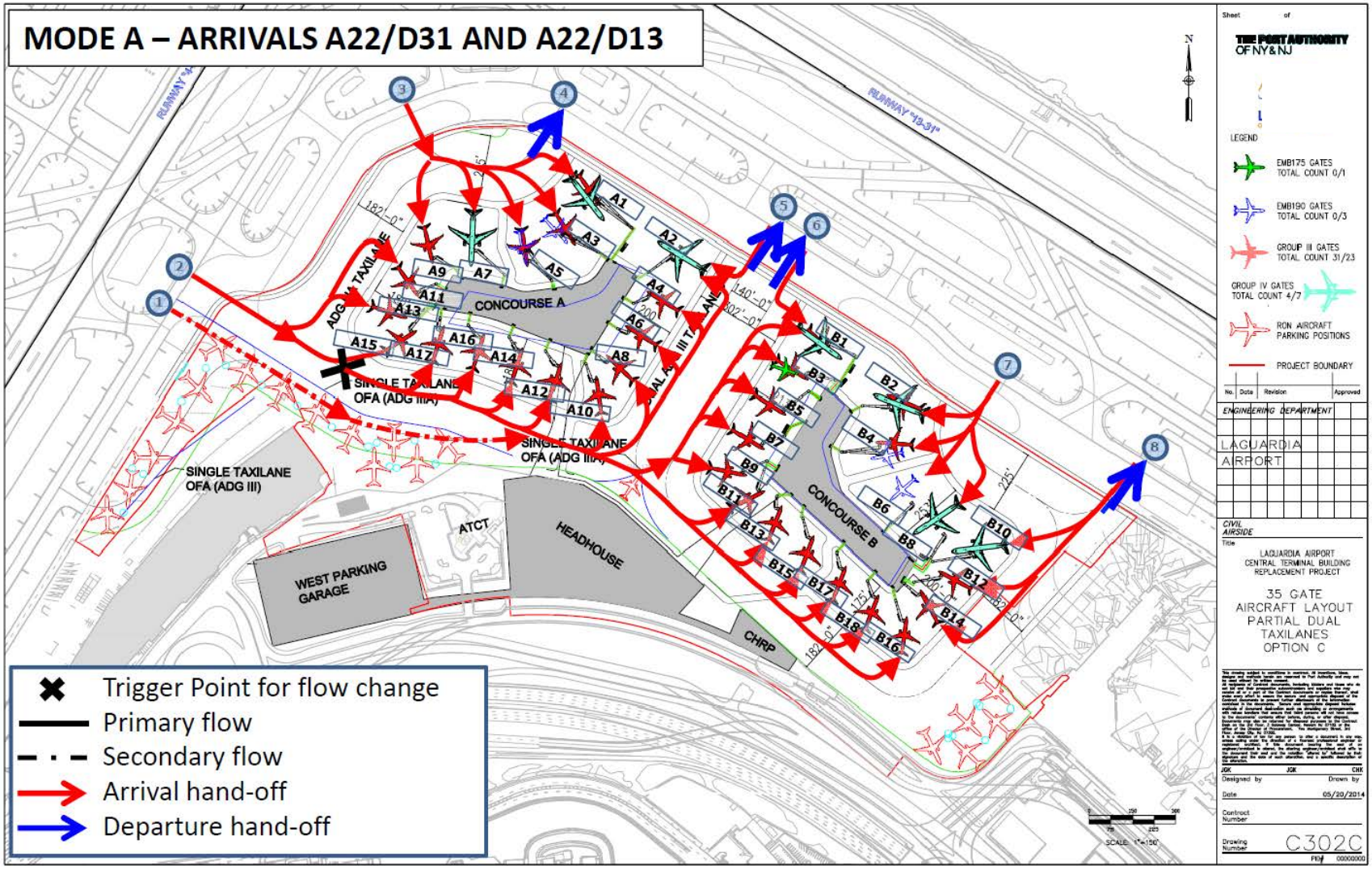
- Gates B2, B4, B6, B8 and B10 (if Cat IV)

Other rules

If the departure queue towards point 2 backs up to Gate A15:

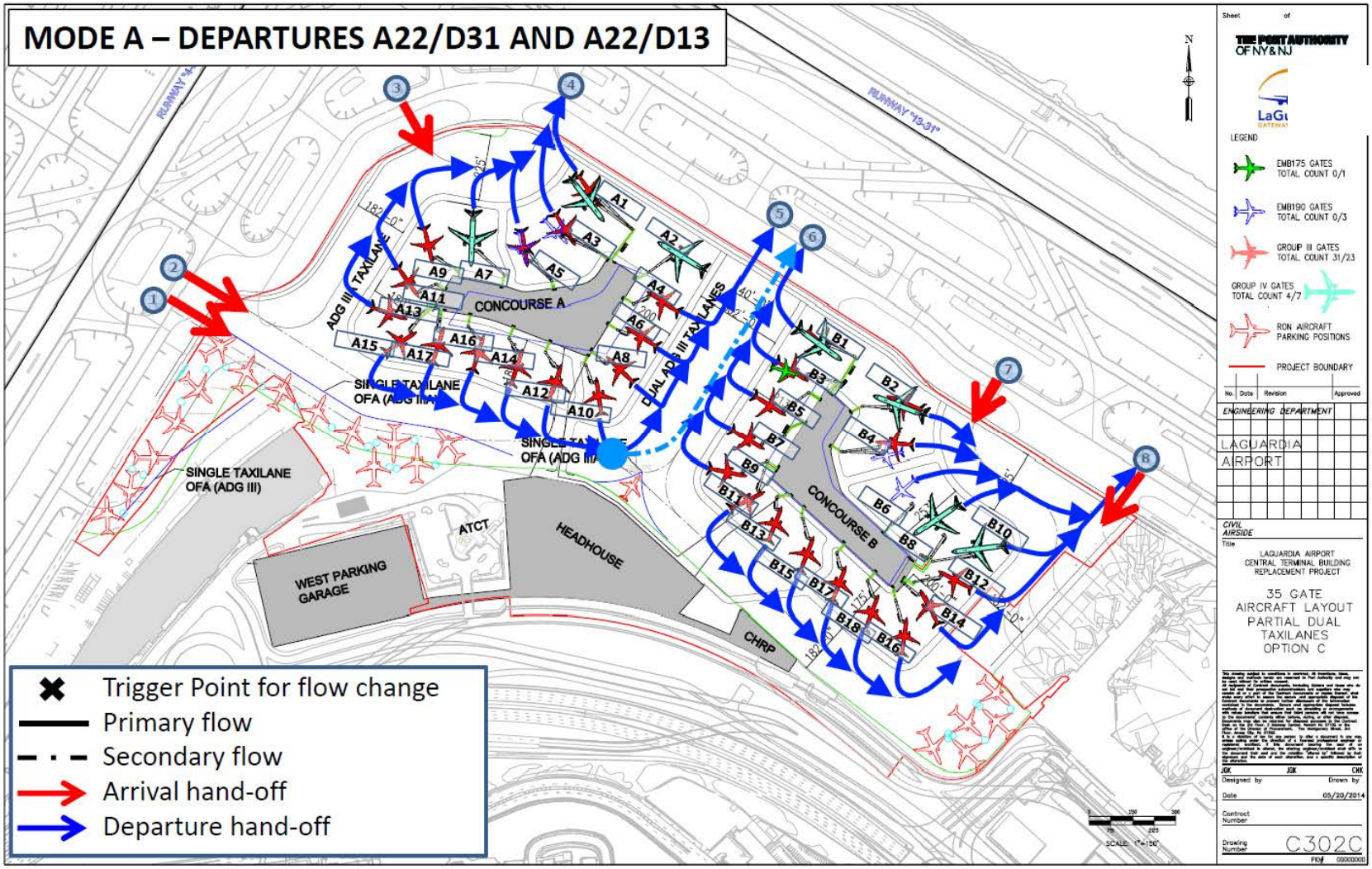
- The departures from gate A2 (if not assigned to a CatIV aircraft), A4, A6, A8, A10, A12, A14, A16 and A17 can exit via Point 1 if the RON's on new dual taxilane to its south are cleared. Then departures from B11, B13, B15, B17, B18, B16, B14, B12, B10 will be redirected towards Point 6

Figure 6-2: Proposed Satellite CTB Layout – Mode A Arr 22/Dep 31 and Arr 22/Dep 13 – Arrival Taxi Flows



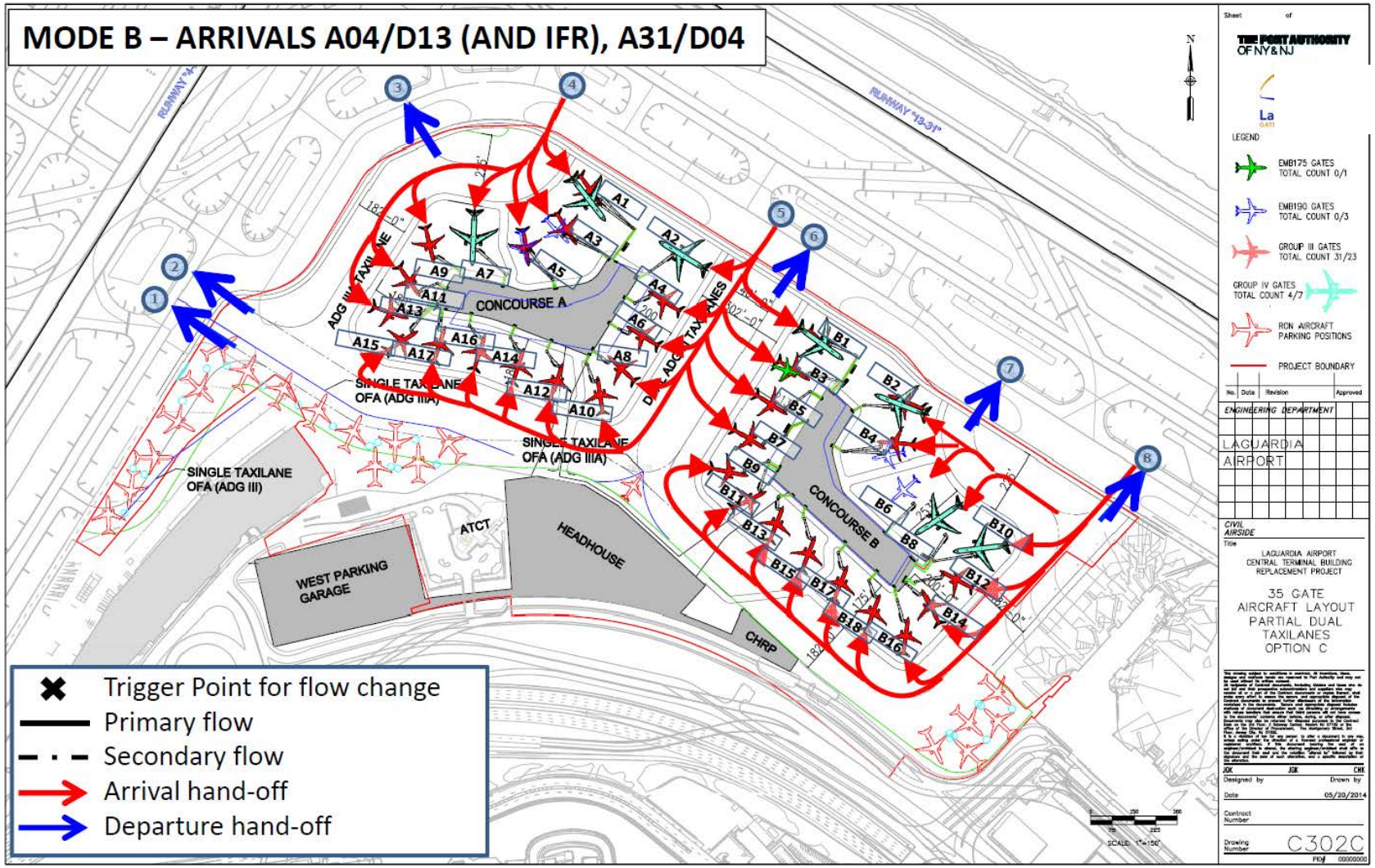
Source: The Port Authority of New York and New Jersey.

Figure 6-3: Proposed Satellite CTB Layout – Mode A Arr 22/Dep 31 and Arr 22/Dep 13 – Departure Taxi Flows



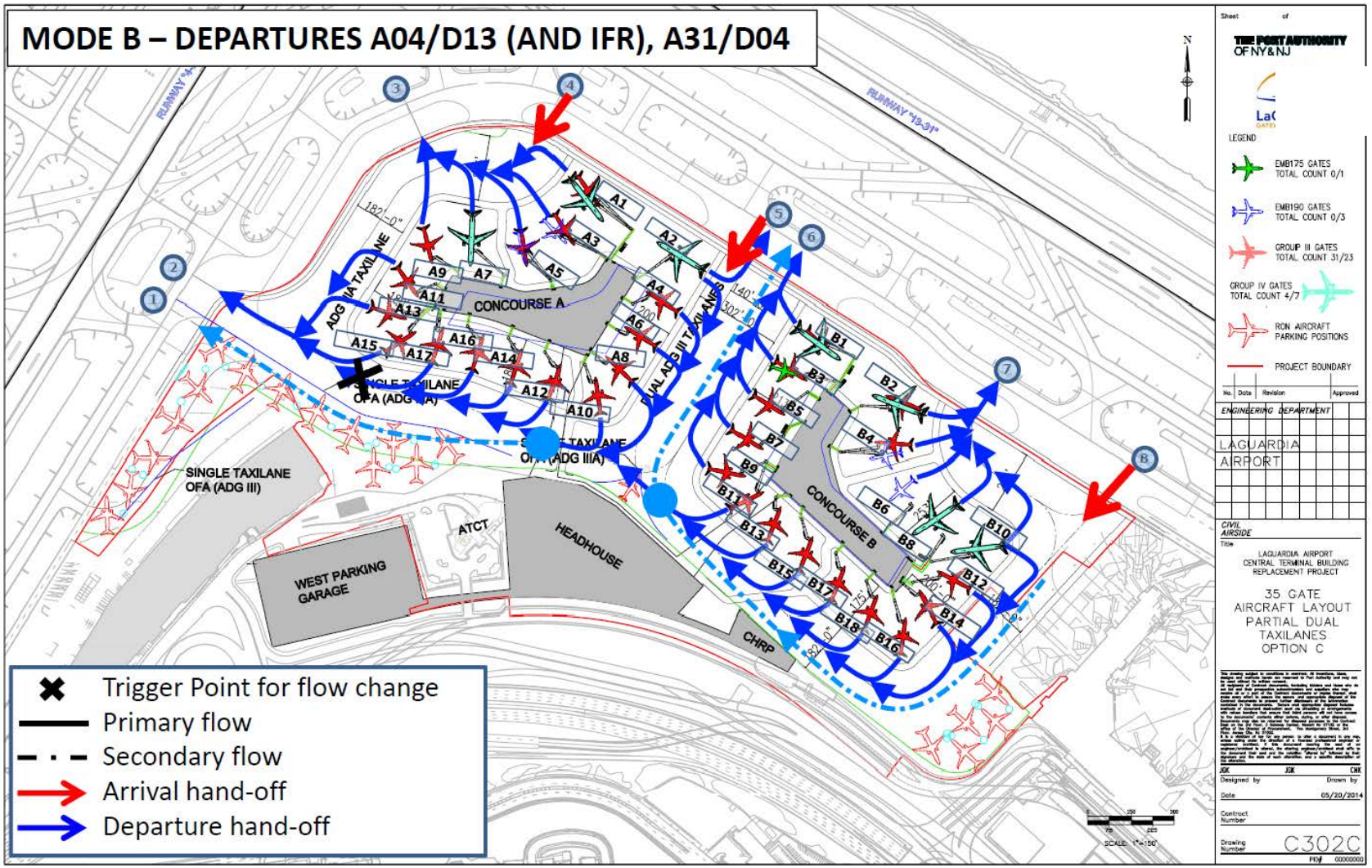
Source: The Port Authority of New York and New Jersey.

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



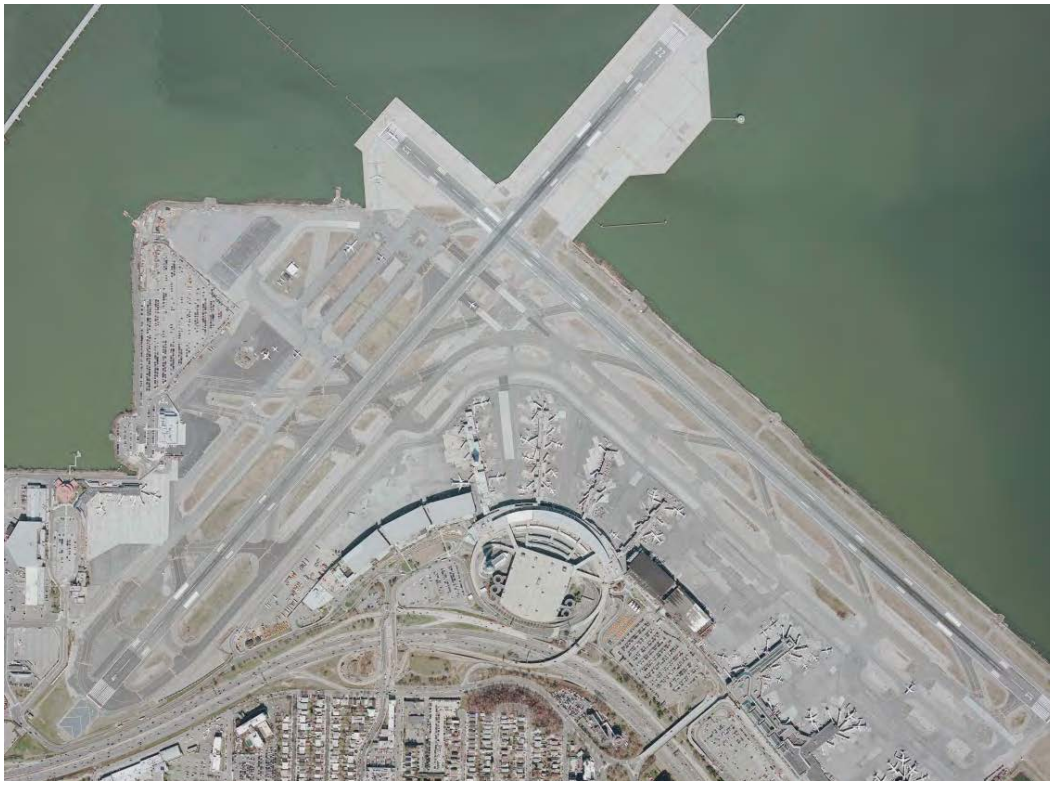
Source: The Port Authority of New York and New Jersey.

Appendix C

2013 Simulation Modeling Calibration

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:

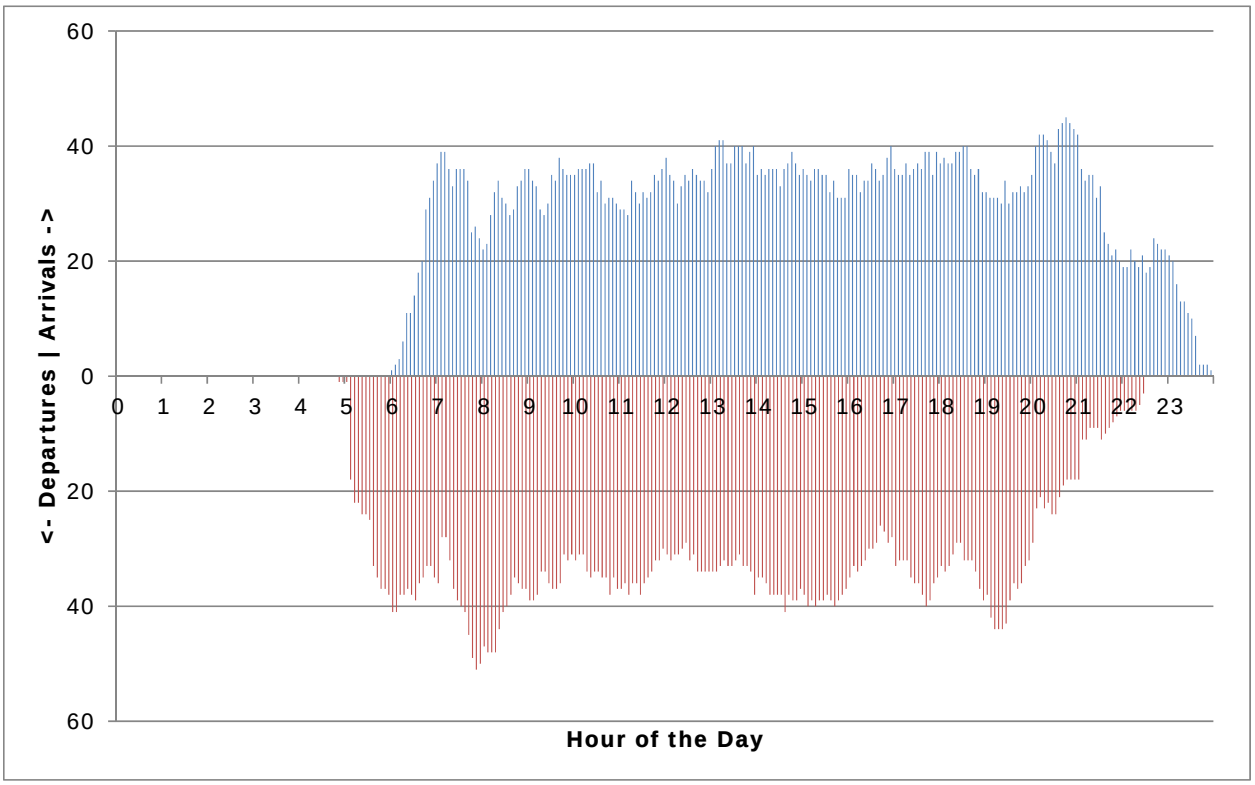
- US Airways will give up 132 daily pairs. US Airways will continue shuttle service to BOS and DCA. US Airways will also continue service to CLT, PHL, and PIT. US Airways will retain 6 gates and 3 hardstands on Terminal C.
- Delta will add 116 daily pairs to their existing operation. Delta will get 16 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***.

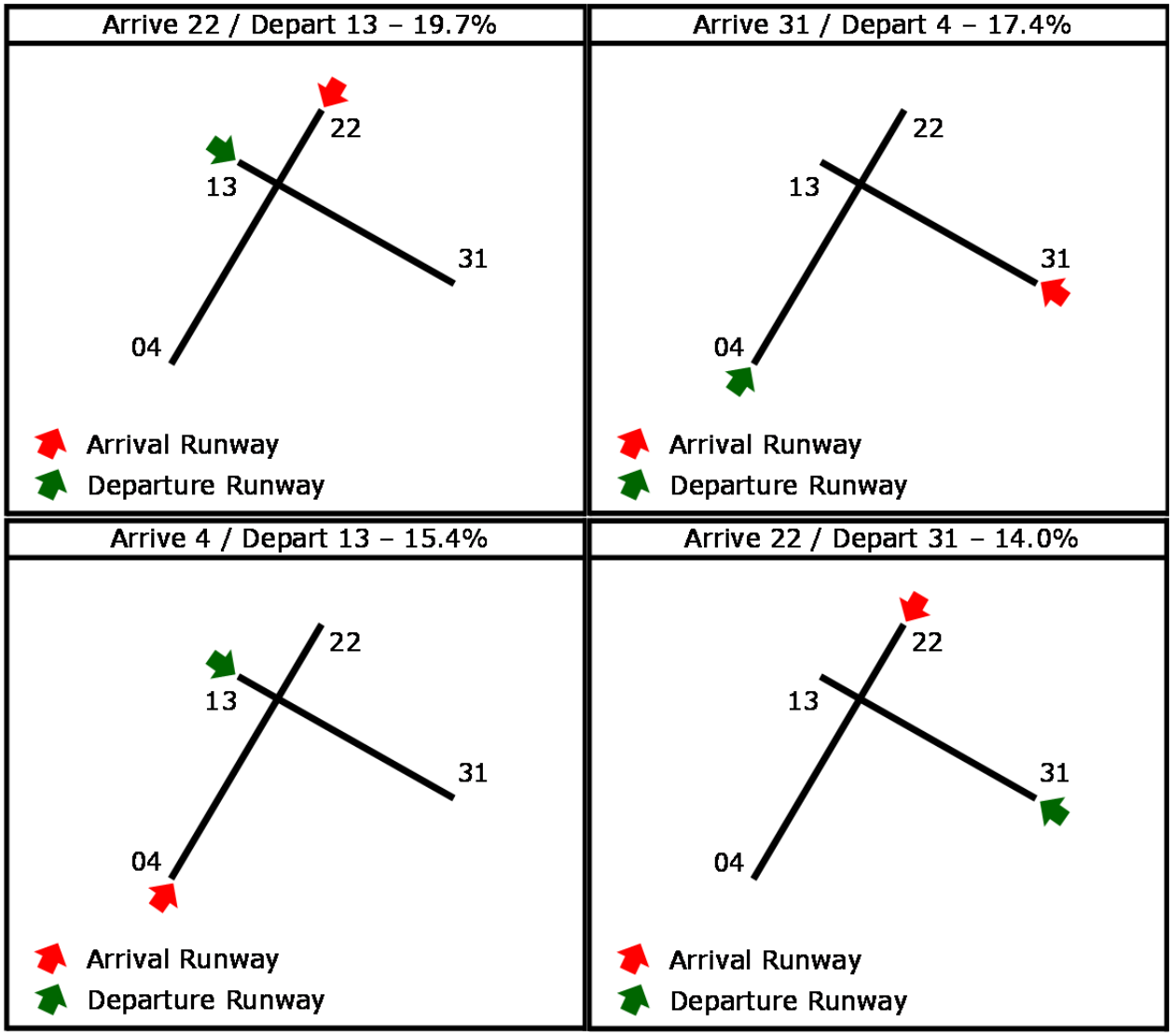
The top five runway configurations were used 78.9 percent of the time in 2009. The usage of these five configurations is fairly evenly distributed. However, it is worth noting an increase in the use of the runway configuration 31|31 over the past five years to the detriment of 22|13. The 22/13 configuration 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

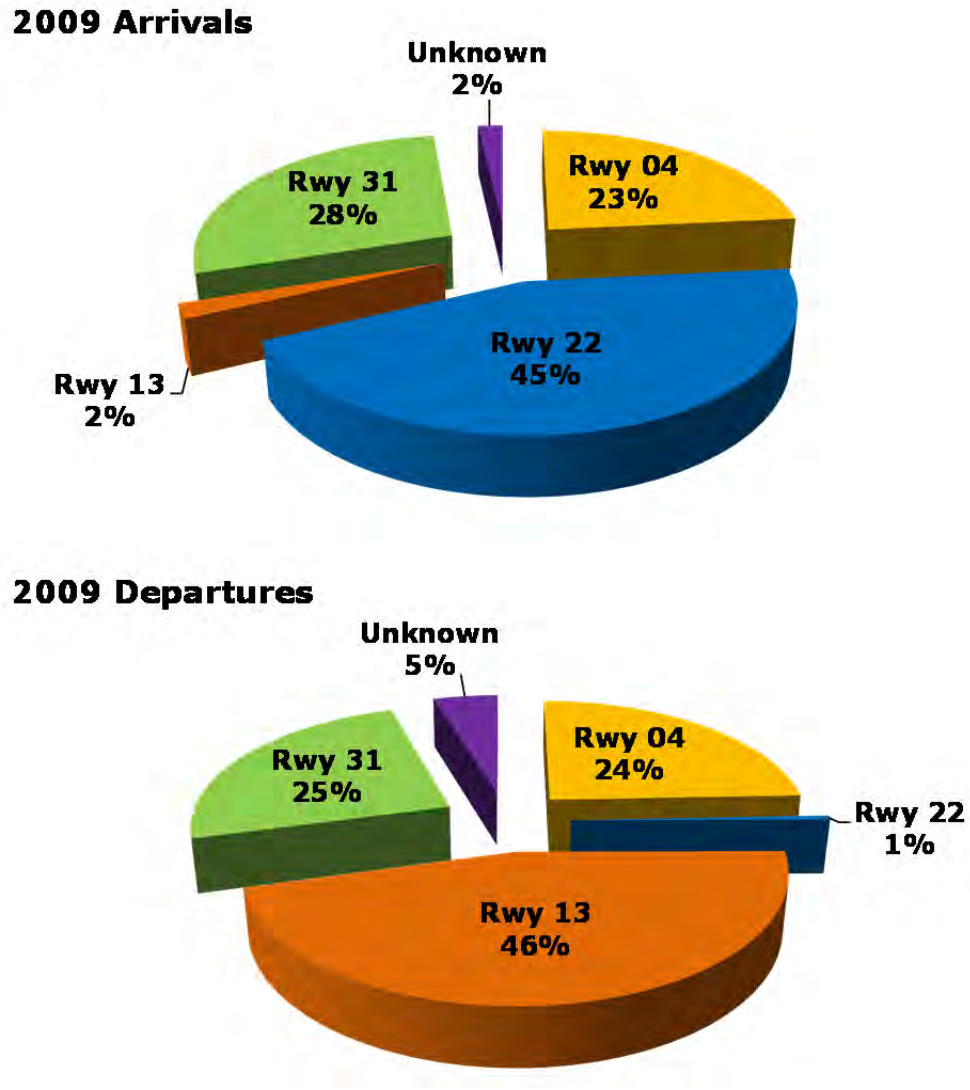
Figure 5-1: LGA Top Airport Runway Configurations – Year 2009 Usage



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

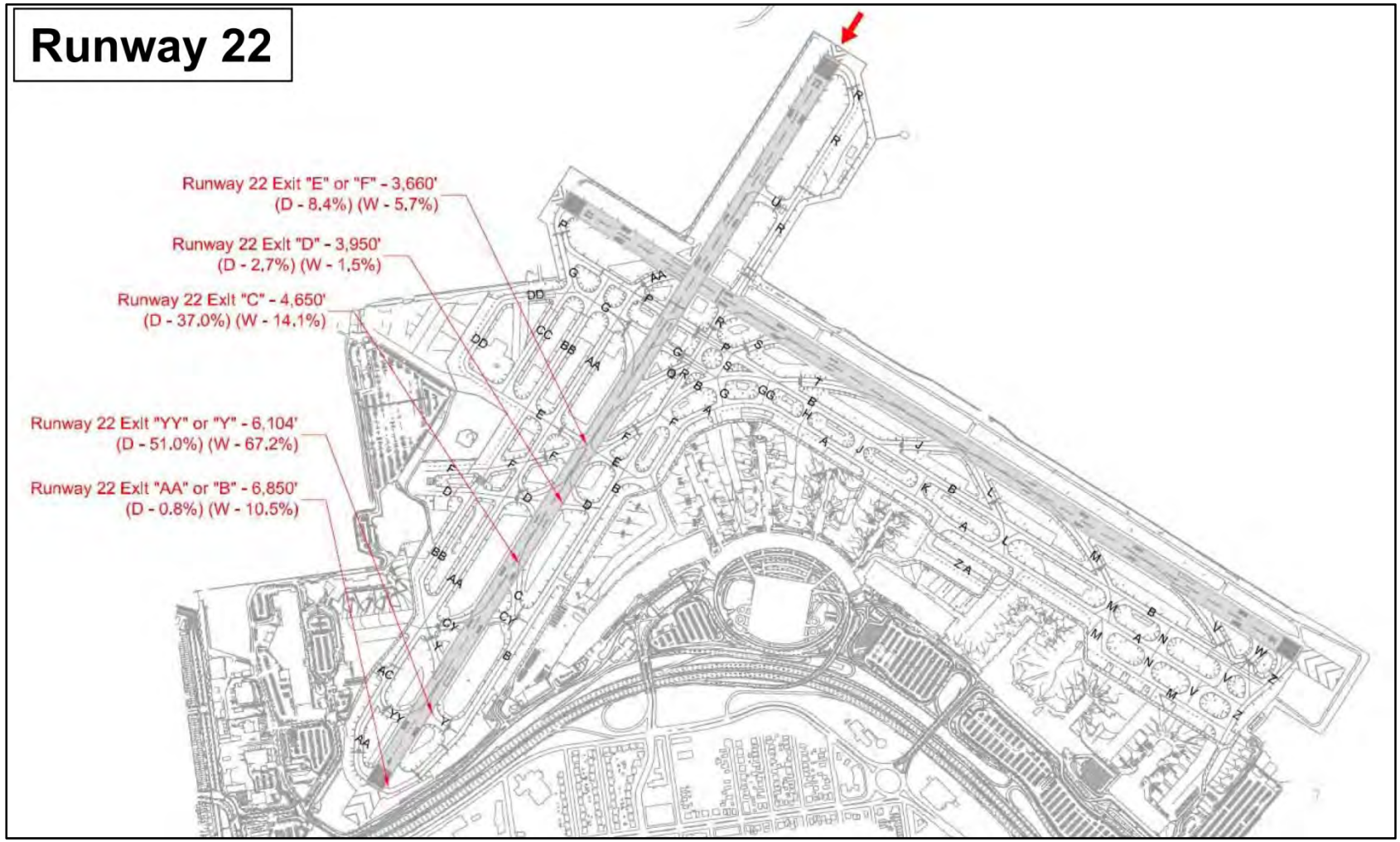
In order to properly calibrate the TAAM model, an analysis of runway exits and runway occupancy time was conducted for year 2009 at LGA using the FAA Runway Exit Design Interactive Model (REDIM). As shown in **Figure 5-3, *Runway Exit Utilization – Runway 22***, **Figure 5-4, *Runway Exit Utilization – 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%

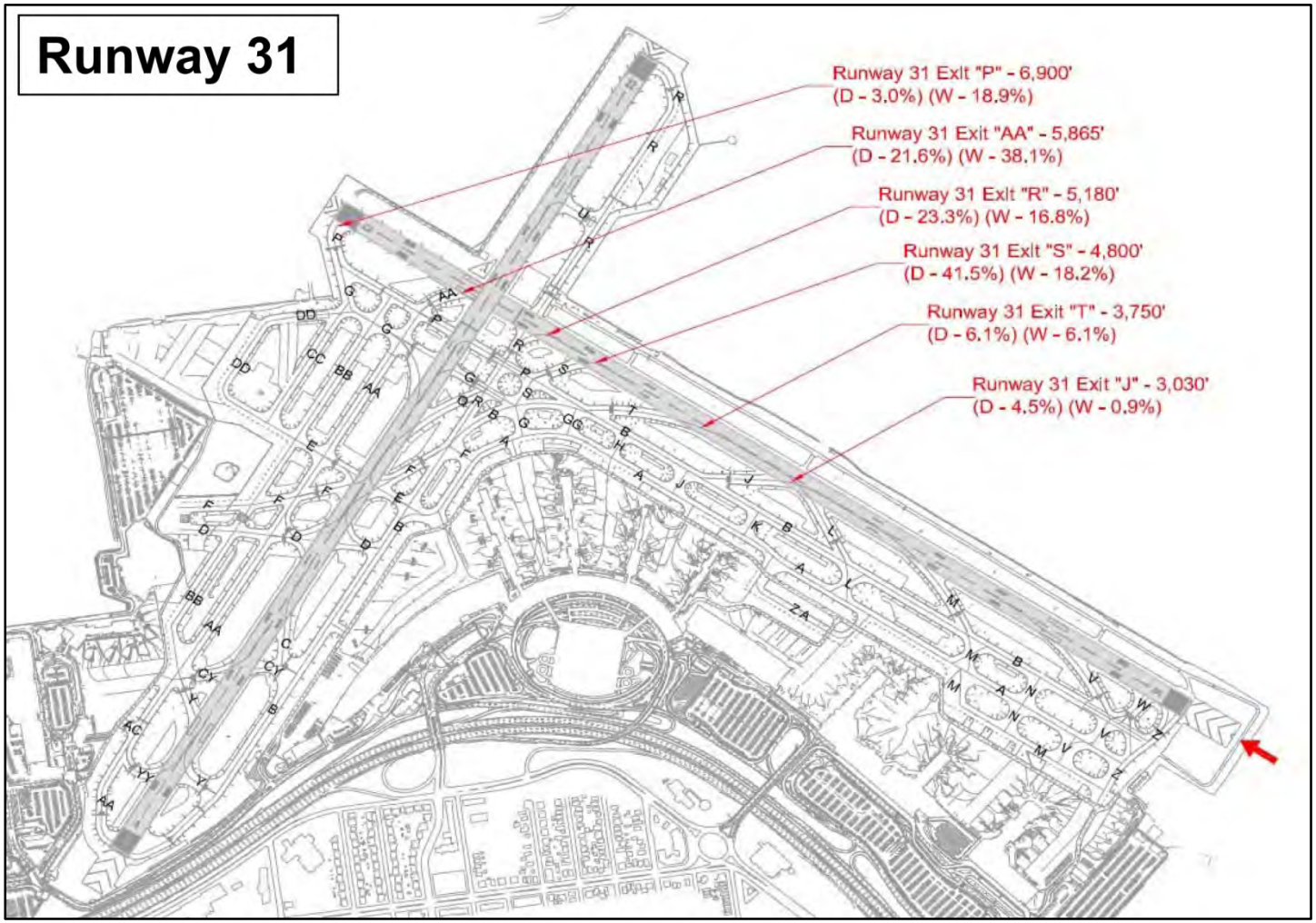
Source: Port Authority of New York and New Jersey.

Figure 5-3: LGA Runway Exit Utilization – Runway 22



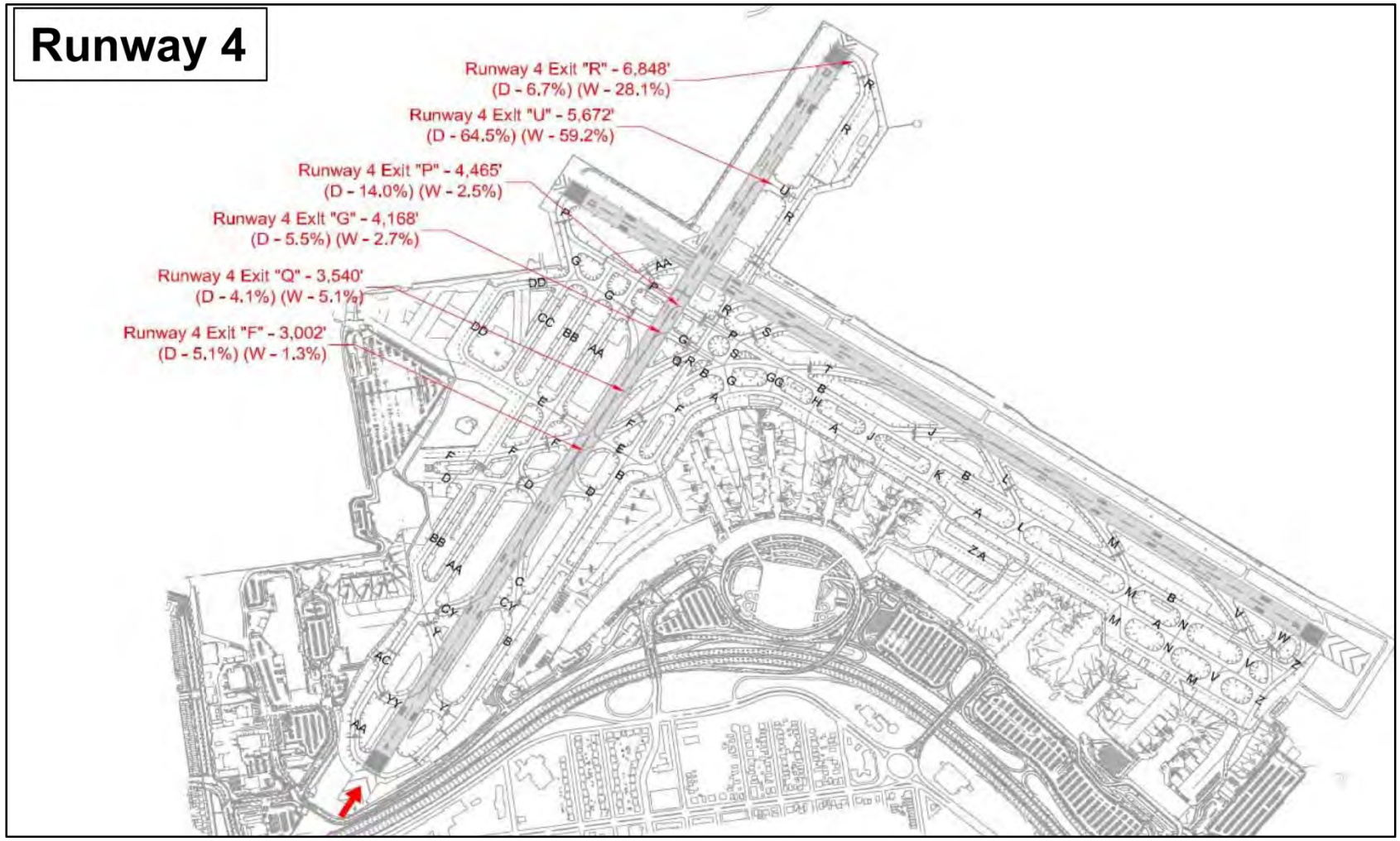
Sources: Port Authority of New York and New Jersey; Landrum & Brown analysis.

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

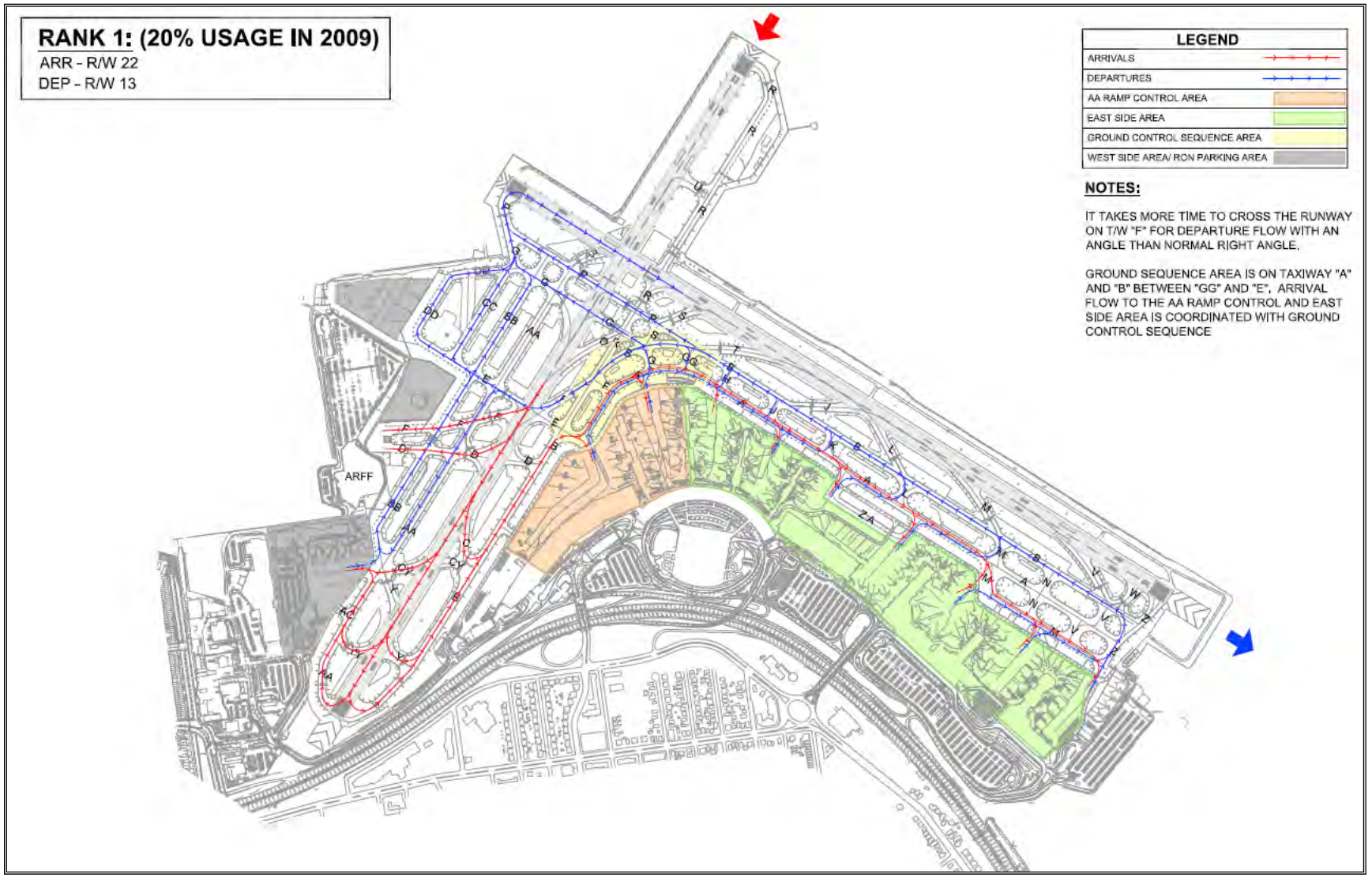
Due to the real estate constraints, LGA has a limited taxiway network. The runways are separated from the terminal area by two taxiways, Taxiways A and B, which provide most of the taxiway flow between the gate apron areas and the runways. In most runway configurations, Taxiways A and B have to be used 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.

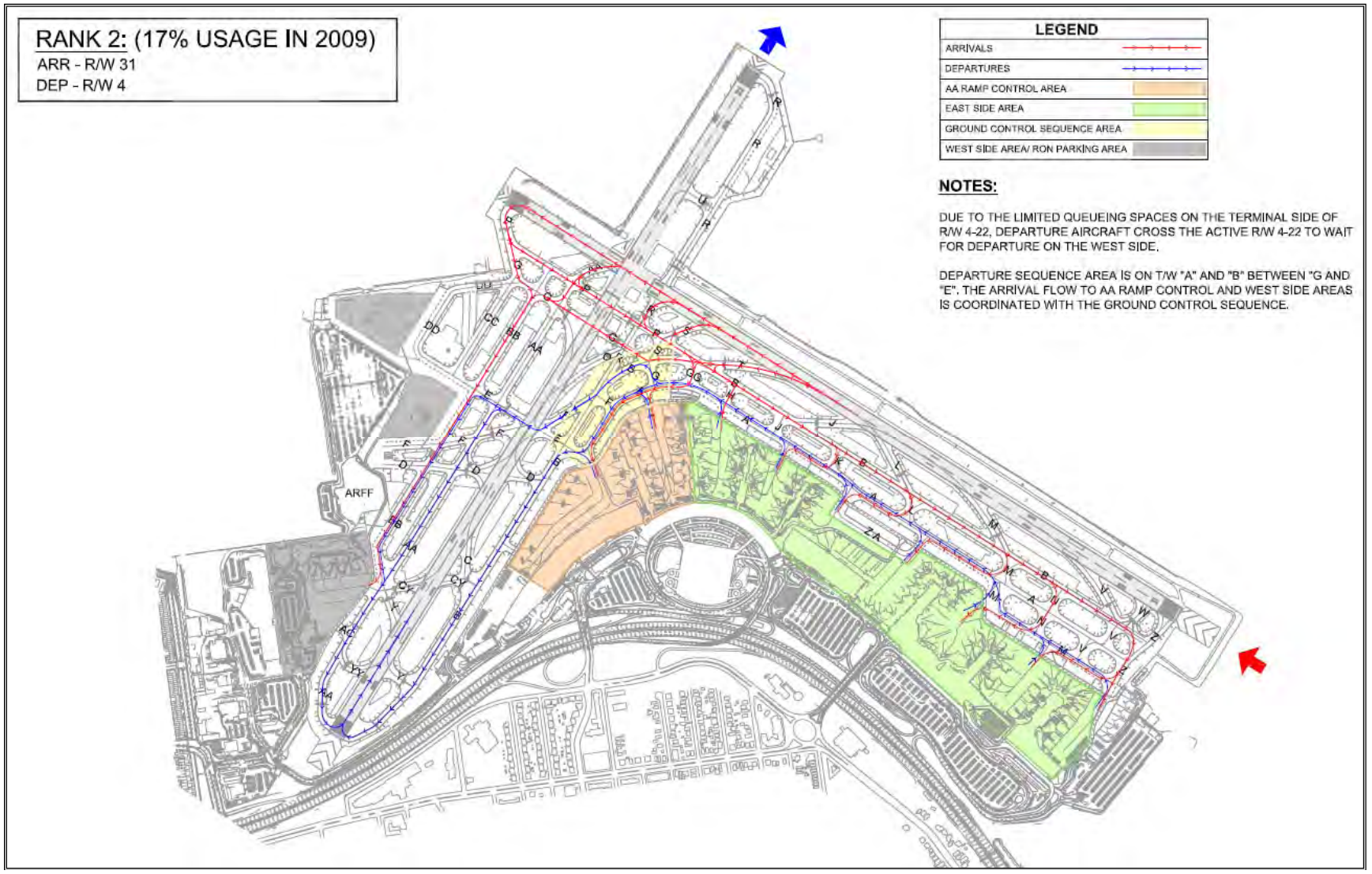
Figure 5-6, *Taxiway Flow Pattern – 22/13 Configuration*, **Figure 5-7, *Taxiway Flow Pattern – 31/4 Configuration***, **Figure 5-8, *Taxiway Flow Pattern – 4/13 Configuration***, and **Figure 5-9, *Taxiway Flow Pattern – 22/31 Configuration***, present the taxi routes used by arriving and departing aircraft under each operating flow at LGA.

Figure 5-6: Taxiway Flow Pattern – 22/13 Configuration



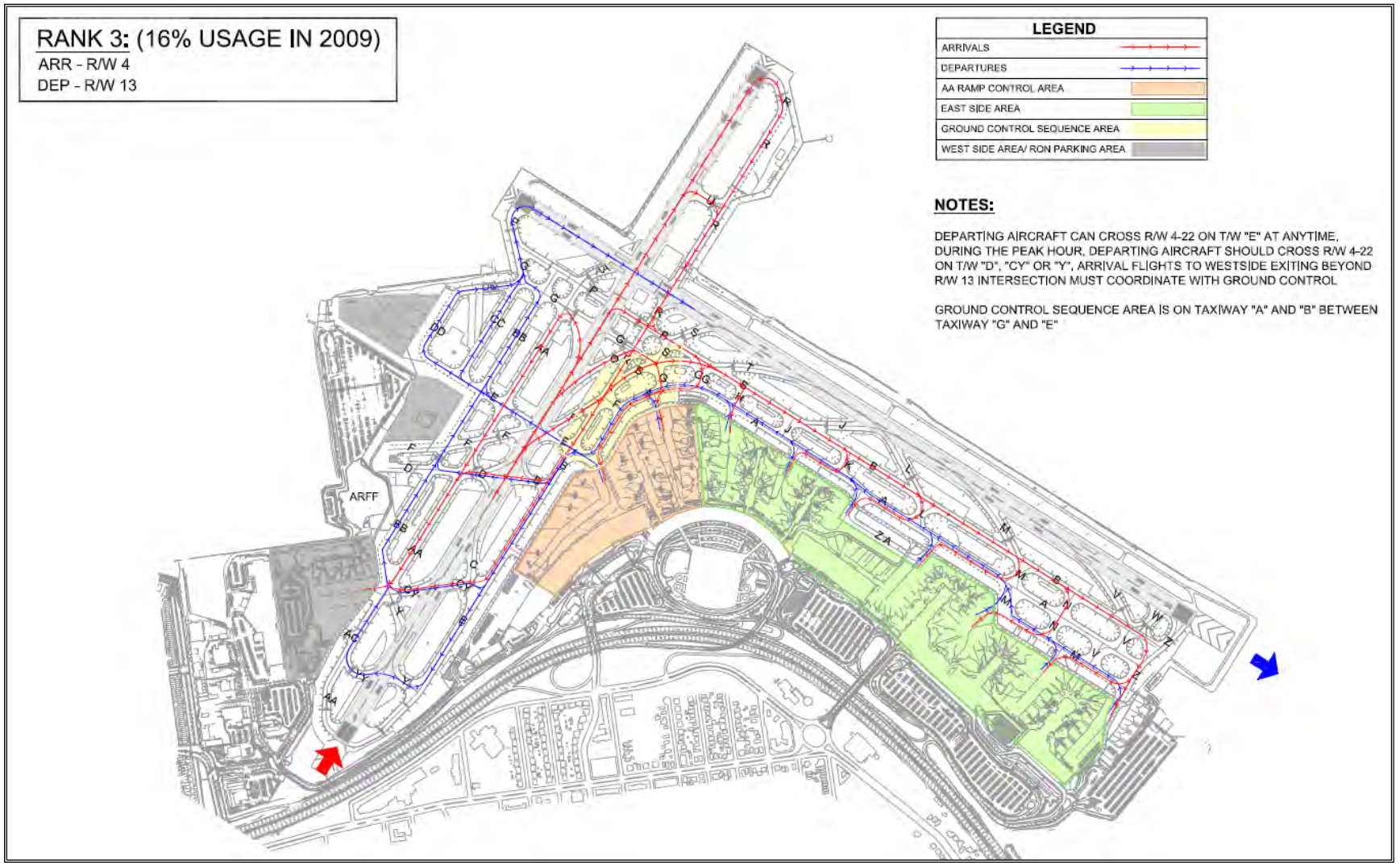
Source: Landrum & Brown analysis.

Figure 5-7: Taxiway Flow Pattern – 31/4 Configuration



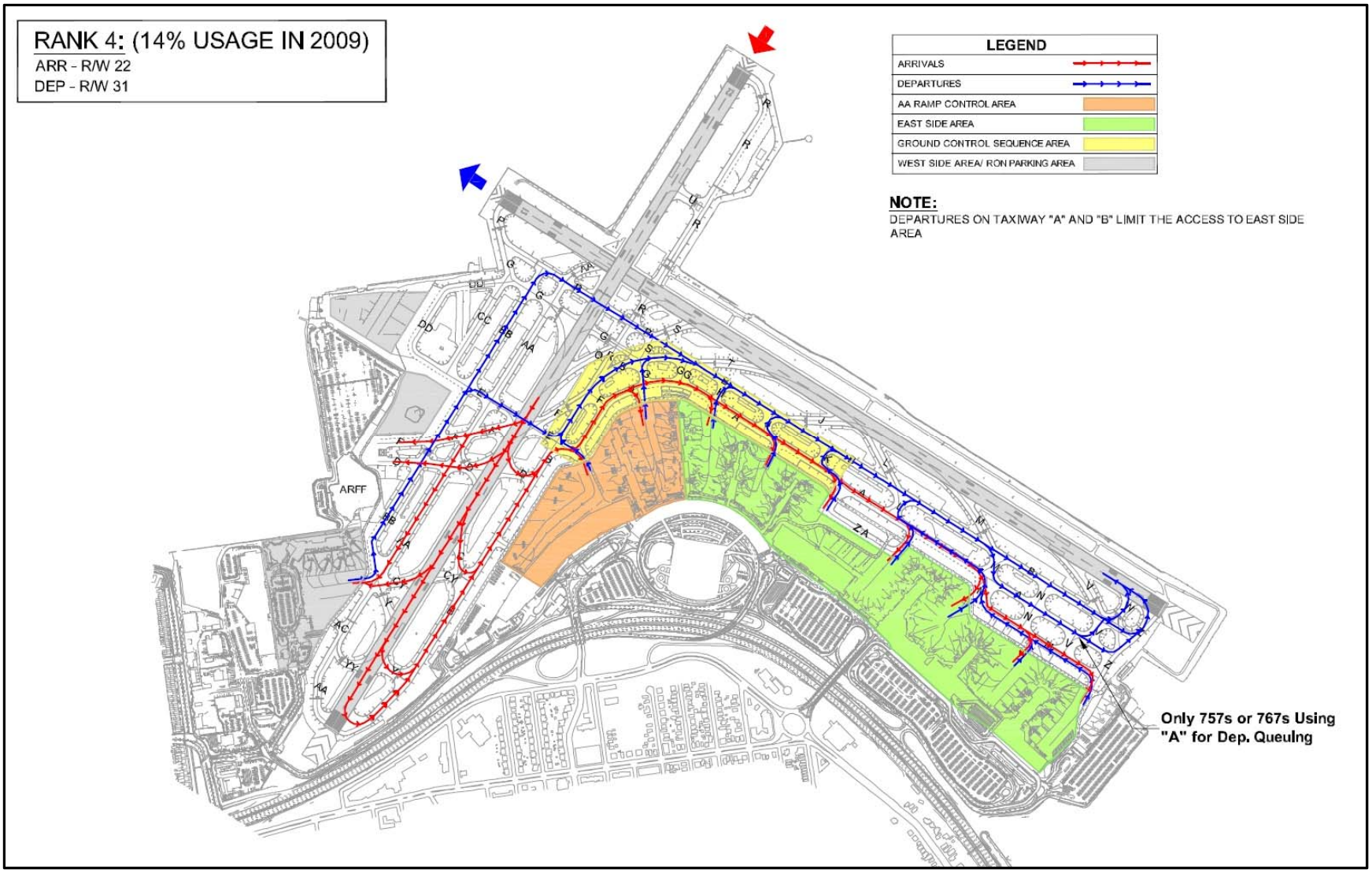
Source: Landrum & Brown analysis.

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

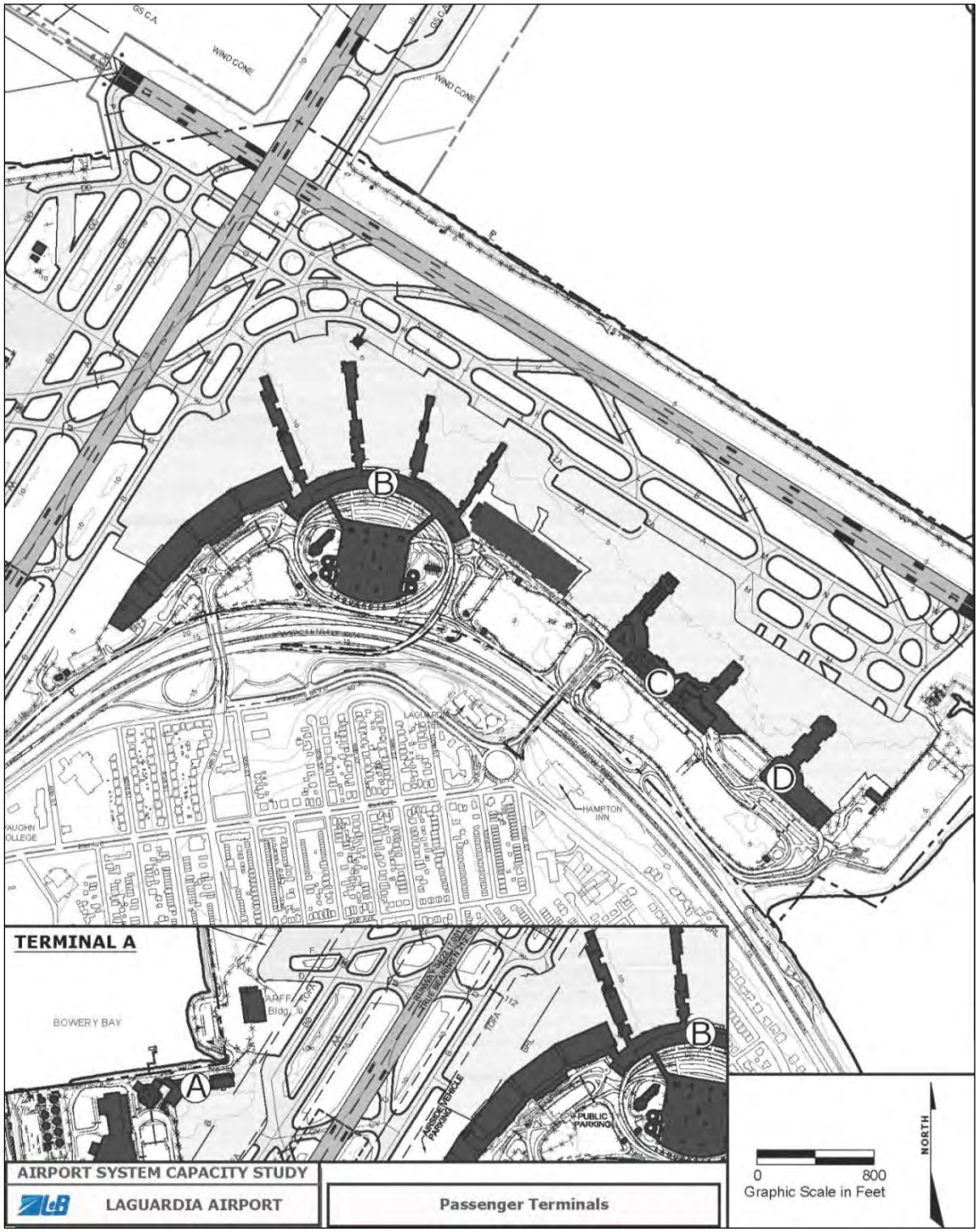
Departures can taxi to Runway 31 using one the following taxi routes:

- 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



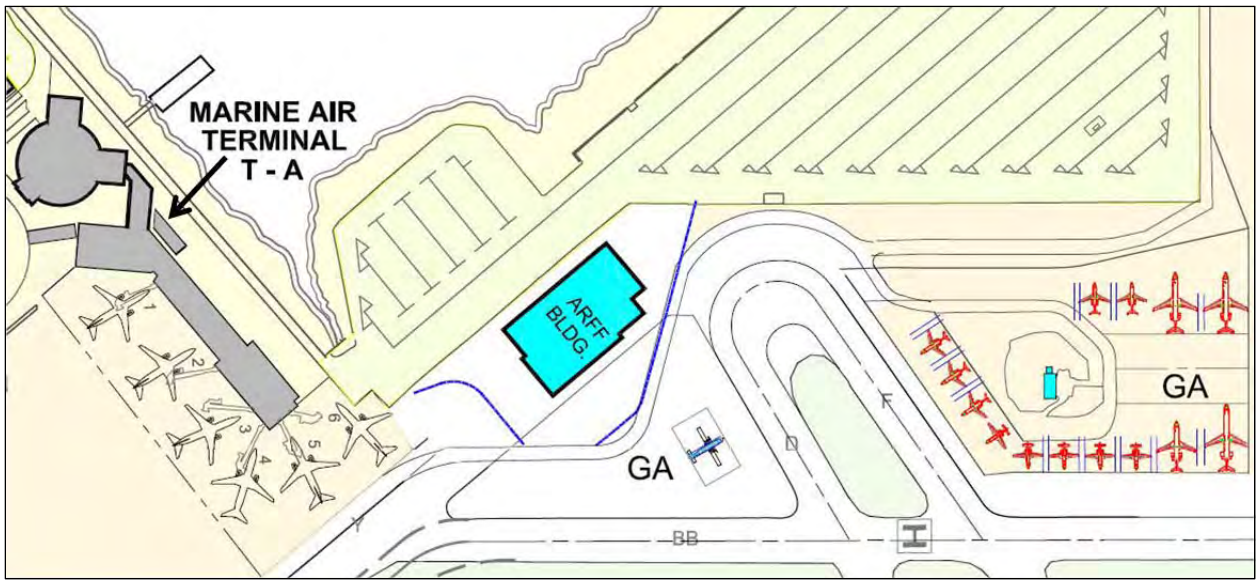
Source: Landrum & Brown analysis.

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.

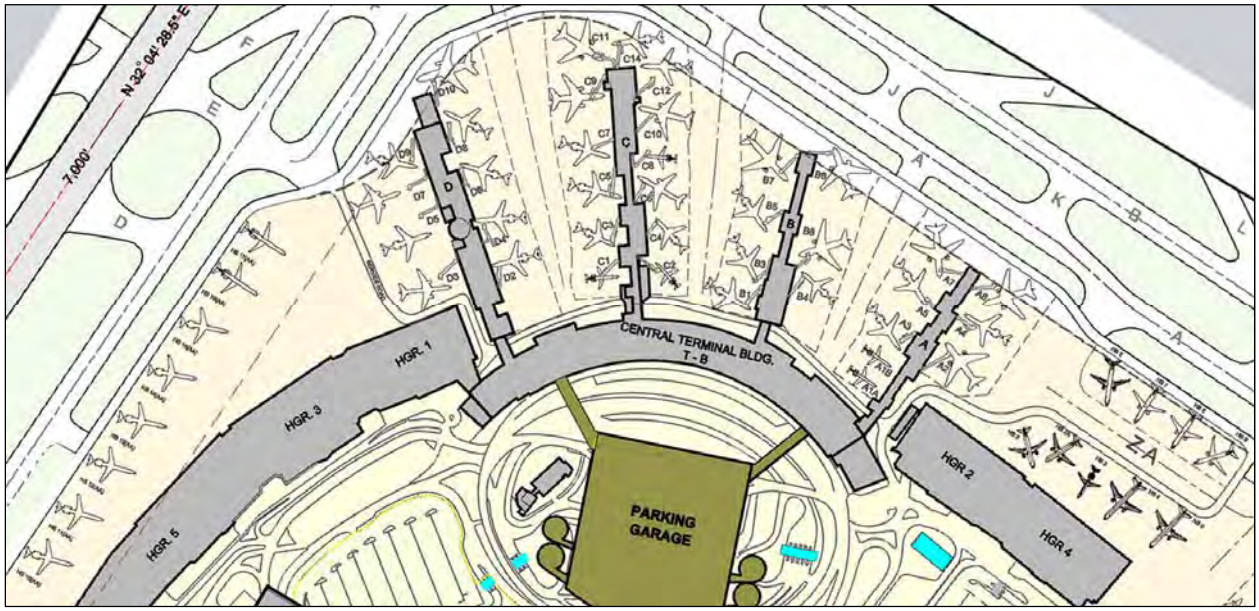
Figure 6-2: LGA Terminal A



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.

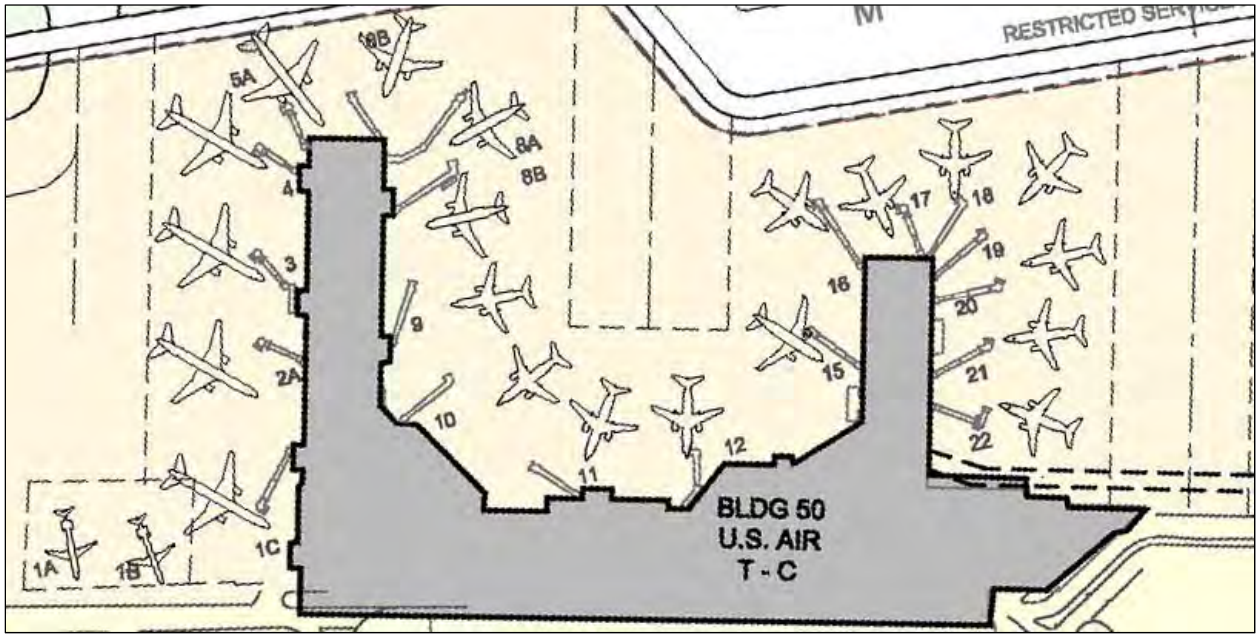
Figure 6-3: LGA Terminal B



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.

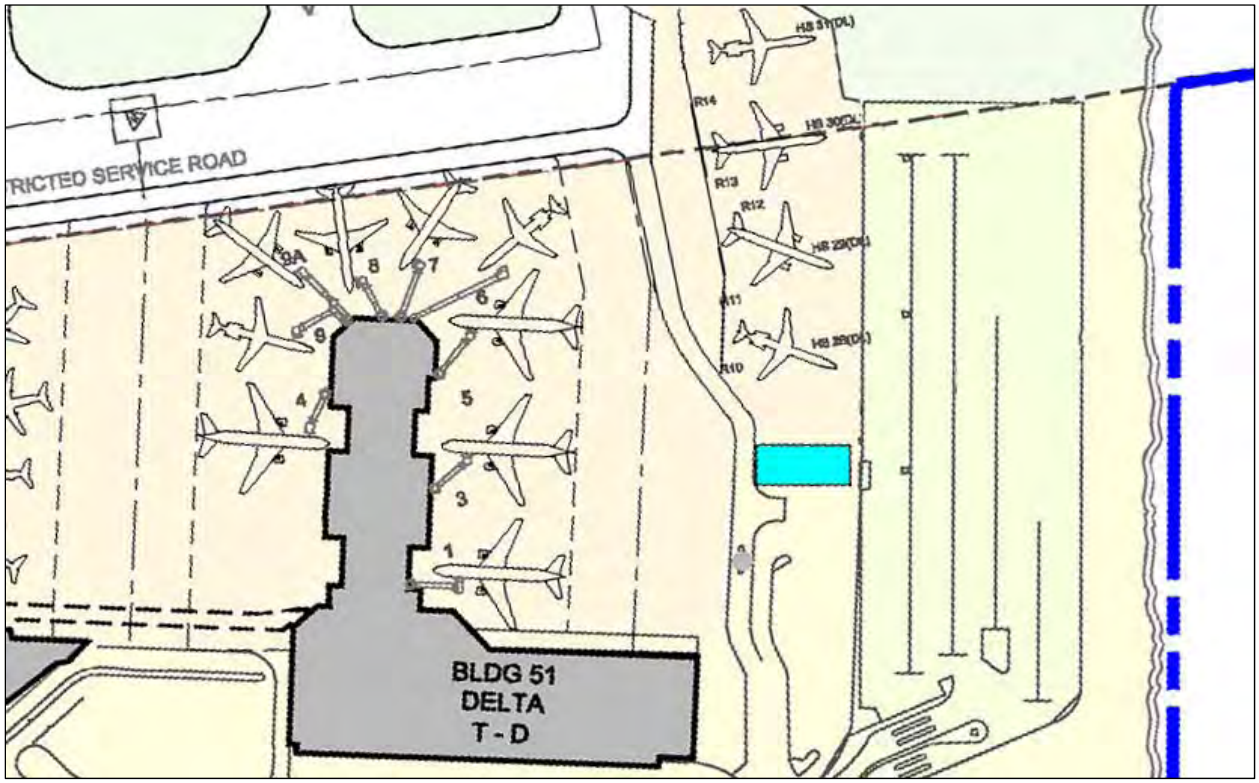
Figure 6-4: LGA Terminal C



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

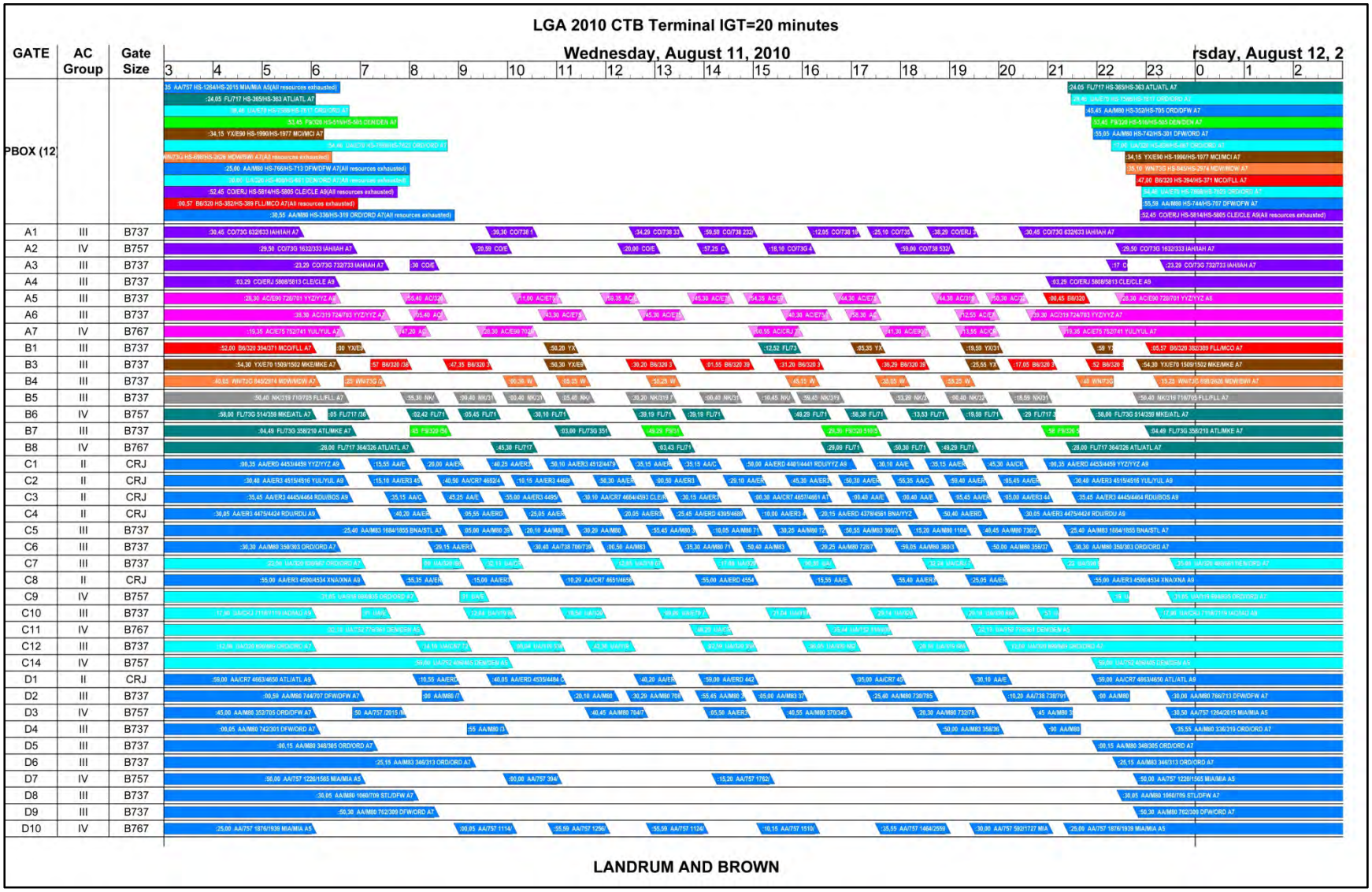
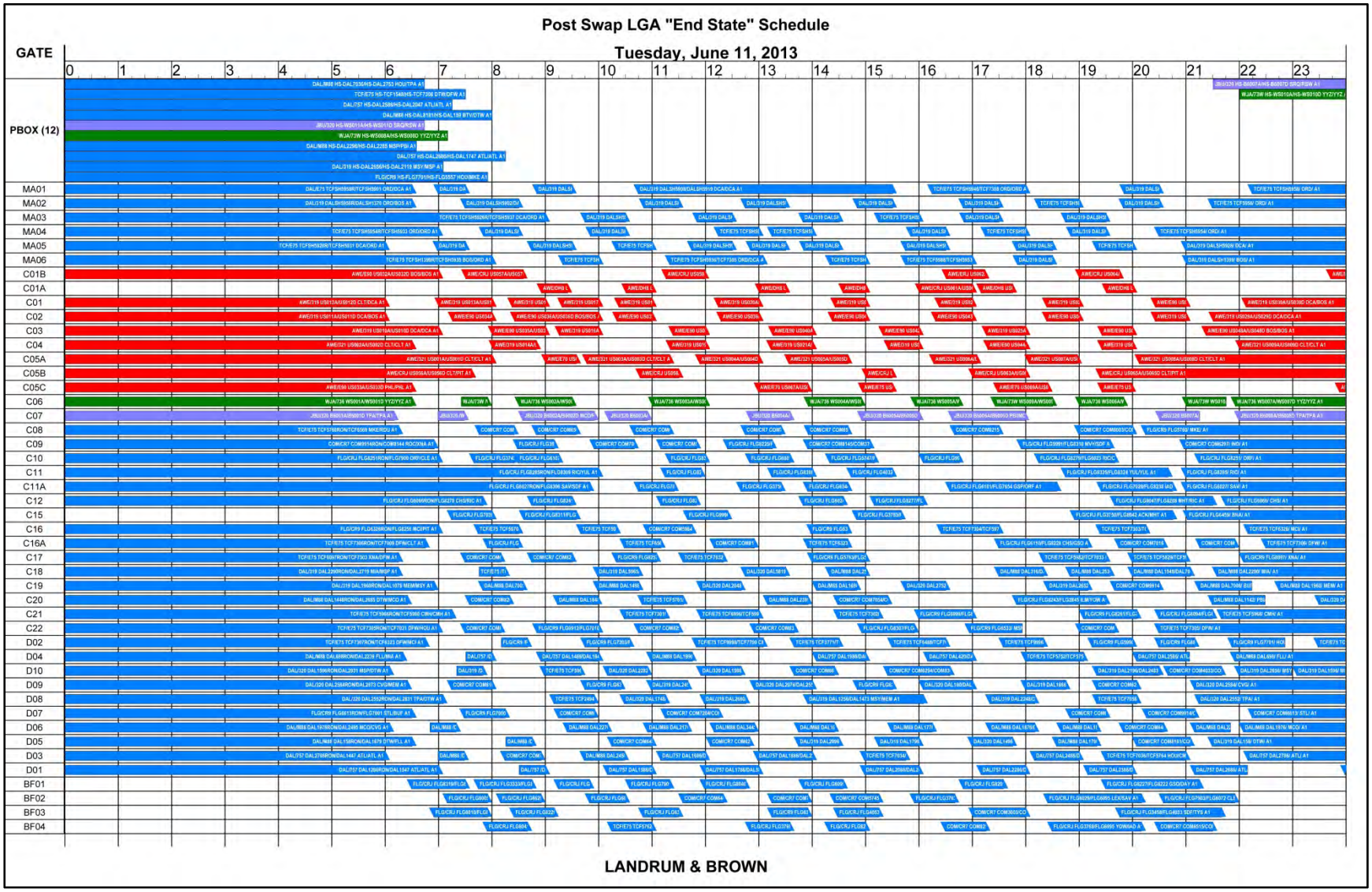


Figure 6-6: LGA Design Day Gated Schedule (Cont.)



Source: Landrum & Brown analysis.

6.3 OTHER TERMINAL-RELATED ASSUMPTIONS

6.3.1 Aircraft Pushback Operations

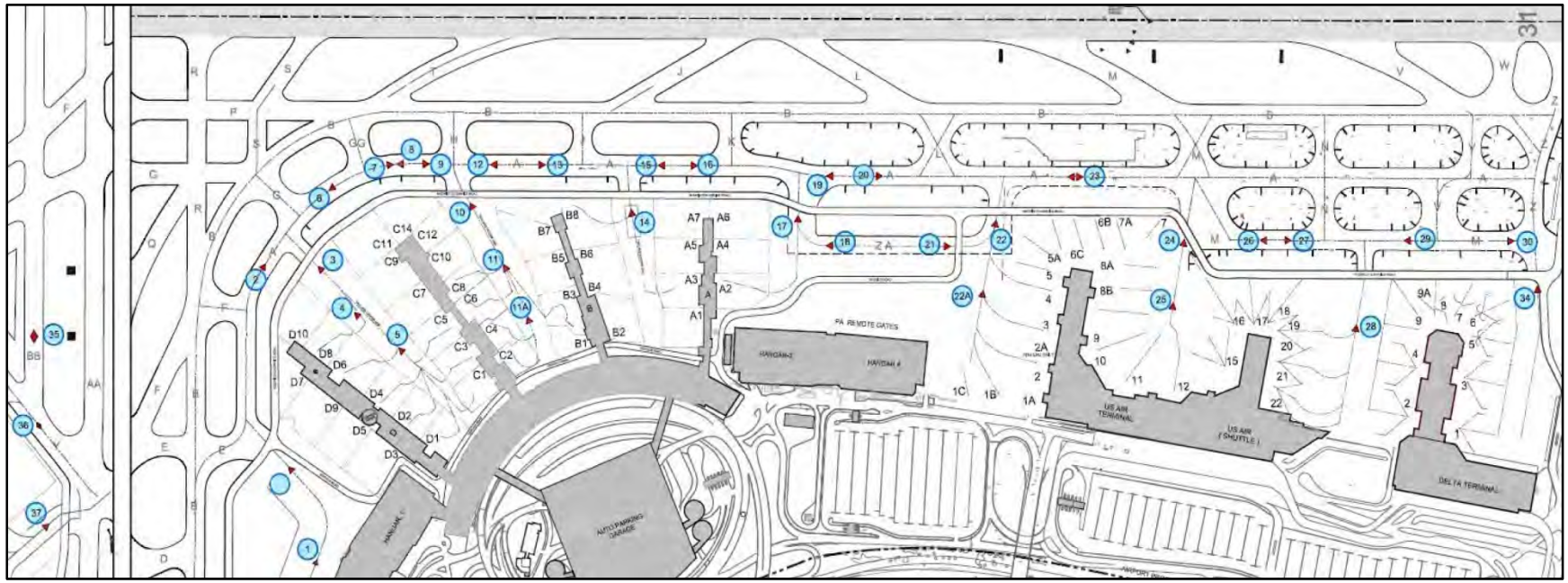
An Aircraft pushback operation can be split into five different phases: (a) actual push-back; (b) pull-forward; (c) detach tug; (d) start engines and (e) get clearance to taxi. Aircraft pushback operations were timed for each phase of the operation for CTB and the Delta Terminal at LGA. Due to the configuration 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:

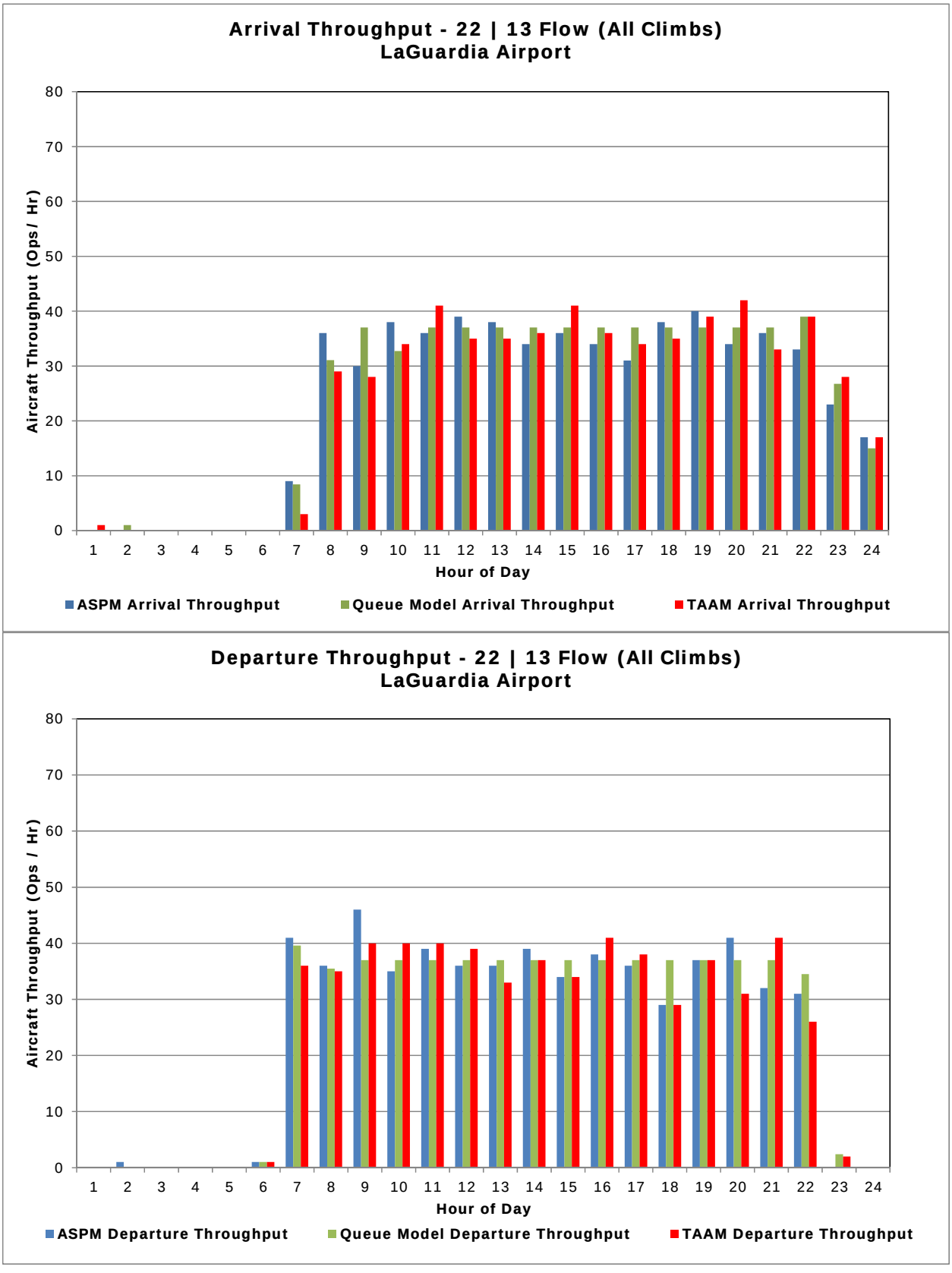
- 22/13 Configuration - All Climbs
- 22/13 Configuration - All Whitestone Climbs
- 31/4 Configuration
- 4/13 Configuration
- 22/31 Configuration

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***

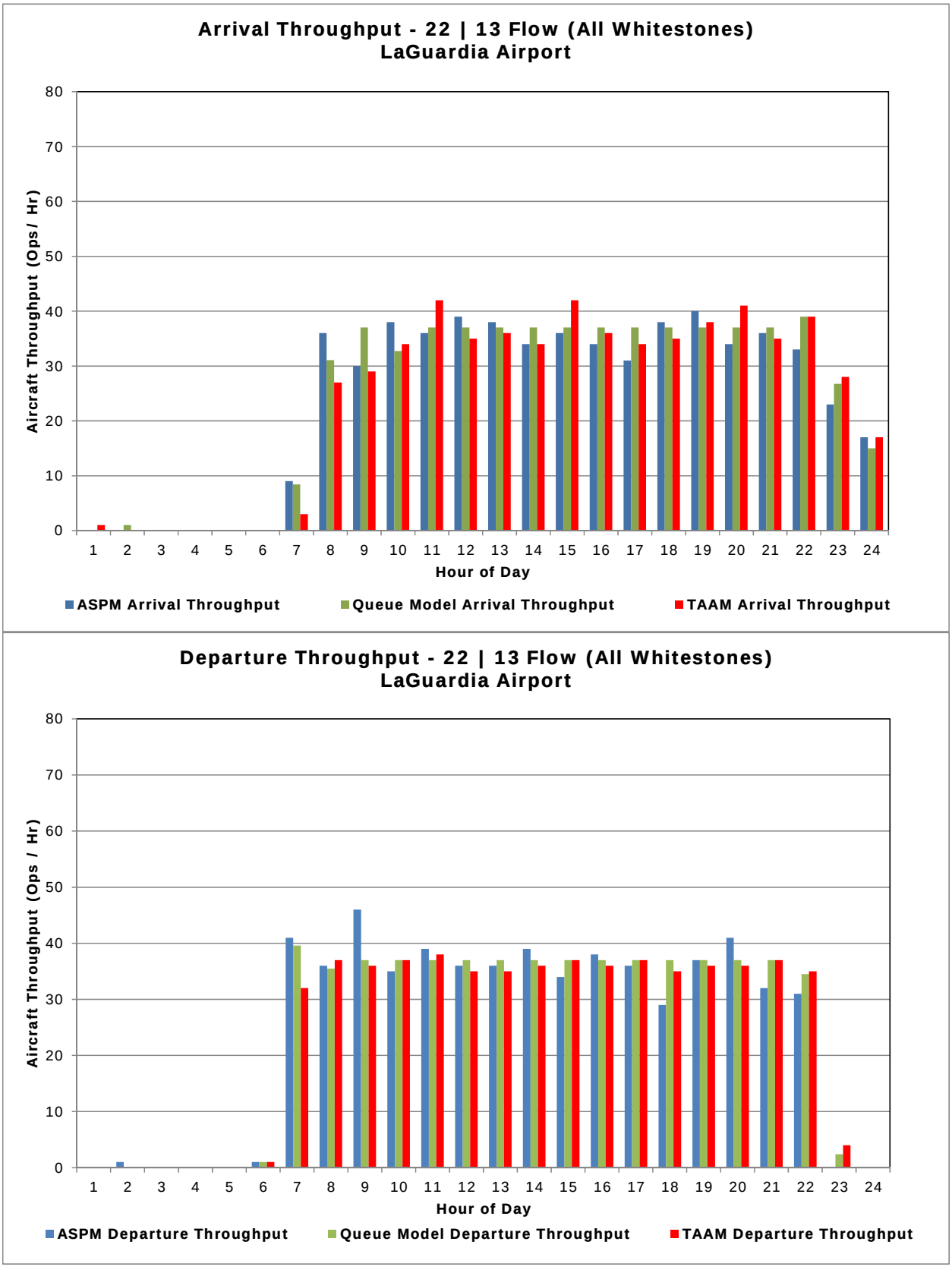
Calibration – 31/4 Configuration, **Figure 7-4, *LGA TAAM Calibration – 4/13 Configuration***, and **Figure 7-5, *LGA TAAM Calibration – 22/31 Configuration***.

Figure 7-1: LGA TAAM Calibration – 22/13 All Climbs



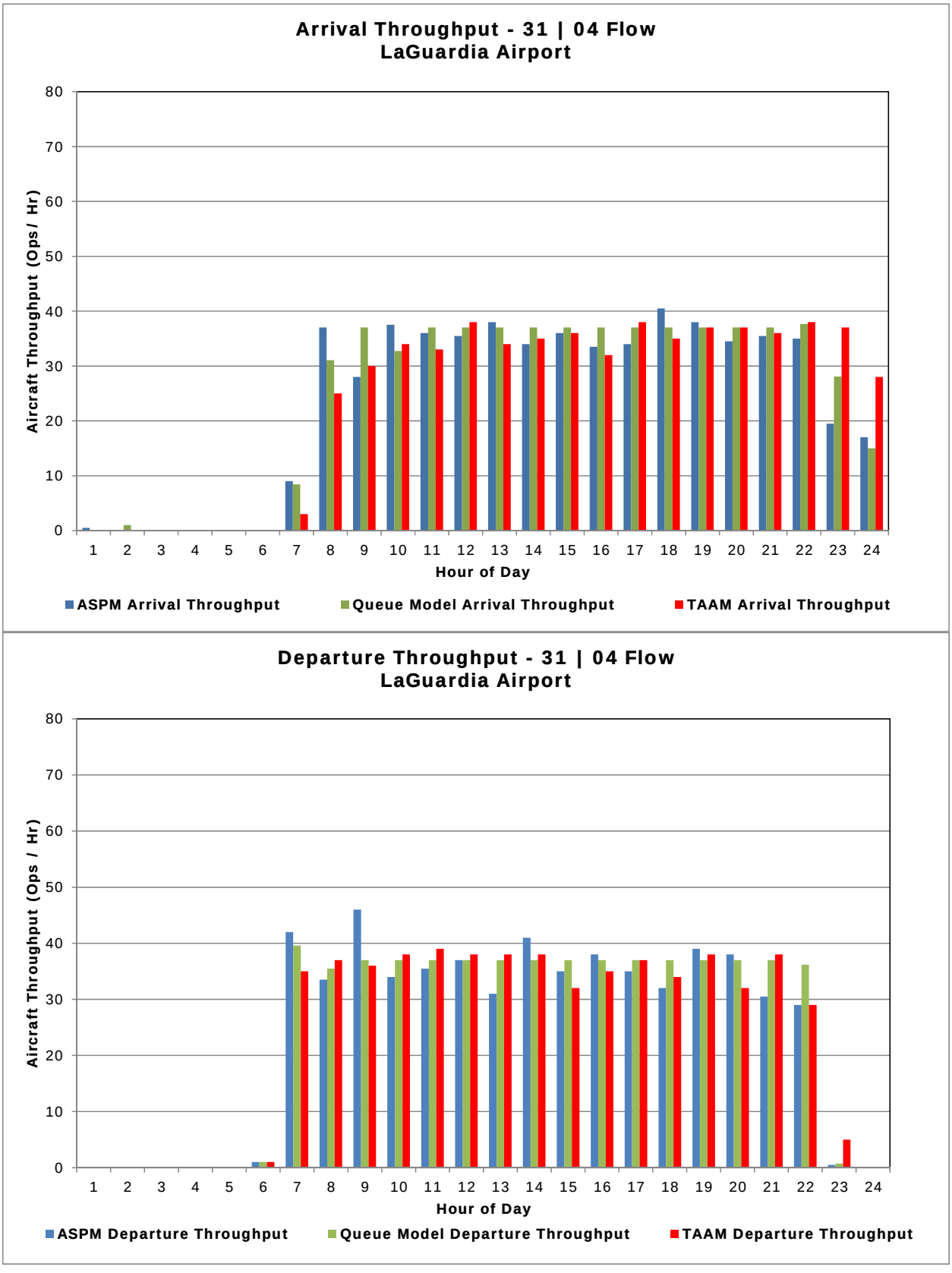
Source: Landrum & Brown analysis.

Figure 7-2: LGA TAAM Calibration – 22/13 All Whitestone Climbs



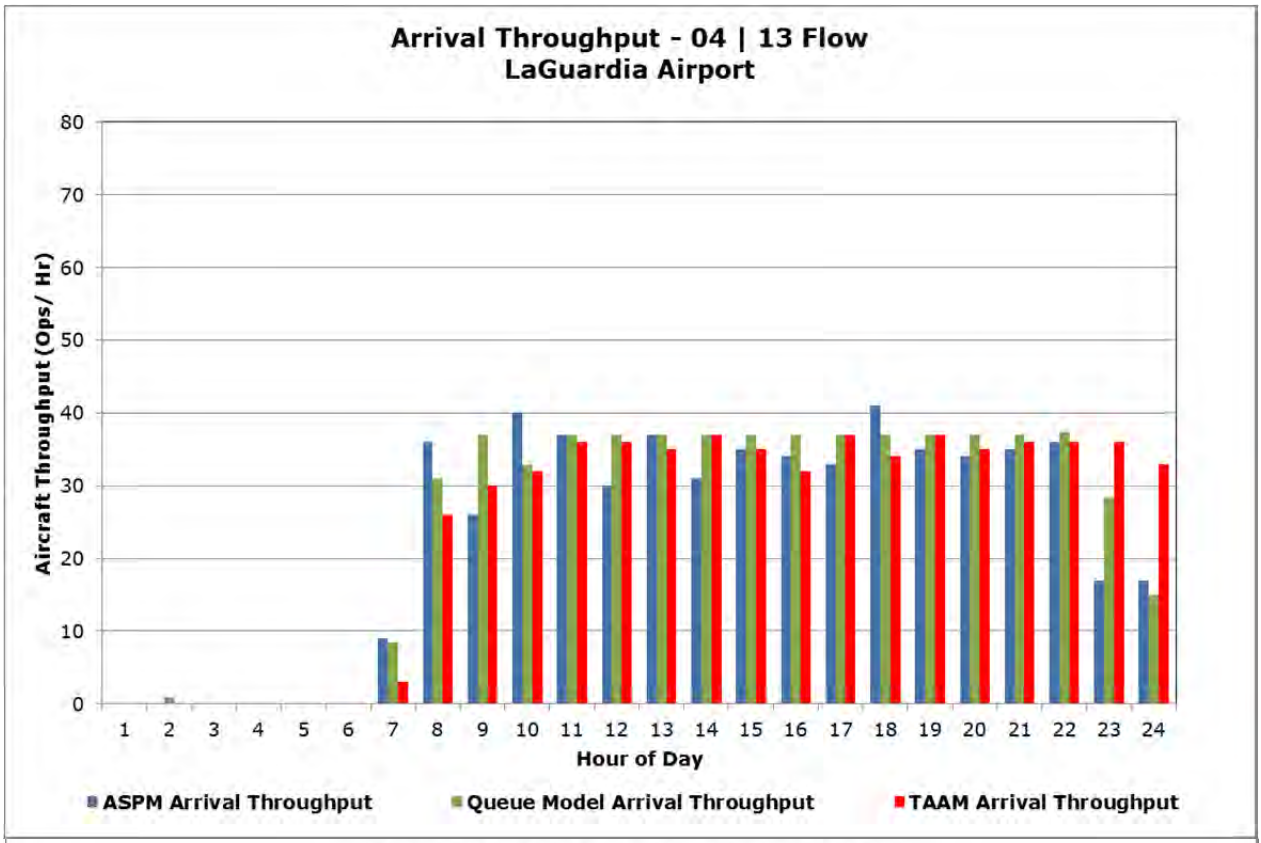
Source: Landrum & Brown analysis.

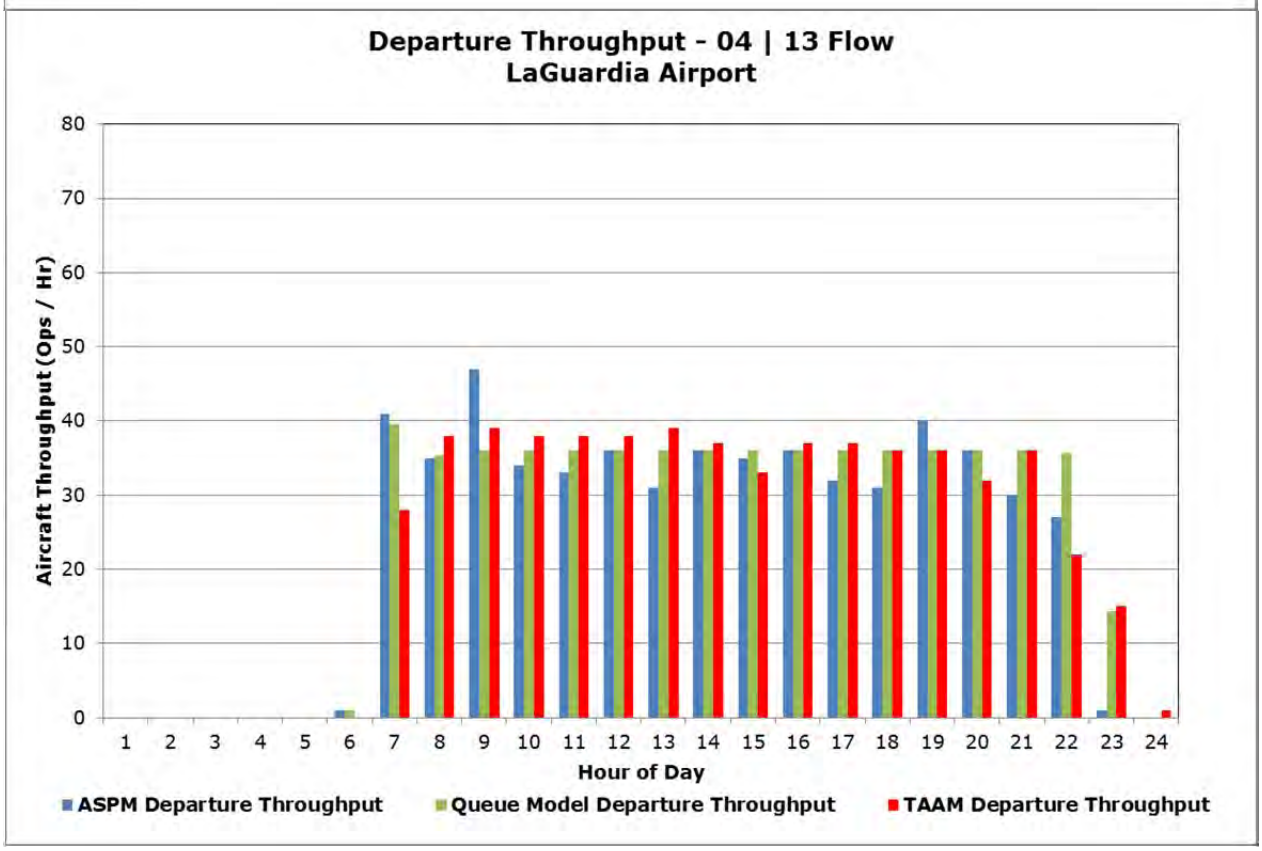
Figure 7-3: LGA TAAM Calibration – 31 / 4 Configuration



Source: Landrum & Brown analysis.

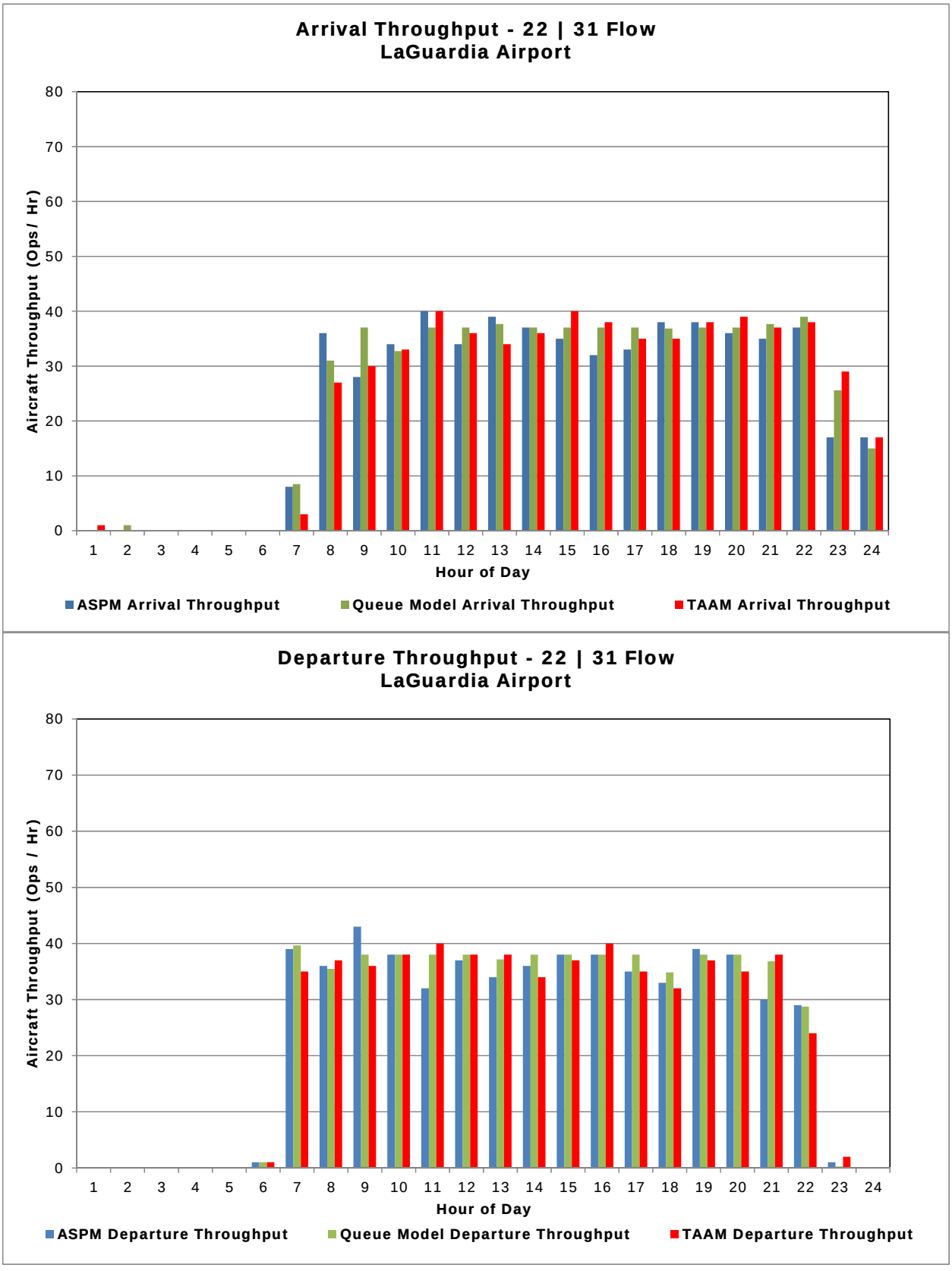
Figure 7-4: LGA TAAM Calibration – 4/13 Configuration





Source: Landrum & Brown analysis

Figure 7-5: LGA TAAM Calibration – 22/31 Configuration



Source: Landrum & Brown analysis.

Appendix D

Terminal C&D Airside Reconfiguration Airfield Simulation Analysis (TAAM) Results 2024 & 2029 Demand Levels

LaGaurdia Airport

Terminal C&D Airside Reconfiguration

Airfield Simulation Analysis (TAAM) Results
2024 & 2029 Demand Levels

LaGuardia Airport

DELTA

Table of Contents

- LGA Redevelopment Scenarios
  - Two scenarios were analyzed for the 2024 and 2029 Demand Level
- Airfield Simulation Analysis and Results
  - Definitions
  - Runway Through-put rates comparison
    - 2024 Demand Level
    - 2029 Demand Level
  - Arrival and Departure Metrics
    - Arrival and departure delays and taxi times for the 2024 Demand Level
    - Arrival and departure delays and taxi times for the 2029 Demand Level
- Conclusion

Scenarios

LGA Redevelopment Scenarios

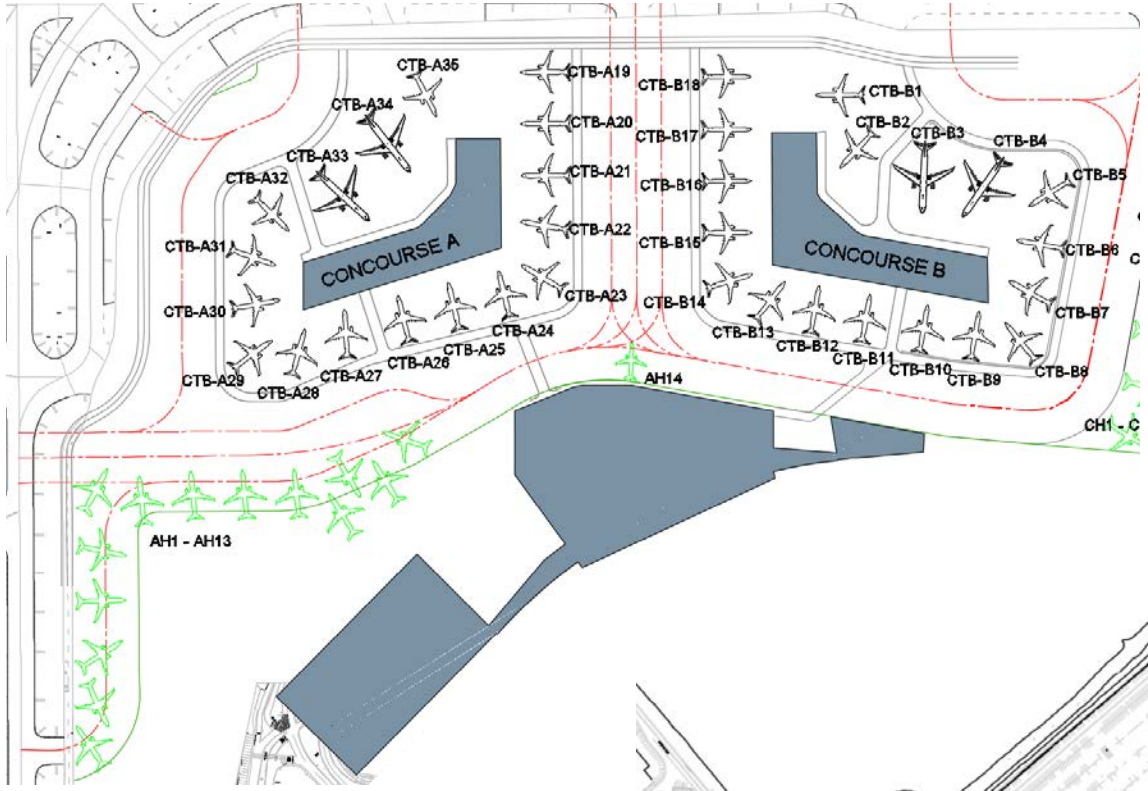
- 2 scenarios were analyzed for 2024 & 2029 demand levels:
  - **No Action** (Terminal B redevelopment only)
  - **Full Build** (Terminal B redevelopment & Terminal C-D redevelopment)

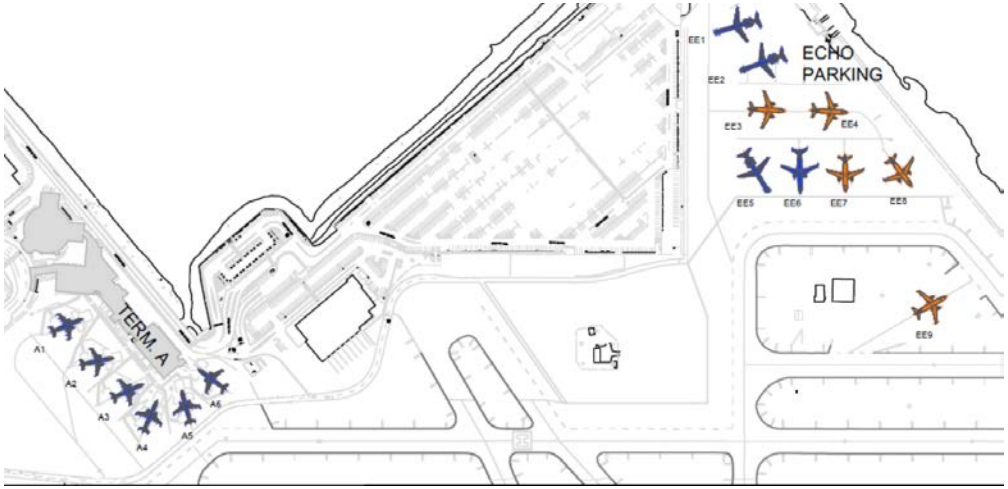
Demand Level	No Action	Full Build
2024	✓	✓
2029	✓	✓

- An Appendix to this report includes the results of a sensitivity analysis assuming airline colocation in the new terminals in the Full Build scenario

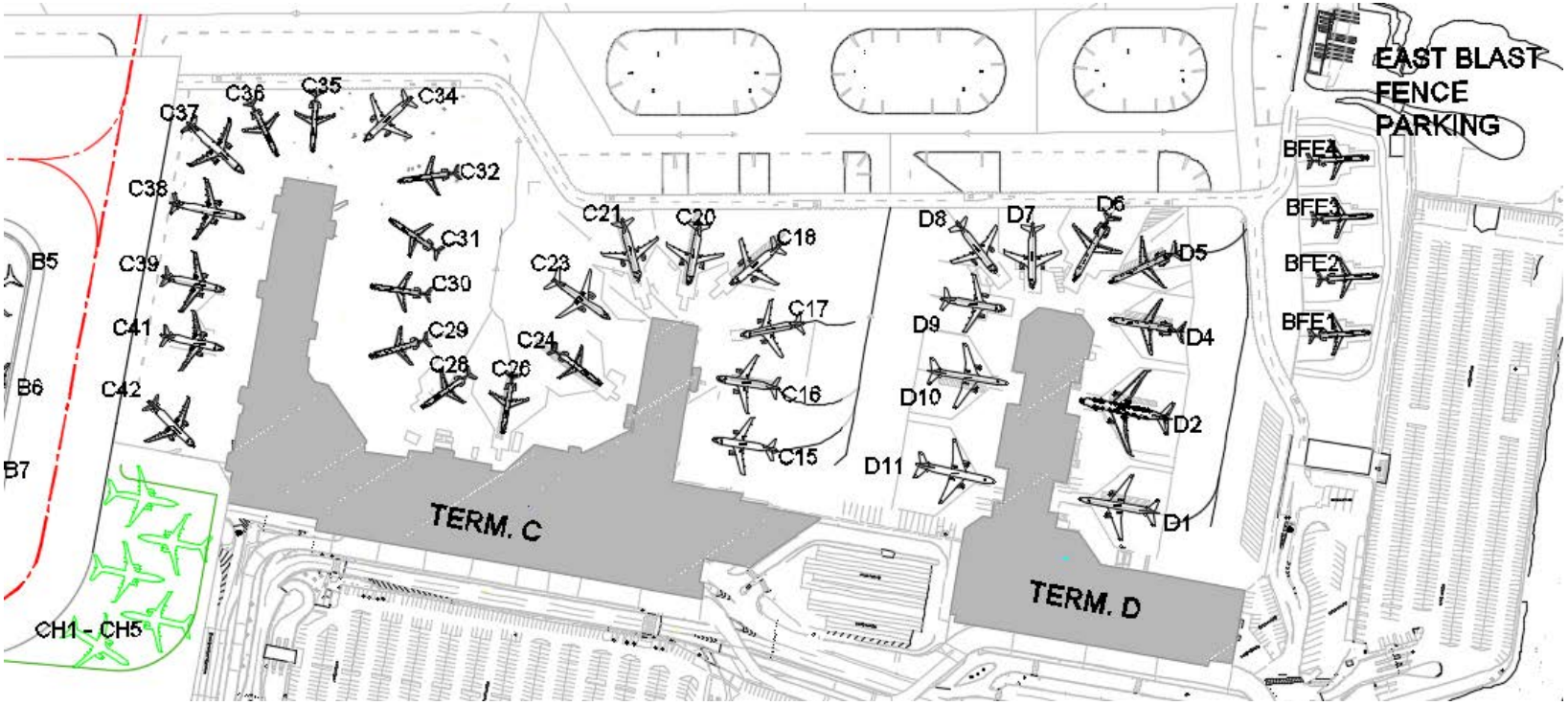
No Action Scenario

Existing Terminal A & Proposed Terminal B



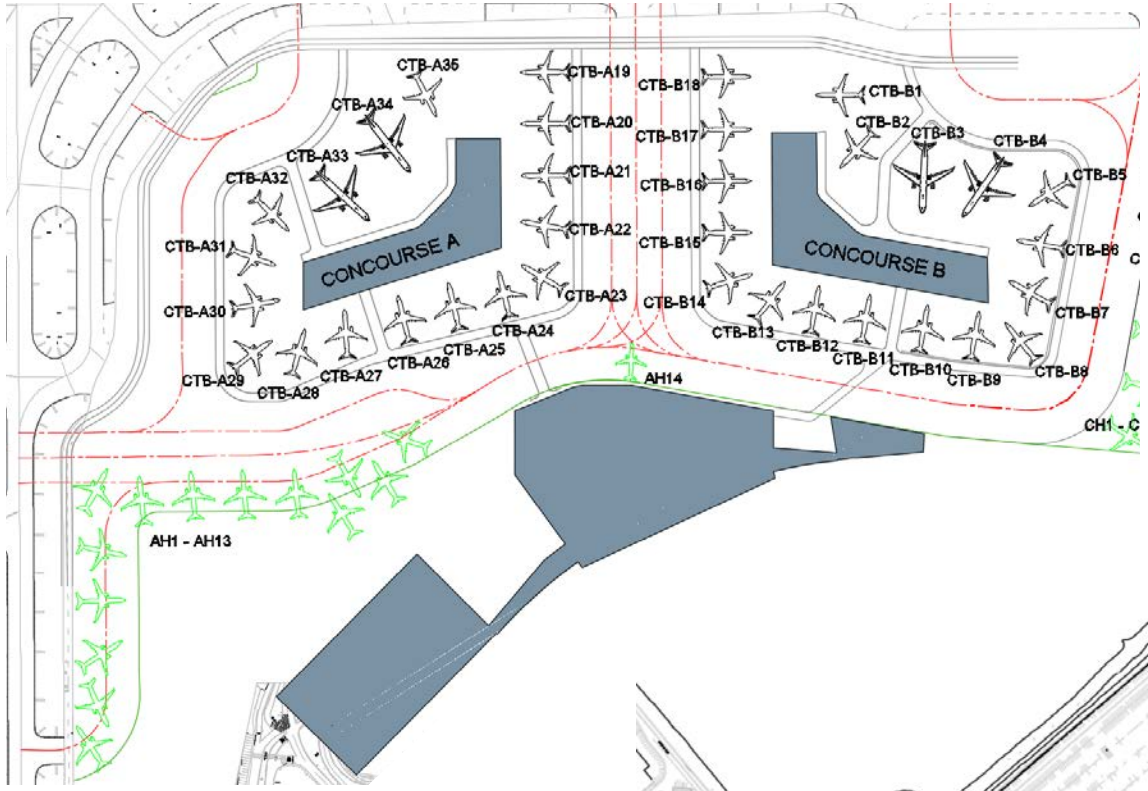


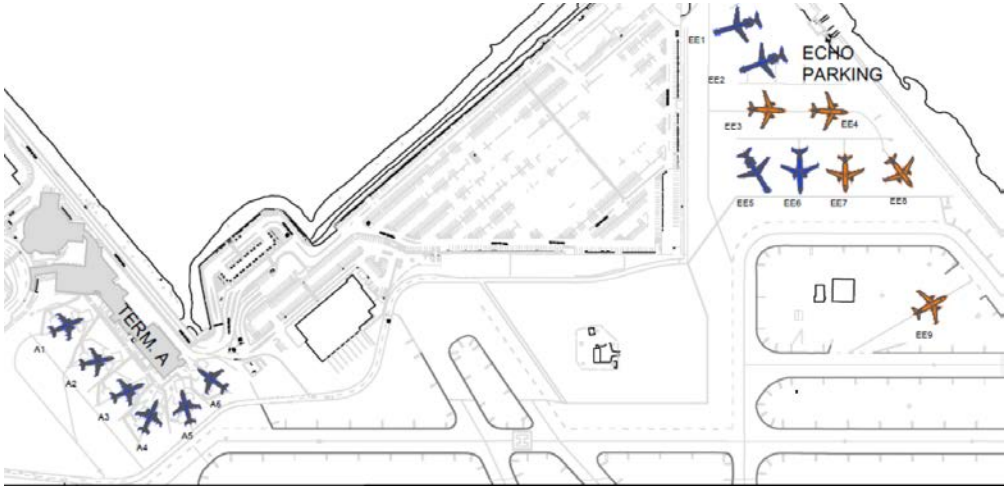
No Action Scenario
Existing Terminals C and D



Full Build Scenario

Existing Terminal A & Proposed Terminal B





Full Build Scenario
Proposed Terminal C/D

Airfield Simulation Analysis and Results

Performance Metric Definitions

Definitions

- Peak Through-put Rates: This is a measure of practical capacity of an airport system during periods of constant demand
  - Through-put rates are reported for each 60-minute interval in a 24-hour period for a given operating scenario
- Average Unimpeded Departure Taxiing Time: 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 interruptions
  - This does not include the time required for the aircraft to pushback and to detach the tug
- Average Unimpeded Arrival Taxiing Time: Time required for an arriving aircraft to reach its arrival gate after it exits the arrival runway and taxies at the default taxiing speed without any interruptions
- Average Departure Taxiing Delay: Delay incurred by a departing aircraft while taxiing to the departure runway
  - This delay is incurred due to aircraft taxiing at lower-than-default speeds and / or stopping-and-starting on the taxiways due to the presence of other aircraft in the vicinity
- Average Arrival Taxiing Delay: Delay incurred by an arriving aircraft while taxiing to its arrival gate

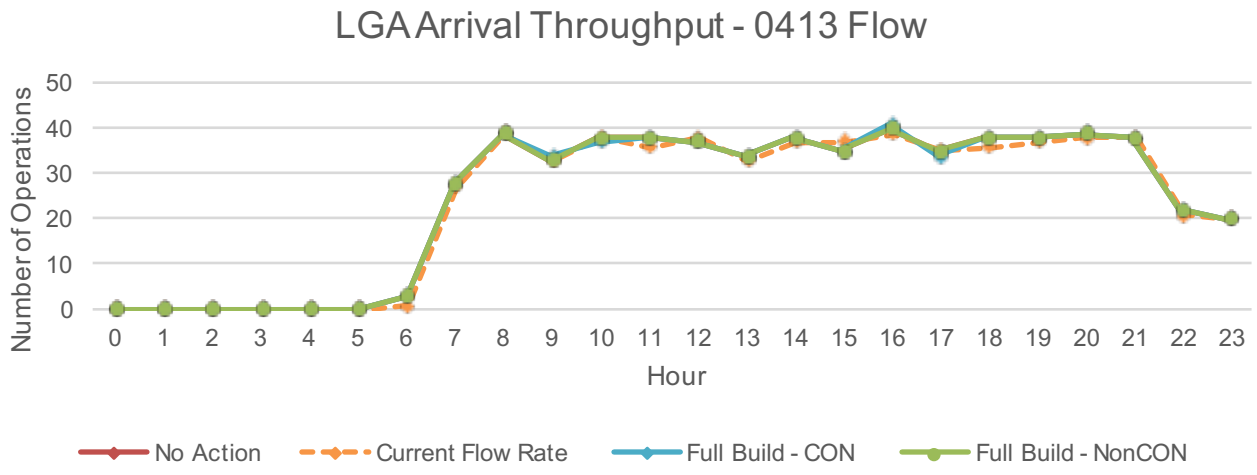
Definitions

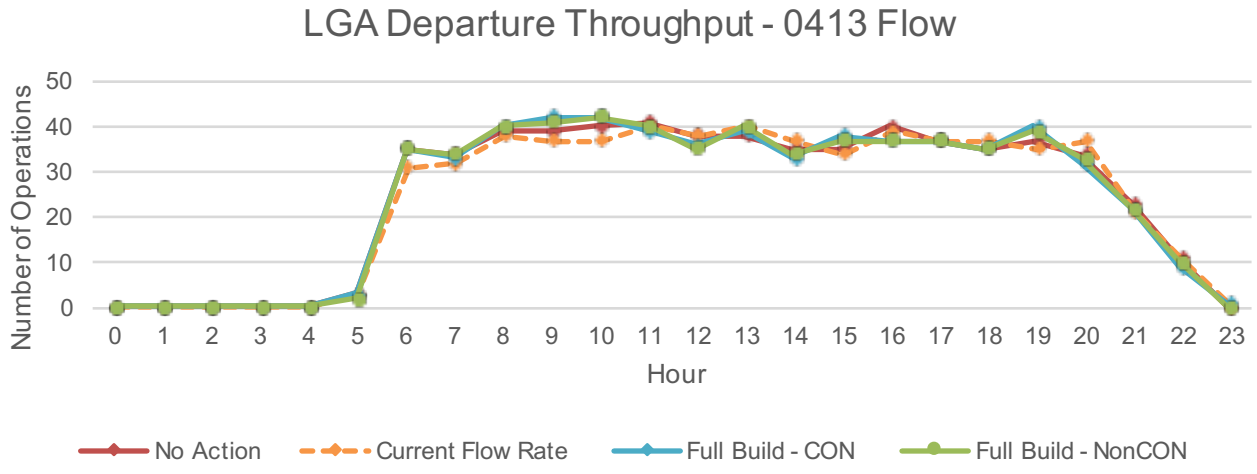
- Average Departure Taxiing Time: Average departure taxiing time is the sum of average unimpeded departure taxiing time and average departure taxiing delay
- Average Arrival Taxiing Time: Average arrival taxiing time is the sum of average unimpeded arrival taxiing time and average arrival taxiing delay
- Average Gate Delay: Delay incurred due to gates being unavailable and / or due to impediments that delay timely pushback from gates
- Average Departure Queuing Delay: Delay incurred by departing aircraft due to time spent in the runway line-up queue while waiting for take-off
- Average Arrival Sequencing Delay: Delay incurred by arriving aircraft due to time spent in a holding pattern or adjusting its speed in order to maintain safe separations from other arriving aircraft
- Average Departure Delay: Average departure delay is the sum of average departure gate delay, taxiing delay and queuing delay
- Average Arrival Delay: Average arrival taxiing time is the sum of average arrival sequencing delay, taxiing delay and gate delay

Airfield Simulation Analysis and Results

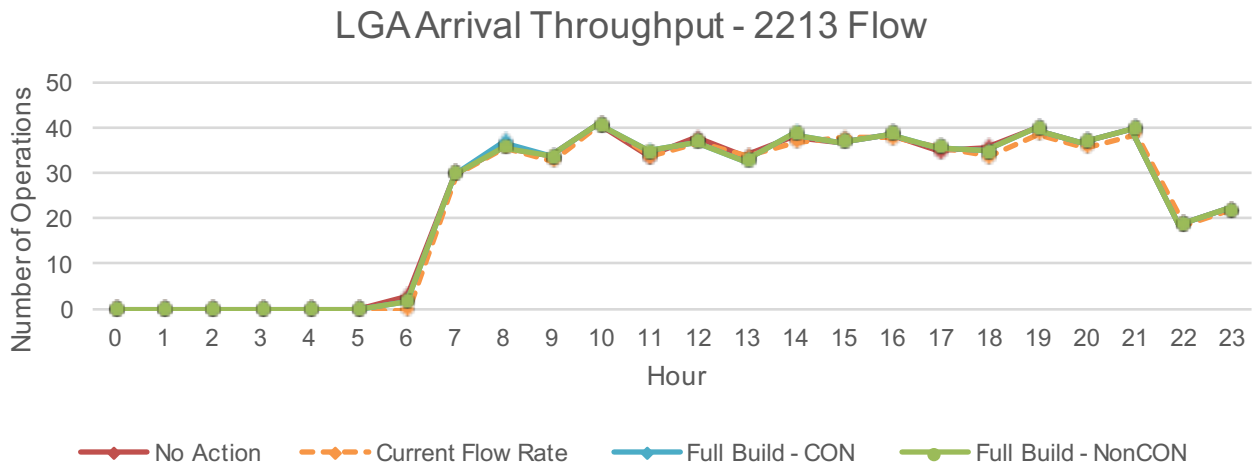
Runway Through-put Rates
2024 Demand Level

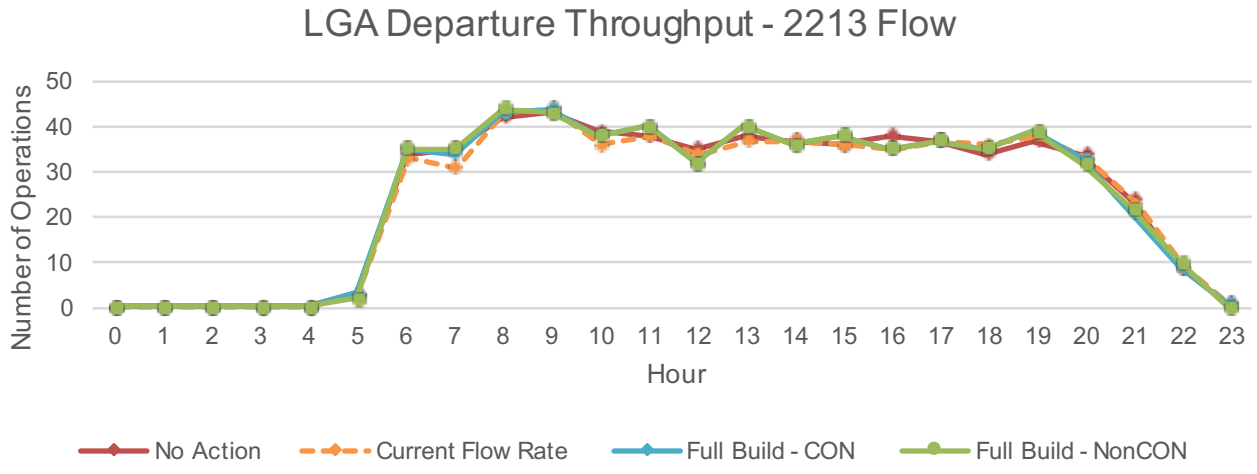
Runway Through-put Rates
A04 / D13 (VMC) – 2024 Demand Level



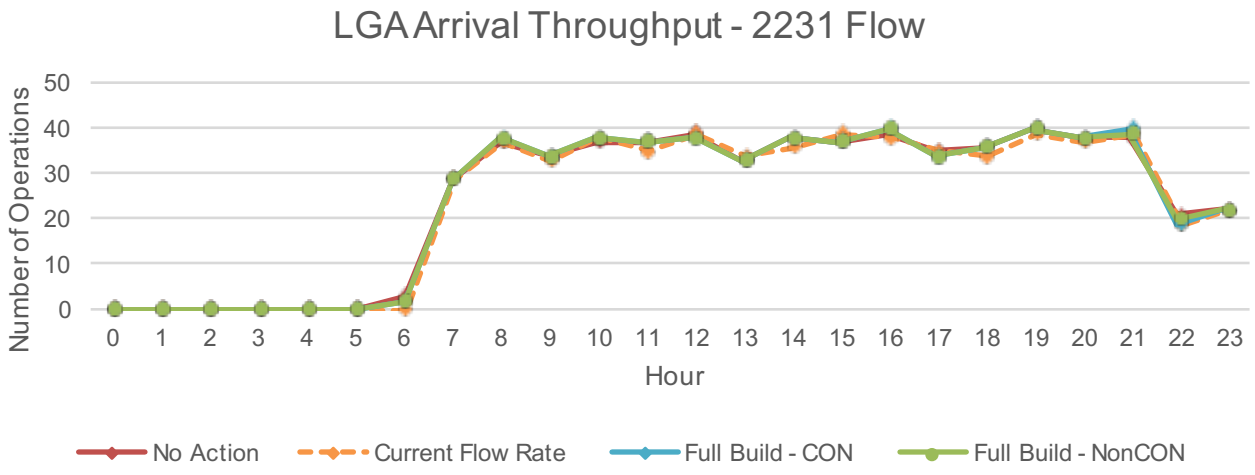


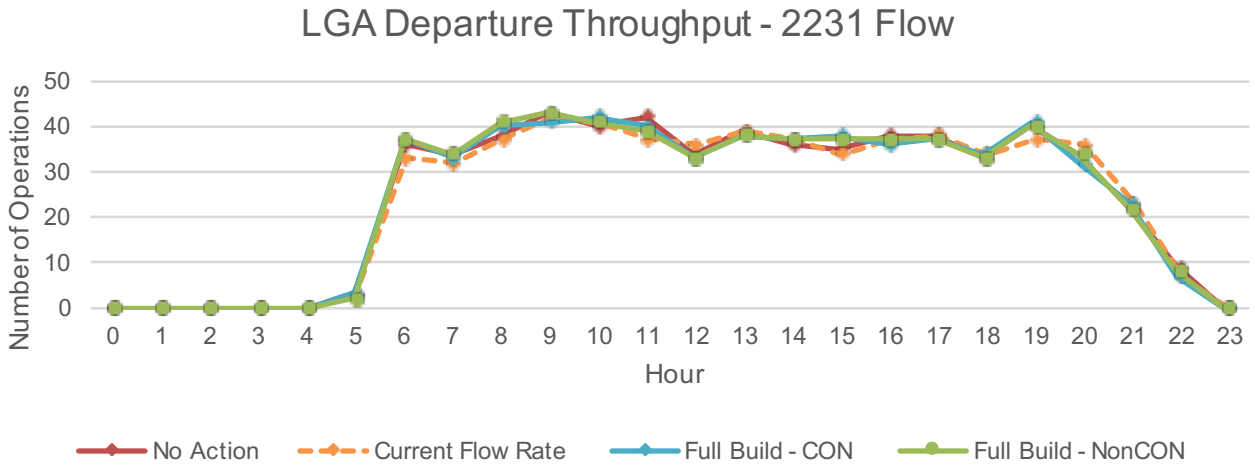
Runway Through-put Rates
A22 / D13 (VMC) – 2024 Demand Level



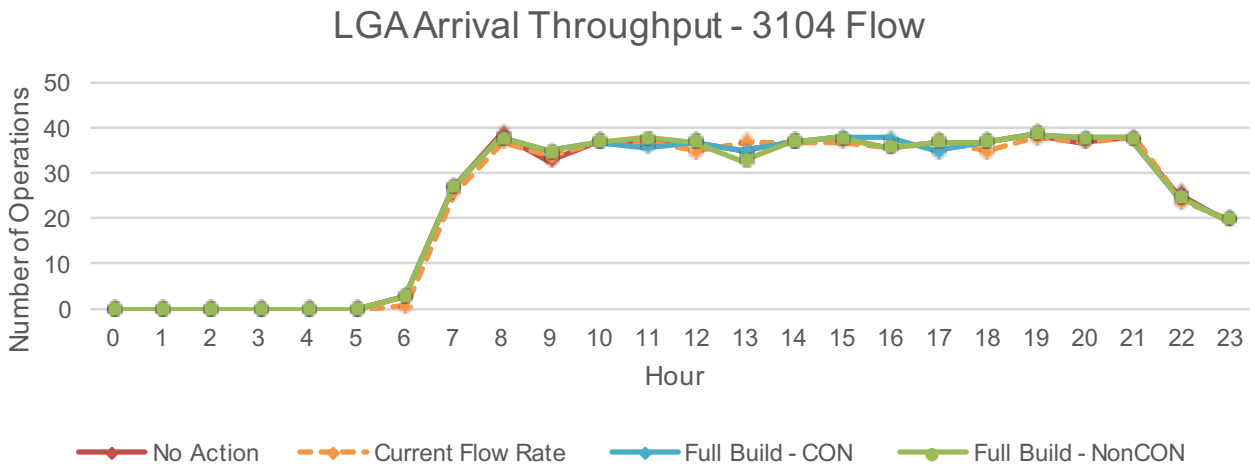


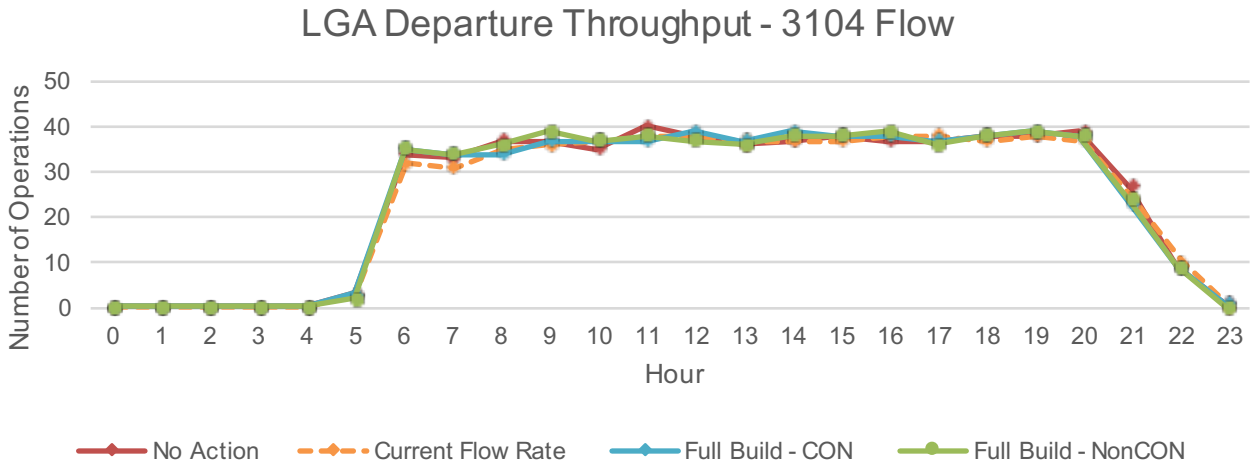
Runway Through-put Rates
A22 / D31 (VMC) – 2024 Demand Level



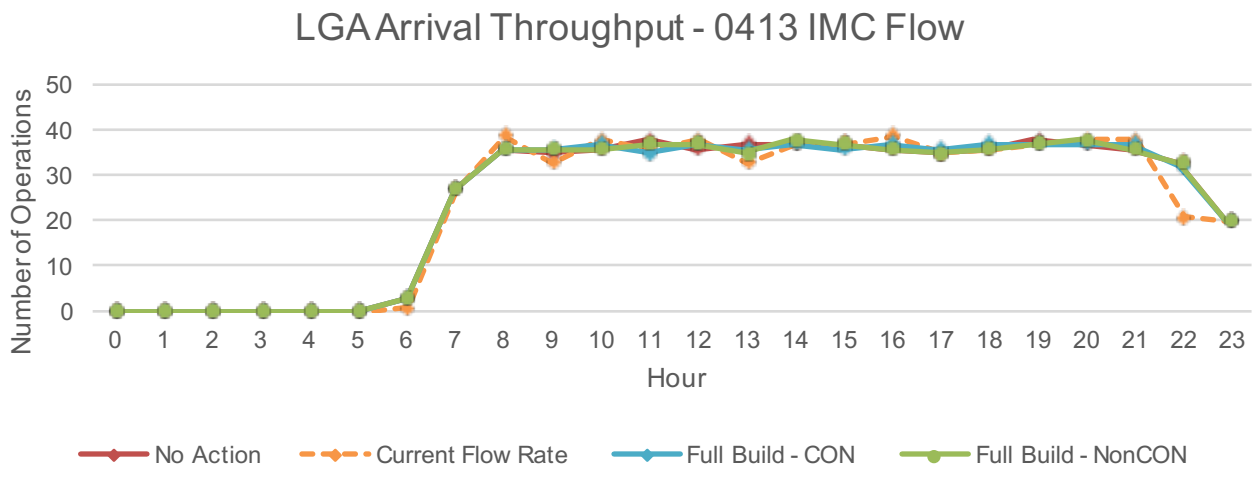


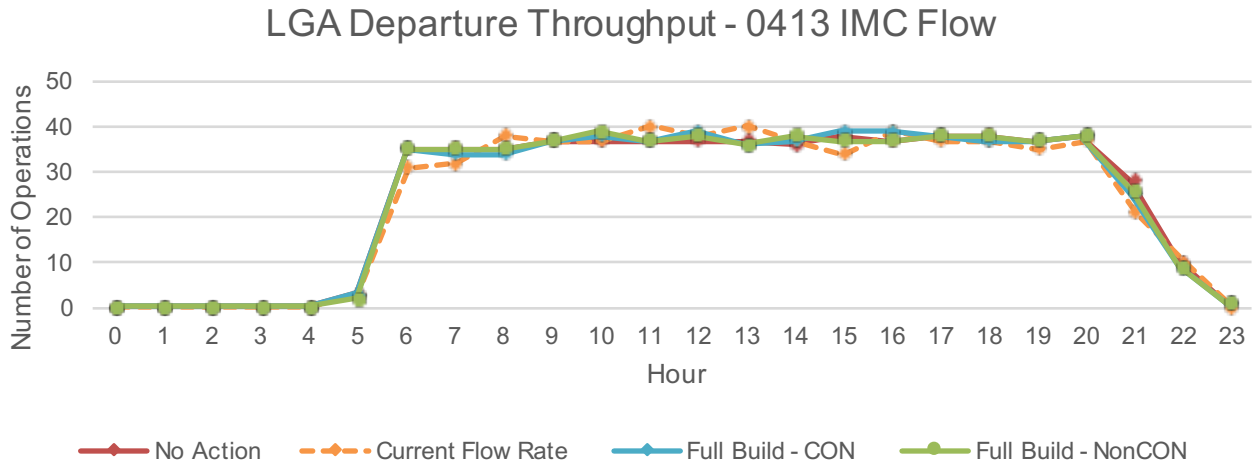
Runway Through-put Rates
A31 / D04 (VMC) – 2024 Demand Level



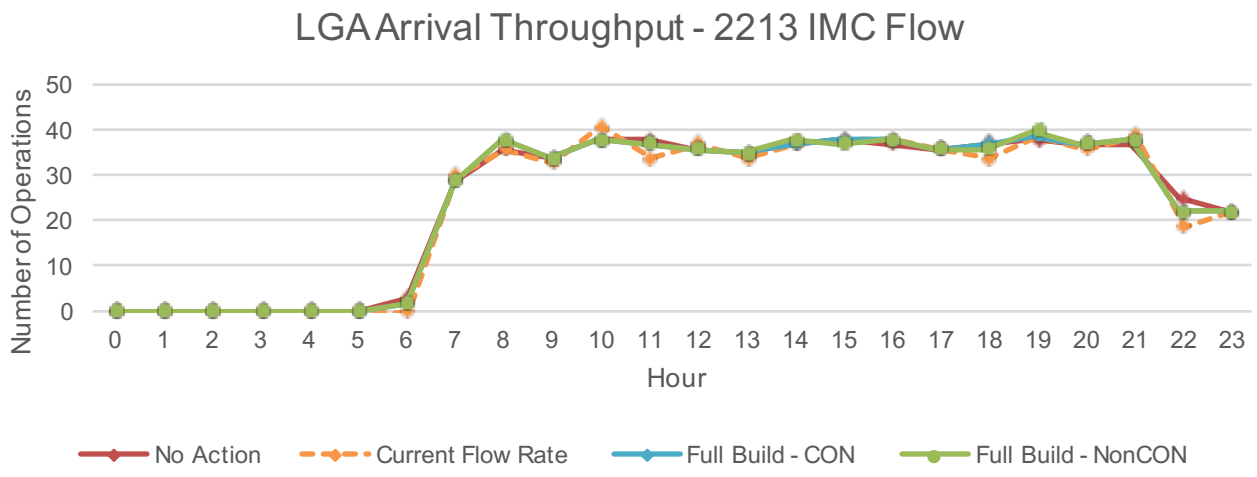


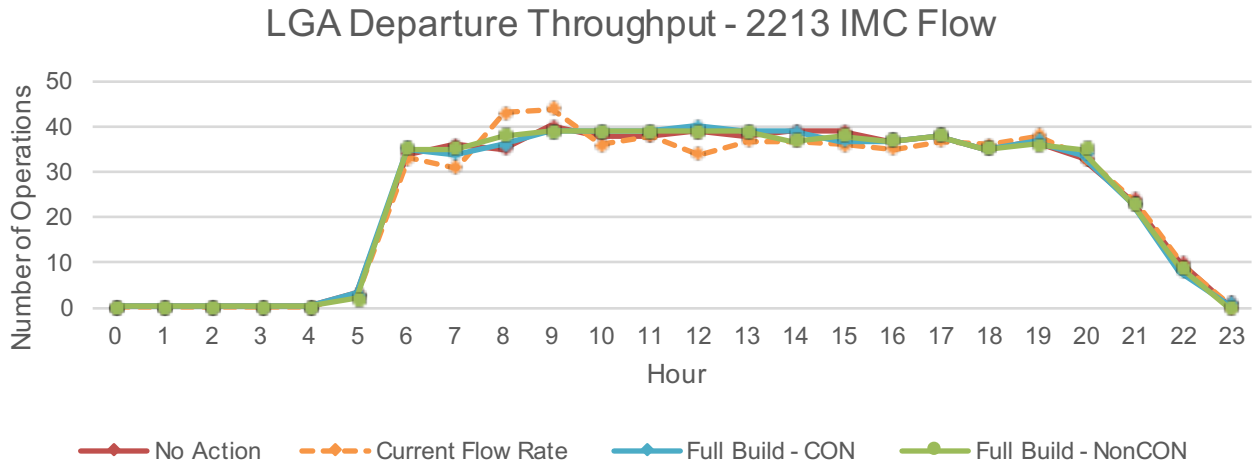
Runway Through-put Rates
A04 / D13 (IMC) – 2024 Demand Level





Runway Through-put Rates
A22 / D13 (IMC) – 2024 Demand Level

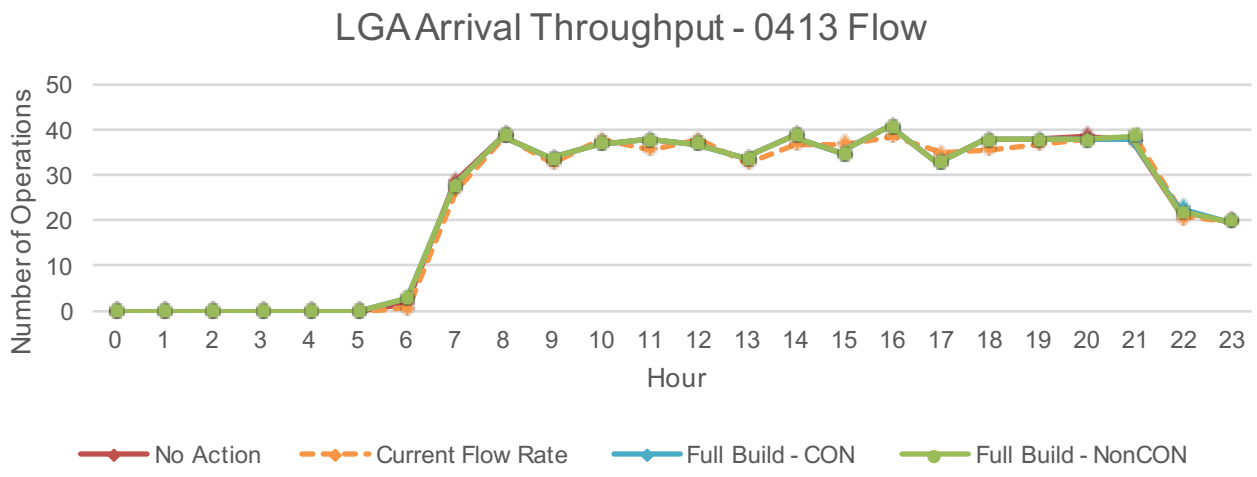


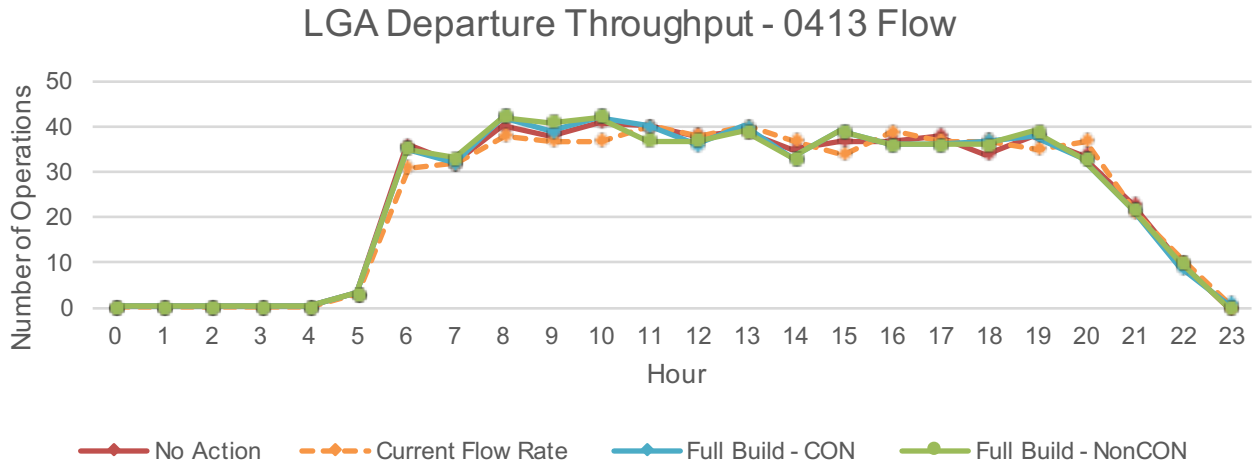


Airfield Simulation Analysis and Results

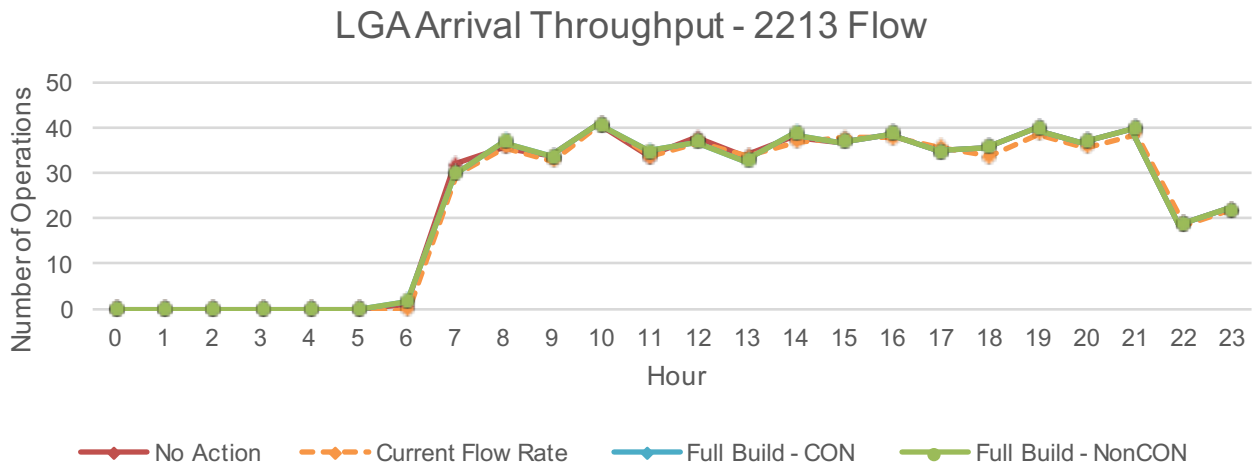
Runway Through-put Rates
2029 Demand Level

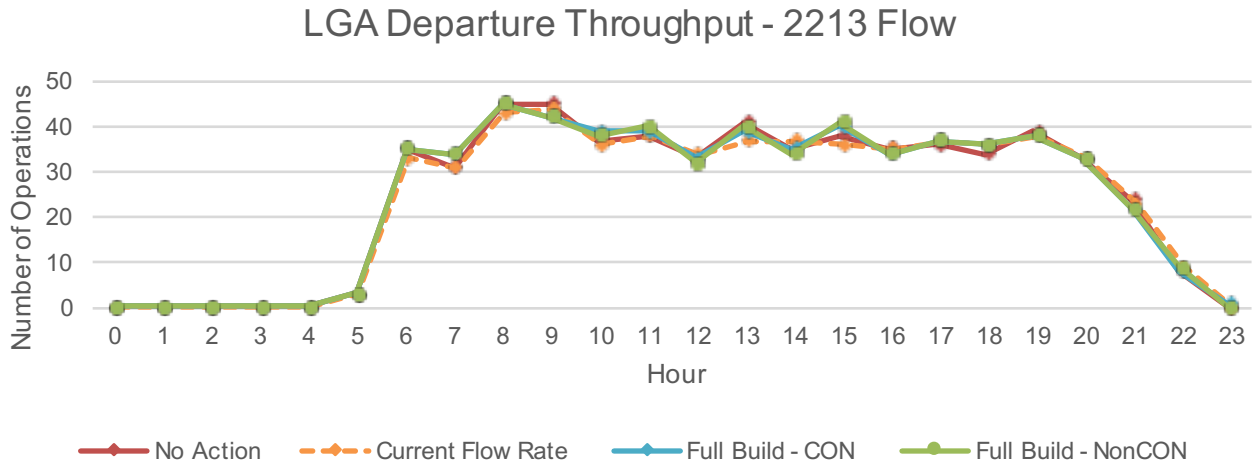
Runway Through-put Rates
A04 / D13 (VMC) – 2029 Demand Level



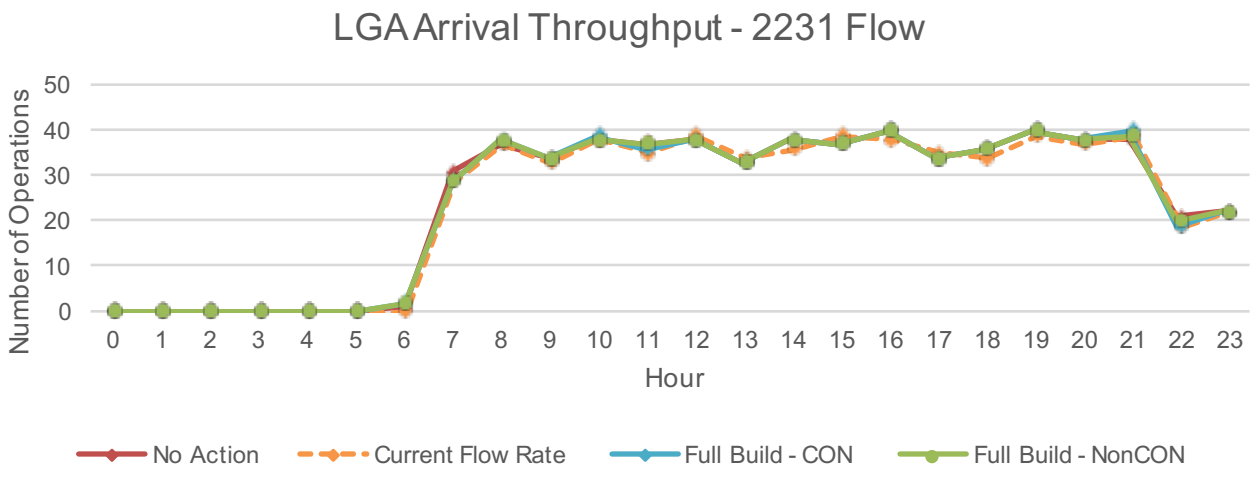


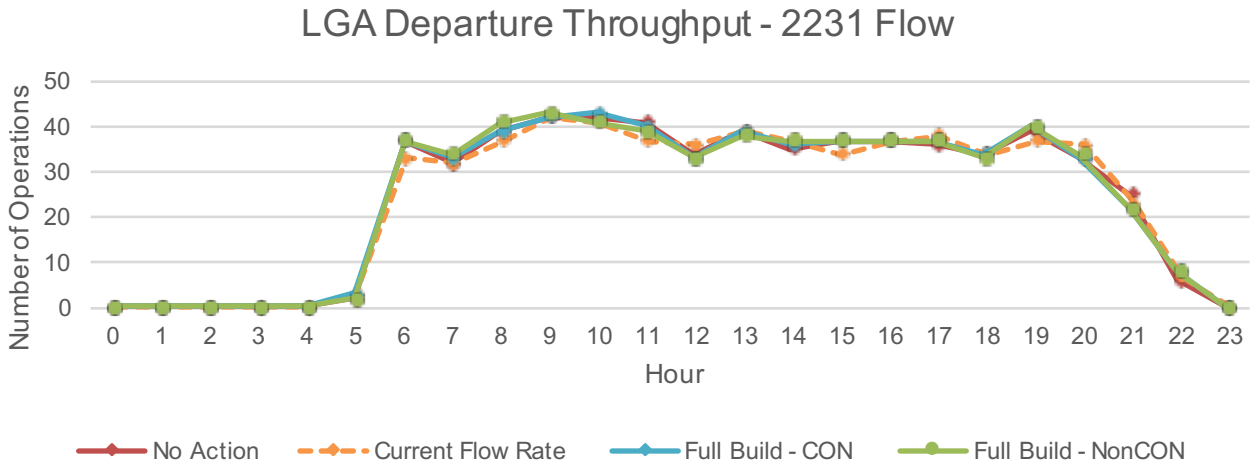
Runway Through-put Rates
A22 / D13 (VMC) – 2029 Demand Level



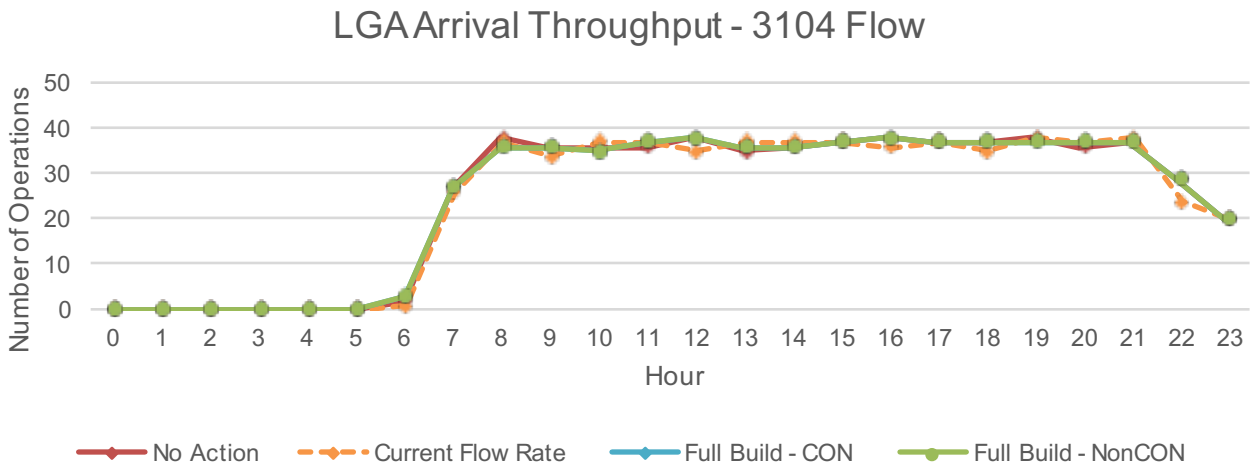


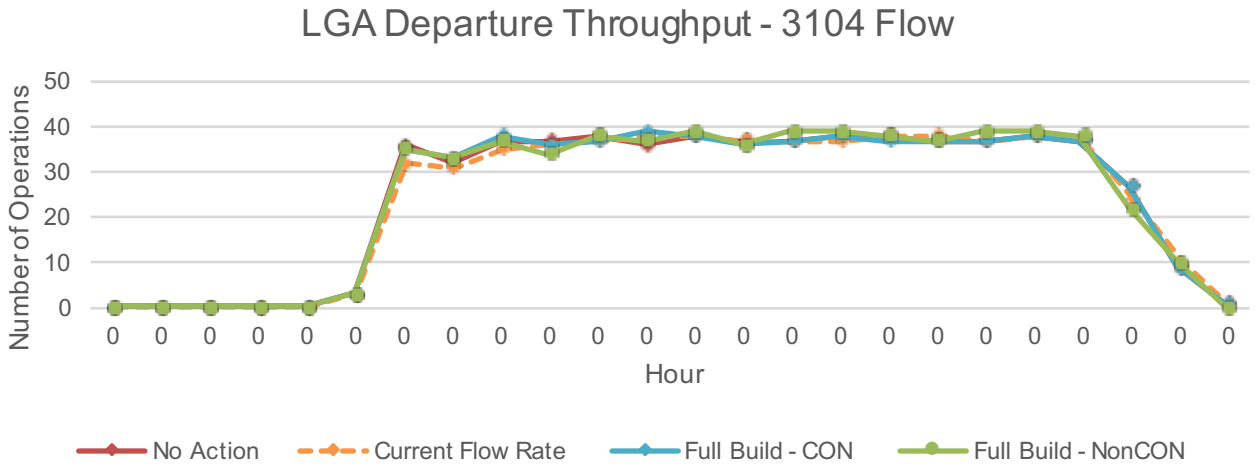
Runway Through-put Rates
A22 / D31 (VMC) – 2029 Demand Level



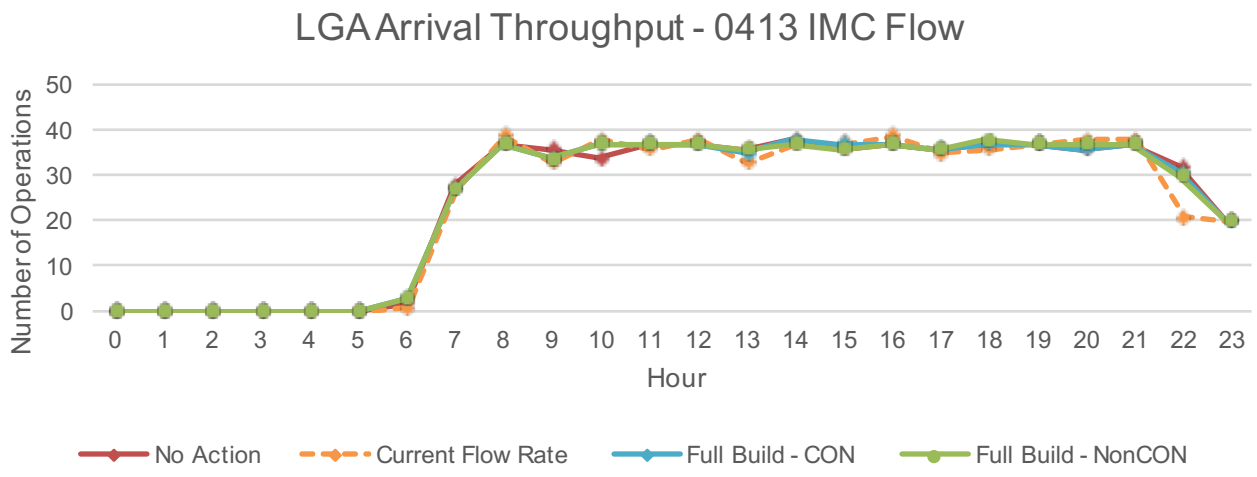


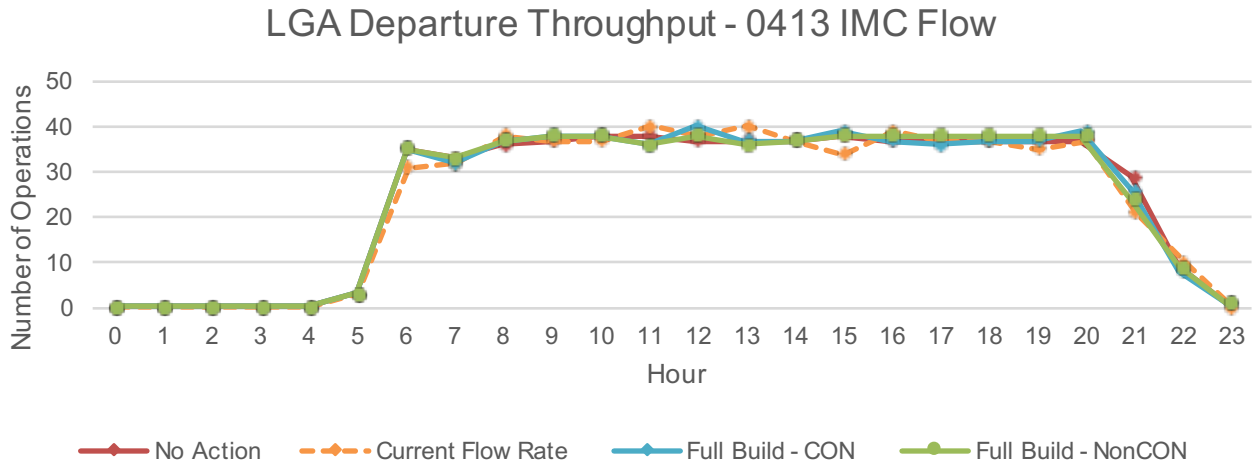
Runway Through-put Rates
A31 / D04 (VMC) – 2029 Demand Level



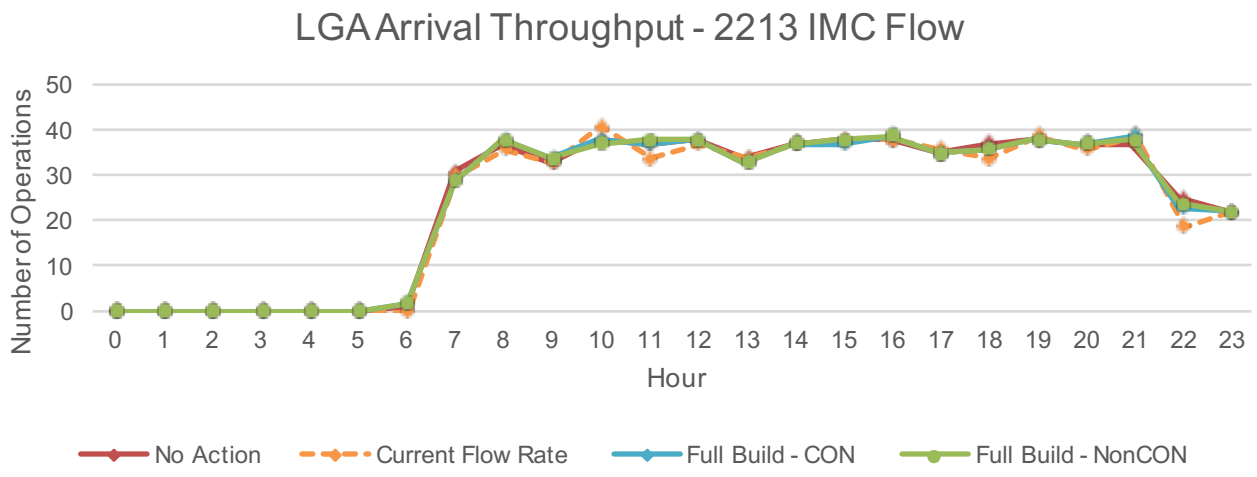


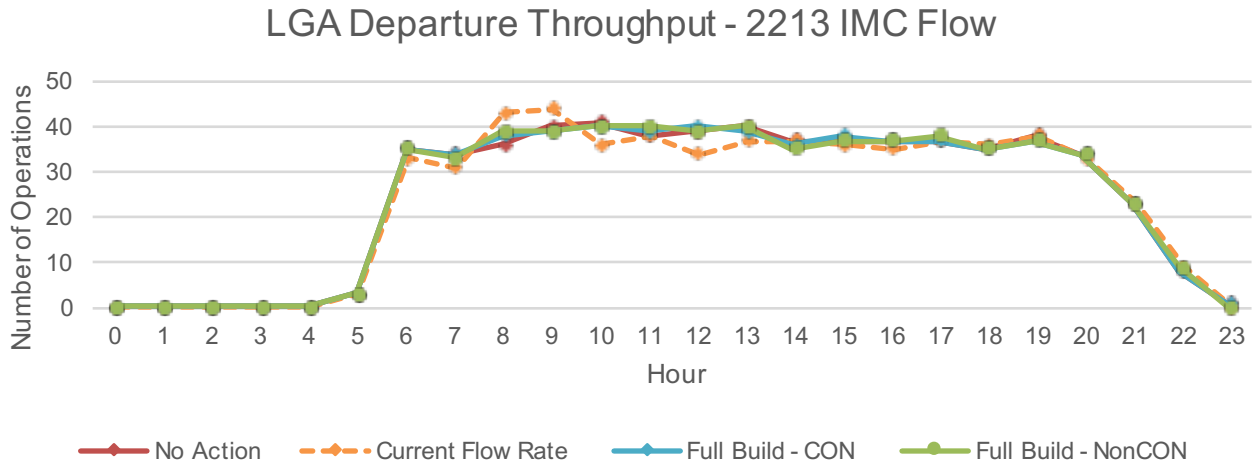
Runway Through-put Rates
A04 / D13 (IMC) – 2029 Demand Level





Runway Through-put Rates
A22 / D13 (IMC) – 2029 Demand Level





Airfield Simulation Analysis & Results

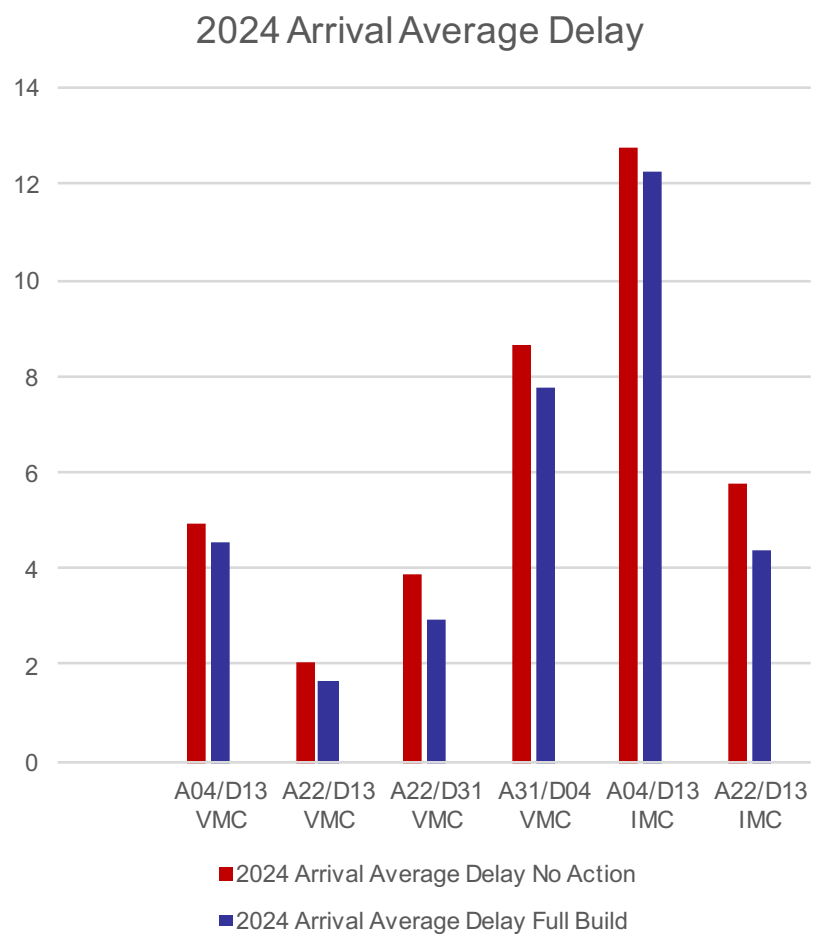
Runway Through-put Summary

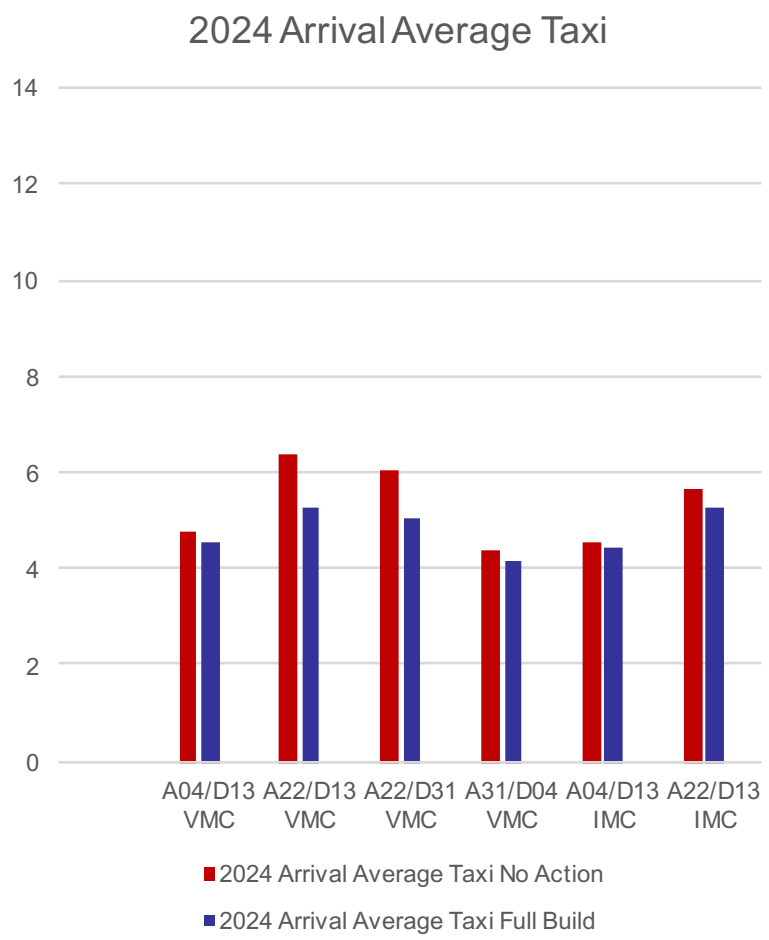
- This study does not include any changes to the runways or the supporting taxiway system
  - The capacity of runways and the taxiway system does not change
  - As a result, the runway through-put rates do not vary very much compared to existing conditions
- Some fluctuation is observed in the departure throughput rates in the morning hours
  - Dual taxi-lanes on (some or all) aprons in the Full Build scenario reduces apron congestion
  - This results in significantly fewer blocked-pushbacks in the Full Build scenario and enables departing aircraft to the departure runway sooner
- It is important to note that we are **not** raising through-put rates in the models

Airfield Simulation Analysis and Results

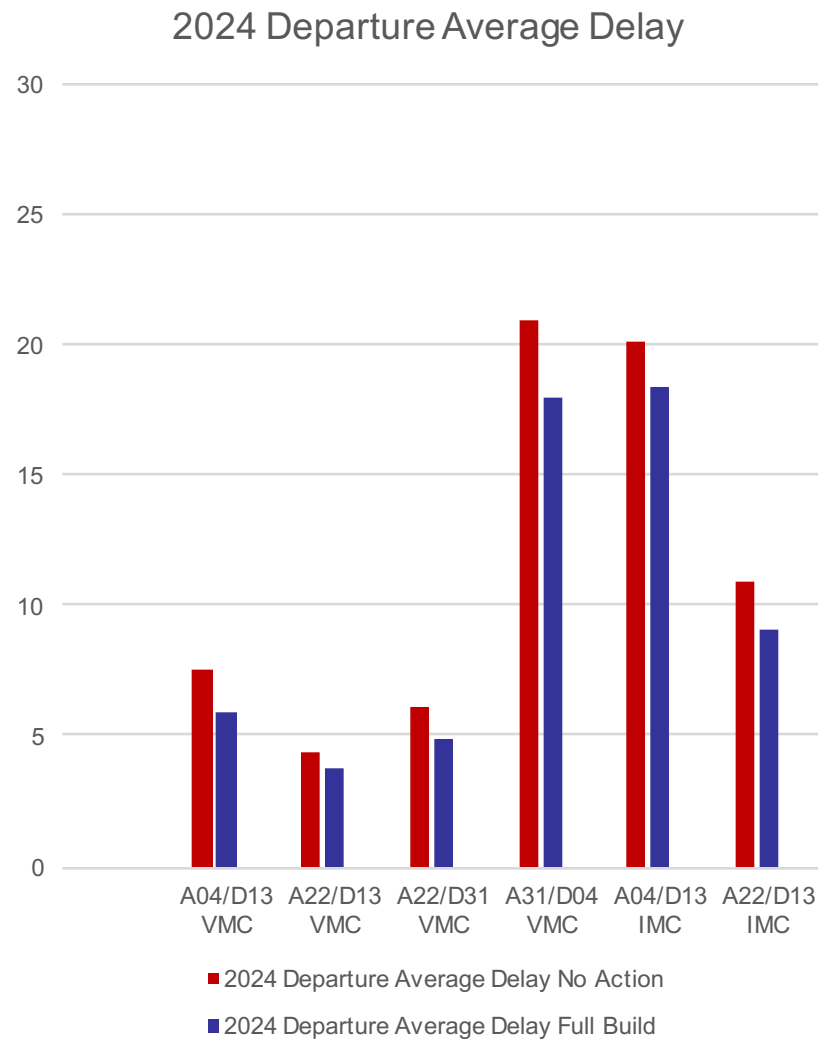
Arrival and Departure Metrics
2024 Demand Level

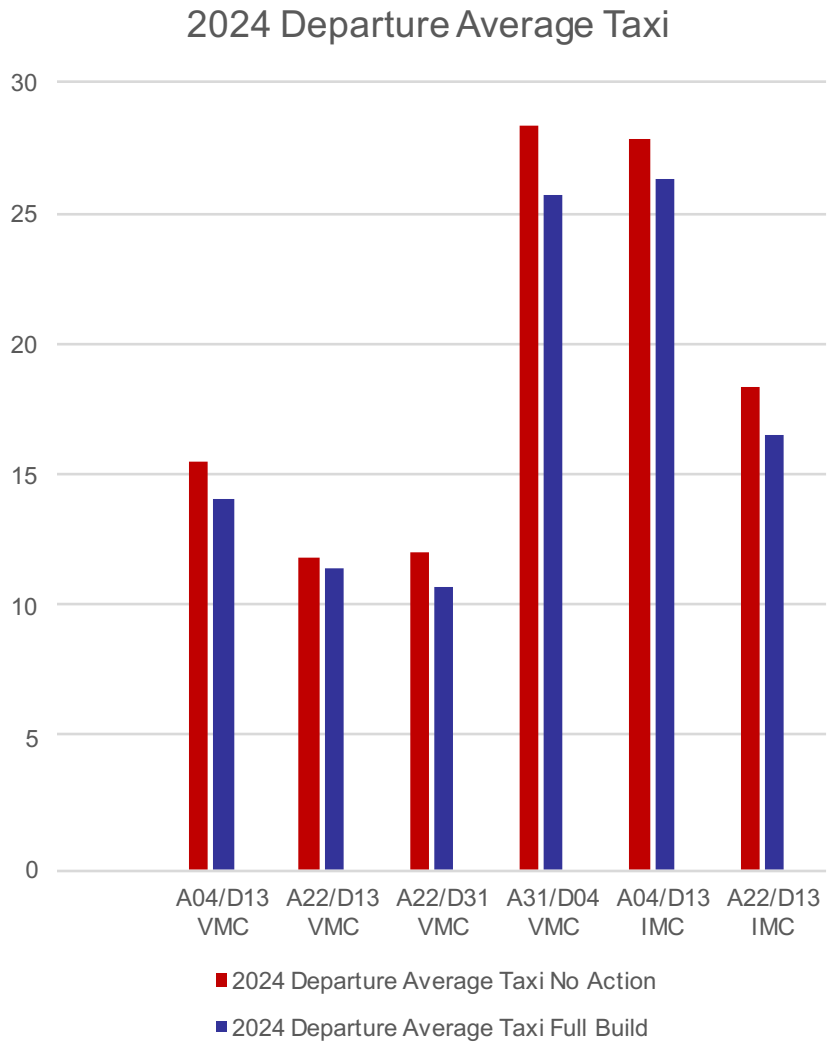
Arrival Metrics
2024 Demand Level





Departure Metrics
2024 Demand Level





Arrival Metrics
2024 Demand Level

2024 Arrival Average Delay		
Flow	No Action	Full Build
A04/D13 VMC	5	4.6
A22/D13 VMC	2.1	1.7
A22/D31 VMC	3.9	3
A31/D04 VMC	8.7	7.8
A04/D13 IMC	12.8	12.3
A22/D13 IMC	5.8	4.4

2024 Arrival Average Taxi		
Flow	No Action	Full Build
A04/D13 VMC	4.8	4.6
A22/D13 VMC	6.4	5.3
A22/D31 VMC	6.1	5.1
A31/D04 VMC	4.4	4.2
A04/D13 IMC	4.6	4.5
A22/D13 IMC	5.7	5.3

Departure Metrics
2024 Demand Level

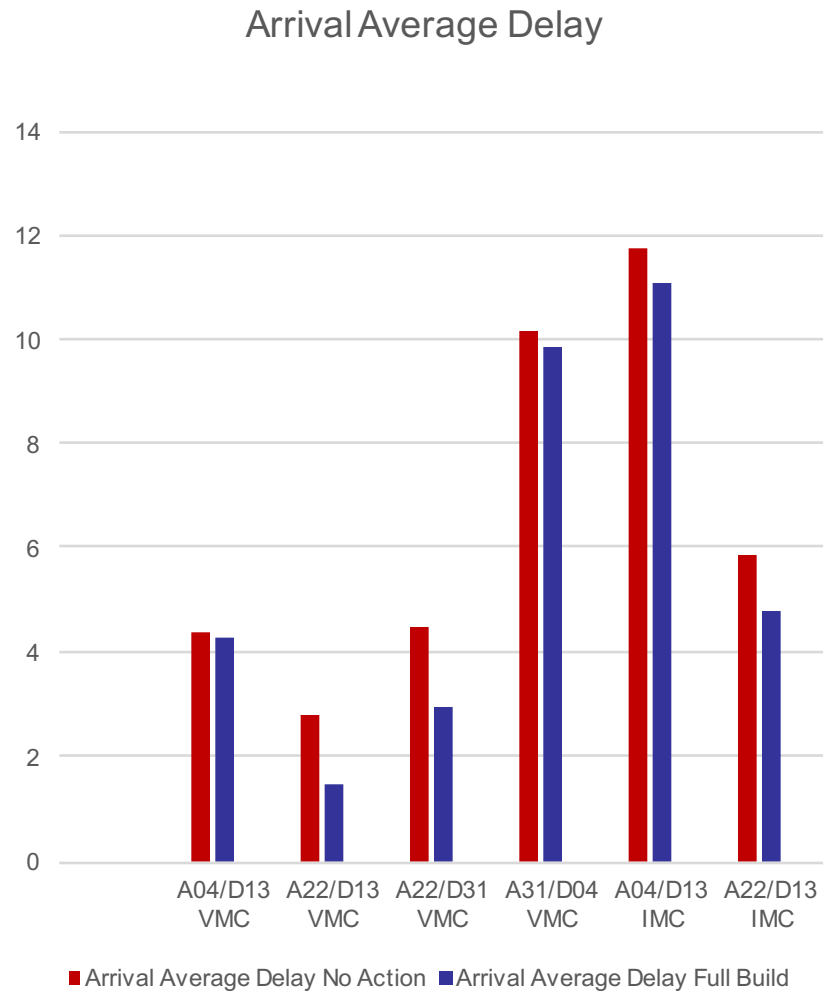
2024 Departure Average Delay		
Flow	No Action	Full Build
A04/D13 VMC	7.6	6
A22/D13 VMC	4.4	3.8
A22/D31 VMC	6.2	4.9
A31/D04 VMC	21	18
A04/D13 IMC	20.2	18.4
A22/D13 IMC	11	9.1

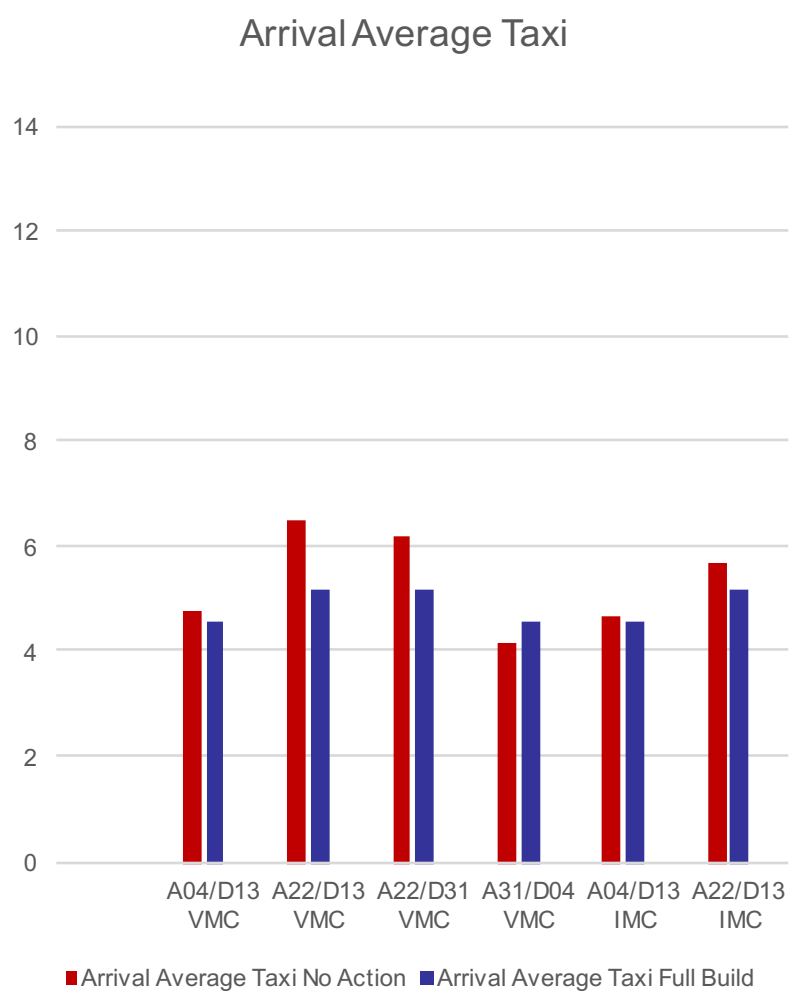
2024 Departure Average Taxi		
Flow	No Action	Full Build
A04/D13 VMC	15.6	14.1
A22/D13 VMC	11.9	11.5
A22/D31 VMC	12.1	10.8
A31/D04 VMC	28.4	25.7
A04/D13 IMC	27.9	26.3
A22/D13 IMC	18.4	16.6

Airfield Simulation Analysis and Results

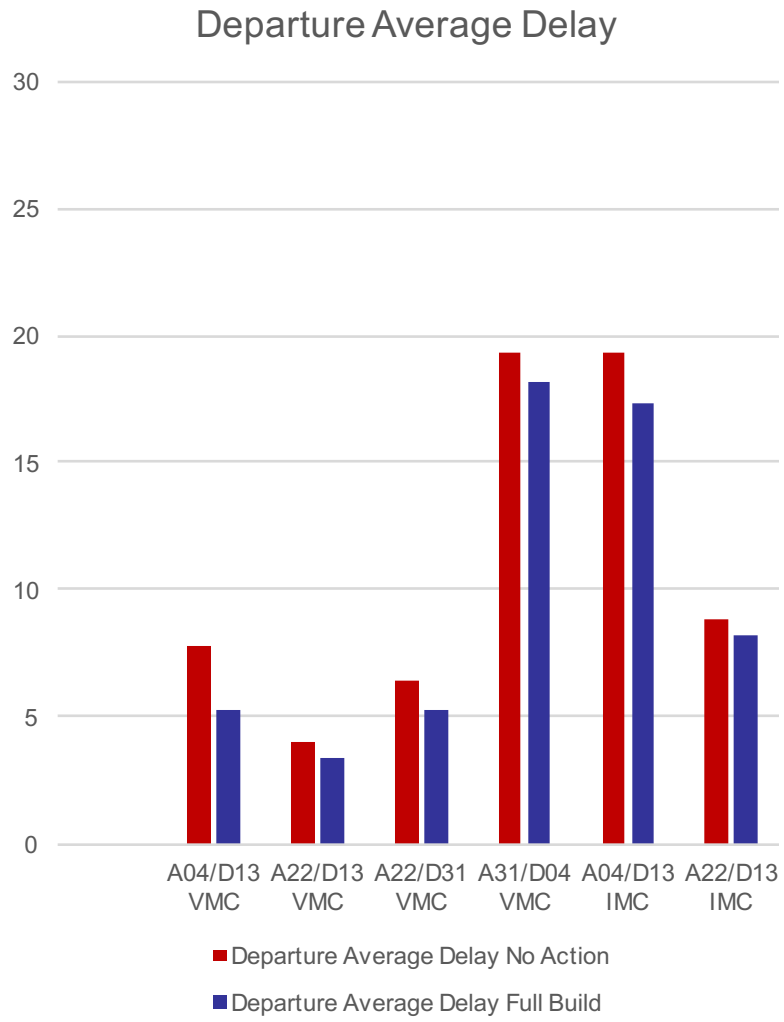
Arrival and Departure Metrics
2029 Demand Level

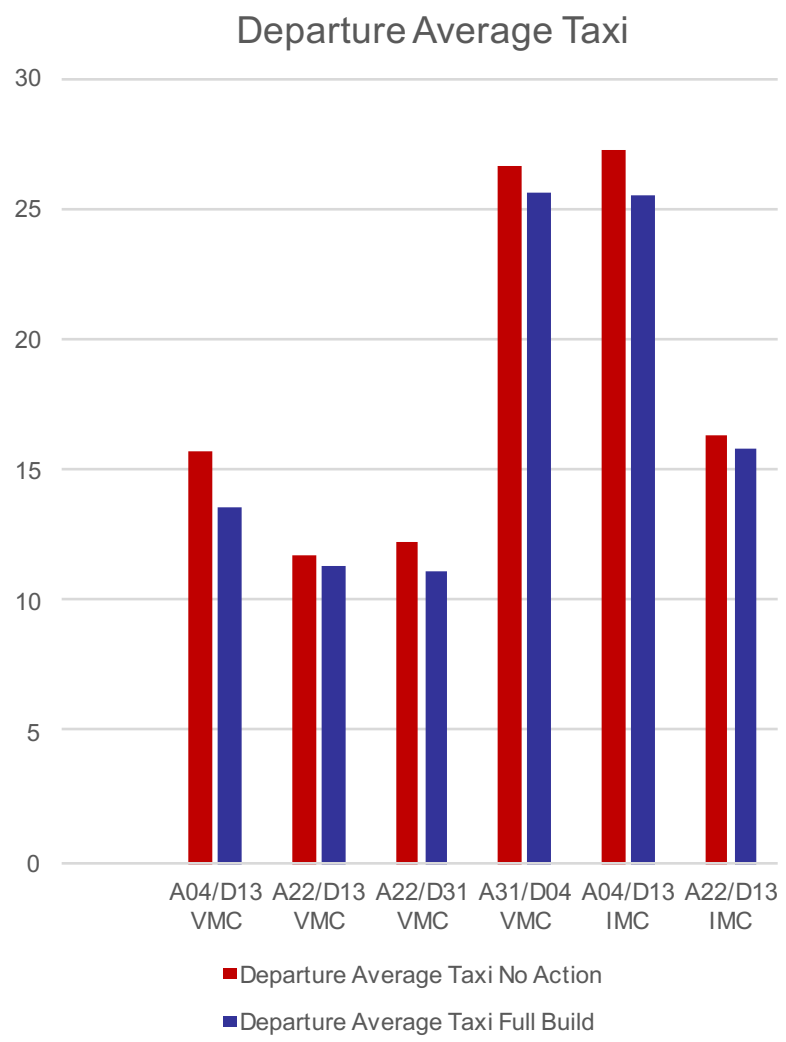
Arrival Metrics
2029 Demand Level





Departure Metrics
2029 Demand Level





Arrival Metrics
2029 Demand Level

Arrival Average Delay		
Flow	No Action	Full Build
A04/D13 VMC	4.4	4.3
A22/D13 VMC	2.8	1.5
A22/D31 VMC	4.5	3
A31/D04 VMC	10.2	9.9
A04/D13 IMC	11.8	11.1
A22/D13 IMC	5.9	4.8

Arrival Average Taxi		
Flow	No Action	Full Build
A04/D13 VMC	4.8	4.6
A22/D13 VMC	6.5	5.2
A22/D31 VMC	6.2	5.2
A31/D04 VMC	4.2	4.6
A04/D13 IMC	4.7	4.6
A22/D13 IMC	5.7	5.2

Departure Metrics
2029 Demand Level

Departure Average Delay		
Flow	No Action	Full Build
A04/D13 VMC	7.8	5.3
A22/D13 VMC	4.1	3.4
A22/D31 VMC	6.5	5.3
A31/D04 VMC	19.4	18.2
A04/D13 IMC	19.4	17.4
A22/D13 IMC	8.9	8.2

Departure Average Taxi		
Flow	No Action	Full Build
A04/D13 VMC	15.8	13.6
A22/D13 VMC	11.8	11.4
A22/D31 VMC	12.3	11.2
A31/D04 VMC	26.7	25.6
A04/D13 IMC	27.3	25.5
A22/D13 IMC	16.4	15.9

Conclusion

Conclusion

- The Full Build scenario reduces airfield congestion and results in lower ground delays for arriving and departing aircraft at LGA Airport
- Taxi and delay times improve in the Full Build scenario. In several instances the taxi times are reduced to a lesser extent. This can be attributed to the following reasons:
  - In the Full Build scenario, proposed Terminal C layout pushes several gates farther east. In flow configurations where departing aircraft have to travel to the west-end of the airport (A22/D13, A04/D13 and A31/D04), several departing aircraft have to taxi longer distances
  - In the No Action and Full Build scenarios, the proposed layout of the CTB has a significantly larger apron and longer taxilanes. Aircraft taxi at lower speeds (5 knots) while on the apron, compared to up to 20 knots while on the taxiway system
- Dual taxilanes between concourses result in extremely efficient aprons. Aprons no longer 'meter' the flow of aircraft on to the taxiway system.
- Larger gauge aircraft can be accommodated at all gates in the Full Build scenario increasing efficiency even further by preventing aircraft from having to wait for gates to become available.

Appendix

Sensitivity Analysis
Airline Colocation Scenario

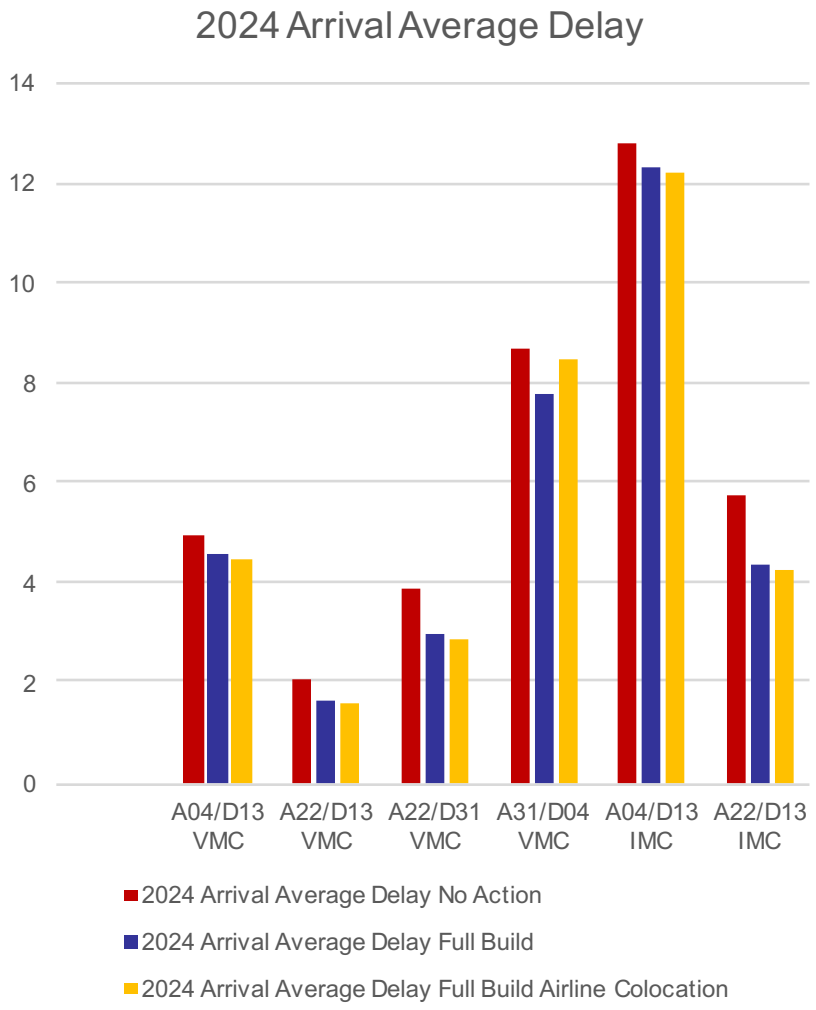
Airline Colocation Scenario

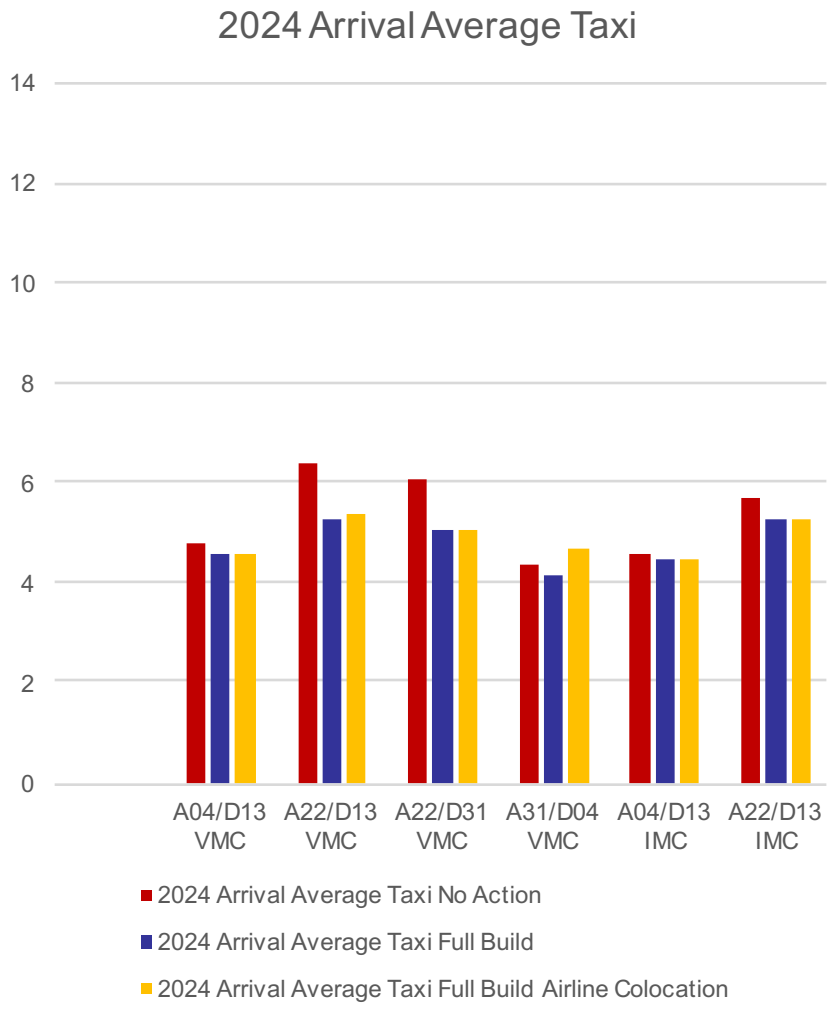
- Both Delta and American currently operate from multiple terminals at LaGuardia. Delta operates out of Terminals A, C & D with exclusive use of Terminal A. Each carrier now has the opportunity to consolidate its operation in its respective new terminal, American in Terminal B, and Delta in its reconfigured terminal.
- As part of these collocations it is expected that other carrier(s) would move their operations out of Terminal B and into Terminal A. At this point, the identity of the airline(s) that would shift to Terminal A is unknown. Despite this unforeseeable factor, a sensitivity analysis has been performed using an airline with a flight schedule and passenger load that can operate in Terminal A as currently configured.

Sensitivity Analysis
Airline Colocation Scenario
Airfield Simulation Analysis and Results

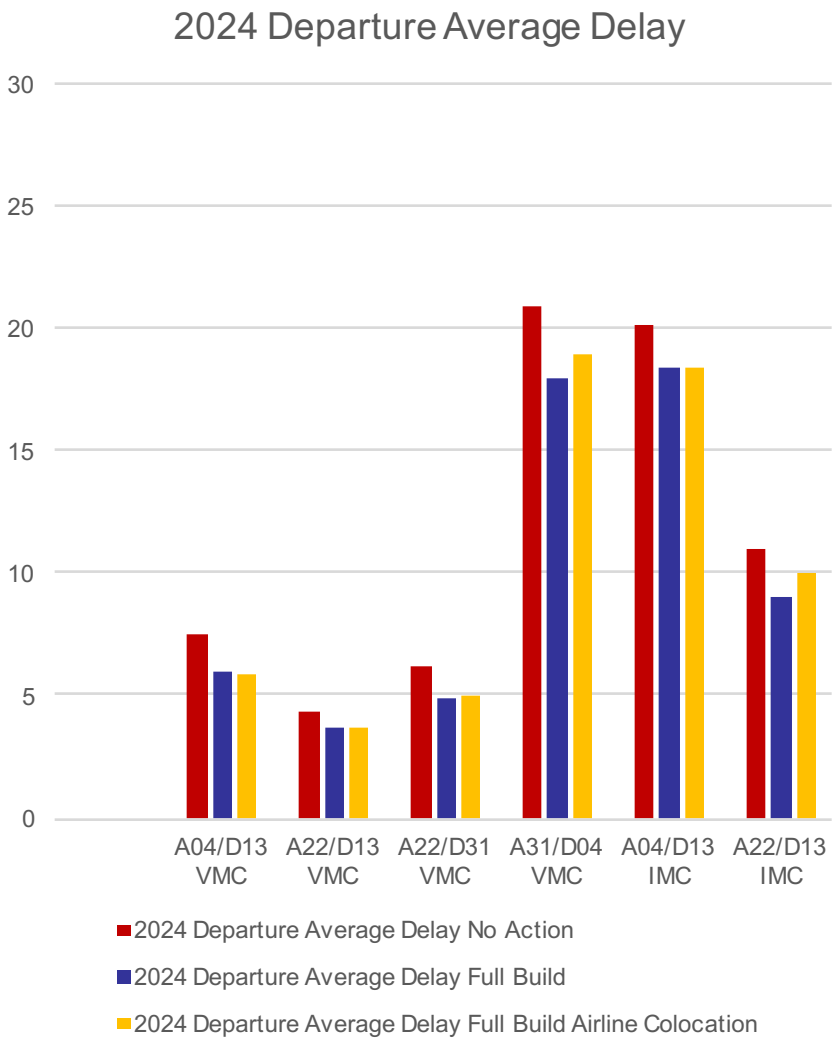
Arrival and Departure Metrics
2024 Demand Level

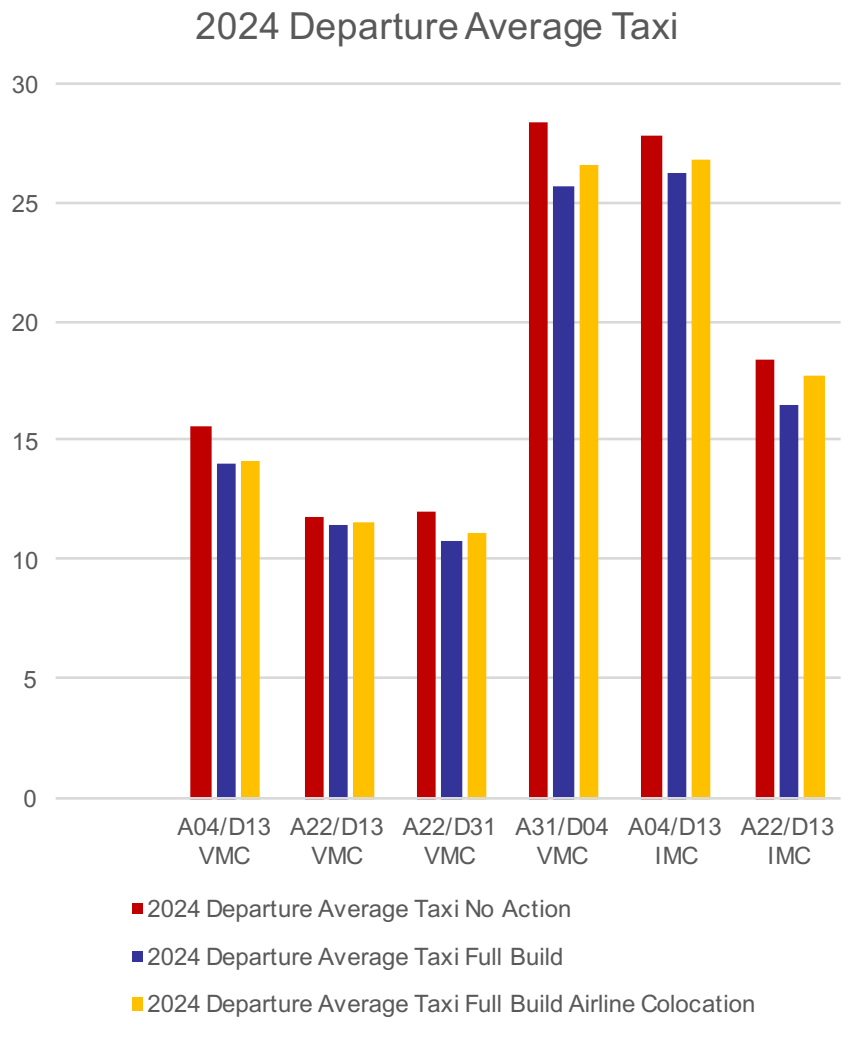
Arrival Metrics
2024 Demand Level





Departure Metrics
2024 Demand Level





Arrival Metrics
2024 Demand Level

2024 Arrival Average Delay			
Flow	No Action	Full Build	Full Build Airline Colocation
		-	-
A04/D13 VMC	5	4.6	4.5
A22/D13 VMC	2.1	1.7	1.6
A22/D31 VMC	3.9	3	2.9
A31/D04 VMC	8.7	7.8	8.5
A04/D13 IMC	12.8	12.3	12.2
A22/D13 IMC	5.8	4.4	4.3

2024 Arrival Average Taxi			
Flow	No Action	Full Build	Full Build Airline Colocation
		-	-
A04/D13 VMC	4.8	4.6	4.6
A22/D13 VMC	6.4	5.3	5.4
A22/D31 VMC	6.1	5.1	5.1
A31/D04 VMC	4.4	4.2	4.7
A04/D13 IMC	4.6	4.5	4.5
A22/D13 IMC	5.7	5.3	5.3

Departure Metrics
2024 Demand Level

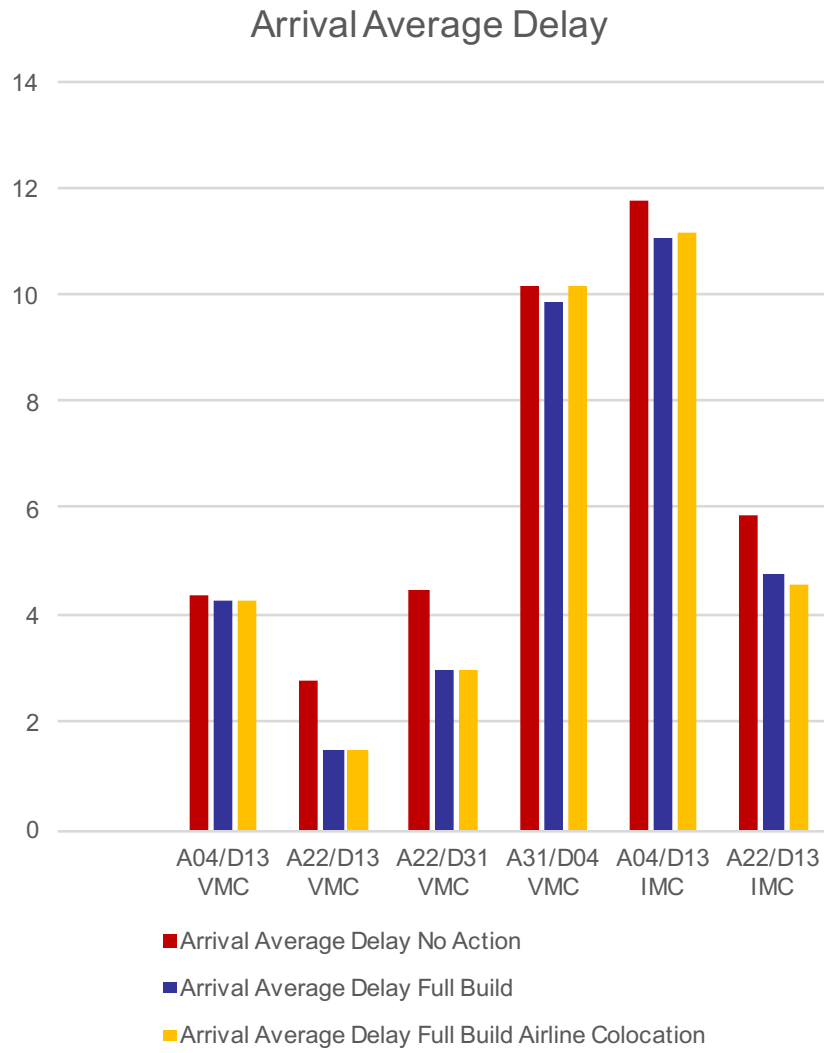
2024 Departure Average Delay			
Flow	No Action	Full Build	Full Build Airline Colocation
		-	-
A04/D13 VMC	7.6	6	5.9
A22/D13 VMC	4.4	3.8	3.8
A22/D31 VMC	6.2	4.9	5.1
A31/D04 VMC	21	18	19
A04/D13 IMC	20.2	18.4	18.5
A22/D13 IMC	11	9.1	10.1

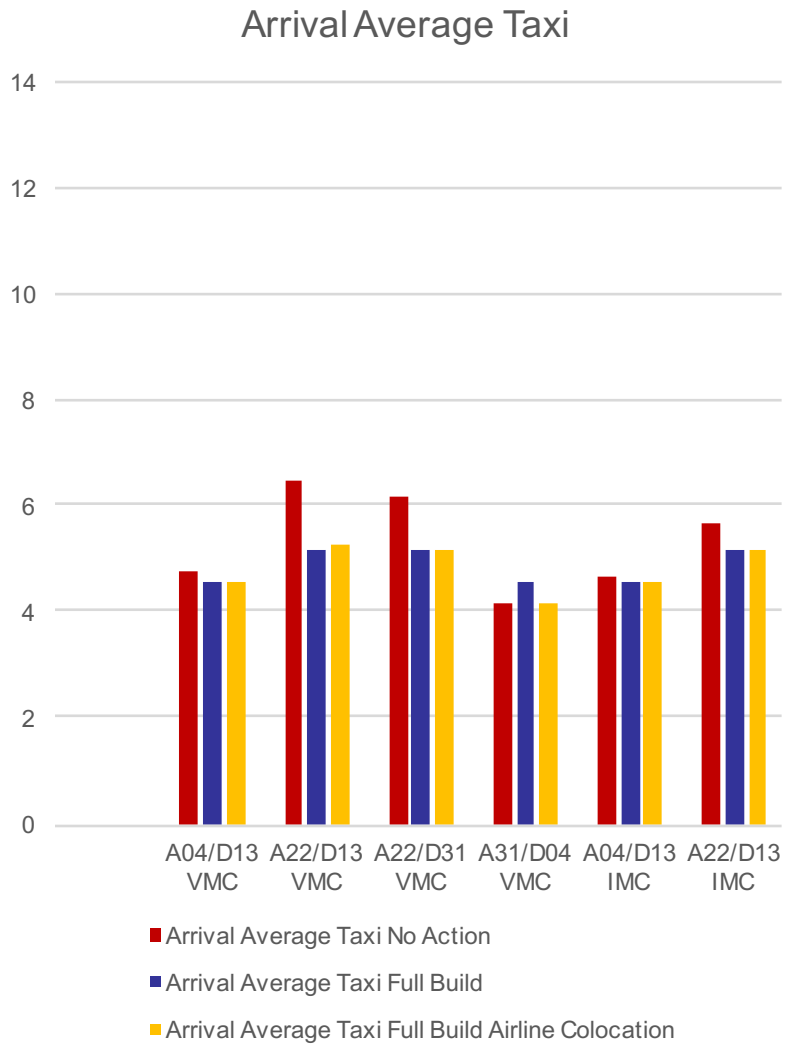
2024 Departure Average Taxi			
Flow	No Action	Full Build	Full Build Airline Colocation
		-	-
A04/D13 VMC	15.6	14.1	14.2
A22/D13 VMC	11.9	11.5	11.6
A22/D31 VMC	12.1	10.8	11.2
A31/D04 VMC	28.4	25.7	26.6
A04/D13 IMC	27.9	26.3	26.8
A22/D13 IMC	18.4	16.6	17.8

Sensitivity Analysis
Airline Colocation Scenario
Airfield Simulation Analysis and Results

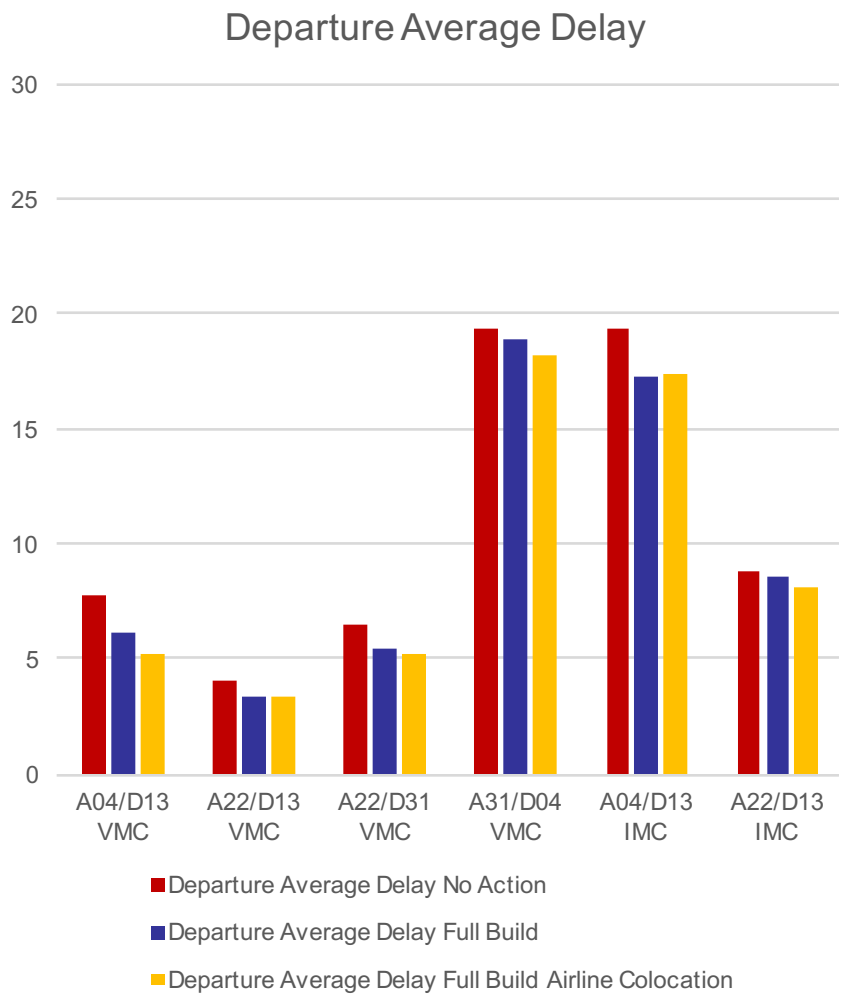
Arrival and Departure Metrics
2029 Demand Level

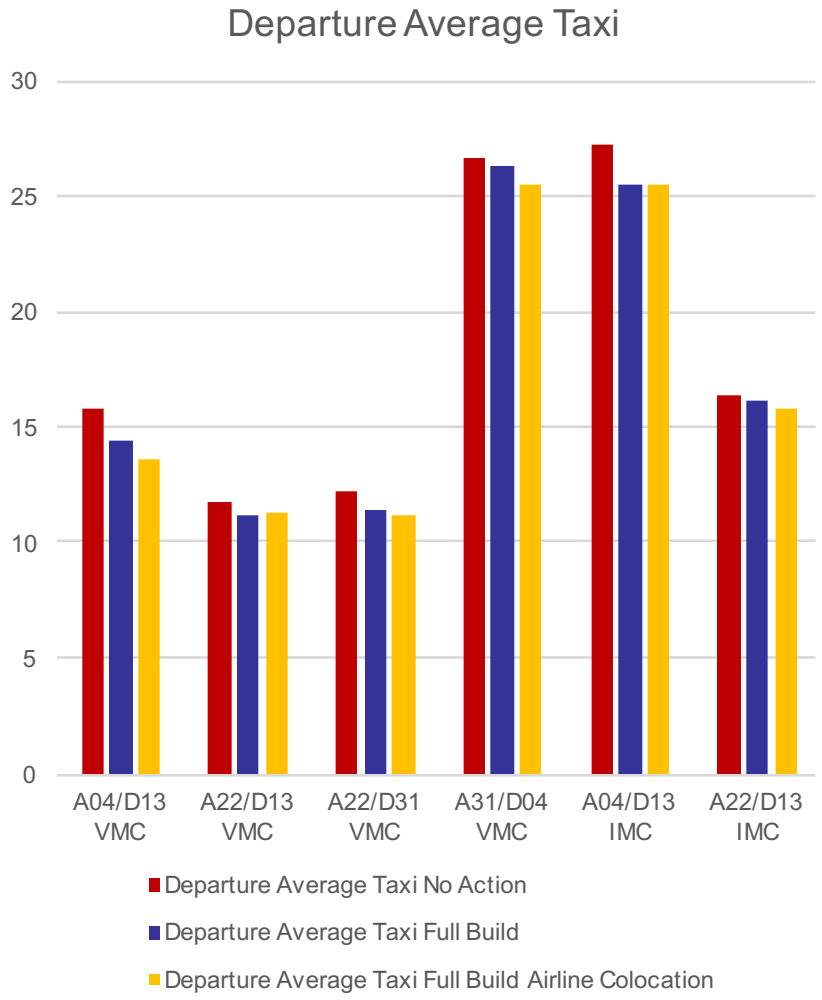
Arrival Metrics
2029 Demand Level





Departure Metrics
2029 Demand Level





Arrival Metrics
2029 Demand Level

Arrival Average Delay			
Flow	No Action	Full Build -	Full Build Airline Colocation -
A04/D13 VMC	4.4	4.3	4.3
A22/D13 VMC	2.8	1.5	1.5
A22/D31 VMC	4.5	3	3
A31/D04 VMC	10.2	9.9	10.2
A04/D13 IMC	11.8	11.1	11.2
A22/D13 IMC	5.9	4.8	4.6

Arrival Average Taxi			
Flow	No Action	Full Build -	Full Build Airline Colocation -
A04/D13 VMC	4.8	4.6	4.6
A22/D13 VMC	6.5	5.2	5.3
A22/D31 VMC	6.2	5.2	5.2
A31/D04 VMC	4.2	4.6	4.2
A04/D13 IMC	4.7	4.6	4.6
A22/D13 IMC	5.7	5.2	5.2

Departure Metrics
2029 Demand Level

Departure Average Delay			
Flow	No Action	Full Build -	Full Build Airline Colocation -
A04/D13 VMC	7.8	5.3	6.2
A22/D13 VMC	4.1	3.4	3.4
A22/D31 VMC	6.5	5.3	5.5
A31/D04 VMC	19.4	18.2	18.9
A04/D13 IMC	19.4	17.4	17.3
A22/D13 IMC	8.9	8.2	8.6

Departure Average Taxi			
Flow	No Action	Full Build -	Full Build Airline Colocation -
A04/D13 VMC	15.8	13.6	14.5
A22/D13 VMC	11.8	11.4	11.2
A22/D31 VMC	12.3	11.2	11.5
A31/D04 VMC	26.7	25.6	26.4
A04/D13 IMC	27.3	25.5	25.5
A22/D13 IMC	16.4	15.9	16.2

Sensitivity Analysis Conclusion

- The results of this sensitivity analysis demonstrate that the airfield impacts of airline collocation in the new and reconfigured terminals are negligible when measured against the current multiple terminal operations by Delta and American.
- Arrival delays and arrival taxi times are fairly consistent between the Full Build and Full Build Airline Colocation scenarios.
- Departure delays and departure taxi times for the Full Build scenario are slightly lower than the Full Build Airline Colocation scenario.

Appendix C.
Air Quality and Noise Impact Analysis

Air Quality and Noise Impact Analysis Memorandum

LaGuardia Airport
East Side Reconfiguration

Prepared for:

Prepared By:

January 2017

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1 Introduction

As part of the Delta Air Lines reconfiguration of the apron area around Terminals C and D at LaGuardia Airport (LGA), an air quality and noise assessment was conducted as part of an environmental assessment (EA) in accordance with the National Environmental Policy Act (NEPA), the Clean Air Act and its amendments (CAAA), Federal Aviation Administration (FAA) guidance, U.S. Environmental Protection Agency (EPA) guidance, New York City Environmental Quality Review (CEQR) guidance and the New York State Environmental Quality Review Act (SEQRA).

The air quality assessment is comprised of three components:

- Temporary construction activities including both equipment and vehicle operations;
- Long-term airside operations due to changes in aircraft taxi and idling time in mode;
- Power-related stationary source operations.

The noise assessment included an evaluation of temporary construction activities assuming that potential noise impacts due to long-term operations would not change, as compared to the No Action Alternative on both the airside of the airport (e.g., noise effects due to changes in aircraft fleet mix or annual flight operations) and the landside of the airport (e.g., noise effects due to changes in roadway traffic and other stationary sources at the airport).

1.1 Proposed Action

Delta Air Lines is proposing to reconfigure the existing apron area around Terminals C and D, creating dual taxilanes between the concourses in order to reduce delays and improve reliability. Due to the constraints of the airport boundaries, the terminal headhouse must be relocated to the south to create additional aeronautical operations areas and the terminal roadways would be reconfigured to support the shifting building. Terminals C and D would be consolidated into a single headhouse with four concourses.

The Proposed Action includes a series of projects divided into four functional areas: airside apron, terminal building, landside roadways and parking, and electrical capacity.

- Airside Apron—The terminal apron would be reconfigured to provide dual taxilanes and gating flexibility at 37 contact gate positions.
- Terminal Building—In order to accommodate passenger demand at acceptable levels of service, a new 1.1 million square foot terminal would be constructed with updated amenities.
- Landside Roadways and Parking—The terminal roadways would be redesigned to provide safe and efficient access and connection to the remainder of the airport. An extension to the East Garage would provide between 520 and 900 additional spaces and taxi/for-hire vehicle staging lots serving the new East Terminal and the future Central Terminal Building (CTB) would be established.[1]

[1] The Proposed Action includes construction of 520 spaces to the east and an additional 350-400 spaces to the south of the east garage. At present, an area has been contemplated in the previously unused grassy space between roadways in front of the future CTB for the 300-space CTB taxi hold lot.

- Electrical Capacity—A new 12 MVA electrical substation would be constructed on the roof of the proposed terminal on the far east side of the airport in order to meet future electrical demand as a result of the Proposed Action.

2 Air Quality Assessment

2.1 Analysis Methodology

The air quality assessment included an evaluation of both temporary construction activities and long-term operations. Air quality impacts due to long-term operations were evaluated for the airside (e.g., effects on emissions due to changes in aircraft taxi in and out and idling at gates) and landside operations (e.g., effects on emissions due to changes in stationary sources).

2.1.1 Pollutants of Concern and Regulatory Setting

Criteria Pollutants and National Ambient Air Quality Standards

The EPA, under the requirements of the 1970 CAA, as amended in 1977 and 1990, has established National Ambient Air Quality Standards (NAAQS) for six contaminants referred to as criteria pollutants (40 CFR 50). As shown in Table 1, these criteria pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), lead (Pb), and sulfur dioxide (SO_2). Criteria pollutants typically result from a wide range of man-made activities and associated stationary and mobile combustion sources. Areas that meet the NAAQS standard for a criteria pollutant are designated as being "in attainment." Areas where a criteria pollutant level exceeds the NAAQS are designated as being "in non-attainment." O_3 non-attainment areas are categorized based on the severity of their pollution problem -- marginal, moderate, serious, severe, or extreme. CO and PM_{10} non-attainment areas are categorized as moderate or serious. When a non-attainment area is re-designated as an attainment area, the CAA requires that a maintenance plan be put in place to ensure continued compliance with the corresponding NAAQS. Therefore, a former non-attainment area is also defined as a maintenance area. Where insufficient data exist to determine an area's attainment status, an area is designated unclassifiable (or in attainment).

Clean Air Act and General Conformity Rule

The Proposed Action would take place in Queens County, New York, an area designated as:

- A marginal nonattainment area for O_3;
- A maintenance area for $PM_{2.5}$ and CO; and
- An attainment area for all other criteria pollutants.

The CAA, as amended in 1990, mandates that states with criteria pollutant nonattainment areas adopt State Implementation Plans (SIPs) that target the elimination or reduction of the severity and number of violations of the NAAQS. SIPs set forth policies to expeditiously achieve and maintain attainment of the NAAQS. The 1990 CAA Amendments (CAAA) expanded the scope of the statute's "conformity" provisions by clearly relating the concept of proposed federal actions. The CAAA requires that proposed federal actions will be in conformity with the SIP's purpose and may not:

Table 1
National and New York State Ambient Air Quality Standards for Criteria Pollutants

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		Primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead (Pb)		Primary and Secondary	Rolling 3-month average	0.15 $\mu g/m^3$(1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		Primary and Secondary	Annual	53 ppb(2)	Annual mean
Ozone (O_3)		Primary and Secondary	8-hour	0.070 ppm(3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particulate Matter	$PM_{2.5}$	Primary	Annual	12 $\mu g/m^3$(4)	Annual mean, averaged over 3 years
		Secondary	Annual	15 $\mu g/m^3$	Annual mean, averaged over 3 years
		Primary and Secondary	24-hour	35 $\mu g/m^3$	98th percentile, averaged over 3 years
	PM_{10}	Primary and Secondary	24-hour	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		Primary	1-hour	75 ppb(5)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Notes:

(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

(2) The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(3) Final rule signed October 16, 2015.

(4) Final rule signed January 15, 2013. The primary annual fine particle ($PM_{2.5}$) standard was lowered from 15 to 12 $\mu g/m^3$.

(5) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

Source: http://www.epa.gov/air/criteria.html.

1. Cause or contribute to any new violations of any standards in any area;
2. Increase the frequency or severity of any existing violation of any standards in any area; or
3. Delay timely attainment of any standard or any required interim emission reductions or other milestones in an area.

EPA has developed two sets of conformity regulations. Federal actions are differentiated into transportation projects and non-transportation-related projects:

- Transportation projects funded or requiring approval from Federal Highway Administration (FHWA) or Federal Transit Administration (FTA), which are regulated under the "transportation conformity" regulations (40 CFR Parts 51 and 93), effective on December 27, 1993 and revised on August 15, 1997.
- Non-transportation projects including airport development projects, which are regulated under the "general conformity" regulations (40 CFR Parts 6, 51 and 93) described in the final rule for Determining Conformity of General Federal Actions to State or Federal Implementation Plans published in the Federal Register on November 30, 1993. The general conformity rule became effective January 31, 1994 and was revised on March 24, 2010.

Since the Proposed Action is an airport apron and terminal reconfiguration project requiring an approval from FAA, the general conformity rule applies.

Hazardous Air Pollutants and Mobile Source Air Toxics

In addition to the criteria air pollutants for which NAAQS have been established, the EPA also regulates air toxics that include pollutants known or suspected to cause cancer and/or other serious health effects. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes, auxiliary power units (APU), ground support equipment (GSE), etc.), and stationary sources (e.g., a power plant). Their effects and potential toxicity may have impacts on human health, including risks of cancer, respiratory conditions, etc. The CAA identifies 188 hazardous air pollutants (HAPs); the EPA has identified 93 HAPs as mobile source air toxics (MSATs), of which seven are priority MSATs:

- Acrolein
- Benzene
- 1,3-butadiene
- Diesel particulate matter plus diesel exhaust organic gases (diesel PM)
- Formaldehyde
- Naphthalene
- Polycyclic organic matter (POM)

MSATs are compounds emitted by highway-traveling vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted when the fuel evaporates or passes through the engine unburned. Other toxics are generated by the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

However, it should be noted that unlike the criteria pollutants, no ambient standards have been established for air toxics. Based on the typical scale of airport projects that do not significantly change aircraft operations or impact heavily travelled highways, potential MSATs impacts are not of concern and not addressed for the Proposed Action.

Greenhouse Gases

Greenhouse gases (GHGs) are compounds that contribute to the greenhouse effect. The greenhouse effect is a natural phenomenon where gases trap heat within the surface-troposphere (lowest portion of the earth's atmosphere) system, causing heating (radiative forcing) at the surface of the earth. The primary long-lived GHGs directly emitted by human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Although CO_2, CH_4, and N_2O occur naturally in the atmosphere, their concentrations have increased by 38%, 149%, 23%, respectively, from the preindustrial era (1750) to 2007/2008 (EPA 2009). These gases influence the global climate by trapping heat in the atmosphere that would otherwise escape to space. Global warming and climate change can affect many aspects of the environment. Not all effects of GHGs are related to climate, for example, elevated concentrations of CO_2 can lead to ocean acidification and stimulate terrestrial plant growth, and CH_4 emissions can contribute to ozone levels.

Although increased concentrations of GHGs are occurring on a global scale, the environmental effects of climate change are also likely to be felt at the local level. Through *PlaNYC* (*2011 Update)*, New York City has established sustainability initiatives and goals for both greatly reducing GHG emissions and adapting to climate change in the City. The goal to reduce citywide GHG emissions to 30 percent below 2005 levels by 2030 was codified by Local Law 22 of 2008, known as the New York City Climate Protection Act (the "GHG reduction goal"). Seeking to expand its goal, the City is undertaking a study to determine potential strategies to reduce its GHG emissions by more than 80 percent by 2050.

2.1.2 Methodology and Modeling Assumptions

The air quality assessment for the proposed project was conducted in accordance with FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* , FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and as supplemented by the 1050.1F Desk Reference. The analysis includes baseline local air quality, an assessment of nonattainment or maintenance pollutants, i.e., O_3, CO, and $PM_{2.5}$, a "hot spot" analysis near roadway intersections, and a general conformity applicability analysis that includes a net emissions analysis for proposed construction and operational activities.

General Conformity Rule Applicability

The general conformity rule (GCR) applies to federal actions occurring in air basins designated as nonattainment for the NAAQS or in attainment areas subject to maintenance plans (maintenance areas). Federal actions occurring in air basins that are in attainment with the NAAQS are not subject to the conformity rule.

Since the Proposed Action would occur in a nonattainment area for O_3 and a maintenance area for CO and $PM_{2.5}$, the general conformity rule applies to the Proposed Action for these nonattainment or maintenance pollutants.

To focus general conformity requirements on those federal actions with the potential to have significant air quality impacts, threshold (*de minimis*) rates of emissions were established in the final rule. A formal conformity determination is required when the annual net total of direct and indirect emissions from a federal action occurring in a nonattainment or maintenance area for a criterion pollutant would equal or exceed the annual *de minimis* level for that pollutant.

For O_3 nonattainment areas, EPA's conformity rules establish *de minimis* emission levels for both O_3 precursors, VOC and NO_x, on the presumption that VOC and NO_x reductions will contribute to reductions in O_3 formation. For the same reason, SO_2 is considered a precursor for $PM_{2.5}$. The applicable *de minimis* levels applicable for the Proposed Action include:

- 100 tons per year (tpy) of NO_x and 50 tpy of VOC, since the project site is located in an O_3 moderate nonattainment area in an O_3 transport region.
- 100 tpy for CO, $PM_{2.5}$ and SO_2.

Pursuant to the GCR, any reasonably foreseeable net increase in emissions (both direct and indirect) associated with the implementation of the Proposed Action should be quantified and compared to the applicable annual *de minimis* levels to determine potential air quality impacts and whether a formal conformity determination is required.

The conformity applicability analysis for a federal action examines the impacts of the direct and indirect net emissions from both mobile and stationary sources. Direct emissions are emissions of a criterion pollutant or its precursors that are caused or initiated by a federal action and occur at the same time and place as the action. Indirect emissions, occurring later in time and/or further removed in distance from the action itself, must be included in the determination if both of the following apply:

- The federal agency can practicably control the emissions and has continuing program responsibility to maintain control.
- The emissions caused by the federal action are reasonably foreseeable.

Increased direct and indirect NO_x, VOC, $PM_{2.5}$, CO, and SO_2 emissions from the proposed construction and operational activities would result from:

- Use of diesel and gas-powered demolition and construction equipment;
- Movement of trucks transporting construction materials and concrete;
- Replacement of existing terminal heating and refrigeration boilers and generators;
- Change in aircraft taxi and idling time in mode.

According to the GCR, a proposed action would not require a formal conformity determination and would have minimal air quality impacts if the predicted net increases in annual nonattainment and/or maintenance pollutants are below the corresponding *de minimis* level.

Construction Year Emissions Estimates

The quantity and type of equipment necessary for the proposed reconfiguration action were provided by STV who established the construction plan for the project. Construction of the project would involve

multiple phases over a total of eight years (early 2017 into 2025). Various and multiple pieces of construction equipment would be utilized during both demolition and construction activities.

All equipment was assumed to be diesel-powered unless otherwise noted. Estimates of equipment emissions were based on the estimated hours of usage and emission factors for each motorized source during both demolition and construction activities. For emissions estimate purposes, emission factors for NO_x, VOC, $PM_{2.5}$, CO, and SO_2 related to heavy-duty diesel equipment were predicted using EPA Motor Vehicle Emission Simulator (MOVES2014a) emission factor model. The New York State Department of Transportation (NYSDOT) has supplied model inputs and guidance to handle various factors in using MOVES to predict emissions factors applicable to Queens County where the project site is located. NYSDOT is the agency responsible for developing the regional Transportation Improvement Programs (TIP) in order to conform to the SIP to improve state air quality condition on mobile sources as a requirement of CAA conformity rule.

The EPA recommends the following formula to calculate hourly emissions from nonroad engine sources:

$$M_i = N \times HP \times LF \times EF_i$$

where:

M_i = mass of emissions of i^{th} pollutants during inventory period;
N = source population (units);
HP = average rated horsepower;
LF = typical load factor; and
EF_i = average emissions of i^{th} pollutant per unit of use (e.g., grams per horsepower-hour).

Typical load factor values were already included in the MOVES2014a Emission Factor model.

Operation Year Emissions Estimates

Stationary Sources

Stationary source air emissions that could be affected by the Proposed Action includes construction of several new heating boilers and power generators that replace the existing sources. The CAA sets permit rules and emission standards for pollution sources of certain sizes. EPA oversees the programs that grant stationary source operating permits (Title V) and new or modified major stationary source construction and operation permits for a major source. The New Source Review (NSR) program requires new major stationary sources or major modification of existing major stationary sources of pollutants to obtain permits before initiating construction. If these new sources are classified as a major source for which the NSR is applicable, the emissions from the new sources are exempt from the general conformity rule analysis since they are regulated under NSR regulatory program.

Since Delta is currently operating existing stationary sources that do not require an air permit, the upgraded new sources are anticipated to be capped under the major source Title V permit requirement. Therefore, the potential increase as a result of new stationary sources is considered in the general conformity rule analysis.

The actual annual fuel usage data from the existing stationary source operations and the size of each source were used as the basis to establish the emissions levels for the existing sources. The existing

condition fuel data sheets and associated emission estimate worksheet provided by Delta was used as the basis to prorate the actual emissions under the Proposed Action based on the proposed design heating and cooling capacity. This approach is considered conservative since the new sources are designed with greater energy efficiency and anticipated to result in a lower unit emission rate for each applicable nonattainment or maintenance pollutant.

Aircraft Taxi and Idling

Since the Proposed Action would not change in aircraft fleet mix or overall annual flight operations, aircraft flight and ground service equipment (GSE) related emissions would remain the same as the No Action Alternative. However, the improvement in the apron layout and incorporation of dual taxilanes would change the associated taxi and idling time in mode under the proposed condition.

The FAA's Office of Environment and Energy (AEE) has developed the Aviation Environmental Design Tool (AEDT), a software system to dynamically model aircraft performance in space and time to compute emissions and the air quality impacts around the airport. The FAA requires the use of AEDT software to conduct air quality analyses for all new projects. Using the most recent version of AEDT (i.e., AEDT2b), aviation-related emissions inventories can be computed for the EPA criteria air pollutants and their precursors. Sources of airport emissions included in AEDT2b include aircraft, APUs, GSE, and an array of stationary sources (e.g., boilers, generators, etc.). Therefore, for developing on-airport operational emissions inventory, AEDT2b would be used to predict emissions for all sources with the exception of ground access vehicles and parking facilities. This model was used to predict the net change in aircraft operation associated taxi and idling emissions as a result of the Proposed Action.

On-Road Vehicles

It is anticipated that the Proposed Action would not affect any existing roadway network configuration beyond the airport. Therefore, the change in on-road vehicle emissions would be minimal and is not considered in the EA.

On-Road Mobile Source Hot Spot Impact

Typical pollutants of concern related to on-road mobile source operations are CO and fine PM ($PM_{2.5}$). Because the construction duration of the project would exceed five years in any single location, the impact incurred during construction would not be considered temporary per 40 CFR 93.123(c)(5) and was treated in the same way as those during operational years. Therefore, a CO and $PM_{2.5}$ hot-spot assessment was conducted for construction conditions. Operational on-road mobile impacts were not evaluated in the EA.

A hot spot CO analysis was performed for construction year conditions according to the following criterion (40 CFR 93.123a (1) (ii)): projects affecting intersections that are at Level-of-Service D, E, or F, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes related to the project.

A screening procedure established in the *CEQR Technical Manual* was used to further determine whether a refined $PM_{2.5}$ hot spot analysis is required, per 40 CFR 93.116 requirements.

Traffic data used for the air quality analysis were derived from existing traffic counts, projected future growth in traffic, and other data developed as part of the traffic analysis for the Proposed Action. Traffic data for the future without and with the Proposed Action during the construction years were used in the air quality modeling scenarios. Weekday peak periods (i.e., AM and PM) were evaluated. These time periods were selected for the mobile source analysis because these periods produce the maximum anticipated project-generated traffic, particularly at those signalized intersections with the greatest congestion and which, therefore, have the greatest potential for significant air quality impacts.

Each signalized intersection analyzed for potential peak period impacts was first screened using the hourly thresholds recommended in the *CEQR Technical Manual*, as follows:

- Traffic operational LOS "D" or worse; and
    - For CO: 170 or more incremental vehicle trips from the Proposed Action;
    - For $PM_{2.5}$: 23 or more incremental truck trips at arterial roadways (further refined, as presented later in this memo, for 19 or more incremental equivalent heavy duty diesel vehicle [HDDV] trips at collector roadways for $PM_{2.5}$).

If the screening thresholds were not exceeded at an intersection, no further dispersion analysis was warranted. For those intersections that exceeded the screening thresholds, a further ranking to determine the worst-case intersections was performed. The ranking was made based on worst-case LOS, overall highest Future With-Action traffic volume, and incremental increase in traffic attributable to the Proposed Action.

A CO hot spot modeling analysis is typically performed using the CAL3QHC model to determine the wind direction resulting in the maximum concentrations at each receptor following the EPA guidelines. EPA MOVES model is used for predicting emission factors. CO concentrations were predicted at intersections selected from a screening analysis using the CEQR-established procedures.

A $PM_{2.5}$ hot spot modeling analysis is typically performed with the CAL3QHCR model, which includes the modeling of hourly concentrations based on hourly traffic data and the most recent five years of hourly meteorological data collected at the closest weather station such as the LGA station. The highest model-predicted concentration for each averaging period was used to determine the worst-case potential impacts.

In order to compare the analysis results with the applicable NAAQS, cumulative concentration levels were calculated by combining the highest pollutant concentrations as a result of the Proposed Action with background pollutant concentrations. Background concentrations are those pollutant concentrations originating from distant sources not accounted for in the air quality modeling analysis of intersections, which only accounts for vehicular emissions from the streets immediately adjacent to the intersections selected for hot spot analysis. For this mobile source impact analysis, the most recent highest background concentrations monitored at the nearest station.

Greenhouse Gas Emissions

The dominant GHG gas emitted is CO_2, mostly from fossil fuel combustion (85.4%) (EPA, April 15, 2009). CH_4 is the second largest component of emissions, followed by N_2O. Overall greenhouse gas emissions are presented in terms of equivalent emissions of CO_2 (i.e., CO_2e). Furthermore, among the primary

long-lived GHGs directly emitted by human activities, only CH_4 and N_2O have the potential to be produced from fossil fuel combustion sources (EPA, April 15, 2009).

This EA follows the recently released *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* issued by the Council of Environmental Quality (CEQ) (CEQ, August 2016). The potential effects of proposed GHG emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. In keeping with CEQ guidance, the focus of the cumulative air quality GHG analysis is to disclose GHG emissions from the Proposed Action.

2.2 Existing Conditions

The New York State Department of Environmental Conservation (NYSDEC) collects air quality data in terms of ambient concentration levels at representative sites throughout the state. The most recent available data (from 2012 to 2014) from nearby monitoring stations are used to describe the existing baseline ambient air quality at the airport. As shown in Table 2, all measurements are below the standards shown in Table 1, with the exception of O_3 since the region (within which the airport is located) has been designated an 8-hour O_3 nonattainment area.

As previously described, the Proposed Action would take place in Queens County, New York, an area designated as:

- A marginal nonattainment area for O_3,
- A maintenance area for $PM_{2.5}$ and CO; and
- An attainment area for all other criteria pollutants.

Table 2
Measured Ambient Background Concentrations for Criteria Pollutants

Pollutant	Location	Units	Averaging Period	Concentration		
				2012	2013	2014
CO	Queens College 65-30 Kissena Blvd Parking Lot#6, Queens County, NY	ppm	1-hour	1.7	2.0	1.9
			8-hour	1.1	1.4	1.1
SO_2	Queens College 65-30 Kissena Blvd Parking Lot#6, Queens County, NY	ppb	1-hour	12.2	11.8	19.0
			3-year average	14.3		
PM_{10}	Queens College 65-30 Kissena Blvd Parking Lot#6, Queens County, NY	µg/m3	24-hour	33	33	36
			3-year average	34.0		
$PM_{2.5}$	Queens College 65-30 Kissena Blvd Parking Lot#6, Queens County, NY	µg/m3	24-hour	19.7	25.0	20.5
			3-year average	21.7		
			annual	7.8	8.4	8.5
			3-year average	8.2		
NO_2	Queens College 65-30 Kissena Blvd Parking Lot#6, Queens County, NY	ppb	1-hour	56.6	58.6	58.5
			3-year average	57.9		
			annual	17.5	17.5	16.8
Ozone	IS-52 681 Kelly St, Bronx, NY	ppm	8-Hour	0.068	0.071	0.071
			3-year average	0.070		

Source: http://www.epa.gov/airdata/ad_rep_mon.html

2.3 Proposed Action

2.3.1 Construction Activity Emissions

Per the CAA General Conformity Rule requirements applicable to federal actions, the construction period emissions from both construction equipment and on-road trucks and construction commuter vehicles were estimated on an annual basis for this assessment.

Equipment Emissions

The quantity and type of equipment necessary for the proposed reconfiguration action were determined based on the activities resource data provided by Delta Air Lines. Various and multiple pieces of construction equipment would be utilized during both demolition and construction activities. Demolition equipment would include dozers, backhoes, gas engine vibrators, hydraulic excavators, and front end loaders. Construction equipment would include cranes, compressors, graders, asphalt pavers, and rollers. Although demolition would generally precede construction in a given area, the phasing for the project requires that both types of activities would be occurring throughout most of the construction period.

According to the activity schedule, 2021 would be the worst-case construction year resulting in the maximum annual construction equipment emissions (Table 3). The specific equipment type, size, operational hours, and associated emissions during the worst-case year are presented in Table 3a.

Table 3
Construction Equipment Emissions by Construction Year

Year	Annual Emission Rate (ton)						
	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2
2017	3.495	28.655	15.737	2.596	2.518	0.029	4,879.0
2018	4.405	31.838	17.869	2.959	2.870	0.040	6,827.8
2019	2.814	21.414	11.124	1.899	1.842	0.025	4,174.0
2020	2.730	20.473	11.697	1.909	1.852	0.026	4,366.4
2021	4.937	36.961	23.557	3.723	3.611	0.042	6,991.0
2022	3.598	28.408	14.454	2.580	2.502	0.036	6,175.9
2023	2.510	17.634	11.855	1.885	1.829	0.022	3,786.4
2024	1.011	6.810	4.624	0.740	0.717	0.008	1,299.3
2025	0.171	1.155	0.780	0.125	0.121	0.001	221.4

Table 4
Worst-case Year Construction Equipment Emissions

Equipment Type	Equipment Days	Hours	Horsepower (hp)	Emission Factor (grams/hp-hour)							Emission Rate (tons)						
				VOC	NOx	CO	$PM_{2.5}$	PM_{10}	SO_2	CO_2	VOC	NOx	CO	$PM_{2.5}$	PM_{10}	SO_2	CO_2
Application Equipment	2	16	350	0.19	1.69	0.57	0.11	0.11	0.00	536.30	0.00	0.01	0.00	0.00	0.00	0.00	3.00
Asphalt paver, 130 HP	2	16	130	0.21	1.89	0.80	0.18	0.38	0.00	536.25	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Backhoe loader, 80hp	2886	23088	80	0.93	4.28	5.29	0.74	0.57	0.00	693.32	1.72	7.91	9.77	1.37	1.41	0.01	1280.60
Centrif. water pump, 6"	1787	14296	57	0.52	4.79	2.46	0.41	0.25	0.00	588.85	0.42	3.90	2.00	0.33	0.34	0.00	479.84
Concrete pump, small	660	5280	210	0.36	3.93	1.09	0.21	0.45	0.00	530.01	0.40	4.36	1.21	0.23	0.24	0.00	587.67
Crane, 40 ton	945	7560	177	0.20	1.95	0.43	0.08	0.25	0.00	530.48	0.27	2.60	0.57	0.11	0.11	0.00	709.85
Diesel hammer, 41k ft-lb	233	1864	101	0.22	2.14	0.57	0.14	0.25	0.00	530.43	0.04	0.40	0.11	0.03	0.03	0.00	99.86
Dozer, 300 HP	509	4072	300	0.19	1.55	0.52	0.10	0.30	0.00	536.32	0.23	1.90	0.64	0.12	0.12	0.00	655.16
Front end loader, TM, 2.5cy	706	5648	97	0.26	2.44	2.29	0.29	0.17	0.00	595.43	0.14	1.33	1.25	0.16	0.16	0.00	326.21
Gas welding machine	1248	9984	66	1.10	5.15	5.39	0.75	0.30	0.00	692.80	0.72	3.39	3.55	0.50	0.51	0.00	456.52
Manlift	2743	21944	62	0.24	2.30	0.93	0.20	0.33	0.00	536.16	0.33	3.12	1.26	0.27	0.28	0.00	729.46
Motor grader, 30,000 lb	93	744	193	0.19	1.52	0.51	0.09	7.64	0.00	536.32	0.03	0.22	0.07	0.01	0.01	0.00	77.01
Pavement removal bucket	693	5544	168	0.19	1.49	0.65	0.15	0.06	0.00	536.31	0.18	1.39	0.61	0.14	0.14	0.00	499.52
Pavement breaker, 60lb	809	6472	49	0.23	3.85	0.91	0.15	0.28	0.00	589.71	0.07	1.22	0.29	0.05	0.05	0.00	187.01
Paving machinery & equipment	416	3328	450	0.24	3.22	1.38	0.18	0.22	0.00	536.16	0.35	4.82	2.06	0.27	0.28	0.00	802.95
Vibratory drum roller	162	1296	137	0.22	2.04	0.85	0.19	0.17	0.00	536.22	0.04	0.36	0.15	0.03	0.03	0.00	95.21
Total Emissions											4.94	36.96	23.56	3.61	3.72	0.04	6991.00

On-road Mobile Source Emissions

Various construction trucks (e.g., concrete and material delivery and haul trucks), workers' commuting vehicle, and shuttle bus operations would also result in indirect emissions during the construction period. The trip forecasts used in the analysis are described in the Construction Traffic Report. These on-road construction related vehicles are assumed to:

- Travel 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.

MOVES2014a emissions 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 5.

Table 5
Truck and Commuter Vehicle Emissions by Construction Year

Year	Annual Emission Rate (ton)						
	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2
2017	0.189	1.343	1.120	0.178	0.093	0.005	557.2
2018	0.220	1.563	1.334	0.208	0.109	0.006	653.1
2019	0.180	1.279	0.997	0.168	0.089	0.005	519.4
2020	0.164	1.163	1.014	0.155	0.081	0.005	489.2
2021	0.162	1.137	1.331	0.159	0.079	0.006	532.3
2022	0.148	1.040	1.129	0.144	0.072	0.005	473.3
2023	0.187	1.331	1.029	0.175	0.093	0.005	539.1
2024	0.215	1.543	0.840	0.195	0.108	0.005	568.6
2025	0.036	0.257	0.140	0.033	0.018	0.001	94.8

General Conformity Applicability Determination

Under the GCR, 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 the SIP for the criteria pollutant 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 6, the expected annual increases in construction emissions under the Proposed Action dominated by construction equipment emissions would be below the applicable *de minimis* criteria.

Table 6
Total Construction Annual Emissions

Year	Annual Emission Rate (ton)						
	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2
2017	3.685	29.998	16.858	2.775	2.612	0.035	5,436.2
2018	4.626	33.401	19.202	3.167	2.979	0.046	7,480.9
2019	2.993	22.693	12.121	2.067	1.931	0.030	4,693.4
2020	2.894	21.636	12.711	2.064	1.932	0.030	4,855.6
2021	5.100	38.097	24.888	3.882	3.690	0.048	7,523.3
2022	3.747	29.448	15.583	2.724	2.575	0.041	6,649.3
2023	2.697	18.965	12.884	2.060	1.921	0.027	4,325.5
2024	1.226	8.352	5.464	0.935	0.825	0.013	1,867.9
2025	0.206	1.412	0.920	0.157	0.139	0.002	316.2
De minimis	*50*	*100*	*100*	*n/a*	*100*	*100*	*n/a*
GCR Applicable?	No	No	No	n/a	No	No	n/a

Mobile Source Hot Spot Impact

The anticipated hot spot air quality impacts associated with off-site mobile source activities during the worst-case year for construction traffic (i.e., 2019) were evaluated for the Proposed Action. Mobile air pollutant sources include engine exhaust emitted from proposed traffic within the roadway network around the project site (i.e., construction trucks along designated truck routes, workers' commuting vehicles, and shuttle bus operations). Given the type of development proposed, the truck component of the project-related traffic would be minor. On-road traffic volumes and the incremental equivalent heavy duty diesel vehicle (HDDV) trips at each analyzed intersection were first screened using the *CEQR Technical Manual* recommended screening thresholds:

- 170 or more incremental vehicle trips for CO; and
- 23 or more incremental equivalent HDDV trips at Principal and minor arterial roadways for $PM_{2.5}$.

CO Hot Spot Screening Analysis

According to the screening results at each affected intersection at which a traffic analysis was conducted (as shown in Table 7) a further hot spot dispersion impact analysis is not warranted for CO at any of studied intersection. Therefore, CO hot spot impacts during the construction period would not be significant.

$PM_{2.5}$ Screening

$PM_{2.5}$ hot spot screening was first performed at each intersection based on peak hour traffic increments in each of the applicable vehicle classifications using average vehicle weight and fuel types. These class-specific increments were then used as inputs into the CEQR screening worksheet to determine incremental truck equivalency and compared to the screening threshold. Since each analyzed intersection has one or more arterial roadways present, a 23-equivalent truck screening threshold was used to determine whether a further tier screening or dispersion modeling analysis is required. According to the peak hour screening results at each affected intersection, as shown in Table 8, all intersections pass the Tier 1 screening based on hourly equivalent truck increments. Therefore, no further hot spot $PM_{2.5}$ analysis is warranted and $PM_{2.5}$ mobile source impacts would not be significant.

Table 7
CO Hot Spot Screening Results

Intersection	Peak Hour Trip Increment	6-7 am						3-4 pm					
		Auto	Shuttle Bus	Truck	Total	Thres-hold	Pass/ Fail	Auto	Shuttle Bus	Truck	Total	Thres-hold	Pass/ Fail
1	Astoria Boulevard / 94th Street	9		12	21	170	Pass	9		12	21	170	Pass
2	Northern Boulevard / Junction Boulevard	13		4	17	170	Pass	13		4	17	170	Pass
3	Astoria Boulevard / 77th Street	9		2	11	170	Pass	0		2	2	170	Pass
4	Astoria Boulevard / 82nd Street / 24th Avenue	9		4	13	170	Pass	9		4	13	170	Pass
5	Shea Road / Boat Basin Place	60	7		67	170	Pass	127	7		134	170	Pass
6	Boat Basin Place / Marina Road	60			67	170	Pass	67	7		74	170	Pass
7	Shea Road / 34th Avenue / 126th Street	89	7		96	170	Pass	89	7		96	170	Pass
8	Northern Boulevard EB / 126th Street	0	0	0	0	170	Pass	89			89	170	Pass
9	Northern Boulevard WB / 126th Street			2	2	170	Pass	89		2	91	170	Pass
10	Astoria Boulevard / 114th Street / Northern Boulevard	22	7	2	31	170	Pass	80	7	2	89	170	Pass
11	126th Street / 36th Avenue	0	0	0	0	170	Pass	0	0	0	0	170	Pass
1	Astoria Boulevard / 94th Street	9		12	21	170	Pass	9		12	21	170	Pass
2	Northern Boulevard / Junction Boulevard	13		4	17	170	Pass	13		4	17	170	Pass

Table 8
$PM_{2.5}$ Hot Spot Screening Results

Intersection #	Intersection	Max Peak Hour Increment				PM2.5 Screening		
		Auto	Shuttle	Truck	Total	Screening Criteria	Equivalent Truck	Screening Result
1	Astoria Boulevard / 94th Street	9		12	21	23	12	Pass
2	Northern Boulevard / Junction Boulevard	13		4	17	23	5	Pass
3	Astoria Boulevard / 77th Street	0		2	2	23	2	Pass
4	Astoria Boulevard / 82nd Street / 24th Avenue	9		4	13	23	4	Pass
5	Shea Road / Boat Basin Place	127	7		134	23	8	Pass
6	Boat Basin Place / Marina Road	67	7		74	23	6	Pass
7	Shea Road / 34th Avenue / 126th Street	89	7		96	23	7	Pass
8	Northern Boulevard EB / 126th Street	89			89	23	4	Pass
9	Northern Boulevard WB / 126th Street	89		2	91	23	6	Pass
10	Astoria Boulevard / 114th Street / Northern Boulevard	80	7	2	89	23	8	Pass
11	126th Street / 36th Avenue	0	0	0	0	23	0	Pass

2.3.2 Operational Activity Emissions

Aircraft Taxi and Idling Emissions

The most recent FAA's AEDT2b software was used to predict the emissions affected by aircraft operations under the Proposed Action in terms of the changes in taxi in/out and gate idling associated with each landing/take-off (LTO) cycle as summarized in Table 9.

Larger jet aircraft have an auxiliary power unit or APU to operate heat, air conditioning, and electric systems while the aircraft is parked at the gate. The APU is also used to restart the engines before departing from the gate area. Based on the improvement under the Proposed Action with anticipated reduction of aircraft taxi in/out time in mode and APU running time at gate areas, a net reduction of aircraft operational emissions under the Proposed Action as compared to No Action Alternative was predicted and summarized in Table 10.

Table 9
Aircraft Fleet Mix and Annual LTOs (2029)

Aircraft Fleet Mix	No Action/Proposed Action Flight LTO
A319	14,965
A320	28,470
A321	10,220
B717	27,375
B738	25,185
B739	11,315
B752	4,745
A321/32B	365
B737-700	2,190
737-800	6,570
B737-700	9,855
CRJ-700	29,200
CRJ-900	17,885
CRJ-100	1,095
ERJ-170	19,345
ERJ-175	27,375
ERJ-190	11,315
ERJ-145	3,650
Total	251,120

Source: Landrum & Brown, April 1, 2016.

Table 10
Aircraft Operational Emissions for Year 2029 (Tons)

Pollutant	Source	No Action	Proposed Action	Proposed Net Change
CO	Taxi	55.3	49.4	-6.0
	Idling	9.3	3.8	-5.5
	Total	64.6	53.2	-11.4
VOC	Taxi	6.1	5.6	-0.5
	Idling	0.7	0.3	-0.4
	Total	6.8	5.9	-1.0
NOx	Taxi	8.4	7.3	-1.1
	Idling	7.2	2.6	-4.6
	Total	15.6	9.9	-5.7
SOx	Taxi	2.5	2.2	-0.3
	Idling	1.2	0.4	-0.7
	Total	3.6	2.6	-1.1
PM_{10}	Taxi	0.3	0.3	0.0
	Idling	1.1	0.4	-0.7
	Total	1.4	0.7	-0.7
$PM_{2.5}$	Taxi	0.3	0.3	0.0
	Idling	1.1	0.4	-0.7
	Total	1.4	0.7	-0.7
CO_2	Taxi	6,048.2	5,292.1	-756.1
	Idling	-	-	-
	Total	6,048.2	5,292.1	-756.1

Stationary Source Emissions

Stationary source air emissions under the Proposed Action would be affected by the upgrade of terminal heat and power system. Existing hot water heater, boilers, and diesel generators would be replaced with more modern and cleaner models utilizing natural gas but with a greater capacity, as summarized in Table 11. Delta is currently operating its stationary source emissions below the state facility permit threshold. Since the new power system would increase the capacity as compared to the existing condition, it is anticipated that Delta would apply for a state facility air permit and cap out the emissions below the major source Title V permit threshold. Therefore, the potential increase as a result of new power system is considered in the general conformity rule analysis. It should be noted that these actual emissions were estimated for federal general conformity rule analysis purposes only. Further impact analysis based on the potential to emit per the NYSDEC permitting requirements would be addressed during the final design stage. Since the predicted stationary source actual emissions (Table 12) would likely exceed the major source threshold for NOx (25 tons per year), the NOx emissions from the new power system would be capped in order to meet the state facility permit threshold.

Table 11
Stationary Source Capacity Comparison

Pollutant	Existing Condition Capacity	Proposed Condition Capacity	Net Change in Total CHRP Capacity
Hot Water Heater	1 x 275 MBH (gas) 2 X 495 MBH (gas) = Total 1,265 MBH (gas)	2 x 230 MBH (gas) = Total 460 MBG (gas)	-805 MBH (gas)
Boiler	2 x 12,000 MBH (dual fuel) 7 x 1,900 MBH (gas) 1 x 540 MBH (gas RTU) 1 x 350 MBH (gas RTU) = Total 38,190 MBH (dual fuel)	5 x 12,000 MBH (gas) = Total 60,000 MBH (gas)	21,810 MBH (gas)
Diesel Generator	1 x 1000 kw 1 x 750 kw 1 x 100 kw 1 x 500 kw 1 x 420 kw = Total 2,770 kw	3 x 1500 kw 2 x 1750 kw 1 x 2000 kw = Total 10,000 kw	7,230 kw

Source: Burns & McDonnell, September 13, 2016

Table 12
Net Change in Stationary Source Annual Emissions

Emission Source	NO_x Emissions (tons/yr)	CO Emissions (tons/yr)	PM_{10} Emissions (tons/yr)	$PM_{2.5}$ Emissions (tons/yr)	SO_2 Emissions (tons/yr)	VOC Emissions (tons/yr)	CO_2 Emissions (tons/yr)
Existing Condition – Actual Emissions	10.0	7.4	0.8	0.8	0.1	1.9	11,554.0
Proposed Condition – Predicted Emissions	39.2	22.6	1.4	1.4	0.1	8.7	8,451.3
Total Net Change in Emissions	29.2	15.2	0.6	0.6	0.0	6.8	-3,102.7

General Conformity Applicability Determination

As shown in Table 13, any expected annual increases in operational emissions between the No Action and the Proposed Action conditions would be well below the applicable *de minimis* criteria. Therefore, a formal conformity determination is not required and air quality impacts under the Proposed Action would not be significant.

Table 13
Net Change in Operational Annual Emissions (2029)

Source	Emissions (tons per year)						
	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2
Aircraft	-1.0	-5.7	-11.4	-0.7	-0.7	-1.1	-756.1
Stationary Sources	6.8	29.2	15.2	0.6	0.6	0.0	-3,102.7
Total	5.8	23.5	3.8	-0.1	-0.1	-1.1	-3,858.8
De Minimis Levels	*50*	*100*	*100*	*n/a*	*100*	*100*	*n/a*
GCR Applicable?	No	No	No	n/a	No	No	n/a

2.3.3 Greenhouse Gas Emissions Under Construction and Operation Conditions

The overall GHG emissions as a result of the proposed construction and operation of the new terminal are predicted and summarized in Tables 6 and 13. These annual levels are well below the CEQ 25,000 tons per year assessment threshold and, therefore, they are not considered to have a meaningful impact on the climate change. The change in climate conditions caused by GHG resulting from the burning of fossil fuels from construction and operational activities associated with the Proposed Action is a global effect and requires that the emissions be assessed on a global scale. Therefore, the disclosure of localized incremental increases CO_2 has no weight in addressing climate change. Consequently, given the minimal increase predicted for the proposed project, overall global or US GHG emissions would remain near the current level under the proposed condition, resulting in an insignificant cumulative impact to global climate change. No specific GHG emission mitigation measures are warranted.

2.4 Air Assessment Summary

The analysis described in this technical memorandum concludes that the proposed Delta Air Lines Reconfiguration would not result in significant air quality impacts in each of the below studied elements:

General Conformity Review

The purpose of a general conformity evaluation is to examine the results of the emissions inventories and to determine the applicability of the General Conformity Rule to the Proposed Action. A General Conformity Determination is required if the net increase in emissions resulting from the Proposed Action exceed the applicable *de minimis* thresholds. Tables 6 and 13 show that the estimated net emissions from both airside and landside activities from both mobile and stationary sources under

either construction or operational years would be less than the applicable *de minimis* thresholds. Because the Proposed Action (both construction and the long-term operations) would not result in increased emissions above the applicable *de minimis* thresholds, no further analysis is required under the General Conformity Rule (40 CFR Part 93, §93.153) and the Proposed Action is presumed to conform to the state implementation plan.

Hot Spot Analysis

A hot spot screening analysis in accordance with CEQR Technical Manual-established methodologies was conducted to determine whether carbon monoxide and particulate matter emissions due to construction traffic volumes would result in unacceptably high concentration levels in public areas. This screening analysis found that no study intersection would require further dispersion modeling analysis; therefore, no significant air quality impacts would occur at local hot spots as a result of the Proposed Action.

Greenhouse Gas Emissions

In August 2016, the Council on Environmental Quality issued *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* describing how and when Federal agencies should address the subject of greenhouse gas emissions in documents prepared pursuant to NEPA. It is reasonable to conclude that the Proposed Action, as measured from an air quality perspective, would not have meaningful cumulative effects on the climate change, which is a global effect. Further examination of this subject in this document is neither necessary nor appropriate.

Conclusion

The Proposed Action includes several improvements that would have the potential to increase both airside and landside efficiency at LGA. The Proposed Action would not cause significant adverse air quality impacts because it includes several emission-reducing features such as reduced aircraft congestion in the terminal area and the availability of ground power to reduce gated aircraft idling emissions. Therefore, this project is intended to improve efficiency and passenger level of service and would ultimately reduce emissions. Although the new terminal power system would have the potential to increase current power generating capacity in the terminal building, the system would be more modernized with greater fuel efficiency. Therefore the overall stationary source operation would be unlikely to result in significant adverse air quality impacts.

Although construction activities would last approximately 8 years, these activities would occur at different sites over a relatively large project area within the airport. The ambient air quality impacts from these construction activities would be temporary in nature and do not warrant further analysis. On-road mobile source screenings for both CO and $PM_{2.5}$ were performed at study intersections for construction. And all intersections passed the screening based on peak hour traffic increments. Therefore, CO and $PM_{2.5}$ mobile source impacts would not be significant and no further CO and $PM_{2.5}$ analysis is warranted.

3 Noise Assessment

3.1 Noise Fundamentals and Evaluation Criteria

3.1.1 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 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 (similar to most human senses). 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 20 dBA (the threshold of hearing) to between 130 and 140 dBA (the threshold of pain). Table 14 summarizes noise levels from common sources.

Table 14
Noise Levels of Common Sources

Noise Source	Level (dBA)
Air Raid Siren at 50 Feet	120
On Platform by Passing Subway	100
On Sidewalk by Passing Heavy Truck or Bus	90
On Sidewalk by Typical Highway	80
On Sidewalk by Passing Automobiles with Mufflers	70
Typical Urban Area	60-70
Typical Suburban Area Background	50-60
Quiet Suburban Area at Night	40-50
Typical Rural Area at Night	30-40

Source: *CEQR Technical Manual*.

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*.

Alternatively, it is often useful when measuring noise levels to take into account the difference in perception and response between daytime waking hours and nighttime sleeping hours. To this end, a descriptor called the day-night noise level (or DNL) has been developed. DNL is defined as the A-weighted average sound level during a 24-hour period, with a 10 dBA penalty weighting applied to noise occurring during the nighttime period (10 pm to 7 am). The 10 dBA weighting accounts for the fact that noises at night are more perceptible because of lower background noise levels.

The DNL descriptor has been recognized by the Department of Housing and Urban Development (HUD), the EPA, the FAA, and the Department of Defense (DoD) as one of the most appropriate metrics for estimating the degree of nuisance or annoyance that increased noise levels would cause in residential neighborhoods. Therefore, DNL has been selected as the appropriate noise descriptor for evaluating aircraft noise impacts in this analysis.

3.1.2 Construction Noise Analysis Methodology and Evaluation Criteria

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 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 FHWA-approved Roadway Construction Noise Model (RCNM) 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.

3.2 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 as shown in Figure 1 in the context of the closest surrounding land use for a further construction noise impact analysis. Among these sites, typical weekday peak hour noise monitoring was conducted in 2013 on Sites M1 and M2 to reflect current baseline conditions.

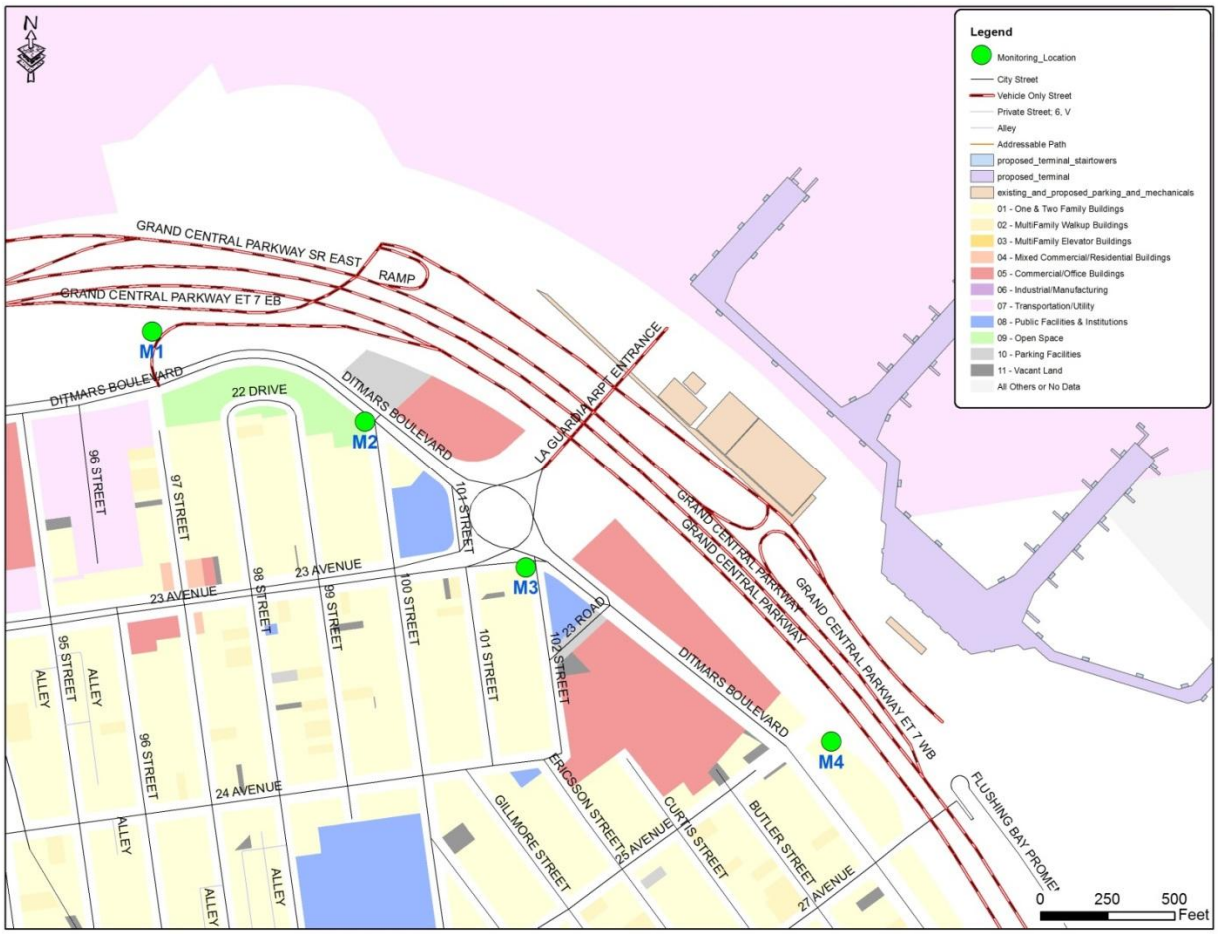

Figure 1: Noise Analysis Locations in Close Vicinity of the Proposed LGA Delta Terminal

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 are summarized in Table 15.

The aircraft-generated noise levels from La Guardia Airport in terms of the DNL descriptor are depicted in Figure 2. The existing condition DNL levels at selected sensitive sites (M1 through M4) are below 65 dBA.

Table 15
Existing Ambient Noise Monitoring Results

Site	Location	Land Use	Noise Level (dBA)			
			Peak hour	Leq	L10	L90
M1	Overlook Park	Park	AM	64.6	67.3	60.4
			MD	64.3	66.1	59.9
			PM	64.5	67.1	60.6
M2	100th St. & Ditmars Blvd.	Residential	AM	63.5	66.0	58.1
			MD	63.6	65.7	57.9
			PM	63.7	65.9	58.5

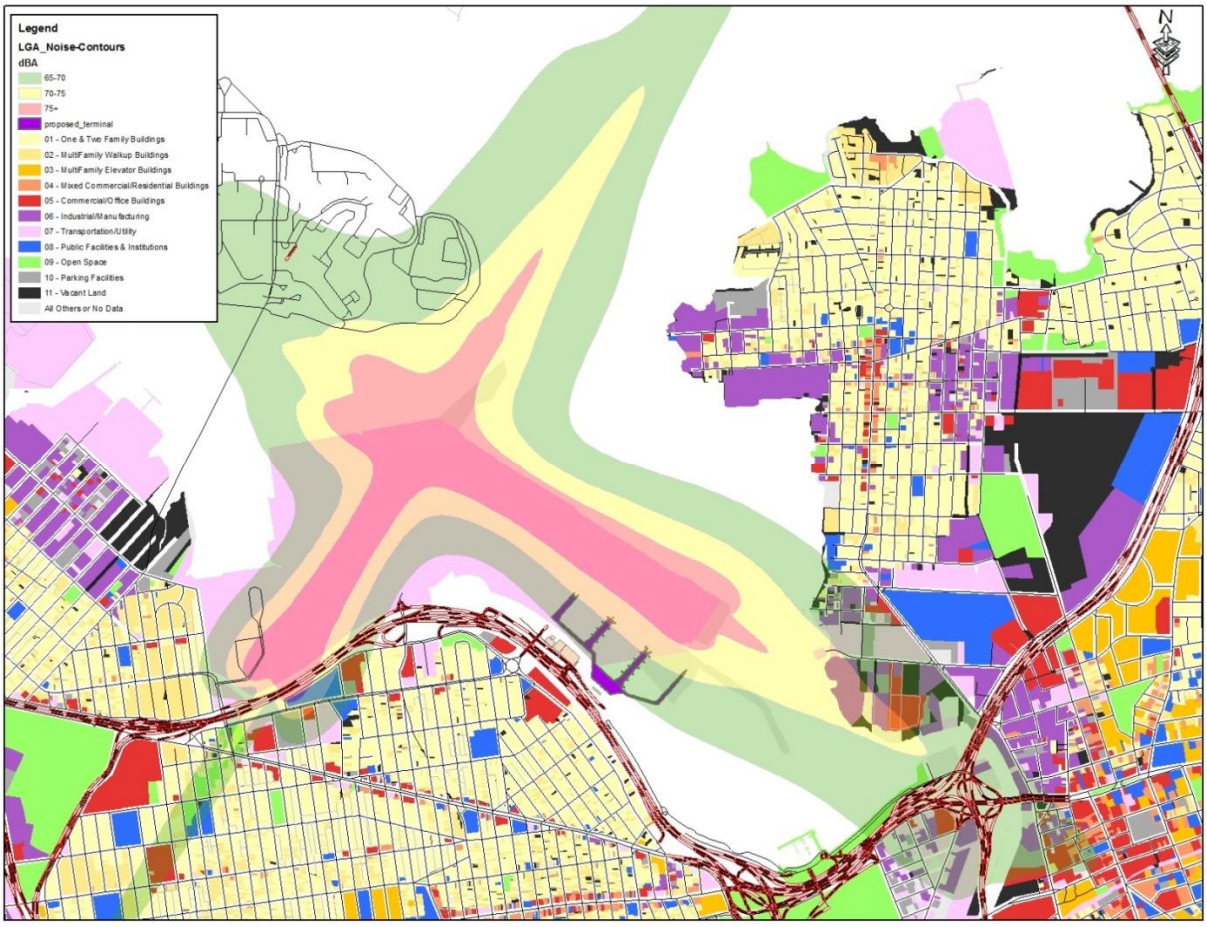

Figure 2: Existing Condition Noise Contours from La Guardia Airport Aircraft Operations

3.3 Environmental Consequences

Potential construction noise impacts from the Delta Air Lines Reconfiguration Project were assessed for the peak construction period.

3.3.1 Construction Equipment Noise

Construction of the Delta Terminal Reconfiguration would involve multiple phases over eight years (early 2017 into 2025). 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 to be utilized) was selected as the worst-case condition for each year. Construction equipment noise was compared with existing monitored background levels at four noise sensitive sites (Sites M1, M2, M3, and M4) shown in Figure 1. 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 on-site construction equipment. The noise reference levels used for applicable equipment are summarized in Attachment 1. Table 16 shows RCNM-predicted worst-case noise levels at the four off-site sensitive receptor locations. The Proposed Action construction activity would likely result in noticeable noise increases that range from 3 to 9 dBA above existing background levels in areas around sites M3 and M4. The relatively high noise increases would essentially occur as a result of impact pile driving. However, the construction equipment noise levels are predicted to be well below the 85 dBA impact criterion established by NYSDOT in all cases.

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 3.4 for specific mitigation recommendations.

3.3.2 Construction Traffic Noise

Since the roadway network around the airport is heavily travelled, the additional truck or commuter vehicle or shuttle bus trips during construction periods would not double the traffic volume under the No Action Alternative at a given intersection. Therefore, it is assumed that noise levels would not increase by 3 dBA causing potential traffic noise impacts from construction of the Proposed Action. No mitigation measures related to construction traffic are likely warranted to comply with CEQR guidelines.

Table 16
RCNM Predicted Worst-case Daytime $L_{eq}(1)$ Noise Levels at Select Sites

Receptors	Weekday Peak Hour	Measured background Leq (dBA)	Construction Generated Noise Level Leq (dBA)								
			2016	2017	2018	2019	2020	2021	2022	2023	2024
M1- Overlook Park	AM	65	55.7	62.9	62.6	58.5	62.3	58.0	56.9	62.4	62.4
	MD	64									
	PM	65									
M2- 100th St. & Ditmars Blvd.	AM	64	59.3	66.6	66.3	62.2	65.9	61.7	60.6	66.0	66.0
	MD	66									
	PM	66									
M3*- 102nd St. & Ditmars Blvd.	AM	65	60.2	67.4	67.1	63.0	66.8	62.5	61.4	66.9	66.9
	MD	66									
	PM	66									
M4*- Backyard of 105-05 Ditmars Blvd.	AM	65	66.8	74.0	73.7	69.7	73.4	69.1	68.0	73.5	73.5
	MD	66									
	PM	66									

*Background levels are based on the highest measured data obtained at M1 and M2.

3.4 Mitigation

Based on the results of the noise analysis, pile driving activities of the construction of the Proposed Action would result in an increase of up to 9 dB over background noise measured at two monitoring sites (Sites M1 and M2) and assumed at two additional sites (Sites M3 and M4) 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;
- Reduce the "ringing" noise of the steel piles by utilizing acoustical paint across the web of each pile at 4-6 foot intervals;
- Prohibit pile driving at night.

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 all 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.

3.5 Noise Summary

The noise from of long-term operations under the Proposed Action on both airside and landside would remain the same under the No Action Alternative. Construction activities would include use of equipment on-site as well as construction traffic in the surrounding area. The increased construction traffic would not double the No Action Alternative traffic volumes at any intersections resulting 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 in a close proximity to the project site. Mitigation measures would be implemented and a noise control plan drafted to minimize the adverse effects on the community.

ATTACHMENT 1: Supporting Documentation

Table A-1: Database of Equipment Noise Emissions and Usage Factors

Equipment	Use Factor (%)	L_{max} at 50ft (dBA)
All Other Equipment > 5 HP	50	85
Auger Drill Rig	20	85
Backhoe	40	80
Bar Bender	20	80
Blasting	-- N/A --	94
Boring Jack Power Unit	50	83
Chain Saw	20	85
Clam Shovel (dropping)	20	93
Compactor (ground)	20	83
Compressor (air)	40	80
Concrete Batch Plant	15	83
Concrete Mixer Truck	40	85
Concrete Pump Truck	20	82
Concrete Saw	20	90
Crane	16	85
Dozer	40	85
Drill Rig Truck	20	84
Drum Mixer	50	80
Dump Truck	40	84
Excavator	40	85
Flat Bed Truck	40	84
Front End Loader	40	80
Generator	50	82
Generator (<25KVA, VMS signs)	50	73
Gradall	40	85
Grader	40	85
Grapple (on backhoe)	40	87
Horizontal Boring Hydraulic Jack	25	82
Hydra Break Ram	10	90
Impact Pile Driver	20	101
Jackhammer	20	89
Man Lift	20	85
Mounted Impact Hammer (hoe ram)	20	90
Pavement Scarafier	20	90
Paver	50	85
Pickup Truck	40	75
Pneumatic Tools	50	85
Pumps	50	81
Refrigerator Unit	100	82

Table A-1: Database of Equipment Noise Emissions and Usage Factors (continued)

Equipment	Use Factor (%)	L_{max} at 50ft (dBA)
Rivet Buster/chipping gun	20	85
Rock Drill	20	85
Roller	20	85
Sand Blasting (Single Nozzle)	20	96
Scraper	40	85
Shears (on backhoe)	40	96
Slurry Plant	100	78
Slurry Trenching Machine	50	82
Soil Mix Drill Rig	50	80
Tractor	40	84
Vacuum Excavator (Vac-truck)	40	85
Vacuum Street Sweeper	10	82
Ventilation Fan	100	85
Vibrating Hopper	50	87
Vibratory Concrete Mixer	20	80
Vibratory Pile Driver	20	101
Warning Horn	5	85
Welder / Torch	40	74

Source: FHWA Roadway Construction Noise Model User's Guide. January 2006.

Table A-2: Construction Equipment and Hours of Operation

Construction Equipment Type	Horsepower	Hours of Operation per Year								
		2017	2018	2019	2020	2021	2022	2023	2024	2025
Application Equipment	350	560	192	608	328	16	152	640	224	40
Asphalt paver, 130 HP	130	560	192	608	328	16	152	640	224	40
Backhoe loader, 80hp	80	15,160	8,136	1,848	8,968	23,088	7,544	16,048	4,440	744
Centrif. Water pump, 6”	57	26,616	2,224	-	-	14,296	2,960	608	448	80
Concrete pump, small	210*	9,240	6,840	7,496	4,504	5,280	6,808	1,472	1,336	224
Crane, 40 ton	177	1,112	8,320	7,104	7,504	7,560	4,144	3,672	1,560	264
Diesel hammer, 41k ft-lb	101	5,176	4,072	1,920	560	1,864	2,368	616	888	152
Dozer, 300 HP	300	744	14,784	2,592	6,288	4,072	4,440	3,624	448	80
Front end loader, TM, 2.5cy	97	744	-	464	4,344	5,648	1,184	1,552	224	40
Gas welding machine	66	928	20,328	15,248	7,672	9,984	8,872	2,456	3,888	648
Manlift	62	928	26,064	27,184	19,760	21,944	52,632	11,520	6,544	1,096
Motor grader, 30,000 lb	193	4,072	744	1,664	1,296	744	8,872	1,960	448	80
Pavement removal bucket	168*	1,848	560	744	-	5,544	-	2,704	448	80
Pavement breaker, 60lb	49	744	-	928	4,992	6,472	-	2,592	-	-
Paving machinery & equipment	450	1,848	560	-	-	3,328	-	1,352	224	40
Vibratory drum roller	137	4,072	744	-	-	1,296	6,656	2,096	224	40

Appendix D.
Phase IA Archaeological Survey Report

PHASE IA ARCHAEOLOGICAL SURVEY REPORT

DELTA AIR LINES RECONFIGURATION PROJECT
AT LAGUARDIA AIRPORT

Queens Borough
New York City

Prepared for
Delta Air Lines
JFK International Airport
Terminal 4 Trailer Complex
Jamaica, NY 11430

Prepared by
John W. Lawrence, Principal Investigator

AECOM
437 High Street
Burlington, NJ 08016

APRIL 2016

Management Summary

SHPO PROJECT REVIEW NUMBER:
16PR01506

INVOLVED STATE AND FEDERAL AGENCIES:
FAA
Port Authority of New York and New Jersey

PHASE OF SURVEY:
IA, Literature Search and Sensitivity Assessment

LOCATION INFORMATION:
Location: New York City
Minor Civil Division: Queens Borough
County: Queens County

SURVEY AREA:
Length: 0.5 miles (0.8 kilometers)
Width: 0.28 miles (0.45 kilometers)
Number of Acres Surveyed: 79.2 acres (32 hectares)

USGS 7.5 MINUTE QUADRANGLE MAP:
Central Park, Flushing

SENSITIVITY ASSESSMENT:
Prehistoric (high, medium, low): Sensitivity Area 4 (moderate)
Historic (high, medium, low): Sensitivity Area 4 (moderate to high)

ARCHAEOLOGICAL SURVEY METHODOLOGY:
Background research
Surface survey: visual inspection by walkover

RESULTS OF ARCHITECTURAL SURVEY:
Number of structures in project area: 2 (Terminals C and D)
Number of known National Register of Historic Places listed/eligible structures: 0
Number of recommended eligible structures/districts: 0
Number of listed/eligible or potentially eligible structures that may be impacted: 0

RESULTS OF ARCHAEOLOGICAL SURVEY:
Number and name of prehistoric sites identified: 0
Number and name of historic sites identified: 0
Number and name of sites recommended for Phase IB/avoidance: 0

REPORT AUTHOR:
John W. Lawrence

DATE OF REPORT:
April 2016

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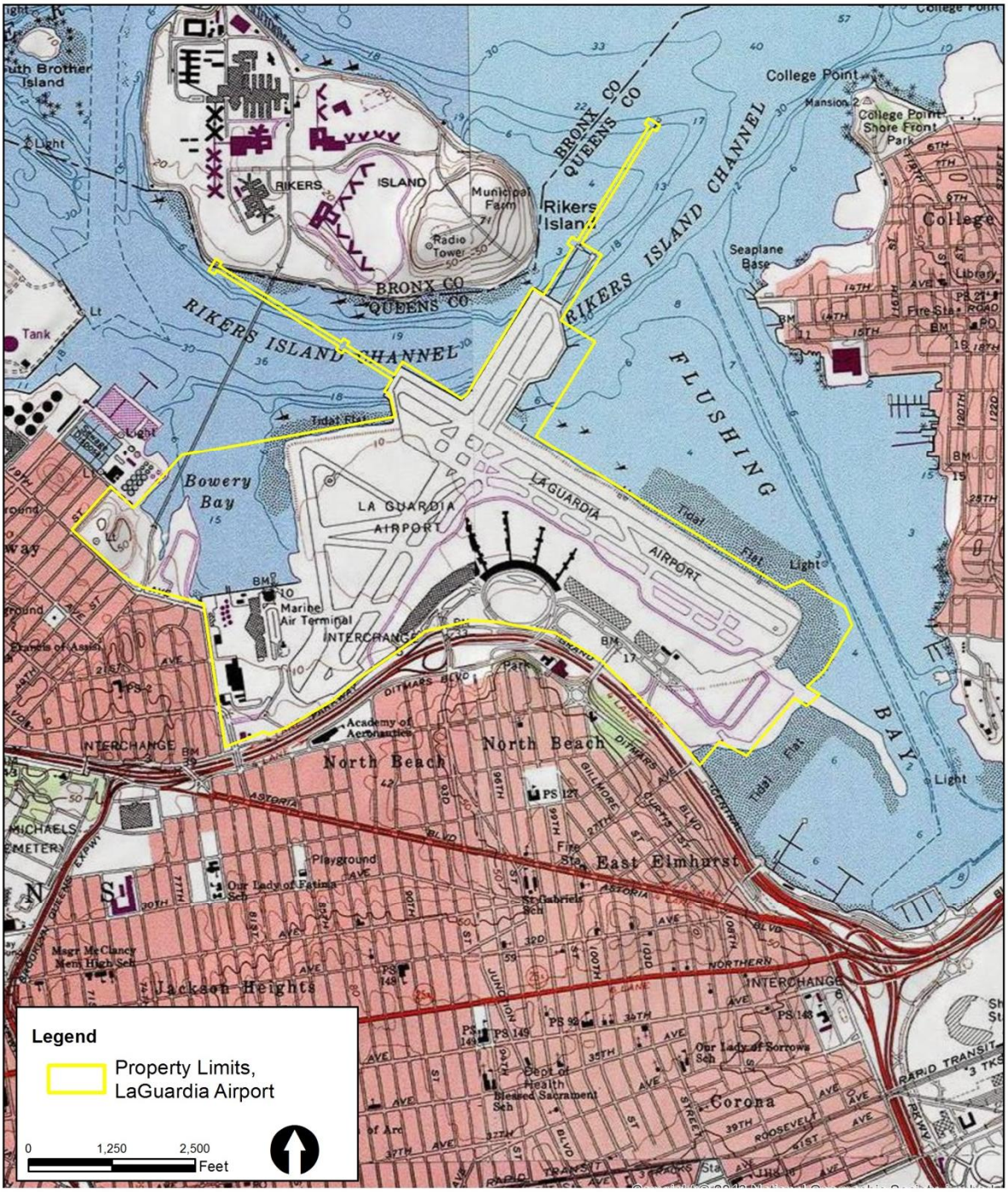
1.0 INTRODUCTION

This report presents the results of a Phase IA archaeological survey undertaken for the proposed Delta Air Lines Reconfiguration Project, located at LaGuardia Airport in Queens Borough, New York City (**Figure 1**). The proposed project includes the reconfiguration of the airside apron associated with Terminals C and D, demolition of existing Terminals C and D, construction of a new terminal building, expansion of the East Garage, and construction of pedestrian bridges. This report was completed for Delta Air Lines, Inc., of Atlanta, Georgia.

This survey was performed in accordance with federal and state laws for the protection of significant cultural resources. These mandates include: Section 106 of the National Historic Preservation Act of 1966, as amended, 49 U.S.C. § 470f: Protection of Historic and Cultural Resources, 36 CFR 800; the Federal-Aid Highway Act of 1966, as amended in 1968 and 510; the National Environmental Policy Act of 1969, 42 U.S.C. §§ 4331(b)(4) and 4332; and the Archaeological and Historic Preservation Act of 1974, 16 U.S.C. § 469 et seq. In addition, Section 4(f) of the Department of Transportation Act, as amended, 49 U.S.C. § 303 protects historic sites of national, state, or local significance, and requires planning to minimize project impacts on such properties. This work was conducted in accordance with the New York Archaeological Council's *Cultural Resource Standards Resource Handbook* (2000) and the report format follows guidelines the New York State Historic Preservation Office set forth in their *State Historic Preservation Office Phase I Archaeological Report Format Requirements* (NYSOPRHP 2005).

A professional archaeologist meeting 36CFRPart 61, John W. Lawrence, conducted the Phase IA archaeological survey between December 2015 and March 2016 for Delta Air Lines. All records and files related to the survey are kept at the offices of AECOM in Burlington, New Jersey.



Source: ESRI 2015
Prepared by: AECOM 2015

Figure 1

LaGuardia Airport
DELTA Air Lines Reconfiguration

Project Location

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2.0 PROJECT DESCRIPTION

On July 27, 2015, New York State Governor Andrew M. Cuomo announced his goal to transform LaGuardia Airport. The governor's goal would be achieved through implementation of a series of separate projects to be undertaken by different parties on individual timeframes. One project, which is underway, is the Central Terminal Building (CTB) Redevelopment Program, to be designed, constructed, and operated by LaGuardia Gateway Partners, a Public-Private Partnership.

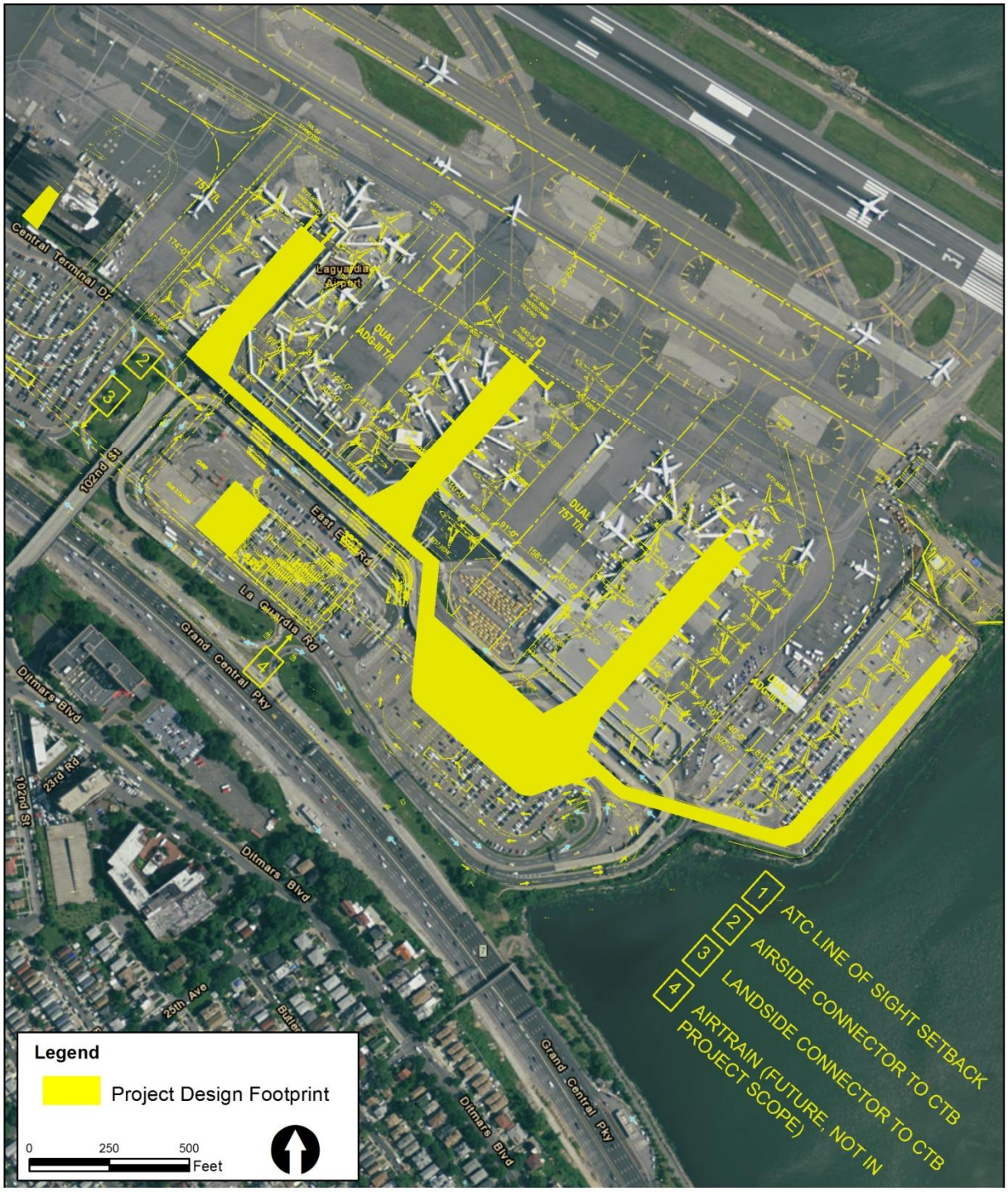
As a separate project, Delta Air Lines proposes to redevelop Terminals C and D, the airside apron, landside roadways, and parking within the eastern side of LaGuardia Airport. Existing facilities would be demolished and replaced with new facilities designed and constructed to meet the latest federal standards for airport safety and security, and to accommodate improved levels of service. The Proposed Action, designated the Delta Air Lines Reconfiguration Project, does not involve the airfield runways or taxiways, or other terminals or facilities at LaGuardia Airport.

As will be described in detail below, a portion of Delta's reconfiguration project overlaps a portion of the airport included in the CTB Redevelopment Program. The CTB Redevelopment Program has been reviewed under Section 106 of the National Historic Preservation Act (NHPA) and a series of archaeological survey reports were produced (Mikolic et al. 2013; Lawrence and Albright 2013), as well as architectural survey forms. Those previous surveys and their findings will be referenced throughout this document, as they are pertinent to the Proposed Action.

2.1 Project Design

In an effort to improve aircraft operations, reduce delays, and improve reliability, Delta proposes to reconfigure the apron area around Terminals C and D. The plan calls for the creation of dual taxiways between the concourses. Due to the desire to create dual taxilanes by widening the distance between the three existing concourses to the east, and given the constraints of the airport boundaries, the Proposed Action necessitates pushing the headhouse to the south to create additional aeronautical operations areas. Under the Proposed Action, Terminals C and D would be consolidated into a single headhouse. The Proposed Action does not involve any changes to the airfield runways or taxiways (with the exception of Taxiway M), or other terminals or facilities at LaGuardia Airport.

The Proposed Action includes a series of projects divided into three functional areas: (1) terminal building, (2) airside apron, and (3) landside roadways and parking. The Proposed Action elements are depicted in **Figure 2**, and are described below.



Source: ESRI 2015
Prepared by: AECOM 2015

Figure 2

LaGuardia Airport
DELTA Air Lines Reconfiguration

DELTA

Project Design

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Terminal Building

The airside apron around Terminals C and D would be reconfigured in compliance with several criteria: the new airside apron must meet FAA geometric design standards, including modification of standards (MOS) requirements, while also satisfying airline operating procedures. The project would include the following elements:

- Dual parallel taxilanes, or two points of entry, between the concourses;
- Head-of-stand or tail-of-stand apron service roads to allow GSE access to parked aircraft;
- Three remote overnight (RON) positions;
- An air operations area (AOA) service road and gate from the landside roadways, along the eastern edge of the airport property, connecting to the restricted vehicle road (RVR);
- Nine hardstand/deicing positions in close proximity to the concourses (three of these positions would be capable of being in use concurrently);
- A deicing containment system incorporated into the apron storm drainage to allow spent aircraft deicing fluid to be isolated, pumped out, and properly treated or disposed of; and
- Provisions for hydrant fueling (i.e., hydrant fuel lines and hydrant pits) within the apron area only.

Airside Apron

A new single terminal headhouse with four concourses (labeled A, B, C, and D) would be constructed south of the existing terminals. The concourses would include 37 contact gate positions—27 gates for both Group II and Group III aircraft, and 10 gates for Group IV aircraft. The building would be compliant with PANYNJ's *Sustainable Design Guidelines* and replace antiquated building heating and cooling systems. Within approximately 1,100,000 square feet, the terminal and concourses would include standard amenities, such as check-in positions (counters and kiosks), bag claim units, and operations and support space, with additional area dedicated to concessions, retail areas, airline clubs, gate holdrooms, and a secure circulation area. In addition, the following services would be included:

- Curbside check-in with convenient access to the security level;
- Checked-bag handling system with a centralized in-line baggage screening;
- Consolidated passenger screening checkpoints;
- Two ramp control towers (one will have back-up capability for FAA use); and
- Centralized control center for building controls (life, safety, and security systems)

A landside pedestrian connector between the proposed Delta terminal and the new Terminal B would also be constructed, although the responsible entity (Delta, PANYNJ, or LaGuardia Gateway Partners) has not yet been determined.

Landside Roadways and Parking

The existing arrival and departure roadways directly in front of the new terminal would be reconfigured to support the shifting of the terminal building toward the Grand Central Parkway. Proposed terminal frontage roads would connect to existing on-airport circulation and access roads or those designed as part of the CTB Redevelopment Program. Two-level terminal roadway frontage would be constructed (at-grade frontage at the arrivals level and elevated frontage at the departures level) with multiple drop-off/pick-up and bypass lanes for both private and commercial vehicles. Two four-lane frontage areas in front of the headhouse would be separated by an island with provisions for curbside check-in. A pedestrian overpass from the island up to the security level within the headhouse would eliminate at-grade crosswalks. An extension to the East Garage would provide 520 spaces, and two pedestrian bridges would connect the garage to the new terminal. A taxihold lot in the vicinity of the terminal would replace the existing taxihold between Terminals C and D.

2.2 Area of Potential Effects (APE)

The APE for the project has been developed to account for potential direct and indirect effects of the Proposed Action on archaeological resources, in accordance with Section 106, and has been approved by the NYOPRHP (Appendix A). The archaeological APE (**Figure 3**) is confined to the footprint of temporary and permanent disturbances the Proposed Action will create; the APE measures 79.2 acres (32 hectares).

Source: ESRI 2015
Prepared by: AECOM 2015

Figure 3

LaGuardia Airport
DELTA Air Lines Reconfiguration
DELTA

Area of Potential Effects

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3.0 BACKGROUND RESEARCH

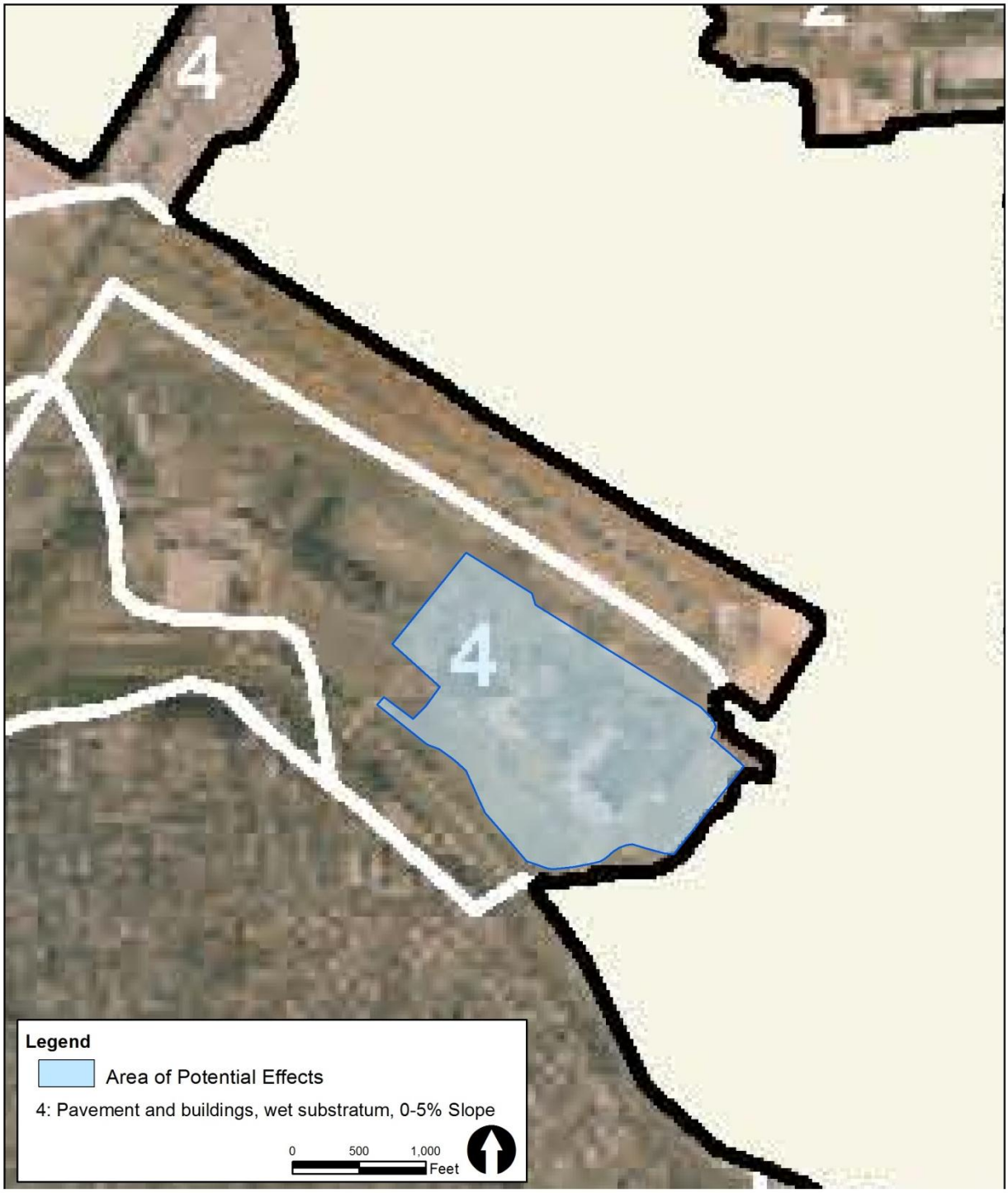
3.1 Environmental Setting

The project is located within northwestern Queens County, New York. Surface geology consists of glacial tills deposited over 15,000 years ago by the retreating Wisconsin ice sheet (Sirkin 1982). Topography in the APE has been significantly altered by cutting, grading, filling, and other activities associated with airport, roadway, building, parking lot, and utility construction. Elevation within the APE average 5 meters (17 feet) above sea level.

Reflecting the heavy disturbances throughout the project APE, the one soil type mapped within the project APE is classified as urban soils and has been heavily modified through construction activities (**Figure 4**). This soil is designated pavement and buildings, wet substratum, 0–5% slopes (map key 4); the surrounding soil types are similar in nature (NYCSSS 2005). Below is a description of each of the soil in the APE:

> Pavement and buildings, till substratum, 0 to 5 percent slopes, are located on nearly level to gently sloping, highly urbanized areas where more than 80 percent of the surface is covered by impervious pavement and buildings over glacial till. Typically located in urban centers.
>
> (Sirkin 1982)

Most of the airport is constructed on land that has been reclaimed from the adjacent Flushing and Bowery Bays by the placement of up to 30 feet of incinerated refuse and miscellaneous fill over the tidal mud flats of deep, soft organic clays and silts. **Figure 5** displays the reconstruction of historic shorelines relative to the APE, based on a series of historic maps ranging from 1860 and 1947 (Lindenkohl and Witzel 1860; Beers 1873; USCGS 1933, 1934, 1947; USGS 1891). Geotechnical studies conducted at LGA for a variety of projects have been used to model the approximate depth of this fill within the APE (**Figure 6**). The original boring logs used for modeling depth of fill are presented in **Appendix B**. The two data sets (shoreline reconstruction and boring logs) are complimentary, in that the historic shoreline reconstruction documents the location of the nineteenth-century shoreline on or about the southern margin of the APE, which conforms to the area of least fill. The depth of fill (with some exceptions) tends to increase moving northeastward, which mimics the expected increase in depth of the Flushing and Bowery Bays with greater distance from the shoreline. At a minimum, surficial fill is measured at 8 feet thick in the APE.



Source: USDA 1986
Prepared by: AECOM 2015

Figure 4

LaGuardia Airport
DELTA Air Lines Reconfiguration

DELTA

Soils in the APE

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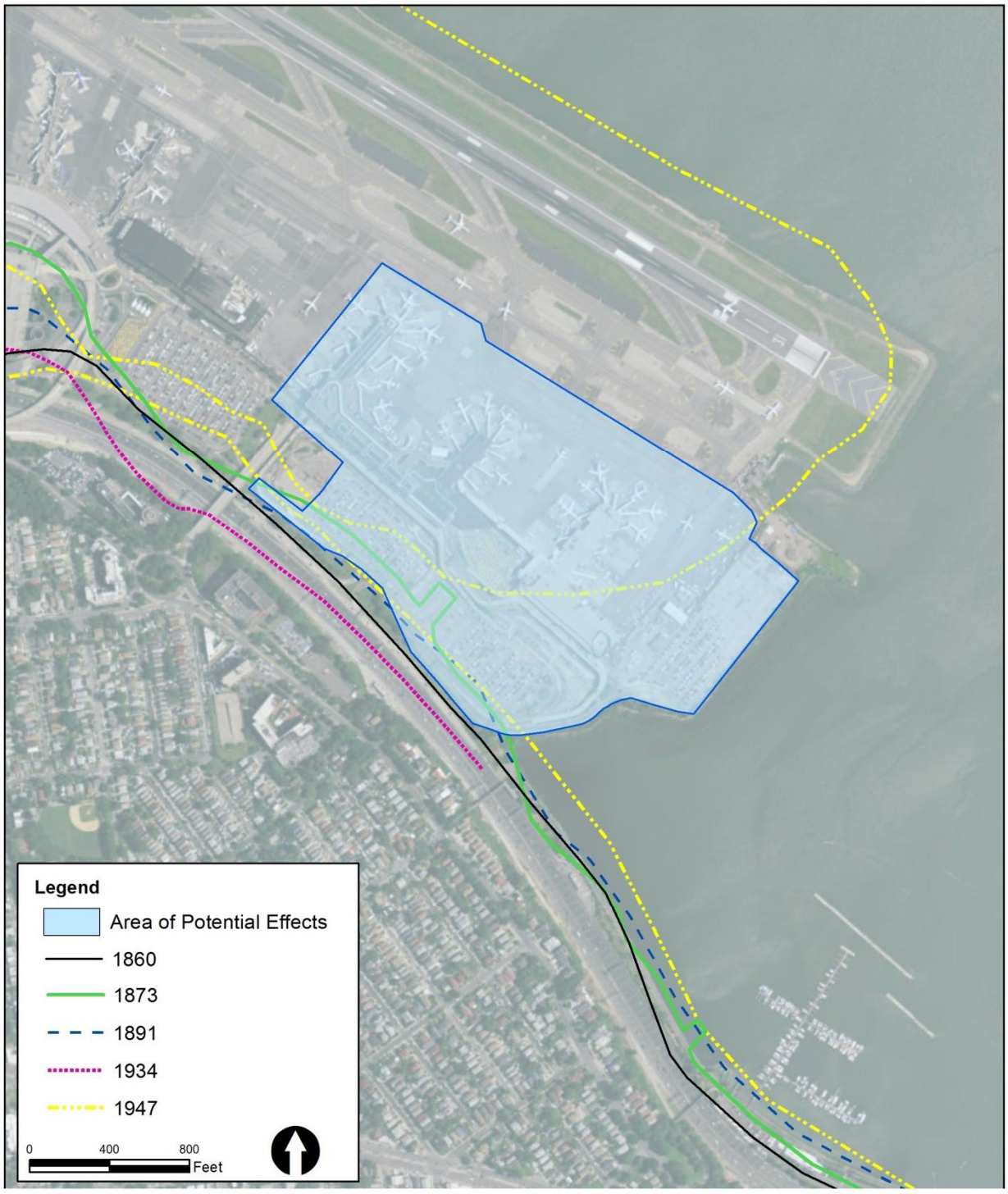

Source: ESRI 2015
Prepared by: AECOM 2015

Figure 5

LaGuardia Airport
DELTA Air Lines Reconfiguration

Historic Shoreline Reconstruction

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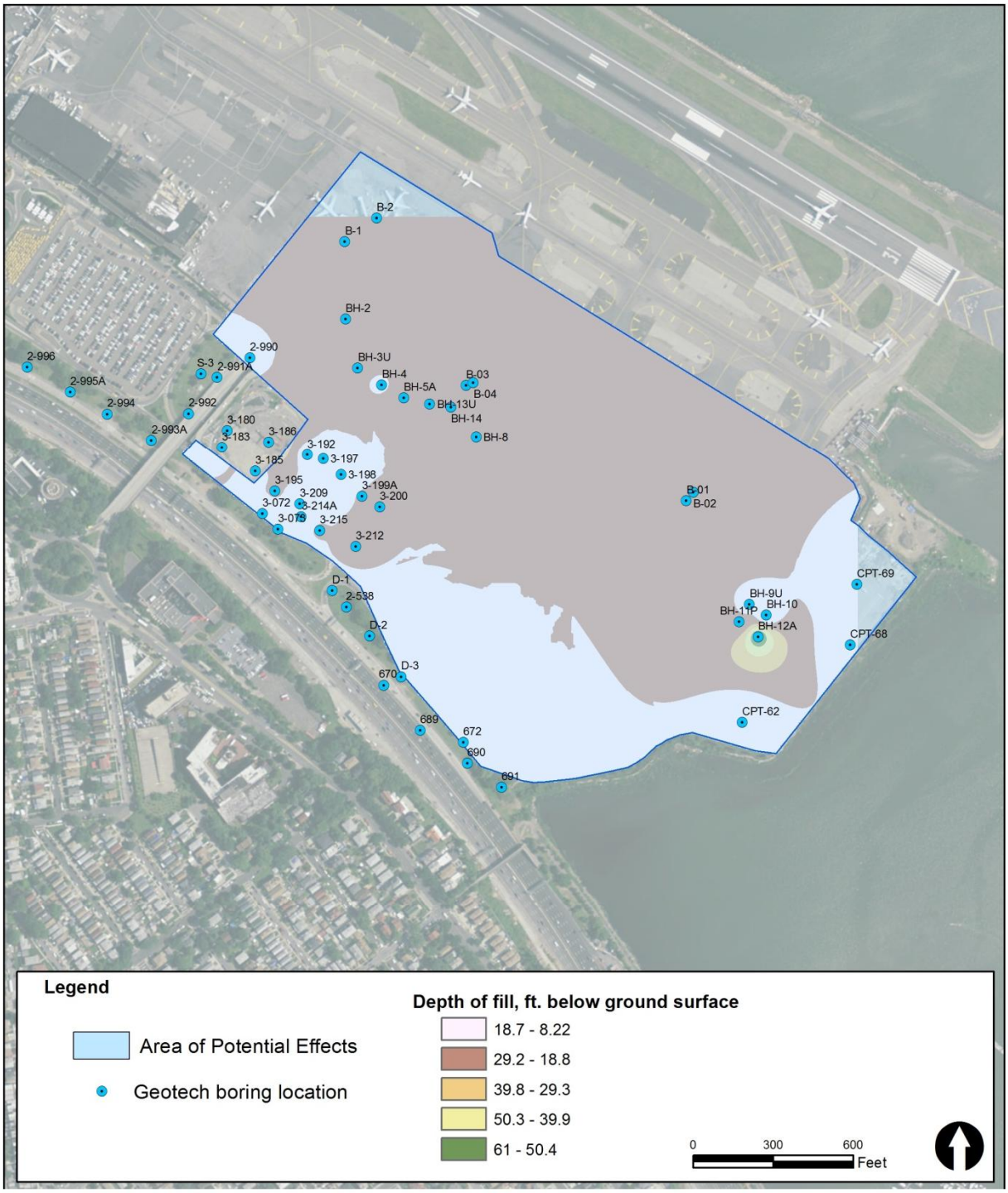

Source: ESRI 2015
Prepared by: AECOM 2015

Figure 6

LaGuardia Airport
DELTA Air Lines Reconfiguration

Modeled Depth of Fill

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3.2 File Review

The site assessment began with a literature review, which included an examination of site files and archaeological reports files at the NYSHPO office in Waterford, New York, and CRIS. Five known archaeological sites are located within a 1-mile (1.6-kilometer) radius of the APE, but none are located within or proximate to the APE (**Table 1**). Analysis of site data indicates that all of the sites contained prehistoric components and were identified by Arthur C. Parker in the early 1920s. Site ACP QUNS 10 (NYSM# 4533) is identified as a prehistoric shell midden and is located within the western half of the LaGuardia Airport property, but is not within the APE. Site NYSM # 4533 is identified as a "shell heap on Jackson property on Poor Bowery at North Beach" (NYSM Site File) and is located on either side of the Grand Central Parkway, between the 94th Street interchange and 49th Street. The National Register of Historic Places (NRHP) eligibility of the ACP QUNS-10 Site remains undetermined. No other previously identified archaeological resources have been identified within the APE.

Table 1. Archaeological Sites within 1 Mile (1.6 Kilometers) of the APE.

NYSOPRHP Site Number	NYSM Site Number	Distance from APE mi (km)	Time Period	Site Type
08101.000103	–	0.81 mi (1.3 km) West	Unknown prehistoric	Undetermined
08101.000133	??	0.78 miles (1.2 km) East-southeast	??	??
ACP QUNS 10	NYSM 4533	0.47 miles (0.76 km) West	Prehistoric without cultural or chronological attribution	Shell midden
-	NYSM 4540	0.93 mi (1.5 km) Northeast	Prehistoric without cultural or chronological attribution	Burial site
-	NYSM 4542	0.99 mi (1.6 km) Northeast	Prehistoric without cultural or chronological attribution	Camp site

**Source: NYSHPO; CRIS*

Two cultural resource studies have been conducted in and adjacent to the project APE. Panamerican Consultants' *Cultural Resources Baseline Study for the Flushing Bay Ecosystem Restoration Project* (Pickman et al. 2003) was conducted at several different locations, one of which was situated at the eastern limits of the APE, along the shoreline of Flushing Bay (**Figure 7**). This portion of the survey was identified as the Inner Flushing Bay Survey Area and was noted to contain a low sensitivity for prehistoric and historic resources (Pickman et al. 2003).

As described in Section 2.0 above, in June 2013 and again in August 2013, AECOM completed two Phase IA archaeological survey reports for PANYNJ's CTB Redevelopment Project (Mikolic et al. 2013; Lawrence and Albright 2013). The APE for AECOM's CTB surveys substantially overlaps the APE for the Delta Air Lines Reconfiguration Project (see **Figure 7**). The Phase IA archaeological survey completed in June 2013 established the presence of four areas sensitive for potentially intact archaeological resources (see **Figure 8** in Section 4.0).[1] One of those areas, Area 4, is located within the current APE at the far southeastern corner of the LaGuardia Airport property. Discussion of the sensitivity assessment of that area is presented below, in Section 4.0 of this report.

[1] The addendum Phase IA report produced in August 2013 presented the vertical APE for the proposed undertaking and evaluated the potential for the CTB Program to impact potentially artifact-bearing soil horizons (Lawrence and Albright 2013).

Source: ESRI 2015
Prepared by: AECOM 2015

Figure 7

LaGuardia Airport
DELTA Air Lines Reconfiguration

Previous Archaeologial Surveys

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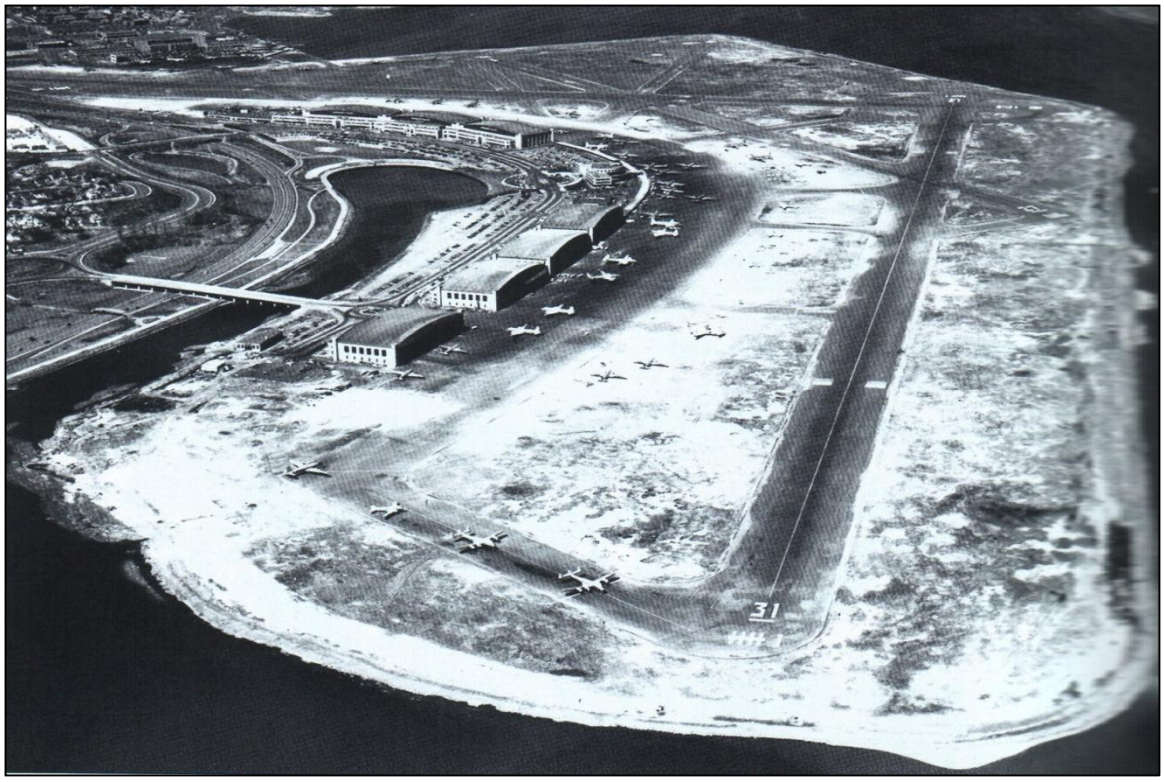
3.3 Historic Map and Document Review

Historic maps from 1860, 1873, 1891, 1934, and 1947 indicate that the original shoreline along Flushing Bay has changed significantly over the last 140 years (see **Figure 5**). Historic maps from 1860 to 1934 indicate a fairly stable shoreline near what is now the northern shoulder of Grand Central Parkway, allowing for some element of landfilling, as well as variation in the quality of the historic maps to account for the differences from year to year.

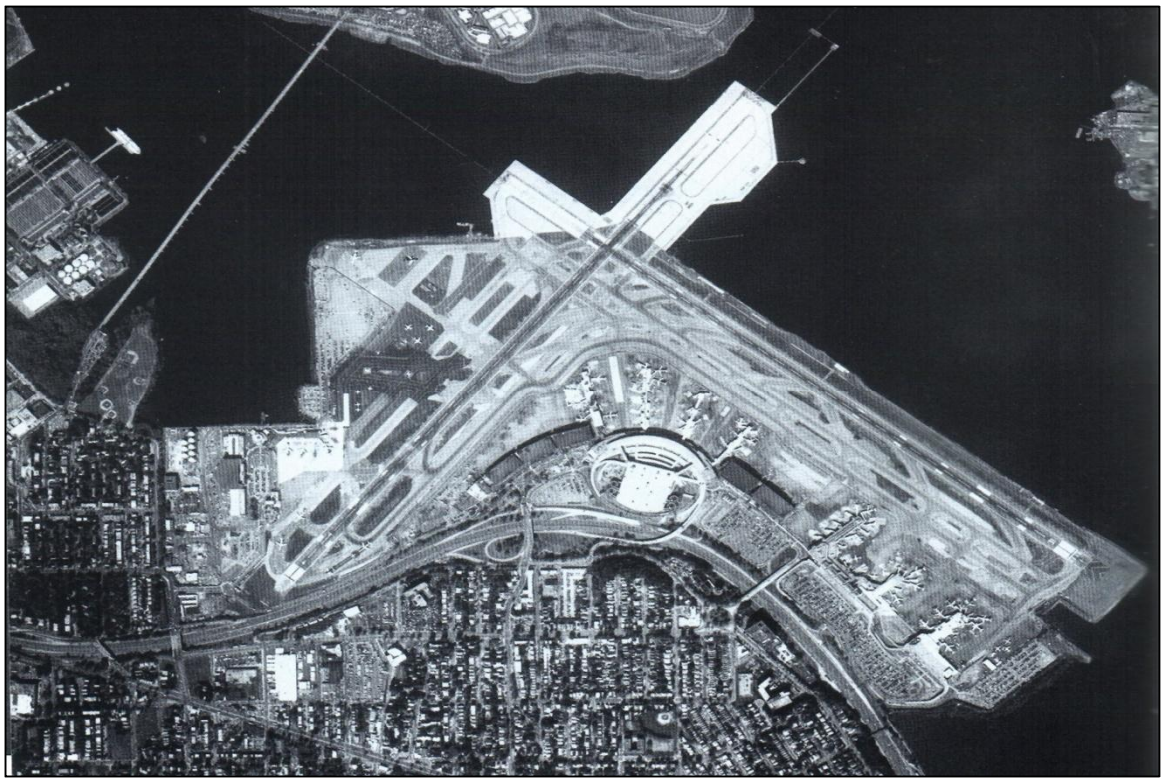
Extensive land forming began within the APE in 1929 with the construction of the Glenn H. Curtiss Airport/North Beach Airport. As the 1935 aerial (**Photograph 1**) shows, northern and eastern expansion into Flushing Bay began with the construction of the private airfield after 1929. Additional land forming occurred in 1937 to expand the North Beach Airport into a much larger 550-acre (222.6-hectare) facility that would initially be called the New York Municipal Airport, until 1947, when the name was officially changed to LaGuardia Airport (**Photograph 2**). By 1947, the airport property took on a configuration similar to the present day, with the exception of a narrow waterway and lagoon-type feature where the CTB now stands. Sporadic development and construction continued at the airport through the latter half of the twentieth century and into the twenty-first century, including the expansion of LaGuardia's Northern Runway in the early 1980s (**Photograph 3**).

Structures once existed along the original shoreline during the nineteenth and early twentieth century. Remnants of any of these structures within the southern portion of the APE would now be located, if they still exist, under the Grand Central Parkway. Construction of the Grand Central Parkway along the southern edge of the APE was completed in 1933 and would have severely disturbed that portion of the proposed APE.

Photograph 1. 1935 Aerial Photograph of the North Beach Airport (AOM 2011).



Photograph 2. 1946 Aerial Photograph of LaGuardia Airport (Holden 2007).



Photograph 3. Early 1980s Aerial Photograph of LaGuardia Airport Showing Recently Constructed Northern Runway Expansion (Holden 2007).

3.4 Local Prehistoric Context

As stated in Section 3.2, site files contained information on six prehistoric sites within 1 mile (1.6 kilometers) of the APE. Arthur C. Parker identified all of these sites in his 1920 statewide survey; only general information and scant details are known about these sites. Site ACP QUNS 10 (NYSM# 4533), which Parker identified in 1922 as a shell midden, is located within the western edge of the APE. The general project area would have likely been attractive to Native Americans due to the proximity of nearby resources, such as freshwater streams and saltwater marshes prior to extensive land filling in the area. Expected site types would include resource-procurement stations, where short-term and likely specialized activities took place. Further information on prehistoric land use and potential is presented in Section 4.0.

3.5 Local Historic Context

Beginning in 1928, passengers travelling to New York City via airplane arrived at Newark Airport in New Jersey, which afforded easy access to Manhattan. In 1931, Floyd Bennett Field, situated on Jamaica Bay in Brooklyn, opened as New York City's first municipal airport. However, it was never a commercial success, due to its inconvenient location, which lacked direct rail transportation or highways to Manhattan. As a result, Newark Airport continued to dominate air travel in the metropolitan area throughout the 1930s (Gordon 2008).

This changed with the opening of LaGuardia Airport in 1939 (initially known simply as New York Municipal Airport, shortly thereafter renamed New York Municipal Airport, LaGuardia Field, and presently known as LaGuardia Airport). Mayor Fiorello LaGuardia, who took office in 1934, was a strong advocate for the establishment of a new municipal airport in New York City. He recognized the deficiencies of Floyd Bennett Field, and opted to establish an airport that would be easily accessible to Manhattan and rival Newark Airport. The site selected was the privately owned Glenn Curtiss Airport in an area known as North Beach, the present-day location of LaGuardia Airport. Prior to its development as an airport, the Gala Amusement Park occupied North Beach.

The location chosen for LaGuardia Airport was readily accessible to Manhattan, via the Grand Central Parkway, completed in 1933, and the Triborough Bridge (now the Robert F. Kennedy Bridge), completed in 1936. In addition, subway lines in Jackson Heights, Flushing, and Astoria were relatively nearby, offering additional transportation options. Furthermore, the waterfront location was ideal for seaplane landings, which were widely in use during this time period (Gordon 2008; Stoff 2008).

By 1937, construction of the new airport—funded jointly by the city and the Works Progress Administration (WPA)—commenced. The majority of the airport was completed in 1939 and was dedicated on October 15 of that year. It cost over $40,000 to build, making it the largest WPA-funded project at that time (Stoff 2008). The architectural firm Delano & Aldrich designed the airport, which featured two Art Deco–style terminals: the Marine Air Terminal (NRHP-listed and a New York City landmark) and the Central Terminal. Seven hangars were also constructed at the airport. A five-sided seaplane hangar (Administration Building/Hangar 7) was constructed west of the Marine Air Terminal. Three hangars with lean-tos and shops (Hangars 1, 3, and 5) were constructed west of the Central Terminal and, according to *The New York Times* (October 8, 1939), were occupied by American Airlines. Three hangars (Hangars 2, 4, and 6) were constructed east of the Central Terminal, and were completed in 1940 (Stoff 2008).

Upon the two-year anniversary of the airport's opening in 1941, *The New York Times* (November 30, 1941) reported on the success of the airport. By that time, more than 2,000,000 passengers flew to or from the airport annually on more than 100,000 flights. In addition, the article also documented the impact that the airport had on the surrounding area, estimating that the population of northern Queens and Long Island rose by roughly 10,000.

In the late 1950s, the airport commenced a redevelopment program, which included expansion of the runways and construction of a new terminal and control tower. As a result, the original Delano & Aldrich–designed Central Terminal was demolished. Architect Wallace K. Harrison designed the new 650,000-square-foot (60,387-square-meter) Central Terminal and control tower, which opened in 1964. As built, the Central Terminal was six blocks long, four stories tall, and featured four concourses. A landscaped park, known as Fiorello Park, was constructed

south of the terminal. By 1976, construction of the present-day parking garage and road network resulted in demolition of the park (Stoff 2008).

The airport has undergone multiple improvements from the 1980s to the present. In 1983, Delta Air Lines constructed Terminal D at the eastern end of the airport; the east concourse of Terminal C was constructed in the early 1980s; and in 1992, US Airways constructed the west concourse of Terminal C. In 2012, a new pedestrian bridge was opened to allow passengers to walk between Terminals C and D without having to reenter through security. In 2010, a new air traffic control tower was constructed west of the CTB, and the Harrison-designed control tower located within Concourse D of the CTB was partially demolished (Stoff 2008).

4.0 ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL

As the current APE is found partially in the APE for PANYNJ's CTB Redevelopment Program, the assessment of archaeological sensitivity is based heavily on the analysis of archaeological probability and sensitivity presented in the Phase IA archaeological survey reports prepared for that project (Mikolic et al. 2013; Lawrence and Albright 2013). Portions of the current project APE outside of that analysis area will be assessed independently. As an aside, the area Panamerican Consultants surveyed in 2003 adjacent to the APE was assessed to have low potential for archeological deposits.

AECOM's assessment of archaeological sensitivity included the following variables and analyses:

- Analysis in GIS of historic maps and atlases to determine the location and rank the probability of historic archaeological deposits being present within the APE for the CTB Redevelopment Program;
- Reconstruction of nineteenth-century shorelines and probable environmental conditions relevant to the assessment of prehistoric site sensitivity in the APE;
- Cut-and-fill analysis using contemporary digital elevation model (DEM) data, geotechnical boring logs, and a late-nineteenth-century topographic quadrangle were used to assess the presence and probable depth of fill within the APE; and
- Presence and depth of existing utilities and building pilings in the CTB Redevelopment Program APE that would have compromised the integrity of potential archaeological deposits.

The analysis first assessed the archaeological sensitivity of the APE, the relative likelihood that a given location was utilized by human beings during the historic or prehistoric periods, and subsequently measured the integrity, or the probability, that subsequent natural and cultural processes (e.g., erosion, quarrying, grading, etc.) have not erased or substantially disturbed historic or prehistoric archaeological deposits at that same location. The final product of the analysis was an ordinal-scale measurement (high, medium, low) of the potential for intact historic or prehistoric archaeological deposits to be present in the APE.

Graphics projecting both prehistoric and historic archaeological site sensitivity were generated (Mikolic et al. 2013:23) and are reproduced here, with the current project APE superimposed (**Figure 8**). A pedestrian reconnaissance of the APE for the CTB Redevelopment Program refined that mapping into four areas of archaeological potential for historic and/or prehistoric archaeological sites (**Figure 9**). As mentioned in Section 3.2 above, one of the archaeologically sensitive areas (Area 4) is situated within the current project APE (**Figure 10**). The sensitivity assessment for that area is quoted directly from the report (reference to photographs and figures in the original text have been omitted from the following quotation; **Photographs 4** and **5** illustrate the area):

> Area 4 is a large grass median area with small trees located along the southeastern edge of the APE between LaGuardia Access Road and LaGuardia Road. Proposed construction impacts within Area 4 include the resurfacing of the existing roadway. Disturbances noted within the area during pedestrian reconnaissance included those caused by roadway and parking lot construction. Lot 4, designated as a short-term/daily public parking lot, is located within the northern portion of Area 4. Modeling of cut and fill areas within the airport indicates that 10 ft to 16 ft (3 m to 5 m) of fill material is present within Area 4. Historic maps indicate that this area was once part of the original shoreline where filling has occurred. At least two structures of unknown function once stood along the shoreline in the late nineteenth and early twentieth century. Area 4 contains a moderate to high potential for historic archaeological resources due to the presence of these former structures. The sensitivity model also indicates that the area has a moderate potential for prehistoric resources due to the areas proximity to the former shoreline. However, as the only expected project impact within Area 4 is the resurfacing of the existing roadway and the depth of fill appears to be a minimum of 10 ft (3 m) thick, it is unlikely that any potential historic or prehistoric site will be impacted during construction activities.
>
> (Mikolic et al. 2013:31)

Photograph 4. Area 4 as Seen in 2012, Looking Northwest (Mikolic et al. 2013:31).

Photograph 5. Area 4 in December 2015, View Southeast.

Source: ESRI 2015
Prepared by: AECOM 2015

Figure 8

LaGuardia Airport
DELTA Air Lines Reconfiguration

Archaeological Site Sensitivity

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Source: ESRI 2015
Prepared by: AECOM 2015

Figure 9

LaGuardia Airport
DELTA Air Lines Reconfiguration

Areas of Archaeological Site Potential

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Source: ESRI 2015
Prepared by: AECOM 2015

Figure 10

LaGuardia Airport
DELTA Air Lines Reconfiguration

Area of Archaeological Site Potential 4

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4.1 Archaeological Sensitivity, Unsurveyed Portion of APE

The portion of the APE not previously surveyed was investigated for its sensitivity for prehistoric and historic archaeological resources. Based on the historic shoreline reconstruction and boring logs, no terrestrial historic sites are anticipated within this portion of the APE (**Figure 11**). The existing Terminal C and D buildings are constructed on a dense matrix of pilings, and the area beneath the footprint of those buildings is assessed to be comprehensively disturbed. Existing subsurface utilities are found throughout most of the APE, but are concentrated within the landward third of the area (**Figure 12**).

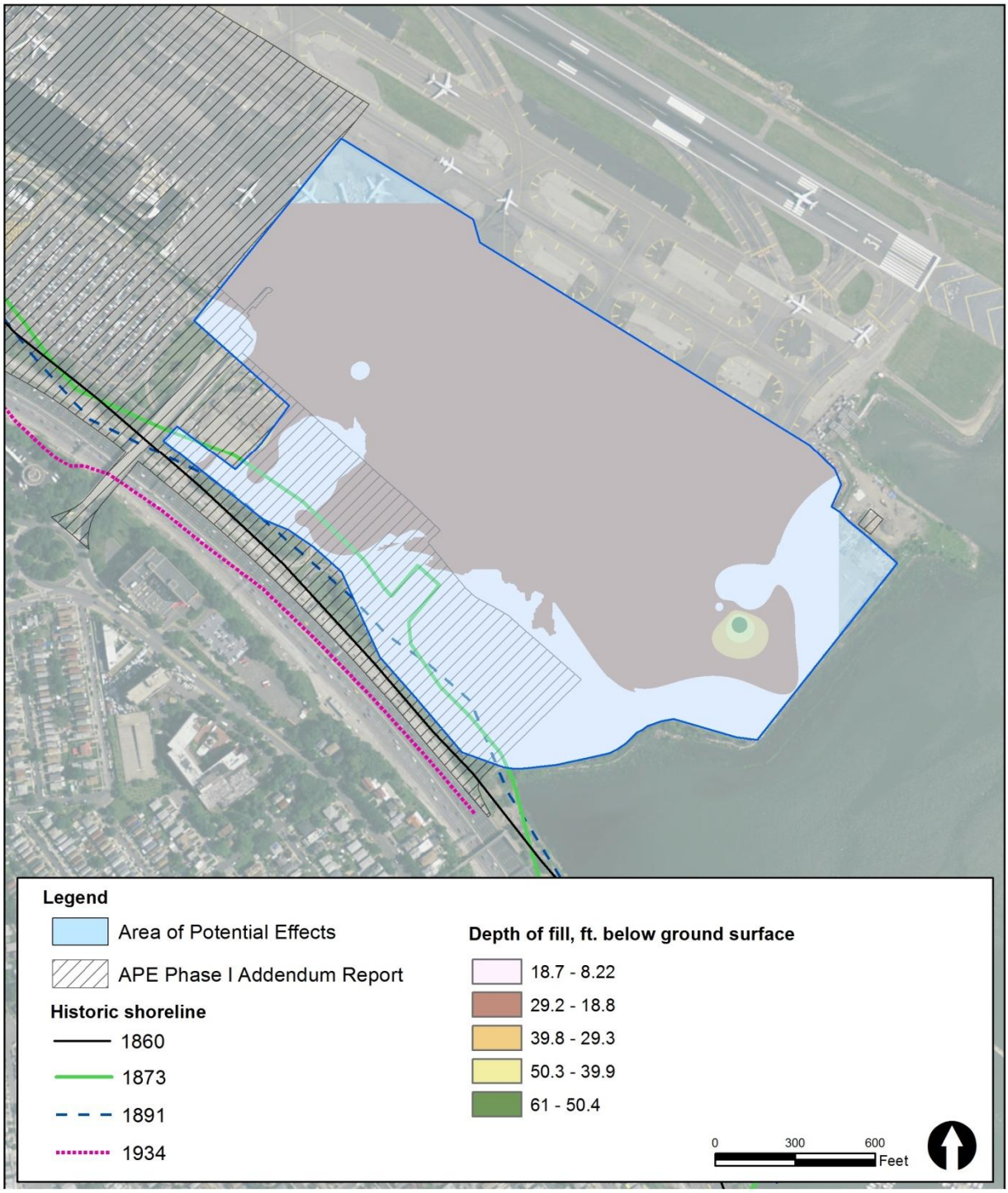
Review of the 1934 United States Coastal and Geodetic Survey chart, prior to the massive infilling for airport construction, does not indicate any shipwrecks within the APE or the airport property as a whole (**Figure 13**). The closest wreck (and only wreck indicated in Flushing Bay) lies over 1,700 feet from the APE. We assume therefore that there is little to no potential for historic shipwrecks to be buried beneath the fill on which the APE is situated. Consequently, the APE is assessed to have low to nil sensitivity for undocumented historic archaeological sites.

The estimated depth of fill within the unsurveyed portion of the APE ranges from 8 to 61 feet below ground surface, with an average depth of about 25 feet. Regarding the potential for the formerly submerged surfaces to contain prehistoric archaeological deposits, we quote the addendum Phase IA report produced for the CTB Redevelopment Program at LaGuardia Airport:

> As requested in the 18 July 2013 NYSOPRHP review letter, a professional geomorphologist was consulted for their interpretation of the organic clay and silt horizon. Dr. Daniel Wagner of Geo-Sci Consultants was sent the relevant boring logs and illustrations of historic shoreline development of LaGuardia Airport. Dr. Wagner (personal communication, 2013) responded with two observations:
>
> 1) Generally, in topographic settings such as this, the original retreating upland is a little too sloping for preservative submergence. Landscapes like this tend to be laterally truncated by marine transgression rather than protectively inundated as sea levels rose during the Holocene;
>
> 2) The "Organic Clays and Silts" stratum recorded in the geotechnical borings is not a former land surface. Former surfaces are generally 20 to 30 ft thick, and would be typical for accreting estuarine deposits.
>
> (Lawrence and Albright 2013:6)

Dr. Wagner's observations and conclusions were based on the same data set that applies to the current project, and the APEs for the two projects overlap to a significant extent. As a result, we conclude that there is little to no potential for undocumented prehistoric archaeological resources to be present within the previously unsurveyed portion of the APE.

In conclusion, the only archaeologically sensitive portion of the APE is the previously identified Area 4.



Source: ESRI 2015
Prepared by: AECOM 2016

Figure 11

LaGuardia Airport
DELTA Air Lines Reconfiguration

Archaeologial Potential of the APE

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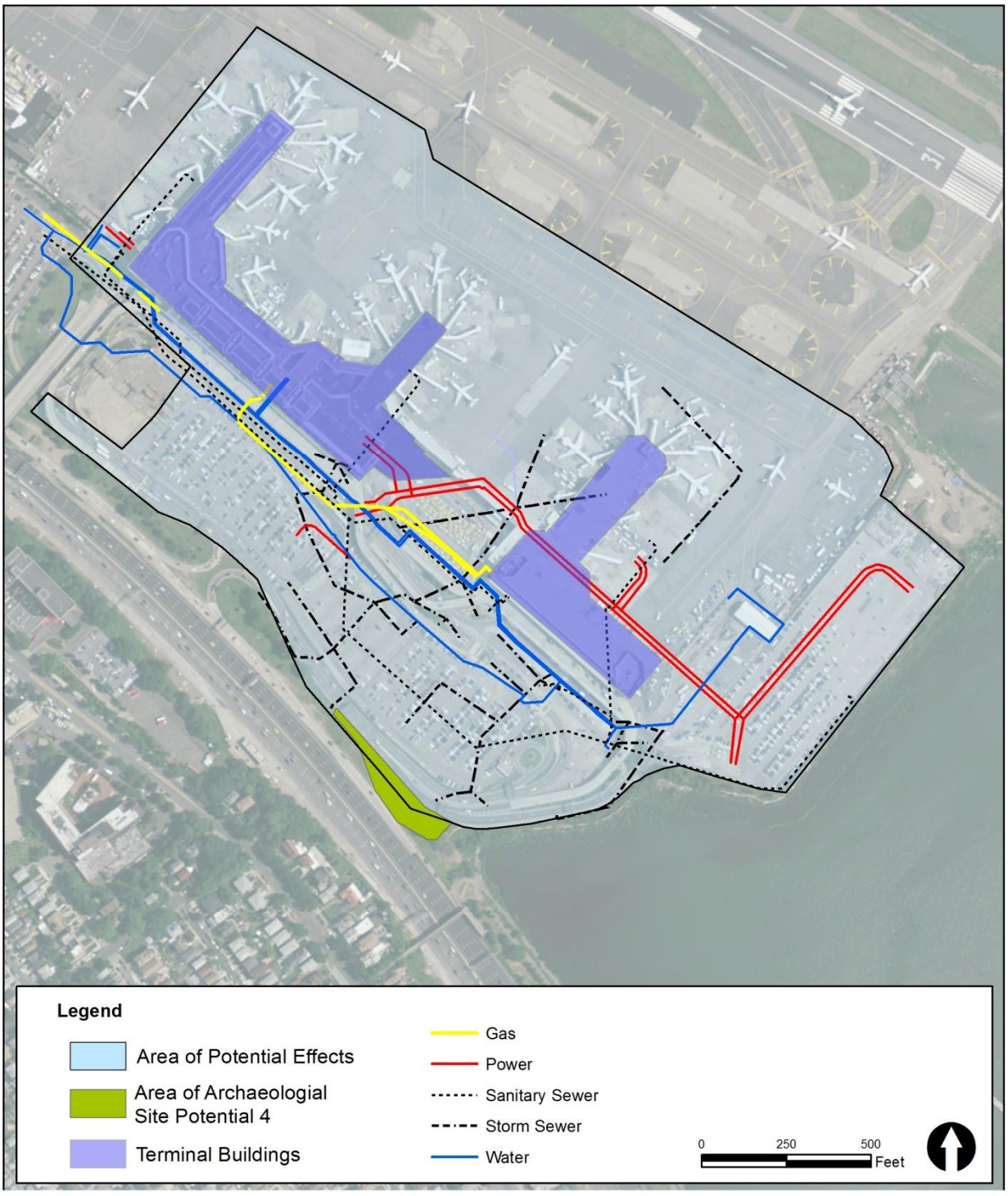

Source: ESRI 2015
Prepared by: AECOM 2016

Figure 12

LaGuardia Airport
DELTA Air Lines Reconfiguration
DELTA

Existing Infrastructure in the APE

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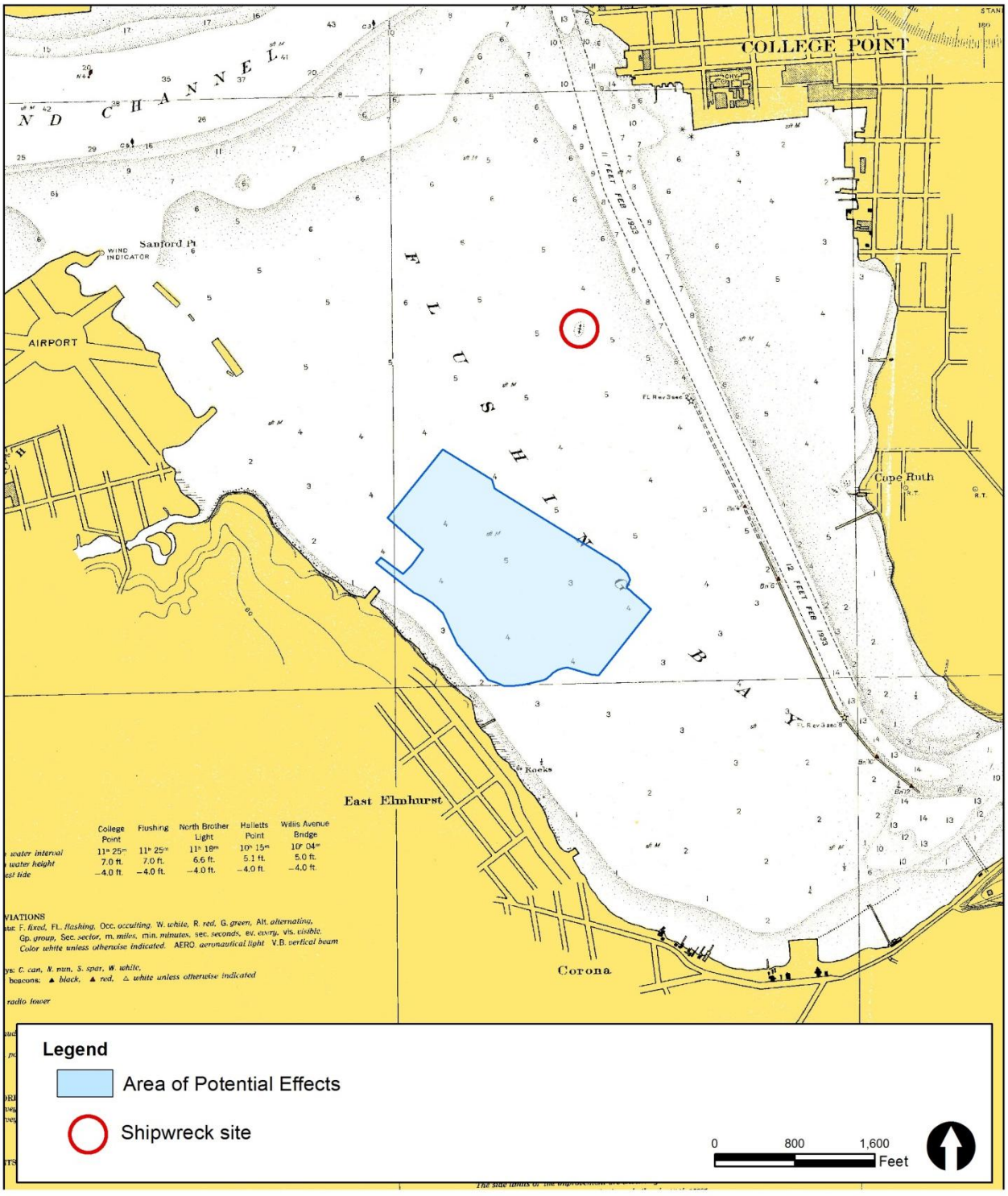

Source: USCGS 1933
Prepared by: AECOM 2015

Figure 13

LaGuardia Airport
DELTA Air Lines Reconfiguration

Mapped Shipwrecks

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5.0 ASSESSMENT OF IMPACTS

Impacts to subsurface environments with the potential to affect intact archaeological deposits derive from three activities:

1) Building and roadway demolition/construction;
2) Subsurface utility installation; and
3) Grading.

The vertical APE for the proposed undertaking is defined by the maximum depth to which each of these activities may be anticipated within their respective footprints of disturbance. Construction of the new concourse building and elevated sections of new approach roadways will require pilings to be driven a minimum of 90 feet into the ground, if not to bedrock.[2] For the purpose of assessing potential impacts to archaeological resources, the vertical APE in the footprint of these structures is defined as the entire soil package overlying bedrock. The vertical APE excludes those areas already affected by pilings (i.e., Terminals C and D).

Subsurface utilities will be excavated to variable depths:

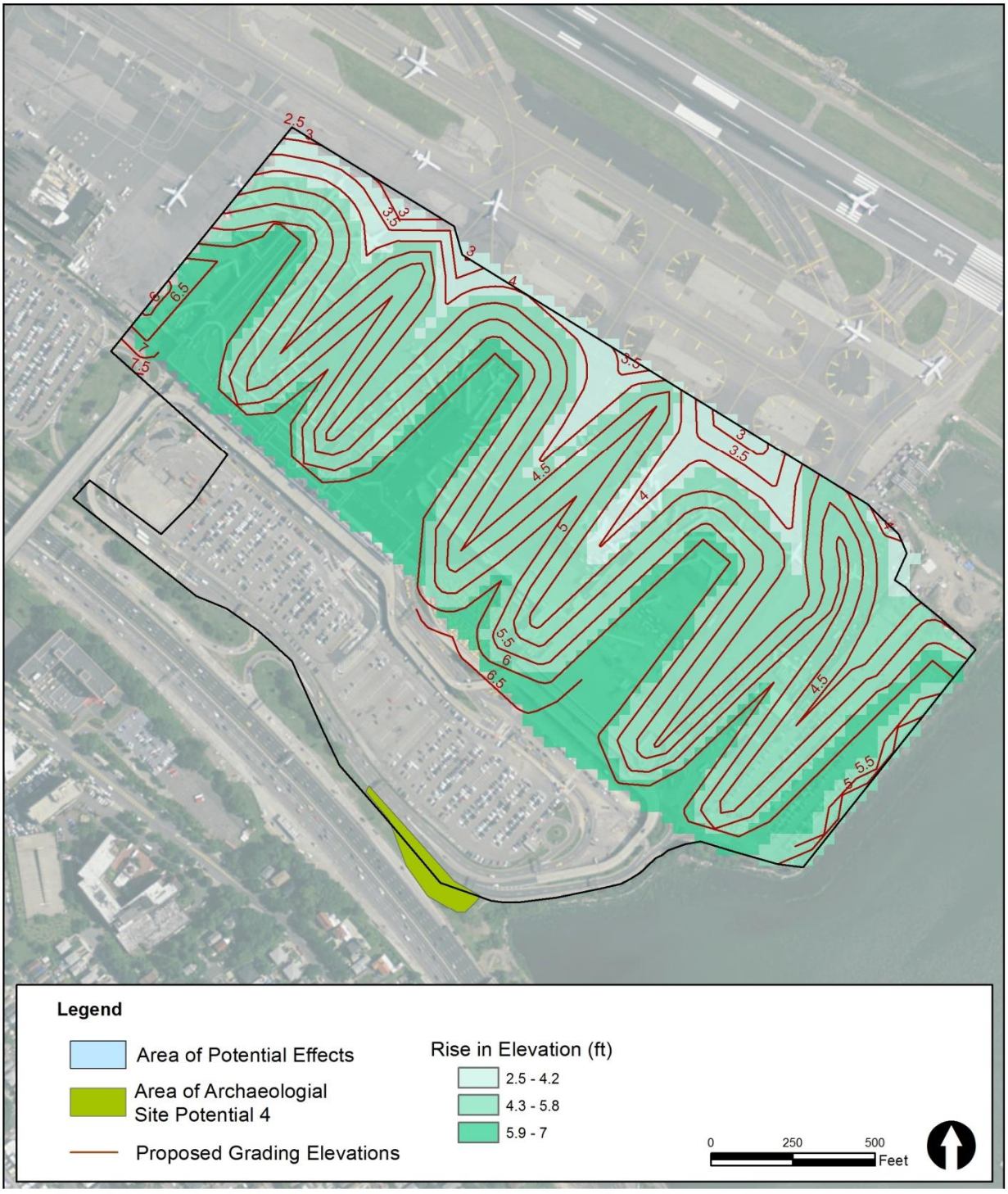
- New sanitary sewer lines will be excavated 4 feet deep;
- Storm manholes will be approximately 15 feet deep;
- Water and gas lines will be excavated 4–5 feet; and
- Electrical lines would be excavated between 3 and 8 feet deep.

To date, grading plans have only been developed for the airside portion of the APE. Grading plans have not been developed for the approach roadway network south of the proposed terminal building. The preliminary grading plans available to date indicate that the elevation of the airside of the APE will be raised from 2.5 to 7 feet above existing grade (**Figure 14**). No cutting of soils will occur in that area and, therefore, the proposed grading on the airside does not influence definition of the vertical APE.

The vertical APE is presented in **Figure 15**. Based on the data derived from geotechnical borings on the depth of fill across the APE, the vertical APE for the shallower (5-foot) utilities (sanitary sewer, water, gas) do not have the potential to penetrate the fill mantel. The 8-foot depth of proposed subsurface power lines may reach the interface between fill and native soil in a small number of places. The vertical APE for the deepest utilities (15 feet) will penetrate areas of shallow fill (8.23–15 feet), particularly in the southeast corner and, notably, in Archaeological Site Potential Area 4 (see **Figure 15**). The deepest vertical APE (90 feet) will penetrate all fill deposits and the action in those areas (pile driving) has the potential to affect intact soil deposits.

The proposed undertaking has the potential to affect intact prehistoric and/or historic archaeological deposits that may exist in the previously defined Archaeological Potential Area 4 (**Figure 16**). Based on currently available information, those impacts are limited to the installation of a stormwater drainage system, but those impacts may extend to 15 feet below ground surface. A Phase IB testing strategy for this area is presented in Section 6.0 of this report.

[2] Preliminary design plans call for piling supports at 45-foot intervals across the building footprint.



Source: ESRI 2015
Prepared by: AECOM 2016

Figure 14

LaGuardia Airport
DELTA Air Lines Reconfiguration
DELTA

Site Grading and Filling

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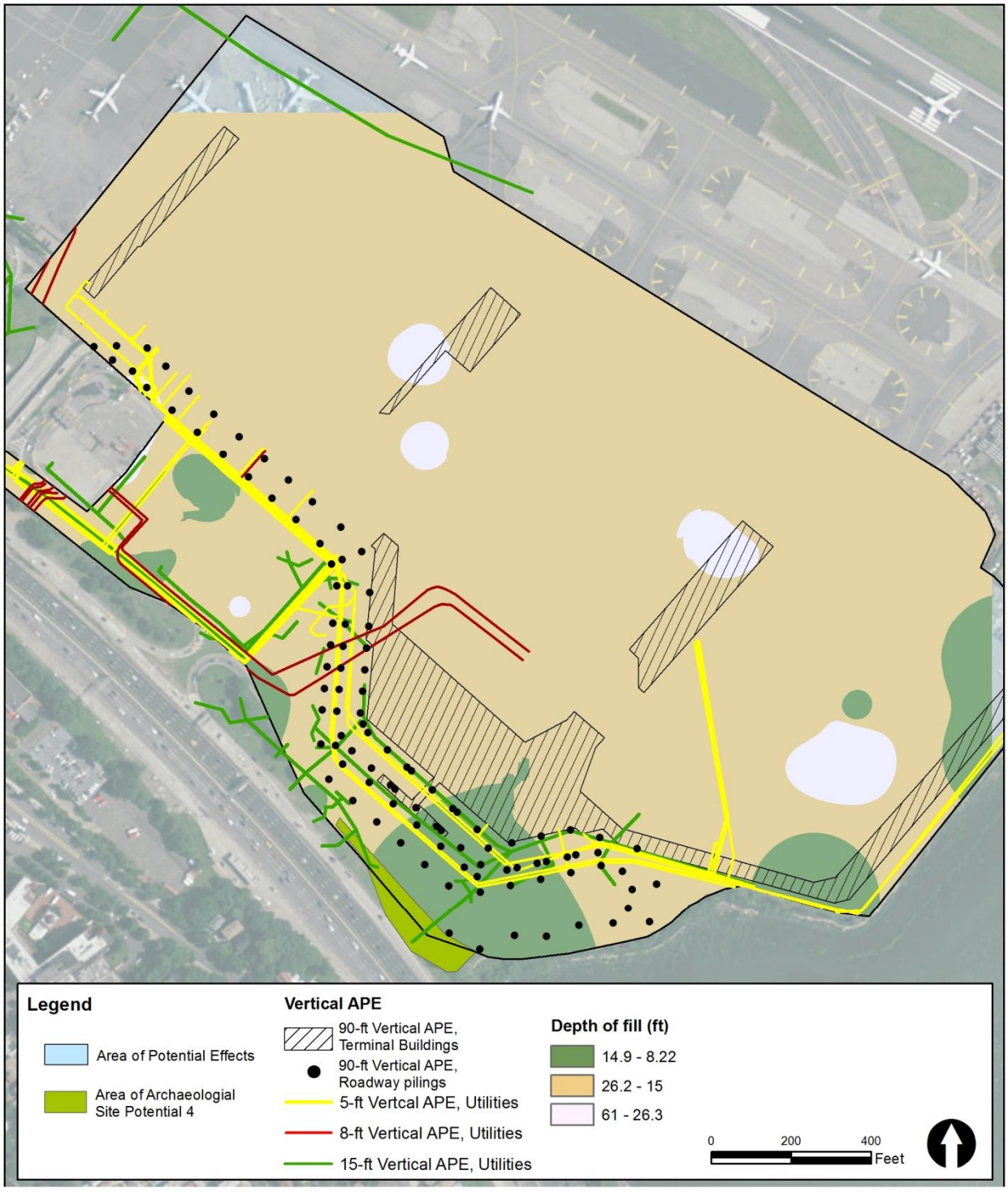

Source: ESRI 2015
Prepared by: AECOM 2016

Figure 15

LaGuardia Airport
DELTA Air Lines Reconfiguration

Vertical APE

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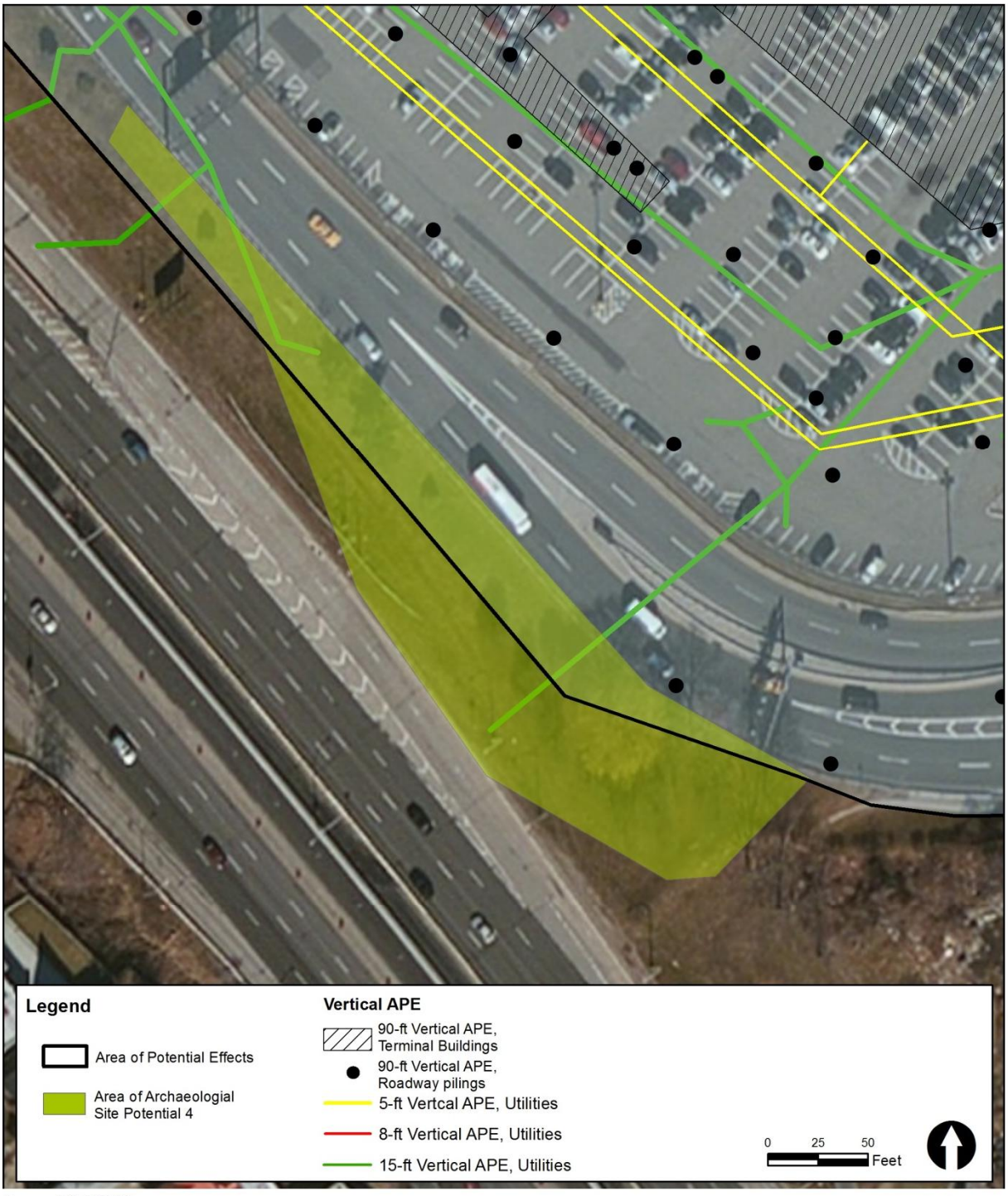

Source: ESRI 2015
Prepared by: AECOM 2016

Figure 16

LaGuardia Airport
DELTA Air Lines Reconfiguration
DELTA

Impacts, Archaeological Potential Area 4

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6.0 CONCLUSIONS AND RECOMMENDATIONS

Large portions of the APE, including all but a narrow band along the southern margin, consist of made-land created through the infilling of Flushing and Bowery Bays during the early twentieth century. The in-filled areas contain no potential for prehistoric or historic archaeological resources. GIS sensitivity models of the APE identified one area of archaeological potential within the APE. Archaeological Potential Area 4 may contain prehistoric and/or historic archaeological deposits beneath fill deposits of unknown depth, but which may be up to 8 feet deep. Proposed utility installation in this area is anticipated to be up to 15 feet deep. This storm sewer installation will affect approximately 200 linear feet of Archaeological Potential Area 4.

Given the depth of the utility impacts and the fact that potential archaeological deposits may also be quite deep, archaeological monitoring of construction is the recommended treatment option. The mechanical equipment for excavation and appropriate safety measures will be in place during construction to facilitate access and inspection of trench excavations by a professional archaeologist. A protocol for archaeological monitoring of construction will be developed and implemented during utility installation in this sensitive area. The monitoring protocol will be modeled on the monitoring protocol developed for the CTB Redevelopment Program and will be reviewed and approved by the NYSOPRHP prior to implementation. Finally, the archaeological monitoring protocol will be included in the construction bid packages for potential contractors to include in their construction work plans to assure compliance with the protocol.

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APPENDIX A:
PROJECT CORRESPONDENCE

JFK International Airport
Terminal 4 Trailer Complex
Jamaica, NY 11430
(718) 751-3575

March 9, 2016

Ms. Ruth Pierpont
Deputy Commissioner for Historic Preservation
New York State Office of Parks, Recreation and Historic Preservation
P.O. Box 189
Waterford, NY 12188-0189

Re: Section 106 Consultation Initiation for
Delta Air Lines Reconfiguration Project at LaGuardia Airport
Queens, New York

Dear Ms. Pierpont:

As part of Governor Cuomo's vision for the comprehensive redesign of LaGuardia Airport, Delta Air Lines proposes to reconfigure the existing Terminals C and D. Under Delta's reconfiguration project, a single, four-concourse terminal would be constructed, creating dual taxiways between the concourses. The on-airport roadways in front of the existing terminals would be reconfigured and an extension added to the East Garage.

The lead federal agency for the project is the Federal Aviation Administration (FAA) because the agency must approve changes to the Airport Layout Plan (ALP); federal funds may be granted; and the approval to collect and use Passenger Facility Charges (PFCs) may be sought to implement the project. Therefore, an Environmental Assessment (EA) is being prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended.

With respect to cultural resources, the undertaking must also comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, which requires federal agencies, or entities undertaking federally funded, licensed, or permitted projects to take into account the effects of their actions on historic properties, and plan to minimize harm to adversely affected properties. This letter initiates the Section 106 consultation process with your agency.

I. Background Information – Central Terminal Building Redevelopment Program

In preparation for undertaking a project to replace the Central Terminal Building (CTB) at LaGuardia Airport in 2012, the Port Authority of New York and New Jersey (PANYNJ) prepared a Statement of Purpose and Need for review and confirmation by the FAA that the project qualified for an EA under NEPA.

Following FAA confirmation, PANYNJ, through AECOM, proceeded with development of an EA to obtain a Finding of No Significant Impact (FONSI) and a Record of Decision (ROD) from the FAA. The Preferred Alternative, for the purpose of analysis in the EA, was the Stage 1 Conceptual Design (Stage 1 Design) developed by PANYNJ. In December 2014, the FAA approved the EA and signed a FONSI/ROD for the CTB Redevelopment Program at LaGuardia Airport.

Subsequently, LaGuardia Gateway Partners (LGP) was designated the Preferred Proposer in response to the Request for Proposals (RFP) issued by PANYNJ for the CTB Redevelopment Program, seeking competitive Proposals for a Design, Build, Finance, Operate and Maintain (DBFOM) form of project delivery. The proposal put forth by LGP advocated an Alternative Concept to PANYNJ's Stage 1 Design. In December 2015, PANYNJ submitted the *Technical Report: Proposed Design Changes to the Central Terminal Building Redevelopment Program at LaGuardia Airport*, which analyzed and compared potential impacts associated with the proposed design changes as compared to the potential impacts of the original design. FAA concluded that a new or supplemental EA need not be prepared and signed a Written Reevaluation and Record of Decision (WR/ROD) that confirmed the validity of the findings in the 2014 FONSI/ROD.

As part of the 2014 CTB Redevelopment Program EA, AECOM prepared a Cultural Resources Technical Memorandum and Phase IA Archaeological Assessment and Addendum in 2013. A summary of findings is provided below.

Historic Architectural Assessment

The Area of Potential Effect (APE) for the historic architectural assessment encompassed the entire CTB area at LaGuardia Airport, from Flushing Bay to the north to Grand Central Parkway to the south, and from Flushing Bay to the east, to Runway 4-22 to the west **(Figure 1)**. The APE also included Terminals C and D, and adjacent areas.

Research conducted at the New York State Historic Preservation Office (SHPO) and New York City Landmarks Preservation Commission (LPC) in 2012 indicated that no historic properties listed in the National Register of Historic Places (NRHP) were located within the APE. Two NRHP-listed sites are located in the vicinity of the CTB outside the APE, but would not be affected by it. The Marine Air Terminal (built 1939) located on the west side of the Airport, and the Lent Homestead and Cemetery (est. 1654-56) located further west of the Airport, were beyond the designated APE. The FAA determined, and SHPO concurred, that the CTB Redevelopment would not affect any NRHP-listed properties (Tabachnick et al., July 26, 2013).

The Marine Air Terminal is also an interior and exterior landmark designated by LPC. In addition, south of the Airport outside the APE, the LPC-eligible Malcom X House (built 1925) was identified. There would be no impact to the LPC-designated properties as a result of the CTB Redevelopment.

Five existing aircraft hangars (built 1939-1940) within the APE were over 50 years old at the time of the survey, and met the age requirement for NRHP consideration. Hangars 1, 3, and 5, and Hangars 2 and 4, are part of the original LaGuardia Airport and have remained relatively unaltered over time. All five

hangars were evaluated using NRHP eligibility criteria and were recommended eligible based on their place in aviation history (Criterion A), and as representations of early twentieth century industrial design (Criterion C). According to SHPO, existing Central Terminal Building (circa 1964) does not meet NRHP criteria due to major alterations that occurred in the 1970s and the 1990s. No other potentially-eligible historic properties were identified for further evaluation (Howe, June 25, 2013).

Based on the findings, the FAA determined, and the SHPO concurred, that the surviving Hangars 1, 3, and 5, and Hangars 2 and 4, were eligible for listing in the NRHP as significant historical features of LaGuardia Airport. SHPO also determined that the existing CTB is not eligible for listing due to the major building alterations over time.

Working closely with the SHPO, the FAA determined that the CTB Redevelopment would have an adverse effect on Hangars 1, 3, and 5, and Hangars 2 and 4. Hangars 1, 2, and 4 would be directly affected by demolition; whereas, Hangars 3 and 5 would be indirectly affected by the demolition of the adjoining Hangar 1. In addition, the public's view of Hangars 3 and 5 would be obstructed by construction of the proposed West Garage. No other adverse effects were identified. FAA sent a notice of adverse effect to the ACHP on August 22, 2013.

To mitigate the adverse effect, a Memorandum of Agreement (MOA) was drafted and signed by FAA, SHPO, PANYNJ, the Airport sponsor, and three concurring parties, including the Queens Borough President, the New York Landmarks Conservancy, and the Chair of the NYC LPC. The MOA was fully executed on November 12, 2014, and included the following stipulations:

- Photographic documentation and Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) recordation of Hangars 1, 3, and 5, Hangars 2 and 4, and Hangar 7 (located outside the APE) thereby establishing a permanent public record of all remaining historic buildings on the Airport.

- Development of an interpretive display illustrating the history of the LaGuardia Airport and the historic hangars,

- Implementation of a demolition/construction management plan to ensure that adverse effects to the remaining Hangars 3 and 5 are avoided to the greatest extent practicable during construction, and

- Implementation of a maintenance plan to ensure that Hangars 3 and 5 are maintained in a state-of-good-repair for the foreseeable future.

Hangars 2 and 4 were demolished in early 2015.

Phase IA Archaeological Survey

The APE delineated for the Phase IA Archaeological Survey was defined by the footprint of direct impacts by permanent or temporary disturbances affected by implementation of the CTB Redevelopment Program (**Figure 1**).

The Phase IA Archaeological Survey Report (AECOM, June 2013) found that only the western portion of the APE (Areas 1, 2, and 3) and a section in the far southeastern corner of the APE (Area 4) were assessed to be sensitive for both prehistoric and historic archaeological resources. (Area 4 lies within the proposed APE for the Delta Terminals C and D Reconfiguration Program.) Supplemental analysis in the subsequent Phase IA Addendum Report (AECOM, August 2013) indicated that construction activities associated with the CTB Redevelopment Program would only have the potential to disturb potential intact soil horizons beneath existing roads in the vicinity of archaeologically sensitive Area 1 (outside the Delta Program project limits). To mitigate potential adverse effects caused by the CTB Redevelopment, the MOA stipulated that archaeological monitoring be conducted during construction phase activities in this area (**Figure 2**).

II. Description of Delta Terminals C and D Optimization Program

In July 2015, New York State Governor Andrew Cuomo announced 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 the airport, as recommended by the Governor's airport design panel. In conjunction with that goal, Delta Air Lines proposes to reconfigure Terminals C and D and the adjacent aircraft parking apron, landside roadways, and parking facilities on the eastern side of the Airport. These facilities would be demolished and replaced with new facilities designed and constructed to meet the latest federal standards for airport safety and security, and to accommodate improved levels of service. The Proposed Action does not involve the airfield runways or taxiways, or other terminals or facilities at LaGuardia Airport.

The Proposed Action includes a series of projects divided into three functional areas: (1) terminal building, (2) airside apron and parking area, and (3) landside roadways and parking.
The Proposed Action elements are depicted in **Figure 3**, and are described below:

Terminal Building:

- Demolish the existing Terminals C and D;
- Construct a single terminal headhouse and four concourses that can accommodate 37 contact gates;
- Construct a Central Heating and Refrigeration Plant (CHRP) within the terminal building.

Airside Apron and Parking Area:

- Reconfigure the airside apron in compliance with FAA geometric design standards and airline operating procedures, as applicable;

- Include dual parallel taxilanes or two points of entry;
- Provide 37 contact gate positions that provide the greatest flexibility for gating aircraft that range in size from Group II to Group V;
- Provide nine hardstand/deicing positions (three could be used concurrently).

Landside Roadways and Parking:

- Remove and replace the arrival and departure roadways serving the existing Terminals C and D;
- Connect roads to the Grand Central Parkway and western side of the Airport;
- Construct an extension to the East Garage (recently constructed in front of the existing Terminal C) to replace parking spaces taken up by construction within Parking Lot 5;
- Construct two pedestrian bridges from the East Garage and/or extension to the proposed terminal headhouse.

III. Historic Architectural Assessment

The proposed historic architectural APE for the Delta Terminals C and D Reconfiguration Program would be the same as the historic architectural APE developed for the CTB Redevelopment Program (**Figure 4**). The APE encompasses the eastern portion of the Airport, including Terminals C and D, and adjacent airside and landside areas (roadways and Parking Lot 5). These resources were constructed in recent times. Specifically, in 1983, Delta Air Lines constructed Terminal D at the eastern end of the airport, the east concourse of Terminal C was constructed in the early 1980s and in 1992, US Airways constructed the west concourse of Terminal C. In 2012, a new pedestrian bridge was opened that allows passengers to walk between Terminals C and D without having to reenter through security.

It is recommended that no additional survey and evaluation of historic architectural resources are required because of the following:

- Terminals C and D do not meet the 50 year age criterion to be considered for NRHP eligibility, and are unlikely to meet Criterion Consideration G – Properties that have Achieved Significance in the Past 50 Years because they are commonplace terminals that lack architectural distinction.
- Terminals C and D will be replaced with contemporary structures, and adjacent areas will be reconfigured.
- LaGuardia Airport will be reconfigured when the CTB, and NRHP-eligible Hangars 1, 2 and 4 are removed as part of the CTB Redevelopment Program, and this will change the context of Terminals C and D and the adjacent areas.
- The MOA has been fully executed in accordance with Section 106 to mitigate the adverse effect of implementation of the CTB Redevelopment Program, including removal of Hangar 1 and Hangars 2 and 4 located west of Terminals C and D, and Parking Lot 5.

Photos of the proposed historic architectural APE are included in **Attachment 1**.

Delta Air Lines seeks your concurrence with the APE for this project, and your concurrence that no additional survey and evaluation of historic architectural resources is required because an analysis of LaGuardia Airport was recently completed for the CTB Redevelopment Program.

IV. Archaeological Resources

The proposed archaeological APE for the CTB Redevelopment Program is defined as the Limits of Disturbance (LOD) of the proposed action (**Figure 4**). Areas of the proposed APE for the Delta Program that fall outside the APE for the CTB Redevelopment are limited to the current eastern shoreline of the LaGuardia Airport property and the two terminals.

The Phase IA Archaeological Survey (June 2013) and *Addendum* (August 2013) prepared for the CTB Redevelopment Program identified an area within the proposed APE for the Delta Program (Area 4) that was assessed to be sensitive to both prehistoric and historic archaeological resources. Delta is preparing a Phase IA Archaeological Survey Report for this project, which will define a vertical APE for the Proposed Action, assess the archaeological sensitivity of the APE outside the CTB project footprint and the potential of the Proposed Action to impact intact archaeological deposits. The report will be highly focused on assessing archaeological sensitivity and rely as appropriate on analyses, background research and reporting contained in the Phase IA Archaeological Survey Reports prepared for the CTB Redevelopment Program. Specific recommendations for additional archaeological investigations will be included, as necessary.

V. Conclusion

We look forward to receiving your concurrence on the proposed APEs and associated recommendations. Please feel free to contact our consultants, AECOM, if you have any questions – Allison Rachleff (Historic Architecture) at (212) 377-8723 or John Lawrence (Archaeology) at (609) 386-5444.

Sincerely,

Ryan Marzullo

Enclosures

cc: Meenakshi Srinivasan, NYCLPC
Marie Jenet, FAA
Nicole Weymouth, AECOM

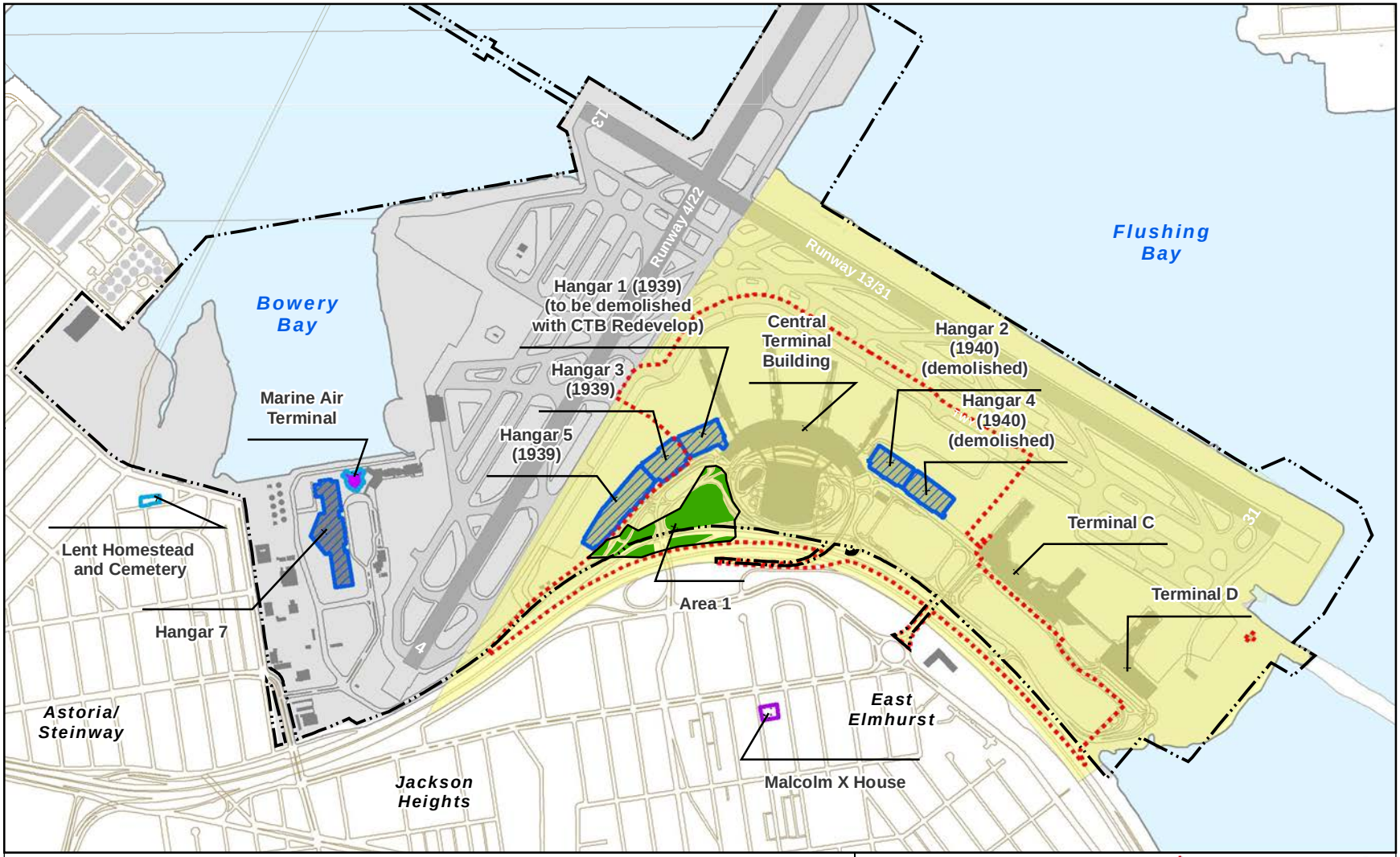
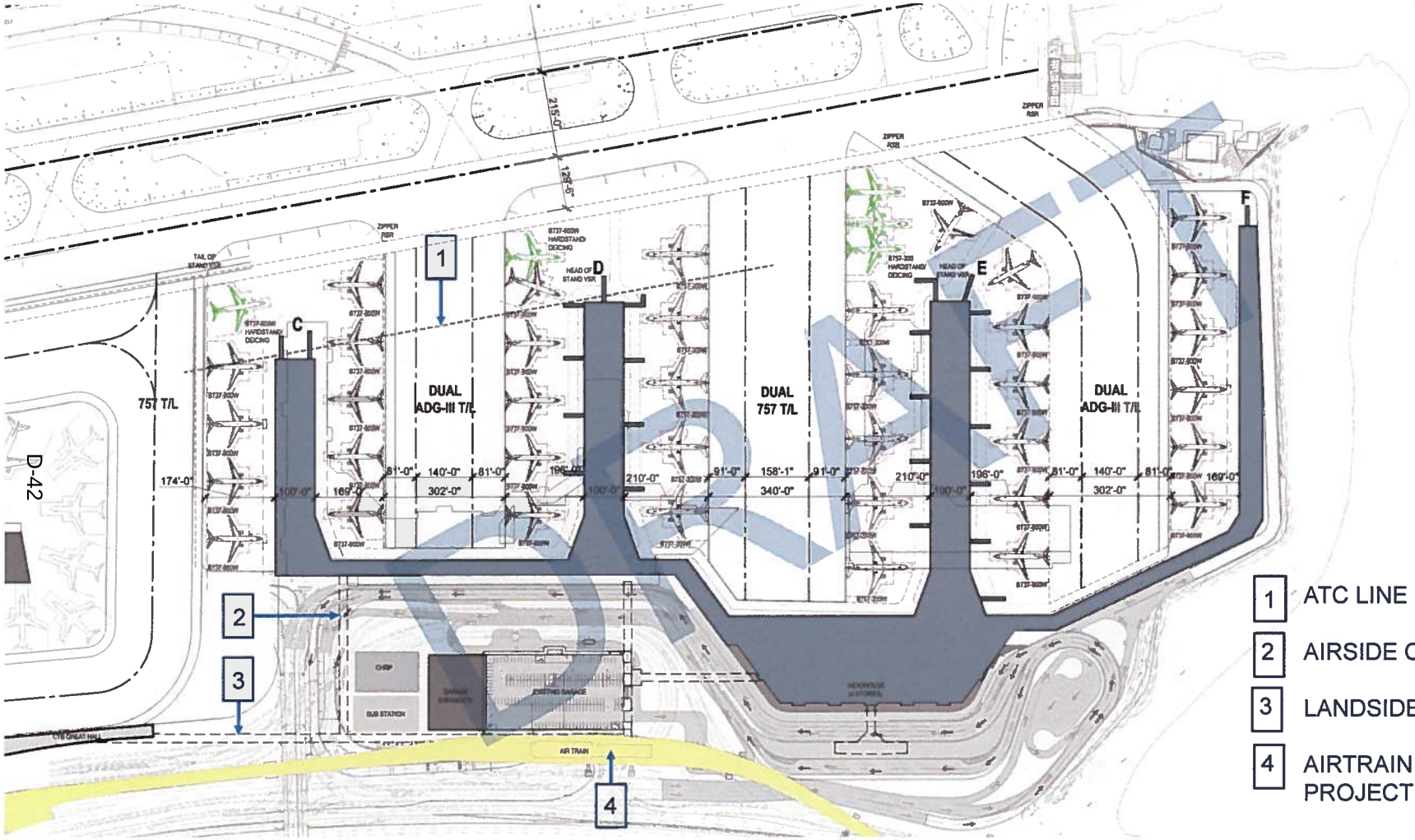


Figure 1

Historic Resources/ Areas of Potential Effects for CTB EA

Figure 2

Proposed APE for Archaeology / Area of Archaeological Sensitivity



1 ATC LINE OF SIGHT SETBACK

2 AIRSIDE CONNECTOR TO CTB

3 LANDSIDE CONNECTOR TO CTB

4 AIRTRAIN (FUTURE, NOT IN PROJECT SCOPE)

CURRENT SITE PLAN

Figure 3

01-19-2016

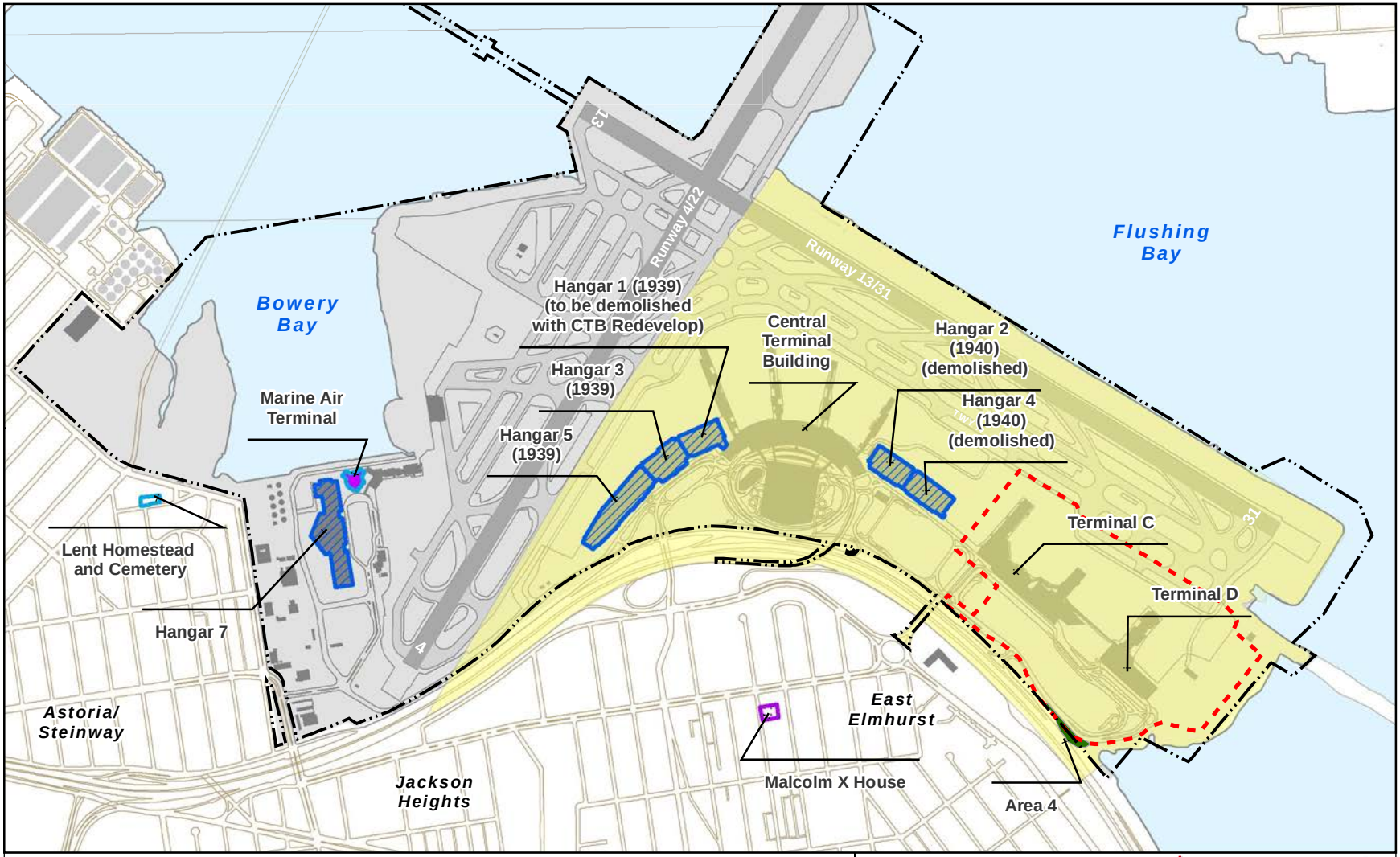


Figure 4

Historic Resources/ Areas of Potential Effects for Delta Terminals EA

Photograph 1. Landside View of Terminal C (built 1992), Looking North (photo taken 6/8/2012, prior to construction of East Garage)

Photograph 2. Landside View of Terminal C (built 1992) and East Garage (built 2015), Looking West (photo taken 12/22/2015)

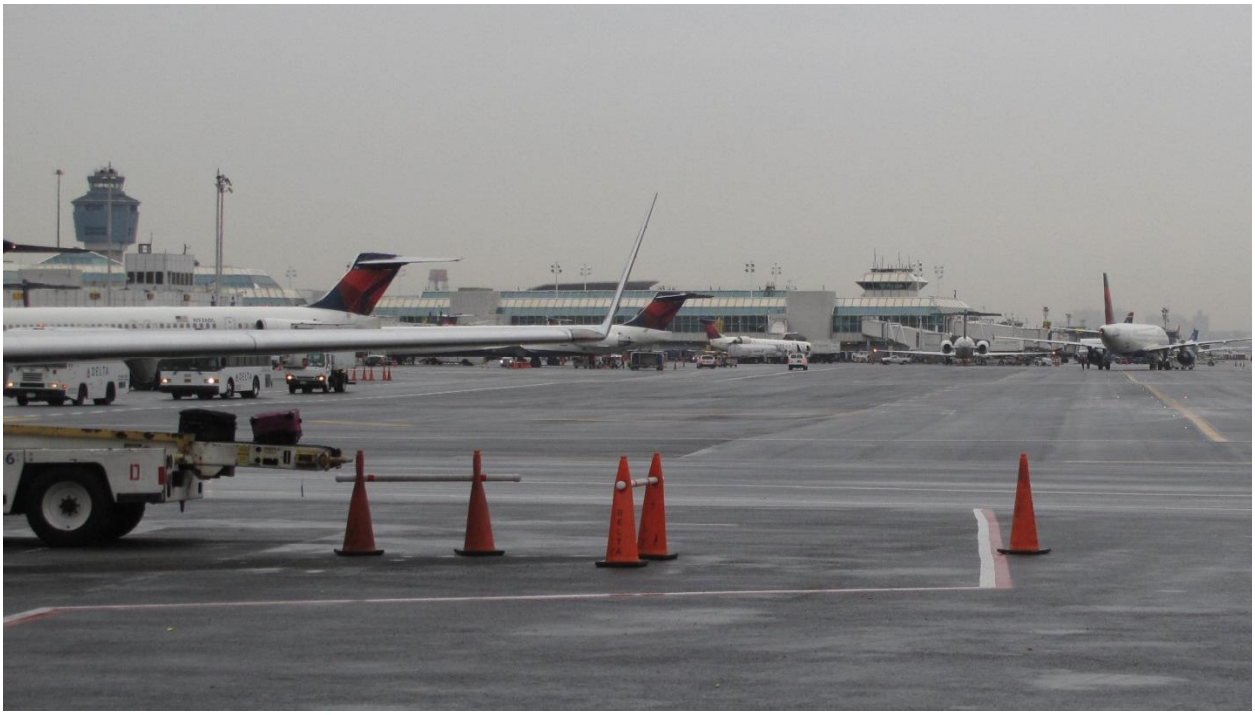
Photograph 3. Airside View of Terminal C (built 1992), Looking South (photo taken 6/8/2012)

Photograph 4. Airside View of Terminal C (built 1992), Looking South (photo taken 6/8/2012)

Photograph 5. Airside View of Terminal C (built 1992), Looking Southwest (photo taken 12/22/2015)

Photograph 6. Airside View of Terminal C (built 1992), Looking East (photo taken 12/22/2015)

Photograph 7. Airside View of Walkway Connecting Terminals C and D (built 2012), Looking West (photo taken 12/22/2015)



Photograph 8. Airside View of Terminals C (built 1992) and Terminal D (built 1983), Looking West (photo taken 12/22/2015)

Photograph 9. Landside View of Terminal D (built 1983), Looking North (photo taken 6/8/2012)

Photograph 10. Landside View of Walkway Connecting Terminals C and D (built 2012), Terminal D (built 1983) and Taxi Hold Lot, Looking Southeast (photo taken 12/22/2015)

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

March 21, 2016

Ms. Allison Rachleff
Sr. Architectural Historian
AECOM
125 Broad Street, 16th Floor
New York, NY 10004

Re: FAA
Delta Air Lines Reconfiguration Project at LaGuardia Airport
Terminals C and D, Queens, NY
16PR01506

Dear Ms. Rachleff:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

SHPO has reviewed the information submitted for this project (letter from Ryan Marzullo, Delta Air Lines, 9 March 2016). Please submit the Phase IA archaeological report referenced in the letter to this office for review and comment. We have no further concerns regarding standing buildings and structures.

If you have any questions please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via e-mail only

NYC Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ARCHAEOLOGY

Project number: FEDERAL AVIATION AUTHORITY / 106-Q
Project: LAGUARDIA AIRPORT CENTRAL TERMINAL BLDG REDEVELOPM
Address: GRAND CENTRAL PKWY, **BBL:** 4009260001
Date Received: 4/17/2014

This document only contains Archaeological review findings. If your request also requires Architecture review, the findings from that review will come in a separate document.

[ ] No archaeological significance

[ ] Designated New York City Landmark or Within Designated Historic District

[ ] Listed on National Register of Historic Places

[X] Appears to be eligible for National Register Listing and/or New York City Landmark Designation

[X] May be archaeologically significant; requesting additional materials

Comments: The LPC is in receipt of the Draft Environmental Assessment and Section 4(f) Evaluation Volume 1- Technical Report dated April 2014. The text pertaining to archaeology, including the construction monitoring protocol dated February 2014 and the Draft MOA text dated 4/4/14, is fine.

Cc: NYSHPO

Amanda Sutphin

4/28/2014

SIGNATURE DATE
Amanda Sutphin, Director of Archaeology

File Name: 28794_FSO_ALS_04252014.doc

APPENDIX B:
BORING PROFILES

GEOTECHNICAL REPORT
LAGUARDIA AIRPORT
TERMINAL C & D RECONFIGURATION
QUEENS, NEW YORK

AERO SYSTEM ENGINEERING, INC.
P.O. Box 4426
Marietta, Georgia 30061

Mueser Rutledge Consulting Engineers
14 Penn Plaza, 225 West 34th Street
New York, NY 10122

April 11, 2012
(Revised July 19, 2012)

Mueser Rutledge
Consulting Engineers
14 Penn Plaza · 225 West 34th Street · New York, NY 10122
Tel: (917) 339-9300 · Fax: (917) 339-9400
www.mrce.com

Alfred H. Brand
David M. Cacoilo
Peter W. Deming
James L. Kaufman
Roderic A. Ellman, Jr.
Francis J. Arland
Partners

David R. Good
Walter E. Kaeck
Associate Partners

Hugh S. Lacy
Joel Moskowitz
George J. Tamaro
Peter H. Edinger
Elmer A. Richards
Edmund M. Burke
John W. Fowler
Consultants

Raymond J. Poletto
Thomas R. Wendel
Domenic D'Argenzio
Robert K. Radske
Ketan H. Trivedi
Hiren J. Shah
Alice Arana
Joel L. Volterra
Tony D. Canale
Jan Cermak
Sissy Nikolaou
Anthony DeVito
Frederick C. Rhyner
Senior Associates

Michael J. Chow
Douglas W. Christie
Gregg V. Piazza
Pablo V. Lopez
Steven R. Lowe
Sitotaw Y. Fantaye
Ira A. Beer
James M. Tantalla
Andrew R. Tognon
T. C. Michael Law
Associates

Joseph N. Courtade
Director of Finance and Administration

Martha J. Huguet
Director of Marketing

April 11, 2012
Revised July 19, 2012

AERO System Engineering, Inc.
P.O. Box 4426
Marietta, Georgia 30061

Attention: Mr. Russ Bramlett

Re: Geotechnical Report
LaGuardia Airport Terminal C & D Reconfiguration
Queens, New York
MRCE File No. 11720

Gentlemen:

In accordance with our Proposal dated January 18, 2012, Mueser Rutledge Consulting Engineers (MRCE) has completed a subsurface geotechnical investigation consisting of fourteen geotechnical borings and seven pavement cores for LaGuardia Airport Terminal C & D Reconfiguration in Queens, NY. This report summarizes the investigation, presents the data and results, and provides foundation recommendations.

EXHIBITS

The following exhibits are attached to this Report:

Figure No. 1	-	Site Location Plan
Figure No. 2	-	1891 Historical Map
Figure No. 3	-	Terminal C: Measured Settlements 1979-2004
Drawing No. B-1	-	Boring Location Plan
Drawing No. GS-1	-	Geologic Section A-A
Drawing No. GS-2	-	Geologic Section B-B
Drawing No. GS-3	-	Geologic Section C-C
Drawing No. GS-R	-	Geotechnical Reference Standards
Table No. 1	-	Summary of Laboratory Test Data
Figure No. 4	-	Shallow Foundation Concept
Figure No. S-1	-	Design Response Spectrum
Appendix A	-	MRCE Boring & Core Hole Logs

SITE AND PROJECT DESCRIPTION

The project site is at LaGuardia Airport in Queens, New York. The airport is bordered by Bowery and Flushing Bays to the north, and the Grand Central Parkway along its south side, as shown in Figure No. 1. The work is on the "air side" of Terminals C and D on the eastern portion of the airport property. The air side is the terminal side where movement, loading and unloading of aircraft occurs. Delta and US Airways are the primary tenants in Terminals C and D respectively.

The project consists of the construction of new passenger boarding bridges at Terminals C and D and a new Ground Services Equipment (GSE) Building on a site to the east. Eight individual locations for new boarding bridges are planned at Terminal C. The bridges typically consist of a fixed sloping walkway from the terminal and a moveable section pinned at an intermediate rotunda foundation. Re-use of existing foundations is planned for support of the walkways at several of the new bridges. We understand that the GSE Building has a footprint of about 100 feet by 70 feet, resulting in an area of about 7,000 square feet, although details about this building and its loads are not yet available. In addition, the project includes pavement work in several areas outside Terminals C and D, typically replacing asphalt with concrete.

SITE HISTORY AND GEOLOGY

Based on historical maps as shown on Figure 2, the site was once called Sanford's Point between Bowery and Flushing Bays both extending from the East River. A tributary to Flushing Bay, named Jacksons Creek, crossed the southeast area of the airport and was bordered by marshland. Marshlands once bordered other portions of the waterfront, but it appears that Sanford's Point was an area of higher ground. An amusement park occupied the area until around 1929. At that time fill was placed in the bays to extend the shoreline for North Beach Airport, later called Curtiss Airport. In the late 1930s the shoreline was further extended for construction of LaGuardia Field, which became LaGuardia Airport. This massive land reclamation project expanded the airport by 558 acres and was accomplished by excavating approximately 14 million cubic yards of incinerated refuse fill from a city landfill on nearby Riker's Island and spreading it over tidal mud flats of an organic silty clay deposit. The refuse fill was selected for filling over the soft organic clay due to its light weight with unit weights as low as 70 pcf in the loose state.

Figure No. 2 illustrates site conditions prior to fill placement with the approximate limits of the present day airport shown superimposed. Terminals C and D are located outboard of the historical shoreline on man-made land extended into Flushing Bay. Drawing B-1shows the layout of Terminals C and D within the airport. The areas north of the terminals where construction of the new boarding bridges is proposed are active aprons for movement, loading, and unloading of aircraft. The area to the east of Terminal D where construction of the GSE Building is planned contains an existing building, several trailers, and a parking area.

The natural soils at the site were deposited in three distinct geological periods. These soils are, in order of increasing depth: (1) recent deposits of compressible, fine grained marsh soils, (2) Pleistocene sands, silts and clays, both stratified glacial outwash deposits and glacial sands, (3) Cretaceous sands and clays.

The site is overlain by man-made fill placed in the early 1930s. Below the fill is a thick deposit of highly compressible organic clay . Beneath the organic clay is an upper layer of glacial outwash sand, which was deposited during the most recent glacial retreat. Underlying this upper sand is varved silt and clay, which is a remnant of Glacial Lake Flushing. Within the varved silt and clay are layers and pockets of outwash sand at varying depths and thicknesses. The varved soils and outwash sands were deposited in a glacial valley.

Typically, the bottom of the valley is formed of dense glacial sands deposited in the Pleistocene period and pre-glacial dense sands and hard clays of the Raritan Formation, deposited during the Cretaceous period. Underlying the Raritan Clay is the Lloyd Sand formation. Bedrock occurs at depths of over 200 feet below grade. All borings were terminated at least 20 feet below the organic clay soils in the dense outwash sands and varved silts and clays.

GROUND SETTLEMENT AND FOUNDATION CONSTRUCTION

Fill placed to create land has caused the underlying highly compressible organic clay to consolidate under the weight of the fill with consequent settlement of the ground. Ground settlements of almost eight feet are reported by the Port Authority since LaGuardia Airport opened in 1940. These large settlements have created special problems in foundation construction and airport operations:

1. The ground settlements produced large downdrag loads on foundation piling and caused failures of early pile foundations where the piling was not adequately designed for downdrag. Downdrag is explained in greater detail under our recommendations.

2. Settlements adjacent to pile supported structures required continuous maintenance to preserve access for planes and pedestrians at hangars and terminals.

3. Buried utilities have ruptured due to differential settlements particularly where utilities entered pile supported buildings.

Except for a few buildings located inboard of the original shoreline where the organic deposits are thin or absent, most of the major airport structures are supported on pile foundations. Terminal D (existing Delta Terminal) and its associated boarding bridges are supported on 14 inch diameter concrete filled pipe piles with a 50 ton capacity. The west half of Terminal C (US Airways Terminal) and its boarding bridges are also pile supported. This half of the terminal was added in 1992.

One notable exception is the east half of Terminal C (former Eastern Airlines Shuttle) which is supported on a shallow "floating" foundation consisting of spread footings and a slab on grade bearing on the fill soils. The east half of Terminal C is designed to settle with the ground ("float") and thereby mitigate differential settlements and maintenance problems that plague other pile supported structures where planes, vehicles and utilities access the building. A crawlspace was excavated beneath the building with the material removed to create the crawlspace compensating for the weight of the building. The foundation design included provision for periodic jacking of the building columns to compensate for observed settlements. However, the Port Authority has indicated that such jacking may never have been performed.

The Port Authority is monitoring performance of the east half of Terminal C. Figure 3 shows the column layout with measured settlements of the floor slab in 1988. Settlements in the nine year period (1979-1988) since completion of construction in 1979 range from three to 12 inches with the larger settlements occurring along the terminal perimeter. Settlements also tend to increase with distance from the center of the terminal as the benefit of unloading due to excavation and crawlspace construction reduces near the building edges. Figure 3 also provides a time history of measured settlement in the period from 1979 through 2004 for select columns near the locations of the proposed boarding bridges. Current (2012) and future settlements shown on Figure 3 are estimated based on a straight line projection of the previous data and may slightly over-predict settlements. The available monitoring data indicates that building settlement is on-going with settlements expected to increase by 0.5 to 1.5 inches in the next 10 years.

SUBSURFACE INVESTIGATION

The geotechnical investigation for the proposed terminal reconfiguration consists of fourteen borings (Nos. BH-1 through BH-14) and seven pavement coreholes (Nos. CH-1 through CH-7), made between February 20 and March 1, 2012. The drilling was performed by Warren George, Inc. (WGI) of Jersey City, New Jersey. Two pavement cores, Nos. CH-8 and CH-9, planned at Terminal D were cancelled during the field investigation upon request by AERO, as the plan for terminal reconfiguration in that area was not finalized at the time. The boring and corehole locations were selected by AERO and were reviewed and approved by MRCE as appropriate for the intended purpose. MRCE and AERO located the borings and coreholes in the field by dimensioning off of existing terminal structures. Utility mark-out was arranged by WGI prior to the start of work.

Prior to drilling, a schedule was arranged between U.S. Airways, WGI, AERO, and MRCE to complete the drilling work with a minimum number of gate closures and provide uninterrupted access to boring/core locations and efficient operations. The work was performed around the clock in two-continuous 12-hour shifts, five days per week using two drill rigs and crews. All MRCE, WGI, and AERO personnel were accompanied by airport escort personnel at all times while on the air side.

The borings and pavement coreholes were drilled with a Mobile B-57 truck-mounted drill rig and an Acker AD II truck-mounted drill rig, under the continuous inspection of MRCE Resident Engineers Messrs. Daniel George and Randy Nunez. The borings were advanced using rotary techniques with water, drilling mud and casing to stabilize the borehole. WGI attempted to hand-

auger each boring to a minimum depth of eight feet to clear utilities, but experienced great difficulty due to a layer of coarse gravel encountered directly below the asphalt or concrete pavement. By using a flight-step auger, jetting with an open-ended drill rod, and following with casing, all borings were cleared past utilities to a depth of eight feet. Where possible utilities or obstructions were encountered, borings were offset to allow drilling to proceed, as was the case with Borings Nos. BH-5, BH-7, BH-7A, and BH-12.

Following hand-augering, soil samples were typically taken at five foot intervals. Soil samples were obtained with a standard two-inch O.D. split-spoon sampler driven through four six-inch intervals with a 140-pound hammer free falling 30 inches (ASTM D1586). The number of blows required to drive the sampler through each of the four six-inch increments was recorded. The sum of the blows for the second and third six-inch intervals is defined as the Standard Penetration Test (SPT) Resistance, or N-Value. The N-Value is an index of the in-situ density of the material and is reported in blows per foot (bpf). Where soils were too dense for the sampler to penetrate the full 24 inches, or where gravel, boulders or other obstructions were encountered, the sampler was driven for 100 blows and the depth of actual penetration was measured and recorded (i.e. 100/3"). Both drill rigs used a safety hammer to drive the split-spoon sampler. Occasionally, soil samples were collected at intervals closer than five feet for additional stratigraphic information. Boring depths ranged from 97 to 119 feet.

Thirteen undisturbed tube samples of organic silty clay were recovered in Borings Nos. BH-3U, BH-9U, and BH-13U. Samples taken at BH-3U were taken with a 3-inch diameter Shelby tube sampler and have a sample number suffix "S". Undisturbed samples taken at BH-9U and BH-13U were taken with 3-inch diameter fixed piston sampler and have a sample number suffix "U". Upon recovery, all tubes were temporarily sealed with plastic caps and tape until transported landside of the terminals where they could be sealed with hot wax, as use of open flame for melting the wax was not permitted airside. All tubes were transported to MRCE's laboratory for testing.

A standpipe piezometer was installed in the completed Boring No. BH-11P to monitor groundwater levels. The well installation record is attached to the boring log in Appendix A and includes water level readings that were measured during the subsurface investigation. A flush-mount cap was installed to protect the well and facilitate future readings.

After the borings were drilled, all boreholes not receiving a piezometer were backfilled with soil cuttings. Excess cuttings and drilling fluids were collected by WGI in 55-gallon drums, labeled, and stored at designated areas on the site for later environmental testing and disposal by WGI. Environmental testing of the soil or groundwater was not within the scope of the MRCE investigation.

The pavement cores were obtained with a PQ barrel providing 3.35 inch diameter core specimens. Soils below the tarmac pavement were sampled using the flight step auger to a depth of 1.6 to 7 feet to determine characteristics of the soil below the pavement.

As-drilled boring and corehole locations are shown on Drawing No. B-1. Any offset locations were measured from the planned locations by MRCE's resident engineers. Ground surface elevations were estimated based on nearby benchmarks given on a survey provided by AERO, indicating existing grade at El. +6. The referenced datum is not provided but we believe that it is based on Mean Sea Level.

LABORATORY TESTING

Upon completion of the investigation, all soil samples, and pavement cores were delivered by WGI to MRCE's soil laboratory. Field descriptions were reviewed and revised as necessary for conformance with MRCE's Geotechnical Reference Standards, described on Drawing No. GS-R. Individual soil sample descriptions are based on the Unified Soil Classification System (USCS) and are provided in the boring logs in Appendix A.

Laboratory testing consisted of water content determination and unconsolidated undrained (UU) triaxial strength tests. Natural water contents as a percent of dry weight were obtained for all jar samples consisting of fine grained material (silts and clays) and all undisturbed samples, and are reported on the boring logs. UU triaxial strength tests were performed in order to determine the shear strength of the organic silty clay deposits. UU tests were performed on 11 tube samples from Borings Nos. BH-3U, BH-9U and BH-13U. Samples were subjected to a uniform confining pressure equal to 80 percent of the estimated effective vertical overburden stress at the sample depth and sheared immediately without drainage. All test results on undisturbed samples are presented in Table No. 1, Summary of Laboratory Test Data.

SUBSURFACE CONDITIONS

Our interpretation of typical subsurface conditions is illustrated graphically on Geologic Sections A-A, B-B, and C-C on Drawing Nos. GS-1, GS-2, and GS-3, respectively. Boring information shown on the section includes sample number and position, sampler penetration resistance (N-Value), natural water content and Unified Soil Classification System (USCS) group symbol for soil samples and core run number, position and percent recovery for the pavement core samples. The boring legend and explanation of the USCS symbols are shown on Drawing No. GS-R. Descriptions of the soil strata are summarized below in order of their occurrence with depth. Material classifications are also provided based on the 2008 New York City Building Code.

Stratum F – Fill (NYC Class 7): The uppermost material encountered in each boring is pavement consisting of asphalt varying in thickness from 5 to 17 inches, except at Boring Nos. BH-2, BH-4 and BH-6 where 12 to 16 inches of concrete was encountered. Typically the pavement is underlain by a base course consisting of 1 to 3 feet of gray and brown coarse gravel, some to trace fine to coarse sand, trace silt. The coarse gravel base is underlain by fill consisting of loose to compact gray, brown, and black fine to coarse sand, some to trace silt, gravel, brick, trace to some cinders, trace glass, wood, concrete fragments, and ceramic. A petroleum odor was noted throughout Stratum F, though the exact nature of these contaminants is not within the scope of this investigation.

The N-Values in the fill stratum range from extremes of weight-of-rods (WR) to more than 100 blows per foot (bpf), with a typical range of about 3 to 20 bpf. N-Values are not available in the upper 8 feet of Stratum F due to hand augering for clearing utilities. The thickness of Stratum F generally ranges from 21 to 34 feet. The deeper fill present in Boring BH-12A at the proposed GSE Building (see Geologic Section B-B) may be the result of drilling along a sand drain or other deep excavation that was made and subsequently backfilled during previous construction. The limits of this deeper fill are not known.

Stratum O – Organic Silty Clay (NYC Class 6): Stratum F is underlain by Stratum O consisting of soft to medium gray organic silty clay, trace to some shells, trace wood and fine sand.

Two thirds of the N-values for this stratum are weight-of-rods (WR) or weight-of-hammer (WH). The remaining N-values range from 1 to 13 bpf, with an average of 1 bpf. The highest values are at Boring BH-12A beneath a fill thickness of 68 feet. The thickness of Stratum O ranges from 13.5 to 64 feet, with an average thickness of 49 feet. Natural water contents range between 30 and 102 percent, with an average of 76 percent.

Eleven UU triaxial strength tests were performed on tube samples obtained at various depths in Stratum O. The compressive strength of these samples ranges from 0.11 tsf to 0.71 tsf. The undrained shear strength (c) is equal to one-half of the compressive strength and ranges from 0.055 to 0.35 tsf, or about 110 to 700 psf. Some of the samples had low strengths that suggest sample disturbance. The ratio of shear strength to effective overburden stress (c/p ratio) for the clearly undisturbed samples is approximately 0.2 to 0.25, which is typical for normally consolidated organic marine deposits.

Stratum S1 – Sand (NYC Class 3): Stratum O is underlain by a natural sand layer, Stratum S1, consisting of medium compact to very compact brown and gray-brown fine to medium sand, trace silt to silty, trace coarse sand, gravel, silty clay layers.

N-Values for Stratum S1 range from 10 to more than 100 bpf, with an average of 40 bpf. The thickness of Stratum S1 ranges from 6.5 feet to 30 feet, with an average thickness of 16 feet. Borings BH-6 and BH-9U were terminated in Stratum S1 at 102 and 97 feet, respectively.

Stratum V – Varved Silt and Sand (NYC Classes 4 and 5): The Stratum S1 sands are underlain by a varved glacial lake stratum, Stratum V, consisting of medium compact brown silty fine sand and silt varved with brown and gray-brown clayey silt and micaceous silty fine sand, trace to some silty clay, silty fine to medium sand and occasional micaceous fine to medium sand and clay layers. Varving is distinct thin layering of contrasting soils (sand, silt and clay) resulting from seasonal deposition in a previous glacial lake with coarser grained sands typically deposited in warmer seasons when surface water runoff is greatest and finer grained silts and clays deposited in cooler seasons when runoff is low and lake levels more tranquil.

N-values range from 8 to 40 bpf, with an average of 26 bpf. Natural water contents of fine-grained and cohesive components of Stratum V range between 27 and 40 percent, with an average of 31 percent. All borings except Borings BH-3U, BH-6, and BH-9U were terminated in Stratum V.

Stratum S2 – Sand (NYC Class 3): Stratum S2 was only encountered in Boring BH-3U, where drilling extended to a depth of 119 feet. This material consists of compact gray-brown and brown fine to medium sand, some silt, trace coarse sand, gray brown silty clay layer.

A single N-value in Stratum S2 is 30 bpf. The top of Stratum S2 is at a depth of 116.5 feet at Boring BH-3U.

Underlying Strata: Based on available information obtained in previous subsurface investigations at the airport, Stratum V extends to depths as great as 175 feet. In some areas, Stratum V is underlain by sand strata extending as deep as 220 feet. Bedrock consisting of schist and gneiss is encountered at depths of 175 feet to 220 feet.

Groundwater

Groundwater or drilling mud levels were measured in most boreholes during drilling or upon completion and are shown in the Boring Logs and Geologic Sections. The fluid levels measured in the boreholes may not represent stabilized groundwater levels as drilling mud was used to stabilize the borehole walls, and therefore mud levels may not be indicative of the groundwater regime. Groundwater levels measured in Piezometer No. BH-11P are more reliable and indicate that the groundwater was at a depth of about 6 feet during a two-day period when the well was monitored, corresponding to about El. 0. Groundwater levels are expected to vary throughout the year depending on precipitation, surface runoff and tidal variations in Flushing Bay. Water level readings are summarized on the piezometer installation record for Boring No. BH-11P in Appendix A.

FOUNDATION DESIGN AND CONSTRUCTION RECOMMENDATIONS

The subsurface investigation was intended to define subsurface conditions and to provide information for foundation and pavement design. In general the subsurface profile encountered in the borings consists of about 20 to 30 feet of man-made fill overlying 45 to 55 feet of soft to medium organic silty clay. The organic deposits are underlain by 10 to 25 feet of medium compact to compact fine to medium sand, followed by a deposit of glacial lake sediments consisting of medium compact varved silt and sand with clay.

Soil Parameters. We recommend the following soil parameters for design:

Stratum	**F**	**O**	**S1**	**V**
Total Unit Weight (pcf)	115	100	120	115
Angle of Internal Friction (deg.)	30	0	36	28
Undrained Shear Strength or Cohesion (psf)	0	400-800 [1]	0	0
Active Earth Pressure Coeff., K_a	0.33	N/A	N/A	N/A
At-Rest Earth Pressure Coeff, K_o	0.5	N/A	N/A	N/A
Passive Earth Pressure Coeff., K_p	3.0	N/A	N/A	N/A
Friction Coefficient, - soil to concrete	0.35	N/A	N/A	N/A

Notes:

1. Undrained shear strength (c) at any depth is calculated using a c/p ratio of 0.25 where p is equal to the existing effective vertical overburden stress with groundwater at Elev. 0.

New Foundations. On-going ground settlement and variable foundation support at Terminal C complicate boarding bridge construction. The east half of the terminal is supported on shallow foundations that will continue to settle with the ground while the west half is supported on piles that will not settle. Accordingly, in order to mitigate potential differential settlements between new and existing structures, we recommend the use of bridge foundations that match the construction of the connecting terminal foundations. This will involve the installation of deep foundations for boarding bridge construction along the west half of Terminal C and shallow foundations along the east half of the terminal.

We understand that the new bridge structures will consist of elevated walkways supported on one or more posts with vertical loads due to dead and live loads varying from about 30 to 50 tons. Higher loads are expected due to transient conditions such as wind. Lateral loads will range up to about 4.5 tons. Loading for the GSE Building is not available at this time.

Deep Foundations. Deep foundation options include driven or drilled piles bearing in the Stratum S1 sand layer underlying the organic stratum. Driven piles are expected to provide a more economical alternative relative to drilled piles. Driven piles also do not generate spoil during installation reducing requirements for handling and disposal of contaminated fill soils during construction. Drilled piles are therefore not considered further herein.

Pile Types

Driven piles can be classified into two major categories, displacement and non-displacement piles, based on the relative volume of ground displaced by the pile during installation. Displacement piles typically have a solid section and include such types as tapered piles, closed end pipe piles and precast concrete piles. Non-displacement piles include steel H-piles, and open ended pipe piles which do not form a plug during driving. In order to reduce the chance that piles may penetrate the Stratum S1 sand layer and continue to significant depth into the somewhat weaker varved stratum, we recommend displacement piles such as closed-end pipe piles or tapered piles.

A tapered pile is more likely to achieve capacity in the Stratum S1 sands without punching into and driving significantly deeper into the underlying weaker varved deposits. This is due to the combination of bearing and frictional resistance produced by the wedge shape of the taper which is greater than the side friction and end bearing of a cylindrical pipe pile. Timber piles are tapered but are commonly available in lengths only up to about 60 feet. Timber piles are therefore not considered practical at this site due to the much greater depth to the pile bearing stratum. Accordingly, we recommend the use of a concrete filled, steel tapered pile in construction of boarding bridge foundations. Tapered steel piles can be either 12 inch diameter Monotube or Tapertube piles with a minimum 15 ft long bottom tapered section. The extensions above the taper can consist of straight-sided shafts. Monotube piles are fluted and should have a minimum gauge 3 (0.24 inches) wall thickness. Tapertube piles use conventional pipe for extensions and should have a minimum wall thickness of 3/8 inch.

Downdrag Loads

Fill placement to form the airport resulted in consolidation of the organic stratum and settlement of the overlying fill. Monitoring data from Terminal C (See Figure 3) indicates that this settlement is on-going. Future re-grading/repaving may also add load and cause additional settlement. As a result, a pile bearing below the compressible organic deposits will experience frictional or drag forces applied to the pile as the soil consolidates and moves down (settles) relative to the pile. The overlying fill settles with the compressible organic soils producing additional drag forces. These forces, referred to as downdrag, act to increase the loads on the piles. Therefore, the piles must resist both the sustained structural loads (dead and live loads) and downdrag loads. We estimate that downdrag loads on a 12-inch diameter pile are on the order of 50 tons per pile. However, it is well recognized that application of transient loads to a pile causes compression of the pile shaft and of the material supporting the pile tip. For long friction piles required for support of the boarding bridges, the resulting pile-soil movement relieves an equal amount of downdrag load.

We understand maximum pile loads of 30 tons are expected with about 60% of this load derived from transient loading. We therefore recommend the pile design include a downdrag allowance of 32 tons to account for the relief in downdrag loading under transient conditions. Downdrag loads are deducted from the ultimate pile capacity. A pile must therefore be driven to an ultimate capacity equal to a factor of safety (typically 2.0 or greater) times the structural

load plus the downdrag allowance. For example, assuming a structural load of 30 tons and factor of safety of 2.25, the pile must be driven to achieve an ultimate capacity of about 100 tons (2.25 x 30 tons + 32 tons) in the pile bearing stratum.

Pile Testing and Safety Factors

Boarding bridge foundations are expected to consist of two or more piles with design loads up to 30 tons per pile based on the load information provided. The NYC Building Code requires load testing where the pile design compressive load is greater than 40 tons. The Code does not expressly dictate requirements for piles (testing or otherwise) subject to downdrag other than that downdrag must be accounted for in pile design. In our case, the pile load is equal to the structural load of 30 tons per pile plus the allowance for downdrag of 32 tons. Thus the design load per pile will exceed 40 tons and load testing is required.

The Code prescribes the use of static testing to confirm design load and allows the use of a factor of safety of two (2.0) in pile design where static testing is used as the primary construction control procedure. Given the relatively large downdrag loads, variable thickness of the sand bearing stratum, and potential for piles to punch into the underlying varved deposits where Stratum S1 is thin, at least two static load tests would be needed. Conventional static load tests are expensive and would be disruptive to airport operations. Due to these drawbacks, we recommend the use of a higher factor of safety (2.25) in pile design and dynamic testing of initial piles with a Pile Driving Analyzer (PDA) instead of static testing. PDA testing is relatively inexpensive and offers the advantage of testing a greater number of piles across the site. Also, it is less disruptive and can be used to develop pile driving criteria for production driving and evaluate the adequacy of piles exhibiting unusual driving lengths or resistance. This alternate pile design and construction methodology is consistent with the recommendations of the Federal Highway Administration (FHWA) and others but may require a waiver from the NYC Building Department.

For planning purposes, we recommend performing dynamic testing on initial piles driven near Borings BH-1 and BH-2 to evaluate driving criteria for the range in anticipated thickness of the S1 sands along the west half of the terminal. Experience has demonstrated that pile capacity can increase with time in soils, particularly finer grained soils such as the Stratum V deposits that become disturbed during initial driving but recover (setup) and re-gain load carrying capacity following driving. Construction documents should therefore include provision for pile re-strike a minimum of three days after initial driving to assess pile setup should piles drive longer than expected.

Accordingly, we recommend the construction documents include the following requirements/ provisions for pile installation and testing:

1. The Contractor should engage a qualified dynamic pile testing consultant to perform initial wave equation analysis that represents the subsurface conditions on this project, the pile properties, and proposed driving equipment to confirm the adequacy of the driving train and determine driving criteria proposed for indicator piles.

2. A pre-production testing program should be performed consisting of two indicator piles (IP-1 and IP-2) installed near test borings BH-1 and BH-2 respectively to determine actual production pile lengths and any other additional pile construction criteria. Indicator piles should be dynamically tested in accordance with ASTM D 4945 during initial driving and on re-strike a minimum of three (3) days following initial driving.

   IP-1 is located where the Stratum S1 sands are relatively thin and there is potential for the pile to punch through the sands and penetrate into the underlying varved deposits. IP-1 should be driven through the S1 sands to Elev. -110 to evaluate pile capacity in the varved deposits. IP-2 should stop in the Stratum S1 sands at Elev. -85 unless the required ultimate capacity during driving is reached in the sand at higher elevation. Indicator piles should be constructed in the same manner as production piles.

3. Following completion of the pre-production testing program, analyze dynamic test results of indicator piles and perform refined wave equation analyses by the Case Pile Wave Analysis Program (CAPWAP) and submit a test report detailing tests results and plan for installation of production piles including proposed driving criteria.

4. Drive all production piles to the minimum tip elevations and minimum driving resistances as established from the results of successful testing of the indicator piles.

5. A unit price provision should be included for additional dynamic testing on re-strike where variations in driving resistances are observed or pile damage is suspected during production pile installations.

Pile Capacity and Spacing

As discussed above, the use of a higher factor of safety (2.25) is recommended where PDA testing is the primary construction control procedure. On that basis, we estimate that a 12 inch diameter tapered steel pile penetrating about 10 feet into the Stratum S1 sands can achieve an ultimate pile capacity of about 100 tons and allowable design capacity of 30 tons in compression. An allowable pile uplift capacity of 15 tons can be used in design since the fill and organic soils will provide positive resistance under uplift loading.

The NYC Building Code limits the maximum lateral load of a pile to one ton without testing. Based on the loads provided, this may control the number of piles at any bridge foundation unless load testing is performed to demonstrate higher lateral pile capacity.

The minimum center to center spacing between driven piles should be no less than three times the pile diameter. Installation of pile foundations is subject to special inspection by a qualified geotechnical engineer in accordance with the NYC Building Code.

Re-use of Existing Foundations

Test pits are recommended where existing foundations will be re-used to support the new bridges to confirm that (1) foundation types are similar to the new bridge foundations and (2)

the existing foundations remain in good condition. New loads and load configurations should remain similar to the original service loads unless pile driving records or other foundation information is available to substantiate any proposed increase in foundation loading.

Shallow Foundations. Shallow "floating" foundations are recommended for support of the boarding bridges along the east half of Terminal C where spread footings are used for building support. In this way, the bridge foundation will also settle with the ground and thereby mitigate the potential of adverse differential settlements between the terminal and bridge foundations.

A floating or compensated foundation is typically constructed by excavating a volume of soil with a weight nearly equal to that of the proposed structure and then building the structure within this excavation. In this way, the net load on the underlying soil is very small and settlements are tolerable. For the boarding bridge, the design of the floating foundation only requires balancing the applied dead loads as live loads from passengers and wind are not sustained and will not cause long term settlement. The proposed foundation concept is shown on Figure 4 and includes:

1. The use of lightweight concrete with a unit weight of about 110 pcf for footing construction to roughly balance the weight of the removed soils. The lightweight concrete must be of sufficient thickness to counter buoyancy of the foam concrete in a flood event.

2. Over-excavation to a depth of five feet (i.e. within one foot of the water table) and replacement with lightweight foam concrete with a unit weight of 30 pcf to compensate for the applied dead load of the bridge structure. Based on the maximum dead load of 32 kips provided by Aero Systems for the bridge foundations, we estimate this block of foam concrete will measure 2.5 feet deep and about 12.5 feet square.

3. Ground improvement of the fill soils beneath the footing by proof rolling using a heavy vibratory compactor.

Similar to the existing terminal structure, some provision for future jacking/re-leveling of the boarding bridge should be provided in the shallow foundation design.

Allowable Bearing Pressures

Bearing pressures under sustained dead loads will be compensated by foundation construction. We recommend limiting bearing pressures under transient loading such as wind to 2.5 tons per square foot.

Ground Improvement and Footing Subgrade Preparation

Shallow foundation construction requires excavation in silty sands to near the water table. Proof rolling is also required to densify soils and improve bearing of surficial soils beneath

footing foundations. Subgrade preparation must therefore consist of the following measures to provide for bearing of footings on an undisturbed subgrade:

2. Determine depth to groundwater in advance of footing construction. Work may have to be coordinated with tide levels.

3. Excavate to a depth of four feet or to no closer than within two feet of the groundwater table. Proof roll subgrade using a vibratory compactor with a minimum static weight of 1000 lbs/ft of roller width and minimum dynamic force of 4000 lb/ft of roller width.

4. Exercise care in excavation to prevent disturbing or loosening of the soil in the sides and bottom of footing excavations. Footing construction requires support on an undisturbed subgrade.

5. Excavate to five feet or within one foot of the water table. Final cut to subgrade shall be made by an excavator fitted with smooth edge bucket operating by reach of equipment and working at least two feet above subgrade followed by either immediate placement of foam concrete fill or placement of a three inch thick mud mat to protect exposed subgrade from subsequent deterioration from weather, surface water infiltration and construction traffic. In cold weather, measures should be taken to prevent freezing of foundation subgrades.

6. Place pervious lightweight foam concrete to bottom of structural concrete in accordance with manufacturer's recommendations. Foam concrete should have a unit weight of 30 pcf and minimum compressive strength of 100 psi.

Proof rolling and final footing subgrades must be inspected and approved for foundation construction by a qualified geotechnical engineer.

Groundwater Levels and Uplift. Groundwater was encountered in the observation well in Boring No. BH-11P at a depth of 6 feet corresponding to about El. 0. The groundwater level probably varies with the tides in the adjacent waterways as well as seasonally. Flood maps indicate that the airport is within the area where the 100-year flood is at El. 13 to 15 referenced to National Geodetic Vertical Datum, where Elev. 0.0 is equal to Mean Sea Level (MSL) at Sandy Hook, NJ.

Groundwater will produce an uplift pressure that must be resisted by the dead load of the structure. Structures must therefore be built above flood levels or designed to withstand groundwater uplift pressures. We recommend using a factor of safety of at least 1.2 in evaluating uplift resistance under normal groundwater conditions. This factor of safety may be reduced to 1.1 under extreme flood conditions. Uplift resistance should be calculated using only the dead weight of the structure in place. Live load within the structure should not be taken as a resisting force to counter uplift pressures. If the dead weight of the structure is not sufficient, tension piles or other positive measures must be provided to resist uplift pressures.

If excavations for footings, pile caps or other below-grade structures extend to or below the groundwater level, dewatering will be required to provide a dry work area. If large scale or duration dewatering is planned, effective stresses in the underlying compressible organic stratum will increase potentially leading to additional settlement in the affected area. Curbs or other barriers should be placed around the perimeter of excavations to prevent surface water runoff from entering excavations and ponding and disturbing foundation subgrades.

Lateral Support. Temporary construction excavations should be sloped as necessary for safety and stability or supported by sheeting and bracing, in accordance with OSHA regulations. Open-cut excavation is permissible provided groundwater is properly controlled in advance of excavation and such excavation is stable and does not undermine or cause damage to adjacent structures or pavements. Temporary excavations should be made no steeper than 1.5H:1V for stability and to limit ground movements. If there is not sufficient room to make safely sloped excavation cuts, temporary shoring will be required. Temporary excavation support should be designed for an equivalent fluid pressure of 40 pounds per cubic foot (pcf) above the groundwater level, and 80 pcf below groundwater. In addition to earth and water pressures, appropriate surface surcharge pressures should be considered such as airport traffic and potential construction loads. The excavation support system should be designed by a licensed Professional Engineer.

Adjacent Building and Facilities. The proposed construction will be done in the vicinity of existing, occupied airport structures. Pile driving will produce vibrations that could cause settlement and damage of adjacent structures due to densification of the underlying soils or excessive vibration levels. The west half of Terminal C is supported on piles likely penetrating to greater depth than the much more lightly loaded piles planned for the boarding bridges. The successful use of driven piles in the 1992 construction of the western expansion of Terminal C immediately adjacent to the older east half that is supported on spread footings also alleviates concerns of adverse effects of pile driving. However, given the close proximity of some bridge foundations to existing structures, pre-drilling through the fill stratum is recommended in advance of pile driving at pile locations within 25 feet of existing facilities to clear obstructions and reduce vibration intensity during driving. Pre-drilling tools should be of a size two inches smaller than the pile diameter to minimize loss of lateral load capacity of the piles. Pile driving should be scheduled during outages at nearby gates or off hours as the thresholds of human perception for the noise and vibration intensity generated by pile driving are usually much less than the thresholds for damage to structures.

A pre-construction condition survey should be performed on nearby structures to document their condition and assess their susceptibility to damage from construction vibrations, primarily related to pile driving. Vibration and settlement monitoring should be performed to observe and control the effects of construction activities.

Pavement Design. We understand that the project includes replacement of some asphalt-paved areas with concrete. The borings and core holes indicated that the existing pavement is underlain by a layer of coarse gravel, presumably bedding. Assuming that the gravel layer may be inconsistent, and based on the loose to medium compact fill soils below, the new pavement can

be designed for a subgrade with a CBR of 15 and a Resilient Modulus of 20,000 pounds per square inch.

Because the borings and core holes only exposed a small portion of the existing pavement bedding and subgrade material, the materials should be assessed when exposed during construction. We recommend that once the asphalt or concrete pavement is removed, the resulting subgrade should be proofrolled with a heavy smooth-drum roller. Any soft or otherwise unacceptable subgrade should be removed down to firm material and replaced with compacted granular fill. New bedding and pavement can then be installed as designed.

SEISMIC DESIGN

Based on the New York City Building Code (the Building Code) soil classification system, the site is classified as Class F. If a site is Class F, the Building Code requires a site-specific study to be performed since there are no seismic parameters for such soil conditions in the Building Code.

Site-Specific Study. MRCE performed a site-specific seismic study based on geologic, seismologic, and soil characteristics of the site. The site-specific analyses were performed using the 1-D equivalent linear ground response analysis program SHAKE (Schnabel et al. 1972). The program analyzes horizontally layered soil columns excited by vertically propagating shear waves originating from the bedrock. Input for the analysis includes the shear wave velocity (Vs) profile, additional geotechnical properties for each soil stratum, and acceleration time histories at the rock level. The Vs correlation was developed based on established correlations, in-house data, and the boring and laboratory data collected at the site. The depth to rock was assumed to vary from 175 ft to 220 ft. The Vs values used in our analysis are shown in Table S-1 below.

Table S-1. Shear Wave Velocity Profile

Stratum	Depth (ft)	Shear Wave Velocity (ft/s)
Fill	0 to 25	500 to 550
Organic Clay	25 to 75	275 to 375
S1 Sand	75 to 90	850 to 925
Varved Silt/Clay and Sand	90 to 175	800 to 950
S2 Sand	175 to 220	1000 to 1075

The available geotechnical information at the site indicates a relatively consistent soil profile within the area of the proposed construction. However, we performed parametric analyses to address uncertainties in the evaluation of Vs, properties of the soft organic clay layer, and depth to rock. Consistent with the Building Code's seismic design basis, we used input rock acceleration time histories representative of the seismic hazard at the site for the Maximum

Considered Earthquake (MCE), equivalent to an earthquake with a 2,500 year return period. Three pairs of horizontal input rock acceleration time histories were applied, with each pair corresponding to two orthogonal directions of shaking.

Recommended Design Spectrum. The recommended site-specific design spectrum is presented in Figure S-1 as a plot of Spectral Acceleration (SA) vs. structural period (T) for structural damping (ξ) of 5%. The SA values correspond to 2/3 of the Maximum Considered Earthquake (MCE). SA values for discrete structural periods are provided in the table in Figure S-1. The limitations in applying the design spectrum are:

- The design spectrum is applicable to a depth of foundation from existing grade to 5 ft below existing grade. Should this design assumption change, MRCE must review the changes and revise the design spectrum as necessary.
- The design spectrum must be considered in its entire range of periods and supersede any generic site classification previously derived for the site. The values of Spectral Acceleration (SA) at 0.2 sec, SDS (0.415 g), and SA at 1 sec, SD1 (0.22 g), cannot be used to generate an alternative response spectrum for the site.
- No site class should be provided in the design drawings. Site class should indicate "As per site-specific study."

The Seismic Design Category (SDC), for the recommended seismic design coefficients of S_{DS} = 0.415g and S_{D1} = 0.22g, is "D" for the assumed Occupancy Category II structure.

Liquefaction. The liquefaction screening diagram in Section 1813 of the Building Code for Occupancy Category II structures showed a potential for liquefaction during the design earthquake. Therefore, we used the site-specific analyses performed to derive the design spectrum to develop a site-specific screening diagram for the site. The organic clay stratum is soil that is not considered liquefiable. With the site-specific study, the screening became more favorable and the vast majority of the soil samples fell on the safe side of the diagram, with an equivalent factor of safety greater than 1 for initiation of liquefaction under the design earthquake event. The few soil samples that fell on the potentially liquefiable side of the diagram indicate potential pockets of liquefaction in the fill stratum, rather than a continuous liquefiable layer. Therefore, liquefaction does not need to be addressed as a consequence of the design earthquake.

We trust that this report provides you with adequate information for foundation and pavement design. If you have any questions or comments, please do not hesitate to contact us.

ADDITIONAL SERVICES

Plan and Specification Review

We recommend that MRCE conduct a general review of the final plans and specifications to confirm that our foundation and construction recommendations have been properly interpreted and implemented in the design.

Construction Observation and Testing

The purpose of these services would be to provide MRCE with the opportunity to observe soil conditions and behavior as exposed during construction, evaluate the applicability of the recommendations provided in this report to the soil conditions encountered, and recommend appropriate changes in design or construction procedures if conditions differ from those described herein. We recommend that all foundation construction be observed by an MRCE representative including pile installation and testing, and preparation of pavement subgrades.

Very truly yours,

MUESER RUTLEDGE CONSULTING ENGINEERS

By: Robert T. Wisniewski
Robert T. Wisniewski

By: Walter E. Kaeck
Walter E. Kaeck

DJG:SMR:RTW:WEK:JLK
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Attachments

EXHIBITS

Source: 2012 *Google Maps.*

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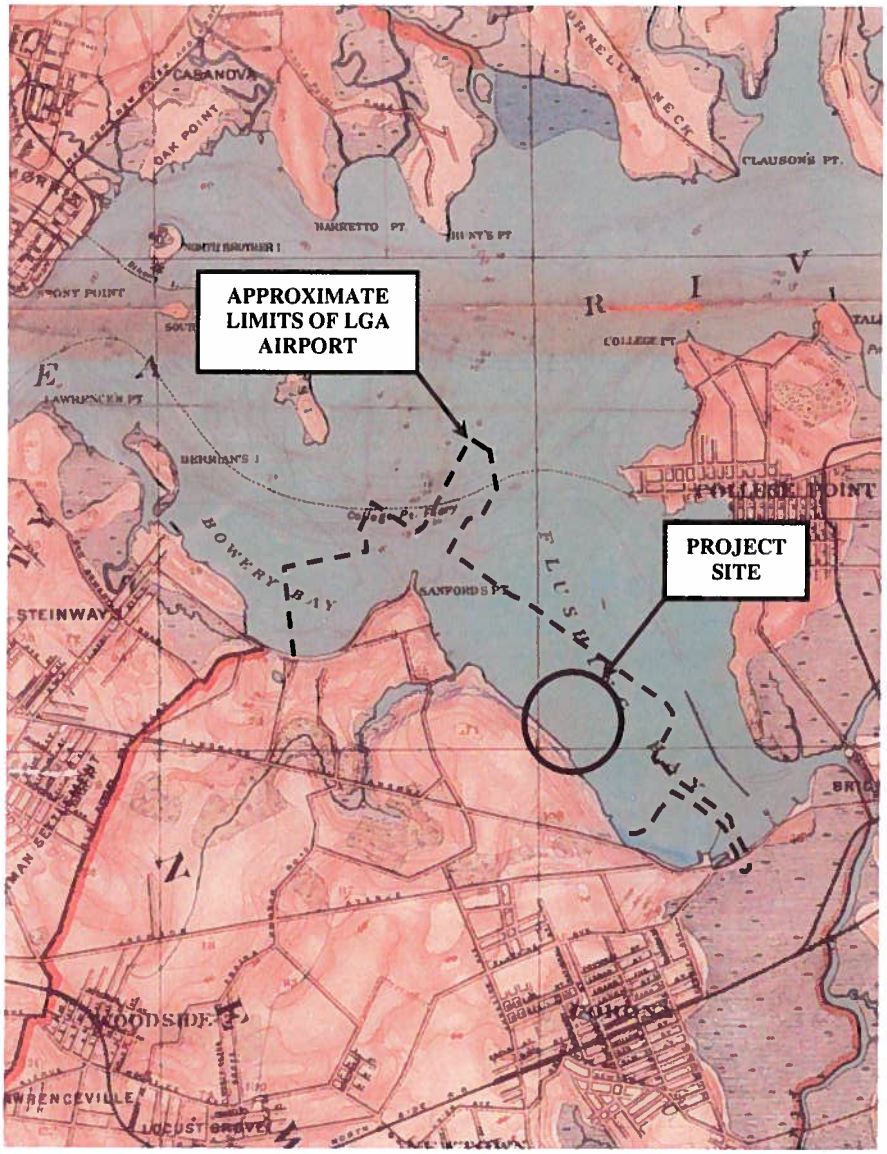
SCALE -	MADE BY: SMR DATE: 03-19-12 CH'KD BY: RTW DATE: 03-21-12	FILE NO. 11720
SITE LOCATION PLAN		FIGURE NO. 1



Source: *Atlas of the Metropolitan District and Adjacent Country, Plate VIII – Long Island Sound – Westchester North to Mt. Vernon – Queens South to Jamaica Map, by Julius Bien & Co., dated 1891.*

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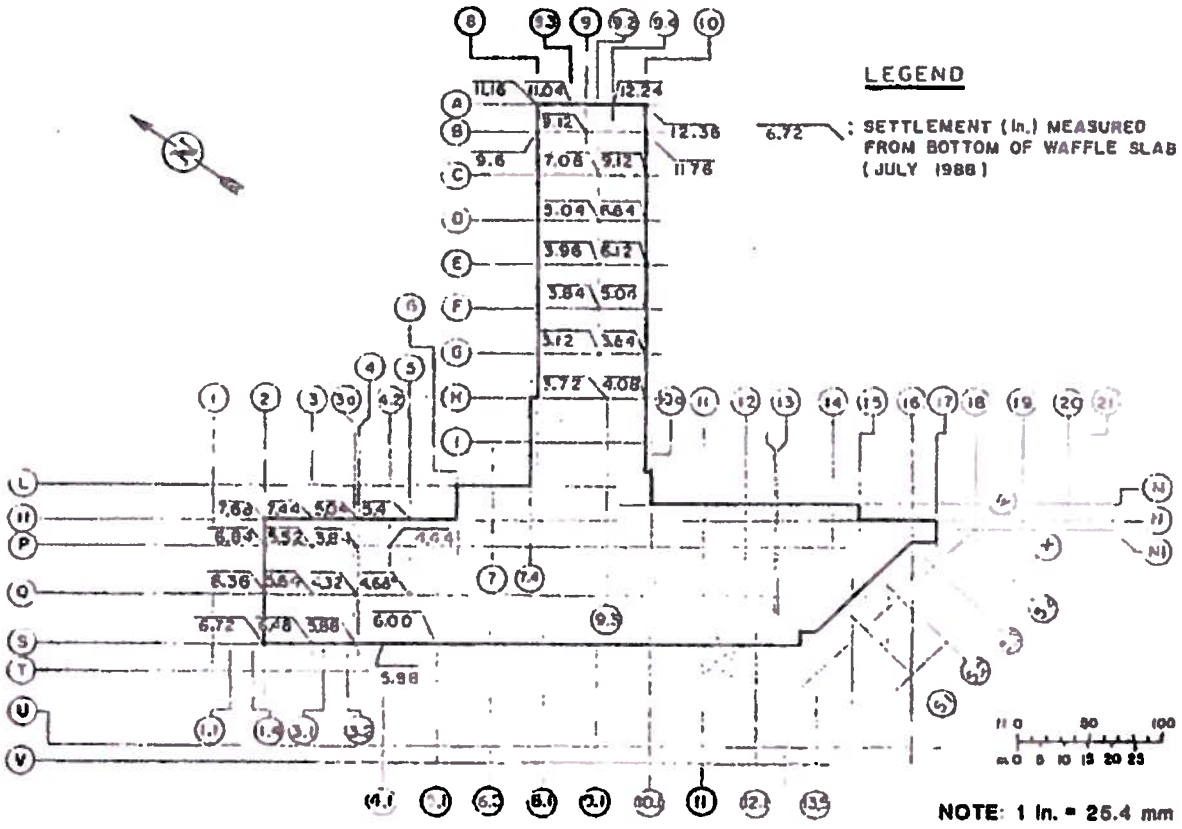
1891 HISTORICAL MAP		FIGURE NO. 2



Terminal C – East Half Plan

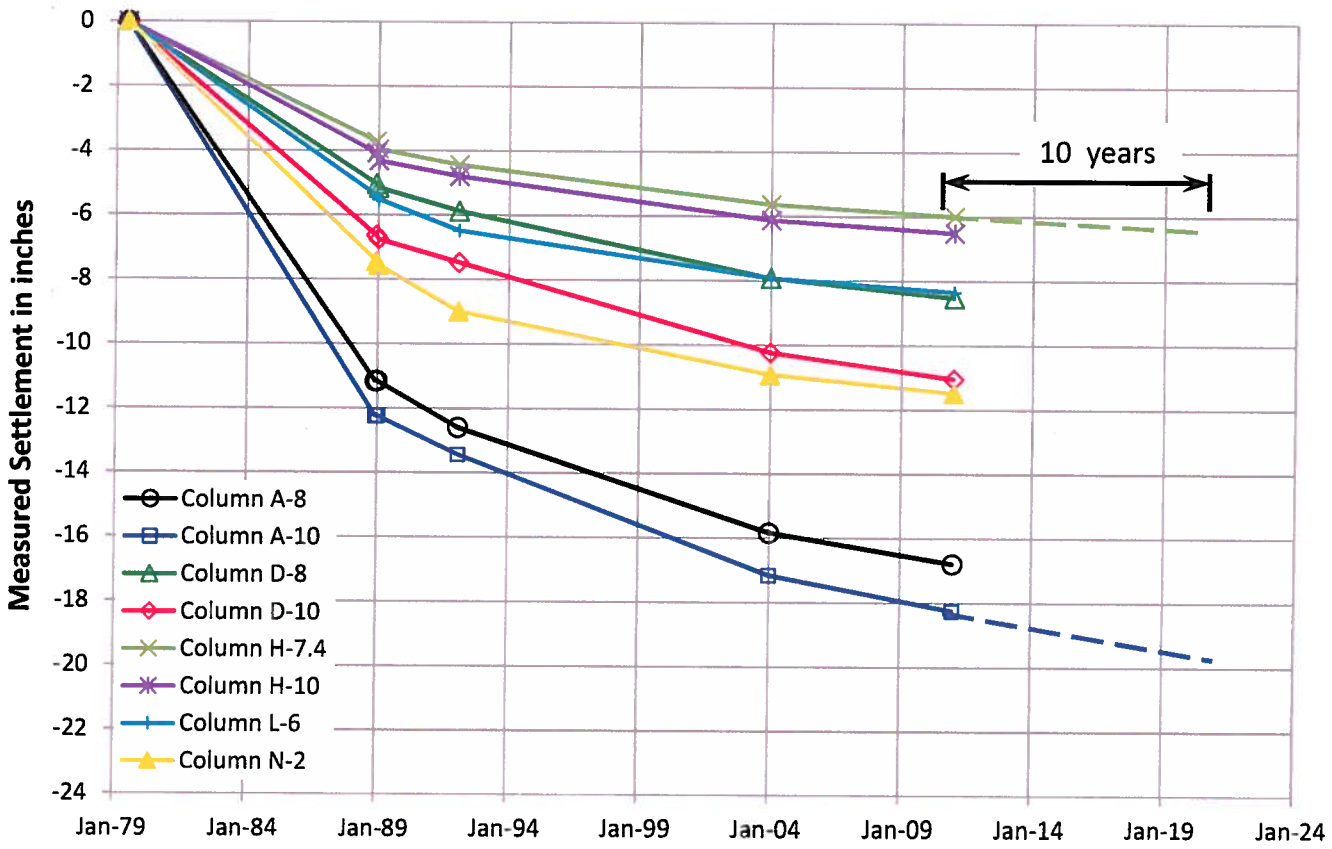
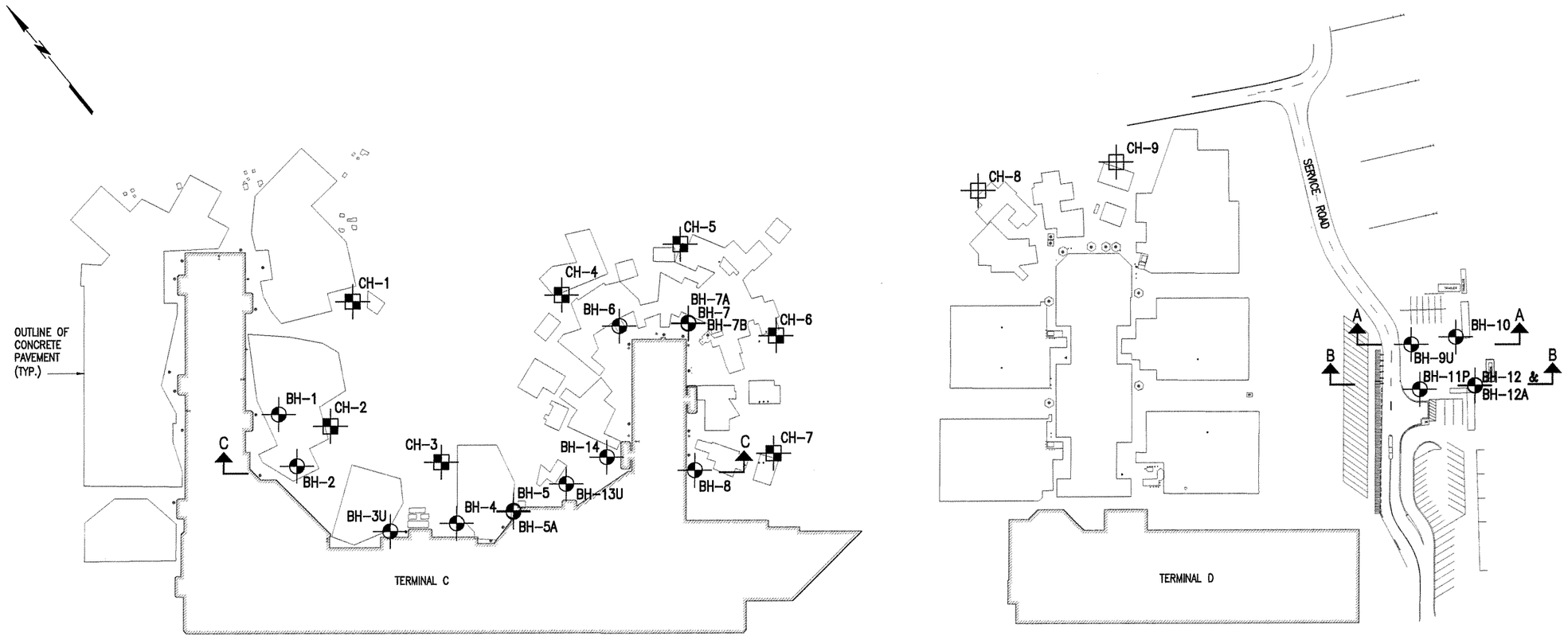


Figure 3
Terminal C: Measured Settlements 1979 - 2004
MRCE File 11720



P L A N

PLAN NOTES:

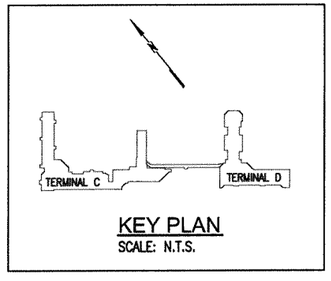
1. BASE PLAN PROVIDED BY AERO SYSTEMS ENGINEERING INC., DRAWINGS SHEET NO. S-1.0, REVISION 3, DATED 1/27/2012.
2. BORINGS NOS. BH-1 THROUGH BH-14 AND CORE HOLES NOS. CH-1 THROUGH CH-7 WERE MADE BETWEEN FEBRUARY 20 AND MARCH 1, 2012 BY WARREN GEORGE, INC. UNDER THE CONTINUOUS INSPECTION BY MUESER RUTLEDGE CONSULTING ENGINEERS (MRCE).
3. BORINGS WERE LAID OUT BY AERO AND MRCE. AS-DRILLED LOCATIONS WERE ADJUSTED TO APPROXIMATE OFFSETS FROM PLANNED LOCATIONS.
4. FOR GEOLOGIC SECTIONS A-A THROUGH C-C, SEE DRAWINGS GS-1 THROUGH GS-3.
5. CORE HOLES NOS. CH-8 AND CH-9 WERE NOT MADE.

LEGEND:

BH-1 – BORING MADE IN FEBRUARY-MARCH 2012
"U" INDICATES UNDISTURBED SAMPLING
"P" INDICATES PIEZOMETER INSTALLATION
"A", "B" INDICATES OFFSET FROM ORIGINAL LOCATION

CH-1 – COREHOLE MADE IN FEBRUARY-MARCH 2012

CH-8 – PROPOSED COREHOLE LOCATION



KEY PLAN
SCALE: N.T.S.

GRAPHIC SCALE
100' 50' 0 100' 200'

D-75

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BORING LOCATION PLAN — DRAWING NUMBER B-1

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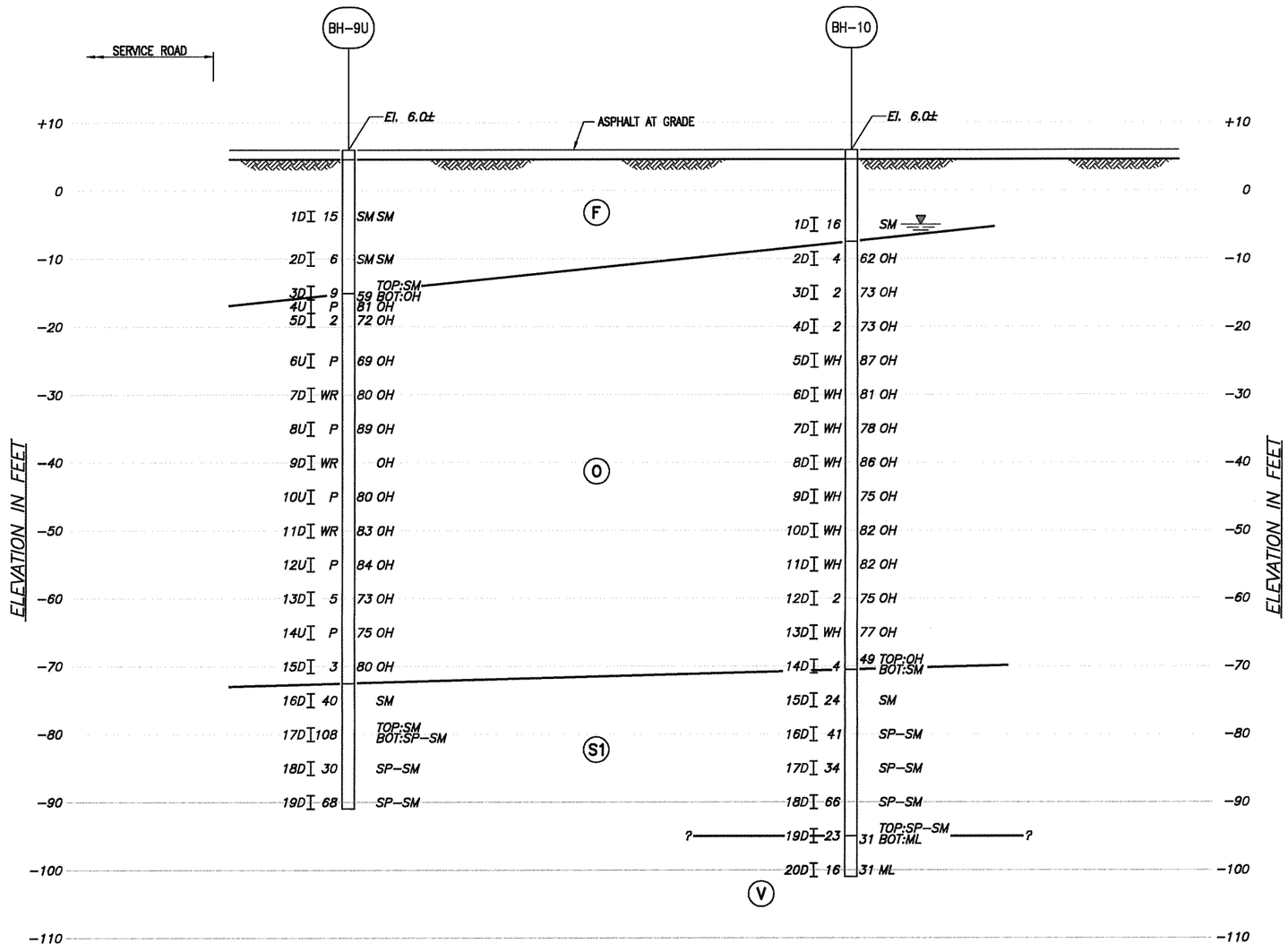

GEOLOGIC SECTION A-A

GENERAL NOTES:

1. FOR PLAN NOTES AND SECTION LOCATIONS SEE DRAWING NO. B-1.
2. SEE REPORT TEXT FOR ELEVATION DATUM REFERENCE.
3. STRATIFICATIONS SHOWN ARE BASED ON NECESSARY INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
4. SAMPLE DESCRIPTIONS AND STRATIFICATIONS SHOWN ARE BY MRCE.
5. COMPLETE SOIL DESCRIPTIONS ARE PROVIDED ON BORING LOGS IN APPENDIX A.
6. SEE DRAWING NO. GS-R FOR BORING LEGEND AND SUMMARY OF UNIFIED SOIL CLASSIFICATION SYSTEM.
7. BORINGS ADVANCED WITH ROTARY DRILLING TECHNIQUES; STABILIZED WATER OR MUD LEVELS WERE NOT OBSERVED IN BORINGS NOT RECEIVING PIEZOMETERS.

GENERAL STRATA DESCRIPTIONS:

(F) **FILL** – LOOSE TO COMPACT BLACK, BROWN, AND GRAY FINE TO COARSE SAND, SOME TO TRACE SILT, GRAVEL, BRICK, TRACE CINDERS, GLASS, WOOD, CONCRETE FRAGMENTS, CERAMIC.

(O) **ORGANIC SILTY CLAY** – SOFT TO MEDIUM GRAY ORGANIC SILTY CLAY, TRACE TO SOME SHELLS, TRACE WOOD, FINE SAND.

(S1) **SAND** – MEDIUM COMPACT TO VERY COMPACT BROWN AND GRAY BROWN FINE TO MEDIUM SAND, TRACE SILT TO SILTY, TRACE COARSE SAND, GRAVEL, SILTY CLAY LAYERS.

(V) **VARVED SILT AND SAND** – MEDIUM COMPACT BROWN SILTY FINE SAND AND SILT VARVED W/BROWN AND GRAY-BROWN CLAYEY SILT AND MICACEOUS SILTY FINE SAND, TRACE TO SOME SILTY CLAY, SILTY FINE TO MEDIUM SAND, OCCASIONAL FINE TO MEDIUM SAND SEAMS, CLAY LAYERS.

(S2) **SAND** – COMPACT GRAY/BROWN FINE TO MEDIUM SAND, SOME SILT, TRACE COARSE SAND, GRAY-BROWN SILTY CLAY LAYER.

GRAPHIC SCALE
10' 5' 0 10' 20'

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GEOLOGIC SECTION A-A — DRAWING NUMBER GS-1

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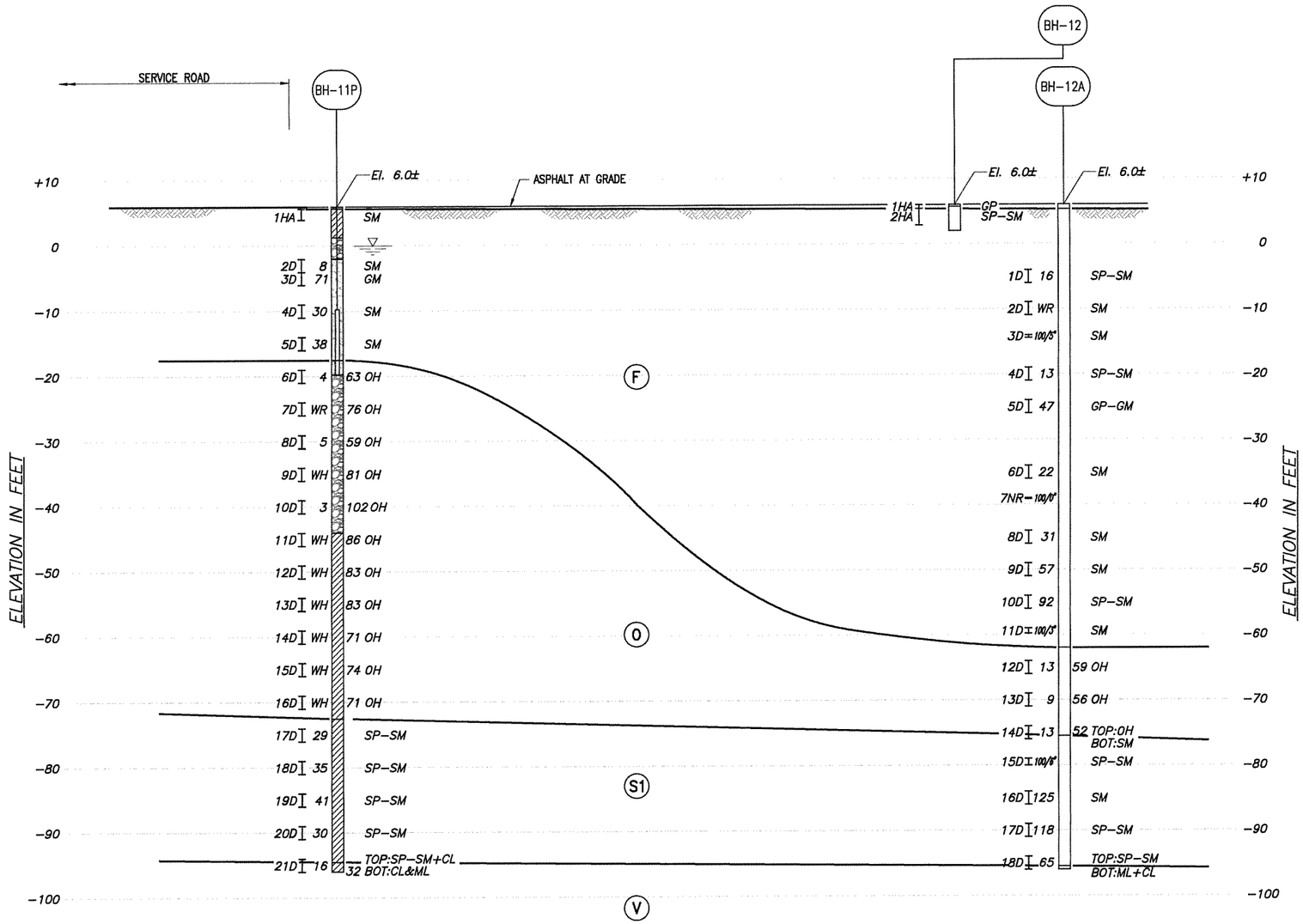

GEOLOGIC SECTION B-B

NOTES:

1. FOR GENERAL NOTES, SEE DRAWING NO. GS-1.

GENERAL STRATA DESCRIPTIONS:

(F) **FILL** – LOOSE TO COMPACT BLACK, BROWN, AND GRAY FINE TO COARSE SAND, SOME TO TRACE SILT, GRAVEL, BRICK, TRACE CINDERS, GLASS, WOOD, CONCRETE FRAGMENTS, CERAMIC.

(O) **ORGANIC SILTY CLAY** – SOFT TO MEDIUM GRAY ORGANIC SILTY CLAY, TRACE TO SOME SHELLS, TRACE WOOD, FINE SAND.

(S1) **SAND** – MEDIUM COMPACT TO VERY COMPACT BROWN AND GRAY BROWN FINE TO MEDIUM SAND, TRACE SILT TO SILTY, TRACE COARSE SAND, GRAVEL, SILTY CLAY LAYERS.

(V) **VARVED SILT AND SAND** – MEDIUM COMPACT BROWN SILTY FINE SAND AND SILT VARVED W/BROWN AND GRAY-BROWN CLAYEY SILT AND MICACEOUS SILTY FINE SAND, TRACE TO SOME SILTY CLAY, SILTY FINE TO MEDIUM SAND, OCCASIONAL FINE TO MEDIUM SAND SEAMS, CLAY LAYERS.

(S2) **SAND** – COMPACT GRAY/BROWN FINE TO MEDIUM SAND, SOME SILT, TRACE COARSE SAND, GRAY-BROWN SILTY CLAY LAYER.

GRAPHIC SCALE
10' 5' 0 10' 20'

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GEOLOGIC SECTION B-B — DRAWING NUMBER GS-2

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GZA
GeoEnvironmental
of New York

Engineers and
Scientists

May 14, 2012
GZA Project No.: 41.0162020.00

Mr. J. Richard Savignano
Severud Associates Consulting Engineers, P.C.
469 Seventh Avenue
New York, New York 10018

Re: Geotechnical Engineering Recommendations
Delta East Baggage Sortation Canopy
Terminal C, LaGuardia Airport, Queens, New York

Dear Mr. Savignano:

104 West 29th Street
10th Floor
New York, NY 10001
(212) 594-8140
Fax (212) 279-8180
www.gza.com

We are pleased to submit this letter report providing geotechnical engineering recommendations for the proposed Delta East Baggage Sortation Canopy at La Guardia Airport Terminal C in Queens, New York. Our services were performed in accordance with our proposal number 41.P000283.12 dated February 22, 2012, which was executed by you on February 27, 2012. Our objective was to evaluate subsurface conditions and provide geotechnical design and construction recommendations for the project. Our services are subject to the terms and conditions included in our proposal and the limitations presented in Appendix A to this letter report.

BACKGROUND

We understand Delta Airlines intends to construct a baggage sortation canopy adjacent to the east wing of the existing Terminal C building. The dimensions of the canopy are approximately 40 feet by 80 feet. The project site is currently paved with asphalt.

A portion of the land occupied by LaGuardia Airport was created by the filling of the former marshlands in two phases. The first phase, which generally included the northern portion of the airport, occurred prior to 1940, with the remainder filled during the 1960s. The project site lies in the area that was filled prior to 1940. The fill material, which is reportedly comprised of excavated material from the general vicinity, was placed over soft, highly compressible organic silty clay.

Based on information provided in the report by Raamot Associates, P.C. (now GZA), entitled "Interim Foundation Report, Eastern Airlines Unit Terminal, LaGuardia Airport, New York" dated August 31, 1988, we understand that the existing Terminal C Building is supported on a combination of shallow foundations and driven pile foundations. The oldest portion of Terminal C is the former Eastern Shuttle Building, which was constructed on shallow spread footings bearing on mandrel-driven compaction sand piles in the fill material. This building was reportedly constructed with a crawl space beneath to allow for jacking to accommodate differential settlement; we are unaware whether any jacking has ever taken place. The newer portions of Terminal C are understood to be founded on piles driven through the fill and soft organic silty clay.

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SCOPE OF SERVICES

Our scope of services consisted of the following items:

- Review of borehole logs and laboratory testing results by others;
- Geotechnical analyses;
- Preparation of this letter report summarizing recommended subsurface properties and design parameters, the recommended foundation type for the proposed structure and estimated foundation settlement, and liquefaction potential and seismic site classification; and
- Preparation of drawing notes for the recommended foundation type

SUBSURFACE EXPLORATIONS

Two boreholes (BH-13U and BH-14) were drilled by Warren George, Inc. to reported depths of 102 feet and 107 feet on February 22 and 23, 2012 within and directly adjacent to the footprint of the proposed structure. Mueser Rutledge Consulting Engineers (MRCE) logged the boreholes, collected the samples, performed laboratory testing on selected samples, and provided an unsealed geotechnical data report dated March 29, 2012 summarizing their services. This report is attached in Appendix B. It should be noted that a report sealed by the professional engineer in charge of the work must be provided to the project team to comply with the requirements of the NYCBC. The locations of the boreholes are shown on Figure 1.

We also reviewed two reports from our Raamot files, including the aforementioned 1988 Interim Foundation Report and a report entitled "East End Terminal, LaGuardia Airport, Test Boring, Water Observation Well and Test Pile Locations" dated November 10, 1989. Test boring B-25 (attached in Appendix C) was performed in November 1989 within the current footprint of Terminal C, in the vicinity of the proposed baggage handling facility canopy.

The subsurface conditions were generally consistent between the recent MRCE work and the Raamot work in the 1980s, although some of the SPT-N-values in the Raamot report were noticeably higher than those measured by MRCE. The difference is probably due to differences in drilling techniques and testing equipment and does not affect the geotechnical design.

SUBSURFACE CONDITIONS

Based on the information provided by others as noted above, the following generalized subsurface profile (in order of increasing depth) has been inferred:

- FILL (Class 7) – A surficial asphalt layer with a thickness ranging between 12 and 17 inches was noted in the MRCE report. A base course consisting of gravel with varying amounts of sand with a thickness ranging between 1 foot and 3 feet

was noted. Based on our prior experience at the airport we understand that the surface asphalt and/or the base course may be considerably thicker in localized portions of the project site. The fill stratum was reported below the surficial asphalt layer to a depth of 28.5 feet. This stratum consists of a heterogeneous mixture of sand, silt, gravel, brick, cinders, glass, wood, concrete fragments, and ceramic fragments, with a petroleum odor.

- ORGANIC SILTY CLAY (Class 6) – This stratum was encountered immediately below the fill stratum at a depth of 28.5 feet and was reported to extend to depths ranging between 77.5 and 78.5 feet. This stratum consists generally of gray organic silty clay with varying amounts of wood, fine sand and shell fragments. Measured SPT N-values in this stratum ranged between WOR (Weight of Rods) and 2, indicating a very soft consistency. Measured water contents on two samples from this stratum were 78% and 86%. The measured compressive strengths of these two samples were 0.52 tons per square foot (tsf) and 0.71 tsf, using an unconfined undrained triaxial test procedure.

- UPPER SAND (Class 3a/3b) – This stratum was encountered immediately below the organic silty clay stratum at depths of 77.5 and 78.5 feet and was reported to extend to a depth of 91 feet. This stratum consists generally of fine to medium sand, trace to some silt, trace gravel. Measured SPT N-values in this stratum ranged between 18 and 38, with an average of approximately 30, indicating a medium dense to dense consistency.

- VARVED SILT AND SAND (Class 3b/5b) – This stratum was encountered immediately below the upper sand stratum at a depth of 91 feet and extended beyond the termination depths of the boreholes. This stratum consists generally of brown sand and silt varved with brown/gray-brown clayey silt and micaceous fine sand. Measured SPT N-values in this stratum ranged between 15 and 33, indicating a medium dense consistency.

- LOWER SAND (Class 3a) – This stratum was beyond the termination depth of the MRCE borings. In test boring B-25 by Raamot, this stratum was encountered immediately below the varved silt and sand stratum at a depth of 189 feet and extended to a depth of 195 feet. This stratum consists generally of medium to coarse sand, trace silt, trace gravel. The single measured SPT N-value in this stratum was 39, indicating a dense consistency.

Weathered gneiss bedrock (Class 1d) is noted below a depth of 195 feet in test boring B-25 by Raamot. Gneiss bedrock (Class 1c or better) is noted at a depth of 208 feet.

Groundwater depth measurements in BH-13U and BH-14 were made after the use of drilling mud, and may not be indicative of actual groundwater levels. MRCE reported a groundwater depth of 6 feet from a piezometer installed in BH-11P. This measurement is consistent with our previous experience in the vicinity, which indicates that the depth to

groundwater is approximately 5 to 10 feet below the existing ground surface elevation. Groundwater levels will fluctuate due to changes in temperature, precipitation, season and other factors not present at the time of measurement.

FOUNDATION RECOMMENDATIONS

The subsurface conditions at this portion of LaGuardia Airport are historically known for long term settlement resulting from the placement of fill material and consolidation of the thick, organic silty clay stratum. The use of shallow foundations at the project site is not feasible; foundation loads should be supported on driven piles to mitigate potential settlement. The piles should be driven into the upper sand stratum; the top of which was encountered approximately 77.5 to 78.5 feet below the ground surface in the test boreholes performed at the project site.

We recommend driven, closed-end, concrete-filled, steel pipe piles with an allowable vertical service load of 70 kips. This pile service load is based on an ultimate capacity of 175 kips, with a factor of safety of 2.5. We analyzed potential downdrag on the piles due to long-term subsidence as a result of consolidation and secondary compression in the organic silty clay stratum. Based on our analysis of the estimated elastic compression of the piles under structural loads and the estimated subsidence over a 50-year service life, we recommend no downdrag design load allowance for the piles, provided there will not be any raise in grade.

Piles should be driven to a depth of 84 feet below the existing ground surface elevation, which is approximately 6 feet into the upper sand stratum. This corresponds to an elevation of -78 feet, using the elevation datum from the MRCE report. Piles must not be driven more than 6 feet into the upper sand stratum due to the weaker underlying soil stratum.

The steel pipe piles should be ASTM A252 Grade 3 (45 ksi yield strength), having an outside diameter of 14 inches and a minimum wall thickness of 0.312 inches. The pile bottoms are to be closed with steel conical points meeting the requirements of ASTM A-27 65/3, welded to the bottom of the pipe by means of a complete penetration single bevel groove weld so as to have adequate strength to sustain driving stresses and to create a watertight connection.

The pile concrete fill should have a minimum 28-day compressive strength of 4,000 psi. Concrete must be placed in the pile within 30 minutes after mixing. Immediately before placing the concrete, all water should be removed from the pile and one cubic foot of flowable Portland cement grout is to be placed in the pile. Concrete is to be placed through a funnel having an 8-inch diameter tube that extends at least 15 feet into the top of the pile with centralizers.

The allowable uplift capacity of each pile is 50 kips, based on an ultimate uplift capacity of 150 kips with a factor of safety of 3.0. Once the uplift forces on the piles are

understood and pile groups are designed, we should review the uplift capacity per pile to check for interaction among adjacent piles which could reduce the uplift capacity.

We estimated the displacement at the top of each pile (14-inch diameter, 0.312-inch wall thickness) using the LPILE Plus 4.0 computer application assuming fixed head conditions. A lateral load of 10 kips at the top of each pile is estimated to cause a lateral displacement of approximately ½ inch. A lateral load of 17 kips at the top of each pile is estimated to cause a lateral displacement of approximately 1 inch. These estimates are based on an edge-to-edge pile spacing of at least three diameters.

We modeled the pile driving using the GRLWEAP 2010 computer application. All piles should be driven with a pile hammer providing a minimum transferred energy of 40 kip-feet with a final driving resistance in the upper sand stratum of at least 15 blows per foot. If the pile installation contractor proposes to use alternative driving equipment, they should submit a wave equation analysis prior to mobilization which demonstrates that the proposed driving equipment can achieve the design pile capacity without inducing stresses greater than 90% of the design yield stress in the pile and which provides the required final driving resistance in the upper sand stratum.

Dynamic pile testing pursuant to the requirements of ASTM D4945 is to be performed on the first three piles driven with each piling hammer used on the project, and on 50% of the total production piles for the project.

In accordance with the applicable provisions of the NYCBC, axial static load tests are not required for driven steel closed-end pipe piles with design capacity equal to or less than 80 kips.

The estimated settlement at each group of piles is approximately ½ inch. Due to the predominately granular nature of the upper sand bearing layer, more than half of this settlement is expected to occur during construction as structural loads are applied.

It is understood that no slab-on-grade will be constructed. The ground surface will be paved asphalt for vehicular usage.

Utility services should be provided with flexible connections into the structure due to the potential for utility services not supported on piles to undergo differential settlement relative to the pile-supported structure.

Based on the reported subsurface conditions and in accordance with the provisions of the NYCBC, Seismic Site Class E is recommended for the project site.

Portions of the fill stratum are considered susceptible to liquefaction based on the reported soil type and SPT N-values, in accordance with criteria outlined in the NYCBC. We performed an additional analysis utilizing the Youd et al methodology with the reported soil type and SPT N-values. Based on our analysis, only limited portions of the fill material may be subject to liquefaction during a seismic event. The driving of steel

pipe piles will cause some densification of the fill material which will further limit liquefaction susceptibility. This potential limited liquefaction in the fill material should not have a negative impact on the load-carrying capacity of the piles supporting the proposed structure. However, a limited amount of settlement may occur through densification of the sand, which would manifest itself as surface distortions and may have implications for subsurface utility performance, adjacent roadways, etc.

Vibration monitoring during pile driving is recommended at the existing adjacent Terminal building and any other vibration-sensitive structures or utilities within 100 feet of the project site. The maximum allowable particle velocity that may be allowed at the monitoring points should be provided by the building or utility owner. If this information is not provided and given the subsurface conditions and considering the adjacent building age and construction, we recommend instituting a maximum allowable particle velocity of 2.0 inches per second (ips) for frequencies greater than 40 Hertz and 1.0 ips for frequencies less than 40 Hertz.

CONSTRUCTION SERVICES

In accordance with the NYCBC, pile installation must be observed by a qualified professional engineer. We recommend that GZA be retained to provide this service, due to our familiarity with the subsurface conditions at the project site and the project design to date.

We appreciate the opportunity to work with you on this project. Should you have any questions, please contact us.

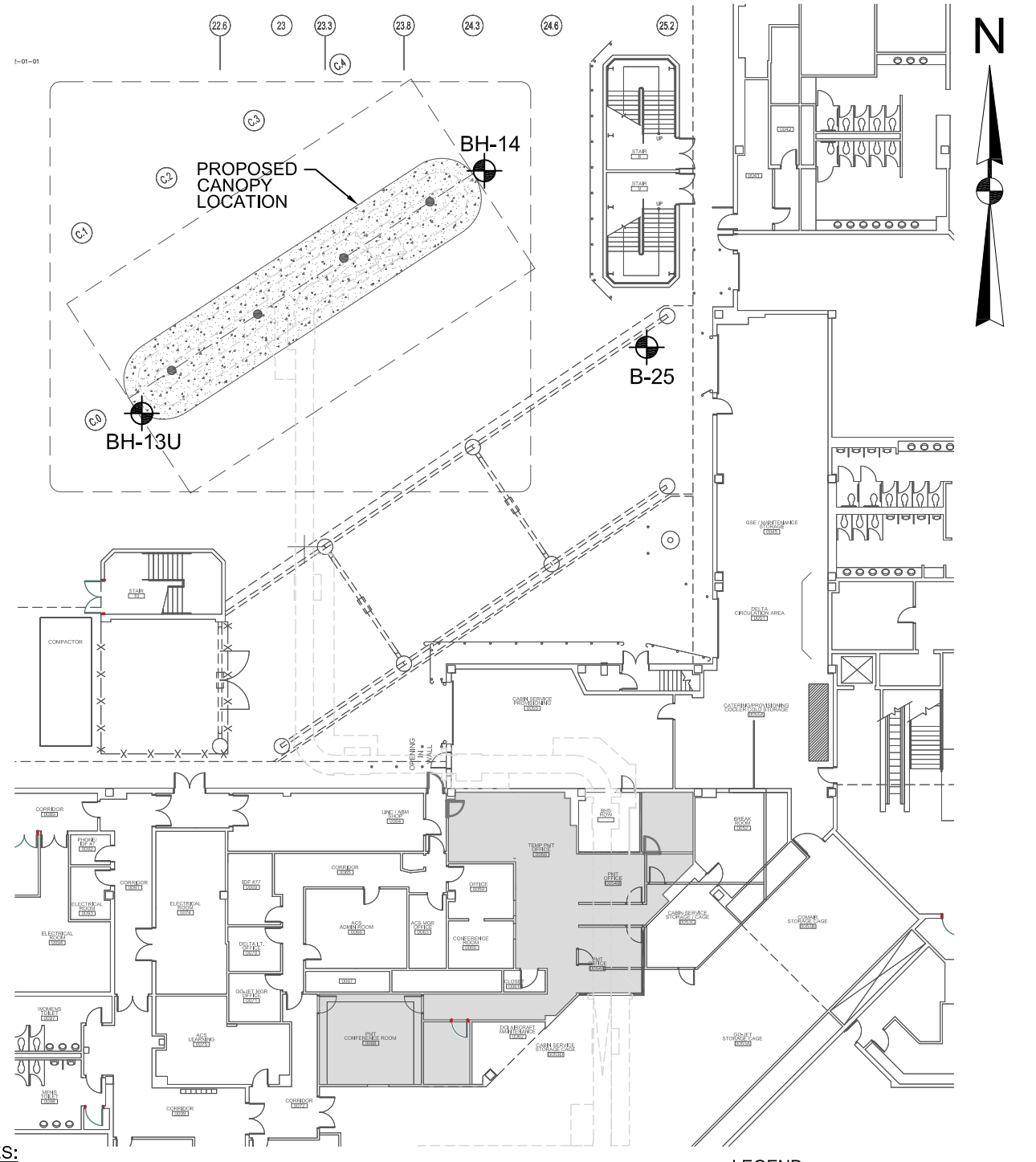
Very truly yours,
GZA GEOENVIRONMENTAL OF NEW YORK

Patrick D. Mahon, P.E.
Senior Project Manager

for

Bruce W. Fairless
Consultant/Reviewer

Douglas S. Roy, P.E.
Associate Principal



NOTES:

1) BASE MAP DEVELOPED FROM PLAN PROVIDED BY SEVERUD ASSOCIATES ENTITLED "CONSTRUCTION PLAN & ELEVATIONS," DATED 04/09/12, ORIGINAL SCALE 1/8" = 1'=0", DRAWING No. A02.0.

2) BOREHOLE BH-13U AND BH-14 LOCATIONS FROM FIGURE B-1 IN MRCE REPORT DATED MARCH 29, 2012.

3) BOREHOLE B-25 LOCATION FROM DRAWING1 IN RAAMOT REPORT DATED NOVEMBER 10, 1989.

LEGEND:

SOIL BORING LOCATION

0 15' 30' 60'

SCALE IN FEET

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

NO.	ISSUE/DESCRIPTION	BY	DATE

DELTA EAST BAGGAGE SORTATION CANOPY
TERMINAL C, LAGUARDIA AIRPORT
QUEENS, NEW YORK

BOREHOLE LOCATION PLAN

PREPARED BY:
GZA GeoEnvironmental of New York
Engineers and Scientists
104 WEST 29TH STREET, 10TH FLOOR
NEW YORK, NEW YORK 10001

PREPARED FOR:
SEVERUD ASSOCIATES

PROJ MGR: PM	REVIEWED BY: PM	CHECKED BY: DSR	FIGURE 1
DESIGNED BY: PM	DRAWN BY: EM	SCALE: 1" = 30'	
DATE: MAY 2, 2012	PROJECT NO. 41.0162020.00	REVISION NO.	SHEET NO. 1 OF 1

D-84

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GEOTECHNICAL DATA REPORT
LAGUARDIA AIRPORT
TERMINAL C & D RECONFIGURATION
BAGGAGE HANDLING FACILITY
QUEENS, NEW YORK

AERO SYSTEM ENGINEERING, INC.
P.O. Box 4426
Marietta, Georgia 30061

Mueser Rutledge Consulting Engineers
14 Penn Plaza, 225 West 34th Street
New York, NY 10122

March 29, 2012

Mueser Rutledge
Consulting Engineers
14 Penn Plaza · 225 West 34th Street · New York, NY 10122
Tel: (917) 339-9300 · Fax: (917) 339-9400
www.mrce.com

Alfred H. Brand
David M. Cacoilo
Peter W. Deming
James L. Kaufman
Roderic A. Ellman, Jr.
Francis J. Arland
Partners

David R. Good
Walter E. Kaeck
Associate Partners

Hugh S. Lacy
Joel Moskowitz
George J. Tamaro
Peter H. Edinger
Elmer A. Richards
Edmund M. Burke
John W. Fowler
Consultants

Raymond J. Poletto
Thomas R. Wendel
Domenic D'Argenzio
Robert K. Radske
Ketan H. Trivedi
Hiren J. Shah
Alice Arana
Joel L. Volterra
Tony D. Canale
Jan Cermak
Sissy Nikolaou
Anthony DeVito
Frederick C. Rhyner
Senior Associates

Michael J. Chow
Douglas W. Christie
Gregg V. Piazza
Pablo V. Lopez
Steven R. Lowe
Sitotaw Y. Fantaye
Ira A. Beer
James M. Tantalla
Andrew R. Tognon
T. C. Michael Law
Associates

Joseph N. Courtade
Director of Finance and Administration

Martha J. Huguet
Director of Marketing

March 29, 2012

AERO System Engineering, Inc.
P.O. Box 4426
Marietta, Georgia 30061

Attention: Mr. Russ Bramlett

Re: Geotechnical Data Report
Baggage Handling Facilities
LaGuardia Airport Terminal C & D Reconfiguration
Queens, New York
MRCE File No. 11720

Gentlemen:

In accordance with our Proposal dated January 18, 2012, Mueser Rutledge Consulting Engineers (MRCE) has completed a subsurface geotechnical investigation consisting of fourteen geotechnical borings and seven pavement cores for the LaGuardia Airport Terminal C & D Reconfiguration in Queens, NY. This data report summarizes the investigation and presents the data and results for the two borings made for the proposed Baggage Handling Facilities.

EXHIBITS

The following exhibits are attached to this Report:

Figure No. 1	-	Site Location Plan
Drawing No. B-1	-	Boring Location Plan
Drawing No. GS-R	-	Geotechnical Reference Standards
Table No. 1	-	Summary of Laboratory Test Data
Appendix A	-	MRCE Boring Logs

SITE AND PROJECT DESCRIPTION

The project site is at LaGuardia Airport in Queens, New York. The airport is bordered by Bowery and Flushing Bays to the north, and the Grand Central Parkway along its south side, as shown in Figure No. 1. The overall site is on the "air side" of Terminals C and D including an area to the east, all on the eastern portion of the airport property.

The project consists of the construction of new passenger boarding bridges at Terminals C and D and a new Ground Services Equipment (GSE) Building on a site to the east. Two borings were also made for a Baggage Handling Facility between existing Gates Nos. 12 and 15 at Terminal C.

SUBSURFACE INVESTIGATION

The geotechnical investigation for the proposed terminal reconfiguration consisted of fourteen borings (Nos. BH-1 through BH-14) and seven pavement core holes (Nos. CH-1 through CH-7), made between February 20 and March 1, 2012. Borings Nos. BH-13U and BH-14 were specifically added to the program to address subsurface conditions for the proposed Baggage Handling Facilities. The drilling was performed by Warren George, Inc. (WGI) of Jersey City, New Jersey. The boring and core hole locations were selected by AERO, who provided MRCE with a boring location plan showing Borings Nos. BH-1 through BH-14. MRCE and AERO located the borings and core holes in the field by dimensioning from existing terminal structures. Utility mark-out was arranged by WGI prior to the start of work.

Prior to drilling, a schedule was arranged between U.S. Airways, WGI, AERO, and MRCE to complete the drilling work with a minimum number of gate closures and provide uninterrupted access to boring/core locations to promote efficient operations. The work was performed around the clock in two continuous 12-hour shifts, five days per week using one or two drill rigs and crews. All MRCE, WGI, and AERO personnel were accompanied by airport escort personnel at all times while on the airside.

Borings Nos. BH-13U and BH-14 were drilled with an Acker AD II truck-mounted drill rig, under the continuous inspection of MRCE Resident Engineers Messrs. Daniel George and Randy Nunez. The borings were advanced using rotary techniques with water, drilling mud and casing to stabilize the borehole. WGI attempted to hand-auger each boring to a minimum depth of eight feet to clear utilities, but experienced great difficulty due to a layer of coarse gravel encountered directly below the asphalt or concrete pavement. By using a flight-step auger, jetting with an open-ended drill rod, and following with casing, all borings were cleared past utilities to a depth of eight feet.

Following hand-augering, soil samples were typically taken at five foot intervals. Soil samples were obtained with a standard two-inch O.D. split-spoon sampler driven through four six-inch intervals with a 140-pound hammer free falling 30 inches (ASTM D1586). The number of blows required to drive the sampler through each of the four six-inch

increments was recorded. The sum of the blows for the second and third six-inch intervals is defined as the Standard Penetration Test (SPT) Resistance, or N-Value. The N-Value is an index of the in-situ density of the material and is reported in blows per foot (bpf). Where soils were too dense for the sampler to penetrate the full 24 inches, or where gravel, boulders or other obstructions were encountered, the sampler was driven for 100 blows and the distance of actual penetration was measured and recorded (i.e. 100/3"). A safety hammer was used to drive the split-spoon sampler. Occasionally, soil samples were collected at intervals less than five feet for additional stratigraphic information. Overall, boring depths ranged from 97 to 119 feet, with Borings Nos. BH-13U and BH-14 penetrating to depths of 102 and 107 feet, respectively.

Two undisturbed tube samples of organic silty clay were recovered in Boring No. BH-13U. Undisturbed samples were taken with 3-inch diameter fixed piston sampler and have a sample number suffix "U". Upon recovery, all tubes were temporarily sealed with plastic caps and tape until transported landside of the terminals where they could be sealed with hot wax, as use of open flame for melting the wax was not permitted airside. All tubes were transported to MRCE's laboratory for testing.

Upon completion, both boreholes were backfilled with soil cuttings. Excess cuttings and drilling fluids were collected by WGI in 55-gallon drums, labeled, and stored at designated areas on the site for later environmental testing and disposal by WGI. Environmental testing of the soil or groundwater was not within the scope of the MRCE investigation.

As-drilled locations of all borings and core holes are shown on Drawing No. B-1. Any offset locations were measured from the planned locations by MRCE's resident engineers. Ground surface elevations were estimated based on nearby benchmarks given on a survey provided by AERO, indicating existing grade at about El. +6. The datum is not provided, but we believe that it is based on Mean Sea Level.

LABORATORY TESTING

Upon completion of the investigation, all soil samples were delivered by WGI to MRCE's soil laboratory. Field descriptions were reviewed and revised as necessary for conformance with MRCE's Geotechnical Reference Standards, described on Drawing No. GS-R. Individual soil sample descriptions are based on the Unified Soil Classification System (USCS) and are provided in the boring logs in Appendix A.

Laboratory testing consisted of water content determination and unconsolidated undrained (UU) triaxial strength tests. Natural water content as a percent of dry weight was obtained for all jar samples consisting of fine grained material and all undisturbed samples, and is reported on the boring logs. UU triaxial strength tests were performed in order to define the compressive strength of undisturbed soil samples. UU tests were performed on two tube samples from Boring No. BH-13U. Samples were subjected to a uniform confining pressure equal to 80 percent of the estimated effective vertical overburden stress at the sample depth and sheared immediately without drainage. The

test results on undisturbed samples are presented in Table No. 1, Summary of Laboratory Test Data.

SUBSURFACE CONDITIONS

Soil sample descriptions, Unified Soil Classification System (USCS) group symbols, and natural water contents are provided on the boring logs in Appendix A. An explanation of the USCS symbols is shown on Drawing No. GS-R. General descriptions of the soil strata are summarized below in order of their occurrence with depth. Material classifications are also provided based on the 2008 New York City Building Code. Strata characteristics (thickness, N-value, etc.) are reported as a range and/or average observed in all 14 borings and then compared with measurements in Borings BH-13U and BH-14 made at the proposed Baggage Handling Facility.

Stratum F – Fill (NYC Class 7): The uppermost material encountered in each boring is pavement consisting of asphalt varying in thickness from 12 to 17 inches. Typically the pavement is underlain by a base course layer consisting of 1 to 3 feet of gray and brown coarse gravel, some to trace fine to coarse sand, trace silt. The coarse gravel base is underlain by fill consisting of loose to compact gray, brown, and black fine to coarse sand, some to trace silt, gravel, brick, trace cinders, glass, wood, concrete fragments, and ceramic. A petroleum odor was noted throughout Stratum F, though the exact nature of these contaminants is not within the scope of this investigation.

The N-Values in the fill stratum range from extremes of weight-of-rods (WR) to more than 100 blows per foot (bpf), with a range of 2 to 14 bpf in Borings Nos. BH-13U and BH-14. N-Values are not available in the upper 8 feet of Stratum F due to hand augering for clearing utilities. The thickness of Stratum F was 28.5 feet in both borings, comparable to the average thickness of 28 feet for all 14 borings.

Stratum O – Organic Silty Clay (NYC Class 6): Stratum F is underlain by Stratum O consisting of soft to medium gray organic silty clay, trace to some shells, trace wood and fine sand.

Overall, two thirds of the N-values for this stratum are weight-of-rods (WR) or weight-of-hammer (WH). The remaining N-values range from 1 to 13 bpf, with an average of 1 bpf. The thickness of Stratum O ranges from 13.5 to 64 feet in the 14 borings, and from 49 to 50 feet in the two borings for the Baggage Handling Facilities, comparable to the average thickness of 49 feet.

Natural water contents range between 30 and 102 percent, with an average of 76 percent. The range of natural water content in Borings BH-13U and BH-14 is 65 to 89 percent. The undrained shear strength of the two samples ranges from 0.52 to 0.71 tons per square foot (tsf). The ratio of shear strength to effective overburden stress (c/p ratio) for the samples is approximately 0.2 to 0.25, which is typical for normally consolidated organic marine deposits.

Stratum S1 – Sand (NYC Class 3): Stratum O is underlain by a natural sand layer, Stratum S1, consisting of medium compact to very compact brown and gray-brown fine to medium sand, trace silt to silty, trace coarse sand, gravel, silty clay layers.

Overall, N-Values for Stratum S1 range from 10 to more than 100 bpf, with an average of 40 bpf. N-values measured in Borings BH-13U and BH-14 range from 18 to 38 bpf. The range of thickness of Stratum S1 in the 14 borings is 6.5 feet to 30 feet, and 13 to 14 feet in Borings Nos. BH-13U and BH-14.

Stratum V – Varved Silt and Sand (NYC Classes 4 and 5): The Stratum S1 sands are underlain by a varved glacial lake stratum, Stratum V, consisting of medium compact brown silty fine sand and silt varved with brown and gray-brown clayey silt and micaceous silty fine sand, trace to some silty clay, silty fine to medium sand and occasional micaceous fine to medium sand and clay layers. Varving is distinct thin layering of contrasting soils (sand, silt, and clay) resulting from seasonal deposition in a previous glacial lake with coarser grained sands typically deposited in warmer seasons when surface water runoff is greatest and finer grained silts and clays deposited in cooler seasons when runoff is low and lake levels more tranquil.

Overall, N-values range from 8 to 40 bpf, with an average of 26 bpf. N-values in Borings Nos. BH-13U and BH-14 range from 15 to 33 bpf. Natural water contents of fine-grained and cohesive components of Stratum V range between 27 and 40 percent, with an average of 31 percent. Borings BH-13U and BH-14 were terminated in Stratum V.

Underlying Strata: Boring BH-3U was advanced to a depth of 119 feet and encountered a second sand stratum beneath Stratum V at a depth of 116.5 feet. This deeper sand stratum consists of compact gray-brown and brown fine to medium sand, some silt, trace coarse sand, and trace gray brown silty clay layer. Based on available information obtained in previous subsurface investigations at the airport, Stratum V extends to depths as great as 175 feet. In some areas, Stratum V is underlain by sand strata extending as deep as 220 feet. Bedrock consisting of schist and gneiss is encountered at depths of 175 feet to 220 feet.

Groundwater

Groundwater or drilling mud levels were measured in most boreholes during drilling or upon completion and are shown in the Boring Logs. Drilling fluid levels measured in the boreholes may not represent stabilized groundwater levels as drilling mud was used to stabilize the borehole walls, and therefore mud levels may not be indicative of the groundwater regime. Groundwater levels measured in Piezometer No. BH-11P, made at the site of the proposed GSE Building, are more reliable and indicate that the groundwater was at a depth of about 6 feet during a 2-day period when the well was monitored, corresponding to about El. 0. Groundwater levels are expected to vary throughout the year depending on precipitation, surface runoff and tidal variations in Flushing Bay. Piezometer BH-11P was installed with a surface protective casing and flush mount cap and remains accessible for additional water level measurements.

We trust that this report provides you with adequate data for foundation and pavement design. If you have any questions or comments, please do not hesitate to contact us.

Very truly yours,

MUESER RUTLEDGE CONSULTING ENGINEERS

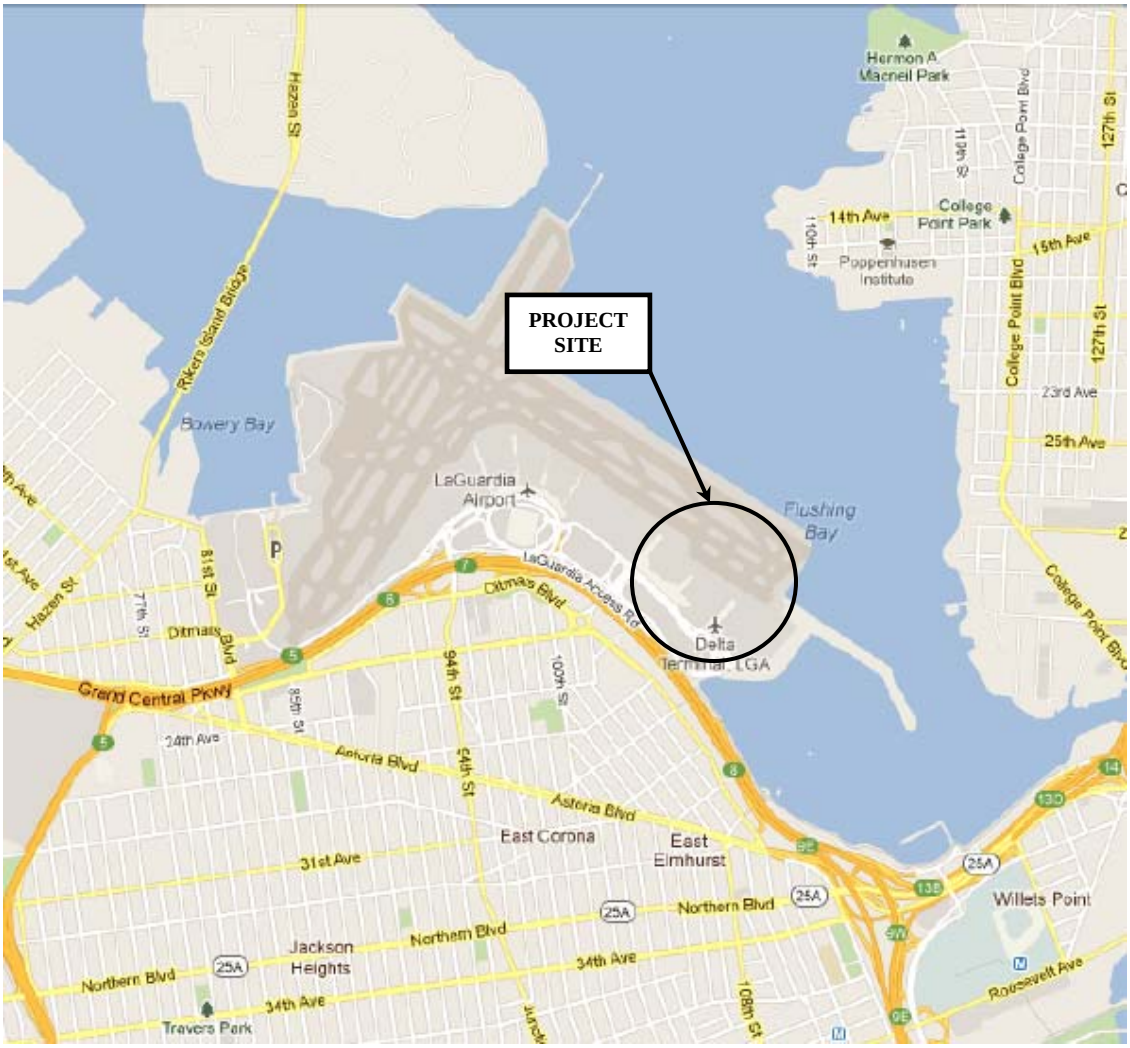
By: Robert T. Wisniewski
Robert T. Wisniewski

By: Walter E. Kaeck
Walter E. Kaeck

SMR:RTW:WEK
F:\117\11720\Geotech Report\LGA Data Report - Bag Handling.docx

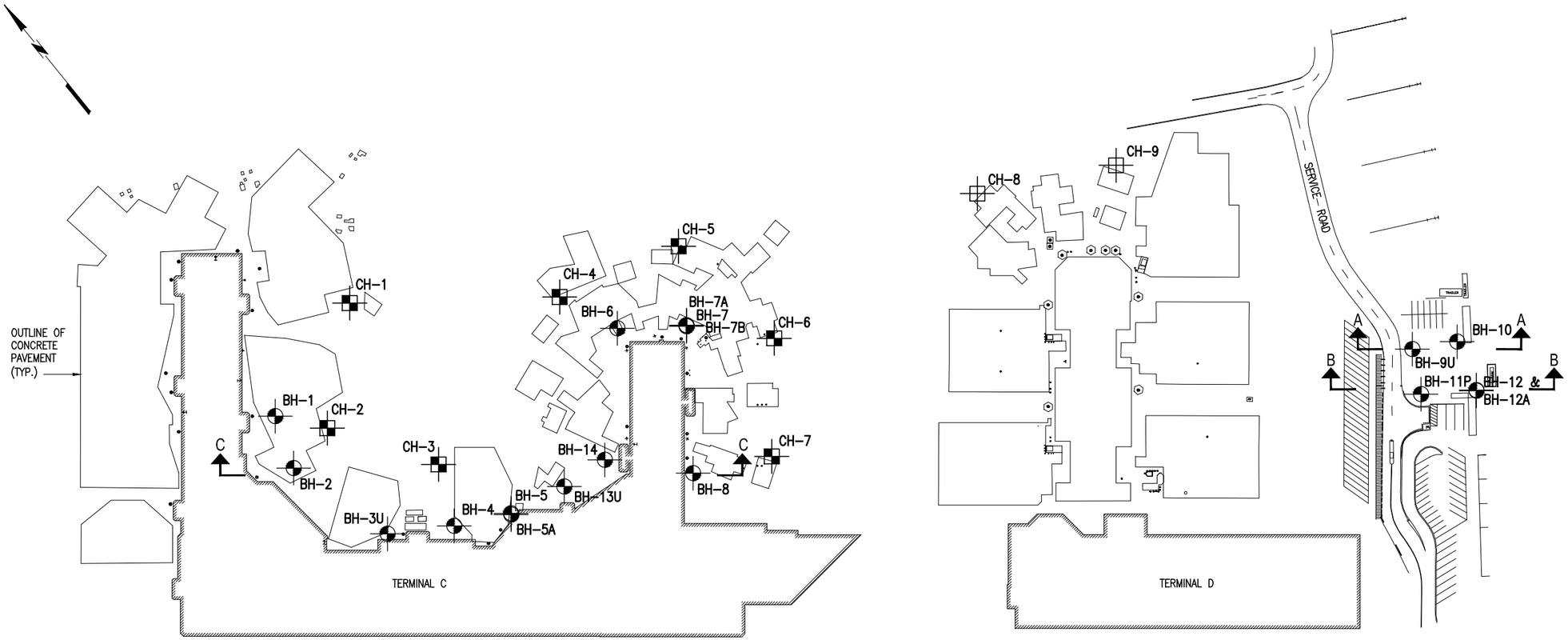
Attachments

EXHIBITS



Source: 2012 *Google Maps.*

LAGUARDIA AIRPORT TERMINAL C & D RECONFIGURATION		
QUEENS		NEW YORK
AERO SYSTEM ENGINEERING, INC.		
MARIETTA		GEORGIA
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK, NY 10122		
SCALE -	MADE BY: SMR DATE: 03-19-12 CH'KD BY: RTW DATE: 03-21-12	FILE NO. **11720**
SITE LOCATION PLAN		FIGURE NO. **1**



P L A N

PLAN NOTES:

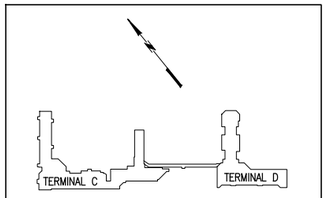
1. BASE PLAN PROVIDED BY AERO SYSTEMS ENGINEERING INC., DRAWINGS SHEET NO. S-1.0, REVISION 3, DATED 1/27/2012.
2. BORINGS NOS. BH-1 THROUGH BH-14 AND CORE HOLES NOS. CH-1 THROUGH CH-7 WERE MADE BETWEEN FEBRUARY 20 AND MARCH 1, 2012 BY WARREN GEORGE, INC. UNDER THE CONTINUOUS INSPECTION BY MUESER RUTLEDGE CONSULTING ENGINEERS (MRCE).
3. BORINGS WERE LAID OUT BY AERO AND MRCE. AS-DRILLED LOCATIONS WERE ADJUSTED TO APPROXIMATE OFFSETS FROM PLANNED LOCATIONS.
4. FOR GEOLOGIC SECTIONS A-A THROUGH C-C, SEE DRAWINGS GS-1 THROUGH GS-3.
5. CORE HOLES NOS. CH-8 AND CH-9 WERE NOT MADE.

LEGEND:

BH-1 – BORING MADE IN FEBRUARY-MARCH 2012
"U" INDICATES UNDISTURBED SAMPLING
"P" INDICATES PIEZOMETER INSTALLATION
"A", "B" INDICATES OFFSET FROM ORIGINAL LOCATION

CH-1 – COREHOLE MADE IN FEBRUARY-MARCH 2012

CH-8 – PROPOSED COREHOLE LOCATION



KEY PLAN
SCALE: N.T.S.

GRAPHIC SCALE
100' 50' 0 100' 200'

D-94

WARNING: IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER ANY ITEM ON THESE PLANS IN ANY WAY. IF ALTERATIONS TO THESE PLANS ARE MADE, THE ALTERATIONS SHALL BE MADE IN ACCORDANCE WITH ARTICLE 145 – SECTION 7209.2 OF THE NEW YORK STATE EDUCATION LAW.

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REV.	DATE	BY	DESCRIPTION

LAGUARDIA AIRPORT
TERMINAL C & D RECONFIGURATION
QUEENS NEW YORK

AERO SYSTEM ENGINEERING, INC.
MARIETTA GEORGIA

MUESER RUTLEDGE CONSULTING ENGINEERS
14 PENN PLAZA – 225 W. 34TH STREET, NY, NY 10122

SCALE	MADE BY: L.R.	DATE: 03-20-2012	FILE NUMBER
GRAPHIC	CH'KD BY: S.M.R.	DATE: 03-20-2012	11720

BORING LOCATION PLAN — DRAWING NUMBER B-1

Printed by: Inna Yagilskaya
Printed on: Thursday, Mar 29, 2012 – 09:18:37 AM
Last saved by: cperez on Monday, Mar 26, 2012 – 3:09:43 PM
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APPENDIX A

MRCE BORING LOGS

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. BH-13U
SHEET 1 OF 4
PROJECT: LAGUARDIA AIRPORT TERMINAL C & D **FILE NO.** 11720
LOCATION: QUEENS, NEW YORK **SURFACE ELEV.** +6±
RES. ENGR. R. NUNEZ/D. GEORGE

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
05:30					ASPHALT		DRILLED	1.4' of asphalt.
02-23-12						1.4	AHEAD	
Thursday							4"	
Partly							↓	
Cloudy						5	↓	Used open end rod
40°F							↓	and drilled ahead with
	1HA	6.0	HAND	Gray gravel, trace coarse to fine sand (Fill)			↓	with heavy mud, 4"
		7.0	AUGER	(GP)			↓	casing and 3" roller
							↓	bit to hand auger to 8'.
						10		Coarse gravel below
	2D	10.0	7-8	Black fine to coarse sand, some gravel, silt,				asphalt to 10'.
		12.0	6-5	trace cinders, glass (Fill) (SM)				Peteroleum odor 10'
								to 28'.
						15		
	3D	15.0	11-8	Black fine to coarse sand, some cinders,	F			REC=11"
		17.0	6-4	gravel, silt (Fill) (SM)				
								REC=15"
						20		
	4D	20.0	3-2	Black fine to coarse sand, some gravel,				REC=6"
		22.0	3-2	cinders, silt, trace wood, glass (Fill) (SM)				
						25		
	5D	25.0	3-3	Black gravelly fine to coarse sand, some				REC=10"
		27.0	3-2	cinders, silt, trace wood, glass (Fill) (SM)				
								Organic odor from 28'
						28.5		to 78.5'.
						30		
	6D	30.0	WR/24"	Medium gray organic silty clay (OH)				REC=12"
		32.0						pp=0.6
								WC=74
						35		
	7D	35.0	WR/24"	Do 6D (OH)				REC=15"
		37.0						pp=0.6
								WC=69
						40		3-7/8" drag bit used
	8U	40.0	PUSH=24"	Soft gray organic silty clay, trace shells (OH)	O			in organics.
		42.0	REC=24"					WC=78
						45		
	9D	45.0	WR/24"	Medium gray organic silty clay, trace shells				REC=14.5'
		47.0		(OH)				pp=0.7, 0.5
								WC=81
						50		

MRCE Form BL-1

BORING NO. BH-13U

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. BH-13U
SHEET 2 OF 4
PROJECT: LAGUARDIA AIRPORT TERMINAL C & D **FILE NO.** 11720
LOCATION: QUEENS, NEW YORK **SURFACE ELEV.** +6±
RES. ENGR. R. NUNEZ/D. GEORGE

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd	10U	50.0	PUSH=24"	Soft gray organic silty clay, trace shells (OH)				WC=86
2-23-12		52.0	REC=24"					
Thursday								
Partly								
Cloudy						**55**		
40°F	11D	55.0	WR/24"	Medium gray organic silty clay, trace shells				REC= 2.5"
		57.0		(OH)				WC=87
						60		
	12NR	60.0	PUSH=24"	No recovery				12NR: Attempt
		62.0	REC=0"					undisturbed sample.
	13D	62.0	WR/24"	Medium gray organic silty clay, trace shells				REC=5"
		64.0		(OH)				WC=81
					O	**65**		
	14D	65.0	WR-WH/18"	Do 13D (OH)				REC=12"
		67.0						pp=0.6
								WC=67
						70		
	15NR	70.0	PUSH=24"	No recovery				15NR: Attempt
		72.0	REC=0"					undisturbed sample.
	16D	72.0	WR-WH/18"	Medium gray organic silty clay, trace shells				WC=81
		74.0		(OH)				
						75		
	17D	75.0	WR/12"	Top 9": Do 16D (OH)				REC=13"
		77.0	WH/12"	Bot 4": Gray organic clayey fine to medium				Top 17D: pp=1.1, 1.5
				sand, trace shells (SC)				Top WC=65
						78.5		
						80		
	18D	80.0	11-17	Brown fine to medium sand, trace gray brown				REC=18"
		82.0	16-15	silty clay layers, coarse sand, gravel, silt				
				(SP-SM)				Rig chatter 83' to 85'.
					S1	**85**		
	19D	85.0	13-19	Brown fine to coarse sand, trace red brown				REC=24"
		87.0	19-20	and gray brown clayey silt layers, gravel, silt				
				(SP-SM)				
						90		
	20D	90.0	10-14	Top 10": Brown fine to medium sand,		**91**		REC=22"
		92.0	18-17	trace silt, coarse sand (SP-SM)				
				Bot 12": Brn fine sand, some silt varved				
				with silty fine sand, trace clayey silt (SM)				
						95		
	21D	95.0	8-16	Brown fine to medium sand, some silt varved				REC=11"
		97.0	17-21	with trace brown clayey silt (SM)	**V**			
						100		

MRCE Form BL-1

BORING NO. BH-13U

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. BH-13U
SHEET 3 OF 4
PROJECT: LAGUARDIA AIRPORT TERMINAL C & D **FILE NO.** 11720
LOCATION: QUEENS, NEW YORK **SURFACE ELEV.** +6±
RES. ENGR. R. NUNEZ/D. GEORGE

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd	22D	100.0	11-14	Brown fine sand, some silt varved with some	V			REC=9"
15:00		102.0	19-19	clayey silt (SM+ML)		102		End of boring at 102'.
								pp=Pocket
						105		Penetrometer
								Unconfined Compres-
								sive Strength in tsf.
								WC=Water Content
						110		in percent of dry
								weight.
						115		
						120		
						125		
						130		
						135		
						140		
						145		
						150		

MRCE Form BL-1

BORING NO. BH-13U

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. BH-13U
SHEET 4 **OF** 4

PROJECT LAGUARDIA AIRPORT TERMINAL C & D
FILE NO. 11720
LOCATION QUEENS, NEW YORK
SURFACE ELEV. +6±
BORING LOCATION SEE BORING LOCATION PLAN
DATUM UNKNOWN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

		TYPE OF FEED DURING CORING		CASING USED					
TYPE OF BORING RIG					X YES		NO		
TRUCK	ACKER	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	9
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO	
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO	
OTHER									

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON
U-SAMPLER	FIXED-HEAD PISTON
S-SAMPLER	
CORE BARREL	PQ
CORE BIT	DIAMOND
DRILL RODS	NWJ

DRILLING MUD USED X YES NO
DIAMETER OF ROTARY BIT, IN. 3-7/8, 2-15/16
TYPE OF DRILLING MUD EZ MUD

AUGER USED X YES NO
TYPE AND DIAMETER, IN. FLIGHT STEP AUGER

*CASING HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAMPLER HAMMER, LBS. 140 AVERAGE FALL, IN. 30
*SAFETY HAMMER USED

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
02-23-12	7:30	2.2	___	2.1	MORNING WATER LEVEL READING.

PIEZOMETER INSTALLED ___ YES X NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.

PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	94	NO. OF 3" SHELBY TUBE SAMPLES		
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES		2
CORE DRILLING	LIN. FT.	1.4	OTHER:	HAND AUGER (FT)	6.6

BORING CONTRACTOR WARREN GEORGE, INC.
DRILLER ANGEL MEDRANO/CLINTON BURGESS HELPERS DAVE FIGUEROA/ALLEN BURGESS
REMARKS BORING BACKFILLED WITH SOIL CUTTINGS UPON COMPLETION AND PATCHED WITH CONCRETE.
RESIDENT ENGINEER DANIEL GEORGE/RANDY NUNEZ DATE 2/23/2012
CLASSIFICATION CHECK: CHERYL MOSS TYPING CHECK: SARA ROCHA

MRCE Form BS-1 **BORING NO.** BH-13U

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. BH-14
SHEET 1 OF 4
PROJECT: LAGUARDIA AIRPORT TERMINAL C & D **FILE NO.** 11720
LOCATION: QUEENS, NEW YORK **SURFACE ELEV.** +6±
RES. ENGR. RANDY NUNEZ

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
19:00					ASPHALT	1	DRILLED	12" of asphalt.
02-22-12							AHEAD	
Wednesday							4"	Hand Auger: 1'-7'.
Cloudy	1HA	3.0	HAND	Gray fine to coarse sand, some silt, gravel				
40°F		4.0	AUGER	(Fill) (SM)		5		
								Lost tip of flight step auger at 7'; later retrieved.
						10		
	2D	10.0	3-1	Black silty fine to coarse sand, some gravel,				
		12.0	2-1	trace wood (Fill) (SM)				
						15		
	3D	15.0	3-4	Do 2D, trace plastic (Fill) (SM)	F			
		17.0	5-5					
						20		
	4D	20.0	2-1	Black fine to coarse sand, some gravel, silt,				
		22.0	1-2	trace wood (Fill) (SM)				
						25		
	5D	25.0	2-2	Do 4D (Fill) (SM)				WC=75
		27.0	2-3					
						28.5		
						30		
	6D	30.0	WH/18"	Soft gray organic silty clay, trace fine sand,				REC=24"
		32.0	2	shells (OH)				pp=0.2
								WC=67
						35		
	7D	35.0	WH/24"	Do 6D (OH)				REC=24"
		37.0						WC=81
						40		
	8D	40.0	WH/24"	Do 6D (OH)	O			REC=22"
		42.0						pp=0.2
								WC=86
						45		
	9D	45.0	WR/12"	Soft gray organic silty clay, trace fine sand (OH)				REC=23"
		47.0	WH/12"					WC=89
						50		

MRCE Form BL-1

BORING NO. BH-14

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. BH-14
SHEET 2 OF 4
PROJECT: LAGUARDIA AIRPORT TERMINAL C & D **FILE NO.** 11720
LOCATION: QUEENS, NEW YORK **SURFACE ELEV.** +6±
RES. ENGR. RANDY NUNEZ

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd	10D	50.0	WR/18"	Soft gray organic silty clay, trace fine sand,				REC=20"
2-22-12		52.0	WH	shells (OH)				pp=0.5
Wednesday								WC=83
Cloudy								
40°F						**55**		
	11D	55.0	WH/24"	Soft gray organic silty clay, trace fine sand,				WC=77
		57.0		shells, wood (OH)				Observed wood in
								tip of spoon.
						60		
	12D	60.0	WR/18"	Soft gray organic silty clay, trace fine sand,				REC=19"
		62.0	1	shells (OH)				pp=0.5
								WC=72
					O			
						65		
	13D	65.0	WR-1	Do 12D (OH)				WC=78
		67.0	1/12"					
						70		
	14D	70.0	WH/12"	Do 12D (OH)				WC=76
		72.0	1-1					
						75		
	15D	75.0	WH/24"	Do 12D (OH)				
		77.0						
						77.5		
						80		
	16D	80.0	5-8	Brown fine to medium sand, trace silt, coarse				
		82.0	10-10	sand (SP-SM)				
					S1	**85**		
	17D	85.0	8-14	Do 16D, trace gravel (SP-SM)				
		87.0	14-13					
						90		
	18D	90.0	6-8	Top 5": Do 16D (SP-SM)		**91**		
		92.0	13-16	Bot 12": Brown silt varved with clayey silt,				Bot WC=27
				some silty fine sand seams (ML+SM)				
						95		
	19D	95.0	4-6	Brown silty fine sand varved with some clayey				
		97.0	9-13	silt seams, trace silty clay (SM+ML)	**V**			
						100		

MRCE Form BL-1

BORING NO. BH-14

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING LOG

BORING NO. BH-14
SHEET 3 OF 4
PROJECT: LAGUARDIA AIRPORT TERMINAL C & D **FILE NO.** 11720
LOCATION: QUEENS, NEW YORK **SURFACE ELEV.** +6±
RES. ENGR. RANDY NUNEZ

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
Cont'd	20D	100.0	5-8	Do 19D (SM+ML)				WC=30
2-22-12		102.0	11-13					
Wednesday								
					V			
						105		
02-23-12	21D	105.0	6-10	Do 9D (SM+ML)				
04:05		107.0	12-15			107		End of Boring at 107'.
								pp=Pocket
						110		Penetrometer
								Unconfined Compres-
								sive Strength in tsf.
								WC=Water Content
						115		in percent of dry
								weight.
						120		
						125		
						130		
						135		
						140		
						145		
						150		

MRCE Form BL-1

BORING NO. BH-14

MUESER RUTLEDGE CONSULTING ENGINEERS

BORING NO. BH-14
SHEET 4 **OF** 4

PROJECT LAGUARDIA AIRPORT TERMINAL C & D
FILE NO. 11720
LOCATION QUEENS, NEW YORK
SURFACE ELEV. +6±
BORING LOCATION SEE BORING LOCATION PLAN
DATUM UNKNOWN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG		TYPE OF FEED DURING CORING		CASING USED		X YES		NO		
TRUCK	ACKER	MECHANICAL		DIA., IN.	4	DEPTH, FT. FROM	0	TO	9	
SKID		HYDRAULIC	X	DIA., IN.		DEPTH, FT. FROM		TO		
BARGE		OTHER		DIA., IN.		DEPTH, FT. FROM		TO		
OTHER										

TYPE AND SIZE OF:

D-SAMPLER	2" O. D. SPLIT SPOON	DRILLING MUD USED	X YES		NO
U-SAMPLER		DIAMETER OF ROTARY BIT, IN.	3-7/8		
S-SAMPLER		TYPE OF DRILLING MUD	E-Z-MUD		
CORE BARREL	PQ	AUGER USED	X YES		NO
CORE BIT	DIAMOND	TYPE AND DIAMETER, IN.	FLIGHT STEP AUGER		
DRILL RODS	NWJ				
		CASING HAMMER, LBS.	140	AVERAGE FALL, IN.	30
		*SAMPLER HAMMER, LBS.	140	AVERAGE FALL, IN.	30
		*SAFETY HAMMER USED			

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION
02-23-12	04:05	107	9	9.7	END OF BORING MUD LEVEL READING.

PIEZOMETER INSTALLED ☐ YES ☒ NO SKETCH SHOWN ON

STANDPIPE:	TYPE		ID, IN.		LENGTH, FT.		TOP ELEV.		
INTAKE ELEMENT:	TYPE		OD, IN.		LENGTH, FT.		TIP ELEV.		
FILTER:	MATERIAL		OD, IN.		LENGTH, FT.		BOT. ELEV.		

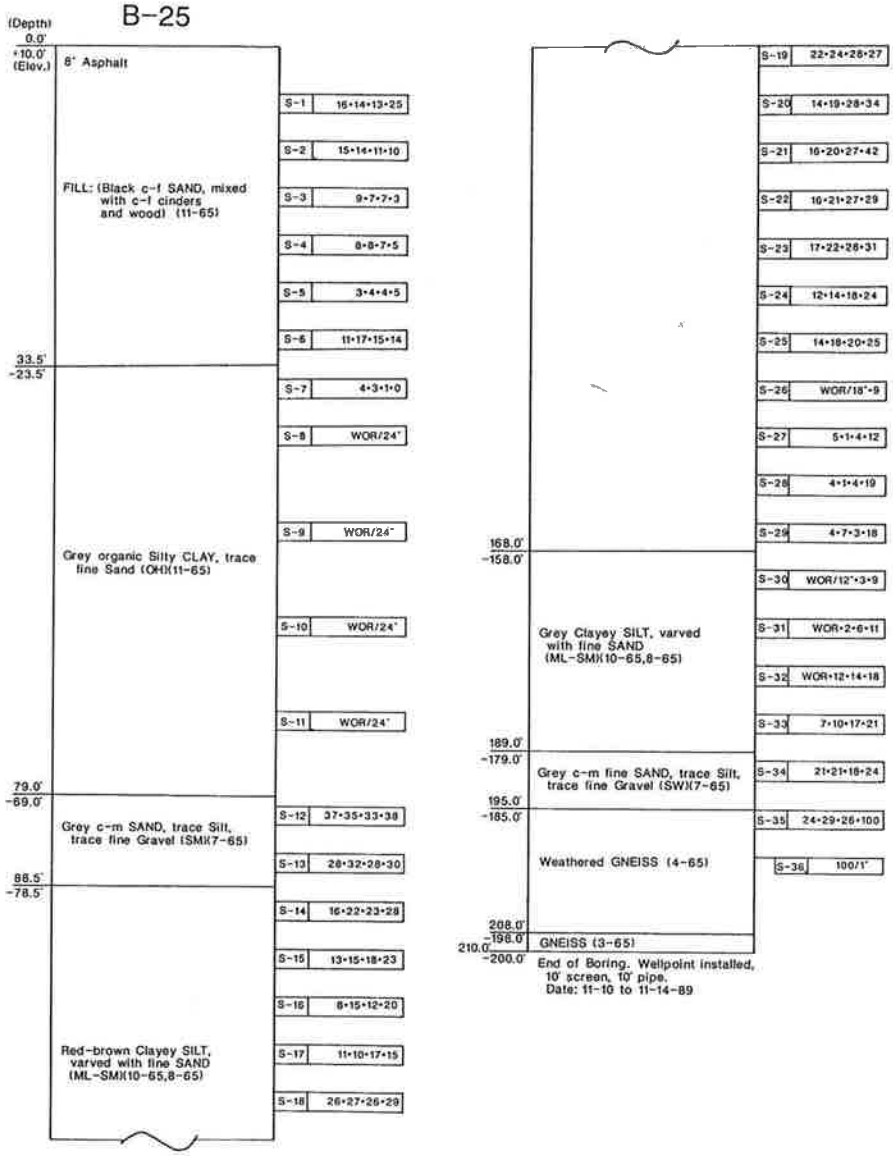
PAY QUANTITIES

3.5" DIA. DRY SAMPLE BORING	LIN. FT.	100	NO. OF 3" SHELBY TUBE SAMPLES		
3.5" DIA. U-SAMPLE BORING	LIN. FT.		NO. OF 3" UNDISTURBED SAMPLES		
CORE DRILLING	LIN. FT.	1	OTHER: HAND-AUGER (FT)		6

BORING CONTRACTOR WARREN GEORGE, INC.
DRILLER CLINTON BURGESS HELPERS ALLEN BURGESS
REMARKS BORING BACKFILLED WITH SOIL CUTTINGS UPON COMPLETION AND PATCHED WITH CONCRETE.
RESIDENT ENGINEER RANDY NUNEZ DATE 2/23/2012
CLASSIFICATION CHECK: CHERYL MOSS TYPING CHECK: DANIEL GEORGE

MRCE Form BS-1 **BORING NO.** BH-14

Appendix C– Raamot Boring B-25


B-25
(Depth)
0.0'
+10.0'
(Elev.)
8" Asphalt
FILL: (Black c-f SAND, mixed with c-f cinders and wood) (11-65)
33.5'
-23.5'
Grey organic Silty CLAY, trace fine Sand (OH)(11-65)
79.0'
-69.0'
Grey c-m SAND, trace Silt, trace fine Gravel (SM)(7-65)
86.5'
-78.5'
Red-brown Clayey SILT, varved with fine SAND (ML-SM)(10-65,8-65)
S-1 16•14•13•25
S-2 15•14•11•10
S-3 9•7•7•3
S-4 8•8•7•5
S-5 3•4•4•5
S-6 11•17•15•14
S-7 4•3•1•0
S-8 WOR/24"
S-9 WOR/24"
S-10 WOR/24"
S-11 WOR/24"
S-12 37•35•33•38
S-13 28•32•28•30
S-14 16•22•23•28
S-15 13•15•18•23
S-16 8•15•12•20
S-17 11•10•17•15
S-18 26•27•26•29
S-19 22•24•26•27
S-20 14•19•28•34
S-21 16•20•27•42
S-22 16•21•27•29
S-23 17•22•26•31
S-24 12•14•18•24
S-25 14•18•20•25
S-26 WOR/18"•9
S-27 5•1•4•12
S-28 4•1•4•19
S-29 4•7•3•18
168.0'
-158.0'
Grey Clayey SILT, varved with fine SAND (ML-SM)(10-65,8-65)
189.0'
-179.0'
Grey c-m fine SAND, trace Silt, trace fine Gravel (SW)(7-65)
195.0'
-185.0'
Weathered GNEISS (4-65)
208.0'
-196.0'
GNEISS (3-65)
210.0'
-200.0'
End of Boring. Wellpoint installed, 10' screen, 10' pipe. Date: 11-10 to 11-14-89
S-30 WOR/12"•3•9
S-31 WOR•2•6•11
S-32 WOR•12•14•18
S-33 7•10•17•21
S-34 21•21•18•24
S-35 24•29•26•100
S-36 100/1"

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VRH Construction Corp.
320 Grand Avenue
Englewood, NJ 07631-4355

Attn: Mr. Steve Haussel

April 23, 2013

RE: W.O. 6636.01
GEOTECHNICAL DATA REPORT
DELTA AIR LINES – TERMINAL C STAIR TOWERS
LA GUARDIA AIRPORT
QUEENS, NEW YORK

Dear Mr. Haussel:

In accordance with our proposal dated September 27, 2012, Tectonic Engineering & Surveying Consultants, P.C. (Tectonic) performed a subsurface investigation consisting of test borings and laboratory testing for the above referenced project. The following provides brief descriptions of the performed investigation and the findings. Logs of the test borings and the results of the laboratory testing are attached.

1.0 TEST BORINGS

The subsurface investigation consisted of the performance of two test borings, designated as B-1 and B-1, which were performed at locations selected by others. The locations of the borings are shown on the attached Boring Location Plan, Figure 1.

The borings were performed by Craig Test Boring Company, Inc. between the dates of April 3 and April 5, 2013 utilizing a CME truck mounted rig equipped with an auto hammer. After penetrating the asphalt and/or concrete surface cover, the borings were hand augered to a depth of 6 feet. Thereafter, the borings were advanced utilizing a 3-7/8 inch diameter tricone bit and mud rotary drilling techniques to total depths of 120 feet. Four inch I.D. driven casing was used to stabilize fill soils and the upper zone of the native soils. Casing was driven to a depth of 35 feet at boring B-1 and 25 feet at boring B-2. Standard Penetration Testing (SPT) and split-spoon sampling were performed continuously from a depth of 6 feet to 12 feet and at 5-foot intervals thereafter.

The performance of the borings was observed on a full-time basis by a geotechnical engineer. Logs of the borings are included in Appendix I.

2.0 LABORATORY TESTING

Laboratory testing consisted of the performance of two gradation analyses, six Atterberg limits determinations, and four in-situ moisture content tests. The gradation analyses were performed in accordance with the procedures outlined in ASTM Standard D422. The Atterberg limits testing were performed in accordance with ASTM Standard D4318, and the moisture content tests were performed in accordance with ASTM Standard D2216. Laboratory test results are included in Appendix II.

3.0 SUBSURFACE CONDITIONS

The encountered subsurface conditions consist, in turn, of a surface layer of concrete, or a surface layer of asphalt overlying concrete; fill soils that extend to depths ranging from roughly 22 to 25 feet; and native high plasticity clay and silt soils that contain inter-bedded sand layers below a depth of approximately 80 feet. General descriptions of the subsurface conditions are provided below. More detailed descriptions are provided on the boring logs included in Appendix I.

3.1 Pavement

The pavement at boring B-1 was measured to consist of a 12-inch thick layer of asphalt overlying an 18-inch thick layer of concrete. At boring B-2, the pavement consists of a single 18-inch thick layer of concrete.

3.2 Fill

Fill consisting predominately of black or dark brown coarse to fine sand with trace amounts of silt, and varying amounts of gravel underlie the pavement and extend to a depth of 25.3 feet at boring B-1 and to a depth between 22 and 25 feet at boring B-2. A sample obtained at a depth of 6 feet at boring B-1 consisted of an approximately 8-inch thick layer of tar. Standard Penetration Test (SPT) N-values within the fill were variable ranging from 3 blows per foot (bpf) to split spoon sampler refusal, which was defined as over 100 blows for less than 6 inches of sampler penetration. However, the N-values generally indicate that the soils are in a medium dense state to a depth of approximately 12 feet, and that the deeper fills are in a loose to very loose state. The higher N-values are attributed to the presence of oversized materials within the fill. The fill has the New York City Code (Code) class of 7.

3.3 Native Soils

High plasticity clay and silt soils underlie the fill and extend to a depth of approximately 80 feet at both boring locations where they become inter-bedded with sand soils. The high plasticity clays and silts often contain minor amounts of fine sand, and occasionally, trace shell fragments.

Based on the performed laboratory testing, the fine grained soils have plasticity indices ranging from 38 to 51, and liquid limits ranging from 73 to 86. The natural water contents range from 64 to 91 percent. Based on the identified plasticity indices and liquid limits, the fine grained soils have the Unified Soil Classification of CH or MH.

SPT N-values within the fine grained soils were typically zero, with the sampler advancing under the weight of the rods or the combined weight of the rods and the hammer. This indicates that the high plasticity clay and silt soils typically have a very soft consistency. Exceptions occur where these soils are inter-bedded with the sands. Here, N-values ranged from zero to 33 bpf, which indicate consistencies ranging from very soft to hard. The higher N-values occasionally coincide with clay layers having higher sand contents.

The fine grained soils have Code Class 6 except where they are stiffer, where they have Code Classes 4c or 4b.

The inter-bedded sand layers range from being medium to fine to fine in gradation and they contain from trace amounts of silt to approximately 20 percent silt. SPT N-values in the sand layers ranged from 17 to 48 bpf and indicate that the sands range from being in a medium dense to a dense state.

The inter-bedded sand soils have Code Classes 3a or 3b.

3.4 Groundwater

Due to the introduction of drilling slurry during advancement of the borings, accurate groundwater levels could not be obtained during advancement of the borings. Groundwater was estimated to be at a depth of approximately 4 feet at both boring locations based on the depth that hand auger cuttings became wet. It is noted, however, that the depth to groundwater will vary seasonally, with rainfall, and with tide level. Therefore, groundwater should be anticipated to be encountered at other depths at other times.

4.0 LIMITATIONS

This report has been prepared for the exclusive use of VRH Construction Corporation. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical engineers and geologists practicing in this or similar situations. The interpretation of the field data is based on good judgment and experience. However, no matter how qualified the geotechnical engineer or detailed the investigation, subsurface conditions cannot always be predicted beyond the points of actual sampling and testing. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The data contained in this report are intended for design purposes only. Contractors and others involved in the construction of this project are advised to make an independent assessment of the subsurface conditions for establishing quantities, schedules and construction techniques.

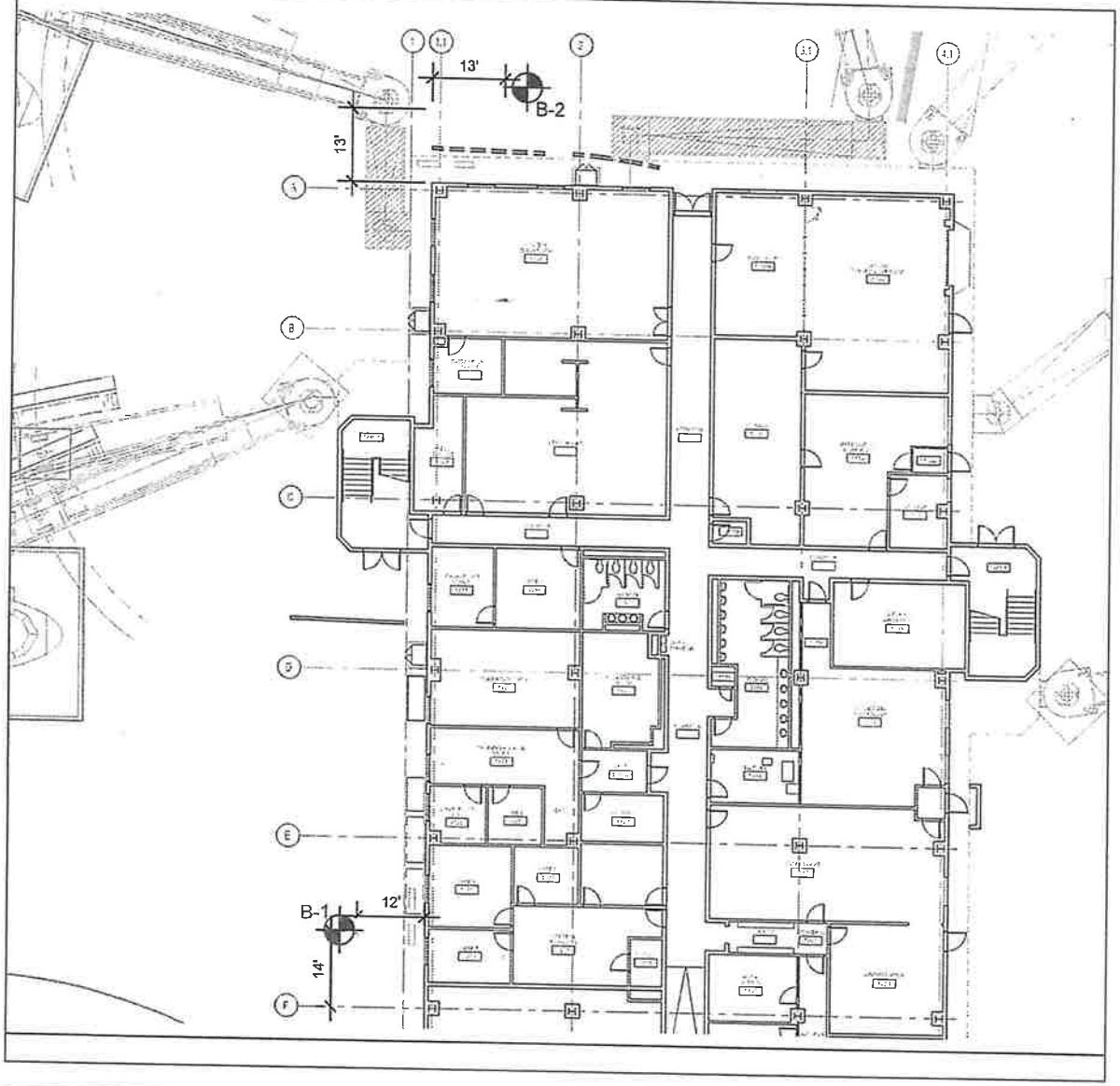
We trust this report will allow you to proceed with the proposed improvements.

Sincerely,

TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C.

George P. Murphy, P.E.
Senior Geotechnical Engineer

Attachments: Boring Location Plan
Boring Logs
Laboratory Test Results



LEGEND

B-1 APPROXIMATE BORING LOCATION

NOTES

1. PLAN BASED ON DRAWING NO. SK-1, ENTITLED, "EXTERIOR EXIT STAIRS, BORING LOCATION LAYOUT", BY CORGAN, DATED 3/29/2012.
2. THE BORING LOCATIONS WERE LOCATED BY MEASURING OFF OF EXISTING SITE FEATURES AND SHOULD BE CONSIDERED APPROXIMATE.

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT
TECTONIC Engineering & Surveying Consultants P.C.
P.O. Box 37, 70 Pleasant Hill Road
Mountainville, NY 10953
Phone: (845) 534-5959
Fax: (845) 534-5999
www.tectonicengineering.com

BORING LOCATION PLAN

DELTA AIRLINES – TERMINAL C STAIR TOWERS
LAGUARDIA AIRPORT
QUEENS, NEW YORK

Date	Work Order	Drawing No.	Rev
4/16/2013	6636.01	FIGURE 1	0
Scale 1"=20'			

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-1

SHEET No. 1 of 5

CLIENT: VRH Construction Corp.
CONTRACTOR: Craig Test Boring Co., Inc.

METHOD OF ADVANCING BORING	DIA.	DEPTH
POWER AUGER:		TO
ROT. DRILL:	3 7/8"	6 TO 120'
CASING:	4"	0 TO 35'
DIAMOND CORE:		TO

CME 75 Truck Mounted with Auto Hammer

GROUND WATER	DATE	TIME	DEPTH
	4/3		4'

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: Clear TEMP: 30° F
DEPTH TO ROCK: ---
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: John Kenney
DRILLER: Dave
SURFACE ELEVATION: ---
DATUM: See Remarks
DATE START: 4/3/13
DATE FINISH: 4/4/13

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % ✕ WATER CONTENT % ⊗ LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
1-6								12" Asphalt 18" Concrete Hand augered from 2.5' to 6.3'	
3-4			B-1			W	SM	Dk bwn m-f SAND, little Silt (FILL) (Class 7) ▼	
7-8	35	6 7 28 33	S-1	8		W		Asphalt Tar	
9-10	38	12 19 19 14	S-2	12		W	SP-SM	Dk bwn m-f SAND, trace Silt, trace f Gravel (FILL) (Class 7)	
11-12	15	12 8 7 5	S-3	18		W	SP-SM	Blk c-f SAND, trace Silt (FILL) (Class 7)	
13-15									
16-17	3	1 1 2 7	S-4	10		W	SP-SM	Same (FILL) (Class 7)	
18-20									
21-22	10	3 5 5 3	S-5	6		W	SP-SM	Same (FILL) (Class 7)	
23-25									

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C.

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-1

SHEET No. 2 of 5

CLIENT: VRH Construction Corp.
CONTRACTOR: Craig Test Boring Co., Inc.

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
26	4	3 3 1 WOH	S-6	8		W	SP-SM	Top 4" Same (FILL) (Class 7)
27							CH	Bottom 4" Gy CLAY, little f Sand (Class 6)
28								
29								
30								
31	0	WOR WOH WOH WOH	S-7	22		W	CH	Same (Class 6)
32								
33								
34								
35								
36	0	WOR WOR WOR WOR	S-8	20		W	CH	Gy CLAY, trace f Sand
37								
38								
39								
40								
41	0	WOR WOR WOR WOR	S-9	17		W	MH	Gy CLAY, trace f Sand, trace shells (Class 6)
42								
43								
44								
45								
46	0	WOR WOR WOR WOR	S-10	10		W	MH	Same (Class 6)
47								
48								
49								
50								
51	0	WOR WOH WOH WOH	S-11	18		W	MH	Gy SILTY CLAY, trace f Sand (Class 6)
52								
53								
54								
55								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-1

SHEET No. 3 of 5

CLIENT: VRH Construction Corp.
CONTRACTOR: Craig Test Boring Co., Inc.

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56	0	WOH WOH WOH WOH	S-12	10		W	CH	Gy CLAY, trace f Sand (Class 6)
61	0	WOR WOR WOR WOR	S-13	18		W	CH	Same (Class 6)
66	0	WOR WOR WOR WOR	S-14	18		W	CH	Gy CLAY, trace f Sand, trace shells (Class 6)
71	0	WOR WOR WOH WOH	S-15	16		W	CH	Same (Class 6)
76	0	WOR WOR WOR WOR	S-16	14		W	CH	Same (Class 6)
81	17	WOR 6 11 17	S-17	10		W W	CH SM	Top 4" Same (Class 6) Dk bwn-gy m-f SAND, some Silt, trace shells (Class 3b)

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % ✕ — WATER CONTENT % ⊗ — LIQUID LIMIT % △ 10 20 30 40 50
● STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-1

SHEET No. 4 of 5

CLIENT: VRH Construction Corp.
CONTRACTOR: Craig Test Boring Co., Inc.

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
86	30	9, 14, 16, 15	S-18	22		W	SM	Bwn m-f SAND, little Silt (Class 3b)
87								
88								
89								
90								
91	38	10, 18, 20, 15	S-19	17		W	SM	Bwn c-f SAND, little Silt, little f Gravel (Class 3a)
92								
93								
94								
95								
96	22	7, 12, 10, 9	S-20A / S-20B	17		W	SP / CH	Bwn m-f SAND, trace Silt (Class 3b) / Bottom 1" Bwn CLAY, little f Sand (Class 4b)
97								
98								
99								
100								
101	7	3, 4, 3, 4	S-21	24		W	CH	Same (Class 4c)
102								
103								
104								
105								
106	0	WOR, WOR, WOH, WOH	S-22	22		W	CH	Same (Class 6)
107								
108								
109								
110								
111	0	WOR, WOR, WOR, WOR	S-23	24		W	CH	Bwn CLAY, trace f Sand (Class 6)
112								
113								
114								
115								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● — 1 2 3 4 5
PLASTIC LIMIT % × — WATER CONTENT % ⊗ — LIQUID LIMIT % △ — 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● — 10 20 30 40 50

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-1

SHEET No. 5 of 5

CLIENT: VRH Construction Corp.
CONTRACTOR: Craig Test Boring Co., Inc.

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
116	0	WOR WOR WOH WOH	S-24	23		W	CH	Bwn CLAY, trace f Sand (Class 6)	
117									
118									
119									
120									
121	0	WOR WOH WOH WOH	S-25	24		W	CH	Bwn CLAY, trace f Sand (Class 6)	
122								End of Boring at 122'	
123									
124									
125									
126									
127									
128									
129									
130									
131									
132									
133									
134									
135									
136									
137									
138									
139									
140									
141									
142									
143									
144									
145									

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-2

SHEET No. 1 of 5

CLIENT: VRH Construction Corp.
CONTRACTOR: Craig Test Boring Co., Inc.
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | 3 7/8" | 6 TO 120'
CASING: | 4" | 0 TO 25'
DIAMOND CORE: | | TO
CME 75 Truck Mounted with Auto Hammer

GROUND WATER: DATE 4/4 | TIME | DEPTH 4'
MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: Overcast TEMP: 40° F
DEPTH TO ROCK: ---
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: John Kenney
DRILLER: Dave
SURFACE ELEVATION: ---
DATUM: See Remarks
DATE START: 4/4/13
DATE FINISH: 4/5/13

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % ✕ WATER CONTENT % ⊗ LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
1								18" Concrete Hand auger from 18" to 6'
3			B-1			W	GP-GM	Bwn-blk c-f GRAVEL, and c-f Sand, trace Silt (FILL) (Class 7)
6	100+	100/0	S-1	0				No Recovery
9	16	1 6 10 7	S-2	18		W	SP-SM	Dk bwn c-f SAND, some f Gravel, trace Silt, trace organics (FILL) (Class 7)
11	21	6 12 9 12	S-3	22		W	SM	Dk bwn c-f SAND, some f Gravel, trace Silt (FILL) (Class 7)
16	8	4 4 4 2	S-4	9		W	SM	Same (FILL) (Class 7)
21	3	3 1 2 2	S-5	10		W	SM	Same (FILL) (Class 7)

LITHOLOGY*

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-2

SHEET No. 2 of 5

CLIENT: VRH Construction Corp.
CONTRACTOR: Craig Test Boring Co., Inc.

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % × — WATER CONTENT % ⊗ — LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*	DEPTH (FT.)
26	0	WOH WOH WOH WOH	S-6	19		W	CH	Gy CLAY, trace f Sand, trace shells (Class 6)		26
27										27
28										28
29										29
30										30
31	0	WOR WOR WOR WOR	S-7	8		W	CH	Same (Class 6)		31
32										32
33										33
34										34
35										35
36	0	WOR WOR WOH WOH	S-8	10		W	CH	Same, trace shells (Class 6)		36
37										37
38										38
39										39
40										40
41	02	WOR WOR 2 1	S-9	17		W	MH	Gy CLAY, trace f Sand, trace shells (Class 6)		41
42										42
43										43
44										44
45										45
46	0	WOR WOR WOR WOR	S-10	14		W	MH	Same (Class 6)		46
47										47
48										48
49										49
50										50
51	0	WOR WOR WOR WOR	S-11	12		W	MH	Same (Class 6)		51
52										52
53										53
54										54
55										55

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-2

SHEET No. 3 of 5

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
56	0	WOR WOR WOR WOR	S-12	10		W	CH	Gy CLAY, trace f Sand, trace shells (Class 6)
61	0	WOH WOH WOR WOR	S-13	23		W	CH	Gy CLAY, trace f Sand, trace shells (Class 6)
66	0	WOH WOH WOH WOH	S-14	20		W	CH	Same (Class 6)
71	0	WOR WOR WOR WOR	S-15	19		W	CH	Same (Class 6)
76	0	WOR WOR WOR WOR	S-16	21		W	CH	Same (Class 6)
81	31	6 15 16 14	S-17	24		W	CH	Top 5" Same (Class 6)
							SM	Bwn m-f SAND, some Silt (Class 3a)

75'

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % ✕ ⊗ △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-2

SHEET No. 4 of 5

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
86	40	9 18 22 15	S-18	18		W	SM	Bwn m-f SAND, little Silt (Class 3a)
91	15	6 7 8 8	S-19	21		W	CH	Bwn CLAY, trace f Sand (Class 4b)
96	33	7 17 16 20	S-20	20		W	CH	Bwn CLAY, trace m-f Sand (Class 4b)
101	48	13 24 24 18	S-21	17		W	SP	Bwn f SAND, trace Silt (Class 3a)
106	27	10 10 17 16	S-22	18		W	SP	Same (Class 3b)
111	6	WOH 3 3 4	S-23	22		W	CH	Bwn CLAY, trace f Sand (Class 4c)

7.5' + 9.5' = 17'

9.5'

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

LITHOLOGY*

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-2

SHEET No. 5 of 5

CLIENT: VRH Construction Corp.
CONTRACTOR: Craig Test Boring Co., Inc.

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
116	0	WOH WOH WOH WOH	S-24	22		W	CH	Same (Class 6)	
117									
118									
119									
120									
121	0	WOH WOH WOH WOH	S-25	21		W	CH	Same (Class 6)	
122								End of Boring at 122'	
123									
124									
125									
126									
127									
128									
129									
130									
131									
132									
133									
134									
135									
136									
137									
138									
139									
140									
141									
142									
143									
144									
145									

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ⊖
1 2 3 4 5

PLASTIC LIMIT % ✕ — WATER CONTENT % ⊗ — LIQUID LIMIT % △
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.) ●
10 20 30 40 50

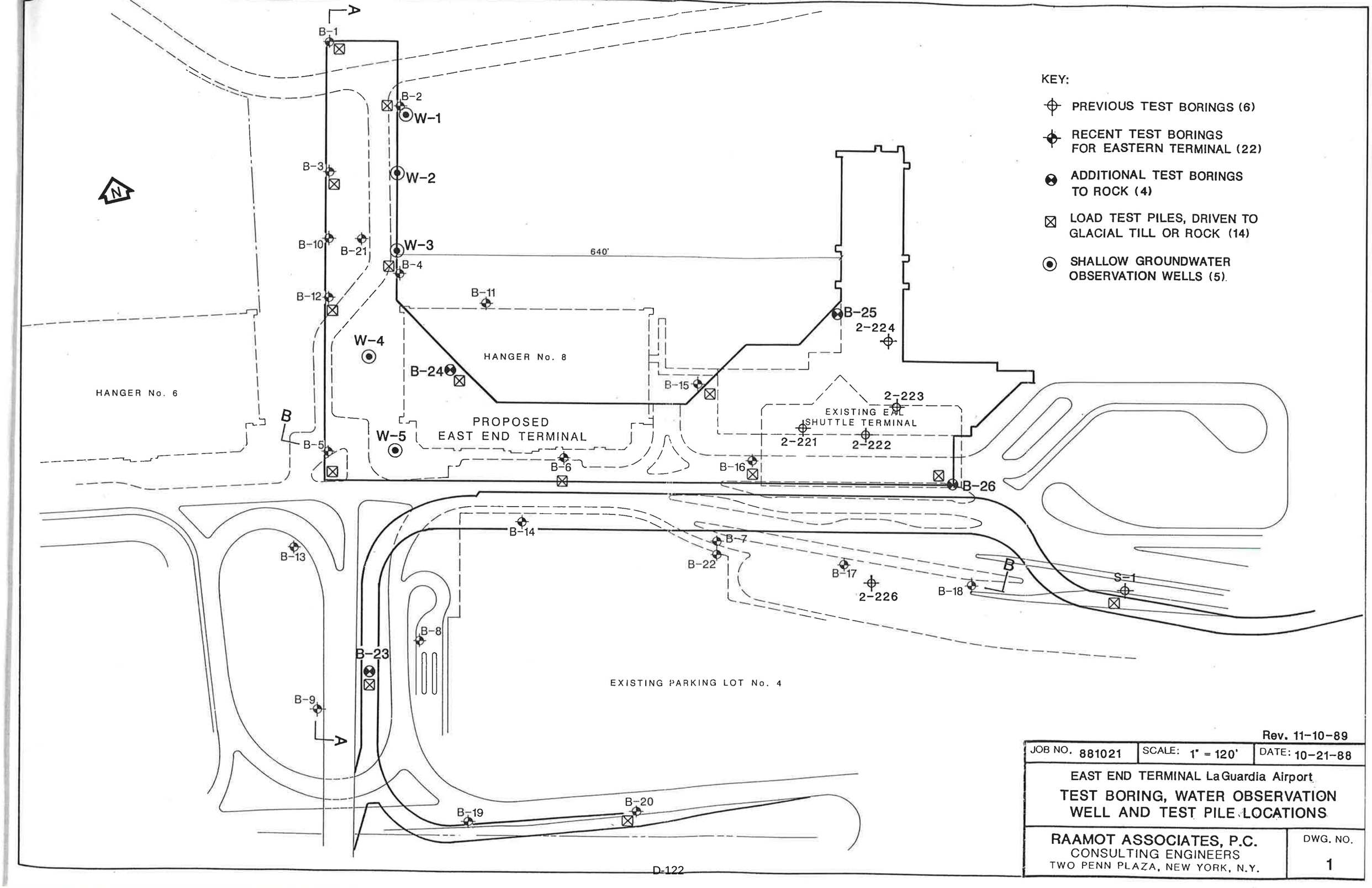
DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

Appendix C

Raamot Borings B-1 and B-2



Rev. 11-10-89

JOB NO. 881021	SCALE: 1" = 120'	DATE: 10-21-88

EAST END TERMINAL LaGuardia Airport

TEST BORING, WATER OBSERVATION WELL AND TEST PILE LOCATIONS

RAAMOT ASSOCIATES, P.C.
CONSULTING ENGINEERS
TWO PENN PLAZA, NEW YORK, N.Y.

DWG. NO. 1

B-1

(Depth)			
0.0'			
+6.8' (Elev.)	1.5 ft. ASPHALT		
	FILL: (Gray SILT, trace Gravel with cinders, glass, wood, brick, concrete) (11-65)	S-1	6-5-4-5
		S-2	9-12-28-30
		S-3	3-2-2-3
		S-4	3-3-3-3
23.0' -16.2'		S-5	1-1-1-2
		S-6	1-1-2-1
		S-7	W O R
		U-1	REC. 24"
		S-8	W O R
	Grey organic Silty CLAY, with Shells (OH) (11-65)	S-9	W O R
		S-10	W O R
		U-2	REC. 24"
		S-11	W O R
		S-12	W O R
		S-13	1-0-1-0
78.0' -71.2'		S-14	21-36-36-36
		S-15	24-29-33-32
		S-16	15-26-33-28
	Grey c-f SAND, trace Silt (SW)(7-65)	S-17	18-27-29-25
		S-18	11-22-26-21
		S-19	10-17-27-24
		S-20	25-32-49-53
		S-21	26-54-68-78
96.0' -89.2'		S-22	26-43-50-62
	Grey f SAND, and Silt (SM)(6-65)	S-23	26-37-43-49
		S-24	32-37-40-53
104.0' -97.2'		S-25	4-6-6-8
	Grey Clayey SILT (ML)(10-65)	S-26	4-7-7-9
		S-27	6-8-12-9
122.0' -115.2'		S-28	4-8-11-12

END OF BORING
Start: 6-4-66 Finish: 6-4-66

B-2

(Depth)			
0.0'			
+7.9' (Elev.)	FILL: (Gray c-f SAND, and Silt with cinders, wood, brick, concrete) (11-65)	S-1	21-31-59-31
		S-2	3-3-3-3
		S-3	10-6-4-2
		S-4	1-2-4-3
24.5' -16.6'		S-5	W O R
		S-6	W O R
		S-7	W O R
		U-1	REC. 24"
		S-8	W O R
	Grey organic Silty CLAY, with Shells (OH)(11-65)	S-9	W O R
		S-10	W O R
		U-2	REC. 24"
		S-11	W O R
		S-12	W O R
		S-13	W O R
78.8' -70.1'	Brown c-f SAND, trace Silt, trace f Gravel (SW)(6-65)	S-14	15-18-21-21
		S-15	18-18-20-21
		S-16	11-14-21-26
86.0' -78.1'	Brown m-f GRAVEL, c-f Sand, trace Silt (GM)(6-65)	S-17	12-18-21-24
89.5' -81.6'		S-18	13-17-21-27
	Varved reddish grey Clayey SILT, trace f Sand (ML)(10-65)	S-19	12-15-17-22
98.5' -90.6'		S-20	10-3-6-8
	Varved reddish grey SILT and CLAY, trace f Sand (ML-CL)(10-65)	S-21	W O H

Continued

Continued

(Depth)			
		S-22	W O R
125.0' -117.1'			
	Brown c-f SAND, trace Silt, trace f Gravel (SW)(7-65)	S-23	8-8-13-17
		S-24	8-8-14-21
146.0' -138.1'			
	Greyish Brown m-f GRAVEL, trace c-f Sand, trace Silt (GM)(6-65)	S-25	12-11-11-11
155.0' -147.1'			
	Greyish Brown SILT, and f Sand (ML)(10-65)	S-26	41-36-26-21
		S-27	24-14-26-36
175.0' -167.1'			
	Brown c-f SAND, little m-f Gravel, trace Silt (SW)(7-65)	S-28	44-31-63-100/5"
185.0' -177.1'			
	Grey m-f GRAVEL (weathered Gneiss) (GP)(6-65)	S-29	100/6"
195.0' -187.1'			
	Grey GNEISS (2-65)	R1	REC. 94%
204.0' -196.1'			

END OF BORING
Start: 6-7-66 Finish: 6-10-66

(Depth)
0.0'
+9.5' (Elev.)
8.2' ▼ +1.3'
29.0' -19.5'
81.9' -72.4'
91.5' -82.0'
122.0' -112.5'

GZA
GeoEnvironmental of
New York

Engineers and
Scientists

September 15, 2015
GZA Project No. 12.0076327.00

Mr. Sloan C. Gutowski, RA, LEED AP BD+C
Burns & McDonnell
100 Eagle Rock Avenue, Suite 303
East Hanover, NJ 07936

Re: Geotechnical Engineering Report
LaGuardia Airport Terminal C & D Holdroom Level of Service (LOS) Additions
Delta Airlines Terminal C – LOS Upgrade
Delta Airlines Terminal D – LOS Upgrade
Delta Airlines Terminal C – Escalator Improvements

104 West 29th Street
10th Floor
New York, NY 10001
(212) 594-8140
Fax (212) 279-8180
www.gza.com

Dear Mr. Gutowski:

We are sending our final revised geotechnical engineering report for the proposed LGA Airport Terminal C and D Holdroom Level of Service Additions in Flushing, NY.

This report addresses the Port Authority of New York and New Jersey (PANYNJ) comments in letters dated August 21 and August 24, 2015, along with other items discussed in the conference call occurring on September 1, 2015 between Burns & McDonnell and GZA.

It is a pleasure working with Burns & McDonnell and with you. We look forward to our continued involvement on this project and other future endeavors. We would be pleased to continue to provide you with our consulting services as this project progresses. Feel free to contact us with any questions regarding this report.

Very truly yours,
GZA GEOENVIRONMENTAL OF NEW YORK

Andrew Rizk, PE
Project Manager

Cassandra A. Wetzel, P.E.
Principal

Ernest R. Hanna, P.E.
Consultant/Reviewer

An Equal Opportunity Employer M/F/V/H

GEOTECHNICAL ENGINEERING REPORT

LaGuardia (LGA) Airport Terminals C and D
Holdroom Level of Service Additions and Escalator Improvements
Flushing, New York

PREPARED FOR:
Burns & McDonnell, P.C.
100 Eagle Rock Avenue, Suite 303
East Hanover, NJ 07936

PREPARED BY:
GZA GeoEnvironmental of New York
104 West 29th Street, 10th Floor
New York, NY 10001

July 17, 2015 (revised September 15, 2015)
File No. 12.0076327.00

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Table 1: Recommended Use and Gradation Criteria for Fill Materials
Table 2: Compaction Methods

FIGURES

FIGURE 1: SITE LOCATION
FIGURE 2-4: EXPLORATION LOCATION PLANS

APPENDICES

APPENDIX A LIMITATIONS
APPENDIX B SOIL BORING LOGS
APPENDIX C LABORATORY TEST RESULTS
APPENDIX D PILE CAPACITY CALCULATIONS

1 PROJECT BACKGROUND

This report contains the results of GZA GeoEnvironmental of New York's (GZA's) subsurface explorations, foundation design and construction recommendations for the proposed Terminal C and D, Holdroom Level of Service (LOS) Additions at LaGuardia (LGA) Airport (Site) for Delta Air Lines, Inc. (Owner). **Specifically, this is for Delta Airlines Terminal C - LOS Upgrade, Delta Airlines Terminal D - LOS Upgrade, and Delta Airlines Terminal C – Escalator Improvements.** Our services were performed in accordance with our proposal number 12.P000246.15, dated March 23, 2015, and the Professional Geotechnical Consultant Agreement (Document No. SP-2B Geotech), dated April 14, 2015, between Burns & McDonnell, P.C. (B&M/You/Client) and GZA.

Our scope of services consisted of performing a geotechnical subsurface exploration consisting of a total of six geotechnical soil borings on the "air side" of Terminal C and Terminal D, laboratory testing, review of previous geotechnical investigation performed by others at the Site and readily available subsurface data in the project vicinity, geotechnical analysis, and preparation of a geotechnical report summarizing our observations and geotechnical recommendations for the proposed LOS additions.

The findings and recommendations of this report are subject to the limitations presented in Appendix A and the Terms and Conditions of our executed agreement.

2 PROJECT UNDERSTANDING

Our initial project understanding is based on the Technical Guidelines, Subsurface Investigation and Geotechnical Report, Terminal C and D Holdroom Level of Service Additions, LaGuardia Airport, Flushing, New York," prepared by B&M, and dated March 05, 2015 (Technical Guidelines Report), boring locations plans titled "LGA Optimization-Holdroom LOS, Boring Location Map, Terminal C – East" and "LGA Optimization-Holdroom LOS, Boring Location Map, Terminal D" dated January 27, 2015, and "Taxi lane Centerline Relocation, Boring Location Plan, Apron Pavement Design" dated March 4, 2015.

Our project understanding is also based on the following information provided to GZA as of the date of this report:

- Geotechnical Engineering Recommendations, Delta East Baggage Sortation Canopy, prepared by GZA, dated May 14, 2012 (GZA Project No. 41.0162020.00)
- Geotechnical Report, LaGuardia Airport Terminal C & D Reconfiguration, Queens New York, prepared by Mueser Rutledge Consulting Engineers (MRCE), revised July 19, 2012 (MRCE File No. 11720)
- Overall Site Plan prepared and provided by B&M, showing proposed work areas.
- Terminal C LOS Upgrade Escalator Improvements Structural Plan Set, dated 03/03/2015, prepared by B&M (project 14345.0100), Drawing No. S-001E, S-002E, SD-111 E-F, S-111 E-F, S-301 E-F, and S-501 E-F.
- Terminal C LOS Upgrade Structural Plan Set, dated 03/30/2015, prepared by B&M (project 14345.0100), Drawing No.: S-001, S002, S003, S101-G, S102-G-B, S301-

G.

- Maximum Reactions at Footings for Terminal C LOS structure (exterior stairs), provided by B&M, prepared by Casco Bay Engineering, dated 05/20/2015.
- Terminal D LOS Upgrade Structural Plan Set, dated 03/30/2015, prepared by B&M (project 14345.0100), Drawing No.: S-001, S002, S003, S101-K-B, S102-K-B, S201-K, S202-K, S203-K, S301-K, S401-K, S402-K, S403-K, S500-K.
- Maximum Reactions at Footings for Terminal D LOS structure (stair tower), provided by B&M, prepared by Casco Bay Engineering, dated 05/31/2015.

2.1 Existing Conditions

The Site is bordered by Bowery and Flushing Bays to the north and the Grand Central parkway along its south side. See Figure 1 for Site Locus. Our work was performed on the eastern portion of the airport property, at Terminals C and D. The site elevations where we performed our work ranged between El. 2.5 and El. 6, as provided by B&M. The datum is unknown but assumed to be North American Vertical Datum of 1988 (NAVD88).

A portion of the land occupied by LaGuardia Airport was created by the filling of the former marshlands in two phases. The first phase, which generally included the northern portion of the airport, occurred prior to 1940, with the remainder filled during the 1960s. The project site lies in the area that was filled prior to 1940. The fill material, which is reportedly comprised of excavated material from the general vicinity and hydraulically placed fill from the bay, was placed over soft, highly compressible organic silty clay.

Based on available information, we understand that the existing Terminal C Building is supported on a combination of shallow foundations and driven pile foundations. The oldest portion of Terminal C is the former Eastern Shuttle Building, which was constructed on shallow spread footings bearing on mandrel-driven compaction sand piles bearing in the fill material. This building was reportedly constructed with a crawl space beneath to allow for jacking to accommodate differential settlement; we are unaware whether any jacking has ever taken place. The newer portions of Terminal C are understood to be supported on piles driven through the fill and soft organic silty clay and bearing in the upper sand stratum. Terminal D appears to be fully supported by pile foundations. Based on our review of the settlement monitoring data for the eastern half of Terminal C, we understand that building settlement is ongoing but at a very slow rate representing the secondary compression of the underlying clay layer.

2.2 Proposed Development

According to the Technical Guidelines Report and the structural drawings dated March 3, 2015 and March 30, 2015, the Owner is proposing the construction of various additions to the existing Terminal C and D concourse structures at LGA Airport. These structures will house stairs, ramps, elevators and utility spaces to support the proposed holdroom level of service upgrades within Terminals C and D. Foundations for the new structures are anticipated to be shallow concrete foundations at Terminal C and deep foundations at Terminal D. Also, an approximately 2,500 square feet asphaltic cement concrete area

between Terminals C and D will be completely replaced with Portland cement concrete (PCC) to accommodate the existing taxiway centerline to be shifted westward.

Specifically, the proposed construction will consist of the following:

- The proposed addition (exterior stairs) at Terminal C will be constructed on the west side of the Terminal C-East structure and will encompass a footprint of approximately 14 feet-1 inch by 23 feet-1 inch or approximately 320 square feet (sf). Based on information provided by B&M, the nodal reactions at the base level of the exterior stairs (that is, loads at the footings) are anticipated to range between less than 1 and 8 kips in compression, less than 1 and 3.5 kips in uplift, and up to 2.7 kips in lateral loading.
- The proposed addition (stair tower with elevator shaft) at Terminal D will be constructed on the northeast corner of the Terminal D structure and will encompass an area of approximately 30 feet-4 inch by 26 feet – 9 inch, or approximately 810 sf. Based on information provided by B&M, the nodal reactions at the foundation level of the stair tower are anticipated to range between approximately 30 and 115 kips in compression, up to 30 kips of uplift in certain areas, and up to 20.5 kips in lateral loading in certain areas.
- The existing taxi-way consists of about 10,000 sf concrete apron located between Terminal C-East and Terminal D structures. It will be extended by approximately 12 feet to the west (a total reconstruction of approximately 2,500 sf which will include replacing the asphalt pavement with rigid/PCC pavement.
- New escalators will be installed inside the existing Terminal C-East structure. The escalators pit walls will cover an area of approximately 150 sf. The work will include expansion of an existing pit, and construction of a new pit directly adjacent to the existing pit. Both pits will be supported by shallow foundations extending to subsurface soils below the existing crawlspace (at approximate elevation El. 102' 5-3/4" per structural drawings). The shallow footings will have dimensions (in plan view) of approximately 4 feet by 9.5 feet for the new pit and 5 feet by 9.5 feet for the rehabilitated existing pit. The loading (dead load plus live load) is anticipated to be approximately 14 kips based on information provided by B&M, or a bearing pressure of 300 to 350 pounds per square foot (psf) at the footing base. The pits will be constructed near existing column footing S9.3/SN, per old structural drawings of the existing Terminal C building.

3 SUBSURFACE EXPLORATION

3.1 GZA Subsurface Exploration Program

Our subsurface exploration program consisted of a geophysical survey followed by drilling of six borings (B-01 through B-06) on the "air side" of Terminals C and D; that is, on the eastern portion of the airport property. The borings were drilled by our drilling subcontractor, Aquifer Drilling & Testing, Inc. (ADT) of Mineola, New York, between May 21 and June 2, 2015 using a truck-mounted drill rig.

Prior to our drilling program, a geophysical survey was performed by our subcontractor Utility Survey Corp. (USC) to identify the presence of below grade utilities and other obstructions at the boring locations. USC scanned the footprint of the proposed 320 sf and 810 sf additions at Terminal C and Terminal D, and where proposed borings were to be located near the taxi-way (approximately 80 sf of area) to clear the proposed boring locations. This survey was performed utilizing Ground Penetrating Radar (GPR) equipment and buried utilities were identified using Electro-Magnetic/Radio Frequency Pipe/Cable Locator Technology. USC provided mark outs on the ground identifying subsurface utilities/structures within the scanned areas. Proposed boring locations were relocated as necessary, following this survey.

Our drilling program was performed in general accordance with our proposal and the requested work scope. The borings were observed and logged by a GZA representative. Borings B-01 and B-02 were drilled between gate D-4 and D-5 at Terminal D to depths of 100 and 102 feet below existing ground surface (bgs), respectively; borings B-03 and B-04 were drilled between gate C-23 and C-24 at Terminal C – East to depths of 102 and 117 feet bgs, respectively; and borings B-05 and B-06 were drilled adjacent to the existing taxiway concrete apron between Terminal C and Terminal D, each to a depth of 11 feet bgs. The boring locations were surveyed by B&M following our exploration program, and we were provided the following existing ground surface elevations (datum unknown but assumed to be North American Vertical Datum of 1988 (NAVD88)):

- B-01 El. 4.5 feet
- B-02 El. 4.46 feet
- B-03 El. 6.16 feet
- B-04 El. 6.05 feet
- B-05 El. 4.18 feet
- B-06 El. 2.5 feet.

The borings were advanced using 4-inch-diameter casing and mud rotary drilling procedures. Standard Penetration Tests (SPTs) were performed in general accordance with ASTM D-1586 and split spoon samples were obtained continuously in the upper 12 feet and at approximate 5-foot intervals thereafter. The 2-inch-outer-diameter sampler was driven 24 inches into the soil with blows from a 140 pound automatic hammer falling a distance of 30 inches; and the number of blows required to drive the sampler for each six-inch interval was recorded. The cumulative number of blows for the middle two six-inch intervals (blows/foot) is termed the uncorrected SPT Resistance (N-value) which can be correlated empirically with relative density of granular soils or consistency of fine-grained soils and their approximate engineering characteristics.

Undisturbed Shelby tube samples were collected in cohesive strata of interest. Hand held pocket penetrometer and torvane readings were obtained on cohesive samples during field work, and recorded on the boring logs.

Groundwater data was estimated based on wetness of soil samples and measurements inside open boreholes prior to switching over to mud-rotary drilling. Groundwater was

encountered at an estimated depth of 7 to 9 feet. Mud-rotary drilling was initiated at a depth of about 15-feet.

Soil samples collected from the spoons were classified in accordance with a Modified Burmister Soil Classification System and the 2014 New York City Building Code (NYCBC). The description of the soil samples based on visual identification and the SPT values at various depths are recorded on the boring logs.

Upon completion of borings, the boreholes were grouted and patched with concrete, soils cuttings were drummed and staged at the designated area. The borings were located based on tape measurements from existing site features; refer to Figures 2 through 4. Boring logs (along with a log key for definitions of some of the symbols and terms used in the borings logs) are included in Appendix B.

3.2 Laboratory Testing

Eleven select soil samples collected from split spoons were sent to Thielsch Engineering in Cranston, Rhode Island for moisture content testing (ASTM D-2216), grain size distribution testing (ASTM D-422), Atterberg limit testing (ASTM D-4318), soil resistivity (EPA Method SW-846, 9050A), pH measurement (EPA Method SW-846, 9045D), sulfate content measurement (SW-846, 9038) and chloride content measurement (SW-846, 9250).

Two undisturbed Shelby tubes were sent to the laboratory for consolidation tests (ASTM D2435), Atterberg limits, and triaxial unconsolidated-undrained (UU) shear strength test (ASTM D2850). Two composite soil samples in five gallon buckets collected from the top 1 to 5 feet bgs from the apron borings B-05 and B-06 were tested for California Bearing Ratio (CBR) (ASTM D1883) and Modified Compaction Test (ASTM D-1557). The laboratory test results are provided in Appendix C.

4 SUBSURFACE CONDITIONS

This section presents our understanding of the site geology and subsurface conditions encountered within the borings at the Site.

4.1 Regional Geology

Based on our review of readily available historical maps and local geological maps the natural soils at the Site were deposited in three distinct geological periods; contemporary compressible, fine grained marsh soils; Pleistocene sands, silts and clays, both stratified glacial outwash deposits and glacial sands; and Cretaceous sands and clays.

Fill materials extended to depths of up to 28 feet. Below the fill is a thick, highly compressible organic clay underlain by a glacial outwash sand deposited during the most recent glacial retreat, underlain by varved silt and clay, which is the remainder of Glacial Lake Flushing. Within the varved silt and clay are layers and pockets of outwash sand at varying depths and thicknesses. They varved soils and outwash sands were deposited in a glacial valley. The bottom of the valley is formed of dense glacial sands from the Pleistocene period and pre-glacial dense sands and hard clays of the Raritan Formation, from the Cretaceous period. Underlying the Raritan Clay is the Lloyd Sand formation.

Bedrock occurs at depths greater than 200 feet below grade. All borings were terminated in the Clayey Silt layer / varved silt and sand.

4.2 Generalized Subsurface Conditions

The subsurface conditions at the Site, based on our borings, generally consist of asphalt underlain by fill materials extending to depths of up to 28 feet, underlain by soft organic silty clay extending to depths of up to 78 feet, underlain by a medium dense sand stratum extending to depths of up to 93 feet, underlain by a soft to stiff clayey-silt stratum at the termination depths of our deep borings. Our two shallow borings (B-05 and B-06) were terminated in the fill stratum.

The following is our interpreted summary of the information obtained from our drilling explorations below the surface cover.

- SURFACE MATERIAL - A surficial asphalt layer with a thickness ranging between 10 and 12 inches was encountered in the six test borings.

- FILL (NYCBC Class 7) – The Fill stratum below the surficial asphalt/base course layers extended to a depths ranging between 23 feet to 28 feet bgs in GZA borings B-01 through B-04, corresponding to elevations ranging between El. -19 and -24 feet. This stratum consists of a heterogeneous mixture of sand, silt, gravel with occasional miscellaneous debris such as brick and concrete fragments and sporadic petroleum odors. Uncorrected SPT N-values ranged from 1 to 86 blows per foot (bpf), with an average of 33 bpf, indicating a very loose to very dense condition (primarily dense). The Fill was generally observed to be medium dense to very dense in the top 11 to 13 feet bgs, underlain by loose materials beyond 13 feet bgs. GZA borings B-05 and B-06 were terminated in the Fill stratum.

  Moisture content and Grain size distribution testing performed on five samples collected from this stratum indicated variable composition, with fines content ranging between 8 and 21 percent and water content ranging between 6 and 42 percent.

  Moisture density testing and CBR on a composite bulk sample collected from the Fill stratum at B-05 and B-06 from 1 to 5 feet bgs indicated a Modified Proctor maximum dry density and optimum moisture content of 134 pounds per cubic feet (pcf) and 5.7 percent, respectively, and a CBR value of approximately 26 for a sample compacted to 95 percent of the Modified Proctor, at 5.5 percent moisture content then saturated before penetration (final water content of 11 percent).

- ORGANIC SILTY CLAY (NYCBC Class 6) – An approximate 50 feet thick Organic Silty Clay stratum was encountered immediately below the Fill stratum, and extended to a depth of approximately 78 feet bgs, corresponding to elevations ranging between El. -72 and -74. This stratum generally consists of gray organic silty clay with trace shell fragments. Uncorrected SPT N-values in this stratum ranged between weight of rods or weight of hammer (WOR or WOH; that is full

24 inch penetration of the split spoon sampler under the weight of the drill rods or hammer) and 1 bpf, indicating a very soft consistency.

Hand held penetrometer and torvane readings taken on disturbed and undisturbed samples indicated unconfined compressive strengths of less than 0.25 tsf and undrained shear strengths ranging between 0.17 and 1.5 tsf.

Two undisturbed Shelby tubes collected from this stratum (one from boring B-02 at a depth of 40 to 42 feet bgs and one from boring B-05 at a depth of 55 to 57 feet bgs) were tested for moisture content, Atterberg limits, dry unit weight, undrained shear strength, and consolidation parameters. As-received water contents measured from the extracted Shelby tube samples ranged between 74 and 130 percent. Atterberg limits indicated a plasticity index of 43 to 50. As-received total unit weight was measured to be approximately 92.5 pcf. The measured compressive strength of the undisturbed sample collected from B-02, using the unconsolidated undrained triaxial test procedure, was 1,444 psf (0.72 tsf) at a strain of 7.8%, translating to an undrained shear strength (one-half the compressive strength) of approximately 720 psf (0.36 tsf). Laboratory data including consolidation parameters not summarized herein are included in Appendix C.

- UPPER SAND (NYCBC Class 3a/3b) – This stratum was encountered immediately below the organic silty clay stratum in borings B-01 through B-04 and extended to a depth of about 93 feet bgs, corresponding to elevations El. -87 to -89. The observed thickness of this stratum ranged between 15 feet and 18 feet. This stratum generally consists of fine to medium sand, trace to little silt, and trace to little gravel. Uncorrected SPT N-values ranged from 19 to 73 bpf, with an average of 34 bpf, indicating a medium dense to very dense condition (primarily dense).

  Moisture content and grain size distribution testing performed on three samples collected from this stratum indicated fines content ranging between 4 and 7 percent and water content ranging between 16 and 21 percent.

- CLAY (NYCBC Class 5b/6) – This stratum was encountered immediately below the upper sand stratum and extended to the termination depth of the GZA borings B-01 through B-04, which were drilled to depths of between 100 and 117 feet bgs, corresponding to elevations El. -95 to -111. This stratum consists generally of brown/gray-brown CLAY&SILT with trace fine sand. Measured SPT N-values in this stratum ranged between 1 and 31 blows/foot, with an average of approximately 11 blows/foot, indicating a soft to stiff consistency.

  Grain size distribution (with hydrometer analysis), moisture content, and Atterberg limits testing performed on two samples collected from this stratum indicated fines content ranging between 94 and 98 percent, water content of approximately 32 percent, and plasticity index ranging between 7 and 11.

Groundwater Observations: Groundwater was estimated based on change of moisture in collected soil samples, before drilling mud was introduced to stabilize the borehole. The groundwater was found to range between 7 and 9 feet bgs (corresponding to El. -0.8 to -4.5 feet). This may not represent stabilized groundwater levels. It should be noted that fluctuations in groundwater levels will occur due to variations in seasonal influences, precipitation amounts, utility leakage, and other factors different from those existing at the time the observations were made during drilling.

5 GEOTECHNICAL RECOMMENDATIONS

5.1 Key Geotechnical Issues

Based on our understanding of the observed subsurface conditions and the proposed construction, we have identified the following geotechnical issues that will impact design and construction of the proposed development:

- The Site is underlain by approximately 30 feet of fill, underlain by about 50 feet of very soft, compressible, organic silty clay, underlain by nearly 15 feet of a medium-dense to dense sand stratum, underlain by a soft to stiff clay layer.
- The soft organic silty clay layer is still undergoing settlement but at a slow rate due to the placement of the fill in the early 1900's. The continuous settlement of this layer may impose down drag force on a deep foundation (piles).
- Groundwater was observed at a depth of approximately 7 to 9 feet below the existing ground surface.

5.2 Foundation Recommendations

5.2.1 Delta Airlines - Terminal C LOS Upgrade (Exterior Stairs)

The proposed exterior stairs to be located to the west of the Terminal C – East structure should be constructed on shallow foundations due to the anticipated light loads as well as to minimize differential settlement between the existing Terminal C structure (which is supported on shallow foundations) and the planned addition.

The proposed addition may be supported on spread footings consisting of square concrete piers having a minimum dimension of 1 feet-4 inch (as shown on structural drawings) extending to a spread footing with a minimum width of 3 feet. The recommended maximum net allowable bearing pressure for footings supported on the existing Fill should be limited to 850 psf. Bearing pressures under transient loading should be limited to 2,500 psf.

As such, footing dimensions shown on the structural drawings provided to GZA should be adjusted. The footings should be constructed to a minimum depth of 4 feet bgs to address frost protection requirements and/or resist anticipated uplift.

We recommend that lateral loads be resisted with a combination of passive resistance of the spread footing against adjacent soils and sliding friction between the spread footing and subgrade soil/rock. We recommend a passive equivalent fluid pressure of 200 pounds per cubic foot (pcf) and a friction factor against base shear of 0.35 (ultimate). The passive contribution of the upper 1 foot of soil should be neglected.

Proposed slab-on-grade should be constructed over top a compacted base course consisting of at least 6-inches of compacted DGABC in compliance with Specification Section 32 22 31, Aggregate Base Course. Slabs should be designed assuming a modulus of subgrade reaction (K_{v1}) of 60 pounds per cubic inch (pci), referenced to a 1 foot by 1 foot plate load area, and must be adjusted for the actual size and geometry of the loaded area prior to use in analysis. Per the Naval Facilities Engineering Command (NAVFAC) Design Manual (DM) 7-2, for granular soils, the modulus of subgrade reaction for a footing or mat of width "b" (K_b) can be estimated based on the equation: $K_b = K_{v1} * ((b+1) / 2b)^2$.

Existing asphalt, utilities, foundations, and other obstructions, should be completely removed from within the footprint of the planned structure prior to construction of footings or slabs. During construction, all footing subgrades should be protected from frost. Footing and slab subgrades should be prepared in accordance with our construction recommendations below.

We recommend that the exterior stair units be equipped to allow for extension of the anchor bolts to allow for shimming, as needed. Three inch allowance at all connections is considered suitable. .

5.2.2 Delta Airlines Terminal D LOS Upgrade (Stair and Elevator Tower)

We recommend driven, closed-end, concrete-filled, steel pipe piles, driven to the Upper Sand stratum underlying the Organic Silty Clay layer, to support the proposed addition at Terminal D. These piles should be designed with an allowable vertical service load of 101 kips, which is based on an ultimate compression capacity of 228 kips, with a factor of safety of 2.25. This is the maximum allowable capacity. Piles may be driven to lower capacities by driving to required design load times a factor of safety of 2.25 (assuming dynamic pile testing per our recommendations below will be implemented).

We analyzed potential downdrag on the piles due to long-term subsidence as a result of consolidation and secondary compression in the organic silty clay stratum. Based on our analysis of the estimated elastic compression of the piles under structural loads, the results of the soil testing and the estimated settlement over a 50-year service life, we recommend no downdrag design load allowance for the piles, provided there will not be any fill placement to raise site grades.

Piles should be driven to a depth of approximately 90 feet below the existing ground surface elevation or approximately 10 feet into the upper sand stratum. This corresponds to minimum pile tip elevation of approximately El. -84 to -85. Piles must not be driven more than 10 feet into the upper sand stratum to avoid bearing in the weaker underlying clay stratum. If piles are driven past the upper sand layer, the piles may need to be driven through the varved silt/sand layer and into the lower sand layer, which was encountered at approximately 116.5 feet or at approximate El -110.5 in boring BH-3U, to attain the required pile capacity. Final pile lengths will be determined from the driving resistance encountered during installation and based on the results of dynamic pile testing.

The steel pipe piles should be ASTM A252 Grade 3 (45 ksi yield strength), having an outside diameter of 14 inches and a minimum wall thickness of 0.375 inches. The pile bottoms are to be closed with steel conical points, with diameter matching the outside

diameter of the driven pile, meeting the requirements of ASTM A-27 65/3, welded to the bottom of the pipe by means of a complete penetration single-bevel groove weld so as to have adequate strength to sustain driving stresses and to create a water resistant connection. We have analyzed the structural pile compression capacity in accordance with pile material allowable stress requirements of the NYCBC, assuming a 1/16-inch corrosion loss, and conclude that corrosion protection (coating) of the piles is not necessary. Pile splices must not be in the upper 20 feet of the pile.

The pile concrete fill should have a minimum 28-day compressive strength of at least 4,000 psi. Concrete must be placed in the pile within 90 minutes after mixing. Immediately before placing the concrete, all water should be removed from the pile and one cubic foot of flowable Portland cement grout is to be placed in the pile. Concrete is to be placed through a funnel having an 8-inch diameter tube that extends at least 15 feet into the top of the pile with centralizers.

The allowable uplift capacity of each pile is 68 kips, based on an ultimate uplift capacity of 203 kips with a factor of safety of 3.0. A factor of safety of 2.0 can be applied if static tension load testing is performed, however, based on anticipated uplift loads it is unnecessary and not economically feasible to perform a tension load test.

We estimated the lateral displacement at the top of each pile (using a 0.312-inch wall thickness to account for 1/16-inch loss due to corrosion) using the LPILE v2012 computer application, assuming fixed head, 50 percent (partial) fixity, and free head conditions. A lateral load of approximately 24 kips, 18 kips, and 10 kips, at the top of a single pile is estimated for fixed head, partial fixity, and free head conditions, respectively; which is half the load required to cause a lateral displacement of approximately 1 inch per the NYCBC. It should be noted that piles in groups will behave differently laterally than single piles as their zones of stress influence will “shadow” each other when grouped.

We modeled the pile driving using the GRLWEAP 2010 computer application. All piles should be driven with a pile hammer providing a minimum hammer transferred energy of 35 kip-feet with a final driving resistance in the upper sand stratum of at least 14 blows per foot for three consecutive feet. The pile installation contractor should submit his wave equation analysis prior to mobilization demonstrating that the proposed pile driving equipment can achieve the design pile capacity without inducing driving stresses greater than 90% of the design yield stress in the pile and provides the required final driving resistance in the upper sand stratum.

Pile calculations, including static capacity, LPILE analysis and WEAP analysis, are provided in Appendix D.

Dynamic pile testing pursuant to the requirements of ASTM D4945 should be performed on the initial three production piles and one-third of the remaining piles driven on the project. The final pile driving resistance should be determined in the field based on the results of the dynamic pile testing.

In accordance with Section 1808.3 of the NYCBC, axial static load tests (ASTM D1143) are not required for driven steel closed-end pipe piles with design capacity equal to or less than 80 kips. If the design loads on a single pile exceed 80 kips, a static load test will be required. Furthermore, the above referenced section of the NYCBC allows for an allowable pile lateral load capacity of 2 kips per pile without the need for lateral load testing. Lateral pile capacity in excess of 2 kips per pile will need to be substantiated in the field by a lateral load test performed in accordance with the provisions of ASTM D3966 and provisions of the NYCBC.

A minimum spacing of 3D between piles is required (D = pile diameter); that is, 3.5 feet spacing for a 14 inch diameter pile. Based on the pile lay out provided to GZA (Plan Sheet SK-003, entitled "Terminal C LOS Upgrade Elev. & Stair Fdn. Plan Typ. Pile Cap Detail", prepared by Burns & McDonnell), reductions to axial capacities due to group effect is not anticipated. Group efficiency reduction coefficients of 0.7 should be used for uplift of individual piles For laterally load groups, group reductions or p-multiplier to be used to modify the p-y curve on an individual pile based on piles row position are identified by FHWA-HI-97-013, Section 9.8.4.

Although a minimum spacing of 3D is required, a spacing of 6D will avoid axial and lateral group reductions.

5.2.3 Soil Properties

In their unimproved states, it is recommended that the following properties of subsurface materials be used for design purposes:

Stratum (NYCBC Class of Materials)	Total Unit Weight (pcf)*	Friction Angle (deg)	Cohesion (psf)
Fill (7)	110	30	
Organic Silt (6)	95	NA	700
Upper Sand (3a,3b)	125	34	
Clay (5b, 6)	115	NA	1,500

Groundwater design elevation should be taken as 5 feet below existing ground surface at each structure.

5.2.4 Settlement

The estimated axial settlement at each pile is estimated to be less than ½ inch. More than half of this settlement is expected to occur during construction as structural loads are applied. The settlement beneath proposed shallow foundations for the Terminal C structure will also be limited to ½ inch, with up to half of that amount for differential settlement.

Required utility services should be provided with flexible connections into the structure at Terminal D due to the potential for utility services not supported on piles to undergo differential settlement relative to the pile-supported structure.

5.3 Seismic Assessment

Based on the subsurface conditions observed in the borings and in accordance with the provisions of the NYCBC, Seismic Site Class E is recommended for the project site. The Maximum Considered Earthquake (MCE) spectral response accelerations for short and long periods can be taken as S_S = 0.281 g and S_1 = 0.073 g, respectively[1]. These parameters can be adjusted for site effects using site class coefficients of Fa = 2.37 and Fv = 3.50. Alternatively, the USGS Seismic Design Map, Earthquake Hazard Program provides a S_S of 0.278 and a S_1 of 0.072, with corresponding site class coefficients of Fa = 2.41 and Fv = 3.50[2].

Portions of the fill stratum are considered susceptible to liquefaction based on the reported soil type and SPT N-values, in accordance with criteria outlined in the NYCBC. We performed an additional analysis utilizing using the Idriss, I.M. and Boulanger, R.W. (2008) method using maximum seismic ground acceleration values, approximate groundwater depth, corrected SPT N-values, and content of fines in soil based on laboratory results. Based on our analysis, only a limited portion of the fill may be subject to liquefaction during a seismic event. Installation of piles may provide some densification of the fill material which will further limit liquefaction susceptibility. This potential limited liquefaction within the fill material should not have a negative impact on the load-carrying capacity of the piles supporting the proposed structures. A limited amount of settlement may occur through densification of the fill, which would manifest itself as surface distortions and may have implications for subsurface utility performance, adjacent roadways, etc.

5.4 Groundwater Control and Earthwork

Based on the available subsurface information, we anticipate that groundwater control during foundation and/or utility excavations can be performed using submersible pumps. All dewatering should be performed in accordance with local, State, Federal, and Port Authority regulations.

For soils excavation, the Contractor should be aware that slope height, slope inclination, or excavation depth should in no case exceed those specified in local, state, or federal safety regulations such as OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations. Note that during construction, rain water and surface run-off will collect in the excavation. Neighboring structures with below-grade levels deeper than the proposed excavation, including the existing Terminal C building, could experience water infiltration. Therefore, the contractor should berm the sloped excavation perimeter to limit runoff, and should have a temporary sump available at all times to evacuate any water that may enter the excavation.

5.5 Taxi-way Apron Re-construction

Based on the laboratory-measured CBR value of subsurface material collected from the Fill stratum from borings B-05 and B-06, near the existing taxi-way concrete apron and per

[1] New York City Building Code
[2] 2012 International Building Code

the guidance set forth by NAVFAC DM 5.4, we recommend that new PCC pavement be designed for a subgrade of CBR 20 and a subgrade modulus of 225 pci for pavement subgrade design, provided that the subgrade is compacted to a firm and stable consistency and to 95 percent of the maximum dry density as determined by ASTM D1557. Any soft spots should be replaced with granular Fill per recommendations below. The subgrade should be prepared in accordance with the earthwork specification for the project under supervision of a GZA qualified geotechnical engineer.

We recommend an expansion joint between the new pad and the existing pavement. Flexible connections are recommended between utilities located below the apron.

5.6 Delta Airlines Terminal C – Escalator Improvements

GZA understands that a maximum net allowable bearing pressure of 810 psf is anticipated for the proposed interior escalator pit footings to be supported on the existing Fill. This takes into account the use of light-weight concrete during construction to minimize the net load increase.

GZA estimates a total settlement of one inch below the proposed interior escalator pits due to the immediate settlement of the Fill layer during construction, and primary and secondary consolidation of the underlying Organic Silt layer (not considering settlement of nearby footings). It is to be noted that no boring data, subsurface explorations, or laboratory analysis of the subsurface profile in the direct vicinity of the proposed footings was available or provided by GZA. Data from the nearby exterior Terminal C boring logs (B-03 and B-04) performed by GZA during this exploration program was used for our settlement analysis. Expected settlement will be based on actual subsurface conditions, as well as the settlement of the nearby foundations of the existing building.

The nearby foundations of the existing building will contribute to the settlement at the proposed escalator pits since the bearing influence zones overlap. We anticipate global settlement due to the existing structure and that the foundation(s) will settle 'together' following construction.

The construction should include a bond breaker separating the proposed escalator pit foundations and the existing column footings to limit differential settlement. Gaps and compressible fill between existing and new foundations are also recommended.

We recommend that the escalator units be equipped with mechanical leveling or jacking in the future in the event of undesired subsidence or differential settlement affecting the functionality of the equipment. Escalator manufacturers typically include leveling systems as part of their package.

5.7 Corrosion Potential

Two soil samples were collected from the fill layer (one composite sample from B-01 within the Terminal D addition footprint from a depth of 3 to 9 feet bgs, and one composite sample from B-04 within the Terminal C addition footprint from a depth of 1 to 7 feet bgs) were analyzed to determine the electro-chemical properties of the subsurface soils.

The sulfate content was determined to be 579 parts per million (ppm) or 0.0579 percent by weight in B-01 and 158 ppm or 0.0158 percent by weight in B-04. This falls in the

negligible corrosion to concrete category in Table 4.3.1 of the ACI Building Code 318/318R for concrete exposed to sulfate containing solutions. Exposure to seawater is equivalent to moderate sulfate exposure. The chloride content was not detected in both borings, indicating corrosion due to chloride content to steel or concrete is not a concern.

A pH of 7.4 and 8.13 was measured in both samples. Soils usually have a pH range of 5 to 8, and values in this range are not considered to be the dominant variable affecting corrosion rates. More acidic soils (pH less than 5), however, represent a serious corrosion/degradation risk to common construction materials such as steel and concrete. In general, the test results indicate that pH is not of significant concern affecting corrosion potential of steel.

The electrical resistivity of the soil sample was measured to be 1,000 ohm-cm in B-01 and 3,000 ohms-cm in B-02. The criteria given in Table 2-1 of U.S. Department of Defense Unified facilities Criteria (UFC 3-570-02A, dated March 1, 2005) indicate that the Fill soils have moderate to severe corrosive potential for uncoated steel.

Based on the laboratory analysis results, fill soils present a mild to severe corrosivity potential for cast iron alloys and steel. GZA recommends complete removal of urban fill soils if it is to remain in-place adjacent to (directly below or on the side of) utilities. GZA considered corrosion of pipe piles to be used at Terminal D and assumed up to 1/16 inch loss of steel due to corrosion. Even with this potential loss of steel, the recommended pipe piles will provide sufficient capacity to resist proposed loads. As such, protective coating is not considered further by us for the piles.

Further, for concrete to be exposed to urban fill soil and/or seawater, we would recommend the use of Type II Portland cement to decrease the permeability of the concrete, to limit sulfate corrosion, and limit steel rebar corrosion.

The test results should be reviewed by the Utility, Utility Representative or the precast splice vault supplier to determine if additional or other special corrosion protection is needed for any or all below grade pipe line elements.

Other sources of potential corrosion not included in our scope, including ground water chemistry and stray electric currents, may need to be considered by the Designer. Our present scope did not include testing or evaluation of sources of stray currents within the area of the site. Finally, we have not tested groundwater for potential corrosive elements.

6 CONSTRUCTION CONSIDERATIONS

New piles should be installed at least 5 feet away from the existing piles. Pre-drilling through the fill may be necessary to effectively drive the piles through obstructions within the fill and to minimize noise and vibrations during pile driving. We recommend that the annular space between a pre-drilled hole and installed pile be completely filled with flowable fill or lean concrete.

6.1 Excavation, Subgrade Preparation, and Backfill

Existing utilities and asphalt materials should be completely removed from within the proposed additions and apron pavement footprint. Removed materials should be disposed

offsite in accordance with any environmental regulations. Over excavations should be backfilled with structural (granular) fill.

The recommendations herein are for shallow foundation areas (Terminal C addition), apron pavement subgrade, and utility trenches.

Following the removal of asphalt and excavation to achieve slabs, foundations, or pavement subgrades, the subgrade should be proof rolled to a stable and firm consistency with a minimum of six passes of a double drum roller (with a minimum static drum weight of 10,000 pounds capable of at least 15,000 pounds of dynamic force) to the satisfaction of the onsite geotechnical engineer. Areas of unstable ground observed during proof-compaction should be over-excavated until the exposed ground is stable and firm. The over-excavated soils should be replaced with compacted granular fill, or lean concrete (concrete with f'c < 2,000 psi). Fill should not be placed over frozen soil.

The final six inches of excavation should be performed with a smooth-edged blade attached to the bucket of the excavator, or by hand shoveling any loose disturbed material over the bearing layer.

Final excavations should not be made until the areas are ready for fill or concrete placement. Footing subgrade soils should be proof-compacted prior to fill or concrete placement with at least six passes of a large vibratory plate compacter. The contractor may choose to protect the subgrade from disturbance with either 6-inches of DGABC in compliance with Specification Section 32 22 31, Aggregate Base Course; 4-inches of ¾-inch Crushed Stone, or 2-inches of lean concrete. If ¾-inch Crushed Stone is placed in thicknesses greater than 4 inches, it should be wrapped in non-woven filter fabric such as Mirafi 140N.

Compacted structural fill placed below the foundations, floor slab, and pavement areas should consist of clean, granular fill placed on proof-rolled subgrade. The fill should be compacted to at least 95 percent of its maximum dry density, as determined by the Modified Proctor Test (ASTM D1557). The gradation requirements for the fill material are presented in Table 1. The recommended maximum loose lift thickness of fill and minimum number of passes of compaction equipment are given in Table 2. Lift thicknesses should be adjusted as required to achieve the minimum compaction requirements. We recommend performing at least one gradation and one moisture-density test per each 100 cubic yards of fill, or a minimum of three (3) tests per borrow source.

A minimum thickness of six inches of DGABC in compliance with Specification Section 32 22 31, Aggregate Base Course is recommended as bedding material beneath concrete slabs and utilities with a diameter of up to one foot. Eight inches of this DGABC is recommended for utilities with a diameter of up to three feet, and twelve inches for larger utilities. The maximum grain size should not exceed 1/10 of the maximum diameter of the utility. The DGABC bedding should be nominally compacted with a hand-operated vibratory plate or light roller. In general, GZA recommends that the minimum compaction limits for utilities are 95 percent of the maximum dry density by ASTM D 1557 (Modified Proctor).

All fill should be free from ice, snow, roots, sod, rubbish, and other deleterious or organic matter. The Contractor should reduce or stop drum vibration if pumping or weaving of the subgrade is observed.

6.2 Temporary Excavation Support

Temporary excavation support adjacent to neighboring structures may be required to facilitate the proposed grade beam and pile cap construction at Terminal D. The temporary excavation support system should be designed by the Contractor's Professional Engineer registered in the State of New York and reviewed by GZA and should consider earth pressures, hydrostatic pressures, and any surcharge loading from equipment, materials, and neighboring structures.

6.3 Assessment and Monitoring of Adjacent Structures

Settlement monitoring points should be established on existing neighboring building columns, walls, and foundation units adjacent to the pile installation area and should be monitored during pile installation. Vibration monitoring during pile driving is recommended at the existing adjacent Terminal building D and any other vibration-sensitive structures or utilities within 100 feet of the project site. The maximum allowable peak particle velocity that may be allowed at the monitoring points should be provided by the building or utility owner. If this information is not provided and given the subsurface conditions and considering the adjacent building age and construction, we recommend instituting a maximum allowable peak particle velocity of 2.0 inches per second (ips) for frequencies greater than 40 Hertz and 1.0 ips for frequencies less than 40 Hertz.

7 CONSTRUCTION SERVICES

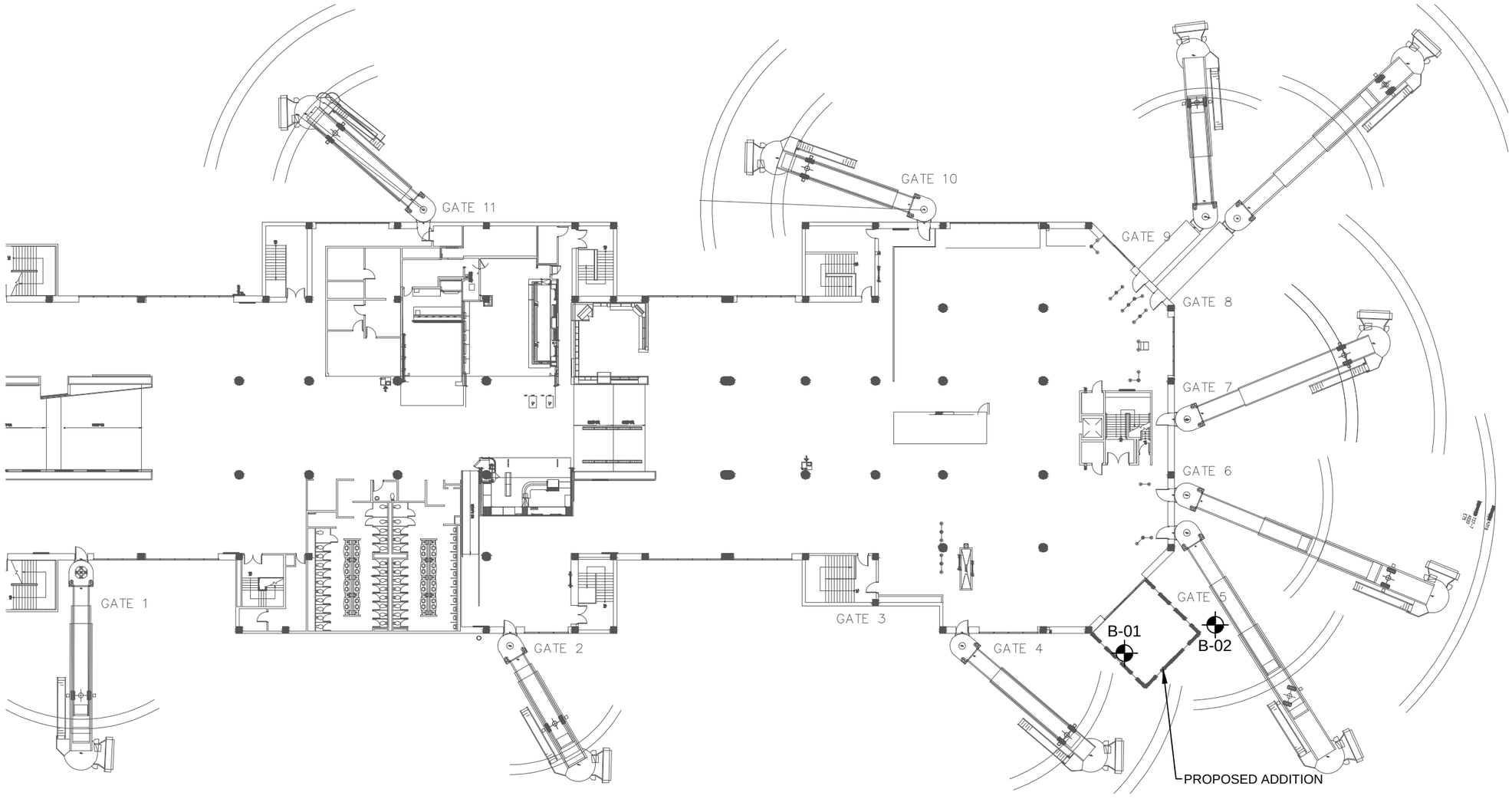
In accordance with the NYCBC, special inspection of pile installation must be provided by a qualified professional engineer. We recommend that GZA be retained to provide this service due to our familiarity with the subsurface conditions at the project site and the project design to date.

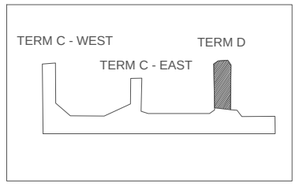
8 LIMITATIONS

This report is subject to the limitations as described in Appendix A.

ATTACHMENTS

FIGURE 2-4: EXPLORATION LOCATION PLANS





KEY PLAN

N

0 20' 40' 80'

APPROXIMATE SCALE IN FEET

LEGEND:

EXPLORATION LOCATION

NOTES:

1. BASE MAP DEVELOPED FROM PLAN PROVIDED BY BURNS & McDONNELL CONSULTANTS, PC, ENTITLED, "LGA OPTIMIZATION - HOLDROOM LOS, BORING LOCATION MAP, TERMINAL D," DATED 01/27/2014, ORIGINAL SCALE 1" = 16', DRAWING No. SK-01.

2. THE EXPLORATION LOCATIONS WERE APPROXIMATELY DETERMINED BY TAPE MEASUREMENT FROM EXISTING SITE FEATURES. THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

D-145

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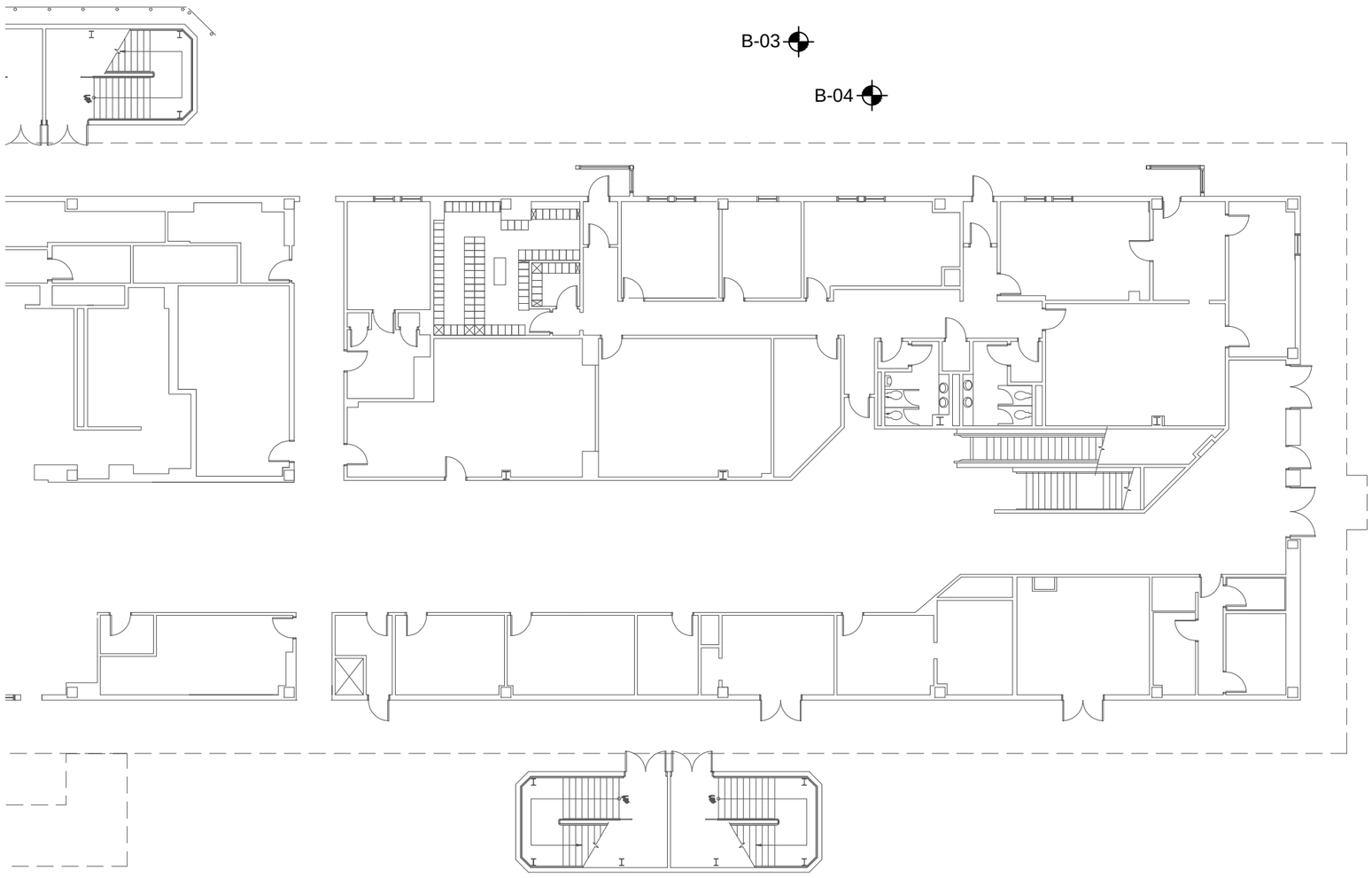
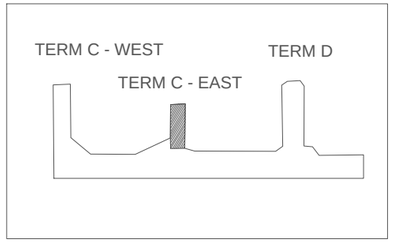
LAGUARDIA AIRPORT TERMINAL C-D
HOLDROOM LEVEL OF SERVICE ADDITIONS
NEW YORK, NEW YORK

SUBSURFACE EXPLORATION PLAN
TERMINAL D

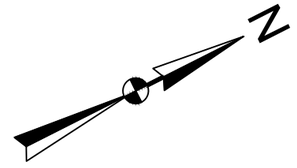
PREPARED BY: GZA GeoEnvironmental of New York Engineers and Scientists www.gza.com		PREPARED FOR: BURNS & McDONNELL CONSULTANTS, PC	
PROJ MGR: AR	REVIEWED BY: AR	CHECKED BY: CAW	FIGURE 2
DESIGNED BY: MY	DRAWN BY: MT	SCALE: 1" = 40'	
DATE: JULY 2015	PROJECT NO. 12.0076327.00	REVISION NO.	SHEET NO.

©2015 – GZA GeoEnvironmental, Inc. GZA–J:\76000's\12.0076327.00\Figures\CAD\76327.00.001.dwg [FIG–2] July 06, 2015 – 1:43pm miguel.torres





KEY PLAN



APPROXIMATE SCALE IN FEET

LEGEND:

EXPLORATION LOCATION

NOTES:

1. BASE MAP DEVELOPED FROM PLAN PROVIDED BY BURNS & McDONNELL CONSULTANTS, PC, ENTITLED "LGA OPTIMIZATION - HOLDROOM LOS, BORING LOCATION MAP, TERMINAL C," DATED 01/27/2014, ORIGINAL SCALE 1" = 8', DRAWING No. SK-02.

2. THE EXPLORATION LOCATIONS WERE APPROXIMATELY DETERMINED BY TAPE MEASUREMENT FROM EXISTING SITE FEATURES. THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

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LAGUARDIA AIRPORT TERMINAL C-D
HOLDROOM LEVEL OF SERVICE ADDITIONS
NEW YORK, NEW YORK

SUBSURFACE EXPLORATION PLAN
TERMINAL C

PREPARED BY: GZA GeoEnvironmental of New York Engineers and Scientists www.gza.com		PREPARED FOR: BURNS & McDONNELL CONSULTANTS, PC	
PROJ MGR: AR	REVIEWED BY: AR	CHECKED BY: CAW	FIGURE 3
DESIGNED BY: MY	DRAWN BY: MT	SCALE: 1" = 20'	
DATE: JULY 2015	PROJECT NO. 12.0076327.00	REVISION NO.	SHEET NO.

©2015 – GZA GeoEnvironmental, Inc. GZA–J:\76000's\12.0076327.00\Figures\CAD\76327.00.001.dwg [FIG–3] July 06, 2015 – 1:43pm miguel.torres

LEGEND:

EXPLORATION LOCATION

NOTES:

1. BASE MAP DEVELOPED FROM PLAN PROVIDED BY BURNS & McDONNELL CONSULTANTS, PC, ENTITLED "TAXIWAY CENTERLINE RELOCATION, BORING LOCATION MAP, APRON PAVEMENT DESIGN," DATED 03/04/2015, ORIGINAL SCALE 1" = 60', DRAWING No. SK-03.

2. THE EXPLORATION LOCATIONS WERE APPROXIMATELY DETERMINED BY TAPE MEASUREMENT FROM EXISTING SITE FEATURES. THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

D-147

NO.	ISSUE/DESCRIPTION	BY	DATE

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LAGUARDIA AIRPORT TERMINAL C-D
HOLDROOM LEVEL OF SERVICE ADDITIONS
NEW YORK, NEW YORK

SUBSURFACE EXPLORATION PLAN
TAXIWAY APRON

PREPARED BY: GZA GeoEnvironmental of New York Engineers and Scientists www.gza.com		PREPARED FOR: BURNS & McDONNELL CONSULTANTS, PC	
PROJ MGR: AR	REVIEWED BY: AR	CHECKED BY: CAW	FIGURE 4
DESIGNED BY: MY	DRAWN BY: MT	SCALE: 1" = 80'	
DATE: JULY 2015	PROJECT NO. 12.0076327.00	REVISION NO.	SHEET NO.

©2015 – GZA GeoEnvironmental, Inc. G:\ZA–U:\76000's\12.0076327.00\Figures\CAD\76327.00.001.dwg [FIG–4] July 06, 2015 – 1:46pm miguel.torres

APPENDICES

APPENDIX B

SOIL BORING LOGS WITH LOG KEY

LOG KEY

GZA
Geo Environmental, Inc.
Engineers and Scientists

BURMISTER SOIL CLASSIFICATION (INORGANIC)

COMPONENT	NAME	PROPORTIONAL TERM	PERCENT BY WEIGHT
MAJOR	GRAVEL, SAND, FINES*		>50
Minor	Gravel, Sand, Fines*	and	35 - 50
		some	20-35
		little	10-20
		trace	0-10

*See identification of fines table.

IDENTIFICATION OF FINES

Material	PI	Atterberg Thread Dia.
SILT	0	Cannot Roll
Clayey SILT	1-5	1/4"
SILT & CLAY	5-10	1/8"
CLAY & SILT	10-20	1/16"
Silty CLAY	20-40	1/32"
CLAY	>40	1/64"

GRADATION DESIGNATION	PROPORTION OF COMPONENT
Fine to coarse	All fractions > 10%
Medium to coarse	<10% fine
Fine to medium	<10% coarse
Coarse	<10% fine and medium
Medium	<10% coarse and fine
Fine	<10% coarse and medium

PLASTIC SOILS

Consistency	Blows/Ft. SPT N-Value
Very Soft	< 2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	>30

GRAVEL & SAND

Density	Blows/Ft. SPT N-Value
Very Loose	< 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

BURMISTER SOIL CLASSIFICATION (ORGANIC)

Fibrous PEAT (Pt) - Lightweight, spongy, mostly visible organic matter, water squeezes readily from sample. Typically near top of deposit.
Fine Grained PEAT (Pt) - Lightweight, spongy, little visible organic matter, water squeezes reqdily from sample. Typically below fibrous peat.
Organic Silt (OL) - Typically gray to dark gray, often has strong H2S odor. Typically contains shells or shell fragments. Lightweight. Usually found near coastal regions. May contain wide range of sand fractions.
Organic Clay (OH) - Typically gray to dark gray, high plasticity. Usually found near coastal regions. May contain wide range of sand fractions. Need organic content test for final identification.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) (ASTM D 2487)

MAJOR DIVISIONS			Group Symbols
Coarse Grained Soils More than 50% of material larger than No. 200 sieve.	Gravel More than 50% larger than No. 4 sieve.	Clean Gravels (Little or no fines)	GW GP
		Gravels with Fines (Appreciable amount of fines)	GM GC
	Sand More than 50% smaller than No. 4 sieve.	Clean Sands (Little or no fines)	SW SP
		Sands with Fines (Appreciable amount of fines)	SM SC
Fine Grained Soils More than 50% of material smaller than No. 200 sieve.		Silts and Clays Liquid Limit <50	ML CL
		Silts and CLays Liquid Limit >50	OL MH CH OH
		Highly Organic Soils	Pt

ABBREVIATIONS

MR = Mud Rotary
HSA = Hollow Stem Auger
SSA = Solid Stem Auger
SS = Split Spoon Sampler
U = Undisturbed Sample (Shelby Tube)
MC = Modified California Sampler
V = Vibracore
M = Macrocore

USCS = Unified Soil Classification System (ASTM D2487)
NYCBC = New York City Building Code
WOR = Weight of Rods
WOH= Weight of Hammer
SPT = Standard Penetration Test (ASTM D1586)
N-Value = Cumulative number of uncorrected blows for the middle two six-inch intervals (blows/foot).

Tv = Field Vane Shear Test (Torvane)
PP = Pocket Penetrometer
PI = Plasticity Index
MC = Moisture Content
CO = Consolidation
UC = Unconfined Compression Test
SI = Sieve Analysis
DS = Direct Shear
PID = Photoionization Detector
ppm = Parts Per Million
REC = Recovery
RQD = Rock Quality Designation
▼ = Measured Water Level

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-01
SHEET: 1 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 4.5
Final Boring Depth (ft.): 102
Date Start - Finish: 5/30/2015 - 6/2/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)			
Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
											0.9	ASPHALT	3.6
		S-1	1-3	24	20	10 34 21 22	55	S-1 : Very dense, dark gray, fine to coarse SAND, some Silt, little Gravel, occasional brick fragments.					
		S-2	3-5	24	16	16 20 17 10	37	S-2 : Dense, dark gray, fine to coarse SAND, some Silt, little Gravel.					
5		S-3	5-7	24	20	40 28 20 14	48	S-3 : Dense, black, fine to coarse SAND, little Silt, little Gravel.					
		S-4	7-9	24	18	19 15 17 11	32	S-4 : Dense, black, fine to coarse SAND, little Silt, little Gravel.					
10		S-5	9-11	24	20	5 7 5 4	12	S-5 : Medium dense, black, fine to coarse SAND, and fine to coarse Gravel.	1				
		S-6	11-13	24	12	3 5 2 3	7	S-6 : Loose, black, fine to coarse SAND, little Silt and fine to coarse Gravel.					
15		S-7	15-17	24	0	1 2 2 2	4	S-7 : No recovery				FILL (7)	
20		S-8	20-22	24	6	2 3 2 4	5	S-8 : Loose, black, fine to coarse SAND, little Gravel, little Silt.					
25		S-9	25-27	24	0	2 2 3 2	5	S-9 : No recovery					
30											28.5	ORGANIC SILTY CLAY (6)	-24.0

REMARKS

1 - Wet sample

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-01

GZA TEMPLATE TEST BORING; 7/6/2015; 10:00:56 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-01
SHEET: 2 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 4.5
Final Boring Depth (ft.): 102
Date Start - Finish: 5/30/2015 - 6/2/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-10	30-32	24	6	WH 1 WH 1	1	S-10 : Very soft, gray, organic Silty CLAY, trace shell.					
35		S-11	35-37	24	20	WR WR WR WR	0	S-11 : Very soft, gray, organic Silty CLAY, trace shell.	2	PP < 0.25 TV = 0.5			
40		S-12	40-42	24	1	WR WR WR WR	0	S-12 : Very soft, gray, organic Silty CLAY, trace shell.					
45		S-13	45-47	24	24	WH WH WH WH	0	S-13 : Very soft, gray, organic Silty CLAY, trace shell.	3	PP < 0.25 TV = 0.75		ORGANIC SILTY CLAY (6)	
50		S-14	50-52	24	24	WR WR WR WR	0	S-14 : Very soft, gray, organic Silty CLAY, trace shell.					
55		S-15	55-57	24	24	WH WH WH WH	0	S-15 : Very soft, gray, organic Silty CLAY, trace shell.					
60											60		-55.5

REMARKS

2 - Pocket Penetrometer (PP) and torvane (TV) readings obtained estimating unconfined compressive strength and undrained shear strength in tsf.
3 - Push casing to 45 feet, losing water.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-01

GZA TEMPLATE TEST BORING; 7/6/2015; 10:00:57 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-01
SHEET: 3 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 4.5
Final Boring Depth (ft.): 102
Date Start - Finish: 5/30/2015 - 6/2/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)			
Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-16	60-62	24	18	WR WR WR WR	0	S-16 : Very soft, gray, organic Silty CLAY, trace shell.		PP < 0.25 TV = 0.5			
65		U-1	65-67	24	17	PUSH		U-1 : Very soft, gray, organic Silty CLAY, trace shell.				ORGANIC SILTY CLAY (6)	
70		S-17	70-72	24	24	WR WR WR WR	0	S-17 : Very soft, gray, organic Silty CLAY, trace shell.					
75		S-18	75-77	24	4	WH 7 12 14	19	S-18 : Very soft, gray, organic Silty CLAY, trace shell.			78		-73.5
80		S-19	80-82	24	18	9 12 15 19	27	S-19 : Medium dense, gray, fine to medium SAND, trace Gravel, trace Silt.				SAND (3a, 3b)	
85		S-20	85-87	24	20	5 14 19 18	33	S-20 : Dense, gray, fine to coarse SAND, trace Gravel, trace Silt.					
90													

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-01

GZA TEMPLATE TEST BORING; 7/6/2015; 10:00:57 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-01
SHEET: 4 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 4.5
Final Boring Depth (ft.): 102
Date Start - Finish: 5/30/2015 - 6/2/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)			
Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-21	90-92	24	24	29 29 44 49	73	S-21 : Very dense, dark gray, fine to coarse SAND, trace Gravel, trace Silt.				SAND (3a, 3b)	
											94		-89.5
95		S-22	95-97	24	24	12 12 19 22	31	S-22 : Dense, brown, CLAY & SILT, trace Sand.				CLAY (4a, 4b)	
100		S-23	100-102	24	20	3 4 4 8	8	S-23 : Stiff, brown, CLAY & SILT, trace Sand.					
											102		-97.5
								End of exploration at 102 feet.	4				
105													
110													
115													
120													

REMARKS

4 - Boring was grouted and patched with concrete upon completion.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-01

GZA TEMPLATE TEST BORING; 7/6/2015; 10:00:57 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-02
SHEET: 1 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 4.5
Final Boring Depth (ft.): 100
Date Start - Finish: 5/28/2015 - 5/29/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
											0.9	ASPHALT	3.6
		S-1	1-3	24	20	54 45 49 35	94	S-1 : Very dense, dark gray, fine to coarse SAND, little Gravel, little Silt, occasional brick fragments.					
		S-2	3-5	24	20	29 40 29 23	69	S-2 : Very dense, black to brown, fine to coarse SAND, little Silt, little fine Gravel.					
5		S-3	5-9	24	18	40 36 38 39		S-3 : Very dense, brown, fine to medium SAND, trace Silt.					
		S-4	7-9	24	20	27 26 27 18	74 53	S-4 : Very dense, black, fine Sand, some Silt, trace Gravel.					
		S-5	9-11	24	6	15 12 13 11	25	S-5 : Medium dense, black, fine to coarse SAND, some Silt.	1				
10		S-6	11-13	24	14	6 4 5 5	9	S-6 : Loose, black, fine SAND, some Silt.				FILL (7)	
15		S-7	15-17	24	11	7 8 5 5	13	S-7 : Medium dense, black, fine to coarse SAND, some Gravel, trace Silt.					
20		S-8	20-22	24	10	1 1 5 5	6	S-8 : Loose, black, fine to coarse SAND, some Gravel, little Silt.			23.5		-19.0
25		S-9	25-27	24	20	1 1 WH 1	1	S-9 : Very soft, gray, organic Silty CLAY, trace shell.	2			ORGANIC SILTY CLAY (6)	
30											30		-25.5

REMARKS

1 - Sample is wet at 9-11 feet.
2 - Pushed casing to 25 feet.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-02

GZA TEMPLATE TEST BORING; 7/6/2015; 10:00:59 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-02
SHEET: 2 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 4.5
Final Boring Depth (ft.): 100
Date Start - Finish: 5/28/2015 - 5/29/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)			
Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-10	30-32	24	18	WH WH WH WH	0	S-10 : Very soft, organic Silty CLAY.					
35		S-11	35-37	24	24	WR WR WR WR	0	S-11 : Very soft, organic Silty CLAY.					
40		U-1	40-42	24	12	PUSH		U-1 : Very soft, organic Silty CLAY, trace shell.					
45		S-12	45-47	24	24	WR WR WR WR	0	S-12 : Very soft, organic Silty CLAY, trace shell.				ORGANIC SILTY CLAY (6)	
50		S-13	50-52	24	24	WR WR WR WR	0	S-13 : Very soft, organic Silty CLAY, trace shell.					
55		S-14	55-57	24	24	WR WR WR WR	0	S-14 : Very soft, organic Silty CLAY, trace shell.					
60											60		-55.5

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-02

GZA TEMPLATE TEST BORING; 7/6/2015; 10:00:59 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-02
SHEET: 3 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 4.5
Final Boring Depth (ft.): 100
Date Start - Finish: 5/28/2015 - 5/29/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)			
Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-15	60-62	24	24	WR WR WR WR	0	S-15 : Very soft, organic Silty CLAY, trace shell.					
65		S-16	65-67	24	24	WR WR WR WR	0	S-16 : Very soft, organic Silty CLAY, trace shell.				ORGANIC SILTY CLAY (6)	
70		S-17	70-72	24	18	WR WR WR WR	0	S-17 : Very soft, organic Silty CLAY, trace shell.					
75		S-18	75-77	24	22	WR WR WR WR	0	S-18 : Very soft, organic Silty CLAY, trace shell.			78.5		-74.0
80		S-19	80-82	24	12	8 11 14 11	25	S-19 : Medium dense, gray, fine to medium SAND, trace Silt.				SAND (3a, 3b)	
85		S-20	85-87	24	24	8 14 16 17	30	S-20 : Medium dense, gray, fine to medium SAND, trace Silt.					
90													

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-02

GZA TEMPLATE TEST BORING; 7/6/2015; 10:00:59 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-02
SHEET: 4 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 4.5
Final Boring Depth (ft.): 100
Date Start - Finish: 5/28/2015 - 5/29/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)			
Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-21	90-92	24	14	15 20 29 31	49	S-21 : Dense, fine to medium SAND, trace Gravel, trace Silt.				SAND (3a, 3b)	
											93		-88.5
95		S-22	95-97	24	22	4 8 10 12	18	S-22 : Very stiff, CLAY & SILT, trace Sand.				CLAY (4b, 6)	
		S-23	98-100	24	24	1 1 2 4	3	S-23 : Soft, CLAY & SILT, trace Sand.	3	PP < 0.5 TV = 1			
100											100		-95.5
								End of exploration at 100 feet.	4				
105													
110													
115													
120													

REMARKS

3 - Pocket Penetrometer (PP) and torvane (TV) readings obtained estimating unconfined compressive strength and undrained shear strength in tsf.
4 - Boring was grouted and patched with concrete upon completion.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-02

GZA TEMPLATE TEST BORING; 7/6/2015; 10:00:59 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-03
SHEET: 1 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 6.2
Final Boring Depth (ft.): 102
Date Start - Finish: 5/22/2015 - 5/23/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
											0.8	ASPHALT	5.4
		S-1	1-3	24	22	26 24 23 21	47	S-1 : Dense, black, fine to coarse SAND, little Gravel, trace Silt.					
		S-2	3-5	24	18	22 20 21 21	41	S-2 : Dense, black, fine to coarse SAND, little Gravel, trace Silt.					
5		S-3	5-7	24	24	32 17 13 19	30	S-3 : Dense, black to brown, fine to coarse SAND, some fine Gravel, some Silt.					
		S-4	7-9	24	24	17 17 18 10	35	S-4 : Dense, black, fine to coarse SAND, little Gravel, little Silt, petroleum like odor.					
10		S-5	9-11	24	16	10 9 4 3	13	S-5 : Medium dense, black, fine to coarse SAND, little Gravel, little Silt.					
		S-6	11-13	24	20	3 5 12 14	17	S-6 : Medium dense, black, fine to coarse SAND, little Gravel, little Silt.	1				
15		S-7	15-17	24	4	2 4 4 2	8	S-7 : Loose, fine to coarse SAND, some Gravel.				FILL (7)	
20		S-8	20-22	24	10	1 2 2 2	4	S-8 : No recovery	2				
25		S-9	25-27	24	18	1 1 WH 1	1	S-9 : Very loose, dark brown, fine to coarse SAND, and fine to coarse Gravel, trace Silt.					
30											28.5	ORGANIC SILTY CLAY (6)	-22.3

REMARKS

1 - Start to use mud, drive casing to 15 feet.
2 - Push casing to 20 feet.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-03

GZA TEMPLATE TEST BORING; 7/6/2015; 10:01:01 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-03
SHEET: 2 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 6.2
Final Boring Depth (ft.): 102
Date Start - Finish: 5/22/2015 - 5/23/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-10	30-32	24	12	Wh 18/1"	R	S-10 : Very soft, gray, organic Silty CLAY.					
35		S-11	35-37	24	24	WH WH WH WH	0	S-11 : Very soft, gray, organic Silty CLAY.	3	PP < 0.25 TV = 1.5			
40		U-1	40-42	24	24	PUSH		U-1 : Very soft, gray, organic Silty CLAY.					
45		S-12	45-47	24	24	WR WR WR WR	0	S-12 : Very soft, gray, organic Silty CLAY.		PP < 0.25 TV = 1.0		ORGANIC SILTY CLAY (6)	
50		S-13	50-52	24	24	WR WR WR WR	0	S-13 : Very soft, gray, organic Silty CLAY.		PP < 0.25 TV = 1.0			
55		S-14	55-57	24	18	WH WH WH WH	0	S-14 : Very soft, gray, organic Silty CLAY.					
60											60		-53.8

REMARKS

3 - Pocket Penetrometer (PP) and torvane (TV) readings obtained estimating unconfined compressive strength and undrained shear strength in tsf.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-03

GZA TEMPLATE TEST BORING; 7/6/2015; 10:01:01 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-03
SHEET: 3 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 6.2
Final Boring Depth (ft.): 102
Date Start - Finish: 5/22/2015 - 5/23/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)			
Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-15	60-62	24	24	WH WH WH WH	0	S-15 : Very soft, gray, organic Silty CLAY, trace shell.					
65		S-16	65-67	24	24	WR WR WR WR	0	S-16 : Very soft, gray, organic Silty CLAY, trace shell.					
												ORGANIC SILTY CLAY (6)	
70		S-17	70-72	24	24	WR WR WR WR	0	S-17 : Very soft, gray, organic Silty CLAY, trace shell.					
75		S-18	75-77	24	24	WR WR WR WR	0	S-18 : Very soft, gray, organic Silty CLAY, trace shell.					
											78.5		-72.3
80		S-19	80-82	24	18	9 15 20 17	35	S-19 : Dense, gray, fine to medium SAND, trace Silt.					
												SAND (3a)	
85		S-20	85-87	24	12	9 16 17 16	33	S-20 : Dense, gray-brown, fine to medium SAND, trace Silt, trace Gravel.					
90													

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-03

GZA TEMPLATE TEST BORING; 7/6/2015; 10:01:01 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-03
SHEET: 4 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 6.2
Final Boring Depth (ft.): 102
Date Start - Finish: 5/22/2015 - 5/23/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)			
Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-21	90-92	24	12	13 12 17 15	29	S-21 : Medium dense, gray, fine to medium SAND, trace Silt.				SAND (3a)	
											93		-86.8
95		S-22	95-97	24	24	2 2 5 5	7	S-22 : Loose, brown, CLAY & SILT, trace Sand.				CLAY (4c, 6)	
100		S-23	100-102	24	24	1 1 WH 6	1	S-23 : Loose, brown, CLAY & SILT, trace Sand.					
											102		-95.8
								End of exploration at 102 feet.	4				
105													
110													
115													
120													

REMARKS

4 - Boring was grouted and patched with concrete upon completion.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-03

GZA TEMPLATE TEST BORING; 7/6/2015; 10:01:01 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-04
SHEET: 1 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 6.1
Final Boring Depth (ft.): 117
Date Start - Finish: 5/23/2015 - 5/25/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
											0.8	ASPHALT	5.3
		S-1	1-3	24	20	34 20 18 19	38	S-1 : Dense, dark gray, fine to coarse SAND, little Gravel, little Silt and Clay.					
		S-2	3-5	24	18	28 20 19 17	39	S-2 : Dense, gray, fine to coarse SAND, little Gravel, little Silt.					
5		S-3	5-7	24	22	50 40 29 33	69	S-3 : Very dense, gray, fine to coarse SAND, little Gravel, little Sand.					
		S-4	7-9	24	20	19 17 50 40	67	S-4 : Dense, black, fine to coarse SAND, little Silt and Clay, little Gravel, petroleum odor.					
		S-5	9-11	24	14	20 10 6 5	16	S-5 : Medium dense, black, fine to coarse SAND, some Gravel, little Silt.	1				
10		S-6	11-13	20	20	22 37 49 100/2"	86	S-6 : Very dense, black, fine to coarse SAND, some Silt and Clay and little Gravel.					
												FILL (7)	
15		S-7	15-17	24	1	6 4 2 4	6	S-7 : Loose, black, fine to medium GRAVEL, little Sand.	2				
20		S-8	20-22	24	12	2 2 1 2	3	S-8 : Loose, black, fine to medium GRAVEL, little Sand.	3				
25		S-9	25-27	24	4	1 1 1 1	2	S-9 : Very loose, fine to coarse GRAVEL, some Sand, trace Silt.	4				
											28.5		-22.4
30												ORGANIC SILTY CLAY (6)	

REMARKS

1 - Sample is wet.
2 - Drive casing to 15 feet.
3 - Drive casing to 20 feet.
4 - Push casing to 25 feet.
5 - Push casing to 30 feet.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-04

GZA TEMPLATE TEST BORING; 7/6/2015; 10:01:02 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-04
SHEET: 2 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 6.1
Final Boring Depth (ft.): 117
Date Start - Finish: 5/23/2015 - 5/25/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)			
Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-10	30-32	24	24	WH WH WH 1	0	S-10 : Very soft, dark gray, organic Silty CLAY, trace shell.	5				
35		S-11	35-37	24	24	WH WH WH WH	0	S-11 : Very soft, dark gray, organic Silty CLAY, trace shell.					
40		S-12	40-42	24	12	WH WH WH WH	0	S-12 : Very soft, dark gray, organic Silty CLAY, trace shell.					
45		S-13	45-47	24	24	WR WR WR WR	0	S-13 : Very soft, dark gray, organic Silty CLAY, trace shell.				ORGANIC SILTY CLAY (6)	
50		S-14	50-52	24	24	WR WR WR WR	0	S-14 : Very soft, dark gray, organic Silty CLAY, trace shell.					
55		U-1	55-57	24	24	PUSH		U-1 : Very soft, dark gray, organic Silty CLAY, trace shell.					
60													

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-04

GZA TEMPLATE TEST BORING; 7/6/2015; 10:01:02 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-04
SHEET: 3 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 6.1
Final Boring Depth (ft.): 117
Date Start - Finish: 5/23/2015 - 5/25/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-15	60-62	24	22	WR WR WR WR	0	S-15 : Very soft, dark gray, organic Silty CLAY, trace shell.					
65		S-16	65-67	24	24	WR WR WR WR	0	S-16 : Very soft, dark gray, organic Silty CLAY, trace shell.					
												ORGANIC SILTY CLAY (6)	
70		S-17	70-72	24	14	WR WR WR WR	0	S-17 : Very soft, dark gray, organic Silty CLAY, trace shell.					
75		S-18	75-77	24	24	WR WR WR WR	0	S-18 : Very soft, dark gray, organic Silty CLAY, trace shell.			78		-71.9
80		S-19	80-82	24	18	12 18 18 18	36	S-19 : Dense, dark gray, fine to medium SAND, trace Silt.				SAND (3a)	
85		S-20	85-87	24	10	12 14 17 14	31	S-20 : Dense, dark gray, fine to medium SAND, trace Silt.					
90											90		-83.9

REMARKS

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-04

GZA TEMPLATE TEST BORING; 7/6/2015; 10:01:03 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-04
SHEET: 4 of 4
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 6.1
Final Boring Depth (ft.): 117
Date Start - Finish: 5/23/2015 - 5/25/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-21	90-92	24	12	10 13 13 12	26	S-21 : Dense, dark gray, fine to medium SAND, trace Silt.				SAND (3a, 3b)	
											93		-86.9
95		S-22	95-97	24	21	3 5 7 7	12	S-22 : Stiff, red-brown, CLAY & SILT, trace Sand.					
100		S-23	100-102	24	24	1 4 4 8	8	S-23 : Stiff, brown, CLAY & SILT, trace Sand.					
105		S-24	105-107	24	24	1 3 5 8	8	S-24 : Stiff, brown, CLAY & SILT, trace Sand.				CLAY (4b)	
110		S-25	110-112	24	24	3 5 6 8	11	S-25 : Stiff, brown, CLAY & SILT, trace Sand.					
115		S-26	115-117	24	22	3 6 13 15	19	S-26 : Stiff, brown, CLAY & SILT, trace Sand.					
											117		-110.9
								End of exploration at 117 feet.	6				
120													

REMARKS

6 - Boring was grouted and patched with concrete upon completion.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-04

GZA TEMPLATE TEST BORING; 7/6/2015; 10:01:03 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-05
SHEET: 1 of 1
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 4.2
Final Boring Depth (ft.): 11
Date Start - Finish: 5/28/2015 - 5/28/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
											0.8	ASPHALT	3.4
		S-1	1-3	24	16	20 14 15 15	29	S-1 : Medium dense, light brown, fine to medium SAND, trace Gravel, trace Silt.	1				
		S-2	3-5	24	20	30 66 41 28	R	S-2 : Very dense, gray to black, fine to coarse SAND, some Gravel, little Silt and Clay.					
5		S-3	5-7	24	20	24 23 30 23	53	S-3 : Very dense, gray to black, fine to coarse SAND, some Gravel, little Silt and Clay, petroleum odor.				FILL (7)	
		S-4	7-9	24	20	8 10 11 11	21	S-4 : Medium dense, dark gray, fine to coarse SAND, little Gravel, little Silt and Clay.					
10		S-5	9-11	24	24	13 13 8 7	21	S-5 : Medium dense, dark gray, fine to coarse SAND, little Gravel, little Silt and Clay.			11		-6.8
								End of exploration at 11 feet.	2				
15													
20													
25													
30													

REMARKS

1 - Sample is wet.
2 - Boring was grouted and patched with concrete upon completion.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-05

GZA TEMPLATE TEST BORING; 7/6/2015; 10:01:04 AM

TEST BORING LOG

GZA GeoEnvironmental, Inc
Engineers and Scientists

Burns & McDonnell, P.C.
Delta Airlines
LGA Terminal C & D, LOS Additions
Flushing, NY

EXPLORATION NO.: B-06
SHEET: 1 of 1
PROJECT NO: 12.0076327.00
REVIEWED BY:

Logged By: M. Yang
Drilling Co.: Aquifer Drilling and Testing, Inc.
Foreman: C. Chaillou

Type of Rig: Truck
Rig Model: CME-75
Drilling Method: MR

Boring Location: See Plan
Ground Surface Elev. (ft.): 2.5
Final Boring Depth (ft.): 11
Date Start - Finish: 5/28/2015 - 5/28/2015

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
											0.8	ASPHALT	1.7
		S-1	1-3	24	18	62 55 52 26	R	S-1 : Very dense, gray to black, fine to coarse SAND, little Silt and Clay, little Gravel.					
		S-2	3-5	24	16	36 63 49 58	R	S-2 : Very dense, gray to black, fine to coarse SAND, little Silt and Clay, little Gravel.					
5		S-3	5-7	24	10	5 4 4 3	8	S-3 : Loose, black, fine to coarse SAND, little Gravel, little Silt, petroleum odor.				FILL (7)	
		S-4	7-9	24	2	3 2 2 3	4	S-4 : Loose, black, fine to coarse SAND, some Gravel, trace Silt, petroleum odor.	1				
		S-5	9-11	24	12	13 6 4 7	10	S-5 : Medium dense, black, fine to coarse SAND, little Gravel, little Silt.					
10											11		-8.5
								End of exploration at 11 feet.	2				
15													
20													
25													
30													

REMARKS

1 - Sample wet from 7 -9 feet.
2 - Boring was grouted and patched with concrete upon completion.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: B-06

GZA TEMPLATE TEST BORING; 7/6/2015; 10:01:04 AM

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VRH Construction Corp.
320 Grand Avenue
Englewood, NJ 07631-4355

Attn: Mr. Steve Haussel

April 23, 2013

RE: W.O. 6636.01
GEOTECHNICAL DATA REPORT
DELTA AIR LINES – TERMINAL C STAIR TOWERS
LA GUARDIA AIRPORT
QUEENS, NEW YORK

Dear Mr. Haussel:

In accordance with our proposal dated September 27, 2012, Tectonic Engineering & Surveying Consultants, P.C. (Tectonic) performed a subsurface investigation consisting of test borings and laboratory testing for the above referenced project. The following provides brief descriptions of the performed investigation and the findings. Logs of the test borings and the results of the laboratory testing are attached.

1.0 TEST BORINGS

The subsurface investigation consisted of the performance of two test borings, designated as B-1 and B-1, which were performed at locations selected by others. The locations of the borings are shown on the attached Boring Location Plan, Figure 1.

The borings were performed by Craig Test Boring Company, Inc. between the dates of April 3 and April 5, 2013 utilizing a CME truck mounted rig equipped with an auto hammer. After penetrating the asphalt and/or concrete surface cover, the borings were hand augered to a depth of 6 feet. Thereafter, the borings were advanced utilizing a 3-7/8 inch diameter tricone bit and mud rotary drilling techniques to total depths of 120 feet. Four inch I.D. driven casing was used to stabilize fill soils and the upper zone of the native soils. Casing was driven to a depth of 35 feet at boring B-1 and 25 feet at boring B-2. Standard Penetration Testing (SPT) and split-spoon sampling were performed continuously from a depth of 6 feet to 12 feet and at 5-foot intervals thereafter.

The performance of the borings was observed on a full-time basis by a geotechnical engineer. Logs of the borings are included in Appendix I.

2.0 LABORATORY TESTING

Laboratory testing consisted of the performance of two gradation analyses, six Atterberg limits determinations, and four in-situ moisture content tests. The gradation analyses were performed in accordance with the procedures outlined in ASTM Standard D422. The Atterberg limits testing were performed in accordance with ASTM Standard D4318, and the moisture content tests were performed in accordance with ASTM Standard D2216. Laboratory test results are included in Appendix II.

3.0 SUBSURFACE CONDITIONS

The encountered subsurface conditions consist, in turn, of a surface layer of concrete, or a surface layer of asphalt overlying concrete; fill soils that extend to depths ranging from roughly 22 to 25 feet; and native high plasticity clay and silt soils that contain inter-bedded sand layers below a depth of approximately 80 feet. General descriptions of the subsurface conditions are provided below. More detailed descriptions are provided on the boring logs included in Appendix I.

3.1 Pavement

The pavement at boring B-1 was measured to consist of a 12-inch thick layer of asphalt overlying an 18-inch thick layer of concrete. At boring B-2, the pavement consists of a single 18-inch thick layer of concrete.

3.2 Fill

Fill consisting predominately of black or dark brown coarse to fine sand with trace amounts of silt, and varying amounts of gravel underlie the pavement and extend to a depth of 25.3 feet at boring B-1 and to a depth between 22 and 25 feet at boring B-2. A sample obtained at a depth of 6 feet at boring B-1 consisted of an approximately 8-inch thick layer of tar. Standard Penetration Test (SPT) N-values within the fill were variable ranging from 3 blows per foot (bpf) to split spoon sampler refusal, which was defined as over 100 blows for less than 6 inches of sampler penetration. However, the N-values generally indicate that the soils are in a medium dense state to a depth of approximately 12 feet, and that the deeper fills are in a loose to very loose state. The higher N-values are attributed to the presence of oversized materials within the fill. The fill has the New York City Code (Code) class of 7.

3.3 Native Soils

High plasticity clay and silt soils underlie the fill and extend to a depth of approximately 80 feet at both boring locations where they become inter-bedded with sand soils. The high plasticity clays and silts often contain minor amounts of fine sand, and occasionally, trace shell fragments.

Based on the performed laboratory testing, the fine grained soils have plasticity indices ranging from 38 to 51, and liquid limits ranging from 73 to 86. The natural water contents range from 64 to 91 percent. Based on the identified plasticity indices and liquid limits, the fine grained soils have the Unified Soil Classification of CH or MH.

SPT N-values within the fine grained soils were typically zero, with the sampler advancing under the weight of the rods or the combined weight of the rods and the hammer. This indicates that the high plasticity clay and silt soils typically have a very soft consistency. Exceptions occur where these soils are inter-bedded with the sands. Here, N-values ranged from zero to 33 bpf, which indicate consistencies ranging from very soft to hard. The higher N-values occasionally coincide with clay layers having higher sand contents.

The fine grained soils have Code Class 6 except where they are stiffer, where they have Code Classes 4c or 4b.

The inter-bedded sand layers range from being medium to fine to fine in gradation and they contain from trace amounts of silt to approximately 20 percent silt. SPT N-values in the sand layers ranged from 17 to 48 bpf and indicate that the sands range from being in a medium dense to a dense state.

The inter-bedded sand soils have Code Classes 3a or 3b.

3.4 Groundwater

Due to the introduction of drilling slurry during advancement of the borings, accurate groundwater levels could not be obtained during advancement of the borings. Groundwater was estimated to be at a depth of approximately 4 feet at both boring locations based on the depth that hand auger cuttings became wet. It is noted, however, that the depth to groundwater will vary seasonally, with rainfall, and with tide level. Therefore, groundwater should be anticipated to be encountered at other depths at other times.

4.0 LIMITATIONS

This report has been prepared for the exclusive use of VRH Construction Corporation. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical engineers and geologists practicing in this or similar situations. The interpretation of the field data is based on good judgment and experience. However, no matter how qualified the geotechnical engineer or detailed the investigation, subsurface conditions cannot always be predicted beyond the points of actual sampling and testing. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The data contained in this report are intended for design purposes only. Contractors and others involved in the construction of this project are advised to make an independent assessment of the subsurface conditions for establishing quantities, schedules and construction techniques.

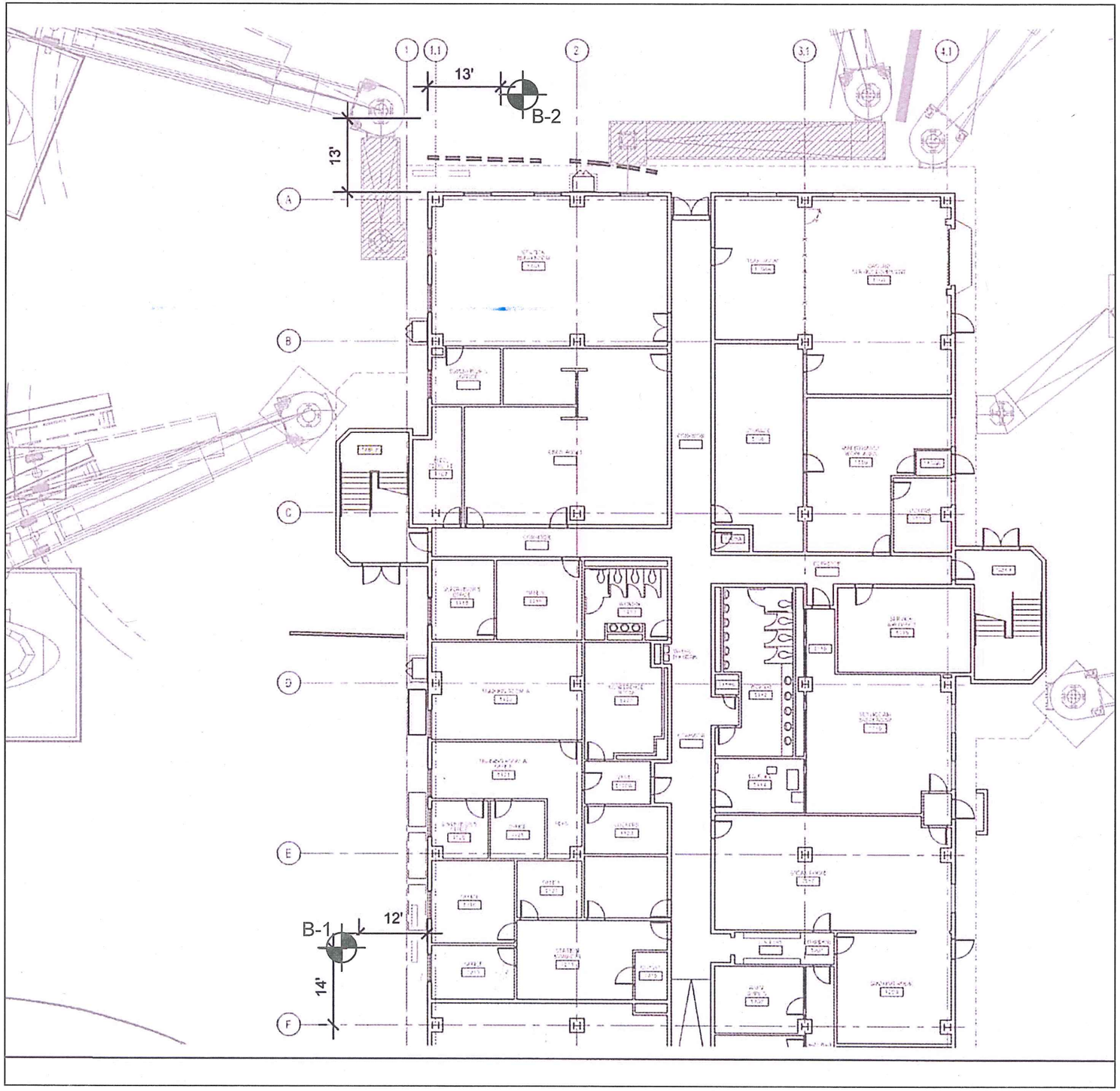
We trust this report will allow you to proceed with the proposed improvements.

Sincerely,

TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C.

George P. Murphy, P.E.
Senior Geotechnical Engineer

Attachments: Boring Location Plan
Boring Logs
Laboratory Test Results



LEGEND

B-1 APPROXIMATE BORING LOCATION

NOTES

1. PLAN BASED ON DRAWING NO. SK-1, ENTITLED, "EXTERIOR EXIT STAIRS, BORING LOCATION LAYOUT", BY CORGAN, DATED 3/29/2012.

2. THE BORING LOCATIONS WERE LOCATED BY MEASURING OFF OF EXISTING SITE FEATURES AND SHOULD BE CONSIDERED APPROXIMATE.

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TECTONIC Engineering & Surveying Consultants P.C.
P.O. Box 37, 70 Pleasant Hill Road
Mountainville, NY 10953
Phone: (845) 534-5959
Fax: (845) 534-5999
www.tectonicengineering.com

BORING LOCATION PLAN

DELTA AIRLINES – TERMINAL C STAIR TOWERS
LAGUARDIA AIRPORT
QUEENS, NEW YORK

Date	Work Order	Drawing No.	Rev
4/16/2013	6636.01	FIGURE 1	0
Scale 1"=20'			

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. **6636.01**
PROJECT: **Delta Air Lines - Terminal C Stair Towers**
LOCATION: **Queens, NY**

BORING No. B-1

SHEET No. 1 of 5

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | 3 7/8" | 6 TO 120'
CASING: | 4" | 0 TO 35'
DIAMOND CORE: | | TO
CME 75 Truck Mounted with Auto Hammer

GROUND WATER

DATE	TIME	DEPTH
4/3		4'

MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: **Clear** TEMP: **30° F**
DEPTH TO ROCK: ---
*CHANGES IN STRATA ARE INFERRED

INSPECTOR: **John Kenney**
DRILLER: **Dave**
SURFACE ELEVATION: ---
DATUM: **See Remarks**
DATE START: **4/3/13**
DATE FINISH: **4/4/13**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) 1 2 3 4 5
PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
1								12" Asphalt 18" Concrete Hand augered from 2.5' to 6.3'
4			B-1			W	SM	Dk bwn m-f SAND, little Silt (FILL) (Class 7) ▼
7	35	6 7 28 33	S-1	8		W		Asphalt Tar
9	38	12 19 19 14	S-2	12		W	SP-SM	Dk bwn m-f SAND, trace Silt, trace f Gravel (FILL) (Class 7)
11	15	12 8 7 5	S-3	18		W	SP-SM	Blk c-f SAND, trace Silt (FILL) (Class 7)
16	3	1 1 2 7	S-4	10		W	SP-SM	Same (FILL) (Class 7)
21	10	3 5 5 3	S-5	6		W	SP-SM	Same (FILL) (Class 7)

LITHOLOGY*

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. **6636.01**
PROJECT: **Delta Air Lines - Terminal C Stair Towers**
LOCATION: **Queens, NY**

BORING No. B-1

SHEET No. 2 of 5

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
26	4	3 3 1 WOH	S-6	8		W	SP-SM CH	Top 4" Same (FILL) (Class 7) Bottom 4" Gy CLAY, little f Sand (Class 6)	
27									
28									
29									
30									
31	0	WOR WOH WOH WOH	S-7	22		W	CH	Same (Class 6)	
32									
33									
34									
35									
36	0	WOR WOR WOR WOR	S-8	20		W	CH	Gy CLAY, trace f Sand	
37									
38									
39									
40									
41	0	WOR WOR WOR WOR	S-9	17		W	MH	Gy CLAY, trace f Sand, trace shells (Class 6)	
42									
43									
44									
45									
46	0	WOR WOR WOR WOR	S-10	10		W	MH	Same (Class 6)	
47									
48									
49									
50									
51	0	WOR WOH WOH WOH	S-11	18		W	MH	Gy SILTY CLAY, trace f Sand (Class 6)	
52									
53									
54									
55									

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. **6636.01**
PROJECT: **Delta Air Lines - Terminal C Stair Towers**
LOCATION: **Queens, NY**

BORING No. B-1

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % ✕ — WATER CONTENT % ⊗ — LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
56	0	WOH WOH WOH WOH	S-12	10		W	CH	Gy CLAY, trace f Sand (Class 6)	
57									
58									
59									
60									
61	0	WOR WOR WOR WOR	S-13	18		W	CH	Same (Class 6)	
62									
63									
64									
65									
66	0	WOR WOR WOR WOR	S-14	18		W	CH	Gy CLAY, trace f Sand, trace shells (Class 6)	
67									
68									
69									
70									
71	0	WOR WOR WOH WOH	S-15	16		W	CH	Same (Class 6)	
72									
73									
74									
75									
76	0	WOR WOR WOR WOR	S-16	14		W	CH	Same (Class 6)	
77									
78									
79									
80									
81	17	WOR 6 11 17	S-17	10		W W	CH SM	Top 4" Same (Class 6) Dk bwn-gy m-f SAND, some Silt, trace shells (Class 3b)	
82									
83									
84									
85									

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. **6636.01**
PROJECT: **Delta Air Lines - Terminal C Stair Towers**
LOCATION: **Queens, NY**

BORING No. B-1

SHEET No. 4 of 5

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL
86	30	9 14 16 15	S-18	22		W	SM	Bwn m-f SAND, little Silt (Class 3b)
87								
88								
89								
90								
91	38	10 18 20 15	S-19	17		W	SM	Bwn c-f SAND, little Silt, little f Gravel (Class 3a)
92								
93								
94								
95								
96	22	7 12 10 9	S-20A S-20B	17		W	SP CH	Bwn m-f SAND, trace Silt (Class 3b) Bottom 1" Bwn CLAY, little f Sand (Class 4b)
97								
98								
99								
100								
101	7	3 4 3 4	S-21	24		W	CH	Same (Class 4c)
102								
103								
104								
105								
106	0	WOR WOR WOH WOH	S-22	22		W	CH	Same (Class 6)
107								
108								
109								
110								
111	0	WOR WOR WOR WOR	S-23	24		W	CH	Bwn CLAY, trace f Sand (Class 6)
112								
113								
114								
115								

LITHOLOGY*

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. **6636.01**
PROJECT: **Delta Air Lines - Terminal C Stair Towers**
LOCATION: **Queens, NY**

BORING No. B-1

SHEET No. 5 of 5

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
116	0	WOR WOR WOH WOH	S-24	23		W	CH	Bwn CLAY, trace f Sand (Class 6)	
121	0	WOR WOH WOH WOH	S-25	24		W	CH	Bwn CLAY, trace f Sand (Class 6)	
								End of Boring at 122'	

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.)
10 20 30 40 50

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. **6636.01**
PROJECT: **Delta Air Lines - Terminal C Stair Towers**
LOCATION: **Queens, NY**

BORING No. B-2

SHEET No. 1 of 5

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**
METHOD OF ADVANCING BORING | DIA. | DEPTH
POWER AUGER: | | TO
ROT. DRILL: | 3 7/8" | 6 TO 120'
CASING: | 4" | 0 TO 25'
DIAMOND CORE: | | TO
CME 75 Truck Mounted with Auto Hammer

GROUND WATER

DATE	TIME	DEPTH
4/4		4'

INSPECTOR: **John Kenney**
DRILLER: **Dave**
SURFACE ELEVATION: ---
DATUM: **See Remarks**
DATE START: **4/4/13**
DATE FINISH: **4/5/13**
MON. WELL ☐ YES ☒ NO
SCREEN DEPTH: --- TO ---
WEATHER: **Overcast** TEMP: **40° F**
DEPTH TO ROCK: ---
*CHANGES IN STRATA ARE INFERRED

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % ⊗ WATER CONTENT % △ LIQUID LIMIT %
10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV. LENGTH (IN.)	RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
1								18" Concrete Hand auger from 18" to 6'	
3			B-1			W	GP-GM	Bwn-blk c-f GRAVEL, and c-f Sand, trace Silt (FILL) (Class 7)	
6	100+	100/0	S-1	0				No Recovery	
9	16	1 6 10 7	S-2	18		W	SP-SM	Dk bwn c-f SAND, some f Gravel, trace Silt, trace organics (FILL) (Class 7)	
11	21	6 12 9 12	S-3	22		W	SM	Dk bwn c-f SAND, some f Gravel, trace Silt (FILL) (Class 7)	
16	8	4 4 4 2	S-4	9		W	SM	Same (FILL) (Class 7)	
21	3	3 1 2 2	S-5	10		W	SM	Same (FILL) (Class 7)	

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC.ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. **6636.01**
PROJECT: **Delta Air Lines - Terminal C Stair Towers**
LOCATION: **Queens, NY**

BORING No. B-2

SHEET No. 2 of 5

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % ✕ WATER CONTENT % ⊗ LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	RECOV.: LENGTH (IN.)	RECOV.: ROD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
26	0	WOH WOH WOH WOH	S-6	19		W	CH	Gy CLAY, trace f Sand, trace shells (Class 6)	
31	0	WOR WOR WOR WOR	S-7	8		W	CH	Same (Class 6)	
36	0	WOR WOR WOH WOH	S-8	10		W	CH	Same, trace shells (Class 6)	
41	02	WOR WOR 2 1	S-9	17		W	MH	Gy CLAY, trace f Sand, trace shells (Class 6)	
46	0	WOR WOR WOR WOR	S-10	14		W	MH	Same (Class 6)	
51	0	WOR WOR WOR WOR	S-11	12		W	MH	Same (Class 6)	

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. 6636.01
PROJECT: Delta Air Lines - Terminal C Stair Towers
LOCATION: Queens, NY

BORING No. B-2

SHEET No. 3 of 5

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % × — WATER CONTENT % ⊗ — LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
56	0	WOR WOR WOR WOR	S-12	10		W	CH	Gy CLAY, trace f Sand, trace shells (Class 6)	
57									
58									
59									
60									
61	0	WOH WOH WOR WOR	S-13	23		W	CH	Gy CLAY, trace f Sand, trace shells (Class 6)	
62									
63									
64									
65									
66	0	WOH WOH WOH WOH	S-14	20		W	CH	Same (Class 6)	
67									
68									
69									
70									
71	0	WOR WOR WOR WOR	S-15	19		W	CH	Same (Class 6)	
72									
73									
74									
75									
76	0	WOR WOR WOR WOR	S-16	21		W	CH	Same (Class 6)	
77									
78									
79									
80									
81	31	6 15 16 14	S-17	24		W	CH	Top 5" Same (Class 6)	
82							SM	Bwn m-f SAND, some Silt (Class 3a)	
83									
84									
85									

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC.ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. **6636.01**
PROJECT: **Delta Air Lines - Terminal C Stair Towers**
LOCATION: **Queens, NY**

BORING No. B-2

SHEET No. 4 of 5

CLIENT: **VRH Construction Corp.**
CONTRACTOR: **Craig Test Boring Co., Inc.**

UNCONFINED COMPRESS. STRENGTH (TONS/FT) ● 1 2 3 4 5
PLASTIC LIMIT % ✕ — WATER CONTENT % ⊗ — LIQUID LIMIT % △ 10 20 30 40 50
STANDARD PENETRATION (BLOWS/FT.) ● 10 20 30 40 50

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
86	40	9 18 22 15	S-18	18		W	SM	Bwn m-f SAND, little Silt (Class 3a)	
91	15	6 7 8 8	S-19	21		W	CH	Bwn CLAY, trace f Sand (Class 4b)	
96	33	7 17 16 20	S-20	20		W	CH	Bwn CLAY, trace m-f Sand (Class 4b)	
101	48	13 24 24 18	S-21	17		W	SP	Bwn f SAND, trace Silt (Class 3a)	
106	27	10 10 17 16	S-22	16		W	SP	Same (Class 3b)	
111	6	WOH 3 3 4	S-23	22		W	CH	Bwn CLAY, trace f Sand (Class 4c)	

DEPTH (FT.): 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

TECTONIC *ENGINEERING & SURVEYING CONSULTANTS P.C.*

PROJECT No. **6636.01**

PROJECT: **Delta Air Lines - Terminal C Stair Towers**

LOCATION: **Queens, NY**

BORING No. B-2

SHEET No. 5 of 5

CLIENT: **VRH Construction Corp.**

CONTRACTOR: **Craig Test Boring Co., Inc.**

DEPTH (FT.)	N OR MIN./FT.	PENETRATION RESISTANCE (BL/6 IN.)	SAMPLES: SAMPLE NUMBER	SAMPLES: RECOV. LENGTH (IN.)	SAMPLES: RECOV. RQD (%)	SAMPLES: MOISTURE	UNIFIED SOIL CLASS.	DESCRIPTION OF MATERIAL	LITHOLOGY*
116	0	WOH WOH WOH WOH	S-24	22		W	CH	Same (Class 6)	
117									
118									
119									
120									
121	0	WOH WOH WOH WOH	S-25	21		W	CH	Same (Class 6)	
122									
123								End of Boring at 122'	
124									
125									
126									
127									
128									
129									
130									
131									
132									
133									
134									
135									
136									
137									
138									
139									
140									
141									
142									
143									
144									
145									

UNCONFINED COMPRESS. STRENGTH (TONS/FT)
1 2 3 4 5

PLASTIC LIMIT % × — WATER CONTENT % ⊗ — LIQUID LIMIT % △
10 20 30 40 50

STANDARD PENETRATION (BLOWS/FT.) ●
10 20 30 40 50

DEPTH (FT.)

REMARKS: B-1 indicates bulk sample 1. Depth to groundwater based on depth that hand auger cuttings became wet. Surface elevation to be determined by others.

BORING LOG 6636-01.GPJ TECTONIC ENG.GDT 4/23/13

Archaeological Monitoring Protocol

ARCHAEOLOGICAL MONITORING PROTOCOL

EAST SIDE RECONFIGURATION
AT LAGUARDIA AIRPORT
Queens Borough
New York City

Project number: 16PRO1506

Prepared for

Delta Air Lines
JFK International Airport
Terminal 4 Trailer Complex
Jamaica, NY 11430

Prepared by

AECOM
John W. Lawrence, Principal Investigator
40 British American Blvd.
Latham, New York 12110

MAY 2017

INTRODUCTION

This archaeological monitoring protocol was requested by the New York State Historic Preservation Office (NYSHPO) in response to submittal of a Phase IA Archaeological Survey Report for the proposed East Side Reconfiguration at LaGuardia Airport, Queens Borough, New York City (Project number 16PRO1506). In the review letter dated April 29, 2016, NYSHPO requested a draft archaeological monitoring protocol in order to continue Section 106 consultation for the proposed undertaking; this document fulfills that request.

ARCHAEOLOGICAL MONITORING OF CONSTRUCTION

An approximately 0.6-acre area of archaeological sensitivity has been defined at the southeast end of the Area of Potential Effects (APE) for the East Side Reconfiguration Project (**Figure 1**). Archaeological monitoring requires that an archaeologist be present on site during any activities that result in the excavation or significant movement of soil below the documented level of fill. For the proposed East Side Reconfiguration Project, the archaeologist on-site will meet the Secretary of the Interior's Professional Qualifications Standards (48 Federal Register [FR] 44738-44739 – Appendix A to 36 CFR 61).

Archaeological monitoring of construction will only be required in the area of sensitivity illustrated in **Figure 1**. Construction activities in all other areas of the East Side Reconfiguration Project will not require archaeological monitoring. Monitoring is also limited to those activities with the potential to disturb soils below the documented level of fill; these activities include but may not be limited to: grading, trenching and excavating. There are no known or documented hazardous waste sites present within the area of archaeological sensitivity. Based on current design plans, construction activities with the potential to affect archaeological deposits are limited to utility trenching. The limits of those activities in the archaeologically sensitive area are depicted in **Figure 2**. As project design advances, other forms of ground disturbance may be necessary within the archaeologically sensitive area. If additional or other forms of disturbance are identified within the sensitive area, NYSHPO will be consulted for concurrence on any proposed changes to the monitoring activity.

Protocol for Monitoring Activities
It will be the responsibility of Delta Air Line's Project Supervisor to inform the archaeological consultant of the date that excavations are set to begin with at least one month notice.

An archaeological monitor[1] will be on-site whenever excavations below the level of documented fill are conducted within the sensitive area, highlighted in **Figure 2**. Known impacts within this area consist of multiple utility trenches that may be excavated as deep as fifteen (15) feet below current grade. It is assumed that the contractor will implement the necessary safety controls to comply with OSHA in the event it is necessary for the archaeological monitor to enter these excavation sites. If multiple trench excavations are taking place simultaneously, steps will be taken to assure monitoring is taking place at all locations where it is required. The archaeological monitor may request that an equipment operator temporarily stop work in order to examine the excavation for artifacts or cultural features. Work stoppages of this nature will average 20 minutes. If the artifact deposit or cultural features appear to be potentially significant, the archaeological monitor will determine if the nature of any discovery made during construction may warrant construction to cease for a period of time necessary to evaluate the extent and significance of the find.

[1] The archaeological monitor will be a professional archaeological qualified under 36 CFR Part 61 and affiliated with the Register of Professional Archaeologists (RPA).

If, in the opinion of the archaeological monitor, the archaeological find is assessed to be potentially significant, they will notify the Contractor Foreman. The Contractor Foreman will order a ***Stop Work*** to the excavator and excavations will be temporarily halted for inspection. It is anticipated that a work stoppage to determine the function and cultural affiliation of artifacts or features may last from 20 minutes up to four (4) hours.

Hand excavations by the archaeological monitors may be required to identify and assess the objects or features. If the objects and/or features are determined by the archaeological consultant not to be significant, this information will be relayed to Delta's Project Supervisor, who will contact the Contractor Foreman to resume work.

If the artifacts and/or features are assessed by the archaeological consultant to be potentially significant archaeological remains, Delta's Project Supervisor, Port Authority of New York & New Jersey (PANYNJ), NYSHPO and the New York City Landmarks Preservation Commission (LPC) will be notified. No work by the Contractor will be allowed to continue within that area until it has been cleared by the archaeological consultant, PANYNJ and the NYSHPO. Up to two full days may be required to conduct sufficient testing to make a recommendation of National Register-eligibility. The extent of the area to be protected will be defined by the archaeological consultant in consultation with Delta's Project Supervisor but will include sufficient space to adequately sample the cultural deposits and stage the work space for further archaeological investigation. If possible evidence of human remains or burial features is encountered, the *State Historic Preservation Office/ New York State Office of Parks, Recreation and Historic Preservation Human Remains Discovery Protocol* (October 2016) will be implemented.

Once a specific excavation has been completed and no significant archaeological remains have been found, the archaeological monitor will recommend that the specific location be declared a ***Cleared Site*** and no further archaeological monitoring will be required. This recommendation will be forwarded to Delta's Project Supervisor, PANYNJ, NYSHPO and LPC. Once all parties have agreed to this recommendation, Delta's Project Supervisor will notify the Contractor and work may proceed on that work site without the presence of archaeological monitors.

Administration

During the course of archaeological monitoring under these contracts, bi-weekly progress reports will be produced by the archaeological consultant and distributed to Delta's Project Supervisor, PANYNJ, the NYSHPO and LPC. The reports will be brief and they will outline the activities carried out during the two-week period. These reports will be submitted by the end of day every other Friday.

In the event that a National Register-eligible archaeological site (or sites) is encountered during construction monitoring, the archaeological consultant will complete a Curation Request Form and consult with the New York State Museum (NYSM) to determine whether the collection falls within the Museum's collection interest. If the NYSM wishes to accept the artifact collection, a Curation Agreement Form will be signed between the PANYNJ and the NYSM and all artifacts collected from the site or sites will be curated according to the standards and guidelines established by the NYSM (www.nysm.nysed.gov). Upon completion of the monitoring project, all artifacts will be delivered to the NYSM (or to any other institution agreed upon by the PANYNJ and the NYSM) for final storage. If the NYSM declines to accept the collection, SHPO and LPC will be consulted to identify an alternate curation facility.

Mitigation

If in the event that an archaeological site is encountered in the archaeologically sensitive area and is determined to be eligible for listing in the National Register of Historic Places, a resource-specific Memorandum of Agreement (MOA) to mitigate the adverse impacts to that resource will be drafted and subsequently reviewed and approved by the NYSHPO. Once the MOA for mitigation has been concurred

upon by all parties, mitigation of the adverse impacts to the sites will be implemented. Construction at the archaeological site will recommence after the fieldwork for the Data Recovery is completed (if mitigation includes excavation) or as specified in the MOA (if alternate mitigation measures are agreed upon).

Reporting

At the conclusion of the archaeological monitoring activity, the archaeological consultant for Delta Air Lines will produce an Archaeological Monitoring Report.

Source: ESRI 2015
Prepared by: AECOM 2015

Figure 1

LaGuardia Airport
DELTA Air Lines Reconfiguration

DELTA

Area of Potential Effects and Area of Archaeological Sensitivity

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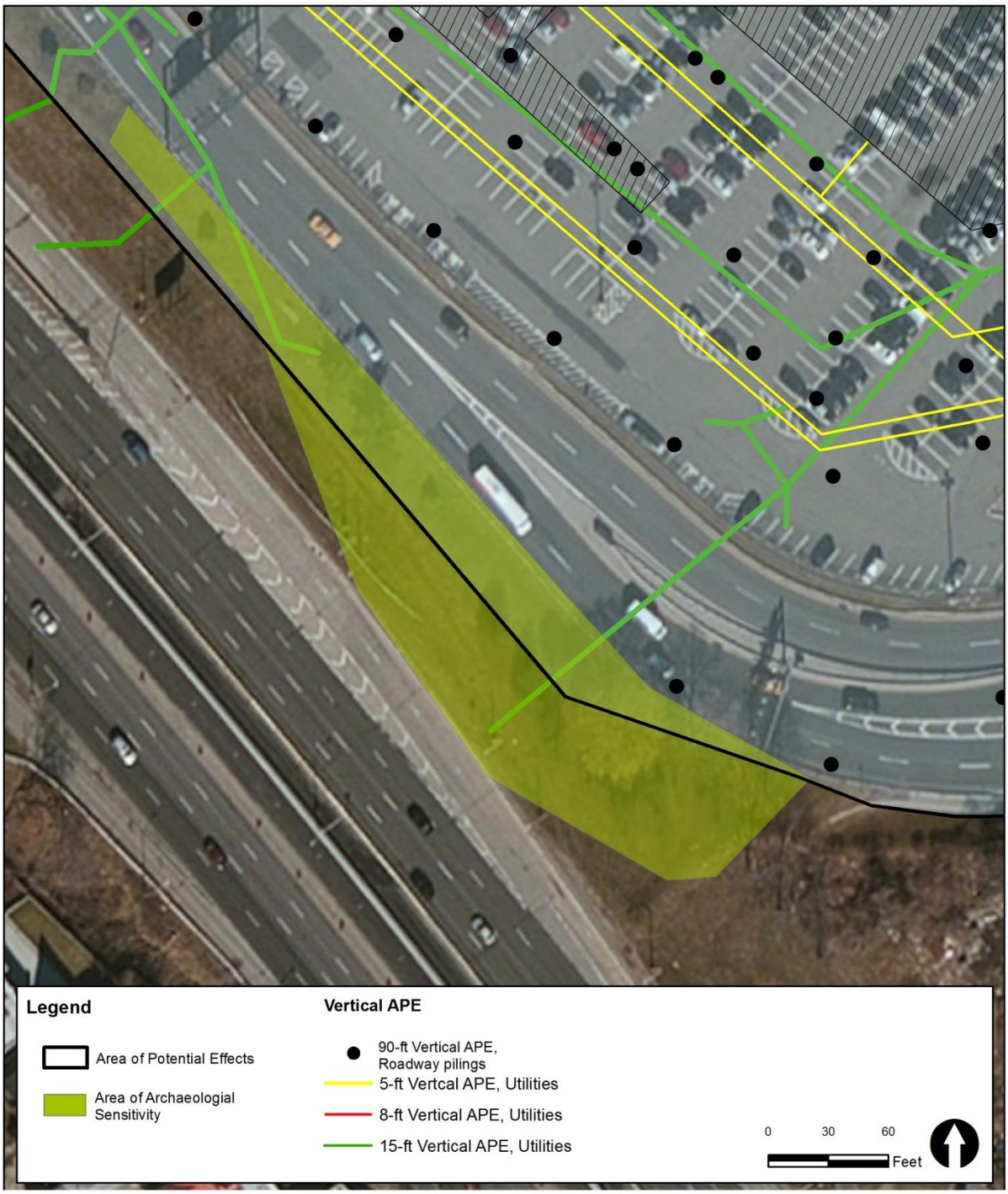

Source: ESRI 2015
Prepared by: AECOM 2016

Figure 2

LaGuardia Airport
DELTA Air Lines Reconfiguration

Known Impacts in Archaeologially Sensitive Area

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Appendix E.
Traffic Study Reports

Construction Traffic

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TRANSPORTATION

1.0 INTRODUCTION

Under the National Environmental Policy Act (NEPA), disruptions of local traffic patterns are considered Social Impacts and require consultation with local transportation officials to evaluate significance. For LaGuardia Airport, located in the Borough of Queens, New York, the March 2014 edition of the *City Environmental Quality Review (CEQR) Technical Manual* provides evaluation criteria for impacts to traffic and transportation from both operations and construction.

According to the *CEQR Technical Manual*, interrelationships between the key technical areas of the transportation system—traffic, transit, pedestrians, and parking—should be taken into account in any assessment. Furthermore, the individual technical areas should be separately assessed to determine whether a project has the potential to adversely and significantly affect a specific area of the transportation system. The *CEQR Technical Manual* states that a preliminary trip generation assessment should be prepared to determine whether a quantified analysis of any technical areas of the transportation system is necessary. Except in unusual circumstances, a further quantified analysis would typically not be needed for a technical area if the proposed development would result in fewer than the following increments:

- 50 peak hour vehicle trips;
- 200 peak hour subway/rail or bus transit riders; or
- 200 peak hour pedestrian trips.

The *CEQR Technical Manual* also states that if the threshold for traffic is not surpassed, it is likely that further parking assessment is also not needed.

The Proposed Action—reconfiguration of Terminals C and D (Delta Air Lines terminals) at LaGuardia Airport (LGA)—is anticipated to add more than 50 new vehicle trips during the typical weekday AM and PM peak hours during construction. As such, further construction traffic analyses are required in order to assess whether potentially significant adverse impacts are expected to occur. The Proposed Action is not expected to add more than 50 peak hour vehicle trips under the Operational condition, nor is it expected to add 200 new peak hour public transit riders, nor more than 200 new pedestrian trips (off Airport premises) during either the Operation or Construction conditions. Therefore, no further transit or pedestrian analyses are required.

2.0 BACKGROUND

2.1 The Proposed Action

Delta Air Lines proposes to reconfigure and replace Terminals C and D and the adjacent aircraft parking apron, landside roadways, and parking facilities on the eastern side of LaGuardia Airport. These facilities would be demolished and replaced with new facilities designed and constructed to meet the latest federal standards for airport safety and security, and to accommodate improved levels of service. The purpose of the Proposed Action is to improve aircraft operations and reduce delays to enable Delta Air Lines to safely and effectively meet passenger demand at acceptable levels of service. The Proposed Action would not result in an increase in aircraft operations or forecast passengers. Further, it does not involve the airfield runways or taxiways, or other terminals or facilities at LaGuardia Airport.

Construction of the terminal building is expected to start in March 2017 with a projected completion date in early 2025.

2.2 Airport Description and Vehicular Access Configuration

As shown in Figure 1, LaGuardia Airport is located north of the Grand Central Parkway and east of 81st Street in Queens, along the waterfront between Bowery Bay and Flushing Bay.

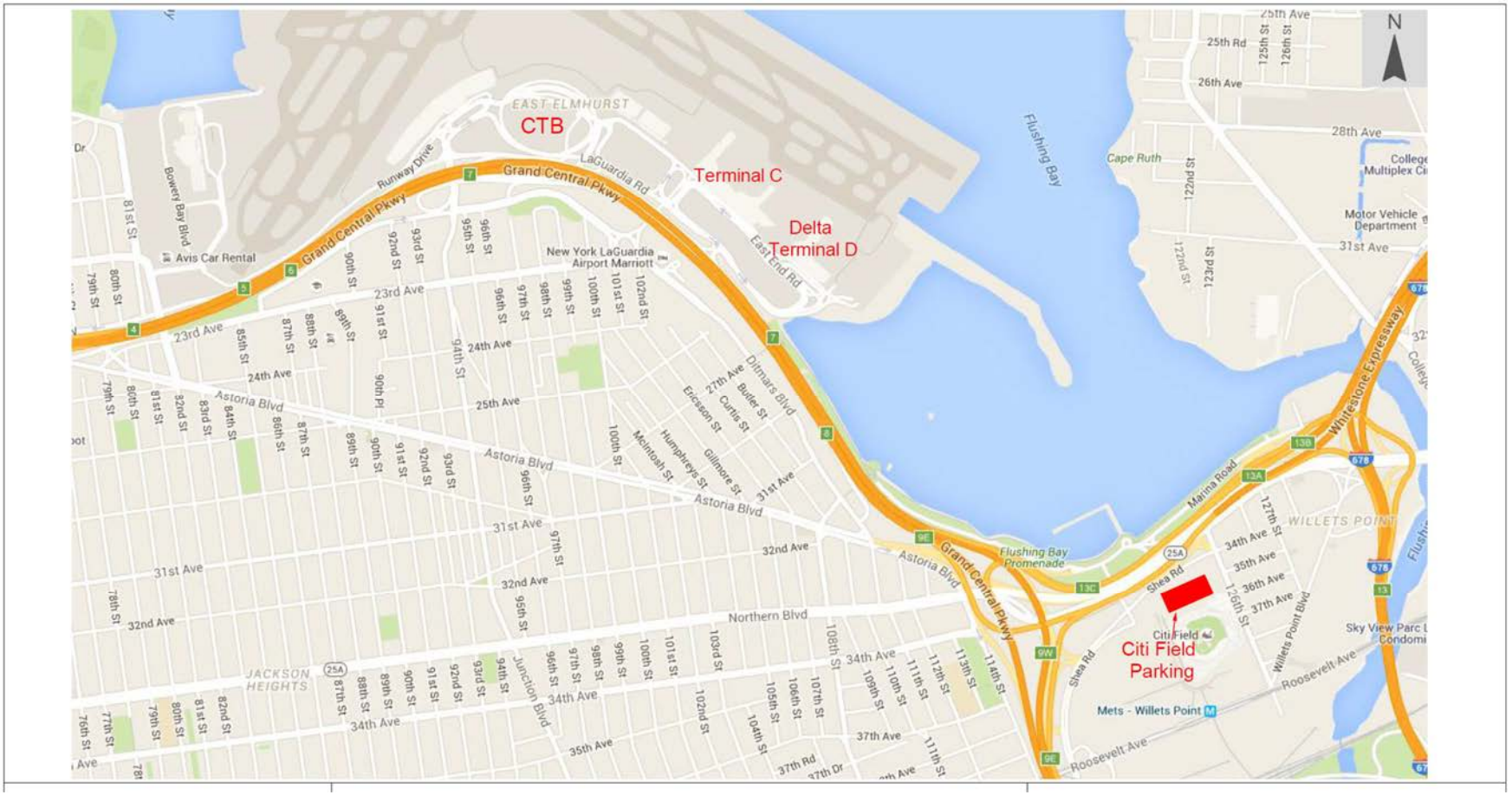
Eastbound ingress to LaGuardia Airport from Grand Central Parkway is available via Exit 6 ("94th Street") and Exit 7 ("LaGuardia Airport Terminals"). Eastbound egress from LaGuardia Airport to the Grand Central Parkway is available via a loop ramp on the southwest quadrant of the 94th Street interchange, and also via an on-ramp from the north side of Ditmars Boulevard, east of 94th Street, that can be accessed by traveling over the Grand Central Parkway bridge near Terminals C and D, and then west through the rotary intersection at 23rd Avenue/Ditmars Boulevard.

Westbound ingress from Grand Central Parkway is available via a two/three-lane frontage road ("LaGuardia Access Road") that is aligned north of, and parallel to, Grand Central Parkway beginning at Exit 7 ("LaGuardia Airport Terminals / 94th Street") and terminating at the 94th Street bridge. Ramp connections between the frontage road and airport terminals are provided in the vicinity of Delta Terminals C and D, and in the vicinity of the Central Terminal Building (CTB). Two westbound on-ramps from the frontage road to the westbound lanes of the Grand Central Parkway are also provided: one on-ramp is located immediately east of the 94th Street interchange and a second on-ramp is located at the 94th Street interchange.

Local access connections between LaGuardia Airport and the East Elmhurst neighborhood are available via 94th Street, as well as the bridge over the Grand Central Parkway that connects to the 23rd Avenue/Ditmars Boulevard rotary intersection on the south side of the Grand Central Parkway.

LaGuardia Airport is also served by five MTA bus lines: the M60, Q47, Q48, Q70 and Q72. The M60 provides service between Morningside Heights in Manhattan and all terminals at LaGuardia Airport. The M60 operates via 125th Street, the Robert F. Kennedy (Triborough) Bridge, and Astoria Boulevard. The Q47 provides service between Glendale and the Marine Air Terminal of LaGuardia Airport. The Q48 provides service between downtown Flushing and all terminals at LaGuardia Airport, primarily via 108th Street, Roosevelt Avenue, Ditmars Boulevard, and 23rd Avenue. The Q70 provides service between the 61st Street/Woodside subway station in Woodside and LaGuardia Airport Terminals B, C, and D. The Q72 provides service between Rego Park and Terminals B, C, and D, primarily via Junction Boulevard and 94th Street. Private operator express bus service is also provided between LaGuardia Airport and various Manhattan locations, as well as to and from the John F. Kennedy (JFK) International Airport. No direct subway service is provided to LaGuardia Airport.

Figure 1: Study Area



2.3 LaGuardia Airport Traffic Monitoring Program

On-airport intersections, which are under the jurisdiction of the Port Authority, are not proposed to be studied for impact assessment during construction of Terminals C and D. The Port Authority is preparing to implement a rigorous on- and off-airport traffic monitoring program at LaGuardia Airport that would involve a comprehensive, multi-modal traffic data collection and monitoring effort including autos, buses, taxis, and for-hire vehicles. The monitoring program is expected to coincide with the start of construction of the CTB and continue throughout the estimated eight-year construction period. Hence, it will also cover the peak phase of construction activity for Terminals C and D. It is expected that as construction activities proceed and evolve at LGA that on-airport parking, traffic circulation, and taxi-holding patterns would also evolve based on the phase of construction and other concurrent activities at the airport. The monitoring program, which would be coordinated with the New York State Department of Transportation (NYSDOT) and the New York City Department of Transportation (NYCDOT), would focus on these dynamic changes and would be informed by a "live" on-airport data gathering effort including traffic volumes, queues, and frontage activities, as well as traffic conditions on the Grand Central Parkway and at key off-airport locations. Based on observed conditions on, and in the vicinity of the airport, appropriate short-term mitigating and improvement strategies would be implemented in coordination with relevant agencies.

One of the key construction-related factors for Terminals C and D is the planned accommodation of construction worker parking at Citi Field (home baseball park of Major League Baseball's New York Mets), which is located north of Whitestone Expressway and the Grand Central Parkway, along the Flushing Bay Promenade. As discussed in this chapter, contractor parking at this location would necessitate the study of intersections near Citi Field for the analysis of construction-related traffic impacts (in addition to those several other intersections requested by NYCDOT).

3.0 OPERATIONAL TRAFFIC IMPACT ASSESSMENT

The Proposed Action would not result in an increase in forecast passenger travel. Although there would be a reconfiguration of parking facilities and relocation of taxi hold lots, under future operational conditions all facilities would remain on airport property. Delta Air Lines will work with the Port Authority to rationalize the proposed parking supply with projected future parking demands through a reallocation of facilities throughout the airport. An objective of this rationalization process is to ensure that vehicles accessing LaGuardia Airport are entirely accommodated on-site in new and/or reconfigured parking and taxi-hold facilities at the airport. No off-site demand for parking is expected to occur on city streets in the vicinity of the airport. Therefore, a traffic impact assessment of operational conditions (i.e., upon completion of construction and full operation of the new Delta Air Lines terminal facility) is not needed, and will not be performed as part of the EA.

4.0 CONSTRUCTION TRAFFIC IMPACT ASSESSMENT

This section describes the effects of construction-generated vehicle trips to and from the Citi Field contractor parking site and LaGuardia Airport during the typical construction peak hours. The construction traffic analysis examines the potential operational effects of additional construction-related vehicle trips generated on the roadway system as a result of construction activities during the peak construction phase.

Construction at LaGuardia Airport will commence in March 2017 and will continue into the first quarter of 2025. Based on the manpower distribution over the construction duration shown in the *EA Preliminary Review (LaGuardia Terminal Reconfiguration Project)*, prepared by STV, the peak month of construction was determined to occur during the third quarter of 2019, corresponding to Phase 1B of the overall construction schedule. Therefore, for construction traffic analyses purposes, a typical weekday during the month of July 2019 has been identified as the peak analysis time period.

During the peak construction month, it is anticipated that all daily parking for construction personnel would be accommodated at off-airport property at the Citi Field parking lot, located off the Route 25A (West)/Northern Boulevard/Citi Field exit (Exit 13D) of westbound Grand Central Parkway and along the Flushing Bay Promenade. Furthermore, along eastbound Grand Central Parkway, this lot is located off the Route 25A (East)/Northern Boulevard/Citi Field exit. Access to Citi Field parking lots would occur via 126th Street and Shea Road.

There is ample parking capacity at Citi Field to accommodate the peak 270 contractor personnel vehicles that are projected to require parking. After parking at Citi Field, it is expected that there will be shuttle bus service for contractors operating between the Citi Field parking lot and the Terminals C/D construction site. During day games at Citi Field, and during the United States Tennis Association (USTA) games, there would either be no construction at all, no day-time construction, or construction workers may be offered transit vouchers to take mass transit to and from work. As such, construction worker parking would not overlap with day-game or USTA parking at Citi Field.

Construction traffic associated with the Proposed Action will consist of passenger vehicle trips generated by workers traveling to/from the parking lot at Citi Field, truck trips (e.g., delivery trucks, concrete mixers, construction equipment, etc.) moving materials and equipment traveling directly to the Terminal C/D construction site via designated New York City truck routes, and buses shuttling workers between the Citi Field parking lot and the construction site at LGA.

4.1 Construction Trip Generation

As indicated previously, the total volume of construction-related traffic—including both trucks and construction personnel (i.e., laborers, management, and administrative staff)—is projected to peak in July 2019, with an average of approximately 598 (rounded to 600) construction personnel on-site daily at this time, as shown in Figure 2. Further, based on a review of the aforementioned STV report, it was determined that there would be an estimated 1,277 trucks per month during the peak construction phase, corresponding to an estimated 58 trucks per day during the peak construction month. Figure 3 shows the projected truck volumes during the different construction phases of Terminals C/D.

During construction, travel to and from the site by means other than single-occupant vehicle will be encouraged and supported by Delta Air Lines. Based on discussions with NYCDOT staff as part of the *CTB Redevelopment EA*, an average auto-occupancy rate of 1.50 and an auto mode share of 75 percent have been assumed for construction personnel driving to, and parking at, Citi Field. From there, there will be anticipated round-trip shuttle bus service from the Citi Field contractor parking lot to selected bus stop(s) at Terminals C and D. The average capacity of a shuttle bus is 50 passengers. The remaining 25 percent of construction personnel are projected to arrive and depart via transit (bus). The MTA bus stop at Terminal D is served by the M60, Q48, Q70, and Q72 bus lines which also provide connections to subway stations in Manhattan and Queens.

Figure 2: Projected Manpower Utilization: 3-Month Averages

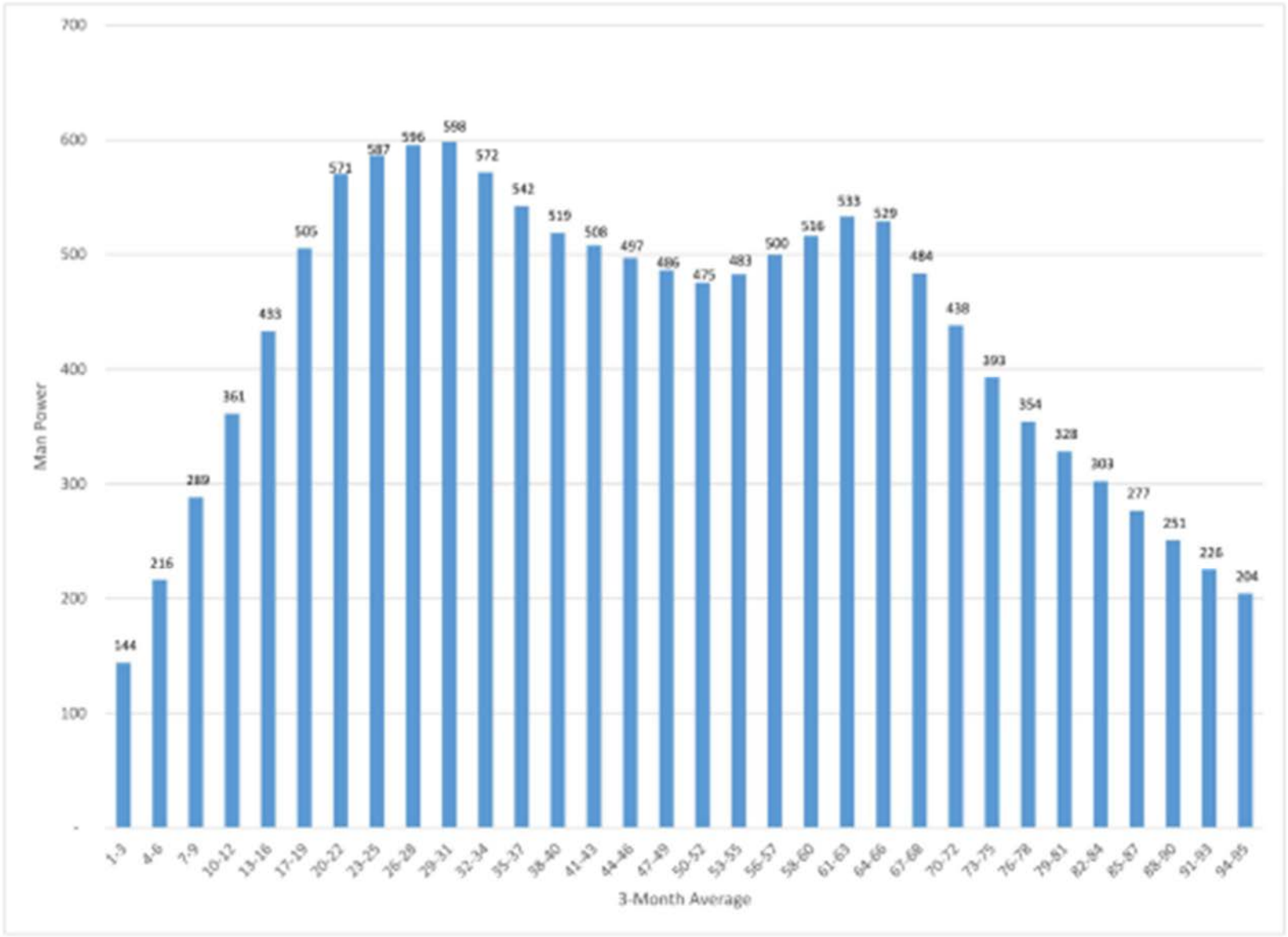
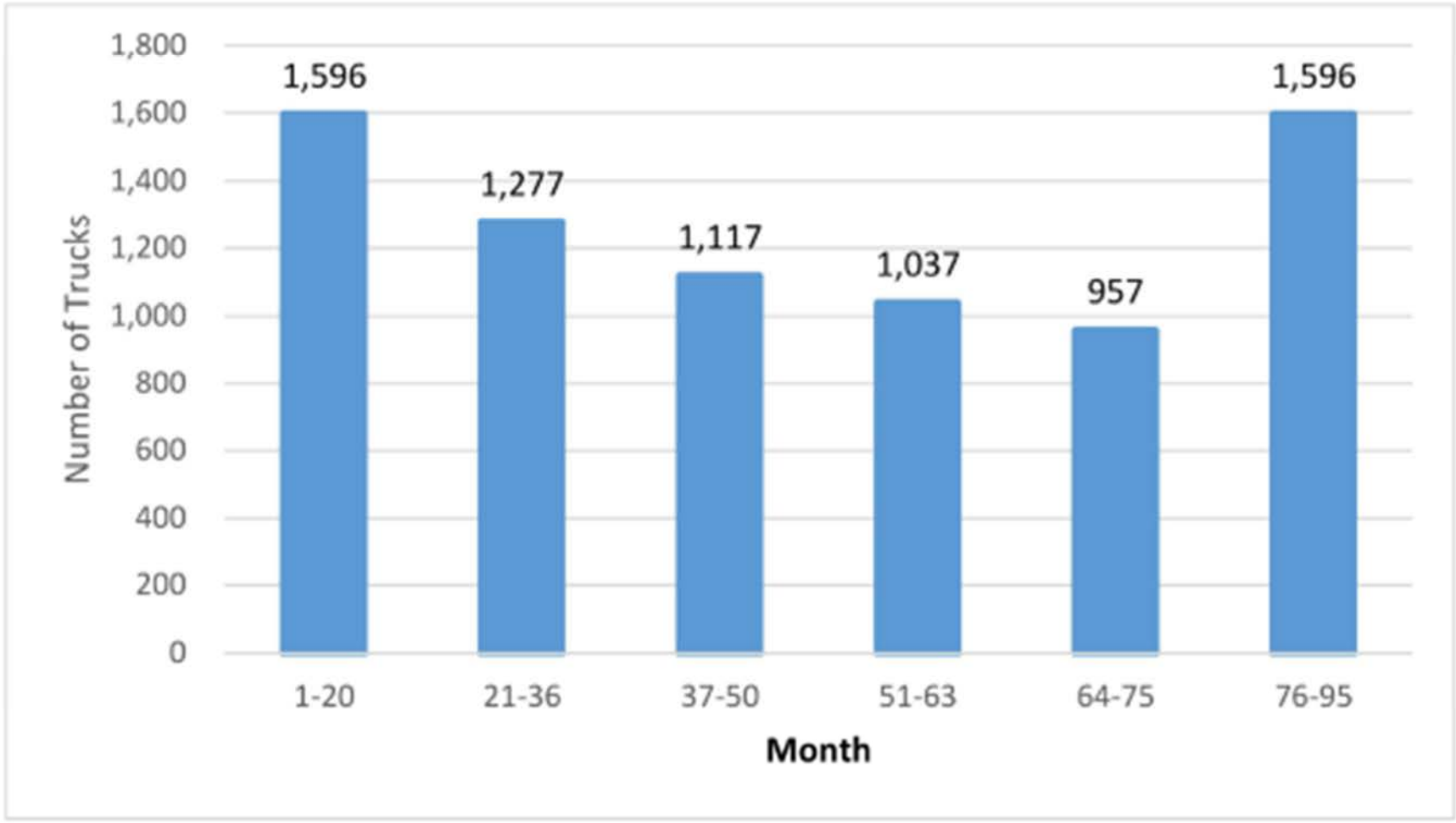


Figure 3: Estimated Truck Volumes during Construction, by Month



All construction activities are assumed to take place during two construction shifts. The first shift is assumed 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 was assumed to occur from approximately 3:00 PM to approximately 11:00 PM and comprise approximately 10 percent of the total construction personnel workforce. The majority of the travel for construction personnel (approximately 80 percent) in the first shift would typically take place during the hour immediately before the start of the shift and the hour immediately after the end of the shift, with the remaining travel occurring before and after these times due to the slight variations in the particular schedules and work activities of the various trades.

Delta Air Lines will coordinate with its contractors and the Port Authority 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. It is assumed that there will be no significant amount of truck staging or queuing at the construction site: "just-in-time" delivery will be applied. Truck arrivals are expected to be generally uniform throughout this time period with slightly higher numbers of trips during the midday hours (8:00 AM to 2:00 PM) when on-site work activities are expected to peak. Some truck deliveries would also be made 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 (typically one hour or less).

Table 1 shows the numbers of construction personnel-related auto trips, as well as construction truck trips, during the peak construction month, based on these transportation planning assumptions. The estimated daily vehicle trips were distributed to various hours of the day based on the projected work shift allocations and arrival/departure patterns of construction trucks, as described above.

Based on these assumptions, the peak hour construction traffic was estimated for the peak construction period. The total vehicle trips per hour are shown in Table 1 along with passenger-car equivalent (PCE) values, which are based on 1.0 PCE per auto; 1.5 PCE per shuttle bus; and 2.0 PCEs per truck (corresponding to a 3-axle truck).

4.2 Construction Trip Distribution

Figure 4 shows the estimated distribution for construction personnel-related auto trips during the weekday AM and PM peak hours to and from Citi Field. The trip distribution for construction personnel, shown in Figure 4, was estimated based on an analysis of 2010 Census data performed by the NY Building Congress showing home origins and work destinations for construction personnel working in Queens.

Figure 5 shows the estimated distribution of construction truck trips during the weekday AM and PM peak hours. The vehicle trip distribution for construction trucks, shown in Figure 5, was estimated based on the locations of NYCDOT "local" and "through" truck routes in the vicinity of LaGuardia Airport—including Astoria Boulevard and 94th Street-Junction Boulevard—and the locations of major expressways throughout Queens, including the Long Island Expressway, the Brooklyn-Queens Expressway, and the Van Wyck Expressway, which are expected to serve as the primary "through" truck routes to and from Terminals C/D.

Table 1: Hourly Construction Vehicle Trip Increments for Terminals C and D Reconfiguration during Peak Construction Month

Average Daily Number of Construction Personnel during Peak Construction Quarter[1] = 600 Personnel in peak quarter

Percentage of Daily Construction Personnel Working First Shift[2] = 90%
Percentage of Daily Construction Personnel Working Second Shift[2] = 10%
Construction Personnel Auto-Occupancy[3] = 1.50
Construction Personnel Auto Mode Split[3] = 75%
Construction Personnel Transit Mode Split[3] = 25%

Average Daily Number of Construction Personnel Driving during Peak Construction Period = 300

PCE for shuttle buses with 2 axles[3] = 1.5 passenger car equivalents/bus
Estimated passenger capacity per shuttle bus = 50 passengers/bus

Average Number of Daily Trucks during Peak Construction Period[1] = 58 trucks in peak quarter
PCE for construction trucks[4] = 2.0 passenger car equivalents/truck

Hour of Day	Temporal Distributions[1]						Auto Trips (Personnel): 1st Shift			Auto Trips (Personnel): 2nd Shift			Shuttle Bus Trips (Personnel): 1st Shift			Shuttle Bus Trips (Personnel): 2nd Shift			Truck Trips			Truck and Bus (PCE) Trips			Total Vehicle Trips			Total Vehicle Trips (PCEs)		
	Auto IN: 1st Shift	Auto OUT: 1st Shift	Auto IN: 2nd Shift	Auto OUT: 2nd Shift	Truck IN	Truck OUT	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
12-1AM	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-2 AM	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-3AM	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-4AM	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-5AM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
5-6AM	10%	0%	0%	0%	5%	5%	27	0	27	0	0	0	1	1	2	0	0	0	3	3	6	7	7	15	31	4	35	34	7	42
6-7AM	80%	0%	0%	0%	5%	5%	216	0	216	0	0	0	7	7	14	0	0	0	3	3	6	16	16	33	226	10	236	232	16	249
7-8AM	10%	0%	0%	0%	5%	5%	27	0	27	0	0	0	1	1	2	0	0	0	3	3	6	7	7	15	31	4	35	34	7	42
8-9AM	0%	0%	0%	0%	6%	6%	0	0	0	0	0	0	0	0	0	0	0	0	3	3	7	7	7	14	3	3	7	7	7	14
9-10AM	0%	0%	0%	0%	7%	7%	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	8	8	16	4	4	8	8	8	16
10-11AM	0%	0%	0%	0%	7%	7%	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	8	8	16	4	4	8	8	8	16
11AM-12PM	0%	0%	0%	0%	7%	7%	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	8	8	16	4	4	8	8	8	16
12-1PM	0%	0%	0%	0%	7%	7%	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	8	8	16	4	4	8	8	8	16
1-2PM	0%	0%	0%	0%	6%	6%	0	0	0	0	0	0	0	0	0	0	0	0	3	3	7	7	7	14	3	3	7	7	7	14
2-3PM	0%	10%	100%	0%	5%	5%	0	27	27	30	0	30	1	1	2	1	1	2	3	3	6	9	9	18	35	32	67	39	36	75
3-4PM	0%	80%	0%	0%	5%	5%	0	216	216	0	0	0	7	7	14	0	0	0	3	3	6	16	16	33	10	226	236	16	232	249
4-5PM	0%	10%	0%	0%	5%	5%	0	27	27	0	0	0	1	1	2	0	0	0	3	3	6	7	7	15	4	31	35	7	34	42
5-6PM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
6-7PM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
7-8PM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
8-9PM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
9-10PM	0%	0%	0%	0%	5%	5%	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
10-11PM	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11PM-12AM	0%	0%	0%	100%	0%	0%	0	0	0	0	30	30	0	0	0	1	1	2	0	0	0	2	2	3	1	31	32	2	32	33
TOTAL =	100%	100%	100%	100%	100%	100%	270	270	540	30	30	60	18	18	36	2	2	4	58	58	116	146	146	292	378	378	756	446	446	892

Note:
1 = Estimate, based on STV report.
2 = Assumed by AECOM.
3 = Estimated based on census reverse journey-to-work data for all workers at LaGuardia Airport and discussions with NYCDOT Traffic Planning staff as part of the *LaGuardia Airport Central Terminal Building Redevelopment EA*.
4 = Based on *CEQR Technical Manual*, Table 16-3, page 16-11.

Figure 4: Vehicle Trip Distribution for Passenger Car Trips by Construction Workers

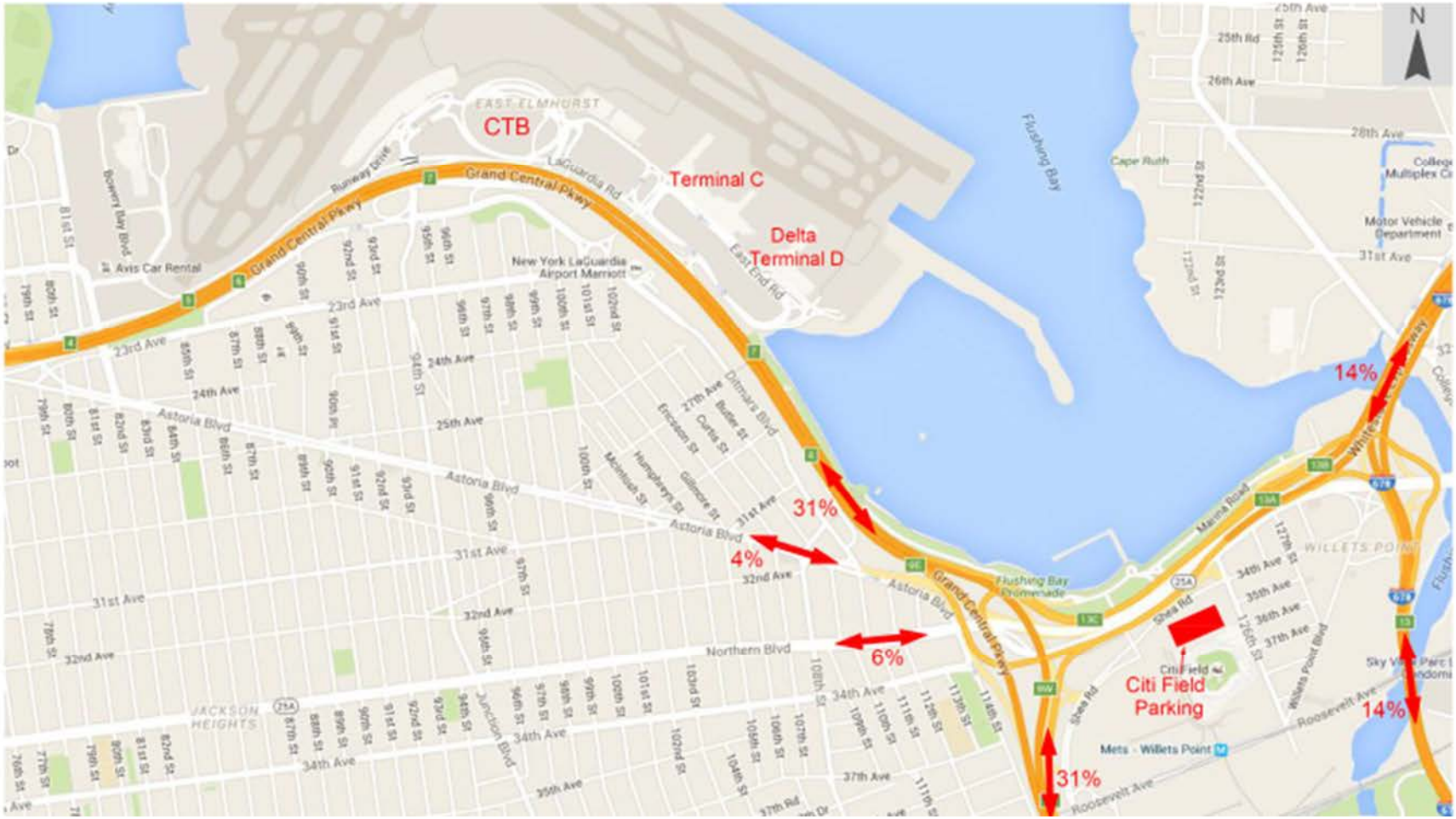
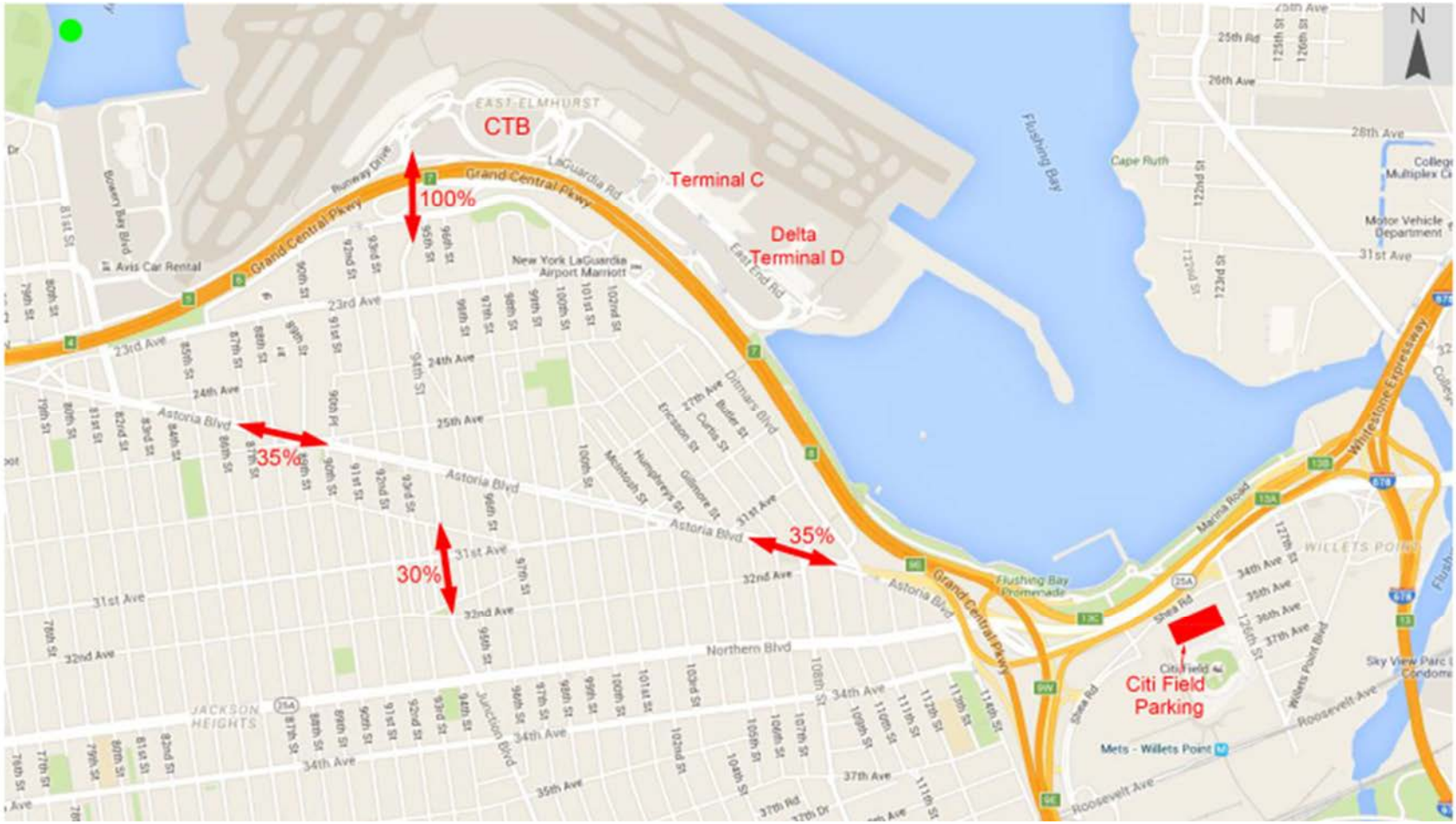


Figure 5: Vehicle Trip Distribution for Construction Trucks



4.3 Construction Trip Routing

Figures 6A and 6B show the projected routing of construction workers' inbound and outbound auto trips to the roadway network in the vicinity of Citi Field, respectively. Figure 7 shows the projected routing of construction-related truck trips to the roadway network in the vicinity of LaGuardia Airport. All trucks destined to, and departing from, the construction site at Terminals C/D from were assumed to enter and leave La Guardia Airport via 94th Street; the 102nd Street bridge is scheduled to operate one-way southbound during the peak construction phase. The results of the preliminary construction trip generation estimate in Table 1 and these routing patterns indicate that several key intersections in the vicinity of LaGuardia Airport and Citi Field should be analyzed for construction-generated traffic associated with the Proposed Action. Also, the anticipated contractor parking demand can be adequately accommodated at Citi Field.

4.4 Construction Trip Assignments

Based on the trip generation estimates and routing patterns for autos, trucks and shuttle buses, trip assignment maps were prepared for autos, trucks and shuttle buses for the AM and PM peak construction hours. Figures 8 and 9 show the total construction trip assignments for all modes combined (autos, trucks and shuttle buses) for the weekday AM and PM peak hours of construction, respectively.

The results of the construction trip assignment indicate that more than 50 PCE trips are projected to be generated through seven (7) key intersections in the vicinity of Citi Field (shown in bold in the list below) as a result of construction-generated traffic associated with the Proposed Action. Therefore, in accordance with the *CEQR Technical Manual*, a more detailed traffic analysis is warranted at these intersections. Based on the result of the traffic assignments, as well as discussions with NYCDOT staff, four (4) additional intersections were added to the study locations because of poor existing levels-of-service. Figure 10 illustrates the locations of all eleven (11) of the study intersections.

- Shea Road / Boat Basin Place (signalized, flashing on non-game days)
- Boat Basin Place / Marina Road (stop-controlled)
- Shea Road / 34th Avenue / 126th Street (signalized)
- Northern Boulevard eastbound / 126th Street (signalized)
- Northern Boulevard westbound / 126th Street (signalized)
- Astoria Boulevard / 114th Street / Northern Boulevard (signalized)
- 126th Street / 36th Avenue (stop-controlled)
- Astoria Boulevard / 94th Street (signalized)
- Northern Boulevard / Junction Boulevard (signalized)
- Astoria Boulevard / 77th Street (signalized)
- Astoria Boulevard North / 82nd Street / 24th Avenue (signalized)

Figure 6A: Inbound Trip Assignment: Passenger Cars for Construction Worker Trips

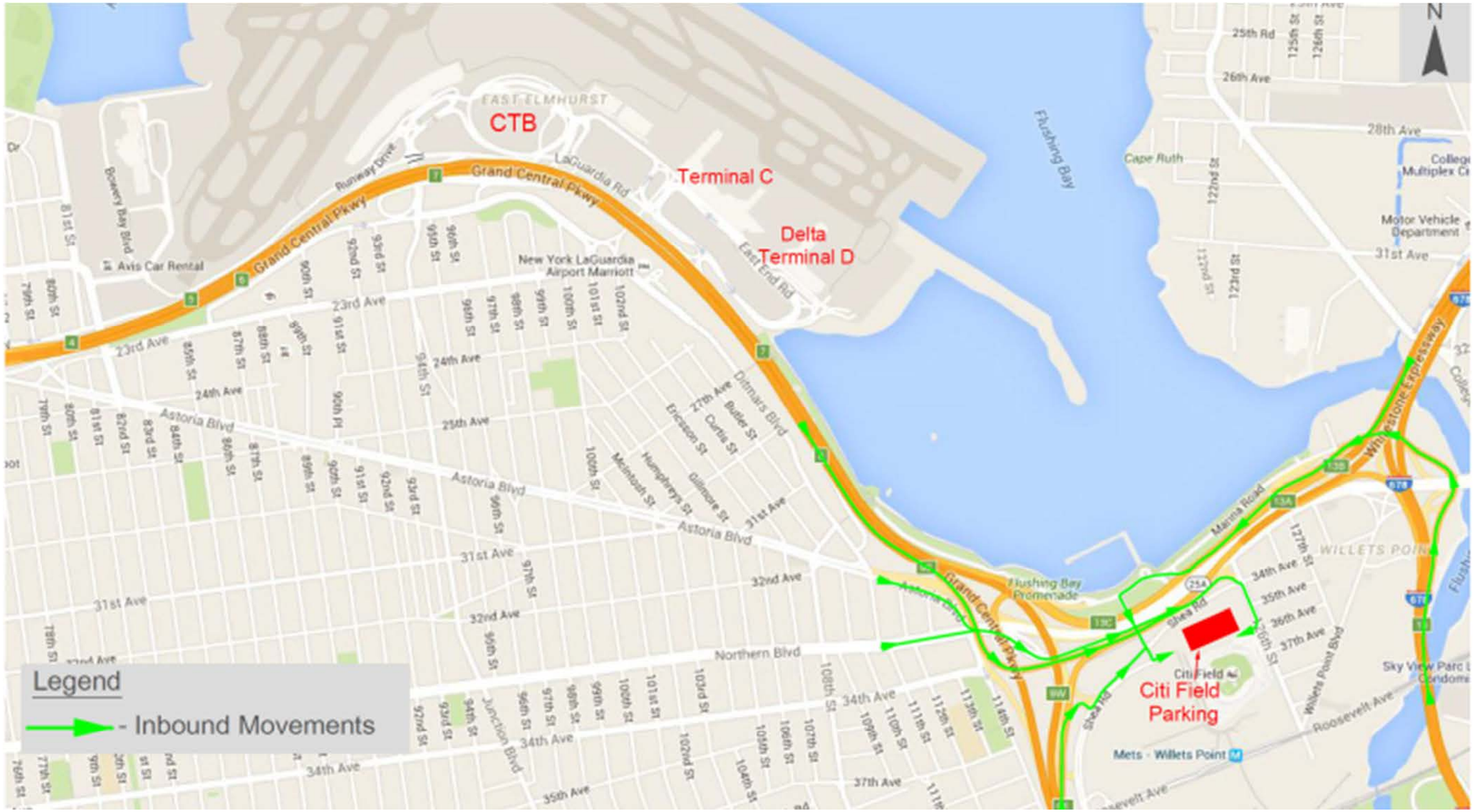


Figure 6B: Outbound Trip Assignment: Passenger Cars for Construction Worker Trips

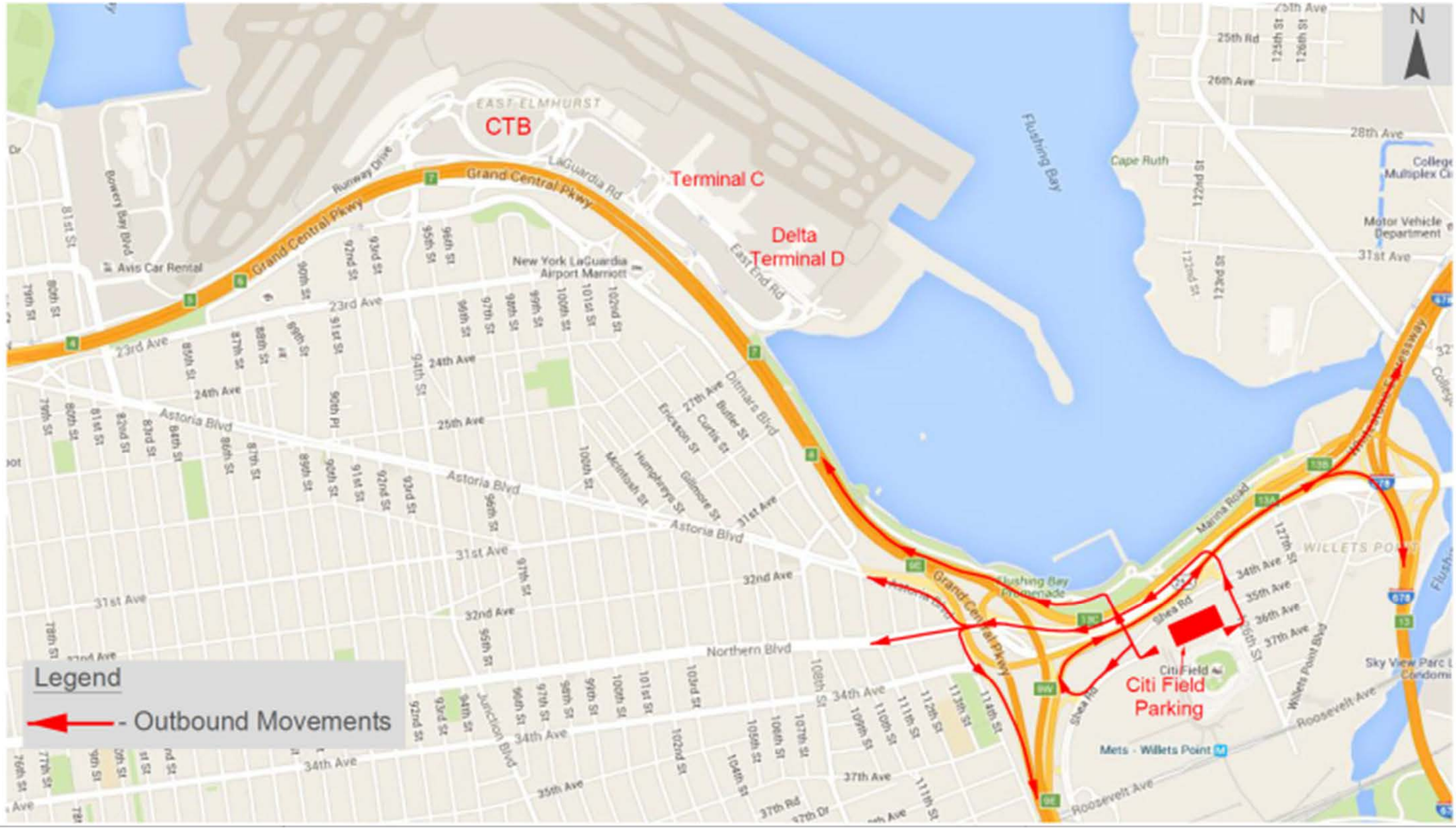


Figure 7: Vehicle Trip Assignment for Construction Trucks

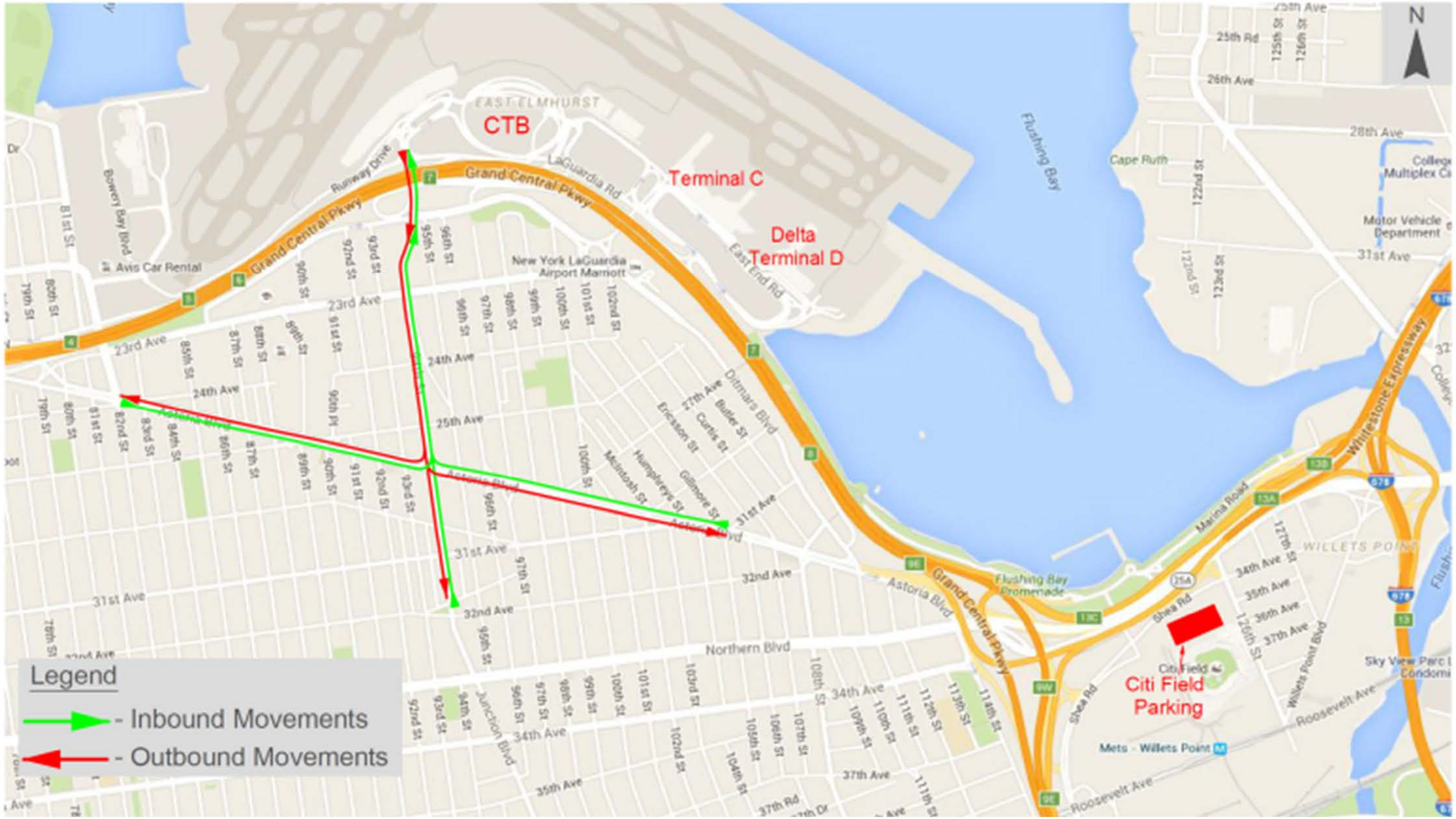


Figure 8: Total Incremental Vehicle Trips During Construction: Weekday AM Construction Peak Hour

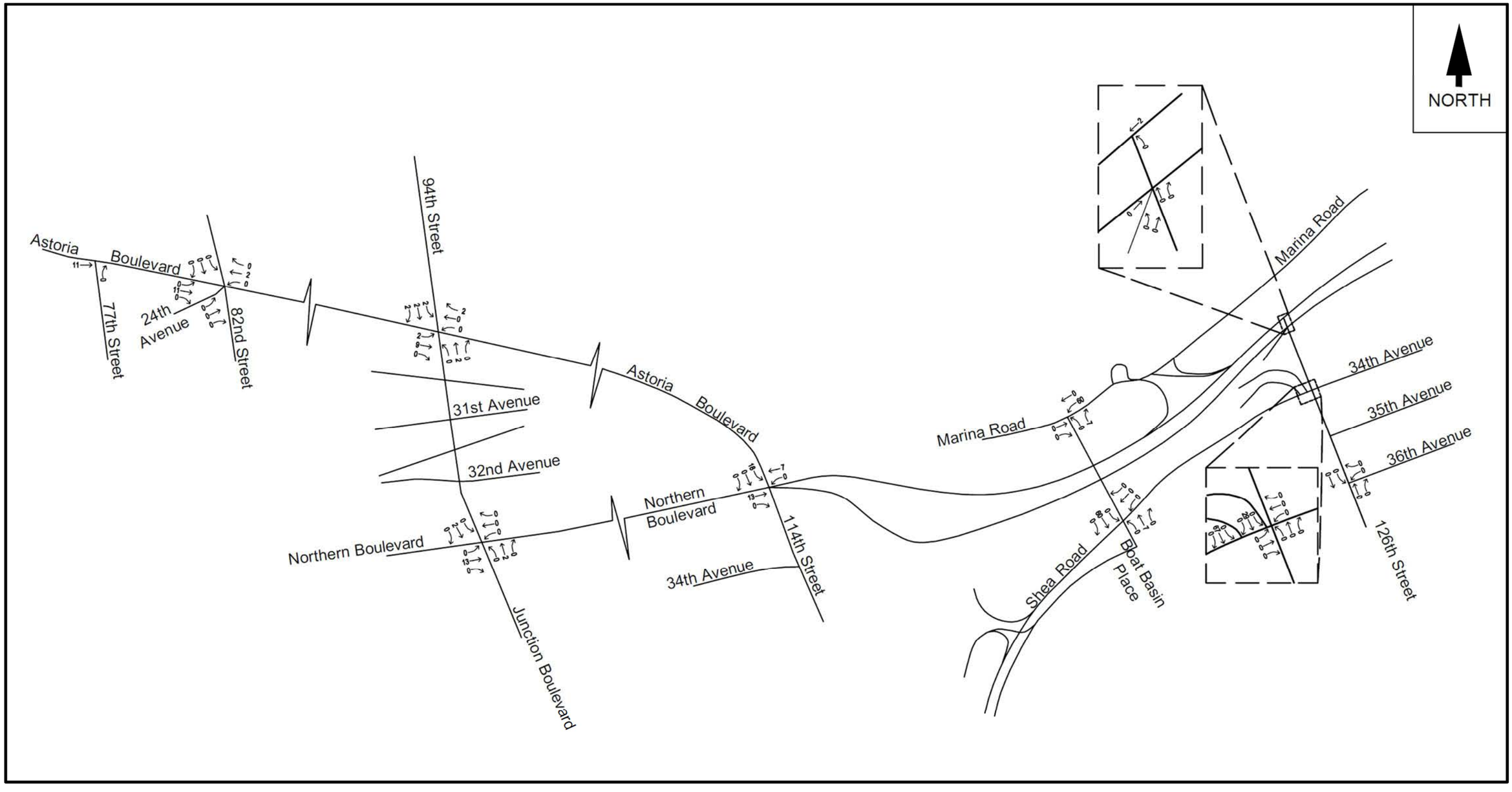


Figure 9: Total Incremental Vehicle Trips During Construction: Weekday PM Construction Peak Hour

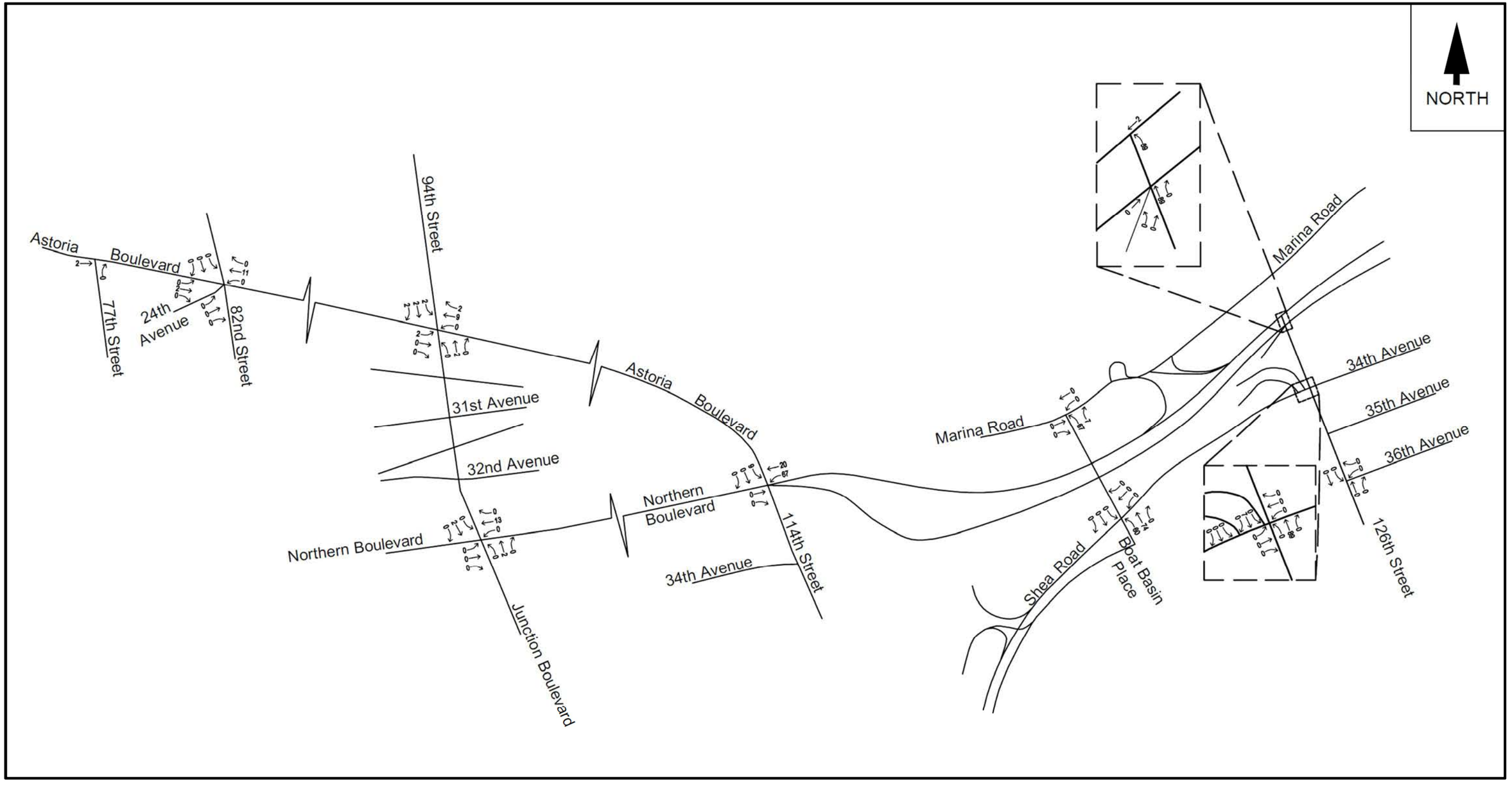
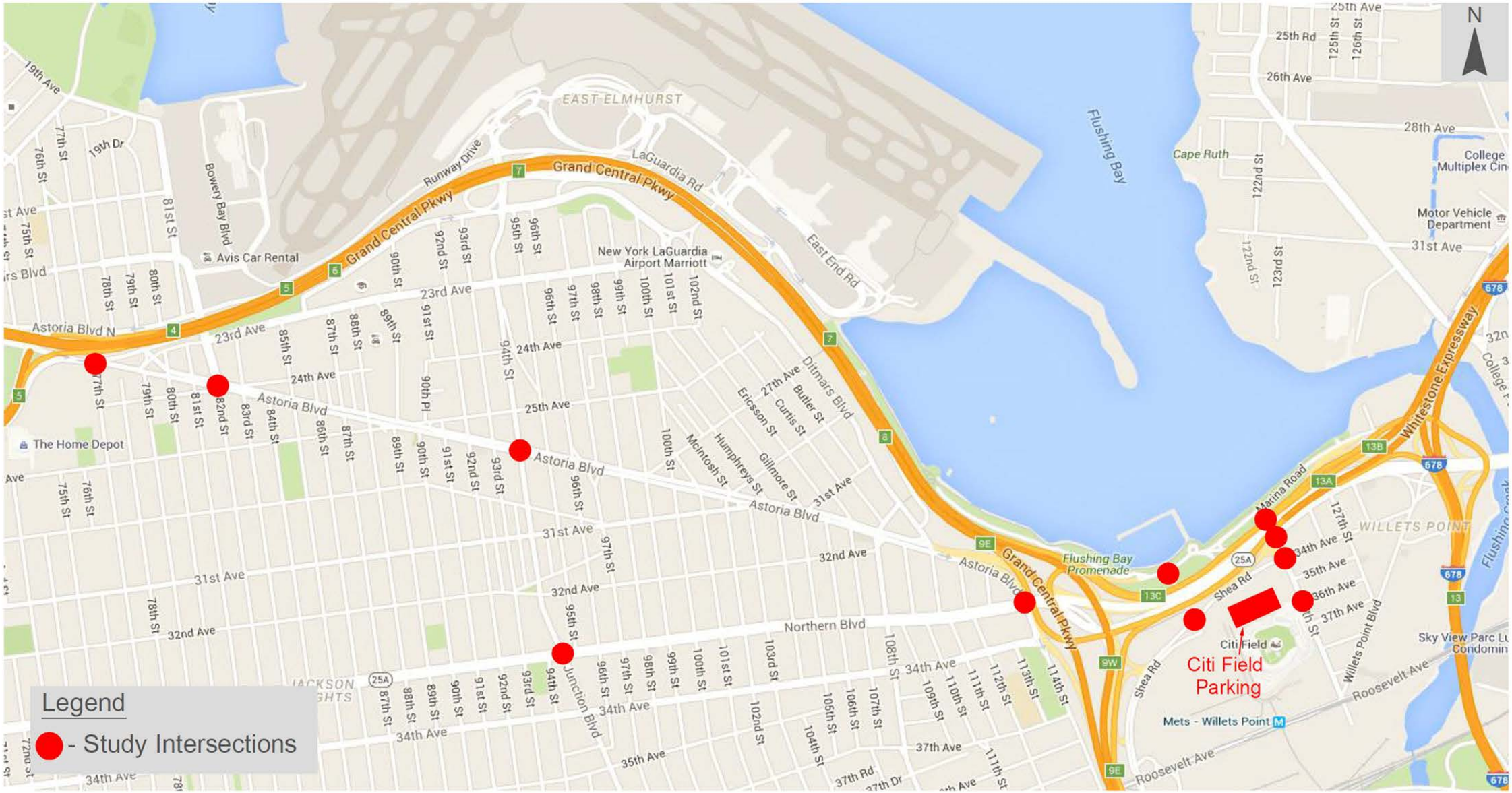


Figure 10: Study Intersections



These intersections have the potential to experience changes in traffic operations as a result of construction activities associated with the Proposed Action. Outside of this identified study area, project-generated traffic volumes would be more dispersed and, therefore, the effects of project-generated traffic would be less significant. As described in the sections below, a comprehensive data collection effort was undertaken at all of the study intersections listed above to obtain the necessary data required for the traffic operations analysis. All of the intersections listed above are signalized except for the Boat Basin Place/Marina Road intersection which is stop-controlled on the northbound approach and the 126th Street/36th Avenue intersection which is stop-controlled on the westbound approach.

4.5 Traffic Impact Assessment

4.5.1 Street Network

The physical and operational characteristics of the major streets comprising the roadway network within the study area are described as follows:

- *Grand Central Parkway* is a divided, two-way New York State parkway that is classified as a Principal Arterial (Expressway) and is generally aligned east-west through the project study area. As a parkway, all commercial (i.e., truck and bus) traffic is prohibited.[1] The Grand Central Parkway provides direct access to LaGuardia Airport. In the eastbound direction, ingress to LaGuardia Airport from Grand Central Parkway is available via Exit 6 ("94th Street") and Exit 7 ("LaGuardia Airport Terminals"). Eastbound egress from LaGuardia Airport to the Grand Central Parkway is available via a loop ramp from the 94th Street bridge, as well as an on-ramp from Ditmars Boulevard. Westbound ingress from Grand Central Parkway is available via a two- to three-lane frontage road ("LaGuardia Access Road") that is aligned north of, and parallel to, Grand Central Parkway beginning at Exit 7 ("LaGuardia Airport Terminals / 94th Street") and terminating at the 94th Street bridge. Ramp connections between the frontage road and airport terminals are provided in the vicinity of the Delta/US Airways Terminal and in the vicinity of the CTB. Two westbound on-ramps from the frontage road to the westbound lanes of the Grand Central Parkway are also provided: one on-ramp is located immediately east of the 94th Street interchange and a second on-ramp is located west of the 94th Street interchange. Local access to and from LaGuardia Airport is also available via a bridge over the Grand Central Parkway that connects to Ditmars Boulevard and 23rd Avenue via a rotary intersection located on the south side of the Grand Central Parkway in the East Elmhurst neighborhood.

- *94th Street* is an undivided two-way (north-south) roadway classified as a Principal Arterial (Other Street). It extends between LaGuardia Airport to the north (via a bridge over the Grand Central Parkway) and 32nd Avenue to the south. South of its intersection with 32nd Avenue, 94th Street continues as Junction Boulevard and terminates at Queens Boulevard in Rego Park, Queens. In the study area, 94th Street accommodates one travel lane in each direction, with curbside parking allowed on both sides of the roadway.

[1] An exception to this vehicle prohibition exists in both directions on the portion of the Grand Central Parkway between the Robert F. Kennedy (Triborough) Bridge and the western leg of the Brooklyn-Queens Expressway. Single-unit vehicles with no more than three axles and ten tires may operate in both directions.

- *Ditmars Boulevard* has two alignments—easterly and westerly—within the study area. The easterly alignment of Ditmars Boulevard is aligned south of, and generally parallel to, Grand Central Parkway in the study area and extends between 86th Street (near its intersection with 23rd Avenue) to the west and Astoria Boulevard to the southeast. East of 94th Street, along the easterly alignment, Ditmars Boulevard is a two-way divided roadway classified as a Principal Arterial (Other Street), with two travel lanes in each direction, exclusive left-turn lanes at key intersections, and limited segments where curbside on-street parking is allowed. Breaks in the raised concrete median divider are provided at selected public street intersections and driveways. A rotary intersection is formed by the intersection of Ditmars Boulevard, 23rd Avenue, and the access bridge serving LaGuardia Airport over the Grand Central Parkway. West of 94th Street, along the easterly alignment, Ditmars Boulevard is an undivided, one-way eastbound roadway classified as a Minor Arterial, with one travel lane plus curbside parking allowed on both sides of the roadway. A separate, westerly alignment of Ditmars Boulevard extends west from the intersection with Astoria Boulevard North-Grand Central Parkway westbound off-ramp, continuing west/northwest and terminating at Shore Boulevard on the northeast side of Astoria Park in Astoria, Queens. Within the study area, the westerly alignment is a divided two-way roadway classified as a Principal Arterial (Other Street) and generally accommodates two travel lanes in each direction and limited curbside parking along both sides of the roadway. However, the one-block segment of Ditmars Boulevard between Astoria Boulevard North-Grand Central Parkway westbound off-ramp and Marine Terminal Road within the study area accommodates three lanes in each direction with no curbside parking allowed. Direct access to LaGuardia Airport is provided via the Ditmars Boulevard/Marine Terminal Road intersection.

- *Astoria Boulevard* is a two-way, east-west, divided roadway classified as a Principal Arterial (Other Street) within the study area. Astoria Boulevard extends from the Whitestone Expressway/Northern Boulevard/Grand Central Parkway interchange to the west, and continues through the study area as a two-way roadway with three travel lanes in each direction and curbside parking allowed on both sides of the roadway. Breaks in the raised concrete median divider, along with exclusive left-turn lanes, are provided at major public street intersections. At 80th Street, near the westerly limits of the study area, the directional travel lanes on Astoria Boulevard split, and the roadway operates as an elevated service road for the Grand Central Parkway, with the westbound lanes aligned on the north side of the Grand Central Parkway and the eastbound lanes aligned on the south side.

- *Northern Boulevard* is a major, two-way east-west arterial within the study area. Northern Boulevard generally provides two travel lanes and a parking lane in each direction, with turning lanes at major intersections. In the eastern section of the study area in the vicinity of Citi Field, Northern Boulevard runs underneath the connector ramps of the Grand Central Parkway, Whitestone Expressway and Van Wyck Expressway, with at-grade signalized intersections in the eastbound and westbound directions at 126th Street. Northern Boulevard continues easterly across Flushing Creek into Flushing and eastern Queens.

- *Marina Road* is a local access roadway running along the southern/western edge of Flushing Bay and provides access to World's Fair Marina. Marina Road, at its eastern end, is accessible from the exit off of northbound Van Wyck Expressway for the westbound Grand Central Parkway. Marina Road intersects with Boat Basin Place just north of Citi Field.

- *Shea Road*, also named Meridian Road south of Roosevelt Avenue, is a local access roadway providing access to Citi Field from the Grand Central Parkway (Exit 9E), and the Van Wyck Expressway and Whitestone Expressway (via Boat Basin Place). It extends west of 126th Street and connects to the circumferential ring road (Meridian Road) within the tennis stadium. East of 126th Street, Shea Road continues as 34th Avenue.

- *Boat Basin Place* is a relatively short north-south roadway connecting Shea Road to the south and Marina Road to the north. There is a traffic signal at its intersection with Shea Road; however, this signal is only operational on game days at Citi Field. At all other time (including during the data collection for this EA) it reverts to a flashing mode.

- *126th Street* in the study area extends from Roosevelt Avenue (to the south) to westbound Northern Boulevard (to the north), northeast of Citi Field. 126th Street provides direct access to Citi Field's north parking lot via an entrance/exit located just north of 36th Avenue. North of 34th Avenue, 126th Street currently operates one-way northbound with signalized intersections at both the eastbound and westbound directional travel lanes along Northern Boulevard. At the signalized intersection of 126th Street with 34th Avenue, separate ramp approaches from Northern Boulevard and Grand Central Parkway constitute the southbound approaches.

4.5.2 Baseline Traffic Data Collection

The traffic-data collection effort included two-day manual turning movement and vehicle classification counts, supplemented by nine-day Automatic Traffic Recorder (ATR) counts. In addition, a comprehensive inventory of the physical and operational characteristics of each study intersection was conducted in the field.

Generally, for environmental reviews in accordance with the *CEQR Technical Manual*, traffic data older than three years are not considered usable. Because traffic data (including data collected for the *CTB Redevelopment EA*) from the last three years were not available, manual turning movement and vehicle classification counts were initially performed at four of the 11 study intersections during the 5:00 to 8:00 AM and 2:00 to 5:00 PM peak hours in November 2015 under "normal" traffic and roadway conditions when schools were in session. Traffic data at the additional seven intersections (which were identified subsequent to the November 2015 data collection effort) were collected in March 2016 for the same hours under the same "normal" conditions when schools were in session.

Based on the data collected in November 2015 and March 2016, manual turning movement volumes were summarized for each of the study intersections during the weekday AM and PM peak hours of construction (i.e., 6:00 to 7:00 AM and 3:00 to 4:00 PM). Figures 11 and 12 show the vehicle turning movement volumes at all of the study intersections during the weekday AM and PM construction peak hours, respectively, under existing conditions.

Concurrent with the turning movement counts collected in November 2015, for a period of nine consecutive days—from Saturday, November 14 to November 22, 2015—ATR counts were conducted continuously at 15-minute intervals at the following locations:

- Astoria Boulevard, between 81st and 82nd Streets

- Astoria Boulevard, between 93rd and 94th Streets
- Astoria Boulevard, between 94th and 95th Streets
- 94th Street, between 30th Avenue and Astoria Boulevard
- 94th Street, between Astoria Boulevard and 25th Avenue
- Junction Boulevard, between 34th Avenue and Northern Boulevard
- Northern Boulevard, between 100th and 101st Streets
- Astoria Boulevard, between 100th and 101st Streets
- 23rd Avenue between 93rd and 94th Streets
- 23rd Avenue, between 100th and 101st Streets

In addition, concurrent with the turning movement counts collected in March 2016, for a period of ten consecutive days—from Saturday, March 19 to Monday, March 28, 2016—ATR counts were conducted continuously at 15-minute intervals at the following locations:

- 126th Street, between 35th and 36th Avenues
- Boat Basin Place, between Shea Road and Marina Road

The physical and operational characteristics of all the construction study intersections were also inventoried in the field. This inventory specifically included:

- Street directions;
- Number, configuration, and widths of lanes;
- Type of intersection traffic control;
- Signal timing and phasing sequences as observed in the field;
- Crosswalk locations;
- Curbside parking regulations;
- Turning restrictions and prohibitions; and
- Bus stop locations.

Figure 13 shows the existing lane configurations and traffic control devices at the study intersections. Official traffic signal phasing sequences and timing plans were provided by the NYCDOT for all of the signalized study intersections, and were used in all intersection capacity analyses.

Figure 11: Existing Turning Movement Volumes: Weekday AM Construction Peak Hour

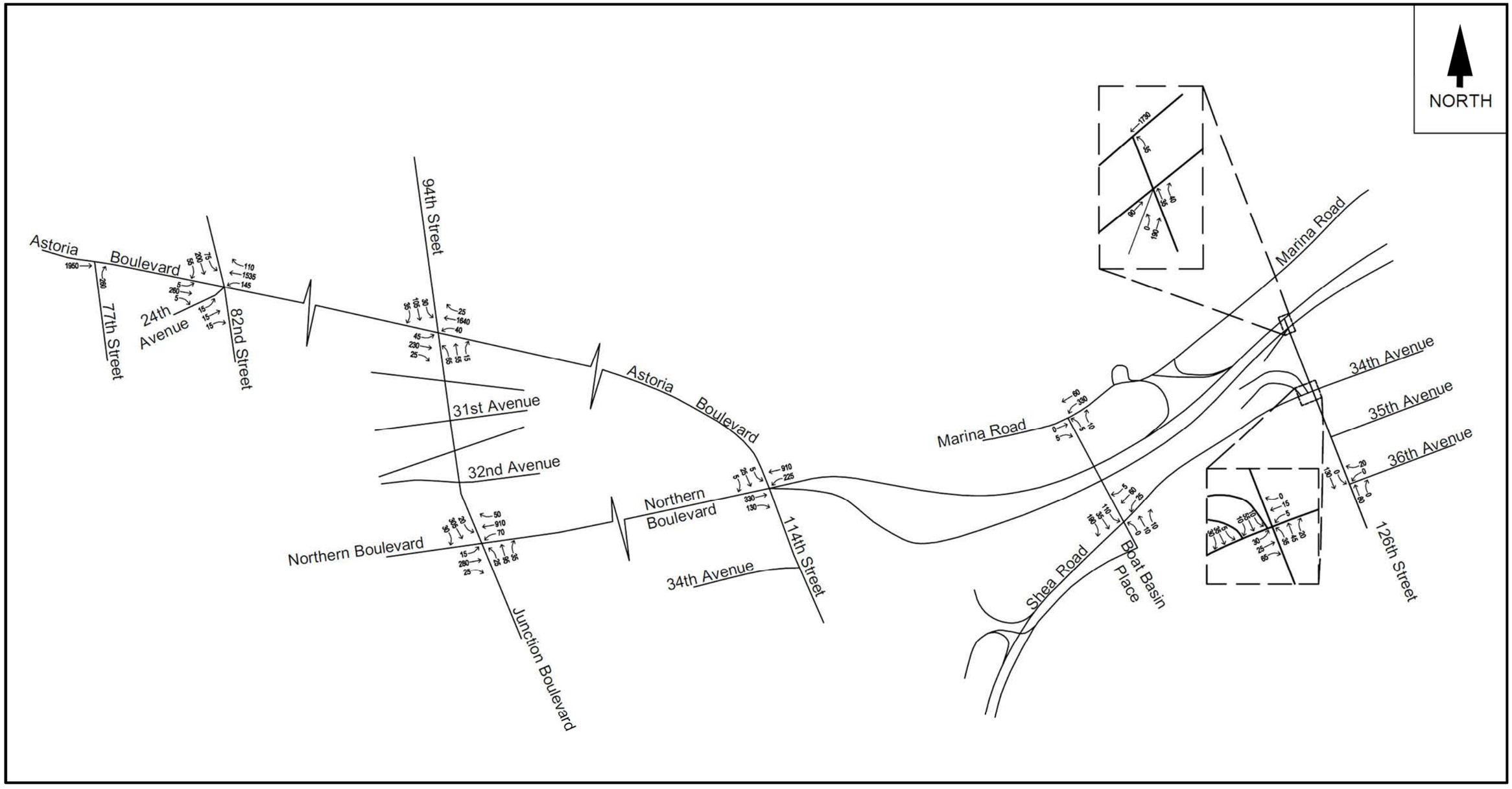


Figure 12: Existing Turning Movement Volumes: Weekday PM Construction Peak Hour

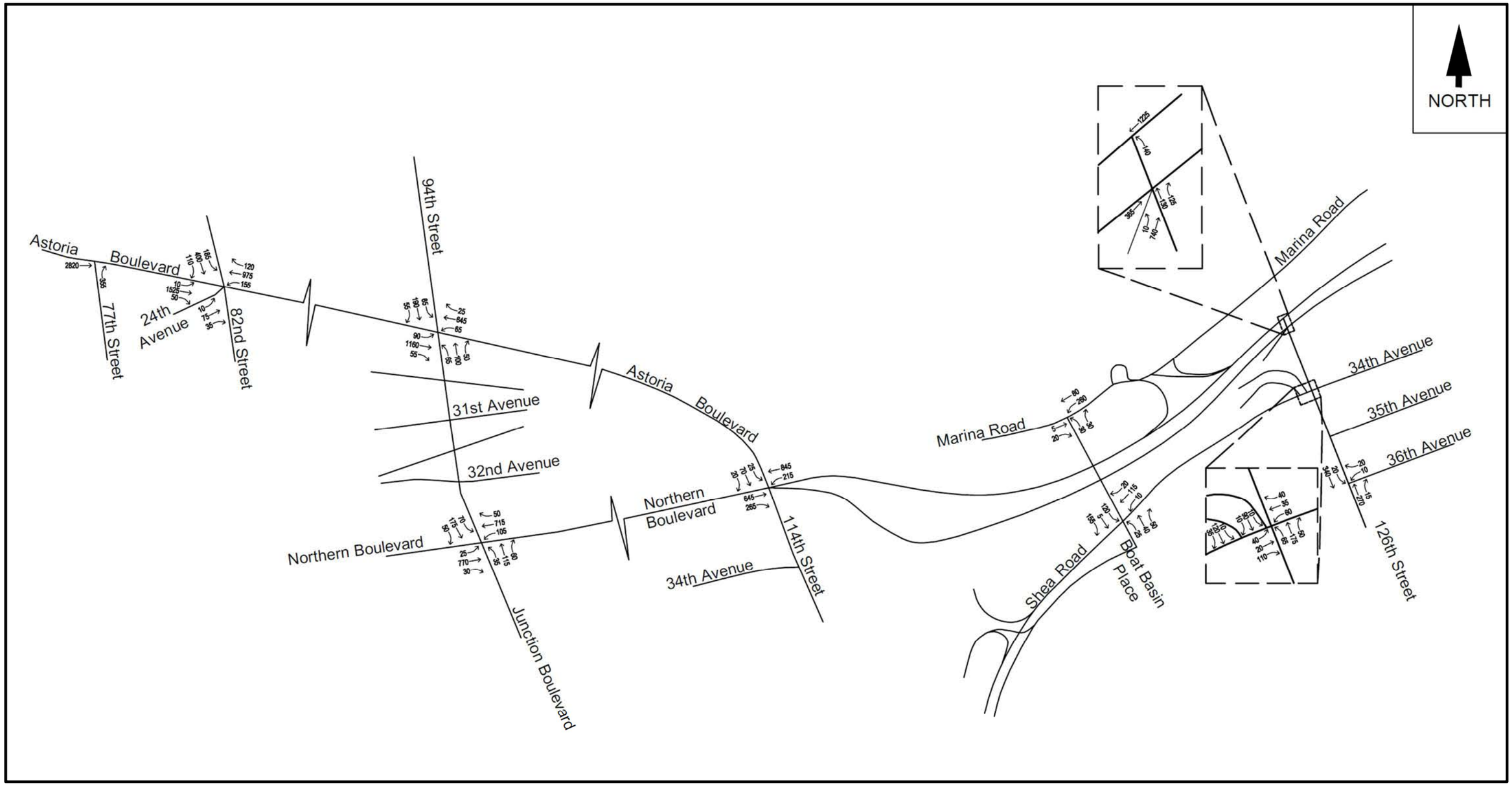
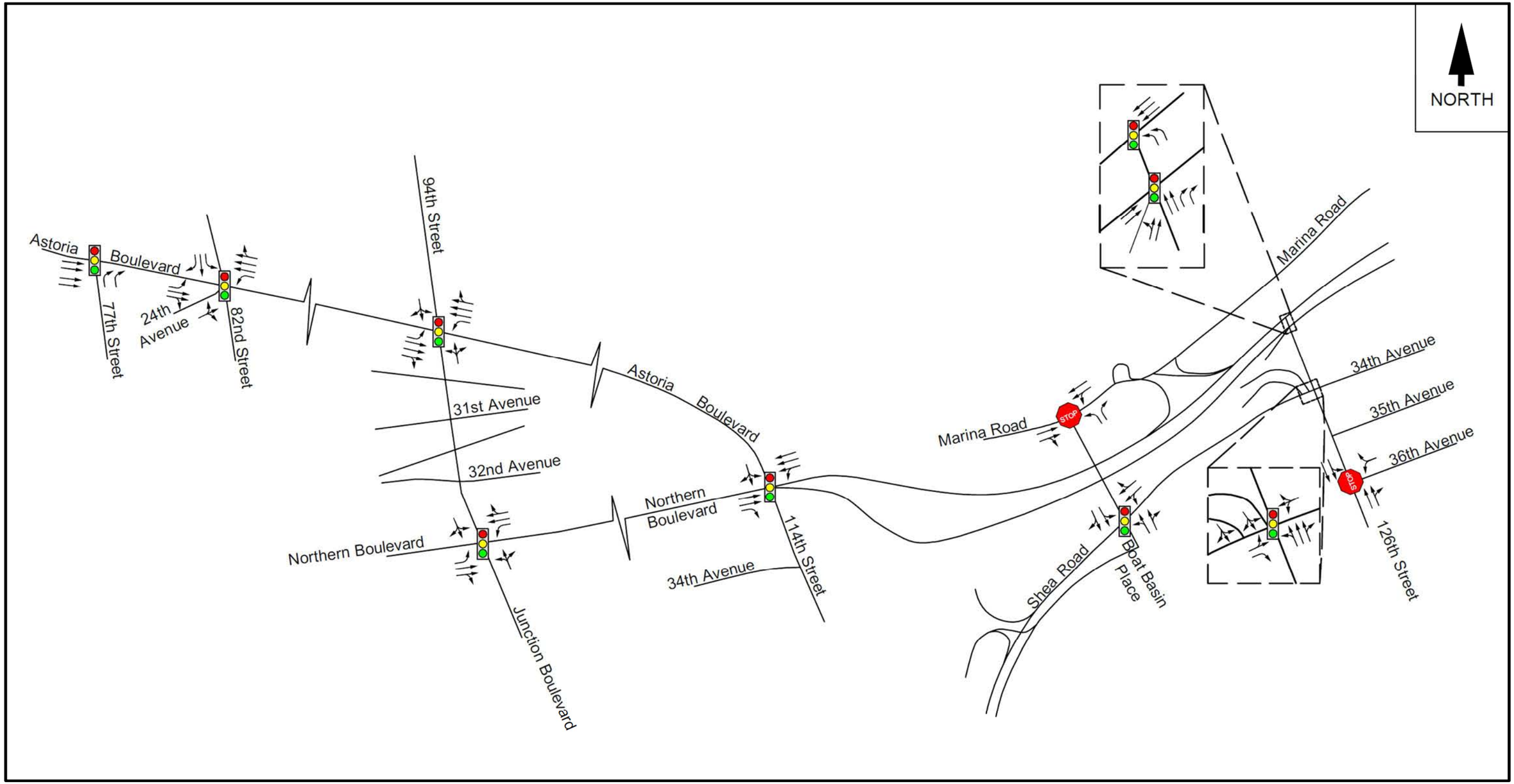


Figure 13: Existing Lane Configurations and Traffic Control Devices



4.5.3 Existing Traffic Operations

The traffic operations analyses for the study area intersections were conducted using the Synchro software (Version 9) and were based on the methodologies described in the *2000 Highway Capacity Manual (HCM)*. For signalized intersections, the *HCM* methodology calculates a volume-to-capacity (v/c) ratio for each approach or lane group. The v/c ratio represents the ratio of traffic volumes on the approach to the approach's vehicle-carrying capacity. At v/c ratios between 0.95 and 1.00, traffic volumes approach capacity and delays to motorists could become substantial. Volume-to-capacity ratios exceeding 1.00 indicate saturated conditions, typically characterized by long delays and building queues.

The *HCM* methodology also expresses the quality of flow for an approach or lane group in terms of level-of-service (LOS), a measure based on the average delay that motorists experience when traveling through the intersection. This includes delays associated with acceleration, deceleration, and queue move-up time, in addition to stopped delay at the intersection. For signalized intersections, LOS ranges on a letter-grade scale from "A" (average delays of 10 seconds or less per vehicle) to "F" (average delays exceeding 80 seconds per vehicle).

For unsignalized two-way stop-controlled intersections, the *HCM* methodology assumes that major-street through and right-turning traffic is unaffected by turning movements from the minor street. Left-turns from the major street are assumed to be affected by the opposing (oncoming) major-street traffic flow. Minor-street traffic movements are affected by all of the conflicting higher-priority movements described above.

As with signalized intersections, the *HCM* methodology for two-way stop-controlled intersections expresses the quality of flow in terms of both v/c ratio and a letter-grade LOS, with LOS based on the average delay experienced by motorists making left-turns from the major street or turns from the minor-street approach. However, the relationships between delay and LOS for two-way stop-controlled intersections are different from those for signalized intersections, primarily because motorists expect different levels of performance from these two types of intersections. For unsignalized two-way stop-controlled intersections, LOS ranges from "A" (average delays of 10 seconds or less per vehicle) to "F" (average delays exceeding 50 seconds per vehicle).

Table 2 shows the relationships between average delay and LOS for signalized and unsignalized intersections using the *HCM* methodologies. Levels-of-service "A", "B" and "C" generally represent extremely favorable to fair levels of traffic flow. At LOS "D", delays increase and the influence of congestion becomes noticeable. LOS "E" is considered to be the limit of acceptable delay for most motorists. LOS "F" is considered to be unacceptable to most motorists, with traffic flow at, or exceeding, the capacity of the roadway.

Table 2: Level-of-Service Criteria for Signalized and Unsignalized Intersections

Level-of-Service	Signalized Intersections	Unsignalized Intersections
	Average Delay (seconds per vehicle)	Average Delay (seconds per vehicle)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Source: *2000 Highway Capacity Manual*.

Using the existing turning movement volumes shown in Figures 11 and 12, traffic operations analyses were conducted for each of the study intersections for the weekday AM and PM construction peak hours. The capacity adjustments shown in Table 3 were made to the existing conditions traffic operations analyses based on the data collected and field observations.

Table 3: Existing Conditions Intersection Capacity Adjustments

Intersection	Weekday Peak Hour	Capacity Adjustments
Astoria Boulevard/ 82nd Street/24th Avenue	PM	Westbound left-turn: base saturation flow rate = 2,050 pcphgpl, lost time = 1 second Southbound through: base saturation flow rate = 2,050 pcphgpl, lost time = 1 second, PHF = 0.95

pcphgpl = passenger cars per hour green per lane

Table 4 shows the results of the traffic operations analyses, including volume-to-capacity (v/c) ratios, average delays, and corresponding levels-of-service. The table highlights (with shading) those intersection movements that operate at level-of-service (LOS) "E" or LOS "F" or have a high v/c ratio (0.90 and above), and are therefore considered to be congested.

Table 4: Existing Levels-of-Service, Weekday AM and PM Construction Peak Hours

Intersection	Approach	Movement	Weekday AM Construction Peak Hour (6:00 to 7:00 AM)				Weekday PM Construction Peak Hour (3:00 to 4:00 PM)			
			v/c	Average Delay	LOS	95th % Queue (feet)	v/c	Average Delay	LOS	95th % Queue (feet)
SIGNALIZED INTERSECTIONS										
Shea Road / 34th Avenue / 126th Street	EB	LT	0.28	42.1	D	78	0.26	41.3	D	78
		R	0.27	41.6	D	91	0.44	45.1	D	137
	WB	LTR	0.10	38.2	D	36	0.45	45.1	D	169
	NB	LTR	0.09	19.2	B	28	0.19	20.3	C	74
	SB	Lower-Level Ramp	0.12	28.3	C	66	0.18	40.4	D	92
	SE	Upper-Level Ramp	0.25	34.2	C	114	0.60	62.5	E	224
	Overall		**0.28**	**31.8**	**C**	**-**	**0.60**	**40.0**	**D**	**-**
Northern Boulevard eastbound / 126th Street	EB	LT	0.13	22.0	C	61	0.63	57.9	E	226
	NE	L	0.21	26.8	C	56	0.54	27.0	C	304
		R	0.22	27.0	C	100	0.58	28.2	C	334
	NB	T	0.08	27.1	C	31	0.21	32.1	C	84
		R	0.12	28.0	C	37	0.27	33.4	C	90
	Overall		**0.58**	**25.8**	**C**	**-**	**0.63**	**36.9**	**D**	**-**
Northern Boulevard westbound / 126th Street	WB	T	0.58	9.6	A	277	0.45	8.0	A	165
	NB	L	0.06	1.5	A	0	0.24	7.6	A	13
	Overall		**0.58**	**9.5**	**A**	**-**	**0.63**	**7.9**	**A**	**-**
Astoria Boulevard / 114th Street / Northern Boulevard	EB	T	0.41	28.7	C	156	0.54	19.6	B	255
		R	0.30	27.7	C	124	0.38	17.8	B	186
	WB	LT	0.41	9.6	A	260	0.32	3.0	A	38
	SB	LTR	0.12	41.2	D	53	0.42	47.1	D	143
	Overall		**0.41**	**15.8**	**B**	**-**	**0.54**	**13.0**	**B**	**-**
Astoria Boulevard / 94th Street	EB	L	0.26	28.0	C	30	0.24	13.7	B	53
		TR	0.16	19.3	B	63	0.67	27.4	C	347
	WB	L	0.08	10.2	B	27	0.26	19.8	B	41
		TR	0.88	35.6	D	539	0.39	22.2	C	167
	NB	LTR	0.40	36.1	D	147	0.70	48.1	D	244
	SB	LTR	0.39	35.2	D	173	0.75	48.1	D	339
	Overall		**0.88**	**33.0**	**C**	**-**	**0.75**	**29.9**	**C**	**-**
Northern Boulevard / Junction Boulevard	EB	L	0.08	8.3	A	11	0.10	8.1	A	16
		TR	0.23	14.4	B	92	0.55	19.1	B	283
	WB	L	0.14	7.9	A	35	0.36	13.2	B	49
		TR	0.73	23.9	C	378	0.52	18.5	B	257
	NB	LTR	0.63	51.4	D	189	0.86	70.2	E	280
	SB	LTR	1.03	95.0	F	468	1.01	94.3	F	403
	Overall		**1.03**	**37.8**	**D**	**-**	**1.01**	**34.4**	**C**	**-**
Astoria Boulevard / 77th Street	EB	L	0.55	11.0	B	191	0.74	13.9	B	363
	NB	R	0.39	28.1	C	78	0.57	31.4	C	153
	Overall		**0.55**	**13.1**	**B**	**-**	**0.74**	**16.2**	**B**	**-**
Astoria Boulevard / 82nd Street / 24th Avenue	EB	L	0.20	39.8	D	14	0.11	20.1	C	16
		TR	0.25	21.7	C	102	0.81	30.3	C	480
	WB	L	0.34	18.6	B	98	0.97	104.7	F	218
		TR	0.71	23.2	C	407	0.49	16.0	B	229
	NB	LTR	0.32	52.6	D	74	0.89	100.8	F	228
	SB	L	0.33	44.1	D	100	0.68	55.4	E	222
		T	0.61	51.6	D	239	1.01	94.1	F	543
		R	0.26	43.0	D	80	0.53	50.7	D	143
	Overall		**0.71**	**26.9**	**C**	**-**	**1.01**	**40.0**	**D**	**-**
UNSIGNALIZED INTERSECTIONS										
Shea Road / Boat Basin Place	WB	LT	0.12	9.5	A	0	0.13	9.3	A	0
		TR	0.08	9.5	A	0	0.15	9.3	A	0
	NB	LT	0.01	8.4	A	0	0.08	9.0	A	0
		TR	0.02	7.5	A	0	0.11	8.3	A	0
	SB	LT	0.24	10.5	B	0	0.23	10.4	B	0
		TR	0.31	9.2	A	0	0.26	9.1	A	0
	Overall		*	**9.6**	**A**	**-**	*	**9.3**	**A**	**-**
Boat Basin Place / Marina Road	NB	L	0.02	16.5	C	0	0.16	24.7	C	0
		R	0.01	8.4	A	0	0.04	9.3	A	0
	WB	L	0.00	0.0	A	0	0.24	8.7	A	0
126th Street / 36th Avenue	WB	LR	0.03	9.5	A	0	0.06	11.2	B	0
	SB	LT	0.00	0.0	A	0	0.02	8.5	A	0

Notes:

v/c = volume-to-capacity ratio; LOS = Level-of-Service

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound; NEB = Northeastbound, NWB = Northwestbound

L = Left-Turn; T = Through; R = Right-Turn;

LT = Left-Turn/Through; TR = Through/Right-Turn; LR = Left-Turn/Right-Turn; LTR = Left-Turn/Through/Right-Turn

Average Delay shown in units of seconds/vehicle

* = Overall v/c ratio not calculated for this intersection.

As shown in Table 4, all of the lane groups at all of the study intersections currently operate at LOS "D" or better (delays of 55 seconds per vehicle or less for signalized intersections and delays of 35 seconds or less for unsignalized intersections) during the weekday AM and PM peak hours for construction, with the exception of the following locations:

- Shea Road/34th Avenue/126th Street – During the weekday PM peak hour for construction, the upper level ramp (from the Whitestone Expressway) operates at LOS "E". The intersection as a whole currently operates at LOS "C" overall during the weekday AM construction peak hour, and at LOS "D" overall during the weekday PM construction peak hour.

- Northern Boulevard eastbound/126th Street – During the weekday PM peak hour for construction, the eastbound approach currently operates at LOS "E". The intersection as a whole currently operates at LOS "C" overall during the weekday AM construction peak hour, and at LOS "D" overall during the weekday PM construction peak hour.

- Northern Boulevard/Junction Boulevard – During the weekday AM construction peak hour, the southbound approach operates over capacity with delays corresponding to LOS "F." During the weekday PM construction peak hour, the northbound approach operates at LOS "E" and the southbound approach operates over capacity at LOS "F". The intersection as a whole currently operates at LOS "D" overall during the weekday AM peak hour and at LOS "C" overall during the weekday PM construction peak hour.

- Astoria Boulevard/82nd Street/24th Avenue – During the weekday PM construction peak hour, the westbound left-turn movement currently operates near capacity at LOS "F" and the northbound approach operates at LOS "F". Also, during the weekday PM construction peak hour, the southbound left-turn movement operates at LOS "E" and the southbound through movement operates over capacity at LOS "F". The intersection as a whole currently operates at LOS "C" overall during the weekday AM construction peak hour and LOS "D" overall during the weekday PM construction peak hour.

4.5.4 Future Traffic Operations Without Construction

The Future Without Construction condition traffic analysis identifies how the study area's transportation system is projected to operate in the future *without* the construction traffic associated with the Proposed Action. As stated earlier in this report, projected construction conditions on a typical weekday during the peak month of July 2019 were analyzed for this purpose. It is expected that regardless of the planned construction at Terminals C and D, traffic volumes at the study intersections during this timeframe would increase due to a combination of normal background growth, as well as traffic generated from other construction activities at LaGuardia Airport.

To establish year 2019 Future Without Construction traffic volumes, the existing traffic volumes from November 2015/March 2016 were first increased by applying a compounded background growth rate in accordance with the *CEQR Technical Manual* to account for regional growth between 2015/2016 and 2019. A compounded total growth rate of 2.02 percent was calculated for the 2019 horizon year[2] and applied to the existing traffic volumes, in accordance with the growth rate recommendations described in the *CEQR Technical Manual*.

In addition, the projected increase in vehicular traffic associated with overlapping construction activities at the Central Terminal Building (CTB) at LaGuardia Airport were included in the year 2019 Future Without Construction traffic volumes.

- LaGuardia Airport Central Terminal Building Redevelopment – This project, which involves the reconstruction of the Central Terminal Building (Terminal B) at La Guardia Airport, received an initial Finding of No Significant Impact (FONSI) certification in December 2014. Subsequently, a Written Reevaluation of the Environmental Assessment (EA) was performed to reflect refinements to the program, including changes to the peak construction timeframe from the fourth quarter of 2015 to the second quarter of 2017, and other related parameters such as construction worker shift patterns. The Written Reevaluation received its FONSI in December 2015.

  Weekday peak hour traffic generated by the CTB during its peak construction quarter, as documented in the Written Reevaluation, were included in the Without Construction condition for Delta Terminals C/D. Although the peak construction years for the CTB and Delta Terminals C/D do not exactly coincide (2017 for CTB and 2019 for Terminals C/D), to be conservative, the 2017 peak hour construction volumes associated with the CTB were included without any adjustment to reflect higher construction traffic volumes in 2019.

Other major planned projects were considered but their projected traffic estimates were not included in the Without Construction condition:

- Willets Point Development District – This project is located adjacent to Citi Field in an area generally bounded by 126th Street to the west, Roosevelt Avenue to the south, the Van Wyck Expressway and an undeveloped parcel owned by the Metropolitan Transportation Authority

[2] A compounded total growth rate of 2.02 percent over four years (2015 to 2019) was calculated based on a 0.50 percent annual growth rate for "Other Queens," in accordance with the March 2014 *CEQR Technical Manual* guidelines (Table 16-4 on page 16-30). This four-year growth rate was applied to the traffic volumes collected in November 2015, as well as to those collected in March 2016, to ensure a conservative analysis.

(MTA) to the east, and Northern Boulevard to the north. The proposed project will include a mix of residential, retail, office, community facility and institutional uses. According to the *Willets Point Development Plan FGEIS*, dated September 2008, the project was expected to be in operation by 2017. However, the project has been delayed, and because a firm completion and operational date has not been established at this time, traffic projected to be generated by the Willets Point development was not included in the Without Construction condition. This issue was discussed with NYCDOT staff who concurred with this assumption.

The Flushing West Rezoning EIS – The New York City Department of City Planning (DCP) is proposing a series of land use actions to implement recommendations of the Flushing West Plan, which is the subject of an ongoing community process, to create opportunities for new mixed-income housing, community facilities, economic development, and new public access areas along the Flushing Creek waterfront within an approximately 11-block area in the western portion of Downtown Flushing in Queens, Community District 7. The affected area covers approximately 47 acres and is generally bounded by Northern Boulevard to the north, Prince Street to the east, Roosevelt Avenue to the south and Flushing Creek to the west. The Proposed Actions have been crafted as part of a comprehensive neighborhood planning process that seeks to support Mayor de Blasio's housing plan, Housing New York. They also build upon a draft land use, zoning, and master planning effort initiated by the Flushing Willets Point Corona Local Development Corporation (FWCLDC). The proposed Build year for the EIS is 2026 which is beyond the analysis year for the Delta Terminals C/D construction impact assessment; as such, this project was not included in the Without Construction condition.

The resulting year 2019 Future Without Construction condition traffic volumes are shown in Figures 14 and 15 for the weekday AM and PM construction peak hours, respectively. Using these traffic volumes, intersection operations analyses were again repeated using the Synchro software and the LOS criteria described previously.

Figure 14: Year 2019 Future Without Construction Conditions Turning Movement Volumes: Weekday AM Construction Peak Hour

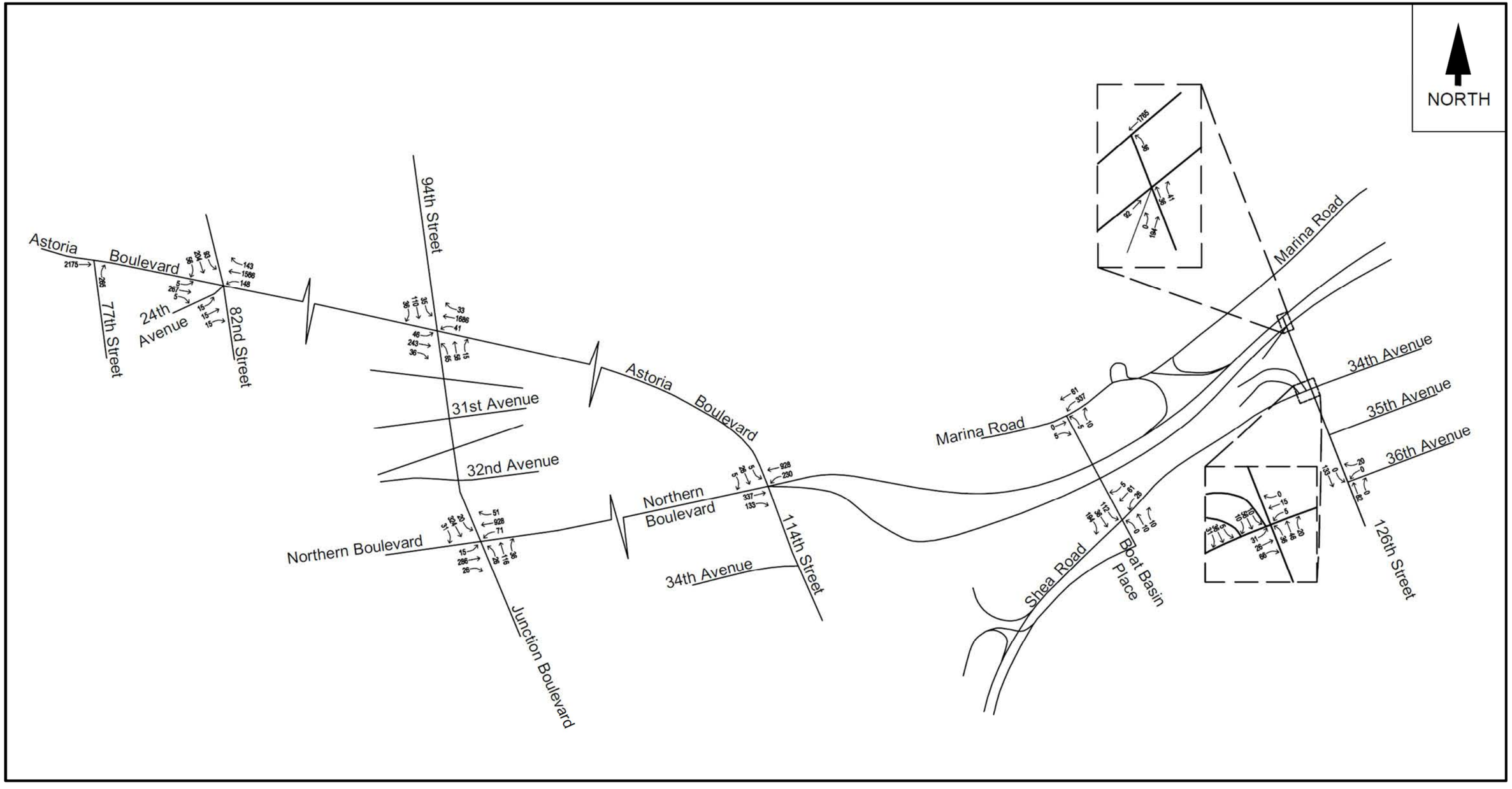
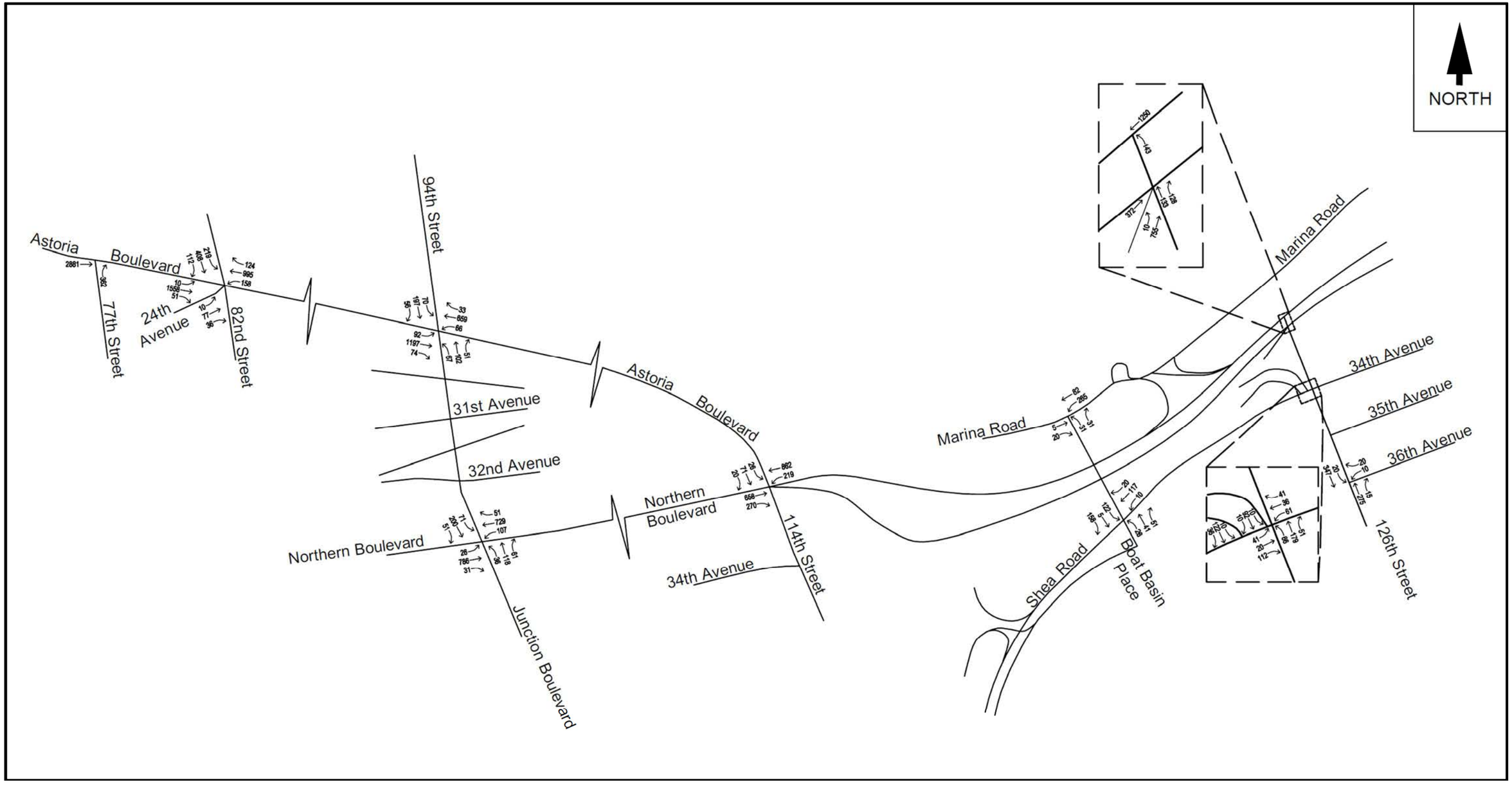


Figure 15: Year 2019 Future Without Construction Conditions Turning Movement Volumes: Weekday PM Construction Peak Hour



As shown in Table 5, all of the lane groups at all of the study intersections are projected to operate at a LOS "D" or better (delays of 55 seconds per vehicle or less for signalized intersections and delays of 35 seconds or less for unsignalized intersections) during the weekday AM and PM construction peak hours, with exception of the following locations:

- Shea Road/34th Avenue/126th Street – During the weekday PM construction peak hour, the upper level ramp (from the Whitestone Expressway) is projected to operate at LOS "E". The intersection as a whole is projected to operate at LOS "C" overall during the weekday AM construction peak hour and at LOS "D" overall during the weekday PM construction peak hour.

- Northern Boulevard eastbound/126th Street – During the weekday PM construction peak hour, the eastbound approach is projected to operate at LOS "E". The intersection as a whole is projected to operate at LOS "C" and LOS "D" overall during the weekday AM and PM construction peak hours, respectively.

- Northern Boulevard/Junction Boulevard – During the weekday AM construction peak hour, the northbound approach is projected to operate at LOS "E" and the southbound approach is projected to operate over capacity with delays corresponding to LOS "F". During the weekday PM construction peak hour, the northbound approach is projected to operate near capacity at LOS "E", and the southbound approach is projected to operate over capacity at LOS "F". The intersection as a whole is projected to operate over capacity at LOS "D" overall during the weekday AM and PM construction peak hours.

- Astoria Boulevard/82nd Street/24th Avenue – During the weekday PM construction peak hour, the westbound left-turn movement is projected to operate at capacity at LOS "F" and the northbound approach is projected to operate near capacity at LOS "F". Also during the weekday PM construction peak hour, the southbound left-turn movement is projected to operate at LOS "E", and the southbound through movement is projected to operate over capacity at LOS "F". The intersection as a whole is projected to operate at LOS "C" overall during the weekday AM construction peak hour and at LOS "D" overall during the weekday PM construction peak hour.

Table 5: Year 2019 Projected Levels-of-Service, Future Without Construction Conditions, Construction Peak Hours

Intersection	Approach	Movement	Weekday AM Construction Peak Hour (6:00 to 7:00 AM)				Weekday PM Construction Peak Hour (3:00 to 4:00 PM)			
			v/c	Average Delay	LOS	95th % Queue (feet)	v/c	Average Delay	LOS	95th % Queue (feet)
SIGNALIZED INTERSECTIONS										
Shea Road / 34th Avenue / 126th Street	EB	LT	0.29	42.3	D	80	0.26	41.5	D	79
		R	0.28	41.7	D	92	0.44	45.3	D	139
	WB	LTR	0.10	38.2	D	36	0.46	45.4	D	173
	NB	LTR	0.10	19.3	B	28	0.20	20.3	C	76
	SB	Lower-Level Ramp	0.12	28.1	C	67	0.18	42.1	D	93
	SE	Upper-Level Ramp	0.26	34.1	C	115	0.61	62.7	E	228
	Overall		**0.29**	**31.8**	**C**	**-**	**0.61**	**40.3**	**D**	**-**
Northern Boulevard eastbound / 126th Street	EB	LT	0.13	21.9	C	62	0.65	58.0	E	231
	NEB	L	0.22	26.9	C	58	0.55	27.2	C	311
		T	0.23	27.1	C	101	0.59	28.5	C	343
	NB	T	0.09	27.1	C	31	0.22	32.3	C	86
		R	0.12	27.8	C	38	0.28	33.6	C	92
	Overall		**0.60**	**25.8**	**C**	**-**	**0.65**	**37.1**	**D**	**-**
Northern Boulevard westbound / 126th Street	WB	T	0.60	9.8	A	286	0.45	8.1	A	169
	NB	L	0.07	1.5	A	0	0.25	7.3	A	13
	Overall		**0.60**	**9.6**	**A**	**-**	**0.65**	**8.0**	**A**	**-**
Astoria Boulevard / 114th Street / Northern Boulevard	EB	T	0.42	28.9	C	160	0.55	19.8	B	263
		R	0.30	27.8	C	127	0.39	17.9	B	190
	WB	LT	0.42	9.6	A	268	0.33	3.0	A	39
	SB	LTR	0.12	41.3	D	55	0.43	47.3	D	146
	Overall		**0.42**	**15.9**	**B**	**-**	**0.55**	**13.1**	**B**	**-**
Astoria Boulevard / 94th Street	EB	L	0.27	28.4	C	31	0.25	14.0	B	54
		TR	0.18	19.5	B	68	0.70	28.3	C	372
	WB	L	0.08	10.3	B	28	0.28	22.3	C	41
		TR	0.91	38.0	D	569	0.41	22.4	C	172
	NB	LTR	0.51	39.6	D	173	0.74	50.4	D	253
	SB	LTR	0.42	35.8	D	184	0.79	51.2	D	357
	Overall		**0.91**	**34.9**	**C**	**-**	**0.79**	**31.0**	**C**	**-**
Northern Boulevard / Junction Boulevard	EB	L	0.08	8.4	A	11	0.11	8.3	A	16
		TR	0.24	14.5	B	94	0.57	19.4	B	291
	WB	L	0.20	9.0	A	35	0.38	13.8	B	50
		TR	0.75	24.4	C	390	0.54	18.7	B	264
	NB	LTR	0.75	59.2	E	220	0.91	79.2	E	300
	SB	LTR	1.08	110.7	F	507	1.08	112.8	F	452
	Overall		**1.08**	**42.6**	**D**	**-**	**1.08**	**38.9**	**D**	**-**
Astoria Boulevard / 77th Street	EB	L	0.58	11.3	B	241	0.76	14.3	B	378
	NB	R	0.40	28.3	C	115	0.58	31.7	C	156
	Overall		**0.58**	**13.4**	**B**	**-**	**0.76**	**16.5**	**B**	**-**
Astoria Boulevard / 82nd Street / 24th Avenue	EB	L	0.20	39.8	D	14	0.12	20.4	C	17
		TR	0.26	21.8	C	104	0.83	31.1	C	497
	WB	L	0.35	18.9	B	100	1.00	113.2	F	228
		TR	0.75	24.2	C	436	0.51	16.2	B	235
	NB	LTR	0.32	52.6	D	74	0.91	105.7	F	234
	SB	L	0.40	45.9	D	120	0.81	64.7	E	264
		T	0.63	52.2	D	244	1.03	98.6	F	557
		R	0.26	43.1	D	82	0.54	51.0	D	145
	Overall		**0.75**	**27.7**	**C**	**-**	**1.03**	**42.1**	**D**	**-**
UNSIGNALIZED INTERSECTIONS										
Shea Road / Boat Basin Place	WB	LT	0.12	9.5	A	0	0.14	9.4	A	0
		TR	0.08	9.5	A	0	0.15	9.4	A	0
	NB	LT	0.01	8.4	A	0	0.08	9.0	A	0
		TR	0.02	7.5	A	0	0.11	8.3	A	0
	SB	LT	0.24	10.6	B	0	0.23	10.5	B	0
		TR	0.32	9.3	A	0	0.27	9.2	A	0
	Overall		*	**9.6**	**A**	**-**	*	**9.4**	**A**	**-**
Boat Basin Place / Marina Road	NB	L	0.02	16.8	C	0	0.17	25.5	D	0
		R	0.01	8.4	A	0	0.04	9.3	A	0
	WB	L	0.00	0.0	A	0	0.24	8.7	A	0
126th Street / 36th Avenue	WB	LR	0.03	9.5	A	0	0.06	11.3	B	0
	SB	LT	0.00	0.0	A	0	0.02	8.5	A	0

Notes:

v/c = volume-to-capacity ratio; LOS = Level-of-Service

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound; NEB = Northeastbound, NWB = Northwestbound

L = Left-Turn; T = Through; R = Right-Turn;

LT = Left-Turn/Through; TR = Through/Right-Turn; LR = Left-Turn/Right-Turn; LTR = Left-Turn/Through/Right-Turn

Average Delay shown in units of seconds/vehicle

* = Overall v/c ratio not calculated for this intersection.

4.5.5 Future Traffic Operations With Construction

The Future With Construction condition traffic analysis identifies how the study area intersections will operate in the 2019 horizon year with the addition of:

1) Vehicular traffic generated by construction activities associated with the proposed reconfiguration of Terminals C and D, and

2) Transportation improvements that are planned to be implemented in conjunction with construction.

Vehicle trips estimated to be generated on a typical construction workday in the peak month of July 2019 were added to the Future Without Construction traffic volumes to produce the Future With Construction traffic volumes. In this analysis, the projected weekday AM and PM peak hour construction vehicle trips associated with the proposed project (shown previously in Figures 8 and 9) were added to the respective future Without Construction condition traffic volumes (shown in Figures 14 and 15) to arrive at projected future With Construction condition traffic volumes (shown in Figures 16 and 17).

Intersection operations analyses were then repeated for both analysis peak hours using the projected future With Construction condition traffic volumes shown in Figures 15 and 16 in order to evaluate the performance of the transportation system including construction traffic associated with the proposed reconfiguration of Terminals C and D. The results of the future Without Construction and With Construction conditions analyses were then compared in accordance with *CEQR Technical Manual* criteria to identify any critical changes in projected traffic operations associated with construction of the proposed project, as well as the transportation improvements that would be required to ensure acceptable traffic operations with the addition of construction traffic during peak construction time periods.

The following is a recommended transportation improvement for the With Construction condition. This improvement is recommended as temporary measure to reduce delays and ensure the most efficient traffic operations during periods of peak construction activity. The improvement noted below is subject to review and approval by the NYCDOT.

- Northern Boulevard/Junction Boulevard – During the weekday AM and PM peak periods, reallocate one (1) second of green time from the east-west left-turn phase to the north-south phase.

Figure 16: Year 2019 Future With Construction Conditions Turning Movement Volumes: Weekday AM Construction Peak Hour

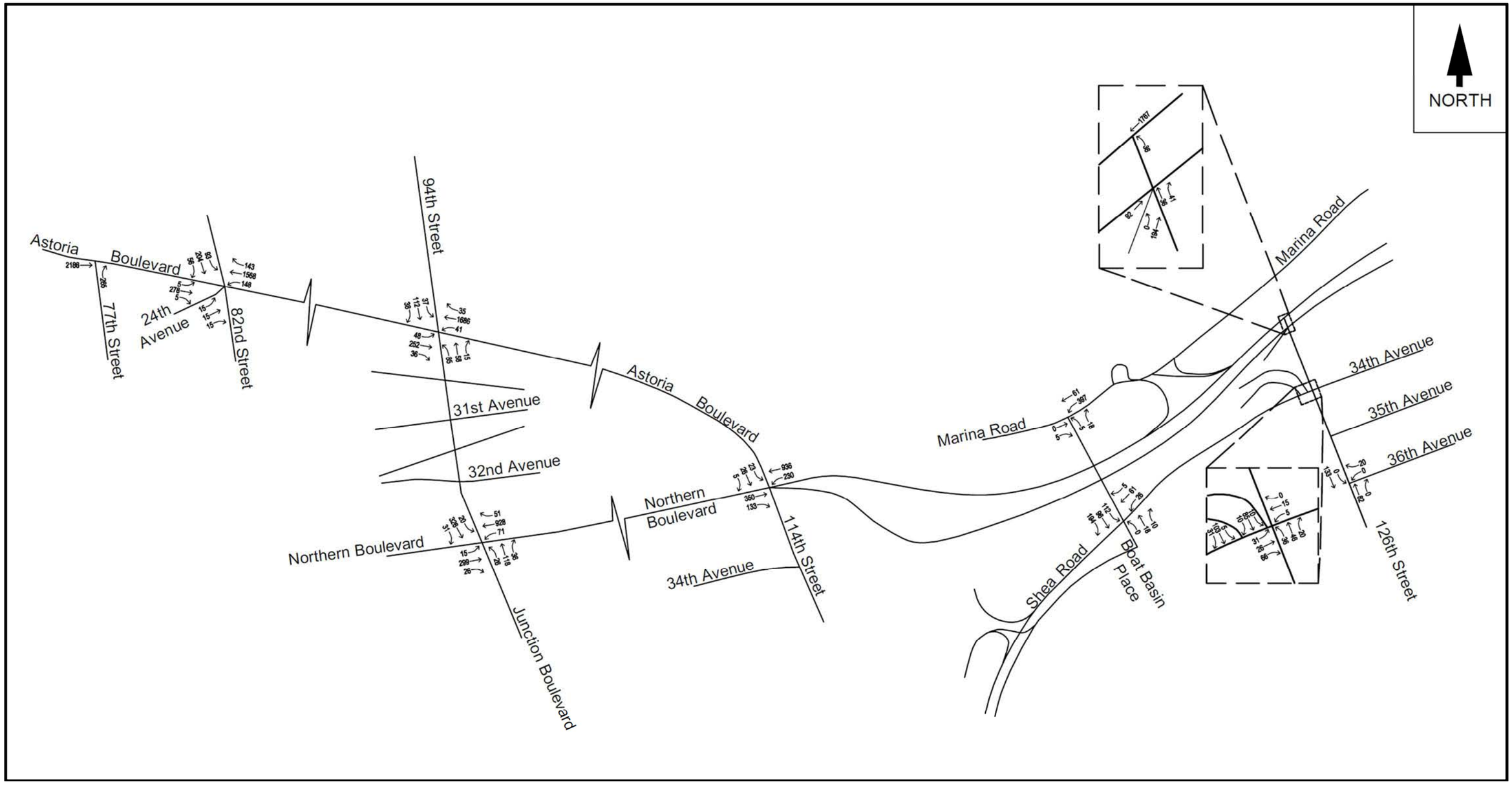


Figure 17: Year 2019 Future With Construction Conditions Turning Movement Volumes: Weekday PM Construction Peak Hour

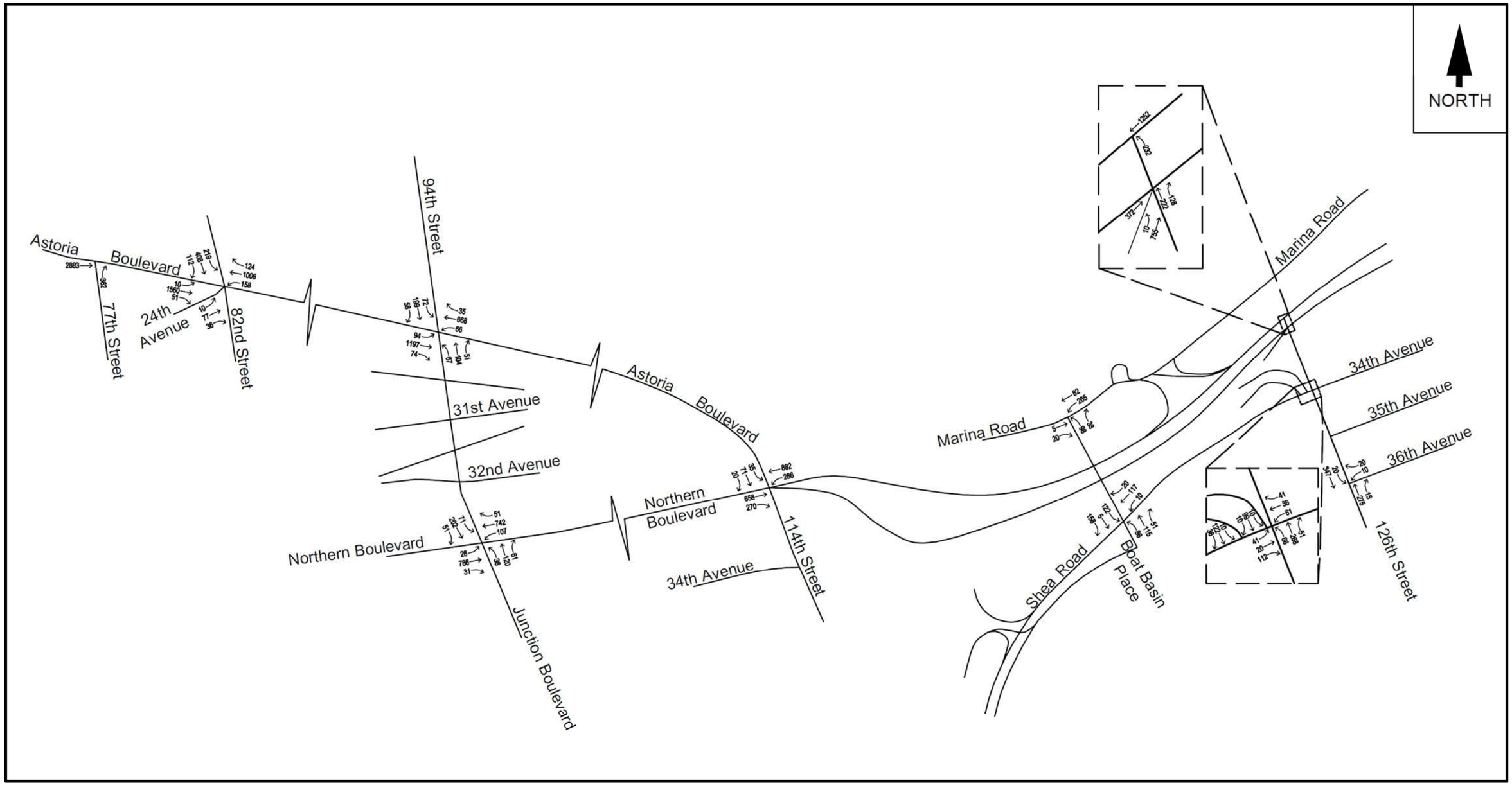


Table 6 compares the weekday AM and PM peak hour intersection capacity analysis results for the Future Without Construction Condition with those under the Future With Construction Condition with the transportation improvements noted above. With these improvements in place, no significant traffic impacts are projected to occur in accordance with the *CEQR Technical Manual* criteria.

4.5.6 Conclusion

In conclusion, this section presented an analysis of the effects of additional vehicle trips projected to be generated by construction activities associated with the reconfiguration of Terminals C and D during the weekday AM and PM peak hours for construction (i.e., 6:00 to 7:00 AM and 3:00 to 4:00 PM). The results of this analysis indicate that—with the improvements described above—the additional vehicle trips generated by the construction of Terminals C and D can be accommodated on the roadway network during the weekday AM and PM construction peak hours without significant traffic impacts according to *CEQR Technical Manual* criteria.

Table 6: Comparison of Year 2019 Levels-of-Service, Future Without Construction and With Construction Conditions, Construction Peak Hours – with improvements

Intersection	Approach	Movement	Weekday AM Construction Peak Hour (6:00 to 7:00 AM)										Weekday PM Construction Peak Hour (3:00 to 4:00 PM)									
			Without Construction				With Construction with Improvements				Change in Delay	Impact?	Without Construction				With Construction with Improvements				Change in Delay	Impact?
			v/c	Average Delay	LOS	95th % queue	v/c	Average Delay	LOS	95th % queue			v/c	Average Delay	LOS	95th % queue	v/c	Average Delay	LOS	95th % queue		
SIGNALIZED INTERSECTIONS																						
Shea Road / 34th Avenue / 126th Street	EB	LT	0.29	42.3	D	80	0.29	42.3	D	80	0.0		0.26	41.5	D	79	0.26	41.5	D	79	0.0	
		R	0.28	41.7	D	92	0.28	41.7	D	92	0.0		0.44	45.3	D	139	0.44	45.3	D	139	0.0	
	WB	LTR	0.10	38.2	D	36	0.10	38.2	D	36	0.0		0.46	45.4	D	173	0.46	45.4	D	173	0.0	
	NB	LTR	0.10	19.3	B	28	0.10	19.3	B	28	0.0		0.20	20.3	C	76	0.25	21.0	C	97	0.7	
	SB	Lower-Level Ramp	0.12	28.1	C	67	0.16	37.5	D	88	9.4		0.18	42.1	D	93	0.19	44.7	D	98	2.6	
	SE	Upper-Level Ramp	0.26	34.1	C	115	0.50	38.9	D	184	4.8		0.61	62.7	E	228	0.61	62.1	E	199	-0.6	
	Overall		**0.29**	**31.8**	**C**	**-**	**0.50**	**35.3**	**D**	**-**	3.5		**0.61**	**40.3**	**D**	**-**	**0.61**	**39.2**	**D**	**-**	-1.1	
Northern Boulevard eastbound / 126th Street	EB	LT	0.13	21.9	C	62	0.13	21.0	C	60	-0.9		0.65	58.0	E	231	0.65	57.4	E	230	-0.6	
	NEB	L	0.22	26.9	C	58	0.22	26.9	C	58	0.0		0.55	27.2	C	311	0.55	27.2	C	311	0.0	
		T	0.23	27.1	C	101	0.23	27.1	C	101	0.0		0.59	28.5	C	343	0.59	28.5	C	343	0.0	
	NB	T	0.09	27.1	C	31	0.09	27.1	C	32	0.0		0.22	32.3	C	86	0.36	34.7	C	132	2.4	
		R	0.12	27.8	C	38	0.12	27.9	C	38	0.1		0.28	33.6	C	92	0.28	30.5	C	90	-3.1	
	Overall		**0.60**	**25.8**	**C**	**-**	**0.60**	**25.6**	**C**	**-**	-0.2		**0.65**	**37.1**	**D**	**-**	**0.65**	**36.8**	**D**	**-**	-0.3	
Northern Boulevard westbound / 126th Street	WB	T	0.60	9.8	A	286	0.60	9.8	A	286	0.0		0.45	8.1	A	169	0.46	8.1	A	169	0.0	
	NB	L	0.07	1.5	A	0	0.07	1.5	A	0	0.0		0.25	7.3	A	13	0.40	7.6	A	17	0.3	
	Overall		**0.60**	**9.6**	**A**	**-**	**0.60**	**9.6**	**A**	**-**	0.0		**0.65**	**8.0**	**A**	**-**	**0.65**	**8.0**	**A**	**-**	0.0	
Astoria Boulevard / 114th Street / Northern Boulevard	EB	T	0.42	28.9	C	160	0.44	29.2	C	167	0.3		0.55	19.8	B	263	0.55	19.8	B	263	0.0	
		R	0.30	27.8	C	127	0.30	27.8	C	127	0.0		0.39	17.9	B	190	0.39	17.9	B	190	0.0	
	WB	LT	0.42	9.6	A	268	0.42	9.7	A	269	0.1		0.33	3.0	A	39	0.35	4.7	A	63	1.7	
	SB	LTR	0.12	41.3	D	55	0.19	42.4	D	76	1.1		0.43	47.3	D	146	0.46	48.0	D	155	0.7	
	Overall		**0.42**	**15.9**	**B**	**-**	**0.44**	**16.4**	**B**	**-**	0.5		**0.55**	**13.1**	**B**	**-**	**0.55**	**13.8**	**B**	**-**	0.7	
Astoria Boulevard / 94th Street	EB	L	0.27	28.4	C	31	0.28	29.0	C	32	0.6		0.25	14.0	B	54	0.26	14.3	B	55	0.3	
		TR	0.18	19.5	B	68	0.19	19.6	B	71	0.1		0.70	28.3	C	372	0.70	28.3	C	372	0.0	
	WB	L	0.08	10.3	B	28	0.08	10.3	B	28	0.0		0.28	22.3	C	41	0.28	22.3	C	41	0.0	
		TR	0.91	38.0	D	569	0.91	38.2	D	571	0.2		0.41	22.4	C	172	0.41	22.5	C	176	0.1	
	NB	LTR	0.51	39.6	D	173	0.52	40.0	D	176	0.4		0.74	50.4	D	253	0.74	51.0	D	255	0.6	
	SB	LTR	0.42	35.8	D	184	0.43	36.2	D	189	0.4		0.79	51.2	D	357	0.82	53.4	D	369	2.2	
	Overall		**0.91**	**34.9**	**C**	**-**	**0.91**	**35.0**	**C**	**-**	0.1		**0.79**	**31.0**	**C**	**-**	**0.82**	**31.4**	**C**	**-**	0.4	
Northern Boulevard / Junction Boulevard	EB	L	0.08	8.4	A	11	0.08	8.4	A	11	0.0		0.11	8.3	A	16.0	0.11	8.8	A	17	0.5	
		TR	0.24	14.5	B	94	0.25	14.6	B	98	0.1		0.57	19.4	B	291.0	0.57	19.4	B	291	0.0	
	WB	L	0.20	9.0	A	35	0.20	9.0	A	35	0.0		0.38	13.8	B	50.0	0.39	14.7	B	51	0.9	
		TR	0.75	24.4	C	390	0.75	24.4	C	390	0.0		0.54	18.7	B	264.0	0.54	18.8	B	269	0.1	
	NB	LTR	0.75	59.2	E	220	0.76	60.1	E	223	0.9		0.91	79.2	E	300.0	0.88	71.9	E	290	-7.3	
	SB	LTR	1.08	110.7	F	507	1.09	113.6	F	512	2.9		1.08	112.8	F	452.0	1.04	100.3	F	443	-12.5	
	Overall		**1.08**	**42.6**	**D**	**-**	**1.09**	**43.2**	**D**	**-**	0.6		**1.08**	**38.9**	**D**	**-**	**1.04**	**36.4**	**D**	**-**	-2.5	
Astoria Boulevard / 77th Street	EB	L	0.58	11.3	B	241	0.59	11.4	B	243	0.1		0.76	14.3	B	378	0.76	14.3	B	378	0.0	
	NB	R	0.40	28.3	C	115	0.40	28.3	C	115	0.0		0.58	31.7	C	156	0.58	31.7	C	156	0.0	
	Overall		**0.58**	**13.4**	**B**	**-**	**0.59**	**13.4**	**B**	**-**	0.0		**0.76**	**16.5**	**B**	**-**	**0.76**	**16.5**	**B**	**-**	0.0	
Astoria Boulevard / 82nd Street / 24th Avenue	EB	L	0.20	39.8	D	14	0.20	39.8	D	14	0.0		0.12	20.4	C	17	0.12	20.5	C	17	0.1	
		TR	0.26	21.8	C	104	0.27	21.9	C	108	0.1		0.83	31.1	C	497	0.83	31.1	C	497	0.0	
	WB	L	0.35	18.9	B	100	0.36	19.1	B	100	0.2		1.00	113.2	F	228	1.00	113.2	F	228	0.0	
		TR	0.75	24.2	C	436	0.75	24.2	C	437	0.0		0.51	16.2	B	235	0.51	16.2	B	239	0.0	
	NB	LTR	0.32	52.6	D	74	0.32	52.6	D	74	0.0		0.91	105.7	F	234	0.91	105.7	F	234	0.0	
	SB	L	0.40	45.9	D	120	0.40	45.9	D	120	0.0		0.81	64.7	E	264	0.81	64.7	E	264	0.0	
		T	0.63	52.2	D	244	0.63	52.2	D	244	0.0		1.03	98.6	F	557	1.03	98.6	F	557	0.0	
		R	0.26	43.1	D	82	0.26	43.1	D	82	0.0		0.54	51.0	D	145	0.54	51.0	D	145	0.0	
	Overall		**0.75**	**27.7**	**C**	**-**	**0.75**	**27.8**	**C**	**-**	0.1		**1.03**	**42.1**	**D**	**-**	**1.03**	**42.0**	**D**	**-**	-0.1	
UNSIGNALIZED INTERSECTIONS																						
Shea Road / Boat Basin Place	WB	LT	0.12	9.5	A	0	0.12	9.8	A	0	0.3		0.14	9.4	A	0	0.15	9.8	A	0	0.4	
		TR	0.08	9.5	A	0	0.08	9.7	A	0	0.2		0.15	9.4	A	0	0.16	9.9	A	0	0.5	
	NB	LT	0.01	8.4	A	0	0.02	8.6	A	0	0.2		0.08	9.0	A	0	0.26	10.6	B	0	1.6	
		TR	0.02	7.5	A	0	0.03	7.8	A	0	0.3		0.11	8.3	A	0	0.18	9.0	A	0	0.7	
	SB	LT	0.24	10.6	B	0	0.30	11.1	B	0	0.5		0.23	10.5	B	0	0.24	10.8	B	0	0.3	
		TR	0.32	9.3	A	0	0.37	10.0	A	0	0.7		0.27	9.2	A	0	0.28	9.6	A	0	0.4	
	Overall		*	**9.6**	**A**	**-**	*	**10.4**	**B**	**-**	0.8		*	**9.4**	**A**	**-**	*	**10.1**	**B**	**-**	0.7	
Boat Basin Place / Marina Road	NB	L	0.02	16.8	C	0	0.03	19.6	C	0	2.8		0.17	25.5	D	0	0.43	28.5	D	0	3.0	
		R	0.01	8.4	A	0	0.02	8.4	A	0	0.0		0.04	9.3	A	0	0.06	9.4	A	0	0.1	
	WB	L	0.00	0.0	A	0	0.00	0.0	A	0	0.0		0.24	8.7	A	0	0.24	8.7	A	0	0.0	
126th Street / 36th Avenue	WB	LR	0.03	9.5	A	0	0.03	9.5	A	0	0.0		0.06	11.3	B	0	0.06	11.3	B	0	0.0	
	SB	LT	0.00	0.0	A	0	0.00	0.0	A	0	0.0		0.02	8.5	A	0	0.02	8.5	A	0	0.0	

Notes:
v/c = volume-to-capacity ratio; LOS = Level-of-Service
NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound; NEB = Northeastbound, NWB = Northwestbound
L = Left-Turn; T = Through; R = Right-Turn;
LT = Left-Turn/Through; TR = Through/Right-Turn; LR = Left-Turn/Right-Turn; LTR = Left-Turn/Through/Right-Turn
Average Delay shown in units of seconds/vehicle
* = Overall v/c ratio not calculated for this intersection.

5.0 PEDESTRIANS

As per the *CEQR Technical Manual*, *Chapter 16*, *Section 300. Assessment Methods*, quantified analysis for pedestrians would typically not be needed if the proposed development would result in fewer than 200 peak hour pedestrian trips. Because the Proposed Action is not projected to generate more than 200 pedestrian trips at any *off-site* locations (outside the airport), a pedestrian assessment is not warranted during construction.

6.0 TRANSIT

LaGuardia Airport is not directly accessible via subway, and no modifications to subway service are proposed under the Action condition. Therefore, detailed subway analyses are not warranted for the Proposed Action.

As per the *CEQR Technical Manual*, *Chapter 16*, *Section 300. Assessment Methods*, quantified analysis for bus transit would typically not be needed if the proposed development would result in fewer than 200 peak hour bus trips. It is expected that private bus carriers will continue to serve the airport and provide more frequent service to accommodate projected increases in ridership demand under both the Future Without Construction and Future With Construction conditions. With respect to public bus service, based on the estimated construction trip generation during the peak month (July 2019), the proposed construction condition is not projected to increase public bus ridership by more than 200 new person-trips during any one peak hour. Therefore, according to *CEQR* guidelines, detailed bus analyses are not warranted during construction.

7.0 PARKING

As per the *CEQR Technical Manual*, *Chapter 16*, *Section 313.4. Parking*, a parking analysis may be needed if a quantified traffic analysis is necessary based on the initial screening analyses. As stated earlier in this chapter, all construction worker parking during the peak phase of construction would be accommodated at Citi Field. This, and other key assumptions described herein, formed the basis of the traffic analyses proposed to be conducted for construction conditions.

It is expected that Delta Air Lines, in coordination with the Port Authority, will continually seek to rationalize the proposed construction parking supply with construction parking demands during different construction phases. An objective of this rationalization process is to ensure that vehicles generated during construction are entirely accommodated on-site in new and/or reconfigured parking facilities at Citi Field. Therefore, no off-site demand for parking is expected to occur on city streets in the vicinity of the airport, and a parking assessment is not warranted during construction.

8.0 SAFETY ASSESSMENT

The *CEQR Technical Manual* defines a "high crash location" as any location with 48 or more total reportable and non-reportable crashes, or five or more pedestrian/bicyclist injury crashes in any consecutive 12 months of the most recent three-year period for which data is available. Crash data compiled by the NYCDOT for the most recent available three-year period (i.e., 2012 to 2014) was

reviewed to identify the crash history at all 10 study intersections.[3] The data is summarized in Tables 7 through 9. It should be noted that no crash data was available from NYCDOT for the study intersections of Shea Road/Boat Basin Place and Boat Basin Place/Marina Road. Table 7 summarizes the total crashes at the study intersections, as well as the number of pedestrian, bicyclist, and fatal crashes. Table 8 provides a year-by-year summary of the crashes at each study intersection. Table 9 summarizes the numbers of pedestrian and bicyclist crashes, by year, at the study intersections.

Table 7: Summary of Crash Data for 2012 to 2014

Intersection	Total Crashes	Pedestrian Crashes	Bicyclist Crashes	Fatal Crashes
Shea Road / Boat Basin Place[1]	-	-	-	-
Boat Basin Place / Marina Road[1]	-	-	-	-
Shea Road / 34th Avenue / 126th Street	4	1	0	0
Northern Boulevard / 126th Street[2]	26	0	0	0
Astoria Boulevard / 114th Street / Northern Boulevard	45	2	0	0
126th Street / 36th Avenue	1	0	0	0
Astoria Boulevard / 94th Street	21	3	3	0
Northern Boulevard / Junction Boulevard	4	1	0	0
Astoria Boulevard / 77th Street	10	0	0	0
Astoria Boulevard North / 82nd Street / 24th Avenue	23	4	0	0
Totals =	134	11	3	0

Source: New York State Department of Motor Vehicles and New York City Department of Transportation (2012-2014).
1: No data received from New York City Department of Transportation.
2: The two separate intersections at Northern Boulevard/126th Street (eastbound direction and westbound direction) were combined by NYCDOT for crash data summary purposes.

As shown in Table 7, the NYCDOT data indicates that there were no fatal crashes at the study intersections during the three-year period between 2012 and 2014. None of the study intersections exceeded the 48 or more total reportable and non-reportable crashes during the three-year period. The intersection with the highest number of pedestrian/bicyclist crashes was the Astoria Boulevard / 94th Street intersection, with six crashes (three pedestrian crashes and three bicycle crashes) over the three-year period, although the *CEQR* threshold of five or more pedestrian/bicyclist crashes was not exceeded during any single 12-month period from 2012 to 2014. There were no more than four total pedestrian/bicyclist crashes during the three-year period at any other study intersection. Therefore, the total numbers of pedestrian/bicyclist crashes at each study intersection are below the CEQR "high-crash location" threshold of five or more crashes per 12-month period. Table 8 summarizes the total number of crashes, year by year, at each intersection.

[3] The two separate intersections at Northern Boulevard/126th Street (eastbound direction and westbound direction) were combined by NYCDOT for crash data summary purposes.

Table 8: Summary of Crash Data by Year for 2012 to 2014

Intersection	Total Crashes	2012 Crashes	2013 Crashes	2014 Crashes
Shea Road / Boat Basin Place[1]	-	-	-	-
Boat Basin Place / Marina Road[1]	-	-	-	-
Shea Road / 34th Avenue / 126th Street	4	0	4	0
Northern Boulevard / 126th Street[2]	26	4	10	12
Astoria Boulevard / 114th Street / Northern Boulevard	45	13	17	15
126th Street / 36th Avenue	1	1	0	0
Astoria Boulevard / 94th Street	21	10	5	6
Northern Boulevard / Junction Boulevard	4	1	2	1
Astoria Boulevard / 77th Street	10	1	5	4
Astoria Boulevard North / 82nd Street / 24th Avenue	23	6	11	6
Totals =	134	36	54	44

Source: New York State Department of Motor Vehicles and New York City Department of Transportation (2012-2014).
1: No data received from New York City Department of Transportation.
2: The two separate intersections at Northern Blvd/126th Street (eastbound lanes and westbound lanes) were combined by NYCDOT for crash data summary purposes.

A detailed review of the crash data was also conducted to determine the number of pedestrian and bicyclist crashes per year. Table 9 summarizes the numbers of pedestrian and bicyclist crashes occurring at each year, at each study intersection, for the duration of the most recent available three-year period. As shown in Table 9, there were a total of 11 pedestrian and three bike crashes for the most recent available three-year period. There were three pedestrian crashes and two bike crashes in 2012, five pedestrian crashes and no bicycle crashes in 2013, and three pedestrian crashes and one bike crash in 2014. Because none of the study intersections had five or more pedestrian/bicycle crashes, nor 48 or more total crashes, within a single 12-month period during the most recent three-year period for which data is available from NYCDOT, none of the study intersections are classified as "high-crash locations" as defined in the *CEQR Technical Manual*.

Table 9: Summary of NYCDOT Pedestrian and Bicyclist Crash Data by Year

Intersection	Total Ped Crashes	Total Bike Crashes	2012 Ped Crashes	2012 Bike Crashes	2013 Ped Crashes	2013 Bike Crashes	2014 Ped Crashes	2014 Bike Crashes
Shea Road / Boat Basin Place[1]	-	-	-	-	-	-	-	-
Boat Basin Place / Marina Road[1]	-	-	-	-	-	-	-	-
Shea Road / 34th Avenue / 126th Street	1	0	0	0	1	0	0	0
Northern Boulevard / 126th Street[2]	0	0	0	0	0	0	0	0
Astoria Boulevard / 114th Street / Northern Boulevard	2	0	2	0	0	0	0	0
126th Street / 36th Avenue	0	0	0	0	0	0	0	0
Astoria Boulevard / 94th Street	3	3	1	2	1	0	1	1
Northern Boulevard / Junction Boulevard	1	0	0	0	0	0	1	0
Astoria Boulevard / 77th Street	0	0	0	0	0	0	0	0
Astoria Boulevard North / 82nd Street / 24th Avenue	4	0	0	0	3	0	1	0
Totals =	11	3	3	2	5	0	3	1

Sources: New York State Department of Motor Vehicles and New York City Department of Transportation (2012-2014).
1: No data received from New York City Department of Transportation.
2: The two separate intersections at Northern Boulevard/126th Street (eastbound direction and westbound direction) were combined by NYCDOT for crash data summary purposes.

9.0 CONCLUSIONS

The transportation analyses described in this chapter resulted in the following conclusions:

9.1 Vehicular Traffic: Operational Conditions

- The Proposed Action would not result in an increase in forecast passenger travel. Although there would be a reconfiguration of parking facilities and relocation of taxi hold lots, under future operational conditions all facilities would remain on airport property. Delta Air Lines will work with the Port Authority to rationalize the proposed parking supply with projected future parking demands through a reallocation of parking facilities throughout the airport. An objective of this rationalization process is to ensure that vehicles accessing LaGuardia Airport are entirely accommodated on-site in new and/or reconfigured parking and taxi-hold facilities at the airport. No off-site demand for parking is expected to occur on city streets in the vicinity of the airport. Therefore, a traffic impact assessment of operational conditions (i.e., upon completion of construction and full operation of the new Delta Air Lines terminal facility) is not needed, and no significant adverse traffic impacts are projected under the operational condition.

9.2 Vehicular Traffic: Construction Conditions

- With the improvement described below, the additional vehicle trips generated by the construction of Terminals C and D can be accommodated on the roadway network during the weekday AM and PM construction peak hours without significant traffic impacts according to *CEQR Technical Manual* criteria:
    - Northern Boulevard/Junction Boulevard – During the weekday AM and PM peak periods, reallocate one (1) second of green time from the east-west left-turn phase to the north-south phase.

9.3 Pedestrians

- Both construction and operation of Terminals C and D are not projected to generate more than 200 pedestrian trips at any off-site locations (outside the airport). Therefore, no significant adverse pedestrian-related impacts are projected to occur.

9.4 Subway

- LaGuardia Airport is not directly accessible via subway, and no modifications to subway service are proposed as part of the reconfiguration of Terminals C and D. Therefore, no significant adverse subway impacts are projected.

9.5 Public Bus Transit

- Based on the estimated construction trip generation during the peak month (July 2019), the proposed construction condition is not projected to increase public bus ridership by more than 200 new person-trips during any one peak hour under both the construction or operational condition. Therefore, no significant adverse bus impacts are projected.

9.6 Parking

- During the peak phase of construction, all parking for construction workers would be accommodated at Citi Field. It is expected that Delta Air Lines, in coordination with the Port Authority, will continually seek to rationalize the proposed construction parking supply with construction parking demands during different construction phases. An objective of this rationalization process is to ensure that vehicles generated during construction are entirely accommodated in new and/or reconfigured parking facilities at Citi Field. Therefore, no off-site demand for parking is expected to occur on city streets in the vicinity of the airport.

9.7 Transportation Safety

- None of the study intersections are classified as "high-crash locations" as defined in the *CEQR Technical Manual*.

AECOM
605 Third Avenue, New York, NY 10158
T 212.973.2900 F 212.973.3000 www.aecom.com

Technical Memorandum – FINAL

Terminals C and D (Delta Air Lines) Reconfiguration at LaGuardia Airport: Environmental Assessment

Date: March 24, 2016

Subject: Transportation Planning Assumptions

Prepared by: Atma Sookram, AICP, CTP, PP, PTP
Bryan Suelto, PE, PTOE

1.0 INTRODUCTION

This technical memorandum presents AECOM's transportation planning assumptions for the proposed Terminals C and D (Delta Air Lines) Reconfiguration Environmental Assessment (EA) at LaGuardia Airport (LGA) in Queens, NY. Specifically, it documents the proposed level of traffic assessment during Construction during the weekday AM and PM peak hours for off-airport intersections under the jurisdiction of the New York City Department of Transportation (NYCDOT). The traffic assessment for the EA will be conducted in collaboration with the Port Authority of NY & NJ (the "Port Authority"), NYCDOT and the New York State Department of Transportation (NYSDOT). This revised memorandum reflects comments received by the New York City Department of Transportation (NYCDOT) on March 9, 2016, and on March 21, 2016.

On-airport intersections, which are under the jurisdiction of the Port Authority, are not proposed to be studied for impact assessment during construction of Terminals C and D. The Port Authority is preparing to implement a rigorous traffic monitoring program at LaGuardia Airport that would involve a comprehensive multi-modal traffic data collection and monitoring effort including autos, buses, taxis and for-hire vehicles. The monitoring program is expected to coincide with the start of construction of the Central Terminal Building (CTB) and continue throughout the estimated 8-year construction period. Hence, it will also cover the peak phase of construction activity for Terminals C and D. It is expected that as construction activities proceed and evolve at LGA that on-airport parking, traffic circulation and taxi-holding patterns would also evolve based on the phase of construction and other concurrent activities at the airport. The monitoring program, which would be coordinated with NYSDOT and NYCDOT, would focus on these dynamic changes and would be informed by a "live" data gathering on-airport effort including traffic volumes, queues, and frontage activities, as well as "real time" travel times on the Grand Central Parkway, and traffic conditions at key off-airport locations. Based on observed conditions on, and in the vicinity of the airport, appropriate short-term mitigating and improvement strategies would be implemented in coordination with relevant agencies.

One of the key construction-related factors for Terminals C and D is the planned accommodation of construction worker parking at Citi Field (home baseball park of Major League Baseball's New York Mets), which is located north of Whitestone Expressway and the Grand Central Parkway, along the Flushing Bay Promenade. As discussed in this memorandum, contractor parking at this location would necessitate additional study intersections for the analysis of construction-related traffic impacts (in addition to those preliminary intersections that were identified and where traffic data were collected in November 2015).

2.0 BACKGROUND

2.1 The Proposed Action

Delta Air Lines proposes to reconfigure and replace Terminals C and D and the adjacent aircraft parking apron, landside roadways, and parking facilities on the eastern side of LaGuardia Airport. These facilities would be demolished and replaced with new facilities designed and constructed to meet the latest federal standards for airport safety and security, and to accommodate improved levels of service. The purpose of the Proposed Action is to improve aircraft operations and reduce delays to enable Delta Air Lines to safely and effectively meet passenger demand at acceptable levels of service. The Proposed Action would not result in an increase in aircraft operations or forecast passengers. Further, it does not involve the airfield runways or taxiways, or other terminals or facilities at LaGuardia Airport. Construction of the terminal building is expected to start in September 2016 with a projected completion date of 2024.

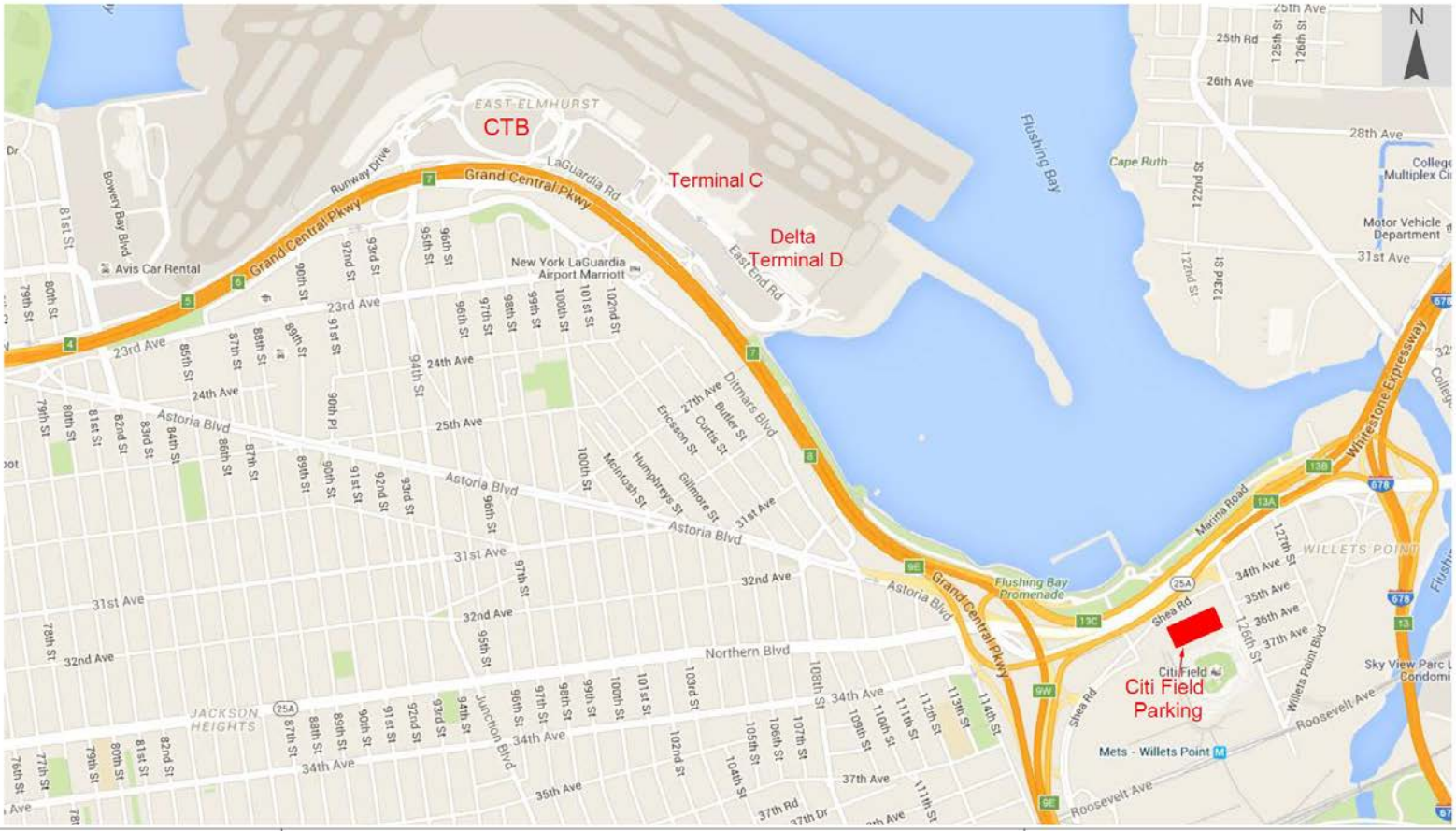
2.2 Site Description and Vehicular Access Configuration

As shown in **Figure 1**, LaGuardia Airport is located north of the Grand Central Parkway and east of 81st Street in Queens, along the waterfront between Bowery Bay and Flushing Bay.

Eastbound ingress to LaGuardia Airport from Grand Central Parkway is available via Exit 6 ("94th Street") and Exit 7 ("LaGuardia Airport Terminals"). Eastbound egress from LaGuardia Airport to the Grand Central Parkway is available via a loop ramp on the southwest quadrant of the 94th Street interchange, and also via an on-ramp from the north side of Ditmars Boulevard, east of 94th Street, that can be accessed by traveling over the Grand Central Parkway bridge near Terminals C and D and then west through the rotary intersection at 23rd Avenue/Ditmars Boulevard.

Westbound ingress from Grand Central Parkway is available via a two/three-lane frontage road ("LaGuardia Access Road") that is aligned north of, and parallel to, Grand Central Parkway beginning at Exit 7 ("LaGuardia Airport Terminals / 94th Street") and terminating at the 94th Street bridge. Ramp connections between the frontage road and airport terminals are provided in the vicinity of Delta Terminals C and D and in the vicinity of the CTB. Two westbound on-ramps from the frontage road to the westbound lanes of the Grand Central Parkway are also provided: one on-ramp is located immediately east of the 94th Street interchange and a second on-ramp is located at the 94th Street interchange.

Local access connections between LaGuardia Airport and the East Elmhurst neighborhood are available via 94th Street, as well as the bridge over the Grand Central Parkway that connects to the 23rd Avenue/Ditmars Boulevard rotary intersection on the south side of the Grand Central Parkway.



AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	Site Vicinity Map Figure 1

LaGuardia Airport is also served by five MTA bus lines: the M60, Q47, Q48, Q70 and Q72. The M60 provides service between Morningside Heights in Manhattan and all terminals at LaGuardia Airport. The M60 operates via 125th Street, the Robert F. Kennedy (Triboro) Bridge, and Astoria Boulevard. The Q47 provides service between Glendale and the Marine Air Terminal of LaGuardia Airport. The Q48 provides service between downtown Flushing and all terminals at LaGuardia Airport, primarily via 108th Street, Roosevelt Avenue, Ditmars Boulevard, and 23rd Avenue. The Q70 provides service between the 61st Street/Woodside subway station in Woodside and LaGuardia Airport Terminals B, C, and D. The Q72 provides service between Rego Park and Terminals B, C, and D, primarily via Junction Boulevard and 94th Street. Private operator express bus service is also provided between LaGuardia Airport and various Manhattan locations, as well as to and from the John F. Kennedy (JFK) International Airport. No direct subway service is provided to LaGuardia Airport.

3.0 OPERATIONAL TRAFFIC IMPACT ASSESSMENT

The Proposed Action would not result in an increase in forecast passenger travel. Although there would be a reconfiguration of parking facilities and relocation of taxi hold lots, under future operational conditions all facilities would remain on airport property. Delta will work with the Port Authority to rationalize the proposed parking supply with projected future parking demands through a reallocation of facilities throughout the airport. An objective of this rationalization process is to ensure that vehicles accessing LaGuardia are entirely accommodated on-site in new and/or reconfigured parking and taxihold facilities at the airport. No off-site demand for parking is expected to occur on city streets in the vicinity of the airport. Therefore, a traffic impact assessment of operational conditions (i.e., upon completion of construction and full operation of the new Delta terminal facility) is not needed, and will not be performed as part of the EA.

4.0 CONSTRUCTION TRAFFIC IMPACT ASSESSMENT

The Construction Traffic analysis will examine the potential operational effects of additional construction-related vehicle trips generated on the roadway system as a result of construction activities during the peak construction phase. According to the report prepared by STV, *EA Preliminary Review (LaGuardia Terminal Reconfiguration Project)*, construction at LaGuardia Airport will commence in September 2016 and will continue through 2024. Based on the manpower distribution over the construction duration shown in the STV report, the peak month of construction was determined to occur during the first quarter of 2019, corresponding to Phase 1B of the overall construction schedule. Therefore, for Construction Traffic analyses purposes, a typical weekday during the month of January 2019 has been identified as the peak analysis time period.

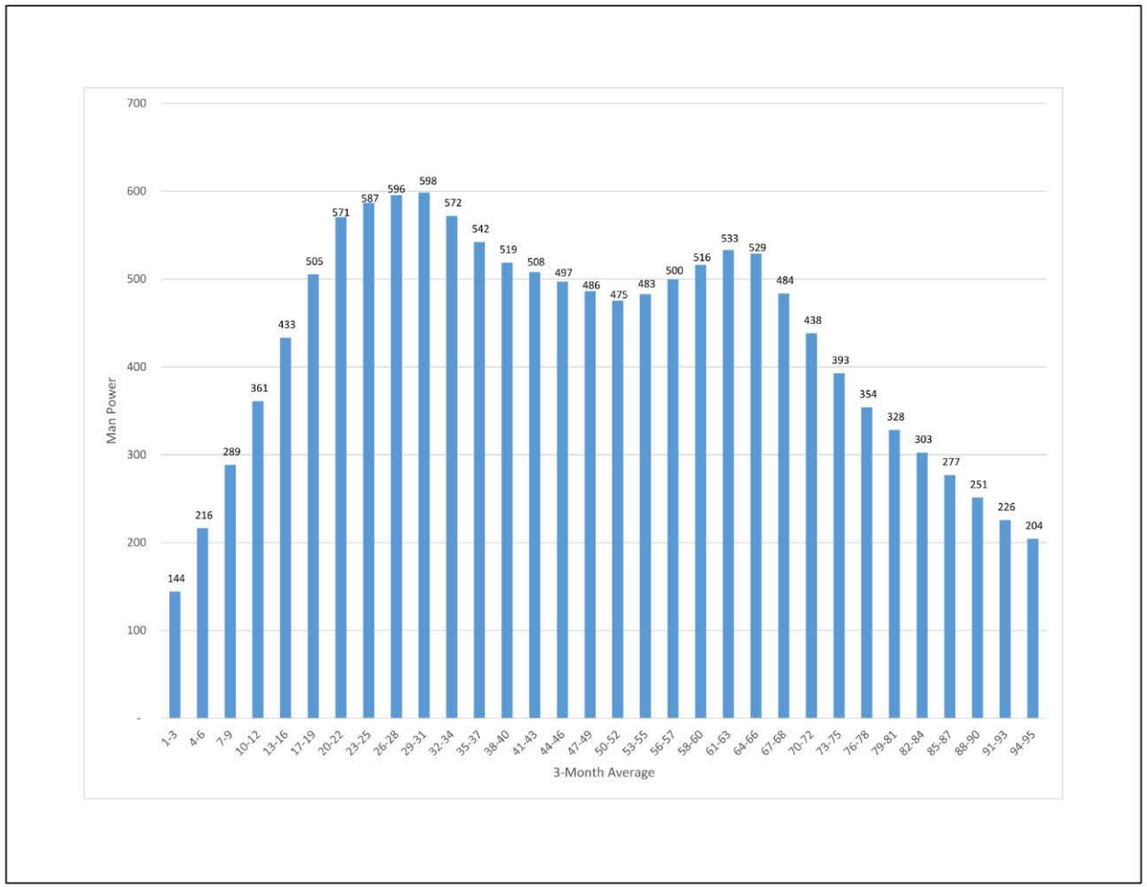
During the peak construction month, it is anticipated that all daily parking for construction personnel would be accommodated at off-airport property at the Citi Field parking lot, located off the Route 25A (West)/Northern Boulevard/Citi Field exit (Exit 13D) of westbound Grand Central Parkway and along the Flushing Bay Promenade. Furthermore, along eastbound Grand Central Parkway, this lot is located off the Route 25A (East)/Northern Boulevard/Citi Field exit. Access to Citi Field parking lots would be via 126th Street and Shea Road.

There is ample parking capacity at Citi Field to accommodate the peak 270 contractor personnel vehicles that are projected to require parking (see Table 1). After parking at Citi Field, it is expected that there will be shuttle bus service for contractors operating between the Citi Field parking lot and Terminals C/D construction site. On day games at Citi Field, and during the USTA games, there would either be no construction at all; no day-time construction; or construction workers may be offered transit vouchers to take mass transit to and from work. As such, construction worker parking would no overlap with day-game or USTA parking at Citi Field.

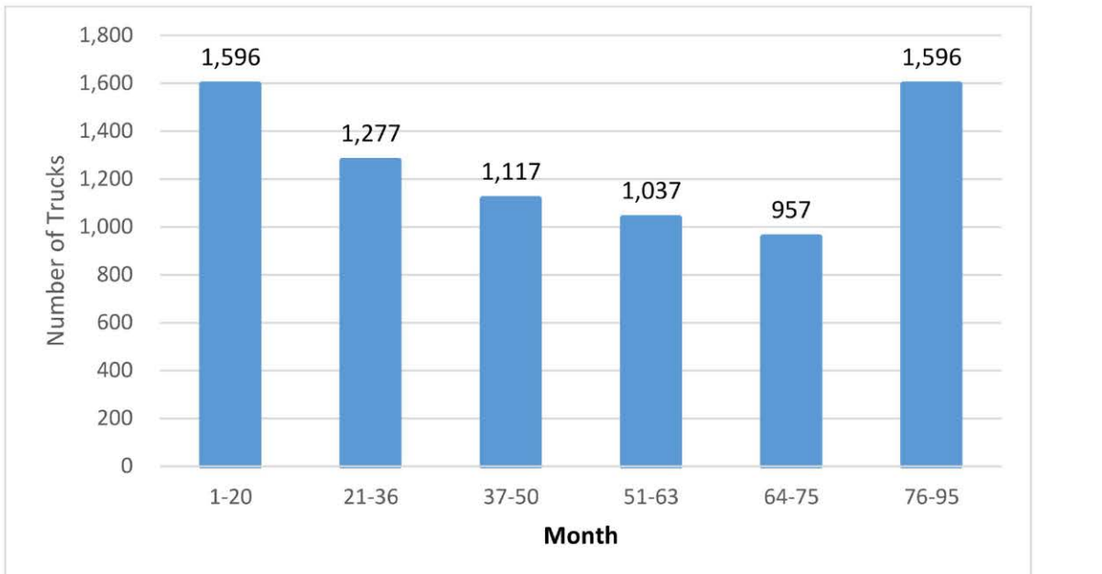
4.1 Construction Trip Generation

As indicated previously, the total volume of construction-related traffic—including both trucks and construction personnel (i.e., laborers, management, and administrative staff)—would peak during Month 28, with an average of approximately 598 (rounded to 600) construction personnel on-site daily during this quarter, as shown in **Figure 2**. Further, based on a review of the aforementioned STV report, it was determined that there would be an estimated 1,277 trucks per month during the peak construction phase, for an estimate of 58 trucks per day during the peak construction month. **Figure 3** shows the projected truck volumes during the different construction phases of Terminals C/D.

During construction, travel to and from the site by means other than single-occupant vehicle will be encouraged and supported by Delta Air Lines. Based on discussions with NYCDOT staff as part of the CTB



AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	Projected Manpower Utilization - 3 Month Averages Figure 2



AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	Estimated Truck Volumes During Construction by Month Figure 3

Reconfiguration EA, an average auto-occupancy rate of 1.50 and an auto mode share of 75 percent have been assumed for construction personnel driving to, and parking at, Citi Field. From there, there will be anticipated round-trip shuttle bus service from the Citi Field contractor parking lot to selected bus stop(s) at Terminals C and D. The average capacity of a shuttle bus is 50 passengers. The remaining 25 percent of construction personnel are projected to arrive and depart via transit (bus). The MTA bus stop at Terminal D is served by the M60, Q48, Q70, and Q72 bus lines which also provide connections to subway stations in Manhattan and Queens.

All construction activities are assumed to take place during two construction shifts. The first shift was assumed 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 was assumed to occur from approximately 3:00 PM to approximately 11:00 PM and comprise approximately 10 percent of the total construction personnel workforce. The majority of the travel for construction personnel (approximately 80 percent) in the first shift would typically take place during the hour immediately before the start of the shift and the hour immediately after the end of the shift, with the remaining travel occurring before and after these times due to the slight variations in the particular schedules and work activities of the various trades.

Delta Air Lines will coordinate with its contractors and the Port Authority 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. It is assumed that there will be no significant amount of truck staging or queuing at the construction site: "just-in-time" delivery will be applied. Truck arrivals are expected to be generally uniform throughout this time period with slightly higher numbers of trips during the midday hours (8:00 AM to 2:00 PM) when on-site work activities are expected to peak. Some truck deliveries would also be made 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 (typically one hour or less).

Table 1 shows the numbers of construction personnel-related auto trips, as well as construction truck trips, during the peak construction month, based on these transportation planning assumptions. The estimated daily vehicle trips were distributed to various hours of the day based on the projected work shift allocations and arrival/departure patterns of construction trucks, as described above.

Based on these assumptions, the peak hour construction traffic was estimated for the peak construction period. The total vehicle trips per hour are shown in **Table 1** along with passenger-car equivalent (PCE) values, which are based on 1.0 PCE per auto; 1.5 PCE per shuttle bus; and 2.0 PCEs per truck.

Table 1:

Hourly Construction Vehicle Trip Increments for Terminals C and D (Delta Air Lines) Reconfiguration during Peak Construction Month

Average Daily Number of Construction Personnel during Peak Construction Quarter[1] =	600	Personnel in peak quarter
Percentage of Daily Construction Personnel Working First Shift[2] =	90%	
Percentage of Daily Construction Personnel Working Second Shift[2] =	10%	
Construction Personnel Auto-Occupancy[3] =	1.50	
Construction Personnel Auto Mode Split[3] =	75%	
Construction Personnel Transit Mode Split[3] =	25%	
Average Daily Number of Construction Personnel Driving during Peak Construction Period =	300	
PCE for shuttle buses with 2 axles[3] =	1.5	passenger car equivalents/bus
Estimated passenger capacity per shuttle bus =	50	passengers/bus
Average Number of Daily Trucks during Peak Construction Period[1]=	58	trucks in peak quarter
PCE for construction trucks[4] =	2.0	passenger car equivalents/truck

Hour of Day	Temporal Distributions[1]						Auto Trips (Personnel): 1st Shift			Auto Trips (Personnel): 2nd Shift			Shuttle Bus Trips (Personnel): 1st Shift			Shuttle Bus Trips (Personnel): 2nd Shift			Truck Trips			Truck and Bus (PCE) Trips			Total Vehicle Trips			Total Vehicle Trips (PCEs)		
	Auto IN: 1st Shift	Auto OUT: 1st Shift	Auto IN: 2nd Shift	Auto OUT: 2nd Shift	Truck IN	Truck OUT	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
12-1AM	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-2 AM	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-3AM	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-4AM	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4-5AM	0%	0%	0%	0%	**5%**	**5%**	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
5-6AM	**10%**	0%	0%	0%	**5%**	**5%**	27	0	27	0	0	0	1	1	2	0	0	0	3	3	6	7	7	15	31	4	35	34	7	42
6-7AM	**80%**	0%	0%	0%	**5%**	**5%**	216	0	216	0	0	0	7	7	14	0	0	0	3	3	6	16	16	33	226	10	236	232	16	249
7-8AM	**10%**	0%	0%	0%	**5%**	**5%**	27	0	27	0	0	0	1	1	2	0	0	0	3	3	6	7	7	15	31	4	35	34	7	42
8-9AM	0%	0%	0%	0%	**6%**	**6%**	0	0	0	0	0	0	0	0	0	0	0	0	3	3	7	7	7	14	3	3	7	7	7	14
9-10AM	0%	0%	0%	0%	**7%**	**7%**	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	8	8	16	4	4	8	8	8	16
10-11AM	0%	0%	0%	0%	**7%**	**7%**	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	8	8	16	4	4	8	8	8	16
11AM-12PM	0%	0%	0%	0%	**7%**	**7%**	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	8	8	16	4	4	8	8	8	16
12-1PM	0%	0%	0%	0%	**7%**	**7%**	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	8	8	16	4	4	8	8	8	16
1-2PM	0%	0%	0%	0%	**6%**	**6%**	0	0	0	0	0	0	0	0	0	0	0	0	3	3	7	7	7	14	3	3	7	7	7	14
2-3PM	0%	**10%**	**100%**	0%	**5%**	**5%**	0	27	27	30	0	30	1	1	2	1	1	2	3	3	6	9	9	18	35	32	67	39	36	75
3-4PM	0%	**80%**	0%	0%	**5%**	**5%**	0	216	216	0	0	0	7	7	14	0	0	0	3	3	6	16	16	33	10	226	236	16	232	249
4-5PM	0%	**10%**	0%	0%	**5%**	**5%**	0	27	27	0	0	0	1	1	2	0	0	0	3	3	6	7	7	15	4	31	35	7	34	42
5-6PM	0%	0%	0%	0%	**5%**	**5%**	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
6-7PM	0%	0%	0%	0%	**5%**	**5%**	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
7-8PM	0%	0%	0%	0%	**5%**	**5%**	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
8-9PM	0%	0%	0%	0%	**5%**	**5%**	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
9-10PM	0%	0%	0%	0%	**5%**	**5%**	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	6	6	12	3	3	6	6	6	12
10-11PM	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11PM-12AM	0%	0%	0%	**100%**	0%	0%	0	0	0	0	30	30	0	0	0	1	1	2	0	0	0	2	2	3	1	31	32	2	32	33
TOTAL =	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**270**	**270**	**540**	**30**	**30**	**60**	**18**	**18**	**36**	**2**	**2**	**4**	**58**	**58**	**116**	**146**	**146**	**292**	**378**	**378**	**756**	**446**	**446**	**892**

Note:

1 = Estimate, based on STV report.

2 = Assumed by AECOM.

3 = Estimated based on census reverse journey-to-work data for all workers at LaGuardia Airport and discussions with NYCDOT Traffic Planning staff as part of the *LaGuardia Airport Central Terminal Building Redevelopment EA*.

4 = Based on *CEQR Technical Manual,* Table 16-3, page 16-11.

4.2 Construction Trip Distribution

Figure 4 shows the estimated distribution for ***construction personnel-related auto trips*** during the weekday AM and PM peak hours to and from Citi Field. The trip distribution for construction personnel, shown in **Figure 4**, was estimated based on an analysis of 2010 Census data performed by the NY Building Congress showing home origins and work destinations for construction personnel working in Queens.

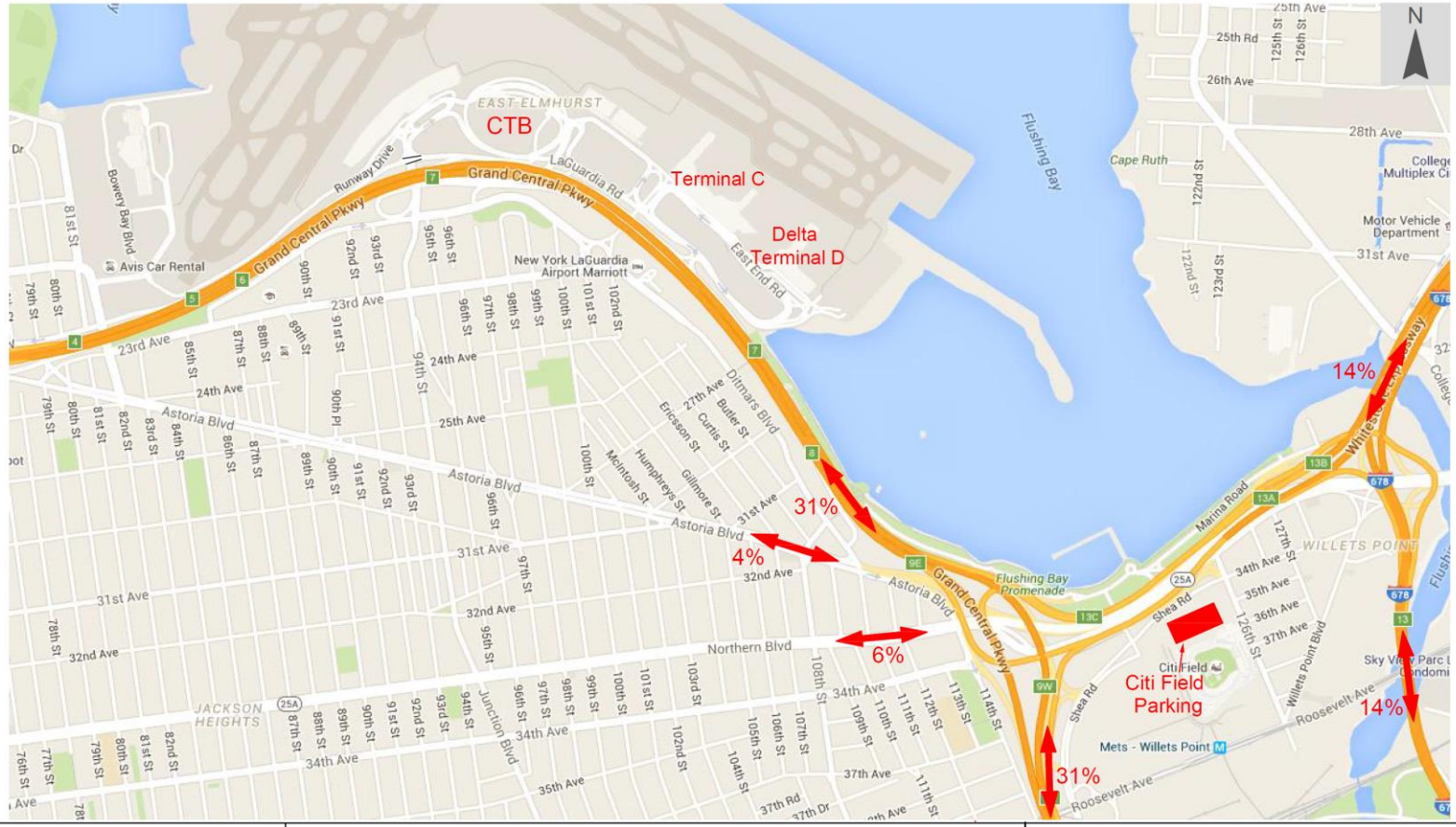
Figure 5 shows the estimated distribution of ***construction truck trips*** during the weekday AM and PM peak hours. The vehicle trip distribution for construction trucks, shown in **Figure 5**, was estimated based on the locations of NYCDOT "local" and "through" truck routes in the vicinity of LaGuardia Airport—including Astoria Boulevard and 94th Street-Junction Boulevard—and the locations of major expressways throughout Queens, including the Long Island Expressway, the Brooklyn-Queens Expressway, and the Van Wyck Expressway, which are expected to serve as the primary "through" truck routes to and from Terminals C/D.

4.3 Construction Trip Routing

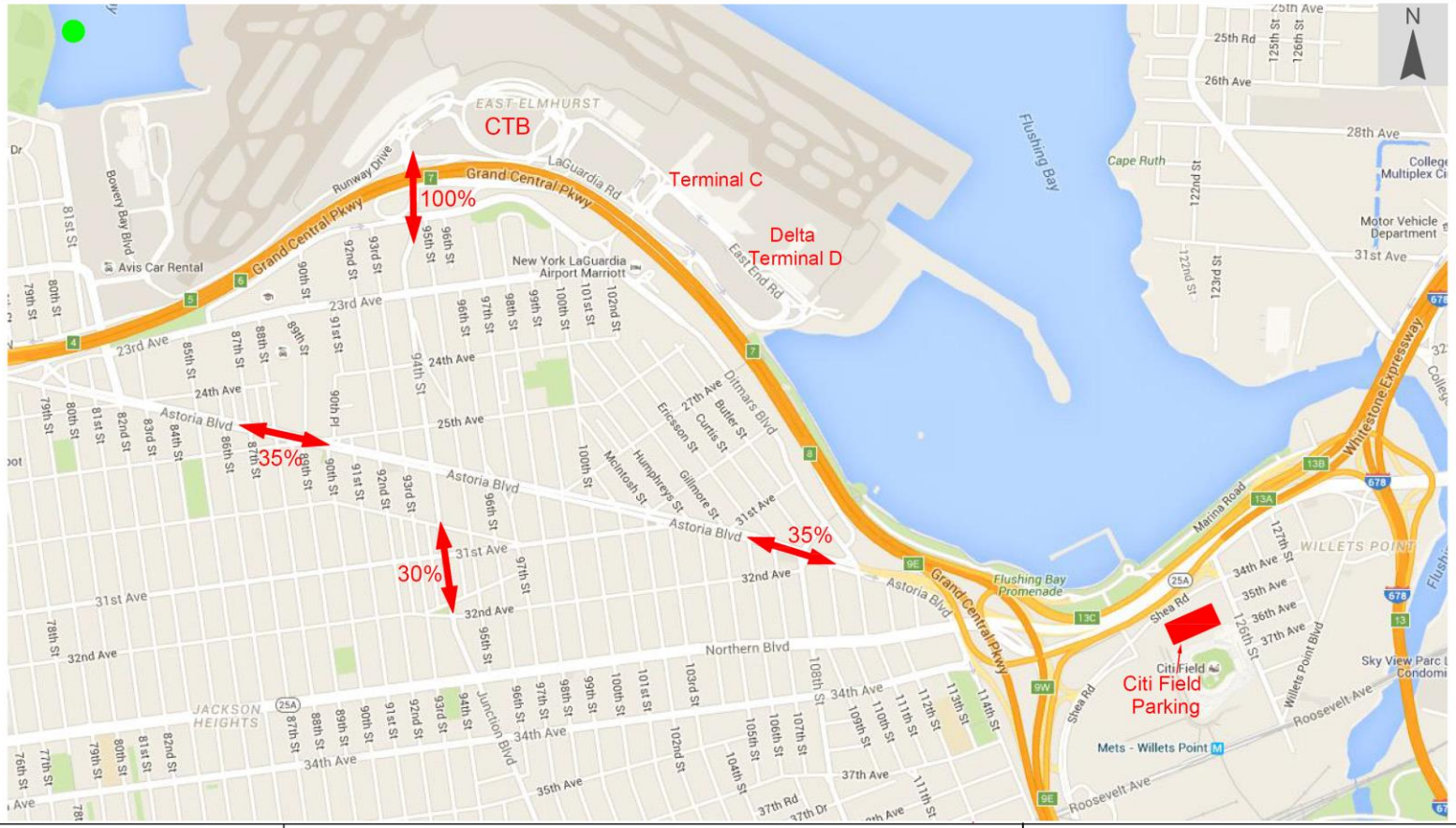
Figures 6A and 6B show the projected routing of construction workers' inbound and outbound auto trips to the roadway network in the vicinity of Citi Field, respectively. **Figure 7** shows the projected routing of construction-related truck trips to the roadway network in the vicinity of LaGuardia Airport. All trucks destined to, and departing from the construction site at Terminals C/D from were assumed to enter and leave La Guardia Airport via 94th Street; the 102nd Street bridge is scheduled to operate one-way southbound during the peak construction phase. The results of the preliminary construction trip generation estimate in **Table 1** and these routing patterns indicate that several key intersections in the vicinity of LaGuardia Airport and Citi Field should be analyzed for construction-generated traffic associated with the proposed Action. Also, given the anticipated contractor parking demand, it can be adequately accommodated at Citi Field.

4.4 Construction Trip Assignments

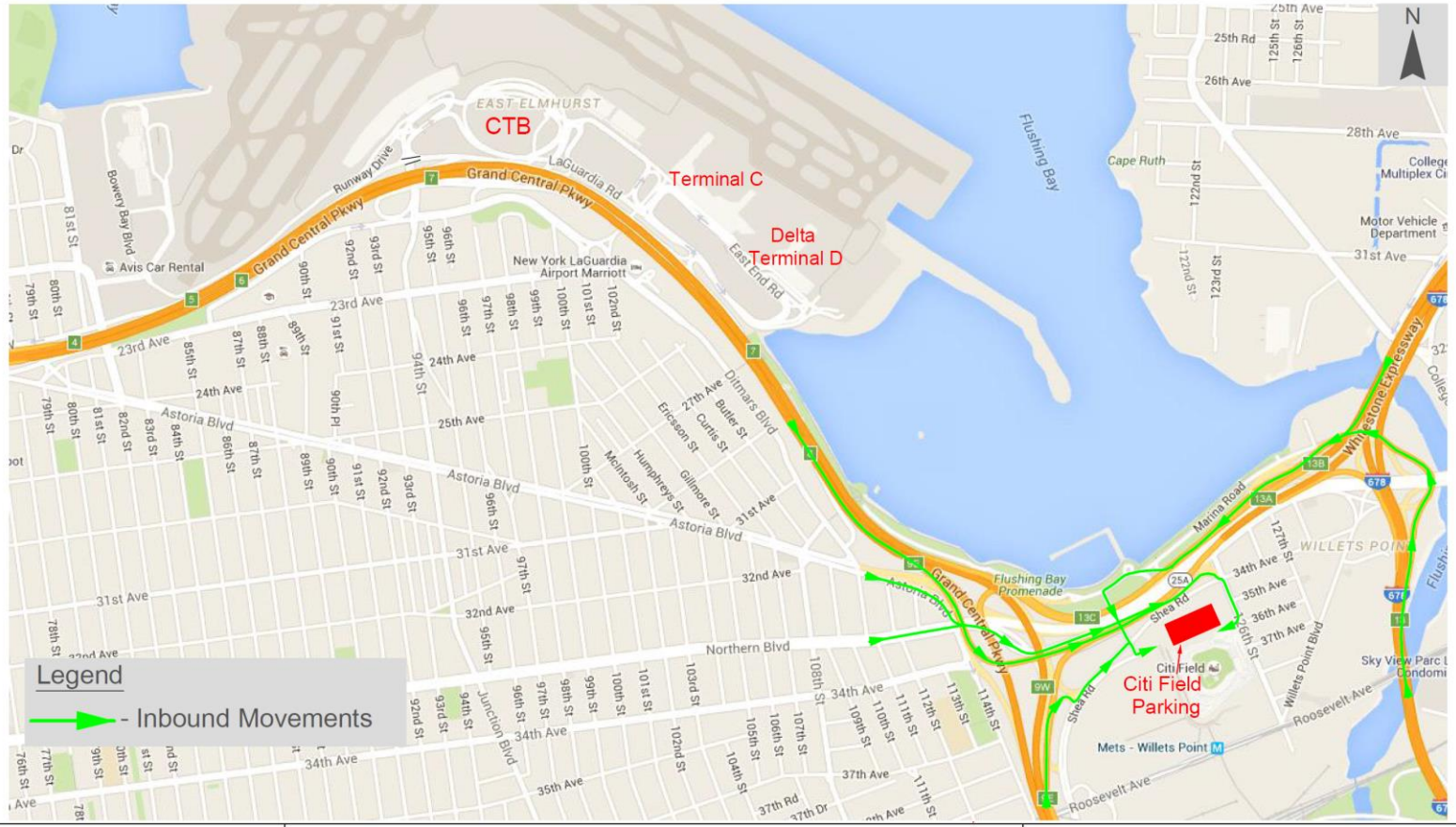
Based on the trip generation estimates and routing patterns for autos, trucks and shuttle buses, trip assignment maps were prepared for autos, trucks and shuttle buses for the AM and PM peak construction hours. **Figures 8 and 9** show the trip assignments for autos for the AM and PM peak hours, respectively. **Figures 10 and 11** show the trip assignments for trucks (in pces) for the AM and PM peak hours, respectively. **Figures 12 and 13** show the trip assignments for shuttle buses (in pces) for the AM and PM peak hours, respectively. **Figures 14 and 15** show the trip assignments for all modes combined (autos, trucks and shuttle buses) for the AM and PM peak hours, respectively.



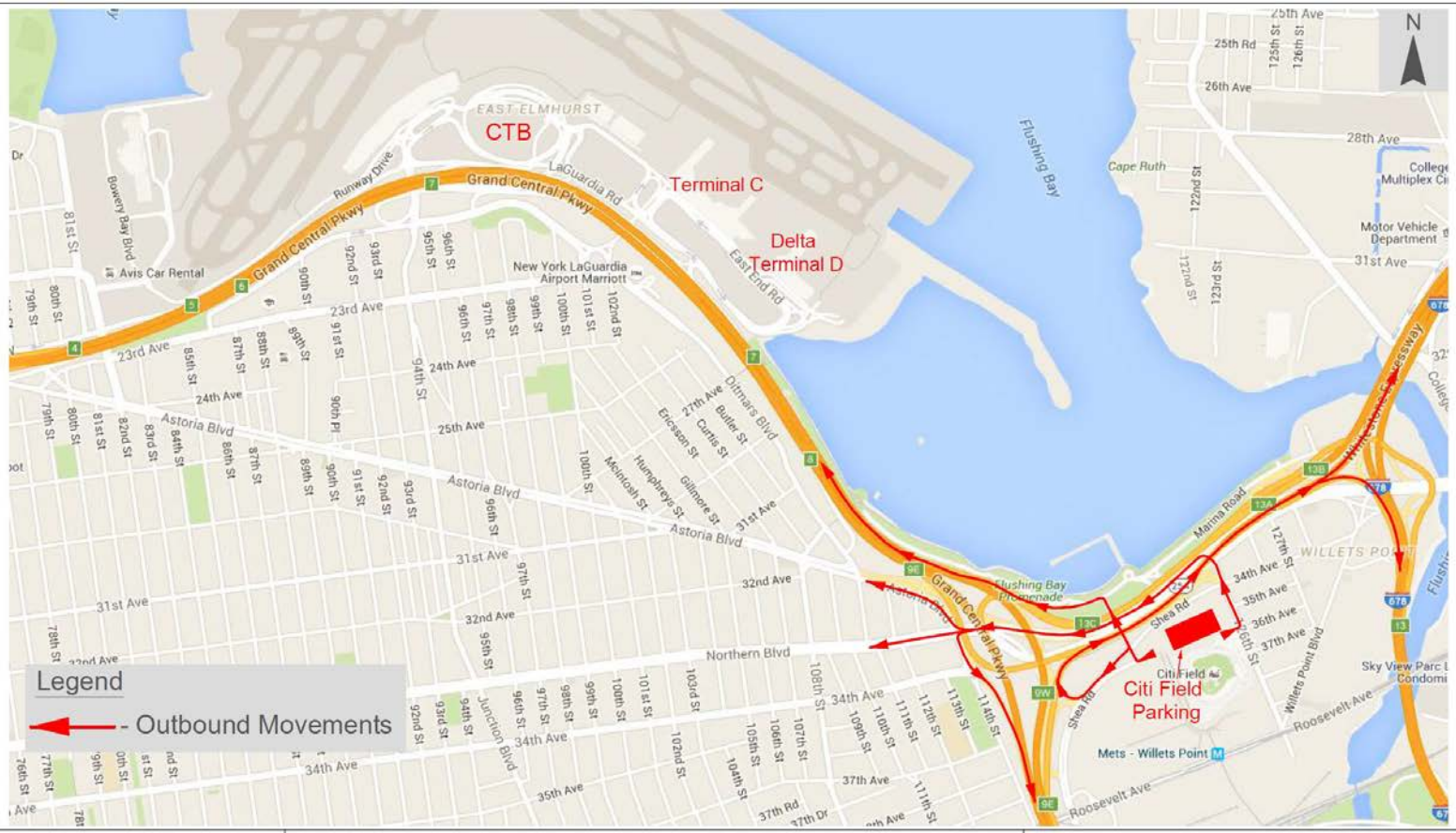
AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	Trip Distribution - Auto Figure 4



AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	Trip Distribution - Trucks Figure 5



AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	Inbound Trip Assignment - Auto Figure 6A


CTB
Terminal C
Delta
Terminal D
Citi Field
Parking
Legend
- Outbound Movements
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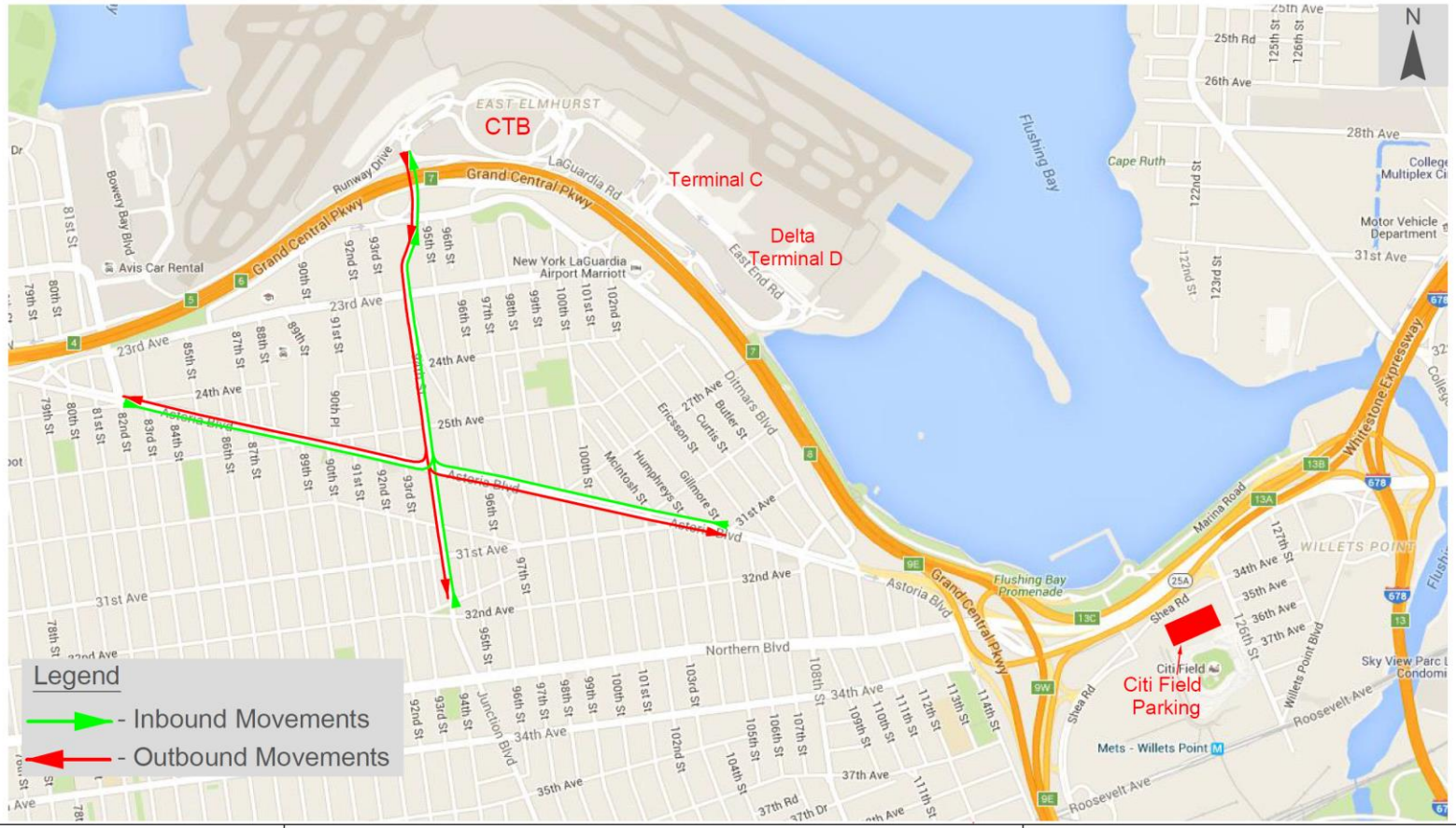
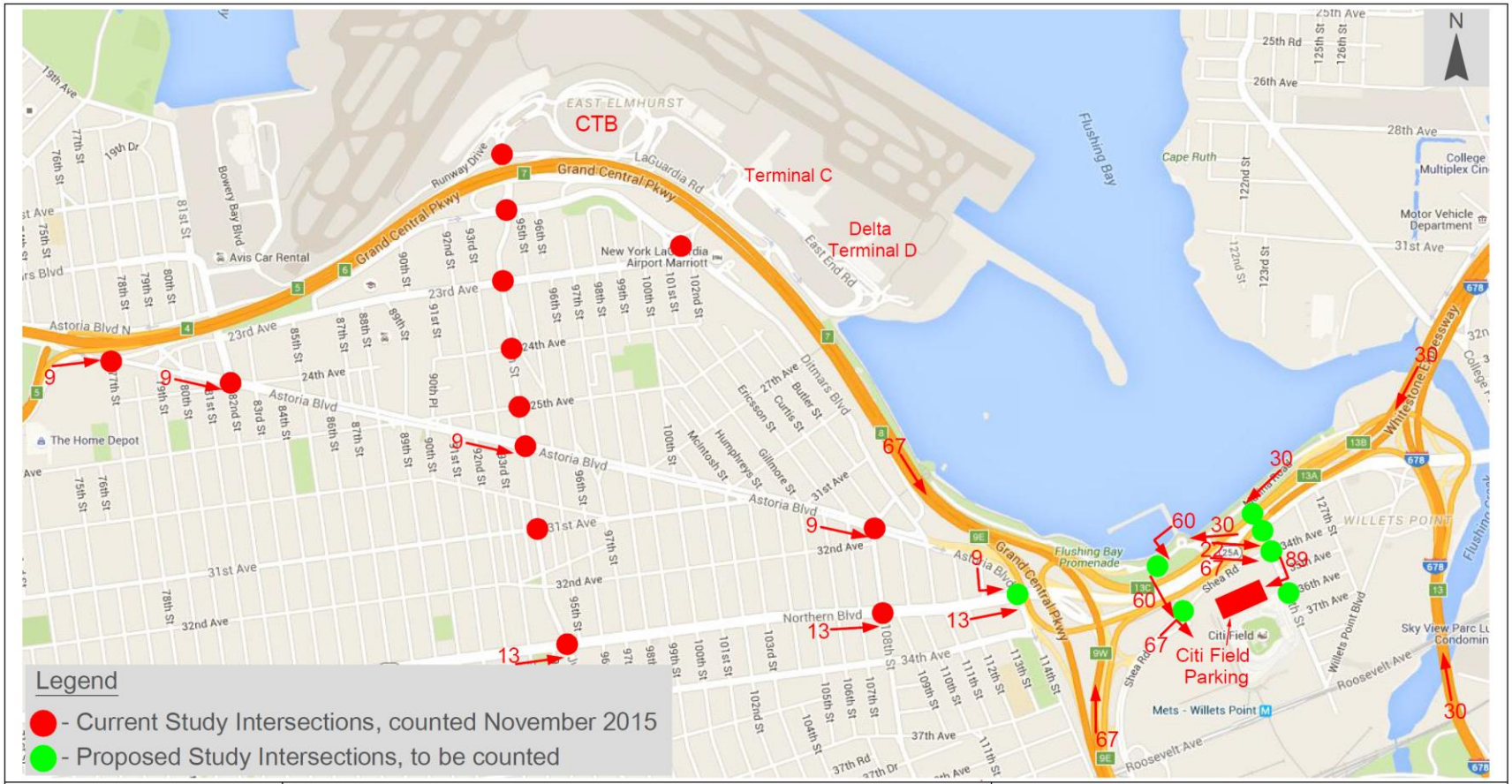
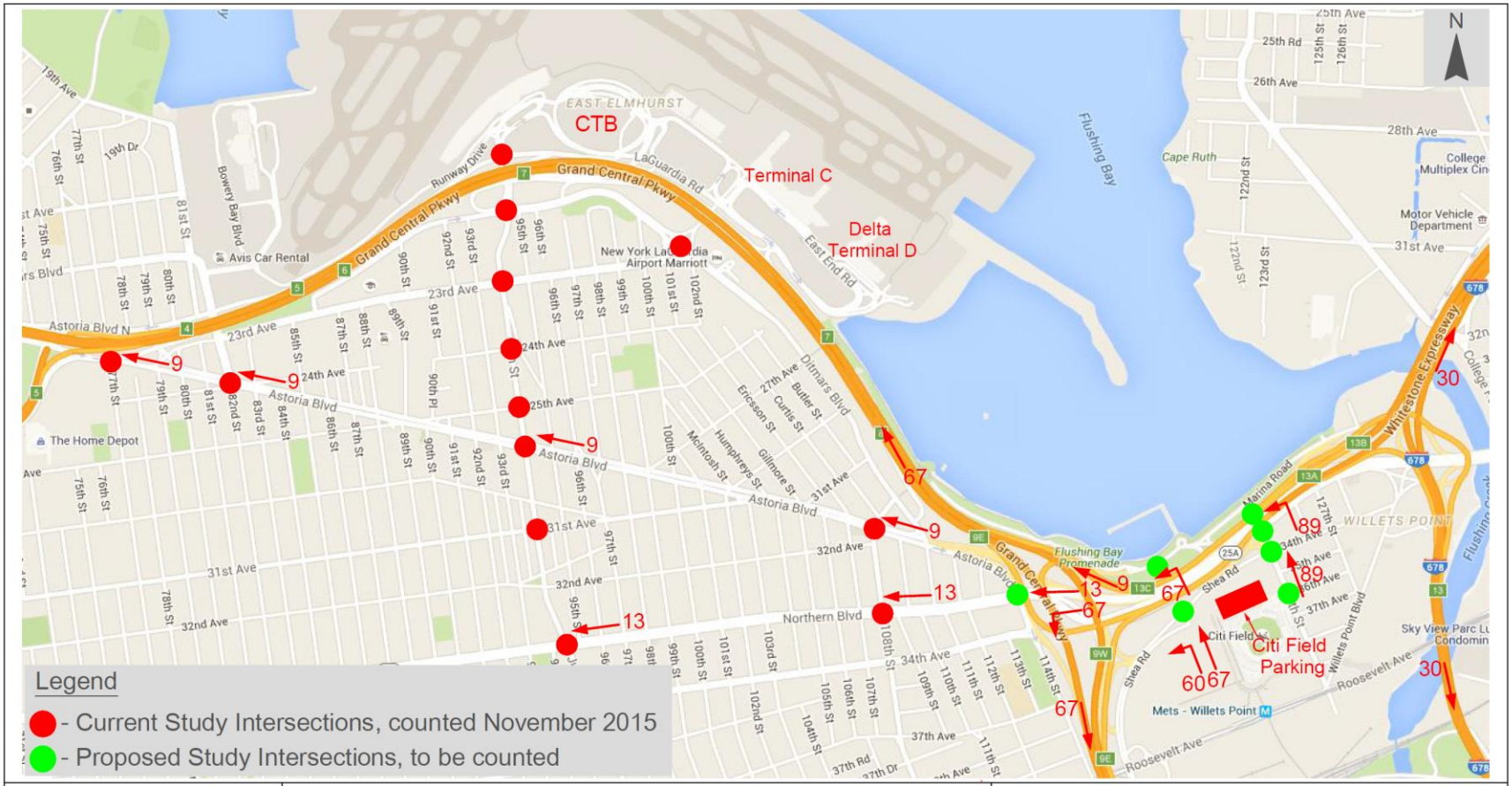
LaGuardia Airport Terminal C and D Reconfiguration
Environmental Assessment
Queens, New York
Outbound Trip Assignment - Auto
Figure 6B



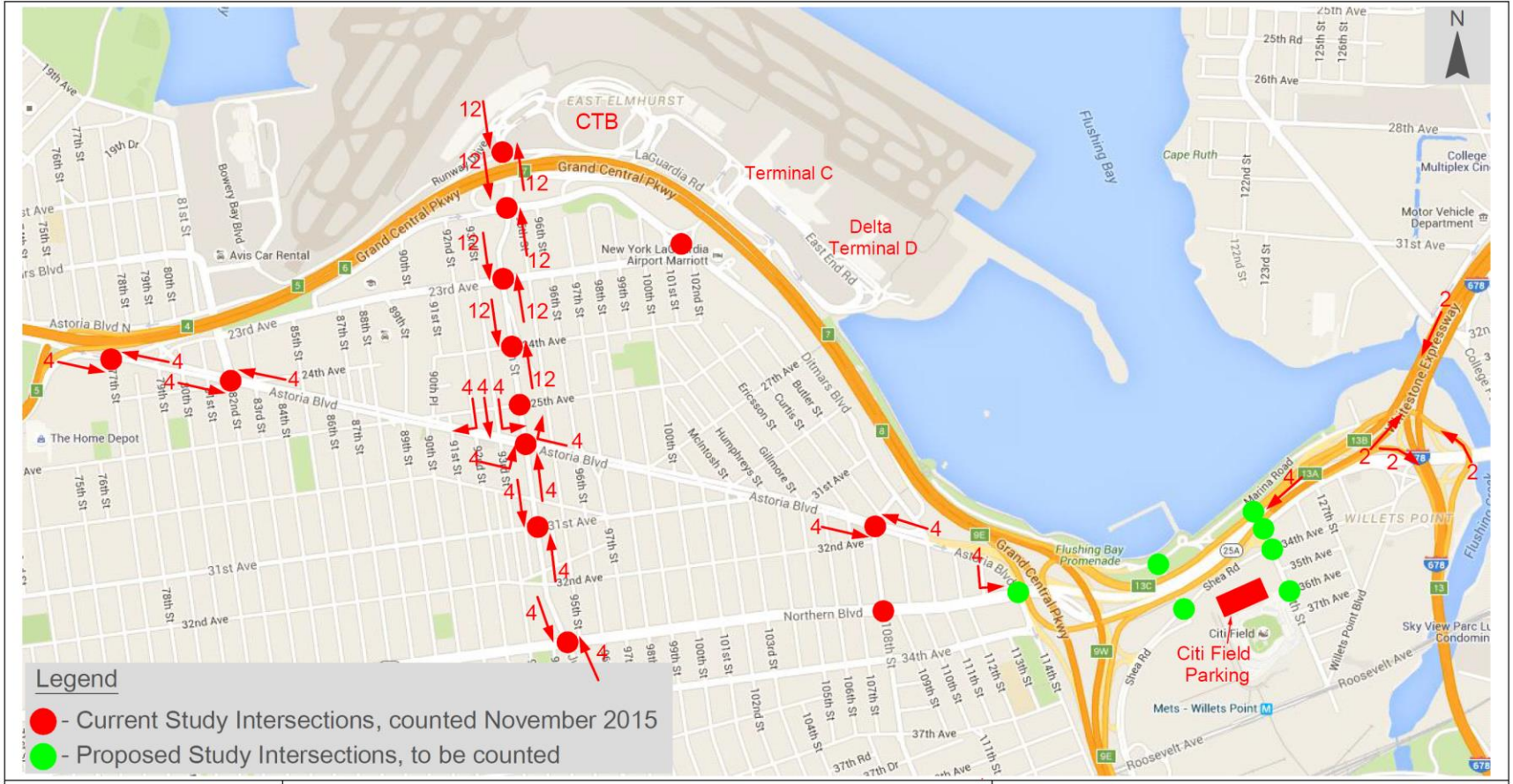
AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	Trip Assignment - Trucks Figure 7



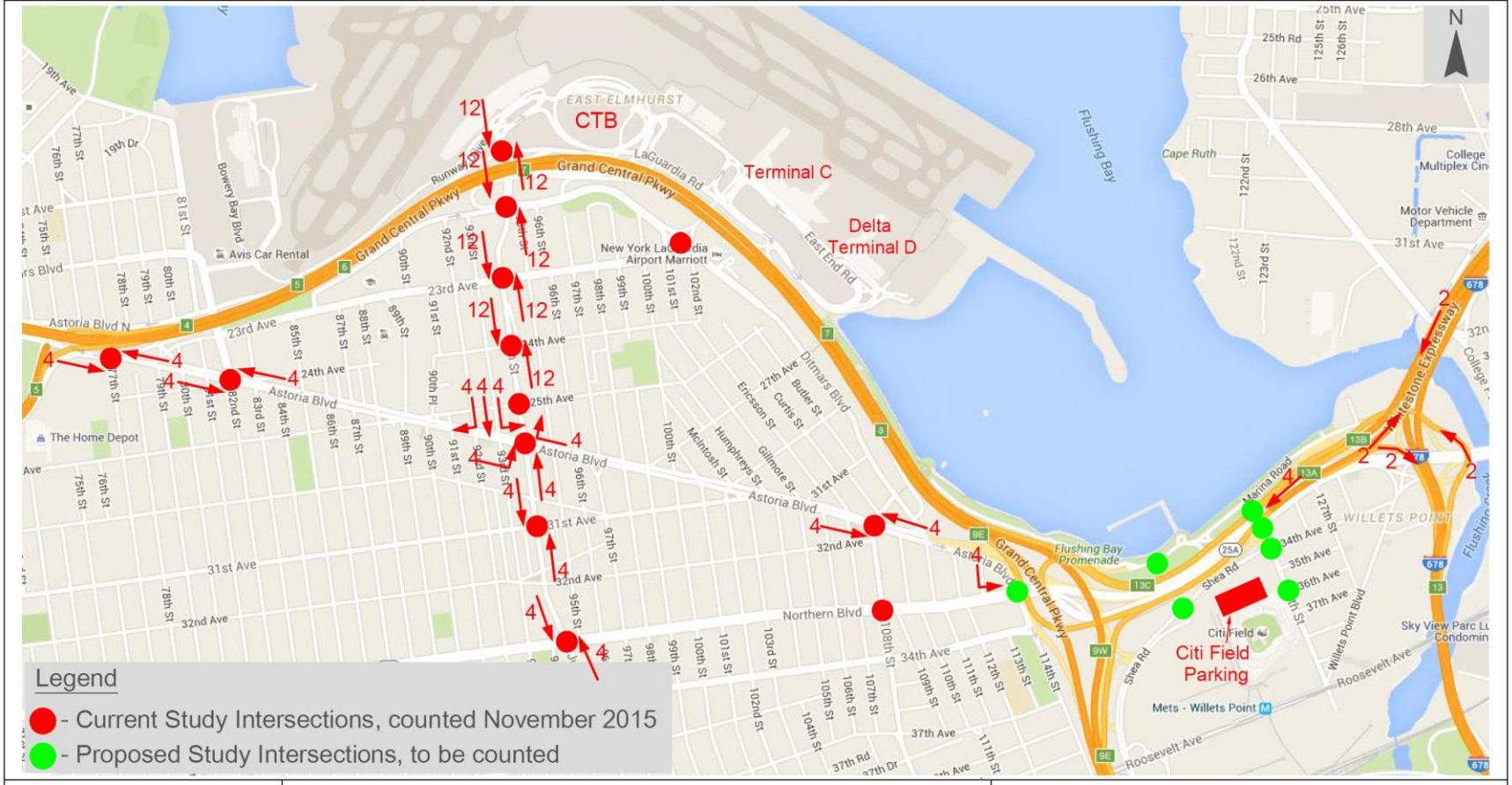
AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	During Construction Trip Assignment Autos: AM Peak Hour Figure 8



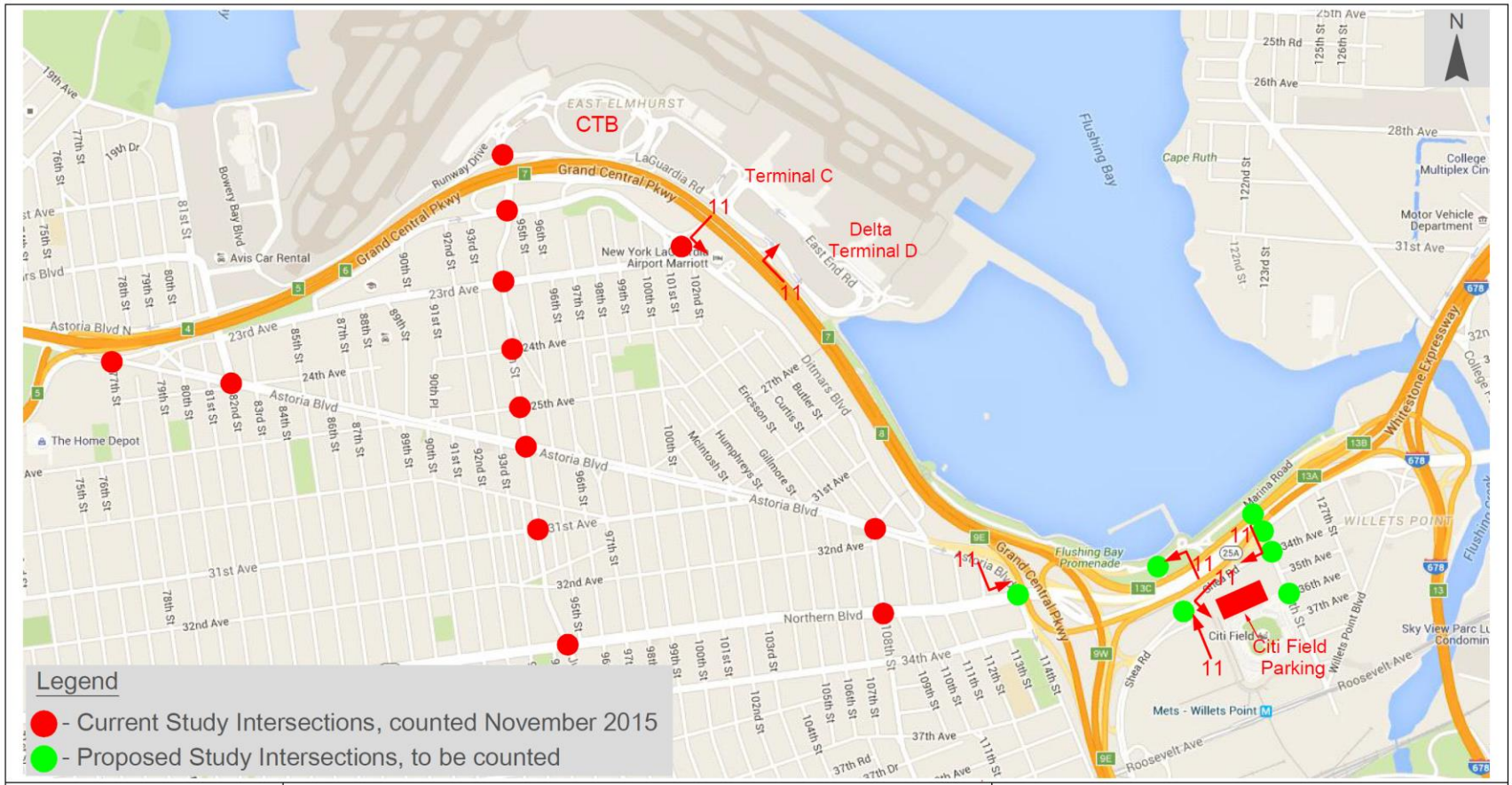
AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	During Construction Trip Assignment Autos: PM Peak Hour Figure 9



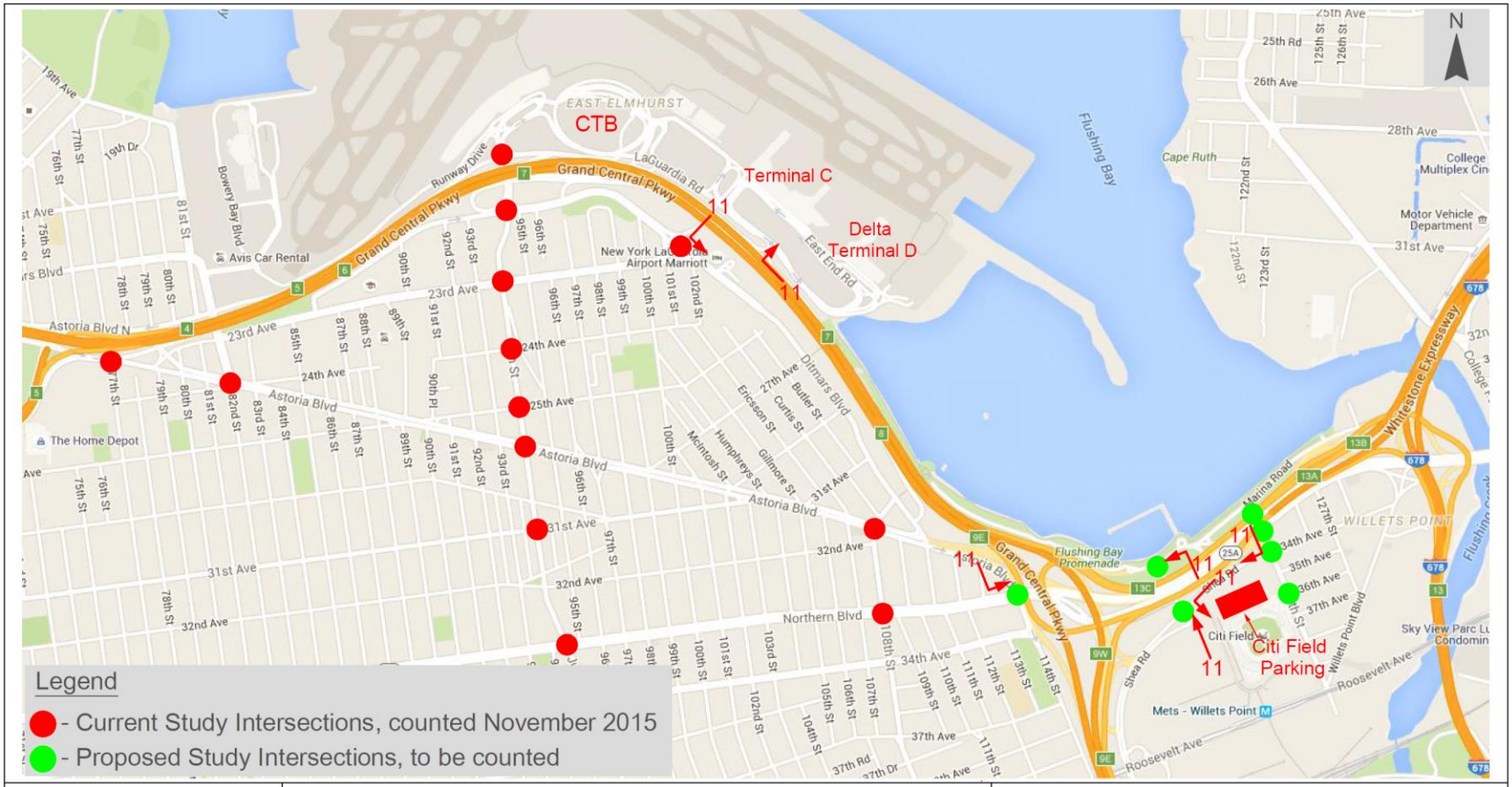
AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	During Construction Trip Assignment Trucks (pces): AM Peak Hour Figure 10



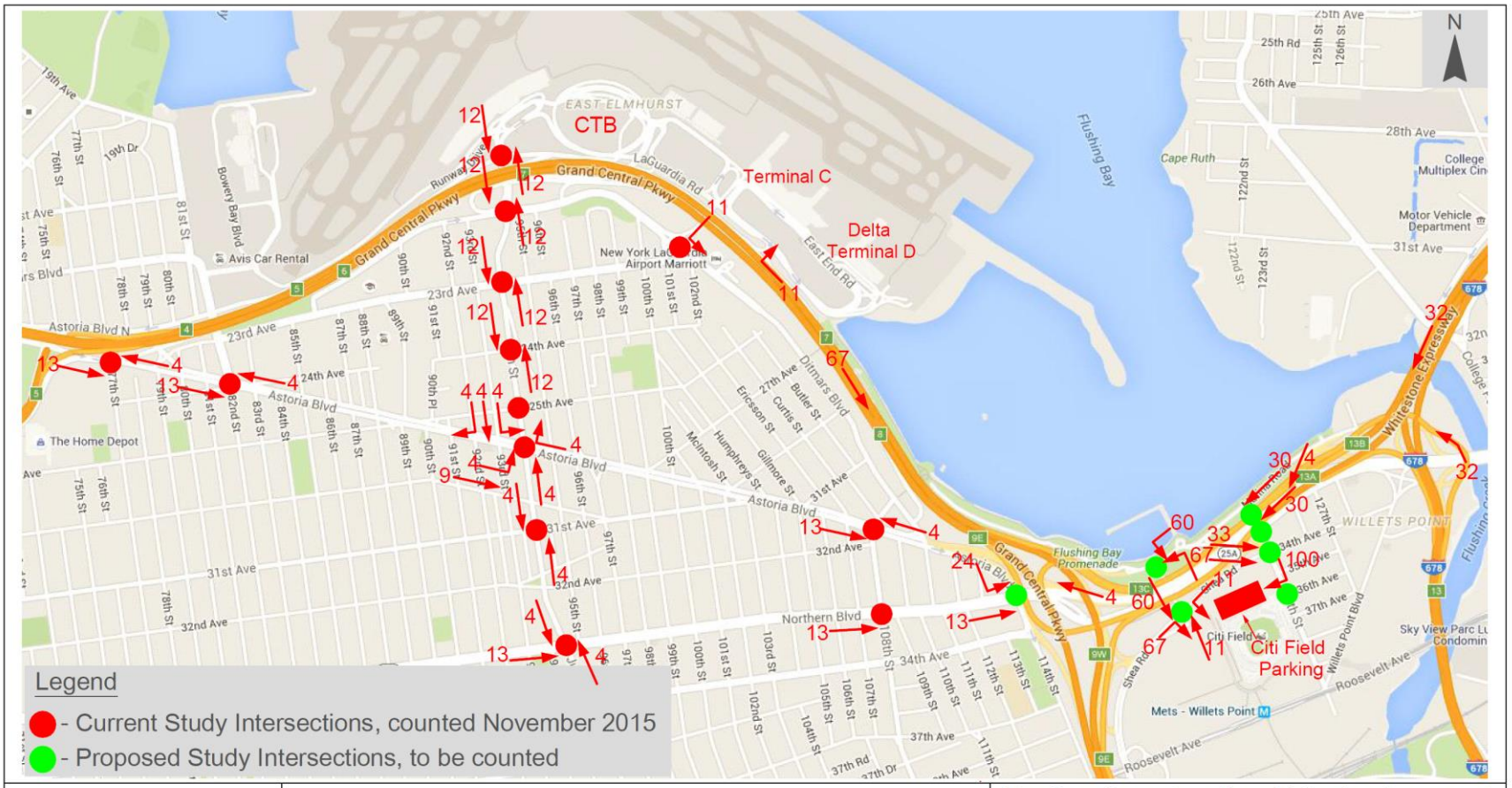
AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	During Construction Trip Assignment Trucks (pces): PM Peak Hour Figure 11



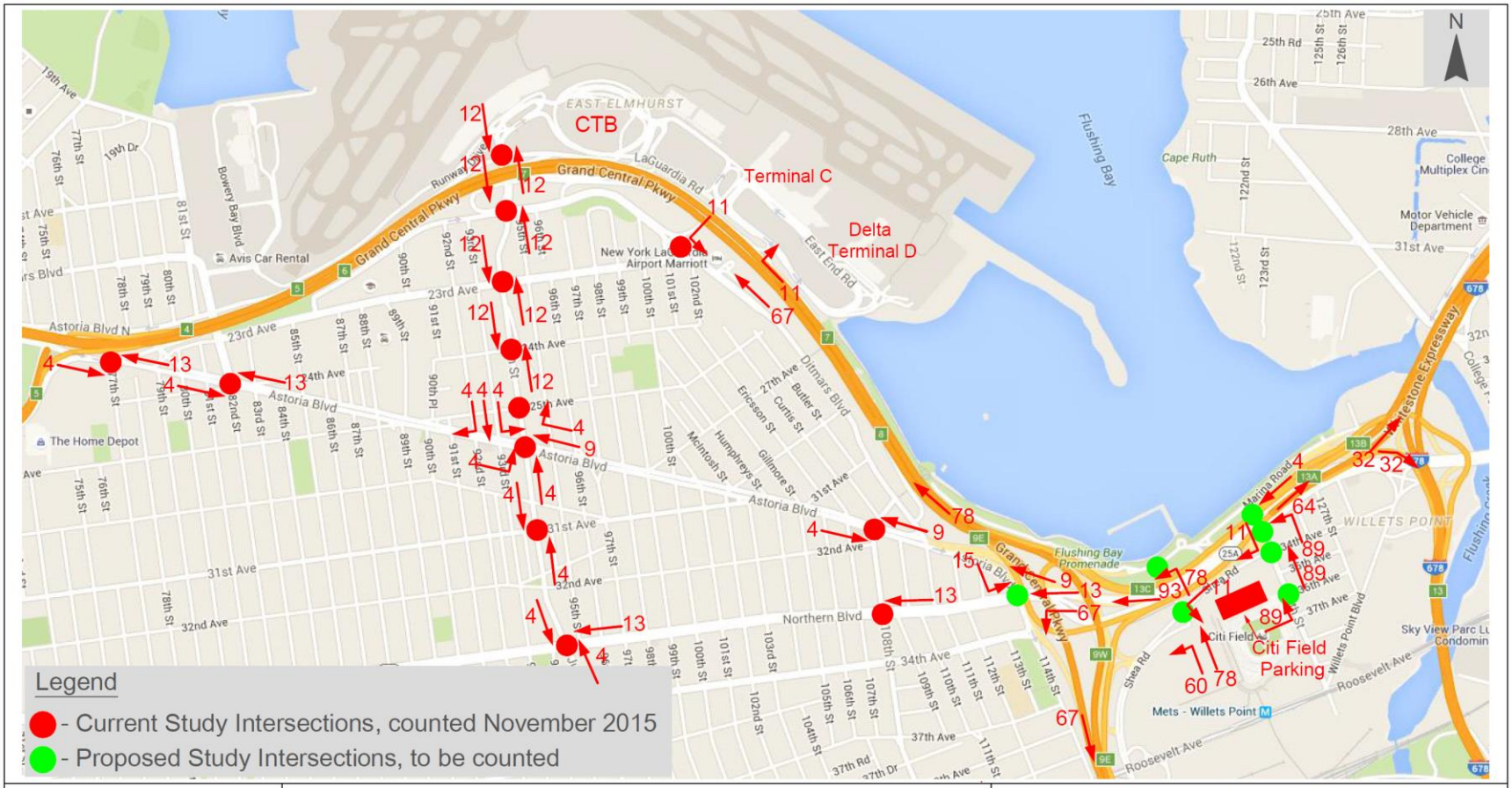
AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	During Construction Trip Assignment Shuttle Buses (pces): AM Peak Hour Figure 12



AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	During Construction Trip Assignment Shuttle Buses (pces): PM Peak Hour Figure 13



AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	During Construction Trip Assignment Total Incremental Trips: AM Peak Hour Figure 14



AECOM	LaGuardia Airport Terminal C and D Reconfiguration Environmental Assessment Queens, New York	During Construction Trip Assignment Total Incremental Trips: PM Peak Hour Figure 15

4.4 Traffic Impact Assessment

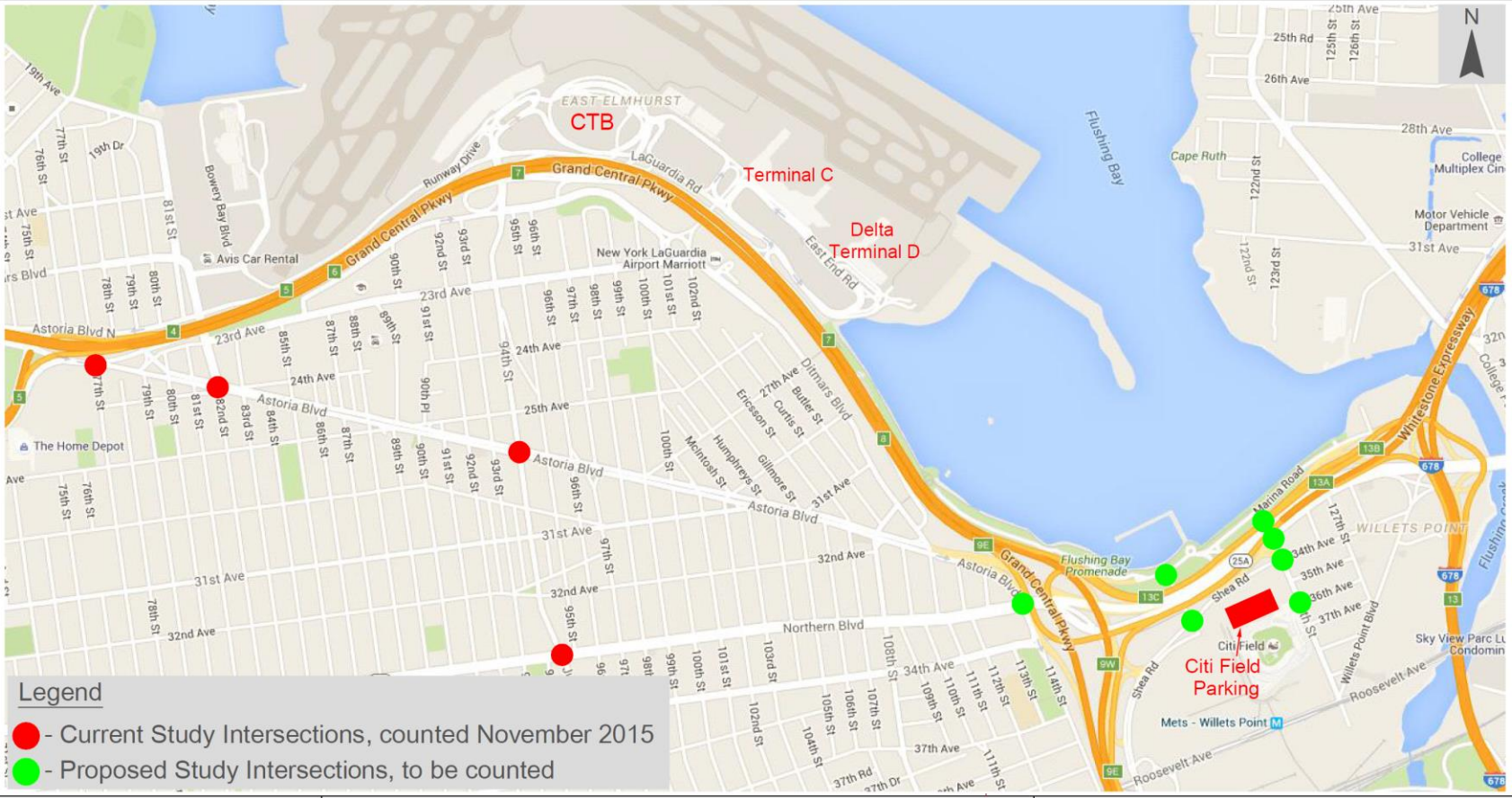
Based on the result of the preliminary traffic assignment and our familiarity with the roadway network in the vicinity of LaGuardia Airport, we had initially considered analyzing 13 intersections for construction impact assessment and had collected data at those locations in November 2015. Subsequently, with construction worker parking now assumed to be accommodated at Citi Field, an additional seven (7) intersections located in the vicinity of Citi Field (shown in **bold** below) have been proposed for study. The total incremental trip assignments shown in Figures 14 and 15 indicate, however, that several intersections would not meet the CEQR threshold of at least 50 pces for requiring a detailed traffic study. In discussion with NYCDOT, several of these intersections were eliminated from further study. At some locations, although the projected incremental volumes would not exceed 50 pces, because of poor existing levels of service they were included for detailed study.

The resulting 11 intersections as shown in **Figure 16** will be studied:

- Astoria Boulevard / 94th Street
- Northern Boulevard / 94th Street
- Astoria Boulevard / 77th Street
- Astoria Boulevard North / 82nd Street / 24th Avenue
- **Shea Road / Boat Basin Place**
- **Boat Basin Place / Marina Road**
- **Shea Road / 34th Avenue / 126th Street**
- **Northern Boulevard eastbound / 126th Street**
- **Northern Boulevard westbound / 126th Street**
- **Astoria Boulevard / 114th Street / Northern Boulevard**
- **126th Street / 36th Avenue**

4.4.1 Baseline Traffic Data Collection

Existing studies and other data sources will be reviewed to determine if recent, usable traffic counts and other relevant information are available at the proposed study intersections. Generally, for environmental reviews in accordance with the *CEQR Technical Manual*, traffic data older than three years are not considered usable. Because recent traffic data (including data collected for the CTB EA) were not available, traffic counts were initially performed at four of the 11 study intersections during the 5:00 to 8:00 AM and 2:00 to 5:00 PM peak hours in November 2015. Traffic data at the additional seven intersections (which have been identified subsequent to the November 2015 data collection effort) would be collected when schools are in session, and under "normal" traffic and roadway conditions. The additional data collection effort will be coordinated with the Port Authority's planned Traffic Monitoring Plan data collection effort at La Guardia Airport. The data collected will be used in conjunction with previously collected data to develop Baseline Traffic Networks for the weekday AM and PM construction peak hours.



AECOM

LaGuardia Airport Terminal C and D Reconfiguration
Environmental Assessment
Queens, New York

Current and Proposed
Study Intersections

Figure 16

4.4.2 Future Condition Without Construction

As stated earlier in this memorandum, projected construction conditions on a typical weekday during the peak month of January 2019 will be analyzed. It is expected that with, or without the planned construction at Terminals C and D, traffic volumes at the study intersections during this timeframe would increase due to a combination of normal background growth as well as traffic generated from construction activities and development projects at and near LaGuardia Airport.

To establish year 2019 Future Without Construction traffic volumes, the existing traffic volumes will first be increased by applying a compounded background growth rate in accordance with the 2014 *CEQR Technical Manual.* In addition, the projected increase in vehicular traffic associated with overlapping construction activities at the CTB and from other known projects (the Willets Point Development Project is the only known project of significant size at this time) will be included in the year 2019 Future Without Construction traffic volumes.

The Future Without Construction condition will also reflect any planned roadway changes that are expected to be in place by 2019. Relevant agencies including NYSDOT and NYCDOT will be contacted for information on future roadway network changes.

4.4.3 Future Condition With Construction

Vehicle trips estimated to be generated on a typical construction workday in the peak month of January 2019 will be added to the Future Without Construction traffic volumes to produce the Future With Construction traffic volumes. The Future With Construction condition analysis will also account for any local reassignment of traffic associated with planned modifications to the roadway network and access configurations at LaGuardia Airport that coincides with the peak month of construction.

4.4.4 Analysis Methodology

The proposed study intersections for the 2015 Baseline, Future 2019 Without Construction and Future 2019 With Construction conditions, described above, will be analyzed using the *Synchro* traffic simulation software, Version 9 (or as determined by NYCDOT).

5.0 PEDESTRIANS

As per the *CEQR Technical Manual, Chapter 16, Section 300. Assessment Methods*, quantified analysis for pedestrians would typically not be needed if the proposed development would result in fewer than 200 peak hour pedestrian trips. Since the Proposed Action is not projected to generate more than 200 pedestrian trips at any *off-site* locations (outside the airport), a pedestrian assessment is not warranted during construction.

6.0 TRANSIT

LaGuardia Airport is not directly accessible via subway, and no modifications to subway service are proposed under the Action condition. Therefore, detailed subway analyses are not warranted for the proposed Action.

As per the *CEQR Technical Manual, Chapter 16, Section 300. Assessment Methods*, quantified analysis for bus transit would typically not be needed if the proposed development would result in fewer than 200 peak hour bus trips. It is expected that private bus carriers will continue to serve the airport and provide more frequent service to accommodate projected increases in ridership demand under both the Future Without Construction and Future With Construction conditions. With respect to public bus service, based on the estimated construction trip generation during the peak month (January 2019), the proposed construction condition is not projected to increase public bus ridership by more than 200 new person-trips during any one peak hour. Therefore, according to *CEQR* guidelines, detailed bus analyses are not warranted during construction.

7.0 PARKING

As per the *CEQR Technical Manual, Chapter 16, Section 313.4. Parking*, a parking analysis may be needed if a quantified traffic analysis is necessary based on the initial screening analyses. As stated earlier in this memorandum, all construction worker parking during the peak phase of construction would be accommodated at Citi Field. This, and other key assumptions described in this memorandum, formed the basis of the traffic analyses proposed to be conducted during construction.

It is expected that Delta Air Lines, in coordination with the Port Authority, will continually seek to rationalize the proposed construction parking supply with construction parking demands during different construction phases. An objective of this rationalization process is to ensure that vehicles generated during construction are entirely accommodated on-site in new and/or reconfigured parking facilities at Citi Field. Therefore, no off-site demand for parking is expected to occur on city streets in the vicinity of the airport, and a parking assessment is not warranted during construction.

8.0 SAFETY ASSESSMENT

Once the study intersections are approved by NYCDOT, they will be screened to determine if any intersection qualifies as a “high crash” location. The *CEQR Technical Manual* defines a “high crash location” as those locations with 48 or more total reportable and non-reportable crashes—or five or more pedestrian/bicyclist injury crashes—in any 12-month period of the most recent three-year period for which data is available. Crash data from the NYCDOT will be reviewed for the most recent available three-year period at the study intersections. At any “high crash” locations, a detailed summary will be

made of the type of crashes occurring at each location, by year. This summary will serve as the basis of an analysis of crash patterns. A determination will be made as to the likelihood if the additional vehicular traffic generated during construction will contribute to a significant worsening of existing safety conditions.

9.0 CONCLUSIONS

Key transportation planning assumptions have been presented in this memorandum—including the estimated daily construction worker and truck volumes, the construction worker parking location at Citi Field and shuttle bus service to and from Terminals C and D, and projected shift times and modal split percentages for construction workers (auto vs. bus). These assumptions form the basis of the traffic analyses to be performed to assess the potential impacts during construction of Delta Air Lines Terminals C/D at La Guardia Airport. The additional data collection will be coordinated with the Port Authority and has been scheduled for the week of March 21, 2016.

Rich Smyth
Port Authority of New York and New Jersey
Bulova Corporate Center
75-20 Astoria Blvd., Suite 150
East Elmhurst, New York 11370

Dear Rich,

This letter serves as confirmation that the Mets are currently in negotiations with Delta Air Lines to provide approximately 300 parking spaces in the Citi Field parking lots (Southfield) for Delta's use during their upcoming construction program at LaGuardia airport. The program is scheduled to commence by the second quarter of 2017 for the following two years, with the option to extend, if needed.

We are confident that we will come to an agreement with Delta on terms of use in the near future, and we are happy to assist Delta as they undertake this historic and much-needed redevelopment of LaGuardia airport.

Sincerely,

Haeda Mihaltses
Executive Diretor, Extenal Affairs
New York Mets

CC: Ryan Marzullo, Managing Director, Corporate Real Estate, Delta Air Lines

New York Mets • Citi Field • Flushing, N.Y. 11368 • 718.507.6387

LGA Traffic Operations Study

LGA Traffic Operations Study
Prepared by the Port Authority in Support of Delta Air Lines Environmental Assessment
February 15, 2017

Summary

The Delta Air Lines (Delta) proposed redevelopment of Terminals C and D at LaGuardia Airport (LGA) would require the relocation of some on-airport facilities to other sites both on-airport and off-airport with the consequential reallocation of airport-related traffic volumes for different vehicle classes resulting in a change in travel patterns. The major components of this shift include: the displacement of airport-wide long-term customer parking to the west side of the airport; the reallocation of employee parking spaces at Parking Lot 10E (P10) for both employee parking and long-term customer parking operations; the relocation of employee parking spaces displaced from P10 to a proposed new employee parking lot at Ingraham's Mountain; and the relocation of taxi holding operations for Terminal B to a proposed new holding area in front of the redeveloped Terminal B head house.

The relocation of airport-wide long-term customer parking, employee parking, and the Terminal B taxi holding area is anticipated to result in changes to the airport travel patterns for some vehicles affected by the Proposed With-Action condition which may result in potential traffic impacts at certain on-airport and off-airport locations.

Eleven key on-airport and off-airport intersections that were deemed most likely to be potentially impacted by the Proposed With-Action condition were analyzed using Synchro software.

In order to facilitate the analysis of the key intersections that would be potentially affected by the Proposed With-Action condition, balanced traffic flow maps were prepared for both the No-Action and With-Action conditions. Traffic volumes for No-Action conditions for on-airport and most off-airport roadways were based on the 2030 flight schedule for SK-02 (Stage I) approved by the Port Authority which serves as the baseline condition for Delta's East Side Reconfiguration Project. Traffic volumes for No-Action conditions for the off-airport roadways in the 19th Avenue study area, near the proposed new employee parking lot at Ingraham's Mountain, were derived from 2016 ground counts and increased to represent 2030 conditions. For the With-Action condition flow maps, individual traffic layers for each affected vehicle class were reassigned to match the change in routing due to the Proposed With-Action condition. Traffic impacts were assessed using the City Environmental Quality Review (CEQR) Technical Manual traffic impact criteria used by the New York City Department of Transportation (NYCDOT) and other City agencies to determine significant traffic

impacts. At intersections, the CEQR criteria used by NYCDOT is applied to each movement and allows less than 5 seconds of additional delay above mid-Level-of-Service (LOS) D (greater than 45 seconds per vehicle), less than 4 seconds of additional delay at LOS E, and less than 3 seconds of additional delay at LOS F before an impact is deemed significant and requires mitigation. The CEQR traffic impact thresholds are presented in Attachment A.

Of the 11 key intersections analyzed, there are three intersections that would exceed the delay thresholds for individual movements under With-Action conditions resulting in potential adverse traffic impacts: the intersection of the Grand Central Parkway (GCP) westbound off-ramp (Exit 5) and 82nd Street/Ditmars Boulevard, the intersection of 19th Avenue and Hazen Street, and the intersection of 19th Avenue and 45th Street. The Port Authority and NYCDOT would collaborate to implement mitigation measures at these locations that would address potential significant traffic impacts of the Proposed With-Action condition as described below:

- At the intersection of the GCP westbound off-ramp and 82nd Street/Ditmars Boulevard, the reconfiguration of the travel lanes in the westbound approach and the adjustment of the signal timing plan for the intersection would address the potential exceedance of the CEQR criteria due to the Proposed With-Action condition. If a reconfiguration of the travel lanes in the westbound approach or an adjustment of the signal timing plan for the intersection is needed, the Port Authority would work with NYCDOT to implement these permanent mitigation actions.

- At the intersection of 19th Avenue and 45th Street, the reconfiguration of this intersection from a two-way stop-controlled intersection (northbound /southbound) to a signalized intersection, would address the potential exceedance of the CEQR criteria due to the Proposed With-Action condition. If a traffic signal is warranted, the Port Authority would work with NYCDOT to install a permanent traffic signal at this location; signal warrant analyses would be needed.

- At the intersection of 19th Avenue and Hazen Street, the adjustment of the signal timing plan for the intersection would address the potential exceedance of the CEQR criteria due to the Proposed With-Action condition.

At all other intersections, the Proposed With-Action condition would not result in significant adverse traffic impacts under the CEQR criteria.

In conclusion, since the mitigation measures highlighted in this report would address the exceedances of the CEQR thresholds for significant traffic impacts at the three locations identified, the Proposed With-Action condition would not result in any significant adverse traffic impacts.

Study Purpose

The purpose of the LGA Traffic Operations Study is to analyze the effects on traffic conditions at LGA and the immediate vicinity due to the Proposed With-Action condition consisting mainly of the relocation of airport-wide long-term customer parking to the west side of the airport, the shift of some employee parking spaces to a nearby off-airport location, and the shift of taxis serving Terminal B to a new taxi holding area by the redeveloped Terminal B. The focus of the analysis was on on-airport and off-airport intersections adjacent to airport property between 82nd Street/Ditmars Boulevard and 102nd Street, and two intersections along 19th Avenue adjacent to the proposed new employee parking lot at Ingraham's Mountain. On-airport roadways and intersections east of 102nd Street have been analyzed by Delta Air Lines under a parallel effort and, therefore, they are not included as part of this analysis.

The purpose of the analysis was to compare the level of service (LOS) and delays between No-Action and With-Action conditions at key intersections in order to determine potential traffic impacts due to the Proposed With-Action condition.

Summary of No-Action Conditions

The No-Action condition scenario includes all changes to the on-airport and off-airport roadway network associated with the SK-02 (Stage I) layout and reconstruction of Terminal B. Traffic volumes for No-Action conditions for on-airport and most off-airport roadways were based on the 2030 flight schedule for SK-02 (Stage I) approved by the Port Authority which serves as the baseline condition for Delta's East Side Reconfiguration Project. Traffic volumes for No-Action conditions for the off-airport roadways in the 19th Avenue study area, near the proposed new employee parking lot at Ingraham's Mountain, were derived from 2016 ground counts and grown to represent 2030 conditions.[1]

Summary of With-Action Conditions

The primary component of the Proposed With-Action condition is the replacement of the existing Terminal C and Terminal D structures and associated roadway system with a new, larger Terminal C and a new roadway system. The Proposed With-Action condition would require the relocation of some on-airport facilities to other sites both on-airport and off-airport with the consequential reallocation of traffic volumes for

[1] It is noted that the analysis of the two intersections in the 19th Avenue study area resulted in different peak hours than the other nine intersections primarily due to traffic destined to and originated from Rikers Island. The resultant weekday peak hours for these two intersections are 6:00-7:00 AM and 3:00-4:00 PM versus 8:00-9:00 AM and 5:00-6:00 PM for the other nine intersections.

different vehicles classes (see Figure 1). The proposed relocation of these facilities would change travel patterns within and outside of the airport.

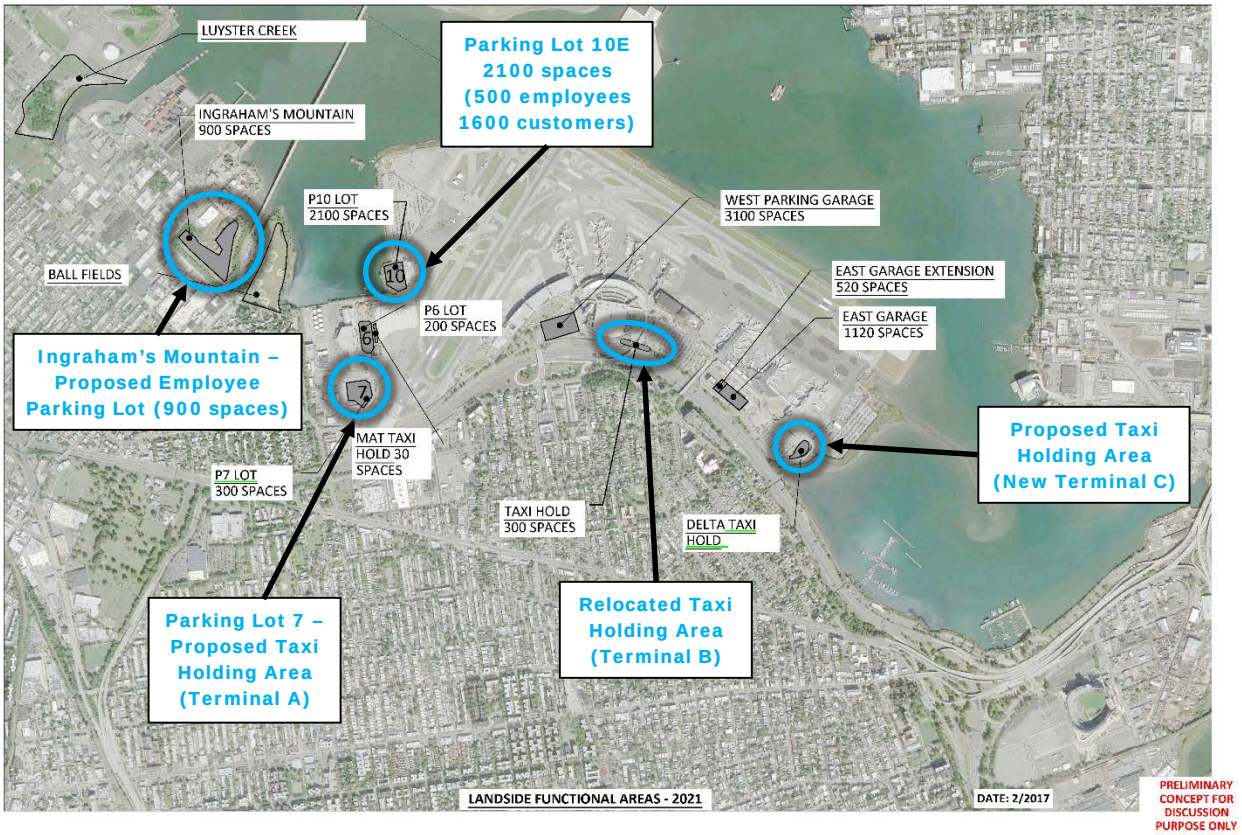
The following is a summary of the proposed relocation of facilities:

- Relocation of airport-wide long-term customer parking to Parking Lot 10E (P10), in the vicinity of Terminal A, which would provide 1,600 long-term parking spaces for customers and 500 employee parking spaces at the west end of the airport.

- The reallocation of parking spaces at P10 to accommodate long-term customer parking would result in the relocation of 900 employee parking spaces from P10 to a new parking lot at Ingraham's Mountain.

- The relocation of Terminal B taxi holding operations to a proposed new holding area, with 300 spaces, in front of the redeveloped Terminal B head house.

Figure 1: Facility Relocations due to the Proposed With-Action Condition[1]



Notes:

1. Blue circles indicate areas whose traffic assignments are affected by facility relocations associated with the Proposed With-Action condition.

Changes in Airport Traffic Patterns due to the Proposed With-Action Condition

Private Vehicles (Long-Term Parking)

- It is assumed that the 1,600 spaces allocated for customers at P10 would be used for airport-wide long-term parking.
- It is assumed that 13 percent[2] of all parking entrance and exit volumes at LGA under No-Action conditions would be long-term customer parking, and they would be reassigned to P10 under With-Action conditions.
- It is assumed that long-term customer-parking-related traffic would use the routes presented in Figure 2 to access and exit the airport.

For-Hire Vehicles

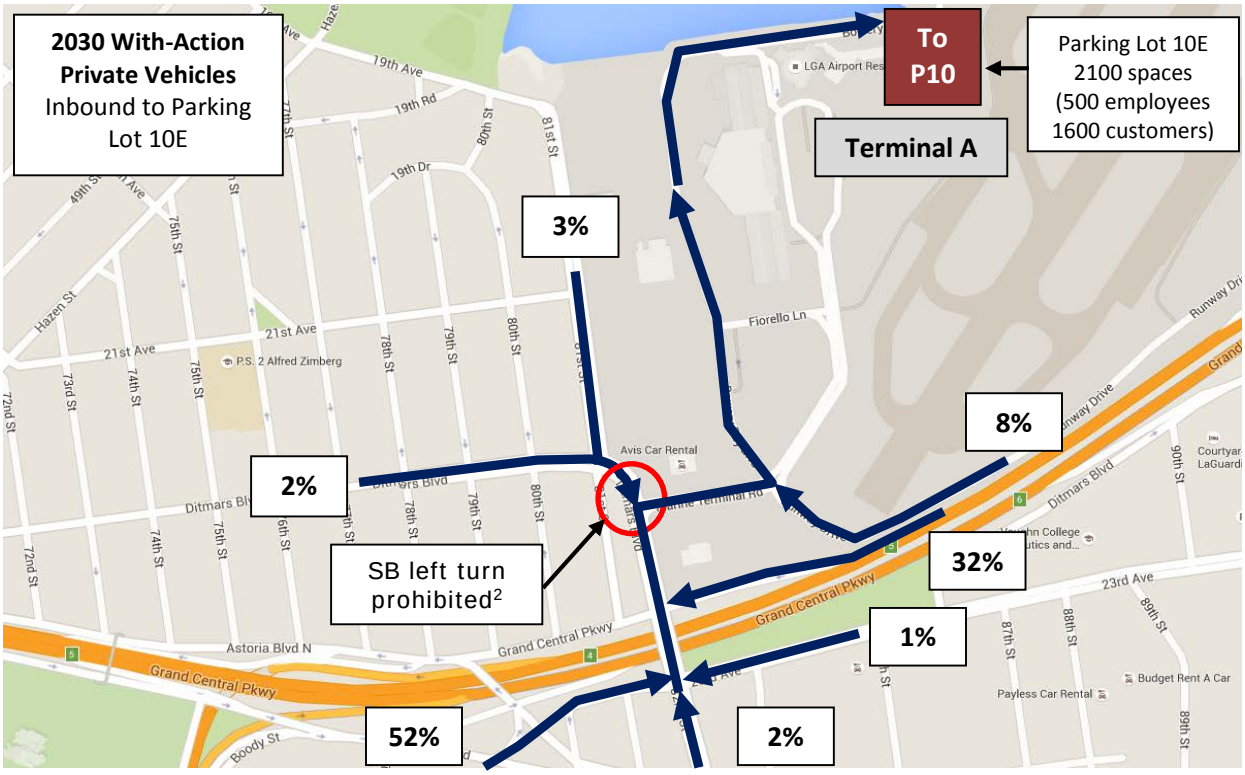
- It is assumed that there would be no change in For-Hire Vehicles from No-Action conditions.

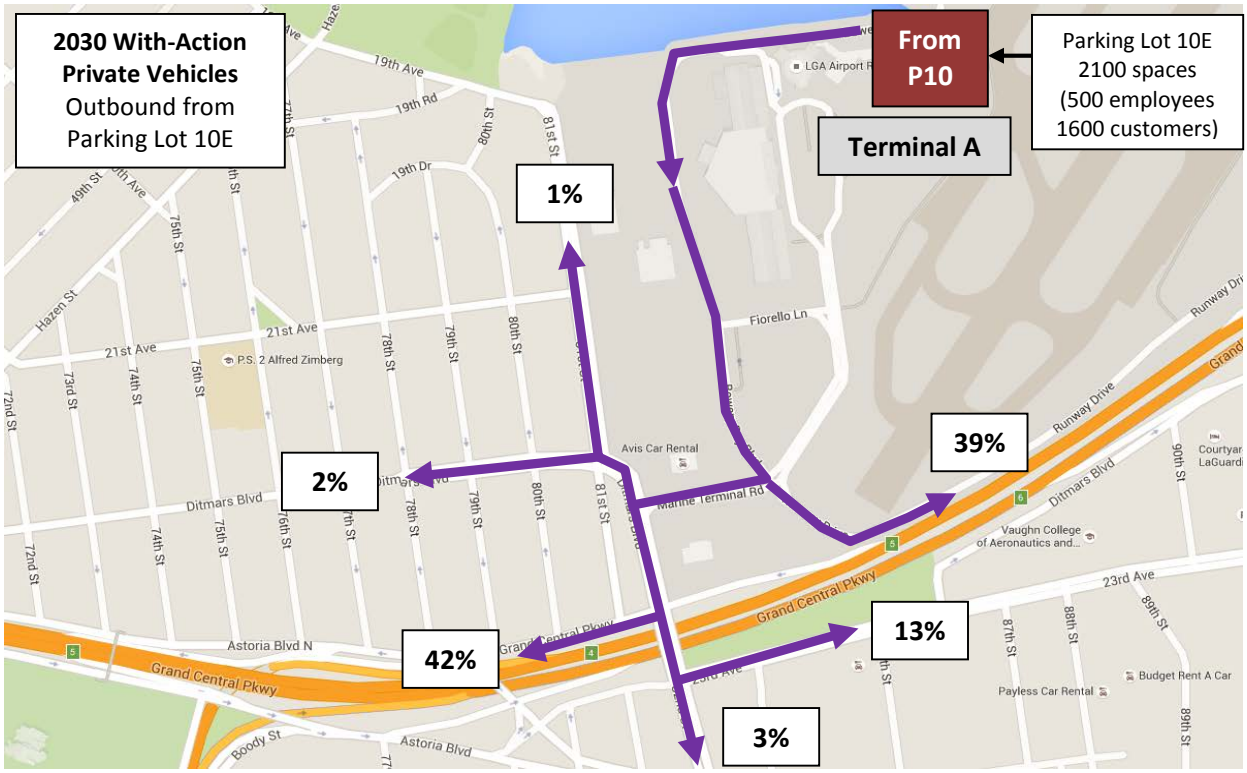
Employee Vehicles (Employee Parking)

- It is assumed that the 500 spaces allocated for employees at P10 would be used for airport-wide employee parking.
- It is assumed that the 900 spaces allocated for employees at Ingraham's Mountain would be used for airport-wide employee parking.
- It is assumed that the hourly employee parking demand would be split proportionally between these two lots under the Proposed With-Action condition.
- It is assumed that employees parking in P10 would have their routing assignments unchanged by the Proposed With-Action condition, but that employees parking at Ingraham's Mountain would be primarily routed on 82nd Street/Ditmars Boulevard to reach the site.

[2] Percentage based on August 2010 parking transactions at LGA.

Figure 2: Inbound & Outbound Routing to/from P10[1]





Notes:

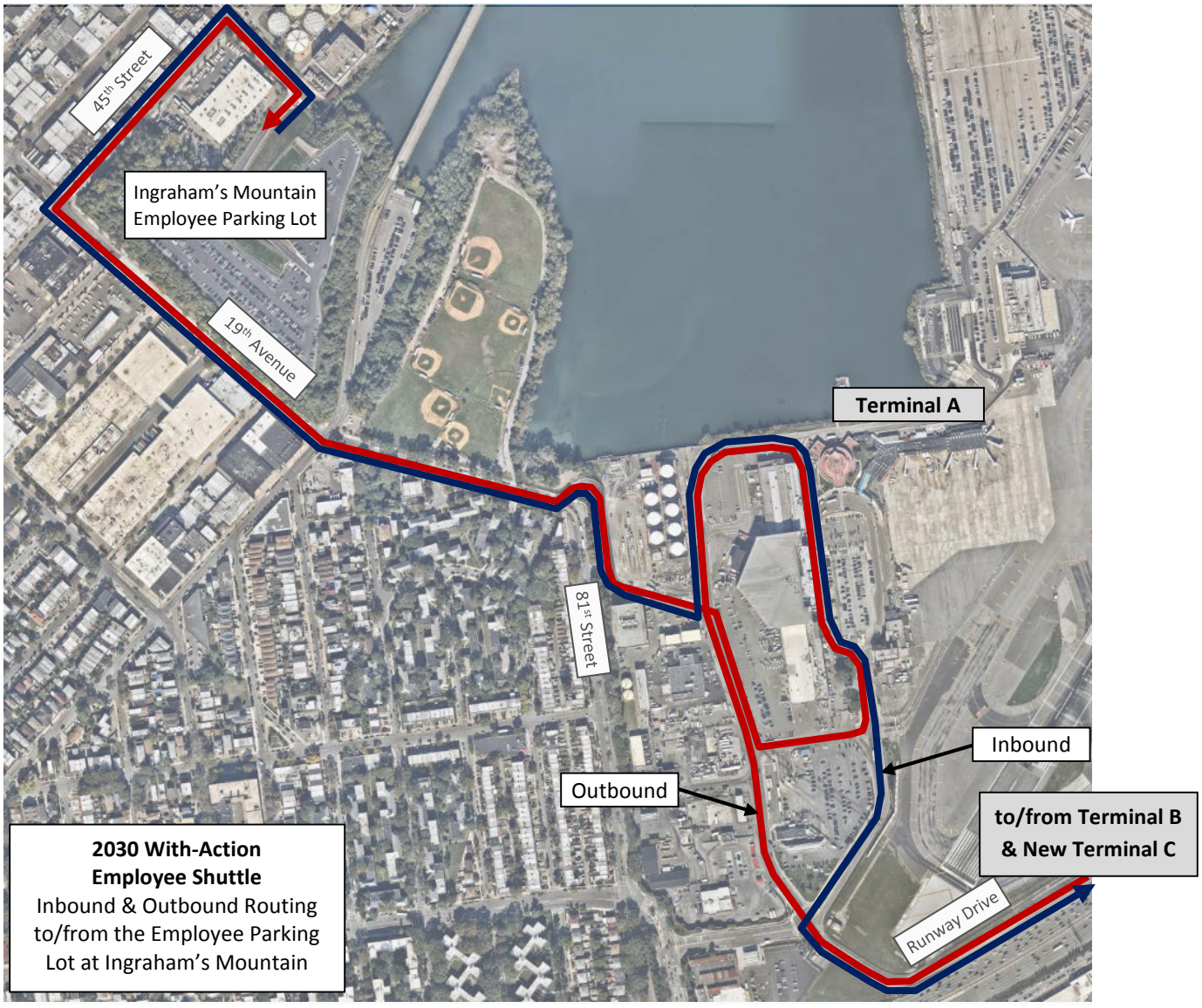
1. Percentages are approximate and based on the 2030 PM No-Action flow maps.
2. Vehicles would continue on Ditmars Boulevard/82nd Street and turn around northbound at 23rd Avenue to enter the airport at Marine Terminal Road.

On-Airport Buses

- An additional Employee Shuttle would be provided under With-Action conditions to link the employee parking lot at Ingraham's Mountain with the airport, with up to 10 buses per hour during the peak hours. This additional shuttle service would follow the routing presented in Figure 3.

- It is assumed that the forecast number of on-airport buses (65 buses during the AM peak hour and 37 buses during the PM peak hour) using the High-Occupancy-Vehicle (HOV) frontage in the vicinity of Terminal A under No-Action conditions would be sufficient to accommodate the additional peak-hour passenger demand due to the relocation of airport-wide long-term customer parking to P10.

Figure 3: Employee Shuttle Routing



Taxis

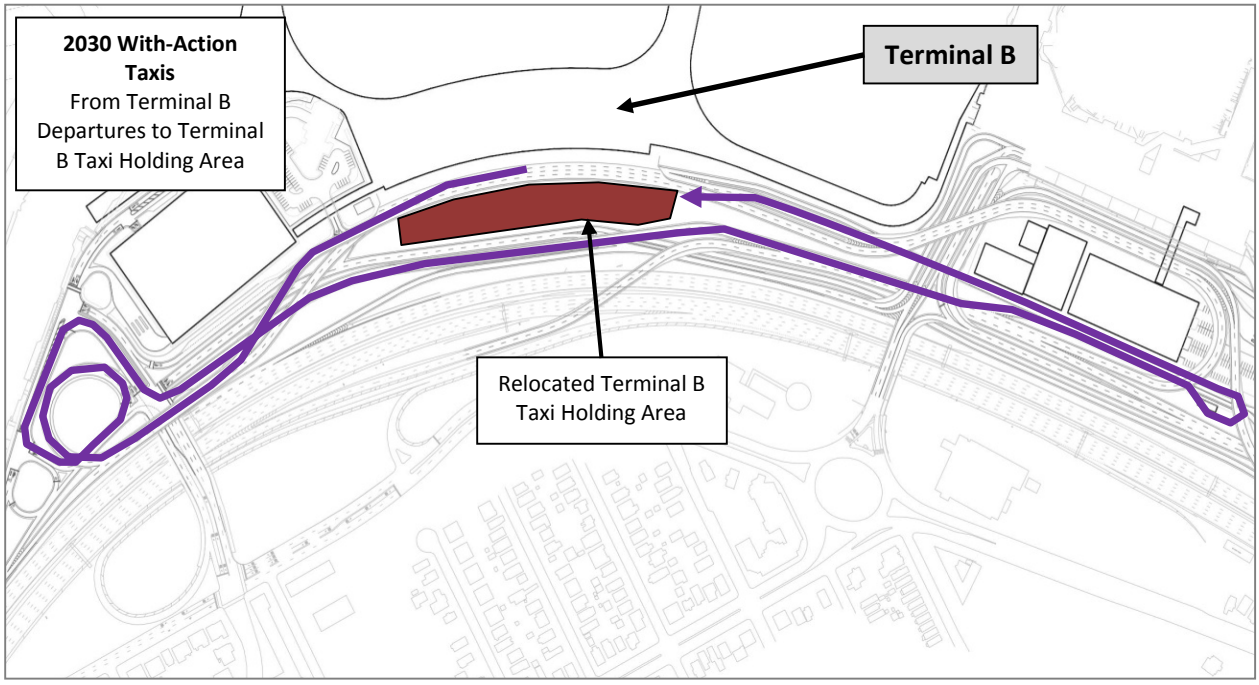
Departures:

- It is assumed that the taxi holding area at Parking Lot 7 (P7) would serve taxis coming empty from off-airport and taxis recirculating from the frontage at Terminal A.

- It is assumed that a dedicated taxi holding area relocated in front of Terminal B would serve taxis coming empty from off-airport and taxis recirculating from the departures frontage at Terminal B.

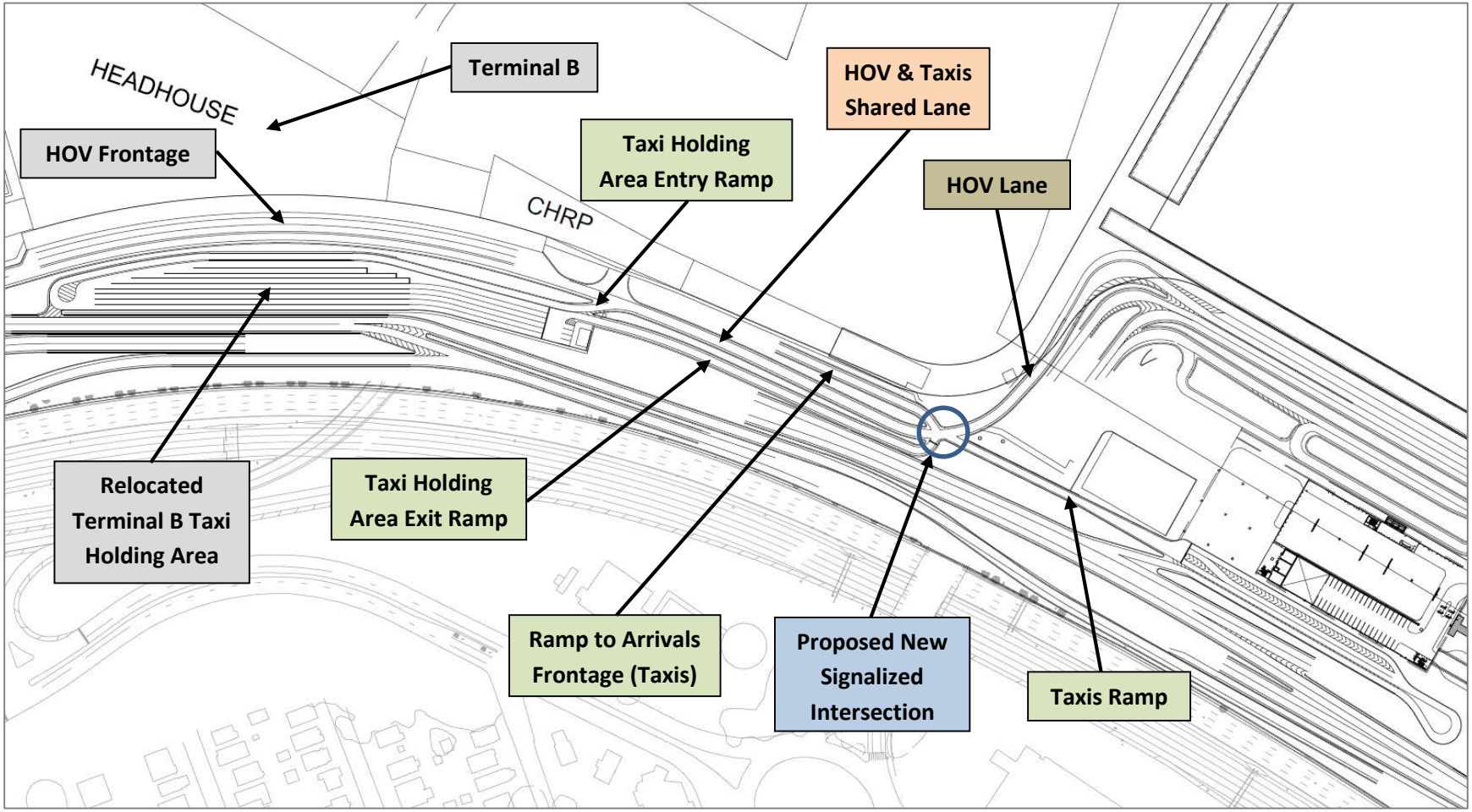
- It is assumed that taxis leaving the departures frontage at Terminal B towards the relocated taxi holding area would continue to use the same roadway segments used by taxis under No-Action conditions, except for the final roadway segment leading towards the holding area where they would share space with HOVs going to the HOV frontage at Terminal B (see Figure 4 and Figure 5).

Figure 4: Taxi Routing from Terminal B Departures[1]



Notes:
1. 2030 LGA SK02 (Stage I) roadway network.

Figure 5: Ground-Level Traffic Operations by Terminal B[1]



Notes:
1. Conceptual plan of ground-level traffic operations at Terminal B. To be used for discussion purposes only.

- It is assumed that a dedicated taxi holding area by the new Terminal C would serve taxis coming empty from off-airport and taxis recirculating from the departures frontage at the new Terminal C, and they would only use roadways and intersections east of 102nd Street.

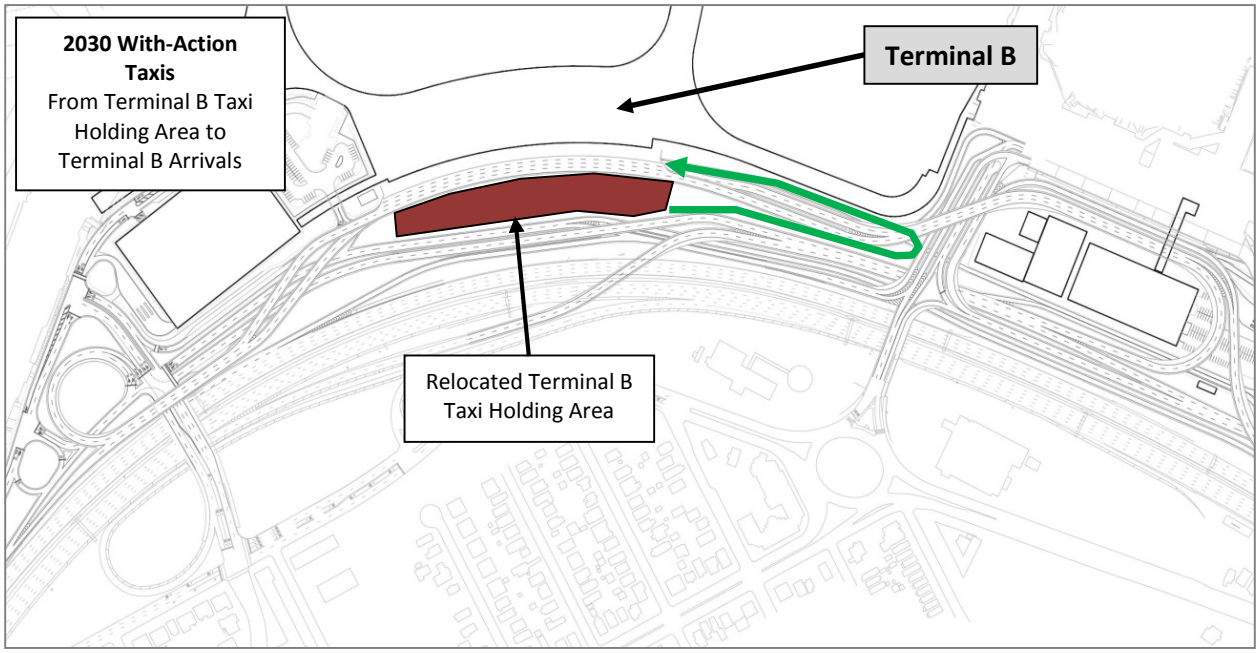
- It is assumed that 2/3 of the taxis leaving the departures frontages at each individual terminal would go to their designated taxi holding area, and the remaining 1/3 of the taxis would exit the airport as assumed under No-Action conditions.

Arrivals:

- It is assumed that taxis leaving P7 towards the frontage at Terminal A would use the same route as under No-Action conditions.

- It is assumed that taxis going to the arrivals frontage at Terminal B would come from the relocated Terminal B Taxi Holding Area and use a new holding area exit ramp in order to access the taxi ramp to the Terminal B arrivals frontage (see Figure 6). Due to this new holding area exit ramp, the two-leg unsignalized intersection between the taxi ramp and the HOV lane under No-Action conditions would change to a three-leg signalized intersection under With-Action conditions (see Figure 5).

Figure 6: Taxi Routing to Terminal B Arrivals[1]



Notes:
1. 2030 LGA SK02 (Stage I) roadway network.

- It is assumed that taxis going to the arrivals frontage at the new Terminal C would come from the dedicated taxi holding area at the eastern portion of the airport, by the new Terminal C, and they would only use roadways and intersections east of 102nd Street.

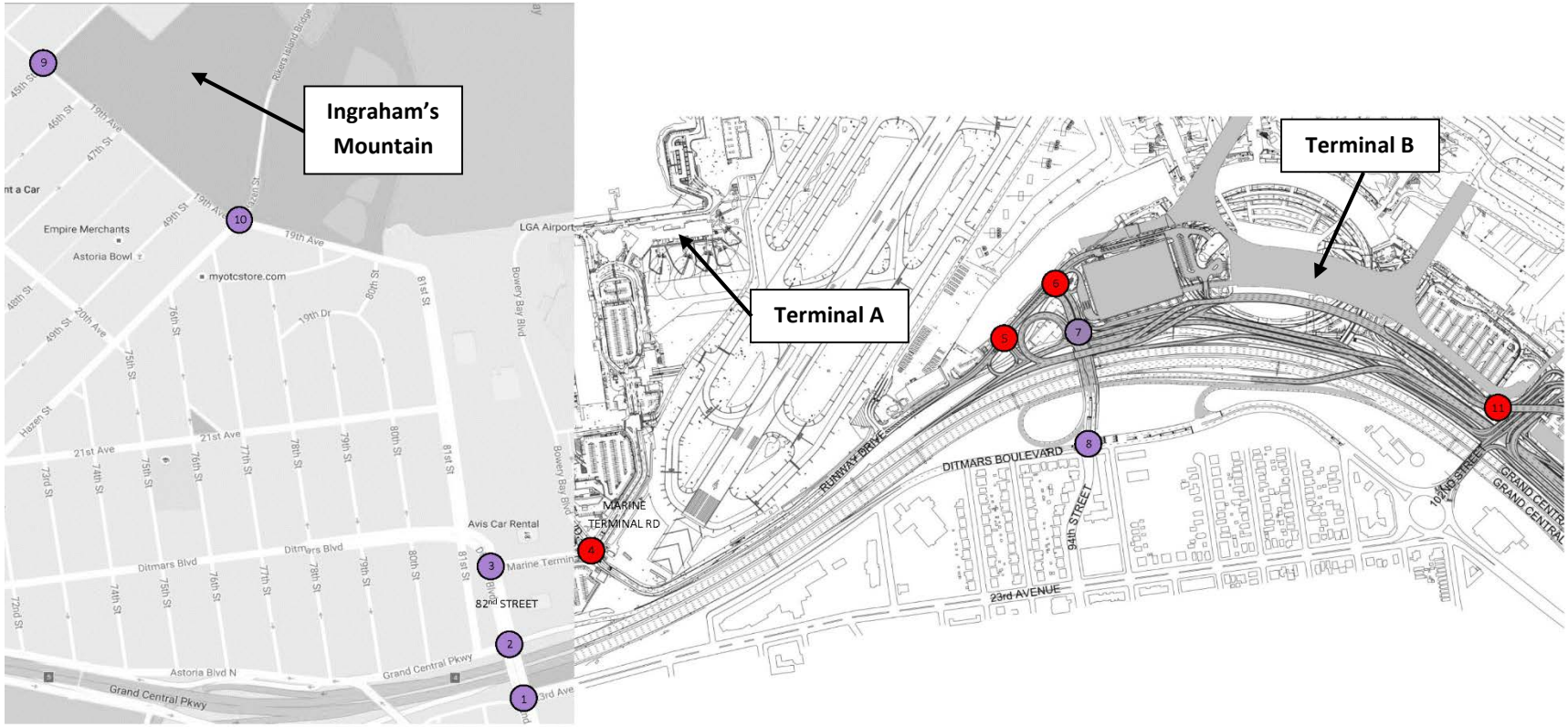
Traffic Analysis

The traffic analysis was performed during the 8:00-9:00 AM and 5:00-6:00 PM peak hours for all locations with the exception of the two intersections on 19th Avenue, as previously noted. The 2030 LGA SK-02 (Stage I) roadway network was used for No-Action conditions and extended to the two intersections on 19th Avenue. Flow maps for 2030 No-Action conditions and 2030 With-Action conditions (including the relocation of taxis, airport-wide long-term customer parking, and employee parking trips) were prepared and the difference in traffic volumes was calculated (see Attachment B) to determine the change in volumes between No-Action and With-Action conditions.

The study area included on-airport roadways within LGA, as well as some off-airport roadways adjacent to the airport including the GCP, 82nd Street, Ditmars Boulevard, 19th Avenue, 94th Street, and 23rd Avenue. Figure 7 shows the location of the 11 key intersections analyzed (nine signalized and two unsignalized).

Intersections were analyzed using Synchro software and the results of the analysis can be found in Attachment C. It should be noted that intersection signal timing splits and offsets were optimized using Synchro for both No-Action and With-Action conditions. Signal timing splits and offsets where optimized based on the assumption that for the next several years leading into the analysis year, the Port Authority would work in coordination with NYCDOT to revise the signal timing plans at the intersections analyzed in order to maintain efficient traffic flow at those intersections due to natural traffic growth or changes in travel patterns that might affect those intersections. In addition, the Port Authority has already implemented a traffic monitoring program at off-airport intersections in the vicinity of LGA, including the ones analyzed in this study, and would continue doing this until the new Terminal C is fully constructed and operational. This monitoring program involves the collection and evaluation of traffic data to determine the need for improvements at the intersections analyzed, including signal optimization. These monitoring efforts would be conducted at an agreed-upon frequency determined as part of on-going and future coordination efforts between the Port Authority and NYCDOT.

Figure 7: Intersection Analysis Locations[1,2]



LEGEND:	Off-Airport Key Intersection	On-Airport Key Intersection

KEY INTERSECTIONS:

1. 82nd Street & 23rd Avenue
2. 82nd Street/Ditmars Boulevard & GCP Westbound Off-Ramp/North Service Road
3. Ditmars Boulevard & Marine Terminal Road
4. Runway Drive/Bowery Bay Boulevard & Marine Terminal Road
5. Central Terminal Loop Ramp & Runway Drive
6. 94th Street & Runway Drive
7. 94th Street & LGA Service Road
8. 94th Street & Ditmars Boulevard
9. 19th Avenue & 45th Street (unsignalized)
10. 19th Avenue & Hazen Street
11. HOV Lane & Taxi Ramp (unsignalized)

Notes:
1. Locations are additional to the ones analyzed by Delta Air Lines.
2. 2030 LGA SK02 (Stage I) roadway network.

Summary of Findings

Relocation of Vehicles to Different Routes

During the AM peak hour, approximately 95 airport-wide long-term customer parking trips (combined in and out movements) would be relocated to P10, in the vicinity of Terminal A. About 125 employee parking trips (combined in and out movements) would be allocated at P10, and approximately 225 employee parking trips (combined in and out movements) would be relocated to a proposed employee parking lot at Ingraham's Mountain. Approximately 255 taxis serving the arrivals frontage at Terminal B would be relocated to a new taxi holding area in front of the redeveloped Terminal B head house.

During the PM peak hour, approximately 160 airport-wide long-term customer parking trips (combined in and out movements) would be relocated to P10, in the vicinity of Terminal A. Approximately 110 employee parking trips (combined in and out movements) would be allocated at P10, and approximately 195 employee parking trips (combined in and out movements) would be relocated to a proposed employee parking lot at Ingraham's Mountain. Approximately 415 taxis serving the arrivals frontage at Terminal B would be relocated to a new taxi holding area in front of the redeveloped Terminal B head house.

Key Intersections

Of the 11 key intersections analyzed to determine potential impacts as the result of the Proposed With-Action changes, capacity issues were found at three locations: Key Intersections 2, 9, and 10.

- Key Intersection 2, at 82nd Street/Ditmars Boulevard and the GCP westbound off ramp. For No-Action and With-Action conditions, the volumes making the westbound right turn movement during the AM peak hour and the PM peak hour are expected to be approximately 850 and 560 vehicles, respectively. Under the existing striping, the three-lane westbound approach is configured as a two-lane shared left/through lane group plus a one-lane dedicated right turn lane. Under With-Action conditions during the AM peak hour, this configuration would result in volume-to-capacity (v/c) ratios greater than 1.0 and exceedances of the CEQR thresholds by about 9.0 seconds and 2.5 seconds on individual movements on the southbound and westbound approaches, respectively, resulting in significant traffic impacts under the CEQR criteria during the AM peak hour.

  The reconfiguration of the travel lanes in the westbound approach would mitigate the potential exceedance of the CEQR criteria on that approach due

to the Proposed With-Action condition. The proposed mitigation would revise the lane use approach striping to a two-lane shared left/through and through/right lane group plus a one-lane dedicated right turn lane. Under this configuration, westbound traffic would use both the middle and rightmost lanes to turn right onto Ditmars Boulevard. A vehicle turning analysis was performed to determine if the turning radii of two vehicles (per AASHTO, passenger car (P): 19 feet long) simultaneously turning right coming from the westbound approach is geometrically feasible. The results show that the scenario described before would work under the current geometric characteristics of the intersection (see Figure 8). Trucks are not allowed on the GCP and on its on-ramps and off-ramps. However, shuttle buses and vans (up to nine shuttle buses/vans per hour, or about two percent) may use the GCP, and therefore, the off-ramp at Exit 5 to access destinations north by turning right onto Ditmars Boulevard. Since the percentage of buses and vans that may make the right turn on the westbound approach is small, the probability of having two buses or vans turning right at the same time are small as well. Therefore, a more realistic vehicle turning analysis was performed to determine if the turning radii of one regular car and one shuttle bus/van (per AASHTO, passenger car (P): 19 feet long and single-unit truck (SU)[3]: 30 feet long, respectively) simultaneously turning right coming from the westbound approach is geometrically feasible. The results show that the scenario described before would work under the current geometric characteristics of the intersection (see Figure 9).

The adjustment of the signal timing plan for this intersection would mitigate the potential exceedance of the CEQR criteria on the southbound approach due to the Proposed With-Action condition. The proposed mitigation would revise the signal timing plan for No-Action conditions to reallocate one second of green time from the westbound phase to the northbound/southbound phases.

These proposed mitigation measures would decrease the v/c ratios and delays under mitigated With-Action conditions and there would be no resulting significant traffic impacts from the additional vehicles using the intersection due to the Proposed With-Action condition.

- Key Intersection 9, at 19th Avenue and 45th Street. This is an unsignalized two-way stop-controlled intersection with the stop-controlled approaches being the northbound and southbound approaches. Under With-Action conditions, the increase in traffic volumes on the eastbound and westbound approaches due

[3] A single-unit truck (SU) template measuring 30 feet long was used in order to simulate a shuttle bus/van also measuring 30 feet long turning right from GCP westbound off-ramp onto Ditmars Boulevard.

to employees utilizing the proposed employee parking lot at Ingraham's Mountain and the increase in traffic volumes on the southbound approach due to employees coming from the proposed parking lot would increase the delay on the southbound approach and would result in v/c ratios greater than 1.0 and exceedances of the CEQR threshold up to about 190 seconds resulting in significant traffic impacts under the CEQR criteria during the AM and PM peak hours.

The installation of a permanent traffic signal at this location, if warranted, would mitigate the potential exceedance of the CEQR criteria due to the Proposed With-Action condition. If a traffic signal is warranted, the Port Authority would work with NYCDOT to install a permanent traffic signal at this location.

This proposed mitigation measure would decrease the v/c ratios and delays under mitigated With-Action conditions and there would be no resulting significant traffic impacts from the additional vehicles using the intersection due to the Proposed With-Action condition.

- Key Intersection 10, at 19th Avenue and Hazen Street. This signalized intersection carries all the traffic destined to and originated from Rikers Island (total of approximately 1,230 vehicles and about 1,165 vehicles during the AM and PM peak hour, respectively.) Under With-Action conditions, the increase in traffic volumes on the eastbound and westbound approaches due to employees utilizing the proposed employee parking lot at Ingraham's Mountain would increase the delay on the eastbound and westbound approaches and would result in exceedances of the CEQR threshold by about 2.0 seconds and 1.5 seconds, respectively, resulting in significant traffic impacts under the CEQR criteria during the PM peak hour.

  The adjustment of the signal timing plan for this intersection would mitigate the potential exceedance of the CEQR criteria on the eastbound and westbound approaches due to the Proposed With-Action condition. The proposed mitigation would revise the signal timing plan for No-Action conditions to reallocate one second of green time from the northbound/southbound phases to the eastbound/westbound phases.

  This proposed mitigation measure would decrease the delays under mitigated With-Action conditions and there would be no resulting significant traffic impacts from the additional vehicles using the intersection due to the Proposed With-Action condition.

Figure 8: Vehicle Turning Analysis at Key Intersection 2

Scenario 1 – Two Passenger Cars

No-Action and With-Action Conditions **With-Action Conditions with Proposed Mitigation**

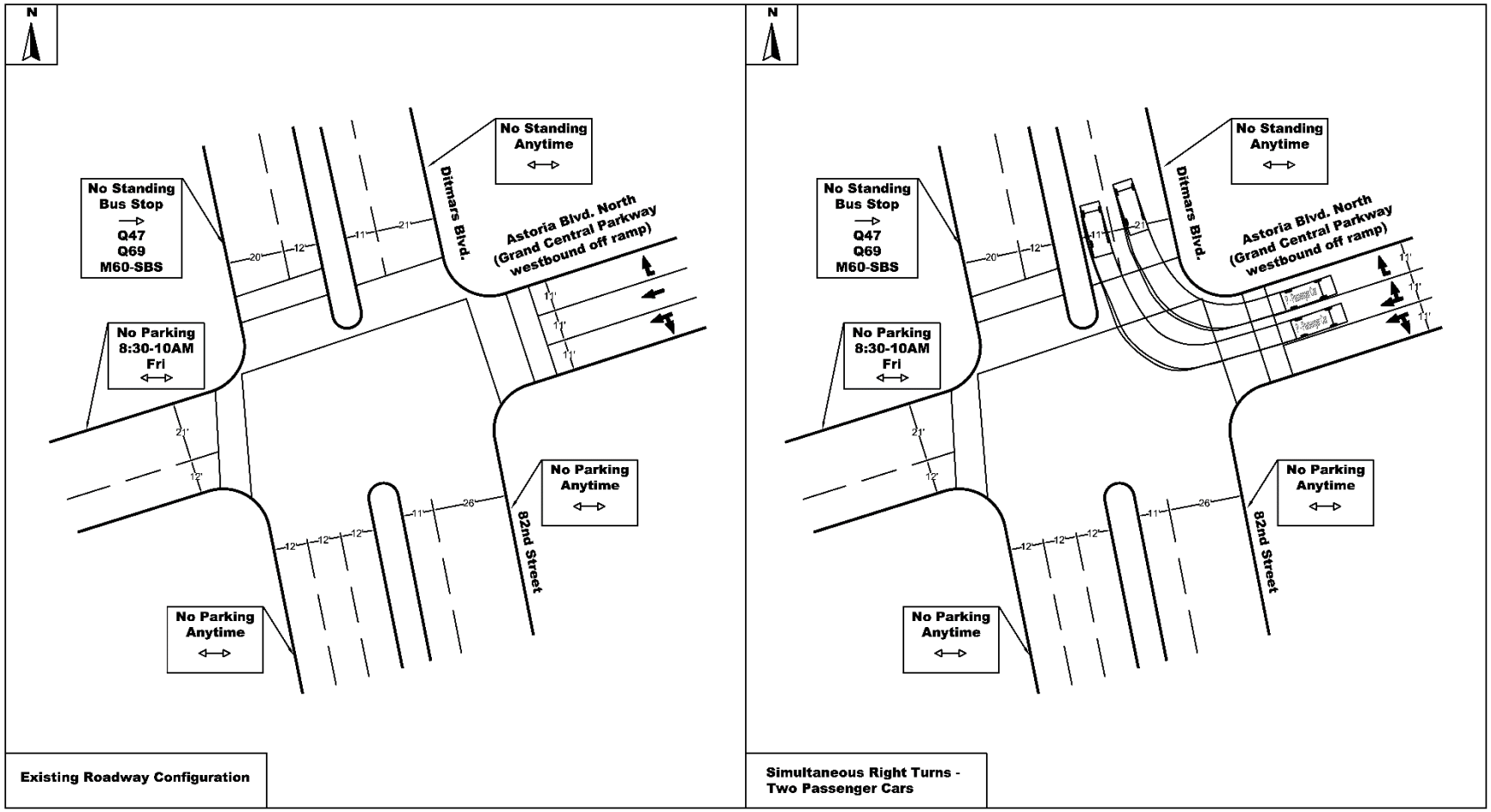
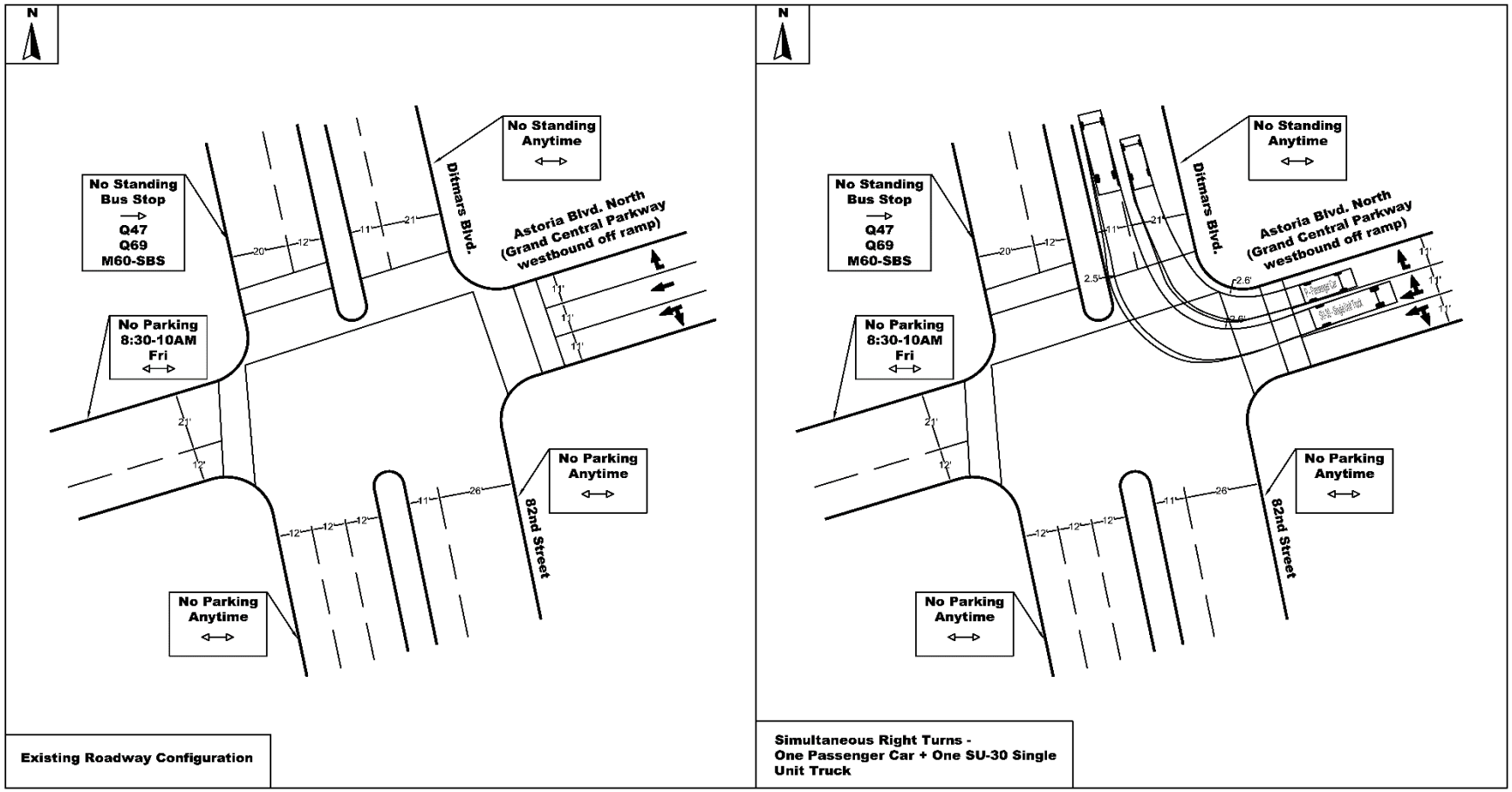


Figure 9: Vehicle Turning Analysis at Key Intersection 2

Scenario 2 – One Passenger Car & One Shuttle Bus/Van[1]

No-Action and With-Action Conditions **With-Action Conditions with Proposed Mitigation**



Notes:

1. A single-unit truck (SU) template measuring 30 feet long was used in order to simulate a shuttle bus/van also measuring 30 feet long turning right from GCP westbound off-ramp onto Ditmars Boulevard.

ATTACHMENT A

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Please ensure you have the current version that can be found on www.nyc.gov/oec.

Correspondingly, the determination of significant impacts must respond to several important questions:

- Would generated vehicle trips likely cause a noticeable change in volumes on study area streets?
- Would generated vehicle trips likely cause additional traffic delays considered to be unacceptable?
- Would generated vehicle trips likely exacerbate or create unsafe conditions?
- Would generated vehicle trips likely worsen pedestrian crossing conditions on the affected streets?
- Would generated vehicle trips likely create significant delays for surface transit trips?
- Would generated pedestrian trips likely cause noticeable delays and congestion to vehicular traffic?
- Would the location and use of truck loading docks or other goods delivery areas create significant problems for vehicles, pedestrians, and bicycles?
- Would the volume of project-generated subway trips likely cause congestion, delays, or unsafe conditions on station stairwells, platforms or corridors, or through its turnstiles?
- Would the volume of project-generated bus passengers cause overcrowding on buses? Would it necessitate adding more bus service?
- Could the volume of pedestrian trips generated by the proposed project be accommodated on study area sidewalks and safely within its crosswalks and corners at key intersections?

The sections that follow present recommended guidelines for determining impact significance for each transportation element.

410. DETERMINATION OF SIGNIFICANT TRAFFIC IMPACTS

Different municipalities and agencies around the country use different definitions of a significant traffic impact. There is no industry wide standard for the definition of a significant traffic impact. In general, however, there is agreement that deterioration in levels of service (LOS) within the clearly acceptable range (LOS A through LOS C) is not considered significant. Deterioration to marginally acceptable LOS D (mid-LOS D or better) is also not considered significant. If the LOS under the With-Action condition deteriorates to worse than mid-LOS D, then the determination of whether the impact is considered significant is based on a sliding scale that varies with the No-Action LOS. This impact determination is premised on the assumption that deterioration in LOS under the With-Action condition becomes less tolerable when there is a poor LOS in the No-Action condition. The following guidelines should be applied in determining whether or not the traffic impacts of a proposed project being evaluated are significant.

411. Signalized Intersections

Determination of significant impacts for signalized intersections is summarized as follows:

- If a lane group under the With-Action condition is within LOS A, B or C, or marginally acceptable LOS D (average control delay less than or equal to 45.0 seconds/veh), the impact is not considered significant. The level of service changes, however, could affect neighborhood character should they occur on residential streets, and, therefore, should be disclosed (see Chapter 21, "Neighborhood Character," for further guidance). However, if a lane group under the No-Action condition is within LOS A, B or C, then a deterioration under the With-Action condition to worse than mid-LOS D (delay greater than 45.0 seconds/veh) should be considered a significant impact.
- For a lane group with LOS D under the No-Action condition, an increase in projected average control delay of 5.0 or more seconds should be considered significant if the With-Action delay exceeds mid-LOS D (delay greater than 45.0 seconds/veh).

WARNING: These printed materials may be out of date.
Please ensure you have the current version that can be found on www.nyc.gov/oec.

- For a lane group with LOS E under the No-Action condition, an increase in projected delay of 4.0 or more seconds should be considered significant.
- For a lane group with LOS F under the No-Action condition, an increase in projected delay of 3.0 or more seconds should be considered significant.

412. Unsignalized Intersections

For unsignalized intersections the same criteria as for signalized intersections would apply. For the minor street to trigger a significant impact, 90 PCEs must be identified in the future With-Action conditions in any peak hour.

413. Basic Freeway Segments

The determination of significant impacts for basic freeway segments is summarized as follows:

- If the level of service under the no-action condition is LOS D, an increase in the projected density of 5 or more passenger cars per mile per lane (pc/mi/ln) under the action condition should be considered a significant impact.
- If the level of service under the no-action condition is LOS E, an increase in the projected density of 4 or more pc/mi/ln under the action condition should be considered a significant impact.
- If the level of service under the no-action condition is LOS F, an increase in the projected density of 3 or more pc/mi/ln under the action condition should be considered a significant impact.

414. Freeway Weaving and Freeway Merge and Diverge Segments

The determination of significant impacts for freeway weaving and freeway merge and diverge segments is summarized as follows:

- If the level of service under the no-action condition is LOS D, an increase in the projected density of 4 or more passenger cars per mile per lane (pc/mi/ln) under the action condition should be considered a significant impact.
- If the level of service under the no-action condition is LOS E, an increase in the projected density of 3 or more pc/mi/ln under the action condition should be considered a significant impact.
- If the level of service under the no-action condition is LOS F, an increase in the projected density of 2 or more pc/mi/ln under the action condition should be considered a significant impact.

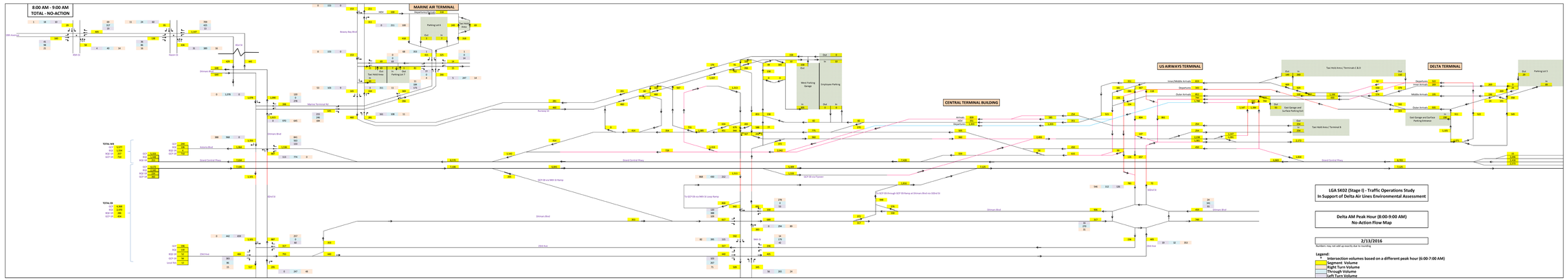
420. DETERMINATION OF SIGNIFICANT SUBWAY/RAIL TRANSIT IMPACTS

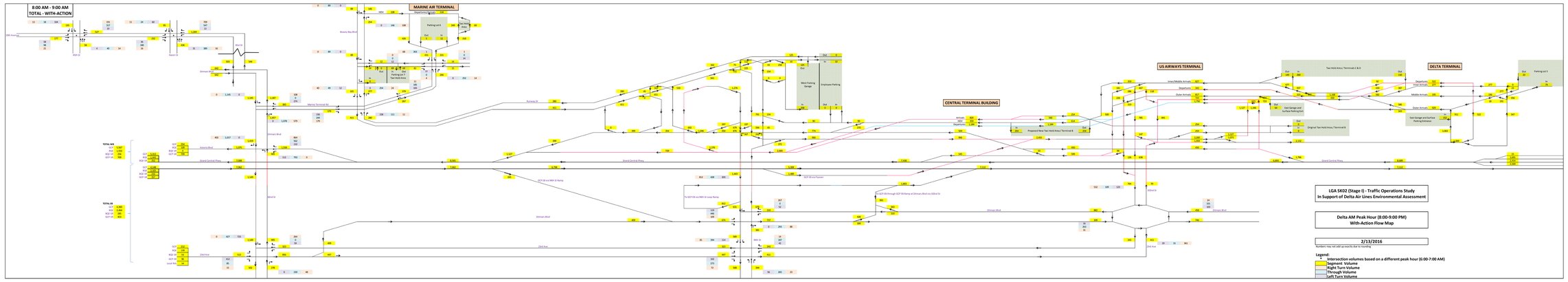
The determination of significant impacts differs for stairways, passageways/corridors, turnstiles, and platform conditions. For all circulation elements, however, it is important to highlight incremental changes in passenger volumes as well as v/c changes. NYCT is the agency in New York responsible for implementing or overseeing the implementation of rail transit mitigation measures, should they be needed. There may be cases where alternative assessments may be warranted to cover either unique conditions or alternative With-Action analysis methodologies.

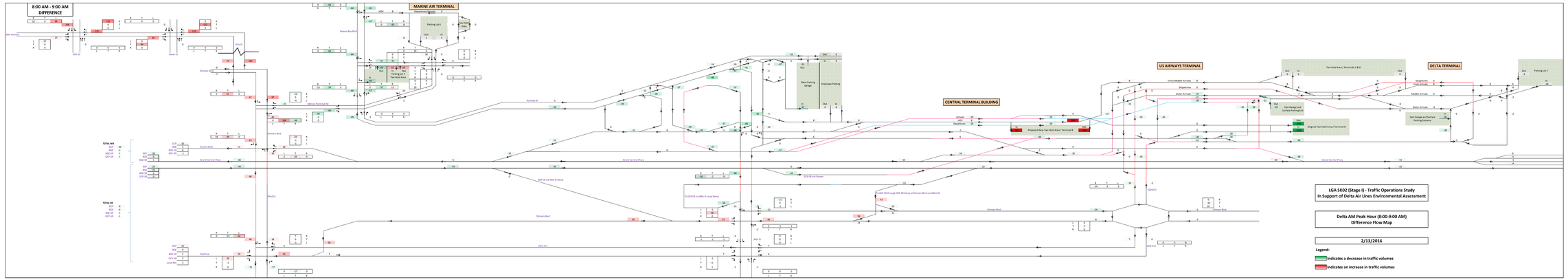
421. Stairways and Passageways

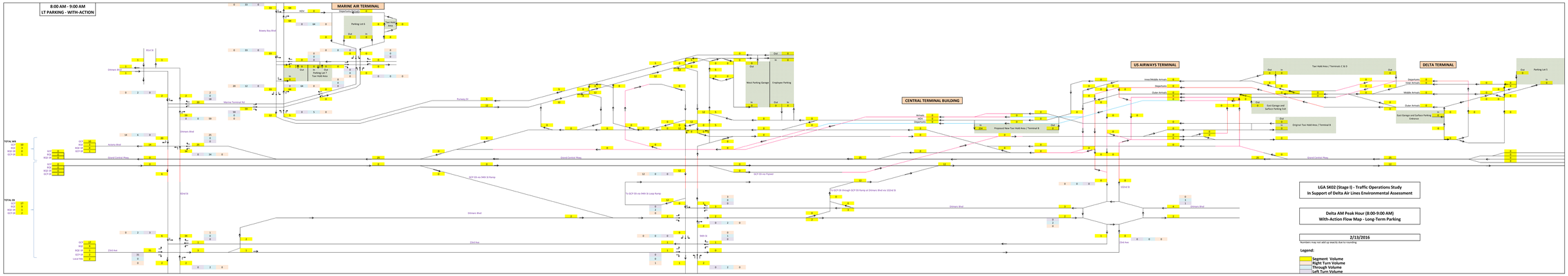
NYCT has defined significant stairway impacts in terms of the width increment threshold (WIT) needed to bring the stair or passageway back to its No-Action v/c ratio or to bring it to a v/c ratio of 1.00, whichever is greater. Please note that the WIT is used to determine significant impact, and is not the actual widening that would be required to mitigate a significant impact (see Section 520 for stairway/passageway mitigation).

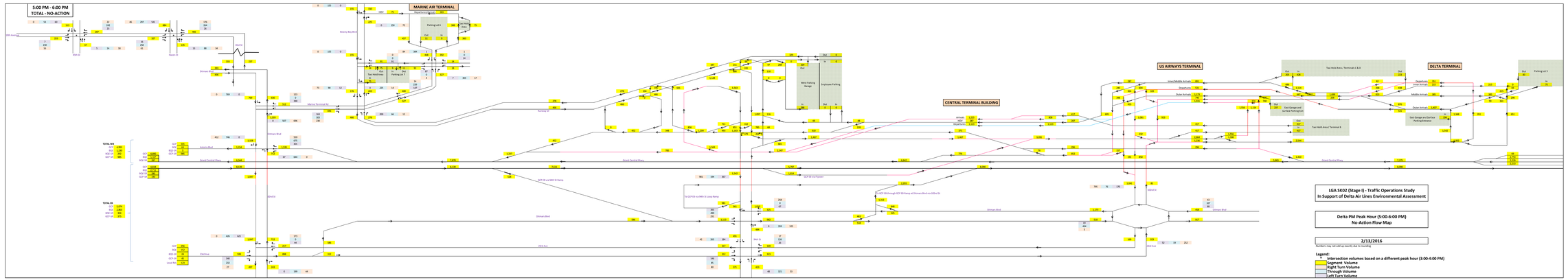
ATTACHMENT B

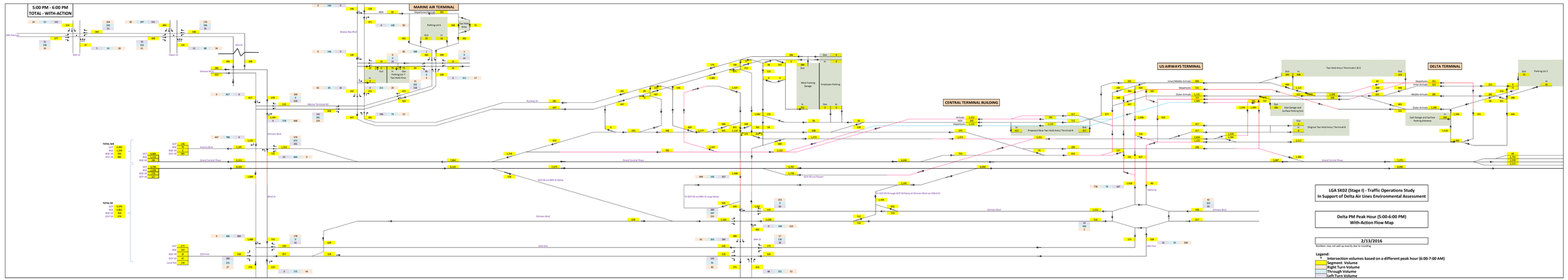

8:00 AM - 9:00 AM
TOTAL - NO-ACTION
MARINE AIR TERMINAL
CENTRAL TERMINAL BUILDING
US AIRWAYS TERMINAL
DELTA TERMINAL
Marine Air Terminal
Departures Curb
Two Hold Area
Parking Lot 6
Parking Lot 7
Parking Lot 5
Bowery Bay Blvd
Marine Terminal Rd
Bowery Dr
Ditmars Blvd
Astoria Blvd
Grand Central Pkwy
23rd Ave
Hoyt Ave
West Parking Garage
Employee Parking
Arrivals
Departures
Gate Garage and Surface Parking Exit
Two Hold Area / Terminals C & D
Two Hold Area / Terminal B
Gate Garage and Surface Parking Entrance
Inner Arrivals
Middle Arrivals
Outer Arrivals
Departures
Ramp to/from GCP EB through GCP EB Ramp at Ditmars Blvd via 102nd St
To GCP EB via 94th St Loop Ramp
GCP EB via 94th St Ramp
GCP EB via Tunnel
TOTAL AM
TOTAL MD
LGA SK02 (Stage I) - Traffic Operations Study
In Support of Delta Air Lines Environmental Assessment
Delta AM Peak Hour (8:00-9:00 AM)
No-Action Flow Map
2/13/2016
Numbers may not add up exactly due to rounding
Legend:
Intersection volumes based on a different peak hour (6:00-7:00 AM)
Segment Volume
Right Turn Volume
Through Volume
Left Turn Volume


8:00 AM - 9:00 AM
TOTAL - WITH-ACTION
MARINE AIR TERMINAL
CENTRAL TERMINAL BUILDING
US AIRWAYS TERMINAL
DELTA TERMINAL
Grand Central Pkwy
Ditmars Blvd
Marine Terminal Rd
Runway 13/31
Runway 4/22
Aviation Blvd
23rd Ave
Main St
86th St
Boundary Rd
Parking Lot 6
Parking Lot 7
Taxi Hold Area
West Parking Garage
Employee Parking
Proposed New Taxi Hold Area / Terminal B
Taxi Holding Area
Two Hold Area / Terminals C & D
East Garage and Surface Parking Exit
Original Taxi Hold Area / Terminal B
East Garage and Surface Parking Entrance
Parking Lot 5
Inner Arrivals
Middle Arrivals
Outer Arrivals
Departures
Arrivals
Departures
LGA SK02 (Stage I) - Traffic Operations Study
In Support of Delta Air Lines Environmental Assessment
Delta AM Peak Hour (8:00-9:00 PM)
With-Action Flow Map
2/13/2016
Numbers may not add up exactly due to rounding
Legend:
Intersection volumes based on a different peak hour (6:00-7:00 AM)
Segment Volume
Right Turn Volume
Through Volume
Left Turn Volume


8:00 AM - 9:00 AM
DIFFERENCE
MARINE AIR TERMINAL
CENTRAL TERMINAL BUILDING
US AIRWAYS TERMINAL
DELTA TERMINAL
Marine Air Terminal Rd
Runway 13-31
Runway 7-25
Runway 4-22
Runway 18-36


8:00 AM - 9:00 AM
LT PARKING - WITH-ACTION
MARINE AIR TERMINAL
CENTRAL TERMINAL BUILDING
US AIRWAYS TERMINAL
DELTA TERMINAL
Runway Dr
Rotary Way Blvd
Eliot St
Delmars Dr
Marine Terminal Rd
Delmars Blvd
Astoria Blvd
Grand Central Pkwy
102nd St
23rd Ave
GCP E8 via 94th St Ramp
GCP E8 via Flyover
To GCP E8 via 94th St Loop Ramp
To GCP E8 through GCP E8 Ramp at Delmars Blvd via 102nd St
94th St
Parking Lot 6
Parking Lot 7
Taxi Hold Area
Taxi Hold Area / Terminals C & D
Proposed New Taxi Hold Area / Terminal B
West Parking Garage
Employee Parking
East Garage and Surface Parking Exit
Original Taxi Hold Area / Terminal B
East Garage and Surface Parking Entrance
Parking Lot 5
Inner/Middle Arrivals
Departures
Outer Arrivals
Middle Arrivals
Arrivals
HOV
Departures
TOTAL WB
TOTAL EB
LGA SK02 (Stage I) - Traffic Operations Study
In Support of Delta Air Lines Environmental Assessment
Delta AM Peak Hour (8:00-9:00 AM)
With-Action Flow Map - Long-Term Parking
2/13/2016
Numbers may not add up exactly due to rounding
Legend:
Segment Volume
Right Turn Volume
Through Volume
Left Turn Volume


5:00 PM - 6:00 PM
TOTAL - NO-ACTION
MARINE AIR TERMINAL
CENTRAL TERMINAL BUILDING
US AIRWAYS TERMINAL
DELTA TERMINAL
Grand Central Pkwy
Ditmars Blvd
Marine Terminal Rd
Aviation Rd
Astoria Blvd
Rikers Bay Blvd
Runway 4-22
Runway 13-31
23rd Ave
Parking Lot 6
Parking Lot 7
Parking Lot 5
Two Hold Area
Two Hold Area / Terminals C & D
Two Hold Area / Terminal B
West Parking Garage
Employee Parking
East Garage and Surface Parking Exit
East Garage and Surface Parking Entrance
Departures
Inner Arrivals
Middle Arrivals
Outer Arrivals
Gates/Middle Arrivals
LGA SK02 (Stage I) - Traffic Operations Study
In Support of Delta Air Lines Environmental Assessment
Delta PM Peak Hour (5:00-6:00 PM)
No-Action Flow Map
2/13/2016
Numbers may not add up exactly due to rounding
Legend:
Intersection volumes based on a different peak hour (3:00-4:00 PM)
Segment Volume
Right Turn Volume
Through Volume
Left Turn Volume


5:00 PM - 6:00 PM
TOTAL - WITH-ACTION
MARINE AIR TERMINAL
CENTRAL TERMINAL BUILDING
US AIRWAYS TERMINAL
DELTA TERMINAL
Marine Air Terminal
Departures
Arrivals
Parking Lot 6
Parking Lot 7
Taxi Holding Area
Rental Car Ready/Return
Bowery Bay Blvd
Marine Terminal Rd
Runway 5/23
Runway 13/31
Runway 4/22
Ditmars Blvd
Astoria Blvd
Grand Central Pkwy
23rd Ave
Hoyt Ave
West Parking Garage
Employee Parking
Prospect New Taxi Hold Area / Terminal B
Taxi Hold Area / Terminals C & D
Original Taxi Hold Area / Terminal B
East Garage and Surface Parking Exit
East Garage and Surface Parking Entrance
Parking Lot 5
Gates A-D
Gates E-G
Gates H-J
Gates K-M
Gates N-Q
Gates R-T
Gates U-W
Gates X-Z
Gates 1-5
Gates 6-9
Gates 10-12
Gates 13-17
Gates 18-20
Gates 21-23
Gates 24-26
Gates 27-30
Gates 31-34
Gates 35-37
Gates 38-40
Gates 41-43
Gates 44-46
Gates 47-50
Gates 51-54
Gates 55-59
Gates 60-63
Gates 64-66
Gates 67-69
Gates 70-72
Gates 73-75
Gates 76-78
Gates 79-81
Gates 82-84
Gates 85-87
Gates 88-90
Gates 91-93
Gates 94-96
Gates 97-99
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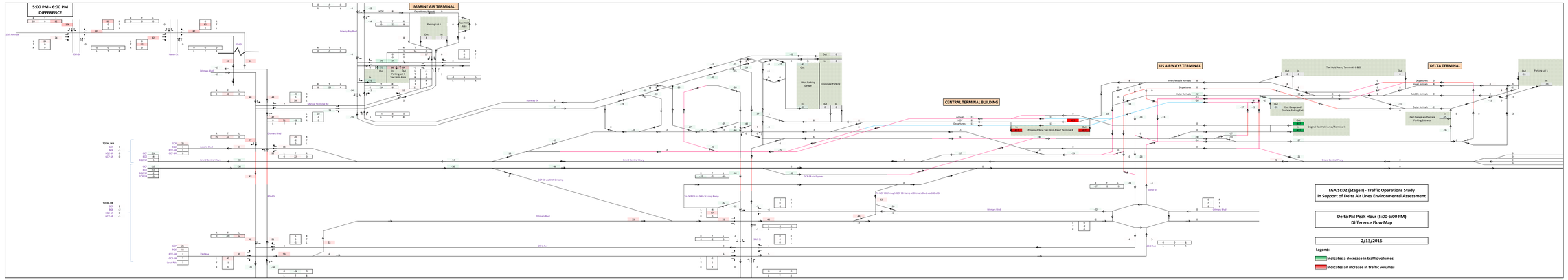
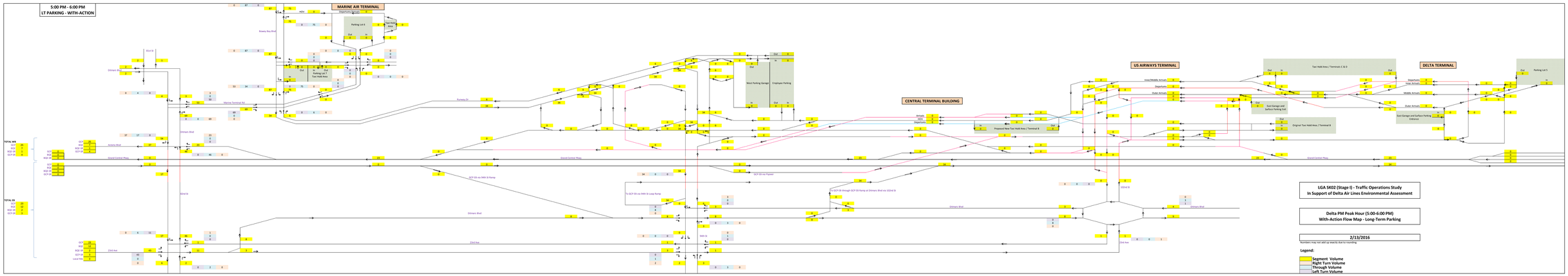
Gates 109-111
Gates 112-114
Gates 115-117
Gates 118-120
Gates 121-123
Gates


5:00 PM - 6:00 PM
DIFFERENCE
MARINE AIR TERMINAL
CENTRAL TERMINAL BUILDING
US AIRWAYS TERMINAL
DELTA TERMINAL
Parking Lot 6
Parking Lot 7
Parking Lot 5
West Parking Garage
Employee Parking
Two Hold Area / Terminals C & D
East Garage and Surface Parking Exit
Original Taxi Hold Area / Terminal B
East Garage and Surface Parking Entrance
Proposed New Taxi Hold Area / Terminal B
Runway 13-31
Runway 4-22
Runway 9-27
Marine Terminal Rd
Rotunda Rd
Rotunda Cir
Ditmars Blvd
Grand Central Pkwy
Astoria Blvd
23rd Ave
82nd St
94th St
90th St
108th Avenue
Bowery Bay Blvd
Arrivals
Departures
Outer Arrivals
Middle Arrivals
Inner Arrivals
Prepared by:
LGA SK02 (Stage I) - Traffic Operations Study
In Support of Delta Air Lines Environmental Assessment
Delta PM Peak Hour (5:00-6:00 PM)
Difference Flow Map
2/13/2016
Legend:
Indicates a decrease in traffic volumes
Indicates an increase in traffic volumes


5:00 PM - 6:00 PM
LT PARKING - WITH-ACTION
MARINE AIR TERMINAL
CENTRAL TERMINAL BUILDING
US AIRWAYS TERMINAL
DELTA TERMINAL
Runway Dr
Grand Central Pkwy
Ditmars Blvd
Astoria Blvd
Rowey Bay Blvd
Marine Terminal Rd
81st St
94th St
102nd St
19th Ave
21st Ave
23rd Ave
Parking Lot 6
Parking Lot 7
Taxi Hold Area
Taxi Hold Area / Terminals C & D
Proposed New Taxi Hold Area / Terminal B
Original Taxi Hold Area / Terminal B
East Garage and Surface Parking Exit
East Garage and Surface Parking Entrance
Parking Lot 5
West Parking Garage
Employee Parking
Opportunity Access
HOV
Arrivals
Departures
Inner/Middle Arrivals
Outer Arrivals
Middle Arrivals
GCP EB via 94th St Ramp
To GCP EB via 94th St Loop Ramp
GCP EB via Flyover
To GCP EB through GCP EB Ramp at Ditmars Blvd via 102nd St
TOTAL WB
TOTAL EB
LGA SK02 (Stage I) - Traffic Operations Study
In Support of Delta Air Lines Environmental Assessment
Delta PM Peak Hour (5:00-6:00 PM)
With-Action Flow Map - Long-Term Parking
2/13/2016
Numbers may not add up exactly due to rounding
Legend:
Segment Volume
Right Turn Volume
Through Volume
Left Turn Volume

ATTACHMENT C

2030 LGA Traffic Operations Study - Delta Air Lines Environmental Assessment
No-Action (NA) vs With-Action (WA) vs With-Action Mitigated (WA_M)*
AM Peak Hour

Intersection					Approach	Movement	Lane Group	Movement	Volume		Change in Volume	V/C Ratio			Delay			Change in Delay		LOS			CEQR IMPACT?	
ID	Name	Type (NA)	Type (WA)	Type (WA_M)					(NA)	(WA)	(WA) vs (NA)	(NA)	(WA)	(WA_M)	(NA) (sec)	(WA) (sec)	(WA_M) (sec)	(WA) vs (NA) (sec)	(WA_M) vs (NA) (sec)	(NA)	(WA)	(WA_M)	(WA)	(WA_M)
1	82nd Street & 23rd Avenue	S	S	S	EB	EBL	L	L	383	412	29	0.79	0.85	0.85	42.7	47.2	47.2	4.5	4.5	D	D	D		
						EBT	TR	T	86	85	-1	0.28	0.28	0.28	26.8	26.7	26.7	-0.1	-0.1	C	C	C		
						EBR		R	15	15	0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00		
					WB	WBL	L	L	60	59	-1	0.21	0.21	0.21	26.0	26.0	26.0	0.0	0.0	C	C	C		
						WBR	R	R	257	264	7	0.26	0.26	0.26	6.4	6.5	6.5	0.1	0.1	A	A	A		
					NB	NBT	TR	T	247	230	-17	0.34	0.33	0.33	31.5	31.3	31.3	-0.2	-0.2	C	C	C		
						NBR		R	48	48	0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00		
					SB	SBL	L	L	659	723	64	0.79	0.82	0.82	13.5	13.9	15.1	0.4	1.6	B	B	B		
						SBT	T	T	442	427	-15	0.76	0.80	0.80	8.4	9.1	10.3	0.7	1.9	A	A	B		
					Intersection				2197	2263	66				19.4	20.5	21.1	1.1	1.7	B	C	C		
2	82nd Street/Ditmars Boulevard & GCP WB North Service Road/GCP WB Off-Ramp	S	S	S	WB	WBL	LT	L	133	132	-1													
						WBT		T	563	562	-1	0.37	0.37	0.64	11.4	11.3	16.0	-0.1	4.6	B	B	B		
						WBR	R	R	841	864	23	1.00	1.03	0.64	51.8	59.3	18.8	7.5	-33.0	D	E	B	YES	
					NB	NBL	LT	L	113	112	-1													
						NBT		T	774	793	19	0.91	0.93	0.90	39.7	41.0	37.2	1.3	-2.5	D	D	D		
					SB	SBT	TR	T	968	1017	49	0.99	1.04	1.00	47.8	61.8	49.3	14.0	1.5	D	E	D	YES	
						SBR		R	388	402	14													
					Intersection				3780	3882	102				40.1	47.4	33.5	7.3	-6.6	D	D	C		
3	Ditmars Boulevard & Marine Terminal Road	S	S	S	WB	WBL	L	L	278	274	-4	0.58	0.57	0.57	31.8	31.6	31.6	-0.2	-0.2	C	C	C		
						WBR	R	R	120	108	-12	0.27	0.24	0.24	25.2	24.9	24.9	-0.3	-0.3	C	C	C		
					NB	NBT	T	T	970	1078	108	0.50	0.55	0.55	8.9	9.3	12.3	0.4	3.4	A	A	B		
						NBR	R	R	645	579	-66	0.63	0.59	0.59	1.7	1.4	4.1	-0.3	2.4	A	A	A		
					SB	SBT	T	T	1078	1145	67	0.56	0.60	0.60	63.3	63.7	63.7	0.4	0.4	E	E	E		
					Intersection				3091	3184	93				29.0	29.9	31.3	0.9	2.3	C	C	C		
4	Runway Drive/Bowery Bay Boulevard & Marine Terminal Road	S	S	S	EB	EBL	LTR	L	215	156	-59													
						EBT		T	246	244	-2	0.75	0.71	0.71	34.9	34.0	34.0	-0.9	-0.9	C	C	C		
						EBR		R	184	179	-5													
					WB	WBL	LTR	L	173	183	10													
						WBT		T	184	185	1	0.64	0.65	0.65	36.2	35.8	35.8	-0.4	-0.4	D	D	D		
						WBR		R	11	11	0													
					NB	NBL	LT	L	161	158	-3													
						NBT		T	108	111	3	0.41	0.40	0.40	24.9	24.4	24.4	-0.5	-0.5	C	C	C		
						NBR	R	R	11	11	0	0.02	0.02	0.02	0.1	0.1	0.1	0.0	0.0	A	A	A		
					SB	SBL	LT	L	9	12	3													
						SBT		T	103	49	-54	0.18	0.10	0.10	22.2	21.4	21.4	-0.8	-0.8	C	C	C		
						SBR	R	R	53	40	-13	0.11	0.08	0.08	22.0	21.5	21.5	-0.5	-0.5	C	C	C		
					Intersection				1458	1339	-119				31.7	31.4	31.4	-0.3	-0.3	C	C	C		
5	Central Terminal Loop Ramp & Runway Drive	S	S	S	EB	EBT	TR	T	460	411	-49	0.37	0.34	0.34	19.4	19.1	19.1	-0.3	-0.3	B	B	B		
						EBR		R	0	0	0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00		
					WB	WBL	LT	L	60	45	-15	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00		
						WBT		T	116	117	1	0.45	0.40	0.40	4.8	4.0	4.0	-0.8	-0.8	A	A	A		
					NB	NBL	L	L	164	163	-1	0.48	0.45	0.45	18.5	18.0	18.0	-0.5	-0.5	B	B	B		
						NBR	R	R	567	530	-37	0.24	0.23	0.23	0.4	0.3	0.3	-0.1	-0.1	A	A	A		
					Intersection				1367	1266	-101				12.3	11.8	11.8	-0.5	-0.5	B	B	B		
6	94th Street & Runway Drive	S	S	S	EB	EBT	T	T	266	225	-41	0.63	0.59	0.59	17.3	16.1	16.1	-1.2	-1.2	B	B	B		
						EBR	R	R	762	715	-47	0.67	0.61	0.61	18.8	16.8	16.8	-2.0	-2.0	B	B	B		
					WB	WBL	L	L	91	75	-16	0.52	0.41	0.41	52.1	47.6	47.6	-4.5	-4.5	D	D	D		
						WBT	T	T	67	50	-17	0.52	0.41	0.41	51.3	47.2	47.2	-4.1	-4.1	D	D	D		
					NB	NBL	L	L	109	112	3	0.54	0.57	0.57	29.1	33.7	33.7	4.6	4.6	C	C	C		
						NBR	R	R	49	43	-6	0.12	0.10	0.10	11.0	12.3	12.3	1.3	1.3	B	B	B		
					Intersection				1344	1220	-124				22.6	21.0	21.0	-1.6	-1.6	C	C	C		
7	94th Street & LGA Service Road	S	S	S	WB	WBL	L	L	567	567	0	0.78	0.78	0.78	39.9	39.9	39.9	0.0	0.0	D	D	D		
						WBT	T	T	208	207	-1	0.84	0.84	0.84	45.9	45.2	45.2	-0.7	-0.7	D	D	D		
					NB	NBL2	L	L	242	242	0	0.91	0.91	0.91	75.9	75.7	75.7	-0.2	-0.2	E	E	E		
						NBT	T	T	77	65	-12	0.54	0.45	0.45	52.6	48.6	48.6	-4.0	-4.0	D	D	D		
						NBR	R	R	372	372	0	0.60	0.60	0.60	14.8	14.7	14.7	-0.1	-0.1	B	B	B		
					SB	SBL	L	L	588	594	6	0.45	0.47	0.47	10.2	9.9	9.9	-0.3	-0.3	B	A	A		
						SBT	T	T	265	197	-68	0.34	0.25	0.25	9.6	7.6	7.6	-2.0	-2.0	A	A	A		
					SEB	SER	T	T	679	679	0	0.86	0.86	0.86	36.8	36.8	36.8	0.0	0.0	D	D	D		
						SER2	R	R	634	597	-37	0.54	0.51	0.51	21.5	21.0	21.0	-0.5	-0.5	C	C	C		
					Intersection				3632	3520	-112				29.9	29.8	29.8	-0.1	-0.1	C	C	C		
8	94th Street & Ditmars Boulevard	S	S	S	EB	EBL	L	L	120	119	-1	0.22	0.22	0.22	23.0	23.0	23.0	0.0	0.0	C	C	C		
						EBT	TR	T	388	446	58	0.46	0.51	0.51	25.3	26.0	26.0	0.7	0.7	C	C	C		
						EBR		R	109	109	0													
					WB	WBL	L	L	53	52	-1	0.28	0.30	0.30	15.7	16.9	16.9	1.2	1.2	B	B	B		
						WBR	R	R	278	267	-11	0.19	0.18	0.18	1.7	1.7	1.7	0.0	0.0	A	A	A		
					NB	NBT	TR	T	294	293	-1	0.48	0.48	0.48	26.8	26.8	26.8	0.0	0.0	C	C	C		
						NBR		R	89	88	-1													
					SB	SBL	L	L	212	203	-9	0.42	0.41	0.41	39.2	37.8	37.8	-1.4	-1.4	D	D	D		
						SBT	T	T	430	428	-2	0.45	0.45	0.45	6.6	6.9	6.9	0.3	0.3	A	A	A		
					Intersection				1973	2005	32				19.3	19.6	19.6	0.3	0.3	B	B	B		
9	19th Avenue & 45th Street	U	U	S	EB	EBL	LTR	L	41	58	17													
						EBT		T	98	98	0	0.05	0.08	0.57	2.9	3.6	18.3	0.7	15.4	A	A	B		
						EBR		R	21	21	0													
					WB	WBL	LTR	L	19	19	0													
						WBT		T	317	317	0	0.02	0.02	0.70	0.6	0.6	25.3	0.0	24.7	A	A	C		
						WBR		R	69	191	122													
					NB	NBL	LTR	L	4	4	0													
						NBT		T	40	40	0	0.22	0.27	0.11	18.2	22.7	18.3	4.5	0.1	C	C	B		
						NBR		R	14	14	0													
					SB	SBL	LTR	L	31	125	94													
						SBT		T	18	18	0	0.35	1.33	0.58	26.7	221.8	34.5	195.1	7.8	D	F	C	YES	
						SBR		R	1	13	12													
					Intersection				673	918	245				5.6	56.2	25.8	50.6	20.2	A	F	C		
10	19th Avenue & Hazen Street	S	S	S	EB	EBL	LTR	L	36	36	0													
						EBT		T	108	202	94	0.38	0.66	0.87	18.3	26.4	26.4	8.1	8.1	B	C	C		
						EBR		R	16	16	0													
					WB	WBL	LT	L	13	13	0													
						WBT		T	425	547	122	0.65	0.83	0.83	23.6	33.1	33.1	9.5	9.5	C	C	C		
						WBR	R	R	709	709	0	0.79	0.79	0.21	16.1	16.1	16.1	0.0	0.0	B	B	B		
					NB	NBL	LTR	L	31	31	0													
						NBT		T	389	389	0	0.73	0.73	0.31	40.5	40.5	40.5	0.0	0.0	D	D	D		
						NBR		R	16	16	0													
					SB	SBL	L	L	60	60	0	0.33	0.33	0.95	18.9	18.9	18.9	0.0	0.0	B	B	B		
						SBT	TR	T	24	24	0	0.09	0.09	0.44	16.1	16.1	16.1	0.0	0.0	B	B	B		
						SBR		R	11	11	0													
					Intersection				1838	2054	216				23.8	27.0	27.0	3.2	3.2	C	C	C		
11	HOV Lane & Taxi Ramp	U	S	S	WB	WBT	T	T	351	359	8	0.21	0.79	0.79	0.0	33.4	33.4	33.4	33.4	A	C	C		
					NB	NBL	L	L		254	254		0.61	0.61		32.8	32.8	32.8	32.8		C	C		
					NWB	NWL	L	L	254	254	0	0.45	0.60	0.60	16.4	31.9	31.9	15.5	15.5	C	C	C		
					Intersection				605	867	262				6.9	32.8	32.8	25.9	25.9	A	C	C		

Legend:

S = Signalized ; U = Unsignalized; v/c ratio = volume-to-capacity ratio ; sec = seconds

Indicates v/c ratio greater than 1.00
Indicates an increase in delay greater than 5 seconds between No Action and With Action conditions
Indicates traffic impact

Notes:
* Intersection splits and offsets have been optimized using Synchro for No-Action conditions. Optimized signal timing plans for No-Action conditions have been utilized for With-Action and With-Action (Mitigated) conditions.

2030 LGA Traffic Operations Study - Delta Air Lines Environmental Assessment
No-Action (NA) vs With-Action (WA) vs With-Action Mitigated (WA_M)*
PM Peak Hour

Intersection					Approach	Movement	Lane Group	Movement	Volume		Change in Volume	V/C Ratio			Delay			Change in Delay		LOS			CEQR IMPACT?	
ID	Name	Type (NA)	Type (WA)	Type (WA_M)					(NA)	(WA)	(WA) vs (NA)	(NA)	(WA)	(WA_M)	(NA) (sec)	(WA) (sec)	(WA_M) (sec)	(WA) vs (NA) (sec)	(WA_M) vs (NA) (sec)	(NA)	(WA)	(WA_M)	(WA)	(WA_M)
1	82nd Street & 23rd Avenue	S	S	S	EB	EBL	L	L	340	380	40	0.69	0.77	0.77	36.5	41.0	41.0	4.5	4.5	D	D	D		
						EBT	TR	T	232	231	-1	0.66	0.65	0.65	37.1	37.0	37.0	-0.1	-0.1	D	D	D		
						EBR		R	27	27	0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00		
					WB	WBL	L	L	44	43	-1	0.23	0.22	0.22	28.2	28.0	28.0	-0.2	-0.2	C	C	C		
						WBR	R	R	173	178	5	0.18	0.19	0.19	5.9	5.9	5.9	0.0	0.0	A	A	A		
					NB	NBT	TR	T	199	175	-24	0.30	0.28	0.28	31.1	30.9	30.9	-0.2	-0.2	C	C	C		
						NBR		R	44	44	0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00		
					SB	SBL	L	L	621	683	62	0.70	0.73	0.73	21.6	21.9	21.9	0.3	0.3	C	C	C		
						SBT	T	T	426	406	-20	0.69	0.72	0.72	17.3	17.2	17.2	-0.1	-0.1	B	B	B		
					Intersection				2106	2167	61				24.4	25.1	25.1	0.7	0.7	C	C	C		
2	82nd Street/Ditmars Boulevard & GCP WB North Service Road/GCP WB Off-Ramp	S	S	S	WB	WBL	LT	L	301	301	0													
						WBT		T	675	673	-2	0.56	0.56	0.56	16.1	16.1	16.1	0.0	0.0	B	B	B		
						WBR	R	R	559	579	20	0.74	0.75	0.75	24.0	24.6	24.6	0.6	0.6	C	C	C		
					NB	NBL	LT	L	67	67	0													
						NBT		T	644	666	22	0.59	0.66	0.66	23.6	24.0	24.0	0.4	0.4	C	C	C		
					SB	SBT	TR	T	746	788	42	0.72	0.77	0.77	19.4	20.3	20.3	0.9	0.9	B	C	C		
						SBR		R	412	447	35													
					Intersection				3404	3521	117				20.1	20.6	20.6	0.5	0.5	C	C	C		
3	Ditmars Boulevard & Marine Terminal Road	S	S	S	WB	WBL	L	L	390	418	28	0.66	0.70	0.70	30.0	31.5	31.5	1.5	1.5	C	C	C		
						WBR	R	R	123	100	-23	0.24	0.19	0.19	21.3	20.6	20.6	-0.7	-0.7	C	C	C		
					NB	NBT	T	T	507	578	71	0.29	0.33	0.33	10.7	10.9	10.9	0.2	0.2	B	B	B		
						NBR	R	R	696	668	-28	0.66	0.65	0.65	5.2	4.0	4.0	-1.2	-1.2	A	A	A		
					SB	SBT	T	T	769	817	48	0.43	0.46	0.46	25.2	32.5	32.5	7.3	7.3	C	C	C		
					Intersection				2485	2581	96				17.2	19.7	19.7	2.5	2.5	B	B	B		
4	Runway Drive/Bowery Bay Boulevard & Marine Terminal Road	S	S	S	EB	EBL	LTR	L	163	141	-22													
						EBT		T	303	301	-2	0.83	0.77	0.77	41.4	36.1	36.1	-5.3	-5.3	D	D	D		
						EBR		R	230	225	-5													
					WB	WBL	LTR	L	147	158	11													
						WBT		T	239	242	3	0.67	0.67	0.67	39.1	36.8	36.8	-2.3	-2.3	D	D	D		
						WBR		R	14	15	1													
					NB	NBL	LT	L	200	196	-4													
						NBT		T	66	74	8	0.44	0.40	0.40	29.3	25.5	25.5	-3.8	-3.8	C	C	C		
						NBR	R	R	12	12	0	0.02	0.02	0.02	0.1	0.1	0.1	0.0	0.0	A	A	A		
					SB	SBL	LT	L	12	16	4													
						SBT		T	90	65	-25	0.19	0.14	0.14	26.1	22.9	22.9	-3.2	-3.2	C	C	C		
						SBR	R	R	73	81	8	0.17	0.17	0.17	26.3	23.5	23.5	-2.8	-2.8	C	C	C		
					Intersection				1549	1526	-23				36.7	32.8	32.8	-3.9	-3.9	D	C	C		
5	Central Terminal Loop Ramp & Runway Drive	S	S	S	EB	EBT	TR	T	466	447	-19	0.35	0.34	0.34	18.6	18.5	18.5	-0.1	-0.1	B	B	B		
						EBR		R	0	0	0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00		
					WB	WBL	LT	L	104	85	-19	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00		
						WBT		T	83	89	6	0.50	0.44	0.44	5.5	3.8	3.8	-1.7	-1.7	A	A	A		
					NB	NBL	L	L	195	193	-2	0.58	0.55	0.55	21.2	20.6	20.6	-0.6	-0.6	C	C	C		
						NBR	R	R	661	636	-25	0.28	0.27	0.27	0.5	0.4	0.4	-0.1	-0.1	A	A	A		
					Intersection				1509	1450	-59				12.7	12.3	12.3	-0.4	-0.4	B	B	B		
6	94th Street & Runway Drive	S	S	S	EB	EBT	T	T	241	212	-29	0.68	0.67	0.67	20.1	19.7	19.7	-0.4	-0.4	C	B	B		
						EBR	R	R	886	871	-15	0.71	0.68	0.68	21.5	20.3	20.3	-1.2	-1.2	C	C	C		
					WB	WBL	L	L	211	190	-21	0.62	0.54	0.54	46.9	43.5	43.5	-3.4	-3.4	D	D	D		
						WBT	T	T	118	96	-22	0.61	0.54	0.54	45.9	43.1	43.1	-2.8	-2.8	D	D	D		
					NB	NBL	L	L	69	77	8	0.50	0.57	0.57	32.6	39.4	39.4	6.8	6.8	C	D	D		
						NBR	R	R	47	38	-9	0.11	0.09	0.09	11.7	12.2	12.2	0.5	0.5	B	B	B		
					Intersection				1572	1484	-88				26.4	25.3	25.3	-1.1	-1.1	C	C	C		
7	94th Street & LGA Service Road	S	S	S	WB	WBL	L	L	379	379	0	0.84	0.84	0.84	53.5	53.5	53.5	0.0	0.0	D	D	D		
						WBT	T	T	231	229	-2	0.84	0.83	0.83	52.6	52.0	52.0	-0.6	-0.6	D	D	D		
					NB	NBL2	L	L	261	261	0	0.86	0.86	0.86	66.8	66.4	66.4	-0.4	-0.4	E	E	E		
						NBT	T	T	68	59	-9	0.41	0.36	0.36	49.4	47.9	47.9	-1.5	-1.5	D	D	D		
						NBR	R	R	681	680	-1	0.99	0.99	0.99	49.1	47.9	47.9	-1.2	-1.2	D	D	D		
					SB	SBL	L	L	785	792	7	0.50	0.51	0.51	11.4	10.7	10.7	-0.7	-0.7	B	B	B		
						SBT	T	T	312	268	-44	0.34	0.29	0.29	10.4	9.1	9.1	-1.3	-1.3	B	A	A		
					SEB	SER	T	T	851	851	0	0.94	0.94	0.94	40.7	40.7	40.7	0.0	0.0	D	D	D		
						SER2	R	R	711	686	-25	0.52	0.50	0.50	17.5	17.2	17.2	-0.3	-0.3	B	B	B		
					Intersection				4279	4205	-74				34.1	33.8	33.8	-0.3	-0.3	C	C	C		
8	94th Street & Ditmars Boulevard	S	S	S	EB	EBL	L	L	393	389	-4	0.58	0.58	0.58	25.9	25.7	25.7	-0.2	-0.2	C	C	C		
						EBT	TR	T	490	547	57	0.58	0.62	0.62	23.9	24.7	24.7	0.8	0.8	C	C	C		
						EBR		R	231	231	0													
					WB	WBL	L	L	67	66	-1	0.42	0.42	0.42	27.7	27.7	27.7	0.0	0.0	C	C	C		
						WBR	R	R	258	253	-5	0.17	0.16	0.16	4.7	4.7	4.7	0.0	0.0	A	A	A		
					NB	NBT	TR	T	359	358	-1	0.70	0.70	0.70	36.7	36.6	36.6	-0.1	-0.1	D	D	D		
						NBR		R	125	124	-1													
					SB	SBL	L	L	367	357	-10	0.66	0.64	0.64	40.9	40.2	40.2	-0.7	-0.7	D	D	D		
						SBT	T	T	194	192	-2	0.22	0.22	0.22	7.6	7.2	7.2	-0.4	-0.4	A	A	A		
					Intersection				2484	2517	33				26.1	26.1	26.1	0.0	0.0	C	C	C		
9	19th Avenue & 45th Street	U	U	S	EB	EBL	LTR	L	10	34	24													
						EBT		T	230	230	0	0.02	0.04	0.57	0.7	1.6	20.8	0.9	20.1	A	A	C		
						EBR		R	16	16	0													
					WB	WBL	LTR	L	23	23	0													
						WBT		T	242	242	0	0.03	0.03	0.70	1.0	0.9	25.5	-0.1	24.5	A	A	C		
						WBR		R	34	116	82													
					NB	NBL	LTR	L	5	5	0													
						NBT		T	14	14	0	0.15	0.19	0.11	16.3	19.7	15.5	3.4	-0.8	C	C	B		
						NBR		R	18	18	0													
					SB	SBL	LTR	L	93	175	82													
						SBT		T	53	53	0	0.65	1.16	0.58	35.9	146.0	26.6	110.1	-9.3	E	F	C	YES	
						SBR		R	2	26	24													
					Intersection				740	952	212				9.7	42.5	23.9	32.8	14.2	A	E	C		
10	19th Avenue & Hazen Street	S	S	S	EB	EBL	LTR	L	16	16	0													
						EBT		T	284	366	82	0.75	0.90	0.87	34.6	47.1	42.9	12.5	8.3	C	D	D	YES	
						EBR		R	61	61	0													
					WB	WBL	LT	L	26	26	0													
						WBT		T	275	357	82	0.69	0.86	0.83	33.0	46.6	42.2	13.6	9.2	C	D	D	YES	
						WBR	R	R	176	176	0	0.21	0.21	0.21	1.3	1.3	1.2	0.0	-0.1	A	A	A		
					NB	NBL	LTR	L	13	13	0													
						NBT		T	88	88	0	0.30	0.29	0.31	31.5	31.4	32.5	-0.1	1.0	C	C	C		
						NBR		R	34	34	0													
					SB	SBL	L	L	541	541	0	0.95	0.93	0.95	42.6	40.3	44.3	-2.3	1.7	D	D	D		
						SBT	TR	T	297	297	0	0.43	0.43	0.44	15.1	15.0	15.8	-0.1	0.7	B	B	B		
						SBR		R	46	46	0													
					Intersection				1857	2021	164				29.8	34.6	34.2	4.8	4.4	C	C	C		
11	HOV Lane & Taxi Ramp	U	S	S	WB	WBT	T	T	287	295	8	0.18	0.80	0.80	0.0	42.4	42.4	42.4	42.4	A	D	D		
					NB	NBL	L	L		417	417		0.81	0.81		41.1	41.1	41.1	41.1		D	D		
					NWB	NWL	L	L	417	417	0	0.75	0.77	0.77	26.4	35.8	35.8	9.4	9.4	D	D	D		
					Intersection				704	1129	425				15.6	39.5	39.5	23.9	23.9	C	D	D		

Legend:

S = Signalized ; U = Unsignalized; v/c ratio = volume-to-capacity ratio ; sec = seconds

Indicates v/c ratio greater than 1.00
Indicates an increase in delay greater than 5 seconds between No Action and With Action conditions
Indicates traffic impact

Notes:
* Intersection splits and offsets have been optimized using Synchro for No-Action conditions. Optimized signal timing plans for No-Action conditions have been utilized for With-Action and With-Action (Mitigated) conditions.

Consolidation Memorandum

AECOM

One Penn Plaza
Suite 600
New York, NY 10119
(o) 212-736-4444
(f) 212-629-4249

Memorandum

To: Ryan Marzullo, Delta Air Lines

cc: Nicole Weymouth, WSP | Parsons Brinckerhoff

Subject: LaGuardia Airport Consolidation of Operations Landside Impacts

From: Atma Sookram

Date: February 13, 2017

At LaGuardia Airport, Delta Air Lines and American Airlines currently operate from multiple terminals. American operates out of the CTB (Terminal B) and Terminal C and Delta operates out of Terminals A, C and D with exclusive use of Terminal A. At LaGuardia, as a result of the CTB Redevelopment now under construction, American will have the opportunity to consolidate its operations in the new CTB and, when the East Side Reconfiguration is complete, Delta would have the opportunity to centralize all operations in its reconfigured terminal. If either or both of these operational consolidations occur, it can be expected that other carriers, by themselves or in combination with each other, may approach the PANYNJ as lessor of the airport and seek permission to shift their operations to other gates or other terminals.

Although at this point, it is uncertain if and which airline(s) may shift to Terminal A , two factors must be considered when determining if there would be potential impacts to traffic operations at intersections at and near Terminal A as a result of a possible consolidation:

- Passenger travel patterns, including travel party size
- Historic passenger volumes

Based on data from PANYNJ, the average party size for passengers of the type of airline that would be likely to relocate from the CTB is 1.7, and the average party size for passengers at Terminal A is 1.4. Since Delta's shuttle service currently operates out of Terminal A, serving primarily business passengers, it makes sense that party size would be lower than the party size at the CTB. By moving a different airline with a larger party size into Terminal A, operational consolidation could potentially reduce the number of passenger vehicles by up to 20% (assuming that mode split and auto occupancy rates remain unchanged and there is no change in the size of aircraft or number of flights operating out of the terminal).

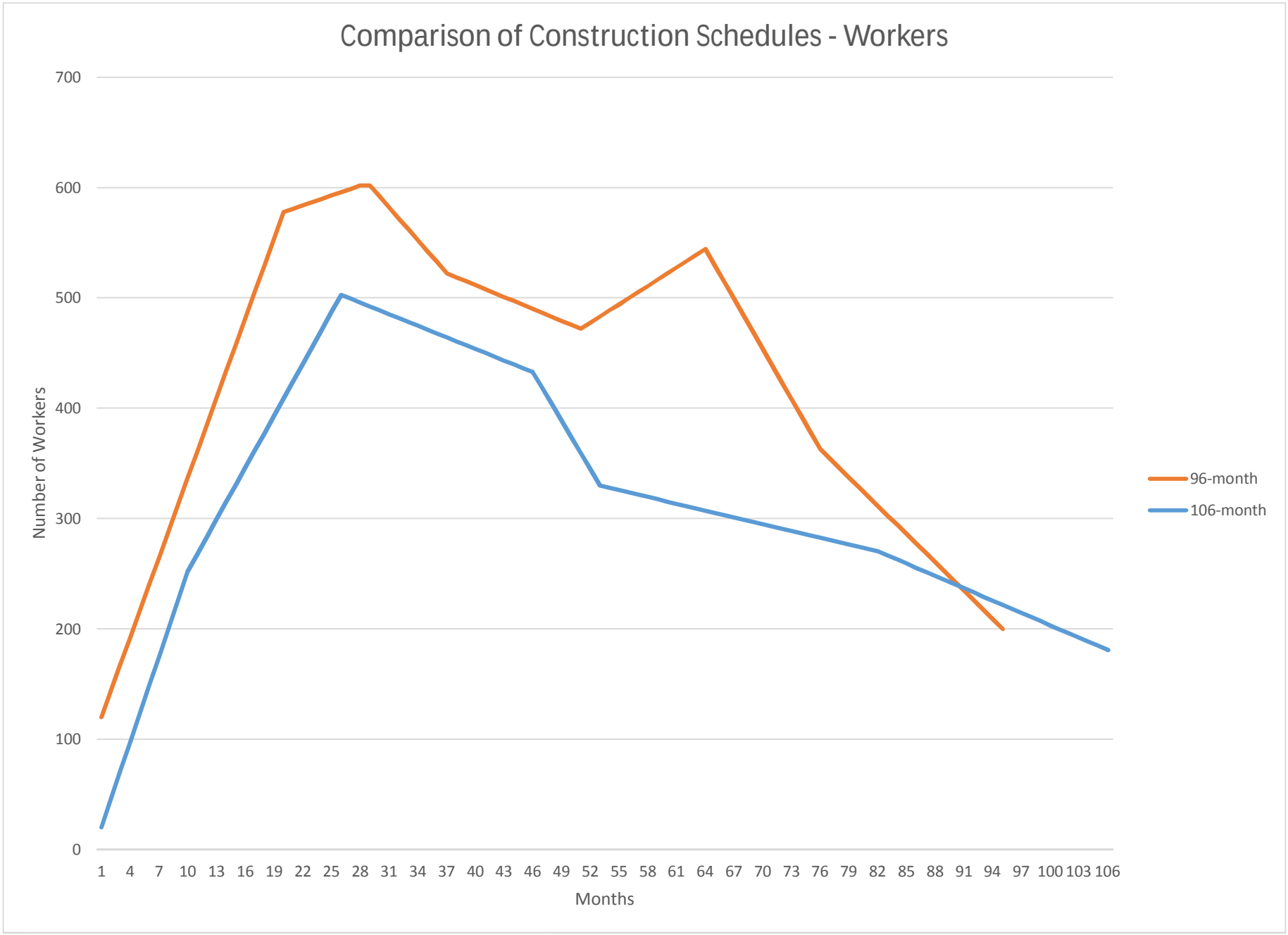
Since it is difficult to predict the flight schedule and passenger load of the airline that would shift to Terminal A, an analysis of historic data may be used as a surrogate measure to measure the historic and future passenger demands of the terminal, and the capacity of the roadway system to handle such demands. Terminal A is currently serving significantly fewer passengers than it did pre-9/11. In 1998, Terminal A served 2,082,472 passengers (1998 Airport Traffic Report, PANYNJ Aviation Department) and

AECOM

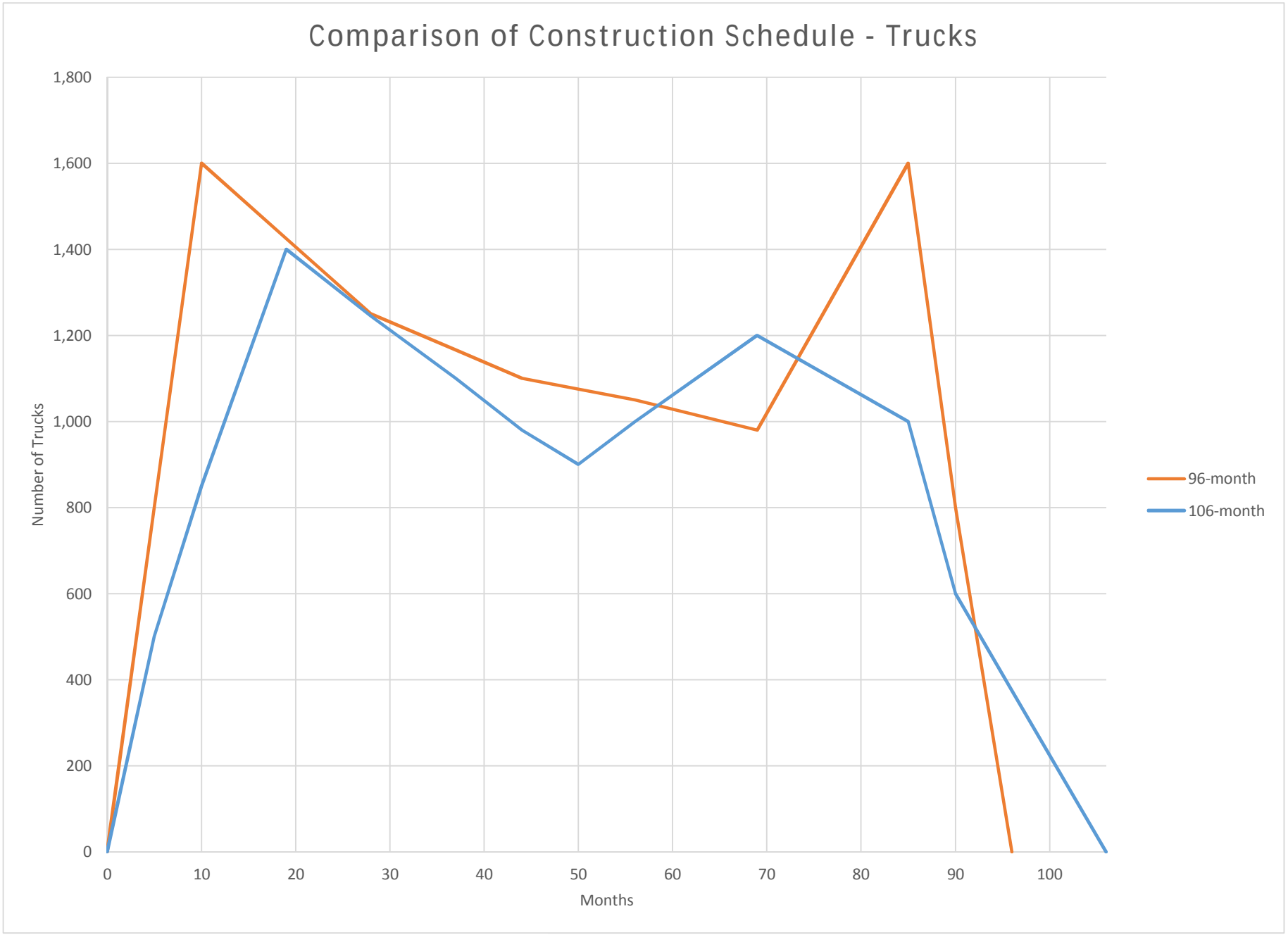
One Penn Plaza
Suite 600
New York, NY 10119
(o) 212-736-4444
(f) 212-629-4249

in 2015, the terminal served only 644,149 passengers (2015 Airport Traffic Report, PANYNJ Aviation Department); only 31% of pre-9/11 enplanements. With no indication of future increases in enplanements at Terminal A, it is, therefore, highly unlikely that historic volumes would be met or exceeded by consolidation, and as a result, it is expected that there would be no potential impact to traffic operation of on- or off-airport intersections.

Appendix F.
Supporting Data



Sources: STV, January 2016; Delta Air Lines, January 2017



Sources: STV, January 2016; Delta Air Lines, January 2017

Delta Air Lines Reconfiguration
Construction Equipment Phasing

LINE#	PHASE	MONTH NUMBER	ACTIVITY	TRUCKS	EQUIPMENT PIECES PER DAY																		DURATION		
					MILLING MACHINE	FRONTEND LOADER	CONCRETE GUILOTINE	CONCRETE RAM	GRADER	BULL DOZER	PUMPS	COMPRESSORS	COMPACTION VIBRATORS	BACK HOE	CRANE	WELDING MACHINE	LULL LIFT	BOOM LIFTS	PILE DRIVER	CONCRETE PUMPER	ASPHALT MACHINE	ASPHALT ROLLER	NUMBER OF DAYS	HOURS PER DAY	TOTAL HOURS
1	1	0-6	ASPHALT REMOVAL	30	3																		42	8	11088
2			CONCRETE REMOVAL	30			3							6									42	8	13104
3			UTILITY TRENCHING								8			2									63	8	5040
4			GRADING	2					2				2										63	8	3024
5			PILE DRIVING	2		1													2				42	8	1680
6			PILE CAP INSTALL																					8	0
7			FOUNDATIONS																					8	0
8			STEEL ERECTION																					8	0
9			CURTAIN WALL																					8	0
10			CONCRETE																					8	0
11			ASPHALT	10																	1	1	21	8	2016
12			JETBRIDGE INSTALL A																					8	0
13			DEMOLITION	10		1		2		2				2	2								42	8	6384
14			EXCAVATION	10							4			4									42	8	6048
15			PHASE SUBTOTAL																						48384
16																									
17	2	7-10	ASPHALT REMOVAL	20	2																		42	8	7392
18			CONCRETE REMOVAL	20			2							2									42	8	8064
19			UTILITY TRENCHING								4			4									84	8	5376
20			GRADING	4					4				4										84	8	8064
21			PILE DRIVING	6															6				84	8	8064
22			PILE CAP INSTALL	15							12			4						6			84	8	24864
23			FOUNDATIONS	15							12			4						6			84	8	24864
24			STEEL ERECTION												2	5		5					21	8	2016
25			CURTAIN WALL																					8	0
26			CONCRETE	10																	1	1	42	8	4032
27			ASPHALT	10																1			42	8	3696
28			JETBRIDGE INSTALL B																					8	0
29			DEMOLITION																					8	0
30			EXCAVATION																					8	0
31			PHASE SUBTOTAL																						96432
32																									
33	3.1	11-13	ASPHALT REMOVAL	5	1									1									63	8	3528
34			CONCRETE REMOVAL	5			1							1									63	8	3528
35			UTILITY TRENCHING								4			4									42	8	2688
36			GRADING	2					2				2										42	8	2016
37			PILE DRIVING	4															2				42	8	2016
38			PILE CAP INSTALL	10							2			2						2			21	8	2688
39			FOUNDATIONS	10							2			2						2			21	8	2688
40			STEEL ERECTION												6	15		15					84	8	24192
41			CURTAIN WALL																					8	0
42			CONCRETE	10													1			1			21	8	2016
43			ASPHALT																					8	0
44			JETBRIDGE INSTALL																					8	0
45			DEMOLITION	5											1								21	8	1008
46			EXCAVATION																					8	0
47			PHASE SUBTOTAL																						46368
48																									
49	3.2	14-22	ASPHALT REMOVAL																					8	0
50			CONCRETE REMOVAL																					8	0
51			UTILITY TRENCHING							4				4									42	8	2688
52			GRADING																					8	0
53			PILE DRIVING	4															2				189	8	9072
54			PILE CAP INSTALL	5						4				1						1			189	8	16632
55			FOUNDATIONS	5						4				1						1			189	8	16632
56			STEEL ERECTION												4	10	10						105	8	20160
57			CURTAIN WALL															8					42	8	2688
58			CONCRETE	20													2			2			147	8	28224
59			ASPHALT	10																	1	1	21	8	2016
60			JETBRIDGE INSTALL																					8	0
61			DEMOLITION																					8	0
62			EXCAVATION																					8	0
63			PHASE SUBTOTAL																						98112
64																									
65	3.3	23-29	ASPHALT REMOVAL																					8	0
66			CONCRETE REMOVAL																					8	0
67			UTILITY TRENCHING																					8	0
68			GRADING				2		2	2													42	8	2016
69			PILE DRIVING	2															2				109	8	3488
70			PILE CAP INSTALL	10																1			109	8	9592
71			FOUNDATIONS	10																1			109	8	9592
72			STEEL ERECTION	3											4	10		5					147	8	25872
73			CURTAIN WALL															8					147	8	9408
74			CONCRETE	40													2			3			147	8	52920
75			ASPHALT	20																	2	2	21	8	4032
76			JETBRIDGE INSTALL																					8	0
77			DEMOLITION																					8	0
78			EXCAVATION																					8	0
79			PHASE SUBTOTAL																						116920
80																									
81	3.4	30-41	ASPHALT REMOVAL																					8	0
82			CONCRETE REMOVAL																					8	0
83			UTILITY TRENCHING																					8	0

Delta Air Lines Reconfiguration
Construction Equipment Phasing

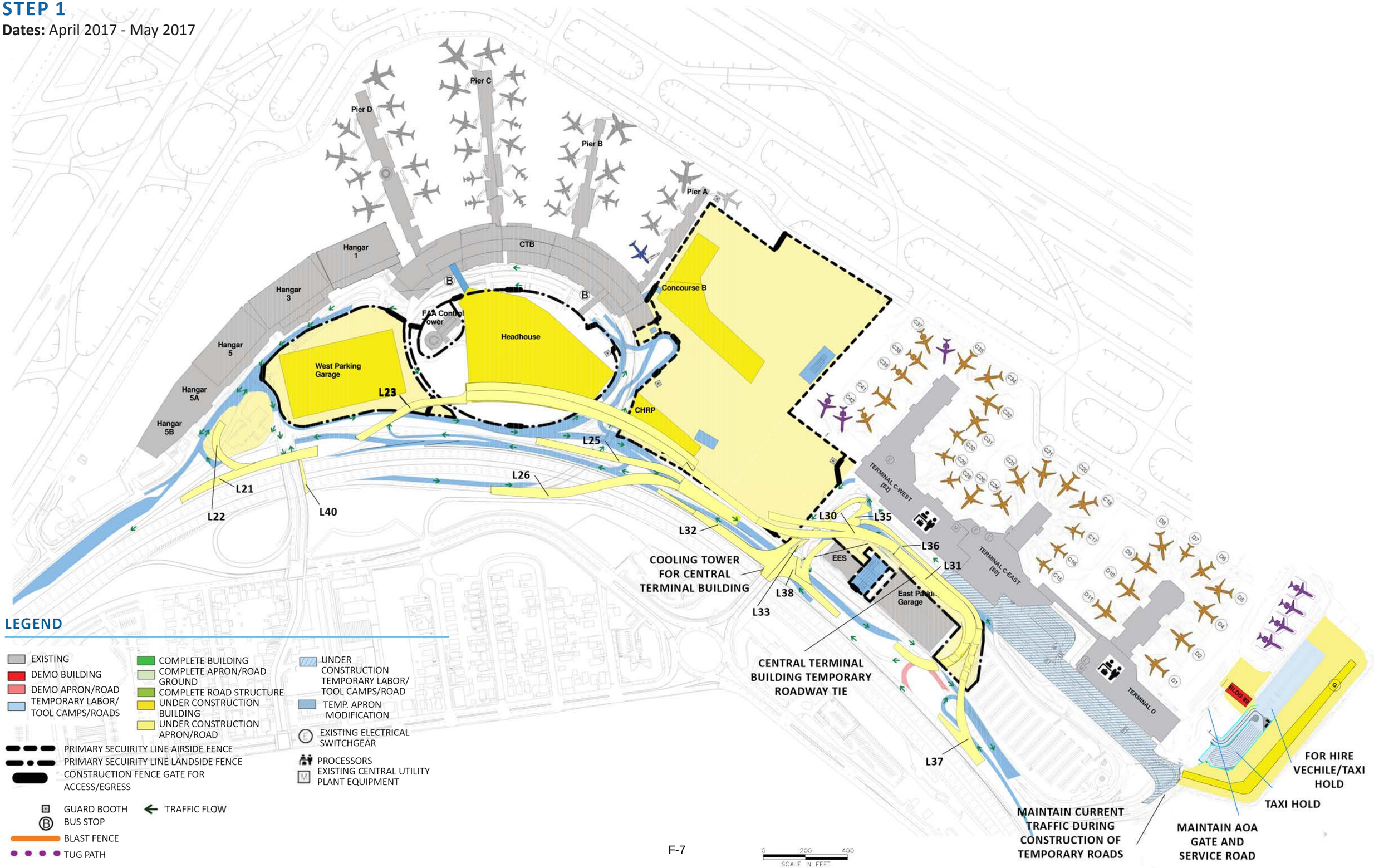
LINE#	PHASE	MONTH NUMBER	ACTIVITY	TRUCKS	EQUIPMENT PIECES PER DAY																		DURATION		
					MILLING MACHINE	FRONTEND LOADER	CONCRETE GUILOTINE	CONCRETE RAM	GRADER	BULL DOZER	PUMPS	COMPRESSORS	COMPACTION VIBRATORS	BACK HOE	CRANE	WELDING MACHINE	LULL LIFT	BOOM LIFTS	PILE DRIVER	CONCRETE PUMPER	ASPHALT MACHINE	ASPHALT ROLLER	NUMBER OF DAYS	HOURS PER DAY	TOTAL HOURS
84			GRADING						4	4				4									63	8	6048
85			PILE DRIVING																					8	0
86			PILE CAP INSTALL																					8	0
87			FOUNDATIONS																					8	0
88			STEEL ERECTION												2	5		5					126	8	12096
89			CURTAIN WALL	126														8					84	8	90048
90			CONCRETE	15													3			2			231	8	36960
91			ASPHALT	10																	3	3	21	8	2688
92			JETBRIDGE INSTALL	2											1								21	8	504
93			DEMOLITION	10		1		2		2				2	2		1						126	8	20160
94			EXCAVATION																					8	0
95			PHASE SUBTOTAL																						168504
96																									
97	4	42-51	ASPHALT REMOVAL																					8	0
98			CONCRETE REMOVAL																					8	0
99			UTILITY TRENCHING																					8	0
100			GRADING																					8	0
101			PILE DRIVING - EG-HH/HH-CA	4															2				63	8	3024
102			PILE CAP INSTALL - EG-HH/HH-CA	9										3						3			63	8	7560
103			FOUNDATIONS - EG-HH/EG-CC/HH-CA																	3			84	8	2016
104			STEEL ERECTION - EG-HH/EG-CC/HH-CA	1											3	12		3					84	8	12768
105			CURTAIN WALL - HH-CA															4					63	8	2016
106			CONCRETE - HH-CA	1													1			1			42	8	1008
107			ASPHALT																					8	0
108			JETBRIDGE INSTALL																					8	0
109		EG-HH/EG-CC	DEMOLITION	40		4		4		4				6	4		3	4					210	8	115920
110			EXCAVATION																					8	0
111			PHASE SUBTOTAL																						144312
112																									
113	5	52-57	ASPHALT REMOVAL	12	3									4									126	8	19152
114			CONCRETE REMOVAL	12			5							4									126	8	21168
115			UTILITY TRENCHING								8		2	6									42	8	5376
116			GRADING																					8	0
117			PILE DRIVING	4													1		2				63	8	3528
118			PILE CAP INSTALL	5										1						1			63	8	3528
119			FOUNDATIONS	5																1			63	8	3024
120		EG-HH/EG-CC	STEEL ERECTION	2											4	13		8					42	8	9072
121			CURTAIN WALL																					8	0
122			CONCRETE - EG-HH/EG-CC	8													2			2			84	8	8064
123			ASPHALT																					8	0
124			JETBRIDGE INSTALL																					8	0
125			DEMOLITION	8		2		3							1		2	2					105	8	15120
126			EXCAVATION	8							10			4									126	8	22176
127			PHASE SUBTOTAL																						110208
128																									
129	6	58-72	ASPHALT REMOVAL																					8	0
130			CONCRETE REMOVAL																					8	0
131			UTILITY TRENCHING																					8	0
132			GRADING	3					4	2			3	3									315	8	37800
133			PILE DRIVING	8		2													4				84	8	9408
134			PILE CAP INSTALL	10										2			2			2			63	8	8064
135			FOUNDATIONS								5												84	8	3360
136			STEEL ERECTION	4											4	10		5					126	8	23184
137		EG-HH/EG-CC	CURTAIN WALL															16					315	8	40320
138			CONCRETE	40													4	4		4			210	8	87360
139			ASPHALT	10																	1	1	21	8	2016
140			JETBRIDGE INSTALL	2											2								42	8	1344
141				10		1	2			2				2	1									8	0
142			EXCAVATION																					8	0
143			PHASE SUBTOTAL																						212856
144																									
145	7	73-79	ASPHALT REMOVAL	5	1									4									147	8	11760
146			CONCRETE REMOVAL	5			2							4									147	8	12936
147			UTILITY TRENCHING																					8	0
148			GRADING	2					2	1			2	2									21	8	1512
149			PILE DRIVING																					8	0
150			PILE CAP INSTALL																					8	0
151			FOUNDATIONS																					8	0
152			STEEL ERECTION																					8	0
153			CURTAIN WALL																					8	0
154			CONCRETE	20													2						63	8	11088
155			ASPHALT	5									1								1	1	63	8	4032
156			JETBRIDGE INSTALL																					8	0
157			DEMOLITION	10		1		2		2				2	2								147	8	22344
158			EXCAVATION	2										2									21	8	672
159			PHASE SUBTOTAL																						64344
160																									
161	8	80-96	ASPHALT REMOVAL	5	1									4									42	8	3360
162			CONCRETE REMOVAL	5			2							4									42	8	3696
163			UTILITY TRENCHING								4		2	4									21	8	1680
164			GRADING	5		2			4	4				4									21	8	3192
165			PILE DRIVING	4															2				84	8	4032
166			PILE CAP INSTALL	5										1						1			84	8	4704

Delta Air Lines Reconfiguration
Construction Equipment Phasing

LINE#	PHASE	MONTH NUMBER	ACTIVITY		EQUIPMENT PIECES PER DAY																		DURATION		
				TRUCKS	MILLING MACHINE	FRONTEND LOADER	CONCRETE GUILOTINE	CONCRETE RAM	GRADER	BULL DOZER	PUMPS	COMPRESSORS	COMPACTION VIBRATORS	BACK HOE	CRANE	WELDING MACHINE	LULL LIFT	BOOM LIFTS	PILE DRIVER	CONCRETE PUMPER	ASPHALT MACHINE	ASPHALT ROLLER	NUMBER OF DAYS	HOURS PER DAY	TOTAL HOURS
167			FOUNDATIONS	5																1			84	8	4032
168			STEEL ERECTION	2											2	5		5					147	8	16464
169			CURTAIN WALL															4					105	8	3360
170			CONCRETE	10													1			1			84	8	8064
171			ASPHALT	10																	2	2	21	8	2352
172			JETBRIDGE INSTALL																					8	0
173			DEMOLITION																					8	0
174			EXCAVATION	2										2									126	8	4032
175			PHASE SUBTOTAL																						58968
176																									
177	FINAL	96	ASPHALT REMOVAL																					8	0
178			CONCRETE REMOVAL																					8	0
179			UTILITY TRENCHING																					8	0
180			GRADING																					8	0
181			PILE DRIVING																					8	0
182			PILE CAP INSTALL																					8	0
183			FOUNDATIONS																					8	0
184			STEEL ERECTION																					8	0
185			CURTAIN WALL																					8	0
186			CONCRETE																					8	0
187			ASPHALT																					8	0
188			JETBRIDGE INSTALL																					8	0
189			DEMOLITION																					8	0
190			EXCAVATION																					8	0
191			PHASE SUBTOTAL																						0
192																									
193																									
194			GRAND TOTAL																						1165408
195																									
196		LEGEND	CONCOURSE A																						
197			CONCOURSE B																						
198			HEADHOUSE																						
199			ROADWAY SYSTEM																						
200			TERMINAL C																						
201			TERMINAL D																						
202			WEST SUBSTATION																						
203			CONNECTOR																						
204			ROOF																						
205			EAST GARAGE																						

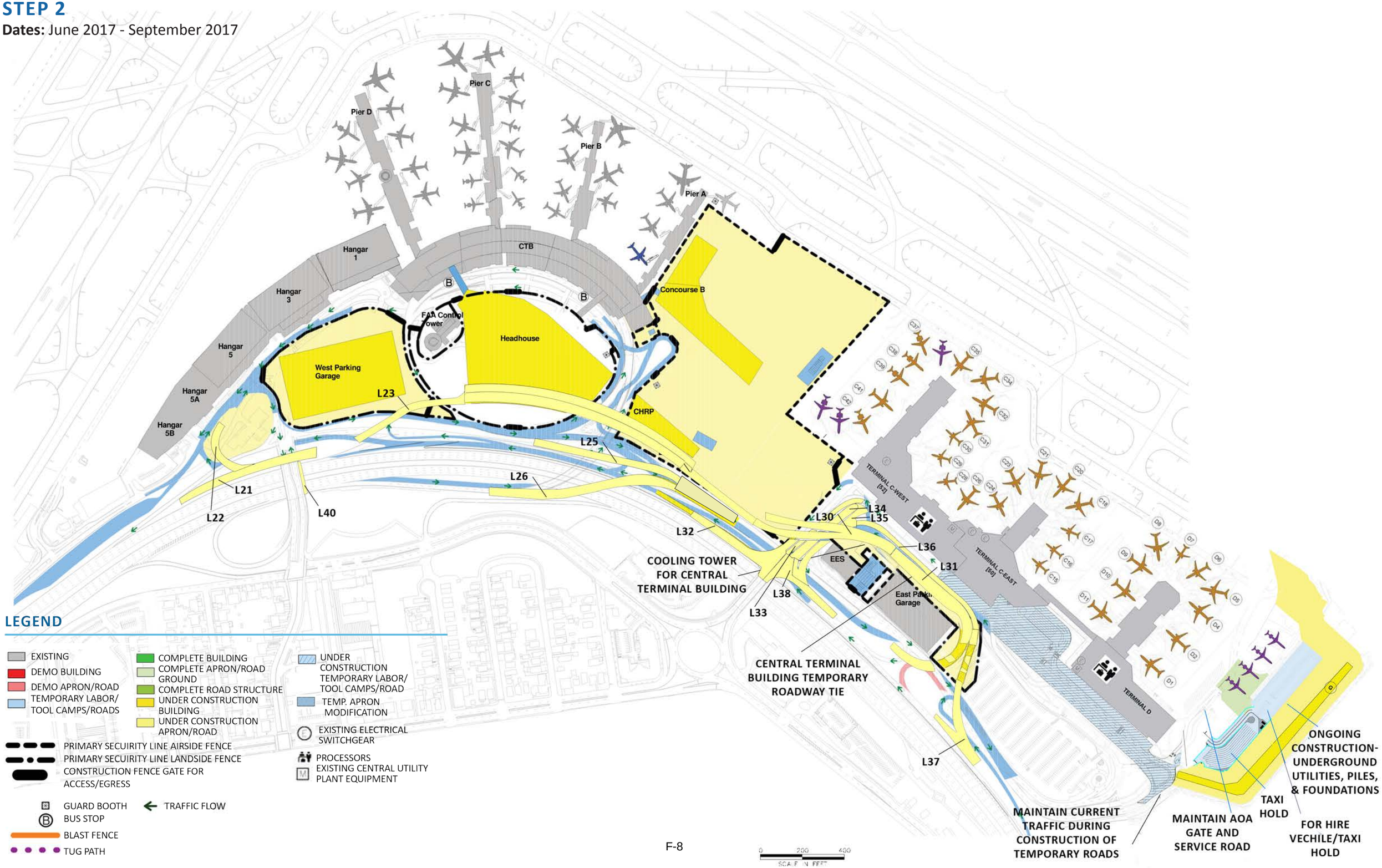
STEP 1

Dates: April 2017 - May 2017



STEP 2

Dates: June 2017 - September 2017



LEGEND

- EXISTING
- DEMO BUILDING
- DEMO APRON/ROAD
- TEMPORARY LABOR/ TOOL CAMPS/ROADS
- COMPLETE BUILDING
- COMPLETE APRON/ROAD GROUND
- COMPLETE ROAD STRUCTURE
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- TEMP. APRON MODIFICATION
- EXISTING ELECTRICAL SWITCHGEAR
- PROCESSORS
- EXISTING CENTRAL UTILITY PLANT EQUIPMENT
- PRIMARY SECUIRITY LINE AIRSIDE FENCE
- PRIMARY SECUIRITY LINE LANDSIDE FENCE
- CONSTRUCTION FENCE GATE FOR ACCESS/EGRESS
- GUARD BOOTH
- BUS STOP
- TRAFFIC FLOW
- BLAST FENCE
- TUG PATH

STEP 3

Dates: October 2017 - January 2018

Pier C
Pier D
Pier B
Pier A
CTB
Hangar 1
Hangar 3
Hangar 5
Hangar 5A
Hangar 5B
FAA Control Tower
Headhouse
West Parking Garage
Concourse B
CHRP
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East Parking Garage
COOLING TOWER FOR CENTRAL TERMINAL BUILDING
CENTRAL TERMINAL BUILDING TEMPORARY ROADWAY TIE
L37
TERMINAL C-WEST (53)
TERMINAL C-EAST (50)
TERMINAL D
MAINTAIN AOA GATE AND SERVICE ROAD
ONGOING CONSTRUCTION- UNDERGROUND UTILITIES, PILES, AND FOUNDATIONS
FOR HIRE VECHILE/TAXI HOLD

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- TRAFFIC FLOW

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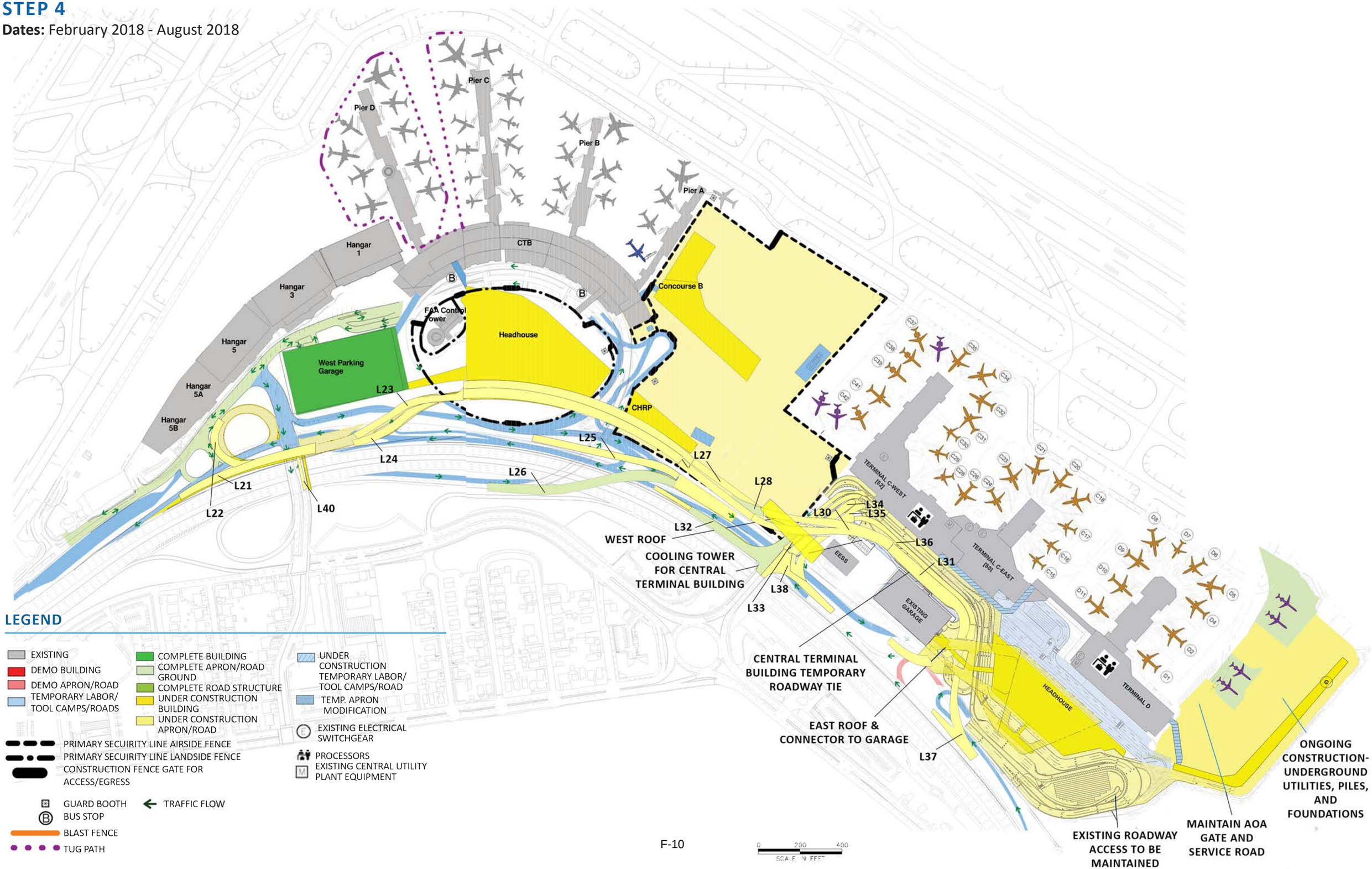
SCALE IN FEET

STEP 4

Dates: February 2018 - August 2018



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- BLAST FENCE
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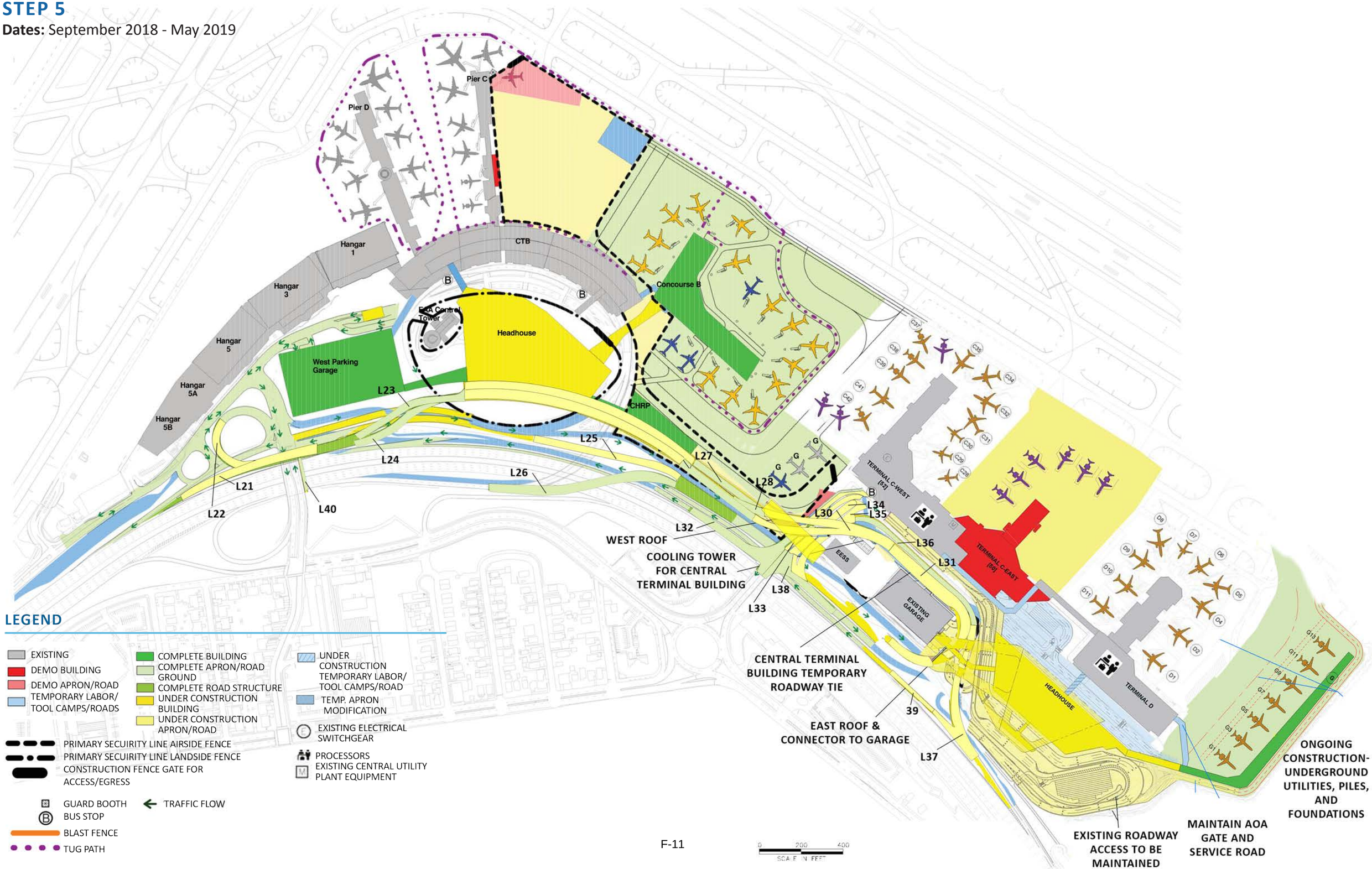
- TRAFFIC FLOW

STEP 5

Dates: September 2018 - May 2019



LEGEND

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STEP 6

Dates: June 2019 - September 2019

Pier C
Pier D
CTB
Hangar 1
Hangar 3
Hangar 5
Hangar 5A
Hangar 5B
Concourse B
FAA Control Tower
Headhouse
West Parking Garage
CHRP
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WEST ROOF
COOLING TOWER FOR CENTRAL TERMINAL BUILDING
CENTRAL TERMINAL BUILDING TEMPORARY ROADWAY TIE
EAST ROOF & CONNECTOR TO GARAGE
TERMINAL C-WEST [52]
TERMINAL C-EAST [50]
TERMINAL D
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ONGOING CONSTRUCTION- UNDERGROUND UTILITIES, PILES, AND FOUNDATIONS
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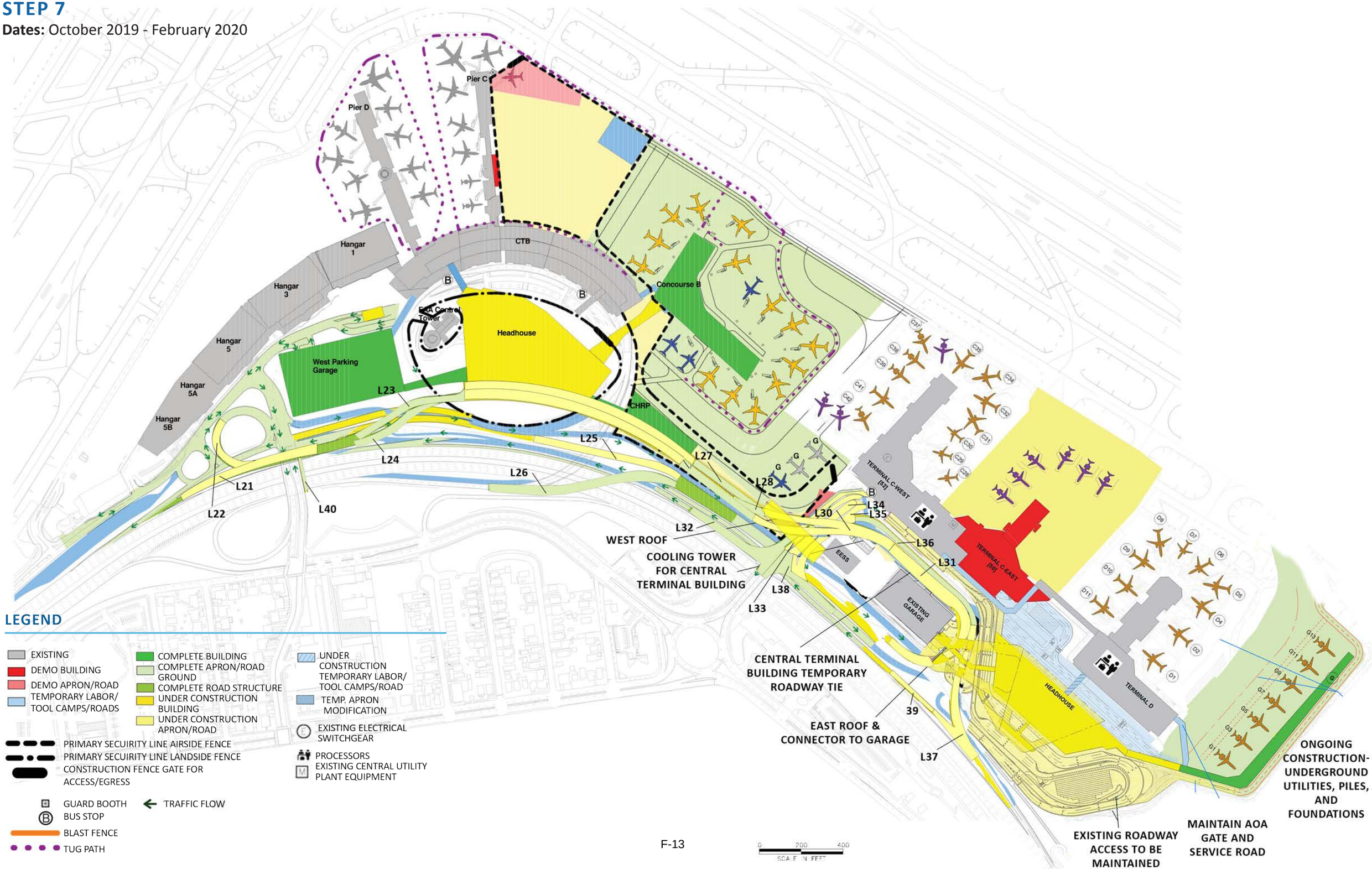
- TRAFFIC FLOW

STEP 7

Dates: October 2019 - February 2020



LEGEND

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- BLAST FENCE
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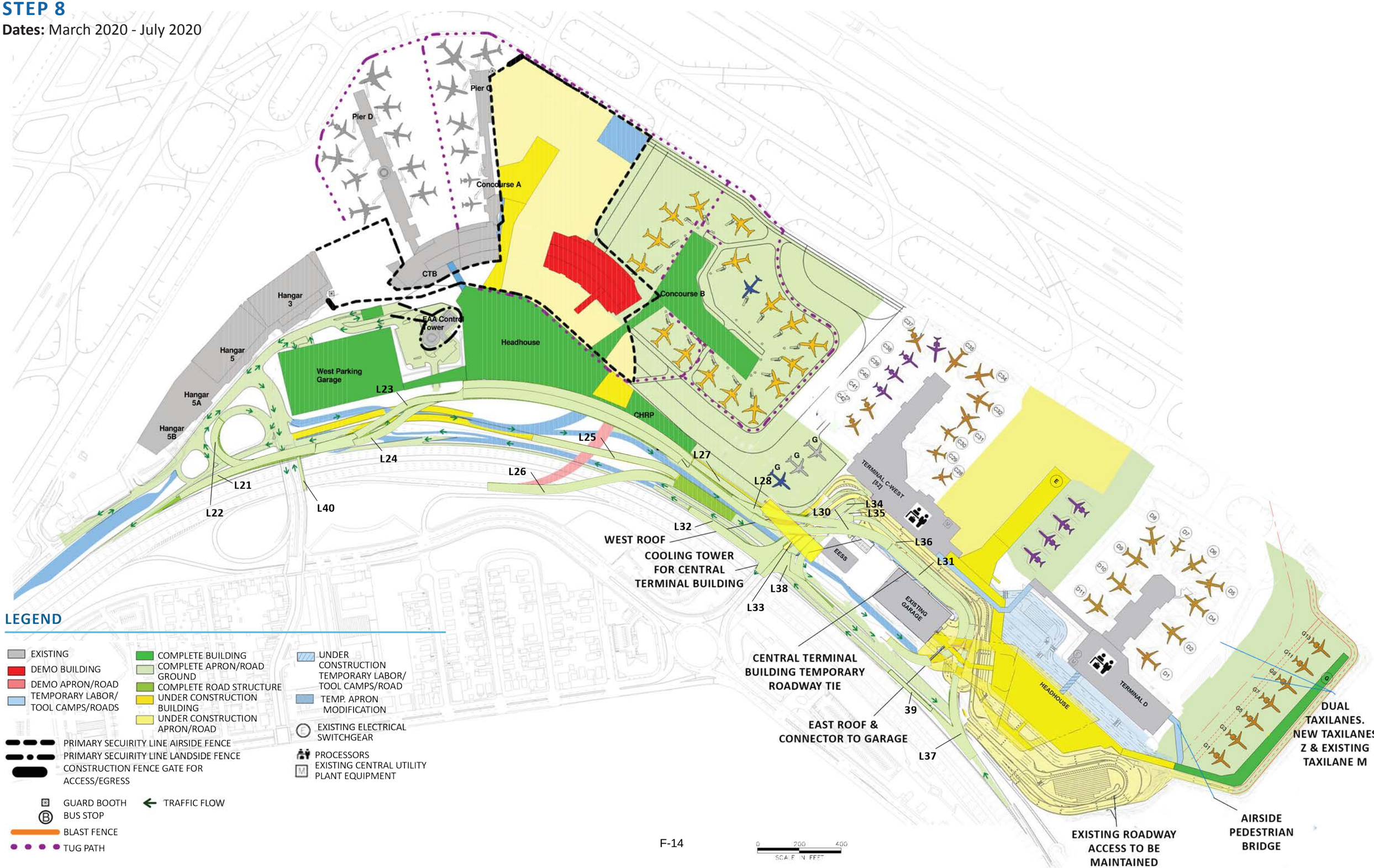
STEP 8

Dates: March 2020 - July 2020



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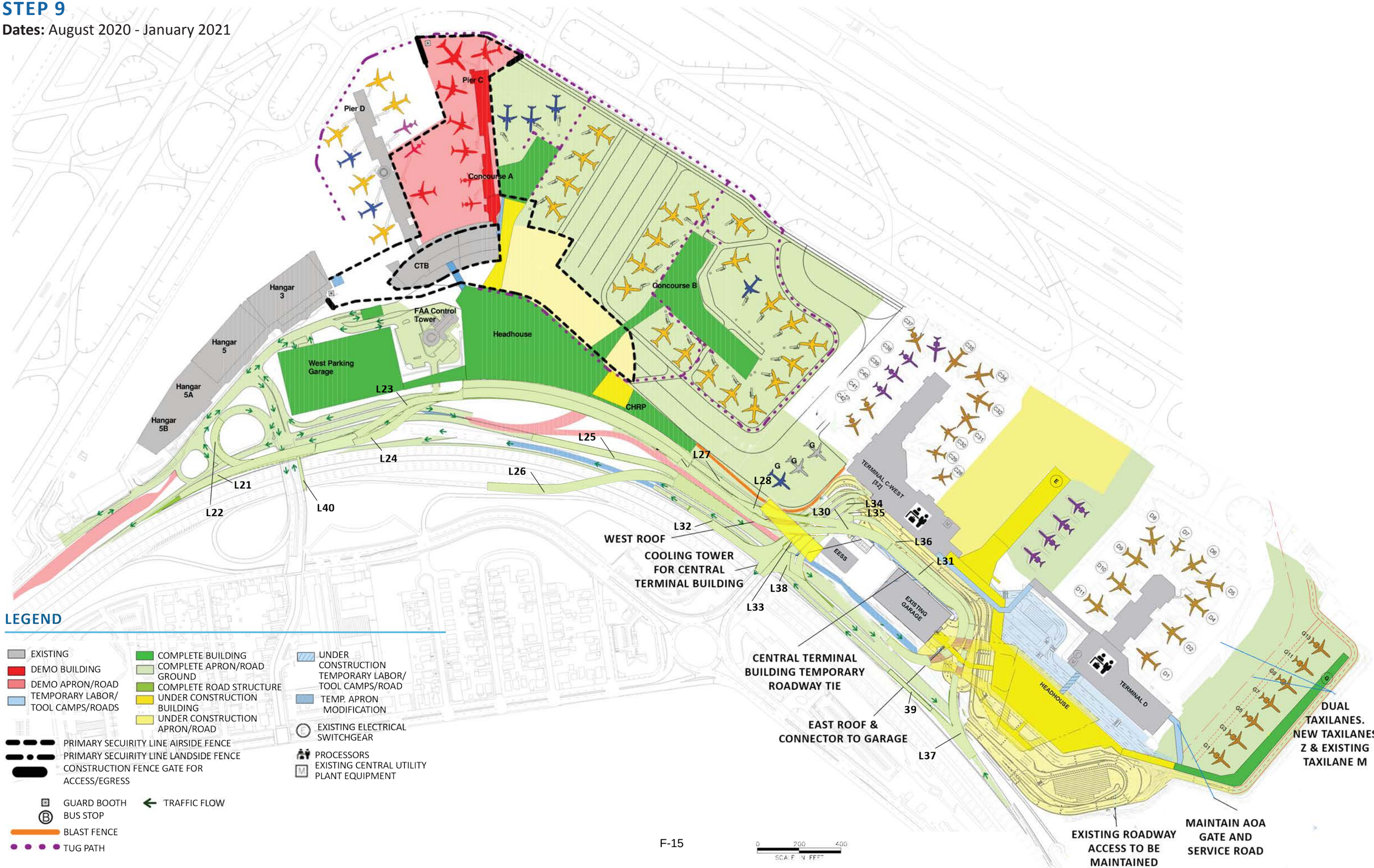
- BLAST FENCE
- TUG PATH
- TRAFFIC FLOW

STEP 9

Dates: August 2020 - January 2021



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STEP 10

Dates: February 2021 - August 2021

Pier D
Concourse A
CTB
Hangar 3
Hangar 5
Hangar 5A
Hangar 5B
FAA Control Tower
West Parking Garage
Headhouse
Concourse B
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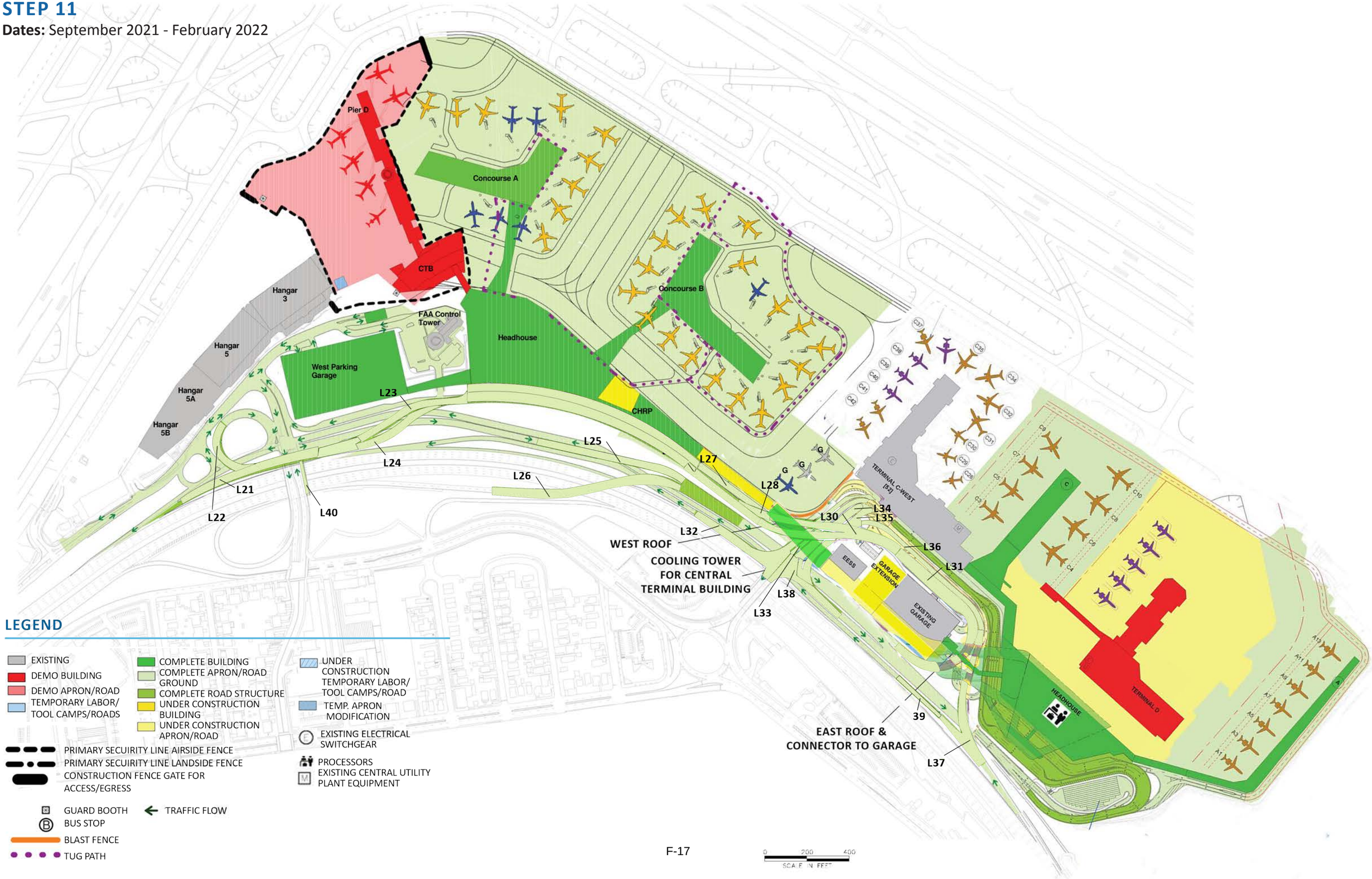
0 200 400
SCALE IN FEET

STEP 11

Dates: September 2021 - February 2022



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STEP 12

Dates: March 2022 - January 2024

LEGEND

- EXISTING
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STEP 13

Dates: February 2024 - June 2024

LEGEND

- EXISTING
- DEMO BUILDING
- DEMO APRON/ROAD
- TEMPORARY LABOR/ TOOL CAMPS/ROADS
- COMPLETE BUILDING
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STEP 14

Dates: July 2024 - February 2026

LEGEND

- EXISTING
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Appendix **G**.
Public Involvement

Public Information Session and Public Hearing for the East Side Reconfiguration at LaGuardia Airport Draft Environmental Assessment

May 3, 2016

Introduction

The Port Authority of New York and New Jersey (PANYNJ) and Delta Air Lines hosted a Public Information Session and Public Hearing regarding the East Side Reconfiguration at LaGuardia Airport Draft Environmental Assessment (EA). This meeting, held in conjunction with the public comment period for the Draft EA, provided an opportunity for the public to learn about the plans for improving the East Side Terminal at LaGuardia Airport, discuss any potential impacts to the community, and submit formal comments as part of the National Environmental Policy Act (NEPA) process.

Meeting Logistics

The meeting took place on Wednesday, May 3, 2017 at the Sheraton Hotel at LaGuardia, located at 135-20 39th Ave, Flushing, NY 11354. The Public Information Session took place from 3:00 pm to 6:00 pm and the Public Hearing took place from 7:00 pm to 9:00 pm.

The Public Information Session consisted of 22 storyboards (see Attachment 1) on the following topics:

- Welcome
- NEPA Overview and Impacts
- Purpose and Need
- No Action Alternative
- Alternatives Eliminated from Further Consideration
- Proposed Action Airside, Terminal and Landside
- Visual Impacts
- Air Quality and Sustainable Design
- Water Resources
- Environmental Impacts
- Construction Timeline, Parking and Impacts
- Series of Renderings of Proposed Action
- Opportunities to Comment

At each station, which included two to three story boards, members of PANYNJ and Delta Air Lines project teams were on hand to answer questions and listen to comments from the attendees.

During the Public Hearing portion, the public was able to give formal testimony before PANYNJ and Delta Air Line panelists Ryan Marzullo (Managing Director at Delta Air Lines) and Katie Lamond (Environmental Specialist at PANYNJ). The hearing officer Nicole Weymouth (Environmental Manager at WSP USA), convened the hearing and presented the regulatory context and procedures for the hearing. Next, Mr. Marzullo gave a presentation on the East Side Reconfiguration and a summary of the Draft EA findings (the presentation followed the storyboards from the Public Information Session, Attachment 1).

After the presentation, public comments were heard. A stenographer recorded the entire Public Hearing Session and a transcript was prepared (see Attachment 2).

Meeting Notification

Multiple methods were used to publicize the Public Information Session and Public Hearing. A notice of Availability, Request for Comment and Notice of Public Hearing was published in 11 local newspapers (see copies in Attachment 3). The following table identifies the name of the publication, its area or subject circulation, and the date the advertisement was published in the newspaper.

Publication	Circulation Area	Date
Daily News (Queens Edition)	Queens and Long Island	April 3, 2017
Newsday	Queens	April 3, 2017
The Greek National Herald	Greek Communities	April 3, 2017
Sing Tao Daily	Chinese Communities	April 3, 2017
Queens Gazette	All Editions	April 5, 2017
Queens Chronicle	All Editions	April 6, 2017
Queens Ledger	Queens	April 6, 2017
Queens Courier	All Editions	April 6, 2017
Queens Tribune	All Editions	April 6, 2017
Queens Time Ledger	All Editions	April 7, 2017
El Especialito	Spanish Speaking Communities	April 7, 2017

Emails were sent to over 550 individuals and organizations, including members of the local Queens Chamber of Commerce; representatives of the five adjacent Queens Community Boards (1, 3, 4, 7 and 11); officials from the City, State and Federal agencies with interest and/or involvement in the review process; airlines and airport industry personnel; elected officials from the City, State, and Federal legislative bodies with jurisdictional interests in LaGuardia Airport; and other stakeholders who have previously expressed interest in development activities at the Airport. A copy of the notification list, which includes email addresses, is included as Attachment 4.

The email notifications included all logistical information and were sent on April 3, 2017, with a reminder on April 26, 2017 (see Attachment 3) .

Attendees

There were 20 attendees at the meeting, including local residents and representatives of the following agencies and organizations.

Type	Name
Academic Institutions	Vaughn College
Business Organizations	AECOM Skanska USA Techno Consulting Inc.
Community & Business Organizations	Queensboro Hill Civic Association NYC Building and Construction Trades Council CBT Aviation Roundtable Aviation Development Council
Elected Officials	US Congress
Agencies	Federal Aviation Administration New York State Department of Transportation

Attachment 1 - Story Boards/ Public Hearing Presentation

East Side Reconfiguration at LaGuardia Airport

Welcome!

Public Information Session and
Public Hearing for the
East Side Reconfiguration at
LaGuardia Airport
Draft Environmental Assessment

May 3, 2017

3:00 - 6:00 PM
Information Session
7:00 - 9:00 PM
Public Hearing

THE PORT AUTHORITY OF NY & NJ

East Side Reconfiguration at LaGuardia Airport

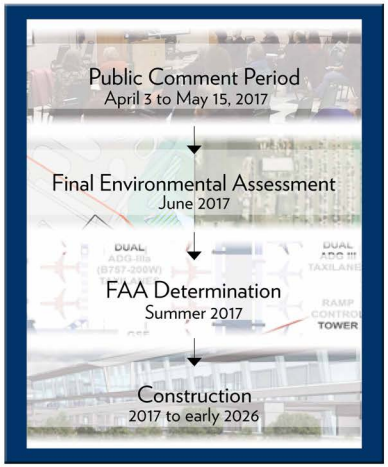
NEPA Overview

National Environmental Policy Act of 1969 (NEPA)

Required for any action that requires federal approval or funding. Promotes better decision making.

Major elements include:

- Define project purpose and need
- Evaluate reasonable alternatives
- Avoid, minimize, or mitigate impacts, wherever feasible
- Provide opportunity for public participation



THE PORT AUTHORITY OF NY & NJ

East Side Reconfiguration at LaGuardia Airport

NEPA Impact Categories

- Air Quality
- Biological Resources
- Climate
- Coastal Resources
- Department of Transportation Act, Section 4(f)
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historic Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise-Compatible Land Use
- Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Visual Effects
- Water Resources
- Cumulative Impacts

THE PORT AUTHORITY OF NY & NJ

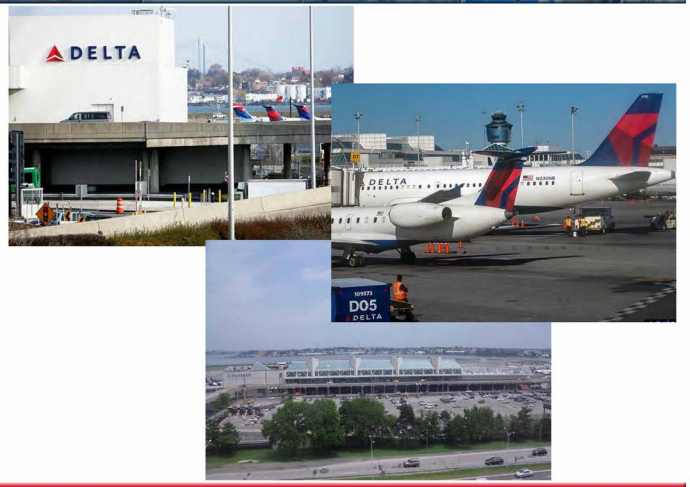
East Side Reconfiguration at LaGuardia Airport

Purpose and Need

Purpose:
To improve aircraft operations and reduce delays to enable the airlines to safely and effectively meet passenger demand at acceptable levels of service.

Need:

- Delays at LGA affect airline networks/ other airports and cause poor passenger experience
- Compliance with Tarmac Delay Rule (without taking significant operational penalties) requires flexible gating options and multiple apron access points
- Current ramp layouts do not include dual taxilanes, independent deicing operations, or gating flexibility
- Constrained property requires impacts to terminals and roadways to reconfigure airside layout

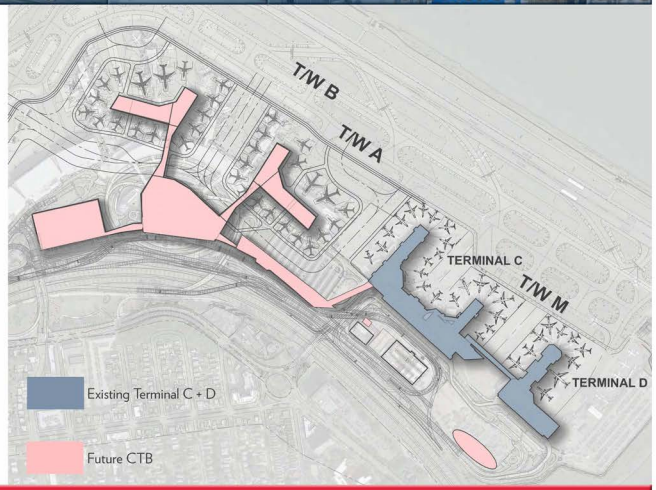


THE PORT AUTHORITY OF NY & NJ

East Side Reconfiguration at LaGuardia Airport
No Action Alternative

No Action Alternative:

- Assume CTB redevelopment is constructed as planned, but Terminal C+D remain in current state
- 31 contact gates and 7 hard stand gates (requires long walk or busing for some passengers)
- Limited gating flexibility due to insufficient clearances between gate positions
- Single taxilanes between concourses maintain high taxi times and delays
- Constrained check-in hall
- Crowded gate hold rooms
- Fragmented functions (security screening, baggage) across two terminals
- At-grade crossings between terminals and parking



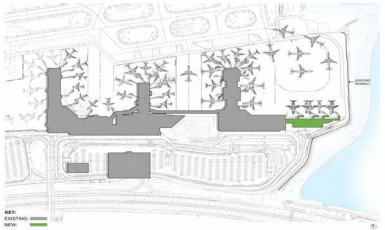
THE PORT AUTHORITY OF NY & NJ

East Side Reconfiguration at LaGuardia Airport
Alternatives Eliminated from Further Consideration

Terminal D Extension

- Maintain existing Terminals C&D and expand into P5
  - 4 new contact gates
  - 2 hardstand positions
  - Taxilane for ADG IV aircraft

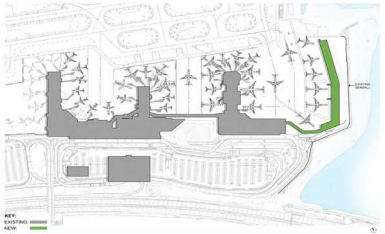
✓ Low cost, short construction schedule
- Limited gating flexibility
X No improvement for most gates



East Concourse

- Maintain existing Terminal C&D with new concourse in P5
  - 6 new contact gates
  - Dual taxilane

✓ Low cost, short construction schedule
- Reduced taxi times and gate wait delays for east side gate only
- Limited gating flexibility
X No improvement for most gates



Alternatives Do Not Meet Purpose And Need.

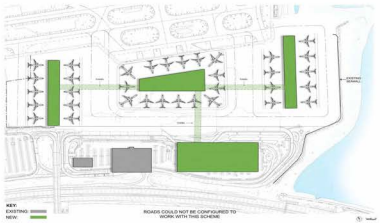
THE PORT AUTHORITY OF NY & NJ

East Side Reconfiguration at LaGuardia Airport
Alternatives Eliminated from Further Consideration

Island Concourse

- All new headhouse with 3 island concourses
  - 35 contact gates
  - Dual taxilanes between concourses

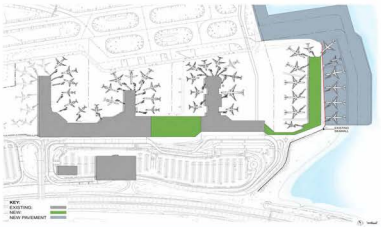
✓ Dual taxilanes would reduce taxi times and delays
✓ Improved in-terminal conditions
X Only 35 gates - would not meet forecasted demand
X Design challenges for tunnels or bridges connecting to concourses



Expansion into Flushing Bay

- Combine Terminals C&D into single headhouse and construct new concourse in P5
  - New taxilane within Flushing Bay

✓ Gating flexibility and dual taxilanes for eastern concourses
✓ Increased number of contact gates
X No improvements to west concourses
X Significant environmental impacts and high construction costs



Alternatives Do Not Meet Purpose And Need.

THE PORT AUTHORITY OF NY & NJ

East Side Reconfiguration at LaGuardia Airport
Proposed Action
Airside

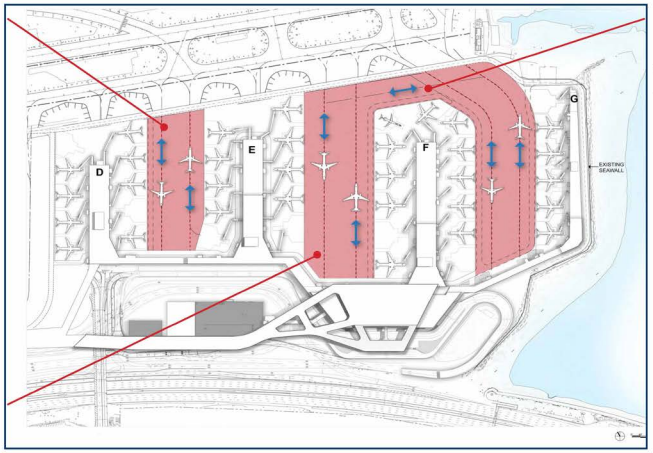
Reconfigured Apron with Dual Taxilanes would reduce average taxi time by 2.1 minutes

Flexible gate system including:
- **37 contact gate positions**
  - **27 gates for ADG II & III aircraft**
  - **10 gates for ADG IIIa aircraft**

6 Deicing positions

4 Remain Overnight (RON) positions

Ground Service Equipment Fuel Island



Reconfigured Taxiway "M"

Vehicle Service Roads for Ground Service Equipment

Charging stations for electrical ground service equipment

Upgraded Aircraft Ground Power and Pre-Conditioned Air at each gate

THE PORT AUTHORITY OF NY & NJ

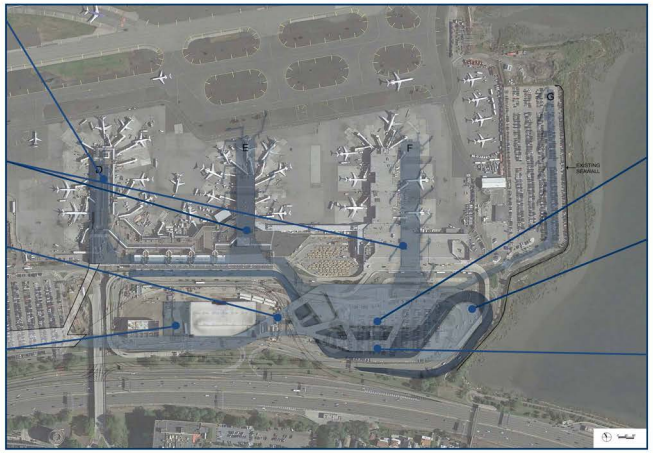
East Side Reconfiguration at LaGuardia Airport
Proposed Action
Terminal and Landside

Larger gate hold areas

2 Ramp Control Towers

Streamlined access between terminal and garage via new elevated connector

Expanded East Garage



LEED Silver Certified Terminal Building

Consolidated Passenger Screening Check Points

Taxi-hold Lot for 300 vehicles

Curbside Check-in with convenient access to security level

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East Side Reconfiguration at LaGuardia Airport
Proposed Action
Landside

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East Side Reconfiguration at LaGuardia Airport
Proposed Action
Terminal

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East Side Reconfiguration at LaGuardia Airport
Visual Impacts

- New terminal building and connector to CTB set closer to Grand Central Parkway
- Unified airport design
- Row of modern buildings connected by unified roof

- East Terminal maximum height = 110' above ground level
  - Comparable to future CTB (112')
- Aligned with East Garage, substation, future CTB, and West Garage
- No blocked views from neighborhood across GCP

THE PORT AUTHORITY OF NY & NJ

East Side Reconfiguration at LaGuardia Airport
Air Quality and Sustainable Design

Air Quality:
- Modeled aviation related emissions
  - Reduce aircraft taxi time by average of 2.1 minutes
  - Install 400 Hz power at each gate (power aircraft rather than use jet fuel while parked at the gate)
  - Pre-conditioned air at each gate (heat/cool aircraft between flights)
  - Charging stations for electric ground service equipment (baggage tractors, belt loaders, pushback tractors)
- Reduce emissions compared to No Action
- Larger terminal area offset by newer, more efficient central utility plant.
- Greenhouse gas emissions reduced by almost 4,000 tons per year (CO_2e)

Sustainability:
- Leadership in Energy and Environmental Design (LEED) Silver (minimum)
- Ice storage tanks would store ice produced off peak to cool terminal during peak hours
- PANYNJ Sustainability Design Guidelines
  - Require ultra-low sulfur diesel fuel (construction)
  - Retrofit construction equipment with best available emission control devices
- PANYNJ Design Guidelines - Climate Resilience
  - Incorporate sea level rise in building levels

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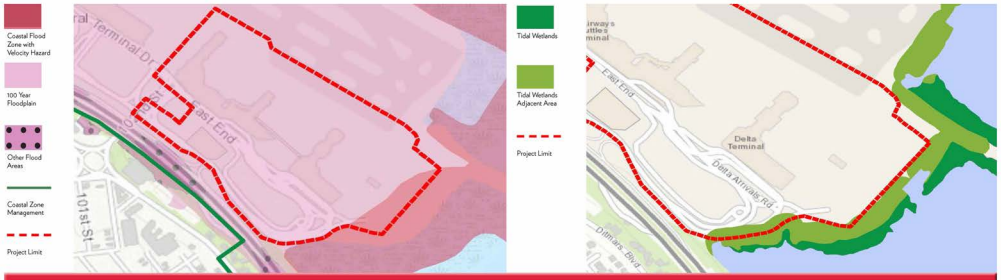
East Side Reconfiguration at LaGuardia Airport
Water Resources

Coastal Resources:
- Airport within New York City Coastal Zone
- No in-water activities and no impacts to coastal habitat
- Proposed Action consistent with NYC's Waterfront Revitalization Program and State Waterfront Revitalization of Coastal Areas and Inland Waterways Act

Floodplains:
- Project site within 1% chance floodplain
  - Portion of site within coastal flood zone with velocity hazard
- No practical alternative to avoid floodplain
- Flood hazard mitigation measures
  - Adjust building levels for sea level rise
  - Dry flood-proof critical areas and equipment

Wetlands:
- Tidal wetlands along eastern perimeter of the site
- No wetlands within project area
  - Some construction within 150 foot "adjacent area"
- Tidal Wetlands Permit from NYSDEC
  - No mitigation required



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East Side Reconfiguration at LaGuardia Airport
Environmental Impacts

Category	Assessment
Biological Resources	• Limited observed wildlife of little to no significance in area. • Piping plovers reported incidentally; Snowy owl (migratory bird) observed at airport. • No impact to federal- or state-listed species or habitat
Department of Transportation Section 4(f)	• No public parks, recreational lands, open space, wildlife/waterfowl refuges or historic resources in project limits • No permanent, temporary or constructive use of Section 4(f) resources
Farmland	• No farmlands in vicinity of the Airport
Hazardous Materials & Solid Waste	• Potential for hazardous materials (soil contaminants, asbestos, lead, PCBs) to be removed during construction • Soil and construction debris reused or recycled to extent possible • Recycling of solid waste at new terminal, per PANYNJ Sustainable Design Guidelines
Historic Architecture, Archaeological Sites, Cultural Resources	• No historic properties within the area of potential effect • Small area of archaeological sensitivity (SE corner) will be monitored during construction
Land Use	• No changes in land use on or off Airport and no changes to local zoning plans
Natural Resources & Energy Supply	• Emphasis on recycled and locally sourced construction materials • Nominal increase in energy usage during construction • Decrease in future fuel consumption due to reduced aircraft taxi times & increased GSE, PCAir, and ground power at gates
Noise	• No increase in noise from aircraft or vehicular traffic • Construction equipment noise levels below State & City thresholds • Noise attenuation measures for pile-driving
Social Impacts, Environmental Justice, Socioeconomics	• Benefits to local and regional economies from construction spending and jobs • No disproportionate adverse impact to EJ communities

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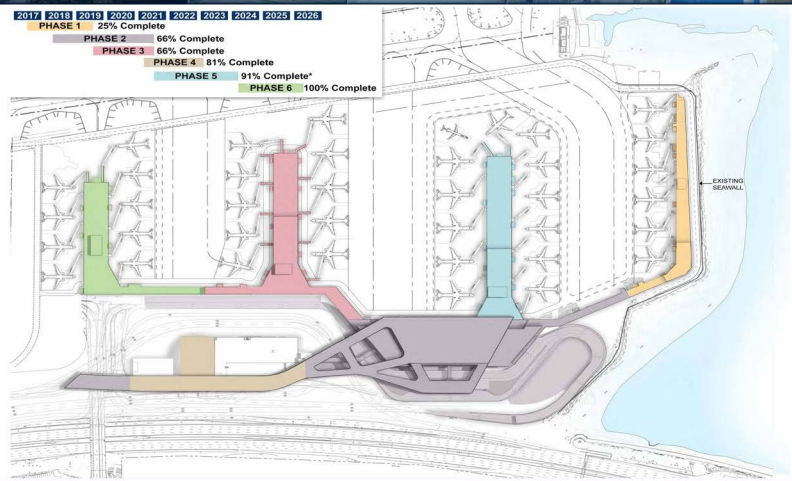
East Side Reconfiguration at LaGuardia Airport
Construction Timeline



*The civil work for Concourse D will be substantially complete in mid - 2024, with aircraft parking in their final configuration

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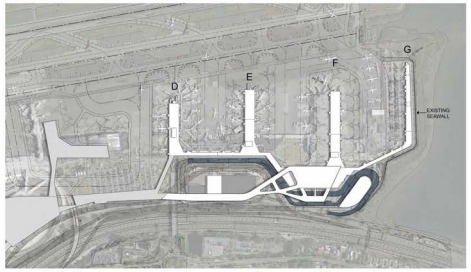
East Side Reconfiguration at LaGuardia Airport
Construction *Traffic Impacts*

East Side Reconfiguration Roadways



- Landside Transportation Management Command Center
  - Created by PANYNJ and LaGuardia Gateway Partners
  - Manage real-time traffic conditions from CTB Redevelopment Program construction
  - Use on-site traffic monitoring cameras and vehicle detection sensors
  - Incorporate passenger flight activity and off- airport traffic conditions
  - Report on traffic and implement mitigation measures
- Delta will have its own traffic monitoring program to collaborate with Landside Transportation Management Command Center

- Contractor parking at Citi Field
- Trucks would use NYC DOT truck routes
- Peak construction traffic in July 2019
- Analyzed 11 key intersections near airport, per CEQR Technical Manual
  - Only 1 temporary improvement (Northern Blvd/ Junction Blvd) to ensure no significant traffic impacts

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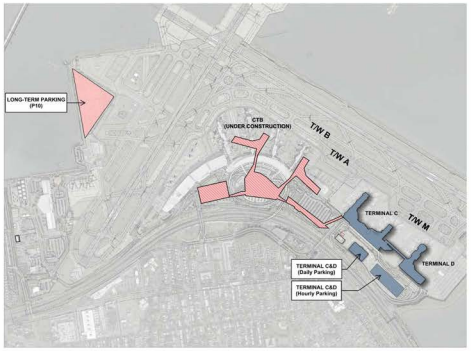
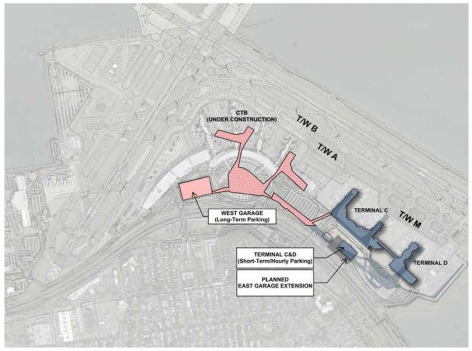
East Side Reconfiguration at LaGuardia Airport
Patron Parking During Construction





West Garage Under Construction

West Garage Complete (February 2018)

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East Side Reconfiguration at LaGuardia Airport
Construction *Other Impacts*

Air Quality:
- Emissions from construction equipment and/or trucks below demand threshold
- No significant cumulative impacts from CTB construction
- Best management practices and emissions reduction strategies to reduce emissions
  - use ultra low sulfur diesel fuel
  - retrofit equipment with emission control devices

Noise:
- Construction Noise Control Plan will be developed
- No pile-driving at night
- Noise attenuating measures (resilient pad in anvil chamber, steel enclosure around hammer exhaust, acoustical paint across web of each pile)

Hazardous Materials:
- Demolition of buildings and excavation of soil may uncover hazardous materials and waste
- Safety procedures, remediation strategies, and removal protocols for the handling and storage of hazardous materials

Solid Waste:
- Demolition and construction waste (including soil) will be generated
- Soil and construction debris reused or recycled to greatest extent possible
- Goal of diverting 75% of construction debris from receiving landfills (50% typical)

Water Resources:
- Changes in stormwater runoff would be minor
- Water quality best management practices and control measures will be implemented
- State Pollutant Discharge Elimination System (SPDES) permit

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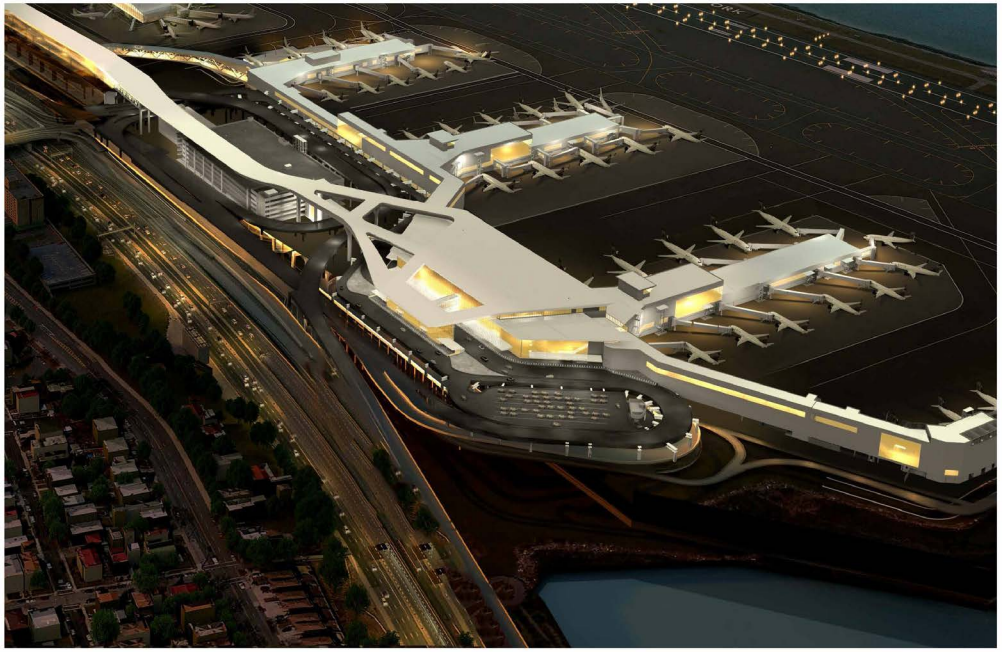

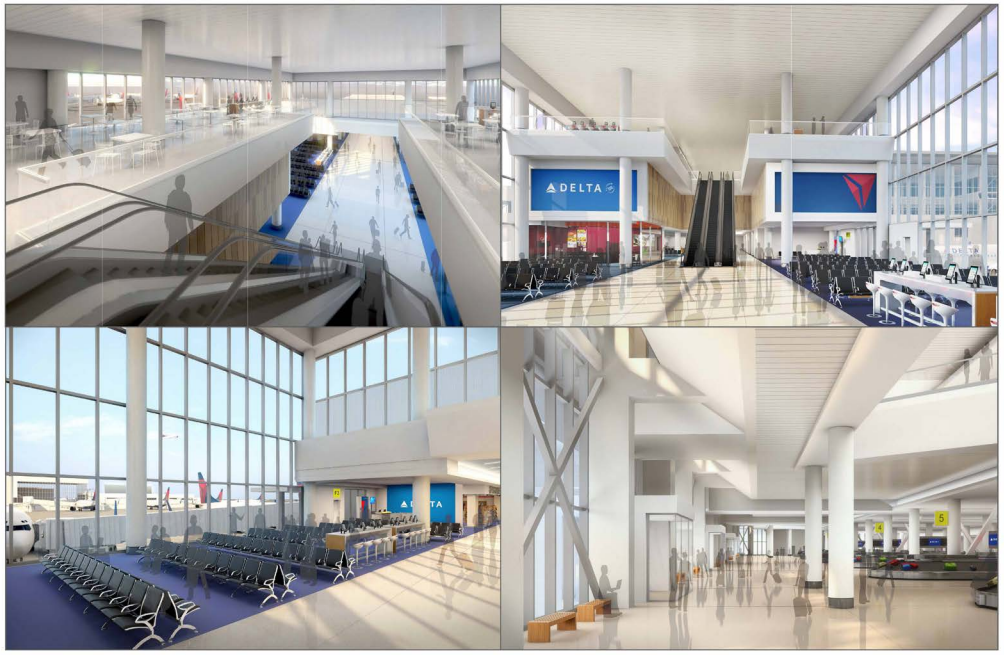

Your Voice Counts

To make sure your comments are recorded as part of the process, you may:

1. Give oral testimony at the Public Hearing
2. Submit written comments at Information Session or Public Hearing
3. Send comments in writing to:

The Port Authority of NY & NJ Aviation Department
Attn: Kathryn Lamond
4 World Trade Center, 18th Floor
New York, NY 10007

4. E-mail comments to: LGAEASTEA@panynj.gov with the subject heading "LGA EAST SIDE EA COMMENT"

Comments are due by 5:00 PM on May 15th, 2017

THE PORT AUTHORITY OF NY & NJ

Attachment 2 - Public Hearing Transcript

Minutes of the Public Hearing for the East Side Reconfiguration at LaGuardia Airport, Draft Environmental Assessment

PUBLIC HEARING

Held on Wednesday, May 3, 2017, taken at the Sheraton LGA, 135-20 39th Avenue, Flushing, New York, 11354, commencing at 7:00 p.m., before Terri Fudens, a Court Reporter and Notary Public in and for the State of Florida.

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PUBLIC HEARING

APPEARANCES:

Nicole Weymouth

Katie Lamond

Ryan Marzullo

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PUBLIC HEARING

PUBLIC HEARING

MAY 3, 2017

MS. WEYMOUTH: We're going to get started now. On behalf of the Port Authority of New York & New Jersey and Delta Air Lines, I would like to welcome you to the Public Hearing for the East Side Reconfiguration at LaGuardia Airport, Draft Environmental Assessment.

My name is Nicole Weymouth. I am from WSP, part of the consultant team that helped prepare the Draft Environmental Assessment. Seated up here with me are representatives from the Port Authority and Delta Air Lines.

We welcome you here tonight to hear a presentation on the reconfiguration project and provide you with an opportunity to make formal comments on the Draft Environmental Assessment for the official record.

This hearing is being conducted to fulfill the public involvement requirements of the National Environmental Policy Act of 1969, as amended, known as NEPA.

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PUBLIC HEARING

Please let me introduce from the Port Authority of New York & New Jersey the airport sponsor, Katherine Lamond, environmental specialist, and from Delta Air Lines, Ryan Marzullo, managing director. In few minutes Ryan is going to give the official presentation on the project.

NEPA establishes procedural requirements for all Federal Government agencies in their decision-making process. Those requirements govern the preparation of the Environment Assessment, this public hearing, and the decision-making process to determine whether or not to grant approval to the Port Authority to pursue this action.

Pursuant to those requirements, notices for this hearing were published on the Port Authority's website at (www.panynj.gov/about/studies-reports.html) and in the following newspapers: Daily News (Queens Edition), Newsday, Queens Chronicle, Queens Gazette, Queens Time Ledger, Queens Ledger, El Especialito, The National Herald, Sing Tao Daily, Queens Courier and the Queens

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Tribune.

The Draft Environmental Assessment was made available for public review starting on April 3, 2017 at the Port Authority's Administration Building at LaGuardia Airport at Hangar 7, Port Authority's office in Manhattan at 4 World Trade Center, and the two branches of the Queens Borough Public Library in Jackson Heights and in Flushing.

The Draft Environmental Assessment will continue to be available for public comment until May 15 at 5:00 p.m. We look forward to listening to and recording your comments here tonight. If you don't want to provide public testimony, you can still submit a comment by the registration desk out front, or provide your comments via E-mail or regular mail at a later time until May 15.

I will now turn it over to Katherine Lamond of the Port Authority.

MS. LAMOND: Good evening and thank you for coming. We realize there have been a lot of changes at LaGuardia recently, and we feel this project will continue the

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progress that has already started.

We are here tonight because we are interested in hearing what you have to say about this project. Any comments received tonight or anytime during the comment period will be addressed in the Final EA. Following the end of the comment period, the Port Authority will work with Delta Air Lines and our consultant team to review and respond to all the comments received tonight.

A final Environment Assessment will then be prepared and submitted to the FAA, the lead federal agency for this NEPA process. The Final EA will include all testimony and comments and will be subject to independent review by the FAA and subsequent environmental determination.

Thank you again for your comments and for your interest in this project.

Now Ryan will give a brief presentation.

MR. MARZULLO: Good morning everyone and thank you for coming out, and thanks to everyone who has been here for the past four

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or five hours.

My name is Ryan Marzullo, the managing director of Delta Air Lines. I oversee the two New York airports and the airport in New Jersey for Delta, the design construction facilities.

So I will give you a brief overview of the proposed action.

(Whereupon, a presentation was given by Ryan Marzullo, including a video that was played.)

MS. WEYMOUTH: So now I would like to go over the procedures for the public testimony portion of the hearing.

The purpose of this hearing is for interested parties to provide comments. As such, we will listen to your testimony, but will not respond to comments or questions. The project representatives in the room are available to clarify information or to direct you to where you can obtain more information in the available EA documentation. Note that all testimony provided at this hearing will be included in the public record as part of

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the Final EA.

I will call the names of the people who have signed up to speak in the order they signed up. If there are any elected officials who would like to speak, I don't believe so, they may go first.

As I call your name, please walk up to the microphone there in the middle of the room to give your testimony. We ask that everyone please state your name and affiliation before you begin your testimony.

Please note that the testimony is being transcribed by a stenographer here. We ask that you speak slowly and clearly so that she can fully capture your remarks.

Each person's testimony will be limited to three minutes, although we will allow a little flexibility considering there doesn't seem to be a lot of speakers. And if you wish to speak but haven't signed up yet, please do so now at the registration desk out front.

A couple of housekeeping items. Note that the hearing procedures are being

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recorded. As a courtesy, please turn off your cell phones and respect the individual speakers throughout the hearing. We ask that there should be no clapping or cheering during or at the conclusion of anyone's testimony. And please note that any personal information, name, address, et cetera may be releasable to the public under the Freedom of Information Act.

We'll go to our first speaker who is Bill Huisman.

MR. HUISMAN: Good evening, everybody. My name is Bill Huisman. I'm Executive Director of Aviation Development Council, and I would like to read my testimony to save a lot of time.

Aviation Development Council supports the Port Authority of New York and New Jersey's proposed East Side Reconfiguration at LaGuardia Airport. This project, which includes the replacement of the existing Terminals C and D with a new, modern single terminal and the construction of associated air and landside improvements is needed to

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improve not only aircraft operations, reduce delays, improve customer service and provide greater aircraft gating flexibility for the airlines operating at what is currently an antiquated two-terminal operation at LaGuardia Airport.

The project is a distinct improvement which is noted in the report to the Governor from the Airport Advisory Panel, which I'm sure a lot of people are already aware of.

The project provides continuity to the Central Terminal Building creating a new efficient and unified airport. Passengers will benefit with larger wait areas, improved vehicle drop off and pick up areas with direct access of course to security, improved security screening, safe and convenient access to the parking garage via a pedestrian bridge, more efficient security screening, which I already mentioned, and baggage claim as well, and improved amenities. This includes new concessions and restaurants.

In addition to the airside benefits, the project provides increased level of

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service overall, reduced delays and less time spent taxiing, with significant air quality benefits.

The Aviation Development Council is a bridge organization between the Port Authority of New York and New Jersey, the airlines that operate from all Port Authority managed or owned airports, and the communities served. We help advance the significant economic benefit of our local airports by promoting the local purchase of products and services from community businesses by the airlines and aviation companies serving the Port Authority airports.

ADC also administers a grass-roots grant program providing funding to local non-profit organizations that focus on youth wellness, youth education and cultural enhancement for young people.

Delta has been directly involved in this community grant outreach program along with the other airline partners of Aviation Development Council. This confirms Delta's commitment to our local communities beyond

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the commercial benefits of a new facility.

We, therefore, fully support Delta Air Lines and the Port Authority of New York & New Jersey in the advancement of this reconfiguration project for LaGuardia, and we look forward to the actualization of this project.

MS. WEYMOUTH: Santos Rodriguez.

MR. RODRIGUEZ: Good evening, everyone. My name is Santos Rodriguez. I am the Director of Community Affairs and Strategic Initiatives for the Building and Construction Trades Council of Greater New York and the vicinity.

I am here on behalf of the Building and Construction Trade Council in support of the LaGuardia/Delta terminal project. The Building and Construction Trades Council is an organization of local building and construction trade unions that are affiliated with 15 international unions in the North American Building Trades Union.

Our local union affiliates represent approximately 100,000 construction workers.

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The Building Trades' mission is to raise the standard of living for all workers, to advocate for safe conditions, and to collectively advance working conditions for our affiliates, members, as well as all workers in New York City.

The Building and Construction Trades Council has long been a strong proponent of infrastructure projects as a way of sustaining and stimulating economic growth as well as improving quality of life.

We strongly support Delta's partnership with Governor Cuomo and the Port Authority to help rebuild and redesign LaGuardia Airport.

Projects such as this that upgrade and modernize existing facilities, stimulate growth, create jobs, improve transportation and provide a more pleasant experience for commuters and citizens are the types of projects we need to bring out city and state through the 21st Century and into the future.

Delta's investment in this project, along with its partnership with the State of

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New York, will help transform LaGuardia Airport into a world transportation hub. The Building and Construction Trades Council of Greater New York and vicinity strongly supports this project.

Thank you for your time and your consideration.

MS. WEYMOUTH: There are no other people signed up at this time.

Is there anybody here in the room that would like to speak?

We are going to keep the hearing open up until 9 p.m., since that was how we advertised. But until somebody else jumps up that wants to speak, we'll put it on a pause.

Thank you.

(Whereupon, a recess was taken.)

MS. WEYMOUTH: As there are no other people who wish to speak and it's 9 p.m., I will close the hearing.

(Whereupon, the Public Hearing concluded at 9:00 p.m.)

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PUBLIC HEARING

CERTIFICATE

I, Terri Fudens, a stenotype reporter and Notary Public within and for the State of New York do hereby certify:

That the foregoing transcription is a true record of my stenographic notes.

I further certify that I am not related to any of the parties by blood or marriage and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand.

Terri Fudens

Court Reporter

Notary Public

DATED: May 9, 2017

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Attachment 3 - Meeting Notifications

THE PORT AUTHORITY OF NY & NJ

NOTICE OF AVAILABILITY, REQUEST FOR COMMENT and NOTICE OF PUBLIC HEARING

Draft Environmental Assessment
EAST SIDE RECONFIGURATION
LaGuardia Airport, Flushing, New York

In accordance with the National Environmental Policy Act, notice is hereby given that copies of a Draft Environmental Assessment (EA) for the reconfiguration of the east side terminal area of LaGuardia Airport are available for public review and comment at the following locations:

The Port Authority of NY & NJ
Aviation Department
4 World Trade Center,
18th Floor
New York, NY 10007
Attn: Kathryn Lamond
Hours: 9:00 am to 5:00 pm

The Port Authority of NY & NJ
LaGuardia Airport
Hangar 7
(Marine Air Terminal area)
Flushing, NY 11371
Attn: General Manager's Office
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 Draft EA document for this project will be available at these locations until the close of the comment period, which is 5:00 PM on Monday, May 15, 2017. If you intend to view the document at the WTC location, please contact Kathryn Lamond at (212) 435-3783 at least one day before your visit to schedule an appointment. A copy of this document may also be viewed online at: http://www.panynj.gov/about/studies-reports.html

The Draft EA document responds to all of the requirements of the Federal Aviation Administration for preparation of an EA under NEPA, and also documents compliance with Federal Executive Order 11988: Floodplain Management and amendment, Executive Order 13690.

INFORMATION SESSION AND PUBLIC HEARING

Additional information regarding this project, an opportunity to ask questions about the project, and an opportunity to comment on the project for the official record will be available through an Information Session and a Public Hearing. The details of the date, times, and location are listed below.

DATE: Wednesday May 3, 2017

TIMES: **INFORMATION SESSION 3:00PM – 6:00PM**
PUBLIC HEARING 7:00PM – 9:00PM

LOCATION: Sheraton LaGuardia East hotel
135-20 39th Ave, Flushing NY 11354
Phone: (718) 460-6666

Comments on the project may be submitted in writing, or verbally at the Public Hearing. Sign language, oral interpretation and translation services can be made available at the Public Hearing. If you are in need of assistance or require a reasonable accommodation, contact Kathryn Lamond at The Port Authority of NY & NJ, 4 World Trade Center, 18th Floor, New York, NY 10007 at least ten (10) days prior to the Public Hearing.

Written comments on the draft EA can also be sent directly to Kathryn Lamond of the Port Authority, 4 World Trade Center, 18th Floor, New York, NY 10007. Additionally, comments may be emailed to LGAEASTEA@panynj.gov with the subject heading "LGA EAST SIDE EA COMMENT." The comment period closes at 5:00PM on Monday, May 15, 2017. If you have any questions on this notice, please contact Kathryn Lamond at (212) 435-3783.

Posted April 03, 2017

REAL ESTATE

Queens

ST ALBANS - 1 Fam, Det, 4 Brs, 2.5 Ba, DR, Full Bsmt, Pvt Drvwy, Gar, Big Bkyd, Nr Shopping Ctr & Transp. $229K. Owner 1-786-422-4845

St. Albans Newly Reno 1-Fam 4 BR, 3 BA, Huge Fin Bsmt w/Pvt Dvwy, Gar & Huge Backyard. $300K ★★★ Owner 917-833-9759 ★★★

Orange Co.

Highland Mills OPEN HOUSE Sunday's 12-4pm★104 Brigadoon Blvd 1 Fam, Col 5 Br, 2.1 Ba, 3700 sq.ft, Granite Kit, Hdwd flrs, Nat Gas, CA 50 miles to NYC, nr Woodbury Cmns $420,000 Owner 845-234-2220

Pennsylvania

DINGMANS FERRY PA HOME Nice Home / land w/huge oversized garage.Email for info $169,990 dogs162002@yahoo.com Owner

NOTICES

Legal Notices

101 RENTALS LLC Articles of Org. filed NY Sec. of State (SSNY) 5/3/16. Office in Queens Co. SSNY design. Agent of LLC upon whom process may be served. SSNY shall mail copy of process to The LLC 108-18 Queens Blvd Ste 906 Forest Hills, NY 11375. Purpose: Any lawful activity.

1221 120TH ST LLC Articles of Org. filed NY Sec. of State (SSNY) 7/22/15. Office in Queens Co. SSNY design. Agent of LLC upon whom process may be served. SSNY shall mail copy of process to Sin Wai Sit 32 Monroe St Apt 2A New York, NY 10002. Purpose: Any lawful activity.

NOTICE OF SALE

SUPREME COURT COUNTY OF QUEENS, WILMINGTON SAVINGS FUND SOCIETY, FSB, DOING BUSINESS AS CHRISTIANA TRUST, NOT IN ITS INDIVIDUAL CAPACITY, BUT SOLELY AS TRUSTEE FOR BCAT 2015-13ATT, Plaintiff, vs. MALIK JAVED A/K/A MALIK A. JAVED, ET AL., Defendant(s).

Pursuant to a Judgment of Foreclosure and Sale duly filed on November 23, 2016, I, the undersigned Referee will sell at public auction at the Queens County Courthouse, Courtroom 25, 88-11 Sutphin Boulevard, Jamaica, NY on April 21, 2017 at 10:00 a.m., premises known as 160-01 84th Road a/k/a 16001 84th Road, Jamaica, NY. All that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of Queens, County of Queens, City and State of New York, Block 9790 and Lot 10. Approximate amount of judgment is $777,881.64 plus interest and costs. Premises will be sold subject to provisions of filed Judgment Index # 24373/12.

Rita Solomon, Esq., Referee
Knuckles, Komosinski
& Manfro, LLP,
565 Taxter Road, Ste. 590,
Elmsford, NY 10523,
Attorneys for Plaintiff

PUBLIC AUCTION

NOTICE OF SALE OF COOPERATIVE APARTMENT SECURITY
By virtue of default in a Collateral Pledge Agreement dated July 13, 2001, as amended by agreements dated September 1, 2006, September 2, 2008, August 17, 2010, September 28, 2012, and December 22, 2014, executed by ELIZABETH KANU, debtor, and in accordance with its rights as holder of the Security, HERMAN J. GEISER, by Victor Marino, Auctioneer, DCA, # 1005640 and/or Donald Leung, Auctioneer, DCA # 1392572 and/or Melanie Pena, Auctioneer, DCA # 1471969 will conduct a public sale of the security consisting of 212 shares of capital stock in FOUNTAINS-CLOVE ROAD APARTMENTS, INC., and all rights title and interest in and to a Proprietary Lease between said corporation and debtor for Apartment UNIT 5D in a building known as and by the street address, 1000 CLOVE ROAD, STATEN ISLAND, NEW YORK 10301, together with fixtures and articles of personal property now or hereafter affixed to or used in connection with said apartment on April 20, 2017 at 11:15 a.m. at the Richmond County Courthouse, 18 Richmond Terrace, Room 106, Staten Island, New York 10301, in satisfaction of an indebtedness in the principal amount of $43,558.34, plus interest, late fees, attorneys fees, maintenance in arrears and all other advanced charges. Such sale shall be subject to the terms of sale, any existing tenancy, and the consent of and payment of all sums due, if any, to FOUNTAINS-CLOVE ROAD APARTMENTS, INC., and/or their attorneys.
The secured party reserves the right to bid. Closing within 30 days.
The Law Firm Hall & Hall, LLP
57 Beach Street
Staten Island, New York 10304
(718) 568-0442
D & V Legal Advertising, LLC
718-875-9677

Legal Notices

THE PORT AUTHORITY OF NY & NJ

NOTICE OF AVAILABILITY, REQUEST FOR COMMENT and NOTICE OF PUBLIC HEARING

Draft Environmental Assessment
EAST SIDE RECONFIGURATION
LaGuardia Airport, Flushing, New York

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LaGuardia Airport
Hangar 7
(Marine Air Terminal area)
Flushing, NY 11371
Attn: General Manager's Office
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35-51 81st Street
Jackson Heights, NY 11372
Hours: Check with library branch

Queens Borough Public Library
41-17 Main Street
Flushing, NY 11355
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PUBLIC HEARING 7:00PM – 9:00PM
LOCATION: Sheraton LaGuardia East hotel
135-20 39th Ave, Flushing NY 11354
Phone: (718) 460-6666

Comments on the project may be submitted in writing, or verbally at the Public Hearing. Sign language, oral interpretation and translation services can be made available at the Public Hearing. If you are in need of assistance or require a reasonable accommodation, contact Kathryn Lamond at The Port Authority of NY & NJ, 4 World Trade Center, 18th Floor, New York, NY 10007 at least ten (10) days prior to the Public Hearing.

Written comments on the draft EA can also be sent directly to Kathryn Lamond of the Port Authority, 4 World Trade Center, 18th Floor, New York, NY 10007. Additionally, comments may be emailed to LGAEASTEA@panynj.gov with the subject heading "LGA EAST SIDE EA COMMENT." The comment period closes at 5:00PM on Monday, May 15, 2017. If you have any questions on this notice, please contact Kathryn Lamond at (212) 435-3783.

NOTICE OF SALE

SUPREME COURT COUNTY OF QUEENS, NYCTL 1998-2 TRUST AND THE BANK OF NEW YORK MELLON AS COLLATERAL AGENT AND CUSTODIAN, Plaintiff, vs. CROWN ENTERPRISES OF NY INC., ET AL., Defendant(s).

Pursuant to a Judgment of Foreclosure and Sale dated March 1, 2017 and entered on March 6, 2017, I, the undersigned Referee will sell at public auction at the Queens County Supreme Courthouse, Courtroom 25, 88-11 Sutphin Boulevard, Jamaica, NY on April 28, 2017 at 10:00 a.m., all that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of Queens, County of Queens, City and State of New York, Block 10934 and Lot 185. Said premises may also be known as 109-35 197 Street, Queens, NY. Approximate amount of judgment is $16,693.94 plus interest and costs. Premises will be sold subject to provisions of filed Judgment and Terms of Sale.
Index # 703917/15.

Hon. Luther V. Dye, Referee
The Law Office of
Thomas P. Malone, PLLC,
60 East 42nd Street, Suite 927,
New York, New York 10165,
Attorneys for Plaintiff

NOTICE OF QUALIFICATION OF Saminski, Rodriguez & Papadopoulo, LLC filed with the Secretary of State of NY (SSNY): Application for Authority on date February 09, 2017. Office location Richmond County formed in LLC State of Origin NJ on date October 21, 2016 SSNY has been designated as agent upon whom process against it may be served. The Post Office address to which the SSNY shall mail a copy of any process against the: LLC served upon him/her is William Rodriguez. The principal business address of the: LLC is 79 Hudson Street # 201, Hoboken, NJ 07030. Certificate of LLC filed with Secretary of State of New Jersey located at 33 West State Street, Trenton, NJ 08608
Purpose: any lawful act or activity: Law Firm
Dissolution date:

178 Foster LLC. Filed with SSNY on 2/14/17. Formed in NJ on 1/18/17. Office: Richmond County. SSNY designated as agent for process & shall mail to: 178 Foster Rd SI NY 10309. NJ SOS: 33 W State St 5th Fl Trenton NJ 08608. Purpose: any lawful

Legal Notices

1861 Victory Boulevard Holding Company LLC. Filed with SSNY on 2/2/17. Office: Richmond County. SSNY designated as agent for process & shall mail to: 251 Malvine Ave SI NY 10309. Purpose: any lawful

3657 36TH STREET REALTY, LLC. Cert. of Con. filed with the SSNY on 12/29/16. Office: Queens County. SSNY designated as agent of the LLC upon whom process against it may be served. SSNY shall mail copy of process to the LLC, 35-11 41st Street, 2nd Floor, Long Island City, NY 11101. Purpose: Any lawful purpose.

45-14 SKILLMAN AVENUE LLC. Art. of Org. filed with the SSNY on 02/06/17. Office: Queens County. SSNY designated as agent of the LLC upon whom process against it may be served. SSNY shall mail copy of process to the LLC, 45-14 Skillman Avenue, Sunnyside, NY 11104. Purpose: Any lawful purpose.

5 GEISER RD LLC Articles of Org. filed NY Sec. of State (SSNY) 1/24/17. Office in Queens Co. SSNY design. Agent of LLC upon whom process may be served. SSNY shall mail copy of process to C/O John L. Dellafiora 22-42 129th St College Pt, NY 11356. Purpose: Any lawful activity.

6735 MYRTLE AVENUE LLC. Arts. of Org. filed with the SSNY on 03/16/17. Office: Queens County. SSNY designated as agent of the LLC upon whom process against it may be served. SSNY shall mail copy of process to the LLC, 53-91 66th Street, Maspeth, NY 11378. Purpose: Any lawful purpose.

6739 MYRTLE AVENUE LLC. Arts. of Org. filed with the SSNY on 03/16/17. Office: Queens County. SSNY designated as agent of the LLC upon whom process against it may be served. SSNY shall mail copy of process to the LLC, 53-91 66th Street, Maspeth, NY 11378. Purpose: Any lawful purpose.

94 Trossach, LLC. Filed with SSNY on 3/2/17. Office: Richmond County. SSNY designated as agent for process & shall mail to: 101 Victory Blvd SI NY 10301. Purpose: any lawful

99 Union Avenue, LLC. Filed with SSNY on 2/13/17. Office: Richmond County. SSNY designated as agent for process & shall mail to: 23 Haywood St SI NY 10307. Purpose: any lawful

NOTICE OF SALE

BY VIRTUE OF DEFAULT in a security agreement filed on May 16, 2007, indebtedness due by July 1, 2037, by COLLEN QUINN AND JONATHAN MURPHY, in accordance with its rights as holder of the security, JPMORGAN CHASE BANK, N.A., its successors and/or assignees: by Victor Marino, Auctioneer, DCA, # 1005640 and/or Donald Leung, Auctioneer, DCA # 1392572 and/or Melanie Pena, Auctioneer, DCA # 1471969 will conduct a public sale of the security consisting of 356 shares of stock issued by 125 EASTERN OWNERS CORP., and all right title and interest in and to a proprietary lease in a building known as and by the street address 125 EASTERN PARKWAY, UNIT 4C, BROOKLYN, NY 11238-6053, with an estimated value of $999,000.00, together with fixtures and articles of personal property now or hereafter affixed to or used in connection with said apartment on April 20, 2017 at 11:00 a.m. at the "foot" of the courthouse steps, facing Adams Street, 360 Adams Street, Brooklyn, N.Y.: in satisfaction of an indebtedness in the original principal amount of $415,000.00, on which there remains an unpaid principal balance of $472,094.37 plus interest from July 1, 2014, subject to open maintenance charges.
Notice is hereby being given to COLLEN QUINN AND JONATHAN MURPHY that payment of the debt is due in full by March 30, 2017. Further, that if COLLEN QUINN AND JONATHAN MURPHY or any person(s) has a dispute of validity of the lien or amount claimed herein, it may be brought to proceeding under Lien Law, Section 201-a, within 10 days of the service of this notice.
You are entitled to an accounting of the unpaid indebtedness secured by the property that we intend to sell. You may request an accounting by calling us at (585) 232-7400 Ext. 257.
The secured party reserves the right to bid on the security interest, to set the minimum sale amount and to reject any and all bids. The secured party makes no warranties or representations. Each bidder must make his/her own inquiry regarding the apartment and any liens or debts in connection therewith. The sale is subject to the Terms of Sale, including ten (10%) percent deposit by cash or certified funds at the auction; balance due upon closing within thirty (30) days; the payment of all sums due to the cooperative corporation; and any existing tenancy.
The apartment will be sold AS IS, possession is to be obtained by purchaser(s).
Dated: March 15, 2017.
FEIN SUCH & CRANE, LLP
ATTORNEYS FOR
SECURED CREDITOR
JPMorgan Chase Bank, N.A.
28 East Main Street, Suite 1800
Rochester, N.Y. 14614
(585) 232-7400
D & V Legal Advertising, LLC
718-875-9677

Legal Notices

AJA Medical Supplies LLC. Filed with SSNY on 12/27/16. Office: Richmond County. SSNY designated as agent for process & shall mail to: 247 Hampton Green SI NY 10312. Purpose: any lawful

David S. Papadatos, LLC Articles of Org. filed NY Sec. of State (SSNY) 12/14/16. Office in Queens Co. SSNY Agent of LLC upon whom process may be served. SSNY shall mail copy of process to David Papadatos at 219-19 56th Ave, Bayside Hills, NY 11364. Purpose: Any lawful activity.

DDZD HOLDING LLC Articles of Org. filed NY Sec. of State (SSNY) 2/2/17. Office in Queens Co. SSNY design. Agent of LLC upon whom process may be served. SSNY shall mail copy of process to The LLC 250-45 Thornhill Ave Little Neck, NY 11362. Purpose: Any lawful activity.

DON CESAR'S RESTAURANT BAR LLC, Arts. of Org. filed with the SSNY on 02/16/2017. Office loc: Richmond County. SSNY has been designated as agent upon whom process against the LLC may be served. SSNY shall mail process to: Hector Bustamante, 7528 Amboy Road, Staten Island, NY 10307. Purpose: Any Lawful Purpose.

D&S MYRTLE, LLC Art. Of Org. Filed Sec. of State of NY 3/5/2015. Off. Loc.: Queens Co. SSNY designated as agent upon whom process against it may be served. SSNY to mail copy of process to The LLC, 144 North Hamel Drive, Beverly Hills, CA 90211. Purpose: Any lawful act or activity.

Dx3 designs LLC Arts of Org filed with NY Sec of State (SSNY) on 1/24/17. Office: Queens County. SSNY designated as agent of LLC upon whom process may be served. SSNY shall mail process to: Mordfin, LLP, 150 Great Neck Rd, #150, Great Neck, NY 11021. General Purposes.

NOTICE OF SALE

SUPREME COURT COUNTY OF QUEENS, WILMINGTON SAVINGS FUND SOCIETY, FSB, DOING BUSINESS AS CHRISTIANA TRUST, NOT IN ITS INDIVIDUAL CAPACITY, BUT SOLELY AS TRUSTEE FOR BCAT 2015-13BTT, Plaintiff, vs. VERILYN FULLER, ET AL., Defendant(s).

Pursuant to a Judgment of Foreclosure and Sale duly filed on August 12, 2016, I, the undersigned Referee will sell at public auction at the Queens County Courthouse, Courtroom 25, 88-11 Sutphin Boulevard, Jamaica, NY on May 05, 2017 at 10:00 a.m., premises known as 176-28 129th Avenue, Jamaica, NY. All that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of Queens, County of Queens, City and State of New York, Block 12527 and Lot 68. Approximate amount of judgment is $554,466.62 plus interest and costs. Premises will be sold subject to provisions of filed Judgment Index # 19996/13.

Karen Grant, Esq., Referee
Knuckles, Komosinski
& Manfro, LLP,
565 Taxter Road, Ste. 590,
Elmsford, NY 10523,
Attorneys for Plaintiff

NOTICE OF SALE OF COOPERATIVE APARTMENT SECURITY
By virtue of default in a security agreement dated August 25, 1998, executed by MODI HANINOVICH AND RONI BEN N. HANINOVICH, Debtors, and in accordance with its rights as holder of the Security, JPMorgan Chase Bank, N.A., by Victor Marino, Auctioneer, DCA # 1005640 and/or Donald Leung, Auctioneer, DCA # 1392572 and/or Melanie Pena, Auctioneer, DCA # 1471969 will conduct a public sale of the security consisting of 826 shares of common stock in OAK Equities Corp. and all rights title and interest in and to a Proprietary Lease between said corporation and debtor for Cooperative Unit 16C in a building known as and by the street address, 512 West End Avenue A.K.A. 514 West End Avenue, New York, New York 10024, together with fixtures and articles of personal property now or hereafter affixed to or used in connection with said apartment on April 19, 2017 at 12:30 p.m. at the Rotunda of the New York County Supreme Court Building, 60 Centre Street, New York, N.Y., in satisfaction of an indebtedness in the principal amount of $ 231,115.23 plus interest, late fees, attorney's fees, maintenance in arrears and all other advanced charges, an accounting of which will be provided upon request. Such sale shall be subject to the terms of sale, any existing tenancy, and the consent of and payment of all sums due, if any, to DAK Equities Corp., and/or their attorneys.
The secured party reserves the right to bid. Closing within 30 days.
Buckley Madole, P.C.
File # 9926-0504
420 Lexington Avenue – Suite 840
New York, New York 10170
Attorneys for Secured Creditor
D & V Legal Advertising, LLC
718-875-9677

Legal Notices

E&A Group LLC. Filed with SSNY on 3/8/17. Office: Queens County. SSNY designated as agent for process & shall mail to: 4561 163rd St Flushing NY 11358. Purpose: any lawful

East Broadway Associates Management LLC. Filed with SSNY on 12/21/16. Office: Richmond County. SSNY designated as agent for process & shall mail to: 1878 Victory Blvd SI NY 10314. Purpose: any lawful

Fammo Associates LLC. Filed with SSNY on 2/7/17. Office: Richmond County. SSNY designated as agent for process & shall mail to: 355 Fairbanks Ave SI NY 10306. Purpose: any lawful

GAZI LLC Arts of Org filed with NY Sec of State (SSNY) on 11/14/16. Office: Queens County. SSNY designated as agent of LLC upon whom process may be served. SSNY shall mail process to: 41-61 63rd St, Woodside, NY 11377. General Purposes.

Jco Behavioral Consulting, LLC Arts of Org. filed SSNY 1/3/17. Office: Richmond Co. SSNY design agent of LLC upon whom process may be served & mail to Incorp Services, Inc. 99 Washington Ave #805-A Albany, NY 12210 General Purpose

Largavista QP 41st, LLC, App. Of Auth. filed with Sec. of State of NY (SSNY) on 2/7/17. Cty: Queens. SSNY desig. as agent of LLC upon whom process against may be served & shall mail process to c/o Largavista Companies, 275 Madison Ave., 37th Fl., New York, NY 10016. General Purpose.

Mack & Mike Dream Homes LLC, Arts of Org. filed with Sec. of State of NY (SSNY) on 2/13/17. Cty: Queens. SSNY desig. as agent upon whom process against may be served & shall mail process to 146-88 181st St., Springfield Gardens, NY 11413. General Purpose.

Notice is hereby given that a license, number 1300629 for liquor, beer, and wine has been applied for by the undersigned to sell beer, liquor and wine at retail in a Bar/Tavern, under the Alcoholic Beverage Control Law at 10-29 44th Road, Long Island City, NY 11101 for On Premises consumption.
THE GOOD LIFE I LLC

PUBLIC AUCTION

NOTICE OF SALE OF COOPERATIVE APARTMENT SECURITY
By virtue of default in a security agreement dated June 3, 2004, executed by YOVANNE CHERY, Debtor, and in accordance with its rights as holder of the Security, JPMorgan Chase Bank, N.A., by Victor Marino, Auctioneer, DCA # 1005640 and/or Donald Leung, Auctioneer, DCA # 1392572 and/or Melanie Pena, Auctioneer, DCA # 1471969 will conduct a public sale of the security consisting of 104 shares of common stock in Site 14 Apartment Corporation and all rights title and interest in and to a Proprietary Lease between said corporation and debtor for Cooperative unit 1Q in a building known as and by the street address, 231-239 West 148th Street, New York, New York 10039 together with fixtures and articles of personal property now or hereafter affixed to or used in connection with said apartment on April 19, 2017 at 12:00 p.m. at the Rotunda of the New York County Supreme Court Building, 60 Centre Street, New York, N.Y., in satisfaction of an indebtedness in the principal amount of $79,849.34 plus interest, late fees, attorney's fees, maintenance in arrears and all other advanced charges, an accounting of which will be provided upon request. Such sale shall be subject to the terms of sale, any existing tenancy, and the consent of and payment of all sums due, if any, to Site 14 Apartment Corporation, and/or their attorneys.
The secured party reserves the right to bid. Closing within 30 days.
Buckley Madole, P.C.
File # 9926-2198
420 Lexington Avenue – Suite 840
New York, New York 10170
Attorneys for Secured Creditor
D & V Legal Advertising, LLC
718-875-9677

NOTICE OF SALE

SUPREME COURT COUNTY OF QUEENS, CENTRAL MORTGAGE COMPANY, Plaintiff, vs. MATTHEW LOUIS, ET AL., Defendant(s).

Pursuant to a Judgment of Foreclosure and Sale duly filed on January 25, 2017, I, the undersigned Referee will sell at public auction at the Queens County Courthouse, Courtroom 25, 88-11 Sutphin Boulevard, Jamaica, NY on April 28, 2017 at 10:00 a.m., premises known as 107-29 172nd Street, Jamaica, NY. All that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of Queens, County of Queens, City and State of New York, Block 10248 and Lot 86. Premises will be sold subject to provisions of filed Judgment Index # 7285/11.

Chanwoo Lee, Esq., Referee
Berkman, Henoch, Peterson,
Peddy & Fenchel, P.C.,
100 Garden City Plaza,
Garden City, NY 11530,
Attorneys for Plaintiff

ISL

THE PORT AUTHORITY OF NY & NJ

NOTICE OF AVAILABILITY, REQUEST FOR COMMENT and NOTICE OF PUBLIC HEARING

Draft Environmental Assessment
EAST SIDE RECONFIGURATION
LaGuardia Airport, Flushing, New York

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Jackson Heights, NY 11372
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PUBLIC HEARING 7:00PM – 9:00PM

LOCATION: Sheraton LaGuardia East hotel
135-20 39th Ave, Flushing NY 11354
Phone: (718) 460-6666

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Curiosidades Wao!

Vida cotidiana en Pekin

Una mujer vestida con un traje tradicional fotografía un almendro en flor en el parque Yuyuantan en Pekín (China).

Legal Notice

THE PORT AUTHORITY OF NY & NJ

NOTICE OF AVAILABILITY, REQUEST FOR COMMENT and NOTICE OF PUBLIC HEARING

Draft Environmental Assessment
EAST SIDE RECONFIGURATION
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New York, NY 10007
Attn: Kathryn Lamond
Hours: 9:00 am to 5:00 pm

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LaGuardia Airport
Hangar 7 (Marine Air Terminal area)
Flushing, NY 11371
Attn: General Manager's Office
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 Draft EA document for this project will be available at these locations until the close of the comment period, which is 5:00 PM on Monday, May 15, 2017. If you intend to view the document at the WTC location, please contact Kathryn Lamond at (212) 435-3783 at least one day before your visit to schedule an appointment. A copy of this document may also be viewed online at: http://www.panynj.gov/about/studies-reports.html

The Draft EA document responds to all of the requirements of the Federal Aviation Administration for preparation of an EA under NEPA, and also documents compliance with Federal Executive Order 11988: Floodplain Management and amendment, Executive Order 13690.

INFORMATION SESSION AND PUBLIC HEARING

Additional information regarding this project, an opportunity to ask questions about the project, and an opportunity to comment on the project for the official record will be available through an Information Session and a Public Hearing. The details of the date, times, and location are listed below.

DATE: Wednesday May 3, 2017
TIMES: **INFORMATION SESSION 3:00PM – 6:00PM**
PUBLIC HEARING 7:00PM – 9:00PM
LOCATION: Sheraton LaGuardia East hotel
135-20 39th Ave, Flushing NY 11354
Phone: (718) 460-6666

Comments on the project may be submitted in writing, or verbally at the Public Hearing. Sign language, oral interpretation and translation services can be made available at the Public Hearing. If you are in need of assistance or require a reasonable accommodation, contact Kathryn Lamond at The Port Authority of NY & NJ, 4 World Trade Center, 18th Floor, New York, NY 10007 at least ten (10) days prior to the Public Hearing.

Written comments on the draft EA can also be sent directly to Kathryn Lamond of the Port Authority, 4 World Trade Center, 18th Floor, New York, NY 10007. Additionally, comments may be emailed to LGAEASTEA@panynj.gov with the subject heading "LGA EAST SIDE EA COMMENT." The comment period closes at 5:00PM on Monday, May 15, 2017. If you have any questions on this notice, please contact Kathryn Lamond at (212) 435-3783.

Γραφεία Τελετών

Η οικογένεια που συμπαραστάθηκε και θα εξακολουθήσει να συμπαραστέκεται για πολλά ακόμα χρόνια στην Ομογένεια

Σαν καλοί γείτονες έχουμε βρεθεί στο πλευρό οικογενειών σε δύσκολες στιγμές και ευελπιστούμε ότι θα εξακολουθήσουμε να προσφέρουμε τις υπηρεσίες μας στην κοινότητα για πολλά ακόμα χρόνια

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Σύλληψη χρυσαυγίτη για άγριο ξυλοδαρμό φοιτητή

ΑΘΗΝΑ. (Γραφείο Εθνικού Κήρυκα). Ενας 24χρονος φοιτητής, περαστικός από στέκι χρυσαυγιτών κοντά στα γραφεία του κόμματός τους, εδάρη ανηλεώς από χρυσαυγίτες που προφανώς θέλησαν να ξεσπάσουν πάνω του για την επίθεση αγνώστων στο βιβλιοπωλείο τους λίγες ώρες νωρίτερα.

Ο άτυχος φοιτητής μίλησε στον τηλεοπτικό σταθμό «Alpha» μέσα από το Νοσοκομείο «Ερυθρός Σταυρός» όπου νοσηλεύεται ακόμη: «Με κυνήγησαν από τα γραφεία. Η χειρονομία που μου έκαναν, τους την έκανα και εγώ πίσω. Γύρναγα από μία εργασία που είχα να κάνω. Ηταν τρεις στην αρχή και μετά κάποιος με χτύπησε και μου πήρε και την τσάντα, Με χτυπούσαν με μπουνιά και κλωτσιά στο κεφάλι».

Περισσότερες λεπτομέρειες δίνει ο πατέρας του φοιτητή: «Τον κυνήγησαν και οι τρεις, τον έδειραν και ήρθε ένας τέταρτος και τον έκλεψε, παίρνοντάς του την τσάντα, με ό,τι είχε μέσα, όλα του τα στοιχεία. Είχε μέσα φωτογραφική μηχανή, μεζούρες, σχέδια, τηλέφωνο, κλειδιά και δεν ξέρω τι άλλο. Του τράβαγε την τσάντα και τον έσερνε. Ολα αυτά στις οδούς

Ο 24χρονος φοιτητής που νοσηλεύεται με βαριά τραύματα.

Παπαδά και Κουσιανόφσκου. Επειδή έτρεξε να φύγει, κάνοντας ζιγκ-ζαγκ από τα γραφεία μέχρι εκεί που τον έπιασαν, είναι δυο παράλληλοι δρόμοι της Μεσογείων... μετά ανέβηκαν τρία άτομα σε ένα μηχανάκι και έφυγαν».

Ο νεαρός έπεσε λιπόθυμος στην άσφαλτο μέχρι που ειδοποίησε ασθενοφόρο ένας αυτόπτης μάρτυρας που αναγνώρισε και έναν από τους δράστες, με αποτέλεσμα αυτός να συλληφθεί το Σάββατο από άνδρες της κρατικής Ασφάλειας.

Οπως έγινε γνωστό, πρόκειται για έναν 42χρονο, ιδιοκτήτη της καφετέριας «Bristol», στους Αμπελόκηπους, η οποία είναι στέκι μελών της Χρυσής Αυγής. Ο 42χρονος κατηγορούμενος, ιδιοκτήτης καφετέριας, φέρεται να είναι υπεύθυνος ασφαλείας των κεντρικών γραφείων του κόμματος και να είχε διατελέσει μετακλητός υπάλληλος στο γραφείο του αρχηγού της Χρυσής Αυγής, Νίκου Μιχαλολιάκου, στη Βουλή.

Ο 42χρονος αρνείται ότι συμμετείχε στον ξυλοδαρμό, αλλά συνελήφθη με βάση συγκεκριμένη μαρτυρία και οδηγήθηκε ήδη στον εισαγγελέα, που του απήγγειλε βαριές κατηγορίες, καθώς του ασκήθηκε ποινική δίωξη για ληστεία κατά συναυτουργία και επικίνδυνη σωματική βλάβη κατά συναυτουργία και παραπέμφθηκε ενώπιον του 14ου τακτικού ανακριτή από τον οποίο ζήτησε και έλαβε ολιγοήμερη προθεσμία προκειμένου να απολογηθεί.

Τα κόμματα εξέδωσαν σκληρές ανακοινώσεις, με πρώτο τον ΣΥΡΙΖΑ που καλεί όλους τους δημοκρατικούς πολίτες να συνταχθούν σε ένα μαζικό κίνημα κατά του φασισμού.

Σε ανάλογο κλίμα η ΔΗΜΑΡ, η οποία προσθέτει πως «κανείς δεν δικαιούται να εκπλήσσεται πλέον με την αποτρόπαια δράση της Χρυσής Αυγής. Η απόλυτη απομόνωση της Χρυσής Αυγής είναι καθήκον όλων μας. Η Δημοκρατία οφείλει να αυτοπροστατεύεται».

Και το ΚΚΕ κατήγγειλε «τη συνεχιζόμενη εγκληματική δράση της ναζιστικής οργάνωσης Χρυσή Αυγή...».

Ημερίδα για τη Μικρά Ασία

ΑΘΗΝΑ. (Γραφείο Εθνικού Κήρυκα). Ολοκληρώθηκε παρουσία του προέδρου Προκόπη Παυλόπουλου η επιστημονική ημερίδα με θέμα «Ελληνισμός και Ορθοδοξία στη Μικρά Ασία», που διοργάνωσε η Μητρόπολη Νέας Ιωνίας και Φιλαδελφείας, σε συνεργασία με το Κέντρο Σπουδής και Ανάδειξης Μικρασιατικού Πολιτισμού (ΚΕ.ΜΙ.ΠΟ.) του Δήμου Νέας Ιωνίας και πραγματοποιήθηκε στην αίθουσα εκδηλώσεων της Ενώσεως Σπάρτης Μ. Ασίας στη Νέα Ιωνία.

Την εκδήλωση, η οποία τελούσε υπό την αιγίδα του Προέδρου της Δημοκρατίας, λάμπρυναν με τη συμμετοχή τους επιφανείς επιστήμονες και διακεκριμένοι ομιλητές. Ο Μητροπολίτης Προύσης Ελπιδοφόρος, καθηγούμενος της Ιεράς Πατριαρχικής και Σταυροπηγιακής Μονής Αγίας Τριάδος Χάλκης και αναπληρωτής καθηγητής του ΑΠΘ Κωνσταντίνος Φωτιάδης, ομότιμος καθηγητής Ιστορίας του Νέου Ελληνισμού στο Πανεπιστήμιο Δυτικής Μακεδονίας, ο κ. Αθανάσιος Καραθανάσης, ομότιμος καθηγητής ΑΠΘ και πρόεδρος της Εταιρείας Μακεδονικών Σπουδών και ο Χάρης Σαπουντζάκης, συγγραφέας και πρόεδρος της Ενώσεως Σπάρτης Μ. Ασίας προσέγγισαν το θέμα μέσα από τη γνώση και την εμπειρία τους και τις μεταλαμπάδευσαν στο ακροατήριο.

Ο Μητροπολίτης Γαβριήλ επιφύλαξε ιδιαίτερα θερμή υποδοχή στον ΠτΔ, στον οποίο απηύθυνε θερμότατο καλωσόρισμα και του προσέφερε ως συμβολικό δώρο αντίγραφο της Ιεράς Εικόνος του Αγίου Γεωργίου του Νεαπολίτου, Προστάτου και Πολιούχου της Μητροπόλεως Νέας Ιωνίας και Φιλαδελφείας, το άφθαρτο σκήνωμα του οποίου φυλάσσεται στον Ιερό Ναό Αγίου Ευσταθίου Περισσού στη Νέα Ιωνία.

Επιπρόσθετα, αναφέρθηκε

«ΡΟΜΦΑΙΑ»

Ο Μητροπολίτης Γαβριήλ επιφύλαξε ιδιαίτερα θερμή υποδοχή στον ΠτΔ, Προκόπη Παυλόπουλο.

στη σπουδαία και μυσταγωγική ευκαιρία που παρουσιάζεται για όλους με την εκδήλωση αυτή, αφού δίνεται η δυνατότητα να προβληθεί η τεράστια προσφορά, αλλά και η ανεκτίμητη συμβολή της Ορθοδόξου Πίστεως, του Σεπτού Οικουμενικού Πατριαρχείου, αλλά και του Ελληνισμού στα ευλογημένα χώματα της Μικράς Ασίας.

Στο σύντομο χαιρετισμό του ο Πρόεδρος της Δημοκρατίας κήρυξε την έναρξη της επιστημονικής ημερίδας και εξέφρασε ότι αποτελεί τιμή για το πρόσωπό του η συμμετοχή του στο συνέδριο. Ο κ. Παυλόπουλος ανέφερε χαρακτηριστικά: «Με πραγματική συγκίνηση κηρύσσω την έναρξη αυτής της εκδήλωσης, που είναι αφιερωμένη στον Ελληνισμό και στην Ορθοδοξία στα ευλογημένα και ποτισμένα με αίμα χώματα της Μ. Ασίας. Θέλω να συγχαρώ τον Σεβασμιότατο, την Ιερά Μητρόπολη Νέας Ιωνίας και Φιλαδελφείας, το Κέντρο Σπουδής και Ανάδειξης Μικρασιατικού Πολιτισμού του Δήμου Νέας Ιωνίας, τον κ. Σαπουντζάκη γι' αυτήν την εκδήλωση και να τους ευχαριστήσω πολύ περισσότερο γιατί για μένα, η σημερινή μου παρουσία εδώ είναι και ένα είδος προσκυνήματος στην κοιτίδα του Μικρασιατικού μας Ελληνισμού και Πολιτισμού. Εμείς οι Ελληνες δεν μπορεί και δεν πρέπει να ξεχνάμε ποτέ ποια ήταν η συνεισφορά, όσων γλίτωσαν από το λεπίδι της συμφοράς και της Γενοκτονίας και ήρθαν εδώ, στα πάτρια εδάφη. Πρέπει να ξέρουμε ότι η προσφορά τους υπήρξε ανεκτίμητη και ανέδειξαν την ιστορική συνέχεια του Ελληνισμού, ο οποίος ξέρει ακόμη και την καταστροφή να τη μετατρέπει σε δύναμη δημιουργίας... Ο Πολιτισμός και η πρόοδος των Ελλήνων οφείλει πολλά στη συμβολή του Μικρασιατικού Ελληνισμού».

Ο ανώτατος άρχων της χώρας ανέφερε ακόμη: «Εμείς όντας πιστοί στην Ιστορία μας και δείχνοντας τον δέοντα σεβασμό δεν πρέπει να ξεχνάμε ότι στη Μικρά Ασία γεννήθηκε το ελληνικό πνεύμα και ο πολιτισμός, από εκεί μεταλαμπαδεύτηκε στην Αθήνα, εκεί γεννήθηκε και πάλι το Βυζάντιο, στο οποίο πολλά οφείλει το ελληνικό πνεύμα και ο χριστιανισμός. Δεν πρέπει ποτέ να λησμονάμε τι σημαίνει το Πατριαρχείο ως ακριβώς η ιστορική συνέχεια του Βυζαντίου».

«Spiegel»: Σε 35 χώρες η τουρκική κατασκοπεία

ΒΕΡΟΛΙΝΟ. Η Τουρκία κατασκοπεύει πολίτες της σε δεκάδες χώρες ανά τον κόσμο μέσω υπαλλήλων σε τουρκικές πρεσβείες και προξενεία, γράφει το περιοδικό «Spiegel» επικαλούμενο διπλωματικές εκθέσεις.

Την ώρα που η γερμανική δικαιοσύνη ερευνά πληροφορίες για πιθανή δράση Τούρκων κατασκόπων στη Γερμανία, νέα στοιχεία που έρχονται στο φως αποκαλύπτουν ότι η τουρκική μυστική υπηρεσία έστησε τα προηγούμενα χρόνια ένα παγκόσμιο δίκτυο παρακολούθησης φερόμενων οπαδών του θρησκευτικού κινήματος Γκιουλέν, το οποίο θεωρείται από την τουρκική ηγεσία εγκέφαλος του αποτυχημένου πραξικοπήματος τον περσινό Ιούλιο.

Στις 20 Σεπτεμβρίου του 2016 η Διεύθυνση Θρησκευτικών Ζητημάτων της Τουρκίας (Diyanet) έδωσε εντολή στις τουρκικές διπλωματικές αντιπροσωπείες να στείλουν «αναλυτικές εκθέσεις για οργανωτικές δομές, δραστηριότητες, εκπαιδευτικά ιδρύματα» του κινήματος Γκιουλέν. Στη διάθεση του «Spiegel» βρίσκονται αναφορές τουρκικών πρεσβειών και προξενείων από 35 χώρες, μεταξύ των οποίων η Γερμανία και η Αυστρία.

Ακόμη, οι διπλωμάτες ενημερώνουν από χώρες όπως η Νιγηρία, η Αυστραλία, η Κένυα και η Σαουδική Αραβία ποια σχολεία πρόσκεινται στο κίνημα Γκιουλέν, σε ποιες οργανώσεις δραστηριοποιούνται οι οπαδοί του και για ποια έντυπα γράφουν.

Στις εκθέσεις περιγράφονται επίσης και οι σχέσεις των οπαδών του Γκιουλέν με την εκάστοτε κυβέρνηση.

Στις αναφορές οι Τούρκοι διπλωμάτες καταγράφουν ακόμη και λεπτομέρειες. Για παράδειγμα, στην έκθεσή του το Γενικό Προξενείο της Τουρκίας στο Σάλτσμπουργκ θεωρεί ύποπτα ακόμη και μαθήματα κολύμβησης για γυναίκες ενός συλλόγου, που εκτιμάται ότι πρόσκειται στο κίνημα Γκιουλέν.

Στην Ελβετία διπλωμάτης παρατηρεί πως οπαδοί του Γκιουλέν έχουν πάψει μετά το πραξικόπημα να επισκέπτονται τα τζαμιά. Και στην αναφορά της τουρκικής πρεσβείας στην Κοπεγχάγη καταγγέλλονται δημοσιογράφοι τουρκικής καταγωγής επειδή στο επίκεντρο της αρθρογραφίας τους δεν βρίσκεται ο «αγώνας του τουρκικού λαού για δημοκρατία» αλλά οι «απολυμένοι δημόσιοι υπάλληλοι».

Στο άρθρο του «Spiegel» εκφράζεται ο φόβος ότι αυτοί που αναφέρονται ονομαστικά στις εκθέσεις των τουρκικών διπλωματικών αρχών διατρέχουν τον κίνδυνο να συλληφθούν κατά την είσοδό τους στην Τουρκία. Μετά την απόπειρα πραξικοπήματος τον περασμένο Ιούλιο ο αριθμός των συλλήψεων στο αεροδρόμιο της Κωνσταντινούπολης -όχι μόνο Τούρκων αλλά και ξένων υπηκόων που εισέρχονται στη χώρα- έχει αυξηθεί. Το γερμανικό υπουργείο Εξωτερικών γνωρίζει τουλάχιστον 10 περιπτώσεις Γερμανών, στους οποίους απαγορεύτηκε η είσοδος στην Τουρκία.

Πηγή: «Deutsche Welle»

ΚΟΛΟΜΒΙΑΝΟΣ ΣΤΡΑΤΟΣ ΜΕΣΩ «ΑΡ»

Μάχη με το χρόνο δίνει ο Στρατός της Κολομβίας να σώσει ανθρώπους μέσα από τη λάσπη.

Εκατοντάδες νεκροί στην Κολομβία

ΜΟΚΟΑ. ΚΟΛΟΜΒΙΑ. Μάχη με το χρόνο ξεκίνησαν οι Ενοπλες Δυνάμεις και τα διασωστικά συνεργεία της Κολομβίας να σώσουν ανθρώπους που καλύφθηκαν από λάσπη λόγω των πλημμυρών, οι οποίες προκάλεσαν το θάνατο τουλάχιστον 200 ανθρώπων, τραυμάτισαν άλλους τόσους, ενώ άφησαν εκατοντάδες άστεγους και πάνω από 150 αγνοούμενους.

Οι εικόνες είναι αποκαρδιωτικές: φτωχικές κατοικίες κατεστραμμένες από τις κατολισθήσεις βράχων και κορμών από δέντρα, απελπισμένοι κάτοικοι που ψάχνουν τους οικείους τους μέσα στα πλημμυρισμένα από τη λάσπη σπίτια, στρατιώτες που μεταφέρουν στα χέρια τους ολοφυρόμενα παιδιά, ανοίγοντας δρόμο ανάμεσα από σωρούς κατεστραμμένων οχημάτων...

Το Σάββατο βρήκε την Μοκόα εντελώς ισοπεδωμένη. Κάτω από τον συννεφιασμένο ουρανό, πάνω από χίλια μέλη των ομάδων αρωγής πάσχιζαν να ανακαλύψουν επιζώντες από την καταστροφή, η οποία έπληξε το βράδυ της Παρασκευής την πόλη των 40.000 κατοίκων και πρωτεύουσας της επαρχίας Πουτουμάγια. Η πόλη από τη νύκτα εκείνη στερείται πόσιμου νερού και ηλεκτρικού ρεύματος.

Πάνω από επτά τόνοι ιατρικών προμηθειών, πόσιμο νερό και ηλεκτρικές γεννήτριες έχουν αποσταλεί στην πόλη και 1.292 μέλη σωστικών συνεργείων εμπλέκονται στην αποστολή Τοdosconmoncoa (Ολοι για την Μονκόα), όπως ανακοίνωσε το Εθνικό Σύστημα Διαχείρισης Κινδύνων Καταστροφών (SNGRD).

Ολάκερες συνοικίες, στην πλειονότητά τους οικιστικές περιοχές εκτοπισμένων από τον εμφύλιο πόλεμο που επί δεκαετίες έχει διχάσει την Κολομβία, έχουν καταστραφεί.

Στον τελευταίο του απολογισμό, ο Ερυθρός Σταυρός καταγράφει 200 νεκρούς και 203 τραυματίες, πολλοί εκ των οποίων φέρουν κρανιοεγκεφαλικές κακώσεις, ενώ μεγάλος παραμένει κι ο αριθμός των αγνοουμένων, που προηγουμένως υπολογιζόταν στους 150. Η Γαλλία, η ΕΕ, η Γερμανία, η Βραζιλία, ο Ισημερινός και η Βενεζουέλα, συγκαταλέγονται μεταξύ εκείνων των χωρών που έχουν εκφράσει τη συμπαράστασή τους στην Κολομβία, όπως η Γερμανίδα καγκελάριος Αγγελα Μέρκελ, η οποία εξέφρασε τη λύπη της για την «τρομακτική φυσική καταστροφή».

Χθες, ο Πάπας Φραγκίσκος, κατά τη διάρκεια της Λειτουργίας που τέλεσε στο Κάρπι (Βόρεια Ιταλία), πόλη που είχε πληγεί το 2012 από σεισμό, εξέφρασε «τη θλίψη του για την τραγωδία που έπληξε την Κολομβία».

Οι επενδύσεις σε κατοικίες δεν στηρίζουν την Οικονομία

ΑΘΗΝΑ. (Γραφείο Εθνικού Κήρυκα). «Η ανάκαμψη της αγοράς ακινήτων στην Ελλάδα σχετίζεται σε μεγάλο βαθμό με τη βελτίωση του επενδυτικού κλίματος και τη μείωση των φορολογικών επιβαρύνσεων. Σε κάθε περίπτωση οι επενδύσεις σε κατοικίες δεν αναμένεται να στηρίξουν σημαντικά την ανάπτυξη της Οικονομίας τα επόμενα έτη, σε αντίθεση με ό,τι συνέβαινε την περίοδο πριν την οικονομική κρίση, καθώς η εγχώρια ζήτηση για αγορά κατοικίας θα παραμείνει υποτονική. Επιπλέον, η όποια ζήτηση για κατοικίες από το εξωτερικό βρίσκεται σε άμεση συνάρτηση με την αποκατάσταση του κλίματος εμπιστοσύνης στην Οικονομία», εκτιμούν οι αναλυτές της Alpha Bank, σύμφωνα με το εβδομαδιαίο της δελτίο.

Το κύριο χαρακτηριστικό του κλάδου των κατασκευών τα τελευταία χρόνια είναι η συνεχιζόμενη συρρίκνωση των επενδύσεων σε κατοικίες και η σταδιακή και αργή ανάκαμψη των υπόλοιπων κατασκευαστικών έργων, ενώ παράλληλα η αγορά ακινήτων παραμένει υποτονική.

Οπως αναφέρεται στην ανάλυση, με βάση τα τελευταία διαθέσιμα στοιχεία της ΕΛΣΤΑΤ, ο κατασκευαστικός κλάδος, και ιδιαίτερα οι επενδύσεις σε κατοικίες, αδυνατούν να ανακάμψουν. Οι ιδιωτικές επενδύσεις σε κατοικίες στην Ελλάδα έχουν υποχωρήσει σωρευτικά κατά

> **Σύμφωνα με το εβδομαδιαίο δελτίο της Alpha Bank**

23,6 δισ. ευρώ την περίοδο 2008-2016. Ειδικά το 2016 σημειώθηκε πτώση των επενδύσεων σε κατοικίες κατά 12,6%, ενώ αντιθέτως, οι επενδύσεις σε κατασκευές εξαιρουμένων των κατοικιών ανέκαμψαν ελαφρά παρουσιάζοντας αύξηση 4,8%. Η αξία των επενδύσεων σε κατοικίες υπολείπεται σημαντικά των επενδύσεων για λοιπές κατασκευές, εν αντιθέσει με ό,τι συνέβαινε πριν το 2012. Αξίζει να σημειωθεί ότι οι επενδύσεις σε κατοικίες αποτελούσαν το 2016 μόλις το 0,7% του ΑΕΠ, έναντι 9,9% του ΑΕΠ το 2007.

Σύμφωνα με την ανάλυση, οι παράγοντες που προκάλεσαν τη μείωση στη ζήτηση οικιστικών μονάδων, όπως αναφέρεται στην μελέτη, ήταν κυρίως οι εξής:

Πρώτον, η μεγάλη πτώση του διαθέσιμου εισοδήματος των νοικοκυριών, το οποίο από το 2010 εμφανίζει αρνητικό ρυθμό μεταβολής, ως αποτέλεσμα της πολιτικής εσωτερικής υποτίμησης για την ανάκτηση της ανταγωνιστικότητας και της προσπάθειας δημοσιονομικής προσαρμογής.

Παράλληλα, μειώθηκε η ζήτηση για στεγαστικά δάνεια, παρά τη μείωση του μέσου επιτοκίου στεγαστικών δανείων.

Δεύτερον, η αύξηση της ανεργίας σε υψηλό επίπεδο σε συνδυασμό με την αύξηση των φορολογικών βαρών συμπίεσε περαιτέρω τα εισοδήματα των νοικοκυριών, με αποτέλεσμα το ποσοστό αποταμίευσης στο διαθέσιμο εισόδημα να παρουσιάσει έντονα πτωτικό ρυθμό -άνω του 10%- από το 2012 και εντεύθεν.

Τρίτον, η υπέρμετρη φορολόγηση ειδικά της ακίνητης περιουσίας, σε συνδυασμό με την αστάθεια του φορολογικού πλαισίου, επέδρασε επίσης καταλυτικά στην καθίζηση της αγοράς. Οι επαναλαμβανόμενοι φόροι στην ακίνητη περιουσία ως ποσοστό στο ΑΕΠ στην Ελλάδα είναι οι τρίτοι υψηλότεροι στην Ευρώπη μετά τη Γαλλία και το Ηνωμένο Βασίλειο. Η σχετικά χαμηλή φορολογία στην ακίνητη περιουσία πριν το 2010 συνέβαλε μεταπολεμικά στην διαμόρφωση ενός παραδοσιακά υψηλού ποσοστού ιδιοκατοίκησης στη χώρα, καθώς το ακίνητο θεωρούνταν μέσο αποθεματοποίησης του πλούτου σε περιβάλλον υψηλότερου πληθωρισμού. Το ποσοστό αυτό βαίνει μειούμενο μετά το 2010, αν και διατηρείται ακόμη υψηλότερα του ευρωπαϊκού μέσου όρου.

Client Name:
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Newsday

Announcements

- Lost/Found
- Personals
- Ticket brokers
- Professional Services
- Legal Services

PERSONALS

May the Sacred Heart of Jesus be adored, glorified and preserved throughout the world now and forever. Sacred Heart of Jesus pray for us. St. Jude worker of miracles pray for us, St. Jude helper of the hopeless pray for us. Thank you for prayers answered, please continue.

Thank - You St. Jude
For Prayers Answered.

Legal Notice # 21254738
JERED REALTY LLC. Cert. of Con. filed with the SSNY on 12/29/16. Office: Queens County. SSNY designated as agent of the LLC upon whom process against it may be served. SSNY shall mail copy of process to the LLC, 35-11 41st Street, 2nd Floor, Long Island City, NY 11101. Purpose: Any lawful purpose.

Legal Notice # 21254750
NEWPORT REALTY VENTURES LLC. Art. of Org. filed with the SSNY on 01/25/17. Latest date to dissolve: 12/31/2099. Office: Queens County. SSNY designated as agent of the LLC upon whom process against it may be served. SSNY shall mail copy of process to the LLC, 41-26 39th Street, Sunnyside, NY 11104. Purpose: Any lawful purpose.

Legal Notice # 21257351
NOTICE OF SALE
SUPREME COURT - COUNTY OF QUEENS
BANK OF AMERICA, NATIONAL ASSOCIATION AS SUCCESSOR BY MERGER TO LASALLE BANK NATIONAL ASSOCIATION, AS TRUSTEE FOR FIRST FRANKLIN MORTGAGE LOAN TRUST, MORTGAGE LOAN ASSET-BACKED CERTIFICATES, SERIES 2007-FF2
150 Allegheny Center Mall
Pittsburgh, PA 15212,
Plaintiff,
Against Index No.: 10877/09
BLANCA MORENO, MARCOS MORENO, MICHELE MORENO, ET AL.,
Defendant(s).
Pursuant to a Judgment of Foreclosure and Sale, duly entered in the Queens County Clerk's Office on 2/19/2010, I, the undersigned Referee, will sell at public auction, the Queens County Supreme Court, 88-11 Sutphin Boulevard, Jamaica, NY in Courtroom #25 on 4/21/2017 at 10:00 am, premises known as 9148 109th Street, South Richmond Hill, NY 11419 and described as follows:
ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being at Richmond Hill, Fourth Ward, Borough and County of Queens, City and State of New York and designated on the tax maps of the Queens County Treasurer as Block 9315 Lot 22.
The approximate amount of the current Judgment lien is $426,968.82 plus interest and costs. The premises will be sold subject to provisions of the aforesaid Judgment of Foreclosure and Sale;
Index # 10877/09.
Peter Menoudakos,
Esq., Referee.
SHELDON MAY & ASSOCIATES Attorneys at Law, 255 Merrick Road, Rockville Centre, NY 11570
Dated: 2/27/2017
File Number: 28243 MNB

Legal Notice # 21259470
32-55, LLC. Arts. of Org. filed with the SSNY on 04/02/12. Amended to 34-35 100 STREET, LLC on 04/11/12. Office: Queens County. SSNY designated as agent of the LLC upon whom process against it may be served. SSNY shall mail copy of process to the LLC, 522 Alicia Drive, Westbury, NY 11590. Purpose: Any lawful purpose.

Legal Notice # 21261184
NOTICE OF PUBLIC SALE OF PERSONAL PROPERTY
Notice is hereby given that the undersigned will sell, to satisfy lien of the owner, at public sale by competitive bidding on April 12th, 2017 at 11:00 A.M. at the Safeguard Self Storage facility located at 4353 Bronx Boulevard Bronx, NY 10466
The personal goods including miscellaneous household goods such as TV's, appliances, beds, furniture, bins, and boxes stored therein by the following: 5005 Donovan Rayan Reid, 5431 Antonios Petratos, 6414 Marian Campbell, 6714 Lashyra Lettsome, 7116 Jessica Gonzalez, 7146 Eric Johnson, 7150 Yuly Delgado, 7241 Jacqueline Lawrence, 7253 Rashan Austin, 8243 Shannon Bess, 8260 James C Nichols / James Carter Nichols, 9118 Shian Drummonds, 9136 Sonia King, 9142 Aisha Mossiah, 9171 Darrell Harrison, 9250 Christina Whaley, 9269 Aisha D Campbell, 6323, Anthony A Rodriguez.
Purchases must be made with cash only and paid at the time of sale. All goods are sold as is and must be removed at the time of purchase. Safeguard Self Storage reserves the right to bid. Sale is subject to adjournment.

Legal Notice # 21257155
NOTICE OF SALE
SUPREME COURT COUNTY OF QUEENS, PENNYMAC LOAN TRUST 2011-NPL1, Plaintiff, vs. NFN MOHIUDDIN A/K/A MOHIUDDIN, ET AL., Defendant(s).
Pursuant to a Judgment of Foreclosure and Sale duly filed on December 12, 2016, I, the undersigned Referee will sell at public auction at the Queens County Supreme Courthouse, Courtroom 25, 88-11 Sutphin Boulevard, Jamaica, NY on April 21, 2017 at 10:00 a.m., premises known as 62-02 60th Place, Maspeth, NY. All that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of Queens, County of Queens, City and State of New York, Block 2736 and Lot 27. Approximate amount of judgment is $836,839.70 plus interest and costs. Premises will be sold subject to provisions of filed Judgment Index # 6367/09.
Howard Pollack, Esq.,
Referee
Knuckles, Komosinski & Manfro, LLP, 565 Taxter Road, Ste. 590, Elmsford, NY 10523, Attorneys for Plaintiff

Legal Notice # 21261133
NOTICE OF PUBLIC SALE:
Self-storage Cube contents will be sold for cash by CubeSmart 41-06 Delong Street, Flushing, NY 11355 to satisfy a lien for rental on April 13, 2017 at approx. 10:30am at www.storagetreasures.com
The contents of approximately 12 Cubes will be sold.

Legal Notice # 21257071
SUPREME COURT – COUNTY OF QUEENS
WELLS FARGO BANK, NATIONAL ASSOCIATION AS TRUSTEE FOR SECURITIZED ASSET BACKED RECEIVABLES LLC 2004-OP2 MORTGAGE PASS-THROUGH CERTIFICATES, SERIES 2004-OP2, Plaintiff against
YOLANDA WALCOTT, ANNIS WALCOTT, DAHRA WALCOTT, et al Defendant(s).
Pursuant to a Judgment of Foreclosure and Sale entered on June 13, 2016.
I, the undersigned Referee will sell at public auction at the Queens County Supreme Courthouse, 88-11 Sutphin Boulevard, Court Room # 25, Jamaica, N.Y. on the 21st day of April, 2017 at 10:00 a.m. premises described as follows: All that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate lying and being in the Borough and County of Queens, City and State of New York.
Said premises known as 255-23 148th Drive, Rosedale, N.Y. 11422.
(Block: 13667, Lot: 56).
Approximate amount of lien $ 286,266.10 plus interest and costs.
Premises will be sold subject to provisions of filed judgment and terms of sale.
Index No. 5553-09. Hippocrates Mertsaris, Esq., Referee.
McCabe, Weisberg, & Conway, P.C.
Attorney(s) for Plaintiff
145 Huguenot Street - Suite 210
New Rochelle, New York 10801
(914) 636-8900

Legal Notice # 21261282
BIDS WILL BE RECEIVED, PUBLICLY OPENED AND READ ALOUD AT THE SACHEM CENTRAL SCHOOL DISTRICT ADMINISTRATIVE OFFICES PURCHASING DEPARTMENT 51 SCHOOL STREET LAKE RONKONKOMA, NEW YORK AT 1:00 P.M. PREVAILING TIME ON APRIL 20, 2017 FOR THE FOLLOWING:
B 17-501 Supply and Install Ready-Mix Concrete
B 17-502 Ready-Mix Concrete Delivery
B 17-503 Utility Mark-Out Services
B 17-510 HVAC Units, Parts and Supplies
B 17-550 Landscaping Materials and Supplies
Specifications and bid forms are available for download at www.empirestatebidsystem.com Inquiries regarding specifications can be addressed by the Purchasing Office between the hours of 8:00 A.M. and 2:00 P.M. at (631) 471-1330. The Board of Education reserves the right to grant awards within forty five (45) days from the date of the bid opening during which period bids shall not be withdrawn. This period may be adjusted if so stated on the Bid Proposal Form. The Sachem Central School District Board of Education reserves the right to reject any or all bids that it considers not to be in the best interest of the school district.
BOARD OF EDUCATION
SACHEM CENTRAL SCHOOL DISTRICT LAKE RONKONKOMA, NEW YORK 11779
Catherine Nocco,
Purchasing Agent
3/29/2017

Legal Notice # 21257527
NOTICE OF SALE
SUPREME COURT COUNTY OF QUEENS, GREEN TREE SERVICING LLC, Plaintiff, vs. WILBER PANTALEON, ET AL., Defendant(s).
Pursuant to a Judgment of Foreclosure and Sale duly filed on December 28, 2016, I, the undersigned Referee will sell at public auction at the Queens County Courthouse, Courtroom 25, 88-11 Sutphin Boulevard, Jamaica, NY on April 28, 2017 at 10:00 a.m., premises known as 107-08 37th Drive, Corona, NY. All that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of Queens, County of Queens, City and State of New York, Block 1774 and Lot 24. Premises will be sold subject to provisions of filed Judgment Index # 19808/09.
Mark Weliky, Esq., Referee
Berkman, Henoch, Peterson, Peddy & Fenchel, P.C., 100 Garden City Plaza, Garden City, NY 11530, Attorneys for Plaintiff

Legal Notice # 21257546
NOTICE OF SALE
SUPREME COURT COUNTY OF QUEENS, GREEN TREE SERVICING LLC, Plaintiff, vs. LETITIA RAGNO, ET AL., Defendant(s).
Pursuant to a Judgment of Foreclosure and Sale duly filed on December 22, 2016, I, the undersigned Referee will sell at public auction at the Queens County Courthouse, Courtroom 25, 88-11 Sutphin Boulevard, Jamaica, NY on April 28, 2017 at 10:00 a.m., premises known as 327 Beach 73 Street, Arverne, NY. All that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of Queens, County of Queens, City and State of New York, Block 16078 and Lot 20. Premises will be sold subject to provisions of filed Judgment Index # 14781/13.
Nestor Diaz, Esq., Referee
Berkman, Henoch, Peterson, Peddy & Fenchel, P.C., 100 Garden City Plaza, Garden City, NY 11530, Attorneys for Plaintiff

Legal Notice # 21261189
NOTICE OF PUBLIC SALE OF PERSONAL PROPERTY
Notice is hereby given that the undersigned will sell, to satisfy lien of the owner, at public sale by competitive bidding on April 12th, 2017 at 11:00 A.M. at the Safeguard Self Storage facility located at 4301 Bronx Boulevard Bronx, NY 10466
The personal goods including miscellaneous household goods such as TV's, appliances, beds, furniture, bins, and boxes stored therein by the following: 0704 Jesus Baez / Jesus M Baez, 1228 Alicia Thompson, 1317 Odetta Cumberbatch, 2319 David Adams, 2414 Ricardo Gobern / Ricardo J Gobern.
Purchases must be made with cash only and paid at the time of sale. All goods are sold as is and must be removed at the time of purchase. Safeguard Self Storage reserves the right to bid. Sale is subject to adjournment.

Legal 2125863101

New York Governor's Office of Storm Recovery
State of New York Action Plan Amendment (APA) No. 15 to the Action Plan for
Community Development Block Grant Disaster Recovery (CDBG-DR) Program
Pursuant to Federal Register Notice FR-5696-N-11

When changes are made to the Governor's Office of Storm Recovery (GOSR) Programs that affect funding and/or eligibility, HUD requires that grantees create a substantial Action Plan Amendment that documents the proposed use of funds, and publish it for public input. HUD approved the State's initial Action Plan on April 25, 2013.

Action Plan Amendment 15 will address the following items:

A. ***Proposed Allocation of Funds:*** Table updated to reflect the reallocation of funds between programs based on unmet needs and additional funding sources.
B. ***Updated Impact and Unmet Needs Assessment:*** Changes made to the State's impact and unmet needs assessments, updating previous analyses provided by New York State.
C. ***NY Rising Homeowner Recovery Program***: Language added to include a new eligible activity.
D. ***NY Rising Housing Flood Insurance Program:*** This new program will assist Low- and Moderate- Income (LMI) NY Rising applicants pay flood insurance premiums, helping ensure that rehabilitated or reconstructed properties are adequately protected from future disasters.
E. ***Manufactured Home Community Resiliency Program:*** Updates have been made to reflect changes to the program including identifying the eligible activities the State has determined to pursue.
F. ***Rebuild by Design:*** Per HUD requirements, a second Action Plan Amendment for the RBD Living Breakwaters project is being done to identify updates that have been made to the project. This amendment also identifies updates to the Living with the Bay project.
G. ***One-for-one replacement:*** The State is including its definition of "not suitable for rehabilitation" in its Action Plan.

The Action Plan, amendments 1 through 13, and Action Plan Amendment No. 15, are available on the State's website at http://stormrecovery.ny.gov Copies of the Action Plan Amendment No. 15 are also are available without charge, to anyone requesting copies at info@stormrecovery.ny.gov or by calling the Recovery Hotline: 1-866-ASK-DHCR (866-275-3427). TTY: 212-480-6062. Additionally it has been translated into Spanish, Russian and Chinese.
Please take notice that the New York Governor's Office of Storm Recovery (GOSR) will hold two (2) public hearings to give all interested persons an opportunity to present oral and written comments on Action Plan Amendment No. 15.

Public hearings will be held:

Wednesday, March 29, 2017
6:30 p.m. – 8:30 p.m.
Catholic Charities of Staten Island, CYO Center
6581 Hylan Blvd
Staten Island, NY 10309

Wednesday, April 5, 2017
6:00 p.m. – 8:00 p.m.
Theodore Roosevelt Executive & Legislative Building
1550 Franklin Avenue
Mineola, NY 11501

Comments may also be submitted in writing at the public hearing, or via the website at http://stormrecovery.ny.gov, or by mail to the attention of The Governor's Office of Storm Recovery, ATTN: Public Comments, 64 Beaver Street, P.O. Box 230, New York, NY 10004, or for TTY at 212-480-6062. The public comment period for APA 15 will end on April 22, 2017 at 5:00 pm. Comments received after 5:00 pm on April 22, 2017 will not be considered.

The public hearings are accessible to people who are mobility impaired. Sign language interpreter services and/or other interpretation services will be provided upon advance request by contacting the Recovery Hotline: 1-866-ASK-DHCR (866-275-34276400 or email info@stormrecovery.ny.gov no later than three (3) days before the hearing for which the services are being requested.

All public hearing dates, times and locations are subject to change due to inclement weather conditions. Information regarding any change in the hearing schedule will be posted at the above mentioned website at least two hours before the scheduled start time of the hearing.

For more information about New York State's storm recovery efforts and to download a copy of the State's Action Plan, related amendments, or this current Amendment No. 15, please visit http://stormrecovery.ny.gov.

Governor's Office of Storm Recovery

Legal 2126127201

THE PORT AUTHORITY OF NY & NJ

NOTICE OF AVAILABILITY, REQUEST FOR COMMENT and NOTICE OF PUBLIC HEARING

Draft Environmental Assessment
EAST SIDE RECONFIGURATION
LaGuardia Airport, Flushing, New York

In accordance with the National Environmental Policy Act, notice is hereby given that copies of a Draft Environmental Assessment (EA) for the reconfiguration of the east side terminal area of LaGuardia Airport are available for public review and comment at the following locations:

The Port Authority of NY & NJ
Aviation Department
4 World Trade Center, 18th Floor
New York, NY 10007
Attn: Kathryn Lamond
Hours: 9:00 am to 5:00 pm

The Port Authority of NY & NJ
LaGuardia Airport
Hangar 7 (Marine Air Terminal area)
Flushing, NY 11371
Attn: General Manager's Office
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 Draft EA document for this project will be available at these locations until the close of the comment period, which is 5:00 PM on Monday, May 15, 2017. If you intend to view the document at the WTC location, please contact Kathryn Lamond at (212) 435-3783 at least one day before your visit to schedule an appointment. A copy of this document may also be viewed online at: http://www.panynj.gov/about/studies-reports.html

The Draft EA document responds to all of the requirements of the Federal Aviation Administration for preparation of an EA under NEPA, and also documents compliance with Federal Executive Order 11988: Floodplain Management and amendment, Executive Order 13690.

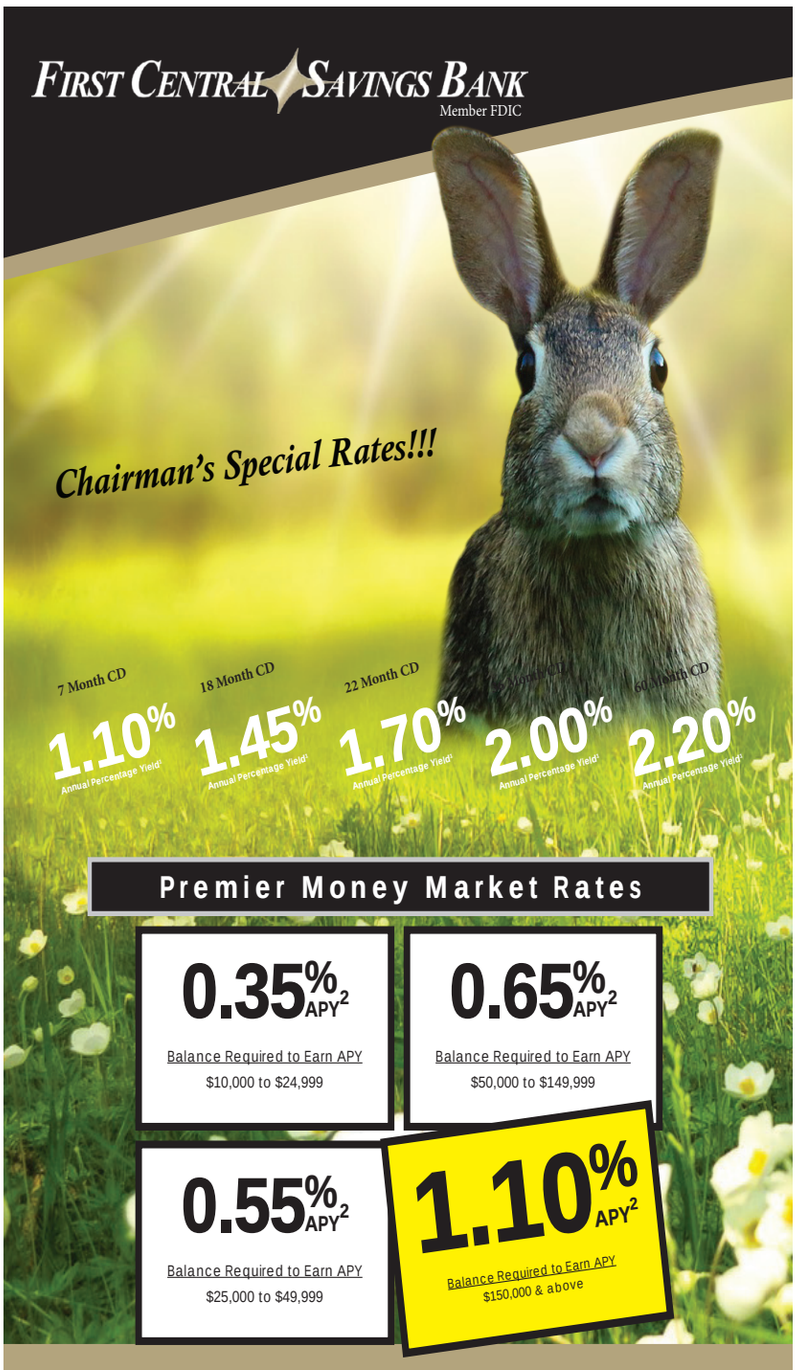
INFORMATION SESSION AND PUBLIC HEARING

Additional information regarding this project, an opportunity to ask questions about the project, and an opportunity to comment on the project for the official record will be available through an Information Session and a Public Hearing. The details of the date, times, and location are listed below.

DATE: Wednesday May 3, 2017
TIMES: **INFORMATION SESSION 3:00PM – 6:00PM**
PUBLIC HEARING 7:00PM – 9:00PM
LOCATION: Sheraton LaGuardia East hotel
135-20 39th Ave, Flushing NY 11354
Phone: (718) 460-6666

Comments on the project may be submitted in writing, or verbally at the Public Hearing. Sign language, oral interpretation and translation services can be made available at the Public Hearing. If you are in need of assistance or require a reasonable accommodation, contact Kathryn Lamond at The Port Authority of NY & NJ, 4 World Trade Center, 18th Floor, New York, NY 10007 at least ten (10) days prior to the Public Hearing.

Written comments on the draft EA can also be sent directly to Kathryn Lamond of the Port Authority, 4 World Trade Center, 18th Floor, New York, NY 10007. Additionally, comments may be emailed to LGAEASTEA@panynj.gov with the subject heading "LGA EAST SIDE EA COMMENT." The comment period closes at 5:00PM on Monday, May 15, 2017. If you have any questions on this notice, please contact Kathryn Lamond at (212) 435-3783.



Can't visit a branch? Open an Account Online[3] at myfcsb.com

Whitestone	Astoria	Ridgewood	Bayside
1919 Francis Lewis Blvd.	35-01 30th Avenue	58-02 Myrtle Avenue	42-12 Bell Blvd.
(718) 352-7100	(718) 204-7444	(718) 366-8008	(718) 225-2650
Glen Cove	**Flushing**	**Ditmars**	**Forest Hills**
70 Glen Street	72-76 Main Street	37-28 Ditmars Blvd.	71-66 Austin Street
(516) 609-3600	(718) 261-6360	(718) 932-6484	(718) 261-5095

[1]**Certificate of Deposit:** New Money Only. The Annual Percentage Yields (APY's) are effective as of **04/05/2017** and subject to change at any time. To earn the APY, the account must be opened with and maintain a minimum balance of $500. Stated APY assumes principal and interest remain on deposit for the term of the CD. Early withdrawal penalties may apply. Fees may reduce earnings. Terms and conditions apply. No brokered deposits accepted. [2]**Premier Money Market:** New Money Only. The minimum balance required to open and obtain the advertised Annual Percentage Yield (APY) for our tiered rate Premier Money Market Account is $10,000 for an APY of .35%. To obtain the higher APYs, the minimum daily balance must be $25,000 for an APY of .55%; $50,000 for an APY of 0.65%; and $150,000 for an APY of 1.10%. Daily balances below $10,000 earn no interest and a $10 Monthly Service Fee will apply for Consumer Premier Money Market Accounts. Daily balances below $10,000 earn no interest and a $15 Monthly Service Fee will apply for Business Premier Money Market Accounts. Fees may reduce the earnings. These variable tiered rates are effective as of **04/05/2017** and the rate on any tier may change after account opening. No brokered deposits accepted. [3] **First Central Direct:** Rates and minimum balances to open online accounts may differ from in–branch rates and opening balance requirements. **Toll Free 1-866-400-3272 (FCSB)**

THE PORT AUTHORITY OF NY & NJ

NOTICE OF AVAILABILITY, REQUEST FOR COMMENT and NOTICE OF PUBLIC HEARING

Draft Environmental Assessment EAST SIDE RECONFIGURATION LaGuardia Airport, Flushing, New York

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LaGuardia Airport
Hangar 7
(Marine Air Terminal area)
Flushing, NY 11371
Attn: General Manager's Office
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

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INFORMATION SESSION AND PUBLIC HEARING

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Phone: (718) 460-6666

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Many foods served at Passover Seders

BY MERLE EXIT

A ritual marathon feast known as a Seder is celebrated on Passover to mark the Jews' liberation from slavery in Ancient Egypt. This year it takes place April 10.

There are some differences between the ritual Seder plate and the various cuisines served for the holiday, but the combination creates some savory meals.

In their migration over the centuries, Jews have traversed the globe in order to practice their religion freely. Thus, the influences on the foods eaten during Passover have been diverse.

In Judaism there are two basic groups Ashkenazi from Germany and Eastern Europe, and Sephardic from Spain, Italy and the Middle East. With adoptions and intermarriage American Jews also have Latino, Asian and African ancestry.

As a second-generation Jewish-American family, we celebrated with the more common rituals and food. I researched the Internet and found myself particularly enlightened by one source, a website entitled Happy-Passover.net.

According to the site, for instance, the customs and traditions followed by Indian Jews are similar to Hindus in both makeup and language. Here it says that the delicacies are a blend of "Indo-Jewish" flavors. Whereas we tend to have chopped liver, brisket of beef, matzo ball soup and potato pancakes, "Indian Jews prepare items such as molagachi, a mahogany chicken with black pepper; ellegal, a spice-rubbed fish in a cool herb salsa; appam, coconut crepes in a date sauce; and masalachi, mutton that is braised with coriander and garlic."

"Following strict sabbath laws, men don a Malabari sarong, called a mondoo, while the women wear flowing silk saris and jewelry that sparkles. Songs of exodus are softly hummed to Indian melodies."

Six ritual foods are on the Seder plate, some different from the traditional Jewish American.

"Lamb bone shank, roasted egg and matzo, are surrounded by romaine lettuce, date jam with walnuts, celery, and lime juice," the site says. Although rice and legumes used to be forbidden, they have become traditional in Sephardic cultures.

While Jews were once ousted from Italy, there now exists a large Jewish population, especially in Rome.

"A traditional Passover menu begins with a paste-like mixture of ground dates, raisins, figs and oranges called Haroset all'italiana.

Syrian meatballs with sour cherry sauce
Pintrest

Carciofi all romana, Roman-style artichokes, are prepared with bresaola, an air-cured beef with lemon and arugula. Cubes of fried white fish are marinated in an herb vinaigrette with caramelized onions for a dish called carpione."

Those are just the side dishes, as the main course of an Italian Seder includes tortino di azzine, a matzo lasagna using vegetables and lamb together and insalata alla Sefardita, a salad of romaine, green onions and dill in a red wine vinaigrette. Desserts are generally comprised of a rich almond-paste cookie rolled up in powdered sugar known as ricciarelli de Siena.

"Here a ritual Seder plate is brought to the table covered with a pretty scarf. Prior to placing it on the table, the plate is placed atop a child's head and rotated allowing everyone to view."

Later, the tradition of having the youngest son recite the "four questions" relates to this. Although we typically take three pieces of matzo and simply place it under a napkin, the Italian ritual has the matzos tied to the napkin to form a little sack. It is then passed around the table from shoulder to shoulder.

Another Sephardic tradition, new to me, is to take a green onion, with long stems, and place it beside each member at the Seder table. Each member picks it up, holding it like a whip while singing the song, Dayenu. When the chorus kicks in, the participant holding the bulb lightly whips each person with a flick of the wrist. This particular ritual is used by Jews in Afghanistan and Iran.

Continued on Page 26

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POLICE BLOTTER

104th Precinct

ASSAULT — Police said they are searching for the operator of a vehicle who is wanted in connection to an assault that occurred in Middle Village on March 28.

Just after 1 a.m., a 55-year-old woman was walking near Eliot Avenue and 69th Street when a vehicle pulled up alongside her and the driver discharged a projectile that struck the victim in the face, police said.

The vehicle fled the scene to parts unknown. The victim sustained a small laceration to her face and was treated and released at her residence, police said.

The individuals are described as white males who were driving a late model white sedan that was last seen traveling westbound on Eliot Avenue.

106th Precinct

GRAND LARCENY — Police are searching for a man wanted in connection with a grand larceny that occurred on March 8 at John F. Kennedy International Airport.

Just after 1 a.m., the suspect was caught on surveillance video inside the 7-Eleven store located at the airport using a stolen credit card from a 62-year-old woman, police said.

The suspect is described as a white man between the ages of 20 and 30 years with an average build and short cropped black hair. He was last seen wearing a dark jacket and a gray shirt.

107th Precinct

FORCIBLE TOUCHING — A man groped several women while aboard a bus in the confines of the 107th Precinct during several incidents in October, November and December.

Three women, each of whom is 18 years old, told police that an unidentified man grabbed their buttocks while they were riding the Q76 bus. During each incident, the suspect groped the women after they had boarded the bus at Francis Lewis Boulevard and Horace Harding Expressway around 3 p.m.

The suspect is described as a 25- to 35-year-old man wearing a red winter coat.

109th Precinct

ASSAULT — Police are searching for a woman who assaulted an elderly man and shouted an anti-Asian sentiment at him on a bus in Flushing on March 7.

PHOTO COURTESY NYPD

Police are searching for this woman in connection with an assault.

Around 11:30 a.m., the woman pushed the 68-year-old man while traveling on a NYCTA Q20 bus. She then told the man that she hated Asians and hit him on his head with an umbrella, police said.

The victim suffered pain, but did not go to a hospital. The woman then exited the bus at Main Street and Kissena Boulevard. She is described as a light skinned woman who was wearing glasses, a red baseball hat and a coat.

115th Precinct

ROBBERY — Police are asking for the public's assistance in locating two individuals wanted in connection to a robbery that occurred on March 24 near Queens Boulevard and 71st Street in Forest Hills.

Around 5 p.m., a 22-year-old taxi driver picked up an individual at the corner of Queens Boulevard and 71st Street and was instructed to go to 31-30 101st St., where a second individual entered the taxi, displayed a knife, pressed it against the victim's abdomen and demanded money, police said.

The taxi driver complied and the individuals fled southbound towards 101st Street.

Both suspects are described as five-foot-eight-inch black men who were believed to be 17 to 20 years old. They were last seen wearing black jeans, black jackets and black sneakers.

From page 5

Bridges and Tunnels will be removing tolling stations along the Cross Bay Veterans Memorial Bridge and the Marine Parkway-Gil Hodges Memorial Bridge on April 30th as part of Governor Cuomo's plans to implement open road, or "cashless" tolling, for all city bridges and tunnels by the end of 2017, State Senator Joseph Addabbo (D–Howard Beach) reported.

Sometime around the summer of 1983, Senator Joe Addabbo worked as a toll booth officer at the Cross Bay Bridge. Addabbo had a unique seasonal job, giving beachgoers change from the then-90 cent tolls, while being extremely jealous that while he was working in his brown uniform, others went off to enjoy Rockaway Beach. It was back then that Addabbo realized how unfair that toll was for the residents of Queens. Now, the upcoming cashless tolls reveal that the toll booth officer may witness the same fate of the dinosaur – extinction.

"While the MTA has assured me that there will be no immediate loss of jobs, I am concerned about the possible elimination of the toll booth positions over time. Aside from the likely jobs reduction, there are other issues that will have to be monitored with the new cashless toll arrangement, such as the potential for lax enforcement against toll evaders and unpaid invoices mailed to the registered vehicle owners, which could cause the MTA to lose millions," Addabbo stated.

On a positive note, the Senator believes cashless tolling will actually alleviate congestion and odor emissions along the boulevard, which comes as a great relief to his constituents in Broad Channel.

The new open road tolling system will allow drivers with an E-Z Pass to drive through gateless tolls along the Cross Bay Veterans Memorial Bridge and the Marine Parkway-Gil Hodges Memorial Bridge. For drivers without an E-Z Pass, the new tolling system will take a photo of their vehicle's license plate and a bill will be mailed to the registered owner of the vehicle. In preparation of the new tolling system, Governor Cuomo announced in January new DMV regulations which will allow the state to suspend an owner's registration for three toll violations over the course of five years, as well as new MTA regulations that will impose increasing fines for non-payment of tolls.

While the Governor's plans include provisions to enforce stiffer penalties on toll evaders and out-of-state travelers, Addabbo feels more can be done for the taxpaying residents in his district and throughout Queens. The Senator has been advocating for an idea that has been heard before – remove the toll entirely on the Cross Bay Bridge and, if not completely, then minimally, from Labor Day to Memorial Day.

Addabbo said, "Access over the bridge should be free for all Queens residents. We all know that the Cross Bay Veterans Memorial Bridge is the only bridge in New York City that requires you pay a toll to travel within the same borough. As I recently drove into the Rockaway part of my district and watched the dismantling of the toll structures there, I thought that this toll should be eliminated totally."

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Maloney, Outraged Advocacy Groups Denounce Rejection Of LGBTQ Census Questions

Congress Member Carolyn B. Maloney (NY-12), co-Chair of the House Census Caucus, was joined on March 31st by LGBT Network CEO David Kilmnick, and LGBTQ advocates to speak out against the Commerce Department's decision to reverse its plan to add questions to the 2020 Census regarding sexual orientation and gender identity. "The data collected from these questions are crucial in ensuring that members of the LGBTQ community are accurately counted and have fair and adequate access to the services and protections they need and deserve under the law and US Supreme Court Decisions," Maloney said, adding that the decision comes on the heels news that the Department of Health and Human Services was deleting questions on sexual orientation from two surveys it had conducted.

Rep. Maloney shared a letter she sent to Commerce Secretary Wilbur Ross, urging him to resume the department's plans to add questions about sexual orientation and gender identity in the final version of the upcoming 2020 decennial Census.

"I am deeply troubled by the Trump Administration's announcement this week that questions pertaining to sexual orientation and gender identity will not be included in the 2020 decennial Census and the American Community Survey as initially proposed," said Rep. Maloney. "As a federal lawmaker, I rely on census data to inform me about the needs of

See page 48

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Queens gets opera company

Inaugural show at Town Hall

BY ERICA FINOCCHIO
efinocchio@queensledger.com

Queens is home to the city's newest professional opera company.

The Queens Opera Theatre will open its inaugural season on Saturday, April 15, at 7:30 p.m. at Flushing Town Hall.

Five singers and a pianist will perform works by composers such as Verdi, Mozart, Wagner and Puccini.

"This is a way to introduce ourselves to the community," said artistic director and conductor Andy Anderson. "Sixteen months ago it was all a dream, now the Queens Opera Theatre is really happening."

Anderson and executive director Brian Gill already have plans for the future of the company, including Chinese operas and the performance of "The Last Ship," a musical about famous musician Sting and his upbringing in Ireland.

"In our programming we are not only trying to find operas that satisfy our artistic desire, but also operas that will fill a need for the community and audience base in Queens," Anderson said.

The pair hopes to introduce opera to public school students in the borough, as well as engage local hip-hop artists and poets, making the Queens Opera Theatre "an avenue for development," Anderson said.

Anderson is a freelance opera conductor who used to teach a class that educated adults on opera and the history of composers. Over the next few years, he and his partner will try to introduce an adult outreach program through the Queens Opera Theatre.

"We want to make a viable arts organization in Queens," Anderson added. "Brian and I have so many artistic ideas."

For next Saturday's inaugural performance, Gloria Kim from the Charlottesville Opera will play the piano, while singers will include Megan King, who has performed with the The Philharmonia of Greater Kansas City, Elizabeth Beers Kataria from the St. Petersburg Opera, and Ron Loyd, who has performed with the American Symphony Orchestra.

They will be joined by Kristee Haney and Benjamin Robinson, who has performed with the Salt Marsh Opera.

The Queens Opera Theatre is a recipient of a space grant from Flushing Town Hall, allowing the opera use of the space for up to six weeks. The Kresge Foundation is also a supporter of the opera company.

Gill has performed at Carnegie Hall and is currently part of the administration there. He hopes one day the Queens Opera Theatre will have a global presence.

"The community has been so supportive," Gill said. "We're dreaming big."

Bar hosts reception

The Queens County Bar Association hosted its annual reception for the county's judges, past presidents of the organization, and longtime members at its headquarters in downtown Jamaica. Pictured are past presidents (standing) Channwoo Lee, Howard Stave, Joseph Carola III, David Adler, Seven Orlow, Seymour James, Jr., Paul Kerson, (seated) Joseph DeFelice, Herbert Rubin, Sidney Strauss, Joseph Risi, Gary Darche, Michael Dikman, and David Cohen. (Photo: Walter Karling)

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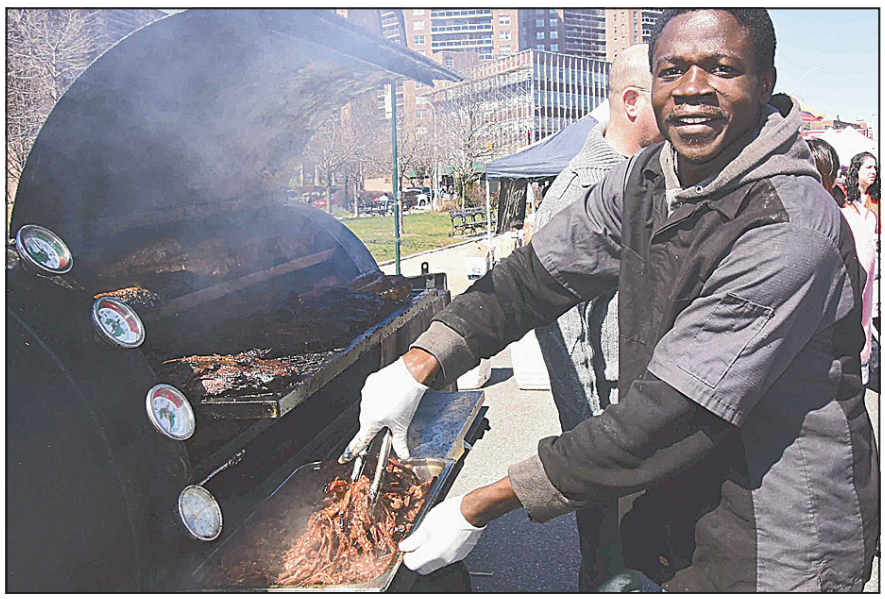

PHOTOS BY RICK MAIMAN

Food to die for in Forest Hills

The Forest Hills Street Festival last Sunday was a celebration of some of the best comfort foods imaginable.

Sarah Nebel, above, couldn't help but show off her two bowls of scrumptious fries.

Barbecue food was also a hit, as the grills and smokers were going all afternoon long, top.

Prostate cancer screening

First Presbyterian Church in Jamaica will host its 14th annual prostate cancer screening event and health fair from 8 a.m. to 1 p.m. on Saturday, April 8.

Services include free prostate screening for men age 35 and older. No insurance is required.

Other services available to all include blood pressure testing, diabetes testing, HIV testing, dental screenings, hearing tests, cholesterol tests and nutritional education.

There also will be the opportunity to enroll in Obamacare for free or low-cost health insurance.

A complimentary breakfast will be served at 8 a.m. with screenings beginning at 9 a.m.

Sponsors include NewYork-Presbyterian-The University Hospital of Columbia and Cornell; Queens Library HealthLink; the American Diabetes Association and the Cancer Research and Treatment Fund.

The church is located at 89-60 164 St. in Jamaica.

Further information is available by calling (718) 526-4775, or online at firstjamaicachurch.org.

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另1人送醫 為保現場安全 提前終止活動

南加大演唱會 過度擁擠4人傷

本報記者曾妮華洛杉磯報道

一年一度，由南加大（USC）學生會主辦的春天音樂節（Springfest），於1日下午在南加大校園登場。不過，因場地過度擁擠，據傳至少造成4人受傷及1人送醫。洛杉磯消防局（LAFD）在評估完現場狀況後，於晚間約9時決定提前終止該音樂節。

■演唱會現場湧入過多人潮。 Daily Trojan圖

《洛杉磯每日報》（Los Angeles Daily News）2日報道，演唱會在南加大內的McCarthy Quad舉行。洛杉磯消防局的發言人杭弗瑞（Brian Humphrey）表示，由於演唱會現場湧入太多人潮，基於安全理由，他們決定於9時10分提早結束活動。他強調，現場並未發生任何踩踏意外，也沒有人受到嚴重傷害。

不過，消防人員判定共有4名參加者受傷或身體不舒服，另有1人被送醫治療，但情況並無大礙。此外，在校園警方警告主辦方現場過度擁擠後，洛杉磯消防局的鎮暴小組也抵達現場待命。

南加大華裔留學生Emily回憶，她於晚間7時多入場，場內已人山人海。抵達表演舞台後，因人實在太多了，他們根本擠不進去。此外，許多人明顯已喝醉，說話非常大聲，動作也相當粗魯，惹怒周遭的人。Emily說，她親眼目睹一群人為了擠到前面，不停推擠附近的人，也差點爆發口角。

演唱會被迫中斷後，參加者紛紛前往活動頁面表示抗議。有學生寫道，演唱會應該只開放給學生，就不會有過度擁擠的問題了。也有學生控訴，既然場地無法容納這麼多人，為什麼要讓他們廣發邀請函？許多學生更異口同聲地直言，這是他們參加過最糟糕的一次春天音樂節，令人相當失望。

據2017年春天音樂節臉書專頁資料顯示，演唱會原定由下午1時進行至晚間10時45分。今年的陣容堅強，演出者包括饒舌嘻哈組合Migos、Big Gigantic、電音DJ Vanic及饒舌歌手Rae Sremmurd。參加者多半為南加大學生，但每一位學生可攜帶一位非學生的訪客。據了解，當主辦方宣布演唱會中斷時，Migos才剛表演完兩首歌，並邀請嘉賓Travis Scott上台。

洛杉磯中領館辦中美元首晤僑學界座談會

■（右起）方杰洲、袁東、田紋瑛、周媄媄、程遠等人出席座談會。 記者李寧攝

中美兩國元首將於4月6至7日在佛羅里達州會晤，是近期中美關係的頭等大事，雙方將就共同感興趣的問題討論，指明下一步中美關係發展的方向，美國僑學界對此熱切期盼和關注。為此，中國駐洛杉磯總領館邀請僑學界舉行座談會，共同交流看法。

出席當天活動的包括中國駐洛杉磯總領館總領事劉健、副總領事孫魯山、莊志哲、王雷、教育參贊袁東，以及南加各大僑團和學界代表。

劉健首先感謝大家利用周末時間參加座談會，他表示，下周中美兩國元首將舉行會晤，此前媒體已經做了很多預報、分析和評論，僑領也在熱議。日前他出席活動接觸美國朋友，也被問到這個問題，說明大家都很關心。

他表示，今年是中美關係承前啓後的一年，既面臨機遇也有挑戰，未來向何處發展、何處走，是大家共同關心的問題。中美關係是雙邊關係，涉及到世界格局的穩定和發展。兩國元首舉行會晤的重要，首先體現中美兩國都把發展中美關係放在非常重要的位置上。這是中美建交之後，美國歷屆新元首最早安排會晤的一次。

劉健說，兩國元首面對面的對國際和地區重大關係交流意見，本身就有利於中美關係的發展。有利於確定未來中美關係的發展方向，在穩定平穩的軌道上，取得更大發展。中國注重中美關係，合作是中美兩國唯一的正確選擇，中國作為最大發展中國家，美國最大發達國家，兩國可以合作的方面很多。中美應該成為合作夥伴，這不僅順應歷史潮流、符合全球發展的需要，也是世界各國人民所期盼的。

他強調，中美建交38年，取得的歷史經驗應該作為進一步發展中美關係的立足點。**本報記者李寧洛杉磯報道**

上班族久坐傷腰 痛到無法走路

坐著比站著更傷腰，一位40歲的女上班族，每天上班8小時幾乎都坐著，日前下背、左腳開始疼痛，最近更是痛到無法走路，就醫檢查確定是椎間盤突出合併神經根壓迫。

據中央社報道，收治患者的台北新光醫院疼痛科醫師陳威廷表示，該女子過去因疼痛，長期使用非類固醇消炎止痛藥控制，最後出現消化性潰瘍徵狀。經介入性疼痛治療，在影像儀器導引下，準確對腰椎背根神經節進行高頻熱凝治療。

陳威廷說，該女子經治療疼痛很快減輕，搭配持續復健，不再需要吃止痛藥，疼痛幾乎完全消失，一年後追蹤發現原本突出的椎間盤，已經明顯縮小。

據2015年多倫多復康研究所領導的研究發現，長時間坐著，可能使人罹患心臟病、糖尿病、癌症以至早死的風險上升。

而數年前美國梅約臨床程序中心的一項調查更指出，坐著兩小時即可抵銷做運動20分鐘的功效。

根據統計，椎間盤突出盛行率約1%至5%，男性多於女性，高發年齡約為30至50歲之間。

據陳威廷透露，研究顯示，人體坐著時腰椎所承受壓力是站著時的1.5倍，而不正確的坐姿不僅會加重腰椎壓力，比站立時高出近2.5倍，還會導致脊椎兩側肌肉張力不平衡，壓迫到腰椎神經，引起慢性疼痛。

陳威廷表示，慢性疼痛就是持續3到6個月以上的疼痛，已超過正常組織的復元時間，好像是下背痛、肩頸神經痛、帶狀皰疹後神經痛或三叉神經痛等，國際的研究顯示，慢性疼痛的盛行率約15%到25%，嚴重影響個人生活品質。

本報記者溫哥華綜合報道

■研究顯示，人體坐著時腰椎所承受壓力是站著時的1.5倍。 網上圖片

THE PORT AUTHORITY OF NY & NJ

NOTICE OF AVAILABILITY, REQUEST FOR COMMENT and NOTICE OF PUBLIC HEARING

Draft Environmental Assessment
EAST SIDE RECONFIGURATION
LaGuardia Airport, Flushing, New York

In accordance with the National Environmental Policy Act, notice is hereby given that copies of a Draft Environmental Assessment (EA) for the reconfiguration of the east side terminal area of LaGuardia Airport are available for public review and comment at the following locations:

The Port Authority of NY & NJ
Aviation Department
4 World Trade Center, 18th Floor
New York, NY 10007
Attn: Kathryn Lamond
Hours: 9:00 am to 5:00 pm

The Port Authority of NY & NJ
LaGuardia Airport
Hangar 7 (Marine Air Terminal area)
Flushing, NY 11371
Attn: General Manager's Office
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 Draft EA document for this project will be available at these locations until the close of the comment period, which is 5:00 PM on Monday, May 15, 2017. If you intend to view the document at the WTC location, please contact Kathryn Lamond at (212) 435-3783 at least one day before your visit to schedule an appointment. A copy of this document may also be viewed online at: http://www.panynj.gov/about/studies-reports.html

The Draft EA document responds to all of the requirements of the Federal Aviation Administration for preparation of an EA under NEPA, and also documents compliance with Federal Executive Order 11988: Floodplain Management and amendment, Executive Order 13690.

INFORMATION SESSION AND PUBLIC HEARING

Additional information regarding this project, an opportunity to ask questions about the project, and an opportunity to comment on the project for the official record will be available through an Information Session and a Public Hearing. The details of the date, times, and location are listed below.

DATE: Wednesday May 3, 2017

TIMES: **INFORMATION SESSION 3:00PM – 6:00PM**
PUBLIC HEARING 7:00PM – 9:00PM

LOCATION: Sheraton LaGuardia East hotel
135-20 39th Ave, Flushing NY 11354
Phone: (718) 460-6666

Comments on the project may be submitted in writing, or verbally at the Public Hearing. Sign language, oral interpretation and translation services can be made available at the Public Hearing. If you are in need of assistance or require a reasonable accommodation, contact Kathryn Lamond at The Port Authority of NY & NJ, 4 World Trade Center, 18th Floor, New York, NY 10007 at least ten (10) days prior to the Public Hearing.

Written comments on the draft EA can also be sent directly to Kathryn Lamond of the Port Authority, 4 World Trade Center, 18th Floor, New York, NY 10007. Additionally, comments may be emailed to LGAEASTEA@panynj.gov with the subject heading "LGA EAST SIDE EA COMMENT." The comment period closes at 5:00PM on Monday, May 15, 2017. If you have any questions on this notice, please contact Kathryn Lamond at (212) 435-3783.

N17C31AA

You're Invited!

Public Information Session and Public Hearing

Delta Air Lines has been working with the Airport Sponsor – Port Authority of New York and New Jersey— to reconfigure the east side terminals as part of Governor Andrew Cuomo's goal to transform LaGuardia Airport into a modern, more efficient transportation facility. This reconfiguration will improve aircraft operations, reduce delays, improve customer service, and provide greater gating flexibility for the airlines operating at Terminals C and D at LaGuardia Airport.

You are invited to attend a Public Information Session and Public Hearing on the Draft Environmental Assessment for the East Side Reconfiguration at LaGuardia Airport.

When:	Wednesday, May 3, 2017
Where:	Sheraton LaGuardia East Hotel 135-20 39th Avenue, Flushing, NY 11354
Time:	Information Session (3:00 PM - 6:00 PM) Public Hearing (7:00 PM - 9:00 PM)

The document is currently available online -- click here to view. Copies have also been placed at the Queens Borough Public Library branches at Flushing and Jackson Heights.

Your Voice Counts

To make sure your comments are recorded as part of the process, you may:

- Give oral testimony at the Public Hearing
- Send comments in writing to:

The Port Authority of NY & NJ
Aviation Department
Attn: Kathryn Lamond
4 World Trade Center, 18th Floor
New York, NY 10007

- E-mail comments to: LGAEASTEA@panynj.gov with the subject heading "LGA EAST SIDE EA COMMENT"

Comments are due by 5:00 PM on May 15, 2017.

If you have any questions or concerns, or need special assistance at the Public Hearing, please contact us at least ten days prior to the hearing at LGAEASTEA@panynj.gov.

You're Invited!

Public Information Session and Public Hearing – Next Week

Delta Air Lines has been working with the Airport Sponsor – Port Authority of New York and New Jersey— to reconfigure the east side terminals as part of Governor Andrew Cuomo's goal to transform LaGuardia Airport into a modern, more efficient transportation facility. This reconfiguration will improve aircraft operations, reduce delays, improve customer service, and provide greater gating flexibility for the airlines operating at Terminals C and D at LaGuardia Airport.

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Your Voice Counts – Comments are due by 5:00 PM on May 15, 2017

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- Send comments in writing to:

The Port Authority of NY & NJ
Aviation Department
Attn: Kathryn Lamond
4 World Trade Center, 18th Floor
New York, NY 10007

- E-mail comments to: LGAEASTEA@panynj.gov with the subject heading "LGA EAST SIDE EA COMMENT"

Attachment 4 - Mailing List

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
48-18 Properties, LLC	David	Taub	48 Harbor Park Drive		Port Washington	NY	11050		dtaub@palmbay.com
5 Borough Pawn LLC	Rebecca	Cabrera	93-45A 104 Street		Ozone Park	NY	11416		5boroughpawn@gmail.com
A M Exclusive Business Machines, Inc.	Jaclyn	Miccio	79-63 77 Avenue		Glendale	NY	11385		jaclyn@amexclusive.com
A.N.I.B.I.C.	Vincent	Tancredi	61-35 220th Street		Bayside	NY	11364		vtancredi@anibic.org
A.S.K. Construction, Inc.	Ioannis	Kotaridis	48-51 36th Street		Long Island City	NY	11101		askconstruction@yahoo.com
Able Steel Equipment Co., Inc.	Bonnie	Tarkenton	50-02 23 Street		Long Island City	NY	11101		ablesteel@aol.com
Accion East	Kevin	McLoughlin	80 Maiden Lane, STE 903		New York	NY	10038		kmcloughlin@accionusa.org
Accounting Taxes And Management LLC - Jocelyne E. Pierre, CPA	Jocelyne	Pierre	656 Seneca Ave. Ste F Left		Ridgewood	NY	11385		jepierre.cpa@verizon.net
Active Fire Control	Mildred	Munich	5-16 47 Avenue		Long Island City	NY	11101		mmunich@activefire.com
Adelphi University	James	Mcgowan	Levermore Hall - Room 304	1 South Avenue	Garden City	NY	11530		mcgowan2@adelphi.edu
Adirondack Oral and Maxillofacial Surgery	Betsy	Miller	95-25 Queens Boulevard	11th Fl	Rego Park	NY	11374		info@adirondackoralsurgery.com
Advanced Cardiovascular Diagnostics, PLLC	Perry	Frankel	410 Lakeville Road	Suite 209	Lake Success	NY	11042		drperryfrankel@advancedcardiodiag.com
Advantages Printing Inc	Fran	Biderman-Gross	7838 Parsons Blvd		Flushing	NY	11366		fran@advantages.net
Aetna Insurance Company	Karen	Taylor	9 Entin Road, Suite 203		Parsippany	NJ	07054		taylork5@aetna.com
Airway Maintenance Corp./Airway Cleaners Inc.	Fred	Catanese	15 Clinton Avenue		Rockville Centre	NY	11570		fcatanese@aol.com
Akerman Senterfitt, LLP	Steven	Sinacori	335 Madison Ave.		New York	NY	10017		steven.sinacori@akerman.com
All Car Rent-A-Car	Miriam	Pena	96-18 63 Drive		Rego Park	NY	11374		mpena@allcarny.com
All Service HVAC/ R	Julia	Dawson	PO Box 564109	18-16 127th Street	College Point	NY	113569		don@allservicerefrigeration.com
All Star Reporters, Inc.	Marc	Schafler	15 Verbena Avenue		Floral Park	NY	11001		marcschafler@allstarreporters.com
Allen Ngai Photography	Allen	Ngai	4218 165 Street Apt 2R		Flushing	NY	11358		mcseallen@aol.com
Allied Properties	Tim	Ziss	9322 Third Avenue		Brooklyn	NY	11209		timziss@alliedpropertiesllc.net
America Works of New York, Inc.	Matthew	Silverstein	228 East 45th Street, 16th Floor		New York	NY	10017		msilverstein@americaworks.com
AMG Medical Group	Jeffrey	Meena	80-02 Kew Gardens Rd.	Concourse Level	Kew Gardens	NY	11415		jeffmeena@yahoo.com
Amna Construction Corp	Henry	Wan	141-07 20th Avenue Suite 406		Whitestone	NY	11357		wangroup@cs.com
Anchin, Block & Anchin LLP	Gregory	Wank	1375 Broadway		New York	NY	10018		greg.wank@anchin.com
Anchor Contractors	Larry	Guadagno	280 W. Jamaica Avenue		Valley Stream	NY	11580		larryanchor@msn.com
Architects Rule, PC	Paul	Athineos	219-03 Northern Blvd.	Suite 4	Bayside	NY	11361		paul@ArchitectsRule.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Astoria Federal Savings	Mayra	DiRico	1 Astoria Federal Plaza		Lake Success	NY	11042		kmeyers@astoriafederal.com
AT&T	Elizabeth	Segal	AT&T Services, Inc.	630 Fifth Avenue, 16th Floor	New York	NY	10111		elizabeth.segal@att.com
ATCO Properties & Management	Dale	Hemmerdinger	555 5th Ave. 16th Floor		New York	NY	10017		dale@atco555.com
ATCO Properties & Management	Damon	Hemmerdinger	555 Fifth Ave.	16th Fl.	New York	NY	10017		damon@atco555.com
ATCO Properties & Management	Leonard	Bernacke	70-36 83rd Street		Glendale	NY	11385		lbernacke@atco555.com
Audrey Lee Jacobs & Associates, PLLC	Audrey	Jacobs	1979 Marcus Avenue	Suite 210	Lake Success	NY	11042		ajpropertylaw@gmail.com
Austin's Ale House	John	Ryan	82-70 Austin St.		Kew Gardens	NY	11415		jjtrsr@aol.com
Aviation Development Council	William	Huisman	141-07 20 Avenue, Suite 404		Whitestone	NY	11357		bhuismanadc@aol.com
Awisco New York Corp.	Lloyd	Robinson	55-15 43 Street		Maspeth	NY	11378		sales@awisco.net
B & B Coverage LLC	Judith	Densky	166-40 Powells Cove Blvd.		Whitestone	NY	11357		jdensky@bbcoverage.com
B'Above WorldWide Institute Inc.	Malikka	Karteron	134-11 Kew Gardens Road		Richmond Hill	NY	11418		mdk@babove.com
Barbara Pryor, Esq	Barbara	Pryor	65-49 Grand Avenue		Maspeth	NY	11378		bpryoresq@yahoo.com
Baybridge Optical Inc	Madelyn	Gonzalez	208-36 Cross Island Parkway		Bayside	NY	11364		baybridgeoptical@yahoo.com
Bayside Business Association	David	Solano	41-16 Bell Blvd		Bayside	NY	11361		Info@BaysideBA.Com
BBDM Consulting	Thomas	Eagar	243 Mason Drive		Manhasset	NY	11030		skygazer11030@yahoo.com
Beardslee Transmission Equip. Co.	William	Beardslee	27-22 Jackson Avenue		Long Island City	NY	11101		beardsleetransmission@verizon.net
Bellido Insurance Brokerage, Inc.	Ricardo L.	Bellido	8000 Cooper Ave. Bldg # 8 Ste 301		Glendale	NY	11385		ricardo@bellidoins.com
Benefits Advisory Service, Inc.	Sher	Sparano	70-20 108 Street #5"O"		Forest Hills	NY	11375		sher@benefitsadvisory.com
Ben's Best Delicatessen	Jay	Parker	96-40 Queens Boulevard		Rego Park	NY	11374		bensbest@gmail.com
Bergman, Bergman, Goldberg & Lamonsoff, LLP	Michael	Bergman	108-18 Queens Boulevard	#903	Forest HIlls	NY	11375		mike@selectattorney.com
Best Western - Jamaica Inn	Rey	Torres	87-07 Van Wyck Expressway		Jamaica	NY	11435		33141@hotel.bestwestern.com
Big Apple Fire Sprinkler Co. Inc.	Alan	Levitt	64-20 Laurel Hill Blvd.		Woodside	NY	11377		alevitt@bigapplesprinkler.com
Bigman Bros., Inc.	Michael	Bigman	43-40 34 Street		Long Island City	NY	11101		bigmanelectric@aol.com
B-I-L Office Furniture, Inc	Stanley	Potash	61-65 Metropolitan Avenue		Middle Village	NY	11379		stanley@bilofficefurniture.com
Black Bear Co., Inc.	Barret	Schleicher	27-10 49 Avenue		Long Island City	NY	11101		jet@blackbearoil.com
Blake Agency, Inc.	William	Blake II	2001 Marcus Ave. Ste W180		Lake Success	NY	11042		wblake@cuagency.com
Blue Book Building & Construction Network	Lisa	Luttinger	P.O. Box 500		Jefferson Valley	NY	10535		lluttinger@mail.thebluebook.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Bluestone Organization, Inc.	Eric	Bluestone	193-04 Horace Harding Expwy. POB 650454		Fresh Meadows	NY	11365		eric@bluestoneorg.com
Bob Coccia's Appliance Center	Robert	Coccia	215-03 Horace Harding Boulevard		Bayside	NY	11364		cocciasale@aol.com
Bombardier Transportation	Kevin	Kirwan	Operations & Maintenance	Pan Am Road, Bldg #402	Jamaica	NY	11430		pat.thompson@us.transport.bombardier.com
Booth Flower Shop	Chris	Tsouratakis	25-63 Francis Lewis Blvd.		Flushing	NY	11358		christos@boothflowershop.com
Boro-Wide Recycling Corp.	Bob	Cristina	3 Railroad Place		Maspeth	NY	11378		info@borowiderecycling.com
Bourbon Street Cafe	Mark	Bocca	40-12 Bell Blvd.		Bayside	NY	11361		mark@bourbonstreetny.com
Brandt, Steinberg & Lewis LLP	Peter E.	Blond	1430 Broadway 6th Floor		New York	NY	10018		pblond@bsl-taxcert.com
Bridge Enterprises	Ted (Tai-Kyuk)	Han	39-24 Bell Blvd.		Bayside	NY	11361		navyofficer86201@yahoo.com
Briguglio Construction Corp.	Cristine	Briguglio	241-02 Northern Boulevard		Douglaston	NY	11362		cbrig15@aol.com
Bronx Borough President	Ruben	Diaz,Jr	851 Grand Concourse Ste. 301		Bronx	NY	10451	(718) 590-3500	webmail@bronxbp.nyc.gov
Brooklyn Borough President	Eric	Adams	209 Joralemon Street		New York	NY	11201	718-802-3700	askeric@brooklynbp.nyc.gov
Brooklyn Chamber of Commerce	Andrew	Hoan	25 Elm Place, Suite 200		Brooklyn	NY	11201		ahoan@brooklynchamber.com
Brown Harris Stevens Commercial Real Estate	David	Sargoy	99 Powerhouse Road	STE 305	Roslyn Heights	NY	11577		dsargoy@bhsusa.com
Bruno's On the Boulevard	John	Fellin	88-25 Astoria Boulevard		Jackson Heights	NY	11369		johnfellin@caterit.com
Bulova Corporation	Warren	Neitzel	One Bulova Avenue		Woodside	NY	11377		wneitzel@bulova.com
Bunch of Balloons	Shanta	Speller	75-22 37th Avenue	Suite 318	Jackson Heights	NY	11372		info@bunch-of-balloons.com
C&G Cleaning Service	Neil	Grant	94-22 212th Street		Queens Village	NY	11428		info@cgcleaningsvc.com
Capital Bankcard of New York	Hiawatha	Colbert	114-61 225th Street		Cambria Heights	NY	11411		support@cbnewyork.com
Capitol Fire Sprinkler Co., Inc.	Richard	Levine	51-51 59 Place		Woodside	NY	11377		richardlevine@capitolfire.com
Card Works Merchant Services	David	Greenberg	1462 Sherwood Drive		East Meadow	NY	11554		dg.cardworks@gmail.com
Carr Business Systems	Philip	Daniele	130 Spagnoli Road		Melville	NY	11747		pdaniele@carrxerox.com
Cassone Leasing , Inc.	Lynn	Cassone	1950 Lakeland Ave.		Ronkonkoma	NY	11779		lynn@cassone.com
Catholic Cemeteries	Stephen	Comando	80-01 Metropolitan Avenue		Middle Village	NY	11379		snc@ccbklyn.org
CDI Development, Inc.	John	Belanich	525 Northern Boulevard		Great Neck	NY	11021		jdbelanich@bellrealtyny.com
Center for Automotive Education & Training	Jayne	Ruconich	15-30 Petracca Place		Whitestone	NY	11357		jayne@autoedcenter.com
Center for Automotive Education and Training	Kristine	Liggio	15-30 Petracca Place		Whitestone	NY	11357		kristine@autoedcenter.com
Center for Wealth Preservation	Bruce	Smith	6800 Jericho Tpke.	Suite 202W	Syosset	NY	11791		brucedsmith2@financialguide.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Central Holidays	Marc	Evangelista	250 Moonachie Road		Moonachie	NJ	07074		mevangelista@centralholidays.com
Champagnie Dawkins, CPAs, PLLC	Karen	Dawkins	One Cross Island Plaza, Suite 316		Rosedale	NY	11422		kdg@champagniedawkins.com
Chapin Home for the Aging	Janet	Unger	165-01 Chapin Parkway		Jamaica	NY	11432		junger@chapinhome.org
Child Center of NY The	Jennifer	Dudley	60-02 Queens Boulevard, Lower Level		Woodside	NY	11377		jenniferdudley@childcenterny.org
Christie & Co Salon	Lois	Christie	23-64 Bell Blvd.		Bayside	NY	11360		lois@intercoiffure.com
Christine Baumann Interiors, LLC	Christine	Baumann	8921 Shore Parkway		Howard Beach	NY	11414		info@christinebaumanninteriors.com
Ciampa Organization	Christine	Ciampa	136-26 37 Avenue		Flushing	NY	11354		cciampa@ciampaorganization.com
Citibank, N.A.	Dennis	Nochowitz	1 Court Square 42nd Floor		Long Island City	NY	11120		dennis.nochowitz@citigroup.com
Citibank, N.A.	Eileen	Auld	One Court Square 45th Flr. Zone 14		Long Island City	NY	11120		eileen.auld@citigroup.com
City Council District 13, Bronx	James	Vacca	3040 East Tremont Ave	Room 104	Bronx	NY	10461	718-931-1721	jvacca@council.nyc.gov
City Council District 19, Queens	Paul	Vallone	42-40 Bell Blvd	Suite 507	Bayside	NY	11361	718-619-8611	district19@council.nyc.gov
City Council District 21, Queens	Julissa	Ferreras	32-33A Junction Blvd.		East Elmhurst	NY	11369	718-651-1917	jferreras@council.nyc.gov
City Council District 22, Queens	Costa	Constantinides	31-09 Newtown Ave	Suite 209	Astoria	NY	11102	718-274-4500	cconstantinides@council.nyc.gov
City Council District 27, Queens	Daneek	Miller	172-12 Linden Blvd.		St. Albans	NY	11434	718-776-3700	district27@council.nyc.gov
City Underwriting Agency, Inc.	Nash	Roe	2001 Marcus Avenue, Suite W. 180	Suite W180	Lake Success	NY	11042		nroe@cuagency.com
City View Pharmacy	Harry	Xidias	23-07 Astoria Blvd.		Astoria	NY	11102		info@cityviewpharmacy.com
Clarion LaGuardia	Cynthia	Romito	9400 Ditmars Blvd.		East Elmhurst	NY	11369		cynthia@newyorkclarion.com
Clarke & Associates	Millicient	Clarke	11 West Sunrise Highway		Freeport	NY	11520		mclarke4@optonline.net
Club Ground & Pound	Anita	Srivastava	PO Box 540904		Linden Hill	NY	11354		11heclub@gmail.com
Coalition for Queens, Inc.	Jukay	Hsu	42-65 Kissena Blvd Apt 223		Flushing	NY	11355		jukay@coalitionforqueens.org
Coalition of Hope Foundation, Inc	David	Perez	1155 Camino Del Mar, #418		Del Mar	CA	92014		david.perez@COHglobal.org
Coldwell Banker R. Weir Realty	Robert	Weir	36-36 Bell Boulevard		Bayside	NY	11361		weirrealty@aol.com
Coldwell Banker Residential Brokerage	Dennis	Fassett	140 Jericho Tpke		Syosset	NY	11791		dennis.fassett@cbmoves.com
Community Board Office, United Community Civic Association	Rose Marie	Poveromo	22-32 81st Street		Jackson Heights	NY	11370	718-932-5415	rmpucca@aol.com
Compass Forwarding	Richard	Shelala	159-15 ROCKAWAY BLVD		JAMAICA	NY	11434		rjs@compassfwd.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Compucolor	Dennis	Launer	47-50 30th Street		Long Island City	NY	11101		dlauner@compucolor.com
Connect Me	Eugene	Erichsen	198 Route 9 SIE 105		Manalpapan	NJ	07726		eugene@connectmevoice.com
Consolidated Edison Co. of NY, Inc.	Carol Ann	Conslato	59-17 Junction Boulevard		Elmhurst	NY	11373		conslatoc@coned.com
Consolidated Edison Co. of NY, Inc.	Elizabeth	Church	The Learning Center	43-82 Vernon Boulevard	Long Island City	NY	11101		churche@coned.com
Consolidated Edison Co. of NY, Inc.	General	Manager	88-11 165 Street		Jamaica	NY	11432		mangera@coned.com
Consolidated Edison Co. of NY, Inc.	Thomas	Newell	30 Flatbush Avenue, Room 609		Brooklyn	NY	11217		newellt@coned.com
Consolidated Security Inc.	John	Rohe	154-53 27 Avenue		Flushing	NY	11354		csi27ave@yahoo.com
Consulate General of India	A M	Gondane - DCG	3 East 64th Street		New York	NY	10065		dcg@indiacgny.org
Conway Funeral Home	Michael	Heredia	82-19 Northern Blvd.		Jackson Heights	NY	11372		michael.heredia@sci-us.com
Cook & Krupa LLC	John	Cook	81 Jericho Turnpike		Mineola	NY	11501		jcook@cookandkrupa.com
Cord Meyer Development LLC	Sal	Panico	PO Box 10		Forest Hills	NY	11375		spanico@cordmeyer.com
Corey B. Bearak, Esq.	Corey	Bearak	254-10 Northern Blvd. Suite 204		Little Neck	NY	11362		bearak@aol.com
Corporate Development Systems, Inc.	Carl	Smith	22-26 76th Street Suite A3		Jackson Heights	NY	11370		service.info@cdsysinc.com
County Clare Consultants, Inc.	Clare	Browne	85-16 55th Avenue		Elmhurst	NY	11373		cebccc@aol.com
County Fair Air Conditioning	Ronald	Nathan	2700 Shames Drive		Westbury	NY	11590		rnathan@countyfair.com
Courtyard by Marriott at JFK Airport	Timothy	McGlinchey	145-11 North Conduit Avenue		Jamaica	NY	11436		timothy.mcglinchey@marriott.com
Courtyard by Marriott at LaGuardia Airport	Robert	Handler	90-10 Ditmars Blvd.		East Elmhurst	NY	11369		bhandler@laguardia.meyerjabara.com
CPR Cell Phone Repair	Terry	Celestin	34-12 Steinway Street		Astoria	NY	11101		repairs@cpr-astoria.com
Cross County Savings Bank	Anthony	Milone	79-21 Metropolitan Avenue		Middle Village	NY	11379		amilone@crosscounty.com
Crowne Plaza JFK Airport	Olga	Angelinas	138-10 135th Avenue		Jamaica	NY	11436		salesmgr@cpjfkairport.com
Cruise Planners	Sherryann	Simon	110-03 Colfax Street		Queens Village	NY	11429		ssimon@cruiseplanners.com
Crystal Window & Door Systems, Ltd.	Steve	Chen	31-10 Whitestone Expressway		Flushing	NY	11354		stevechen@crystalwindows.com
CUNY COPE Program/LaGuardia Comm. College	Nolan	Rhodes	31-10 Thomson Avenue, MB 13		Long Island City	NY	11101		nrhodes@lagcc.cuny.edu
D&D Glass Co. Inc.	Michael	Demetriou	84-14 Queens Blvd.		Elmhurst	NY	11373		MJD8414@aol.com
DaCorta Bros. Hardware Inc.	Vinnie	DeRiggi	91-07 Astoria Blvd.		East Elmhurst	NY	11369		info@dacortahardware.com
Daniels, Norelli, Scully & Cecere C	Albert F.	Pennisi	97-77 Queens Boulevard, Ste 620		Rego Park	NY	11374		afpennisi@dnsclaw.com
DaniPad LLC	Dani	Horowitz	3825 Bell Blvd.		Bayside	NY	11361		bizdev@daniwebmail.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Davidoff Malito & Hutcher	Sean	Crowley	605 Third Ave. 34th Floor		New York	NY	10158		sec@dmlegal.com
DCD Marketing LTD	Mitchell	Vilinsky	73 Wortman Avenue		Brooklyn	NY	11207		mitch@dcdad.com
De Boccia Electrical Construction Corp	Elaine	DeRosa	33-16 38th Avenue		Long Island City	NY	11101		boccia4deboccia@optonline.net
Delta Air Lines	Christine	Boucher							christine.boucher@delta.com
Delta Air Lines	James	Tiefenthaler							james.tiefenthaler@delta.com
Delta Air Lines	Patty	Ornst							patricia.ornst@delta.com
Delta Air Lines	Ryan	Marzullo							ryan.m.marzullo@delta.com
DeMatteis Organizations	Richard	DeMatteis	820 Elmont Road		Elmont	NY	11003		info@dematteisorg.com
Digital Natives	Vlad	Lackovic	522 46th Avenue		Long Island City	NY	11101		vlad@nativesgroup.com
Donnelly Mechanical Corp.	Dan	Donnelly	96-59 222 Street		Queens Village	NY	11429		ddonnelly@donnellymech.com
Dr Marsha Bienenstock	Marsha	Bienenstock	46 Henrietta Ave.		Oceanside	NY	11572		mars2001@aol.com
Driscoll Group, The	William T.	Driscoll	Forest Hills Tower	118-35 Queens Blvd, STE 940	Forest Hills	NY	11375		bill@driscollgroupny.com
Durante Rentals	John	Durante	717 Hutchinson River Parkway		Bronx	NY	10465		jdurante@duranterentals.com
Du-Rite Realty Company	Vincent J.	Gianelli	25-68 Francis Lewis Boulevard		Flushing	NY	11358		doritereal@aol.com
E. Gluck Corporation	Murray	Stimler	6105 Little Neck Parkway		Little Neck	NY	11362		mstimler@egluck.com
Eastern American Data Voice Inc.	Paul	Schmidt	42-50 27 Street		Long Island City	NY	11101		pschmidt@eadv.com
Edible Arrangements - Glen Oaks	Tricia	Dhanraj	253-22 Union Turnpike		Glen Oaks	NY	11004		tricia.planb@yahoo.com
Edmar	Judy	Simon	50-05 47 Avenue		Woodside	NY	11377		judy@edmarclean.com
Elderplan	Agata	Michalik	745 64th Street		Brooklyn	NY	11220		amichali@mjhs.org
Elite Limousine Plus, Inc.	Shafquat	Chaudhary	32-72 Gale Avenue		Long Island City	NY	11101		schaudhary@eliteny.com
Ellis, Ged & Bodden, P.A.	Dana	Rhinesmith	591 Midland Ave		Staten Island	NY	10306		spetosa@ellisandged.com
Elmhurst Hospital Center	Chris	Constantino	79-01 Broadway		Elmhurst	NY	11373		constanc@nychhc.org
Emerging Technologies Institute Inc.	Lyonel	Coriolan	116-16 Queens Blvd. Ste 200-B		Forest Hills	NY	11375		lcoriolan@emergingtech.edu
Empire State Development Corporation	Howard	Zemsky	95 Perry Street	Suite 500	Buffalo	NY	14203	(716) 846-8200	howard.zemsky@esd.ny.gov
Employee Screening Services	Daniel	Stevens	7618 17th Avenue		Brooklyn	NY	11214		dan@employeescreening.com
Eneslow Foot Comfort Centers	Robert	Schwartz	470 Park Ave. South		New York	NY	10016		rss@eneslow.com
European Expert Care,Inc	Yolanta	Maczynska-Khalil	110 Norman Ave		Brooklyn	NY	11222		mail@eecare.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Executive Office Center	Mary	Abrams	Executive Office Center Fresh Meadows	61-43 186 Street	Fresh Meadows	NY	11365		mary.abrams@eocfm.com
Exit Realty - First Choice	Barbara	Sontag	180-32 Union Turnpike		Fresh Meadows	NY	11366		sontagpi@aol.com
Exit Realty Success	Alejandra	Fermin	106-12 Corona Avernue		Corona	NY	11368		afermin@exitrealtysuccesshome.com
ExxonMobil Corporation	Kevin	Thompson	38 Varick Street		Brooklyn	NY	11249		kevin.m.thompson@exxonmobil.com
F & T Group	Michael	Meyer	136-20 38th Ave. 12th fl.		Flushing	NY	11354		michael.meyer@fandtgroup.com
FAA NYADO	David	Sanchez	1 Aviation Plaza	Room 111	Jamaica	NY	11434		david.sanchez@faa.gov
FAA NYADO	Evelyn	Martinez	1 Aviation Plaza	Room 111	Jamaica	NY	11434		evelyn.martinez@faa.gov
FAA NYADO	Marie	Jenet	1 Aviation Plaza	Room 111	Jamaica	NY	11434	516-227-3811	marie.jenet@faa.gov
FAA NYADO	Sukhbir	Gill	1 Aviation Plaza	Room 111	Jamaica	NY	11434		sukhbir.gill@faa.gov
FAA/Eastern Region	Andrew	Brooks	1 Aviation Plaza	Room 111	Jamaica	NY	11434		andrew.brooks@faa.gov
FAA/Eastern Region	David	Fish	1 Aviation Plaza	Room 111	Jamaica	NY	11434		david.fish@faa.gov
FAA/Eastern Region	Steven	Urlass	1 Aviation Plaza	Room 111	Jamaica	NY	11434	516-227-3803	steven.urlass@faa.gov
Fairfield Inn By Marriott LaGuardia Airport Astoria	Steve	Kaye	45-20 Astoria Blvd.		Astoria	NY	11103		steve.kaye@marriott.com
Fairway Market	Jackie	Donovan	240-02 61st Avenue		Douglaston	NY	11362		marketing@fairwaymarket.com
Family Home Improvement Corp	Jan	Arden	434 Elmont Road		Elmont	NY	11003		janarden1@aol.com
Family Residences and Essential Enterprises, Inc. (FREE)	Patrice	Radowitz	191 Bethpage-Sweet Hollow Road		Old Bethpage	NY	11804		pradowitz@familyres.org
Farber Rosen & Kaufman P.C.	Joseph	Farber, Esq.	97-77 Queens Boulevard		Rego Park	NY	11374		jfarber@frklaw.com
Farrell Fritz, P.C.	Charlotte	Biblow	1320 RXR Plaza		Uniondale	NY	11556		cbiblow@farrellfritz.com
Farrell Fritz, P.C.	Louis	Vlahos	1320 RXR Plaza	14th Floor West Tower	Uniondale	NY	11556		lvlahos@farrellfritz.com
Fashion Societé	Cathy	Berger	PO BOX 342		Roslyn	NY	11577		cathy@fashionsociete.com
Federal Congress District 7	Nydia	Velazquez	266 Broadway	Suite 201	Brooklyn	NY	11211	718-599-3658	nydia.velazquez@mail.house.gov
Federal Senate, Senator's Aide	Gerard	Petrella	322 Hart Senate Office Building		Washington	DC	20510	202-224-6542	gerry_petrella@schumer.senate.gov
Federation of NY Housing Cooperatives	Gregory	Carlson	61-20 Grand Central Parkway		Forest Hills	NY	11375		crealty@nyc.rr.com
Ferrari Driving School, Inc.	Domenico	Pinto	32-32 Steinway Street		Astoria	NY	11103		mpinto@ferraridrivingschool.com
Fidelis Care, New York	Maximo	Luna	95-25 Queens Blvd.		Rego Park	NY	11374		mluna@fideliscare.org
Fillmore's Tavern	Rick	Reichenbach	166-02 65 Avenue		Fresh Meadows	NY	11365		fillmorestavern@aol.com
Financial Services of Long Island	Richard	Grebinger	34 Merrick Avenue		Merrick	NY	11566		rgrebing@optonline.net

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Finer Grafx	Michael	Feinberg	70-25 Yellowstone Boulevard, Ste. 19-0		Forest Hills	NY	11378		finergrafx@mac.com
First Development Corp.	Bruce	Pollack	1328 Motor Pkwy		Hauppauge	NY	11749		bp@fdcrealty.com
Flushing Bank	Patricia	Mezeul	1979 Marcus Avenue Suite E140		Lake Success	NY	11042		pmezeul@flushingbank.com
Flushing Bank	John	Buran	1979 Marcus Avenue		Lake Success	NY	11042		jburan@flushingbank.com
Flushing Council On Culture & The Arts	Ellen	Kodabek	137-35 Northern Boulevard		Flushing	NY	11354		info@flushingtownhall.org
Flushing House Senior Retirement Residence	Robert	Salant	38-20 Bowne Street		Flushing	NY	11354		rsalant@uam.org
Flushing Savings Bank	Ram	Mohan	188-08 Hollis Ct Blvd.		Auburndale	NY	11358		rmohan@flushingsavings.com
Flushing YMCA	William	Nelson	138-46 Northern Boulevard		Flushing	NY	11354		wnelson@ymcanyc.org
Fodera Foods	Tony	Fodera	129-02 Northern Boulevard		Corona	NY	11368		tony@foderafoods.com
Food Craft Inc. Worlds Fair Marina Restaurant	Pankaj	Bhatara	1 Worlds Fair Marina		Flushing	NY	11368		pankaj@1wfm.com
Foot & Ankle Surgeons of New York	Dr. Fred J.	DeLucia	3003 New Hyde Park Road	Suite 312	New Hyde Park	NY	11042		info@faasny.com
Ford Lincoln of Queens	Michael	Naclerio	139-40 Queens Blvd.		Jamaica	NY	11435		mike@fordofqueens.com
Forest Hills Chamber of Commerce	Leslie	Brown	PO Box 751123		Forest Hills	NY	11375		fhchamber@aol.com
Forest Hills Financial Group Inc.	Nathan	Perlmutter	95-25 Queens Boulevard, 10 Floor		Rego Park	NY	11374		nperlmutter@fhfg.com
Forest Hills Hospital	Ted	Lehmann	102-01 66th Road		Forest Hills	NY	11375		tlehmann@nshs.edu
Forestdale, Inc.	Anstiss	Agnew	67-35 112th Street		Forest Hills	NY	11375		aagnew@forestdaleinc.org
Forever Cheese	Michele	Buster	36-36 33 Street		Long Island City	NY	11106		info@forevercheese.com
Frank J. Ruggieri MBA, CPA, P.C.	Frank	Ruggieri	1979 Marcus Avenue Suite #210		Lake Success	NY	11042		frankrcpa@verizon.net
French & Casey, LLP	Joseph A.	French	29 Broadway 27th fl.		New York	NY	10006		jfrench@frenchcasey.com
Fresh Pond Crematory	Joseph P.	Di Troia	61-40 Mount Olivet Crescent		Middle Village	NY	11379		j.ditroia@verizon.net
FROMMVIDEO	Richard	Fromm	26-53 202 Street		Bayside	NY	11360		richard@frommvideo.com
Gabrielli Truck Sales, Ltd.	Armando	Gabrielli	153-20 South Conduit Avenue		Jamaica	NY	11434		sales@gabriellitruck.com
Galasso Trucking, Inc.	Frank	Galasso	2 Galasso Place		Maspeth	NY	11378		fgalasso@galasso.com
Galeas Consulting LLC	Bruno	Scap	P.O. Box 2219		Astoria	NY	11102		eop@galeasconsulting.com
Gateway Investments, LLC	Thomas	Santucci	200 Garden City Plaza Ste 402		Garden City	NY	11530		tjs@gatewayinv.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Gentle Dental Family Care	Dana	Simhon	118-60 Metropolitan Ave. #1B		Kew Gardens	NY	11415		info@gentledentalfamilycare.com
Geo. E. Payne & Son, Inc.	Carmela	Schneider	200-15 32 Avenue		Bayside	NY	11361		cschneider@geoepayne.com
Gerald J. Caliendo, R.A., A.I.A.	Gerald	Caliendo	138-72 Queens Boulevard		Briarwood	NY	11435		info@caliendoarchitects.com
Get Taxi	Jing Wang	Herman	C/O AI 149 Fifth Avenue		New York	NY	10010		jing@gettaxi.com
Global Gateway Alliance	Stephen	Sigmund	25 W 39th Street		New York	NY	10018		sigmund@globalgatewayalliance.org
GM Printing	K.	Chow	31-16 Hunters Point Ave.		Long Island City	NY	11101		kychow@gmgroupny.com
Gold Star Electrical,Inc	Samy	Mounas	59-24 57th Street		Maspeth	NY	11378		samy@goldstarelectrical.com
Goodwill Industries of Greater NY & N. NJ	David	Schoch	4-21 27 Avenue		Astoria	NY	11102		dschoch@goodwillny.org
Gordon & McCarthy Inc.	Bruce	Gordon	63-48 Alderton Street		Rego Park	NY	11374		bgordon@gordonmccarthy.com
Gotte's Cafe	Vincent	Gottesman	75-20 Astoria Blvd		Jackson Heights	NY	11370		gottevents@aol.com
Graf & Lewent Architects	Howard	Graf, A.I.A.	90-30 161st Street		Jamaica	NY	11432		h.graf@glarchitects.com
Grant Associates/Queens Business Solutions Ctr	Diane	Edelson	60 Madison Avenue Suite 703		New York	NY	10010		dedelson@grantassociatesinc.com
Greater New York Councils Boy Scouts of America	Joseph	Schiltz	350 Fifth Ave. Suite 7830		New York	NY	10118		jschiltz@bsa-gnyc.org
Grimaldi Bakery Corp.	Joseph	Grimaldi	21-01 Menahan Street		Ridgewood	NY	11385		josephg824@msn.com
GuildNet, Inc.	Joselyn	Salazar	15 W 65th Street		New York	NY	10023		salazarj@jgb.org
Hankin & Mazel, PLLC	Mark.	Hankin	60 Cutter Mill Road Suite 505		Great Neck	NY	11021		mhankin@hhmlegal.com
HealthPlus Amerigroup	Dominic	Bardowell	241 37th Street	3rd Floor	Brooklyn	NY	11232		dominic.bardowell@amerigroup.com
Helms Bros., Inc.	Douglas	Callahan	208-24 Northern Boulevard		Bayside	NY	11361		dcallahan@helmsbros.com
HF Management Services LLC	Tanya	Whitmore	100 Church Street 16th Floor		New York	NY	10007		twhitmore@healthfirst.org
Hillside Honda	Danielle	Ginocchio	139-07 Hillside Avenue		Jamaica	NY	11435		danielle_sales@hillsidehonda.com
Hilo Materials Handling Group	Cindy	Eisele	45-54 37th Street		Long Island City	NY	11101		ceisele@hilousa.com
Holiday Inn Express	Milan	Patel	59-40 55th Road		Maspeth	NY	11378		milan.mpatel@gmail.com
Holiday Inn LaGuardia Airport	Driana	Santos	37-10 114th Street		Corona	NY	11368		exec@holidaylga.com
Holiday Inn LaGuardia Airport	Maria	Shea	37-10 114 Street		Corona	NY	11368		sales@holidaylga.com
Holy Cross High School	Gail	Sicoli	26-20 Francis Lewis Blvd.		Flushing	NY	11358		alumni@holycrosshs.org
Hon. Claire Shulman	Claire	Shulman	14-16 162 Street		Whitestone	NY	11357		MDMSMD2005@yahoo.com
HRAD Construction	Wayne	Adderley	12-06 149 Street		Whitestone	NY	11357		hradconstruction@aol.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
HSBC Bank USA, N.A.	David	Byers	22-15 43rd Avenue		Long Island City	NY	11101		david.x.byers@us.hsbc.com
HSBC Bank USA, N.A.	Jay	Yarnell	452 5th Avenue		New York	NY	11101		charles.f.ryan@us.hsbc.com
HSBC Bank USA, N.A.	Jeff	Needham	452 5th Avenue		New York	NY	10018		jeff.needham@us.hsbc.com
IBI Armored Services, Inc.	John	Brooks	37-06 61 Street		Woodside	NY	11377		john.brooks@ibiarmored.com
Independence Residences, Inc.	Raymond	DeNatale	93-22 Jamaica Avenue, 2 Floor		Woodhaven	NY	11421		rjdenatale@in-res.org
Industrial Management & Training Institute Inc.	Marcel	Veronneau	43-82 Vernon Boulevard		Long Island City	NY	11101		marcelveronneau@yahoo.com
Intercity Agency Inc.	Nicolas	Estevez	42-40 Bell Boulevard Ste 103		Bayside	NY	11361		hne@intercityagency.com
Interstate Envelope Mfg. Corp.	Alfred	Wilkowski	56-15 55 Drive		Maspeth	NY	11378		alfredw@interstate-envelope.com
Investors Bank	Deena	Sattaur	Court Street Branch	81 Court Street	Brooklyn	NY	11201		dsattaur@myinvestorsbank.com
Jackson Lewis	John	Porta	58 South Service Road		Melville	NY	11747		portaj@jacksonlewis.com
James F. Capalino & Assoc.	James F.	Capalino	233 Broadway, Suite 710		New York	NY	10279		james@capalino.com
JCF Electric, Inc.	Bernadette	Jeronimo	86-18 Atlantic Avenue		Ozone Park	NY	11416		info@jcfelectric.com
JFA Insurance Brokerage & Associates Inc.	Francine	Salomon	25-31 Francis Lewis Blvd.		Bayside	NY	11358		fran@jfainsurance.com
John A. Vassilaros & Son, Inc.	John	Vassilaros	29-05 120 Street		Flushing	NY	11354		customerservice@vassilaroscoffee.com
John C. Chen Architect, PLLC	John	Chen	41-22 Fuller Place 3rd Fl.		Flushing	NY	11355		jccar05@yahoo.com
Johnstone Supply	Drew	Garda	27-01 BQE West		Woodside	NY	11377		store60@johnstonesupply.com
Joseph P. Day Realty Corp.	Frank	Zimbaro	9 East 40 Street, 8 Floor		New York	NY	10016		ffz@jpday.com
JW Lee State Farm Agency	JW	Lee	242-07 Northern Blvd		Douglaston	NY	11363		jw.lee.k2o8@statefarm.com
Kaled Management Corp.	Edward	Kalikow	7001 Brush Hollow Road		Westbury	NY	11590		ed@kaled.com
Kalmon Dolgin Affiliates Inc.	Neil	Dolgin	101 Richardson Street		Brooklyn	NY	11211		neil@kalmondolgin.com
Kamco Supply Corp	Evan	Meyers	80 21st Street		Brooklyn	NY	11232		emeyers@kamco.com
Kaufman Astoria Studios Inc.	Hal	Rosenbluth	34-12 36 Street		Astoria	NY	11106		maria@kaufmanastoria.com
Keller Williams Realty Landmark	Helen	Keit	32-55 Francis Lewis Blvd.		Flushing	NY	11358		helen.keit@kw.com
Korean Central Daily News, Inc. dba.The Korean Daily	John	Villafane	43-27 36th Street		Long Island City	NY	11101		villafane.john@koreadaily.com
LaGuardia Community College	Eneida	Rivas	31-10 Thomson Avenue, Room E511		Long Island City	NY	11101		eneidar@lagcc.cuny.edu
LaGuardia Community College	Gail	Mellow	31-10 Thomson Avenue		Long Island City	NY	11101		gmellow@LaGCC.CUNY.EDU

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
LaGuardia Corporate Ctr. Assoc.	Michael	Dumelle	75-20 Astoria Boulevard, Suite 50		Jackson Heights	NY	11370		NYHELP@BDGNET.Com
Laurino & Laurino	Louis	Laurino	229 Seventh Street, Suite 201		Garden City	NY	11530		louislaurino@laurinoandlaurino.com
Law Office of Anthony Mallilo	Jack	Grossman, Esq.	163-09 Northern Boulevard		Flushing	NY	11358		jgross5099@aol.com
Law Office of Vincent L. Petraro, PLLC	Vincent	Petraro, Esq.	350 7th Avenue, Suite 1703		New York	NY	10001		vpetraro@gmail.com
Law Offices of Jason W. Stern & Associates	Jason	Stern	108-18 Queens Blvd. Ste. 902		Forest Hills, N.Y. 11375	NY	11375		J1stern@aol.com
Legal Shield	Cheryl	Miller	164-38 108th Avenue		Jamaica	NY	11433		cherylmiller@legalshieldassociate.com
Levine Builders	Jeffrey	Levine	42-09 235 Street		Douglaston	NY	11363		JeffLevine@levinebuilders.com
Lewis & Murphy Realty	Diane	Macari	95-40 Roosevelt Avenue		Jackson Heights	NY	11372		dmacari@lewismurphyrealty.com
Lewis & Murphy Realty	Louis	Macari	95-40 Roosevelt Avenue		Jackson Heights	NY	11372		dmacari@lewismurphyrealty.com
Liberty Mutual	Bruce	Smith	6800 Jericho Turnpike		Syosset	NY	11791		jmiccio@financialguide.com
Life's Worc	Peter	Smergut	1501 Franklin Avenue		Garden City	NY	11530		smergut@aol.com
Lin + Associates Architects, P.C.	Emily	Lin	8375 117th Street Unit 7A		Richmond Hill	NY	11418		info@linarchitects.com
Lincoln Technical Institute	James	Morrissey	15-30 Petracca Place		Whitestone	NY	11357		jmorrissey@lincolntech.com
Linear Lighting Corp.	Lois	Shorr	31-30 Hunters Point Avenue		Long Island City	NY	11101		lois@linearltg.com
London Lennie's Seafood Rest.	Leslie	Barnes	63-88 Woodhaven Boulevard		Rego Park	NY	11374		leslie@londonlennies.com
London Towncars, Inc.	Stephen	Spencer	40-14 23 Street		Long Island City	NY	11101		slspencer@londontowncars.com
Long Island Business Institute	Monica	Foote	136-18 39th Avenue		Flushing	NY	11354		mfoote@libi.edu
Long Island City Partnership	Elizabeth	Lusskin	27-01 Queens Plaza		Long Island City	NY	11101		ELusskin@licpartnership.org
Lorraine Gregory Corp.	Gregory	Demetriou	Communications Group	100 Schmitt Blvd	Farmingdale	NY	11735		greg@lorrainegregorycorp.com
Louis Armstrong House Museum	Jennifer	Walden	34-56 107th Street		Corona	NY	11368		jennifer.walden@qc.cuny.edu
Lowery Liquor & Wine Co.	Anthony	Lodati	40-14 Queens Boulevard		Sunnyside	NY	11104		anthonylsr@loweryswfo.com
M & T Bank	Stuart	Harker	10-30 Jackson Ave.		Long Island City	NY	11101		sharker@mtb.com
M. SHAFIQUE, CPA, PLLC	MOHAMMAD	SHAFIQUE	74-09 37TH AVENUE	SUITE 306F	JACKSON HEIGHTS	NY	11372		info@shafiquecpa.com
Madelaine Chocolate Novelties	Norman	Gold	96-03 Beach Channel Drive		Rockaway Beach	NY	11693		ngold@madelainechocolate.com
Madison Square Garden Company	Annette	Juraico	Two Pennsylvania Plaza	16th Floor	New York	NY	10121		annette.juriaco@msg.com
Major Automotive Group	Bruce	Bendell	43-40 Northern Boulevard		Long Island City	NY	11101		bbendell@majorauto.com
Manhattan Borough President	Gale	Brewer	1 Centre Street, 19th Floor		New York	NY	10007	212-669-8300	info@manhattanbp.nyc.gov

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Manhattan Chamber of Commerce	Jessica	Walker	1120 Ave of the Americas		New York	NY	10036		jwalker@manhattancc.org
Maple Grove Cemetery Association	Bonnie	Thompson Dixon	127-15 Kew Gardens Road		Kew Gardens	NY	11415		bonnie@maplegrovecenter.org
Marbren Tire Co., Inc.	Mark	Brenner	32-16 Hunters Point Avenue		Long Island City	NY	11101		marbren@verizon.net
Maria Cristina Alvanos	Cristina	Alvanos	13-21 125th St		College Point	NY	11356		cristinalvanos@aol.com
Martha Taylor, ESQ.	Martha	Taylor	175-14 Mayfield Road		Jamaica	NY	11432		marthataylor1@verizon.net
Martin A. Gleason Funeral Home LLC	John	Golden	149-20 Northern Boulevard		Flushing	NY	11354		gleasonfh@aol.com
Mary Louis Academy, The	Kathleen	McKinney	176-21 Wexford Terrace		Jamaica	NY	11432		principal@tmla.org
Mash City Business Systems	Howard	Mann	1 Enterprise Place	STE E	Hicksville	NY	11801		mashmann2@aol.com
Maspeth Federal Savings	Kenneth	Rudzewick	56-18 69th Street		Maspeth	NY	11378		mfsweb@maspethfederal.com
MatchMySpirit, Inc.	Naini	Nakagawa	211-21 45th Road		Bayside	NY	11361		matchmyspirit@gmail.com
Mattone Group, LLC	Carl	Mattone	141-07 20th Avenue Suite 507		Whitestone	NY	11357		cmattone@mattonegroup.com
Mattone Group, LLC	Joseph	Mattone, Esq.	134-01 20 Avenue		College Point	NY	11356		jmattonesr@mattonegroup.com
Mayor's Office of Environmental Coordination	Hilary	Semel	253 Broadway	14th Floor	New York	NY	10002	212-676-3290	hsemel@cityhall.nyc.gov
Mayor's Office of Long Range Planning & Sustainability	Nilda	Mesa	253 Broadway	10th Floor	New York	NY	10002	212-788-3069	nmesa@cityhall.nyc.gov
Mediamorphosis LLC	Adris	Chakraborty	39-15 29th St. 2nd Floor		Long Island City	NY	11101		adris@mediamorphosisinc.com
Meltzer Accounting & Tax Service	Joel	Meltzer	38-08 Bell Blvd. Apt 6		Bayside	NY	11361		meltzeracting100@aol.com
Michelle's Bookkeeping and Accounting Services	Michelle	Wilson	234-15 131st Avenue		Rosedale	NY	11422		Michelle@michellesbookkeeping.com
Micro Center	Tom	Eckert	71-43 Kissena Blvd		Flushing	NY	11367		teckert@microcenter.com
Mike The Glazier	Lance	Lerner	35-18 Linden Place		Flushing	NY	11354		lancemtg@aol.com
Minuteman Press of Bellerose	Scott	Levine	248-02 Union Turnpike		Bellerose	NY	11426		scott@minutemanbellerose.com
Monroe College	Evan	Jerome	Monroe College - King Graduate School	135-16 Roosevelt Ave.	Flushing	NY	11354		ejerome@monroecollege.edu
Montrose Surveying Co. LLP	Saeid	Jalilvand	116-20 Metropolitan Ave.		Richmond Hill	NY	11418		saeid@montrosesurveying.com
Mount Sinai Hospital of Queens	Caryn	Schwab	25-10 30 Avenue		Long Island City	NY	11102		caryn.schwab@mountsinai.org
Mount Sinai Hospital of Queens	Deborah	Tarulli	31-60 21 Street		Astoria	NY	11106		deborah.tarulli@mountsinai.org
Mount Sinai Hospital of Queens	Judy	Trilivas	25-10 30 Avenue		Long Island City	NY	11102		judy.trilivas@mountsinai.org

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MTA Long Island Rail Road	Helena	Williams	Jamaica Station Building		Jamaica	NY	11435		cpapand@lirr.org
MTM Printing Co., Inc.	Steven	Kolman	23-21 College Point Boulevard		College Point	NY	11356		info@mtmprinting.com
Museum of the Moving Image	Christina	Marouda	36-01 35th Avenue		Astoria	NY	11106		members@movingimage.us
Muss Development Company	Joshua	Muss	118-35 Queens Boulevard		Forest Hills	NY	11375		carolyn@muss.com
National Grid	Andrew	Barnes III	One Metro Tech Center		Brooklyn	NY	11201		Andrew.Barnes@us.ngrid.com
Nemo Tile Co., Inc.	Bert	Karlin	177-02 Jamaica Avenue		Jamaica	NY	11432		bkarlin@nemotile.com
New Bronx Chamber of Commerce, The	Lenny	Caro	1200 Waters Place	Ste 106	Bronx	NY	10461		mail@bronxchamber.org
New England Wealth Strategies	Jon	Postyn	50 Charles Lindbergh Blvd. Ste 600 Office 113		Uniondale	NY	11553		jpostyn@yahoo.com
New York Advisory Services, Inc.	Richard	Chernoff	551 Fifth Avenue		New York	NY	10176		rchernoff@nyasi.com
New York City Landmarks Preservation Commission	Meenakshi	Srinivasan	One Centre Street	9th Floor	New York	NY	10007	212-669-7700 / 669-7938	msrinivasan@lpc.nyc.gov
NEW YORK CITY RECRUITING BATTALION (1G6)	MICHAEL	GALLUCCI	BLDG 212 GENERAL LEE AVENUE		FORT HAMILTON	NY	11252		michael.v.gallucci.mil@mail.mil
New York Community Bank	Georgiana	Reese	32 Hathaway Lane		Manhasset	NY	11030		creese1225@aol.com
New York Community Bank	Joseph	Ficalora	615 Merrick Avenue		Westbury	NY	11590		jficalora@mynycb.com
New York Daily News	JoAnn	DiNapoli	4 New York Plaza 6th Fl. Advertising		New York	NY	10004		Jdinapoli@nydailynews.com
New York Grant Company	Jonathan	Breshin	29 Broadway Ste 2222		New York	NY	10006		jonathan@nygrants.com
New York Hall of Science	Dan	Wempa	47-01 111 Street		Queens	NY	11368		dwempa@nyscience.org
New York Hospital Queens	Stephen	Mills	56-45 Main Street		Flushing	NY	11355		ssmills@nyp.org
New York LaGuardia Airport Marriott	David	Salcfas	102-05 Ditmars Boulevard		East Elmhurst	NY	11369		mike.payne@marriott.com
New York LaGuardia Airport Marriott	Tom	Walsh	102-05 Ditmars Boulevard		East Elmhurst	NY	11369		tom.p.walsh@marriott.com
New York Life Insurance / Hispanic Market	Hugo	Clavijo	100 Jericho quadrangle	Suite 325	Jericho	NY	11753		Hugo_clavijo@newyorklife.com
New York Mets	David	Newman	Citi Field	123-01 Roosevelt Avenue	Flushing	NY	11368		dnewman@nymets.com
New York Plumbing, Heating, Cooling Corp.	Chris	Perosi	87-71 Lefferts Blvd.		Richmond Hill	NY	11418		chrisp@nyplumbing.com
New York Power Authority	Edward J.	Birdie	31-03 20 Avenue		Astoria	NY	11105		ed.birdie@nypa.gov
New York Times, The	Mike	Connors	1 New York Times Plaza		Flushing	NY	11354		connem@nytimes.com
New York Times, The	Nicholas	D'Andrea	1 New York Times Plaza		Flushing	NY	11354		dandrnd@nytimes.com
News Corporation -Times Ledger	Ralph	Donofrio	41-02 Bell Blvd.		Bayside	NY	11361		rdonofrio@cnglocal.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
NFH Real Estate Solutions	Norman	Hanlon, MAI	50-12 193 Street		Fresh Meadows	NY	11365		nfhcommre@aol.com
North Shore- LIJ Health System	William J.	Cunningham	145 Community Drive		Great Neck	NY	11021		wcunningham@nshs.edu
North Shore-LIJ Health System	Terence	Lynam	145 Community Drive		Great Neck	NY	11021		tlynam@nshs.edu
Northern Lights Publisher New York, The	Victor R.	Muravin	33-82 164 Street		Flushing	NY	11358		charityarmy@live.com
NorthStar LaGuardia, LLC/DBA Clarion Hotel	VANESSA	PENSON	9400 Ditmars Blvd.		East Elmhurst	NY	11369		david@newyorkclarion.com
NRG Astoria Gas Turbines Operations Inc.	Michael	Schatz	31-01 20 Avenue		Astoria	NY	11105		michael.schatz@nrgenergy.com
NY Graph X Corporation	William	Vitale	166-65 21st Road		Whitestone	NY	11357		contact@nygraphx.com
NYC Council District 25	Daniel	Dromm	37-32 75th St.		Jackson Heights	NY	11372	718-803-6373	Dromm@council.nyc.gov
NYC Council District 29	Karen	Koslowitz	118-35 Queens Blvd.	17th Floor	Queens	NY	11375	718-544-8800	Koslowitz@council.nyc.gov
NYC DEP Bureau of Planning Assessment	Chung	Chan	59-17 Junction Blvd	13th Floor	Flushing	NY	11373	718-595-4479	chungc2@dep.nyc.gov
NYC Department of City Planning	Marisa	Lago	120 Broadway	31st Floor	New York	NY	10271	212-720-3300	mlago@planning.nyc.gov
NYC Department of City Planning, Queens Borough Office	John	Young	120-55 Queens Blvd	Room 201	Kew Gardens	NY	11424	718-286-3170	jyoung@planning.nyc.gov
NYC DOT	Aaron	Sugiera	55 Water Street	9th Floor	New York	NY	10004		asugiera@dot.nyc.gov
NYC DOT	Eric	Beaton	55 Water Street	9th Floor	New York	NY	10004	212-839-6697	ebeaton@dot.nyc.gov
NYC DOT	Naim	Rasheed	55 Water Street	9th Floor	New York	NY	10004	212-839-7710	nrasheed@dot.nyc.gov
NYC DOT	Polly	Trottenberg	55 Water Street	9th Floor	New York	NY	10041		ptrottenberg@dot.nyc.gov
NYC DOT	Shakil	Ahmed	55 Water Street	9th Floor	New York	NY	10004	212-839-7705 / 7777	sahmedz@dot.nyc.gov
NYC DOT	TJ	Jassel	55 Water Street	9th Floor	New York	NY	10004		tjassel@dot.nyc.gov
NYC DOT	Tom	Maquire	55 Water Street	9th Floor	New York	NY	10004		tmaquire@dot.nyc.gov
NYC DOT Queens Borough	Nicole	Garcia	120-55 Queens Blvd	Room 285	Kew Gardens	NY	11424	212-839-2510	ngarcia@dot.nyc.gov
NYC EDC	James	Patchett	110 William Street		New York	NY	10038	212-619-5000	jpatchett@edc.nyc
NYC Landmarks Preservation Commission	Gina	Santucci	1 Centre Street	9N	New York	NY	10007		gsantucci@lpc.nyc.gov
NYC Parks and Recreation	Dorothy	Lewandowski	Olmstead Center	Flushing Meadows Corona Park	Flushing	NY	11368	718-520-5905	dorothy.lewandowski@parks.nyc.gov
NYC Parks and Recreation	Mitchell	Silver	The Arsenal at Central Park	830 Fifth Avenue	New York	NY	10065	212-360-1311	mitchell.silver@parks.nyc.gov
NYC Waste Match	Adannna	Roberts	CCNY Steinman Hall Rm 188	140th and Convent Avenue	New York	NY	10031		wmadmin@ce.ccny.cuny.edu
NYCO Plumbing & Heating Corp.	Nicholas	Yavaldakis	30-43 14 Street		Astoria	NY	11102		mrnyco@aol.com
NYS 26th Assembly District	Edward	Braunstein	213-33 39th Avenue	Suite 238	Bayside	NY	11361	718-357-3588	braunsteine@assembly.state.ny.us

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
NYS 35th Assembly District	Jeffrion	Aubry	98-09 Northern Blvd		Corona	NY	11368	718-457-3615	AubryJ@assembly.state.ny.us
NYS 36th Assembly District	Aravella	Simotas	31-19 Newtown Ave	Suite 401	Astoria	NY	11102	718-545-3889	simotasa@assembly.state.ny.us
NYS 37th Assembly District	Catherine	Nolan	41-02 Queens Blvd	Suite 2B	Sunnyside	NY	11104	718-784-3194	nolanc@assembly.state.ny.us
NYS 38th Assembly District	Michael	Miller	83-91 Woodhaven Boulevard		Woodhaven	NY	11421	518-455-4621	MillerMG@assembly.state.ny.us
NYS 39th Assembly District	Francisco	Moya	82-11 37th Avenue	Suite 709A	Jackson Heights	NY	11372	718-458-5637	moyaf@assembly.state.ny.us
NYS 40th Assembly District	Ron	Kim	136-20 38th Ave., Suite 10A		Flushing	NY	11354	518-455-5411	KimR@assembly.state.ny.us
NYS DEC	Basil	Seggos	625 Broadway		Albany	NY	12233	518-402-8545	basil.seggos@dec.ny.gov
NYS DEC Region 2	Sam	Lieblich	Hunter's Point Plaza	47-40 21st Street	Long Island City	NY	11101		sam.lieblich@dec.ny.gov
NYS DOT	Diane	Park	Hunter's Point Plaza	47-40 21st Street	Long Island City	NY	11101	718-482-4526	diane.park@dot.ny.gov
NYS DOT	Ian	Francis	Hunter's Point Plaza	47-40 21st Street	Long Island City	NY	11101	718-482-4627	ian.francis@dot.ny.gov
NYS DOT	Luis	Calderon	Hunter's Point Plaza	47-40 21st Street	Long Island City	NY	11101	718-482-4690	luis.calderon@dot.ny.gov
NYS DOT	Matthew J.	Driscoll	NYSDOT Main Office	50 Wolf Road	Albany	NY	12232		matthew.driscoll@dot.ny.gov
NYS DOT	Sonia	Pichardo	Hunter's Point Plaza	47-40 21st Street	Long Island City	NY	11101	718-482-4526	sonia.pichardo@dot.ny.gov
NYS DOT	Uchenna	Madu	Hunter's Point Plaza	47-40 21st Street	Long Island City	NY	11101	718-482-4562	uchenna.madu@dot.ny.gov
NYS Office of Parks, Recreation and Historic Preservation	Olivia	Brazee	Peebles Island State Park	P. O. Box 189	Waterford	NY	12188	518-237-8643 x 3260	olivia.brazee@parks.ny.gov
NYS Office of Parks, Recreation and Historic Preservation	Philip	Perazio	Peebles Island State Park	P. O. Box 189	Waterford	NY	12188		philip.perazio@parks.ny.gov
NYS Office of Parks, Recreation and Historic Preservation	Rose	Harvey	625 Broadway		Albany	NY	12238		rose.harvey@parks.ny.gov
NYS DEC	Shirkey	Erin L.	1 Hunter's Point Plaza, , 47-40 21st Street	Region 2 New York City	Long Island City	NY	11101		erin.shirkey@dec.ny.gov
NYSED ACCESS - VR	Jessica	Randolph	59-17 Junction Blvd. 20th Floor		Corona	NY	11368		jrandolp@mail.nysed.gov
Obena Office Supply Co	John	Davis	31-18 38 Avenue		Long Island City	NY	11101		theobena@aol.com
OrthoBalance Physical Therapy	Attilio	Pensavalle	287 Northern Blvd	Suite 104	Great Neck	NY	11021		NYPTM@yahoo.com
Pace Accounting & Tax Services, Inc.	Raymond	Pace	66-70 Queens Midtown Expressway		Maspeth	NY	11378		info@paceaccounting.com
Parsons Preschool	Beatrice	Pascucci	84-60 Parsons Boulevard		Jamaica	NY	11432		Meechelee@aol.com
Patco Tapes, Inc	Wendy	Vigil	59-27 56th Street		Maspeth	NY	11378		info2@patcogroup.com
Patrick B. Jenkins & Associates	Patrick	Jenkins	114-35 140th Street		Jamaica	NY	11436		patrick@pbjenkins.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
People's Alliance Federal Credit Union	Judy	Smolinski	JFK Airport	Building 14 West Wing, RM 4A	Jamaica	NY	11430		jsmolinski@pafcu.org
Pfeil & Holing, Inc.	Sy	Stricker	58-15 Northern Boulevard		Woodside	NY	11377		info@cakedeco.com
Pibbs Industries	Damiano	Petruccelli	133-15 32 Avenue		Flushing	NY	11354		gianna@pibbs.com
Pickman Realty Corp.	Christopher	Winchester	118-21 Queens Boulevard Ste 316		Forest Hills	NY	11375		pickmanrealty@hotmail.com
Pinnacle Realty Of New York LLC	James	Tack	46-34 11th Street		Long Island City	NY	11101		jtack@pinnaclereny.com
Plaza College	Charles	Callahan III	74-09 37 Avenue		Jackson Heights	NY	11372		cec3@plazacollege.edu
Plaza College	Charles E.	Callahan IV	74-09 37 Avenue		Jackson Heights	NY	11372		cec4@plazacollege.edu
Plaza College	Correne	Cavalieri	74-09 37 Avenue		Jackson Heights	NY	11372		ccavalieri@plazacollege.edu
Ponticello Ristorante	Josip	Honovic	46-11 Broadway		Astoria	NY	11103		ponticello1@aol.com
Port Authority of NY & NJ	Elizabeth	Rogak	4 World Trade Center		New York	NY	10007		erogak@panynj.gov
Port Authority of NY & NJ	Jane	Herndon	4 World Trade Center	18th Floor	New York	NY	10007		jherndon@panynj.gov
Port Authority of NY & NJ	Kathryn	Lamond	4 World Trade Center	18th Floor	New York	NY	10007		klamond@panynj.gov
Port Authority of NY & NJ	Lysa	Scully	LaGuardia Airport	Hanger 7 Center, 3rd Floor	Flushing	NY	11371		lscully@panynj.gov
Port Authority of NY & NJ	Nate	Kimball	4 World Trade Center		New York	NY	10007		nkimball@panynj.gov
Port Authority of NY & NJ	Patty	Clark	4 World Trade Center	18th Floor	New York	NY	10007		pclark@panynj.gov
Port Authority of NY & NJ	Ralph	Tragale	4 World Trade Center	18th Floor	New York	NY	10007	212-435-3731	rtragale@panynj.gov
Port Authority of NY & NJ	Tony	Vero	LaGuardia Airport	Hanger 7 Center, 3rd Floor	Flushing	NY	11371		avero@panynj.gov
Portnoy, Messinger, Pearl & Assoc., Inc.	Alan	Pearl	6800 Jericho Turnpike, Ste 218E		Syosset	NY	11791		abpearl@pmphr.com
Pratt Center for Community Development	Vicki	Weiner	Pratt Center	200 Willoughby Ave	Brooklyn	NY	11205	718-637-8645	vweiner@prattcenter.net
Precision Auto Works L.L.C.	Michael	Giannakos	37-46 9th Street at 38th Avenue		Long Island City	NY	11101		precisionautowks@yahoo.com
Progressive Martial Arts	Kathryn	Sacoulas	175-25 Horace Harding Expressway		Fresh Meadows	NY	11365		Ks@progressivemartialarts.com
QSIDE Federal Credit Union	Mark	Johnson	211-31 Jamaica Avenue		Queens Village	NY	11428		mjohnson@qsidefcu.org
Queens Air Services Development Office (ASDO)	Dolores	Hofman	JFK Airport, Bldg. 141, 1 Floor		Jamaica	NY	11430		dolores.hofman@asdoonline.com
Queens Blvd. Extended Care Facility	Jonathan	Mawere	61-11 Queens Boulevard		Woodside	NY	11377		jmawere@qbecf.com
Queens Borough President's Office	Irving	Poy	120-55 Queens Blvd		Kew Gardens	NY	11415	718-286-2860	info@queensbp.org

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Queens Borough President's Office	Melinda	Katz	120-55 Queens Blvd		Kew Gardens	NY	11415	718-286-3000	katz@queensBP.org
Queens Borough President's Office	Melva	Miller							mmiller@queensbp.org
Queens Botanical Garden Soc., Inc.	Susan	Lacerte	43-50 Main Street		Flushing	NY	11355		slacerte@queensbotanical.org
Queens Chamber of Commerce	Jacqueline	Donado	75-20 Astoria Blvd	Suite 140	Jackson Heights	NY	11370	718-898-8500	jdonado@queenschamber.org
Queens Chamber of Commerce	Sophia	Ganosis	75-20 Astoria Blvd	Suite 140	Jackson Heights	NY	11370	718-898-8500	sganosis@queenschamber.org
Queens Chamber of Commerce	Thomas	Grech	75-20 Astoria Blvd	Suite 140	Jackson Heights	NY	11370	718-459-6000	tgrech@queenschamber.org
Queens College CUNY	Evangelos	Gizis	65-30 Kissena Boulevard		Flushing	NY	11367		evangelos.gizis@qc.cuny.edu
Queens College CUNY	Sue	Henderson	65-30 Kissena Blvd., Kiely Hall 1200		Flushing	NY	11367		sue.henderson@qc.cuny.edu
Queens College CUNY	Vincent	Angrisani	65-30 Kissena Blvd.		Flushing	NY	11367		vincent.angrisani@qc.cuny.edu
Queens College Kupferberg Center for the Arts	Vivian	Charlop	65-30 Kissena Blvd.		Flushing	NY	11367		vcharlop@kupferbergcenter.org
Queens College, CUNY	Karen	Kennedy	65-30 Kissena Boulevard		Flushing	NY	11367		karen.kennedy@qc.cuny.edu
Queens Community Board 1	Joseph	Risi	45-02 Ditmars Blvd	LL Suite 125	Astoria	NY	11105	718-626-1021	qn01@cb.nyc.gov
Queens Community Board 11	Denise	Keehan-Smith	46-21 Little Neck Parkway		Little Neck	NY	11362	718-225-1054	qn11@cb.nyc.gov
Queens Community Board 3	Philip	Papas	82-11 37th Avenue	Suite 606	Jackson Heights	NY	11372	718-458-2707	communityboard3@nyc.rr.com
Queens Community Board 4	Damian	Vargos	46-11 104th Street		Corona	NY	11368	718-760-3141	qn04@cb.nyc.gov
Queens Community Board 7	Eugene	Kelty, Jr.	133-32 41st Road	Suite 3B	Flushing	NY	11355	718-359-2800	qn07@cb.nyc.gov
Queens County Savings Bank/Div. of NY Comm. Bank	John	Careddu	106-19 Continental Avenue		Forest Hills	NY	11375		jcareddu@mynycb.com
Queens County Savings Bank/Div. of NY Comm. Bank	John	D'Angelo	98-16 101st Avenue		Ozone Park	NY	11416		john.d'angelo@mynycb.com
Queens Economic Development Corporation	Seth	Bornstein	120-55 Queens Boulevard, Suite 309		Kew Gardens	NY	11424		sbornstein@queensny.org
Queens Library	Thomas	Galante	89-11 Merrick Boulevard		Jamaica	NY	11432		thomas.w.galante@queenslibrary.org
Queens Public Communications Corp.	Daniel	Leone	41-61 Kissena Boulevard Ste 2077		Flushing	NY	11355		dleone@qptv.org
Queens Quiet Skies	Janet	McEneaney	PO Box 604888		Bayside	NY	11360		queensquietskies@aol.com
Queens Theatre	Taryn	Sacramone	14 United Nations Avenue South	Flushing Meadows Corona Park	Flushing	NY	11368		tsacramone@queenstheatre.org
Queens Tribune Publications	Michael	Nussbaum	150-50 14th Road		Whitestone	NY	11357		mschenkler@queenstribune.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Queens Typewriter Co., Inc.	Joseph	Carbone	422 Graham Avenue		Brooklyn	NY	11211		queenstype@aol.com
Queens Village Committee For Mental Health	Diane	Gonzalez	231-35 Merrick Boulevard		Laurelton	NY	11413		dgonzalez@jcapprograms.com
Queensboro Toyota, Inc.	Gilbert	Louzoun	62-10 Northern Blvd,		Woodside	NY	11377		queensboro@earthlink.com
Queensborough Community College	Denise	Ward	220-05 56 Avenue, Room A-407		Bayside	NY	11364		dward@qcc.cuny.edu
Queensborough Community College	Diane	Call	222-05 56 Avenue		Bayside	NY	11364		dcall@qcc.cuny.edu
Quinn Fogarty Funeral Home	Robert	Hogan	162-14 Sanford Avenue		Flushing	NY	11358		robert.hogan@sci-us.com
Rago Foundations, LLC	Justin	Chernoff	18-15 27 Avenue		Long Island City	NY	11102		justin@ragoshapewear.com
Raymond Irrera & Associates Architects P.C.	Raymond	Irrera	14 East 38th Street - 11th Floor		New York	NY	10016		rirrera@designria.com
RCN	Jihan	Mitchell	22-15 43 Avenue 4th Floor		Long Island City	NY	11101		derek.haff@rcn.net
RDS Industries, Inc.	Richard	De Castro	43-01 162 Street		Flushing	NY	11358		rdsindustries@worldnet.att.net
Recon Construction Corp.	Gloria	Kemper	42-12 192nd Street		Flushing	NY	11358		gkemper@reconrebar.com
Regional Alliance for Small Contractors	Earle	Walker	625 8th Ave.	PABT NW 2nd Floor	New York	NY	10018	212-268-2991	ewa0711@aol.com
Register Abstract Co. Inc.	Norman	Horwitz	38-50 Bell Blvd.		Bayside	NY	11361		nhorowitz@titlesny.com
Renaissance Event Hall	Teresa	Lisson	27-34 21st Street		Long Island City	NY	11102		Teresa@renaissanceeventhall.com
Resolve It, Inc.	Joshua	Bienstock	85 Choir Lane		Westbury	NY	11590		bienlaw@aol.com
Resorts World Casino New York	Michelle	Stoddart	110-00 Rockaway Blvd.		Jamaica	NY	11420		Michelle.Stoddart@rwnewyork.com
Riccardo's By the Bridge	Anthony	Corbisiero	21-01 24 Avenue		Astoria	NY	11102		tonyc1961@aol.com
Riddell Group LLC	Glenn	Riddell	119 Washington Avenue		Albany	NY	12210		theriddellgroup@gmail.com
Ridgewood Savings Bank	Laura	Camelo	71-02 Forest Avenue		Ridgewood	NY	11385		lcamelo@ridgewoodbank.com
Rochdale Dental Care, PLLC	Marlene	Cox	165-44A Baisley Blvd.		Jamaica	NY	11434		rochdaledental@verizon.net
RoGallery.com	Robert	Rogal	47-15 36 Street		Long Island City	NY	11101		art@rogallery.com
Roosevelt Building Maint.Co.Inc.	Kenneth	Koenig	62-07 Woodside Avenue		Woodside	NY	11377		roosevelt.cleaning@verizon.net
Rosovich & Associates, Inc.	Laura	Rosovich	261-02 Union Turnpike		Floral Park	NY	11004		ljr@rosovichassociates.com
Ross, Legan, Rosenberg, Zelen & Flaks, LLP	Stanley	Legan, Esq.	41-60 Main Street, 210-A		Flushing	NY	11355		sjlegan@gmail.com
Royal Waste Services, Inc.	Peter L.	Reali	187-40 Hollis Ave.		Hollis	NY	11423		peter@royalwaste.com
Runway Tire Service Co. Inc.	Benjamin	Germano	41-15 19 Avenue		Astoria	NY	11105		runwaytire@aol.com
Ryan Consulting Engineers	William	Ryan, P.E.	299 Broadway Ste 1500		New York	NY	10007		wfryan@ryance.com
Ryan J. Walsh	Ryan	Walsh, Esq	70-50 Austin Street		Forest Hills	NY	11375		rjwesq@gmail.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
S & L Aerospace Metal, LLC	Ted	Varvatsas	120-12 28th Ave.		Flushing	NY	11354		ted@slaerospace.com
Samuel Field Ym & Ywha, Inc.	Steven	Goodman	58-20 Little Neck Parkway		Little Neck	NY	11362		drg@sfy.org
Sandwire	Adam	Schwam	20 Hempstead Turnpike		Farmingdale	NY	11735		adam.schwam@sandwire.com
Santander	Maria	Gargiulo	1535 Richmond Ave.		Staten Island	NY	10314		mgargiul@santander.us
Schumacher & Farley Plumb/Heat	Frederick R.	Dobler	36-52 37 Street		Long Island City	NY	11101		sfph3652@aol.com
SDS Global Logistics, Inc.	Tony	Racioppo	52-09 31 Place		Long Island City	NY	11101		tonyr@sdsgl.com
Servpro Ozone Park/Jamaica Bay	Raymond	Wardell	87-17 97th Ave.		OzonePark	NY	11416		servpro10156@gmail.com
SHAREing & CAREing	Anna	Kril	45-02 Ditmars Blvd. Suite 1015		Astoria	NY	11005		tlc@shareing-careing.com
Sholom & Zuckerbrot Realty LLC	Gail A.	Roseman	35-11 35 Avenue		Long Island City	NY	11106		groseman@s-z.com
Sholom & Zuckerbrot Realty LLC	Lawrence	Smith	35-11 35 Avenue		Long Island City	NY	11106		lsmith@s-z.com
Sholom & Zuckerbrot Realty LLC	Sanford	Zuckerbrot	35-11 35 Avenue		Long Island City	NY	11106		szuckerbrot@s-z.com
Shops at Atlas Park	Peter	DeLucia	7119 80th St	STE 8038	Glendale	NY	11385		peter.delucia@macerich.com
Signs and Decal Corp	Babu	Khalfan	410 Morgan Ave		Brooklyn	NY	11211		babu@signsanddecal.com
Silvercup Studios	Alan	Suna	42-22 22 Street		Long Island City	NY	11101		asuna@silvercupstudios.com
Silvercup Studios	Gary	Kesner	42-22 22nd Street		Long Island City	NY	11101		gkesner@silvercupstudios.com
Silvercup Studios	Stuart Match	Suna	42-22 22 Street		Long Island City	NY	11101		sms@silvercupstudios.com
Sinai Chapels	Sy	Resnick	162-05 Horace Harding Expressway		Fresh Meadows	NY	11365		sinai@jewishfunerals.com
SL Green Realty Corp.	Jeremy	Bier	420 Lexington Ave.		New York	NY	10170		jeremy.bier@slgreen.com
SL Green Realty Corp.	Marc	Holliday	420 Lexington Ave.		New York	NY	10170		marc.holliday@slgreen.com
Sole Grano	Harun	Ekici	16-00 Pollitt Drive		Fair Lawn	NJ	07410		harun@solegrano.com
Southwest Airlines	Jill	Simonson	1461 First Avenue #355		New York	NY	10075		jill.simonson@wnco.com
Sovereign Bank	Gabriel	Jaramillo	650 Madison Ave. 22nd Floor		New York	NY	10022		gjaramillo@gmail.com
SpringHill Suites by Marriott New York LaGuardia Airport	Allison	Mitchell	112-15 Northern Boulevard		Corona	NY	11368		allison.m.mitchell@marriott.com
St. John's University	Brian	Browne	8000 Utopia Parkway	Newman Hall Room #155A	Jamaica	NY	11439		browneb@stjohns.edu
St. John's University	Joseph	Sciame	8000 Utopia Parkway		Queens	NY	11439		sciamej@stjohns.edu
Staffpro Inc.	Jan	Hernstat	431 Beach 20th St.		Far Rockaway	NY	11691		jan@staffproonline.com
Star Training Center	Yen	Chou	41-70 Main Street	STE b320	Flushing	NY	11355		professorchou@gmail.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
State Senate District 11	Tony	Avella	38-50 Bell Boulevard	Suite C	Bayside	NY	11361	718-357-3094	avella@nysenate.gov
State Senate District 12	Michael	Gianaris	31-19 Newtown Ave	Suite 402	Astoria	NY	11102	718-728-0960	gianaris@nysenate.gov
State Senate District 13	Jose	Peralta	32-37 Junction Boulevard		East Elmhurst	NY	11369	718-205-3881	jperalta@nysenate.gov
State Senate District 14	Leroy	Comrie	205-20 Jamaica Avenue	2nd Floor, Legislative Office Building, Room 617	Hollis	NY	11423	718-454-0162	comrie@nysenate.gov
State Senate District 15	Joseph	Addabbo	159-53 102nd Street	Legislative Office Building, Room 613	Howard Beach	NY	11414	718-738-1111	addabbo@nysenate.gov
State Senate District 16	Toby Ann	Stavisky	142-29 37th Ave	Suite 1	Flushing	NY	11354	718-445-0004	stavisky@nysenate.gov
Staten Island Borough President	James	Oddo	10 Richmond Terrace		Staten Island	NY	10301	718-816-2000	joddo@statenislandusa.com
Staten Island Chamber of Commerce	Linda	Baran	130 Bay Street		Staten Island	NY	10301		lbaran@sichamber.com
Steinway Court Veterinarian	Sara	Glasser	32-41R Steinway Street		Long Island City	NY	11103		saraglasser@verizon.net
Steinway Family Dental Center	Carrie	Moncrieffe	32-50 Steinway St		Astoria	NY	11103		pr.steinwayfamilydentalcenter@gmail.com
Stepping Stones Networking	Mark	Krieger	81-16 265 Street		Floral Park	NY	11004		mbkrieger@verizon.net
Sterling National Bank	Jorge	LaCourt	30-30 47 Avenue		Long Island City	NY	11101		jlacourt@snb.com
Stillwell Supply Corp.	Robert	Conforti	44-68 Vernon Boulevard		Long Island City	NY	11101		info@stillwell.net
Storage Deluxe	Todd	Baker	26 W 17th St. Ste 801		New York	NY	10011		tbaker@storagedeluxe.com
Student Sponsor Partners	Angel	Francis	424 Madison Avenue	STE 1002	New York	NY	10017		afrancis@sspnyc.org
Sunnyside Chamber of Commerce	Swain	Weiner	P.O. Box 4399		Sunnyside	NY	11104		sunnysidechamberofcommerce@gmail.com
Sunnyside Community Services	Judy	Zangwill	43-31 39 Street		Sunnyside	NY	11104		jzangwill@scsny.org
Sunrise Chevrolet	Milan	Suga	105 20 Queens Boulevard		Forest Hills	NY	11375		milan219@aol.com
Super-Tek Products, Inc.	Harry	Paulison	25-44 Borough Place		Woodside	NY	11377		hpaulison@super-tek.com
Swim Strong Foundation, Inc.	Shawn	Slevin	30-17 89 Street		East Elmhurst	NY	11369		shawn.slevin@theswimstrongfoundation.org
Tano Group Architects	Gaetano	Ragusa	1801 Kings Highway		Brooklyn	NY	11229		ragusa@tgarch.com
TD Bank N.A.	Richard K.	Dzwlewicz	108-36/50 Queens Blvd.		Forest Hills	NY	11375		richard.dzwlewicz@td.com
TD Bank, N.A.	Margaret	McGowan	31-04 Ditmars Boulevard		Astoria	NY	11105		margaret.mcgowan@yesbank.com
TD Bank, N.A.	Peter	Meyer	317 Madison Avenue 42nd & Madison		New York	NY	10017		peter.meyer@td.com
Ten Ren Tea And Ginseng Co., Inc.	Mark	Lii	135-18 Roosevelt Avenue		Flushing	NY	11354		mtealii@aol.com
Terrace On The Park	Demitri	Kaloidis	52-11 111 Street	Flushing Meadows Park	Flushing	NY	11368		info@terraceonthepark.com
TGI Office Automation	Vincent	Valenti	120 3rd Street		Brooklyn	NY	11231		vvalenti@tgioa.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Thomas Coaching Company	Patricia	Thomas	P. O. Box 690145		East Elmhurst	NY	11369		pcoachpat@aol.com
Thomson Strategies, LLC.	Terri	Thomson	176-25 Union Turnpike Ste 200		Fresh meadows	NY	11366		terri@thomsonstrategies.com
Three T's by TMF, LLC	Tereska	Flood	177-36 Troutville Road		Jamaica	NY	11415		terryf35@yahoo.com
Time Warner Cable of NYC	Cathleen	DeVito	120 E. 23 Street		New York	NY	10010		cathleen.sims@twcable.com
Transitional Services for NY Inc.	Larry	Grubler, Ph.D.	10-16 162 Street		Whitestone	NY	11357		lgrubler@tsiny.org
Triangle Equities	Lester	Petracca	30-56 Whitestone Expressway		Flushing	NY	11354		Lpetracca@triequities.com
TriNet	Mark	Green	60 South Service Road	STE 100	Melville	NY	11747		mark.green@trinet.com
Trinity Tax & Financial Solutions, Inc.	Sushil	Kumar	116-16 Queens Blvd	Suite 245	Forest Hills	NY	11375		sushil@bestcpasolutions.com
Tully Construction Co. Inc.	Dan	Scully	127-50 Northern Blvd.		Flushing	NY	11368		danscully@tullyconstruction.com
Tully Construction Co. Inc.	Laura E.	Imperiale	127-50 Northern Blvd.		Flushing	NY	11368		laura@tullyconstruction.com
Tully Construction Co. Inc.	Peter	Tully	127-50 Northern Boulevard		Flushing	NY	11368		petertully@tullyconstruction.com
TVC dba Net	Gary	Arkin	1712 Tenth Ave.		Brooklyn	NY	11215		garkin@netny.net
Ultimate Champions Tae Kwon Do Flushing	Chan	Ro	150-15 Northern Blvd		Flushing	NY	11354		masterrho@gmail.com
Unishippers	Brian	Bailey	75-30 Metropolitan Ave	Suite 102	Middle Village	NY	11379		brian.bailey@unishippers.com
United Airlines	Monica	Slater Stokes	Newark Liberty International Airport	1 Terminal C	Newark	NJ	07114		kathleen.Agudo@united.com
United Asset Strategies, Inc.	Lee	De Lorenzo	666 Old Country Road, Suite 104		Garden City	NY	11530		leed@unitedfinancialgroup.com
United Health Care	Gary	Summers	6 International Drive		White Plains	NY	10601		gsummers@uhc.com
United Metro Energy Corp	Robert	Leavy	500 Kingsland Avenue		Brooklyn	NY	11222		metroenergy@metroenergy.com
United Print Group Inc.	Bill	Linet	36-36 33rd Street		Long Island City	NY	11106		blinet@unitedpg.com
UPS Store, The	Jerry	Arty	125-28 Queens Blvd.		Kew Gardens	NY	11415		jerryarty@msn.com
US Powergen Astoria Generating Company	Harry	Morrison	18-01 20 Avenue		Astoria	NY	11105		hmorrison@uspowergen.com
US Powergen Astoria Generating Company	Liam	Baker	300 Atlantic Street 5th floor		Stamford	CT	06901		lbaker@uspowergen.com
US Powergen Astoria Generating Company	Thomas	O'Connor	18-01 20 Avenue		Astoria	NY	11105		toconnor@uspowergen.com
USTA National Tennis Center, Inc.	Daniel	Zausner	Flushing Meadows-Corona Park	123-01 Roosevelt Avenue	Flushing	NY	11368		zausner@usta.com
Valente Yeast Co., Inc.	Dominic	Valente	61-26 Maurice Avenue		Maspeth	NY	11378		Dominic@ValenteYeast.com
Valley National Bank	Edward	Barbier	75-20 Astoria Boulevard		Jackson Heights	NY	11370		ebarbier@valleynationalbank.com
Vallo Transportation, Ltd.	Linda	DeSabato	151-17 Sixth Road		Whitestone	NY	11357		vallotrans@aol.com

Agency	First	Last	Address 1	Address 2	City	State	Zip	Phone	Email
Vaughn College of Aeronautics and Technology	Sharon	DeVivo	86-01 23 Avenue		East Elmhurst	NY	11369		sharon.devivo@vaughn.edu
Verizon Communications	Richard	Windram	140 West Street		New York	NY	10007		richard.windram@verizon.com
VHB	David	Buttacavoli	Two Penn Plaza		New York	NY	10121		dbuttacavoli@vhb.com
Visiting Nurse Service of NY	Dominic	Mascara	1250 Broadway	Floor 14	New York	NY	10001		naama.francois@vnsny.org
Wagner and Kelly Real Estate	MD Aminul	Hoque	60-01 Roosevelt Avenue		Woodside	NY	11377		newyork124@gmail.com
Waste Management Of New York, LLC	Jim	Van Woert	123 Varick Ave.		Brooklyn	NY	11237		jvanwoer@wm.com
Watch Guard 24/7 LLC	John	Rafferty	71-16 Myrtle Ave.		Glendale	NY	11385		john@watchguard247.com
Wave Publishing Co. (The Wave)	Susan	Locke	88-08 Rockaway Beach Boulevard		Rockaway Beach	NY	11693		sbl@rockawave.com
Wayland Incorporated	Michael	Sheldon	45-35 11 Street		Long Island City	NY	11101		mssheldon@alpind.com
Webline Designs, Inc.	Neil	Levin	31-00 47 Avenue		Long Island City	NY	11101		neil@webline-designs.com
Weeks-Lerman Group, LLC	Sidney	Lerman	58-38 Page Place		Maspeth	NY	11378		sid@weekslerman.com
Werber Management	David	Werber	40-52 75 Street		Elmhurst	NY	11373		dwerber18@aol.com
Western Queens Gazette	Tony	Barsamian	42-16 34 Avenue		Long Island City	NY	11101		qgazette@aol.com
White Castle System Inc.	Lisa	Bray	69-01 34th Avenue		Woodside	NY	11377		brayl@whitecastle.com
William T Chen CPA, LLC	William	Chen	160-19 25th Drive		Flushing	NY	11358		cntn78@hotmail.com
Woodside On The Move	Rosa	Reyes	39-42 59 Street 2 Floor Ste.5		Woodside	NY	11377		info@woodsideonthemove.org
World Financial Group	Esther	Charles	189 Montague St	STE 220	Brooklyn	NY	11201		estherchomes@gmail.com
YMCA of Greater N Y - LIC Branch	Ebony	Conely-Young	32-23 Queens Boulevard		Long Island City	NY	11101		eyoung@ymcanyc.org
YMCA of Greater New York-Jamaica Branch	Cedric	Dew	89-25 Parsons Boulevard		Jamaica	NY	11432		cdew@ymcanyc.org
YMCA of Greater NY-Cross Island Branch	Dana	Feinberg	238-10 Hillside Avenue		Bellerose	NY	11426		dfeinberg@ymcanyc.org
York Scaffold Equipment Corp.	Kenneth	Buettner	37-20 12 Street		Long Island City	NY	11101		kjbuettner@yorkscaffold.com
Z NYC Hotel	Lisa	Gneo	11-01 43rd Ave.		Long Island City	NY	11101		lisa@zhotelny.com
Zee N Kay Management	Kunal	Kapoor	18 Angler Lane		Port Washington	NY	11050		zeenkay@gmail.com
Zodiac Aviation Support, Inc.	Yilma	Kassaye	11 Sunrise Plaza Suite 306		Valley Stream	NY	11580		yilmak@zasusa.com

Attachment 5 – List of Attendees

Public Information Session

	Name	Affiliation
1	Jeff Sawyer	Skanska
2	Samuel Scozzari	-
3	Magnus Hedenlund	-
4	Quintin Beathwaite	Techno
5	David Werber	-
6	Ian Francis	NYSDOT
7	Marc Pierre	NYSDOT
8	Warren Schreiber	Community Board 7; Aviation Roundtable
9	Justin Chin	NYC Health and Hospitals Elmhurst
10	Mark Leininger	-
11	Meena Nieto	American Airlines
12	Martin Keller	Vaughn College
13	Justin Connor	Congressman Suozzi
14	Marie Jenet	Federal Aviation Administration
15	Andrew Brooks	Federal Aviation Administration
16	Gail Butler	Federal Aviation Administration

Public Hearing

	Name	Affiliation
1	Bill Huisman	Aviation Development Council
2	Warren Schreiber	Community Board 7; Aviation Roundtable
3	Justin Connor	Congressman Suozzi
4	Santos Rodriguez	Building and Construction Trade Council
5	Martin Keller	Vaughn College
6	Joe Dixon	AECOM
7	Don Capalbi	Queensboro Hill Flushing Civic Association
8	Marie Jenet	Federal Aviation Administration
9	Andrew Brooks	Federal Aviation Administration
10	Gail Butler	Federal Aviation Administration

Public Hearing Speakers

	Name	Affiliation
1	Bill Huisman	Aviation Development Council
2	Santos Rodriguez	Building and Construction Trade Council

Public Information Session/Public Hearing Project Team

	Name	Affiliation
1	Nicole Weymouth	WSP USA
2	Stephanie Camay	WSP USA
3	Victoria Hallas	WSP USA

	Name	Affiliation
4	Rachel Van Metre	WSP USA
5	James Rigert	WSP USA
6	Katie Lamond	Port Authority of New York and New Jersey
7	Jim Beers	Port Authority of New York and New Jersey
8	Michael LaFazia	Port Authority of New York and New Jersey
9	Jay Liese	Corgan Associates Architects
10	Richard Ryan	Corgan Associates Architects
11	Peter Chorman	Delta Air Lines
12	Martin Durney	Burns McDonald Engineering
13	Keith Seabolt	Delta Air Lines
14	George Guillanne	Delta Air Lines
15	Matt Durcan	Delta Air Lines
16	Laurie Balbo	Port Authority of New York and New Jersey
17	Ryan Marzullo	Delta Air Lines
18	Ken Champion	Delta Air Lines
19	Alana Calmi	Port Authority of New York and New Jersey
20	Mellisa Douglas	Port Authority of New York and New Jersey
21	Shanel Thomas	Port Authority of New York and New Jersey
22	Rich Smyth	Port Authority of New York and New Jersey
23	Lysa Scully	Port Authority of New York and New Jersey
24	Petra Kaudus	Port Authority of New York and New Jersey
25	Justin Bernbaem	Port Authority of New York and New Jersey
26	John Tarantino	Port Authority of New York and New Jersey
27	Rache Burger	Port Authority of New York and New Jersey
28	Janice Lee	Port Authority of New York and New Jersey
29	Patty Clark	Port Authority of New York and New Jersey
30	Victor Passarelli	Port Authority of New York and New Jersey

Public Comments

Mayra DiRico, *President*
Howard Graf, *Vice President*
Henry Wan, *Treasurer*
Fran Biderman-Gross, *Associate Treasurer*
Nash Roe, *Secretary*
Richard Dzwlewicz, *Associate Secretary*
Albert F. Pennisi, *Immediate Past President*

Thomas J. Grech, *Executive Director*

April 28, 2017

The Port Authority of New York and New Jersey
Kathryn Lamond
Aviation Department
4 World Trade Center, 18th floor
New York, NY 10007

Re: East Side Reconfiguration at La Guardia Airport

Dear Ms. Lamond,

Please consider this letter as a statement of support for the Port Authority of New York & New Jersey's proposed East Side Configuration at LaGuardia Airport. The project, which includes the replacement of the existing Terminals C and D with a new terminal and the construction of associated airside and landside improvements, is needed to improve aircraft operations, reduce delays, improve customer service, and provide greater gating flexibility for the airlines operating at Terminals C and D at LaGuardia Airport. The project is a distinct improvement initiative identified in the Report to the Governor from the Airport Advisory Panel: Guiding Principles for a Comprehensive Airport Master Plan and endorsed by the Governor.

The project provides continuity with the new Central Terminal Building creating a new, unified airport. Passengers will benefit with larger gate wait areas, improved vehicle loading and unloading areas with direct access to security screening, safe and convenient access to the parking garage via a pedestrian bridge, efficient security screening area and baggage claim, and improved amenities including concessions and restaurants. In addition to the airside benefits, the project provides increased level of service overall, reduced delays and time spent taxiing, and air quality benefits.

As the Executive Director of the Queens Chamber of Commerce, I am keenly aware of the impact aviation has on Queens County via jobs, opportunities and development. Please let me know of any other support that might be required for this initiative to succeed.

We are committed to the advancement of this reconfiguration project for La Guardia, and we look forward to continuing our successful working relationship with the PANYNJ and its project team to move the plan to implementation.

Sincerely,

Thomas J. Grech

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NEW YORK BUILDING CONGRESS

May 3, 2017

Ms. Kathryn Lamond
The Port Authority of New York and New Jersey
Aviation Department
4 World Trade Center, 18th floor
New York, NY 10007

Re: East Side Reconfiguration at La Guardia Airport

Dear Ms. Lamond:

The New York Building Congress strongly supports the Port Authority of New York & New Jersey's proposed East Side Reconfiguration at LaGuardia Airport. The successful implementation of the project is critical to the more than 450 constituent organizations and 250,000 industry members the Building Congress represents.

Every year, in collaboration with the contractors, architects, engineers, unions, real estate managers, developers and owners who comprise the building industry, the Building Congress establishes an industry-wide agenda focusing on issues including infrastructure investment and job creation in New York City. A central priority of its most recent agenda involves advancing the implementation of the La Guardia Airport master plan, and by extension, the East Side Reconfiguration project. In addition to delivering the State of New York a much-needed upgrade to its most critical infrastructure, the project will generate thousands of jobs and economic opportunities for members of the building community and beyond.

Furthermore, the reconfiguration of La Guardia Airport's East Side is a priority improvement initiative identified in the *Report to the Governor from the Airport Advisory Panel: Guiding Principles for a Comprehensive Airport Master Plan* and endorsed by the Governor. The project's vision, which includes the replacement of the existing Terminals C and D with a new terminal and the construction of associated airside and landside improvements, is consistent with the Building Congress' mission of building a better New York. La Guardia Airport exists as "the air gateway to America" and its facilities must be equipped to operate as such; the reconfiguration of the Airport will make this a reality.

Among its many other benefits, the project will improve aircraft operations, reduce delays, improve customer service, and provide greater gating flexibility for the airlines operating at Terminals C and D at LaGuardia Airport. Once it is completed, the project will help guarantee the competitiveness of the State and the region during the 21st century.

The Building Congress remains committed to ensuring the advancement of this reconfiguration project for La Guardia, and looks forward to collaborating with the PANYNJ to move the plan to implementation.

Very Truly Yours,

Carlo A. Scissura, Esq.
President and CEO
New York Building Congress

44 WEST 28TH STREET, 12TH FLOOR, NEW YORK, NY 10001, TEL 212.481.9230, FAX 212.447.6037, BUILDINGCONGRESS.COM

Lamond, Kathryn

From: Steve Sigmund <sigmund@globalgatewayalliance.org>
Sent: Friday, May 05, 2017 5:39 PM
To: LGAEASTEA
Subject: Letter of Support from Global Gateway Alliance

The Port Authority of New York and New Jersey

Kathryn Lamond

Aviation Department

4 World Trade Center, 18th floor

New York, NY 10007

Dear Ms. Lamond,

Global Gateway Alliance is a coalition of business, labor, transportation, academic and government leaders dedicated to helping modernize New York area airports.

Please consider this letter as a statement of support for the Port Authority of New York & New Jersey's proposed East Side Configuration at LaGuardia Airport. The project, which includes the replacement of the existing Terminals C and D with a new terminal and the construction of associated airside and landside improvements, is needed to improve aircraft operations, reduce delays, improve customer service, and provide greater gating flexibility for the airlines operating at Terminals C and D at LaGuardia Airport. The project is a distinct improvement initiative identified in the *Report to the Governor from the Airport Advisory Panel: Guiding Principles for a Comprehensive Airport Master Plan* and endorsed by the Governor.

The project provides continuity with the new Central Terminal Building creating a new, unified airport. Passengers will benefit with larger gate wait areas, improved vehicle loading and unloading areas with direct access to security screening, safe and convenient access to the parking garage via a pedestrian bridge, efficient security screening area and baggage claim, and improved amenities including concessions and restaurants. In addition to the airside benefits, the project provides increased level of service overall, reduced delays and time spent taxiing, and air quality benefits.

We are committed to the advancement of this reconfiguration project for La Guardia, and we look forward to continuing our successful working relationship with the PANYNJ and its project team to move the plan to implementation.

Sincerely,

Stephen Sigmund
Executive Director
Global Gateway Alliance
917 459 7794
Sigmund@globalgatewayalliance.org
www.globalgatewayalliance.org
@GGA_NYNJ

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

MAY 10 2017

Jane Herndon
Manager, Environmental Programs
Aviation Department
Port Authority of New York and New Jersey
4 World Trade Center
150 Greenwich Street, 18th Floor
New York, NY 10007

RE: Draft Environmental Assessment, East Side Reconfiguration at LaGuardia Airport

Dear Ms. Herndon:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Assessment (EA) dated March 2017 on the proposed East Side Reconfiguration at LaGuardia Airport, located in Queens County, New York. The EA, prepared for the Federal Aviation Administration, describes the proposed action as a series of projects; a reconfiguration of the airside apron around Terminals C and D, the construction of a new single terminal headhouse with four concourses, new landside roadways and parking, and the consolidation of Delta Air Lines at the new terminal. In general, this project will increase efficiency of aircraft movements on the airport.

EPA finds that the EA supports a finding of no significant impact.

In addition, EPA has also evaluated the project in accordance with Section 1424(e) of the Safe Drinking Water Act (SDWA) as the project is located on the Nassau-Suffolk sole source aquifer designated by EPA on June 21, 1978. EPA has the following comments.

If pumps are used in the discharge of stormwater into Flushing Bay and if they are powered by fuel stored in either aboveground or underground storage tanks, then those tanks must be double-walled and equipped with interstitial leak detection and overfill alarms. Above ground tanks should also have secondary containment that could capture the contents of the tank in the event of a catastrophic spill or leak. Underground tanks should have adequate corrosion protection.

If a well is employed for dewatering purposes, then the well should be constructed in accordance with New York State Department of Health requirements found at:
https://www.health.ny.gov/regulations/nycrr/title_10/part_5/appendix_5b.htm#b3

The oil layer present in oil/water separators that collect runoff from the aircraft parking apron should be drawn off and disposed of safely. Particular care should be taken to capture any ethylene glycol-based deicing fluid before it dissolves in aqueous runoff.

In the excavation for the terminal building, construction vehicles should be re-fueled off site and a spill prevention, control and containment plan should be in place and, ideally, developed with active input from the project's workers.

Provided the precautions above are taken, it is anticipated that this project will not pose a significant threat to public health or ground water resources and complies with Section 1424(e) of the SDWA.

If you have any questions, please contact Lingard Knutson at (212) 637-3747 or knutson.lingard@epa.gov.

Sincerely,

Lingard Knutson

Grace Musumeci, Chief
Environmental Review Section

Lamond, Kathryn

From: Shirkey, Erin L (DEC) <erin.shirkey@dec.ny.gov>
Sent: Thursday, May 11, 2017 4:32 PM
To: LGAEASTEA
Cc: Watts, Stephen (DEC); Southwell, Selvin (DEC); Elburn, Robert H (DEC); Glynn, William; Hallas, Victoria; weymouthn@pbworld.com
Subject: LGA EAST SIDE EA COMMENT

RE: LGA EAST SIDE EA COMMENT
TO: The Port Authority of NY & NJ, Aviation Department
ATTN: Kathryn Lamond
4 World Trade Center, 18th Floor
New York, NY 10007
LGAEASTEA@panynj.gov

Dear Ms. Lamond,

Please accept these comments from the New York State Department of Conservation (NYSDEC) on the "*East Side Reconfiguration at LaGuardia Airport, Draft Environmental Assessment, Prepared for U.S. DOT, FAA, Sponsored by Port Authority of NY & NJ, Prepared by AECOM, dated March 2017*":

1. **Draft EA, Pg 1-20, Section 1.6 Required Land Use/Environmental Permits,** Please edit this section to include the following permits:
   • NYSDEC – ECL Article 17 Titles 7 & 8 Industrial State Pollutant Discharge Elimination System (SPDES) Surface Discharge Permit for groundwater treatment and discharge from temporary construction dewatering;
   • NYSDEC - ECL Article 15 Title 15 Long Island Well Temporary Dewatering Permit .

2. **Draft EA, Pg 1-20, Section 1.6 Required Land Use/Environmental Permits,** Please edit this section to clarify that the NYSDEC SPDES Construction Permit is a general permit, the reference should be: "NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002)".

3. **Draft EA, Pg 1-21, Section 1.6 Required Land Use/Environmental Permits,** Please edit this section to clarify that the "*Air permits from NYSDEC and New York City Department of Environmental Protection*" are separate. The reference should be: "NYSDEC - ECL Article 19 Air State Facility Permit."

4. **Draft EA, Pg 5-75, para 6, Section 5.14.3 Surface Waters, and Pg 5-79, para 1, Section 5.14.4 Groundwater,** Please edit these sections to clarify that a NYSDEC Long Island Well Temporary Dewatering Permit will be obtained in conjunction with an individual SPDES Permit for temporary construction dewatering. This pumped groundwater will require treatment because of historical groundwater contamination, prior to being discharged into the airport's stormwater disposal system, which drains into Flushing Bay, operated by the Port Authority of NY & NJ under SPDES Permit #NY0008133. This new individual SPDES permit, to be obtained by DELTA AIR LINES INC, for groundwater treatment and discharge is separate and in addition to the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002) . The SPDES construction general permit requires the Notice of Intent (NOI) and Stormwater Pollution Prevention Plan (SWPPP) mentioned in Section 5.14.3.

5. **Draft EA, Pg 5-29, para 2, Section 5.7.1 Direct Impacts,** Please edit this section to clarify that groundwater from dewatering will be treated and tested for in accordance with an individual SPDES Permit, and discharged into the airport's stormwater system, operated by the Port Authority of NY & NJ under SPDES Permit #NY0008133: "*"Groundwater from the dewatering process will also be tested for pollution concentration levels, treated if necessary, and disposed in accordance with NYSDEC requirements."*

Please confirm receipt of this email.

Thank You, Erin Shirkey

Erin L. Shirkey
Environmental Analyst II, Division of Environmental Permits

New York State Department of Environmental Conservation
Region 2 New York City, 1 Hunter's Point Plaza, 47-40 21st Street
Long Island City, NY 11101-5407
P: 718-482-4972 | F: 718-482-4975| erin.shirkey@dec.ny.gov
www.dec.ny.gov | |

COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT (DATED MARCH 2017)

COMMENT NO.	NAME/ORGANIZATION	COMMENT DATE	COMMENT	RESPONSE
PUBLIC HEARING COMMENTS (MAY 3, 2017)				
1	Executive Director of Aviation Development Council (Bill Huisman)	5/3/2017	Good evening, everybody. My name is Bill Huisman. I'm Executive Director of Aviation Development Council, and I would like to read my testimony to save a lot of time.	Comments noted.
		5/3/2017	Aviation Development Council supports the Port Authority of New York and New Jersey's proposed East Side Reconfiguration at LaGuardia Airport. This project, which includes the replacement of the existing Terminals C and D with a new, modern single terminal and the construction of associated air and landside improvements is needed to improve not only aircraft operations, reduce delays, improve customer service and provide greater aircraft gating flexibility for the airlines operating at what is currently an antiquated two-terminal operation at LaGuardia Airport.	
		5/3/2017	The project is a distinct improvement which is noted in the report to the Governor from the Airport Advisory Panel, which I'm sure a lot of people are already aware of.	
		5/3/2017	The project provides continuity to the Central Terminal Building creating a new efficient and unified airport. Passengers will benefit with larger wait areas, improved vehicle drop off and pick up areas with direct access of course to security, improved security screening, safe and convenient access to the parking garage via a pedestrian bridge, more efficient security screening, which I already mentioned, and baggage claim as well, and improved amenities. This includes new concessions and restaurants.	

COMMENT NO.	NAME/ORGANIZATION	COMMENT DATE	COMMENT	RESPONSE
1	Executive Director of Aviation Development Council (Bill Huisman)	5/3/2017	In addition to the airside benefits, the project provides increased level of service overall, reduced delays and less time spent taxiing, with significant air quality benefits.	
		5/3/2017	The Aviation Development Council is a bridge organization between the Port Authority of New York and New Jersey, the airlines that operate from all Port Authority managed or owned airports, and the communities served. We help advance the significant economic benefit of our local airports by promoting the local purchase of products and services from community businesses by the airlines and aviation companies serving the Port Authority airports.	
		5/3/2017	ADC also administers a grass-roots grant program providing funding to local non-profit organizations that focus on youth wellness, youth education and cultural enhancement for young people.	
		5/3/2017	Delta has been directly involved in this community grant outreach program along with the other airline partners of Aviation Development Council. This confirms Delta's commitment to our local communities beyond the commercial benefits of a new facility.	
		5/3/2017	We, therefore, fully support Delta Air Lines and the Port Authority of New York & New Jersey in the advancement of this reconfiguration project for LaGuardia, and we look forward to the actualization of this project.	
2	Building and Construction Trade Council (Santos Rodriguez)	5/3/2017	Good evening, everyone. My name is Santos Rodriguez. I am the Director of Community Affairs and Strategic Initiatives for the Building and Construction Trades Council of Greater New York and the vicinity.	Comments noted.

COMMENT NO.	NAME/ORGANIZATION	COMMENT DATE	COMMENT	RESPONSE
2	Building and Construction Trade Council (Santos Rodriguez)	5/3/2017	I am here on behalf of the Building and Construction Trade Council in support of the LaGuardia/Delta terminal project. The Building and Construction Trades Council is an organization of local building and construction trade unions that are affiliated with 15 international unions in the North American Building Trades Union.	
		5/3/2017	Our local union affiliates represent approximately 100,000 construction workers. The Building Trades' mission is to raise the standard of living for all workers, to advocate for safe conditions, and to collectively advance working conditions for our affiliates, members, as well as all workers in New York City.	
		5/3/2017	The Building and Construction Trades Council has long been a strong proponent of infrastructure projects as a way of sustaining and stimulating economic growth as well as improving quality of life.	
		5/3/2017	We strongly support Delta's partnership with Governor Cuomo and the Port Authority to help rebuild and redesign LaGuardia Airport. Projects such as this that upgrade and modernize existing facilities, stimulate growth, create jobs, improve transportation and provide a more pleasant experience for commuters and citizens are the types of projects we need to bring out city and state through the 21st Century and into the future.	
		5/3/2017	Delta's investment in this project, along with its partnership with the State of New York, will help transform LaGuardia Airport into a world transportation hub. Building and Construction Trades Council of Greater New York and vicinity strongly supports this project. Thank you for your time and your consideration.	

COMMENT NO.	NAME/ORGANIZATION	COMMENT DATE	COMMENT	RESPONSE
COMMENTS VIA LETTERS AND EMAILS				
3	Queens Chamber of Commerce	04/28/2017 (letter)	Support letter from Thomas J. Grech.	Comments noted.
4	New York Building Congress	5/3/2017 (Letter)	Support letter from Carlo A. Scissura.	Comments noted.
5	Global Gateway Alliance	5/5/2017 (Letter)	Support letter from Steve Sigmund.	Comments noted.
6	USEPA (Grace Musumeci)	5/10/2017 (Letter)	Dear Ms. Herndon: The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Assessment (EA) dated March 2017 on the proposed East Side Reconfiguration at LaGuardia Airport, located in Queens County, New York. The EA, prepared for the Federal Aviation Administration, describes the proposed action as a series of projects; a reconfiguration of the airside apron around Terminals C and D, the construction of a new single terminal headhouse with four concourses, new landside roadways and parking, and the consolidation of Delta Air Lines at the new terminal. In general, this project will increase efficiency of aircraft movements on the airport. EPA finds that the EA supports a finding of no significant impact.	Comments noted.
7		5/10/2017 (Letter)	If pumps are used in the discharge of storm water into Flushing Bay and if they are powered by fuel stored in either aboveground or underground storage tanks, then those tanks must be double-walled and equipped with interstitial leak detection and overfill alarms. Above ground tanks should also have secondary containment that could capture the contents of the tank in the event of a catastrophic spill or leak. Underground tanks should have adequate corrosion protection.	Fuel stored to power the pumps used in the discharge of stormwater meet the protections described. No change to the Final EA.

COMMENT NO.	NAME/ORGANIZATION	COMMENT DATE	COMMENT	RESPONSE
8	USEPA (Grace Musumeci)	5/10/2017 (Letter)	If a well is employed for dewatering purposes, then the well should be constructed in accordance with New York State Department of Health requirements found at: https://www.health.ny.gov/regulations/nycrr/title IO/part 5/appendix 5b.htm#b3	Text has been added to Section 5.14.4.
9		5/10/2017 (Letter)	The oil layer present in oil/water separators that collect runoff from the aircraft parking apron should be drawn off and disposed of safely. Particular care should be taken to capture any ethylene glycol-based deicing fluid before it dissolves aqueous runoff.	Comment has been noted. Text has been added to Section 5.7.2, Section 5.14.3, and Section 6.7.
10		5/10/2017 (Letter)	In the excavation for the terminal building, construction vehicles should be re-fueled off site and a spill prevention, control and containment plan should be in place and, ideally, developed with active input from the project's workers.	Understood. Text has been added to Sections 5.14.4 and 6.7.
11		5/10/2017 (Letter)	Provided the precautions above are taken, it is anticipated that this project will not pose a significant threat to public health or ground water resources and complies with Section 1424(e) of the SDWA. If you have any questions, please contact Lingard Knutson at (212) 637-3747 or knutson.lingard@epa.gov Sincerely, Grace Musumeci, Chief Environmental Review Section	Comments noted.

COMMENT NO.	NAME/ORGANIZATION	COMMENT DATE	COMMENT	RESPONSE
12	NYSDEC (Erin L. Shirkey)	5/11/2017 (Email)	Dear Ms. Lamond, Please accept these comments from the New York State Department of Conservation (NYSDEC) on the "East Side Reconfiguration at LaGuardia Airport, Draft Environmental Assessment, Prepared for U.S. DOT, FAA, Sponsored by Port Authority of NY & NJ, Prepared by AECOM, dated March 2017": 1. Draft EA, Pg 1-20, Section 1.6 Required Land Use/Environmental Permits, Please edit this section to include the following permits: • NYSDEC – ECL Article 17 Titles 7 & 8 Industrial State Pollutant Discharge Elimination System (SPDES) Surface Discharge Permit for groundwater treatment and discharge from temporary construction dewatering; • NYSDEC - ECL Article 15 Title 15 Long Island Well Temporary Dewatering Permit.	Suggested edits have been made to Section 1.6.
13		5/11/2017 (Email)	2. Draft EA, Pg 1-20, Section 1.6 Required Land Use/Environmental Permits, Please edit this section to clarify that the NYSDEC SPDES Construction Permit is a general permit, the reference should be: "NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002)".	Suggested edit has been made to Section 1.6.
14		5/11/2017 (Email)	3. Draft EA, Pg 1-21, Section 1.6 Required Land Use/Environmental Permits, Please edit this section to clarify that the "Air permits from NYSDEC and New York City Department of Environmental Protection" are separate. The reference should be: "NYSDEC - ECL Article 19 Air State Facility Permit."	NYSDEC Air State Facility Permit added as separate bullet in Section 1.6.

COMMENT NO.	NAME/ORGANIZATION	COMMENT DATE	COMMENT	RESPONSE
15	NYSDEC (Erin L. Shirkey)	5/11/2017 (Email)	4. Draft EA, Pg 5-75, para 6, Section 5.14.3 Surface Waters, and Pg 5-79, para 1, Section 5.14.4 Groundwater, Please edit these sections to clarify that a NYSDEC Long Island Well Temporary Dewatering Permit will be obtained in conjunction with an individual SPDES Permit for temporary construction dewatering. This pumped groundwater will require treatment because of historical groundwater contamination, prior to being discharged into the airport's stormwater disposal system, which drains into Flushing Bay, operated by the Port Authority of NY & NJ under SPDES Permit #NY0008133. This new individual SPDES permit, to be obtained by DELTA AIR LINES INC, for groundwater treatment and discharge is separate and in addition to the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002) . The SPDES construction general permit requires the Notice of Intent (NOI) and Stormwater Pollution Prevention Plan (SWPPP) mentioned in Section 5.14.3.	Comments have been addressed in Section 5.14.3.
16		5/11/2017 (Email)	5. Draft EA, Pg 5-29, para 2, Section 5.7.1 Direct Impacts, Please edit this section to clarify that groundwater from dewatering will be treated and tested for in accordance with an individual SPDES Permit, and discharged into the airport's stormwater system, operated by the Port Authority of NY & NJ under SPDES Permit #NY0008133: *"Groundwater from the dewatering process will also be tested for pollution concentration levels, treated if necessary, and disposed in accordance with NYSDEC requirements."*	Comment has been addressed in Section 5.7.1.