John F. Kennedy International Airport

Title 14 Code of Federal Regulations (CFR) Part 150
Final Noise Compatibility Program

Prepared for

The Port Authority of New York & New Jersey

4 World Trade Center
150 Greenwich Street
New York, NY 10007

September 2022

Environmental Science Associates
2600 Capitol Avenue, Suite 200
Sacramento, CA 95816

and

Fitzgerald & Halliday, Inc.

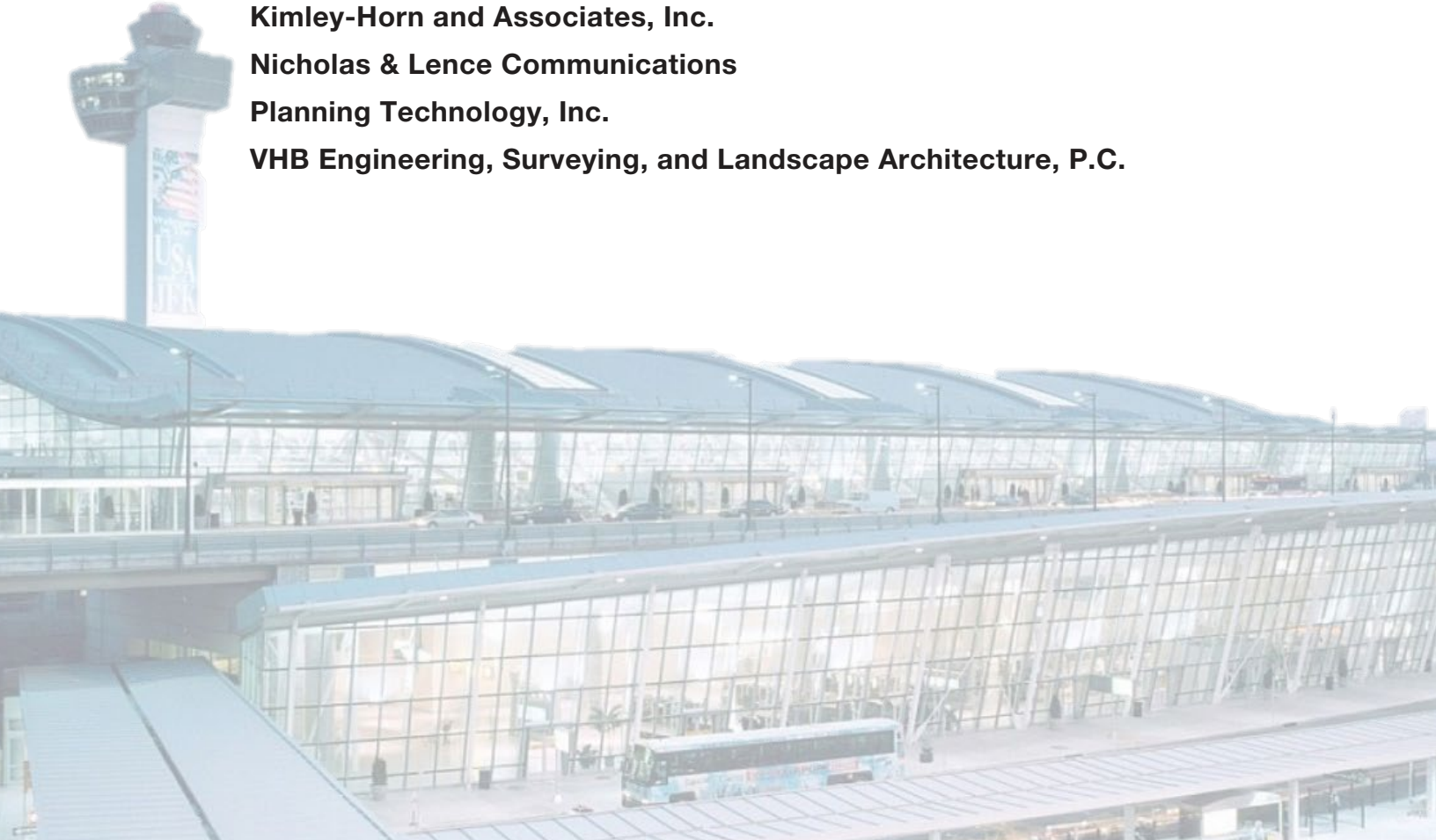
KB Environmental Sciences, Inc.

Kimley-Horn and Associates, Inc.

Nicholas & Lence Communications

Planning Technology, Inc.

VHB Engineering, Surveying, and Landscape Architecture, P.C.



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PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

September 2, 2022

Andrew Brooks
Environmental Program Manager
Federal Aviation Administration
Eastern Regional Office
1 Aviation Plaza
Jamaica, NY 11434

Subject: Final John F. Kennedy International Airport 14 CFR Part 150 Noise Compatibility Program Pursuant to Title 14 of the Code of Federal Regulations

Dear Mr. Brooks:

The Port Authority of New York and New Jersey (the Port Authority) is pleased to submit the Final Noise Compatibility Program (NCP) and supporting documentation. The attached Final NCP was prepared in accordance with 14 CFR Part 150, *Airport Noise Compatibility Planning*. The final recommendations included in this NCP are those of the Port Authority, not those of a consultant or third party.

The Final NCP reflects completion of the second phase of a full Part 150 Noise Compatibility Study. The first phase consisted of the Noise Exposure Maps, which were published and formally accepted by the Federal Aviation Administration (FAA) in May 2017.

The Port Authority is grateful for the meaningful participation provided throughout this project by your office, the FAA NY TRACON, and the FAA Office of Airports. We look forward to continuing to work with the FAA during implementation of the NCP measures.

Please do not hesitate to contact me with any questions.

Sincerely,

DocuSigned by:
Charles R. Everett Jr.
A4FE189A8B2449D...

Charles R. Everett, Jr., C.M.
Director, Aviation
Port Authority of New York and New Jersey
4 World Trade Center
150 Greenwich Street, 18th Floor
New York, NY 10007

enc.

PORT AUTHORITY NY NJ
AIR LAND RAIL SEA

SPONSOR'S CERTIFICATION

The Noise Compatibility Program (NCP) for John F. Kennedy International Airport is hereby submitted in accordance with 14 CFR Part 150. The Program was prepared with the best available information and is certified as true and complete to the best of my knowledge and belief.

The Noise Exposure Map (NEM) was submitted under separate cover in April 2017 and accepted by the Federal Aviation Administration on May 19, 2017.

The NCP Report was prepared in consultation with local public and planning agencies whose area or any portion of whose area of jurisdiction is within the 65 Day-Night Average Sound Level (DNL)[1] contour depicted on the NEM and might be affected by any Port Authority-recommended measures. The consultation also included federal and local officials having oversight responsibility and regular aeronautic users of the airport. The proposed NCP measures are recommended by the Port Authority and not by a consultant or other third party.

It is further certified that adequate opportunity has been afforded to interested persons to submit their views, data, and comments concerning the formulation and adequacy of the NCP and the supporting documentation. The required public hearing was held virtually due to the COVID-19 pandemic restrictions on group gatherings on September 29, 2021 to obtain public comments related to the Port Authority-recommended NCP measures.

By: DocuSigned by: Charles R. Everett Jr. A4FE189A8B2449D...

Title: Director, Aviation Department, Port Authority of New York and New Jersey

Date: 8/22/2022

Airport Name: John F. Kennedy International Airport

Airport Owner/Operator: Port Authority of New York and New Jersey

Address: 4 World Trade Center, 150 Greenwich Street, 18th Floor; New York, NY 10007

[1] For the regulatory definition of DNL, see 14 CFR Part 150 *§150.7 Definitions*: https://www.ecfr.gov/current/title-14/chapter-I/subchapter-I/part-150/subpart-A/section-150.7

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
I. SUBMITTING AND IDENTIFYING THE NCP:			
A. Submission is properly identified:			
1. 14 C.F.R. Part 150 NCP?	X		The cover letter indicates that this is a 14 CFR Part 150 NCP submission.
2. NEM and NCP together?		X	The cover letter indicates that this is a 14 CFR Part 150 NCP submission only.
3. Program revision? (To what extent has it been revised?)		X	The cover letter indicates that this is the first-ever John F. Kennedy International Airport (JFK) 14 CFR Part 150 NCP submission by the Port Authority of New York and New Jersey (Port Authority).
B. Airport and Airport sponsor's name are identified?	X		The cover letter indicates that the Port Authority is the sponsor and operator of JFK.
C. NCP is transmitted by airport sponsor's cover letter?	X		The cover letter is included with the Final NCP.
II. CONSULTATION (including public participation): [150.23]			
A. Documentation includes narrative of public participation and consultation process?	X		See Section 5.2 and Appendix F.
B. Identification of consulted parties:			
1. All parties in 150.23(c) consulted? - FAA ARP ADO & Region - FAA ATO & others - State officials - Public & Planning agencies within 65* - Other Federal officials w/local response for land uses w/in 65 - Air Carries (if applicable) - Other airport users to extent practicable	X		See Sections 5.1 through 5.4, Appendix D, and Appendix F.
2. Public and planning agencies identified?	X		See Section 5.3.2.
3. Agencies in 2, above, correspond to those affected by the NEM noise contours?	X		See Section 5.3.2 and Appendix F.
C. Satisfies 150.23(d) requirements by:			
1. Documentation shows active and direct participation of parties in B., above?	X		See Sections 5.1 through 5.4, Appendix D, Appendix E, and Appendix F.

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
2. Active and direct participation of general public and opportunity to submit their views, data, and comments on the formulation and adequacy of the NCP?	X		See Section 5.2, Appendix D, Appendix E-1 through E-2, and Appendix F.
3. Participation was prior to and during development of NCP and prior to submittal to FAA?	X		See Section 5.2, Appendix D, Appendix E-1 through E-2, and Appendix F.
4. Indicates adequate opportunity afforded to all consulted parties to submit views, data, etc.?	X		See Section 5.2, Appendix D, Appendix E-1 through E-2, and Appendix F.
D. Evidence is included there was notice and opportunity for a public hearing on the final NCP?	X		See Section 5.2, Appendix D, Appendix E-1 through E-2, and Appendix F.
E. Documentation of comments:			
1. Includes summary of public hearing comments, if hearing was held?	X		See Section 5.2 and Appendix F.
2. Includes copy of all written material submitted to operator?	X		See Section 5.2 and Appendix F.
3. Includes operator's responses/disposition of written and verbal comments?	X		See Section 5.2 and Appendix F.
F. Is there written evidence from the appropriate office within the FAA that the sponsor received informal agreement to carry out proposed flight procedures?		X	The Port Authority has received no informal agreement to carry out proposed flight procedures recommended for inclusion in the JFK 14 CFR Part 150 NCP. Proposed flight procedures are given in Section 2.2.
III. NOISE EXPOSURE MAPS: [150.23, B150.3; 150.35(f)] (*This section of the checklist is not a substitute for the Noise Exposure Map checklist. It deals with maps in the context of the Noise Compatibility Program submission.*)			
A. Inclusion of NEMs and supporting documentation:	X		See the cover letter, Chapter 1, and the JFK NEM Report.[1]
1. Map documentation either included or incorporated by reference?	X		See the cover letter, Chapter 1, and the JFK NEM Report.
2. Maps previously found in compliance by FAA?	X		The 2016 (Existing Conditions) NEM and 2021 (Future Conditions) NEM were found in compliance on May 19, 2017; see Appendix A. See the cover letter, Chapter 1, and the JFK NEM Report.

[1] John F. Kennedy International Airport, Title 14 Code of Federal Regulations (CFR) Part 150, Final Noise Exposure Map Report, April 2017.

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
3. FAA's compliance determination still valid? (a) Existing condition NEM represents conditions at the airport at the time of submittal of the NCP for FAA approval? (b) Forecast condition NEM represents conditions at the airport at least 5 years into the future from the date of submittal of the NCP to the FAA for approval? (c) Sponsor letter confirming elements (a) and (b), above, if date of submission is either different than the year of submittal of the previously approved NEMs or over 12 months from the date shown on the face of the NEM? (d) If (a) through (c) cannot be validated, the NEMs must be redone and resubmitted as per 150.21.	X		See the cover letter, Chapter 1, and the JFK NEM Report. (a) Yes. (b) Yes. (c) Yes. (d) N/A
4. Does 180-day period have to wait for map compliance finding?		X	No, NEMs previously approved. See Cover Letter, Chapter 1, and the JFK NEM Report.
B. Revised NEMs submitted with program: (Review using NEM checklist if map revisions included in NCP submittal. Report the applicable findings in the spaces below after a full review using the NEM checklist and narrative.)		X	No revised NEMs are being submitted with this NCP.
1. Revised NEMs included with program?		X	No revised NEMs are being submitted with this NCP.
2. Has airport sponsor requested in writing that FAA make a determination on the NEM(s), showing NCP measures in place, when NCP approval is made?		X	No revised NEMs are being submitted with this NCP.
C. If program analysis uses noise modeling:			
1. INM, HNM, or FAA-approved equivalent?	X		The INM Version 7.0d was used. See Chapter 2.
2. Monitoring in accordance with A150.5?		X	No noise monitoring was performed as part of this NCP, and no monitoring data was used to determine compatibility of land uses with aircraft noise. No monitoring data was used to "calibrate" the INM.
D. One existing condition and one forecast-year map clearly identified as the official NEMs?	X		See the cover letter, Chapter 1, and the JFK NEM Report.
IV. CONSIDERATION OF ALTERNATIVES: [B150.7, 150.23(e)(2)]			

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
A. At a minimum, were the alternatives below considered, or if they were rejected was the reason for rejection reasonable and based on accurate technical information and local circumstances?			
1. Land acquisition and interests therein, including air rights, easements, and development rights?	X		See Section 3.4 and Appendix G.
2. Barriers, acoustical shielding, public building soundproofing	X		See Sections 3.2 and 3.4 and Appendix G.
3. Preferential runway system	X		See Sections 2.2 and 2.3 and Appendix G.
4. Voluntary flight procedures	X		See Section 2.2 and Appendix G.
5. Restrictions described in B150.7 (taking into account Part 161 requirements)	X		The Port Authority is recommending continuation of the existing JFK mandatory departure noise limit and $250 penalty, which was established before the passage of the Airport Noise and Capacity Act of 1990. See Section 2.2 and Appendix G. No other restrictions are being recommended.
6. Other actions with beneficial impact not listed in the regulation	X		See Section 4.2 and Appendix G.
7. Other FAA recommendations (see D, below)		X	No other FAA recommendations.
B. Responsible implementing authority identified for each considered alternative?	X		See Chapter 2, Chapter 3, Chapter 4, and Appendix H.
C. Analysis of alternative measures:			
1. Measures clearly described? 2. Measures adequately analyzed? 3. Adequate reasoning for rejecting alternatives?	X		See Chapter 2, Chapter 3, Chapter 4, Appendix G, and Appendix H.
D. Other actions recommended by the FAA: As the FAA staff person familiar with the local airport circumstances, determine whether other actions should be added? (*List separately, or on back, actions and describe discussions with airport sponsor to have them included prior to the start of the 180-day cycle. New measures recommended by the airport sponsor must meet applicable public participation and consultation with officials before they can be submitted to the FAA for action. See E., below.*)			This section to be completed by the FAA.

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
V. ALTERNATIVES RECOMMENDED FOR IMPLEMENTATION: [150.23(e), B150.7(c); 150.35(b), B150.5]			
A. Document clearly indicates:			
1. Alternatives that are recommended for implementation?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
2. Final recommendations are airport sponsor's, not those of consultant or third party?	X		The final recommendations are those of the Port Authority, not those of a consultant or third party. This will be stated in the cover letter.
B. Do all program recommendations:			
1. Relate directly or indirectly to reduction of noise and noncompatible land uses? (*Note: All program recommendations, regardless of whether previously approved by the FAA in an earlier Part 150 study, must demonstrate a noise benefit if the airport sponsor wants FAA to consider the measure for approval in a program update. See E., below.*)	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
2. Contain description of each measure's relative contribution to overall effectiveness of program?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
3. Noise/land use benefits quantified to extent possible to be quantified? *(Note: some program management measures cannot be readily quantified and should be described in other terms to show their implementation contributes to overall effectiveness of the program.)*	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
4. Does each alternative include actual/anticipated effect on reducing noise exposure within non-compatible area shown on NEM?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
5. Effects based on relevant and reasonable expressed assumptions?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
6. Does the document have adequate supporting data that the measure contributes to noise/land use compatibility?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
C. Analysis appears to support program standards set forth in 150.35(b) and B150.5?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
D. When use restrictions are recommended for approval by the FAA:			
1. Does (or could) the restriction affect Stage 2 or Stage 3 aircraft operations (regardless of whether they presently operate at the airport)? (If the restriction affects Stage 2 helicopters, Part 161 also applies.)		X	The Port Authority is recommending continuation of the existing JFK mandatory departure noise limit and $250 penalty, which was established before the passage of the Airport Noise and Capacity Act of 1990. See Section 2.2.
2. If the answer to D.1 is yes, has the airport sponsor completed the Part 161 process and received FAA Part 161 approval for a restriction affecting Stage 3 aircraft? Is the FAA's approval documented? For restrictions affecting only Stage 2 aircraft, has the airport sponsor successfully completed the Stage 2 analysis and consultation process required by Part 161 and met the regulatory requirements, and is there evidenced by letter from FAA stating this fact?		X	The Port Authority is recommending continuation of the existing JFK mandatory departure noise limit and $250 penalty, which was established before the passage of the Airport Noise and Capacity Act of 1990. See Section 2.2.
3. Are non-restrictive alternatives with potentially significant noise/compatible land use benefits thoroughly analyzed so that appropriate comparisons and conclusions among all alternatives can be made?		X	The Port Authority is recommending continuation of the existing JFK mandatory departure noise limit and $250 penalty, which was established before the passage of the Airport Noise and Capacity Act of 1990. See Section 2.2.
4. Did the FAA regional or ADO reviewer coordinate the use restriction with APP-400 prior to making determination on start of 180-days?		X	The Port Authority is recommending continuation of the existing JFK mandatory departure noise limit and $250 penalty, which was established before the passage of the Airport Noise and Capacity Act of 1990. See Section 2.2.
E. Do the following also meet Part 150 analytical standards?			
1. Recommendations that continue existing practices and that are submitted for FAA re-approval? *(Note: An airport sponsor does not have to request FAA re-approval if noise compatibility measures are in place from previously approved Part 150 studies. If the airport has implemented the measures as approved in the previous NCP, the measures may be reported and modeled as baseline conditions at the airport.)*	X		See Sections 2.2 and 4.2. The Port Authority is recommending continuation of the existing JFK mandatory departure noise limit and $250 penalty, which was established before the passage of the Airport Noise and Capacity Act of 1990.
2. New recommendations or changes proposed at the end of the Part 150 process?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
F. Documentation indicates how recommendations may change previously adopted noise compatibility plans, programs, or measures?	X		See Sections 2.2, 3.2, 3.3, and 4.2.

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
G. Documentation also:			
1. Identifies agencies that are responsible for implementing each recommendation?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
2. Indicates whether those agencies have agreed to implement?	X		There are currently no written agreements to implement any of the recommended NCP measures. See Sections 2.2, 3.2, 3.3, and 4.2.
3. Indicates essential government actions necessary to implement recommendations?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
H. Timeframe:			
1. Includes agreed-upon schedule to implement alternatives?		X	There is no agreed-upon schedule to implement alternatives. The Port Authority has provided anticipated schedules for each recommended NCP measure. See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
2. Indicates period covered by the program?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
I. Funding/Costs:			
1. Includes costs to implement alternatives?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
2. Includes anticipated funding sources?	X		See Sections 2.2, 3.2, 3.3, and 4.2; Appendix G; and Appendix H.
VI. PROGRAM REVISION: [150.23(e)(9)] Supporting documentation includes provision for revision? *(Note: Revision should occur when it is likely a change has taken place at the airport that will cause a significant increase or decrease in the DNL noise contour of 1.5 dB or greater over noncompatible land uses. See §150.21(d))*	X		See JFK Program Management Measure 10 in Section 4.2, Appendix G, and Appendix H.

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John F. Kennedy International Airport Final 14 CFR Part 150 Noise Compatibility Program

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CHAPTER 1
Introduction

This Noise Compatibility Program (NCP) documents the second and final phase of the Port Authority's Title 14 Code of Federal Regulations (CFR) Part 150 ("Airport Noise Compatibility Planning") Study for John F. Kennedy International Airport (JFK or Airport). This NCP was prepared in accordance with the requirements of 14 CFR Part 150. The Federal Aviation Administration (FAA) checklist that outlines the requirements for NCP documentation is included in this NCP before the Table of Contents. The associated supporting references in this document are identified within either the footnotes or appendices.

This NCP presents the results of the Port Authority of New York and New Jersey's (Port Authority's) Study of Airport-related noise exposure in the Airport environs and potential measures to minimize land uses surrounding JFK that are not compatible with Airport activities due to Airport-related noise exposure as identified in the Noise Exposure Maps (NEMs) prepared during the first phase of the Study. While development of the initial NEMs and NCP is voluntary, airport sponsors must have NEMs accepted by the FAA and NCP measures approved by the FAA in order for those NCP measures to be determined eligible for potential federal funding from the Airport Improvement Program (AIP).

The FAA accepted the Port Authority's 2021 forecast condition NEM contours. Since then, the COVID-19 pandemic has resulted in a reduction of aircraft operations at JFK due to significant decreases in business and vacation travel, as well as early retirements of aging aircraft. The severity and duration of these substantial contractions in aviation operations are unknown, but it is expected that demand and airline capacity will grow. Future NEM updates, as discussed in proposed Program Management Measure 9, would reflect updated aviation forecasts and changes to aircraft fleet mix.

The three primary objectives of this JFK 14 CFR Part 150 Study are listed below. The preparation of the NCP addresses the second and third objectives of the Study.

	Objectives	Study Phase
1	Identify JFK's existing operational procedures and determine the existing and future noise conditions around the Airport. Determine existing and future land uses that are and are not compatible with aircraft noise based on the noise conditions and land use compatibility designations in 14 CFR Part 150, Appendix A, Table 1.	Noise Exposure Maps
2	Identify and evaluate potential future operational, land use, and program management measures that could be implemented to reduce noise impacts to noise-sensitive land uses.	Noise Compatibility Program
3	Develop a comprehensive NCP that consists of Airport Sponsor recommendations to the FAA to reduce future noise impacts to the surrounding communities.	

The first phase of the Study resulted in the development of maps depicting existing and anticipated future aircraft noise exposure and to estimate the effects of that noise in terms of the number of people, dwelling units, and noise-sensitive land uses exposed to aircraft noise of Day-Night Average Sound Level (DNL) 65 decibels (dB) and higher. The Existing Conditions NEM represents conditions in the year 2016, while the Future Conditions NEM represents forecast conditions for the year 2021 absent the implementation of measures in this NCP. These NEMs are hereafter referred to as the "2016 NEM" and the "2021 NEM." The NEMs and the assumptions used in their development are documented in the report *John F. Kennedy International Airport, Title 14 Code of Federal Regulations (CFR) Part 150, Final Noise Exposure Map Report*, April 2017, which was accepted by the FAA on May 19, 2017 (the JFK NEM Report). The FAA's acceptance of the JFK NEM Report is presented in **Appendix A**.

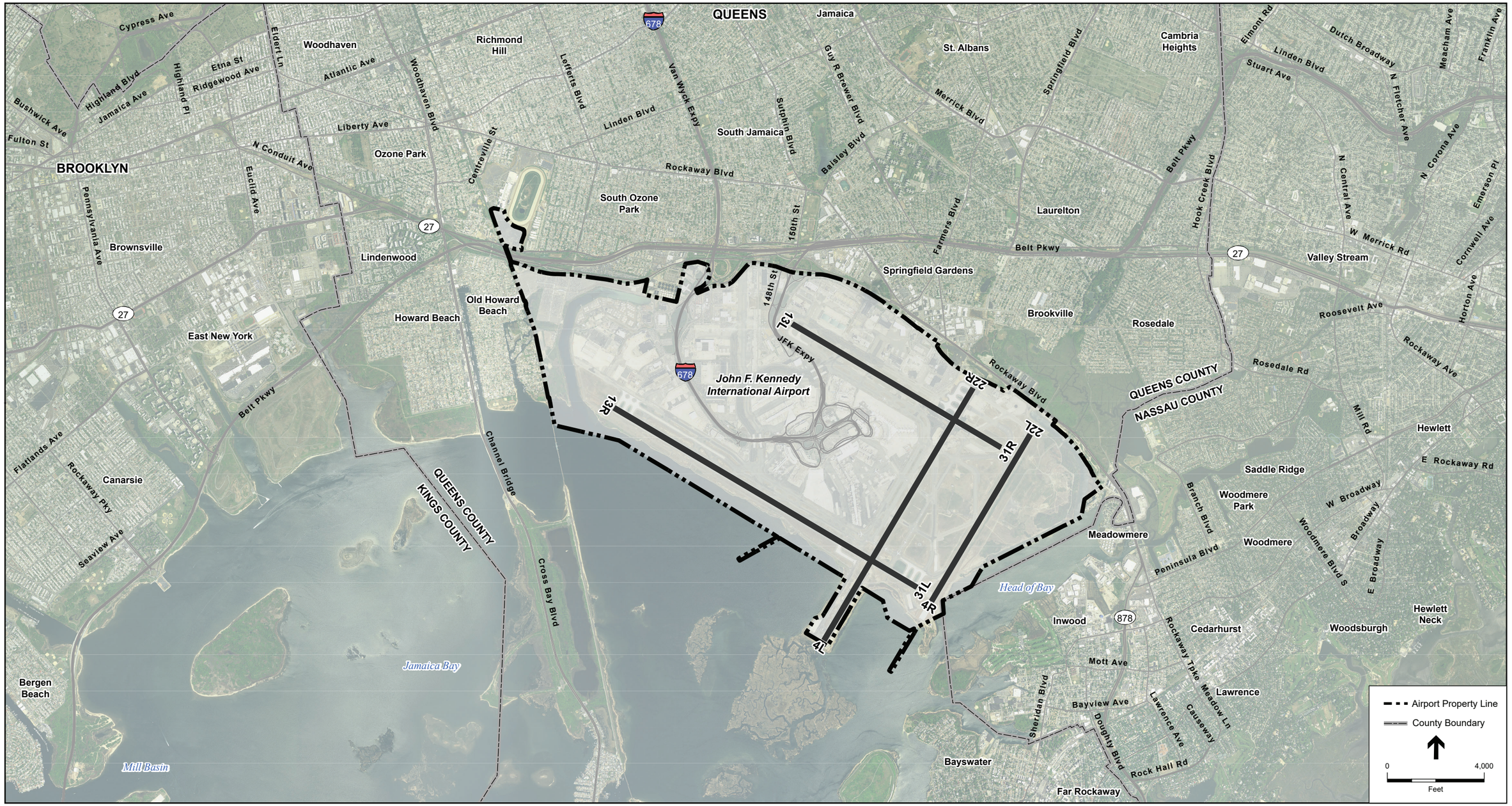
1.1 Project Location and Airport Setting

JFK is located on Jamaica Bay in the southeastern section of the Borough of Queens, within the city limits of New York City. JFK covers 4,930 acres. JFK is partially bounded by water, with Jamaica Bay immediately to the southeast, southwest, and west. Communities that border the Airport include: Howard Beach, Old Howard Beach, and Hamilton Beach to the west; Ozone Park to the northwest; South Ozone Park and Springfield Gardens to the north; Brookville and Rosedale to the northeast; Woodmere, Cedarhurst, and Inwood to the southeast; and Bayswater, Edgemere, Arverne, and Hammels to the southwest. Major regional access to JFK is provided by the Van Wyck Expressway (U.S. Interstate Highway 678), JFK Expressway, Belt Parkway (State Highway 27), Conduit Avenue, and Rockaway Boulevard. The location of the Airport is depicted in **Figure 1-1**. The Airport and its environs are depicted in **Figure 1-2**.

1.1.1 Airport History

In April 1942, New York City began filling the marsh tidelands of the Idlewild Golf Course for the construction of JFK. JFK has been operated by the Port Authority under a lease with New York City since June 1947, when the Airport was known as Idlewild Airport. Construction was completed in 1947 and commercial operations were initiated in 1948. On December 24, 1963, Idlewild Airport was renamed John F. Kennedy International Airport in memory of the former president.

Since 1959, the Port Authority has been active in addressing aircraft noise concerns, including implementation of a noise departure limit at JFK and a $250 penalty for violations of that limit; implementation of a voluntary school sound insulation program in the vicinity of JFK; installation of an aircraft noise monitoring system in communities around JFK; and establishment of a fully staffed noise office to evaluate aircraft noise issues and educate local communities on aircraft noise and airport operations. The Port Authority expended over $192 million to voluntarily sound-insulate schools in the vicinity of JFK, in part with $71 million in FAA AIP grants. Additional details about the Port Authority's noise monitoring, mitigation, abatement, and community outreach programs are contained in Section 2.6 of the JFK NEM Report.



SOURCE: USDA, 2015 (Aerial Imagery); ESA, 2016 and 2020.

John F. Kennedy International Airport 14 CFR Part 150 Study.140037

Figure 1-1

Airport Location Map

John F. Kennedy International Airport

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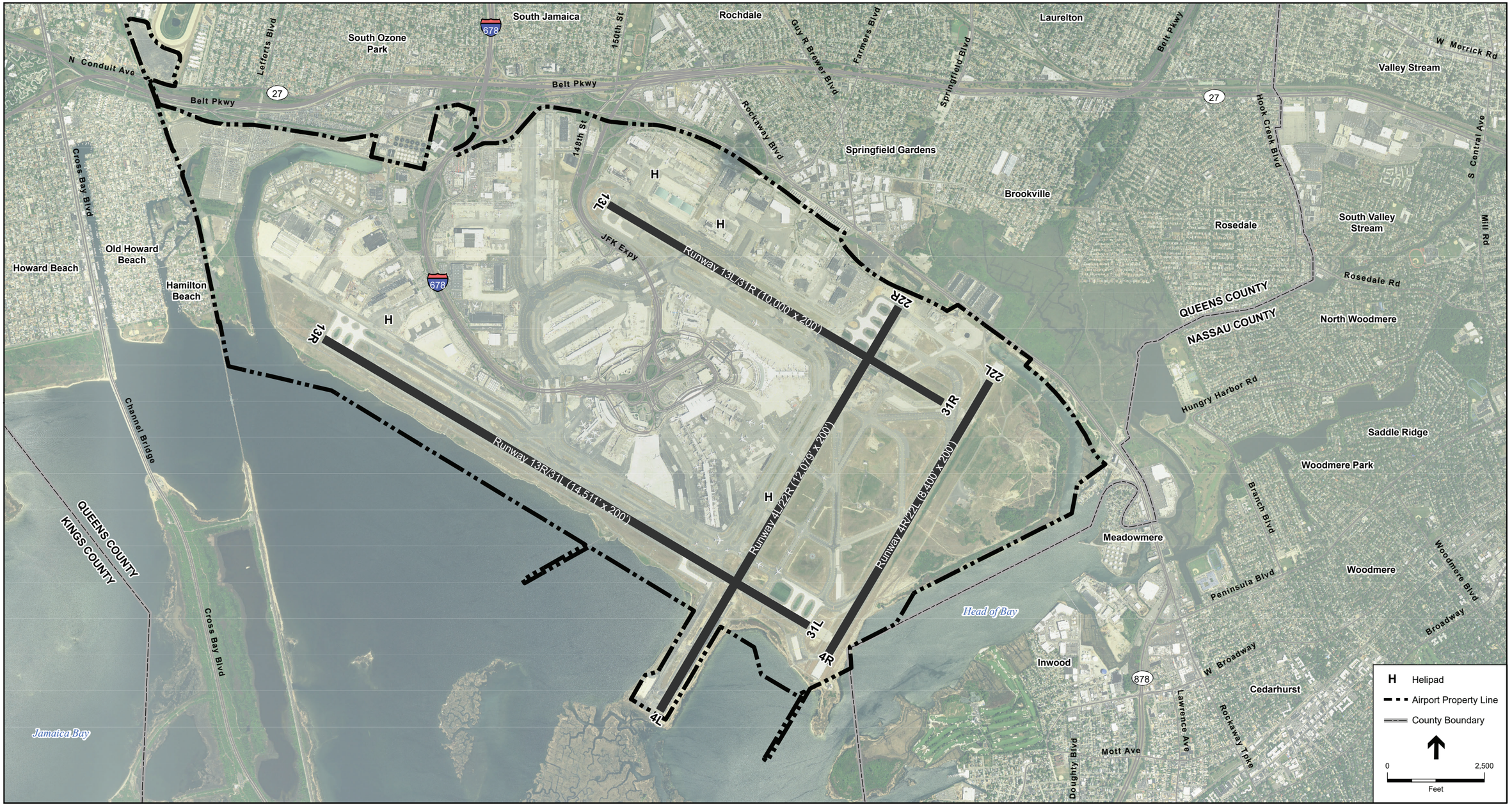

SOURCE: USDA, 2013 (Aerial); ESA, 2016 and 2020.

John F. Kennedy International Airport 14 CFR Part 150 Study.140037

Figure 1-2

Airport Vicinity Map

John F. Kennedy International Airport

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Contribution to Economy and Airport Development

In 2017, JFK was the sixth busiest commercial service airport in the United States, based on passenger traffic.[2] JFK is the busiest airport in the New York City metropolitan area and among the busiest in North America and the world. The Airport provides scheduled domestic and international service for both passengers and air cargo. The FAA's National Plan of Integrated Airport Systems identifies JFK as a Large Hub Primary Commercial Service Airport. Large hubs are those airports that each account for at least one percent of total U.S. passenger enplanements. The configurations of the major airfield and landside facilities at JFK are described in the JFK NEM Report.

1.2 14 CFR Part 150 Study Overview

In 2014, the Port Authority initiated its first-ever 14 CFR Part 150 Study for JFK. Coordination with representatives of jurisdictions in the vicinity of JFK, the FAA, airport users, local communities, and interested members of the public has occurred throughout the Study process, aided by regular meetings of a Technical Advisory Committee (TAC) established as a coordination mechanism at the beginning of the JFK 14 CFR Part 150 Study. **Section 5.1** contains further details about the TAC and its role in the 14 CFR Part 150 Study.

The Port Authority retained a team of consultants led by Environmental Science Associates (ESA) to assist in conducting the 14 CFR Part 150 Studies at JFK and LaGuardia Airport (LGA). An overview of the 14 CFR Part 150 Study process undertaken by the Port Authority and its consultant team (Study Team) is provided in **Figure 1-3**.

1.2.1 Noise Exposure Maps

NEMs graphically depict aircraft noise exposure on and in the vicinity of an airport by presenting lines of equal DNL values. Aircraft DNL values represent the sound exposure produced by a 24-hour period of aircraft activity. DNL is described further in **Section 1.4** of this NCP. NEMs provide local communities an opportunity to visualize aircraft noise exposure in order to make better-informed decisions regarding existing and proposed noise-sensitive development in the vicinity of an airport. The NEMs for the JFK 14 CFR Part 150 Study were published in Appendix M of the JFK NEM Report and accepted by the FAA on May 19, 2017. The FAA acceptance letter is presented in **Appendix A**.

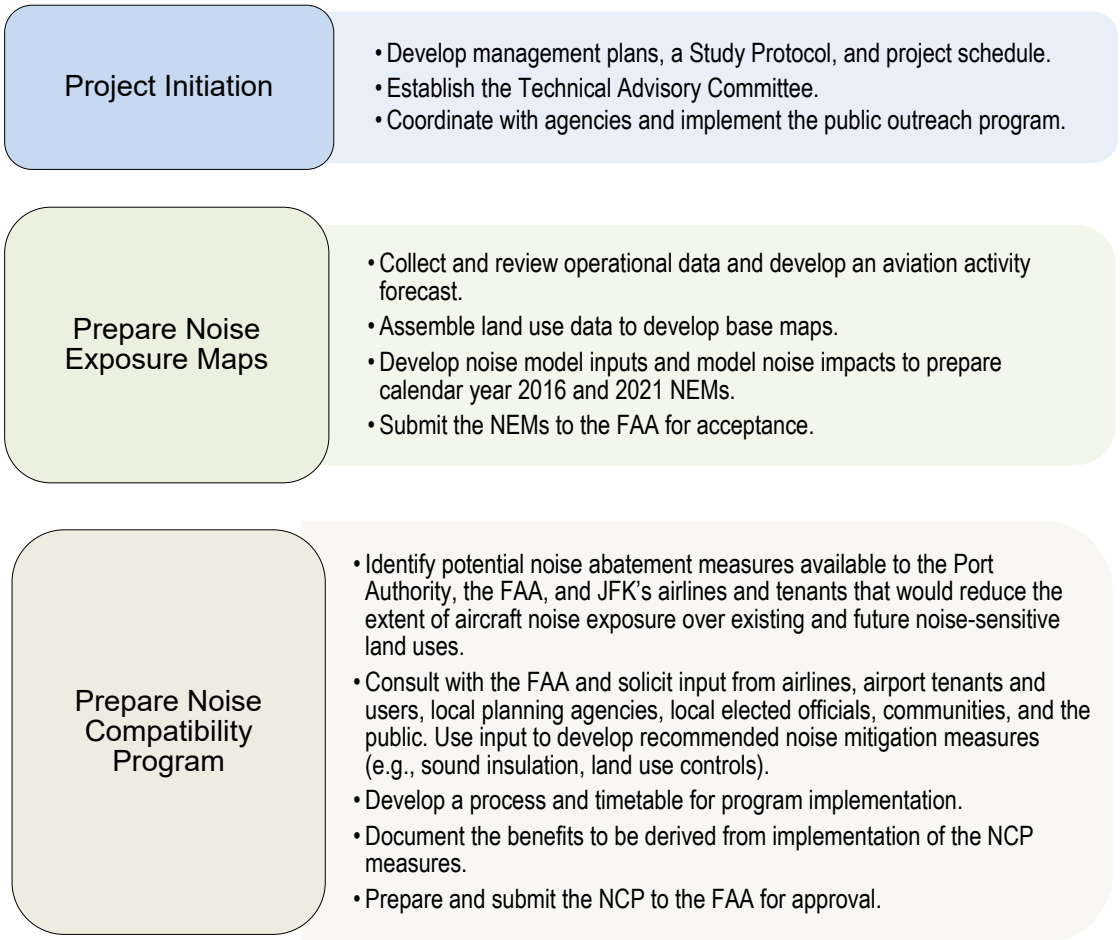
The FAA-accepted JFK NEMs include two maps. The first is JFK's Existing Conditions (calendar year 2016) NEM, hereafter referred to as the 2016 NEM, which depicts existing aircraft noise exposure and noncompatible land uses in the vicinity of the Airport. This NEM was developed using FAA-approved aircraft operation counts based on a combination of FAA data and JFK calendar year 2014 data.[3,4] The 2016 NEM DNL contours are presented in **Figure 1-4**.

2 Port Authority of New York and New Jersey. *2017 Airport Traffic Report.* April 6, 2018.

3 An aircraft operation is defined as one arrival flight or one departure flight.

4 The Port Authority and a consultant (Landrum & Brown) developed the operational forecast for calendar year 2016 and 2021 aircraft activity using the FAA's 2014 Terminal Area Forecast for JFK (issued in January 2015) as a baseline. Calendar year 2014 information and data related to aircraft fleet mix and runway utilization provided a baseline for developing noise model inputs for the 2016 NEM. The 2016 noise model inputs served as the basis for developing the noise model inputs for the 2021 NEM. For further details, please see Section 4.3.1 and Appendix F-1 of the JFK NEM Report.

Figure 1-3
Overview of the 14 CFR Part 150 Process



The second NEM is JFK's Future Conditions (calendar year 2021) NEM, hereafter referred to as the 2021 NEM, which depicts aircraft noise exposure for five-year forecast conditions. This NEM was developed using projected levels of aircraft activity at JFK in 2021 as derived from the Port Authority's aircraft operations forecast. In accordance with 14 CFR Part 150,[5] the 2021 NEM represents conditions five years after the NEM date of submittal to the FAA. The 2021 NEM DNL contours are presented in **Figure 1-5**. A public comment period was provided for the 2016 and 2021 NEMs from October 26, 2016, to November 28, 2016. During the comment period, two Public Information Workshops were held on the JFK NEMs. The first occurred on November 2, 2016, at the JFK Hilton in Jamaica, NY, from 6:00 P.M. to 9:00 P.M. The second, located in Nassau County, occurred on November 3, 2016, at the Cradle of Aviation Museum in Garden City, NY, from 6:00 P.M. to 9:00 P.M. The purpose of the workshops was to afford the public the opportunity to review and comment on the development of the JFK NEMs.

Further details on JFK's FAA-accepted NEMs, including the technical approach used in developing them, are provided in Chapters 4 and 5 of the JFK NEM Report.

5 14 CFR Part 150, Sec. 150.21(a)(1).

SOURCE: New York City Department of City Planning, MapPLUTO 15V1- Tax lot/land use geographic information database, March 2015- June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016 and 2020; ESRI Mapping Services, 2019.

John F. Kennedy International Airport 14 CFR Part 150 Study.140037

Figure 1-4
2016 Noise Exposure Map DNL Contours
John F. Kennedy International Airport

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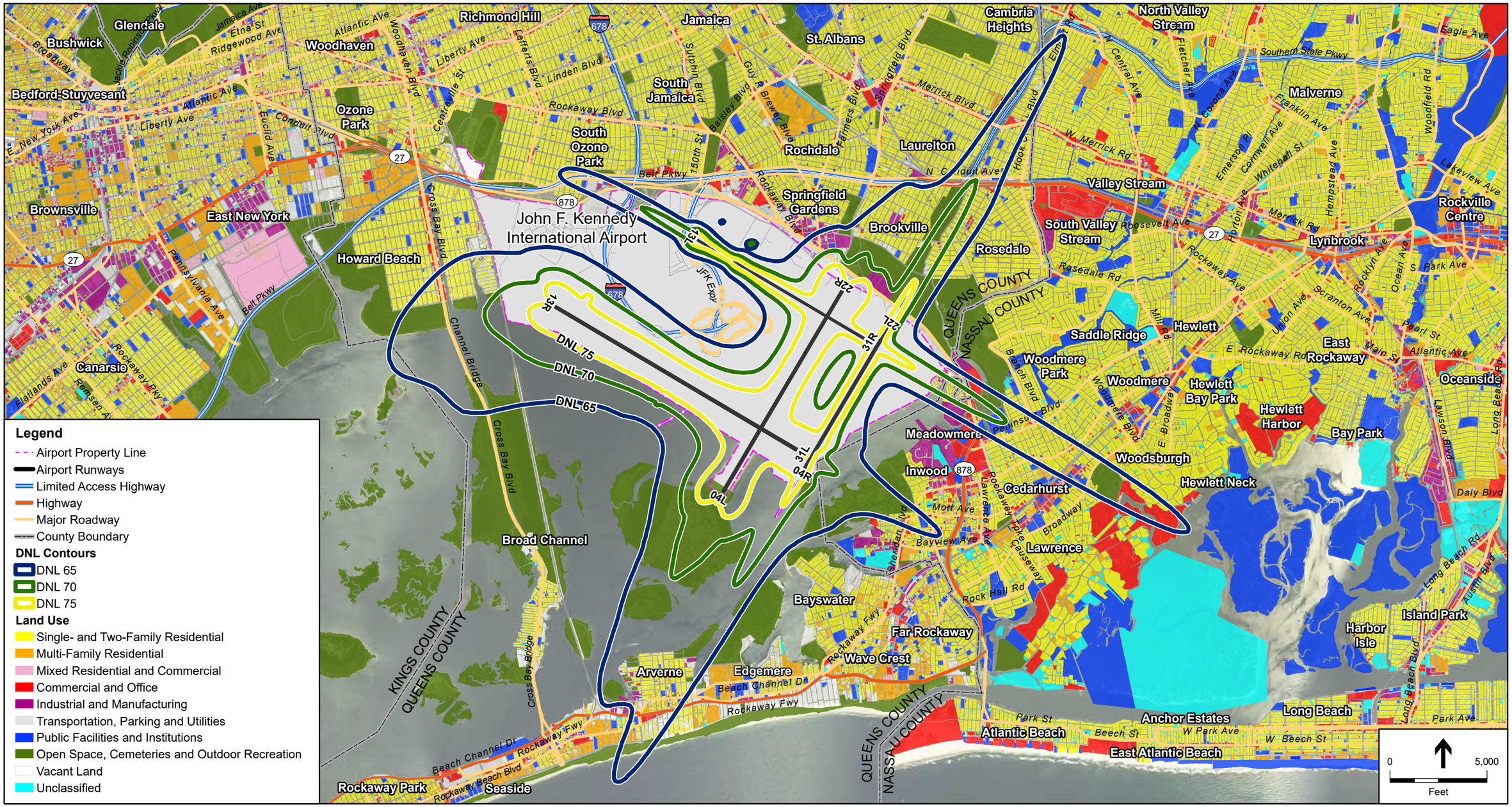

SOURCE: New York City Department of City Planning, MapPLUTO 15V1- Tax lot/land use geographic information database, March 2015- June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016 and 2019; ESRI Mapping Services, 2020.

John F. Kennedy International Airport 14 CFR Part 150 Study.140037

Figure 1-5

2021 Noise Exposure Map DNL Contours
John F. Kennedy International Airport

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1.2.2 Noise Compatibility Program

An NCP contains noise control strategies that have been selected by an airport operator as measures for implementation as a result of a 14 CFR Part 150 Study. There are two primary types of strategies used for reducing aircraft noise exposure on noise-sensitive areas surrounding an airport: noise abatement strategies and noise mitigation strategies. 14 CFR Part 150 defines a number of strategies relative to each that are required to be explored in every study.

Noise abatement strategies address noise at the source to lessen the noise impact on noncompatible land uses. Examples include changes in aircraft flight tracks, changes in runway use, and changes in departure profiles. Noise mitigation strategies address noise at the receiver and include strategies such as sound insulation, management of how land is developed around an airport, and promotion of development that is compatible with airport operations.

The FAA distinguishes between noise mitigation strategies (i.e., at the receiver end) that reduce existing noncompatible uses and strategies that prevent or reduce the probability of additional noncompatible uses being established.[6] In the context of noise mitigation, strategies that reduce existing noncompatible uses are known as corrective strategies, and those that limit the establishment of additional noncompatible uses are known as preventive strategies. Corrective noise mitigation strategies focus on reducing interior noise exposure, such as through the application of sound insulation or the removal of the uses (e.g., land acquisition). Preventive mitigation strategies are intended to discourage the development of new noncompatible land uses using techniques such as the application of zoning regulations and the modification of building codes.

In accordance with 14 CFR Part 150, Appendix B, Sec. 150.7(b), the following types of strategies were considered during the preparation of JFK's NCP:

1) Acquisition of land and interests therein: Discussed in **Section 3.4**
2) Construction of barriers and acoustical shielding, including the soundproofing of public and private buildings: Discussed in **Sections 3.3** and **3.4**
3) Implementation of a preferential runway use program: Discussed in **Sections 2.2** and **2.3**
4) Implementation of restrictions on the use of the Airport by any type or class of aircraft based on the noise characteristics of those aircraft: Discussed in **Section 2.3**
5) The use of flight procedures (including the modifications of flight tracks) to control the operation of aircraft to reduce exposure of individuals (or specific noise-sensitive areas) to noise in the area around the Airport: Discussed in **Sections 2.2** and **2.3**
6) Other actions or combinations of actions that would have a beneficial noise control or abatement impact on the public: Discussed in **Section 4.2**
7) Other actions recommended for analysis by the FAA for the Airport: Discussed in **Section 2.2**

6 14 CFR Part 150, Appendix B, Sec. 150.5(a).

Each JFK noise abatement strategy was evaluated against the following eight criteria specified by the FAA in 14 CFR Part 150, Sec. 150.35(b) and Appendix B, Sec. 150.5:

1) Does the strategy reduce existing noncompatible land uses?
2) Does it prevent or discourage development of noncompatible land uses?
3) Does it impose an undue burden on interstate or foreign commerce?
4) Is it unjustly discriminatory toward particular aircraft operators?
5) Can it be revised if conditions change?
6) Does it derogate aviation safety or adversely affect the safe and efficient use of navigable airspace?
7) Does it meet both the goals and needs of the local community and those of the national air transportation system, to the extent practicable?
8) Can it be implemented in a manner consistent with all the powers and duties of the FAA Administrator?

After issuance of the Record of Approval (ROA) of an NCP, the FAA performs environmental, safety, and other types of reviews of each recommended noise abatement measure in the NCP prior to determining whether the measure can be implemented.

Each noise mitigation strategy was evaluated against the following standard aviation industry criteria:[7]

- Does it reduce existing noncompatible land uses?
- Does it prevent or discourage development of noncompatible land uses?
- Is it consistent with the policies of the Port Authority?
- Is it consistent with the policies of the affected local jurisdictions?
- Would it have a positive effect on existing and planned land use patterns in the airport environs?
- Can it be implemented under existing laws?
- Is it economically, financially, and politically feasible?
- How much time would be necessary for implementation?

Chapters 2, **3**, and **4** of this NCP present and summarize the evaluation of noise abatement and noise mitigation strategies as well as other types of strategies for improving compatibility of the Airport with its environs.

[7] FAA Advisory Circular 150/5020-1, Chapter 3, Sections 2 through 4.

1.3 Roles and Responsibilities

1.3.1 Port Authority

The Port Authority, as the operator of JFK, is responsible for the development of information to support the noise compatibility planning effort. This support includes preparation of the aviation forecasts used in this 14 CFR Part 150 Study, coordination with Airport users related to operational procedures, interaction with local planners and elected officials related to land use compatibility, and the execution of public outreach strategies. In addition, to the extent that the Port Authority elects to pursue any of the FAA-approved noise abatement and mitigation measures in this NCP, the Port Authority would be responsible for implementing or assisting with the implementation of the approved NCP measures and applying for FAA funds (grants) associated with FAA-approved eligible items included in the NCP. A Port Authority–recommended and FAA-approved measure does not require the implementation of the measure, but merely allows the Port Authority to apply for federal AIP grants for eligible measures.

1.3.2 14 CFR Part 150 Study Technical Advisory Committee

After the initiation of the JFK 14 CFR Part 150 Study, the Port Authority formed a TAC. The purpose of the TAC was to provide varying perspectives and inputs to the NEM and NCP development process. The primary emphasis of TAC meetings was to create an atmosphere of understanding, awareness, and working together to derive strategies for improving the compatibility of JFK with its environs. Through an invitation from the Port Authority and a voluntary participation process as set forth in the TAC charter, the TAC brought together representatives from a broad spectrum of entities with interest in the 14 CFR Part 150 process and its outcome.[8] The TAC's role was advisory and its purpose was solely limited to this Study. The TAC offered opinions, advice, and guidance to the Study Team, but the Port Authority had the sole discretion to accept or reject the TAC recommendations. In addition to providing input, comments, and technical advice for the Study, the responsibility of each TAC member was to inform their respective organizations, agency, and/or group of the Committee's discussions. The TAC included members that represent the Port Authority, the FAA, airlines, Airport business associations, government agencies with aviation and land use responsibilities, business groups, planning organizations, private sector interests (particularly in the aviation industry), and representatives of the affected communities in the Airport's environs.

1.3.3 Federal Aviation Administration

The FAA is responsible for reviewing an airport operator's NCP submitted under 14 CFR Part 150 and issuing a Record of Approval (ROA). The FAA's review of the NCP encompasses the details of technical documentation as well as broader issues of safety and the constitutionality of recommended NCP measures. For each measure proposed in an NCP, the FAA is responsible for approving, disapproving, approving or disapproving in part, or stating that no action will be taken for the purposes of 14 CFR Part 150. The FAA evaluates recommended measures and makes a determination as to whether or not certain conditions are met that would

[8] The TAC charter and membership are presented in Appendix D-1 and Appendix D-2, respectively.

include or exclude those measures from consideration for approval or disapproval for the purposes of 14 CFR Part 150, using the criteria presented in 14 CFR Part 150, Sec. 150.35(b) and Appendix B, Sec. 150.5.

FAA involvement includes participation by staff from at least three parts of the agency:

1. Office of Environment and Energy (AEE)
   - The FAA's AEE (at FAA Headquarters) reviews complex technical, regulatory, and legal matters of national environmental policy significance.
2. The Air Traffic Organization (ATO)
   - The FAA's ATO includes air traffic controllers and support staff.
   - JFK's Air Traffic Control Tower provided significant input to the NCP review process in several technical areas, including safety implications, capacity effects, and implementation requirements for suggested noise abatement strategies.
   - The FAA's New York Terminal Radar Approach Control (NY TRACON) also provided input on suggested noise abatement strategies to the extent that their potential implementation might affect operational procedures and airspace at JFK and other nearby airports, including LGA, Newark Liberty International Airport (EWR), and Teterboro Airport (TEB).
3. The Office of Airports (APP)
   - Two groups in the FAA's Office of Airports involved include: (1) FAA Headquarters, ensuring consistency with Part 150 Regulations and reviews of national importance, and (2) the FAA's Eastern Region Office, responsible for determining whether the NCP Report satisfies all Part 150 requirements and final review of the NCP Report for adequacy in satisfying technical and legal requirements.

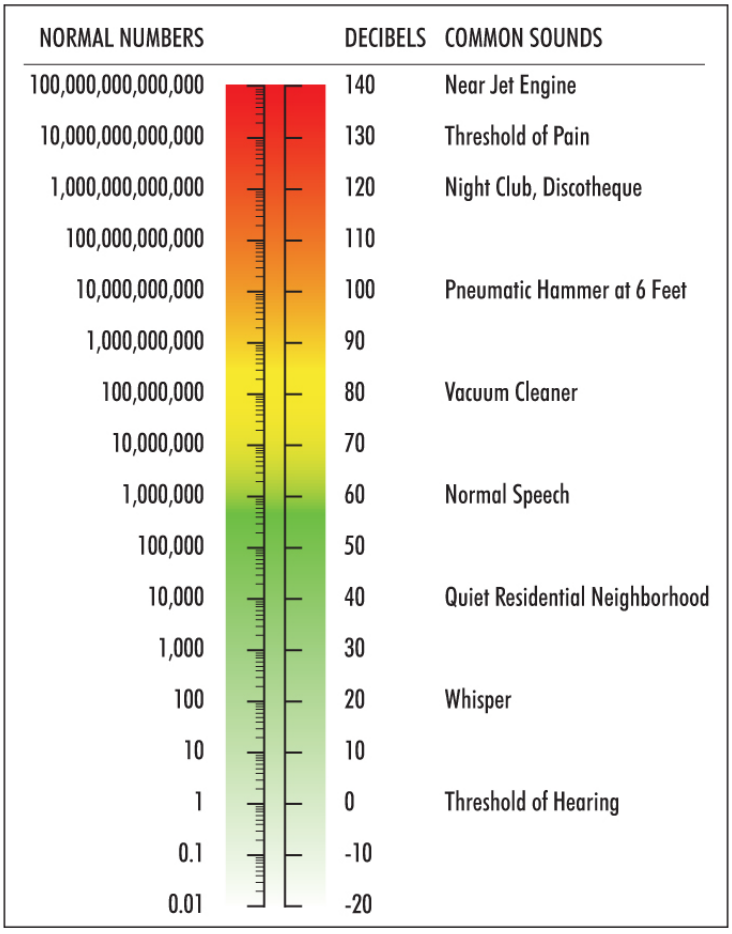
FAA approval specifically involves determining whether a recommended NCP measure meets requirements provided in 14 CFR Part 150, Sec. 150.33 ("Evaluation of Programs") and Sec. 150.35 ("Determinations; publications; effectivity"). FAA approval of an NCP measure does not obligate implementation of that measure. In particular, noise abatement measures approved by the FAA for the purposes of 14 CFR Part 150 may still require further reviews, such as environmental reviews under the National Environmental Policy Act (NEPA), and those reviews may indicate that implementation of an FAA-approved noise abatement measure is infeasible. Upon receipt of the FAA's ROA of this NCP, the Port Authority may begin implementation of FAA-approved program measures and apply for federal financial assistance to support implementation of eligible FAA-approved NCP measures at JFK.

1.4 Noise Terminology

Sound is a wave of alternating high and low pressure levels that travels through the air; any undesirable sound is considered *noise*. The fundamental descriptors of sound are the *amplitude* and *frequency* of a sound, and different *noise metrics* are used to communicate this information. Amplitude is a direct measurement of a sound's magnitude and is expressed in *decibels* (dB).

Because sound magnitudes exist across a very wide range in the physical world, the use of dB expresses sound magnitudes on a logarithmic scale; this converts wide ranges into numbers that are more easily understood. For example, a sound level of 70 dB has 10 times as much acoustic energy as a level of 60 dB, while a sound level of 80 dB has 100 times as much acoustic energy as a level of 60 dB. A sound that is 10 dB higher than another is usually perceived to be twice as loud. **Figure 1-6** shows dB levels of common sounds.

Figure 1-6
Decibel Levels of Common Sounds



SOURCE: ESA, 2016.

Frequency is a direct measurement of how rapidly a sound wave alternates between high and low pressures and is described in cycles per second, known as *Hertz* (Hz). The normal range of frequencies that a young adult can hear is 20 Hz to 20,000 Hz, while the frequency range for aircraft noise is typically 50 Hz to 5,000 Hz. Because the human ear is not sensitive to all frequencies, the magnitudes of individual aircraft noise events are typically determined through emphasis of frequencies where the human ear is most sensitive. These "frequency-weighted" magnitudes are expressed as *A-weighted decibels* (dBA).

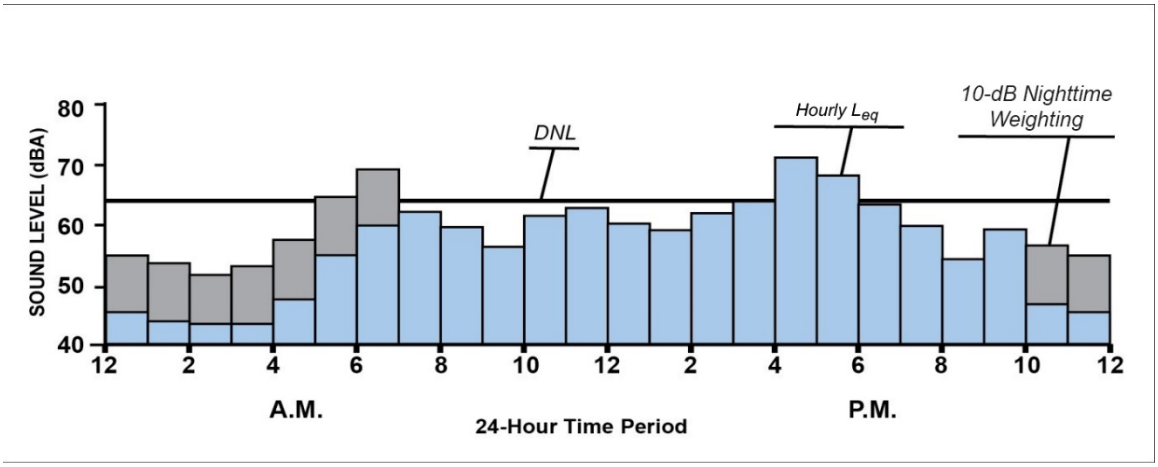
To simultaneously describe both the magnitude and duration of an individual aircraft noise event, the single-event noise metric known as *Sound Exposure Level* (SEL) can be used. SEL expresses

what magnitude would result if the entire noise event were to occur over a duration of one second. SEL is computed from instantaneous dBA levels that occur across the duration of the noise event.

To describe the average noise level of multiple events over a specific period of time, the cumulative noise metric known as *Equivalent Continuous Sound Level* (L_{eq}) can be used. To produce an L_{eq} value, all noise energy occurring during a specified period of time is averaged. L_{eq} can be measured for any time period, but typical L_{eq} time periods are 15 minutes, 1 hour, or 24 hours in length.

14 CFR Part 150 requires the use of the *Day-Night Average Sound Level* (DNL) noise metric for the JFK 14 CFR Part 150 Study.[9] DNL is a cumulative noise metric that accumulates the sound energy of multiple aircraft noise events occurring during a 24-hour period, resulting in a single value that represents the average noise level over that period. DNL values are expressed using dBA. In the calculation of DNL, sound events occurring during the *nighttime* (10:00 P.M. to 6:59:59 A.M.) are increased by a weighting of 10 dB to represent the increased sensitivity of people to noise that occurs at night. DNL can be calculated by averaging hourly L_{eq} values for each hour of the day, with a 10 dB weighting applied to the L_{eq} values for the nighttime hours. Aircraft DNL values represent the cumulative effects of all aircraft operations occurring during an average 24-hour period, referred to as an *annual average day*, which is derived from aircraft operations data for an entire calendar year. **Figure 1-7** illustrates how DNL results from 24 hours of hourly L_{eq} values. Further details on aircraft noise are presented in Appendix C of the JFK NEM Report.

Figure 1-7
Illustration of DNL



SOURCE: ESA, 2016 and 2019.

9 14 CFR Part 150, Appendix A, Section 150.3(b).

1.5 FAA-Accepted 2016 and 2021 Noise Exposure Maps

The fundamental elements of an NEM are DNL contours for existing and forecast conditions, presented over base maps that depict the airport's layout; local land use control jurisdictions; major land use categories; discrete noise-sensitive "receptors"; and other information required by 14 CFR Part 150.[10] The JFK NEMs present DNL contours for existing (2016) and five-year (2021) forecast conditions and noise-sensitive uses within the DNL 65 and higher contours. The NEMs for the JFK 14 CFR Part 150 Study were published in Appendix M of the JFK NEM Report and accepted by the FAA on May 19, 2017. **Figure 1-4** shows the JFK 2016 NEM DNL contours, and **Figure 1-5** shows the JFK 2021 NEM DNL contours.

The DNL contours for this study were prepared using the Integrated Noise Model (INM).[11] The INM is an FAA-approved, industry-accepted tool for determining the cumulative effect of aircraft noise exposure around airports. The airport-specific information required by the INM includes both physical and operational data. The physical data include airfield geometry (e.g., runway locations and utilization), the elevation of the airfield, weather, and terrain data. Operational data include the number and types of aircraft operating at the airport and the three-dimensional flight trajectories of aircraft arriving to and departing from the airport.

The DNL contours were then used in an analysis of land use and population to determine the numbers of residents and dwelling units exposed to DNL 65 and higher, as well as the numbers of other types of noise-sensitive sites (such as places of worship, schools, and libraries) exposed to DNL 65 and higher. This analysis leveraged land use agency and U.S. Census Bureau data on population as well as types and locations of properties in the vicinity of JFK. **Table 1-1** provides a summary of residents, dwelling units, non-residential noise-sensitive sites, and historic sites exposed to DNL 65 and higher in the years 2016 and 2021. The complete JFK NEM Report with detailed information is available for review on the Port Authority website at: http://panynjpart150.com/JFK_FNEM.asp.

10 14 CFR Part 150, Appendix A, Sec. 150.101.

11 The JFK 14 CFR Part 150 Study was initiated in October of 2014, prior to the FAA's release of the Aviation Environmental Design Tool version 2b (AEDT 2b) on May 29, 2015, and the latest version AEDT 3d on March 30, 2021. When the Study began, INM 7.0d was the most current FAA-approved model for determining aircraft noise exposure around airports and was identified as the model required for use in this Study. The FAA approval of INM 7.0d for use in this Study can be found in Appendix G of the JFK NEM Report.

TABLE 1-1
HISTORIC SITES, NOISE-SENSITIVE SITES, AND POPULATION EXPOSED TO DNL 65 AND HIGHER – 2016 AND 2021 NEMS

Noise Exposure	Total Area (Acres)	Dwelling Units	Population	Places of Worship	Schools[1]	Hospitals and Residential Healthcare	Historic Resources[2]	Day Care Facilities	Library
2016									
DNL 65-70	5,421.3	12,752	35,875	18	12	8	3	16	1
DNL 70-75	1,939.6	740	2,175	0	0	0	0	0	0
DNL 75+	1,553.8	0	0	0	0	0	0	0	0
Total	**8,914.7**	**13,492**	**38,050**	**18**	**12**	**8**	**3**	**16**	**1**
2021									
DNL 65-70	5,503.3	13,059	36,812	19	12	8	3	17	1
DNL 70-75	1,994.2	766	2,262	0	0	0	0	0	0
DNL 75+	1,606.9	0	0	0	0	0	0	0	0
Total	**9,104.4**	**13,825**	**39,074**	**19**	**12**	**8**	**3**	**17**	**1**

NOTES:

These exposure data are in reference to the 2016 and 2021 NEMs accepted by the FAA in 2017. The household and population estimates provided above were developed using census block-level demographic data from the 2010 Decennial Census and New York City housing data. This approach provided an average number of persons per household for each individual census block, which accounted for changes in land use, housing types, and residential density within the different areas in the DNL 65 and higher contours.

1 Eight of the twelve schools were included in the School Soundproofing Program and are compatible with DNL 65 and higher (see Section 2.6.1 of the JFK NEM Report).
2 Five schools and places of worship are historic sites, but they are not included here to avoid double counting; see Table 5-6 of the JFK NEM Report for the full list.

SOURCES: Planning Technology, Inc. and ESA, 2016 and 2020.

1.6 Noise and Land Use Compatibility

The FAA has determined that the major land uses listed in 14 CFR Part 150, Appendix A, Table 1 (presented here as **Table 1-2**) are normally compatible with aircraft noise below the DNL 65 contour. Therefore, when evaluating land use compatibility, attention is focused on uses within the DNL 65 contour. The noise metric used for land use compatibility is DNL. Further details on aircraft noise are presented in **Section 1.4** of this NCP and in Appendix C of the JFK NEM Report.

As shown in **Table 1-2**, noise-sensitive land uses such as residential, mobile home parks, transient lodging, schools, and outdoor music venues are considered noncompatible with noise exposure of DNL 65 or higher. Other noise-sensitive land uses such as hospitals, nursing homes, churches, auditoriums, and concert halls are considered compatible with noise exposure of DNL 65 to 75, provided that appropriate noise attenuation is designed into the building's structure. Commercial, manufacturing, and recreational land (parks, amusement parks, zoos, etc.) are generally less sensitive to noise and are considered compatible with noise exposure up to DNL 70 without noise attenuation and up to DNL 80 with appropriate noise attenuation. For the JFK 14 CFR Part 150 Study, the compatible and noncompatible land uses within the DNL 65 and higher contours were identified using the designations provided in **Table 1-2** to the extent that the designations were aligned with New York City land use categories. Land use compatibility is described further in Chapter 3 and Appendix D-1 of the JFK NEM Report.

TABLE 1-2
14 CFR PART 150 LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Land Use	Yearly Day-Night Noise Level (DNL) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail – building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade – general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

NOTES:

Numbers in parentheses refer to notes.

* The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

TABLE 1-2 (CONTINUED)
14 CFR PART 150 LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Key to Table

SLUCM	Standard Land Use Coding Manual.
Y (Yes)	Land use and related structures compatible without restrictions.
N (No)	Land use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35	Land Use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 dB must be incorporated into design and construction of structure.

Notes:

1 Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB to 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
2 Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where normal noise level is low.
3 Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where normal noise level is low.
4 Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where normal noise level is low.
5 Land use compatible provided that special sound reinforcement systems are installed.
6 Residential buildings require an NLR of 25 dB.
7 Residential buildings require an NLR of 30 dB.
8 Residential buildings not permitted.

SOURCE: 14 CFR Part 150, Appendix A, Table 1.

1.7 Report Organization

This NCP provides the technical documentation required under 14 CFR Part 150 for a Noise Compatibility Program for the Port Authority's recommended NCP measures. This NCP is organized as follows:

Chapter 1 Introduction

Chapter 2 Noise Compatibility Program – Noise Abatement Measures
Describes the existing JFK noise abatement program and presents recommended noise abatement measures for the JFK NCP.

Chapter 3 Noise Compatibility Program – Land Use Measures
Describes existing land use measures associated with JFK and presents recommended land use measures for the JFK NCP.

Chapter 4 Noise Compatibility Program – Program Management Measures
Describes current program management measures associated with JFK and presents recommended program management measures for the JFK NCP.

Chapter 5 Stakeholder Engagement – Details consultation and public involvement activities associated with the JFK NCP.

Technical information, documentation, and maps are contained in the appendices to this NCP. The appendices are organized as follows:

Appendix A Federal Aviation Administration Letter of Acceptance for Noise Exposure Maps

Appendix B Glossary of Terms and Acronyms

Appendix C Supplemental Information Related to the Recommended Noise Abatement Measures

Appendix D Technical Advisory Committee

Appendix E Public Outreach

Appendix F Public Comments

Appendix G Noise Compatibility Program Strategies Suggested by Stakeholders

Appendix H Noise Compatibility Program Implementation Schedule

The information required for compliance with 14 CFR 150.23(e)(8) is provided within the text describing each NCP measure as well as in **Appendix H**, including:

- The period covered by the program and the schedule for implementation of the program
- The persons responsible for implementation of each measure in the program
- For each measure, documentation supporting the feasibility of implementation, including any essential governmental actions, costs, and anticipated sources of funding, that will demonstrate that the program is reasonably consistent with achieving the goals of airport noise compatibility planning under Part 150.

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CHAPTER 2
Noise Compatibility Program – Noise Abatement Measures

The Port Authority has implemented noise abatement measures at its airports for several decades; this implementation process long pre-dates the Port Authority's 14 CFR Part 150 Studies. Noise abatement measures are those that control noise at the source; such strategies include airport layout modifications, flight path changes, preferential runway use, and arrival and departure procedures. The intention of noise abatement measures in the NCP is to reduce the number of people and noise-sensitive sites exposed to aircraft noise levels of DNL 65 and higher.[12]

The 14 CFR Part 150 process requires a complete review of existing and potential noise abatement measures that could reduce the number of people exposed to DNL 65 and higher. This includes, at a minimum, a review of the following measures:[13]

- Changes in flight tracks
- Implementation of preferential runway use
- Changes in arrival and departure procedures
- Implementation of airport layout modifications
- Implementation of airport use restrictions

As presented in the JFK NEM Report (Section 2.2.4), JFK is located in one of the most highly congested airspaces in the country. JFK is within 25 miles of two other large-hub airports (LGA and EWR) and the airport with the most domestic business jet operations in the country (TEB[14] in New Jersey), and is within 50 miles of three other general aviation airports that serve the New York–New Jersey metropolitan area.[15] The number and types of noise abatement measures that can be implemented are consequently limited due to the congested airspace and the need to prevent conflicts in the use of the airspace.

12 14 CFR Part 150, Appendix A, Table 1.

13 14 CFR Part 150, Appendix B, Sec. 150.7(b).

14 FAA Business Jet Report: October 2019 Issue. Available: https://aspm.faa.gov/apmd/sys/bjpdf/b-jet-201910.pdf.

15 Large hub airports are those airports that each account for at least 1 percent of total U.S. passenger enplanements. General aviation airports primarily serve civil aircraft that are not engaged in commercial air transport operations.

This chapter details the following seven noise abatement measures recommended for inclusion in this NCP:

- Implement "Tighten SKORR" Departure Procedure
- Turn Runway 22L and 22R Departures to Heading 240 at Night
- Reduce Runway 31L Intersection Departures at Night
- Combine "Tighten SKORR" Departure Procedure with Reduce Runway 31L Intersection Departures at Night
- Implement Noise Abatement Departure Profiles on a Voluntary Basis for Each Runway End
- Implement Nighttime Optimized Profile Descent Procedures
- Continue Existing Mandatory Departure Noise Limit and $250 Penalty

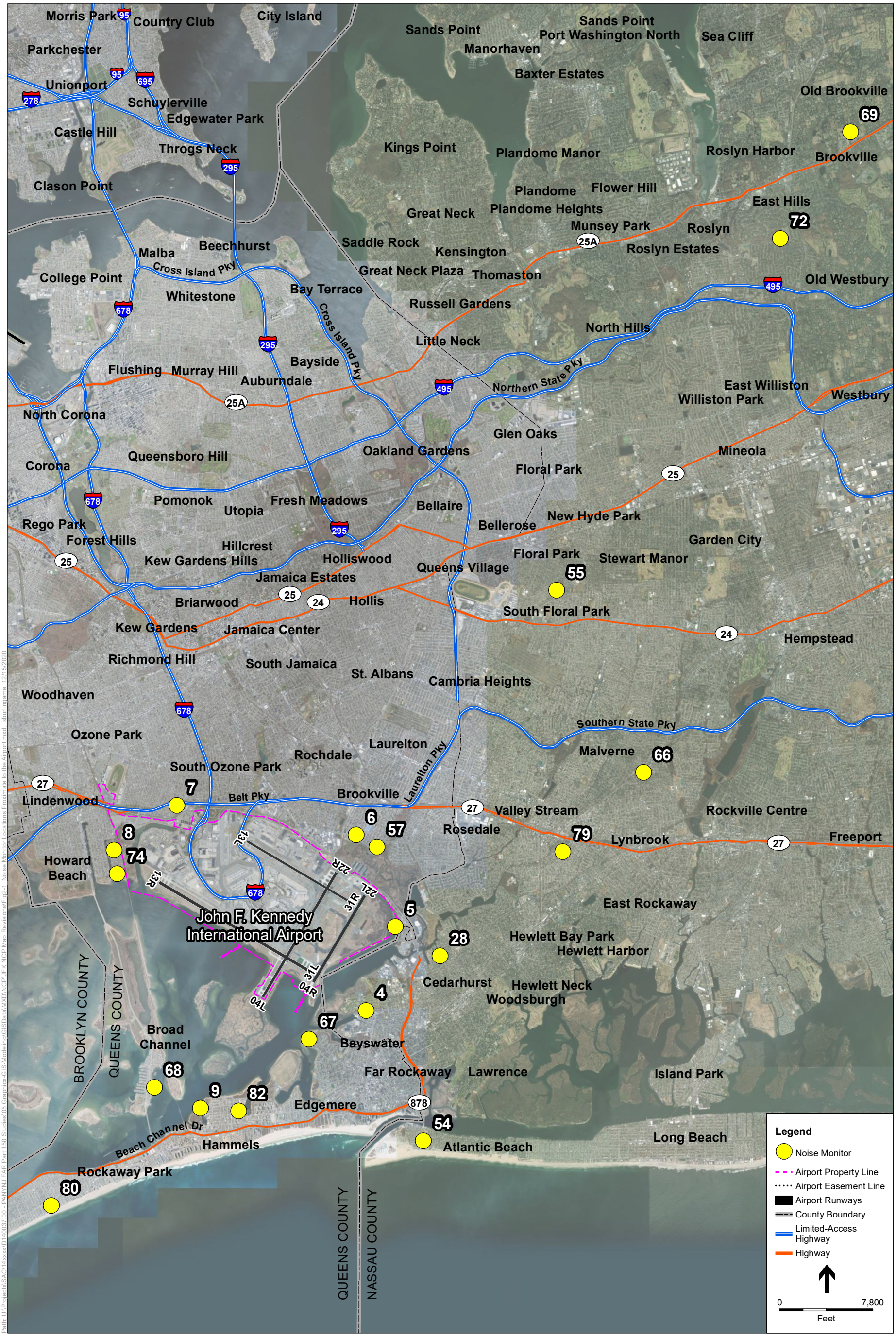
2.1 Existing Aircraft Noise Abatement Program

The Port Authority has pursued aircraft noise abatement measures for several decades. In 1959, the Port Authority established a mandatory noise limit of 112 Perceived Noise Decibels (PNdB) for aircraft departures.[16] PNdB expresses the perceived loudness of an individual aircraft noise event. To enforce the departure noise limit, the Port Authority installed an airport noise monitoring system, which at the time consisted of one monitor for JFK, located in the Queens, NY, neighborhood of Howard Beach. Currently, 19 monitors are located near JFK (**Figure 2-1**). The original system required manual correlation of measured noise levels with individual aircraft operations; a system upgrade in 1992 added flight tracking and automated this process. In 1986, the Port Authority implemented a $250 penalty for each aircraft operation that exceeds the noise limit at JFK.[17] Both the noise departure limit and the $250 penalty at JFK are noise abatement measures that were established before such measures were restricted by the Airport Noise and Capacity Act of 1990 (ANCA). Aircraft operators that violate the mandatory aircraft departure noise limit are contacted by the Port Authority and informed of the violation and penalty.

The passage of ANCA subsequently prohibited operation in the United States after December 31, 1999, of Stage 2 aircraft with a maximum weight above 75,000 pounds. This prohibition provided noise benefits nationwide, including the communities surrounding JFK. ANCA also prevented the Port Authority from establishing additional operational restrictions on Stage 2 (or quieter, such as Stage 3) aircraft in flight except through compliance with 14 CFR Part 161, Notice and Approval of Airport Noise and Access Restrictions. In addition, the FAA Modernization and Reform Act of 2012 (FMRA) prohibited operation of Stage 2 aircraft with weights of 75,000 pounds or lower within the 48 contiguous United States after December 31, 2015.

16 United States Environmental Protection Agency. "Legal and Institutional Analysis of Aircraft and Airport Noise and Apportionment of Authority Between Federal, State, and Local Governments." July 27, 1973. Page 2-57.

17 "Fines to be levied on violators of jet nose [sic] limits at Kennedy." Nassau Herald, May 29, 1986: Page 8. Print.



Path: U:\Projects\SAC\14xxxx\D1400037.00 - PANYNJ FAR Part 150 Studies\05 Graphics-GIS-Modeling\GIS\Data\MXD\NCP\JFK NCP Map Revisions\Fig2-1 Noise Monitor Locations Proximate to the Airport.mxd sburlingame 12/15/2020

SOURCE: Port Authority of New York and New Jersey, 2020; ESRI Mapping Services; ESA 2020.

John F. Kennedy International Airport 14 CFR Part 150 Study

Figure 2-1

Noise Monitor Locations Proximate to the Airport
John F. Kennedy International Airport

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On December 23, 1976, the FAA promulgated Noise Abatement Operating Restrictions in 14 CFR Part 91, which prohibit the operation of most domestic Stage 1 aircraft after January 1, 1985.[18,19] Consistent with the FAA's amendment to 14 CFR Part 91, the Port Authority prohibited[20] the use of Stage 1 aircraft at LGA, JFK, and EWR after January 1, 1985. In 1989, the Port Authority also prohibited the scheduling of additional nighttime flights of Stage 2 aircraft at JFK, LGA, and EWR.[21] Stage 3 aircraft operating at JFK, LGA, and EWR are not subject to the Stage 1 and Stage 2 use restrictions, and they meet the noise standards set forth in 14 CFR Part 36, Appendix B, Sec. 36.5(c).

Table 2-1 presents a timeline of actions taken by the Port Authority, U.S. Congress, and FAA in regard to noise abatement. The table shows Port Authority and federal actions that have provided noise benefits to communities in the vicinity of JFK.

Section 2.2 describes the Port Authority's noise abatement recommendations and then analyzes them. **Section 2.3** identifies the noise abatement strategies that the Port Authority considered but does not recommend including in this NCP, and explains why those strategies are not being recommended.

To determine the potential benefits of the recommended noise abatement measures presented in **Section 2.2** of this NCP, the INM was used to model each measure by assigning the INM inputs as described in **Section 2.2**. The JFK 14 CFR Part 150 Study was initiated in October 2014, before the FAA's release of the Aviation Environmental Design Tool on May 29, 2015. When the Study began, INM 7.0d was the most current FAA-approved model for determining aircraft noise exposure around airports, and it was identified as the model required for use in this Study. The FAA's approval of the use of INM 7.0d for this Study can be found in Appendix G of the JFK NEM Report.

The INM uses data on aircraft operational counts, operating times of day, fleet mix, and altitude profiles to develop noise exposure contours. The INM accounts for each aircraft flight along flight tracks departing from, or arriving to, an airport during an annual average day. The flight tracks are coupled with information in the model's database relating to noise frequencies and magnitudes at varying distances and flight performance data for each type of aircraft. In general, the model computes and sums noise exposure at grid locations at ground level around an airport. The cumulative values of noise exposure at each grid location are used to develop contours of equal noise exposure. The INM can also compute noise exposure at user-defined points.[22]

18 "Stage 1" aircraft are transport-category aircraft of at least 12,500 pounds in maximum takeoff weight, or subsonic jet-powered aircraft of any category, that have never been shown to meet the noise standards in 14 CFR Part 36 (Noise Standards: Aircraft Type and Airworthiness Certification).

19 41 FR 56046, "Noise Abatement Operating Restrictions: Limitations for Certain Turbojets, Propeller-Driven Small Airplanes, and Agricultural-Operation and Fire Fighting Propeller-Driven Aircraft," December 23, 1976.

20 Available: https://aircraftnoise.panynj.gov/aircraft-noise-engagement-history/.

21 "Stage 2" aircraft met the noise standards in 14 CFR Part 36, Appendix B, Sec. 36.5(b), originally established in 1969.

22 For the JFK 14 CFR Part 150 Study, the locations of nonresidential noise-sensitive sites were represented as user-defined points.

TABLE 2-1
TIMELINE OF JFK NOISE ABATEMENT ACTIONS

Timeline of JFK Noise Abatement Actions

Event	1959	1979	1984	1985	1989	1990	1991	1992	2000	2012	2014	2016	2017	2018
Port Authority establishes a noise limit at JFK of 112 Perceived Noise Decibels (PNdB) for aircraft departures and installs an airport noise monitoring system[1]	Port Authority													
Congress passes the Aviation Safety and Noise Abatement Act (ASNA), requiring the FAA to establish processes for aircraft noise measurement and noise compatibility planning		Congress												
FAA promulgates 14 CFR Part 150, Airport Noise Compatibility Planning, in response to requirements of ASNA			FAA											
Port Authority prohibits the use of Stage 1 aircraft at JFK, LGA, and EWR[2]				Port Authority										
Port Authority prohibits the scheduling of nighttime flights of Stage 2 aircraft at JFK, LGA, and EWR[3]					Port Authority									
Congress passes the Airport Noise and Capacity Act of 1990 (ANCA), preventing airports nationwide from establishing additional operational restrictions on Stage 2 (or quieter) aircraft in flight without FAA approval						Congress								
FAA promulgates 14 CFR Part 161, Notice and Approval of Airport Noise and Access Restrictions, in response to requirements of ANCA							FAA							
Port Authority adds flight tracking to noise monitoring system, enabling automatic correlation of flights with noise events						Port Authority								
ANCA prohibits U.S. operations of Stage 1 and 2 aircraft with maximum weight above 75,000 pounds, providing noise benefits nationwide							Congress							
Congress passes the FAA Modernization and Reform Act of 2012 (FMRA)								Congress						
Port Authority initiates 14 CFR Part 150 Studies for JFK, LGA, EWR, and TEB									Port Authority					
FMRA prohibits U.S. operations of Stage 1 and Stage 2 aircraft with maximum weight at or below 75,000 pounds within the 48 contiguous United States										Congress				
FAA promulgates the Stage 5 noise standard; this standard is effective December 31, 2017 for new airplanes with a maximum takeoff weight of at least 121,254 pounds, and December 31, 2020 for new airplanes with a maximum takeoff weight of less than 121,254 pounds													FAA	
Congress passes the FAA Reauthorization Act of 2018														Congress

1. PNdB expresses the perceived loudness of an individual aircraft noise event. K.D. Kryter, "The Meaning and Measurement of Perceived Noise Level," Noise Control 6:5, Sept.-Oct., 1960, pp. 12-17; K.D. Kryter, "Scaling Human Reaction to Sound from Aircraft," Journal of the Acoustical Society of America, vol. 31, 1959, p.1415.
2. "Stage 1" aircraft are transport-category aircraft of at least 12,500 pounds in maximum takeoff weight, or subsonic jet-powered aircraft of any category, that have never been shown to meet the noise standards in 14 CFR Part 36 (Noise Standards: Aircraft Type and Airworthiness Certification).
3. "Stage 2" aircraft met the noise standards in 14 CFR Part 36, Appendix B, Section 36.5(b), originally established in 1969.

Note: Timeline is not to scale

For the analysis of noise abatement measures in this NCP, the INM-computed noise exposure associated with each measure was combined with demographic data from the U.S. Census Bureau and land parcel data provided by land use agencies to determine the land use and population potentially exposed to noise levels of DNL 65 and higher. To determine the potential benefits of each noise abatement measure, the 2021 NEM was used for comparison. The 2021 NEM is presented in **Figure 1-4**. The potential benefits of each noise abatement measure were determined by calculating the changes in land use and population exposed to noise levels of DNL 65 and higher associated with each noise abatement measure in comparison with the 2021 NEM.

2.2 Noise Abatement Measures Recommended for Inclusion in This NCP

This section describes noise abatement measures that the Port Authority recommends for inclusion in this NCP, the potential benefits and implementation requirements (e.g., the party responsible for implementing a measure) for each measure, the estimated cost to implement, funding sources for the cost of implementation, and requirements to implement such measures (such as potential environmental review requirements). While many parties were involved in arriving at these recommendations, as discussed in **Section 1.3** and **Chapter 5**, the recommendations are those of the Port Authority and not the TAC, consultants, or other stakeholders.

Each recommended noise abatement measure in this NCP is a notional design that was developed in order to determine potential noise benefits. Any approved noise abatement measures would need to be developed in detail by the FAA. Precise implementation details, such as flight track locations and altitudes, developed by the FAA may differ from the notional noise abatement measure designs presented in this NCP, in order to adequately address safety, efficiency, and aircraft performance considerations. Detailed noise abatement measure designs may require environmental review under NEPA, which may yield different noise results than the results presented in this NCP. Contradictory results arising from subsequent environmental review efforts may be due to differences in approaches to noise abatement measure design or noise modeling methodology. Any NEM updates performed by the Port Authority in the future, in accordance with JFK Program Management Measure 9 (presented in **Section 4.2**), would reflect actual implementation of the NCP measures as of the date of those NEM updates.

The noise abatement measures being recommended by the Port Authority for the JFK NCP are discussed in detail below.

JFK Noise Abatement Measure 1: Implement "Tighten SKORR" Departure Procedure

Description

This noise abatement measure was suggested by the FAA. "SKORR" is the name of a navigational waypoint located near the Brooklyn neighborhood of Bergen Beach, which is used in the SKORR THREE and DEEZZ FOUR Area Navigation (RNAV) departure procedures at

JFK.[23] The FAA diagrams for these procedures can be found on **pages C-3** and **C-5** of **Appendix C**. In the SKORR THREE and DEEZZ FOUR procedures, aircraft departing Runways 31L and 31R make a left turn to fly by the SKORR waypoint before continuing to other locations as directed by FAA Air Traffic Control (ATC). The intention of the "Tighten SKORR" RNAV departure procedure concept is to reduce aircraft overflights of Howard Beach, Old Howard Beach, and Hamilton Beach (in Queens) by moving the SKORR waypoint from its current location to Jamaica Bay. Relocating the SKORR waypoint could reduce noncompatible land uses in those neighborhoods by shifting the noise contours in the neighborhoods southward. An illustration of the proposed procedure is shown in **Figure 2-2**.

Type of Measure

This measure is a flight procedure modification that could be used to achieve noise benefit within the airspace constraints and reduce exposure of noise-sensitive parcels and people to aircraft noise in the area around JFK.

Analysis

For analysis of the "Tighten SKORR" NCP measure, the FAA provided a draft description of the procedure in a Terminal Area Route Generation and Traffic Simulation (TARGETS) software file, which showed the potential new location of the SKORR waypoint.[24] The INM modeling scenario developed for this measure assumed, pursuant to the input provided by NY TRACON, that all aircraft currently flying procedures that include SKORR would be flying the new "Tighten SKORR" procedure, while all aircraft currently flying procedures that do not include SKORR would continue to fly those procedures. See **page E-233** of **Appendix E-9**. Study Team analysis of aircraft operations indicated that 91 percent of Runway 31L daytime departures and 9 percent of Runway 31L nighttime departures would use the new "Tighten SKORR" procedure, while 41 percent of Runway 31R daytime departures and 59 percent of Runway 31R nighttime departures would use the new "Tighten SKORR" procedure. Potential noise benefits of the "Tighten SKORR" procedure were calculated using the INM.

Potential Noise Benefits

Figure 2-3 shows the DNL 65, 70, and 75 contours from the "Tighten SKORR" analysis overlaid on residential land use, with the 2021 NEM contours. As shown in **Tables 2-2** and **2-3** and the close-up contour plot in **Figure 2-4**, implementation of this measure may shift the noise contours in the neighborhoods southward, resulting in a reduction of the numbers of noncompatible land uses within the DNL 65 and higher contours in the neighborhoods of Howard Beach, Old Howard Beach, and Hamilton Beach. The shift in noise contours may also remove up to 923 people and 351 dwelling units from the DNL 65 contour. **Table 2-2** compares residential land uses exposed to DNL 65 and higher for this NCP measure versus the 2021 NEM. **Table 2-3** compares the numbers of historic sites, non-residential noise-sensitive sites, and total land area exposed to DNL 65 and higher for this NCP measure versus the 2021 NEM.

[23] RNAV procedures are flight procedures that typically use satellite navigation capabilities in equipped aircraft so that aircraft can be guided to locations without the need to use ground-based navigational aids. Most commercial aircraft are equipped with navigational systems that can follow RNAV procedures.

[24] TARGETS is a software tool that is used by the FAA to design flight procedures, including RNAV procedures, and perform preliminary safety, flyability, and procedure design criteria evaluations.

SOURCE: Google Earth, April 19, 2016, last accessed March 31, 2017; Federal Aviation Administration, 2017; ESA, 2020.

Figure 2-2
Existing SKORR THREE and Proposed "Tighten SKORR" Notional Tracks - Example for Runway 31L
John F. Kennedy International Airport

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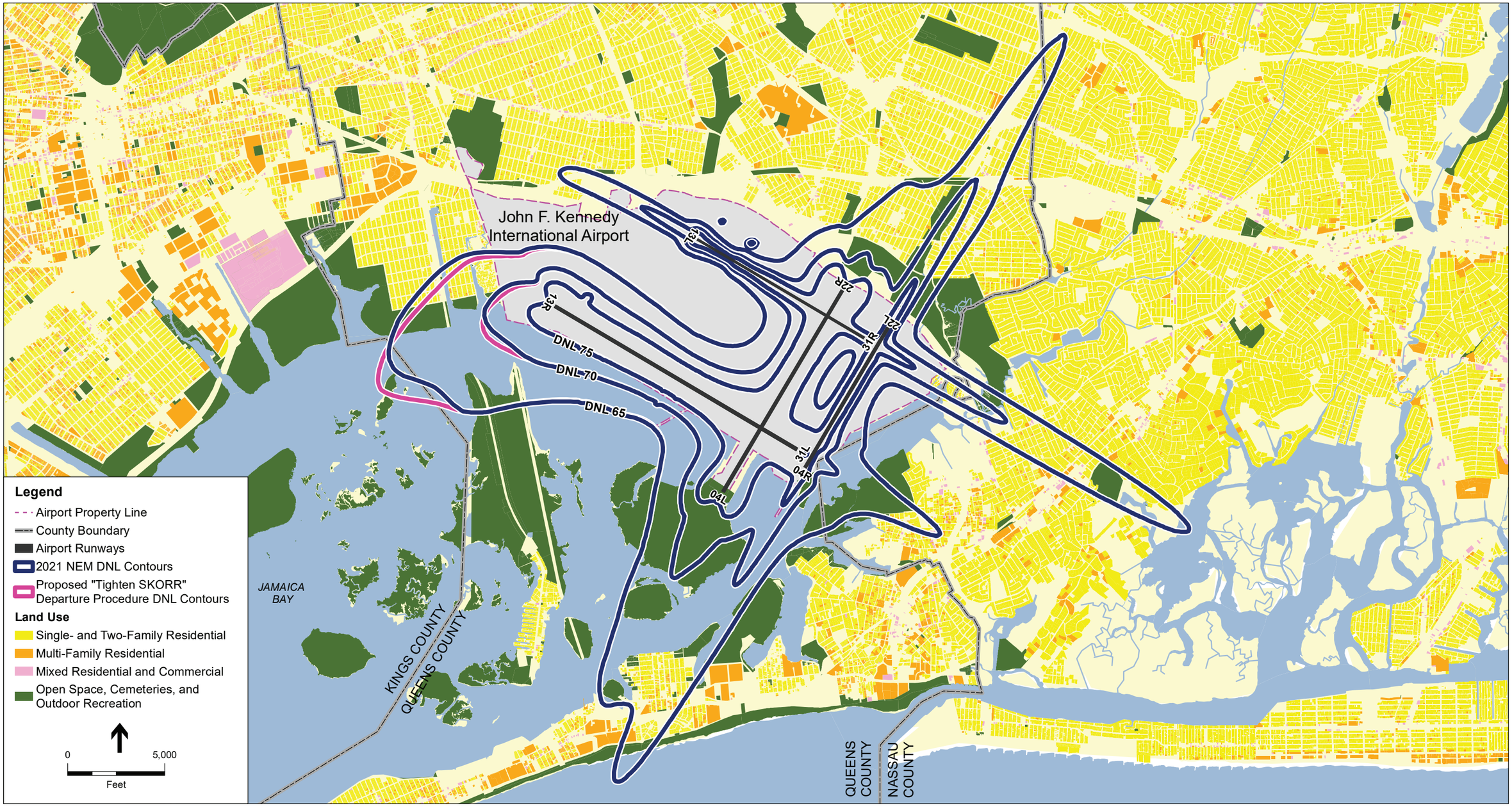

SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-3

DNL 65, 70, and 75 Contours - 2021 NEM and "Tighten SKORR" Departure Procedure
John F. Kennedy International Airport

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SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-4

DNL 65, 70, and 75 Contours - 2021 NEM and "Tighten SKORR" Departure Procedure
Howard Beach, Old Howard Beach, Hamilton Beach
John F. Kennedy International Airport

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TABLE 2-2
RESIDENTIAL LAND USES EXPOSED TO DNL 65 AND HIGHER – 2021 NEM AND "TIGHTEN SKORR" DEPARTURE PROCEDURE (NOISE ABATEMENT MEASURE 1)

	Land Area Exposed to DNL 65 and Higher (acres)			Number of Dwelling Units			Population		
Land Use Category	**2021 NEM**	**Noise Abatement Measure 1**	**Difference**	**2021 NEM**	**Noise Abatement Measure 1**	**Difference**	**2021 NEM**	**Noise Abatement Measure 1**	**Difference**
Single-Family and Two-Family Residential	778.1	752.5	-25.6	11,088	10,738	-350	33,143	32,222	-921
Multi-Family Residential	51.5	51.4	-0.1	2,653	2,653	0	5,698	5,698	0
Mixed-Residential and Commercial	6.6	6.5	-0.1	84	83	-1	233	231	-2
Total	**836.2**	**810.4**	**-25.8**	**13,825**	**13,474**	**-351**	**39,074**	**38,151**	**-923**

NOTE: Numbers may not add up because of rounding. Differences were computed by subtracting the 2021 NEM results from the Noise Abatement Measure 1 results. The household and population estimates provided above were developed using census block demographic data from the 2010 Decennial Census and New York City housing data. This approach provided an average number of persons per household for each individual census block, which accounted for changes in land use, housing types, and residential density within the different areas in the DNL 65 and higher contours.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2020.

TABLE 2-3
HISTORIC SITES, NON-RESIDENTIAL NOISE-SENSITIVE SITES, AND TOTAL LAND AREA EXPOSED TO DNL 65 AND HIGHER – 2021 NEM AND "TIGHTEN SKORR" DEPARTURE PROCEDURE (NOISE ABATEMENT MEASURE 1)

Scenario	Total Land Area (Acres)	Places of Worship	Schools[1]	Hospitals and Residential Healthcare	Historic Resources[2]	Day Care Facilities	Library
2021 NEM	9,104.4	19	12	8	3	17	1
Noise Abatement Measure 1	9,096.3	19	12	8	3	17	1
Difference	-8.1	0	0	0	0	0	0

NOTE: Differences were computed by subtracting the 2021 NEM results from the Noise Abatement Measure 1 results.

1 Eight of the twelve schools were included in the School Soundproofing Program and are compatible with DNL 65 and higher (see Section 2.6.1 of the JFK NEM Report).
2 Five schools and places of worship are historic sites, but they are not included here to avoid double counting.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2020.

Conclusions: *JFK Noise Abatement Measure 1: Implement "Tighten SKORR" Departure Procedure.* This could reduce the population of people exposed to DNL 65 and higher by 923 in the neighborhoods of Howard Beach, Old Howard Beach, and Hamilton Beach, in Queens. The analysis of the measure assumed that all aircraft currently flying procedures that include SKORR would fly the new "Tighten SKORR" procedure.

Table 2-4 provides a summary of implementation requirements, along with the benefits and rationale for the recommendation of JFK Noise Abatement Measure 1.

TABLE 2-4
IMPLEMENTATION SUMMARY FOR JFK NOISE ABATEMENT MEASURE 1: IMPLEMENT "TIGHTEN SKORR" DEPARTURE PROCEDURE

Implementation Item	Discussion
Benefits	Potential reduction of up to 923 people in 351 dwelling units exposed to DNL 65 with implementation of the proposed procedure.
Rationale	The Port Authority is recommending JFK Noise Abatement Measure 1 because it could reduce overflights of the Queens neighborhoods of Howard Beach, Old Howard Beach, and Hamilton Beach by aircraft departing from Runways 31L and 31R, reducing noise exposure in those neighborhoods.
Responsible Parties	Development and implementation of flight procedures is the sole responsibility of the FAA. The Port Authority will request that the development process be initiated, then will work with NY TRACON and other FAA personnel to further study and develop this procedure. Implementation of this measure may require an environmental study as required under the National Environmental Policy Act (NEPA); the FAA would be the responsible party to complete such a study.
Estimated Costs	The expected costs associated with the development and implementation of this procedure are internal to the FAA (e.g., ATO) and other coordinating agencies. These costs are unknown, and an FAA AIP grant would not be required.
Funding Sources	The FAA.
Requirements	FAA approval. Implementation may require an environmental study under NEPA.
Estimated Schedule	The Port Authority will submit a request for procedure development within 6–12 months of the FAA's ROA for the NCP. FAA design, testing, and implementation of the procedure typically could take 18–24 months, potentially up to three years once the Port Authority requests initiation of the development process.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Noise Abatement Measure 2: Turn Runway 22L and 22R Departures to Heading 240 at Night

Description

This noise abatement measure was suggested by the FAA. This measure is a nighttime (10:00 P.M. to 6:59:59 A.M.) RNAV departure procedure for Runways 22L and 22R that would direct aircraft to make a right turn to magnetic heading 240 shortly after takeoff, then a left turn to overfly The Rockaways. This could reduce noncompatible land uses in The Rockaways, as an analysis of 2014 radar data indicated that the majority of Runway 22L and 22R departures maintain runway headings while overflying The Rockaways, causing overflight of densely populated areas. Reducing overflights of noise-sensitive areas at night can be an effective way to reduce noise exposure, because the DNL metric treats one flight at night as equivalent to ten flights during the day for the purposes of calculating aircraft noise levels. An illustration of the proposed procedure is shown in **Figure 2-5**.

Type of Measure

This measure is a flight procedure modification that could be used to achieve noise benefit within the airspace constraints and reduce exposure of noise-sensitive parcels and people to aircraft noise in the area around JFK.

Analysis

As estimated by the FAA, approximately 50 percent of Runway 22L departures and 50 percent of Runway 22R departures at night may be able to use the suggested procedure. This information is shown on **page E-283** of **Appendix E-12**.

Potential Noise Benefits

Figure 2-6 shows the DNL 65, 70, and 75 contours of this NCP measure overlaid onto residential land use, with the 2021 NEM contours. As shown in **Tables 2-5** and **2-6** and the close-up contour plot in **Figure 2-7**, implementation of this measure may shift the noise contours to the northeast, reducing the numbers of noncompatible land uses within the DNL 65 and higher contours within the neighborhoods of Arverne and Hammels in The Rockaways. This shift of the noise contours to the northeast occurs because aircraft departing on the proposed procedure travel a longer distance before reaching The Rockaways (due to the right turn and left turn in the procedure) and therefore reach a higher altitude before overflying The Rockaways in comparison with aircraft maintaining runway heading before reaching The Rockaways. The shift in noise contours may also remove up to 2,989 people and 1,272 dwelling units from the DNL 65 contour. **Table 2-5** compares residential land uses exposed to DNL 65 and higher for this NCP measure versus the 2021 NEM. **Table 2-6** compares the numbers of historic sites, non-residential noise-sensitive sites, and total land area exposed to DNL 65 and higher for this NCP measure versus the 2021 NEM.

TABLE 2-5
RESIDENTIAL LAND USES EXPOSED TO DNL 65 AND HIGHER – 2021 NEM AND TURN RUNWAY 22L AND 22R DEPARTURES TO HEADING 240 AT NIGHT (NOISE ABATEMENT MEASURE 2)

	Land Area Exposed to DNL 65 and Higher (acres)			Number of Dwelling Units			Population		
Land Use Category	**2021 NEM**	**Noise Abatement Measure 2**	**Difference**	**2021 NEM**	**Noise Abatement Measure 2**	**Difference**	**2021 NEM**	**Noise Abatement Measure 2**	**Difference**
Single-Family and Two-Family Residential	778.1	745.0	-33.1	11,088	10,430	-658	33,143	31,352	-1,791
Multi-Family Residential	51.5	43.0	-8.5	2,653	2,045	-608	5,698	4,513	-1,185
Mixed-Residential and Commercial	6.6	6.3	-0.3	84	78	-6	233	220	-13
Total	**836.2**	**794.3**	**-41.9**	**13,825**	**12,553**	**-1,272**	**39,074**	**36,085**	**-2,989**

NOTE: Numbers may not add up because of rounding. Differences were computed by subtracting the 2021 NEM results from the Noise Abatement Measure 2 results. The household and population estimates provided above were developed using census block demographic data from the 2010 Decennial Census and New York City housing data. This approach provided an average number of persons per household for each individual census block, which accounted for changes in land use, housing types, and residential density within the different areas in the DNL 65 and higher contours.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2020.

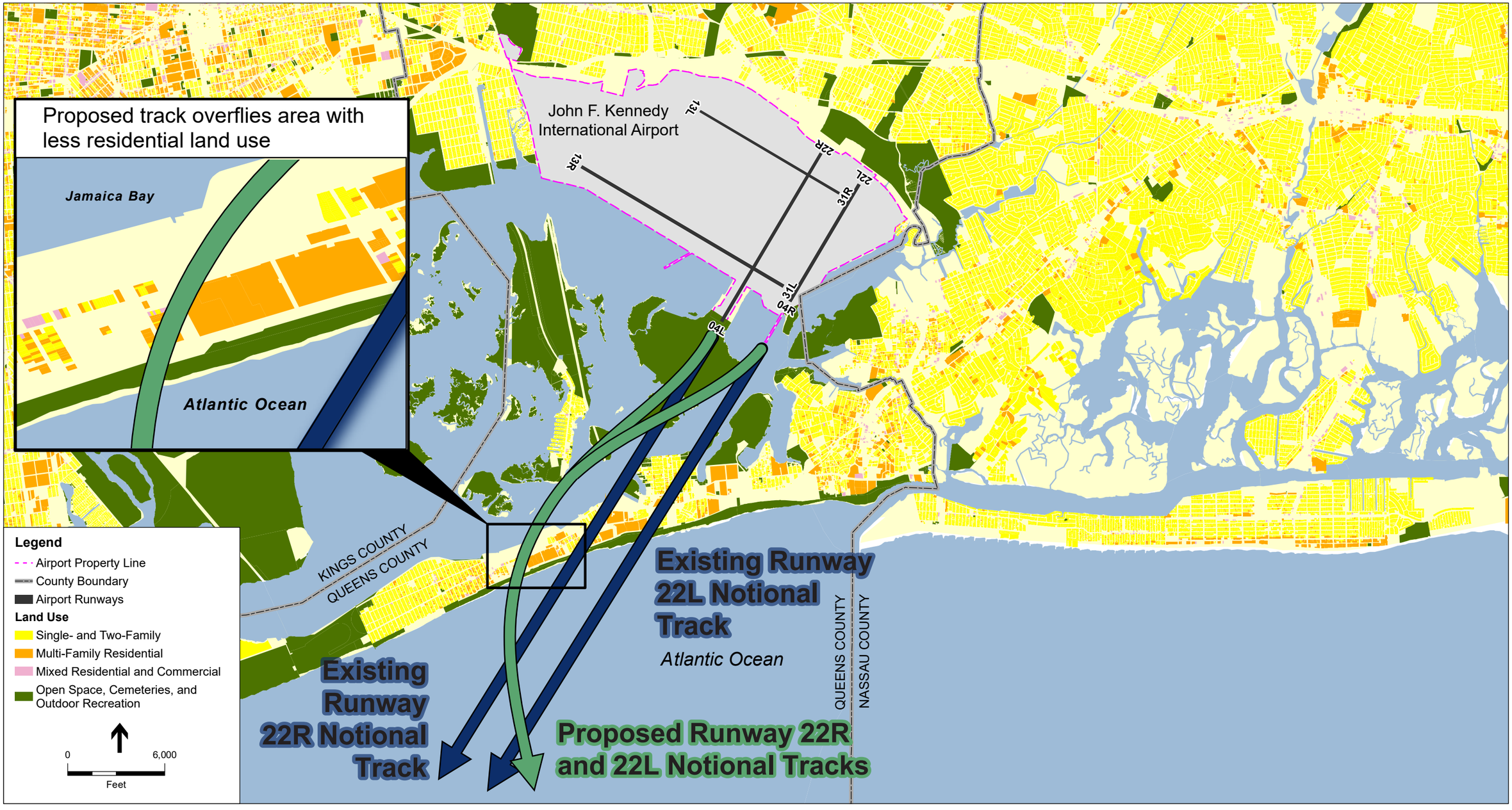
TABLE 2-6
HISTORIC SITES, NON-RESIDENTIAL NOISE-SENSITIVE SITES, AND TOTAL LAND AREA EXPOSED TO DNL 65 AND HIGHER – 2021 NEM AND TURN RUNWAY 22L AND 22R DEPARTURES TO HEADING 240 AT NIGHT (NOISE ABATEMENT MEASURE 2)

Scenario	Total Land Area (Acres)	Places of Worship	Schools[1]	Hospitals and Residential Healthcare	Historic Resources[2]	Day Care Facilities	Library
2021 NEM	9,104.4	19	12	8	3	17	1
Noise Abatement Measure 2	9,009.6	17	12	8	3	17	1
Difference	-94.8	-2	0	0	0	0	0

NOTE: Differences were computed by subtracting the 2021 NEM results from the Noise Abatement Measure 2 results.

1 Eight of the twelve schools were included in the School Soundproofing Program and are compatible with DNL 65 and higher (see Section 2.6.1 of the JFK NEM Report).
2 Five schools and places of worship are historic sites, but they are not included here to avoid double counting.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2020.



SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2017 and 2020; ESRI Mapping Services, 2019.

Figure 2-5

Turn Runway 22L and 22R Departures to Heading 240 at Night
John F. Kennedy International Airport

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John F. Kennedy
International Airport

13R
22R
22L
31L
13L
DNL 75
DNL 70
DNL 65
31R
04R
04L

JAMAICA
BAY

KINGS COUNTY
QUEENS COUNTY

QUEENS
COUNTY
NASSAU
COUNTY

Legend

- Airport Property Line
- County Boundary
- Airport Runways
- 2021 NEM DNL Contours
- Proposed Turn Runway 22L/22R Departures to Heading 240 at Night DNL Contours

Land Use

- Single- and Two-Family Residential
- Multi-Family Residential
- Mixed Residential and Commercial
- Open Space, Cemeteries, and Outdoor Recreation

0 5,000
Feet

SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-6

DNL 65, 70, and 75 Contours - 2021 NEM and Turn Runway 22L/22R Departures to Heading 240 at Night
John F. Kennedy International Airport

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SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-7
DNL 65 Contours - 2021 NEM and Turn Runway 22L/22R Departures to Heading 240 at Night
Arverne and Hammels
John F. Kennedy International Airport

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Conclusions: *JFK Noise Abatement Measure 2: Turn Runway 22L and 22R Departures to Heading 240 at Night.* This could reduce the number of people exposed to DNL 65 and higher by 2,989 in the neighborhoods of Arverne and Hammels in The Rockaways, in Queens, because the procedure would direct flights over areas that are not as densely populated. The analysis of the measure assumed that approximately 50 percent of Runway 22L and 50 percent of Runway 22R departures at night may be able to use the suggested procedure.

Table 2-7 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Noise Abatement Measure 2.

TABLE 2-7
IMPLEMENTATION SUMMARY FOR JFK NOISE ABATEMENT MEASURE 2:
TURN RUNWAY 22L AND 22R DEPARTURES TO HEADING 240 AT NIGHT

Implementation Item	Discussion
Benefits	Potential reduction of up to 2,989 people in 1,272 dwelling units exposed to DNL 65 with implementation of the proposed procedure.
Rationale	The Port Authority is recommending JFK Noise Abatement Measure 2 because it could reduce noise exposure in the neighborhoods of Arverne and Hammels in The Rockaways, in Queens.
Responsible Parties	Development and implementation of flight procedures is the sole responsibility of the FAA. The Port Authority will request that the development process be initiated, then will work with NY TRACON and other FAA personnel to further study and develop this procedure. Implementation of this measure may require an environmental study as required under NEPA; the FAA would be the responsible party to complete such a study.
Estimated Costs	The expected costs associated with the development and implementation of this procedure are internal to the FAA (e.g., ATO) and other coordinating agencies. These costs are unknown, and an FAA AIP grant would not be required.
Funding Sources	The FAA.
Requirements	FAA approval. Implementation may require an environmental study under NEPA.
Estimated Schedule	The Port Authority will submit a request for procedure development within 6–12 months of the FAA's ROA for the NCP. FAA design, testing, and implementation of the procedure typically could take 18–24 months, potentially up to three years once the Port Authority requests initiation of the development process.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Noise Abatement Measure 3: Reduce Runway 31L Intersection Departures at Night

Description

The location along a runway from which an aircraft begins its takeoff affects its altitude above ground level in its initial climb. This NCP measure could reduce the number of nighttime (10:00 P.M. to 6:59:59 A.M.) intersection departures on Runway 31L and increase the number of nighttime departures that use the full length of the runway. Reducing overflights of noise-sensitive areas at night can be an effective way to reduce noise exposure, because the DNL metric treats one flight at night as equivalent to ten flights during the day for the purposes of calculating aircraft noise levels. Currently, aircraft departing Runway 31L may be directed by FAA to begin their takeoff roll at the intersection of Runway 31L and Taxiway KD, which is northwest of Runway 4L-22R. This intersection is shown in **Figure 2-8**. Aircraft that begin their takeoff roll at this intersection do not have to cross Runway 4L-22R, which reduces taxi times for some operations.

If aircraft currently using Runway 31L intersection departures were instead directed to use the full length of Runway 31L, they may be at higher altitudes when they fly over Howard Beach, Old Howard Beach, and Hamilton Beach, potentially reducing noise exposure in those neighborhoods.

Type of Measure

This measure is a type of preferential runway use action. Airport operators do not have authority to mandate that specific runways be used for aircraft operations; only the FAA has the authority to designate active runways. Airport operators are obligated to inform the FAA of which runways are available for use so that the FAA can then select from the available runways for aircraft departures and arrivals. In general, preferential runway use strategies are recommendations made to the FAA and can be implemented only when FAA determines that operating conditions permit.

Analysis

JFK runway usage was evaluated to determine the percentage of aircraft that utilized intersection departures at night.[25] The model was executed assuming that all of those aircraft utilized the full length of Runway 31L for departures, in order to estimate the potential maximum benefit of reducing Runway 31L intersection departure use at night. The areas overflown by the modeled flight tracks and climb rates of the flights were not changed. The effect of the modeling assumptions was therefore to raise the altitudes of aircraft that would otherwise use intersection departures at night.

[25] Runway use data was obtained from the Aerobahn Surface Management System, a product of Saab Sensis Corporation. https://saab.com/security/air-traffic-management/collaborative-decision-making-and-efficiency/aerobahn/. Last accessed: March 20, 2019.

Potential Noise Benefits

Figure 2-9 shows the DNL 65, 70, and 75 contours for this NCP measure overlaid on residential land use, with the 2021 NEM contours. As shown in **Tables 2-8** and **2-9** and the close-up contour plot in **Figure 2-10**, implementation of this NCP measure may shift the noise contours in the neighborhoods southeastward, reducing the noncompatible land uses in the neighborhoods of Howard Beach, Old Howard Beach, and Hamilton Beach. The shift in noise contours may also remove up to 666 people (net) and 259 dwelling units (net) from the DNL 65 contour. **Table 2-8** compares residential land uses exposed to DNL 65 and higher for this NCP measure versus the 2021 NEM. **Table 2-9** compares the numbers of historic sites, non-residential noise-sensitive sites, and total land area exposed to DNL 65 and higher for this NCP measure versus the 2021 NEM.

Because of Inwood's proximity from the east of the Runway 31L end, implementation of this measure may increase noncompatible land uses near this Nassau County neighborhood. **Figure 2-11** shows a close-up contour plot for the neighborhood of Inwood. **Table 2-10** compares the numbers of dwelling units and population exposed to DNL 65 and higher versus the baseline separately for Queens and for Nassau County, showing that the measure may add 7 dwelling units and 23 people to the DNL 65 contour in Nassau County while removing 689 people and 266 dwelling units from the DNL 65 contour in Queens.

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SOURCE: Google Earth, last accessed August 31, 2017; ESA, 2017 and 2020.

John F. Kennedy International Airport 14 CFR Part 150 Study. 140037

Figure 2-8

Location of Runway 31L Intersection Departures, with Taxiway KD Shown

John F. Kennedy International Airport

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John F. Kennedy
International Airport

13R
22R
22L
13L
31R
DNL 75
DNL 70
DNL 65
31L
04R
04L

JAMAICA
BAY

KINGS COUNTY
QUEENS COUNTY

QUEENS
COUNTY
NASSAU
COUNTY

Legend

- Airport Property Line
- County Boundary
- Airport Runways
- 2021 NEM DNL Contours
- Proposed Reduce Runway 31L Intersection Departures at Night DNL Contours

Land Use

- Single- and Two-Family Residential
- Multi-Family Residential
- Mixed Residential and Commercial
- Open Space, Cemeteries, and Outdoor Recreation

0 5,000
Feet

SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-9

DNL 65, 70, and 75 Contours - 2021 NEM and Reduce Runway 31L Intersection Departures at Night
John F. Kennedy International Airport

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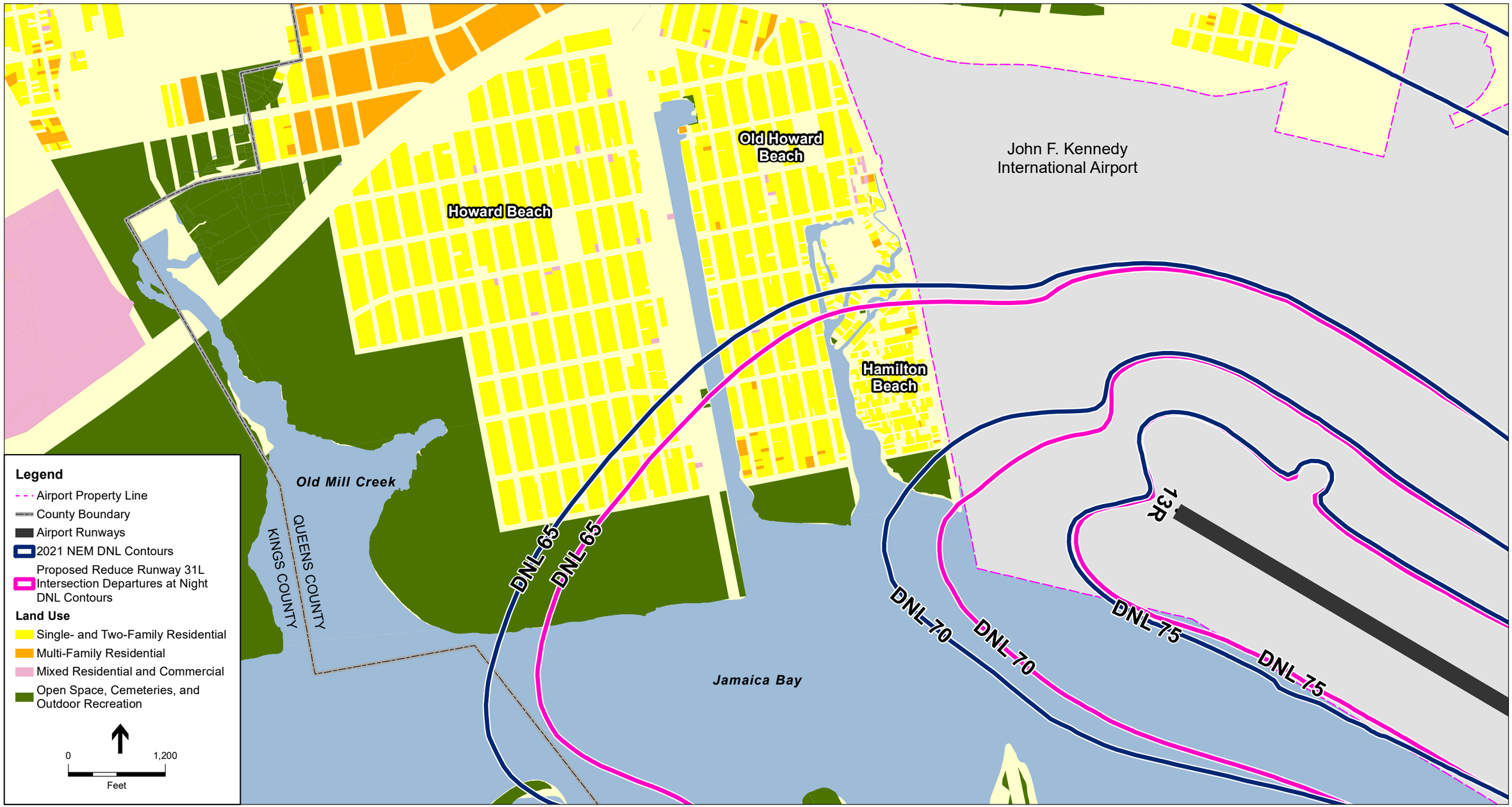

SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-10

DNL 65, 70, and 75 Contours - 2021 NEM and Reduce Runway 31L Intersection Departures at Night
Howard Beach, Old Howard Beach, Hamilton Beach
John F. Kennedy International Airport

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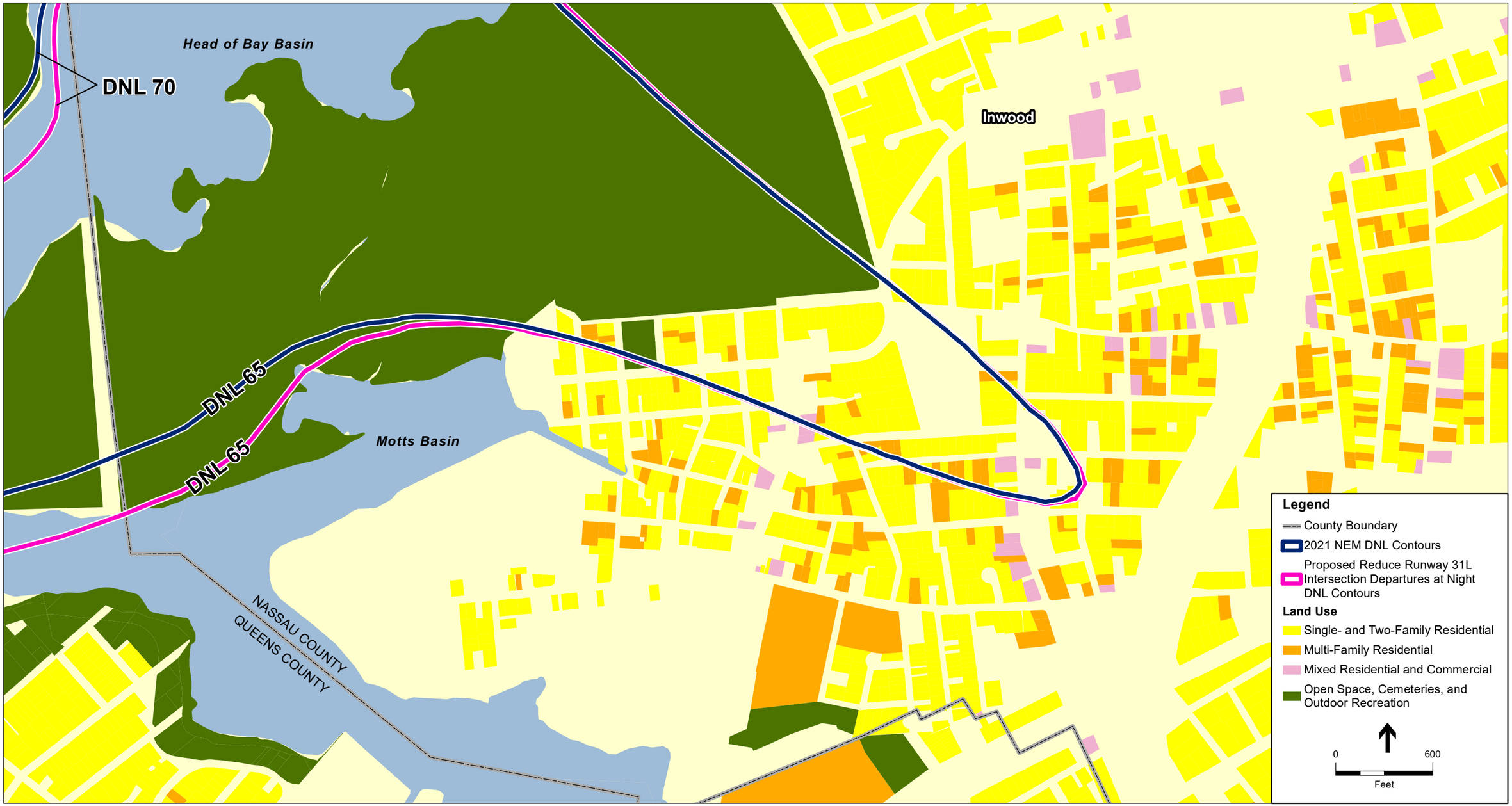

SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-11

DNL 65 and 70 Contours - 2021 NEM and Reduce Runway 31L Intersection Departures at Night
Inwood
John F. Kennedy International Airport

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TABLE 2-8
RESIDENTIAL LAND USES EXPOSED TO DNL 65 AND HIGHER – 2021 NEM AND REDUCE RUNWAY 31L INTERSECTION DEPARTURES AT NIGHT (NOISE ABATEMENT MEASURE 3)

	Land Area Exposed to DNL 65 and Higher (acres)			Number of Dwelling Units			Population		
Land Use Category	**2021 NEM**	**Noise Abatement Measure 3**	**Difference**	**2021 NEM**	**Noise Abatement Measure 3**	**Difference**	**2021 NEM**	**Noise Abatement Measure 3**	**Difference**
Single-Family and Two-Family Residential	778.1	759.6	-18.5	11,088	10,830	-258	33,143	32,479	-664
Multi-Family Residential	51.5	51.4	-0.1	2,653	2,653	0	5,698	5,698	0
Mixed-Residential and Commercial	6.6	6.6	0.0	84	83	-1	233	231	-2
Total	**836.2**	**817.6**	**-18.6**	**13,825**	**13,566**	**-259**	**39,074**	**38,408**	**-666**

NOTE: Numbers may not add up because of rounding. Differences were computed by subtracting the 2021 NEM results from the Noise Abatement Measure 3 results. The household and population estimates provided above were developed using census block demographic data from the 2010 Decennial Census and New York City housing data. This approach provided an average number of persons per household for each individual census block, which accounted for changes in land use, housing types, and residential density within the different areas in the DNL 65 and higher contours.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2020.

TABLE 2-9
HISTORIC SITES, NON-RESIDENTIAL NOISE-SENSITIVE SITES, AND TOTAL LAND AREA EXPOSED TO DNL 65 AND HIGHER – 2021 NEM AND REDUCE RUNWAY 31L INTERSECTION DEPARTURES AT NIGHT (NOISE ABATEMENT MEASURE 3)

Scenario	Total Land Area (Acres)	Places of Worship	Schools[1]	Hospitals and Residential Healthcare	Historic Resources[2]	Day Care Facilities	Library
2021 NEM	9,104.4	19	12	8	3	17	1
Noise Abatement Measure 3	9,026.4	19	12	8	3	17	1
Difference	-78.0	0	0	0	0	0	0

NOTE: Differences were computed by subtracting the 2021 NEM results from the Noise Abatement Measure 3 results.

1 Eight of the twelve schools were included in the School Soundproofing Program and are compatible with DNL 65 and higher (see Section 2.6.1 of the JFK NEM Report).
2 Five schools and places of worship are historic sites, but they are not included here to avoid double counting.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2020.

TABLE 2-10
QUEENS AND NASSAU COUNTY DWELLING UNITS AND POPULATION EXPOSED TO DNL 65 AND HIGHER – 2021 NEM AND REDUCE RUNWAY 31L INTERSECTION DEPARTURES AT NIGHT (NOISE ABATEMENT MEASURE 3)

Category	2021 NEM			Noise Abatement Measure 3			Difference		
	Queens	Nassau County	Total	Queens	Nassau County	Total	Queens	Nassau County	Total
Dwelling Units									
Single-Family and Two-Family Residential	9,556	1,532	**11,088**	9,291	1,539	**10,830**	-265	7	**-258**
Multi-Family Residential	2,270	383	**2,653**	2,270	383	**2,653**	0	0	**0**
Mixed-Residential and Commercial	74	10	**84**	73	10	**83**	-1	0	**-1**
Total	**11,900**	**1,925**	**13,825**	**11,634**	**1,932**	**13,566**	**-266**	**7**	**-259**
Population									
Single-Family and Two-Family Residential	28,034	5,109	**33,143**	27,347	5,132	**32,479**	-687	23	**-664**
Multi-Family Residential	4,853	845	**5,698**	4,853	845	**5,698**	0	0	**0**
Mixed-Residential and Commercial	203	30	**233**	201	30	**231**	-2	0	**-2**
Total	**33,090**	**5,984**	**39,074**	**32,401**	**6,007**	**38,408**	**-689**	**23**	**-666**

NOTE: Numbers may not add up because of rounding. Differences were computed by subtracting the 2021 NEM results from the Noise Abatement Measure 3 results.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2018.

Conclusions: *JFK Noise Abatement Measure 3: Reduce Runway 31L Intersection Departures at Night.* This could reduce the number of people exposed to DNL 65 and higher by up to 689 in the neighborhoods of Howard Beach, Old Howard Beach, and Hamilton Beach, in Queens, but 23 other persons in Nassau County may be exposed to DNL 65 and higher, thus making the net reduction in people exposed up to 666.

Analysis of this measure assumed that all aircraft departing from Runway 31L at night would use the full length of the runway, while using the same climb rates and overflying the same areas as they currently do.

Table 2-11 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Noise Abatement Measure 3.

TABLE 2-11
IMPLEMENTATION SUMMARY FOR JFK NOISE ABATEMENT MEASURE 3:
REDUCE RUNWAY 31L INTERSECTION DEPARTURES AT NIGHT

Implementation Item	Discussion
Benefits	Potential net reduction of up to 666 people in 259 dwelling units exposed to DNL 65 with implementation of the proposed measure.
Rationale	The Port Authority is recommending JFK Noise Abatement Measure 3 because it could reduce overflights of the Queens neighborhoods of Howard Beach, Old Howard Beach, and Hamilton Beach by aircraft departing from Runway 31L at night, reducing noise exposure in those neighborhoods.
Responsible Parties	Selection among available runways for use by aircraft is the sole responsibility of the FAA. The Port Authority will request that the development process for this measure be initiated, and will then work with NY TRACON and other FAA personnel to further study and develop the measure. Implementation of this measure may require an environmental study as required under NEPA; the FAA would be the responsible party to complete such a study.
Estimated Costs	The expected costs associated with the development and implementation of this procedure are internal to the FAA (e.g., ATO) and other coordinating agencies. These costs are unknown, and an FAA AIP grant would not be required.
Funding Sources	The FAA.
Requirements	FAA approval. Implementation may require an environmental study under NEPA.
Estimated Schedule	The Port Authority will submit a request for procedure development within 6–12 months of the FAA's ROA for the NCP. FAA design, testing, and implementation of the procedure typically could take 18–24 months, potentially up to three years once the Port Authority requests initiation of the development process.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Noise Abatement Measure 4: Combine "Tighten SKORR" Departure Procedure with Reduce Runway 31L Intersection Departures at Night

Description

This NCP measure is a combination of JFK Noise Abatement Measures 1 and 3. These suggested measures are described in their respective sections within this chapter. The combination may provide additional noise benefits to the neighborhoods of Howard Beach, Old Howard Beach, and Hamilton Beach in Queens.

Type of Measure

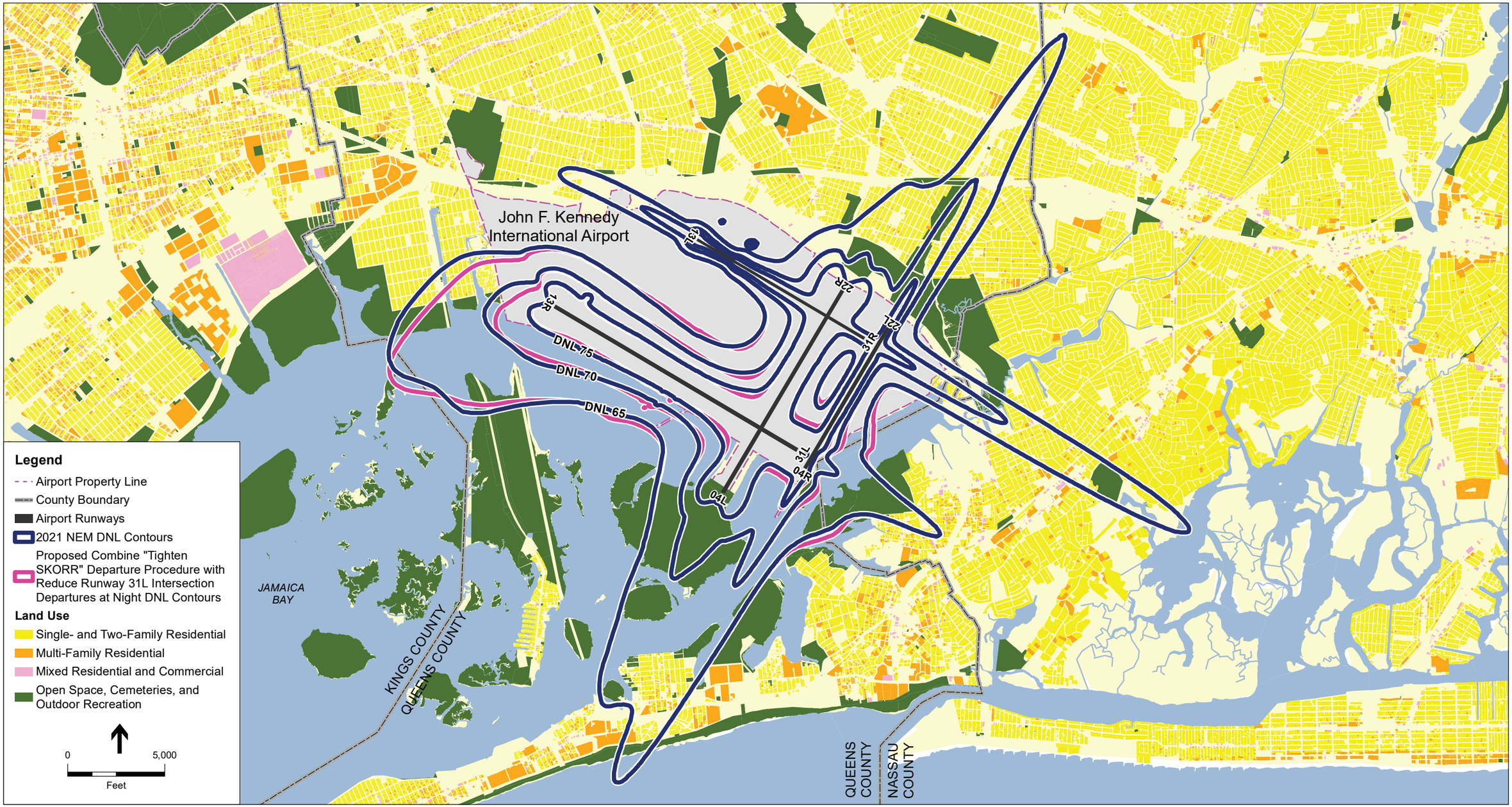
This measure is a combination of a flight procedure and preferential runway use. As stated previously, airport operators do not have authority to mandate that specific runways be used for aircraft operations; only the FAA has the authority to designate active runways. Airport operators are obligated to inform the FAA of which runways are available for use so that the FAA can then select from the available runways for aircraft departures and arrivals. In general, preferential runway use strategies are recommendations made to the FAA and can be implemented only when FAA determines that operating conditions permit.

Analysis

The individual analyses for this combined measure are described in the respective sections within this chapter. To model this measure, all operations (for daytime and nighttime, including intersection and full-length departures) were analyzed to determine which aircraft were currently flying procedures including the SKORR waypoint; those aircraft were assigned to fly the "Tighten SKORR" procedure. In addition, all aircraft currently using intersection departures at night were modeled as utilizing the full length of Runway 31L for departures. The climb rates of the modeled flights were not changed. The effect of the modeling assumptions was therefore to assign the majority of Runway 31L departures to the "Tighten SKORR" procedure while also raising the altitudes of aircraft that would otherwise use intersection departures at night.

Potential Noise Benefits

Figure 2-12 shows the DNL 65, 70, and 75 contours for this NCP measure overlaid on residential land use, with the 2021 NEM contours. As shown in **Tables 2-12** and **2-13** and the close-up contour plot in **Figure 2-13**, implementation of this measure may shift the noise contours in the neighborhoods southeastward, reducing the noncompatible land uses in the neighborhoods of Howard Beach, Old Howard Beach, and Hamilton Beach. The shift in noise contours may remove a net number of up to 1,498 people and 559 dwelling units from the DNL 65 contour. **Table 2-12** compares residential land uses exposed to DNL 65 and higher for this NCP measure versus the 2021 NEM. **Table 2-13** compares the numbers of historic sites, non-residential noise-sensitive sites, and total land area exposed to DNL 65 and higher for this NCP measure versus the 2021 NEM.



SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-12

DNL 65, 70, and 75 Contours - 2021 NEM and Combine "Tighten SKORR" with Reduce Runway 31L Intersection Departures at Night
John F. Kennedy International Airport

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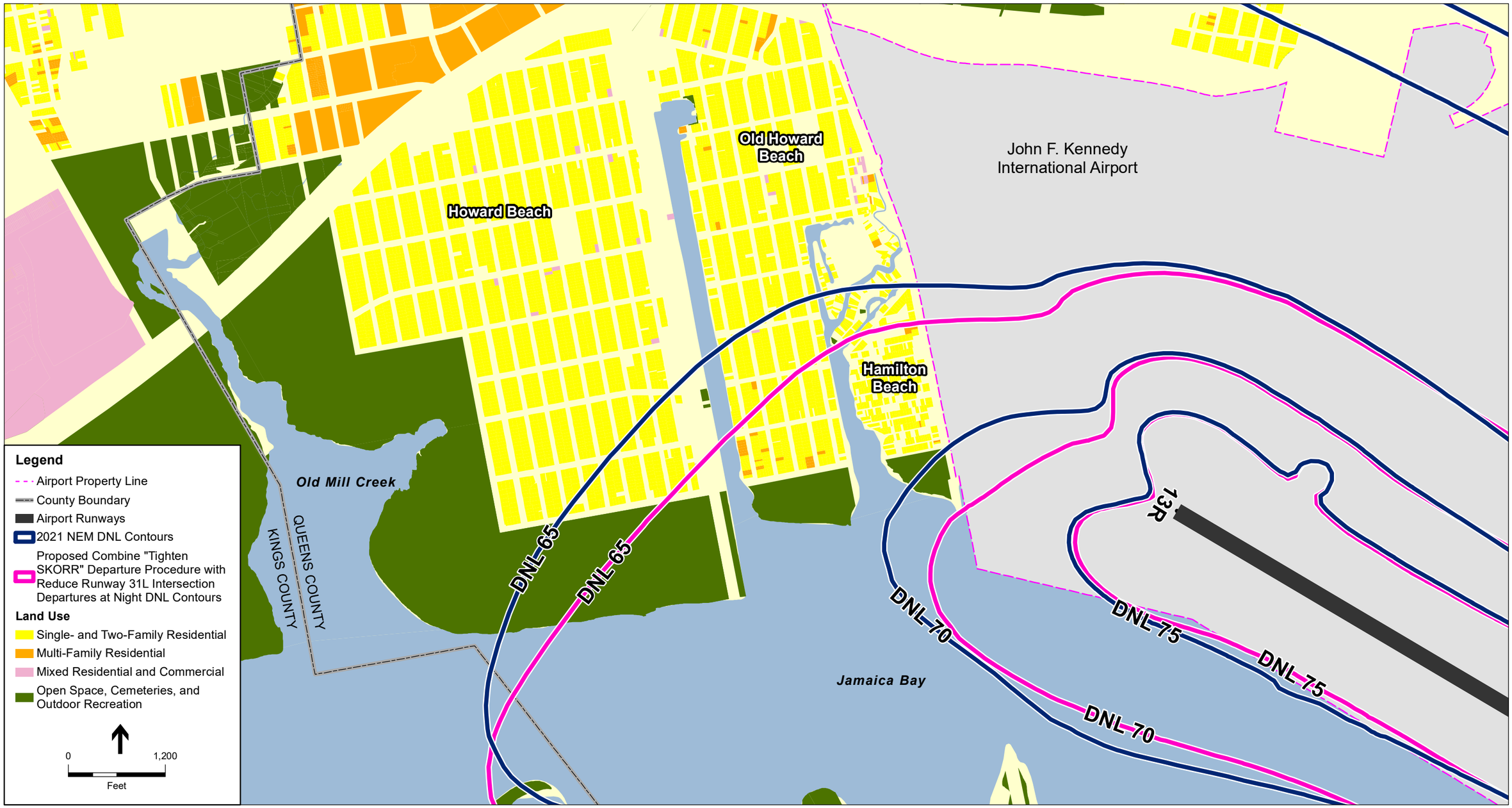

SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-13

DNL 65, 70, and 75 Contours - 2021 NEM and Combine "Tighten SKORR" with Reduce Runway 31L Intersection Departures at Night
Howard Beach, Old Howard Beach, Hamilton Beach
John F. Kennedy International Airport

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TABLE 2-12
LAND USES EXPOSED TO DNL 65 AND HIGHER – 2021 NEM
AND COMBINE "TIGHTEN SKORR" DEPARTURE PROCEDURE WITH REDUCE RUNWAY 31L INTERSECTION DEPARTURES AT NIGHT (NOISE ABATEMENT MEASURE 4)

	Land Area Exposed to DNL 65 and Higher (acres)			Number of Dwelling Units			Population		
Land Use Category	**2021 NEM**	**Noise Abatement Measure 4**	**Difference**	**2021 NEM**	**Noise Abatement Measure 4**	**Difference**	**2021 NEM**	**Noise Abatement Measure 4**	**Difference**
Single-Family and Two-Family Residential	778.1	738.2	-39.9	11,088	10,533	-555	33,143	31,655	-1,488
Multi-Family Residential	51.5	51.2	-0.3	2,653	2,650	-3	5,698	5,690	-8
Mixed-Residential and Commercial	6.6	6.5	-0.1	84	83	-1	233	231	-2
Total	**836.2**	**795.9**	**-40.3**	**13,825**	**13,266**	**-559**	**39,074**	**37,576**	**-1,498**

NOTE: Numbers may not add up because of rounding. Differences were computed by subtracting the 2021 NEM results from the Noise Abatement Measure 4 results. The household and population estimates provided above were developed using census block demographic data from the 2010 Decennial Census and New York City housing data. This approach provided an average number of persons per household for each individual census block, which accounted for changes in land use, housing types, and residential density within the different areas in the DNL 65 and higher contours.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2020.

TABLE 2-13
NOISE-SENSITIVE SITES AND POPULATION EXPOSED TO DNL 65 AND HIGHER – 2021 NEM
AND COMBINE "TIGHTEN SKORR" DEPARTURE PROCEDURE WITH REDUCE RUNWAY 31L INTERSECTION DEPARTURES AT NIGHT
(NOISE ABATEMENT MEASURE 4)

Scenario	Total Area (Acres)	Places of Worship	Schools[1]	Hospitals and Residential Healthcare	Historic Resources[2]	Day Care Facilities	Library
2021 NEM	9,104.4	19	12	8	3	17	1
Noise Abatement Measure 4	9,035.3	19	12	8	3	17	1
Difference	-69.1	0	0	0	0	0	0

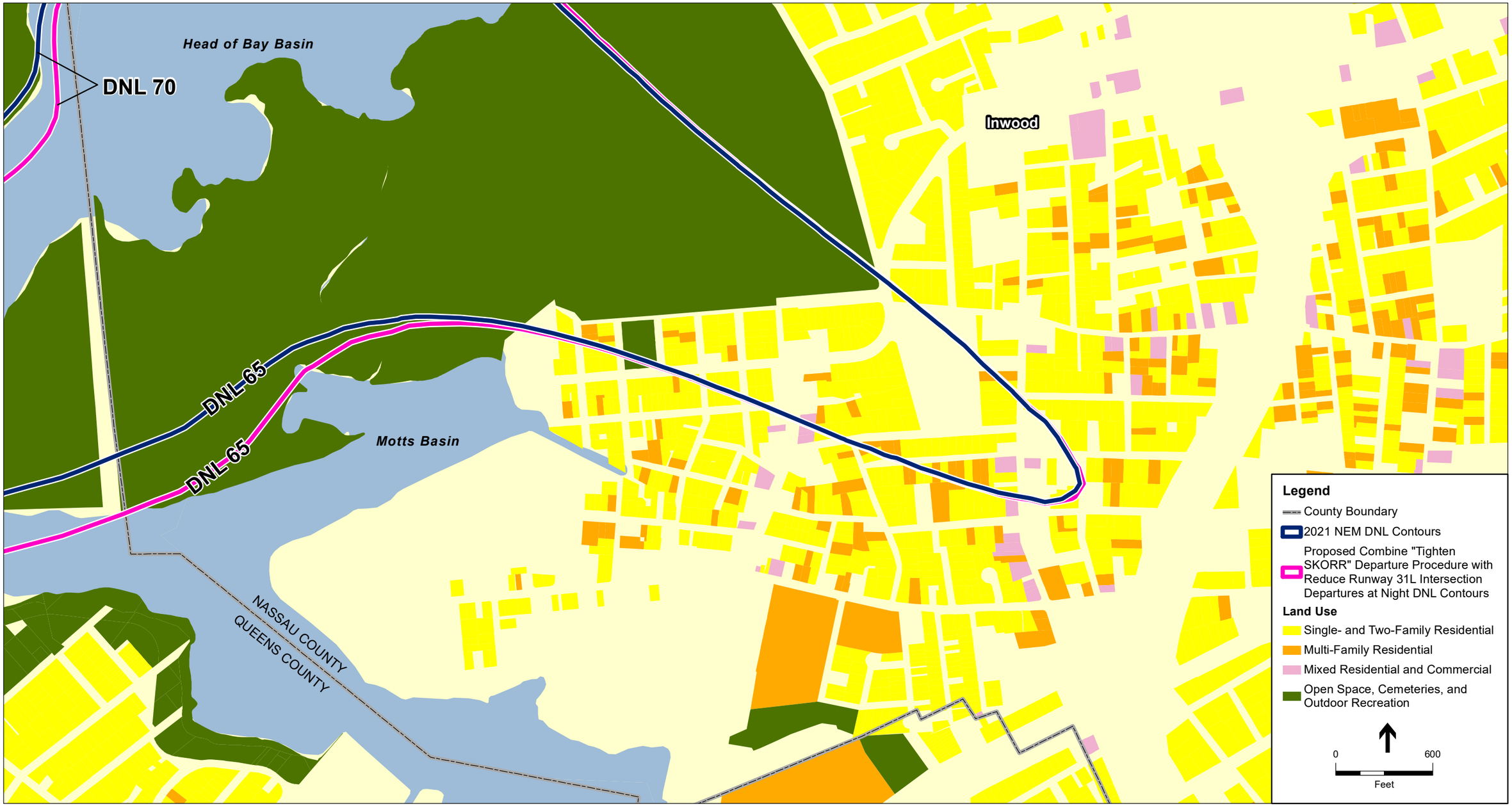
NOTE: Differences were computed by subtracting the 2021 NEM results from the Noise Abatement Measure 4 results.

1 Eight of the twelve schools were included in the School Soundproofing Program and are compatible with DNL 65 and higher (see Section 2.6.1 of the JFK NEM Report).
2 Five schools and places of worship are historic sites, but they are not included here to avoid double counting.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2020.

Because of Inwood's proximity from the east of the Runway 31L end, implementation of this measure may increase noncompatible land uses near this Nassau County neighborhood. **Figure 2-14** shows a close-up contour plot for the neighborhood of Inwood. **Table 2-14** compares the numbers of dwelling units and population exposed to DNL 65 and higher versus the baseline separately for Queens and for Nassau County, showing that the measure may add 19 people and 5 dwelling units to the DNL 65 contour in Nassau County while removing 1,517 people and 564 dwelling units from the DNL 65 contour in Queens.

The noise benefits to residents and dwelling units in Nassau County for this recommended noise abatement measure (19 people and 5 dwelling units) differs from the noise benefits for JFK Noise Abatement Measure #3 ("Reduce Runway 31L Intersection Departures at Night"—23 people and 7 dwelling units). This small change is due to slight differences in the DNL contours for the two recommended noise abatement measures as a result of the "Tighten SKORR" procedure. The implementation of the "Tighten SKORR" procedure slightly changes flight track distances and altitudes for Runway 31L departures in the INM. Because many Runway 31L departures turn to the left and overfly Inwood as well as nearby Nassau County municipalities, aircraft noise levels in these municipalities are slightly affected by the implementation of "Tighten SKORR." Runway 31L departure INM flight tracks are presented in Figure 4-5 of the JFK NEM Report.



SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-14

DNL 65 and 70 Contours - 2021 NEM and Combine "Tighten SKORR" with Reduce Runway 31L Intersection Departures at Night
Inwood
John F. Kennedy International Airport

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TABLE 2-14
QUEENS AND NASSAU COUNTY DWELLING UNITS AND POPULATION EXPOSED TO DNL 65 AND HIGHER – 2021 NEM AND COMBINE "TIGHTEN SKORR" DEPARTURE PROCEDURE WITH REDUCE RUNWAY 31L INTERSECTION DEPARTURES AT NIGHT (NOISE ABATEMENT MEASURE 4)

Category	2021 NEM			Noise Abatement Measure 4			Difference		
	Queens	Nassau County	Total	Queens	Nassau County	Total	Queens	Nassau County	Total
Dwelling Units									
Single-Family and Two-Family Residential	9,556	1,532	**11,088**	8,996	1,537	**10,533**	-560	5	**-555**
Multi-Family Residential	2,270	383	**2,653**	2,267	383	**2,650**	-3	0	**-3**
Mixed-Residential and Commercial	74	10	**84**	73	10	**83**	-1	0	**-1**
Total	**11,900**	**1,925**	**13,825**	**11,336**	**1,930**	**13,266**	**-564**	**5**	**-559**
Population									
Single-Family and Two-Family Residential	28,034	5,109	**33,143**	26,527	5,128	**31,655**	-1,507	19	**-1,488**
Multi-Family Residential	4,853	845	**5,698**	4,845	845	**5,690**	-8	0	**-8**
Mixed-Residential and Commercial	203	30	**233**	201	30	**231**	-2	0	**-2**
Total	**33,090**	**5,984**	**39,074**	**31,573**	**6,003**	**37,576**	**-1,517**	**19**	**-1,498**

NOTE: Numbers may not add up because of rounding. Differences were computed by subtracting the 2021 NEM results from the Noise Abatement Measure 4 results.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2018.

Conclusions: *JFK Noise Abatement Measure 4: Combine "Tighten SKORR" Departure Procedure with Reduce Runway 31L Intersection Departures at Night.* This could reduce the number of people exposed to DNL 65 and higher by 1,517 in the neighborhoods of Howard Beach, Old Howard Beach, and Hamilton Beach, in Queens, but may increase the number of other people exposed to noise levels of DNL 65 and higher by 19 in Nassau County. Therefore, the net reduction in people exposed to DNL 65 and higher may be up to 1,498.

The analysis of the measure assumed that all aircraft currently flying procedures that include SKORR would fly the new "Tighten SKORR" procedure. The analysis also assumed that all aircraft departing from Runway 31L at night would use the full length of the runway, while using the same climb rates as they currently do.

Table 2-15 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Noise Abatement Measure 4.

TABLE 2-15
IMPLEMENTATION SUMMARY FOR JFK NOISE ABATEMENT MEASURE 4: COMBINE "TIGHTEN SKORR" DEPARTURE PROCEDURE WITH REDUCE RUNWAY 31L INTERSECTION DEPARTURES AT NIGHT

Implementation Item	Discussion
Benefits	Potential net reduction of up to 1,498 people in 559 dwelling units exposed to DNL 65 with implementation of the proposed measure.
Rationale	The Port Authority is recommending JFK Noise Abatement Measure 4 because it could reduce overflights of the Queens neighborhoods of Howard Beach, Old Howard Beach, and Hamilton Beach by aircraft departing from Runway 31L at night, reducing noise exposure in those neighborhoods.
Responsible Parties	Development and implementation of flight procedures, and selection among available runways for use by aircraft, are the sole responsibility of the FAA. The Port Authority will request that development of this measure be initiated, and will then work with NY TRACON and other FAA personnel to further study and develop the measure. Implementation of this measure may require an environmental study as required under NEPA; the FAA would be the responsible party to complete such a study.
Estimated Costs	The expected costs associated with the development and implementation of this procedure are internal to the FAA (e.g., ATO) and other coordinating agencies. These costs are unknown, and an FAA AIP grant would not be required.
Funding Sources	The FAA.
Requirements	FAA approval. Implementation may require an environmental study under NEPA.
Estimated Schedule	The Port Authority will submit a request for procedure development within 6–12 months of the FAA's ROA for the NCP. FAA design, testing, and implementation of the procedure typically could take 18–24 months, potentially up to three years once the Port Authority requests initiation of the development process.

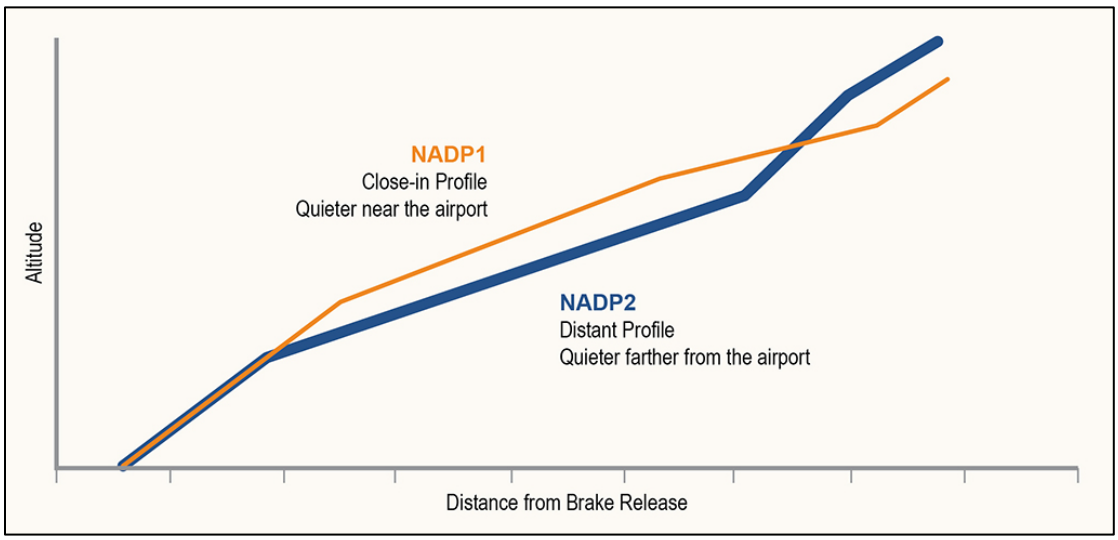
SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Noise Abatement Measure 5: Implement Noise Abatement Departure Profiles on a Voluntary Basis for Each Runway End

Description

This NCP measure involves the voluntary implementation of noise abatement departure profiles (NADPs), which are aircraft climb-out profiles that can provide noise reduction benefits. In 1993, the FAA published acceptable criteria for two safe NADPs for commercial jet aircraft: the close-in NADP, also known as NADP1, and the distant NADP, also known as NADP2 (FAA Advisory Circular (AC) 91-53A).[26] The close-in NADP provides noise reduction benefits to areas adjacent to the airport, whereas the distant NADP provides noise reduction benefits farther from the airport. **Figure 2-15** gives a general overview of both types of NADPs. The NADPs outline criteria for speed, thrust settings, and airplane configurations used in connection with the NADPs. The designs of NADPs as well as their frequencies of use are specific to individual aircraft operators and aircraft types. Airport operators cannot mandate the use of NADPs at an airport because airport operators do not have the authority to require specific operating procedures for aircraft in flight; implementation of NADPs is voluntary and at the choice of aircraft operators. However, FAA AC 91-53A encourages aircraft operators "to use the appropriate NADP when an airport operator requests its use to abate noise for either a close-in or distant community."

Figure 2-15
General Overview of NADP1 (Close-In) and NADP2 (Distant)



NOTE: Graphic is not to scale.

SOURCES: Civil Air Navigation Services Organization and Airports Council International, "Managing the Impacts of Aviation Noise - A Guide for Airport Operators and Air Navigation Service Providers," September 2015; ESA, 2020.

26 The International Civil Aviation Organization's Doc 8168, *Procedures for Air Navigation Services – Aircraft Operations* (also known as PANS-OPS), provides international standards for designing instrument approach and departure procedures. These standards also cover two types of NADPs. NADP1 is intended to reduce noise for noise-sensitive communities located close to an airport, while NADP2 is intended to reduce noise for noise-sensitive communities located farther from the airport. Within the United States, FAA AC 91-53A describes these types of NADPs as the "close-in NADP" and the "distant NADP," respectively.

Type of Measure

This measure is a flight procedure modification that could be used to achieve noise benefit within the airspace constraints and reduce exposure of noise-sensitive parcels and people to aircraft noise in the area around JFK.

Analysis

NADPs are specific to aircraft types and aircraft operators; therefore, they must be developed by aircraft operators themselves through detailed analyses and pilot training. The Study Team used the Port Authority's ANOMS data to develop aircraft vertical profiles used in the 2016 and 2021 NEMs. Throughout the JFK 14 CFR Part 150 Study process, aircraft operators participated in the TAC and provided input on their aircraft vertical profiles, including the use of NADPs. Therefore, these NEMs already reflect any existing use of NADPs by aircraft operators. Because NADP implementations vary by aircraft operator and aircraft type, the use of specific NADPs cannot be identified solely using ANOMS data. For the purposes of determining the potential noise reduction benefits of specific NADP1 or NADP2 implementations in the JFK 14 CFR Part 150 Study, the potential noise benefits of implementing NADP1 or NADP2 were estimated using FAA AC 91-53A and guidance from the INM User Guide. The INM User Guide provides guidance for modeling potential noise effects of generic NADP designs by specifying user-defined departure profiles in INM input files.

With this guidance, two separate modeling scenarios were created using the INM: (1) generic NADP1 departure profiles for the top nine aircraft types expected to operate most frequently at JFK in the year 2021 (which compose approximately 76 percent of Airport operations), and (2) generic NADP2 departure profiles for those same aircraft types. For all other aircraft types in both NADP modeling scenarios, the departure vertical profiles were kept identical to those used in the 2021 NEM. See Appendix E of the JFK NEM Report for details of the baseline vertical profiles.

Potential Noise Benefits

Figure 2-16 illustrates the noise contours associated with the implementation of NADP1 and NADP2 overlaid on residential land use. The DNL 65, 70, and 75 contours are plotted for both types of NADPs. The year 2021 NEM contours are not shown because they cannot be compared with the NADP1- and NADP2-related contours. This is because the 2021 NEM contours were produced using an analysis of actual aircraft departure vertical profiles using historical radar data, while the NADP1- and NADP2-related contours were produced using generic NADP vertical profiles based on FAA AC 91-53A. Aircraft- and operator-specific NADP data were not available for this analysis.

As shown by the close-up NADP1- and NADP2-related DNL 65, 70, and 75 contours over Howard Beach, Old Howard Beach, and Hamilton Beach in **Figure 2-17**, implementation of NADP1 for Runway 31L and 31R departures may be more beneficial than implementation of NADP2 for these runway ends, as the NADP1 contour in the neighborhoods is smaller than the NADP2 contour. Similarly, as shown by the close-up NADP1 and NADP2 contours over Brookville in **Figure 2-18**, implementation of NADP1 for Runway 4L and 4R departures may be

more beneficial than implementation of NADP2 for these runway ends, as the NADP1 contour in the neighborhoods is smaller than the NADP2 contour. This is because NADP1 features a steeper climb close to the airport, resulting in aircraft being at a higher altitude over these neighborhoods than they would be if using the NADP2 profile.

As shown by the DNL 65 contours over Arverne and Hammels in **Figure 2-19**, implementation of NADP2 for Runway 22L and 22R departures may be more beneficial than implementation of NADP1 for these runway ends, as the NADP2 contour in the neighborhoods is smaller than the NADP1 contour. This is likely due to the distance of The Rockaways from JFK and the nature of NADP2, which is intended to reduce noise for communities farther from an airport. Aircraft flying the NADP2 profile when departing Runways 22L and 22R may be at higher altitudes and/or lower engine power levels over The Rockaways than if they were to fly the NADP1 profile.

Modeling indicated negligible differences in NADP1 and NADP2 noise contours over Nassau County areas to the southeast of JFK. This is because departures from Runways 13L and 13R at JFK, which overfly those areas, are rare. Instead, aircraft arrivals are the primary contributors to aircraft noise exposure southeast of JFK.

Table 2-16 compares residential land uses exposed to DNL 65 and higher for the implementation of NADP1 and NADP2. **Table 2-17** compares the numbers of historic sites, non-residential noise-sensitive sites, and total land area exposed to DNL 65 and higher for the implementation of NADP1 and of NADP2.

TABLE 2-16
RESIDENTIAL LAND USES EXPOSED TO DNL 65 AND HIGHER – NADP1 AND NADP2

	Land Area Exposed to DNL 65 and Higher (acres)			Number of Dwelling Units			Population		
Land Use Category	**NADP1**	**NADP2**	**Difference**	**NADP1**	**NADP2**	**Difference**	**NADP1**	**NADP2**	**Difference**
Single-Family and Two-Family Residential	721.0	727.7	6.7	10,231	10,363	132	30,783	31,076	293
Multi-Family Residential	52.1	45.5	-6.6	2,650	2,077	-573	5,688	4,603	-1,085
Mixed-Residential and Commercial	6.4	6.3	-0.1	83	81	-2	231	224	-7
Total	**779.5**	**779.5**	**0.0**	**12,964**	**12,521**	**-443**	**36,702**	**35,903**	**-799**

NOTE: Numbers may not add up because of rounding. Differences were computed by subtracting the NADP2 results from the NADP1 results. The household and population estimates provided above were developed using census block demographic data from the 2010 Decennial Census and New York City housing data. This approach provided an average number of persons per household for each individual census block, which accounted for changes in land use, housing types, and residential density within the different areas in the DNL 65 and higher contours.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2020.

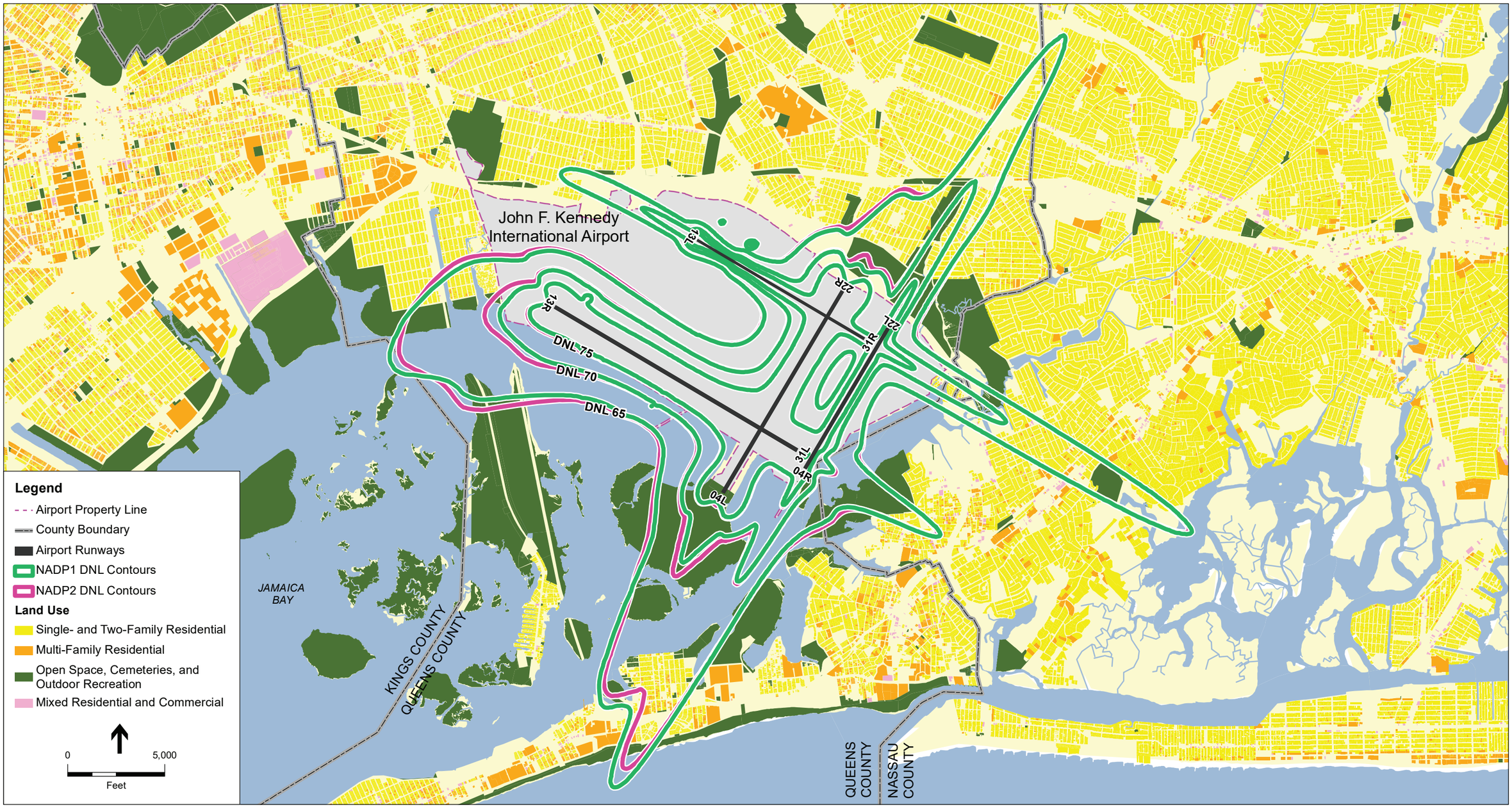
TABLE 2-17
HISTORIC SITES, NON-RESIDENTIAL NOISE-SENSITIVE SITES, AND TOTAL LAND AREA EXPOSED TO DNL 65 AND HIGHER – NADP1 AND NADP2

Scenario	Total Land Area (Acres)	Places of Worship	Schools[1]	Hospitals and Residential Healthcare	Historic Resources[2]	Day Care Facilities	Library
NADP1	8,699.4	19	12	7	3	16	1
NADP2	8,763.8	18	12	7	3	17	1
Difference	64.4	-1	0	0	0	1	0

NOTE: Differences were computed by subtracting the NADP1 results from the NADP2 results.

1 Eight of the twelve schools were included in the School Soundproofing Program and are compatible with DNL 65 and higher (see Section 2.6.1 of the JFK NEM Report).
2 Five schools and places of worship are historic sites, but they are not included here to avoid double counting.

SOURCES: Planning Technology, Inc. and ESA, 2017 and 2020.



SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

John F. Kennedy International Airport 14 CFR Part 150 Study. 140037

Figure 2-16

DNL 65, 70, and 75 Contours - NADP1 and NADP2
John F. Kennedy International Airport

ESA

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SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

Figure 2-17
DNL 65, 70, and 75 Contours - NADP1 and NADP2
Howard Beach, Old Howard Beach, Hamilton Beach
John F. Kennedy International Airport

ESA

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SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

John F. Kennedy International Airport 14 CFR Part 150 Study. 140037

Figure 2-18

DNL 65 Contours - NADP1 and NADP2
Arverne and Hammels
John F. Kennedy International Airport

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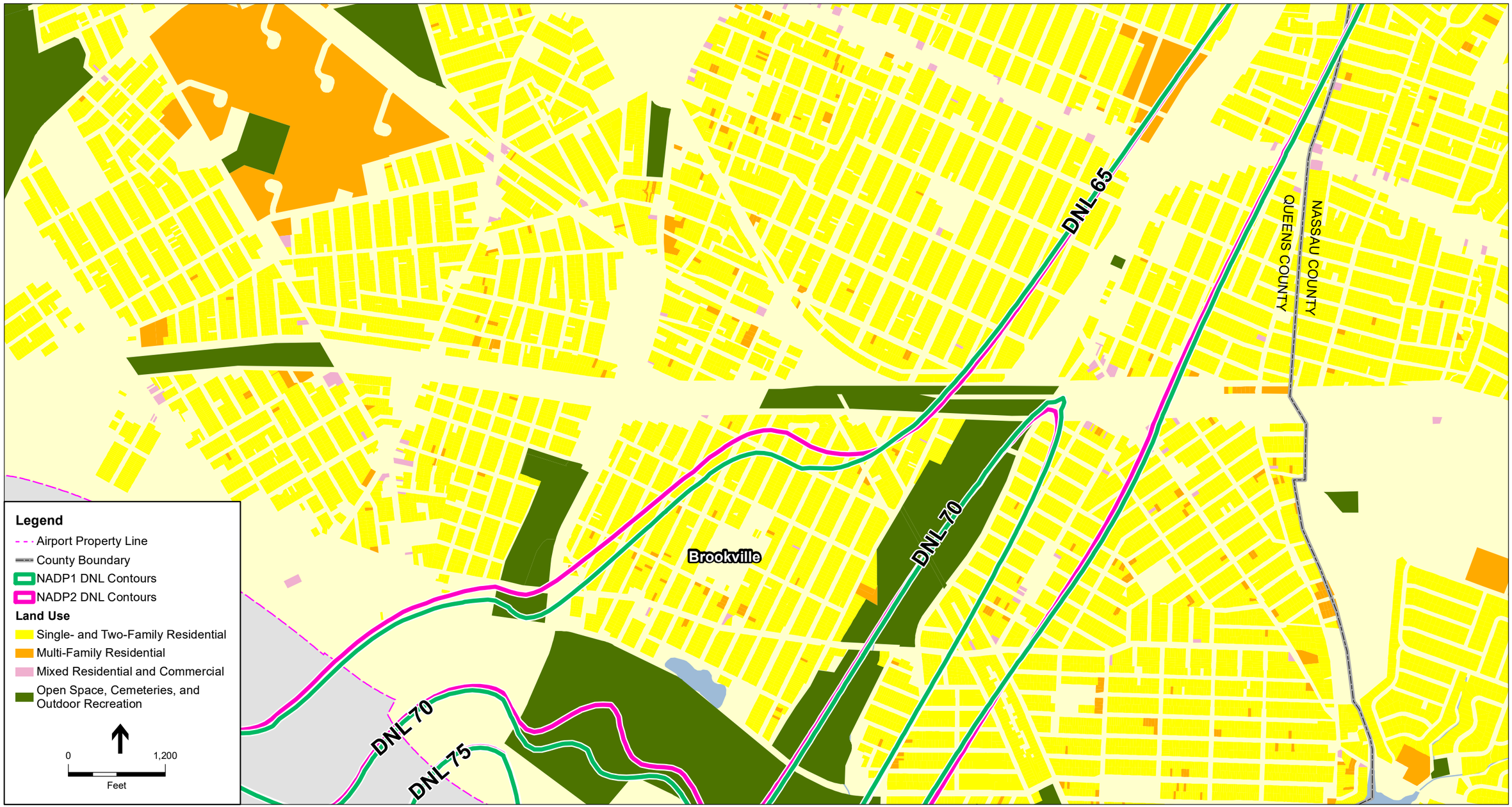

SOURCE: New York City Department of City Planning, MapPLUTO 15V1 - Tax lot/land use geographic information database, March 2015 - June 2015; Nassau County Department of Public Works Planning Division; Property classification and geographic information database, September 2015; INM 7.0d; ESA, 2016, 2017, and 2020; ESRI Mapping Services, 2019.

John F. Kennedy International Airport 14 CFR Part 150 Study. 140037

Figure 2-19

DNL 65, 70, and 75 Contours - NADP1 and NADP2
Brookville
John F. Kennedy International Airport

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Conclusions: *JFK Noise Abatement Measure 5: Implement Noise Abatement Departure Profiles on a Voluntary Basis for Each Runway End.* This could reduce the number of noise-sensitive parcels and people exposed to DNL 65 and higher in the Queens, New York neighborhoods of Howard Beach, Old Howard Beach, Hamilton Beach, Brookville, Arverne, and Hammels. The NADP selected for each runway end would be the NADP that provides the most benefit to nearby communities. NADP2 is the recommended procedure for Runway 22L/22R, while NADP1 is the recommended procedure for Runways 31L/31R and 4L/4R at JFK.

Table 2-18 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Noise Abatement Measure 5.

TABLE 2-18
IMPLEMENTATION SUMMARY FOR JFK NOISE ABATEMENT MEASURE 5:
IMPLEMENT NOISE ABATEMENT DEPARTURE PROFILES ON A VOLUNTARY BASIS FOR EACH RUNWAY END

Implementation Item	Discussion
Benefits	Potential reduction of people and dwelling units in the DNL 65 contour in multiple neighborhoods in Queens, NY, with implementation of the proposed procedures.
Rationale	The Port Authority is recommending JFK Noise Abatement Measure 5 because it could reduce noise exposure in the Queens, New York neighborhoods of Howard Beach, Old Howard Beach, Hamilton Beach, Brookville, Arverne, and Hammels. The NADP selected for each runway end would be the NADP that provides the most benefit to nearby communities. NADP2 is the recommended procedure for Runways 22L and 22R, while NADP1 is the recommended procedure for Runways 31L, 31R, 4L, and 4R at JFK.
Responsible Parties	Pilots are responsible for the operation of their aircraft. The Port Authority will request that aircraft operators begin development of this measure, and will then work with aircraft operators, NY TRACON, and other FAA personnel to further study and develop the measure. Implementation of this measure may require an environmental study as required under NEPA; the FAA would be the responsible party to complete such a study.
Estimated Costs	The expected costs associated with the development and implementation of this procedure are internal to the FAA (e.g., ATO), other coordinating agencies, and aircraft operators. These costs are unknown, and an FAA AIP grant would not be required.
Funding Sources	FAA funding, aircraft operator internal funding.
Requirements	FAA approval. Implementation of this measure may require an environmental study under NEPA.
Estimated Schedule	Dependent upon aircraft operators to design and implement NADPs. Within 6 to 12 months of the FAA's ROA for the NCP, the Port Authority will submit a request for profile development.

SOURCES: Port Authority and ESA, 2018 and 2020.

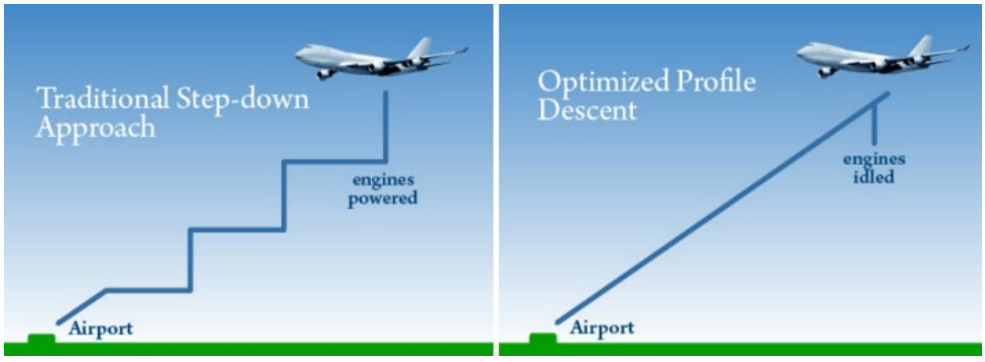
JFK Noise Abatement Measure 6: Implement Nighttime Optimized Profile Descent Procedures

Description

This NCP measure is the implementation of Optimized Profile Descent (OPD) arrival profiles at JFK. An OPD is an arrival procedure that optimizes noise and air emissions reduction by minimizing changes in thrust by using a favorable initial flight path angle and strategic management of flaps and landing gear. Aircraft on an OPD are generally configured with flaps and landing gear, airspeed, and approach angle prior to five miles from the runway, mostly benefitting areas beyond the limit of the DNL 65 contour.

Because of the busy and complex nature of the region's airspace as a whole, aircraft are typically directed by air traffic controllers to hold at a constant altitude for extended periods. OPDs are being recommended only during nighttime hours, given that the airspace is much less busy during the nighttime. The FAA's ATO could examine whether the "hold-downs" can be eliminated or reduced during these hours. **Figure 2-20** provides an illustration of the OPD concept by comparing a notional OPD to a descent with hold-downs, where aircraft increase power and fly at constant altitude when instructed by ATC.

Figure 2-20
Comparison of a Notional OPD and Descent with Level Segments



SOURCE: Federal Aviation Administration, https://www.faa.gov/nextgen/library/media/getSmart_PBN.pdf
NOTE: Graphic is not to scale.

Type of Measure

This measure is a flight procedure that could be used to achieve noise benefit within the airspace constraints.

Analysis

OPDs direct aircraft to descend to the runway with the minimal amount of engine power needed to safely land the aircraft. Hold-downs that require high power settings for the level flight segments with conventional arrival procedures are generally eliminated. This results in less noise being heard on the ground.

Potential Noise Benefits

The extent of the noise reduction on the ground compared to conventional arrival procedures varies by the specific airframe/engine combination and distance from the runway. OPDs generally reduce noise exposure in areas beyond the limit of the DNL 65 contour.

Conclusions: *JFK Noise Abatement Measure 6: Implement Nighttime Optimized Profile Descent Procedures.* This could reduce the aircraft noise levels for areas beyond the limit of the DNL 65 contour.

Table 2-19 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Noise Abatement Measure 6.

TABLE 2-19
IMPLEMENTATION SUMMARY FOR JFK NOISE ABATEMENT MEASURE 6:
IMPLEMENT NIGHTTIME OPTIMIZED PROFILE DESCENT PROCEDURES

Implementation Item	Discussion
Benefits	No reduction of people or dwelling units exposed to DNL 65 will occur with the proposed nighttime use of OPD procedures. However, this measure could reduce noise exposure in residential areas beyond the contours under the arrival flight paths.
Rationale	The Port Authority is recommending JFK Noise Abatement Measure 6 because it may be an effective way to reduce noise exposure in residential areas under the arrival flight path upon approach.
Responsible Parties	Development and implementation of flight procedures is the sole responsibility of the FAA. The Port Authority will request that the development process be initiated, and then will work with NY TRACON and other FAA personnel to further study and develop this procedure. Implementation of this measure may require an environmental study as required under NEPA; the FAA would be the responsible party to complete such a study.
Estimated Costs	The expected costs associated with the development and implementation of this procedure are internal to the FAA (e.g., ATO) and other coordinating agencies. These costs are unknown, and an FAA AIP grant would not be required.
Funding Sources	The FAA.
Requirements	FAA approval. Implementation of procedures identified under this measure may require an environmental study under NEPA.
Estimated Schedule	The Port Authority will submit a request for procedure development within 6–12 months of the FAA's ROA for the NCP. FAA design, testing, and implementation of the procedure typically could take 18–24 months, potentially up to three years once the Port Authority requests initiation of the development process.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Noise Abatement Measure 7: Continue Existing Mandatory Departure Noise Limit and $250 Penalty

The Port Authority has pursued aircraft noise abatement measures for several decades. In 1959, the Port Authority established a mandatory aircraft departure noise limit of 112 PNdB for aircraft departures at JFK. In 1986, the Port Authority implemented a $250 penalty for each aircraft operation that exceeds the noise limit at JFK. Operators of aircraft that violate the departure noise limit at JFK are contacted by the Port Authority and notified of the violation and penalty. The existing monitoring system at JFK, which currently consists of 19 monitors, supports the Port Authority's enforcement of this departure noise limit. The departure noise limit is a measure that was established before such measures were restricted by ANCA in 1990 and is therefore "grandfathered," permitting the Port Authority to continue the measure. The Port Authority is recommending continuation of the existing departure noise limit, with no changes, to continue restricting operational activity that violates the limit. This provides benefits to communities in the vicinity of JFK.

Conclusion: *JFK Noise Abatement Measure 7: Continue Existing Mandatory Departure Noise Limit and $250 Penalty* provides noise benefits to communities in the vicinity of JFK by continuing enforcement of the mandatory 112 PNdB departure noise limit and $250 penalty at JFK.

Table 2-20 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Noise Abatement Measure 7.

TABLE 2-20
IMPLEMENTATION SUMMARY FOR JFK NOISE ABATEMENT MEASURE 7: CONTINUE EXISTING MANDATORY DEPARTURE NOISE LIMIT AND $250 PENALTY

Implementation Item	Description
Benefits	Continuation of the existing mandatory departure noise limit provides noise benefits to communities in the vicinity of JFK by continuing enforcement of the mandatory 112 PNdB departure noise limit and $250 penalty at JFK.
Rationale	The Port Authority is recommending JFK Noise Abatement Measure 7 because it is the continuation of an existing mandatory noise abatement measure with no changes, and the existing measure provides benefits to communities in the vicinity of JFK.
Responsible Parties	The Port Authority.
Estimated Costs	No funding is required to implement this measure, and the Port Authority will continue to enforce the existing mandatory departure noise limit.
Funding Sources	No funding required.
Requirements	Not applicable.
Estimated Schedule	This measure is already implemented; the Port Authority will continue to enforce the existing mandatory departure noise limit and $250 penalty.

SOURCES: Port Authority and ESA, 2018 and 2020.

2.3 Noise Abatement Strategies Considered but Not Recommended for Inclusion in This NCP

This section describes noise abatement strategies that the Port Authority considered but is not recommending for inclusion in this NCP. During the development of the NCP, the Port Authority and Study Team reviewed 55 noise abatement strategies raised by stakeholders that participated in the 14 CFR Part 150 Study. The individual strategies fell within four major categories: (1) develop new or modify existing flight tracks, (2) modify the airfield layout or build noise barriers, (3) modify pilot procedures for operating aircraft, and (4) change operating frequencies by modifying runway use or imposing operating restrictions; these are described below. A full list of suggested noise abatement strategies can be found in **Appendix G**.

Develop New or Modify Current Flight Tracks

Numerous suggestions to create new flight tracks or modify current flight tracks for noise abatement purposes were reviewed. In general, adjustments to flight tracks for noise abatement can either concentrate noise over an area or disperse noise over a larger area.

The FAA NY TRACON staff determined that some suggested modifications to aircraft flight track locations were not feasible to implement because they would require airspace and procedure modifications that are incompatible with other airports in the New York/New Jersey area. Such strategies are not recommended for inclusion in this NCP.

Suggestions to implement steeper glide slopes for aircraft arrivals were also received. The glide slope set by the FAA for aircraft arriving at JFK ranges between 3.0 and 3.2 degrees relative to the surface of the ground. Increases in glide slope near the Airport may reduce the ability of aircraft operators to maintain stabilized approaches, posing a safety hazard. Therefore, increases in glide slope near JFK are not recommended for inclusion in this NCP. However, since increasing the glide slope may have noise benefits outside the DNL 65 contour, the Port Authority will request that the FAA NAC further evaluate changes to the glide slope.

Some of the suggested strategies recommended moving flight tracks with the goal of moving noise over compatible land uses and features (such as non-residential areas, industrial parks, waterways, and large expressways). Given that there are residential areas of various densities in the immediate vicinity of JFK, it is not possible to avoid overflying all residential areas. However, the Port Authority has worked, and will continue to work, with the FAA to identify and promote the use of aircraft flight track locations that place aircraft over compatible land uses to the extent possible, given the multitude of factors that affect the operation of JFK. A number of noise abatement measures recommended for inclusion in this NCP involve potentially feasible modifications to flight procedures with the goal of moving noise over compatible land uses.

Suggestions to disperse flight tracks with the goal of spreading aircraft noise over a larger area while not affecting the operational efficiency of the airport were also received. The shifting or moving of noise from one populated area to another is inconsistent with the 14 CFR Part 150 requirement to develop an NCP that "reduces existing noncompatible uses and prevents or

reduces the probability of the establishment of additional noncompatible uses."[27] Therefore, such strategies are not recommended for inclusion in this NCP. However, pursuant to Section 175 of the FAA Reauthorization Act of 2018,[28] the Port Authority, in consultation with the affected communities, will request that the FAA NAC re-evaluate all new or amended area navigation departure procedures that have the potential for utilizing dispersal headings after this NCP has been approved.

The Port Authority received several suggestions to modify a helicopter route that is near JFK but does not connect directly to the airport. These suggested strategies are not recommended for inclusion in this NCP because 14 CFR Part 150, Sec. 150.21(a)(1) requires NEMs to be produced using "aircraft operations at the airport." The 14 CFR Part 150 process therefore cannot address aircraft operations that do not occur at the airport being studied.

Perform Construction to Modify the Airfield Layout or Add Noise Barriers

Suggested strategies that involve changing the JFK runway layout and other on-airfield modifications were reviewed. These included the displacement of the Runway 22L landing threshold farther south and the construction of noise barriers on JFK property or in neighborhoods.

A landing threshold is the beginning portion of a runway that is usable for landing aircraft. Runway 22L is the shortest runway at JFK. Moving the landing threshold farther south would reduce the length available for landing. For safety reasons, some aircraft that fly into JFK need the full length of Runway 22L when they land. Therefore, reducing this runway's length would limit the types of aircraft that use it and could also shift noise exposure from one noncompatible area to another. The shifting of noise from one noncompatible area to another noncompatible area is inconsistent with the 14 CFR Part 150 requirement to develop an NCP that "reduces existing noncompatible uses and prevents or reduces the probability of the establishment of additional noncompatible uses." For the aforementioned reason, moving the Runway 22L landing threshold farther south is not recommended for inclusion in this NCP.

Under certain conditions, building walls between noise sources and noise-sensitive land uses can reduce noise exposure. Walls generally only benefit properties immediately adjacent to aircraft ground movements at an airport. There are no residential areas adjacent to JFK that would benefit from a wall. Walls deliver no noise benefit to noise-sensitive land uses that are exposed to noise from aircraft in flight. Additionally, walls may also present an obstruction hazard to aircraft operations. For the aforementioned reasons, the construction of noise barriers is not recommended for inclusion in this NCP.

Modify Pilot Procedures for Operating Aircraft

The Study Team reviewed suggestions to modify aircraft operating procedures that pilots follow. These included implementing speed reductions over residential areas, delaying the lowering of landing gear, and reducing engine thrust levels for departures. Pilot procedures such as thrust,

[27] 14 CFR Part 150, Appendix B, Sec. 150.5(a).

[28] FAA Reauthorization Act of 2018, Public Law No. 115-254 (effective October 5, 2018).

speed, and landing gear schedules are aircraft- and operator-specific, and the Port Authority cannot mandate specific cockpit management procedures. The pilot-in-command has the sole authority to determine the procedures required for the safe operation of his or her aircraft, including its speed, thrust and flap settings, and landing gear. Therefore, modifications mandating specific aircraft operating procedures are not recommended for inclusion in this NCP. Certain voluntary modifications to pilot procedures could be discussed in the context of a voluntary Fly Quiet Program, presented in **Section 4.2**.

There is an indication that pilots already try to fly in a manner that reduces aviation impacts to the public. An analysis of departure thrust levels indicated that many aircraft already use reduced thrust levels for departures at JFK. This analysis is discussed in Section 4.5.3 of the JFK NEM Report.

Change Operating Frequencies by Modifying Runway Use or Imposing Operating Restrictions

The Study Team reviewed noise abatement strategies related to changing runway use, limiting the times that a particular runway is in use, restricting aircraft from departing from a specific runway, and banning certain aircraft from operating at JFK altogether.

Changing the utilization rates for runways can be used to direct noise exposure around an airport. The FAA has stated publicly that it implements a Runway Rotation Policy at JFK while managing air traffic in the New York region. Pursuant to the FAA's current Runway Rotation Policy for JFK, FAA ATC personnel evaluate runway selection at JFK every eight hours and make runway selections based on the following factors, listed in order of decreasing priority:

1. Runway availability
2. Prevailing wind and weather patterns
3. Operational efficiency
4. Community noise concerns

These factors include, but are not limited to, whether a runway is closed due to airport construction and/or maintenance, and the length of runway required by the types of aircraft arriving to and departing from JFK.

The Port Authority supports the FAA's Runway Rotation Policy for JFK and encourages the FAA to rotate runway use at JFK when appropriate and safe. Therefore, preferential runway use strategies are not recommended for inclusion in this NCP as the FAA already has a Runway Rotation Policy in place. However, the Port Authority is recommending to reduce Runway 31L intersection departures at night (discussed in **Section 2.2**) and implement a Fly Quiet Program (discussed in **Section 4.2**) to provide a forum in which runway rotation, preferential runway use, and other modifications to runway use can be further discussed, developed, and used to inform the FAA's decision-making on community noise concerns outside of the 14 CFR Part 150 Process.

The Port Authority received suggestions to implement use restrictions for aircraft operating at JFK, including shifting operations to other airports, implementing or modifying landing fees based on aircraft noise characteristics, and limiting or prohibiting operations of certain aircraft.

However, through the recommended noise abatement, land use, and programmatic measures set forth in this NCP, the Port Authority will have an NCP that, once approved and fully implemented, will eliminate noncompatible land uses without the need for aircraft operation restrictions. In addition, the Port Authority must abide by grant assurances in place with the FAA, one of which requires that no restrictions on operations be implemented by the airport authority.[29] Furthermore, no new restrictions can be implemented at JFK without successful completion of a 14 CFR Part 161 Study and approval by the FAA, which also requires that the Port Authority first implement noise control measures that do not require aircraft operating restrictions. Therefore, use restrictions are not recommended for inclusion in this NCP. The Port Authority is instead recommending the continuation of the existing mandatory departure noise limit and $250 penalty as JFK Noise Abatement Measure 7. This mandatory departure noise limit and penalty were established before the passage of ANCA in 1990 and the promulgation of 14 CFR Part 161 in 1991.

2.4 Summary of Recommended Noise Abatement Measures

Appendix H summarizes the full list of recommended noise abatement measures.

Measures Already in Place at JFK

- Continue Existing Mandatory Departure Noise Limit and $250 Penalty

Measures to Be Initiated at JFK within One Year of FAA Record of Approval

- Implement "Tighten SKORR" Departure Procedure
- Turn Runway 22L and 22R Departures to Heading 240 at Night
- Reduce Runway 31L Intersection Departures at Night
- Combine "Tighten SKORR" Departure Procedure with Reduce Runway 31L Intersection Departures at Night
- Implement Noise Abatement Departure Profiles on a Voluntary Basis for Each Runway End
- Implement Nighttime Optimized Profile Descent Procedures

[29] 49 USC §47107(d).

CHAPTER 3
Noise Compatibility Program – Land Use Measures

Land use measures address aircraft noise in areas of high noise exposure that cannot be eliminated through the implementation of noise abatement measures as described in **Chapter 2**. Pursuant to the requirements of 14 CFR Part 150,[30] this chapter evaluates corrective and preventive land use measures. Corrective land use measures, which are typically implemented by an airport operator, are measures intended to mitigate noise exposure at the locations of existing noncompatible land uses. Such measures include land acquisition and sound insulation treatments of structures. In contrast, preventive measures prohibit the introduction of new noncompatible land uses and/or notify potential buyers of properties affected by aircraft noise; such measures are typically implemented by the local planning and zoning jurisdictions. 14 CFR Part 150, Appendix B, Sec. B150.7(b) requires an airport operator to analyze "[a]cquisition of land and interests therein" as well as "[t]he construction of barriers and acoustical shielding, including the soundproofing of public buildings." This NCP discusses these measures in **Sections 3.2** and **3.4**.

The FAA has no regulatory authority to control land uses around airports and recognizes that state and local governments are responsible for land use planning, zoning, and regulation. The Port Authority also does not have any jurisdiction over land use. However, as a condition of receipt of FAA funding for airport development projects, an airport operator must provide the FAA with written assurances that "appropriate action, including the adoption of zoning laws, have been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations including the landing and takeoff of aircraft . . ."[31] In response to this FAA requirement, this NCP discusses preventive land use measures in **Sections 3.3** and **3.4**.

This chapter details the following three land use measures recommended for inclusion in this NCP:

- Sound-Insulate Eligible Dwelling Units
- Sound-Insulate Eligible Non-Residential Noise-Sensitive Structures
- Include Aircraft Noise in Real Estate Disclosures

Table 1 of 14 CFR Part 150 (presented in this NCP as **Table 1-2**) identifies land uses surrounding an airport that are acceptable within the DNL 65, 70, and 75 contours. The table implies that

30 14 CFR Part 150, Appendix B, Sec. 150.7(b).

31 Airport and Airway Development Act of 1970. Pub. L. 91-258. 84 Stat. 219-253. May 21, 1970.

virtually all land uses outside of the DNL 65 contour are compatible with aircraft noise. For the JFK 14 CFR Part 150 Study, the compatible and noncompatible land uses within the DNL 65 and higher contours were identified using the designations provided in **Table 1-2** to the extent that the designations were aligned to the New York City and Nassau County land use categories. Land use compatibility is described further in Chapter 3 and Appendix D-1 of the JFK NEM Report. Corrective measures are applicable to off-airport land within the DNL 65 contour. Preventive measures can be applicable both within and beyond the DNL 65 contour to discourage development of noise-sensitive land uses near an airport.

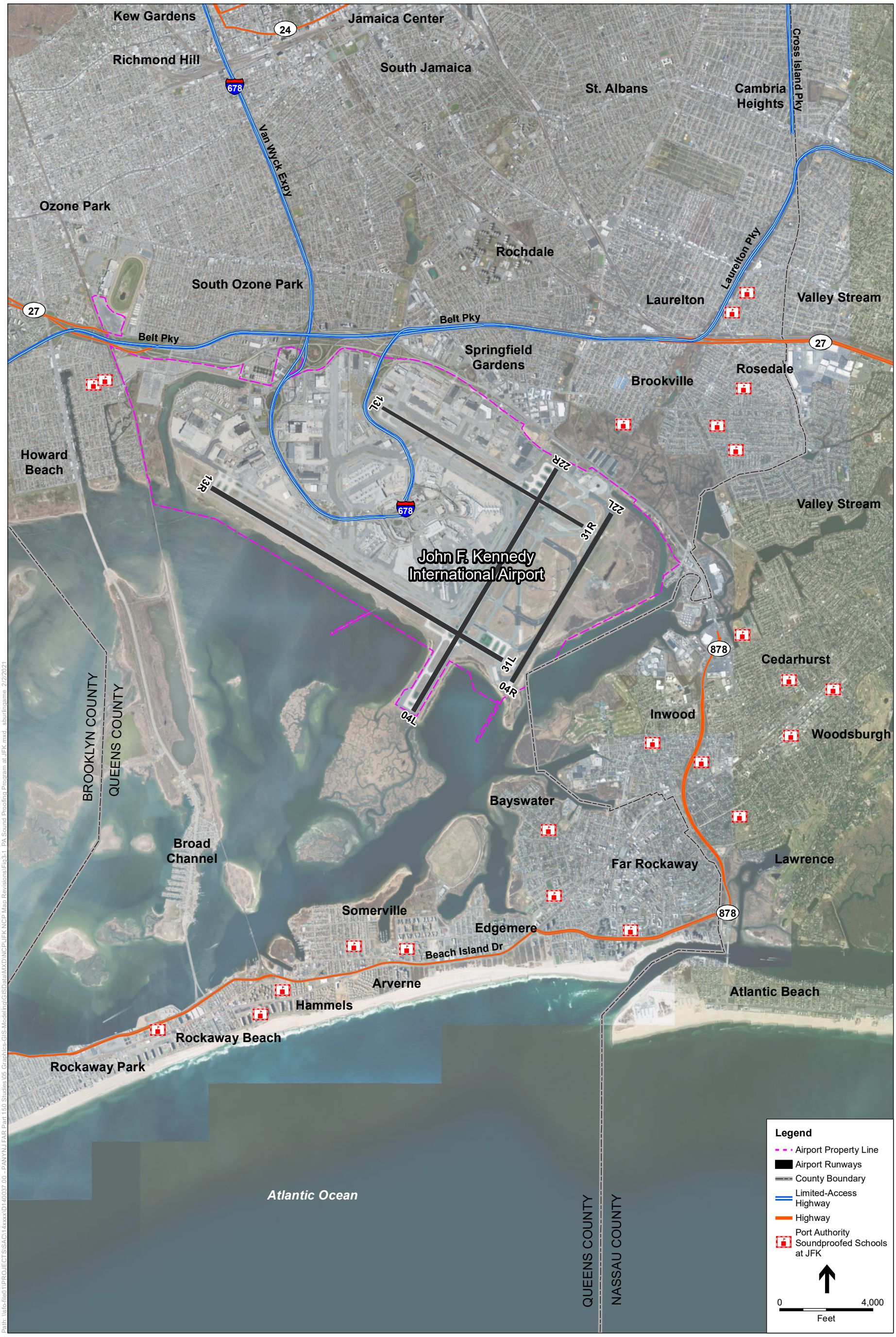
Non-compatible land uses within the 2021 Forecast NEM provided the basis for the cost and schedule estimates for implementation of each recommended land use measure. However, consistent with FAA guidance, the NEM will be updated regularly to identify any changes in noncompatible land uses and to ensure the land use measures address current or forecast aircraft noise exposure. Eligibility to implement the land use measures and costs of such measures will depend on the FAA-accepted NEM at the time of implementation.

3.1 Existing Land Use Measures

Prior to initiating this 14 CFR Part 150 Study, the Port Authority voluntarily implemented a school sound insulation program. Since the program began in 1983, 23 schools in the vicinity of JFK have been sound-insulated to reduce noise impacts. Total program expenditures for the 23 schools exceeded $192 million, which was paid for, in part, with approximately $71 million in FAA AIP grants. The soundproofing program included acoustic windows, insulation, ventilation, and air conditioning. The Port Authority prepared an internal noise analysis to determine whether schools were located within the DNL 65 contour before being sound-insulated.

Table 3-1 provides additional information related to each of the 23 schools, including the year in which the school was sound insulated and the estimated number of students in attendance in the 2015–2016 school year. It is important to note that after a school has been insulated, it is considered a compatible use for the purposes of 14 CFR Part 150. The locations of the schools are shown in **Figure 3-1**. The following eight schools are currently located within the 2021 NEM DNL 65 contour:

- Lawrence High School
- PS 181 Brookfield
- PS 38 Rosedale
- PS/MS 42 R. Vernam
- St. Clare Catholic Academy
- Hebrew Academy of Five Towns & Rockaway
- Lawrence Public School #2
- St. Joachim School



Path: \\sfo-file01\PROJECTS\SAC\14xxxx\D1400370 0 - PANYNJ FAR Part 150 Studies\05 Graphics-GIS-ModelInq\GISData\MXD\NCP\JFK NCP Map Revisions\Fig3-1 PA Sound Proofing Program at JFK.mxd sburlingame 2/2/2021

SOURCE: Port Authority, 2015; New York City Department of Education, 2016; National Center for Education Statistics, 2016; ESRI Mapping Services; ESA, 2020.

John F. Kennedy International Airport 14 CFR Part 150 Study

Figure 3-1

Port Authority School Soundproofing Program
John F. Kennedy International Airport

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TABLE 3-1
PORT AUTHORITY SCHOOL SOUNDPROOFING PROGRAM AT JFK

	School	Neighborhood / Village / Hamlet	2015–2016 Year Students	Sound Insulation Program Completion Year	Within 2021 NEM DNL 65 Contour?
1	Lawrence Public School #5	Cedarhurst	385	1994	N
2	Lawrence High School	Cedarhurst	929	1990	Y
3	Lawrence Middle School	Lawrence	818	1995	N
4	Lawrence Public School #4	Inwood	343	1997	N
5	Our Lady of Grace (Ave Maria Catholic Academy)	Howard Beach	189	1995	N
6	PS 104Q	Far Rockaway	622	1991	N
7	PS 138Q	Rosedale	788	1993	N
8	PS 181 Brookfield	Springfield Gardens	363	1988	Y
9	PS 183Q	Far Rockaway	530	1993	N
10	PS 38 Rosedale	Rosedale	207	1990	Y
11	PS/MS 42 R. Vernam	Arverne	662	2000	Y
12	St. Clare Catholic Academy	Rosedale	318	2002	Y
13	St. Rose of Lima	Rockaway Beach	428	1992	N
14	Yeshiva Darchei Torah	Far Rockaway	800	1998	N
15	Hebrew Academy of Five Towns & Rockaway	Lawrence	1098	2006	Y
16	Lawrence Public School #2	Inwood	414	2012	Y
17	PS 146Q	Howard Beach	701	2006	N
18	IS/MS 180Q (Now Scholars Academy)	Rockaway Park	1,251	2010	N
19	PS 195Q	Rosedale	680	2008	N
20	PS 198Q (Now Goldie Maple Academy)	Arverne	541	2010	N
21	St. Joachim School	Cedarhurst	508	2006	Y
22	St. Pius X (Now Success Academy – Rosedale)	Rosedale	254	2006	N
23	Tapeinu School for Girls (Now Challenge Preparatory Charter School)	Far Rockaway	419	2005	N

SOURCES: Port Authority, 2015; New York City Department of Education, 2016; National Center for Education Statistics, 2016; ESA, 2020.

3.2 Recommended Corrective Land Use Measures

This section describes *corrective* land use measures that are recommended as part of the JFK NCP. Benefits of the land use measures were analyzed using the 2021 NEM contours, which represent the noise exposure in the vicinity of JFK absent NCP implementation. The 2021 NEM is presented in **Section 1.5**.

JFK Land Use Measure 1: Sound-Insulate Eligible Dwelling Units

The term "dwelling units" includes, but is not limited to, single-family units, multi-family units (up to and including high-rise apartment buildings), and mixed-use structures with retail on the ground floor and residential units above.

Sound insulation programs provide compatible noise environments inside structures as a means to mitigate aircraft noise exposure. Sound insulation treatments may include window and door replacement, caulking, weather stripping, and positive air ventilation.[32] Positive ventilation systems use a fan to draw outside air into an indoor space, pressurizing the space. Indoor air is exhausted out of the building through sound-insulated exterior openings.[33] Ventilation-only treatments are limited to structures where positive ventilation does not already exist.

Sound insulation does not change the outdoor noise environment (e.g., backyards, patios, and courtyards). The goal of sound insulation under 14 CFR Part 150 is to provide an average interior DNL of 45 or below and to provide at least a 5 dB improvement to the noise level reduction of the structure. Based on the experience of other airports' residential sound insulation programs, sound insulation is effective in reducing interior noise exposure and has a high level of satisfaction among dwelling unit occupants.

In residential sound insulation programs funded in part by FAA AIP grants, a dwelling unit is eligible for sound insulation only if it meets all of the criteria set forth in the *AIP Handbook*,[34] Appendix R.[35] A dwelling unit is not eligible for federally funded sound insulation just by virtue of its location inside the DNL 65 contour. Rather, to be eligible, the dwelling unit must meet the following criteria:

1. It must be located within the DNL 65 contour of an FAA-approved NEM.
2. It must have been constructed before publication of FAA-approved DNL contours.[36] Dwelling units constructed in the vicinity of JFK after August 4, 2008, are not eligible for sound insulation.[37]

[32] The purpose of the positive air ventilation is to allow for the replacement windows and doors to remain closed to provide the sound insulation benefit to the residents.

[33] National Academies of Sciences, Engineering, and Medicine. 2013. *Guidelines for Airport Sound Insulation Programs*. Washington, DC: The National Academies Press. https://doi.org/10.17226/22519. Section 7.5.3.

[34] FAA Order 5100.38D, *Airport Improvement Program Handbook*, dated 9/30/2014.

[35] Determination of eligibility would be made when the JFK Noise Compatibility Program has been approved, program protocols have been established, and the NCP implementation phase has been initiated.

[36] On March 27, 1998, FAA issued a policy on 14 CFR Part 150 airport noise compatibility programs that limits approval of remedial mitigation measures, e.g., soundproofing, property acquisitions, and relocation, etc., to land uses that were in place as of October 1, 1998 unless an airport operator can demonstrate that DNL contours were not published prior to that date. New noncompatible uses resulting from airport expansion may be eligible for funding consideration. For JFK, DNL 65, 70, and 75 contours were first made available to the public on August 4, 2008.

[37] Notice of Availability and Request for Comment, Environmental Assessment, Delay Reduction Program – New Taxiways, Improvements to Existing Taxiways, and Runway 13R Threshold Relocation, John F. Kennedy International Airport, Jamaica, New York. *Newsday*, August 4, 2008.

3. It must be in compliance with the local building code.[38]

4. It must have an average noise level in *habitable* rooms above DNL 45 (with windows closed).

According to Table C-5 of the *AIP Handbook*, mobile dwelling units are not eligible for FAA-funded sound insulation because the FAA has determined that there are no effective sound insulation methods or materials for mobile homes.

According to 14 CFR Part 150, Appendix A, Sec. 101, a noise-sensitive land use is considered compatible and therefore not eligible for sound insulation funded by FAA AIP grants "if the self-generated noise from a given use and/or the ambient noise from other non-aircraft and non-airport uses is equal to or greater than the noise from aircraft and airport sources." Ambient noise refers to the non-aircraft noise in the vicinity of the land use being investigated for eligibility. Noise exposure generally increases as intensity of development increases, ranging from rural to suburban to urban to dense urban environment. The five boroughs of New York City include land uses that can be classified at the denser end of this range. Through a review of these classifications relative to JFK, it can be determined that areas in proximity to JFK generally fall within the urban to dense urban classification. The areas closest to the Airport would be classified as urban or dense urban. Information from the Port Authority's ANOMS[39] indicates that community noise exposure at the noise monitors placed around JFK varies from around the DNL 50 range to the DNL 70+ range and in many cases exceeds the DNL values for aircraft noise measurements at those sites. Section 3.3.2 of the JFK NEM Report discusses ambient and self-generated noise in further detail.

According to Appendix R-9 of the *AIP Handbook*, a dwelling unit located outside of the DNL 65 contour may be eligible for sound insulation in limited circumstances. Pursuant to Appendix R-9 of the *AIP Handbook*, dwelling units located on or immediately outside the DNL 65 contour may be eligible for FAA-funded sound insulation treatments under the concept of "block rounding." Block rounding involves expanding noise mitigation just beyond the DNL 65 contour to "include parcels contiguous to the project area." The FAA has the option of approving a request for block rounding if all requirements in Table R-2 of the *AIP Handbook* are met. The FAA is not obligated to approve a request for block rounding. Furthermore, a parcel included in a request for block rounding must meet all other eligibility requirements described in Appendix R of the *AIP Handbook*, such as being a noise-sensitive land use, having an average sound level above DNL 45 in *habitable* rooms, and being constructed before publication of FAA-accepted noise contours.

In addition, pursuant to Appendix R-10 of the *AIP Handbook*, an airport sponsor may "consider the use of neighborhood equity when a few residences in the eligible noise contour threshold (per Paragraph R-6) that do not meet the interior noise level requirements are scattered among residences that do meet the interior noise level criteria." The FAA has the option of approving

[38] Areas within a structure that do not meet the local building code are not "habitable" under FAA requirements and therefore are not eligible for sound insulation under the AIP. The *AIP Handbook*, Appendix R, provides the following example of an area that is not eligible for sound insulation: "A resident has converted part of a basement to a bedroom and the bedroom conversion does not meet the building code requirements to be categorized as a bedroom. The converted bedroom is not considered habitable space."

[39] ANOMS is a product of EMS Brüel & Kjær that collects aircraft noise and flight track data. It is described further in Section 4.1.

requests from the airport sponsor for consideration of neighborhood equity; the FAA is not obligated to approve such requests. The residences under consideration would have to meet all other eligibility requirements, such as having been constructed before publication of FAA-accepted noise contours.

The FAA also has discretion to fund sound insulation for dwelling units located in structures that contain a mix of residential and commercial uses (e.g., buildings with retail on the first floor and apartments in upper floors).[40] In addition, a modular structure that has a noise-sensitive use may be eligible for federally funded sound insulation if the structure is permanent and meets the same building requirements for non-modular structures, as given in Appendix R of the *AIP Handbook*.

The following dwelling units may be eligible for federally funded positive ventilation systems, but the FAA is not obligated to provide funding for such systems:

- Dwelling units that qualify for sound insulation and do not have existing positive ventilation systems
- Dwelling units that do not qualify for sound insulation and do not have existing positive ventilation yet require it so that exterior doors and windows can be kept closed to obtain the noise-level reduction required for compatibility

Dwelling units that do not have positive ventilation systems and are determined to be eligible for federally funded positive ventilation systems would be divided into two groups:

- Existing interior noise exposure of at least DNL 45
- Existing interior noise exposure below DNL 45, but only with having all exterior doors and windows closed

In exchange for accepting sound insulation under JFK Land Use Measure 1, the property owner must provide to the Port Authority an avigation easement. An avigation easement is a conveyance of airspace over another property for use by an airport. The property owner has restricted use of their property subject to the airport sponsor's easement for overflight and other applicable restrictions on the use and development of the parcel. Avigation easements run with the land (i.e., are attached to the property for as long as the easement is in effect). Therefore, an avigation easement binds future property owners and informs them of the property's exposure to aircraft noise while also restricting use of the parcel as described in the avigation easement. If the FAA approves JFK Land Use Measure 1, the Port Authority would develop a noise mitigation protocol containing various details of noise mitigation measure implementation, including language regarding avigation easements. The avigation easement will be attached to the property deed in perpetuity.

Based on the 2021 NEM described in **Section 1.5**, there are 13,825 dwelling units and 39,074 people located in the DNL 65 contour, excluding block rounding. For the purposes of this NCP, the Port Authority and the Study Team produced initial estimates of sound insulation costs for dwelling units. Costs to complete sound insulation for dwelling units were estimated based on

[40] 14 CFR Part 150, Appendix A, Table 1 (included in this NCP as Table 1-2) indicates that residential land uses are not compatible with aircraft noise exposure of DNL 65 and higher.

recent residential sound insulation projects in the northeastern United States, adjusted to reflect construction costs in the New York–New Jersey metropolitan area. This includes data from the first four phases of the sound mitigation program for T.F. Green Airport (PVD) in Rhode Island (2013 through 2015),[41] which is a recent noise mitigation program with similar dwelling unit construction types, along with a review of New York and New Jersey construction cost indices in RSMeans data from Gordian.[42] The sound insulation construction cost per dwelling unit is estimated to be approximately $32,000 to $80,000 (in 2018 dollars), with a weighted average estimated cost of $63,000 per dwelling unit.[43] Potential cost escalations associated with sound-insulating residences in the Albemarle Historic District were not considered for the purposes of this analysis.[44] Based on soft costs (project administration, legal, etc.) associated with recent residential sound insulation projects in the northeastern United States and based on Port Authority experience with the school sound insulation program, costs other than actual construction costs were estimated to be approximately 30 percent of construction costs. A 15 percent contingency was then added for unforeseen conditions that may be encountered during construction. Assuming that 92 percent of the 13,825 dwelling units within the 2021 NEM DNL 65 contour are eligible for sound insulation[45] and 100 percent participation in the program, the Port Authority estimates a cost of approximately $1.2 billion (in 2018 dollars) to complete the JFK residential sound insulation program (construction costs plus soft costs) for the purposes of this NCP.

The sound insulation program may also include positive ventilation for dwelling units, depending on sound insulation requirements to be determined for dwelling units on an individual basis. Assuming that 8 percent of the 13,825 dwelling units within the 2021 NEM DNL 65 contour would not be eligible for sound insulation (approximately 1,106 dwelling units), the Port Authority produced a cost estimation for providing positive ventilation to the 1,106 dwelling units, assuming a construction cost of $20,000 per dwelling unit. This estimate is based on recent conversations with sound insulation program management consultants and available construction cost index data.[46] Based on soft costs (project administration, legal, etc.) associated with recent residential sound insulation projects in the northeastern United States and based on Port Authority experience with the school sound insulation program, costs other than actual construction costs were estimated to be approximately 30 percent of construction costs. A 15 percent contingency for unforeseen conditions that may be encountered during construction was added. The total cost of providing positive ventilation to the 1,106 dwelling units is therefore estimated by the Port Authority as approximately $32.1 million.

41 Available: https://www.pvdairport.com/corporate/environment/voluntary-sound-mitigation.

42 RSMeans data from Gordian is a database of North America construction costs. Available: https://www.rsmeans.com/.

43 The weighted average sound insulation construction cost was calculated based on the construction cost per square foot of different dwelling types (e.g., single-family, two-family, etc.) and the total square footage of those dwelling types estimated to reside within the DNL 65 contour.

44 The Albemarle Historic District was defined in the 1970s, and New York State considers it to be a State Historic District. It has not been evaluated for National Register of Historic Places status.

45 Based on field observations of the presence or absence of storm windows on a sample of properties around JFK, and data from the T.F. Green Airport sound mitigation program (2013–2015), it is estimated that 8 percent of the 13,825 dwelling units within the 2021 NEM DNL 65 contour would not be eligible for sound insulation.

46 Gordian Construction Publishers & Consultants, Construction Cost Indexes with RSMeans data, Volume 44, Number 1, January 2018.

Including sound insulation for the approximately 12,719 units that may be eligible for sound insulation (which may include positive ventilation), plus the cost of providing only positive ventilation to the approximately 1,106 dwelling units that may only be eligible for positive ventilation, the total cost of JFK Land Use Measure 1 is therefore estimated by the Port Authority as approximately $1.2 billion without implementation of the noise abatement measures presented in **Chapter 2**. The dwelling units are not automatically eligible for sound insulation or positive ventilation, as described in earlier paragraphs. If JFK Land Use Measure 1 is approved by the FAA, the Port Authority would then develop a noise mitigation protocol describing details of a noise mitigation program. The protocol would contain details of eligibility determinations, including consideration of building construction dates and other factors described above. In implementing JFK Land Use Measure 1 (if approved by FAA), the Port Authority will follow FAA's guidelines as outlined in the AIP handbook for a residential sound insulation program (i.e. starting at the highest level of noise exposure within the noise contour areas moving outwards to the DNL 65).

Once sound insulation programs are well established and proceeding at a relatively regular pace, airport operators typically can install sound insulation in 50 to 250 dwelling units per year. Depending on the availability of program funding from year to year, the pace of construction and other factors, this program may take many years to complete. Because of inflation, the costs per dwelling unit will increase over time. Therefore, total program costs will be higher than what is projected in 2018 dollars.

The Port Authority intends to fund a maximum of 80 percent of residential sound insulation and positive ventilation with FAA AIP grants and at least the remaining 20 percent with fees paid by users of JFK pursuant to an agreement between the users and the Port Authority. Eighty percent of the eligible costs of sound insulation and positive ventilation could be funded with AIP grants; however, not all contingencies and soft costs may be eligible for AIP funding.

Conclusions: *JFK Land Use Measure 1: Sound-Insulate Eligible Dwelling Units.* This could provide appropriate noise level reduction inside the dwelling units and improve the noise level reduction of the structures by at least 5 dB. The sound insulation of dwelling units could be an effective way to improve compatibility with aircraft noise.

Table 3-2 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Land Use Measure 1.

TABLE 3-2
IMPLEMENTATION SUMMARY FOR JFK LAND USE MEASURE 1: SOUND-INSULATE ELIGIBLE DWELLING UNITS

Implementation Item	Description
Benefits	Sound insulation treatments provide adequate noise reduction inside people's homes for compatibility with indoor activities. Once treated, a property is considered compatible with aircraft noise. These treatments may include sound insulation as well as stand-alone positive ventilation systems.
Rationale	The Port Authority is recommending JFK Land Use Measure 1 because it could be an effective way to provide appropriate noise level reduction inside dwelling units.
Responsible Parties	The Port Authority.
Estimated Costs	$1.2 billion to provide sound insulation treatments, assuming that 92 percent of the 13,825 dwelling units (approximately 12,719 dwelling units) would be eligible for sound insulation and 8 percent of the 13,825 dwelling units (approximately 1,106 dwelling units) may be eligible only for positive ventilation, subject to the assumptions and limitations set forth in Section 3.2.
Funding Sources	A maximum of 80 percent FAA AIP and at least 20 percent Port Authority. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	FAA approval; identification of eligible properties; secured funding to sound-insulate properties.
Estimated Schedule	The Port Authority will seek to request federal financial assistance to set up a sound insulation program for JFK when economic conditions recover following the COVID-19 pandemic and after any updates of the NEMs, if necessary. Consistent with Part 150 requirements, the Port Authority will evaluate any changes in the noise environment at JFK and notify the FAA whether the NEM continues to be a reasonable representation of current and/or forecast conditions at JFK or submit an updated NEM to the FAA for acceptance. The noise mitigation program set up task will determine the implementation schedule for JFK Land Use Measure 1.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Land Use Measure 2: Sound-Insulate Eligible Non-Residential Noise-Sensitive Structures

Non-residential noise-sensitive structures, according to current FAA land use compatibility designations,[47] include public use facilities such as schools and places of worship, hospitals and residential healthcare facilities, day care facilities, and libraries. Sound insulation programs provide compatible noise environments inside structures to mitigate aircraft noise exposure. Sound insulation treatments may include window and door replacement, caulking, weather stripping, and positive air ventilation.

The purpose of sound insulation is to provide an average interior DNL[48] of 45 or below and to provide at least a 5 dB improvement to the noise level reduction of the structure with the installation of the treatments. All eligibility requirements in Appendix R of the *AIP Handbook* must be met. Several key eligibility requirements are summarized in the text presenting JFK Land Use Measure 1.

In non-residential sound insulation programs funded in part by FAA AIP grants, a non-residential noise-sensitive structure is eligible for sound insulation only if it meets all of the criteria set forth in the *AIP Handbook*, Appendix R. A structure is not eligible for federally funded sound insulation just by virtue of its location inside the DNL 65 contour. Rather, to be eligible, the structure must meet the following criteria:

1. It must be located within the DNL 65 contour of an FAA-approved NEM.
2. It must have been constructed before publication of FAA-approved DNL contours. In the case of JFK, FAA-approved DNL contours were first made available to the public on August 4, 2008. Therefore, structures constructed in the vicinity of JFK after August 4, 2008, are not eligible for federally funded sound insulation.
3. It must be in compliance with the local building code.
4. It must have an average noise level in *habitable* rooms above DNL 45 (with windows closed).

According to Table C-5 of the *AIP Handbook*, the FAA may not authorize the installation of sound insulation for structures with non-residential noise-sensitive land uses that are temporarily located in commercial facilities (e.g., a house of worship or day care facility under lease in a retail/commercial facility).

The following structures may be eligible for federally funded positive ventilation systems:

- Structures that qualify for sound insulation and do not have existing positive ventilation systems
- Structures that do not qualify for sound insulation and do not have existing positive ventilation yet but require it so that exterior doors and windows can be kept closed to obtain the noise-level reduction required for compatibility

47 14 CFR Part 150, Appendix A, Table 1.

48 Average interior DNL from aircraft operations for non-residential noise-sensitive structures is based on the time of day that the facility is in use. For example, places of worship have particular times that noise-sensitive rooms are in use, and the average interior noise level is to be based on the times these rooms are in use rather than a full 24-hour day.

Structures that do not have positive ventilation systems and are determined eligible for federally funded positive ventilation systems would be divided into two groups:

- Existing interior noise exposure of at least DNL 45
- Existing interior noise exposure below DNL 45, but only with having all exterior doors and windows closed

The 2021 NEM DNL contours include four schools[49] that did not receive sound insulation treatments during previous Port Authority sound insulation programs. The 2021 NEM DNL contours also include 19 places of worship,[50] 17 day care facilities,[51] 1 non-residential historic structure,[52] and 1 library, for a total of 42 non-residential noise-sensitive structures within the DNL 65 contour.[53] This list excludes the Trans World Airlines Flight Center, which is not a noise-sensitive structure; see Chapter 5 of the JFK NEM Report for further details. To estimate the cost of sound insulation for these structures, the RSMeans Square Foot Cost Estimating Guide[54] and information from similar projects at other airports were reviewed. The square footage of each structure was determined through the use of high-resolution aerial photography and Google Street View. Additional factors evaluated for each site included:

- Historic registration status as given by the New York City Landmarks Preservation Commission[55]
- Existence of air conditioning/positive ventilation
- A significant number of windows (including stained glass windows)
- Overall condition of the structure (good, fair, or poor)

A 10 percent contingency was then added for design, along with an additional 15 percent contingency for unforeseen conditions that may be encountered during construction. An estimate of soft costs (project administration, legal, etc.) associated with non-residential sound insulation was assumed to be similar to the soft costs associated with residential sound insulation, which was estimated to be approximately 30 percent of the construction costs.

49 Includes one school that is also a historic structure. Excludes one day care facility that also contains a school.

50 Includes one place of worship that is also a daycare facility. Includes two places of worship that are also historic structures. See Chapter 5 of the JFK NEM Report for further details.

51 Includes one day care facility that also contains a school. Excludes one day care facility that also contains a place of worship.

52 Excludes two places of worship that are also historic structures. Excludes one school that is also a historic structure. See Chapter 5 of the JFK NEM Report for further details.

53 The following eight health care facilities are located in dwelling units and therefore are included in Land Use Measure 1 (Sound-Insulate Eligible Dwelling Units) instead of Land Use Measure 2: Resort Nursing Home, Horizon Care Center, Bernard M. Fineson DDSO, South Island Rehabilitation, The Center for Family Support, Inc., Life's WORC, Inc. QSAC, Inc., and PSCH, Inc. See Chapter 5 of the JFK NEM Report for more information about these facilities.

54 The cost per square foot was determined through a review of similar projects at other airports, adjusted to 2018 dollars using the Building Cost Index published by Engineering News-Record and converted to the New York location factor published by RSMeans.

55 https://www1.nyc.gov/site/lpc/index.page. Last accessed: March 19, 2019.

The Port Authority estimates a cost of $126 million to provide sound insulation treatments to 39 structures, which is approximately 92 percent of the 42 non-residential noise-sensitive structures identified. These sound insulation treatments may also include positive ventilation, depending on sound insulation requirements to be determined for each structure on an individual basis. The 42 identified non-residential noise-sensitive structures are shown in **Table 3-3**.[56]

TABLE 3-3
NON-RESIDENTIAL NOISE-SENSITIVE STRUCTURES POTENTIALLY ELIGIBLE FOR SOUND INSULATION

Name[1]	Facility Type	Address	Borough/ Village/ Hamlet	Within 2016 NEM DNL 65 Contour?	Within 2021 NEM DNL 65 Contour?
Rosedale Library	Library	144-20 243rd St	Queens	Y	Y
Mona Prep Day Care Center, Inc.	Day Care/School	241-15 N Conduit Ave	Queens	Y	Y
Creative Years Day Care Center	Day Care – Assisted Living	138-72 Francis Lewis Blvd	Queens	Y	Y
Little Flowers Early Childhood Center, Inc.	Day Care – Assisted Living	234-10 & 234-14 Merrick Blvd	Queens	Y	Y
DCAIB Center Ltd.	Day Care – Assisted Living	140-17 243rd St	Queens	Y	Y
It's a Happy Day at Kiddy Corner	Day Care – Assisted Living	243-55 & 243-37 Merrick Blvd	Queens	Y	Y
Our Kids Place Country Day	Day Care – Assisted Living	137-25 Brookville Blvd	Queens	Y	Y
Samaritan Village	Day Care – Assisted Living	315 Beach 65th St	Queens	Y	Y
Skyway Men's Shelter	Day Care – Assisted Living	132-10 S Conduit Ave	Queens	Y	Y
Brookville Neighborhood Senior Center	Day Care – Assisted Living	133-33 Brookville Blvd	Queens	Y	Y
Saratoga Family Inn Day Care	Day Care – Assisted Living	175-15 Rockaway Blvd	Queens	N	Y
Day Care Center	Day Care – Assisted Living	16 Dewitt St	Valley Stream	Y	Y
Gan Chamesh Educational Center	Day Care – Assisted Living	748 Central Ave	Woodmere	Y	Y
Sylvester- Brown, Daisha	Day Care – Assisted Living	53 Dewitt St	Valley Stream	Y	Y
New Hope Lutheran Day School	Day Care – Assisted Living	60 Oliver Ave	Valley Stream	N	Y
Calderon, Brinia	Day Care – Assisted Living	118 Solomon Ave	Inwood	Y	Y
Gan Ami Inc.	Day Care – Assisted Living	508 Peninsula Blvd	Cedarhurst	Y	Y
The Marion & Aaron Gural JCC	Day Care – Assisted Living	207 Grove Ave	Cedarhurst	Y	Y

56 The following non-residential historic site is contained within the 2021 NEM DNL 65 contour, but is not noise-sensitive and therefore is not eligible for sound insulation: Trans World Airlines Flight Center. See Appendix D-2 of the JFK NEM Report for more information about this site.

TABLE 3-3 (CONTINUED)
NON-RESIDENTIAL NOISE-SENSITIVE STRUCTURES POTENTIALLY ELIGIBLE FOR SOUND INSULATION

Name[1]	Facility Type	Address	Borough/ Village/ Hamlet	Within 2016 NEM DNL 65 Contour?	Within 2021 NEM DNL 65 Contour?
PS 124 Osmond A Church	School	129-15 150th Ave	Queens	Y	Y
Rosedale Child Development Center	School	133-55 242nd St	Queens	Y	Y
Kulanu Academy	School	620 Central Ave	Cedarhurst	Y	Y
Temple Beth El Religious School	School/Historic Site	46 Locust Ave	Cedarhurst	Y	Y
St. Peter's Episcopal Church	Place of Worship	137-44 244th St	Queens	Y	Y
St. Clare's Rectory & Roman Catholic Church	Place of Worship	137-21 138th Ave & 137-35 Brookville Blvd (Adjacent)	Queens	Y	Y
Parkway Baptist Church	Place of Worship	138-23 Brookville Blvd	Queens	Y	Y
St. Peter's Lutheran Church	Place of Worship	224-04 & 228-13 147th Ave	Queens	Y	Y
Springfield Assembly Apostolic Faith	Place of Worship	230-41 Edgewood Ave	Queens	Y	Y
Throop Memorial Presbyterian	Place of Worship	140-15 Memphis Ave	Queens	Y	Y
Macedonia Baptist Church	Place of Worship	330 Beach 67th St	Queens	Y	Y
Kingdom Hall of Jehovah's Witnesses	Place of Worship	6-16 Beach 68th St	Queens	Y	Y
Community Life Ministries	Place of Worship	514 Beach 69th St	Queens	Y	Y
Battalion Pentecostal Assembly	Place of Worship/ Day Care	450 Beach 67th St	Queens	Y	Y
Mount Carmel Baptist Church	Place of Worship	348 Beach 71st St	Queens	Y	Y
St. John Baptist Church	Place of Worship	74-05 Rockaway Beach Blvd	Queens	Y	Y
Community Church of God	Place of Worship	3-51 Beach 74th St	Queens	Y	Y
Trinity Lutheran Church	Place of Worship	60 Oliver Ave	Valley Stream	N	Y
St. Gregorios Orthodox Church	Place of Worship	987 Elmont Rd	Valley Stream	N	Y
St. Joachim Roman Catholic Church and Rectory	Place of Worship/ Historic Site	614 Central Ave	Cedarhurst	Y	Y
Congregation Beth Medrash	Place of Worship	504 W Broadway	Cedarhurst	Y	Y
Ohr Moshe Torah	Place of Worship	703 W Broadway	Cedarhurst	Y	Y
Temple Beth El	Place of Worship/ Historic Site	46 Locust Ave	Cedarhurst	Y	Y
124 McGlynn Pl	Historic Site	124 McGlynn Pl	Cedarhurst	Y	Y

NOTE:
1 It is estimated that 8 percent of the listed non-residential noise-sensitive structures will later be found not to qualify for sound insulation.

SOURCE: ESA, 2020.

For the purposes of NCP cost estimation, it is assumed that three of the non-residential noise-sensitive structures listed in **Table 3-3** (approximately 8 percent) will not qualify for sound insulation.[57] The Port Authority produced a cost estimation for providing positive ventilation without sound insulation to these three non-residential noise-sensitive structures, assuming a construction cost of $150,000 for each structure. This estimate is based on recent conversations with sound insulation program management consultants and available construction cost index data.[58] To estimate the cost of positive ventilation for the three non-residential noise-sensitive structures, the RSMeans Square Foot Cost Estimating Guide[59] and information from similar projects at other airports were reviewed. To provide a basis for cost estimation, the square footage of each structure was determined using high-resolution aerial photography and Google Street View. Additional factors evaluated for each site included:

- Historic registration status as given by the New York City Landmarks Preservation Commission[60]
- Existence of air conditioning/positive ventilation
- A significant number of windows (including stained glass windows)
- Overall condition of the structure (good, fair, or poor)

A 10 percent contingency was then added for design, along with an additional 15 percent contingency for unforeseen conditions that may be encountered during construction. An estimate of soft costs (project administration, legal, etc.) associated with installation of positive ventilation was assumed to be similar to the soft costs associated with residential sound insulation, which was estimated to be approximately 30 percent of the construction costs. The total cost of providing positive ventilation to the three non-residential noise-sensitive structures is therefore estimated by the Port Authority as approximately $698,000.

Including sound insulation for the approximately 39 non-residential noise-sensitive structures that may be eligible for sound insulation, plus the cost of providing positive ventilation to the approximately three non-residential noise-sensitive structures that may only be eligible for positive ventilation, the total cost of JFK Land Use Measure 2 is therefore estimated by the Port Authority as approximately $127 million. The non-residential noise-sensitive structures are not automatically eligible for sound insulation or positive ventilation, as described in earlier paragraphs. If JFK Land Use Measure 2 is approved by the FAA, the Port Authority would then develop a noise mitigation protocol describing details of a noise mitigation program. The protocol would contain details of eligibility determinations, including consideration of building construction dates and other factors described above.

The Port Authority intends to fund a maximum of 80 percent of non-residential noise-sensitive structure sound insulation and positive ventilation with FAA AIP grants and at least the

[57] Based on field observations of the presence or absence of storm windows on a sample of properties around JFK, and data from the T.F. Green sound mitigation program (2013–2015).

[58] Gordian Construction Publishers & Consultants, Construction Cost Indexes with RSMeans data, Volume 44, Number 1, January 2018.

[59] The cost per square foot was determined through a review of similar projects at other airports, adjusted to 2018 dollars using the Building Cost Index published by Engineering News-Record and converted to the New York location factor published by RSMeans.

[60] https://www1.nyc.gov/site/lpc/index.page. Last accessed: March 19, 2019.

remaining 20 percent with fees paid by users of JFK pursuant to an agreement between the users and the Port Authority. Eighty percent of the eligible costs of sound insulation and positive ventilation could be funded with AIP grants; however, not all contingencies and soft costs may be eligible for AIP funding.

Conclusions: *JFK Land Use Measure 2: Sound-Insulate Eligible Non-Residential Noise-Sensitive Structures.* This could provide appropriate noise level reduction inside eligible non-residential noise-sensitive structures and improve the noise level reduction of the structures by at least 5 dB. The sound insulation of eligible non-residential structures could be an effective way to improve compatibility with aircraft noise.

Table 3-4 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Land Use Measure 2.

TABLE 3-4
IMPLEMENTATION SUMMARY FOR JFK LAND USE MEASURE 2: SOUND-INSULATE ELIGIBLE NON-RESIDENTIAL NOISE-SENSITIVE STRUCTURES

Implementation Item	Description
Benefits	Sound insulation treatments provide noise reduction inside noise-sensitive structures for compatibility with indoor activities. Once treated, the property is considered compatible.
Rationale	The Port Authority is recommending JFK Land Use Measure 2 because it could be an effective way to provide appropriate noise level reduction inside eligible non-residential noise-sensitive structures.
Responsible Parties	The Port Authority.
Estimated Costs	$127 million provide sound insulation treatments, assuming that 92 percent of the 42 non-residential noise-sensitive structures (approximately 39 non-residential noise-sensitive structures) would be eligible for sound insulation and the three remaining non-residential noise-sensitive structures may be eligible only for positive ventilation, subject to the assumptions and limitations set forth in Section 3.2.
Funding Sources	Up to 80 percent FAA AIP and at least 20 percent Port Authority. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	FAA approval; identification of eligible properties; secured funding to sound-insulate properties.
Estimated Schedule	The Port Authority will seek to request federal financial assistance to set up a sound insulation program for JFK when economic conditions recover following the COVID-19 pandemic and after any updates to the NEMs, if necessary. Consistent with Part 150 requirements, the Port Authority will evaluate any changes in the noise environment at JFK and notify the FAA whether the NEM continues to be a reasonable representation of current and/or forecast conditions at JFK or submit an updated NEM to the FAA for acceptance. The noise mitigation program set up task will determine the implementation schedule for JFK Land Use Measure 2.

SOURCES: Port Authority and ESA, 2018 and 2020.

3.3 Recommended Preventive Land Use Measures

Based on the experience of other airports and according to the FAA, the preventive land use measures discussed in this NCP can be effective in preventing the development of new noncompatible land uses. It is up to state and local governments to decide whether to pursue preventive land use measures to reduce noncompatible land use. Consistent with the requirements of 14 CFR Part 150, Appendix A, Sec. 150.123, the Port Authority met with land use planning entities in the communities surrounding JFK[61] to educate them about preventive land use measures and to learn their level of interest in potentially pursuing any of these approaches. A summary of those meetings is set forth in **Section 5.3.2** of this NCP, and meeting notes are provided in **Appendices E-5 through E-8**.

Based on this outreach, the land use planning agencies expressed willingness to explore preventive land use measures in the future, but were not at this time prepared to take action on most preventive measures discussed. At least one of the planning agencies expressed a preference for the Port Authority to focus on developing voluntary measures that would incentivize property owners to install noise mitigation rather than the jurisdictions themselves implementing preventive land use measures through changes in zoning or building codes. For further details on the discussions with land use agencies, see **Appendices E-5** through **E-8**.

The Port Authority acknowledges the local jurisdictions current positions to not pursue changes to their zoning and building codes to prevent future noncompatible land uses. To the extent that a state or local government would like to evaluate preventive land use measures sometime in the future, the Port Authority would make itself available to assist in any such evaluation. Therefore, solely to assist jurisdictions that may elect to pursue such land use measures in the future and based on comments from land use agencies, the Port Authority recommends the preventive land use measure set forth below.

JFK Land Use Measure 3: Include Aircraft Noise in Real Estate Disclosures

Real estate disclosure is a preventive land use strategy that is focused on raising property buyers' awareness of aircraft noise impacts. Real estate disclosures provide the opportunity for prospective buyers to learn about the property and the seller's experience in it. Such disclosures can inform buyers while also protecting the sellers from future legal action by revealing issues that can negatively affect the value, usefulness, or enjoyment of the property.[62] Some communities near airports include aircraft noise in real estate disclosure forms to ensure that the buyer is aware that the property is in the vicinity of an airport.

61 The Port Authority invited the City of Long Beach, Nassau County, National Park Service, New York City Department of Buildings, New York City Department of City Planning, Office of Congressman Tom Suozzi, Queens Borough President's Office, Town of Hempstead, Town of North Hempstead, Village of Lawrence, Village of Valley Stream, and the Village of Woodsburgh to land use planning discussions. All attended except the Village of Woodsburgh and the Village of Valley Stream.

62 https://www.zillow.com/blog/real-estate-disclosures-62807. Last accessed: March 20, 2019.

The decision whether to pursue such a policy is an issue for government entities to decide. However, should any state and/or local governments wish to evaluate this preventive land use measure, the Port Authority would be available to assist in any such evaluation. In particular, discussions with New York City suggested that New York City may support aircraft noise real estate disclosures. For further details on the discussions with land use agencies, see **Appendices E-5** through **E-8**.

Conclusions: *JFK Land Use Measure 3: Include Aircraft Noise in Real Estate Disclosures.* This could help inform buyers of aircraft noise while also protecting the sellers from future legal action by revealing issues that can negatively affect the value, usefulness, or enjoyment of the property.

Table 3-5 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Land Use Measure 3.

TABLE 3-5
IMPLEMENTATION SUMMARY FOR JFK LAND USE MEASURE 3: INCLUDE AIRCRAFT NOISE IN REAL ESTATE DISCLOSURES

Implementation Item	Description
Benefits	Including aircraft noise in real estate disclosures could provide the opportunity for prospective buyers to learn about aircraft noise exposure at the property and the seller's experience of it.
Rationale	The Port Authority is recommending JFK Land Use Measure 3 because it could help inform buyers of aircraft noise while also protecting the sellers from future legal action by revealing issues that can negatively affect the value, usefulness, or enjoyment of the property, and because one jurisdiction expressed interest in such a measure.
Responsible Parties	Land use jurisdictions.
Estimated Costs	The expected costs associated with development and implementation of this measure are unknown at this time.
Funding Sources	Land use jurisdictions.
Requirements	The decision whether to pursue such a policy is an issue for government entities to decide. The Port Authority will respond promptly to any request by a state and/or local government for assistance in evaluating this preventive land use measure.
Estimated Schedule	Not scheduled at this time.

SOURCES: Port Authority and ESA, 2018 and 2020.

3.4 Land Use Strategies Considered but Not Recommended for Inclusion in This NCP

The Port Authority considered, but does not recommend the following land use strategies as part of the JFK NCP.

Acquire Noncompatible Residential Parcels

Acquisition of noncompatible residential parcels is a corrective land use strategy because it reduces noncompatible land use by converting the noncompatible land use to a compatible land use. Land acquisition is the most effective means available to airports under 14 CFR Part 150 to change the land use from noncompatible to compatible with aircraft noise exposure. However, the acquisition of residential properties has the potential to fragment established neighborhoods and communities, depending on the number of property owners that voluntarily choose to sell their property.

***Reason for not recommending for inclusion in this NCP*:** Acquisition of noncompatible residential parcels has the potential to fragment established neighborhoods and communities. See Proposed Land Use Strategy #4 on **page G-22** of **Appendix G.**

Implement Sound Attenuation for New Development

Implementing sound attenuation for new development would involve revision of building codes. The main purpose of building codes is to protect public health, safety, and general welfare as they relate to the construction and occupancy of structures. Building codes are codified and enacted into law within a particular jurisdiction. Local jurisdictions interested in reducing aircraft noise exposure can amend their building codes to specify a required interior noise level in terms of DNL and/or a specific noise level reduction in terms of Sound Transmission Class,[63] Outdoor to Indoor Transmission Class,[64] or both.

During the NCP phase of the 14 CFR Part 150 Study, the Port Authority held several discussions with land use agencies. New York City's current building code does not address noise that emanates from sources outside of a building and does not have sound-attenuating construction requirements for exterior walls to mitigate outside noise. New York City advised that amending the building code to address external-source noise mitigation would require coordination among multiple New York City agencies and is not of interest at this time. Although New York City has not expressed an interest in pursuing such amendments of its building code at this time, the Port Authority would be available to assist New York City should it elect to pursue raising minimum building standards as a measure in future updates to the NCP. For further details on the discussions with land use agencies, see **Appendices E-5** through **E-8**.

63 Sound Transmission Class is a rating of how well a building wall attenuates airborne sound. See ASTM E413, "Classification for Rating Sound Insulation."

64 Outdoor to Indoor Transmission Class is a rating of the noise reduction provided by a structure. See ASTM E1332, "Standard Classification for Rating Outdoor-Indoor Sound Attenuation."

***Reason for not recommending for inclusion in this NCP*:** Implementing sound attenuation for new development is not of interest to land use agencies at this time. See Proposed Land Use Strategies #5 and #6 on **pages G-22** and **G-23** of **Appendix G**, respectively. For further details on the discussions with land use agencies, see **Appendices E-5** through **E-8**.

Acquire Avigation Easements

An avigation easement is a conveyance of airspace over another property for use by an airport. The property owner has restricted use of their property subject to the airport sponsor's easement for overflight and other applicable restrictions on the use and development of the parcel. Easement rights acquired typically include the following: the "right-of-flight" of aircraft; the right to cause noise, dust, and other environmental disturbances; the right to remove all objects protruding into the airspace together with the right to prohibit future obstructions or interference in the airspace; and the right of ingress and egress on the land to exercise the other rights acquired. Avigation easements run with the land (i.e., are attached to the property for so long as the easement is in effect). Therefore, an avigation easement binds future property owners and informs them of the property's exposure to aircraft noise while also restricting use of the parcel as described in the avigation easement.

As set forth in **Section 3.2**, the Port Authority will require avigation easements in exchange for installation of sound insulation. Avigation easements can also be obtained in exchange for compensation, but the Port Authority is not recommending that as a mitigation measure. Easement acquisition as a stand-alone measure would require payment to the parcel owner in accordance with FAA AC 150-5100-17, "Land Acquisition and Relocation Assistance for Airport Improvement Program (AIP) Assisted Projects," Section 2.2.8, "Appraisal of Avigation Easements Acquired for Airport Operations and Standards." The Port Authority is not recommending acquisition of easements other than avigation easements in conjunction with sound insulation and positive ventilation.

***Reason for not recommending for inclusion in this NCP*:** Avigation easements do not reduce noise and therefore do not reduce the number of noncompatible structures within the DNL 65 contour. See Proposed Land Use Strategy #22 on **page G-27** of **Appendix G**. The Port Authority will require avigation easements in exchange for installation of sound insulation, as set forth in **Section 3.2**.

Implement Rezoning of Land Uses

The creation or revision of zoning rules is a preventive land use strategy because it is focused on reducing or preventing construction of future noncompatible uses in areas impacted by aircraft noise.

***Reason for not recommending for inclusion in this NCP*:** During the NCP phase of the 14 CFR Part 150 Study, the Port Authority held several discussions with land use agencies. In general, land use agencies did not support rezoning to promote compatible land use. For further details on the discussions with land use agencies, see **Appendices E-5** through **E-8**. Furthermore, the communities surrounding JFK are already heavily developed, limiting the effectiveness of

rezoning. The Port Authority does not have jurisdiction over zoning codes, but would work with land use and regulatory agencies if they are interested in pursuing noise-related zoning code changes specifically focused toward new development, and may reconsider this as a measure in future updates to the NCP. See Proposed Land Use Strategies #12 through #14 on **pages G-24** and **G-25** of **Appendix G**.

Establish Transferable Development Rights

Transferable Development Rights (TDR) is a zoning technique that redirects development from a location where development is not desired by the jurisdiction to a location that the jurisdiction considers to be best suited for development. Under a TDR program, development rights are treated as a separate article of property that can be sold to a noncontiguous parcel or even to land owned by someone else. In the case of aircraft-related noise, TDR could be used to direct development of noise-sensitive land uses to areas of less noise impact. However, TDR does not reduce noise by itself.

***Reason for not recommending for inclusion in this NCP*:** TDR does not reduce noise and therefore does not reduce the number of noncompatible structures within the DNL 65 contour. This strategy also was not supported by land use agencies. See Proposed Land Use Strategy #15 on **page G-25** of **Appendix G**. For further details on the discussions with land use agencies, see **Appendices E-5** through **E-8**.

Provide Purchase Assurances for Properties in the DNL 65 Contour

This strategy involves the Port Authority agreeing to acquire noise-impacted properties as a purchaser of last resort.

***Reason for not recommending for inclusion in this NCP*:** The Port Authority's recommended NCP measures, once approved and implemented, will make noncompatible land uses compatible with airport operations. Therefore, purchase assurances will not be necessary for properties located within the DNL 65 contour. See Proposed Land Use Strategy #16 on **page G-25** of **Appendix G**.

Provide Voluntary Incentives to Property Owners to Install Noise Mitigation

This strategy involves the Port Authority providing financial incentives to property owners to pro-actively install noise mitigation.

***Reason for not recommending for inclusion in this NCP*:** Voluntary incentives would not qualify for federal noise mitigation funds, as they are considered to be operational costs for implementation of an NCP. Such costs are ineligible for federal noise mitigation funds.[65] See Proposed Land Use Strategy #17 on **page G-25** of **Appendix G**.

[65] FAA Order 5100.38D, *Airport Improvement Program Handbook*, Table C-5, Row 21, dated 9/30/2014.

Install Insulation Bubbles/Closures over Parks/Outdoor Space

This strategy involves the Port Authority providing physical enclosures over outdoor spaces to reduce noise levels in those spaces.

***Reason for not recommending for inclusion in this NCP*:** This strategy would enclose and reduce the utility of outdoor space, which is valued in part due to the access provided to open air and sunlight. See Proposed Land Use Strategy #18 on **page G-26** of **Appendix G**.

Provide Sound Insulation to All Properties within Certain Noise Contours

The Port Authority received suggestions to provide sound insulation to all properties within the DNL 65 contour and all new residential development within the DNL 55 contour.

***Reason for not recommending for inclusion in this NCP*:** Properties must meet specific criteria, provided in **Section 3.2**, in order to be eligible for federally funded sound insulation. In particular, federal funding is generally not available for sound insulation of properties outside of the DNL 65 contour. Furthermore, no federal funding would be available for sound insulation of properties constructed after August 4, 2008. This is the date upon which FAA-approved DNL contours for JFK were first made public.[66] See Proposed Land Use Strategies #19 through #21 on **pages G-26** and **G-27** of **Appendix G**.

Place a Moratorium on Development, Growth, and Expansion of JFK Until Noise Mitigation Measures Have Been Implemented

This strategy involves restricting JFK development until after noise mitigation measures have been implemented, as well as establishing zoning regulations to inhibit further expansion of residential communities in the JFK DNL 55 and higher contours.

***Reason for not recommending for inclusion in this NCP*:** This strategy is incompatible with the intent of 14 CFR Part 150, which is to reduce noncompatible land use rather than restrict airport growth and development. See Proposed Land Use Strategy #7 on **page G-23** of **Appendix G**.

Establish Property Disclosure Laws

The Port Authority received a number of suggestions to establish noise-related property disclosure laws with specific noise thresholds or add noise-related notices on deeds.

***Reason for not recommending for inclusion in this NCP*:** The Port Authority understands that the intention of the suggested strategies is to help potential property buyers be aware of aircraft noise exposure. The measure to include aircraft noise in real estate disclosures, as shown in **Section 3.2**, captures this intention. Furthermore, adding notices on deeds was not supported by land use agencies. See Proposed Land Use Strategies #8 through #11 on **pages G-23** and **G-24**

[66] Notice of Availability and Request for Comment, Environmental Assessment, Delay Reduction Program – New Taxiways, Improvements to Existing Taxiways, and Runway 13R Threshold Relocation, John F. Kennedy International Airport, Jamaica, New York. *Newsday*, August 4, 2008.

of **Appendix G**. For further details on the discussions with land use agencies, see **Appendices E-5** through **E-8**.

3.5 Summary of Recommended Land Use Measures

Appendix H summarizes the full list of recommended land use measures.

Measures with Schedule Dependent Upon External Factors/Pandemic Recovery

- Sound-Insulate Eligible Dwelling Units
- Sound-Insulate Eligible Non-Residential Noise-Sensitive Structures

Measures Not Scheduled at This Time

- Include Aircraft Noise in Real Estate Disclosures

CHAPTER 4
Noise Compatibility Program – Program Management Measures

Program management measures would enable the Port Authority to monitor the implementation and compliance of the recommended noise abatement and land use measures in **Chapters 2** and **3** of this NCP, as well as enhance the stakeholders' understanding of aircraft noise. Program management measures are critical to the success of the NCP. This chapter details the following 12 program management measures recommended for inclusion in this NCP:

- Maintain Noise Office
- Maintain Noise and Operations Management System
- Maintain Public Flight Tracking Portal
- Maintain Noise Complaint Management System
- Maintain Noise Office Website
- Continue Community Outreach Activities
- Establish and Manage a Fly Quiet Program
- Make Aircraft Noise Contours Available in a Geographic Information System (GIS)
- Update the Noise Exposure Map
- Update the Noise Compatibility Program
- Post Monthly Color-Coded DNL Values on Port Authority Website
- The Port Authority to Coordinate with the FAA on Development and Implementation of NextGen Procedures

4.1 Existing Program Management Measures

The Port Authority has been proactive in establishing program management strategies to address aircraft noise concerns, as presented in **Table 2-1**. The Port Authority currently has several programs in place to monitor aircraft noise exposure and engage local communities in understanding aircraft noise. These include a flight tracking system, a fully staffed noise office, and other related strategies, as described below.

- **Noise Office**

  The Port Authority's Noise Office, which was established in 2014, manages the noise programs for JFK, LGA, EWR, and TEB, including the 14 CFR Part 150 Studies for each airport. Currently, six full-time employees staff the Port Authority's Noise Office, providing public liaising as well as management of the noise monitoring, flight tracking, and complaint management systems in place. The Noise Office operates as the principal office for receiving and responding to aircraft noise complaints from the public and interfacing with stakeholder representatives, noise-impacted communities, and airport users. Noise Office staff regularly communicate with FAA personnel, aircraft operators, community members, and aviation industry associations about aircraft noise. In addition, the Noise Office investigates and responds to aircraft noise complaints, compiles data for reports to the public and FAA, operates and maintains the Port Authority's Noise and Operations Management System (NOMS) and the public flight tracking portal system, participates in community meetings to discuss aircraft noise issues, and meets with elected officials to discuss aircraft noise issues.

- **Noise and Operations Management System**

  The Port Authority first established a noise monitoring system for JFK in 1959, consisting of one monitor. The original system required manual correlation of measured noise levels with individual aircraft operations; a system upgrade in 1992 added flight tracking and automated this process. The current NOMS is a system called ANOMS, a product of EMS Brüel & Kjær.[67] This product was installed in 2013 and collects noise monitoring data in the vicinity of JFK using permanent and portable noise monitors. The current contract for software, maintenance, and training extends through 2022. ANOMS receives flight-tracking data from the FAA and can link noise events and complaints to specific aircraft operations. In addition to providing reliable airport operations and noise monitoring data, ANOMS allows investigation and validation of noise complaints, and provides historical data on runway use, flight tracks, and weather. ANOMS data is used by the Port Authority to enforce the departure noise limit of 112 PNdB. For further details, see Section 2.6.5 of the JFK NEM Report. Currently, 19 monitors are located near JFK, as shown in **Figure 2-1**. Of the 19 noise monitors, 10 noise monitors are located within the 2021 NEM DNL 65 contour. The locations of these noise monitors can also be seen on Map 1 of the full-size 2021 NEM in Appendix M of the JFK NEM Report.

- **Public Flight Tracking Portal (WebTrak)**

  The public can view aircraft movements within the New York metropolitan area using the Port Authority's public flight tracking portal, which was established in 2014. The current flight tracking portal, named WebTrak, is a public access component of ANOMS located on the Port Authority's website. For each aircraft operation, WebTrak provides specific information regarding aircraft type, altitude, origin and destination airports, and flight identification. Noise level readings at the noise monitors near JFK are also shown in A weighted instantaneous sound-pressure level readings. The public can use WebTrak to submit a noise complaint to the Port Authority via a link to an online complaint form. The Port Authority also posts runway closure information in a pop-up window on the main WebTrak web page, which is updated on a weekly basis.

67 Available: https://www.emsbk.com/anoms/

- **Noise Complaint Management System (PlaneNoise®)**

  The Port Authority collects and manages noise complaint information from each of the airports in its system. An electronic noise complaint management system, named PlaneNoise®, was implemented in 2012. There are three primary means of filing an aircraft noise complaint: (1) a form on the Port Authority's website, (2) a dedicated noise complaint telephone hotline, or (3) the WebTrak website. Noise complaints are collected with the help of the Port Authority's PlaneNoise® complaint management system. Each complaint received is compiled in a database, verified for accuracy, analyzed, and mapped for reporting. The Port Authority provides noise complaint reports to the FAA on a monthly basis for informational purposes.

- **Noise Office Website**

  The Port Authority maintains a Noise Office website, which provides links to web pages describing the Port Authority's various noise management programs. The Noise Office website was established in 2015. These include links to submit a noise complaint, WebTrak, noise monitoring, data reports, and airport community roundtables. The noise information website also contains a link to frequently asked questions (FAQs) and a central web page for each of the Port Authority's JFK, LGA, EWR, and TEB 14 CFR Part 150 Studies.

- **Community Outreach**

  The Port Authority, in collaboration with the FAA and representatives of communities surrounding its airports, facilitated the development of airport community roundtables for JFK, LGA, EWR, and TEB. Each community roundtable meets on a regular basis to provide opportunities for its members to maintain open communication with the Port Authority and the FAA, seeking mutual and feasible ways to manage aircraft noise impacts. The Port Authority and the FAA participate in the New York Community Aviation Roundtable (NYCAR), which was established in 2014.

4.2 Recommended Program Management Measures

The Port Authority has considered and is recommending the following program management measures for implementation.

JFK Program Management Measure 1: Maintain Existing Noise Office

The Port Authority's Noise Office is a vital link between the Airport and communities on aircraft noise concerns. After the FAA's approval of the recommended NCP measures, the Port Authority's Noise Office's responsibilities will expand to include implementation of the recommended NCP measures and monitoring adherence with the implemented noise abatement measures. It is possible that the Port Authority may need additional staff resources in the Noise Office to adequately address the increased responsibilities that come with the implementation and monitoring of NCPs at JFK, LGA, EWR, and TEB.

Conclusions: *JFK Program Management Measure 1: Maintain Existing Noise Office.* This will enable the Port Authority to continue to understand, respond to, and address community concerns associated with aircraft noise from JFK operations. In the future, the Noise Office will facilitate the implementation of the new measures recommended for inclusion in the JFK 14 CFR Part 150 NCP, as approved by the FAA.

Table 4-1 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 1.

TABLE 4-1
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 1: MAINTAIN EXISTING NOISE OFFICE

Implementation Item	Discussion
Benefits	The existing Noise Office enables the Port Authority to understand, respond to, and address community concerns associated with aircraft noise from JFK operations. In the future, the Noise Office will continue to maintain the existing program management measures, facilitate the implementation of the new approved NCP measures, and monitor compliance with them.
Rationale	The Port Authority is recommending JFK Program Management Measure 1 because the existing Noise Office is the principal office for receiving and responding to aircraft noise complaints from the public and interfacing with stakeholder representatives, noise-impacted communities, and Airport users. With the completion of the NCP, the Noise Office staff will be critical in successful implementation of the approved NCP measures.
Responsible Parties	The Port Authority.
Estimated Costs	The FAA does not fund program operating expenses. The Port Authority will continue to fund the operation of the Noise Office.
Funding Sources	The Port Authority. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	Port Authority approval for additional staff if and when required.
Estimated Schedule	This measure is already implemented; the Port Authority will continue to operate the Noise Office.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Program Management Measure 2: Maintain Noise and Operations Management System

The Port Authority's NOMS supports the investigation of noise complaints as well as communication with the public about the noise environment associated with JFK. NOMS also retains historical data so that noise and operational trends can be determined. Maintenance of the NOMS will enable the Port Authority to investigate noise complaints and will provide a means to monitor adherence to NCP noise abatement measures for JFK. Of the 19 noise monitors in the current JFK NOMS, 10 noise monitors are located within the 2021 NEM DNL 65 contour. These noise monitors can be seen on Map 1 of the full-size 2021 NEM in Appendix M of the JFK NEM Report.

Conclusions: *JFK Program Management Measure 2: Maintain Noise and Operations Management System.* This will enable the Port Authority Noise Office to maintain its ability to investigate noise complaints and provide a means to monitor compliance with NCP noise abatement measures for JFK. The Port Authority will continue to upgrade NOMS software and noise monitors to incorporate future monitoring and flight tracking technologies that would be beneficial to the functions of the Noise Office.

Table 4-2 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 2.

TABLE 4-2
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 2: MAINTAIN NOISE AND OPERATIONS MANAGEMENT SYSTEM

Implementation Item	Discussion
Benefits	The NOMS enables the Port Authority Noise Office to correlate noise-monitoring data with individual aircraft operations at JFK. This supports the investigation of noise complaints as well as communication with the public about the noise environment associated with JFK.
Rationale	The Port Authority is recommending JFK Program Management Measure 2 because the NOMS is a key tool used by the Noise Office.
Responsible Parties	The Port Authority.
Estimated Costs	The FAA does not fund program operating expenses. The Port Authority will continue to fund the maintenance of the existing system. However, if a system upgrade and/or replacement is needed in the future, the cost is expected to be to be approximately $90,000. If any of the existing noise monitors need to be replaced and/or upgraded in the future, the cost for hardware and installation of each noise monitor is expected to be approximately $35,000. These cost estimates are determined based on the development of the existing system as a baseline with added future anticipated cost for system upgrades and/or replacement. If any noise monitor located within the DNL 65 contour needs replacement and/or upgrade, the cost for the replacement and/or upgrade may be eligible to be partially funded by the FAA.
Funding Sources	For replacement and/or upgrades of any noise monitor located within the DNL 65 contour: 80 percent FAA AIP and 20 percent Port Authority. For other system components: The Port Authority. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	FAA approval of this measure, and Port Authority to secure funding for system replacement and/or upgrades.
Estimated Schedule	This measure is already implemented; the Port Authority will continue to maintain the existing NOMS. Within three years of the FAA's ROA, the Port Authority will attempt to request a federal grant for system replacement and/or upgrades.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Program Management Measure 3: Maintain Public Flight Tracking Portal

The existing public flight-tracking portal is an internet-based system that allows the public to view aircraft movements in the New York area via a website. The flight-tracking portal provides a public interface for the Port Authority's NOMS and is therefore a key communication and educational tool used by the Noise Office.

Conclusions: *JFK Program Management Measure 3: Maintain Public Flight Tracking Portal.* This will enable the Port Authority Noise Office to continue providing information to the public about aircraft operations and associated noise levels at JFK. The Port Authority will continue to explore new technologies to incorporate into its flight tracking portal system that would be beneficial to the functions of the Noise Office and the needs of the communities.

Table 4-3 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 3.

TABLE 4-3
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 3: MAINTAIN PUBLIC FLIGHT TRACKING PORTAL

Implementation Item	Discussion
Benefits	The public flight-tracking portal enables the Port Authority Noise Office to provide information to the public about aircraft operations and associated noise exposure at JFK. This supports the Noise Office function of communicating with the public about the impacts of operations at JFK.
Rationale	The Port Authority is recommending JFK Program Management Measure 3 because the existing public flight-tracking portal is a key tool used by the Noise Office. Costs of system upgrades are to be determined, based on appropriate future technologies, and will be partially funded by the FAA.
Responsible Parties	The Port Authority.
Estimated Costs	The FAA does not fund program operating expenses. The Port Authority will continue to fund the maintenance of the existing system. However, if a system upgrade and/or replacement is needed in the future, the cost is expected to be to be approximately $4,000. The cost estimate is determined based on the development of the existing system as a baseline with added future anticipated cost for system upgrades and/or replacement. The cost for the implementation of this measure is eligible to be partially funded by the FAA.
Funding Sources	For system upgrades: 80 percent FAA AIP and 20 percent Port Authority. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	FAA approval of this measure, and Port Authority to secure funding for the system upgrades.
Estimated Schedule	This measure is already implemented; the Port Authority will continue to maintain the existing public flight-tracking portal. Within three years of the FAA's ROA, the Port Authority will attempt to request a federal grant for system replacement and/or upgrades.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Program Management Measure 4: Maintain Noise Complaint Management System

The existing noise complaint management system is used by the Port Authority to collect and manage noise complaint information from each of the airports in its system. The Port Authority provides noise complaint reports to the FAA on a monthly basis for informational purposes. The use of a noise complaint management system enables the Noise Office to efficiently respond to noise complaints and gain insights from noise complaint data.

Conclusions: *JFK Program Management Measure 4: Maintain Noise Complaint Management System.* This will enable the Port Authority Noise Office to continue efficient collection and reporting of noise complaints associated with operations at JFK. The Port Authority will continue to upgrade its noise complaint management system to incorporate future functionality that would be beneficial to the functions of the Noise Office and the needs of the communities.

Table 4-4 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 4.

TABLE 4-4
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 4: MAINTAIN NOISE COMPLAINT MANAGEMENT SYSTEM

Implementation Item	Discussion
Benefits	The existing noise complaint management system, provided by PlaneNoise, enables the Port Authority Noise Office to efficiently collect and report noise complaints associated with aircraft operations at JFK. This supports the Noise Office function of communicating with the public about the impacts of operations at JFK.
Rationale	The Port Authority is recommending JFK Program Management Measure 4 because the existing noise complaint management system supports the function of the Noise Office.
Responsible Parties	The Port Authority.
Estimated Costs	The FAA does not fund operating expenses. The Port Authority will continue to fund the maintenance of the existing system. However, if a system upgrade and/or replacement is needed in the future, the cost is expected to be to be approximately $4,000. The cost estimate is determined based on the development of the existing system as a baseline with added future anticipated cost for system upgrades and/or replacement. The cost for the implementation of this measure is eligible to be partially funded by the FAA.
Funding Sources	For system upgrades: 80 percent FAA AIP and 20 percent Port Authority. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	FAA approval of this measure; and Port Authority to secure funding for the system upgrades.
Estimated Schedule	This measure is already implemented; the Port Authority will continue to maintain the existing noise complaint management system. Within three years of the FAA's ROA, the Port Authority will attempt to request a federal grant for system replacement and/or upgrades.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Program Management Measure 5: Maintain Noise Office Website

The Port Authority's Noise Office website provides links to submit a noise complaint, public flight tracking portal, noise monitoring, data reports, and airport community roundtables. The noise information website also contains a link to a central web page for each of the Port Authority's JFK, LGA, EWR, and TEB 14 CFR Part 150 Studies. Thus, the Noise Office website serves as a single point of entry to all of the publicly available information and services provided by the Noise Office.

Conclusions: *JFK Program Management Measure 5: Maintain Noise Office Website.* This will enable the Port Authority Noise Office to continue providing a single point of entry to all of the publicly available information and services associated with JFK provided by the Noise Office. The Port Authority will continue to upgrade its Noise Office website to incorporate future functionality that would be beneficial to the Noise Office and the needs of communities.

Table 4-5 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 5.

TABLE 4-5
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 5: MAINTAIN NOISE OFFICE WEBSITE

Implementation Item	Discussion
Benefits	The existing Noise Office website provides links to the Port Authority's publicly available information and services associated with the noise environment at JFK. This supports the Noise Office function of communicating with the public about the impacts of operations at JFK.
Rationale	The Port Authority is recommending JFK Program Management Measure 5 because the existing Noise Office website supports the function of the Noise Office.
Responsible Parties	The Port Authority.
Estimated Costs	The FAA does not fund program operating expenses. The Port Authority will continue to fund maintenance and upgrades of the Noise Office website.
Funding Sources	The Port Authority. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	Not applicable.
Estimated Schedule	This measure has already been implemented; the Port Authority will continue to maintain and upgrade the Noise Office website.

SOURCES: Port Authority and ESA, 2018 and 2019.

JFK Program Management Measure 6: Continue Community Outreach Activities

The Port Authority facilitated the development of an airport community roundtable for JFK and LGA, named the New York Community Aviation Roundtable, in collaboration with the FAA and representatives of nearby communities. The NYCAR was launched in 2014. The Port Authority and the FAA have non-voting advisory status on the NYCAR, as indicated in the NYCAR by-laws.[68]

The Roundtable has a sub-committee specifically focused on JFK operations. The Roundtable meets on a regularly scheduled basis to provide ongoing communication with the Port Authority and the FAA, seeking mutual and feasible ways to manage aircraft noise impacts. The Noise Office leverages these types of in-person outreach activities to support and maintain meaningful dialogue with communities, the FAA, and other aviation stakeholders regarding aircraft noise.

Conclusions: *JFK Program Management Measure 6: Continue Existing Community Outreach Activities.* This will enable the Port Authority Noise Office to support and maintain meaningful dialogue with the communities, the FAA, and other aviation stakeholders regarding aviation noise at JFK. The Port Authority will continue to participate in the NYCAR.

Table 4-6 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 6.

TABLE 4-6
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 6: CONTINUE COMMUNITY OUTREACH ACTIVITIES

Implementation Item	Discussion
Benefits	Community outreach activities enable the Port Authority to support and maintain meaningful dialogue regarding aircraft noise at JFK. This supports the Noise Office function of communicating with the public about the impacts of operations at JFK.
Rationale	The Port Authority is recommending JFK Program Management Measure 6 because existing community outreach activities support the function of the Noise Office.
Responsible Parties	The Port Authority.
Estimated Costs	No FAA funding is required to implement, and the Port Authority will continue its community outreach activities.
Funding Sources	Not applicable at this time. The Port Authority would seek reimbursement if funding becomes available in the future. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	Not applicable.
Estimated Schedule	This measure has already been implemented; the Port Authority will continue its community outreach activities.

SOURCES: Port Authority and ESA, 2018 and 2020.

68 Available: https://aircraftnoise.panynj.gov/nycar-by-laws/

JFK Program Management Measure 7: Establish and Manage a Fly Quiet Program

A Fly Quiet Program is a voluntary collaboration of the airport proprietor, aircraft operators, and air traffic controllers that encourages pilots and air traffic controllers to use noise abatement flight procedures and preferential runways. It also typically includes an aircraft operator/pilot awareness campaign with promotional materials (e.g., handouts/flyers, signage, and other educational materials) to ensure pilots know about the recommended noise abatement procedures at the Airport. Adherence to the Fly Quiet Program would benefit surrounding noncompatible land uses by reducing aircraft noise on both a single-event and cumulative basis, in part through encouraging aircraft operators to proactively reduce aircraft noise levels. The exact reduction in aircraft noise levels would be dependent on the level of adherence to the program.

The Port Authority recommends initiating a voluntary Fly Quiet Program for JFK to develop solutions for abating noise from aircraft operations. The Fly Quiet Program would be used to facilitate implementation of recommended noise abatement measures approved by the FAA. The Fly Quiet Program would also be used as a forum for developing and discussing noise abatement measures that may provide benefits outside of the 14 CFR Part 150 process. The Noise Office would monitor aircraft operator adherence to the voluntary noise abatement procedures through the Fly Quiet Program and would issue a report describing this adherence. The program would also include the preparation of comprehensive reports of DNL values at noise monitors using the data acquired and maintained in the Port Authority's NOMS. The Fly Quiet noise reports would be published on the Noise Office website to document the progress of the program and shared with various stakeholders, including but not limited to the FAA, NYCAR members, land use planners, and aircraft operators.

Conclusions: *JFK Program Management Measure 7: Establish and Manage a Fly Quiet Program.* This could enable the collaborative development and management of solutions to abate noise from aircraft operations at JFK. The program could include engagement with pilots, FAA air traffic controllers, and other stakeholders at JFK.

Table 4-7 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 7.

TABLE 4-7
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 7: ESTABLISH AND MANAGE A FLY QUIET PROGRAM

Implementation Item	Discussion
Benefits	Establishment and management of a Fly Quiet Program will enable the collaborative development and management of solutions for abating noise from aircraft operations at JFK.
Rationale	The Port Authority is recommending JFK Program Management Measure 7 so that aircraft noise can be collaboratively abated and managed at JFK.
Responsible Parties	The Port Authority.
Estimated Costs	Establishment of a Fly Quiet Program may cost approximately $150,000 based on previous efforts at other airports.
Funding Sources	80 percent FAA AIP and 20 percent Port Authority. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	FAA's approval of this measure, and Port Authority to develop the Fly Quiet Program.
Estimated Schedule	Within one year of the FAA's ROA for the NCP, the Port Authority will initiate development of the Fly Quiet Program.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Program Management Measure 8: Make Aircraft Noise Contours Available in a Geographic Information System (GIS)

An interactive NEM (presenting DNL 65 and higher contour lines) can provide the public, land use planning agencies, and other stakeholders with easy access to an airport's noise contours to enhance awareness and decision-making regarding aircraft noise. This measure would involve the Port Authority providing a Google Earth file (or other readily useable file) of the JFK 2021 NEM DNL 65, 70, and 75 dB contours to the public for download. The Port Authority could also host a map on its Noise Office website that would include these GIS layers as a downloadable file containing noise contour shapes for easy viewing by interested parties.

Interactive noise contour maps for JFK were developed as part of this Study, containing the 2016 and 2021 NEMs accepted by the FAA in 2017. Those maps allow users to determine whether their residence or other noise-sensitive building is within or outside of the DNL 65 contours. They were favorably received when showcased at the JFK draft NEM workshops and subsequently posted for public access on the JFK 14 CFR Part 150 Study website. It is the Port Authority's intention to maintain public access to these maps.

The Port Authority will also provide the 2021 NEM DNL 65 contours to the local planning agencies with land uses within the contour boundary.

Conclusions: *JFK Program Management Measure 8: Make Aircraft Noise Contours Available in a Geographic Information System (GIS).* This could provide the public, land use planning agencies, and other stakeholders with easy access to JFK 2021 NEM contours to enhance awareness and decision-making regarding aircraft noise.

Table 4-8 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 8.

TABLE 4-8
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 8: MAKE AIRCRAFT NOISE CONTOURS AVAILABLE IN A GEOGRAPHIC INFORMATION SYSTEM (GIS)

Implementation Item	Discussion
Benefits	Making JFK noise contours available in a GIS will provide the public, land use planning agencies, and other stakeholders with easy access to Future Conditions noise contours.
Rationale	The Port Authority is recommending JFK Program Management Measure 8 to provide easy access to JFK 2021 NEM contours that could enhance awareness and decision-making for interested parties regarding aircraft noise.
Responsible Parties	The Port Authority.
Estimated Costs	No FAA funding is required to implement, and the Port Authority has used available methods to provide public access to the existing interactive noise contour map.
Funding Sources	No funding required.
Requirements	Not applicable.
Estimated Schedule	This measure has already been implemented. The Port Authority will maintain public access to the existing interactive noise contour map.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Program Management Measure 9: Update the Noise Exposure Map

The FAA requires that an airport operator maintain NEMs that reflect current or reasonably projected conditions in order to obtain FAA funding for noise programs. Specifically, 14 CFR Part 150, Sec. 150.21(d), states that an airport operator shall "promptly prepare and submit a revised noise exposure map" if any change in the operation of the airport creates a "substantial, new noncompatible use" or a "significant reduction in noise over existing noncompatible uses" that is not reflected on the FAA-accepted NEM on record. The former condition reflects an increase of DNL 1.5 dB over noncompatible uses or uses that became noncompatible by the noise increase. The latter condition reflects a reduction of DNL 1.5 dB over uses that were formerly noncompatible but are made compatible by the noise reduction.

Consistent with Part 150 requirements, the Port Authority will evaluate any changes in the noise environment at JFK and notify the FAA whether the NEM continues to be a reasonable representation of current and/or forecast conditions at JFK or submit an updated NEM to the FAA for acceptance. The Port Authority anticipates updating the NEMs when operations at JFK stabilize as the aviation sector continues to recover from the COVID-19 pandemic.

Conclusions: *JFK Program Management Measure 9: Update the Noise Exposure Map.* This will enable the Port Authority to meet the requirements of 14 CFR Part 150, Sec. 150.21(d), if applicable changes in the noise environment occur at JFK.

Table 4-9 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 9.

TABLE 4-9
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 9: UPDATE THE NOISE EXPOSURE MAP

Implementation Item	Discussion
Benefits	Updating the NEM will enable the Port Authority to meet the requirements of 14 CFR Part 150 if applicable changes in the noise environment occur at JFK.
Rationale	The Port Authority is recommending JFK Program Management Measure 9 to meet the requirements of 14 CFR Part 150, Sec. 150.21(d).
Responsible Parties	The Port Authority.
Estimated Costs	Based on the cost of the JFK NEM development process, an NEM update may cost approximately $2 million. This estimate is based on costs for recent large airport 14 CFR Part 150 studies that the Study Team has participated in, including the NEM phase of the JFK 14 CFR Part 150 Study.
Funding Sources	80 percent FAA Airport Improvement Program and 20 percent Port Authority. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	FAA's approval of this measure, and Port Authority to secure funding for the update of the NEM when warranted.
Estimated Schedule	The Port Authority anticipates updating the NEMs when operations at JFK stabilize from the COVID-19 pandemic. Thereafter, the Port Authority expects to update the NEM in accordance with Section 174 of the FAA Reauthorization Act of 2018.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Program Management Measure 10: Update the Noise Compatibility Program

14 CFR Part 150, Sec. 150.23(e)(9), states that NCPs must include a "[p]rovision for revising the program if made necessary by revision of the noise exposure map." This may occur if a significant change is identified that results in a revision to the NEMs. Examples of changes are a large addition of noncompatible land uses, or new elements required to achieve land use compatibility. The NCP does not require an update each time an NEM is updated. The Port Authority anticipates updating the NCP when additional measures and/or modified measures are required to reduce noncompatible land use. The Port Authority is recommending this measure in order to meet 14 CFR Part 150 requirements if an update to the NCP is made necessary by a revision of the NEM.

Conclusions: *JFK Program Management Measure 10: Update the Noise Compatibility Program.* This will enable the Port Authority to meet the requirements of 14 CFR Part 150, Sec. 150.23(e)(9), if made necessary by a revision of the NEMs for JFK.

Table 4-10 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 10.

TABLE 4-10
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 10: UPDATE THE NOISE COMPATIBILITY PROGRAM

Implementation Item	Discussion
Benefits	Updating the NCP will enable the Port Authority to meet the requirements of 14 CFR Part 150 if a revision of the NCP is made necessary by a revision of the NEM for JFK.
Rationale	The Port Authority is recommending JFK Program Management Measure 10 to meet the requirements of 14 CFR Part 150, Sec. 150.23(e)(9).
Responsible Parties	The Port Authority.
Estimated Costs	Based on the Port Authority's experience with this Study, an NCP update may range from $300,000 to $2 million.
Funding Sources	80 percent FAA AIP and 20 percent Port Authority. Costs borne by the Port Authority would be recovered through fees paid by JFK users pursuant to an agreement between them and the Port Authority.
Requirements	FAA's approval of this measure, and Port Authority to secure funding for the update of the NCP when appropriate.
Estimated Schedule	Within two years of FAA acceptance of a revised NEM, the Port Authority will attempt to initiate a review of the NCP to determine if a revision is necessary.

SOURCES: Port Authority and ESA, 2018 and 2020.

JFK Program Management Measure 11: Post Monthly Color-Coded DNL Values on Port Authority Website

Noise monitoring reports with color-coded values could help the public, land use planning agencies, and other stakeholders easily understand the noise environment in the vicinity of JFK to enhance awareness and decision-making regarding aircraft noise. This measure would involve the Port Authority providing noise monitoring reports with monthly DNL values, for each noise monitor, that are coded with different colors based on which ranges the values fall into, such as DNL 60.0 to 64.9, DNL 65 to 69.9, and so on.

Noise monitoring reports with color-coded values are currently available on the Port Authority's aircraft noise website.[69] It is the Port Authority's intention to continue providing these reports.

Conclusions: *JFK Program Management Measure 11: Post Monthly Color-Coded DNL Values on Port Authority Website.* This could help the public, land use planning agencies, and other stakeholders easily understand the noise environment in the vicinity of JFK to enhance awareness and decision-making regarding aircraft noise.

Table 4-11 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 11.

TABLE 4-11
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 11: POST MONTHLY COLOR-CODED DNL VALUES ON PORT AUTHORITY WEBSITE

Implementation Item	Discussion
Benefits	Posting monthly color-coded DNL values on the Port Authority website could provide the public, land use planning agencies, and other stakeholders with easily understandable information about the noise environment in the vicinity of JFK.
Rationale	The Port Authority is recommending JFK Program Management Measure 11 to provide easy access to noise reports that could enhance awareness and decision-making for interested parties regarding aircraft noise.
Responsible Parties	The Port Authority.
Estimated Costs	No FAA funding is required to implement, and the Port Authority has used available information and methods to make the color-coded reports available.
Funding Sources	No funding required.
Requirements	Not applicable.
Estimated Schedule	This measure has already been implemented. The Port Authority will continue providing these reports.

SOURCES: Port Authority and ESA, 2018 and 2020.

[69] https://aircraftnoise.panynj.gov/reports/

JFK Program Management Measure 12: The Port Authority to Coordinate with FAA on Development and Implementation of NextGen Procedures

Description

The Port Authority supports the FAA's efforts to modernize the air transportation system to make flying safer, more efficient, and more predictable. The FAA's Next Generation Air Transportation System (NextGen) is a comprehensive overhaul of the National Airspace System to make air travel more convenient and dependable, while ensuring that flying is as safe, secure, and convenient as possible. Through NextGen, the FAA seeks to build the capability to guide and track aircraft more precisely and efficiently to save fuel and reduce noise and air pollution.[70] A key NextGen technology is Performance Based Navigation, which uses satellites to guide aircraft along precise flight paths.[71] These precise flight paths often result in the concentration of aircraft within narrow flight corridors. Because the use of NextGen procedures to guide aircraft along precise flight paths can increase the frequency of overflights of areas below the concentrated flight paths, the Port Authority recommends that the FAA coordinate closely with the Port Authority if and when it evaluates the implementation of NextGen flight procedures in the greater New York/New Jersey region.

FAA's NextGen implementation involves the management of flight procedures for numerous airports in the region and is not specific to JFK. The Port Authority is a member of the NextGen Advisory Committee (NAC),[72] which is a federal advisory committee that makes recommendations to the FAA regarding the possible implementation of NextGen in the New York/New Jersey/Philadelphia airspace; this includes air traffic and airspace management recommendations. Through participation in the NAC, the Port Authority can provide its insight for FAA consideration regarding future airspace and procedure designs for the region as a whole. The Port Authority expects to continue that collaborative approach. As a collaborating member of the NAC, the Port Authority can advance measures for further FAA evaluation by either directly engaging with FAA's NY TRACON or submitting measures to the NAC for its consideration.

Additionally, the FAA is working on ways to reduce the concentration of aircraft that results from the implementation of NextGen departure procedures. To address community concerns about the concentration of aircraft on particular flight procedures, Congress enacted legislation requiring FAA to consider dispersal headings[73] when FAA is proposing a new NextGen departure procedure or amending an existing procedure below 6,000 feet over noise-sensitive areas. "Dispersal headings" is a term used to describe the use of more than one departure heading from a runway, which may result in a reduced concentration of departing aircraft over areas close to the airport. Reducing the concentration of aircraft departures through the use of dispersal headings may assist in balancing noise exposure.

70 https://www.faa.gov/nextgen/. Last accessed: March 20, 2019.

71 https://www.faa.gov/nextgen/how_nextgen_works/new_technology/pbn/in_depth/. Last accessed: March 20, 2019.

72 https://www.faa.gov/about/office_org/headquarters_offices/ang/nac/. Last accessed: March 20, 2019.

73 Section 175 – Addressing Community Noise Concerns. FAA Reauthorization Act of 2018, Public Law No. 115-254 (effective October 5, 2018).

Following final approval of this NCP, the Port Authority will, in consultation with the affected communities, request that FAA consider dispersal headings or other lateral track variations pursuant to Section 175 of the FAA Reauthorization Act of 2018 when the FAA is evaluating new or amended area navigation departure procedures.

Conclusions: *JFK Program Management Measure 12: The Port Authority to Coordinate with FAA on Development and Implementation of NextGen Procedures.* This would allow the Port Authority to be aware of potential flight path changes that could affect aircraft noise exposure and land use compatibility around JFK. The implementation of NextGen departures in other areas of the United States has resulted in increased noise to some communities. The Port Authority seeks to avoid noise increases resulting from implementation of NextGen flight procedures and requests that the FAA coordinate closely with the Port Authority if and when it is interested in evaluating the implementation of NextGen in the New York/New Jersey region.

Table 4-12 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of JFK Program Management Measure 12.

TABLE 4-12
IMPLEMENTATION SUMMARY FOR JFK PROGRAM MANAGEMENT MEASURE 12: THE PORT AUTHORITY TO COORDINATE WITH FAA ON DEVELOPMENT AND IMPLEMENTATION OF NEXTGEN PROCEDURES

Implementation Item	Discussion
Benefits	Implementation of NextGen technologies for the improvement of flight procedures in the New York/New Jersey/Philadelphia area and potential noise benefits to noise-sensitive land uses.
Rationale	To find opportunities to reduce community noise exposure through the implementation of NextGen technologies in the airspace. The Port Authority would only support NextGen procedures that would not result in an increase in noise over residential areas.
Responsible Parties	The FAA is responsible for designing, testing, and implementing NextGen flight procedures and for completing the environmental review under NEPA, if required.
Estimated Costs	The expected costs associated with the development and implementation of NextGen procedures are internal to the FAA (e.g., ATO) and other coordinating agencies. The costs to implement such procedures within the FAA are unknown, and an FAA AIP grant would not be required.
Funding Sources	The FAA.
Requirements	FAA approval. Implementation of NextGen procedures may require environmental studies under NEPA.
Estimated Schedule	Ongoing, as part of the Port Authority's participation in the NAC.

SOURCES: Port Authority and ESA, 2018 and 2020.

4.3 Program Management Strategies Considered but Not Recommended for Inclusion in this NCP

The Port Authority considered, but does not recommend the following program management measures as part of the JFK NCP.

Add More Noise Monitors Throughout Queens and Nassau County

The Port Authority operates the NOMS that collects noise-monitoring data in the vicinity of JFK using permanent and portable noise monitors. Currently, the NOMS includes 19 noise monitors in proximity to JFK and can also link noise events and complaints to specific aircraft operations. The Port Authority received a number of suggestions to add more noise monitors and deploy functionality to increase noise monitor analysis capabilities.

***Reason for not recommending for inclusion in this NCP*:** At this time, the Port Authority is not recommending additional noise monitors because its current noise monitors provide coverage of multiple neighborhoods in the vicinity of JFK, including several neighborhoods in Queens as well as villages and hamlets in Nassau County. See Proposed Program Management Strategy #13 on **page G-29** of **Appendix G**.

Consider Improved Ground Transportation Access to Stewart International Airport to Balance Activity

This strategy involves the Port Authority improving ground transportation access to Stewart International Airport (SWF) by way of new or improved ground transportation infrastructure in an attempt to reduce demand at JFK.

***Reason for not recommending for inclusion in this NCP*:** The suggested strategy implies that improving ground transportation access to SWF would reduce operations at JFK by encouraging airline use of SWF instead of JFK. However, the Port Authority does not have control over airline flight schedules or the factors considered in their production. Therefore, the Port Authority is not recommending this measure for inclusion in the JFK NCP. See Proposed Program Management Strategy #14 on **page G-29** of **Appendix G**.

Multiple Suggestions of Aircraft Technology Changes

A number of stakeholders suggested that quieter aircraft technologies be incentivized for aircraft using JFK. These include the use of winglets and the installation of vortex generators on Airbus A320 aircraft. Noise-reducing technologies are already being explored by aircraft manufacturers, aircraft operators, the FAA, NASA, ICAO,[74] and others. The interactions between aircraft technologies, operating characteristics, and noise are complex, and aircraft designs must be evaluated and tested on a case-by-case basis to determine noise profiles. Under 14 CFR Part 36, the FAA is solely responsible for establishing domestic aircraft noise standards and certifying new aircraft to those standards.

[74] NASA – National Aeronautics and Space Administration; ICAO – International Civil Aviation Organization.

***Reason for not recommending for inclusion in this NCP*:** The Port Authority does not have direct control over aircraft technologies that could affect noise levels and thus cannot suggest specific aircraft technologies to aircraft operators. However, as discussed in **Section 4.2**, the Port Authority is recommending the implementation of a Fly Quiet program, which may encourage the use of newer/quieter aircraft at JFK. See Proposed Program Management Strategy #15 on **page G-29** of **Appendix G**.

4.4 Summary of Recommended Program Management Measures

Appendix H summarizes the full list of recommended program management measures.

Measures Already Implemented

- Maintain Existing Noise Office
- Maintain Noise and Operations Management System
- Maintain Public Flight Tracking Portal
- Maintain Noise Complaint Management System
- Maintain Noise Office Website
- Continue Community Outreach Activities
- Make Aircraft Noise Contours Available in a Geographic Information System (GIS)
- Post Monthly Color-Coded DNL Values on Port Authority Website

Measures to Be Initiated at JFK within One Year of FAA Record of Approval

- Establish and Manage a Fly Quiet Program

Measures to Be Implemented on an Ongoing Basis

- The Port Authority to Coordinate with FAA on Development and Implementation of NextGen Procedures

Measures for Which a Schedule Has Not Yet Been Determined

- Update the Noise Exposure Map
- Update the Noise Compatibility Program

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CHAPTER 5
Stakeholder Engagement

14 CFR Part 150, Sec. 150.23(c) requires development of an NCP and associated documentation:

> *"in consultation with FAA regional officials, the officials of the state and of any public agencies and planning agencies whose area, or any portion or whose area, of jurisdiction within the Ldn [DNL] 65 dB noise contours is depicted on the noise exposure map, and other Federal officials having local responsibility of land uses depicted on the map. Consultation with FAA regional officials shall include, to the extent practicable, informal agreement from FAA on proposed new or modified flight procedures. For air carrier airports, consultation must include any air carriers and, to the extent practicable, other aircraft operators using the airport."*

14 CFR Part 150, Sec. 150.23(d) requires airport operators to provide "adequate opportunity for the active and direct participation" of the following stakeholders:

- States
- Public and planning agencies in the areas surrounding the airport
- Aeronautical users of the airport (e.g., airlines, fixed base operators, based aircraft operators)
- The general public

The New York City Department of City Planning; Nassau County Planning Department; the planning departments of the Villages of Cedarhurst, Woodsburgh, and Valley Stream; and the NPS are the sole land use agencies for the land within the 2016 and 2021 NEM DNL 65 contours.

The Port Authority provided opportunities for meaningful public engagement and participation in development of the NCP. Agency consultation and public involvement efforts undertaken for this 14 CFR Part 150 Study are discussed in this chapter.

5.1 Technical Advisory Committee

The 14 CFR Part 150 Study process benefits from the creation and participation of a TAC. In general, the TAC serves several important functions, such as:

- Representing a broad range of stakeholder groups
- Receiving information about the Study and sharing it with TAC members' organizations
- Providing timely input to the Study
- In some cases, providing technical advice to the Study Team

5.1.1 Formation of the TAC

Pursuant to the Study Protocol in Appendix I of the JFK NEM Report, Section 2.5, the Port Authority formed a TAC to provide input into the 14 CFR Part 150 Study prepared for JFK. In order for the TAC to be effective and to be representative of all of the key perspectives, the Port Authority invited a diverse group of key stakeholders including, but not limited to, community representatives, airlines and other aircraft operators, local municipalities and jurisdictions, and land use planners. While representation needed to be broad, the TAC also needed to remain a reasonable size so that deliberations were efficient. A summary of the TAC meetings, including dates and topics discussed, is provided below.

5.1.2 Membership

The JFK TAC meetings were open to the public, and a standing agenda item was provided to offer the opportunity for public comments and discussion at every TAC meeting. Meeting announcements were sent to all TAC members (see **Appendix D** for a list of members) and posted on the Port Authority's website.[75] The JFK TAC served an advisory function only, meaning that the TAC was able to offer opinions, advice, and guidance for the Study, but the Port Authority had the sole discretion to accept or reject the TAC recommendations in accordance with 14 CFR Part 150. The Port Authority is the sponsor of the 14 CFR Part 150 Study, the owner and operator of JFK, and was a member of the TAC. The FAA, as the primary funding agency for the Study and as the approval authority, served as a key advisor of the TAC.

5.1.3 Summary of TAC Meetings

All TAC meeting materials associated with the NCP phase of this Study, including a list of TAC members, agendas, sign-in sheets, presentations, and meeting notes, are provided in **Appendix D** along with a list of TAC members. Note that no members of the public attended TAC Meeting #12; therefore, there are no sign-in sheets in **Appendix D** for that TAC meeting. TAC Meetings #1 through #9 focused solely on the JFK NEM development, and are not detailed in **Appendix D** or in this section; see Section 6.2 of the JFK NEM Report for summaries of those TAC Meetings. TAC Meeting #10 featured a review of both NEM and NCP material, and TAC Meetings #11 through #17 were devoted to the NCP development. Descriptions of TAC Meetings #10 through #17 are shown in **Table 5-1**.

[75] http://panynjpart150.com/JFK_homepage.asp.

TABLE 5-1
SUMMARY OF TAC MEETINGS #10 THROUGH #17

Meeting Number	Date	Theme	Description
10	Dec 14, 2016	Noise abatement strategies	• Summary of TAC meetings #1 through #9 • Hypothetical "what-if" scenarios involving operational changes and noise • Summary of key JFK flight procedures • Discussion of potential JFK noise abatement strategies
11	Feb 15, 2017	Land use strategies	• Contributions of arrivals and departures to JFK noise exposure • Summary of FAA responses to NCP strategies submitted for approval by other airport operators from 2000 through 2016 • Summary of land use strategy types • Discussion of potential JFK land use strategies
12	Apr 19, 2017	Noise abatement and program management strategies	• Several noise abatement strategies to be modeled • Types of program management strategies • Existing JFK program management strategies • Program management strategies suggested by the TAC and the public
13	Jun 21, 2017	Noise abatement strategies	• Additional noise abatement strategies to be modeled • Notification to the TAC that noise abatement strategies submitted after TAC Meeting 13 will be considered for inclusion in the NCP but cannot be modeled • Preliminary draft noise results for noise abatement strategies where modeling has been completed • JFK NCP preliminary outline
14	Oct 18, 2017	Noise abatement strategies	• Update on overall Study status • Indication that the Port Authority has discussed noise abatement strategies with the FAA and aircraft operators • Preliminary draft noise results for additional noise abatement strategies where modeling has been completed
15	Dec 13, 2017	Noise abatement strategies	• Significant information from previous TAC meetings • Common themes for JFK noise abatement strategies • List of all noise abatement strategies received by the Port Authority thus far
16	Jun 6, 2018	Noise abatement strategies	• Noise abatement strategies that may be recommended for the JFK NCP • Status of JFK NCP
17	Oct 16, 2019	Noise abatement, land use, and program management measures	• Noise abatement strategies that may be recommended for the JFK NCP update • Land use measures that may be recommended for the JFK NCP • Program management measures that may be recommended for the JFK NCP

SOURCES: Port Authority and ESA, 2018 and 2020.

5.2 Public Workshops, Public Hearing, and Other Stakeholder Opportunities to Comment

Members of the public who have an interest in the JFK 14 CFR Part 150 Study were encouraged by the Port Authority to stay informed of the Study's progress by visiting the Study's website, attending and providing comments at TAC meetings, participating in public workshops and public hearings, and submitting comments on the draft documents prepared for submittal to the FAA over the course of the Study.

5.2.1 Public Outreach

The Study Team worked with the Port Authority to identify meeting locations, create and distribute press releases about the public meetings, inform media and elected officials about the public meetings, and develop supporting media materials for each meeting. This also included handling all logistics for securing space and ensuring that spaces were Americans with Disabilities Act (ADA)-accessible and (to the extent possible) public transit-accessible. The Study Team members as well as Port Authority staff served as facilitators at various stations at the public workshops and answered questions from the public. A brief summary sheet and comment forms were provided at each workshop.

The JFK 14 CFR Part 150 Study featured several public workshops during the NEM phase of the Study: to introduce the project and the development of the NEMs, and then to present the NEM contours and land use compatibility analysis results. These workshops are summarized in **Table 5-2**. The JFK NEM Report contains all public workshop materials in Appendix K, beginning on page K-2. Copies of workshop materials, presentations, and the Final JFK NEM Report are available on the Port Authority website.[76]

[76] http://panynjpart150.com/JFK_homepage.asp

TABLE 5-2
SUMMARY OF PUBLIC WORKSHOPS THAT OCCURRED DURING THE NEM PHASE OF THE JFK 14 CFR PART 150 STUDY

Meeting Number	Purpose	Date	Time	Location	Material Location
1	Introduction to the JFK 14 CFR Part 150 Study; overview of the Study process	Jun 17, 2015	6:00 P.M. to 8:00 P.M.	Radisson Hotel JFK Airport 135-30 140th St Jamaica, NY 11436	Appendix K-1 of the JFK NEM Report
2	Introduction to the JFK 14 CFR Part 150 Study; overview of the Study process	Oct 29, 2015	6:00 P.M. to 8:00 P.M.	Nassau Community College One Education Dr Garden City, NY 11530	Appendix K-2 of the JFK NEM Report
3	Model inputs, draft DNL contours, and draft noise exposure analysis results	Nov 2-3, 2016	6:00 P.M. to 9:00 P.M.	**Nov 2:** Hilton New York JFK Airport 144-02 135th Ave Jamaica, NY 11436 **Nov 3:** Cradle of Aviation Museum Charles Lindbergh Blvd Garden City, NY 11530	Appendix K-3 of the JFK NEM Report

SOURCES: Port Authority and ESA, 2018 and 2019.

5.2.2 Public Information Workshop and Hearing

A Notice of Availability of the JFK Draft NCP was published in local newspapers in English, Greek, Spanish, and Chinese languages at the start of the public comment period. These notices included details on the public information workshop and public hearing. The Port Authority also published notices on their webpage that included links to the JFK Draft NCP. Elected officials and other interested stakeholders were notified via e-mail. Notice materials for the JFK Draft NCP, and public information workshop and public hearing, are included in **Appendix E**. The Port Authority made the JFK Draft NCP available for public review and comment from September 1, 2021 through October 15, 2021. At the beginning of the public comment period, copies of the JFK Draft NCP were made available for public review in the following manners:

- The Port Authority website at: http://panynjpart150.com/JFK_DNCP.asp
- By hardcopy, CD-ROM, or flash drive to members of the public through calling the Port Authority at 212-435-3880 and specifically indicating lack of access to a computer or the internet

The JFK Draft NCP was the primary topic of the NCP public information workshop for this 14 CFR Part 150 Study, which was held on September 29, 2021. In conjunction with the public information workshop, the Port Authority held a public hearing. At this hearing, the public had the opportunity to provide oral comments on the JFK Draft NCP. These comments were memorialized by a stenographer to be considered by FAA in their decision-making process. The final NCP documentation includes these recorded public comments, along with the Port Authority's responses in **Appendix F**. The final NCP document also contains all materials from the public information workshop and public hearing in **Appendix E**.

Due to the COVID-19 pandemic and consistent with the Port Authority's intent to protect the health and safety of the community, the final public information workshop and public hearing on the JFK Draft NCP were conducted as internet/phone-based public meetings. **Table 5-3** lists the date, times, and registration link for the internet/phone-based public information workshop and public hearing, and indicates where in this NCP the public information workshop materials can be found. For participants without internet access, no advance registration was necessary. The following phone information was provided to access the public information workshop and/or public hearing:

Phone Number: 1-877-853-5247
Webinar ID (access code): 882 2656 1730

TABLE 5-3
DATE, TIMES, AND REGISTRATION LINK FOR THE JFK NCP PUBLIC INFORMATION WORKSHOP AND PUBLIC HEARING

Meeting	Date	Time	Registration Link	Location of Presentation Materials
Public Information Workshop	Sep 29, 2021	5:00 P.M. to 6:30 P.M.	https://bit.ly/jfkpart150	Appendix E
Public Hearing	Sep 29, 2021	7:00 P.M. to 9:00 P.M.		

SOURCES: Port Authority and ESA, 2021.

5.2.3 Summary of Public Comments

Throughout the NCP phase of the JFK 14 CFR Part 150 Study, members of the public could submit comments on the Study to the Port Authority by using a dedicated Port Authority email address at NYPart150@panynj.gov. The Port Authority received six public comments through email before the JFK Draft NCP comment period of September 1, 2021 through October 15, 2021. The most frequent public comments received before the JFK NCP comment period are summarized in **Table 5-4**.

TABLE 5-4
MOST FREQUENT PUBLIC COMMENTS RECEIVED BEFORE THE JFK DRAFT NCP COMMENT PERIOD

Comment Category	Description
Noise Abatement Strategies	Suggested noise abatement procedures for JFK departures
Noise Abatement Strategies	Impacts of aircraft overflights on the Queens neighborhoods of Broad Channel and Far Rockaway, and suggestions for reducing those overflights
Noise Abatement Strategies	Suggestion to use artificial intelligence and machine learning to optimize aircraft flight paths
Noise Exposure Maps	Inclusion of Elmont, NY in the JFK Noise Exposure Maps
Study Area	Question regarding whether the Broadway-Flushing Historic District is contained within the JFK 14 CFR Part 150 Study Area

SOURCES: Port Authority and ESA, 2020.

All public and stakeholder comments received during the JFK Draft NCP comment period and public hearing identified in **Section 5.2.2** are included in **Appendix F.** Eleven submittals containing comments were received during the comment period on the JFK Draft NCP and 14 individuals provided oral comments during the public hearing. Comment responses were developed subsequent to the public information workshops and public hearing and after the comment period on the JFK Draft NCP closed. These comment submittals and their associated responses are included in **Appendix F**. The most common topics identified in the public comments received during the comment period on the JFK Draft NCP include the following:

- Part 150 Study regulations and guidelines
- Public meetings and outreach
- Stakeholder roles and responsibilities
- Use of DNL and the DNL 65 threshold
- Recommended noise abatement, land use, and program management measures included in the NCP
- Eligibility for sound insulation
- Arrival and departure procedures
- Runway use and airport use restrictions
- Health effects of noise and aircraft emissions

5.3 Public and Planning Agency Coordination

As described in the beginning of this chapter, 14 CFR Part 150 requires airport operators to consult with various stakeholders throughout the 14 CFR Part 150 Study process, including public and planning agencies, local jurisdictions, aviation users, and other interested parties. Numerous meetings were conducted to discuss the 14 CFR Part 150 Study with local community groups throughout the development of the NCP. The Port Authority and its consultants also met with local and regional planning organizations and the planning departments of towns and villages in the Study area to discuss the 14 CFR Part 150 Study. Additional elements of the public outreach program implemented by the Port Authority are summarized below.

5.3.1 Presentations to the New York Community Aviation Roundtable (NYCAR) and Community Groups

During the NCP phase of the JFK 14 CFR Part 150 Study, the Port Authority presented brief updates on the Study to the NYCAR and various community groups. The Port Authority's presentations focused on the status of the Study as well as updates on the development of potential NCP strategies. The NYCAR is composed of state and local elected officials and New York City Community Boards as voting members, as well as the Port Authority and the FAA as advisory (non-voting) representatives. The NYCAR has two sub-committees, to represent

communities around JFK and LGA. The general public may attend to observe all of NYCAR's proceedings. Materials presented by the Port Authority at these meetings during the NCP phase of the Study are located in **Appendix E**. Summaries of the presentations are given in **Table 5-5**.

TABLE 5-5
SUMMARY OF PRESENTATIONS MADE BY THE PORT AUTHORITY TO NYCAR AND COMMUNITY GROUPS

Meeting Date	Attendee Groups	Subject Matter
Jul 12, 2017	NYCAR	The Port Authority presented the statuses of the JFK and LGA 14 CFR Part 150 Studies, with a focus on FAA acceptance of the NEMs and the upcoming NCP phase.
Jul 26, 2017	Eastern Queens Alliance	The Port Authority presented the statuses of the JFK and LGA 14 CFR Part 150 Studies, with a focus on FAA acceptance of the NEMs and the upcoming NCP phase.
Jun 4, 2018	NYCAR	The Port Authority presented the status of the NCP phase of the JFK 14 CFR Part 150 Study, as well as common themes of NCP strategies that may or may not be feasible to implement.

SOURCES: Port Authority and ESA, 2018 and 2019.

5.3.2 Land Use Jurisdictional Meetings

14 CFR Part 150, Appendix A, Sec. 150.123 requires that an airport operator provide active and direct participation of the public and planning agencies representing jurisdictions contained within the FAA-accepted NEM's DNL 65 contour during the NCP phase of a 14 CFR Part 150 Study. The New York City Department of City Planning; Nassau County Planning Department; planning departments of the Villages of Cedarhurst, Woodsburgh, and Valley Stream; and the NPS are the sole public agencies with zoning and planning authority for land within the 2021 NEM DNL 65 contour.

In 2017, the Port Authority and their consultants held several meetings with local land use agencies for New York City and Nassau County, as well as with the NPS. The NPS has jurisdiction over the Gateway National Recreation Area (GNRA), which is immediately west of JFK. The Port Authority and the Study Team explained how the following land use strategies could be used to reduce noncompatible land uses:

- Building code revisions
- Real estate fair disclosure requirements
- Avigation easements
- Noise overlay zoning techniques

Each jurisdiction expressed interest in the results of the Study and requested to remain informed throughout the Study process. The meetings are summarized in **Table 5-6**, and the notes and presentations can be found in **Appendices E-5** through **E-8**.

TABLE 5-6
SUMMARY OF PRESENTATIONS MADE BY THE PORT AUTHORITY TO LAND USE AGENCIES

Meeting Date	Jurisdictions in Attendance	Brief Description
Apr 11, 2017	City of Long Beach, Nassau County, Town of Hempstead, Town of North Hempstead, Village of Lawrence	• JFK 14 CFR Part 150 Study introduction • JFK 2016 and 2021 DNL contours and noise impacts • FAA land use compatibility criteria • Land use strategy discussion
Jun 20, 2017	City of New York, Town of North Hempstead	• JFK and LGA 14 CFR Part 150 Studies status update • Land use strategy discussion
Jun 27, 2017	National Park Service	• JFK 14 CFR Part 150 Study introduction • JFK 2016 and 2021 DNL contours • Noise abatement strategy discussion • Land use strategy discussion

SOURCES: Port Authority and ESA, 2018 and 2020.

5.4 Other Opportunities for Stakeholder Engagement and Public Input

5.4.1 Study-Specific Meetings

The Port Authority simultaneously conducted 14 CFR Part 150 Studies at JFK, LGA, EWR, and TEB. The Port Authority, as the operator of all four airports, was responsible for the four studies and managed the consulting teams, led by ESA for the JFK and LGA studies and by the consulting firm HMMH for the EWR and TEB studies. As the evaluation of noise abatement and mitigation strategies began in the NCP phases of the four studies, the Port Authority initiated regular cross-team meetings to discuss potential NCP strategies, ways of maintaining consistency and efficiency between the studies, and any issues that could potentially affect the NCP processes.

The Port Authority and its consultants also conducted a series of joint meetings with FAA and aircraft operators during the course of the Study to review potential noise abatement strategies. The intent of those meetings was to obtain necessary information and guidance for the NCP noise abatement strategies, while also utilizing the FAA as a resource in the most efficient way possible.

Based on input from the TAC, the FAA, the aircraft operators, and the Port Authority, the Study Teams developed a list of suggested noise abatement strategies. These strategies were shared with the FAA ATO to determine whether there were any potential issues or constraints associated with the suggested noise abatement strategies. The FAA reviewed the initial list of potential strategies and provided initial feedback to the Study Teams on which noise abatement strategies may be feasible to implement. The FAA ATO also evaluated some of the proposed strategies in greater detail and provided comments back to the Study Team. On November 10, 2016, the FAA presented a webinar to the Study Teams, TAC members, and the interested public about the complexity of the New York–New Jersey airspace and how aircraft locations and altitudes must

be actively managed by air traffic controllers to maintain safe separation of aircraft in a variety of weather conditions. A link to this webinar can be found on the JFK 14 CFR Part 150 website.[77]

Additional meetings were held among the Port Authority, the Study Teams, and the FAA ATO throughout 2017, as the potential noise abatement strategies were evaluated and discussed. In addition, a number of airlines and the FAA participated in meetings to review and discuss suggested noise abatement strategies in the first quarter of 2018. Their input helped to finalize the potential measures evaluated for JFK's NCP. **Table 5-7** summarizes these meetings. Copies of the agendas, presentations, and meeting notes are provided in **Appendices E-9** through **E-19**.

TABLE 5-7
SUMMARY OF DISCUSSIONS BETWEEN THE PORT AUTHORITY, THE FAA, AND AIRCRAFT OPERATORS

Meeting Date	Attendee Groups	Discussion Topics
Jan 20, 2017	Port Authority, ESA, FAA NY TRACON, FAA Office of Airports	• Draft JFK and LGA DNL contours • Potential noise abatement strategies suggested to date
Feb 22, 2017	Port Authority, ESA, FAA NY TRACON, FAA Office of Airports	• Follow-up discussions of noise abatement strategies originally presented on January 20, 2017 • Additional thoughts from NY TRACON on noise abatement strategy feasibility
Apr 20, 2017	Port Authority, ESA, FAA NY TRACON, FAA Office of Airports	• Presentation of technical memo on information required for modeling specific JFK and LGA noise abatement strategies that may be feasible to implement • NY TRACON initial responses to technical memo
Jul 5, 2017	Port Authority, ESA, FAA NY TRACON, FAA Office of Airports	• Presentation of additional technical memo on information required for modeling specific JFK and LGA noise abatement strategies that may be feasible to implement • NY TRACON responses to technical memo
Sep 8, 2017	Port Authority, HMMH, ESA, FAA AEE, FAA Office of Airports, FAA NY TRACON, FAA ATO Eastern Service Center Operations Support Group, American Airlines, Delta Airlines, FedEx, JetBlue, Southwest Airlines, United Airlines, United Parcel Service	• Presentation regarding flyability of numerous suggested noise abatement procedures • Airline initial reactions to suggested procedures from the perspective of flyability
Oct 6, 2017	Port Authority, HMMH, ESA, FAA NY TRACON, FAA Office of Airports, FAA ATO Eastern Service Center Operations Support Group	• Discussion with FAA on flyability of noise abatement strategies and initial airline reactions
Nov 3, 2017	Port Authority, HMMH, ESA, FAA AEE, FAA Office of Airports, FAA NY TRACON, FAA Flight Standards Division, FAA ATO Eastern Service Center Operations Support Group, FAA ATO Central Service Center Planning & Requirements Group, American Airlines, Delta Airlines, FedEx, JetBlue, Southwest Airlines, United Airlines, United Parcel Service	• Further discussion with airlines on potential noise abatement procedures at JFK, LGA, EWR, and TEB
Nov 16, 2017	Port Authority, HMMH, ESA, FAA NY TRACON, FAA Office of Airports	• Follow-up discussion with FAA on Nov 3, 2017, discussion with airlines on noise abatement procedures

[77] http://panynjpart150.com/JFK_links.asp. Last accessed: March 20, 2019.

TABLE 5-7
SUMMARY OF DISCUSSIONS BETWEEN THE PORT AUTHORITY, THE FAA, AND AIRCRAFT OPERATORS

Meeting Date	Attendee Groups	Discussion Topics
Feb 5, 2018	Port Authority, ESA, FAA NY TRACON, FAA Office of Airports	• Discussion with FAA on LGA noise abatement strategies and related comments received from the TAC and the public
Feb 16, 2018	Port Authority, ESA, FAA NY TRACON, FAA Office of Airports	• Follow-up discussion with FAA on LGA noise abatement strategies
Apr 12, 2018	FAA Office of Airports, HMMH, Fitzgerald & Halliday, Inc. (FHI)	• Discussion with FAA on NCP schedules for Port Authority 14 CFR Part 150 studies as well as whether there is potential to implement noise abatement strategies through the NEC initiative • Discussion of content for upcoming TAC meetings

SOURCES: Port Authority and ESA, 2018 and 2020.

5.4.2 Newsletters

Another component of the public outreach program implemented by the Port Authority included the distribution of periodic newsletters to keep the public and other interested parties informed about the Study. The newsletters were posted on the JFK 14 CFR Part 150 Study project website (in PDF format). Copies of the newsletters are provided in **Appendix E-20**.

Table 5-8 provides information on the newsletters related to the NCP phase.

TABLE 5-8
SUMMARY OF NEWSLETTERS RELATED TO THE NCP PHASE OF THE JFK 14 CFR PART 150 STUDY

Date	Subject Matter
Winter 2017	Provided information about the purpose of an NCP and the different types of NCP strategies.
Spring 2017	Provided further details on the status of noise abatement, land use, and programmatic strategy development.
Winter 2018	Provided a summary of noise abatement strategy themes.

SOURCES: Port Authority and ESA, 2018 and 2019.

5.4.3 Elected Officials

Several elected officials were actively engaged throughout the NCP development process. The elected official email contact list included public officials representing the New York City boroughs of Brooklyn, Queens, and the Bronx; elected officials representing Nassau County; and the New York State Governor's office, State Senate and Assembly members, New York's United States House representatives, and New York's two United States senators. Copies of correspondence between the Port Authority and these officials are provided in Appendix G-3 of the JFK NEM Report.

5.4.4 Newspaper Articles

The ESA Study Team maintained a file throughout the Study containing copies of newspaper articles and publications that discussed or referenced the JFK 14 CFR Part 150 Study and the other 14 CFR Part 150 Studies being conducted by the Port Authority at LGA, EWR, and TEB. Copies of the articles are provided in **Appendix E-21**.

5.4.5 Project Website

A website[78] was developed and published for the JFK 14 CFR Part 150 Study. The website made Study-related information and documents available to stakeholders, agencies, and the general public. Information and documents available on the website included:

- Project announcements
- Project schedule information and schedule updates
- Upcoming project meetings
- Project documents, including the JFK 14 CFR Part 150 Study Protocol, TAC Meeting materials, Public Information Workshop materials, the Draft NEM Report and NEMs, the JFK Draft NCP, and project newsletters
- Links to the FAA's Airport Noise Program fact sheet and the Port Authority's WebTrak website
- FAQs
- Port Authority contact information
- Links to the Port Authority's other 14 CFR Part 150 Study websites
- A link for interested parties to join the JFK 14 CFR Part 150 mailing list to receive project updates and announcements

[78] http://panynjpart150.com/JFK_homepage.asp. Last accessed: August 13, 2021.