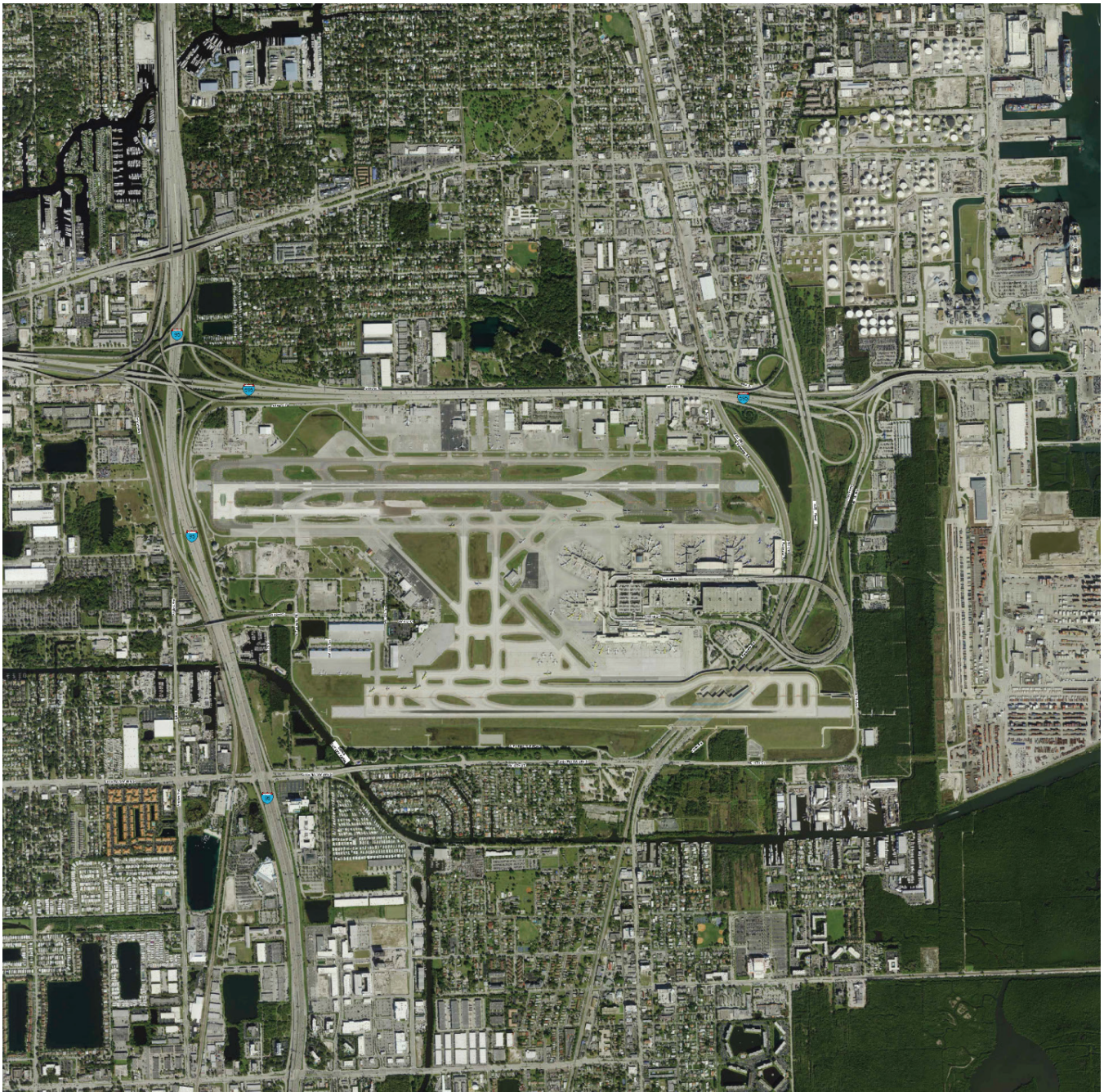


Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study **Final Noise Compatibility Program Report**





AVIATION DEPARTMENT - Fort Lauderdale-Hollywood International Airport
320 Terminal Drive, Suite 200 • Fort Lauderdale, Florida 33315 • 954-359-6100

December 20, 2021

Peter Green, AICP
Environmental Protection Specialist
Orlando Airports District Office
Federal Aviation Administration
8427 Southpark Circle
Orlando, FL 32819

Subject: Final Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Noise Compatibility Program Report, Pursuant to Title 14 of the Code of Federal Regulations

Dear Mr. Green:

The Broward County Aviation Department (BCAD) is pleased to submit the Final Noise Compatibility Program (NCP) Report and supporting documentation for Fort Lauderdale-Hollywood International Airport (FLL). The attached NCP Report was prepared in accordance with 14 CFR Part 150, *Airport Noise Compatibility Planning*. This submission is the third NCP submitted by BCAD for review by the Federal Aviation Administration (FAA). The final recommendations included in this NCP are those of BCAD, not those of a consultant or third party.

The NCP below reflects completion of the second phase of a full Part 150 Noise Compatibility Study. The first phase consisted of the Noise Exposure Maps (NEMs), which were published and formally accepted by the FAA in October 2019. The FAA-approved NEMs can be found in Chapter 1 of this document and the FAA's compliance determination remains valid.

BCAD is grateful for the meaningful participation provided throughout this project by your office, the Orlando Airports District Office, Miami Air Traffic Management/TRACON, and the FLL Air Traffic Control Tower. 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,

A handwritten signature in black ink, appearing to read "Michael P. Pacitto".

Michael P. Pacitto, P.G.

Aviation Director of Planning and Environmental

Broward County Board of County Commissioners

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TABLE OF CONTENTS

Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study

Chapter 1 – Introduction	Page
1.1 Overview	1-1
1.2 Airport Location and Setting.....	1-2
1.2.1 Airport History	1-2
1.2.2 EIS Mitigation Program	1-2
1.3 Previous FLL Part 150 Studies	1-9
1.4 Need for the Preparation of a New Part 150 Study	1-12
1.5 14 CFR Part 150 Study Process.....	1-13
1.6 Noise Exposure Maps.....	1-14
1.7 Noise Compatibility Program	1-15
1.8 Noise Terminology	1-17
1.9 Roles and Responsibilities	1-19
1.9.1 Broward County Aviation Department (BCAD).....	1-20
1.9.2 14 CFR Part 150 Study Committees	1-20
1.9.3 Federal Aviation Administration	1-21
1.10 FAA-Accepted 2018 and 2023 Noise Exposure Maps	1-22
1.11 Noise and Land Use Compatibility	1-28
1.12 Noise Compatibility Program (NCP) Organization.....	1-30
Chapter 2 – Noise Compatibility Program – Noise Abatement Measures	
2.1 Existing Aircraft Noise Abatement Program	2-2
2.2 Noise Abatement Measures Recommended for Inclusion in this NCP	2-3
2.3 Noise Abatement Measures Considered but Not Being Recommended for Inclusion in this NCP.....	2-15
2.4 Summary of Recommended Noise Abatement Measures	2-17
Chapter 3 – Noise Compatibility Program – Land Use Management Measures	
3.1 Introduction to Land Use Management Measures	3-1
3.2 Existing Land Use Management Measures.....	3-2
3.2.1 Land Use Management Measures Implemented as Part of the 2008 EIS ROD and Interlocal Agreement	3-2
3.2.2 Land Use Management Measures Implemented as Part of Future Land Use Plan Amendments	3-3
3.2.3 Summary of Existing Land Use Management Measures	3-11
3.3 Recommended Land Use Management Measures	3-12
3.3.1 Corrective Land Use Management Measures	3-12
3.3.2 Preventive Land Use Management Measures	3-21
3.4 Land Use Management Strategies Considered but not Recommended for Inclusion in this NCP	3-28
3.5 Summary of Recommended Land Use Management Measures	3-28
Chapter 4 – Noise Compatibility Program – Program Management Measures	
4.1 Existing Program Management Measures	4-1
4.2 Recommended Program Management Measures	4-5

4.3	Program Management Strategies Considered but Not Recommended for Inclusion in the NCP	4-18
4.4	Summary of Recommended Program Management Measures	4-18

Chapter 5 – Noise Compatibility Program Implementation

5.1	Overall Roles and Responsibilities	5-1
5.2	NCP Program Overview.....	5-2

Chapter 6 – Consultation and Public Involvement

6.1	Technical Committee	6-1
6.1.1	TC Membership	6-2
6.1.2	Summary of TC Meetings	6-3
6.2	Public Outreach and Hearing.....	6-4
6.2.1	Draft NCP	6-4
6.2.2	Virtual Public Information Workshop and Public Hearing.....	6-5
6.2.3	Summary of Public Comments	6-5
6.3	FAA Coordination.....	6-6
6.3.1	Part 150 Study Coordination.....	6-6
6.3.2	South-Central Florida Metroplex Coordination	6-6
6.4	Land Use Jurisdictional Meetings	6-7
6.5	Other Opportunities for Stakeholder Engagement and Public Input	6-7
6.5.1	Elected Officials and Study Coordination Committee	6-7
6.5.2	Project Website.....	6-8

List of Tables

Page

Table 1-1	Approved Noise Abatement Measures in the 1987 NCP	1-9
Table 1-2	Approved Land Use Management Measures in the 1987 NCP	1-10
Table 1-3	Approved Noise Abatement Measures in the 1994 NCP Update.....	1-11
Table 1-4	Approved Land Use Management Measures in the 1994 NCP Update.....	1-11
Table 1-5	Noise-Sensitive Sites Exposed to DNL 65 and Higher – Existing Conditions (2018).....	1-27
Table 1-6	Noise-Sensitive Sites Exposed to DNL 65 and Higher – Future Conditions (2023).....	1-27
Table 1-7	14 CFR Part 150 Land Use Compatibility Guidelines in Aircraft Noise Exposure Areas.....	1-28
Table 2-1	Change in Residential Housing Units Resulting from Removal of Voluntary User Program for Runway 10R-28L.....	2-7
Table 2-2	Implementation Summary for NA-1: Continue Voluntary User Program for Runway 10R-28L	2-8
Table 2-3	Implementation Summary for NA-2: Reduce Early Aircraft Departure Turns from FLL Through Implementation of ELSO or ELSO-Equivalent Procedures During West-Flow Conditions	2-11
Table 2-4	Implementation Summary for NA-3: Reduce Early Aircraft Departure Turns from FLL Through Implementation of ELSO or ELSO-Equivalent Procedures During East-Flow Conditions	2-13

Table 2-5	Implementation Summary for NA-4: Modify Aircraft Arrival Profiles to the West of FLL to Keep Aircraft Higher.....	2-15
Table 2-6	Summary of NCP-Recommended Noise Abatement Measures.....	2-18
Table 3-1	Summary of Existing Land Use Management Measures	3-11
Table 3-2	Implementation Summary for LU-1: Implement a Voluntary Acquisition Program for a Portion of the Ocean Waterway Mobile Home Park.....	3-16
Table 3-3	Implementation Summary for LU-2: Implement a Voluntary Acquisition Program for a Portion of the Everglades Lakes Mobile Home Park.....	3-18
Table 3-4	Implementation Summary for LU-3: Implement a Voluntary Residential Sound Insulation Program for Eligible Dwelling Units Located in the Future Conditions (2023) DNL 65 and Higher Contours	3-21
Table 3-5	Implementation Summary for LU-4: Encourage Local Jurisdictions to Implement Real Estate Fair Disclosure Requirements that Address Potential for Aircraft-Related Noise	3-23
Table 3-6	Implementation Summary for LU-5: Encourage Local Jurisdictions to Incorporate Planning Actions in their Respective Comprehensive Plans Related to Aircraft Noise that are Consistent with the Policies of the BrowardNEXT Plan.	3-25
Table 3-7	Implementation Summary for LU-6: Encourage Local Jurisdictions Efforts to Incorporate Noise Overlay Zoning Ordinances to Regulate Sound Attenuation and Compatible Land Uses near the Airport.....	3-27
Table 3-8	Summary of NCP-Recommended Land Use Measures.....	3-29
Table 4-1	Permanent Noise Monitor Locations.....	4-2
Table 4-2	Implementation Summary for PM-1: Maintain the Existing Noise Office and Information Webpage.....	4-6
Table 4-3	Implementation Summary for PM-2: Evaluate/Update the Existing Noise Monitoring and Flight Tracking Systems	4-8
Table 4-4	Implementation Summary for PM-3: Maintain Noise Complaint Management System.....	4-11
Table 4-5	Implementation Summary for PM-4: Conduct Community Outreach Activities	4-12
Table 4-6	Implementation Summary for PM-5: Evaluate the Composition of the ANAC	4-13
Table 4-7	Implementation Summary for PM-6: Install Runway Reminder Signs	4-14
Table 4-8	Implementation Summary for PM-7: Evaluate a Voluntary Fly Quiet Program.....	4-16
Table 4-9	Implementation Summary for PM-8: Update the Noise Exposure Maps	4-17

Table 4-10	Implementation Summary for PM-9: Update the Noise Compatibility Program.....	4-18
Table 4-11	Summary of NCP-Recommended Program Management Measures	4-19
Table 5-1	Recommended Measures – Implementation Responsibility and Estimated Cost.....	5-3
Table 5-2	Recommended Measures – Implementation Schedule	5-4
Table 6-1	Part 150 Study Technical Committee Participant List	6-2

List of Figures

		Page
Figure 1-1	Airport Location Map	1-3
Figure 1-2	Airport Vicinity Map	1-5
Figure 1-3	Generalized Existing Residential Land Uses and Sound Insulation Program	1-7
Figure 1-4	Decibel Levels of Common Sounds.....	1-18
Figure 1-5	Illustration of DNL	1-19
Figure 1-6	2018 DNL Contours and Generalized Existing Land Uses.....	1-23
Figure 1-7	2023 DNL Contours and Generalized Existing Land Uses.....	1-25
Figure 2-1	Divergence of Conventional Departures versus RNAV Departures	2-9
Figure 3-1	Future Conditions (2023) Noise Contours and 2008 EIS RSIP	3-5
Figure 3-2	Dania Beach Regional Activity Center (RAC).....	3-7
Figure 3-3	Davie Transient Oriented Corridor (TOC).....	3-9
Figure 3-4	Residential Units in Mobile Home Parks within the 2023 DNL 65 Contour	3-13
Figure 4-1	Current Noise Monitor Locations	4-3
Figure 4-2	Review of Noise Monitor Locations.....	4-9

Appendices

Appendix A	Glossary of Terms and Acronyms
Appendix B	FLL 14 CFR Part 150 Record of Approval
Appendix C	Stakeholder Suggested Measures
Appendix D	Noise Abatement Alternatives Supplemental Information
Appendix E	Land Use Supplemental Information
Appendix F	Agency and Other Consultations
Appendix G	Technical Committee Meetings
Appendix H	Public Outreach
Appendix I	Public Comments

CHAPTER 1

Introduction

1.1 Overview

The Broward County Aviation Department (BCAD) has undertaken a Title 14 Code of Federal Regulations (CFR) Part 150 Noise and Land Use Compatibility Study (Part 150 Study) for the Fort Lauderdale-Hollywood International Airport (FLL or the Airport) to evaluate opportunities to improve the compatibility of FLL with the surrounding communities relative to both current and anticipated aircraft activity.¹ The preparation of a Part 150 Study is a voluntary action on the part of BCAD.² However, once a Part 150 Study is undertaken, an airport sponsor³ is obligated to prepare an update whenever there is a significant change to the noise environment. This Part 150 Study takes into consideration the completed upgrade and extension to FLL's south parallel runway, Runway 10R-28L (formerly Runway 9R-27L), and the resulting changes in FLL's operational capability. This Part 150 Study includes both the development of Noise Exposure Maps (NEMs) and preparation of a Noise Compatibility Program (NCP). The most recent Part 150 Study for FLL was prepared in 1994. In 2007, an update was initiated but was later suspended as a result of the 2008 Runway 9R-27L Environmental Impact Statement (EIS) process.⁴

The three primary objectives of this Part 150 Study are listed below. This report, entitled "Noise Compatibility Program," implements Objectives 2 and 3. Objective 1 was addressed by the Noise Exposure Map Report.⁵ The Federal Aviation Administration (FAA) accepted the NEMs for FLL on October 3, 2019.⁶

	Objectives	Study Component
1	Identify FLL's 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 guidelines in 14 CFR Part 150, Appendix A, Table 1.	Noise Exposure Maps (Completed)
2	Identify and evaluate potential future operational, land use, and programmatic 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.	Noise Compatibility Program

¹ A glossary of terminology and a list of acronyms related to this Part 150 Study can be found in Appendix A.

² The regulations contained in 14 CFR Part 150 are voluntary and airport operators are not required to participate. However, accepted NEMs and an approved NCP are necessary for federal financial participation in 14 CFR Part 150-related noise mitigation measures at an airport.

³ The FAA refers to those entities receiving Airport Improvement Program (AIP) grants as "sponsors".

⁴ Federal Aviation Administration. "Record of Decision – The Development and Expansion of Runway 9R-27L and Other Associated Airport Projects at Fort Lauderdale-Hollywood International Airport – Broward County, Florida." December, 2008.

⁵ Broward County Aviation Department. "Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study – Final Noise Exposure Map Report." June, 2019.

⁶ 84 Fed. Reg. 54942.

1.2 Airport Location and Setting

The Airport is located on approximately 1,700 acres in unincorporated Broward County, Florida. It is bounded by I-595 to the north, I-95 to the west, US Highway 1 to the east, and Griffin Road to the south. It is also convenient to both Florida's Turnpike and I-75. FLL is located approximately 4 miles south of downtown Fort Lauderdale and directly west of Port Everglades. The Airport is bordered by the cities of Fort Lauderdale, Hollywood, and Dania Beach. The location of the Airport is depicted on **Figure 1-1**. The Airport and its environs are depicted on **Figure 1-2**.

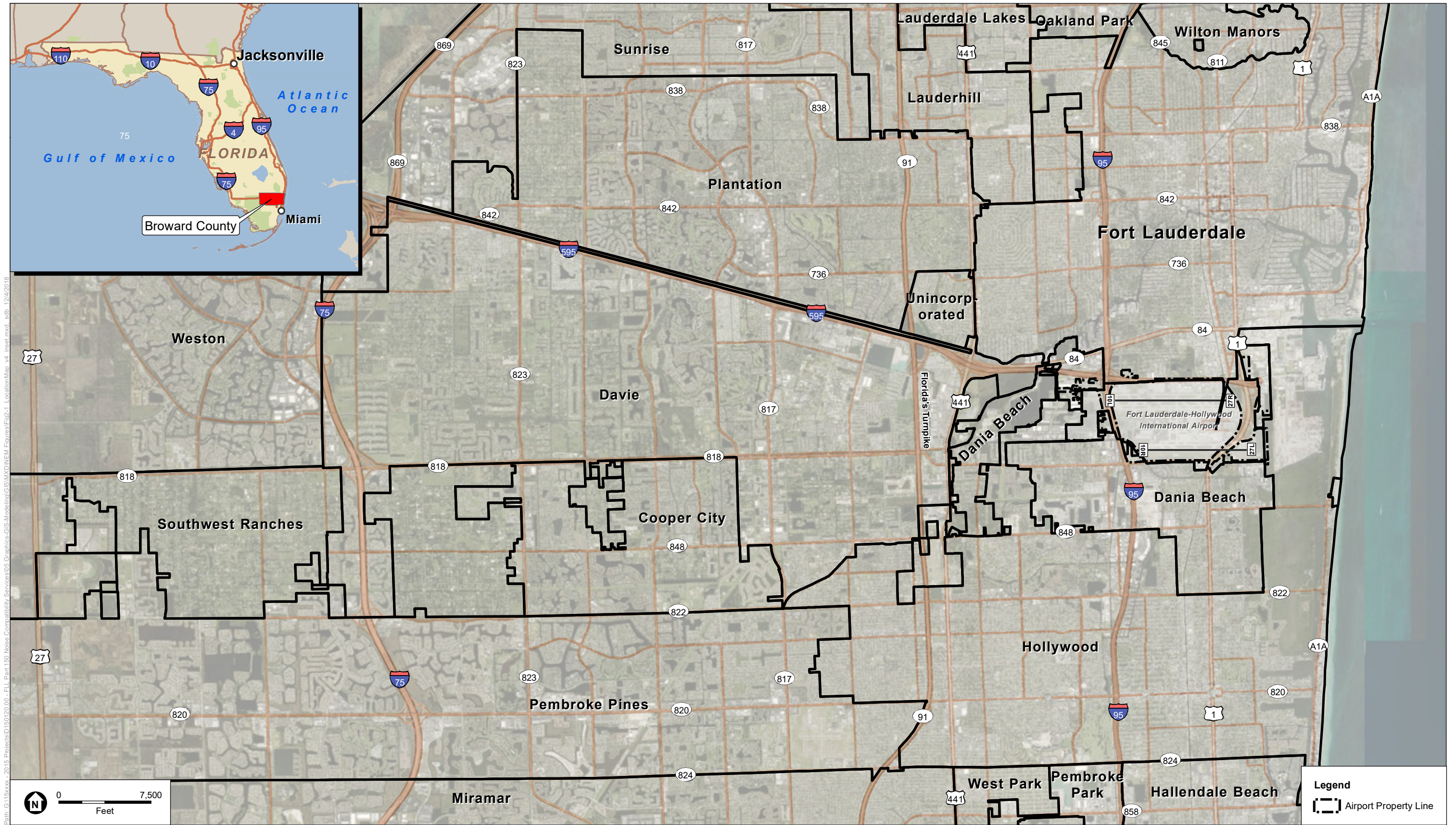
1.2.1 Airport History

The Airport began as Merle Fogg Field on May 1, 1929. In 1942, the Airport was commissioned and renamed Fort Lauderdale Naval Air Station (NAS). The U.S. Navy constructed three runways and a control tower and operated the airfield as a training facility during World War II.

In 1948, Broward County assumed control of the facility and in 1953, the County officially took ownership. Three years later, commercial service began at the Airport. By 1970, the Airport was serving most major national destinations by some of the largest U.S. carriers at the time. During the 1990s, the Airport experienced a large period of growth due largely to the influx of low-cost airlines at FLL. For most of the Airport's history, the airfield consisted of three runways: two parallel east-west runways and one crosswind runway. On May 6, 2013, the crosswind runway (Runway 13-31) was decommissioned. Runway 9R-27L (renamed later to Runway 10R-28L), the south runway, underwent a significant expansion in 2014. In addition to runway modifications, FLL has undergone numerous terminal and facility upgrades since commercial service began.

1.2.2 EIS Mitigation Program

BCAD began implementing noise mitigation measures in 2012 as an outcome of the 2008 Runway 10R-28L Final EIS (the 2008 EIS) Record of Decision (ROD). BCAD implemented a soundproofing program for properties within the DNL (Day-Night Average Sound Level) 65 and higher contours presented in the 2008 EIS. The 2008 EIS estimated that 1,706 housing units were located within those contours. These properties and adjacent approved areas became eligible for voluntary Residential Sound Insulation Program (RSIP) improvements, in accordance with mitigation requirements in the 2008 EIS, which included acoustical treatments designed to reduce aircraft noise levels inside of residential structures. Ultimately, owners of 1,858 housing units were invited to participate in the RSIP and the owners of 1,224 housing units chose to participate. Certain eligible properties located within the DNL 65 contour were also eligible for standard sales assistance and a conveyance and release (CAR) program. Overall, the mitigation program involved expenditures of approximately \$175 million in federal, state, and local funds. The existing RSIP area is shown in **Figure 1-3**.

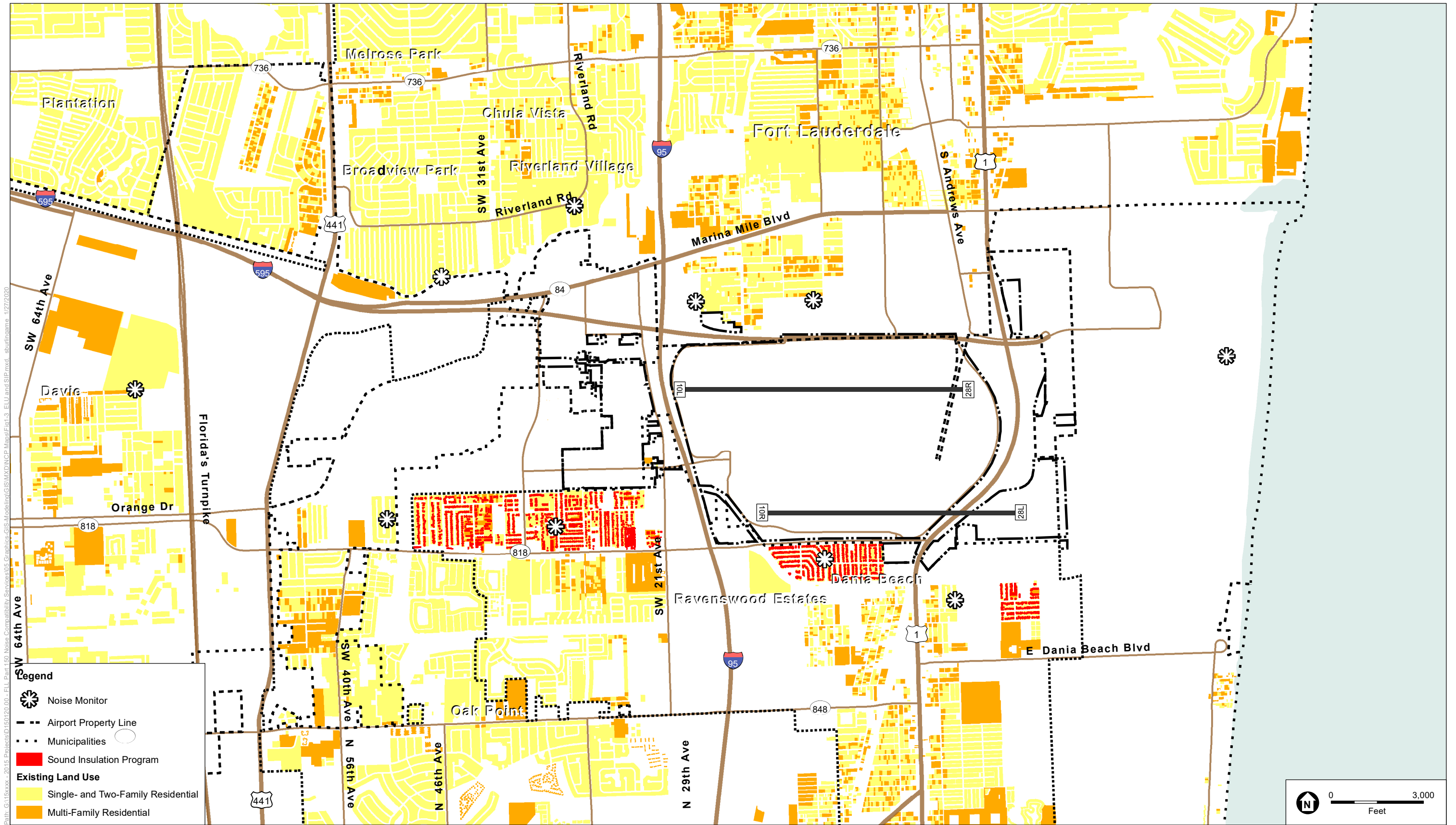


Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

Figure 1-1
 Airport Location Map
 Fort Lauderdale-Hollywood International Airport

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SOURCE: Esri; Broward County GIS Parcel Data Set, October 2017; AEDT 2d; Adapted by Arora Engineers and ESA, 2018

Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

Figure 1-3
Generalized Existing Residential Land Uses and Sound Insulation Program
Fort Lauderdale-Hollywood International Airport

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1.3 Previous FLL Part 150 Studies

Two Part 150 Studies were previously prepared for FLL. The first was completed in 1987 and indicated that in 1985 (the Existing Condition year for the Study), the following were exposed to noise levels of DNL 65 and higher⁷:

- 3,249 people
- 1,321 housing units
- Eight non-residential noise-sensitive sites

The 1987 NCP recommended six noise abatement and seven land use management measures. All but one were approved by the FAA.⁸ The approved noise abatement measures and BCAD's implementation methods for them are shown below in **Table 1-1**, while the approved land use management measures and BCAD's implementation methods for them are shown in **Table 1-2**.

TABLE 1 1 APPROVED NOISE ABATEMENT MEASURES IN THE 1987 NCP ¹	
Approved Noise Abatement Measure	BCAD Implementation Method
Preferential flight tracks for Runway 13-31	"Informal Runway Use Program" developed in collaboration with FLL Airport Traffic Control Tower (ATCT), effective July 25, 1989. Closure of Runway 9R-27L between the hours of 10:00 p.m. and 7:00 a.m., initiated April of 1993.
Noise-reducing "maintain runway heading" departure procedures for Runway 9L-27R and Runway 9R-27L	
Preferential runway use program that (1) minimizes use of Runway 9R-27L by Stage 2 aircraft; (2) maximizes the use of east flow; and (3) concentrates cargo and nighttime jet operations on Runway 9L-27R	
Noise monitoring program for engine maintenance run-ups	Airport Noise and Operations Management System (ANOMS) purchased in 1992.
Noise berm parallel to the length of Runway 9R-27L to reduce noise in communities immediately south of FLL	Mile-long noise berm constructed in 1990.

SOURCE:

¹ Leigh Fisher Associates. "Origin and Status of County's Current Noise Compatibility Program." 2006.

⁷ Broward County Board of County Commissioners. "Fort Lauderdale-Hollywood International Airport – Part 150 Study Technical Report." October 1987, revised December 1988.

⁸ Leigh Fisher Associates. "Origin and Status of County's Current Noise Compatibility Program." 2006.

TABLE 1 2
APPROVED LAND USE MANAGEMENT MEASURES IN THE 1987 NCP¹

Approved Land Use Management Measure	BCAD Implementation Method
Condemnation in the DNL 75 contour	Several residential areas were acquired. BCAD recommended purchase of aviation easements for the Lauder Lakes Mobile Home Park.
Sound insulation for institutions in the DNL 65 contour	Sound insulation process began for one church. Two churches and one elementary school were offered sound insulation but chose not to participate.
Voluntary residential property acquisition in the DNL 70 contour	All properties within the DNL 70 contour in the Ravenswood neighborhood were acquired and condemned.
Purchase assurance program	Not implemented because funds were used for higher-priority land acquisitions.
Incorporate airport noise zone in Broward County Comprehensive Plan	The DNL contours were not included in the Broward County 1989 Comprehensive Plan.
Secure BCAD seat on land development review committee	Implemented, but the committee was later disbanded.
Implementation of airport zoning ordinance	Broward County enacted an ordinance requiring each jurisdiction to include airport zoning regulations and enter into interlocal agreements with the County.

SOURCE:

¹ Leigh Fisher Associates. "Origin and Status of County's Current Noise Compatibility Program." 2006.

The second Part 150 Study for FLL was completed in 1994 and indicated that in 1992 (the Existing Condition year for the Study), the following were exposed to noise levels of DNL 65 and higher⁹:

- 1,085 people
- 463 housing units
- Eight non-residential noise-sensitive sites

The 1994 NCP Update recommended six noise abatement and four land use management measures. Three noise abatement measures were approved by the FAA, while three other noise abatement measures were approved only as voluntary. Three land use management measures were approved by the FAA; one measure was approved, in part, and disapproved, in part.¹⁰ The approved noise abatement measures and BCAD's implementation methods are shown below in **Table 1-3**, while the approved land use management measures and implementation methods are shown in **Table 1-4**.

⁹ Broward County Aviation Department. "Technical Report – Fort Lauderdale-Hollywood International Airport FAR Part 150 Program Update." March 1994, Revised December 1994.

¹⁰ Leigh Fisher Associates. "Origin and Status of County's Current Noise Compatibility Program." 2006.

TABLE 1-3
APPROVED NOISE ABATEMENT MEASURES IN THE 1994 NCP UPDATE¹

Approved Noise Abatement Measure	BCAD Implementation Method
Continue preferential flight tracks recommended in 1987 NCP*	Voluntary "Informal Runway Use Program" revised to specify continuation of measures and addition of helicopter procedures.
Continue noise-reducing "maintain runway heading" departure procedures recommended in the 1987 NCP; add helicopter noise-reducing arrival and departure procedures*	
Continue preferential runway use program recommended in the 1987 NCP; revise program to require Stage 2 aircraft to use Runway 9L-27R when available and weather permits*	
Continue noise monitoring program for engine maintenance run-ups and request retroactive funding from the FAA for ANOMS	BCAD received retroactive funding for ANOMS .
Conduct tests to determine benefits of using "close-in" noise abatement departure procedures (NADP1) and "distant" noise abatement departure procedures (NADP2)	BCAD completed analysis and requested that airlines use NADP2.
Relocate engine maintenance run-up facility to the east end of Runway 9L-27R	BCAD implemented "Engine Run Up Restriction" Policy on November 15, 1996.

SOURCE:

¹ Leigh Fisher Associates. "Origin and Status of County's Current Noise Compatibility Program." 2006.

NOTE:

* Approved only as voluntary.

TABLE 1-4
APPROVED LAND USE MANAGEMENT MEASURES IN THE 1994 NCP UPDATE¹

Approved Land Use Management Measure	BCAD Implementation Method
Request retroactive funding for acquisition of additional noise-sensitive areas in the DNL 75 contour	BCAD received funding from the FAA and the Florida Department of Transportation (FDOT).
Sound insulation for institutions in the DNL 65 contour	Sound insulation of a church (begun after being recommended in the 1987 NCP) was completed in 1994.
Easement acquisition for residential areas in the DNL 65 contour [^]	Implemented between June 2000 and June 2001; 28 property owners participated, and each was compensated \$2,400.00.
Voluntary sales assistance (relocation payments) for areas in the DNL 65 contour	Implemented between June 2000 and June 2003 for property owners who provided easements to BCAD.

SOURCE:

¹ Leigh Fisher Associates. "Origin and Status of County's Current Noise Compatibility Program." 2006.

² Federal Aviation Administration. "Record of Approval, FAR Part 150 Noise Compatibility Program – Fort Lauderdale-Hollywood International Airport, Fort Lauderdale, Florida." December 12, 1995.

NOTE:

[^] Approved in part; the recommendation to provide personal payments to property owners was not approved by the FAA.²

1.4 Need for the Preparation of a New Part 150 Study

While a new Part 150 Study was initiated in 2007, concurrent with the 2008 EIS for the expansion of Runway 9R-27L (renamed later to Runway 10R-28L), it was ultimately suspended with the intent to reinstate it after the expanded runway was operational. As part of the 2008 EIS, noise mitigation measures were identified and the implementation of these noise mitigation measures is on-going.¹¹ In November 2013, the City of Dania Beach and Broward County entered into an Interlocal Agreement that included a provision for voluntary limited nighttime use of Runway 10R-28L between 10:00 p.m. and 5:00 a.m.¹² It should be noted that the FAA was not a party to this agreement. This program, referred to as the Voluntary User Program for Runway 10R-28L, was implemented in April 2015. The program was later modified to apply between the hours of 10:30 p.m. and 6:00 a.m.

The Interlocal Agreement indicated that the voluntary user program would remain in effect until a new Part 150 Study was completed and determinations were made by the FAA on the measures recommended in that study. The Agreement also indicated that the new Part 150 study would be commenced no sooner than 18 months after the opening of Runway 10R-28L, which would allow for the stabilization of the operational environment. The FAA indicated in the 2008 EIS and associated ROD that it “will not consider the approval of a runway development project with noise abatement runway use procedures that would limit its capacity in the opening year without a study of alternative noise abatement measures such as required under 14 CFR Part 150.” This NCP addresses that requirement.

The NCP presented in this document addresses the changes in the operational environment since the 1994 Part 150 Study was completed, including:

- The decommissioning of Runway 13-31 in May 2013;
- The expansion and extension of the south runway, Runway 10R-28L, in September 2014 to enable commercial service aircraft;
- Changes in aircraft operation levels, aircraft types (including up-gauging trends in the commercial aircraft fleet), runway utilization patterns, and flight procedures;
- Passage of the Airport Noise and Capacity Act of 1990 (ANCA), which prohibited operation of Stage 1 and Stage 2 aircraft with a maximum weight above 75,000 pounds within the United States after December 31, 1999; and
- Passage of the FAA Modernization and Reform Act of 2012 (FMRA), which prohibited operation of Stage 1 and Stage 2 aircraft with a maximum weight of 75,000 pounds or lower within the 48 contiguous United States after December 31, 2015.

¹¹ Federal Aviation Administration. Chapter 4 – Summary of Mitigation Measures. “Record of Decision – The Development and Expansion of Runway 9R-27L and Other Associated Airport Projects at Fort Lauderdale-Hollywood International Airport – Broward County, Florida.” December, 2008.

¹² City of Dania Beach and Broward County. Paragraph 2(a). Interlocal Agreement. November 19, 2013.

The goal of this NCP is to identify and implement noise abatement, land use management, and programmatic measures that have the potential to make land uses in the vicinity of FLL compatible with aircraft noise to the extent possible. Subsequent chapters in this document present measures recommended by BCAD to achieve this, along with associated explanations and analysis.

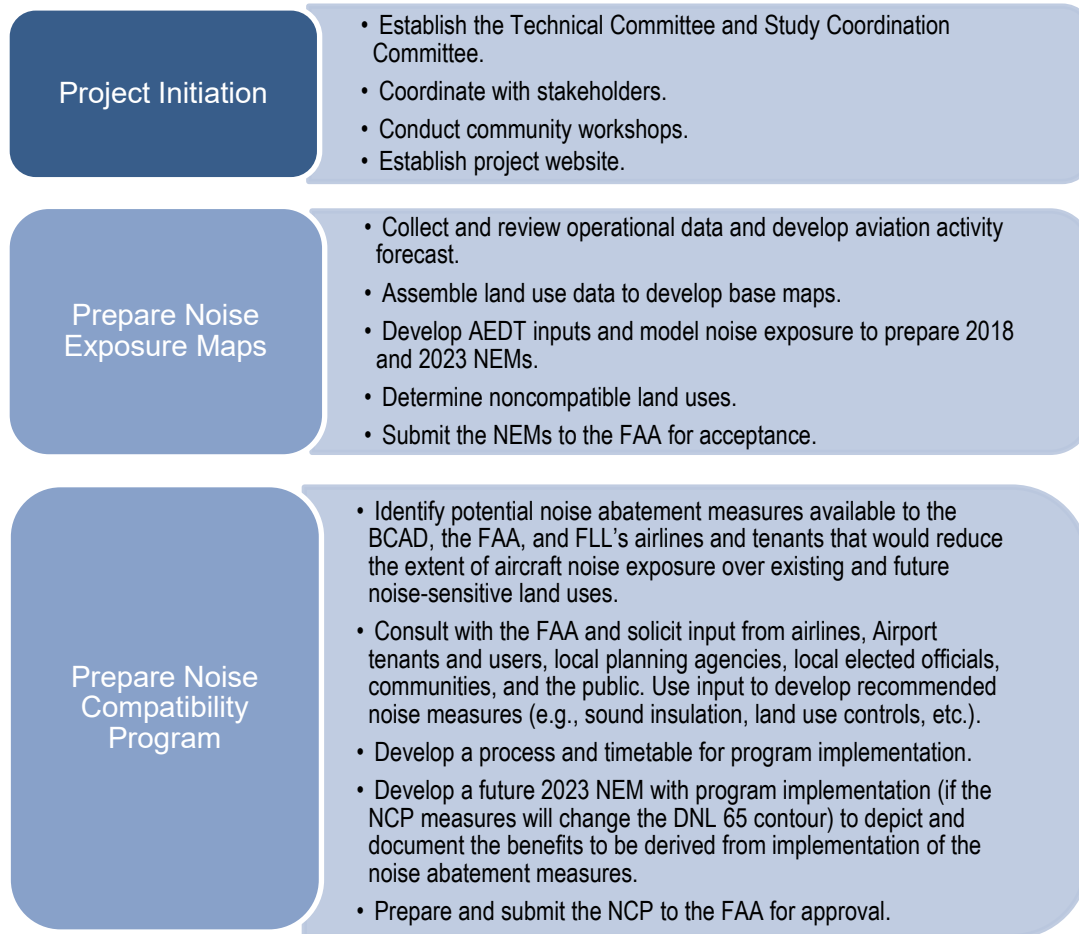
1.5 14 CFR Part 150 Study Process

The Part 150 Study process, shown on the following page, begins with project initiation and then transitions through the preparation of the NEMs and the NCP. NEM development includes collection of operational and land use data, generation of noise exposure contours, and determination of noncompatible uses. Upon acceptance of the NEMs by the FAA, the NCP phase is initiated. NCP development includes identification and evaluation of noise abatement, land use, and programmatic measures as well as development of recommendations and an implementation plan. Upon submission of the NCP to the FAA, the FAA will review the measures and issue a determination for each of the measures. The phase of the process included in this document relates to the development of the NCP.

In 2016, BCAD initiated the Part 150 Study at FLL. At its on-set, key issues were identified through input from BCAD and FLL stakeholders, including local jurisdictions, aviation officials, aircraft operators, local communities, and interested members of the public. Input was received at meetings with BCAD staff, and at a series of public workshops and community meetings. Additionally, stakeholder input was obtained throughout the study process through regular meetings of a Technical Committee (TC).

Initial efforts on this Part 150 Study included an inventory of 2016 operational activity, which was supplemented with information from BCAD, the FAA, and airport tenants. This involved collecting data related to the number of aircraft operating at the Airport on an annual basis, the fleet mix (types of aircraft), the time of day in which the aircraft operate (Day: 7:00 a.m. to 9:59 p.m. or Night: 10:00 p.m. to 6:59 a.m.) and existing aircraft operational procedures (i.e., runway use, flight tracks, departure and arrival corridors). In addition to operational data, land use data was collected and reviewed. This data included zoning regulations, existing land use maps, and future land use plans.

After completing the inventory process, the Aviation Environmental Design Tool (AEDT) Version 2d noise model was used to produce noise contours (areas of equal noise exposure around the Airport). The FAA requires that these noise contours be prepared for the current year (in this case, 2018) and a projected condition for a future year that must be at least five years from the date of submittal of the document (in this case, 2023).



1.6 Noise Exposure Maps

NEMs graphically depict aircraft noise exposure levels on and in the vicinity of an airport by presenting lines of equal aircraft noise in DNL values. Aircraft noise DNL values represent the sound produced by a 24-hour period of aircraft activity. For Part 150 studies, this 24-hour period of aircraft activity is based on average aircraft activity over a 12-month period and the sound energy is represented as A-weighted decibels (dBA). NEMs provide local communities an opportunity to see aircraft noise exposure levels in order to make better informed decisions regarding proposed noise sensitive development in the vicinity of an airport.

The official NEMs include two maps. The first NEM depicts existing noise exposure levels and the land uses in the vicinity of an airport. The FLL Existing Conditions (2018) NEM was developed using an aircraft operations forecast developed for BCAD as part of the current master plan update process. It also uses actual calendar year 2016 day/night utilization, runway usage, flight tracks, and trip length data from BCAD's ANOMS.¹³ The aircraft operations forecast used for the FLL

¹³ An aircraft operation is defined as one arrival flight or one departure flight.

Part 150 Study was approved by the FAA on April 10, 2017, as shown in Appendix B of the FLL NEM Report.

The second NEM depicts noise exposure levels anticipated five years in the future, which represents forecast conditions without the NCP. The future NEM was developed using projected levels of aircraft activity and operational conditions at FLL in 2023. In accordance with 14 CFR Part 150, the Future Conditions (2023) NEM represents five years after the Existing Conditions NEM (2018) previously submitted to the FAA. The NEMs provide the noise exposure baseline against which the effectiveness of measures within the NCP are evaluated.

The NEM Report describes in detail the information, methods, and tools used to develop the NEMs and estimate existing and future aircraft noise impacts in the vicinity of FLL. See **Sections 1.10** and **1.11** for more information on the FAA’s acceptance of the NEMs and land use compatibility.

1.7 Noise Compatibility Program

NCPs contain noise control strategies that have been selected by an airport operator as measures for implementation as a result of a 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., reducing noise exposure at the receiver end) that reduce existing noncompatible uses and strategies that prevent or reduce the probability of additional noncompatible uses being established.¹⁴ 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.

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

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

- 1) Acquisition of land and interests therein
- 2) Construction of barriers and acoustical shielding, including the soundproofing of public and private buildings
- 3) Implementation of a preferential runway use program
- 4) 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
- 5) Implementation of restrictions on the use of the Airport by any type or class of aircraft based on the noise characteristics of those aircraft
- 6) Other actions or combinations of actions that would have a beneficial noise control or abatement impact on the public
- 7) Other actions recommended for analysis by the FAA for the Airport

Each FLL noise abatement strategy was evaluated against the following seven criteria specified by the FAA in 14 CFR Part 150, Appendix B, Sec. 150.5:

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

Each noise mitigation strategy was evaluated against the following criteria:

- 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 Aviation Department?

- 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?

In some cases, based on input from stakeholders, BCAD elected to include certain measures as recommendations that did not decrease noncompatible land uses. In these cases, it was determined that the particular measure also did not increase noncompatible land uses, but had the potential to reduce annoyance or noise exposure in areas beyond the DNL 65 contour. 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.

1.8 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 sound level of 60 dB, while a sound level of 80 dB has 100 times as much acoustic energy as a sound level of 60 dB. A sound that is 10 dB higher than another is usually perceived to be twice as loud. **Figure 1-4** shows dB levels of common sounds.

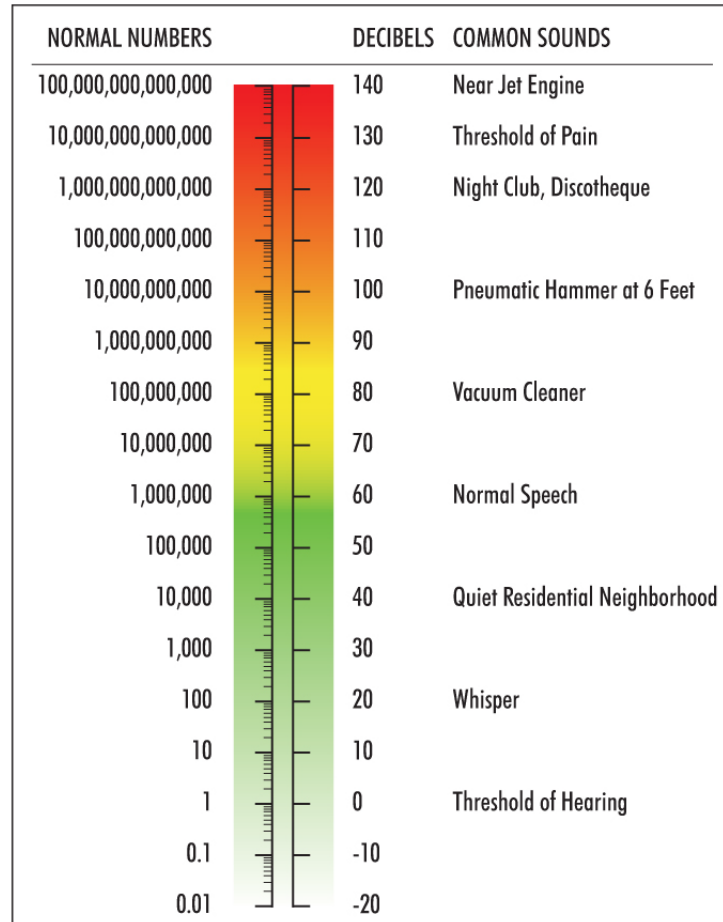
Frequency is a direct measurement of how rapidly a sound wave alternates between high and low pressures and is described in cycles per second, known as *Hertz* (Hz). The normal range of frequencies that a young adult can hear is between 20 Hz and 20,000 Hz, while the frequency range for aircraft noise is typically between 50 Hz and 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.

Figure 1-4
Decibel Levels of Common Sounds



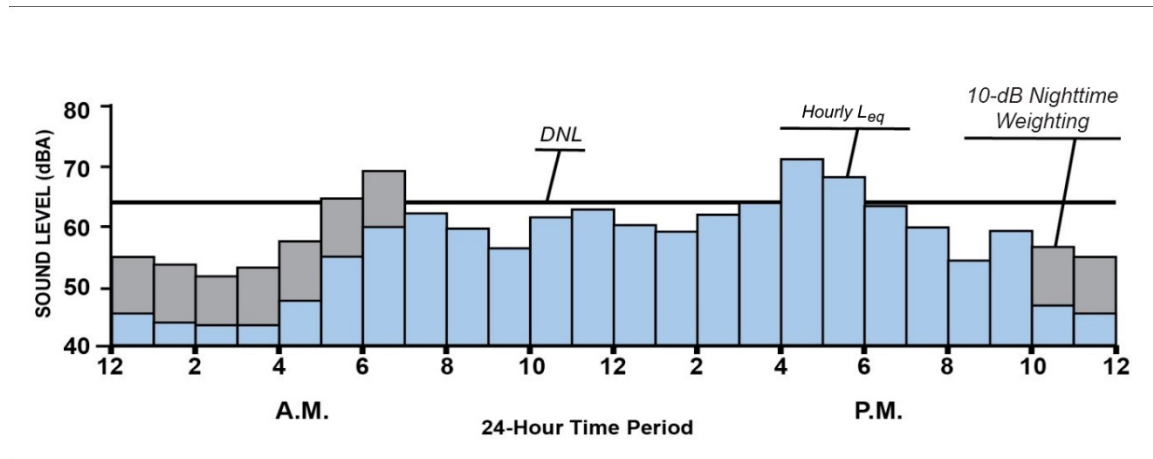
SOURCE: ESA, 2016.

14 CFR Part 150 requires the use of the DNL noise metric for this FLL 14 CFR Part 150 Study.¹⁵ 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 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 1-5** illustrates

¹⁵ 14 CFR Part 150, Appendix A, Section 150.101(a).

how DNL results from 24 hours of hourly L_{eq} values. Further details on aircraft noise are presented in Appendix D of the FLL NEM Report.

Figure 1-5
Illustration of DNL



SOURCE: ESA, 2016 and 2019.

1.9 Roles and Responsibilities

14 CFR Part 150 Sections 150.21(b) and A150.105(a) (Appendix A to Part 150) require that the NEMs and documentation submitted “...be developed and prepared...in consultation with states, public agencies and planning agencies whose area, or any portion of whose area, of jurisdiction is within the [DNL 65] contour depicted on the map, FAA regional officials, and other Federal officials having local responsibility for land uses depicted on the map. This consultation must include regular aeronautical users of the airport. The airport operator shall certify that it has afforded interested persons adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft noise exposure map and descriptions of forecast aircraft operations.”

The consultation and public involvement process for this Part 150 Study included the following elements to provide adequate opportunities for stakeholder engagement and participation during the development of the NEMs:

- Airlines, other airport tenants and users, the FAA, planning agencies, local communities, elected officials, and the general public were involved in the development of the NEMs for FLL.
- TC meetings were the primary means of coordinating with stakeholders and receiving feedback throughout the development of the NEMs. A list of the TC members is provided in **Chapter 5**.
- Public workshops were held to provide the public with information on the study process, noise modeling methodology and project schedule and solicit input on the development of the draft NEMs. A separate Study Coordination Committee (SCC) made up of

representatives of nearby jurisdictions was used to broadly disseminate study information to the public.

- For stakeholders, agencies, and the general public, a Study website¹⁶ was developed to provide study information including updates on the project progress and schedule, Frequently Asked Questions (FAQs), Study documents, additional links, and contact information to submit questions to the Part 150 Study Team (the Study Team). The website also allows for the submission of questions and comments related to “the correctness and adequacy...of the maps” as stated above.

1.9.1 Broward County Aviation Department (BCAD)

BCAD, as the operator of FLL, 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 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 BCAD elects to pursue any of the FAA-approved noise abatement and mitigation measures presented in this NCP Report, BCAD would be responsible for implementing or assisting with the implementation of the approved NCP measures and applying for funds (grants) from the FAA associated with FAA-approved eligible items included in this NCP.

1.9.2 14 CFR Part 150 Study Committees

After the initiation of this Part 150 Study, BCAD formed a TC and an SCC. The purpose of the TC was to provide varying perspectives and inputs to the NEM and NCP development processes. The primary emphasis of TC meetings was to create an atmosphere of understanding, awareness, and working together to derive strategies for improving the compatibility of FLL with its environs. Through an invitation from BCAD and a voluntary participation process as set forth in the TC charter, the TC brought together representatives from a broad spectrum of entities with interest in the Part 150 process and its outcome.¹⁷ The TC’s role was advisory and its purpose was solely limited to this Part 150 Study. The TC offered opinions, advice, and guidance to the Study Team, but BCAD had the sole discretion to accept or reject the TC recommendations. In addition to providing input, comments, and technical advice for the Part 150 Study, the responsibility of each TC member was to inform their respective organizations, agency, and/or group of the Committee’s discussions. The TC included members that represent BCAD, the FAA, airlines, Airport business associations, government agencies with aviation and land use responsibilities, business groups, planning organizations, Airport Noise Abatement Committee (ANAC) members, private sector interests (particularly in the aviation industry), and representatives of the affected communities in the Airport’s environs.

The purpose of the SCC was to engage communities in proximity to FLL to assist in the distribution of information related to the study to the broader community. The SCC served as a key mechanism

¹⁶ <http://www.fllpart150.com/>

¹⁷ The TC charter and membership are presented in **Table 6-1** of **Chapter 6**.

in getting the word out about public workshops, etc., that extended beyond the traditional media-based approach with the intent on maximizing community participation and input.

1.9.3 Federal Aviation Administration

The FAA is responsible for reviewing an airport operator's NCP submitted under 14 CFR Part 150. 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 include or exclude those measures from consideration for approval or disapproval for the purposes of 14 CFR Part 150. For example:

- If a measure would create an undue burden on interstate commerce or cause unjust discrimination toward aircraft operators, the FAA would not approve that measure in its Record of Approval under 14 CFR Part 150.
- If a measure would reduce existing noncompatible land uses and prevent the introduction of additional noncompatible land uses.
- The FAA also reviews any measure that includes the use of new or modified flight procedures to control the operation of aircraft for purposes of noise control or that affect flight procedures in any way, as these may require other types of additional reviews, such as environmental and safety reviews.

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

1. Office of Environment and Energy (AEE) - The FAA's AEE reviews complex technical and regulatory matters of national environmental policy significance.
2. The Air Traffic Organization (ATO) - The FAA's ATO includes air traffic controllers and support staff. FLL'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.
3. The Office of Airports (ARP) - The FAA's ARP holds the responsibility of reviewing submitted NCPs to determine whether they meet all requirements of 14 CFR Part 150. For this NCP, (1) the FAA's Orlando Airports District Office (Orlando ADO) will be responsible for determining whether the NCP satisfied all 14 CFR Part 150 requirements; and (2) the FAA's Southern Region Airport Division Manager will be responsible for final review of the NCP submission for adequacy in satisfying requirements of 14 CFR Part 150.

During review of an NCP, the FAA conducts a review, which involves members of Air Traffic, Flight Standards, Legal, Special Programs, Planning & Requirements, Flight Procedures, and Region offices.

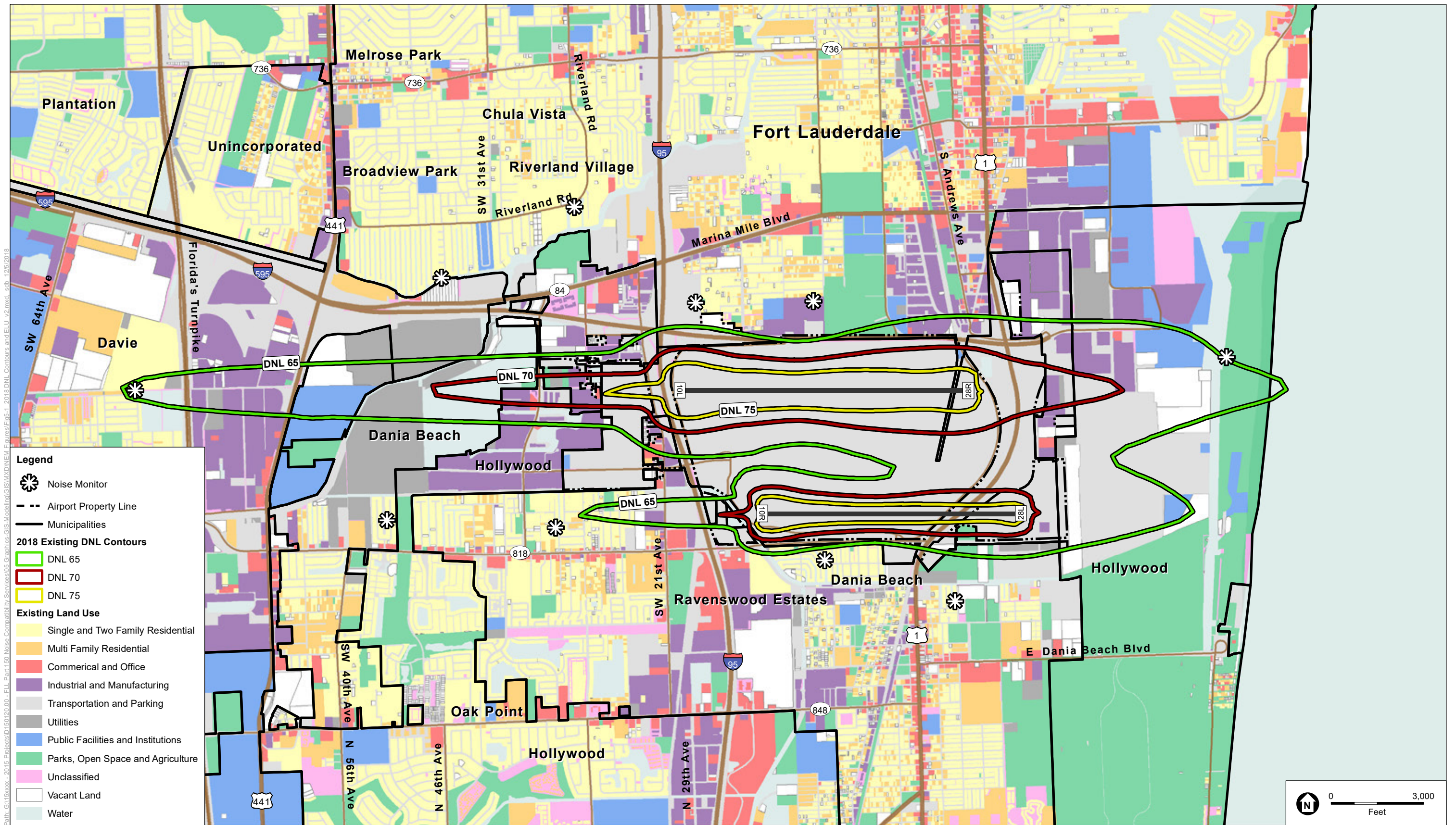
1.10 FAA-Accepted 2018 and 2023 Noise Exposure Maps

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 150.¹⁸ FLL’s NEMs reflect DNL contours for existing (2018) and five-year (2023) forecast conditions and noise-sensitive uses within the DNL 65 and higher contours. The NEMs were published in Appendix K of the FLL NEM Report and accepted by the FAA on October 3, 2019 (see **Appendix B-1**). **Figure 1-6** shows the Existing Conditions (2018) DNL contours, and **Figure 1-7** shows the Future Conditions (2023) DNL contours.

The DNL contours for this study were prepared using AEDT Version 2d. The AEDT 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 AEDT includes both physical and operational data. The physical data include airfield geometry (i.e., 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 noise levels of 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 FLL.

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

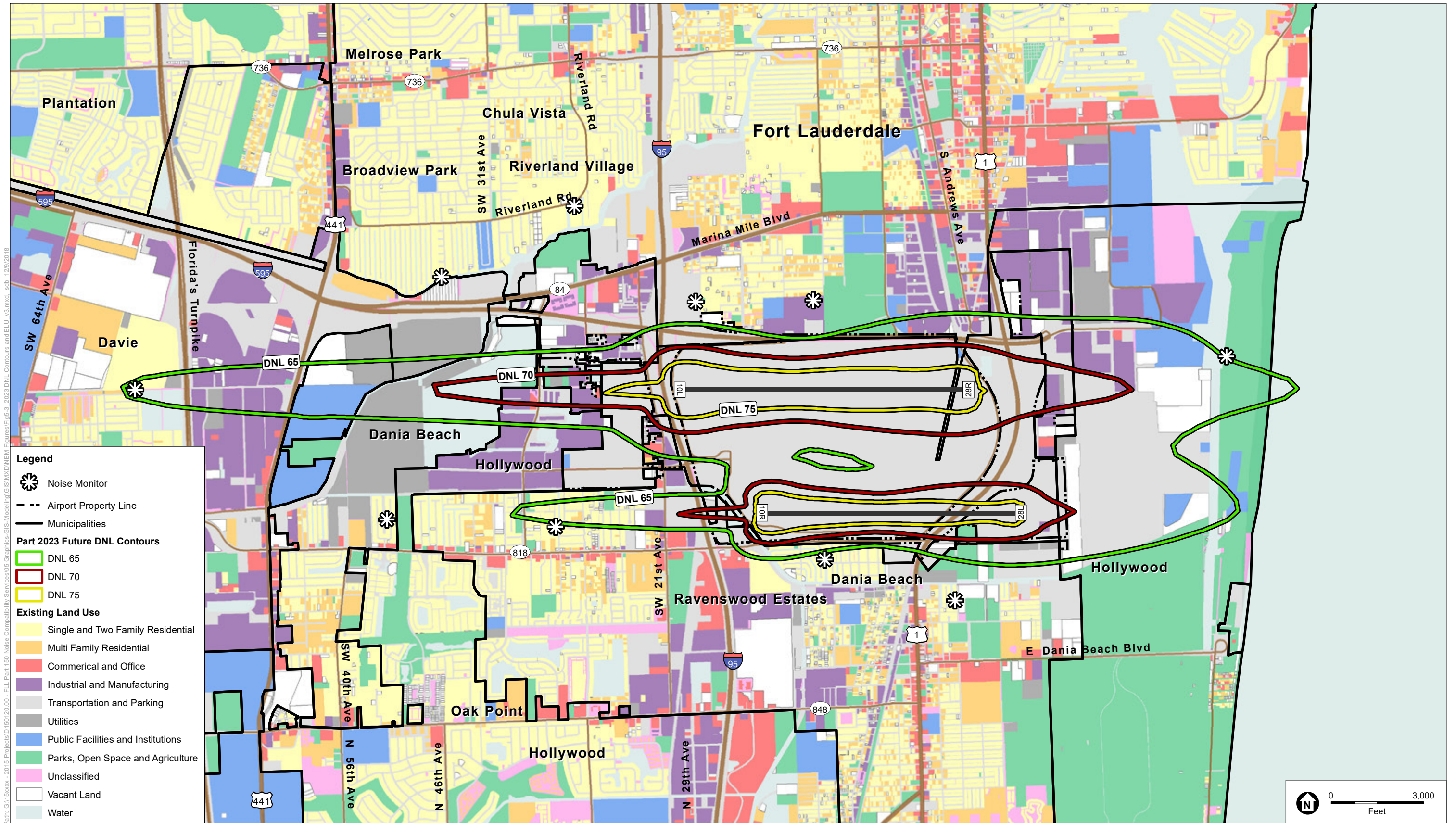


SOURCE: Esri; Broward County GIS Parcel Data Set, October 2017; AEDT 2d; Adapted by Arora Engineers and ESA, 2018

Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

Figure 1-6
2018 DNL Contours and Generalized Existing Land Uses
Fort Lauderdale-Hollywood International Airport

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SOURCE: Esri; Broward County GIS Parcel Data Set, October 2017; AEDT 2d; Adapted by Arora Engineers and ESA, 2018

Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

Figure 1-7
2023 DNL Contours and Generalized Existing Land Uses
Fort Lauderdale-Hollywood International Airport

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Table 1-5 provides a summary of residents, dwelling units, and noise-sensitive sites exposed to DNL 65 and higher in 2018. Out of the 238 housing units and 497 people exposed to noise levels of DNL 65 and higher, 90 housing units and 190 people are not included in the current FLL RSIP. The other 148 housing units are considered to be compatible with aircraft noise.

Table 1-6 provides a summary of residents, dwelling units, and noise-sensitive sites forecasted to be exposed to DNL 65 and higher in 2023. Out of the 548 housing units and 1,121 people exposed to noise levels of DNL 65 and higher, 108 housing units and 231 people are not included in the current FLL RSIP. The other 440 housing units are considered to be compatible with aircraft noise.

The complete FLL NEM Report with detailed information is available for review on the project website at: <http://www.fllpart150.com>.

TABLE 1-5
NOISE-SENSITIVE SITES EXPOSED TO DNL 65 AND HIGHER – EXISTING CONDITIONS (2018)

Noise Level ¹	Total Area (Acres)	Housing Units ²	Population ²	Religious	Schools ³	Hospitals	Historic Resources ⁴	Day Cares	Group Care	Libraries	Nursing Homes
DNL 65-70	2,276.0	238	497	0	0	0	3	0	0	0	0
DNL 70-75	710.1	0	0	0	0	0	0	0	0	0	0
DNL 75+	459.6	0	0	0	0	0	0	0	0	0	0
Total	3,445.7	238	497	0	0	0	3	0	0	0	0

SOURCES:

¹ Noise contours from Environmental Science Associates (ESA).

² Housing units and population estimates derived from 2010 Census block-level data. 90 housing units and 190 people are not included in the current FLL RSIP. The other 148 housing units are considered to be compatible with aircraft noise.

³ Public school data from Broward County Public Schools; private schools from Florida Geographic Data Library (FGDL).

⁴ The historic resources include the Link Trainer NAS Ft Lauderdale (NRHP-Listed), GB Airlink, and the North Coast Trailer Park.

NOTE: All other noise sensitive site data from Florida Geographic Data Library (FGDL).

TABLE 1-6
NOISE-SENSITIVE SITES EXPOSED TO DNL 65 AND HIGHER – FUTURE CONDITIONS (2023)

Noise Level ¹	Total Area (Acres)	Housing Units ²	Population ²	Religious	Schools ³	Hospitals	Historic Resources	Day Cares	Group Care	Libraries	Nursing Homes
DNL 65-70	2,579.0	548	1,121	0	0	0	3	0	0	0	0
DNL 70-75	805.7	0	0	0	0	0	0	0	0	0	0
DNL 75+	503.3	0	0	0	0	0	0	0	0	0	0
Total	3,888.0	548	1,121	0	0	0	3	0	0	0	0

SOURCES:

¹ Noise contours from ESA.

² Housing units and population estimates derived from 2010 Census block-level data. 108 housing units and 231 people are not included in the current FLL RSIP. The other 440 housing units are considered to be compatible with aircraft noise.

³ Public school data from Broward County Public Schools; private schools from Florida Geographic Data Library (FGDL).

NOTE: All other noise sensitive site data from Florida Geographic Data Library (FGDL).

1.11 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 1-7**) 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 to determine land use compatibility is DNL. Further details on aircraft noise are presented in Section 1.8 of this NCP and in Appendix D of the FLL NEM Report.

As shown in **Table 1-7**, noise-sensitive land uses such as residential, mobile home parks, transient lodging, schools, and outdoor music venues are considered incompatible with noise exposures of DNL 65 and 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 (e.g., parks, amusement parks, and zoos) 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 this Part 150 Study, the compatible and incompatible land uses within the DNL 65 and higher contours were identified using the designations provided in **Table 1-7** to the extent that the designations were aligned with Broward County land use categories. Land use compatibility is described further in Chapter 3 of the FLL NEM Report.

TABLE 1-7 14 CFR PART 150 LAND USE COMPATIBILITY GUIDELINES IN AIRCRAFT NOISE EXPOSURE AREAS						
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 & 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

Numbers in parenthesis 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.

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: Title 14 Code of Federal Regulations Part 150, Appendix A, Table 1, *Airport Noise Compatibility Planning*.

1.12 Noise Compatibility Program (NCP) Organization

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

Chapter 1 Introduction

Chapter 2 Noise Compatibility Program – Noise Abatement Measures

Describes the existing FLL noise abatement program and presents recommended noise abatement for the FLL NCP

Chapter 3 Noise Compatibility Program – Land Use Management Measures

Describes the existing land use management measures associated with FLL and presents recommended land use management measures for the FLL NCP

Chapter 4 Noise Compatibility Program – Programmatic Measures

Describes the current programmatic measures associated with FLL and presents recommended programmatic measures for the FLL NCP

Chapter 5 Noise Compatibility Program Implementation

Summarizes the overall NCP program responsibilities, costs and timeline.

Chapter 6 Consultation and Public Involvement

Details consultation and stakeholder and public involvement activities associated with the FLL NCP.

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

Appendix A Glossary of Terms and Acronyms

Appendix B FLL 14 CFR Part 150 Record of Approval

Appendix C Stakeholder Suggested Measures

Appendix D Noise Abatement Alternatives Supplemental Information

Appendix E Land Use Supplemental Information

Appendix F Agency and Other Consultations

Appendix G Technical Committee Meetings

Appendix H Public Outreach

Appendix I Public Comments

CHAPTER 2

Noise Compatibility Program – Noise Abatement Measures

Noise abatement measures control noise at the source; such measures include airport layout modifications, flight path changes, preferential runway use, arrival and departure procedures, and on-airport noise barriers. The objective of noise abatement measures in this NCP is to reduce the number of noise-sensitive land uses exposed to aircraft noise of DNL 65 and higher.¹⁹ As presented in the FLL NEM²⁰ Report (Section 2.1), the Airport is located in a region with highly congested airspace. Within a 36-nautical mile stretch of the South Florida coast, the airspace is shared by Boca Raton (BCT), Pompano (PMP), Fort Lauderdale Executive (FXE), North Perry (HWO), Miami-Opa Locka Executive (OPF), and Miami International Airports (MIA). All of these airports contribute to the complex airspace in which FLL operates. The number and types of noise abatement measures that can be implemented are consequently limited due to the complex airspace and the need to maintain safe and efficient use of airspace.

The 14 CFR Part 150 process includes a review of existing and potential noise abatement measures that could reduce the number of noncompatible uses exposed to DNL 65 and higher. 14 CFR Part 150 requires that an NCP evaluate the following types of noise abatement measures, at a minimum.²¹

- Use of flight procedures, such as flight tracks, arrival procedures, and departure procedures, to reduce noise exposure – addressed in Section 2.2 of this chapter;
- Implementation of a preferential runway use system – addressed in Section 2.2 of this chapter; and
- Implementation of airport use restrictions²² – addressed in Section 2.3 of this chapter.

The AEDT was used for noise modeling to support analysis of stakeholder-suggested noise abatement measures.²³ The AEDT uses airport-specific information (e.g., runway data), flight track information, aircraft operation levels distributed by time of day, aircraft fleet mix, and aircraft altitude profiles to develop noise exposure contours. The AEDT 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,

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

²⁰ A glossary of terminology and a list of acronyms related to this Part 150 Study can be found in **Appendix A**.

²¹ 14 CFR Part 150, Appendix B, Sec. B150.7(b).

²² 14 CFR Part 150 predates the ANCA, which prevents the establishment of operational restrictions without successful completion of the process described in 14 CFR Part 161 and subsequent FAA approval of those restrictions.

²³ See Section 4.2 of the FLL NEM Report for a detailed description of the AEDT.

the model computes and sums noise exposure at pre-determined grid locations equally spaced at ground level around the airport. The cumulative values of noise exposure at each grid location are used to develop contours of equal noise exposure.

2.1 Existing Aircraft Noise Abatement Program

Historically, BCAD has been active in addressing aircraft noise concerns, including the implementation of noise abatement measures that predate this Part 150 Study. The first NCP for FLL was completed in 1987 and recommended six noise abatement measures, five of which were approved by the FAA. An NCP Update was completed in 1994 and recommended six additional noise abatement measures; three of which were approved by the FAA, while the other three were approved only as voluntary. Information on the 1987 and 1994 NCPs is provided in **Section 1.3**.

Further noise abatement actions relevant to FLL include:

- Passage of the ANCA, which prohibited operation of Stage 1 and Stage 2 aircraft with a maximum weight above 75,000 pounds within the United States after December 31, 1999;
- Passage of the FMRA, which prohibited operation of Stage 1 and Stage 2 aircraft with a maximum weight of 75,000 pounds or lower within the 48 contiguous United States after December 31, 2015;
- The 2008 EIS identified a mitigation program based on the preferred alternative's (Alternative B1b) 2020 noise exposure with no operational limitations or restrictions;
- The City of Dania Beach and Broward County entered into an Interlocal Agreement in November of 2013, which included a provision for a voluntary limited nighttime use of Runway 10R-28L between 10:00 p.m. and 5:00 a.m. (see **Appendix C-3**).²⁴ This program was referred to in the Agreement as the Voluntary User Program for Runway 10R-28L. As noted previously, the FAA was not a party to this agreement. The program was later modified to operate between the hours of 10:30 p.m. and 6:00 a.m.²⁵ This action was subject to the following conditions:
 - a. When necessitated by considerations of weather, air traffic safety, or efficiency, as determined by pilots or the Air Traffic Control Tower; or
 - b. During construction or maintenance work on the airfield or the 10L-28R North Runway (formerly known as the 9L-27R North Runway) or closure of the said North Runway for any other reason; or
 - c. The existence of an emergency or safety condition, as declared by the pilot, the Air Traffic Control Tower, or the Airport Aviation Director.”

²⁴ City of Dania Beach and Broward County. Paragraph 2(a). Interlocal Agreement. November 19, 2013.

²⁵ “Fort Lauderdale-Hollywood International Airport (FLL) Informal Runway Use Program.” Tower Order FLL 8400.9a. May 5, 2015.

- Initially enacted in 1996 and updated in 2004, are BCAD’s FLL Idle Power and Full Power Engine Runs procedures. These procedures strictly limit idle-power and full-power engine runs between 11:00 p.m. and 7:00 a.m.²⁶

2.2 Noise Abatement Measures Recommended for Inclusion in this NCP

This section describes noise abatement measures that BCAD recommends for inclusion in this NCP and, for each measure, assesses the following:

- The potential benefits and implementation requirements (e.g., the party responsible for implementing a measure);
- The estimated cost to implement;
- Potential 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 developing the proposed measures and arriving at these recommendations, as discussed in **Section 1.9** and **Chapter 6**, it is important to note that, ultimately, the recommendations are those of BCAD based on coordination with stakeholders.

Noise Abatement Measure Development Process

As discussed in **Chapter 6**, the Study Team solicited input from the TC, members of the public, and various stakeholders regarding suggested noise abatement measures that may reduce noncompatible land uses within the Future Conditions (2023) DNL 65 contour. During the stakeholder engagement process, the Study Team received a broad spectrum of thoughtful ideas and suggestions, many of which were similar in nature and can be grouped into the following six general themes:

1. Close Runway 10R-28L during nighttime hours;
2. Reduce or eliminate early northward turns of departing aircraft during west-flow conditions;
3. Maximize use of runway headings for all arrivals and departures;
4. Implement aircraft departure procedures with steeper climb gradients;
5. Evaluate the 2013 Interlocal Agreement Voluntary Night Closure provision; and

²⁶ Broward County Aviation Department. “Fort Lauderdale-Hollywood International Airport (FLL) Idle Power and Full Power Engine Runs.” May 1, 2004.

6. Increase altitudes of aircraft arrivals to FLL during east-flow conditions.

The process of analyzing these themes by the Study Team served as a useful conceptual starting point to help BCAD understand how different operational changes would affect the Airport noise environment. This information was then used to guide the evaluation of additional noise abatement measures that were either recommended or not recommended in this NCP. Importantly, the exercise of gathering stakeholder input not only brought the public into the decision-making process but also highlighted the aircraft noise-related issues of most concern to the surrounding communities. During the analysis process, the FAA-accepted Future Conditions (2023) NEM was used as the reference for comparison. This NEM includes the forecast changes in aircraft operations, aircraft fleet, and land uses; therefore, it represents the expected future noise exposure in the areas around FLL, absent the implementation of this NCP. The Future Conditions (2023) contours are depicted in **Figure 1-7 of Chapter 1**. The AEDT was used to determine the potential changes in noise levels associated with each stakeholder-suggested noise abatement theme. Modeled noise levels associated with each theme were then compared to the “baseline” Future Conditions (2023) NEM noise levels. The detailed results are presented in **Appendix D**.

The noise abatement recommendations and analysis information for FLL generated by this assessment process are described in detail below and are largely informed by the analyses presented in **Appendix D. Section 2.3** provides a summary of some of the noise abatement strategies that were suggested, but are not being recommended for inclusion in this NCP.

FLL Noise Abatement Measure 1 (NA-1): Continue Voluntary User Program for Runway 10R-28L

Description

This voluntary measure would largely represent a continuation of the program developed to satisfy the 2013 Interlocal Agreement between the City of Dania Beach and Broward County that provides for limited use of Runway 10R-28L between the hours of 10:30 p.m. and 6:00 a.m. (see **Appendix C-3**).²⁷ The Interlocal Agreement was the result of settling all pending litigation between the City of Dania Beach and Broward County related to expansion of the South Runway stemming from the 2008 EIS. The agreement addressed City of Dania Beach concerns related to development of the new runway and included initial considerations related to the operation of the new runway. Section 2(a)(iii)(b) of Interlocal Agreement states that:

The Voluntary Night Closure shall remain in effect until a new Part 150 noise study ("New Part 150 Study") for the Airport is completed by the County and the FAA has made a determination based on the New Part 150 Study. The FAA's determination as a result of the New Part 150 Study shall establish whether or not the Voluntary Night Closure of the Expanded South Runway will remain in effect and, if so, for what periods of time and under what conditions.

²⁷ “Fort Lauderdale-Hollywood International Airport (FLL) Informal Runway Use Program.” Tower Order FLL 8400.9a. May 5, 2015.

Section 2(a)(iii)(e) further indicates that:

The County agrees that in the development of the New Part 150 Study, as described in subparagraph 2(a)(iii)(b), above, the County will include the Voluntary Night Closure as an abatement measure to be analyzed as part of such New Part 150 Study. The County further agrees that it will include continuation of the Voluntary Night Closure in its recommendations to the FAA in connection with such New Part 150 Study unless the City agrees in writing to the contrary.

It should be noted that the FAA does not currently close the South Runway at night, but manages the use of runways based on weather and current operating conditions. Commercial service airports, such as FLL, are generally prohibited from closing runways for reasons other than safety, regardless of the duration. As a condition of receiving funding from the FAA, an airport is obligated to keep its runways open and available to support aircraft arrival and departure operations at all times. The voluntary nighttime runway use program, or Voluntary User Program, implemented for FLL has the effect of reducing aircraft operations over residential areas west of the Airport, off the South Runway, during nighttime hours.²⁸ The Voluntary User Program resulting from the Interlocal Agreement has been reflected in operational conditions at FLL since the opening of Runway 10R-28L. The recommended measure would be subject to the same conditions as the current Voluntary User Program and shall not be in effect during any of the following conditions:

- a. When necessitated by considerations of weather, air traffic safety, or efficiency, as determined by pilots or the Air Traffic Control Tower;
- b. During construction or maintenance work on the airfield or the 10L-28R North Runway or closure of the said North Runway for any other reason; or
- c. The existence of an emergency or safety condition, as declared by the pilot, the Air Traffic Control Tower, or the Airport Aviation Director.

Type of Measure

This measure is a voluntary runway use measure and is intended to improve the noise environment at FLL by reducing overflights of densely populated areas immediately west of the south runway during nighttime hours. 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 and the FAA will not support closing a runway. The current program is voluntary and reduces use of the South Runway (Runway 10R-28L) at night is conditional based on weather, air traffic safety, and efficiency considerations and availability of the North Runway (Runway 10L-28R). Ultimately, runway use remains at the discretion of the pilot. Airport operators are obligated to inform the FAA of which runways are available for use (not temporarily closed for inspection, maintenance, construction, etc.) so that the FAA can then identify which available runways are to be used for aircraft departures and arrivals. In general, voluntary runway use measures are recommendations

²⁸ Unless closed for maintenance purposes, Runway 10R-28L has always been available for use at night and will continue to be available at night.

made to the FAA and can be implemented only when the FAA determines that Airport operating conditions are favorable for use.

Analysis

The Voluntary User Program for Runway 10R-28L represents an existing condition that is reflected in the Existing Conditions (2018) NEM and the baseline Future Condition (Year 2023) NEM. Evaluation of the implications of its potential modification is discussed in **Section D.5 of Appendix D**, and potential noise exposure levels with and without the current Program are shown in **Figure D-9 of Appendix D**. If the measure were to be continued, the noise exposure would be consistent with that reflected in the Future Condition NEM and aircraft overflights of densely populated areas immediately west of the South Runway would continue to be reduced during nighttime hours. If the measure is discontinued, the areas of noncompatible residential land uses would increase. While all 89 noncompatible residential units located west of the North Runway would no longer be within the 2023 DNL 65 contour, there would be an increase of 95 noncompatible residential units located west and south of the South Runway. This includes 42 residential structures located within the mitigation area that was associated with the 2008 EIS that chose not to participate in the residential sound insulation program. It would also include 53 residential structures (mobile homes) anticipated to be located within the 2023 NEM that did not participate in the land acquisition program that was associated with the 2008 EIS mitigation program. As shown in **Table 2-1**, the net effect of removing the Voluntary User Program would be an increase in noncompatible residential uses of six units.

This analysis also showed that discontinuation of this measure would increase the compatible residential uses within the DNL 65 from 408 units to 812 units because it would increase exposure for residential units that previously received sound insulation, which are considered compatible for the purposes of Part 150. Overall, there would be an increase of 404 compatible residential units within the DNL 65 contour.

Because this measure has been in effect since the opening of the new runway more than seven years ago, it is reflected in both the Existing Conditions (2018) and baseline Future Conditions (2023) NEM contours. **Table 2-1** provides a summary of the compatible and non-compatible residential units that would be affected if the Voluntary User Program were to be discontinued. Discontinuing the Voluntary User Program would decrease noise impacts west of the North runway and increase noise impacts south and west of the South Runway. Overall, discontinuing the Voluntary User Program would increase noncompatible land uses by six residential units and would nearly double the number of compatible (already mitigated) residential units located within the DNL 65 and greater contours. Since the discontinuation of this measure would increase the number of noncompatible residential units, continuing this measure is consistent with the goals and objectives of 14 CFR Part 150.

TABLE 2 1 CHANGE IN RESIDENTIAL HOUSING UNITS RESULTING FROM REMOVAL OF VOLUNTARY USER PROGRAM FOR RUNWAY 10R 28L			
	Continue Voluntary User Program (2023)	Discontinue Voluntary User Program (2023)	Net Change if NA 1 is Discontinued
<i>Noncompatible Residential Units (Units located west of North Runway)</i>	89	0	-89
<i>Noncompatible Residential Units (Units located west and south of South Runway)</i>	51	146	+95
Total Noncompatible Residential Units	140	146	+6
Total Compatible Residential Units	408	812	+404

SOURCE: ESA, 2020.

NOTE: Housing estimated based on 2010 Census block-level data.

*Residential units that did not participate in the previous program and would potentially be eligible for inclusion in a Part 150 RSIP.

Potential Noise Benefits

The Voluntary User Program is essentially a continuation of the current operational environment, which has been in place for more than seven years. Its continuation would result in no change in noise exposure relative to the Existing Conditions (2018) NEM and the baseline Future Conditions (2023) NEM. While discontinuing this measure would reduce noncompatible residential units located west of the North Runway, it would also introduce new noncompatible units into the DNL 65 and higher contour near the South Runway. Overall, this measure avoids increased noise exposure of six noncompatible and 404 compatible residential units to the west of Runway 10R. Mitigation and acquisition are proposed as separate measures to address remaining noncompatible land uses if this measure were implemented. If this measure is discontinued, additional mitigation/acquisition would be required near the South Runway to address the additional residential units that are impacted as a result of potential changes in noise exposure.

If this recommended measure is not approved, a new NEM would need to be completed to determine RSIP eligibility. **Table 2-2** provides a summary of the benefits, responsibilities, costs and timeline for this recommended measure.

Conclusions: *NA 1: Continue Voluntary User Program for Runway 10R 28L.* This voluntary measure provides for minimal use of Runway 10R 28L between the hours of 10:30 p.m. and 6:00 a.m., subject to a series of conditions. The Program would continue to promote the use of Runway 10L for arrivals at night during east flow conditions and is reflected in the Airport's Existing and Future Conditions (2018 and 2023) NEM.

TABLE 2 2
IMPLEMENTATION SUMMARY FOR NA 1: CONTINUE VOLUNTARY USER PROGRAM FOR RUNWAY 10R 28L

Implementation Item	Discussion
Benefits	Continuation of the Voluntary User Program would continue to reduce overflights of densely populated areas located west of Runway 10R and would reduce noise exposure during nighttime hours over this area. This measure would reduce total noncompatible land uses within the DNL 65 contour by six units; it would also reduce compatible residential uses within the DNL 65 by 404 units.
Rationale	BCAD is recommending NA-1 because the Voluntary User Program for Runway 10R-28L is already reflected in current operational conditions. Including this recommendation is consistent with its obligations under the 2013 Interlocal Agreement and reduces overflights of both noncompatible and compatible single family residential areas west of the Airport during nighttime hours.
Responsible Parties	FAA
Estimated Costs	The Voluntary User Program for Runway 10R-28L has already been implemented and is represented in the baseline Future Conditions (2023) NEM. Both continuation of the measure as well as disapproval of this measure would require mitigation or acquisition of eligible noncompatible residential units located with the DNL 65 contour.
Funding Sources	N/A
Requirements	None. The Voluntary User Program for Runway 10R-28L is already in effect and is represented in the baseline Future Conditions (2023) NEM.
Estimated Schedule	The Voluntary User Program for Runway 10R-28L has already been implemented and is represented in the baseline Future Conditions (2023) NEM.

SOURCE: BCAD and ESA, 2020.

FLL Noise Abatement Measure 2 (NA-2): Reduce Early Aircraft Departure Turns from FLL through Implementation of ELSO or ELSO-Equivalent Procedures During West-Flow Conditions

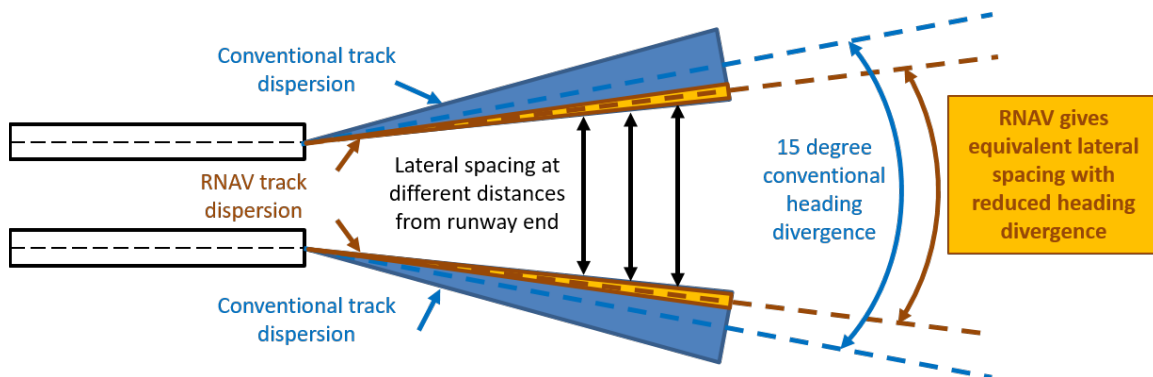
Description

BCAD and the FAA have had several discussions regarding concerns expressed by numerous community members regarding aircraft making early northward turns when departing in west-flow conditions. These meetings with FAA included discussions on how air traffic is handled in the busy airspace surrounding FLL to ensure safety and efficiency. Early northward turns typically place

departing aircraft over residential areas immediately northwest of FLL at low altitudes. While approximately 20% of departures occur during west-flow operations, these activities generate the majority of all noise complaints received by BCAD. BCAD would continue to work with the FAA to modify departure procedures from FLL to reduce early northward turns. To minimize overflights of neighborhoods and maximize use of compatible land use corridors in proximity to FLL, BCAD is requesting that the FAA’s ATO implement either Equivalent Lateral Spacing Operations (ELSO) or equivalent procedures to (1) reduce departure path divergence and (2) keep aircraft over compatible land use corridors to the greatest extent possible without reducing aircraft safety or Airport capacity. ELSO uses Area Navigation (RNAV) departure procedures, which enable aircraft to track a more precise flight path and reduce the lateral spacing between other departing aircraft, as depicted on **Figure 2-1**.

This measure is consistent with BCAD’s recommendations included in its official comments on FAA’s South-Central Florida Metroplex EA.

Figure 2-1
Divergence of Conventional Departures versus RNAV Departures



SOURCE: ESA, 2020.
NOTE: Graphic not to scale.

Type of Measure

This measure is a flight procedure modification that may be used to reduce aircraft noise exposure to noise-sensitive parcels and people in areas northwest of FLL. Specifically, the measure involves modifying the flight paths of aircraft departing from FLL in west-flow conditions to reduce overflights of residential areas to the immediate northwest of the Airport.

Analysis

Aircraft departing westbound are typically assigned either a 275- or a 290-degree departure heading consistent with the 2008 EIS. The difference of 15 degrees, or “divergence”, provides the spacing required for simultaneous departures on the parallel runways.²⁹ Applying 15 degrees of divergence also allows for reduced spacing of consecutive departures taking off on the same runway. For example, when aircraft are assigned a 290-degree heading from departure Runway 28R (the north

²⁹ FAA. “Air Traffic Control” Order 7110.65Y, CHG1. Section 5-8-3, Successive or Simultaneous Departures.

runway), they cross north of Interstate 595 over a number of communities relatively close to the Airport. Because the aircraft are at a higher engine thrust setting during takeoff, more noise is generated. Use of simultaneous departures on the parallel runways or reduced spacing departures on a single runway are important tools to improve efficiency during peak periods, especially when operating in the complex airspace environment. Application of ELSO or ELSO-equivalent procedures may allow for the divergence to be reduced from 15 degrees to 10 degrees or even less. BCAD and FAA have discussed the use of this measure and there are conditions that may substantially affect or may limit its use (e.g., peak period traffic volumes, weather, arrival/departure flows, proximity to other airports, etc.). If implemented, application of ELSO or ELSO-equivalent procedures may provide greater ability to keep aircraft over compatible land use corridors. The potential noise implications of reducing northward turns in the immediate vicinity of FLL in west-flow conditions were evaluated to determine how implementation of ELSO or ELSO-equivalent procedures would affect the noise exposure. Results of this analysis (see **Section D.2 of Appendix D**) indicate that because the residential areas are located outside the DNL 65 contour, the measure would not reduce noncompatible land uses. While this measure would not reduce noncompatible land uses within the DNL 65 contour, it could reduce annoyance to people located in the densely-populated areas west and northwest of the airport.

Potential Noise Benefits

This measure would not reduce noncompatible land uses within the DNL 65 contour, but could reduce annoyance caused by aircraft overflight in residential areas northwest of the Airport. **Table 2-3.** provides a summary of the benefits, responsibilities, costs and timeline for this recommended measure.

Conclusions: *NA 2: Reduce Early Aircraft Departure Turns from FLL through Implementation of ELSO or ELSO Equivalent Procedures During West Flow Conditions.* The BCAD is requesting that the FAA's ATO implement either ELSO or ELSO equivalent procedures to (1) reduce departure path divergence for Runway 28R and (2) keep aircraft over compatible land use corridors to the extent possible without reducing aircraft safety or Airport capacity. This measure would not reduce noncompatible land uses within the DNL 65 contour but could reduce annoyance caused by aircraft overflight in residential areas northwest of FLL.

TABLE 2 3 IMPLEMENTATION SUMMARY FOR NA 2: REDUCE EARLY AIRCRAFT DEPARTURE TURNS FROM FLL THROUGH IMPLEMENTATION OF ELSO OR ELSO EQUIVALENT PROCEDURES DURING WEST FLOW CONDITIONS	
Implementation Item	Discussion
Benefits	NA-2 would not reduce noncompatible land use within the DNL 65 contour. Potential reduction of aircraft overflight-related noise annoyance in residential areas located immediately northwest of FLL, but outside of the DNL 65 contour.
Rationale	BCAD is recommending NA-2 because this measure could reduce annoyance by reducing overflights of neighborhoods to the immediate northwest of FLL. However, there are conditions that may substantially affect or limit the use of this measure (e.g., peak period traffic volumes, weather, arrival/departure flows, proximity to other airports, etc.).
Responsible Parties	FAA
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	FAA
Requirements	FAA Approval. Implementation may require an environmental study under the National Environmental Policy Act (NEPA).
Estimated Schedule	BCAD to submit a request for flight path modification within 6 to 12 months of the FAA's Record of Approval for this NCP. FAA design, testing, and implementation of the procedure could typically take at least one year once BCAD requests initiation of the development process.

SOURCE: BCAD and ESA, 2020.

FLL Noise Abatement Measure 3 (NA-3): Reduce Early Aircraft Departure Turns from FLL through Implementation of ELSO or ELSO-Equivalent Procedures during East-Flow Conditions

Description

BCAD and the FAA have discussed concerns expressed by community members regarding aircraft making early northward turns when departing FLL in east-flow conditions. These early northward turns typically place departing aircraft over residential areas to the northeast of FLL. BCAD would continue to work with the FAA to modify departure procedures from FLL to reduce early northward turns. To minimize overflights of neighborhoods in the immediate northeastern proximity of FLL, BCAD is requesting that the FAA's ATO implement either ELSO or ELSO-equivalent procedures to (1) reduce departure path divergence for Runway 10L and (2) keep aircraft over compatible land use corridors to the extent possible without reducing aircraft safety or Airport capacity. **Figure 2-1** provides an overview of ELSO and the potential reductions in departure track divergence.

This measure is consistent with BCAD's recommendations included its official comments on FAA's South-Central Florida Metroplex EA.

Type of Measure

This measure is a flight procedure modification that may be used to reduce aircraft noise exposure to noise-sensitive parcels and people in the area northeast of FLL. Specifically, the measure

involves modifying the flight paths of aircraft departing from FLL in east-flow conditions to reduce overflights of residential areas to the northeast of the Airport.

Analysis

Aircraft departing eastbound are typically assigned either an 080- or 095-degree departure heading consistent with the 2008 EIS. The difference of 15 degrees or “divergence” provides the spacing required for simultaneous departures on the parallel runways. Applying 15 degrees of divergence also allows for reduced spacing of consecutive departures taking off on the same runway. For example, when aircraft are assigned a 080-degree heading from departure Runway 10L (the north runway), they fly over or very near to a number of communities relatively close to the Airport. Because the aircraft are at a higher engine thrust setting during takeoff, more noise is generated. As noted in NA-2, use of simultaneous departures on the parallel runways or reduced spacing departures on a single runway are important tools to improve efficiency during peak periods, especially when operating in the complex airspace environment. Application of ELSO or ELSO-equivalent procedures could allow for the divergence to be reduced from 15 degrees to 10 degrees or even less. This would allow greater ability to route departing aircraft over water before flying over communities. The potential noise implications of reducing northward turns in the immediate vicinity of FLL in east-flow conditions were evaluated to determine how implementation of ELSO or ELSO-equivalent procedures would affect community noise exposure. Results of this analysis (see **Section D.3 of Appendix D**) indicate that because the residential areas are located outside the DNL 65 contour, the measure would not reduce noncompatible land uses. While it would not reduce noncompatible land uses within the DNL 65 contour, this measure could reduce annoyance to people located in these densely-populated areas.

Potential Noise Benefits

This measure would not reduce noncompatible land uses within the DNL 65 contour, but could reduce annoyance caused by aircraft overflight in residential areas northeast of the Airport. **Table 2-4** provides a summary of the benefits, responsibilities, costs and timeline for this recommended measure.

Conclusions: *NA 3: Reduce Early Aircraft Departure Turns from FLL through Implementation of ELSO or ELSO Equivalent Procedures During East Flow Conditions.* The BCAD is requesting that the FAA’s Air Traffic Organization implement either ELSO or ELSO equivalent procedures to (1) reduce departure path divergence for Runway 10L and (2) keep aircraft over compatible land use corridors to the extent possible without reducing aircraft safety or Airport capacity. This measure would not reduce noncompatible land uses within the DNL 65 contour but could reduce noise exposure caused by aircraft overflight in residential areas northeast of FLL.

TABLE 2 4 IMPLEMENTATION SUMMARY FOR NA 3: REDUCE EARLY AIRCRAFT DEPARTURE TURNS FROM FLL THROUGH IMPLEMENTATION OF ELSO OR ELSO EQUIVALENT PROCEDURES DURING EAST FLOW CONDITIONS	
Implementation Item	Discussion
Benefits	NA-3 would not reduce noncompatible land use within the DNL 65 contour. Potential reduction of aircraft overflight-related noise annoyance in residential areas located immediately northeast of FLL, but outside of the DNL 65 contour.
Rationale	BCAD is recommending NA-3 because this measure could reduce annoyance by reducing overflights of neighborhoods to the northeast of FLL. However, there are conditions that may substantially affect or limit the use of this measure (e.g., peak period traffic volumes, weather, arrival/departure flows, proximity to other airports, etc.).
Responsible Parties	FAA
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	FAA
Requirements	FAA Approval. Implementation may require an environmental study under NEPA.
Estimated Schedule	BCAD to submit a request for flight path modification within 6 to 12 months of the FAA's Record of Approval for this NCP. FAA design, testing, and implementation of the procedure could typically take at least one year once BCAD requests initiation of the development process.

SOURCE: BCAD and ESA, 2020.

FLL Noise Abatement Measure 4 (NA-4): Modify Aircraft Arrival Profiles to the West of FLL to Keep Aircraft Higher

Description

BCAD and the FAA have had several discussions related to community concerns with aircraft arrival altitudes over several communities located in western Broward County. This measure would modify the altitude profiles of arriving aircraft as they transition from the downwind to final approach legs, with the intention of raising aircraft approach altitudes outside of the DNL 65 contour to the west of FLL. This measure may involve developing new procedures and/or increasing use of the existing Required Navigation Performance (RNP) approach to Runway 10L. The FAA has been working with communities to address these concerns and attended an open house in December 2019 in the City of Weston to discuss actions that were being taken to keep aircraft at higher altitudes for longer periods of time. This measure would seek to continue FAA's recent actions to keep aircraft higher on approaches to FLL and evaluate new methods, when available, to improve the ability to maintain aircraft arrival altitudes west of FLL.

Type of Measure

This measure is a flight procedure modification that could be used to reduce aircraft noise exposure to noise-sensitive parcels and people located in areas west of FLL.

Analysis

Aircraft arrival altitudes in east-flow conditions were analyzed for a series of time periods. This analysis (see **Section D.6 of Appendix D**) concluded that, while aircraft arriving from the west are generally higher overall, aircraft transitioning from the north downwind to the extended arrival path were often lower. When merging two arrival streams, the FAA must maintain at least 1,000 feet of vertical aircraft separation or 3 miles of horizontal separation until the aircraft are established on the final approach. During busy operational periods, this means that aircraft being sequenced from the north downwind are often assigned lower altitudes to provide that required separation. However, this also appears to be happening either when there isn't an operational necessity or when alternative aircraft management techniques could be used. In November 2019, the FAA implemented aircraft management techniques during VFR conditions that focus on keeping aircraft higher when conditions permit. A review of the altitudes in November 2019 identified a noticeable increase in the altitudes of aircraft as they transition over the communities west of the Airport. The analysis, combined with recent efforts by the FAA, indicates that there may be opportunities to reduce noise levels in residential areas located to the west of FLL, but outside of the DNL 65 contour. However, it should be noted that as Airport activity increases, the potential for operational conflicts will likely increase and the flexibility controllers have will likely decrease.

Potential Noise Benefits

This measure could reduce annoyance of communities located to the west of FLL, but outside of the DNL 65 contour, by increasing altitudes of aircraft overflights. **Table 2-5** provides a summary of the benefits, responsibilities, costs and timeline for this recommended measure.

Conclusions: *NA 4: Modify Aircraft Arrival Profiles to the West of FLL to Keep Aircraft Higher.* This measure could reduce noise levels outside the DNL 65 contour in residential areas west of FLL. The measure would involve modifying aircraft arrival profiles by raising the altitudes of aircraft transitioning from the downwind to the final legs in east flow conditions. This measure would not reduce noncompatible land uses within the DNL 65 contour but could reduce annoyance caused by aircraft overflight in residential areas west of FLL.

TABLE 2 5 IMPLEMENTATION SUMMARY FOR NA 4: MODIFY AIRCRAFT ARRIVAL PROFILES TO THE WEST OF FLL TO KEEP AIRCRAFT HIGHER	
Implementation Item	Discussion
Benefits	NA-4 would not reduce noncompatible land use within the DNL 65 contour. Potential reduction of annoyance caused by aircraft overflights of residential areas located west of the Airport, but outside of the DNL 65 contour.
Rationale	BCAD is recommending NA-4 because modifying the altitude profiles of the arriving aircraft as they transition from the downwind to the final approach legs could reduce annoyance in the residential areas located to the west of FLL.
Responsible Parties	FAA
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	FAA
Requirements	FAA Approval. Implementation of any published procedures may require an environmental study under NEPA.
Estimated Schedule	BCAD to submit a request for noise abatement measure development within 6 to 12 months of the FAA's Record of Approval for this NCP. FAA design, testing, and implementation of the procedure could typically take at least one year once BCAD requests initiation of the development process.

SOURCE: BCAD and ESA, 2020.

2.3 Noise Abatement Measures Considered but Not Being Recommended for Inclusion in this NCP

This section describes stakeholder-suggested noise abatement strategies that BCAD considered, but is not recommending for inclusion in this NCP. During the development of the NCP, noise abatement strategies were reviewed that were either (1) required to be considered under 14 CFR Part 150 or (2) provided by the TC and other stakeholders. The individual strategies fell within three major categories: (1) develop new or modify existing flight tracks, (2) modify the airfield layout or build noise barriers, and (3) change operating patterns by modifying runway use or imposing operating restrictions. Ultimately, six noise abatement measures were considered and are described below, but are not being recommended for inclusion in this NCP. A complete list of stakeholder-suggested noise abatement measures is provided in **Appendix C**.

Build Noise Barriers

One suggested noise abatement measure was to construct noise barriers that could block aircraft noise in adjacent residential areas. While noise barriers constructed between on-the-ground noise sources and immediately adjacent land uses may be an effective way of reducing noise exposure, they do not reduce noise exposure resulting from aircraft in flight at a height greater than the noise barriers. Accordingly, they are not an effective means of reducing noise exposure from aircraft overflight. In addition, depending on their distance from the runway edge, noise barriers may

penetrate existing 14 CFR Part 77 imaginary surfaces, representing a potential hazard to aircraft operations. The further that barriers are from either the noise source or receiver, the less effective they are. Areas around FLL were assessed to determine if there were opportunities for effective noise barrier placement. This review noted that there is already a large landscape berm that runs along the southern edge of the Airport that likely provides a noise benefit and would minimize any benefits from additional barriers. For these reasons, the construction of noise barriers is not being recommended for inclusion in this NCP.

Develop New or Modify Existing Departure Procedures

One suggested noise abatement measure was implementation of a “close-in” noise abatement departure procedure (NADP1) at the Airport. Noise Abatement Departure Procedures (NADPs) are dedicated aircraft climb-out procedures that can provide noise reduction benefits by modifying headings, altitudes, climb gradients, and engine thrust settings. The FAA has published safety criteria for two NADPs, a close-in NADP, which provides noise reduction benefits to areas near airports (NADP1), and a distant NADP, which provides noise reduction benefits for areas further out (NADP2). Preliminary analysis indicates that implementation of NADP1 on an Airport-wide basis would potentially benefit some areas southwest and east of the Airport, while increasing noncompatible land uses within the DNL 65 contour in areas west and north of the Airport. Therefore, the implementation of a NADP is not being recommended as an airport-wide noise abatement measure. However, due to comments received on the Draft NCP, BCAD proposes to further analyze the potential benefits of implementing strategies such as NADP procedures as part of a Voluntary Fly Quiet Program (see PM-7 recommended in Chapter 4).

Increase Use of Runway 10L-28R

Stakeholders also suggested several operational scenarios for Runway 10L-28R, including: (1) operating Runway 10L-28R until it reaches maximum capacity before using Runway 10R-28L; using Runway 10L-28R for arrivals and Runway 10R-28L for departures; and closing Runway 10R-28L at night. Analysis indicates that any shift in arrivals from Runway 10R to Runway 10L would increase noncompatible uses within the western portion of the DNL 65 contour, as shown in **Section D.1 and D.5 of Appendix D**. The areas that would benefit from increased use of Runway 10L were addressed under the 2008 EIS mitigation program and are considered compatible. Therefore, an increase in use of Runway 10L-28R is not being recommended for inclusion in this NCP.

Reduce Frequency of Operations

Additional suggestions also included that (1) nighttime operations should be reduced or eliminated or (2) the frequency of aircraft operations should, in general, be reduced. However, BCAD does not have authority to establish and enforce reductions in aircraft flight operations, nor does it have authority to control the schedules of aircraft operations. ANCA limits airport operators’ ability to restrict operations or implement financial penalties and prohibits operation of Stage 1 and Stage 2 aircraft with a maximum weight above 75,000 pounds within the United States after December 31, 1999. ANCA also prevents BCAD from establishing additional operational restrictions except through compliance with 14 CFR Part 161, Notice and Approval of Airport Noise and Access Restrictions. The 14 CFR Part 161 process sets a very high bar and only one airport in the United

States has secured approval in the past 30 years. Through the recommended noise abatement, land use, and programmatic measures included in this NCP, noncompatible land uses will be significantly reduced; thus eliminating the need for 14 CFR Part 161-operational restrictions.

Impose Financial Penalties

It was suggested that financial penalties for certain operations should be implemented. However, ANCA limits airport operators' ability to implement financial penalties. Airports that currently use financial penalties implemented them prior to the passage of ANCA and are "grandfathered" in. BCAD cannot impose financial penalties for aircraft operations at FLL. As a result, this measure is not being recommended for inclusion in this NCP.

Continue the "Engine Run Up Restriction" Policy

The Draft NCP Report initially included a measure to continue the "Engine Run Up Restriction" Policy at FLL. This noise abatement measure limits aircraft engine maintenance run-ups to specific times of day and locations at the Airport and dictates when run-up activity must be coordinated with Airport management staff. Because this measure would not result in reducing noncompatible land uses with the DNL 65, it is unlikely to be approved for the purposes of Part 150. Additionally, this measure is already addressed in a local Ordinance (see Broward County Code of Ordinances, Section 2- 21(j)), and as a result, BCAD is not recommending this noise abatement measure in the Final NCP Report.

2.4 Summary of Recommended Noise Abatement Measures

Table 2-6 summarizes the full list of recommended noise abatement measures.

TABLE 2 6
SUMMARY OF NCP RECOMMENDED NOISE ABATEMENT MEASURES

Noise Abatement Measure	Description of Benefits
NA-1: Continue Voluntary User Program for Runway 10R-28L	Continuation of the Voluntary User Program for Runway 10R-28L would continue to reduce overflights of densely populated areas located west of Runway 10R and reduce noise exposure during nighttime hours over this area. This measure would reduce total noncompatible land uses within the DNL 65 contour by six units; it would also reduce compatible residential uses within the DNL 65 by 404 units.
NA-2: Reduce Early Aircraft Departure Turns from FLL through Implementation of ELSO or ELSO-Equivalent Procedures During West-Flow Conditions	Would not reduce noncompatible land use within the DNL 65 contour. Potential reduction of aircraft overflight-related noise annoyance in residential areas located immediately northwest of FLL.
NA-3: Reduce Early Aircraft Departure Turns from FLL through Implementation of ELSO or ELSO-Equivalent Procedures During East-Flow Conditions	Would not reduce noncompatible land use within the DNL 65 contour. Potential reduction of aircraft overflight-related noise annoyance in residential areas located immediately northeast of FLL.
NA-4: Modify Aircraft Arrival Profiles to the West of FLL to Keep Aircraft Higher	Would not reduce noncompatible land use within the DNL 65 contour. Potential reduction of annoyance caused by aircraft overflights of residential areas located west of the Airport.

CHAPTER 3

Noise Compatibility Program – Land Use Management Measures

The FAA has developed land use guidelines that relate the compatibility of aircraft activity to certain land uses surrounding an airport. Land use management measures address areas which, according to federal guidelines, are impacted by aircraft-related noise and where the noise cannot be eliminated through the implementation of noise abatement measures as described in Chapter 2. Jurisdictions may also choose to implement additional land use measures for areas that receive less noise exposure than the thresholds identified in federal guidelines should they decide it is in the best interest of their residents. Pursuant to the requirements of 14 CFR Part 150,³⁰ this chapter evaluates measures to help encourage land uses that are compatible with aircraft noise exposure.

The FAA, as a federal agency, 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. 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 various land use management measures relative to airport noise compatibility.

As outlined in Chapter 6, coordination occurred during the development of this NCP with land use agencies for nearby jurisdictions through the TC. Additional consultation occurred with each of the jurisdictions (City of Dania Beach, Town of Davie, City of Fort Lauderdale, and City of Hollywood) owning property located within the DNL 65 contour.

3.1 Introduction to Land Use Management Measures

There are a variety of planning and land use regulatory tools available to local governments that can help facilitate land use compatibility with airport operations. Land use compatibility planning techniques are generally classified as being either corrective or preventative. Corrective land use measures seek to remedy existing noise impacts to existing residential and other noncompatible land uses which have already been developed within the existing and/or future DNL 65 and higher contours. These measures include land acquisition, obtaining avigation easements, and sound insulation treatments of structures to reduce the interior level of noise exposure.

In contrast, preventive land use measures act to preclude the introduction of new noncompatible land uses within both the existing and future noise exposure contours. These measures include growth

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.

management techniques such as the use of noise overlay zones, building code enhancements to require noise attenuating construction methods, and the rezoning of properties to a category having compatible forms of development such as commercial and industrial. Preventative measures may also include the adoption of requirements to ensure potential purchasers are notified of possible aircraft overflights and the noise associated with this activity. Neither the FAA nor BCAD have the legislative authority to implement these preventative measures, but must rely on local planning and zoning jurisdictions who have been empowered with the authority to regulate land use through state-enabling legislation. It is not uncommon for an NCP to include a combination of both corrective and preventative land use measures.

Table 1 of 14 CFR Part 150, Appendix A (presented in this NCP as **Table 1-7**) identifies land uses surrounding an airport that the FAA has determined are acceptable within the DNL 65, 70, and 75 contours. **Table 1-7** indicates that all land uses located outside of the DNL 65 contour, including residential uses, are considered compatible with aircraft noise. Unless a local government has adopted and enforced a more restrictive threshold for compatibility, corrective land use measures are applicable only to off-airport land within the DNL 65 and higher contours. However, jurisdictions may choose to extend preventive land use measures beyond the DNL 65 contour to discourage development of noise-sensitive land uses in specific areas.

3.2 Existing Land Use Management Measures

Prior to the commencement of this Part 150 Study, BCAD, the City of Dania Beach, and the Town of Davie implemented several corrective and preventative land use measures related to Airport noise. The existing land use-related compatibility measures previously implemented within the City of Dania Beach and Town of Davie are discussed in the following sections.

3.2.1 Land Use Management Measures Implemented as Part of the 2008 EIS ROD and Interlocal Agreement

As part of the 2008 EIS ROD, the FAA required the County to implement noise mitigation measures within the 2008 EIS 2020 DNL 65 and higher contours. In October 2012, the Broward County Board of County Commissioners (BOCC) approved the Noise Mitigation Plan, as amended, to conform to FAA requirements, which identified specific noise mitigation measures that would be implemented as a result of the expansion of Runway 10R-28L and in accordance with the 2008 EIS ROD. These measures were also incorporated into the provisions of an Interlocal Agreement between the City of Dania Beach and Broward County, executed in November 2013 (**Appendix E-1**). This section describes the noise mitigation measures implemented as a result of the Noise Mitigation Plan and the Interlocal Agreement. Please see **Appendix E-1** for additional details related to each element of the plan.

Beginning in 2012, BCAD implemented a voluntary residential sound insulation program (RSIP) to sound-insulate residential properties in the DNL 65 and higher contour areas. Ultimately, 1,858 units were invited to participate in the RSIP which included properties located in neighborhoods within or adjacent to the 2008 EIS 2020 DNL 65 and higher contours. Of the 1,858 that were invited, 1,189 residential units were treated, and a 35-unit apartment complex was put on hold, pending structural

improvements. An additional 313 units were identified as already meeting the interior noise level threshold and were, therefore, deemed to already be compatible with sound insulation criteria. Of the remaining units, 278 declined treatment or did not respond when contacted and 43 were deemed ineligible. These units are depicted in **Figure 3-1**. This figure also shows that the 2008 EIS 2020 DNL 65 contour is larger than the Future Conditions (2023) NEM DNL 65 contour.

Under the County's Voluntary Standard Sales Assistance (SSA) Program, participants listed their property for sale on the market at its appraised fair market value (FMV) with a guarantee from the County to assist financially if the home should sell for less than FMV. A total of 1,014 units were identified as potentially eligible for the SSA Program, all of which were located within the City of Dania Beach. As of January 2020, only one eligible residential unit had utilized the SSA Program.

The CAR Program was developed to provide eligible property owners³² who did not want to sell their home under the SSA Program compensation in exchange for the dedication of a CAR. The CAR agreement operates in a manner similar to an avigation easement, in that the property owner acknowledges BCAD's right to conduct aircraft operations and also acknowledges that impacts may occur. As of January 2020, the County had completed closings on 634 CAR agreements with another 71 in-process.

While two mobile home parks (MHP) (Marshalls Everglade and Ocean Waterway) were identified for voluntary acquisition as part of the Noise Mitigation Plan, the County was unable to reach an agreement for acquisition with either MHP and the program was concluded in 2014.

Though not included in the 2008 EIS ROD, the Interlocal Agreement includes a provision that requires the City of Dania Beach to comply with the City's current Land Development Code in relation to airport compatibility land use planning.³³ Chapter 28 of the City's Code of Ordinances, Article 221 of the City of Dania Beach Land Development Code establishes a provision that requires all new residential construction within the 2008 EIS 2020 DNL 60 and higher contours to provide an interior noise level of not more than 45 dB.

Residential units that participated in the RSIP, the SSA, the CAR program, or were otherwise deemed compatible during the Noise Mitigation Program, are considered compatible residential uses for the purposes of this Part 150 Study.

3.2.2 Land Use Management Measures Implemented as Part of Future Land Use Plan Amendments

Pursuant to the Local Government Planning and Land Development Regulation Act (Chapter 163, Part II, Florida Statutes), the jurisdictions surrounding FLL have developed local land development plans that identify future land uses for each community. Under Section 11.01 of the Broward County Charter (revised 2018), the BOCC also has County-wide authority to regulate land use and environmental

³² Eligible properties under the CAR Program were single- or two-family dwelling units within the DNL 65 and higher contours that met the required 45-dB interior sound level with or without sound insulation improvements.

³³ City of Dania Beach / Broward County Interlocal Agreement, 2013, Section 6(d): *"The City shall comply with the notice, coordination, and compatibility provisions that are contained in the City's current Land Development Code relating to airport compatibility land uses and airport compatibility."*

matters. Under the County's Land Use Code, all Land Use Plan Amendments within the County require approval by the BOCC. Both the City of Dania Beach and the Town of Davie initiated Land Use plan amendments for specific areas in their cities seeking an increase in residential density. The County, through their review and approval authority, worked with both jurisdictions to incorporate several compatibility measures into the plan amendment agreements.

3.2.2.1 Dania Beach Land Use Amendment to Establish a Regional Activity Center (PC 09-5)

In 2010, the BOCC approved a Land Use Amendment Plan (PC 09-5) establishing an area within the City of Dania Beach as a Regional Activity Center (RAC). Located south of FLL, the Amendment application included plans for the development of approximately 7,818 new residential units. A small portion of the RAC is within the 2008 EIS 2020 DNL 65 contour and a larger portion falls within the 2008 EIS 2020 DNL 60 contour. The RAC's boundaries are depicted in **Figure 3-2**.

As part of a 2010 Agreement between Broward County and the City of Dania Beach³⁴ (see **Appendix E-2**), and as condition of approval of Amendment application PC 09-5, the City of Dania Beach agreed to prohibit the development of new residential units and other noncompatible land uses within the 2008 EIS 2020 DNL 60 and higher contours.³⁵ The Agreement, however, included some exceptions and required certain parcels to include sound mitigation measures to achieve an outdoor-to-indoor noise level reduction. The Agreement also required disclosure for new residential units that fall within the 2008 EIS 2020 DNL 60 and higher contours. See **Appendix E-2** for additional details.

3.2.2.2 Town of Davie Land Use Plan Amendment Agreement (PC 06-19)

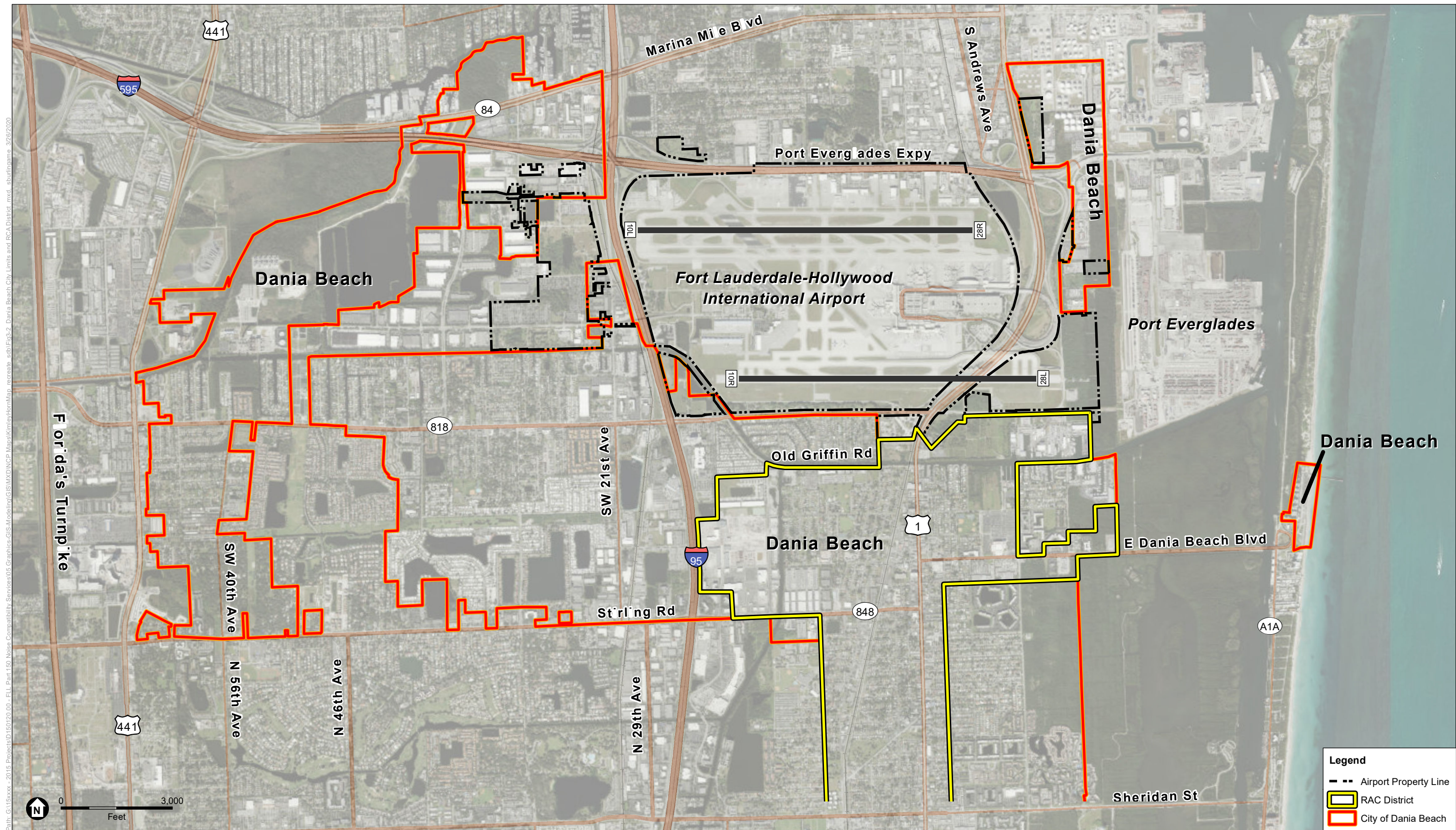
In 2009, the BOCC approved a Land Use Amendment Plan (PC 06-19) that established a Transit Oriented Corridor (TOC) within the Town of Davie. The Amendment includes plans for 6,428 residential units within the TOC, a portion of which is located in the 2008 EIS 2020 DNL 60 and 65 contours. The TOC's boundaries are depicted in **Figure 3-3**.

As a condition of approval of PC 06-19, the County and the Town of Davie agreed to a land use plan amendment that incorporated several land use compatibility measures within the TOC (Recorded 10/27/2009, Broward County CFN No. 108940557) (See **Appendix E-3**). Among the provisions, the Town of Davie agreed to prohibit the development of residential and other noncompatible land uses in any area within the TOC 2008 EIS 2020 DNL 65 and higher contours, incorporate sound-attenuating construction techniques within the 2008 EIS 2020 DNL 60 contour, and provide disclosure notice of potential overflight activity and aircraft-related noise to all potential purchasers of residential units residing within the 2008 EIS 2020 DNL 60 contour. See **Appendix E-3** for additional details.

³⁴ Agreement between Broward County and the City of Dania Beach Recorded 9/8/2010, Broward County CFN No. 109570290

³⁵ Noncompatible land uses are identified in Chapter 333, Florida Statutes and Table 1, 14 CFR Part 150, Appendix B

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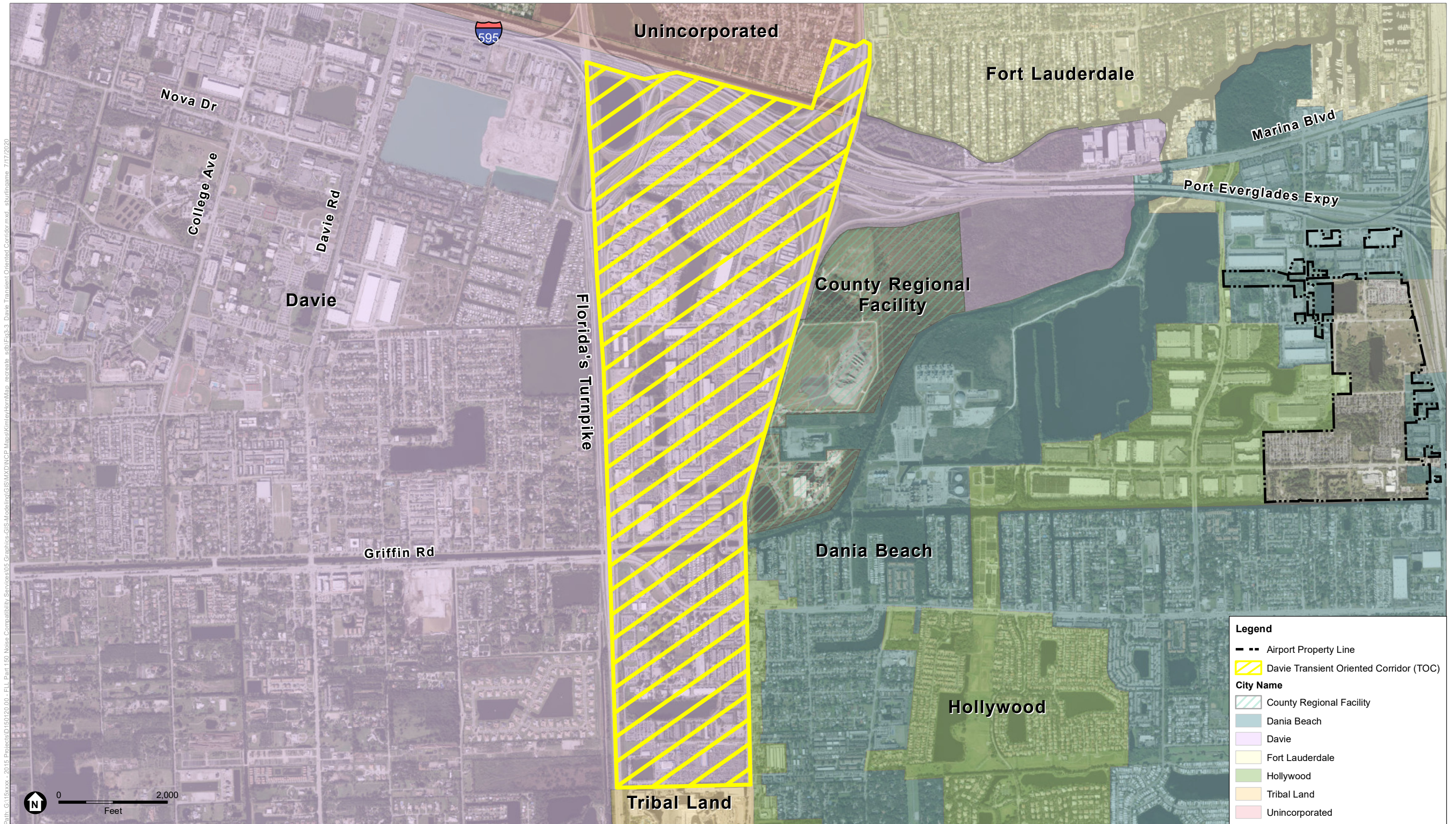


SOURCE: Esri; City of Dania Beach CRA Redevelopment Plan, 2015;; ESA, 2020

Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

Figure 3-2
Dania Beach Regional Activity Center (RAC)
Fort Lauderdale-Hollywood International Airport

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SOURCE: Esri; South Florida Regional Planning Council Memorandum of Land Use Amendments, 2009; ESA, 2020

Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

Figure 3-3
Davie Transient Oriented Corridor (TOC)
Fort Lauderdale-Hollywood International Airport

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3.2.3 Summary of Existing Land Use Management Measures

Table 3-1 provides a summary of existing land use management measures as set forth in the Interlocal Agreement, through the development plan amendment processes with the City of Dania Beach and Town of Davie, and in the 2008 EIS ROD.

TABLE 3 1 SUMMARY OF EXISTING LAND USE MANAGEMENT MEASURES			
Measure	Description	Program / Agreement / Ordinance	Participating Parties
Residential Sound Insulation	Sound insulate homes within 2008 EIS 2020 DNL 65 contour	2008 EIS ROD and Mitigation Plan / Broward County / Dania Beach Interlocal Agreement	The County; all residential units within 2008 EIS 2020 DNL 65 contour (mobile homes excluded)
Purchase Assurance/ Standard Sales Assistance	Provide eligible property owners with the option to sell homes and relocate outside the 2008 EIS 2020 DNL 65 contour	2008 EIS ROD and Mitigation Plan / Broward County / Dania Beach Interlocal Agreement	The County; all residential units within 2008 EIS 2020 DNL 65 contour (mobile homes and properties containing three or more units excluded)
Avigation Easement/ Conveyance and Release	Provide property owners who do not want to participate in the SSA program and instead want a payment in exchange for a recorded CAR Agreement	Mitigation Plan/ Broward County / Dania Beach Interlocal Agreement	The County; all residential units within 2008 EIS 2020 DNL 65 contour (mobile homes and properties containing three or more units excluded)
Residential Sound Insulation/ Building Codes	Sound level reduction in new construction	Broward County / Dania Beach Interlocal Agreement; Dania Beach Land Development Code, Article 221	The County; City of Dania Beach; developers
Land Use Restrictions	Restrict new residential and noncompatible land uses within the Dania Beach RAC	Broward County / Dania Beach Agreement (Recorded 9/8/2018, Broward County CFN No. 109570290)	The County; City of Dania Beach; developers
Noise Level Reduction	Sound level reduction in new construction within the Dania Beach RAC	Broward County / Dania Beach Agreement (Recorded 9/8/2018, Broward County CFN No. 109570290)	The County; City of Dania Beach; developers
Disclosure	Notification of potential aircraft overflight and noise impacts within the Dania Beach RAC	Broward County / Dania Beach Agreement (Recorded 9/8/2018, Broward County CFN No. 109570290)	The County; City of Dania Beach
Growth Planning Policies	Development restrictions within the 2008 EIS 2020 DNL 65 contour within Town of Davie TOC	Broward County / Davie Agreement (Recorded 10/27/2009, Broward County CFN No. 108940557)	The County; Town of Davie
Building Codes	Sound level reduction in new construction within Town of Davie TOC	Broward County / Davie Agreement (Recorded 10/27/2009, Broward County CFN No. 108940557)	The County; Town of Davie
Disclosure	Notification of potential aircraft overflight and noise impacts within Town of Davie TOC	Broward County / Davie Agreement (Recorded 10/27/2009, Broward County CFN No. 108940557)	The County; Town of Davie

SOURCE: BCAD, Kimley-Horn, and ESA, 2020.

3.3 Recommended Land Use Management Measures

3.3.1 Corrective Land Use Management Measures

FLL Land Use Measure LU-1: Implement a Voluntary Acquisition Program for a Portion of the Ocean Waterway Mobile Home Park

The Future Conditions (2023) NEM shows the DNL 65 contour extending over a portion of the Ocean Waterway MHP. **Figure 3-4** depicts the impacted portions of this residential property.

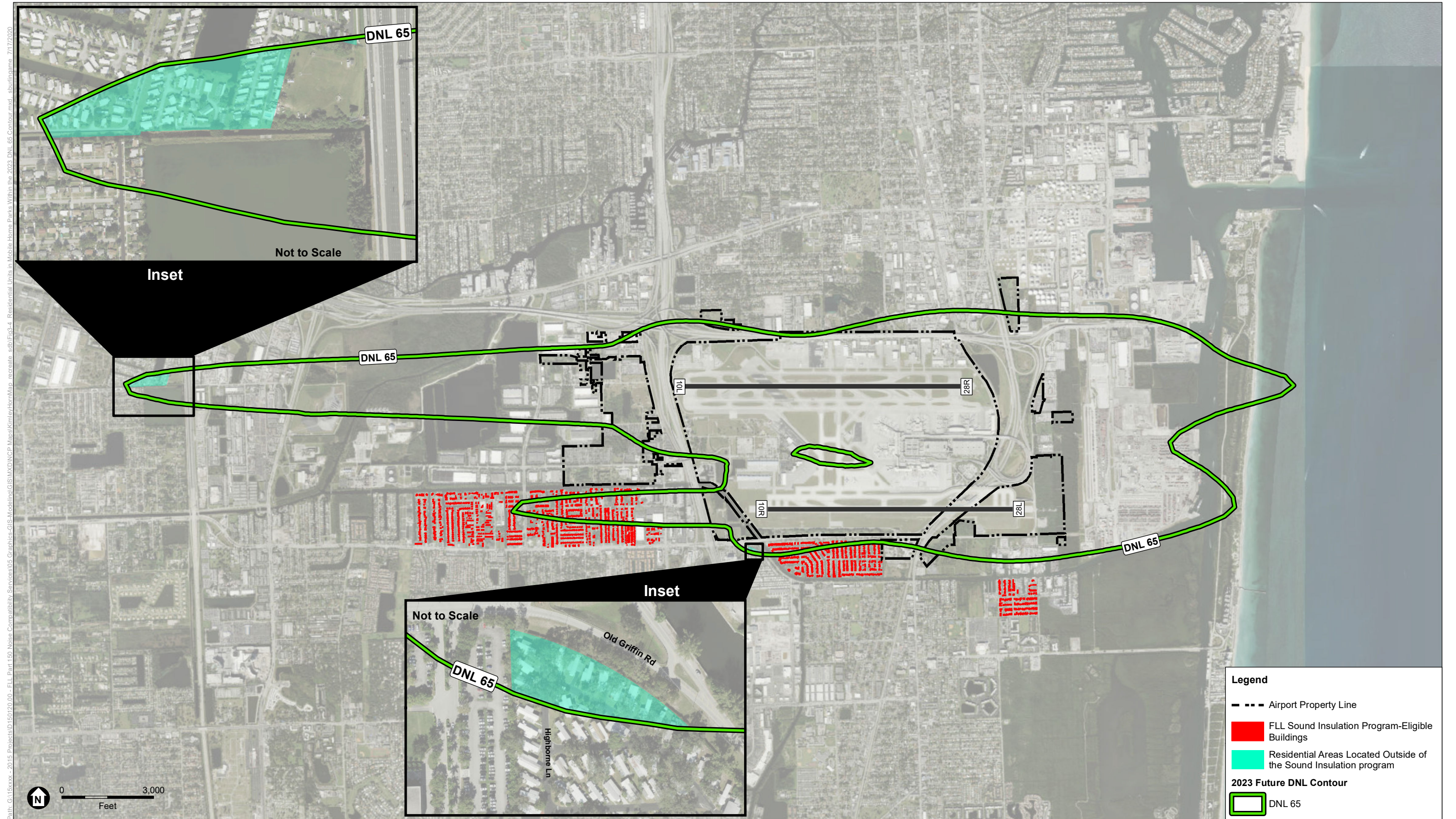
Land Use Measure LU-1 would include the purchase of approximately 1.95 acres of land and 16 mobile homes associated with the Ocean Waterway MHP, which is located south of the Airport near the intersection of Old Griffin Road and Griffin Road. The property and mobile homes subject to purchase under LU-1 are located at the north end of the MHP and lie within the Future Conditions (2023) DNL 65 contour. The area in the MHP within the Future Conditions (2023) DNL 65 contour is smaller than the impacted area previously associated with the 2008 EIS 2020 DNL 65 contour. The 2008 EIS DNL 65 Noise Mitigation Plan included a recommendation to pursue the voluntary purchase of the entire Ocean Waterway MHP. However, the parties at the time—the MHP land owner and the Ocean Waterway Co-Op, Inc.—were unable to reach an agreement with Broward County on the terms of the acquisition and the purchase did not proceed.

Addressing noise-impacted MHPs presents a challenge as mobile homes cannot be effectively sound insulated and the complex ownership structure make the purchase of avigation easements difficult and of limited value in addressing residential noise concerns. These facts significantly reduce the available mitigation options, leaving property acquisition and relocation as the remaining viable options for consideration.

In the case of the Ocean Waterway MHP, purchasing the land involves both the owner of the MHP and the Ocean Waterway Co-Op, Inc. which maintains a first right of refusal on all land sales. Information posted on the community's website³⁶ indicates Ocean Waterway Co-Op, Inc. owners include 201 shareholders and 68 renters (269 total lots). Under this measure, the acquisition of land would be a voluntary process that would involve contacting the property owner and the Ocean Waterway Co-Op, Inc. in order to reach a purchase agreement through negotiations. In the event that mutually agreeable terms between the County and representatives of the MHPs cannot be reached, negotiations would cease, and the purchase effort would be stopped.

Assuming a purchase agreement for the land is reached with the MHP, all residents living on the purchased land will need to relocate. Residents of mobile homes within the Future Conditions (2023) DNL 65 contour would be contacted to initiate negotiations for either the purchase of mobile homes (if owner-occupied), the relocation of the mobile homes (if such action is deemed viable), or the relocation of residents renting mobile homes (if applicable).

³⁶ <http://www.oceanwaterway.com/about-us/> , April 4, 2020



SOURCE: Esri; AEDT 2d; ESA, 2020

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Figure 3-4
Residential Units in Mobile Home Parks
within the 2023 DNL 65 Contour
Fort Lauderdale-Hollywood International Airport

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This acquisition program would be implemented with federal funding assistance, which requires conformity with the provisions of the Uniform Relocation Assistance and Real Property Acquisition Act (Uniform Act), as amended, as well as Chapter 723, Florida Statutes.³⁷ Mobile homes would be appraised, and the purchase offer would be established based on the FMV. In addition, mobile home owners and renters may also be eligible for relocation benefits, including:

- Relocation Housing Payment: available to address a difference between the price paid for the mobile home and the cost to purchase a comparable replacement dwelling
- Rental Assistance Payment: available to address a difference between the cost of rent at the displaced site versus the cost of rent at the replacement site
- Moving costs

Potential relocation-related assistance would be determined on a case-by-case basis per the applicable regulatory requirements. The ultimate cost of relocation assistance cannot be accurately determined until program details are finalized but is estimated at 15% of the acquisition cost.

Once the land has been purchased and cleared of mobile home units, the re-use of the parcel would need to be considered in ways that are compatible with aircraft-related noise under 14 CFR Part 150. In the Ocean Waterway MHP, given the land's location at the intersection of Griffin Road and Old Griffin Road, it is feasible that it may be rezoned and sold for commercial or recreational use. If found to be infeasible, the land could also be retained by the County and used as a landscape buffer between Griffin Road, Old Griffin Road, and the MHP.

As noted previously, there are 16 mobile home units on approximately 2 acres of land that lie within the Future Conditions (2023) DNL 65 contour in Ocean Waterway MHP. The impacted units are generally located at the north end of the MHP along Highborne Lane and Eleuthera Drive, north of Andros Place. A review of 24 previous and pending unit sales in the Ocean Waterway MHP between 2017 and 2020 indicates an approximate average cost of \$100,000 per unit. This is assumed to include the underlying land value. Based on this average cost per unit, the total acquisition cost in Ocean Waterway is estimated at approximately \$1.6 million. Adding 15% to cover costs associated with relocation assistance and another 25% to cover program management and contingency brings the total estimated cost to \$2.3 million.

Conclusions: *LU 1: Implement a Voluntary Acquisition Program for a Portion of the Ocean Waterway Mobile Home Park.* There are limited viable mitigation techniques to address noise impacts within mobile home parks. The implementation of a voluntary acquisition program to purchase the portions of the MHP and the underlying property contained within the Future Conditions (2023) DNL 65 contour would effectively address this noncompatible land use.

³⁷ FAA Order 5100.37B and FAA Advisory Circular 5100-17 provide guidance to airport operators for AIP-assisted projects to develop their land acquisition and relocation assistance procedures in conformance to the Uniform Relocation Act and its implementing regulation 49 CFR Part 24, *Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs*.

Table 3-2 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of FLL LU-1.

TABLE 3 2 IMPLEMENTATION SUMMARY FOR LU 1: IMPLEMENT A VOLUNTARY ACQUISITION PROGRAM FOR A PORTION OF THE OCEAN WATERWAY MOBILE HOME PARK	
Implementation Item	Discussion
Benefits	Removal of noncompatible land uses, per 14 CFR Part 150 compatibility guidelines, that are otherwise unable to be effectively sound-insulated.
Rationale	BCAD is recommending FLL LU-1 to reduce noncompatible land uses by removing 16 mobile home units from within the Future Conditions (2023) DNL 65 contour, which cannot be effectively sound insulated to meet FAA noise level reduction standards.
Responsible Parties	BCAD, Ocean Waterway MHP, Ocean Waterway Co-Op, Inc., occupants of impacted mobile home units.
Estimated Costs	Approximately \$2.3 million based on the calculations and assumptions, as described herein.
Funding Sources	80% FAA AIP, with the remainder from FDOT and BCAD funding sources.
Requirements	Preparation and FAA approval of an Acquisition and Relocation Plan, which includes identification of eligible properties, funding to acquire properties and provide relocation assistance, and agreements with the MHP.
Estimated Schedule	BCAD will request a federal grant within the first year after FAA approval of this measure. Funding procurement, negotiations with MHPs, and logistical planning will determine the implementation schedule for FLL LU-1.

SOURCE: BCAD, Kimley-Horn, and ESA, 2020.

FLL Land Use Measure LU-2: Implement a Voluntary Acquisition Program for a Portion of the Everglades Lakes Mobile Home Park

Land Use Measure LU-2 involves the purchase of 11.3 acres of land and 66 mobile homes associated with the Everglade Lakes MHP (**Figure 3-4**), which is located approximately 3.2 miles west of the Airport beneath the approach and departure paths of Runway 10L-28R in the Town of Davie. The property and mobile homes subject to purchase under LU-2 are located on the south/southeast portion of the MHP and lie within the Future Conditions (2023) DNL 65 contour.

Under this measure, the acquisition of land in the Everglades Lakes MHPs would be a voluntary process that would involve contacting the property owner in order to reach a purchase agreement through negotiations. In the event that mutually agreeable terms between the County and representatives of the MHPs cannot be reached, negotiations would cease, and the purchase effort would be stopped.

Assuming a purchase agreement for the land is reached, residents of mobile homes within the Future Conditions (2023) DNL 65 contour would be contacted to initiate negotiations for either the purchase of mobile homes (if owner-occupied), the relocation of the mobile homes (if such action is deemed viable), or the relocation of residents renting mobile homes (if applicable).

As outlined previously, this acquisition program would require the use of federal funding assistance and, as a result, is anticipated to require conformity with the provisions of the Uniform Relocation and Real Property Assistance Act as well as Chapter 723, Florida Statutes. Potential relocation-related assistance would be determined on a case-by-case basis, per the applicable regulatory requirements.

The ultimate cost of relocation assistance cannot be accurately determined until program details are finalized, but is estimated at 15% of the acquisition cost.

Once the land in the MHP has been purchased and cleared of mobile home units, the re-use of the parcels would need to be considered in ways that are compatible with aircraft-related noise under 14 CFR Part 150. In regard to the Everglades Lakes MHP, the location of the acquired land complicates the re-use of the property for a traditional commercial use. Access to the property is constrained by the MHP security gate on the sole access road to the community on the north, a canal to the south, and the Florida Turnpike to the east. As a potential alternative, the County may want to consider the purchase of the occupancy rights on the impacted lots with the placement of restrictions precluding future residential use on the property being considered for acquisition, leaving the future use determination to the owner of the MHP. No matter the alternative land uses, all purchased property, if resold, will need to be accompanied by deed restrictions which ensure future compatibility within the Future Conditions (2023) DNL 65 contour.

To determine a rough order of magnitude cost for the land and unit acquisition, information from the Broward County Property Appraiser was researched and supplemented with current sales information. The recent sale of the Everglades Lakes MHP was also consulted to determine potential land cost on a per-lot basis. The estimated cost of acquiring the 11.3 acres of impacted land in the Everglades Lakes MHP was developed by dividing the May/June 2018 MHP purchase price (\$50.35 million) by the number of lots in the MHP (612). This approach results in a per-lot cost of \$82,270 or total estimated land cost of \$5.43 million. The estimated cost is believed to represent a high-range value as it also includes the area included for the MHP amenities.

To derive a potential average-unit cost of the mobile homes, information on current pending sales within Everglades Lakes was researched. Based on a review of 27 listings, an estimate cost was developed of \$64,335 per double-wide unit and \$24,730 per single-wide unit. Within the impacted portion of Everglades Lakes, there are an estimated 31 single-wide units and 35 double-wide units. When applying the unit costs, it is estimated that the mobile homes would have a total cost of \$3.02 million. With the previously determined \$5.43 million for the land on which the units reside, the total estimated cost of acquisition within the Everglades Lakes MHP is \$8.45 million. Adding 15% to cover costs associated with relocation assistance and another 25% to cover program management and contingency brings the total estimated cost to \$12.15 million.

Conclusions: *LU 2: Implement a Voluntary Acquisition Program for a Portions of the Everglades Lakes Mobile Home Park.* There are limited viable mitigation techniques to address noise impacts within mobile home parks. The implementation of a voluntary acquisition program to purchase the portions of the MHP and the underlying property contained within the Future Conditions (2023) DNL 65 contour would effectively address this noncompatible use.

Table 3-3 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of FLL LU-2.

TABLE 3 3
IMPLEMENTATION SUMMARY FOR LU 2: IMPLEMENT A VOLUNTARY ACQUISITION PROGRAM FOR A
PORTION OF THE EVERGLADES LAKES MOBILE HOME PARK

Implementation Item	Discussion
Benefits	Removal of noncompatible land uses, per 14 CFR Part 150 compatibility guidelines, that are otherwise unable to be effectively sound-insulated.
Rationale	BCAD is recommending FLL LU- 2 to reduce noncompatible land uses by removing mobile home units from within the Future Conditions (2023) DNL 65 contour, which cannot be effectively sound insulated to meet FAA noise level reduction standards.
Responsible Parties	BCAD, Everglades Lakes MHP, occupants of impacted mobile home units.
Estimated Costs	Approximately \$12.15 million based on the calculations and assumptions as described herein.
Funding Sources	80 percent FAA AIP, with the remainder from FDOT and BCAD funding sources.
Requirements	Preparation and FAA approval of an Acquisition and Relocation Plan, which includes identification of eligible properties, funding to acquire properties and provide relocation assistance, and agreements with the MHP.
Estimated Schedule	BCAD will request a federal grant within the first year after FAA approval of this measure. Funding procurement, negotiations with MHPs, and logistical planning will determine the implementation schedule for FLL LU-2.

SOURCE: BCAD, Kimley-Horn, and ESA, 2020.

FLL Land Use Measure LU-3: Implement a Voluntary Residential Sound Insulation Program for Eligible Dwelling Units located in the Future Conditions (2023) DNL 65 and Higher Contours

Residential sound insulation programs provide compatible noise environments inside housing units as a means to mitigate aircraft noise exposure. Sound insulation treatments may include window and door replacement, caulking, weather stripping, and positive air ventilation.³⁸ The purpose of positive air ventilation is to allow for replacement windows and doors to remain closed to provide the full benefit of the sound insulation treatments to residents. 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.³⁹

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 45 dB or below and to provide at least a 5-dB improvement to the noise level reduction of the structure. Sound insulation can be effective in reducing interior noise exposure and typically has a high level of satisfaction among housing unit occupants.

To receive sound insulation under this Part 150 Study, participants would be required to meet certain eligibility requirements. In residential sound insulation programs funded in part by FAA AIP grants, a housing unit is typically only eligible for sound insulation if it meets all criteria set forth in the *AIP*

³⁸ The purpose of positive air ventilation is to allow for replacement windows and doors to remain closed to provide sound insulation benefit to residents.

³⁹ 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.

Handbook,⁴⁰ Appendix R.⁴¹ A housing 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 housing unit must meet, at a minimum, the following criteria:

1. The dwelling must be located within the DNL 65 contour of an FAA-approved NEM.
2. The dwelling must have been constructed before October 1, 1998.⁴² Housing units constructed in the vicinity of FLL after this date may not be eligible for sound insulation.
3. The dwelling must be in compliance with the local building codes.⁴³
4. The dwelling must have an average interior noise level in *habitable* rooms above 45 dB (with windows closed).
5. The dwelling must not be a mobile housing unit (mobile housing units are not eligible for federally funded sound insulation because the FAA has determined that there are no effective sound insulation methods or materials for mobile homes) (*AIP Handbook*, Table C-5).

The Future Conditions (2023) DNL 65 and higher contours include residential units that are considered noncompatible with aircraft noise. In the Town of Davie, these residential units include single- and multi-family dwellings in a portion of the Playland Village neighborhood along the approach to Runway 10L. A total of 15 single-family units and one multi-family structure (consisting of 8 units) are included within the Future Conditions (2023) DNL 65 contour. The Future Conditions (2023) DNL 65 contour also encompasses 66 mobile home units within the Everglades Lakes Mobile Home Park. As outlined previously however, mobile homes cannot be effectively sound insulated and thus are ineligible for sound insulation.

In Dania Beach, there are 442 residential units and 16 mobile home units within the Future Conditions (2023) DNL 65 contour. Of the 442 residential units, 410 were either sound insulated, deemed compatible through testing or participated in the CAR program. All of these units are considered compatible for the purposes of this NCP. Thirty-two units within the Future Conditions (2023) DNL 65 contour either did not respond to the invitation to participate or withdrew at some point during the 2008 EIS RSIP program. These units could be included for consideration under this Part 150 Study. However, eligibility criteria would be determined during sound insulation program design and would ultimately require FAA approval if BCAD requests federal funding.

Based on the potentially eligible units, a Part 150 Study residential sound insulation program (the Part 150 RSIP) program could include 47 single-family units and 8 multi-family units before considering

⁴⁰ FAA Order 5100.38D, *Airport Improvement Program Handbook*, 2014.

⁴¹ Determination of eligibility would be made when the FLL Noise Compatibility Program has been approved, program protocols have been established, and the NCP implementation phase has been initiated.

⁴² 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., sound insulation, property acquisitions, and relocation, 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.

⁴³ 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.”

block rounding. Assuming block rounding increases the potentially eligible properties within the Town of Davie by 50%, the Part 150 RSIP could include up to 55 single-family and 12 multi-family units. Final unit counts and program details would be determined during program design phase subject to FAA approval consistent with AIP requirements. In exchange for participation in the RSIP program, each unit owner would be required to provide BCAD with an avigation easement. An avigation easement is an easement or right of overflight in the airspace above or near a particular property. It also includes the right to create such noise or other effects as may result from the lawful operation of aircraft in such airspace and the right to remove any obstructions to such overflight.⁴⁴

The Part 150 RSIP is proposed to be funded through AIP grants, with BCAD funding the local match portion from Airport funds. For purposes of defining an order of magnitude cost for the program, the average cost per unit from the 2008 EIS RSIP was \$65,000 per unit which included a mix of single- and multi-family units spread over a number of years. Assuming inflation and the relatively small program size will increase the unit price, \$80,000 per unit was used for the purposes of this estimate. Based on soft costs associated with recent residential sound insulation projects (e.g., project administration and legal costs), expenses other than actual construction costs were estimated to be approximately 25% of total construction costs. Finally, a 15% contingency was then added for unforeseen conditions that may be encountered during construction. Based on the above block rounding assumptions, if 100% of all identified units were deemed eligible and participated in the Part 150 RSIP, the estimated program cost would total approximately \$7.7 million. It is recognized that 100% participation is unlikely and that actual costs may differ if some unit owners elect not to participate or are otherwise determined ineligible.

BCAD anticipates that once the sound insulation program begins, up to two years would be needed to complete the insulation of all eligible housing units. Due to inflation, the cost per housing unit may increase over time. Therefore, total program costs could be higher than what is projected in 2020 dollars.

Conclusions: *LU 3: Implement a Voluntary Residential Sound Insulation Program for Eligible Dwelling Units located in the Future Conditions (2023) DNL 65 and Higher Contours.* There are noncompatible single and multi family dwellings located in within the Future Conditions (2023) DNL 65 and higher contours. Implementation of a voluntary Part 150 RSIP for eligible residential units within the Future Conditions (2023) DNL 65 and higher contours would convert all remaining noncompatible single and multi family residential units to compatible

Table 3-4 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of FLL LU-3.

⁴⁴ FAA Advisory Circular AC150-5000-9B

TABLE 3 4
IMPLEMENTATION SUMMARY FOR LU 3: IMPLEMENT A VOLUNTARY RESIDENTIAL SOUND INSULATION PROGRAM FOR ELIGIBLE DWELLING UNITS LOCATED IN THE FUTURE CONDITIONS (2023) DNL 65 AND HIGHER CONTOURS

Implementation Item	Discussion
Benefits	Sound insulation treatments provide noise reduction inside residential units to achieve compatibility with indoor activities. Once treated, a property is considered compatible with aircraft noise. This measure would convert all eligible noncompatible single and multi-family residential units within the Future Conditions (2023) DNL 65 and higher noise contours to compatible uses.
Rationale	BCAD is recommending FLL LU-3 to reduce noncompatible land uses by making eligible housing units compatible with aircraft noise.
Responsible Parties	BCAD, FAA for funding assistance.
Estimated Costs	The cost associated with 100% participation in the proposed new voluntary Part 150 RSIP is estimated at \$7.7 million to provide sound insulation treatments to approximately 55 single-family housing units and approximately 12 units, subject to the assumptions and limitations set forth in Section 3.2.
Funding Sources	Up to 80% FAA AIP, with the remainder from other BCAD funding sources.
Requirements	FAA approval, identification of eligible properties, funding secured to sound-insulate properties.
Estimated Schedule	BCAD will request a federal grant within two years of FAA approval of this measure to create the Part 150 RSIP. Funding procurement and the time it takes to establish the Part 150 RSIP will determine the implementation schedule for FLL LU-3.

SOURCE: BCAD, Kimley-Horn, and ESA, 2020.

3.3.2 Preventive Land Use Management Measures

This section describes *preventative* land use management measures that are recommended as part of the FLL NCP.

FLL Land Use Measure LU-4: Encourage Local Jurisdictions to Implement Real Estate Fair Disclosure Requirements that Address Potential for Aircraft-Related Noise

Pursuant to Florida law⁴⁵, sellers have a legal obligation to disclose known defects involving residential real estate. In the absence of real estate disclosure requirements, the doctrine of *caveat emptor*, or buyer beware, prevails. Under *caveat emptor*, the seller is generally not obligated to disclose material defects of the property and it is the buyer's sole responsibility to perform the appropriate due diligence prior to purchasing the property. However, in *Johnson v. Davis*, 480 So. 2d 625 (Fla. 1985), the Florida Supreme Court ruled that “*where the seller of a home knows of facts materially affecting the value of the property which are not readily observable and are not known to the buyer, the seller is under a duty to disclose them to the buyer.*” This ruling shifted some of the responsibility for determining potential issues impacting the value of a piece of property from the buyer to the seller. The Florida Association of Realtors developed a standard disclosure form which covers a detailed listing of common property characteristics, including water leaks, roof issues, lead and mold, electrical wiring issues, mechanical

⁴⁵ Sections 125.69 (4)(d), 162.06(5), 404.056(5), and 475.278, 689.261, Florida Statutes; Section 16, CFR 460.1; *Johnson v. Davis*, 480 So. 2d 625 (Fla. 1985); *Jensen v. Bailey*, 76 So.3d 980 (Fla. 2nd DCA 2011)

systems, cracks in foundation, insect infestations, and issues regarding title to the property. The standard disclosure form does not currently make any mention of aircraft-related noise.

Real estate disclosure of aircraft noise recognizes that some people are more sensitive to aircraft noise than others and allows them to make an informed decision. As described in **Section 3.2**, the City of Dania Beach (Broward County CFN No. 109570290) and the Town of Davie (OR BK 4662) each have instituted requirements for areas located within large Community Redevelopment Agency (CRA) developments requiring noise levels in the DNL 60 contour be disclosed. These requirements were put in place as conditions for the approval by the County of land use plan amendments proposed by both the Town of Davie and the City of Dania Beach. While of value, the current disclosures are only required for a limited area within two specific CRAs and do not apply to other areas contained within the DNL 60 and higher contours in either the Town of Davie or the City of Dania Beach jurisdiction. Additionally, the current disclosure requirements are only applicable to new residential construction and do not apply to the re-sale of existing residential units that may be within the same noise exposure contour, or in a contour of even greater noise exposure.

BCAD proposes to continue to encourage local jurisdictions to establish real estate disclosure policies for aircraft noise or, in the case of City of Dania Beach and Town of Davie, extend existing disclosure requirements to the resale of existing properties. Disclosure regulations can be limited to impacted areas (e.g., within the DNL 65 and higher noise contours) or be more broadly employed at the jurisdiction's discretion to include areas of concentrated flight operations (e.g., airport-noise influence areas as implemented by Orlando and Lee County). Where real estate disclosure is implemented, it is recommended that disclosure be required to occur early in the process of purchasing a property (no later than at the time of receipt of a purchase offer by the seller) and that the disclosure form be recorded at the time of sale closing. Subsequent disclosure notifications would be recorded each time a property in the impacted area is resold.

Costs for each jurisdiction associated with this measure can vary depending on the time and staff resources required to define details of a disclosure ordinance and to work with elected officials to gain concurrence with the requirements and provisions of the disclosure measure. Costs would consist of labor and administrative expenses and generally cover staff time and materials required for research, preparation, public hearings, legal reviews, the publishing of notifications and background information, and potential meetings with key community stakeholders to present the proposal and address concerns and questions. These expenses would be paid out of the various jurisdictions' operating budgets.

As noted in discussions with jurisdictional representatives whose communities fall within the Future Conditions (2023) DNL 65 and higher contours, enforcement of the disclosure provisions would not likely be a municipal responsibility but would be handled through civil proceedings between a buyer and the seller/seller's representative.

Conclusions: *LU 4: Encourage Local Jurisdictions to Implement Real Estate Fair Disclosure Requirements that Address Potential for Aircraft Related Noise.* Disclosure allows buyers to make an informed decision as it relates to the purchase of property near an Airport. By requiring disclosure, a level of protection is provided for property owners, potential buyers, the jurisdictions in which they reside, and the Airport. BCAD does not possess the regulatory authority to adopt and implement disclosure; therefore, BCAD proposes to continue to encourage communities including the City of Dania Beach, the Town of Davie, the City of Fort Lauderdale, and the City of Hollywood to adopt municipal ordinances requiring that those involved in the sale of residential property (realtors, owner, sellers, etc.) disclose the potential for aircraft overflights and associated aircraft related noise.

Table 3-5 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of FLL LU-4.

TABLE 3 5 IMPLEMENTATION SUMMARY FOR LU 4: ENCOURAGE LOCAL JURISDICTIONS TO IMPLEMENT REAL ESTATE FAIR DISCLOSURE REQUIREMENTS THAT ADDRESS POTENTIAL FOR AIRCRAFT RELATED NOISE	
Implementation Item	Discussion
Benefits	Implementing aircraft-related noise disclosure requirements ensures that prospective property buyers within noise-impacted areas are aware of aircraft noise levels and can make informed purchasing decisions.
Rationale	BCAD is recommending FLL LU-4 to provide a level of protection for property owners, potential buyers, the jurisdictions in which they reside, and the Airport.
Responsible Parties	BCAD to encourage. The County, City of Fort Lauderdale, City of Dania Beach, City of Hollywood, and Town of Davie are responsible for implementation.
Estimated Costs	Jurisdiction costs will vary and consist of expenses that cover staff time, consultants, and materials required for research, preparation, public hearings, the publishing of notifications and background information, and potential meetings with key community stakeholders.
Funding Sources	Jurisdictional operating budgets.
Requirements	Vary by jurisdiction.
Estimated Schedule	N/A

SOURCE: BCAD, Kimley-Horn, and ESA, 2020.

FLL Land Use Measure LU-5: Encourage Local Jurisdictions to Incorporate Planning Actions in their Respective Comprehensive Plans related to Aircraft Noise that are Consistent with the Policies of the BrowardNEXT Plan

As a Charter form of government, the BOCC serves as the governing body for all of Broward County. Per Section 11.01 of the Broward County Charter (revised 2018), the BOCC also has county-wide authority to regulate land use and environmental matters. In other words, the County ordinances related to land use planning will supersede municipal ordinances in the event contradictions exist. As it relates to comprehensive planning, Article 2.3 of the Broward County Administration Rules requires that the goals, objectives, and policies of municipal comprehensive plans are in “substantial conformity” with the goals, objectives, and policies of the Broward County Land Use Plan, known as BrowardNEXT (2017), which serves as the land use element of the County’s comprehensive plan. Municipalities may

still participate in comprehensive planning pursuant to Chapter 163, Florida Statutes, however the plans must display consistency with the plans of the County.

BrowardNEXT includes two specific policies related to land uses surrounding FLL.⁴⁶

- Policy 2.8.2: Within areas surrounding existing or committed airports/heliports, Broward County's local governments shall not issue development orders for land uses or structures that are noncompatible with airport/heliport uses, pursuant to the Development Review Requirements subsection of the Plan Implementation Requirements section of the Broward County Land Use Plan.⁴⁷
- Policy 2.8.3: The recommendations of adopted Part 150 Study Technical Reports shall be taken under consideration during land use decisions affecting airports/heliports and their adjacent areas.

As previously discussed in this chapter, the County has taken action to protect the Airport and ensure compatible land uses through provisions in various agreements and plan amendment reviews (e.g., Broward County/Dania Beach Interlocal Agreement, Broward County/Dania Beach Land Use Amendment PC 09-5, Broward County/Davie Land Use Amendment PC 06-19). While information related to Airport-adjacent land uses are included in some capacity within each of the existing municipal comprehensive plans, it is important that subsequent updates and/or amendments of the comprehensive plans consider the policies of BrowardNEXT to satisfy state and county consistency requirements.

Incorporating land use management measures in local comprehensive planning consistent with the provisions of BrowardNEXT supports the need for local jurisdictions to fully consider land use compatibility with aircraft operations in their planning and development decisions. As a result of this Part 150 Study, BCAD encourages interagency coordination and consultation with County staff to ensure land use compatibility and the incorporation of County land use goals. Additionally, and pursuant to Policy 2.8.3 of BrowardNEXT, local jurisdictions impacted by aircraft-related noise are encouraged to adopt relevant parts of the NCP as an element of their next comprehensive plan update, or to incorporate NCP recommendations as planning guidelines for future comprehensive plan amendments.

Costs for each jurisdiction associated with this land use measure can vary significantly depending on the time and staff required in the development of comprehensive plan updates and amendments. Costs consist of labor and administrative expenses and generally cover staff time and materials required for research, preparation, public hearings, and publishing and presenting final reports. Consultants may also be retained to assist in the preparation of comprehensive plan updates and amendments. These expenses would be paid out of the various jurisdictions' operating budgets.

⁴⁶ Broward County Board of County Commissioners and the Broward County Planning Council, BrowardNEXT – Broward County Land Use Plan, 2017

⁴⁷ Section 1.f. of the Development Review Requirements subsection of the Plan Implementation Requirements section of the Broward County Land Use Plan regulates against the approval of development orders that include a structure, or alteration thereof, that is subject to the notice requirements of Federal Aviation Regulations (FAR), Part 77, Subpart B.

Conclusions: *LU 5: Encourage Local Jurisdictions to Incorporate Planning Actions in their Respective Comprehensive Plans related to Aircraft Noise that are Consistent with the policies of the BrowardNEXT Plan.* The preparation and adoption of comprehensive plans is a critical and effective part of the process of ensuring land use compatibility around Airport facilities. Pursuant to state and county requirements, BCAD encourages local jurisdictions adjacent to FLL to incorporate land use planning measures into the respective comprehensive plan updates and/or amendments to ensure consistency among local government planning efforts and with the recommendations of the 14 CFR Part 150 process.

Table 3-6 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of FLL LU-5.

TABLE 3 6 IMPLEMENTATION SUMMARY FOR LU 5: ENCOURAGE LOCAL JURISDICTIONS TO INCORPORATE PLANNING ACTIONS IN THEIR RESPECTIVE COMPREHENSIVE PLANS RELATED TO AIRCRAFT NOISE THAT ARE CONSISTENT WITH THE POLICIES OF THE BROWARDNEXT PLAN	
Implementation Item	Discussion
Benefits	Incorporating consistent land use measures in local comprehensive planning helps ensure future land use compatibility with airport operations, consistency among local government planning efforts, and compliance with the recommendations of the 14 CFR Part 150 process.
Rationale	BCAD is recommending FLL LU-5 to reduce noncompatible land uses through the incorporation of consistent land use compatibility goals, objectives, and policies within jurisdictional comprehensive plans.
Responsible Parties	BCAD to encourage. The County, City of Fort Lauderdale, City of Dania Beach, City of Hollywood, and Town of Davie are responsible for implementation.
Estimated Costs	Jurisdiction costs will vary and consist of expenses that cover staff time, consultants, and materials required for research, preparation, public hearings, and publishing and presenting of the final report.
Funding Sources	Jurisdictional operating budgets.
Requirements	Identification of applicable land use measures and approval of municipal comprehensive plans based on consistency with BrowardNEXT under the Broward County Charter.
Estimated Schedule	Pursuant to Rule Chapter 73C-49, Florida Administrative Code, comprehensive plans are required to be reviewed and, if applicable, updated/amended at least every 7 years. The BCAD recommends implementing FLL LU-5 during each impacted municipality's next comprehensive plan update.

SOURCE: BCAD, Kimley-Horn, and ESA, 2020.

FLL Land Use Measure LU-6: Encourage Local Jurisdictions Efforts to Incorporate Noise Overlay Zoning Ordinances to Regulate Sound Attenuation and Compatible Land Uses near the Airport

As an instrument for noise compatibility planning, the application of zoning deals primarily with the limitation of noise-sensitive land uses from being constructed in areas that experience aircraft-related noise levels of DNL 65 and higher. The objectives of zoning ordinances are to establish local regulations that provide locations for all essential uses of land and buildings and ensure that each use is located in the most appropriate place relative to nearby land uses and activities. In noise compatibility

planning, zoning can be used to achieve two primary objectives: (1) reinforce existing compatible land uses and promote the location of future compatible uses in vacant or underdeveloped land; and (2) facilitate the ultimate conversion of existing noncompatible land uses to compatible uses over time through the rezoning of land and the addressing of non-conforming land uses. Thus, if put in place early enough, zoning can be an effective tool to prevent or reduce the establishment of land uses that are noncompatible with airport operations and to facilitate the conversion of land uses from noncompatible to compatible.

A zoning concept that is often employed in compatibility planning is overlay zoning. Overlay zoning is typically established to address certain environmental issues (e.g., floodplains, farmland preservation, groundwater recharge area, historic districts) or to develop special/targeted regulatory requirements to facilitate specific development goals (e.g., central business district zone, tourism district, transit-oriented development areas). An overlay zone (or district) involves the creation of an area of special-purpose zoning regulations, often specific to a defined geographic location, that is placed over an existing base zone or zones as a means of addressing specific area conditions and modifying the requirements associated with the area's underlying zoning designation (e.g., setbacks, permitted uses, density yields). Regulations associated with overlay zoning are supplemental to the requirements of the general underlying zoning district. Therefore, all development and building permits for properties located within an overlay district must meet the requirements of the specific underlying zoning district in which they are located unless the overlay zone has provisions that act to modify those requirements.

Noise overlay zoning augments traditional zoning controls by focusing on noise-related requirements for a specific area. It has been used in the vicinity of numerous airports to facilitate the compatibility of new or redeveloped land uses. Noise overlay zoning can be accomplished by establishing sound-level reduction requirements based on 14 CFR Part 150 criteria, establishing requirements for aviation easements (e.g., conveyance and release agreements) as a condition of rezoning, subdivision platting or building permit issuance within a noise-impacted area, and/or establishing disclosure requirements within the boundaries of an impacted area.

The boundaries of airport noise overlay zones are generally based on noise exposure contours but often use both man-made features (e.g., roads, major utility easements) and natural features (e.g., rivers, shorelines) to aid in defining a readily identifiable boundary. Noise overlay zoning is consistent with the state legislative mandate⁴⁸ that land use controls protect the public health, safety, and general welfare through its regulation of noise-sensitive uses and its requirements intended to mitigate those impacts. Noise overlay zoning has been proven to be an effective tool to regulate land use and development requirements within noise contours and/or overflight activity near an airport. A number of jurisdictions have also opted to expand the coverage of noise overlay zoning to areas adjacent to, but outside the DNL 65 noise contour. Further, most jurisdictions tend to increase the intensity of regulatory requirements within noise overlay zones as the level of noise increases between contour intervals.

⁴⁸ Florida Statute 333. Airport Zoning. Requires that political subdivisions adopt, administer, and enforce airport land use compatibility zoning regulations and that those airport land use compatibility zoning regulations shall address a number of items including noise.

Noise overlay zoning has been successfully implemented by nearby local jurisdictions in Florida, for example, in Orange County⁴⁹ (Orlando International Airport, Orlando Executive Airport) and in Lee County⁵⁰ (Southwest Florida International Airport). In both instances, the local land use authorities opted to extend the limits of their respective noise overlay zones to areas well beyond the DNL 65 noise contour.

Costs for each jurisdiction associated with this land use measure can vary significantly depending on the time and staff required in the development of comprehensive plan updates and amendments. Costs consist of labor and administrative expenses and generally cover staff time and materials required for research, drafting the ordinance, legal review, public hearings, and publishing and presenting the final ordinance. Consultants may also be retained to assist in the preparation of comprehensive plan updates and amendments. These expenses would be paid out of the various jurisdictions' operating budgets.

Conclusions: *LU 6: Encourage Local Jurisdictions Efforts to Incorporate Noise Overlay Zoning Ordinances to Regulate Sound Attenuation and Compatible Land Uses near the Airport.* The preparation and development of overlay zoning can be effective in ensuring land use compatibility around Airport facilities. Pursuant to state and county requirements, BCAD encourages local jurisdictions adjacent to FLL to consider incorporating noise overlay zoning ordinances as a tool in managing land use compatibility.

Table 3-7 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of FLL LU-6.

TABLE 3 7 IMPLEMENTATION SUMMARY FOR LU 6: ENCOURAGE LOCAL JURISDICTIONS EFFORTS TO INCORPORATE NOISE OVERLAY ZONING ORDINANCES TO REGULATE SOUND ATTENUATION AND COMPATIBLE LAND USES NEAR THE AIRPORT	
Implementation Item	Discussion
Benefits	Incorporating noise compatibility overlay zoning helps ensure future development proposals in the vicinity of FLL result in land uses that are compatible with airport operations.
Rationale	BCAD is recommending FLL LU-6 to reduce noncompatible land uses through the incorporation of overlay zoning.
Responsible Parties	BCAD to encourage. The County, City of Fort Lauderdale, City of Dania Beach, City of Hollywood, and Town of Davie are responsible for implementation.
Estimated Costs	Jurisdiction costs will vary and consist of expenses that cover staff time, consultants, and materials required for research, preparation, public hearings, and publication.
Funding Sources	Jurisdictional operating budgets.
Requirements	Vary by jurisdiction.
Estimated Schedule	N/A

SOURCE: BCAD, Kimley-Horn, and ESA, 2020.

⁴⁹ Orange County, Florida Code of Ordinances, Section 9-606

⁵⁰ Lee County Comprehensive Plan

3.4 Land Use Management Strategies Considered but not Recommended for Inclusion in this NCP

There were a number of land use strategies that were investigated in depth throughout the Part 150 Study process. However, based on thorough consideration and discussions with land use agencies, BCAD is not recommending them for inclusion in this NCP. These include:

- Purchase of avigation easements
- Establishment or expansion of CAR
- Amendment of Building Codes

A complete list of stakeholder-suggested land use measures and the analysis associated with not selecting the three suggested measures are provided in **Appendix C**.

3.5 Summary of Recommended Land Use Management Measures

The FAA has identified land uses surrounding an airport that are considered compatible within the DNL 65, 70, and 75 contours. While local governments are responsible for encouraging airport-compatible land use through planning and zoning regulations, various land use management measures may be employed to address noncompatible land uses impacted by aircraft-related noise in areas where the noise cannot be eliminated through the implementation of noise abatement measures as described in Chapter 2.

The primary objective of this chapter is to present recommended measures that help improve compatibility between FLL and the existing and potential noise-sensitive land uses within the Airport's environs, while allowing the Airport to continue to serve in its role as an important element of the regional and national transportation networks. The recommended measures noted in the preceding discussion also build upon and enhance the robust noise mitigation actions that BCAD have implemented over the past 10 to 15 years. **Table 3-8** summarizes the six land use management measures recommended by BCAD, in accordance with 14 CFR Part 150.

TABLE 3 8
SUMMARY OF NCP RECOMMENDED LAND USE MEASURES

Noise Abatement Measure	Description of Benefits
LU-1: Implement a Voluntary Acquisition Program for a Portion of the Ocean Waterway Mobile Home Park	Removes noncompatible land uses, per 14 CFR Part 150 compatibility guidelines, that are otherwise unable to be effectively sound insulated.
LU-2: Implement a Voluntary Acquisition Program for a Portion of the Everglades Lakes Mobile Home Park	Removes noncompatible land uses, per 14 CFR Part 150 compatibility guidelines, that are otherwise unable to be effectively sound insulated.
LU-3: Implement a Voluntary Residential Sound Insulation Program for Eligible Dwelling Units located in the Future Conditions (2023) DNL 65 and Higher Contours	Once treated, a property is considered compatible with aircraft noise. This measure would convert all eligible noncompatible single- and multi-family residential units within the Future Conditions (2023) DNL 65 and higher contours to compatible uses.
LU-4: Encourage Local Communities to Implement Real Estate Fair Disclosure Requirements that Address Potential for Aircraft-Related Noise	Implementing aircraft-related noise disclosure requirements ensures that prospective property buyers within noise-impacted areas are aware of aircraft noise levels and can make informed purchasing decisions.
LU-5: Encourage Local Jurisdictions to Incorporate Planning Actions in their Respective Comprehensive Plans related to Aircraft Noise that are Consistent with the Policies of the BrowardNEXT Plan	Incorporating consistent land use measures in local comprehensive planning helps ensure future land use compatibility with Airport operations, consistency among local government planning efforts, and compliance with the recommendations of the Part 150 Study process.
LU-6: Encourage Local Jurisdictions Efforts to Incorporate Noise Overlay Zoning Ordinances to Regulate Sound Attenuation and Compatible Land Uses near the Airport	Implementing aircraft noise related overlay zoning helps ensure long term land use compatibility with Airport operations.

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CHAPTER 4

Noise Compatibility Program – Program Management Measures

Program management measures would enable the BCAD to monitor the implementation and compliance of the recommended noise abatement and land use management measures in Chapters 2 and 3 of this NCP,⁵¹ as well as enhance its ability to educate and inform communities in the vicinity of FLL about aircraft noise. It is important to note that these measures are implemented and managed at a programmatic level; they therefore collectively support BCAD’s noise program efforts including engagement with communities and other stakeholders about aircraft noise, which is critical to the success of this NCP.

4.1 Existing Program Management Measures

BCAD has been proactive in establishing a thoughtful and programmatic approach to address aircraft noise concerns, and it currently has several programs in place to monitor aircraft noise exposure and engage local communities in understanding aircraft noise. These programs were developed as outcomes of BCAD’s previous Part 150 studies and include a fully staffed noise office, Noise and Operations Management System (NOMS), and other related strategies, as described below.

Noise Office and Hotline

BCAD maintains a full-time Noise Office with a dedicated Noise Officer who oversees and manages the Airport’s existing noise program, which includes a 24-hour Noise Comment Hotline and an Automated Noise Complaint Management System (discussed in greater detail below). The Noise Office monitors trends in aircraft noise complaints (e.g., recent increases in noise complaints in a particular community) and follows up with local community members regarding their concerns.

Noise and Operations Management System (“NOMS”)

FLL’s NOMS is provided by EMS Brüel & Kjær’s Aircraft Noise and Operations Management System (ANOMS). The system consists of two basic elements: the use of a Passive Secondary Surveillance Radar (PASSUR) system for acquiring flight track information, and 13 permanent noise monitoring stations. The noise monitoring sites (see **Table 4-1** and **Figure 4-1**) are equipped with permanent noise monitoring equipment (noise analyzers, microphones, modems, etc.) that provide BCAD with the ability to differentiate between aircraft noise and non-aircraft (i.e., community) noise at each noise monitoring site. The ANOMS main server collects data from both the PASSUR system and the noise monitors in place. This data is analyzed by BCAD’s Noise Officer, who is responsible for maintaining the ANOMS, addressing public concerns regarding

⁵¹ A glossary of terminology and a list of acronyms related to this Part 150 Study can be found in **Appendix A**.

airport noise and assist with the implementation of approved measures from the Part 150 Study where possible.

TABLE 4-1 PERMANENT NOISE MONITOR LOCATIONS		
Monitor Identifier	Address	City
1	3640 Southwest 55 th Avenue	Davie, FL
2	4548 Southwest 37 th Avenue	Dania Beach, FL
3	4609 Southwest 28 th Avenue	Dania Beach, FL
4	805-B Northwest 13 th Avenue	Dania Beach, FL
5	325 Northeast 3 rd Avenue	Dania Beach, FL
6	1021 Southwest 32 nd Court	Fort Lauderdale, FL
7	1750 Southwest 32 nd Street	Fort Lauderdale, FL
8	3411 Southwest 27 th Street	Fort Lauderdale, FL
9	3900 Southwest 100 th Avenue	Davie, FL
10	2343 Southwest 27 th Avenue	Fort Lauderdale, FL
11	6503 N Ocean Dr. Vonn Mizell State Park (North)	Hollywood, FL
12	6503 N Ocean Dr. Vonn Mizell State Park (South)	Hollywood, FL
13	4300 SW 55 th Ave	Davie, FL

SOURCE: BCAD, 2020

Airport Noise Abatement Committee

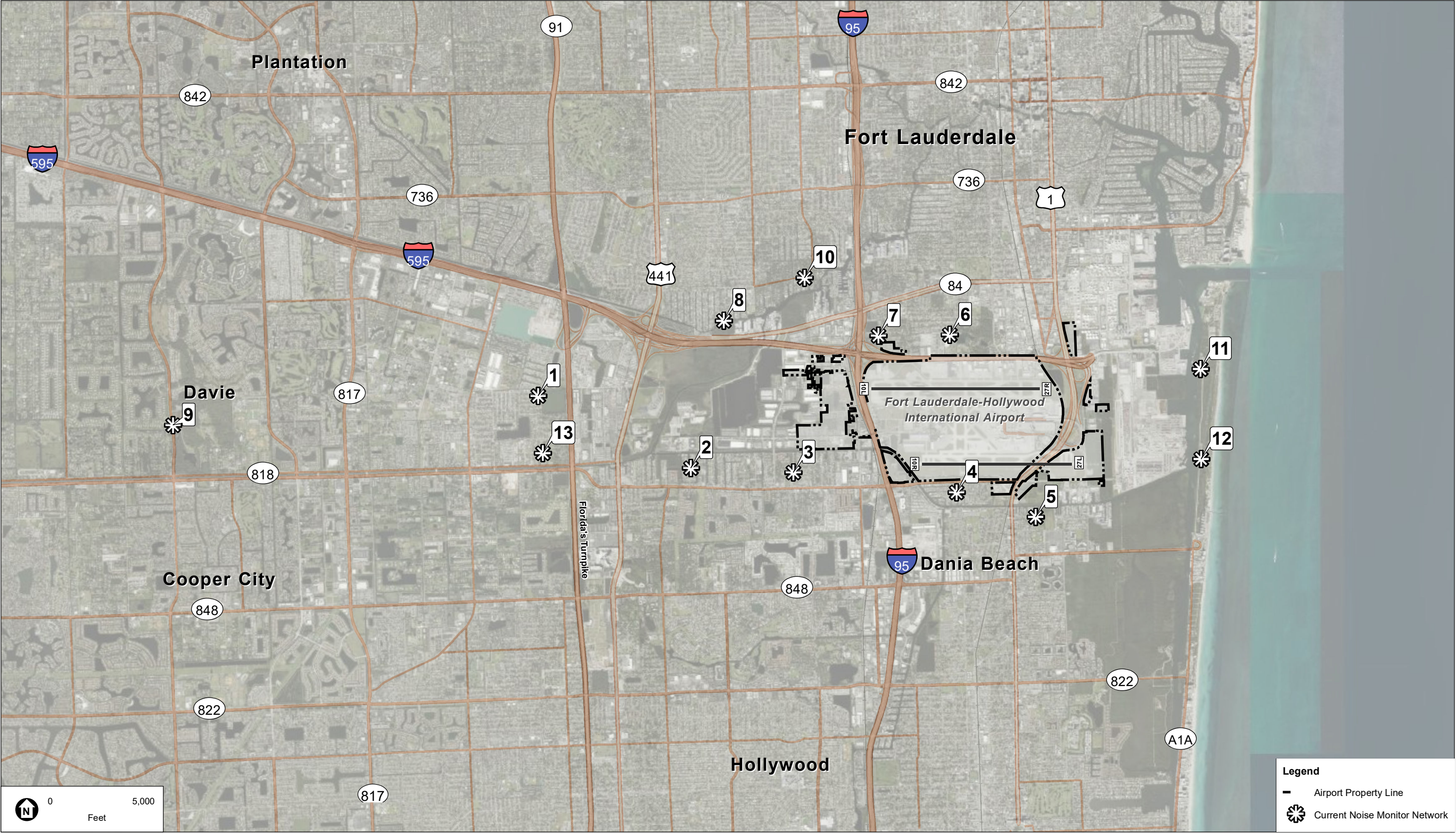
BCAD established the Airport Noise Abatement Committee (ANAC) in 1992 to provide a platform to share airport noise-related information with interested parties.⁵² As stated in the ANAC Charter, ANAC: “provides community and aviation industry interests with a public forum to cooperatively monitor and review aircraft-noise-related issues affecting neighborhoods surrounding FLL, and to recommend actions for the Broward County Director of Aviation to maximize the effectiveness of the Noise Compatibility Program, as implemented.”⁵³

The ANAC is currently comprised of 20 members and meets quarterly on the second Monday of March, June, September, and December at BCAD Administrative Offices when feasible. If the ANAC is unable to meet in-person, virtual meetings are scheduled at the same scheduled time to ensure consistent attendance.

The ANAC membership includes BCAD staff, airline representatives, and local community representatives (largely associated with specific monitor locations [i.e., monitor representatives]).

⁵² <http://www.broward.org/Airport/Business/NoiseInformation/Pages/ANACCommittee.aspx>

⁵³ http://www.broward.org/Airport/Business/NoiseInformation/Documents/Anaccharter_reviseddec2018_ac.pdf



SOURCE: Esri; BCAD; ESA, 2020

Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

Figure 4-1
Current Noise Monitor Locations
Fort Lauderdale-Hollywood International Airport

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Noise Complaint Management System

BCAD utilizes a noise complaint management system to collect and manage noise comment information submitted for FLL. There are three primary ways for submitting noise comments: (1) using an online noise comment form provided on the Airport's Noise Information Webpage; (2) via a dedicated noise comment hotline; and (3) via a mobile application. All comments received are compiled in a database, verified for accuracy, analyzed, and mapped for reporting.

Noise Information Webpage

BCAD has developed a noise information webpage, which provides information and links to FLL's Noise Program, including: how to submit noise comments; noise monitoring data and reports; FLL Informal Runway Use program; the ANAC; FAQs; and a link to the Airport's Part 150 Study.

Community Outreach

BCAD continues to participate in local community meetings to discuss and answer comment/concerns from community members related to aircraft noise. The ANAC serves as one method of outreach to the community. Other outreach initiatives undertaken by BCAD to address noise concerns include the publication of a quarterly "Quieter Skies Report",⁵⁴ which was first released in 2007 and provides an overview of efforts to reduce noise at FLL.

Noise Mitigation Program Office for the South Runway Extension

A separate Noise Mitigation Program Office was established specifically to support the noise mitigation program established for the Runway 10R-28L expansion in the FAA's 2008 EIS and Record of Decision. The activities of this office are completely separate from BCAD Noise Office's and include a separate website that provides information regarding the Noise Mitigation Program. The Noise Mitigation Program Office was accessible to residents for walk-in and scheduled appointments related to the RSIP, SSA, and CAR programs (see Chapters 1 and 3 for program details). The office was permanently closed on November 22, 2019 as the mitigation program transitioned toward substantial completion; however, the Noise Mitigation Program phone line remains active to allow BCAD to address any community concerns specific to the mitigation program.

4.2 Recommended Program Management Measures

As outlined in **Section 2.1**, local stakeholder-suggested measures were collected throughout the course of the 14 CFR Part 150 outreach process and were, in part, used by the Part 150 Study Team to develop the recommended measures presented throughout this document.

FLL Program Management Measure 1 (PM-1): Maintain the Existing Noise Office and Information Webpage

This voluntary measure involves BCAD maintaining and continuing to staff the existing Noise Office and Aviation Department's noise information webpage, which serve as vital links between

⁵⁴ <http://www.broward.org/Airport/NoiseInformation/Pages/QuieterSkies.aspx>

BCAD and surrounding communities relative to aircraft noise concerns. The Aviation Department's noise information webpage provides information describing BCAD's various noise management programs, and includes links to submit a noise complaint, noise monitoring data reports, and ANAC materials.

Conclusions: *PM 1: Maintain the Existing Noise Office and Information Webpage.* This will enable BCAD to continue to understand, respond to, and address community concerns associated with aircraft noise from FLL operations. In the future, the Noise Office will facilitate the implementation of the new measures recommended for inclusion in this NCP, as approved by the FAA.

Table 4-2 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of PM-1.

TABLE 4 2 IMPLEMENTATION SUMMARY FOR PM 1: MAINTAIN THE EXISTING NOISE OFFICE AND INFORMATION WEBPAGE	
Implementation Item	Discussion
Benefits	The existing Noise Office enables BCAD to understand, respond to, and address community concerns associated with aircraft noise from FLL operations. In the future, the Noise Office will continue to maintain the noise program management measures. The Airport's information webpage will be an important interface for collecting and disseminating information related to the noise program.
Rationale	BCAD is recommending PM-1 because the existing Noise Office is the principal entity for receiving and responding to aircraft noise comments from the public and noise-impacted communities, as well as interfacing with community representatives and Airport users. With the completion of the NCP, the Noise Office staff will be critical in successful implementation of the FAA-approved NCP measures.
Responsible Parties	BCAD.
Estimated Costs	The FAA does not fund program operating expenses. BCAD will continue to fund the operation of the Noise Office and information webpage as part of its annual operating expenses.
Funding Sources	BCAD.
Requirements	Adequate resources for the continuation of the program. The program's establishment and continuation is subject to the availability of resources and it may be temporarily or permanently suspended at any time.
Estimated Schedule	This measure is already implemented; BCAD will continue to operate the Noise Office and maintain the information webpage.

SOURCE: BCAD and ESA, 2020.

FLL Program Management Measure 2 (PM-2): Evaluate/Update the Existing Noise Monitoring and Flight Tracking System

This measure involves reviewing the effectiveness of the existing noise monitoring and flight tracking system, which provide information about noise levels associated with aircraft operating in the vicinity of FLL. The primary purpose of noise monitors is to provide insight on aircraft-specific

events, such as time of day, duration, and noise levels and general operational trends, such as increasing/decreasing frequency of flights, etc. Combined with a flight tracking component, these systems enable correlation of noise information with radar track information. Prior to the ANCA, some airports used these systems to identify aircraft that exceeded certain noise levels and fine those aircraft operators. As aircraft have become much quieter, and flight tracking system technology has improved, airport sponsors have shifted towards utilizing systems that place less emphasis on noise monitoring and more emphasis on flight track and operational reporting.

Eleven noise monitors were initially installed around FLL and predate the expanded south runway and closure of the crosswind runway. Two additional monitors, 12 and 13, were recently installed east and west of the Airport along the extended centerlines of Runway 10R-28L (**Figure 4-2**). As a result of recent airfield improvements, and the closure of the crosswind runway, monitors 5, 7, and 10 no longer serve their intended purpose. Generally speaking, the overall existing noise monitoring system requires resource-intensive maintenance and, with the exception of the two newest monitors, the entire system has exceeded its useful life.

The existing flight tracking component of the FLL's ANOMS is outdated and can no longer be updated without a complete upgrade of the system. Operations monitoring and flight tracking system technology has advanced significantly over the past 5 to 10 years, providing automated reporting and improvements with the user interface and offering advanced reporting capabilities not previously available to airports. Current, state-of-the-art systems can provide a wealth of aircraft operational data, including departure/arrival paths, altitudes, and much of the same information captured by noise monitoring systems. As flight tracking systems have evolved, so has the ability to track and understand changes in the local airport operational environment. With the improvements in reporting and tracking capabilities, there is less need, and in some cases, even no need, to rely on noise monitors for this information. Many airports, including Orlando International and Tampa International Airports, now use these new reporting systems, exclusively, without noise monitors.

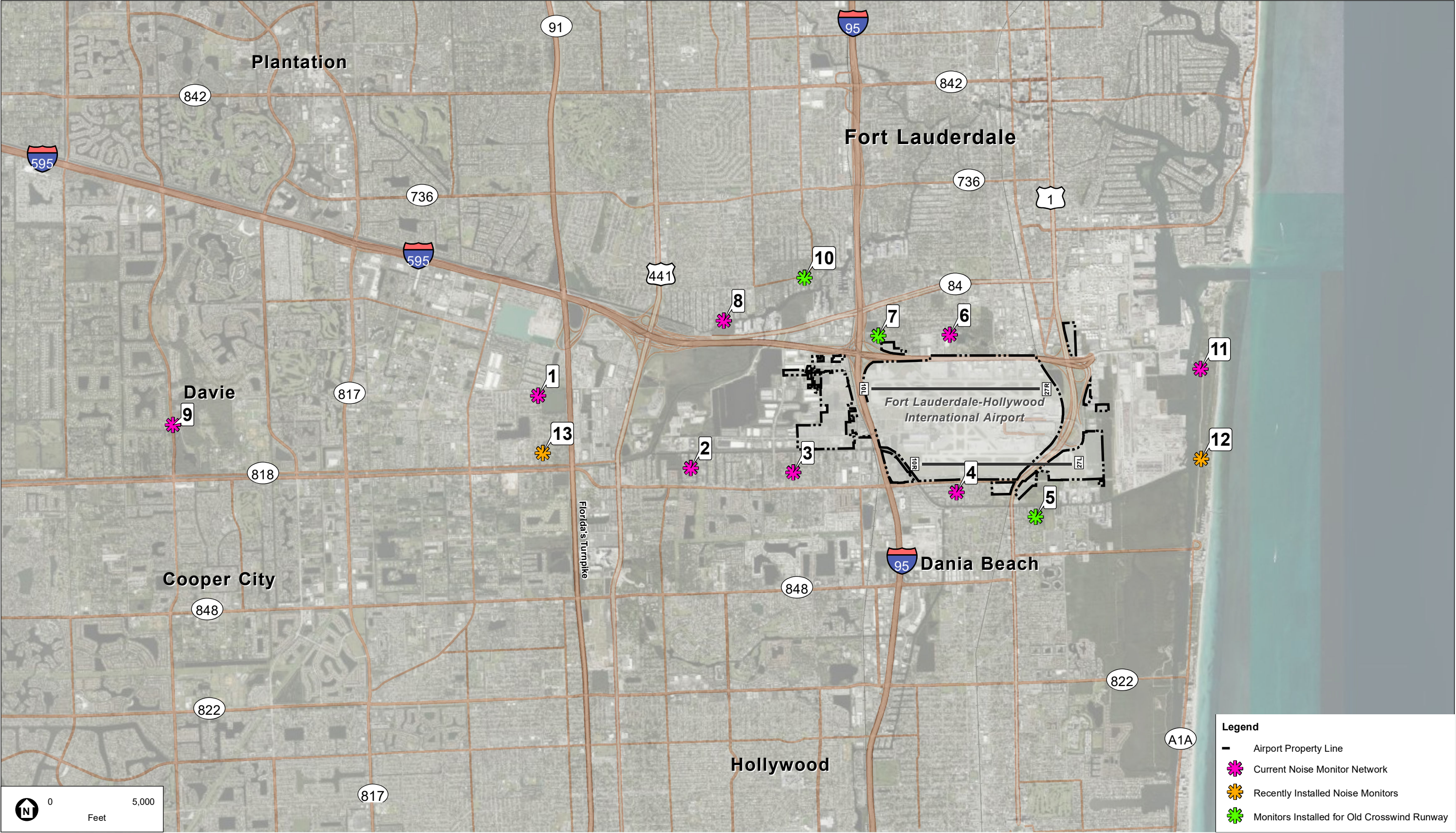
Given that (1) the existing noise monitoring system element is in immediate need of either a major upgrade or replacement and (2) the existing flight tracking system element requires a significant upgrade to take advantage of recent advancements in technology, BCAD is at an opportune crossroad to decide whether it should upgrade to a system that meets all functional requirements. Because this measure would require a significant capital investment, BCAD recommends conducting a thorough and deliberate evaluation of the existing system and the current and future needs of the Airport prior to making any decisions. Such an analysis may consider: the need for removal/decommissioning of monitors, potential new locations of monitors, potential integration of noise complaint system, existing and future operations and maintenance costs; upfront capital costs; and potential eligibility for FAA funding support. This measure is consistent with 14 CFR Part 150's goal of preventing the introduction of additional noncompatible land uses by providing a system to monitor the airspace environment and provide actual data that could be used in future noise contour modeling.

Conclusions: *PM 2: Evaluate/Update the Existing Noise Monitoring and Flight Tracking System.* This analysis would help BCAD understand the functional state of its existing noise monitoring and flight tracking system and determine whether system upgrade/replacement or the installation of a new system best meets the existing and future needs of the Airport. BCAD would then pursue system implementation.

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

TABLE 4 3 IMPLEMENTATION SUMMARY FOR PM 2: EVALUATE/UPDATE THE EXISTING NOISE MONITORING AND FLIGHT TRACKING SYSTEM	
Implementation Item	Discussion
Benefits	This analysis would help BCAD better understand the current state of its noise monitoring and flight tracking system and inform them of a path forward that best meets their current and future needs. The resulting system would allow for better tracking and reporting of trends and take advantage of significant advancements in technology. This supports the investigation of noise complaints as well as communication with the public about the noise environment associated with FLL.
Rationale	BCAD is recommending PM-2 because the current noise monitoring and flight tracking system is in need of upgrade/replacement. Because this would be a major capital investment, a thorough assessment of the best path forward is warranted.
Responsible Parties	BCAD.
Estimated Costs	Costs of the evaluation will vary depending on the scope, but is estimated at between \$35,000 and \$65,000. Costs of the system update will vary depending on the outcome of the evaluation, but implementation could be as much as \$500,000 or more. Annual maintenance costs depend on the type of system and could range between \$90,000 and \$100,000. Maintenance and ongoing operational costs are not eligible for federal funding.
Funding Sources	80% FAA AIP and 20% BCAD for FAA-eligible elements. Only monitors located within the DNL 65 contour and the initial flight tracking system purchase would be eligible for federal funding support.
Requirements	FAA's approval of this measure, and BCAD to secure federal funding.
Estimated Schedule	Within 18 months of the FAA's approval of this NCP, subject to availability of funding.

SOURCE: BCAD and ESA, 2020.



SOURCE: Esri; BCAD; ESA, 2020

Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

Figure 4-2
Review of Noise Monitor Locations
Fort Lauderdale-Hollywood International Airport

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FLL Program Management Measure 3 (PM-3): Maintain Noise Complaint Management System

Since the opening of the expanded south runway, the Airport has experienced a large increase in noise complaints on a monthly basis. Because the volume of complaints is so large, it is not feasible to manage them manually. This measure involves continuing to operate an existing noise complaint management system, which is automated and enables BCAD to collect and manage noise complaints regarding FLL operations. This allows BCAD to track the number of complaints as well as complaint locations and associated households in an efficient manner and to correlate trends in complaints and locations to aircraft activity.

Conclusions: *PM 3: Maintain Noise Complaint Management System.* This measure continues use of an important tool used in managing the high volume of complaints received at the Airport. This measure supports the investigation of noise complaints, as well as communication with the public about the noise environment associated with FLL.

Table 4-4 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of PM-3.

TABLE 4 4 IMPLEMENTATION SUMMARY FOR PM 3: MAINTAIN NOISE COMPLAINT MANAGEMENT SYSTEM	
Implementation Item	Discussion
Benefits	This measure continues use of a noise complaint management system to allow BCAD to monitor noise complaint trends and communicate with the public about the aircraft noise and operational environment associated with FLL.
Rationale	BCAD is recommending PM-3 because it receives a large number of comments and this measure enables it to better understand, investigate and respond to community concerns.
Responsible Parties	BCAD.
Estimated Costs	\$30,000 annually for on-going maintenance costs.
Funding Sources	BCAD. The FAA will not pay for on-going maintenance costs.
Requirements	Adequate resources for the continuation of the program. The program's establishment and continuation is subject to the availability of resources and it may be temporarily or permanently suspended at any time.
Estimated Schedule	This measure is already implemented; BCAD will continue to maintain a Noise Complaint Management System.

SOURCE: BCAD and ESA, 2020.

FLL Program Management Measure 4 (PM-4): Conduct Community Outreach Activities

This measure involves BCAD continuing to participate in outreach activities with local community members, including hosting the ANAC. An important aspect of any noise program is community outreach, which provides valuable insight into community concerns and educating the community about airport operations and on-going activities to reduce noise exposure and improve land use compatibility.

Conclusions: PM 4: Conduct Community Outreach Activities. Outreach is an important tool in understanding community concerns and educating the community on factors influencing airport operations.

Table 4-5 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of PM-4.

TABLE 4 5 IMPLEMENTATION SUMMARY FOR PM 4: CONDUCT COMMUNITY OUTREACH ACTIVITIES	
Implementation Item	Discussion
Benefits	This measure continues the outreach with the public about the aircraft noise and operational environment associated with FLL.
Rationale	BCAD is recommending PM-4 because outreach is critical for information sharing and discussion of concerns and enables it to better understand, investigate and respond to community concerns.
Responsible Parties	BCAD.
Estimated Costs	BCAD will continue to fund public outreach activities as a part of its annual operating expenses.
Funding Sources	BCAD. The FAA will not pay for ongoing operational costs.
Requirements	Adequate resources for the continuation of the program. The program's establishment and continuation is subject to the availability of resources and it may be temporarily or permanently suspended at any time.
Estimated Schedule	This measure is already implemented; BCAD will continue to conduct community outreach activities.

SOURCE: BCAD and ESA, 2020.

FLL Program Management Measure 5 (PM-5): Evaluate the Composition of the ANAC

This measure involves BCAD evaluating and potentially revising the composition of the ANAC to better represent the concerns of communities located both within and outside the DNL 65 contour, as well as other stakeholders (e.g., airlines). Modifications to the Committee would ensure that communities within the DNL 65 contour remain well represented while better reflecting the current noise exposure environment. The current ANAC dates back to 1992 and its composition is primarily associated with the location of existing noise monitors (i.e., Noise Monitor 1 representative, etc.). However, the public meetings conducted and community input received for this Part 150 Study has documented that communities well beyond the existing noise monitor locations have concerns about Airport noise and overflights, which may not be adequately represented by the current composition of the ANAC. Additionally, the existing monitor network was established when the crosswind runway at FLL was still active; this runway has since been decommissioned. To more efficiently engage the local communities and maximize effectiveness the recommended measures in this NCP, the ANAC needs to be structured to support the most current and relevant concerns, priorities, and interests of local communities. This measure would include evaluating the criteria used for ANAC membership and implementation of a structure that effectively engages communities, aircraft operators and the FAA to address noise issues.

Conclusions: *PM 5: Evaluate the Composition of the ANAC.* Evaluating ANAC composition to better reflect the current concerns of affected communities can improve the effectiveness of the ANAC as an outreach tool.

Table 4-6 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of PM-5.

TABLE 4 6 IMPLEMENTATION SUMMARY FOR PM 5: EVALUATE THE COMPOSITION OF THE ANAC	
Implementation Item	Discussion
Benefits	This measure increases the effectiveness of the ANAC by evaluating membership in the context of better reflecting the current concerns of affected communities and effectively engaging aircraft operators at FLL.
Rationale	BCAD is recommending PM-5 because concerns related to aircraft overflights have been expressed throughout the course of the Part 150 Study process by communities that are currently not represented in the ANAC.
Responsible Parties	BCAD.
Estimated Costs	Nominal.
Funding Sources	Already considered in BCAD Noise Office operational costs.
Requirements	FAA's approval of this measure. The ANAC's continuation is subject to the availability of resources and it may be temporarily or permanently suspended at any time.
Estimated Schedule	Within one year of FAA approval of the NCP.

SOURCE: BCAD and ESA, 2020.

FLL Program Management Measure 6 (PM-6): Install Runway Reminder Signs

This measure involves BCAD installing new, additional signage to 1) remind pilots that FLL is a noise-sensitive airport and 2) encourage pilots to follow voluntary noise abatement measures. Signage can be an effective outreach tool to increase pilot awareness related to an airport's operational environment. Signs placed near runway ends can also provide a final reminder for departing aircraft to operate aircraft in a manner that reduces potential community annoyance. This measure includes installation of additional signs to complement existing noise abatement signage. To ensure future adherence to signage instructions, all sign content will need to also be approved by the FAA and be installed consistent with FAA Advisory Circulars and design guidance.

Conclusions: *PM 6: Install Runway Reminder Signs.* Increasing pilot awareness is an important tool in implementing noise abatement measures and reducing impacts on the community.

Table 4-7 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of PM-6.

TABLE 4 7
IMPLEMENTATION SUMMARY FOR PM 6: INSTALL RUNWAY REMINDER SIGNS

	This measure increases pilot awareness of the aircraft noise and operational environment associated with FLL.
Rationale	BCAD is recommending PM-6 because signage reinforces the noise-sensitive nature of the Airport and serves as an additional reminder to departing pilots to operate their aircraft in a manner that minimizes impacts on the community.
Responsible Parties	BCAD.
Estimated Costs	Costs will vary, depending on the number, size and location of signage and procurement methods available to BCAD. It is anticipated that total implementation cost including design and construction could be up to \$75,000.
Funding Sources	80% FAA AIP and 20% BCAD for FAA-eligible elements (design and construction).
Requirements	FAA's approval of this measure, subject to funding availability.
Estimated Schedule	Within two to five years of FAA approval of the NCP. This measure would be implemented in conjunction with adjacent maintenance or improvement projects to minimize operational impacts.

SOURCE: BCAD and ESA, 2020.

FLL Program Management Measure 7 (PM-7): Evaluate a Voluntary Fly Quiet Program

Voluntary “Fly Quiet” programs have been successfully implemented at a number of airports across the country (e.g., San Francisco, Los Angeles, and Chicago O'Hare International Airports) to provide airport stakeholders (i.e., the FAA, airport sponsor, and aircraft operators) an opportunity to voluntarily collaborate in finding ways to minimize aircraft noise exposure and associated community annoyance where possible. These types of programs typically focus on airline/pilot awareness campaigns 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 and promoting existing and proposed noise abatement measures and recognizing actions that may reduce noise that cannot currently be easily quantified. Fly Quiet programs are typically reviewed annually by the airport sponsor and adjusted, as appropriate, to reflect current airport-specific operating considerations and industry-wide trends in aircraft operations. Examples of measures from voluntary Fly Quiet programs that have been established at other airports include:

- Public recognition of aircraft operators that invest in quieter Stage 5 aircraft⁵⁵;
- Public recognition of aircraft operators that implement aircraft modifications to reduce community annoyance (e.g., retrofitting A320 aircraft with vortex generators over the fuel ports to reduce noise);
- Public recognition of aircraft operators' efforts to reduce noise based on how they fly aircraft (e.g., delaying the point at which landing gear are lowered);
- Promotion of higher aircraft altitudes on arrival and departure;
- Promotion of keeping aircraft flight tracks away from noise-sensitive land uses; and,

⁵⁵ A Stage 5 aircraft is an aircraft that meets the noise limit prescribed in 14 CFR Part 36, Appendix B, Sec. B36.5(e).

- Public recognition of aircraft operators that integrate noise abatement considerations into aircraft operator materials (e.g., NADPs).

A Fly Quiet program would also allow further coordination and exploration of the potential benefits of implementing voluntary strategies such as revising where the landing gear is lowered or implementing NADP procedures. Any strategies considered would be evaluated (e.g., preliminary noise contours) to ensure there would not be an increase in noncompatible land uses. If a Fly Quiet program is established, and if strategies were evaluated and recommended, the Fly Quiet program would also develop metrics to monitor usage, community concerns, and other potential issues. This monitoring could include periodic noise contour updates to ensure that a recommended strategy does not increase noncompatible land uses.

Although voluntary Fly Quiet programs have shown success at other airports, it is important to note that there is no one-size-fits-all approach. Not every airport has or even needs a voluntary Fly Quiet program—it is often the case that the voluntary goals set forth in such a program can be accomplished through other NCP measures, and because these programs require stakeholder involvement and reporting, there may be other existing approaches that can accomplish the same goals, but are more cost-effective. Depending on the goals set and the associated level of effort required to achieve them, the program costs can vary. However, because many airports do enjoy the successes resulting from these types of programs, BCAD recommends assessing the feasibility of developing and implementing a voluntary Fly Quiet program at FLL. Such an analysis would consider, at a minimum: costs associated with development and implementation; interest/support from airline operators and the local community; required stakeholder involvement; and ability to enhance existing NCP measures to reduce noise impacts to noncompatible land uses.

Conclusions: *PM 7: Evaluate a Voluntary Fly Quiet Program.* This analysis will help BCAD determine if a Fly Quiet Program is a necessary and cost effective approach to include in FLL's existing noise program.

Table 4-8 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of PM-7.

TABLE 4 8
IMPLEMENTATION SUMMARY FOR PM 7: EVALUATE A VOLUNTARY FLY QUIET PROGRAM

Implementation Item	Discussion
Benefits	This will help BCAD to determine if a voluntary Fly Quiet Program is a necessary and cost-effective approach to include in FLL's noise program. If programs or procedures are implemented that would reduce noncompatible land uses, implementing a Fly Quiet Program to enhance pilot awareness could help increase compliance and reduce noise impacts and potentially reduce existing noncompatible land uses.
Rationale	Voluntary Fly Quiet programs have been successfully implemented at other airports, but not every airport needs one, as there may be other ways, that are cheaper or more efficient, to achieve the same goals. As such, BCAD is recommending PM-7 to evaluate whether a voluntary Fly Quiet Program is appropriate for FLL.
Responsible Parties	BCAD.
Estimated Costs	\$35,000 -\$70,000, depending on scope and scale.
Funding Sources	BCAD.
Requirements	FAA's approval of this measure.
Estimated Schedule	Within one year of FAA acceptance of the NCP.

SOURCE: BCAD and ESA, 2020.

FLL Program Management Measure 8 (PM-8): Update the Noise Exposure Maps

The FAA requires airport operators to maintain NEMs that reflect current or reasonably projected conditions in order to obtain AIP funding for noise programs. Specifically, 2018 FAA Reauthorization Act, Section 174, Updating Airport Noise Exposure Maps, indicates the following:

(b) Revised Maps. -

(1) In general. - An airport operator that submits a noise exposure map under subsection (a) shall submit a revised map to the Secretary if, in an area surrounding an airport, a change in the operation of the airport would establish a substantial new noncompatible use, or would significantly reduce noise over existing noncompatible uses, that is not reflected in either the existing conditions map or forecast map currently on file with the Federal Aviation Administration.

(2) Timing. - A submission under paragraph (1) shall be required only if the relevant change in the operation of the airport occurs during

(A) the forecast period of the applicable noise exposure map submitted by an airport operator under subsection (a); or

(B) the implementation period of the airport operator's noise compatibility program.

Essentially, this means that an NEM update is required if:

- There is an increase of DNL 1.5 dB estimated over currently noncompatible uses or over formerly compatible uses that are made noncompatible by the noise increase; or
- There is a reduction of DNL 1.5 dB estimated over formerly noncompatible uses that makes those uses compatible with aircraft noise.

Importantly, an NEM update is not required to be completed on a periodic basis (i.e., every five years), but instead, is required by 14 CFR Part 150 to be completed when one of the conditions outlined above are satisfied. Once BCAD has determined that one of the conditions above is met, it will confirm, in writing, with the FAA whether (1) the existing NEM continues to be a reasonable representation of current and/or forecast conditions at FLL or (2) an update to the NEM is required. The implementation of FAA’s South-Central Florida Metroplex measures is an example of a change that could require an update to the NEMs. BCAD is recommending this measure to comply with 14 CFR Part 150 requirements in the future.

Conclusions: *PM 8: Update the Noise Exposure Maps.* This will enable BCAD to meet the requirements of 14 CFR Part 150, Sec. 150.21(d), if applicable changes in the noise environment occur at FLL.

Table 4-9 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of PM-8.

TABLE 4 9 IMPLEMENTATION SUMMARY FOR PM 8: UPDATE THE NOISE EXPOSURE MAPS	
Implementation Item	Discussion
Benefits	Updating the NEM will enable BCAD to meet the requirements of 14 CFR Part 150 if applicable changes in the noise environment occur at FLL.
Rationale	BCAD is recommending PM-8 to meet the requirements of 14 CFR Part 150, Sec. 150.21(d).
Responsible Parties	BCAD.
Estimated Costs	Depending on the time since the last update, the extent of change and the amount of stakeholder outreach, the level of effort required to update the NEM will likely range from \$500,000 to \$1,000,000 or more.
Funding Sources	80% FAA AIP and 20% BCAD.
Requirements	FAA’s approval of this measure, and BCAD securing funding for the update of the NEM, when warranted.
Estimated Schedule	BCAD expects to update the NEM on an as-needed basis, determined by a review of the current operational conditions.

SOURCE: BCAD and ESA, 2020.

FLL Program Management Measure 9 (PM-9): Update the Noise Compatibility Program

14 CFR Part 150, Sec. 150.23(e)(9), states that NCPs must include a “provision for revising the program if made necessary by revision of the noise exposure map.” Examples of NEM revisions that would prompt updates in an NCP include large increases in noncompatible land uses that would require new NCP elements to achieve land use compatibility. An NCP update could also be required if there is a reduction in noise exposure to noncompatible uses and any previously relevant measures are no longer needed. However, if the changes reflected in the NEM do not indicate changes that would drive the need for additional measures or modification of an existing measure,

an NCP update may not be warranted. In other words, while the timeline for updating the NCP is typically driven by the NEM update process, an NCP update is not always necessary in response to every NEM update. Accordingly, BCAD recommends updating the NCP only when additional NCP measures and/or modified measures are required to reduce noncompatible land use.

Conclusions: *PM 9: Update the Noise Compatibility Program. This will enable BCAD to meet the requirements of 14 CFR Part 150, Sec. 150.23(e)(9), if made necessary by a revision of the NEMs for FLL.*

Table 4-10 provides a summary of implementation requirements along with the benefits and rationale for the recommendation of PM-9.

TABLE 4 10 IMPLEMENTATION SUMMARY FOR PM 9: UPDATE THE NOISE COMPATIBILITY PROGRAM	
Implementation Item	Discussion
Benefits	Updating the NCP will enable BCAD 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 FLL.
Rationale	BCAD is recommending PM-9 to meet the requirements of 14 CFR Part 150, Sec. 150.23(e)(9).
Responsible Parties	BCAD.
Estimated Costs	Depending on the time since the last update, the extent of change in noise exposure, the number of measures to be evaluated and the amount of stakeholder outreach, the level of effort required to update the NCP can vary substantially. The cost could range from \$350,000 to \$750,000, or more.
Funding Sources	80% FAA AIP and 20% BCAD.
Requirements	FAA's approval of this measure, and BCAD to secure AIP funding for the update of the NCP, when appropriate.
Estimated Schedule	Within one year of FAA acceptance of a revised NEM, BCAD will initiate a review of the NCP to determine if a revision is necessary.

SOURCE: BCAD and ESA, 2020.

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

There were a few program management strategies that were suggested by stakeholders, but after thorough consideration, BCAD is not recommending for inclusion in this NCP. A complete list of stakeholder-suggested program management measures is provided in **Appendix C**.

4.4 Summary of Recommended Program Management Measures

Table 4-11 summarizes the full list of recommended program management measures detailed within this section.

TABLE 4 11
SUMMARY OF NCP RECOMMENDED PROGRAM MANAGEMENT MEASURES

Program Management Measure	Description of Benefits
PM-1: Maintain the Existing Noise Office and Information Webpage	The existing Noise Office enables BCAD to understand, respond to, and address community concerns associated with aircraft noise from FLL operations.
PM-2: Evaluate/Update the Existing Noise Monitoring and Flight Tracking System	An updated system would allow for better tracking and reporting of operational trends and take advantage of significant advancements in technology.
PM-3: Maintain Noise Complaint Management System	A noise complaint management system allows BCAD to monitor noise complaint trends and communicate with the public about the aircraft noise concerns.
PM-4: Conduct Community Outreach Activities	Community outreach allows more issue specific outreach with the public about the aircraft noise and operational environment associated with FLL.
PM-5: Evaluate the Composition of the ANAC	Updating the composition of the ANAC increases its effectiveness by better reflecting the current concerns of affected communities and effectively engaging aircraft operators.
PM-6: Install Runway Reminder Signs	Airfield signage increases pilot awareness of the aircraft noise and operational environment.
PM-7: Evaluate a Voluntary Fly Quiet Program	A Voluntary Fly Quiet Program may be a cost-effective approach to include in FLL's noise program.
PM-8: Update the Noise Exposure Maps	Updating the NEM will enable BCAD to meet the requirements of 14 CFR Part 150, if applicable changes in the noise environment occur.
PM-9: Update the Noise Compatibility Program	Updating the NCP will enable BCAD to meet the requirements of 14 CFR Part 150, if a revision of the NCP is made necessary by a revision of the NEM.

SOURCE: BCAD and ESA, 2020.

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CHAPTER 5

Noise Compatibility Program Implementation

The objective of this NCP⁵⁶ for FLL is to achieve and maintain aircraft noise/off-Airport land use compatibility through the continued efforts of noise abatement procedures and implementation of noise mitigation measures, where possible. Through the analysis of existing and future noise conditions, the direct input from a wide variety of interests including citizens, aircraft operators, the FAA and other stakeholders, a series of recommended operational, land use and programmatic measures were identified.

The roles of each primary stakeholder as well as the existing and recommended measures, costs, and timing of implementation are discussed in the following sections.

5.1 Overall Roles and Responsibilities

The Broward County Aviation Department

BCAD, as owners and operators of FLL, are responsible for the development of information to support the noise compatibility planning effort. This support includes the preparation of this Part 150 Study, community involvement measures, coordination with Airport users related to operational procedures, and the interaction with local planners and elected officials related to land use compatibility. In addition, BCAD is responsible for implementing or assisting with the implementation of the approved NCP measures and applying for funds (grants) from the FAA associated with eligible items included in this NCP.

Federal Aviation Administration

The FAA Airports Division is responsible for developing guidance for preparing noise studies, providing technical support, approving those 14 CFR Part 150 Study Update recommendations that meet its guidance, establishing eligibility requirements for the use of noise related funding, and distributing federal funds in support of approved NCP noise-related recommendations. The FAA's Air Traffic Organization (ATO) is responsible for the movement of aircraft both on the airfield and in the air and has the sole authority to implement noise abatement operational procedures for aircraft in flight.

Local Governments and Elected Officials

Local land use planners and elected officials are responsible for local land use planning. These entities and individuals are responsible for the establishment and implementation of zoning and land use regulations and the application of these actions by taking into consideration the compatibility of land uses in aircraft noise exposure areas.

⁵⁶ A glossary of terminology and a list of acronyms related to this Part 150 Study can be found in **Appendix A**.

Aircraft Operators

Pilots of all aircraft types are responsible for safely operating their aircraft, but when able to do so, are asked to operate their aircraft according to the noise abatement procedures established at an airport.

Residents and Prospective Residents

Residents in areas surrounding an airport are important stakeholders that can provide valuable feedback to BCAD. Residents can report their concerns associated with aircraft noise exposure directly to BCAD through the noise hotline or other means of contact. Residents can also strive to understand the actions that can and cannot legally be taken to minimize the effect of aircraft noise. Prospective residents should acquaint themselves with noise and flight corridor information prior to buying a home.

5.2 NCP Program Overview

This NCP includes 19 measures to be implemented over a multi-year timeframe. The benefits of each measure are detailed in **Chapters 2-4. Table 5-1** identifies each recommended measure, the entity responsible for the measure's implementation and the associated costs. The estimated cost of the overall program is roughly \$25 million in initial implementation costs (without the NEM or NCP update costs) and nearly \$500,000 in on-going operational and maintenance costs. It should be noted that the implementation schedule depends on the availability of funding and may be affected by BCAD's budget cycle and the FAA's AIP grant cycle. Additionally, operational and maintenance costs are not eligible for FAA funding. **Table 5-2** provides the estimated schedule for implementation of the NCP. Implementation of the NCP is subject to the FAA's approval of each specific measure.

The implementation of the measures proposed in this Part 150 Study enhances the overall noise program at FLL and educates stakeholders on noise exposure and related concerns, within the DNL 65 contour. To ensure effectiveness of the program, all FAA-approved measures implemented by BCAD should be reviewed periodically by BCAD to determine their implementation status.

TABLE 5-1
RECOMMENDED MEASURES - IMPLEMENTATION RESPONSIBILITY AND ESTIMATED COST

Recommended Measure	Responsibility	Estimated Cost
Noise Abatement Measures (NA)		
NA-1: Continue Voluntary User Program for Runway 10R-28L	FAA	The Voluntary User Program for Runway 10R-28L has already been implemented and is represented in the baseline Future Conditions (2023) NEM. Both continuation of the measure as well as disapproval of this measure would require mitigation or acquisition of eligible noncompatible residential units located with the DNL 65 contour.
NA-2: Reduce Early Aircraft Departure Turns from FLL through Implementation of ELSO or ELSO-Equivalent Procedures During West-Flow Conditions	FAA	Nominal, would require procedure design and implementation
NA-3: Reduce Early Aircraft Departure Turns from FLL through Implementation of ELSO or ELSO-Equivalent Procedures during East-Flow Conditions	FAA	Nominal, would require procedure design and implementation
NA-4: Modify Aircraft Arrival Profiles to the West of FLL to Keep Aircraft Higher	FAA	Nominal, may require procedure design and implementation
Land Use Measures (LU)		
LU-1: Implement a Voluntary Acquisition Program for a Portion of the Ocean Waterway Mobile Home Park	BCAD	\$2,300,000 including relocation assistance and soft costs.
LU-2: Implement a Voluntary Acquisition Program for a Portion of the Everglades Lakes Mobile Home Park	BCAD	\$12,150,000 including relocation assistance and soft costs.
LU-3: Implement a Voluntary Residential Sound Insulation Program for Eligible Dwelling Units located in the Future Conditions (2023) DNL 65 and Higher Contours	BCAD	\$7,700,000, including program management
LU-4: Encourage Local Jurisdictions to Implement Real Estate Fair Disclosure Requirements that Address Potential for Aircraft-Related Noise	BCAD/Local Jurisdictions	Jurisdiction costs will vary and consist of expenses that cover staff time, consultants, and materials required for research, preparation, public hearings, the publishing of notifications and background information, and potential meetings with key community stakeholders
LU-5: Encourage Local Jurisdictions to Incorporate Planning Actions in their Respective Comprehensive Plans related to Aircraft Noise that are Consistent with the Policies of the BrowardNEXT Plan	BCAD/Local Jurisdictions	Jurisdiction costs will vary and consist of expenses that cover staff time, consultants, and materials required for research, preparation, public hearings, and publishing and presenting of the final report.
LU-6: Encourage Local Jurisdictions Efforts to Incorporate Noise Overlay Zoning Ordinances to Regulate Sound Attenuation and Compatible Land Uses near the Airport	BCAD/Local Jurisdictions	Jurisdiction costs will vary and consist of expenses that cover staff time, consultants, and materials required for research, preparation, public hearings, and publication.
Programmatic Measures (PM)		
PM-1: Maintain the Existing Noise Office and Information Webpage	BCAD	Funded as part of its annual operating expenses.
PM-2: Evaluate/Update the Existing Noise Monitoring and Flight Tracking System	BCAD	\$35,000 to \$65,000 for evaluation; \$500,000 for upgrade of system; \$100,000 for annual maintenance ¹
PM-3: Maintain Noise Complaint Management System	BCAD	\$30,000 annually ¹
PM-4: Conduct Community Outreach Activities	BCAD	Funded as part of its annual operating expenses.
PM-5: Evaluate the Composition of the ANAC	BCAD	Nominal
PM-6: Install Runway Reminder Signs	BCAD	\$75,000
PM-7: Evaluate a Voluntary Fly Quiet Program	BCAD	\$35,000 to \$70,000
PM-8: Update the Noise Exposure Maps	BCAD	\$500,000 to \$1,000,000 (or more), depending on the scope and scale of change and public outreach
PM-9: Update the Noise Compatibility Program	BCAD	\$350,000 to \$750,000 (or more), depending on the scope or scale of measures that are being evaluated

SOURCE: ESA, 2020

NOTE: ¹ Operating and maintenance costs are not eligible for FAA AIP grant funding.

TABLE 5-2
RECOMMENDED MEASURES - IMPLEMENTATION SCHEDULE

Recommended Measure	Implementation Schedule
Noise Abatement Measures (NA)	
NA-1: Continue Voluntary User Program for Runway 10R-28L	Implemented; reflected in the baseline Future Conditions (2023) NEM.
NA-2: Reduce Early Aircraft Departure Turns from FLL through Implementation of ELSO or ELSO-Equivalent Procedures During West-Flow Conditions	BCAD to submit a request for flight path modification within 6 to 12 months of the FAA's Record of Approval for the NCP. ¹
NA-3: Reduce Early Aircraft Departure Turns from FLL through Implementation of ELSO or ELSO-Equivalent Procedures during East-Flow Conditions	BCAD to submit a request for flight path modification within 6 to 12 months of the FAA's Record of Approval for the NCP. ¹
NA-4: Modify Aircraft Arrival Profiles to the West of FLL to Keep Aircraft Higher	BCAD will submit a request for flight path modification within 6 to 12 months of the FAA's Record of Approval for the NCP. ¹
Land Use Measures (LU)	
LU-1: Implement a Voluntary Acquisition Program for a Portion of the Ocean Waterway Mobile Home Park	BCAD will request grant(s) and initiate negotiations with MHP within 1 year of FAA Approval.
LU-2: Implement a Voluntary Acquisition Program for a Portion of the Everglades Lakes Mobile Home Park	BCAD will request grant(s) and initiate negotiations with MHP within 1 year of FAA Approval.
LU-3: Implement a Voluntary Residential Sound Insulation Program for Eligible Dwelling Units located in the Future Conditions (2023) DNL 65 and Higher Contours	BCAD will request grant(s) within two years of FAA approval of this measure.
LU-4: Encourage Local Jurisdictions to Implement Real Estate Fair Disclosure Requirements that Address Potential for Aircraft-Related Noise	Will vary by jurisdiction.
LU-5: Encourage Local Jurisdictions to Incorporate Planning Actions in their Respective Comprehensive Plans related to Aircraft Noise that are Consistent with the Policies of the BrowardNEXT Plan	Will vary by jurisdiction.
LU-6: Encourage Local Jurisdictions Efforts to Incorporate Noise Overlay Zoning Ordinances to Regulate Sound Attenuation and Compatible Land Uses near the Airport	Will vary by jurisdiction.
Programmatic Measures (PM)	
PM-1: Maintain the Existing Noise Office and Information Webpage	Implemented; BCAD will continue to operate the Noise Office and maintain the information webpage.
PM-2: Evaluate/Update the Existing Noise Monitoring and Flight Tracking System	Initiate within 18 months of the FAA's approval of the NCP, subject to availability of funding.
PM-3: Maintain Noise Complaint Management System	Implemented; BCAD will continue to maintain the Noise Complaint Management System.
PM-4: Conduct Community Outreach Activities	Implemented; BCAD will continue to conduct community outreach activities.
PM-5: Evaluate the Composition of the ANAC	BCAD will initiate within 12 months of FAA approval of the NCP.
PM-6: Install Runway Reminder Signs	BCAD will implement within 2 to 5 years of FAA approval of the NCP. This measure would be implemented in conjunction with adjacent maintenance or improvement projects to minimize operational impacts.
PM-7: Evaluate a Voluntary Fly Quiet Program	BCAD will initiate within 12 months of FAA approval of the NCP.
PM-8: Update the Noise Exposure Maps	As-needed; Will be determined by a review of the current operational conditions.
PM-9: Update the Noise Compatibility Program	Within 12 months of FAA acceptance of a revised NEM, BCAD will initiate a review of the NCP to determine if a revision is necessary.

SOURCE: ESA, 2020

NOTE: ¹ FAA design, testing, and implementation of the procedure could typically take at least one year once BCAD requests initiation of the development process.

CHAPTER 6

Consultation and Public Involvement

14 CFR Part 150, Sec. 150.21(b) and Appendix A, Sec. A150.105(a) require that an NCP⁵⁷ and documentation submitted be developed and prepared

“in consultation with states, and public agencies and planning agencies whose area, or any portion of whose area, of jurisdiction is within the [DNL 65] dB contour depicted on the [Noise Exposure Map], FAA regional officials, and other Federal officials having local responsibility for land uses depicted on the map. This consultation must include regular aeronautical users of the airport.”

14 CFR Part 150, Sec. 150.23(d) requires consultation with at least the following entities regarding the NCP:

- Aviation users (e.g., airlines, fixed base operators, based aircraft operators);
- Jurisdictional authorities with land located within the DNL 65 and higher contours (the Town of Davie, City of Fort Lauderdale, City of Hollywood and City of Dania Beach are the land use agencies for land located within the DNL 65 and higher contours); and
- Interested parties (i.e., the public).

BCAD implemented a proactive agency consultation and public involvement program that exceeded the requirements of 14 CFR Part 150 and provided opportunities for meaningful public engagement and participation in development of this NCP. Agency consultation and public involvement efforts undertaken for the Part 150 Study are discussed in this chapter.

6.1 Technical Committee

The Part 150 Study benefited from the formation of the TC at the beginning of and involvement throughout the entire Study process. In general, the TC served several important functions, such as:

- Representing a broad range of stakeholder groups;
- Receiving information about the Part 150 Study and sharing it with TC members’ organizations;
- Providing timely input to the Part 150 Study; and
- In some cases, providing technical advice to the Study Team.

⁵⁷ A glossary of terminology and a list of acronyms related to this Part 150 Study can be found in **Appendix A**.

6.1.1 TC Membership

The TC is comprised of members representing BCAD, local communities, airlines, airline and Airport business associations, local governments, business groups, planning organizations, and the FAA. The TC Members for this Part 150 Study are listed in **Table 6-1**. TC meetings were open to the public.

TABLE 6-1 PART 150 STUDY TECHNICAL COMMITTEE PARTICIPANT LIST		
Organization Represented	Representative	Alternative Representative
BCAD		
Airport Noise Office	Winston Cannicle	Will Castillo
Airport Manager's Office	Will Castillo	Mike Pacitto
Public Information Officer	Gregory Meyer	Allan Siegel replaced by Arlene Satchell
Airport Operations	John Pokryfke	Michael Nonnemacher
Airport Business	Tom Nazzaro replaced by Yasmin Govin	Yasmin Govin
Community Forum		
Airport Noise Abatement Committee (ANAC)	Gary Luedtke	Deborah Van Valkenburgh
Airlines and/or Airline Associations		
JetBlue	Jason Annunziata	Joe Grandolfo
Spirit Airlines	Michael Shiver	
Southwest Airlines	Edwin Solley	
Delta Airlines	Julia Lundrigan, replaced by Kalena Glover	
FedEx	Mary Morrissey	
UPS	Kevin Hoffman, replaced by Jeff Matz	
Airline Business Organizations		
National Business Aviation Association	Gregory Voos	Alex Gertson
Chamber of Commerce/Economic Development		
Greater Fort Lauderdale Chamber of Commerce	Dan Lindblade, CAE	Mitch Anton
Greater Hollywood Chamber of Commerce	Anne Hotte	
Greater Dania Beach Chamber of Commerce	Randie Shane, replaced by Donna Peplin	
Greater Fort Lauderdale Alliance Economic Development Agency	Bob Swindell	
Broward Workshop	Sam Robbin, replaced by Kareen Boutros	
Planning Organizations/ Local Jurisdictions		
City of Dania Beach	Marc LeFerrier	Brad Kaine
City of Fort Lauderdale (1)	Edward Rebholz	Rufus James
City of Fort Lauderdale (2)	Angelina Pluzhnyk Evans, replaced by Ben Sorenson	Geoff Rames
City of Hollywood	Lorie Mertens-Black	Phillip Holste
Town of Davie (1)	Richard Lemack	
Town of Davie (2)	Charles Taylor, replaced by Leona Henry	
City of Plantation	Peter Dokuchitz	
City of Cooper City	Matt Wood	Mark Modrich
Town of Southwest Ranches	John Eastman	
City of Weston	John R. Flint, replaced by Don Decker	Darrel Thomas

TABLE 6-1
PART 150 STUDY TECHNICAL COMMITTEE PARTICIPANT LIST

Organization Represented	Representative	Alternative Representative
Federal/ State Agencies		
FAA - Orlando Airports District Office	Peter Green	Sid Cooley
Miami Air Traffic Management/TRACON	Bob Hildebidle	
FLL Airport Traffic Control Tower	Theodore (TJ) DelNegri, replaced by Richard Sack	
South Florida Flight Standards Division (FSDO)	Mark Hemmerle	
Other Organizations		
Broward County School Board	Chris Akagboosu	

SOURCE: ESA and BCAD, 2020.

6.1.2 Summary of TC Meetings

TC meetings were held throughout both the NEM and NCP phases of the Part 150 Study process. TC Meetings 1 through 4 primarily addressed the first phase of the Study, which involved the development of the NEMs. TC Meetings 5 through 8 addressed the second phase of the study, which involved the development of the NCP. Information related to Meetings 5 through 8, including dates and topics discussed, is provided below. Meeting announcements were sent to all TC members (see **Table 6-1** for a list of members) and posted on the Part 150 Study project website. All TC meeting materials including agendas, sign-in sheets, presentations, and meeting notes for all eight meetings are provided in **Appendix G**.

TC Meeting #5 (January 16, 2019) – Noise Exposure Maps and Noise Compatibility Program

TC Meeting #5 focused on the transition from the NEM phase of the study to the NCP phase. The NEMs were reviewed and next steps were outlined. A working session was conducted to understand TC recommendations for noise abatement, land use, and programmatic measures to consider during the NCP development.

TC Meeting #6 (May 23, 2019) – Review Suggested Noise Compatibility Program Measures

TC Meeting #6 focused on NCP measure suggestions. The purpose of the NCP was reviewed. Different types of noise abatement, land use, and programmatic strategies were then discussed. Afterward, meeting members provided suggestions for NCP measures.

TC Meeting #7 (October 23, 2019) – Analysis of Noise Compatibility Program Measures

TC Meeting #7 began with a summary of NCP measures at other airports, to familiarize the TC members with potential NCP content. A recap of the suggested NCP measures and a preliminary evaluation of noise abatement measure suggestions was presented. A series of “what-if” scenarios were presented, focusing on common themes for suggested noise abatement measures. Information regarding altitudes of aircraft arriving to FLL in west-flow conditions was then presented.

TC Meeting #8 (February 5, 2020) – Noise Compatibility Program Recommendations

TC Meeting #8 reviewed the noncompatible land uses, stakeholder suggestions and evaluation criteria and identified the preliminary recommendations for noise abatement, land use, and programmatic strategies to be carried forward in the NCP. Strategies that were not

recommended to be carried forward were also outlined in the presentation. The public review and hearing process was also discussed as another opportunity for community and stakeholder input.

6.2 Public Outreach and Hearing

During the course of the Part 150 Study, BCAD accepted comments from the public and held several Public Information Workshops. The first round of Public Information Workshops was held over five consecutive nights at five different locations throughout the week of November 13, 2017. An additional Public Information Workshop was held after the release of the Draft NEM Report on January 16, 2019. These Public Information Workshops are described in Chapter 6 of the NEM Report. Following the release of the Draft NCP, a virtual Public Workshop/Public Hearing was held on April 21, 2021. BCAD had planned to hold an in-person Public Workshop/Public Hearing for the Draft NCP. However, due to public health concerns associated with COVID-19 and guidelines issued by the Centers for Disease Control and Prevention (CDC), these meetings were held virtually. Details of the NCP virtual Public Workshop/Public Hearing, release of the Draft NCP Report, and public comments are provided below.

6.2.1 Draft NCP

A Notice of Availability of the Draft NCP and Notice of a virtual Public Information Workshop/Public Hearing was published in the Sun Sentinel on Sunday, March 14, 2021 and the El Sentinel newspaper on March 18, 2021. The Notice was also placed on Part 150 Study website the same day at: <http://www.flpart150.com/meetings/>.

Printed copies and flash drives of the Draft NCP Report were made available for check-out during regular business hours at the locations listed below. The Draft NCP was also made available electronically (in PDF format) for download on the Study website at <http://www.flpart150.com/resources/>.

- **Dania Beach-Paul DeMaio Library:** 1 Park Avenue East, Dania Beach, Florida 33004, Hours – 10:00 a.m. to 6:00 p.m. on Tu, W, F and Sa and from 12:00 p.m. until 8:00 p.m. on M and Th, Closed Su
- **Davie/Cooper City Branch Library:** 4600 SW 82nd Avenue, Davie, Florida 33328, Hours – 10:00 a.m. to 8:00 p.m. M-Tu, 10:00 a.m. to 6:00 p.m. W-Sa, Closed Su
- **Broward County Main Library:** 100 S Andrews Ave, Fort Lauderdale, FL 33301, Hours – 11:00 a.m. to 7:00 p.m. on M and W, 10:00 a.m. to 6:00 p.m. on Tu, Th, and Sa, Closed Su and F

The comment period started on March 14, 2021 and was initially proposed to end on April 30, 2021 at 5:00 p.m. Eastern Time. To provide the public with adequate time to submit their comments, the comment period was extended to May 15, 2021 at 5:00 p.m. Eastern Time. The Draft NCP was available at the above locations until the close of the comment period. Anyone wishing to submit comments was able to do so at any time during the comment period.

6.2.2 Virtual Public Information Workshop and Public Hearing

A virtual Public Information Workshop was conducted, then followed by a Public Hearing, on April 21, 2021. The workshop and hearing were held on a virtual platform to adhere to recommendations issued by the CDC during the COVID-19 pandemic and were held in accordance with local public meeting policies in force at the time. The workshop started at 5:00 p.m. with a brief overview presentation that included information regarding the 14 CFR Part 150 process and a brief summary of the noise abatement, land use, and program management measures recommended in the Draft NCP Report. Following the presentation, the project team answered questions submitted through the virtual platform. The narrated overview presentation, along with more detailed presentations on the specific measures, were made available for viewing on the project website on March 28, 2021. The public was encouraged to view these materials prior to the Public Information Workshop and Hearing. Only the overview presentation was played during the virtual workshop to maximize the time available for questions. Questions or comments submitted during the Public Information Workshop were addressed during the workshop. However, these comments were not considered as part of the formal project record. Interested parties were asked to submit formal comments on the NCP in writing as detailed in the previous section or through the Public Hearing. Copies of the public workshop materials are included in **Appendix H**.

In addition to providing comments in writing as detailed in the previous section, those who wanted to provide official comments on the Part 150 Study were able to do so during the virtual Public Hearing that started at 7:30 p.m. on April 21, 2021, following the Public Information Workshop. A court reporter transcribed comments provided at the Public Hearing, which were recorded as a part of the formal project record included in **Appendix H** (full Public Hearing transcript) and **Appendix I** (comments and responses). To enhance the Public Hearing process, pre-recorded video testimony was accepted in advance and played back during the virtual Public Hearing, in lieu of live comments. Alternatively, the public was able to provide oral comments during the Public Hearing. All comments (pre-recorded and live) during the Public Hearing were recorded and transcribed by a stenographer for consideration by FAA in their decision-making process. All parties were also invited to submit their comments in writing. Public comments submitted in writing were treated equally and are also included as a part of the formal project record (see **Appendix I**).

6.2.3 Summary of Public Comments

All public, local government organization, and stakeholder comments received regarding NCP measures up to and during the NCP comment period are included in **Appendix I**. Comment responses were developed following the close of the comment period and are included in **Appendix I**. There were 101 submittals containing comments that were received during the comment period, including the Public Hearing. Additionally, there were 75 submittals containing comments that were received prior to the start of the comment period; these are included and responded to in **Appendix I**. The most common issues raised in the public comments include the following concerns:

- Sound insulation program and program eligibility;
- Existing/general noise complaints;
- Noise abatement measures;

- Noise monitor locations;
- Aircraft altitude;
- Runway use; and
- Nighttime operations.

6.3 FAA Coordination

6.3.1 Part 150 Study Coordination

Additional meetings to discuss the Part 150 Study were held with the FAA throughout the development of the NCP. BCAD held coordination meetings with the following entities:

- Bi-weekly calls were held through the NCP phase of the project with the FAA's Orlando ADO.
- FAA ATO Coordination (March 11 and July 30, 2019): These coordination meetings discussed community interest to address west flow departure headings, early west flow turns north, and east flow arrival altitudes that affect areas outside of the DNL 65 contour and the challenges associated with air traffic operations at FLL, including proximity to other airports, safety, peak periods, weather, and other matters for consideration in the Part 150 Study. The coordination was to inform BCAD during the development of the NCP and to discuss community concerns, conceptual noise abatement measures identified by BCAD, and understand air traffic procedures and the operating environment around FLL.

6.3.2 South-Central Florida Metroplex Coordination

The FAA separately began a NEPA EA process for its South-Central Florida Metroplex project during the course of BCAD's FLL Part 150 Study. The Metroplex project was an FAA-led project, separate from BCAD's Part 150 Study, that included potential modifications of air traffic routes and procedures above 10,000'. BCAD participated in a number of Metroplex briefings given by FAA to airport operators in the South-Central Florida area. These briefings focused on the FAA Metroplex project schedule and public outreach plan.

- March 29, 2019
- January 6, 2020
- January 31, 2020
- March 27, 2020
- April 17, 2020
- May 8, 2020
- May 29, 2020

Additionally, BCAD provided comments to the FAA on the Draft Metroplex EA consistent with the recommendations outlined in the NCP report. These comments, and FAA’s responses to them, are included in Appendix J-3 of the Metroplex Final EA.⁵⁸

6.4 Land Use Jurisdictional Meetings

As part of the study process, additional outreach was conducted with representatives from jurisdictions with land use authority within the DNL 65 Contour. These meetings reviewed the NEMs, areas of noncompatible land uses, and the specific areas and land uses related to each jurisdiction located within the DNL 65 contour. Digital GIS shapefiles of the NEM contours were provided to each jurisdiction on an external drive. Opportunities for ensuring long term land use including residential notification and disclosures was provided along with example ordinances from other airports. Materials from these meetings are included in **Appendix F**. These meetings were held with the following entities:

- City of Dania Beach – Tuesday, January 28, 2020
- Town of Davie – Wednesday, January 29, 2020
- City of Fort Lauderdale – Wednesday, March 5, 2020
- City of Hollywood – A letter was sent transmitting the NEMs along with materials summarizing the study status and land use within the City of Hollywood

6.5 Other Opportunities for Stakeholder Engagement and Public Input

Additional elements of the public outreach program implemented by BCAD are summarized below.

6.5.1 Elected Officials and Study Coordination Committee

Several elected officials and jurisdiction representatives were actively engaged through the Part 150 Study process. The email contact list includes public officials representing the following jurisdictions:

- City of Cooper City
- City of Dania Beach
- City of Fort Lauderdale
- City of Hollywood
- City of Plantation
- City of Weston

⁵⁸ Federal Aviation Administration. South-Central Florida Metroplex Final Environmental Assessment, Appendix J-3: “Comments on the Draft EA and FAA Responses – Comments and Responses Volume 2.” http://metroplexenvironmental.com/docs/fl_metroplex/CJ3_FL_Metroplex_FEA_App_J-3_CR_VOL2.pdf. Last accessed: February 25, 2021.

- Town of Davie
- Town of Southwest Ranches

Separate from the Part 150 Study process, BCAD initiated the SCC. BCAD coordinated with the above jurisdictions to identify key points of contact with land use planning departments and other key agencies and solicit a representative to serve on the SCC. Information was provided to the SCC for coordination at key points during the NCP development process.

6.5.2 Project Website

A website⁵⁹ was developed and published for the 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:

- Study and Airport information
- Upcoming project meetings
- Study documents, including TC meeting materials, public information workshop materials, Draft and Final NEM Report and NEMs, the Draft NCP and Study newsletters
- Relevant links
- FAQs
- BCAD contact information
- Comment form

⁵⁹ <http://www.flpart150.com/>