



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Orlando Airports District Office  
8427 SouthPark Circle, Suite 524  
Orlando, FL 32819  
Phone: (407) 487-7720  
Fax: (407) 487-7135

October 3, 2019

Michael P. Pacitto, P.G.  
Director of Planning and Environmental  
Broward County Aviation Department  
2200 SW 45th Street, Suite 101  
Dania Beach, Florida 33312

RE: Noise Exposure Maps Compliance Determination

Dear Mr. Pacitto:

This is to notify you that the Federal Aviation Administration (FAA) has evaluated your final submission of the Noise Exposure Maps (NEM) and supporting documentation transmitted by your letter of June 24, 2019, in accordance with Section 103(a)(1) of the Aviation Safety and Noise Abatement Act of 1979 (ASNA), (49 United States Code [U.S.C.] §47503). We have determined that they are in compliance with applicable requirements of Title 14 Code of Federal Regulations [CFR] Part 150. Further, we have determined that the maps entitled "Map 1 of 5, 2018 Noise Exposure Map" and "Map 2 of 5, 2023 Noise Exposure Map" fulfill the requirements for the current year and the future year noise exposure maps.

FAA's determination that your NEMs are in compliance is limited to a finding that the maps were developed in accordance with the procedures contained in Appendix A of 14 CFR Part 150. Such determination does not constitute approval of your data, information, or plans.

Should questions arise concerning the precise relationship of specific properties to noise exposure contours depicted on your NEMs, you should note that the FAA will not be involved in any way in determining the relative locations of specific properties with regard to the depicted noise exposure contours, or in interpreting the maps to resolve questions concerning, for example, which properties should be covered by the provisions of Section 107 of ASNA (49 U.S.C. §47506). These functions are inseparable from the ultimate land use control and planning responsibilities of local government. These local responsibilities are not changed in any way under Part 150 or through FAA's determination relative to your NEMs. Therefore, the responsibility for the detailed overlaying of noise exposure contours onto the maps depicting properties on the surface rests exclusively with you, the airport operator, or with those public agencies and planning agencies with which consultation is required under Section 103 of ASNA (49 U.S.C. §47503). The FAA relies on the certification by you, under 14 CFR §150.21, that the statutorily required consultation has been accomplished.

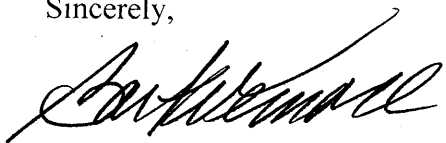
Michael P. Pacitto, P.G.  
October 3, 2019  
Page 2

The FAA will publish a notice in the Federal Register announcing its determination on the NEMs for Fort Lauderdale-Hollywood International Airport.

Your notice of this determination and the availability of the NEMs, when published at least three times in a newspaper of general circulation in the county or counties where affected parties are located, will satisfy the requirements of Section 107 of the ASNA Act (49 U.S.C. §47506).

Your attention is called to the requirements of 14 CFR §150.21(d), involving the prompt preparation and submission of revisions to these maps of any actual or proposed change in the operation of the Fort Lauderdale-Hollywood International Airport which might create any substantial, new noncompatible use in any areas depicted on the NEMs, or significant reduction in noise over noncompatible land uses that were previously included in the NEM contour.

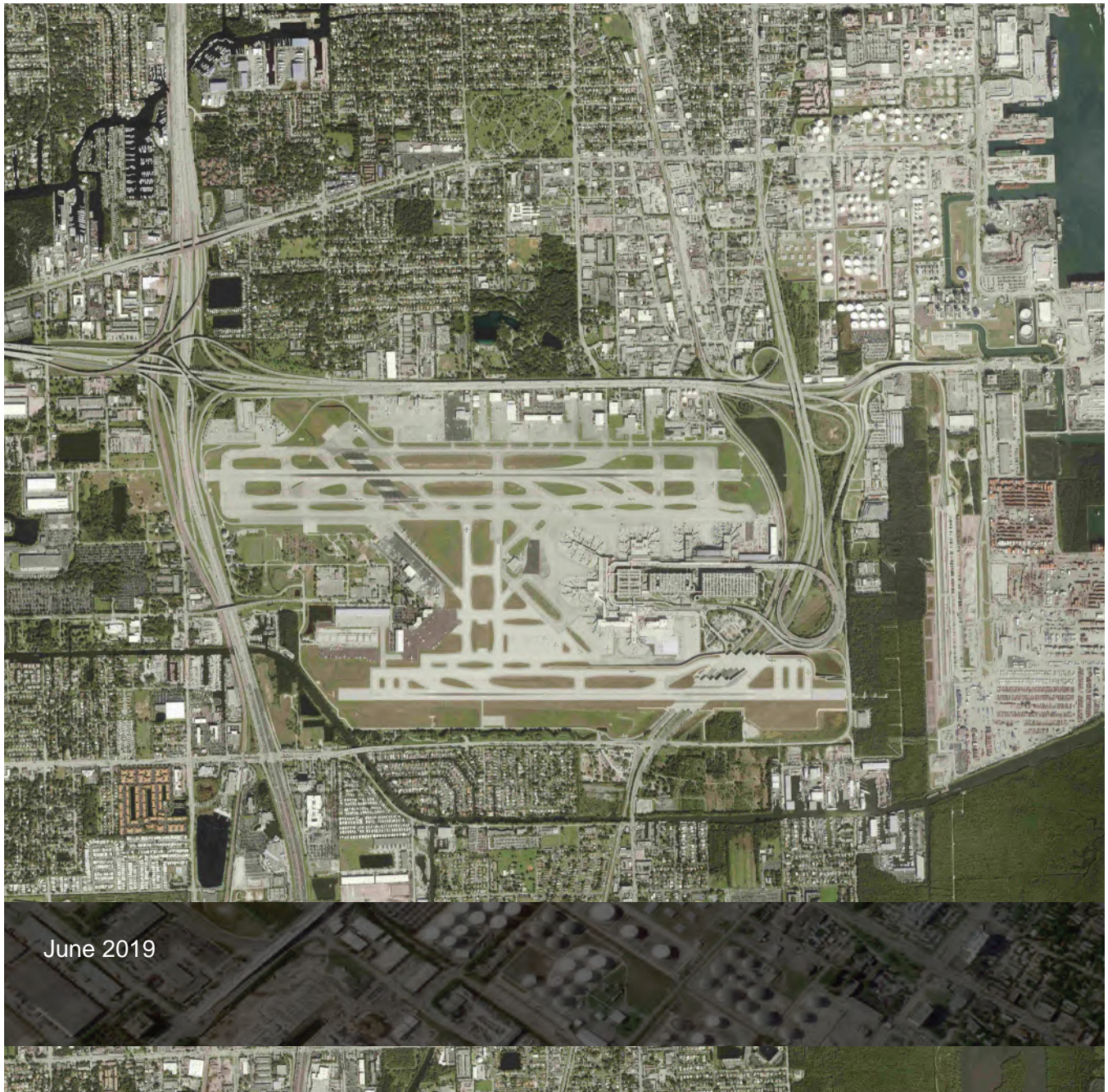
Sincerely,

A handwritten signature in black ink, appearing to read "Bart Vernace", written in a cursive style.

Bart Vernace, P.E.  
Manager

cc:  
APP-400  
ASO-610  
ASO-7

# Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study **Final Noise Exposure Map Report**







**AVIATION DEPARTMENT - Fort Lauderdale-Hollywood International Airport**

2200 SW 45<sup>th</sup> Street, Suite 101 • Dania Beach, Florida 33312 • 954-359-6100

June 24, 2019

Mr. Peter Green  
Environmental Protection Specialist  
Orlando Airports District Office  
Federal Aviation Administration  
8427 SouthPark Circle  
Orlando, Florida 32819

Subject: Noise Exposure Map (NEM) Submission pursuant to Title 14 of the Code of Federal Regulations, Part 150 for Fort Lauderdale-Hollywood International Airport (FLL)

The Broward County Aviation Department (BCAD) is pleased to submit Noise Exposure Maps (NEMs) and supporting documentation for Fort Lauderdale-Hollywood International Airport (FLL), prepared in accordance with 14 CFR Part 150 ("Airport Noise Compatibility Planning"). As of December 31, 2018, the aircraft operations at Fort Lauderdale-Hollywood International Airport within this document are hereby certified by BCAD to be consistent with the fleet mix, forecast operational levels, and flight procedures depicted for calendar years 2018 and 2023.

In accordance with 14 CFR Part 150, Section 150.21(c), BCAD requests that Federal Aviation Administration (FAA) confirm receipt of these Existing (2018) and Forecast (2023) Noise Exposure Maps and indicate whether they are in compliance with the applicable requirements. Both the Existing (2018) and Forecast (2023) NEMs were prepared using the forecast operations reviewed and approved by the FAA.

As discussed in Chapter 6 of the document, the BCAD provided all interested parties 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, consistent with Part 150, §150.21(b). The Sponsor's Certification, the formal certification required by Part 150, is provided after the report cover. As requested, each document contains a CD attached to the front cover containing electronic copies of the document.

Please do not hesitate to contact me with any questions.

Sincerely yours,

A handwritten signature in blue ink, reading "Michael P. Pacitto".

Michael P. Pacitto, P.G.  
Director Planning and Environmental  
Broward County Aviation Department

cc: Marc Gambriel, BCAD; William Castillo, BCAD; Mark Gale, BCAD; Winston Cannicle, BCAD  
enc.





**AVIATION DEPARTMENT - Fort Lauderdale-Hollywood International Airport**  
2200 SW 45<sup>th</sup> Street, Suite 101 • Dania Beach, Florida 33312 • 954-359-6100


## SPONSOR'S CERTIFICATION

The Broward County Aviation Department has completed a comprehensive Title 14 Code of Federal Regulations (CFR) Part 150 Noise Exposure Map Report for Fort Lauderdale-Hollywood International Airport.

This is to certify the following:

- (1) The 2018 and 2023 Noise Exposure Maps for Fort Lauderdale-Hollywood International Airport, and the associated documentation the Broward County Department of Aviation submitted in this volume to the Federal Aviation Administration under Title 14 CFR Part 150, Subpart B, Section 150.21, are true and complete as of December 31, 2018, under penalty of 18 U.S.C. 1001.
- (2) Pursuant to Title 14 CFR Part 150, Subpart B, Section 150.21(b), all interested parties have been afforded adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft noise exposure maps, and of the descriptions of forecast aircraft operations.
- (3) The "2018 Noise Exposure Map" (Appendix K, Map 1 of 5) accurately represents conditions for calendar year 2018.
- (4) The "2023 Noise Exposure Map" (Appendix K, Map 2 of 5) accurately represents forecast conditions for calendar year 2023 as of December 31, 2018.

Though submittal of the document is occurring in June 2019, the operations at Fort Lauderdale-Hollywood International Airport are hereby certified to currently be consistent with the fleet mix, forecast operational levels, and flight procedures depicted for 2018 within this document, as of December 31, 2018. Further information regarding development of the fleet mix, forecast, and procedures can be found in Chapter 4, *NEM Development*; Appendix B, *Aviation Activity Forecast*; and Appendix F, *Radar Flight Tracks*.

By:   
Title: Director Planning and Environmental, Broward County Aviation Department  
Date: 6/21/2019

Airport Name: Fort Lauderdale-Hollywood International Airport  
Airport Owner/Operator: Broward County Aviation Department  
Address: 2200 SW 45<sup>th</sup> Street, Suite 101, Dania Beach, FL 33312

# 14 CFR PART 150 NEM CHECKLIST – PART I

AIRPORT NAME: Fort Lauderdale-Hollywood International Airport

REVIEWER: \_\_\_\_\_

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
<b>I. Submitting And Identifying The NEM:</b>			
A. Submission is properly identified:			
1. 14 C.F.R. Part 150 NEM?	X		Front Cover states, "14 CFR Part 150 Study Noise Exposure Map Report".
2. NEM and NCP together?		X	Submittal is for NEM only. Front Cover states, "Noise Exposure Map Report".
3. Revision to NEMs FAA previously determined to be in compliance with Part 150?	X		The NEMs that FAA has previously determined to be in compliance with 14 CFR Part 150 were accepted by the FAA in 1994.
B. Airport and Airport Operator's name are identified?	X		Airport and Airport Operator's name are identified in the Front Cover and Page 1-1.
C. NCP is transmitted by airport operator's dated cover letter, describing it as a Part 150 submittal and requesting appropriate FAA determination?	X		Submission is NEM only. The dated sponsor's cover letter follows the report cover and describes the submission as a Noise Exposure Map for Fort Lauderdale-Hollywood International Airport dated December 2018. The cover letter requests the FAA to "...confirm receipt of these Existing (2018) and Forecast (2023) Noise Exposure Maps (NEMs) and indicate whether they are in compliance with the applicable requirements."
<b>II. Consultation: [150.21(b), A150.105(a)]</b>			
A. Is there a narrative description of the consultation accomplished, including opportunities for public review and comment during map development?	X		See Section 1.5, Chapter 6, and Appendices H and I for a narrative description of the consultation accomplished, including opportunities for public review and comment during map development.
B. Identification of consulted parties:			
1. Are the consulted parties identified?	X		See Chapter 6 and Appendices H and I for identification of consulted parties.
2. Do they include all those required by 150.21(b) and A150.105(a)?	X		See Chapter 6 and Appendices H and I for identification of all consulted parties required by 150.21(b) and A150.105(a).
3. Agencies in 2, above, correspond to those indicated on the NEM?	X		See the NEM, Chapter 5, Chapter 6, and Appendices H and I for the indication that Broward County and the Cities of Dania Beach, Davie, Fort Lauderdale, and Hollywood are the sole land use agencies for the land within the 2018 and 2023 DNL 65 contours. These agencies correspond to the agencies indicated on the NEM.
C. Does the documentation include the airport operator's certification, and evidence to support it, that interested persons have been afforded adequate opportunity to submit their views, data, and comments during map development and in accordance with 150.21(b)?	X		See Sponsor's Certification following inside cover. Sponsor's Certification indicates that interested persons have been afforded adequate opportunity to submit their views, data, and comments during map development and in accordance with 150.21(b). Evidence is contained in Chapter 6 and Appendices H and I.
D. Does the document indicate whether written comments were received			See Section 6.3 and Appendix J. Written comments received

# 14 CFR PART 150 NEM CHECKLIST – PART I

AIRPORT NAME: Fort Lauderdale-Hollywood International Airport

REVIEWER: \_\_\_\_\_

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
during consultation and, if there were comments that they are on file with the FAA regional airports division manager?	X		during consultation is included in Appendix J.
<b>III. General Requirements: [150.21]</b>			
A. Are there two maps, each clearly labeled on the face with year (existing condition year and one that is at least 5 years into the future)?	X		There are two maps, each clearly labeled on the face with year (Existing Conditions year of 2018, and the five-year Future Conditions year of 2023). Full size plots of the 2018 and 2023 NEMs are provided in Appendix K.
B. Map currency:			
1. Does the year on the face of the existing condition map graphic match the year on the airport operator's NEM submittal letter?		X	Though submittal of the final document is occurring in June 2019, the operations at Fort Lauderdale-Hollywood International Airport are hereby certified to currently be consistent with the fleet mix, forecast operational levels, and flight procedures depicted for 2018 within this document. Further information regarding development of the fleet mix, forecast, and procedures can be found in Chapter 4, Appendix B, and Appendix F. The Existing Conditions map reflects 2018 conditions, which is also the year of the Draft NEM Report submittal.
2. Is the forecast year map based on reasonable forecasts and other planning assumptions and is it for at least the fifth calendar year after the year of submission?	X		The Future Conditions map of the year 2023 is based on reasonable forecasts and other planning assumptions, and is for at least the fifth calendar year after the year of submission (2018). See Section 4.3.2 and Appendix B-1 for information regarding the forecast and the FAA's approval for use in developing the NEMs.
3. If the answer to 1 and 2 above is no, the airport operator must verify in writing that data in the documentation are representative of existing condition and at least 5 years' forecast conditions as of the date of submission?		X	Not applicable. The 2023 Future Conditions Noise Exposure Map (Figure 5-2 in Chapter 5, and Appendix K, 2023 Figure 2 of 5) accurately represents forecast conditions for calendar year 2021.
C. If the NEM and NCP are submitted together:			
1. Has the airport operator indicated whether the forecast year map is based on either forecast conditions without the program or forecast conditions if the program is implemented?		X	Not applicable. This is an NEM submission only.
2. If the forecast year map is based on program implementation:		X	Not applicable. This is an NEM submission only.
a. Are the specific program measures that are reflected on the map identified?		X	Not applicable. This is an NEM submission only.
b. Does the documentation specifically describe how these measures affect land use compatibilities depicted on the map?		X	Not applicable. This is an NEM submission only.
3. If the forecast year NEM does not model program implementation, the airport operator must either submit a revised forecast NEM showing program implementation conditions [B150.3(b), 150.35(f)] or the sponsor must demonstrate the adopted forecast year NEM with approved NCP		X	Not applicable. This is an NEM submission only.



# 14 CFR PART 150 NEM CHECKLIST – PART I

AIRPORT NAME: Fort Lauderdale-Hollywood International Airport

REVIEWER: \_\_\_\_\_

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
measures would not change by plus/minus 1.5 DNL? (150.21(d))			
<b>IV. Map Scale, Graphics, And Data Requirements:</b> [A150.101, A150.103, A150.105, 150.21(a)]			
A. Are the maps of sufficient scale to be clear and readable (they must not be less than 1" to 2,000'), and is the scale indicated on the maps? (Note (1) if the submittal uses separate graphics to depict flight tracks and/or noise monitoring sites, these must be of the same scale, because they are part of the documentation required for NEMs.) (Note (2) supplemental graphics that are not required by the regulation do not need to be at the 1" to 2,000' scale)	X		Full size plots of the 2018 and 2023 NEMs and flight track figures are at a scale of 1 inch = 2,000 feet and are of sufficient scale to be clear and readable. The scale is indicated on the maps. The full size plots are provided in Appendix K, and each plot includes the locations of noise monitoring sites. Supplemental Figures 5-1 and 5-2 are at a scale of 1 inch = 3,000 feet, and supplemental flight track figures (Figures 4-2 and 4-3) are 1 inch = 10,000 feet.
B. Is the quality of the graphics such that required information is clear and readable? (Refer to C. through G., below, for specific graphic depictions that must be clear and readable)	X		The quality of the graphics is such that required information is clear and readable. Refer to NEM Checklist IV.C. through IV.G., below. Also see full sized NEMs for 2018 and 2023 included in this submittal in Appendix K.
C. Depiction of the airport and its environs:			
1. Is the following graphically depicted to scale on both the existing condition and forecast year maps?			
a. Airport boundaries	X		Airport boundaries are graphically depicted to scale on both the Existing Conditions and Future Conditions maps. See the 2018 and 2023 NEMs in Appendix K.
b. Runway configurations with runway end numbers	X		Runway configurations with runway end numbers are depicted to scale on both the Existing Conditions and Future Conditions maps. See the 2018 and 2023 NEMs in Appendix K.
2. Does the depiction of the off-airport data include?			
a. A land use base map depicting streets and other identifiable geographic features	X		The depiction of the off-airport data includes a land use base map depicting streets and other identifiable geographic features. See the 2018 and 2023 NEMs in Appendix K.
b. The area within the DNL <sup>1</sup> 65 dB (or beyond, at local discretion)	X		The depiction of the off-airport data includes the area within the DNL 65. See the 2018 and 2023 NEMs in Appendix K.
c. Clear delineation of geographic boundaries and the names of all jurisdictions with planning and land use control authority within the DNL 65 dB (or beyond, at local discretion)	X		The depiction of the off-airport data includes a clear delineation of geographic boundaries. The NEMs include the names of the following jurisdictions that have planning and land use control authority over land within the 2016 and 2021 DNL 65 contours: Broward County and the Cities of Dania Beach, Davie, Fort Lauderdale, and Hollywood. See the 2018 and 2023 NEMs in Appendix K.
D. 1. Continuous contours for at least the DNL 65, 70, and 75 dB?	X		Continuous contours for the DNL 65, 70, and 75 are shown on the

<sup>1</sup> CNEL for California airports

# 14 CFR PART 150 NEM CHECKLIST – PART I

AIRPORT NAME: Fort Lauderdale-Hollywood International Airport

REVIEWER: \_\_\_\_\_

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
			2018 and 2023 NEMs provided in Appendix K.
2. Has the local land use jurisdiction(s) adopted a lower local standard and if so, has the sponsor depicted this on the NEMs?		X	The DNL 65, 70, and 75 contours are shown on the NEMs. Broward County and the Cities of Dania Beach, Davie, Fort Lauderdale, and Hollywood are the sole land use agencies for the land within the 2018 and 2023 DNL 65 contours.
3. Based on current airport and operational data for the existing condition year NEM, and forecast data representative of the selected year for the forecast NEM?	X		The 2018 NEM is based on current airport and operational data for the Existing Conditions year (2018). The 2023 NEM is based on forecast data representative of the selected year for the forecast NEM (2023). See Section 4.3, Section 5.2, Section 5.3, and Appendix B.
E. Flight tracks for the existing condition and forecast year timeframes (these may be on supplemental graphics which must use the same land use base map and scale as the existing condition and forecast year NEM), which are numbered to correspond to accompanying narrative?	X		Flight tracks for the Existing Conditions and Future Conditions timeframes are shown in full-size flight track plots in Appendix K. Also see Figures 4-2 and 4-3, which are numbered to correspond to the accompanying narrative, and follow page 4-10. Flight tracks for the Existing Conditions and Future Conditions timeframes are the same, as described in Section 4.5.
F. Locations of any noise monitoring sites (these may be on supplemental graphics which must use the same land use base map and scale as the official NEMs)	X		Locations of noise monitoring sites are shown on all figures provided in Appendix K. Also see Figure 4-4, which follows page 4-28.
G. Noncompatible land use identification:			
1. Are noncompatible land uses within at least the DNL 65 dB noise contour depicted on the map graphics?	X		Noncompatible land uses within the DNL 65 contour are depicted on the map graphics. See full-sized plots in Appendix K. Also see supplemental Figures 5-1 and 5-2.
2. Are noise sensitive public buildings and historic properties identified? ( <i>Note: If none are within the depicted NEM noise contours, this should be stated in the accompanying narrative text.</i> )	X		Noise sensitive public buildings and historic properties are identified. See supplemental Figures 3-2 through 3-9. Also see Section 3.3 and Appendix E.
3. Are the noncompatible uses and noise sensitive public buildings readily identifiable and explained on the map legend?	X		Noncompatible uses and noise sensitive public buildings are readily identifiable on the NEMs and explained on the map legend. See full sized plots in Appendix K. Also see supplemental Figures 5-1 and 5-2.
4. Are compatible land uses, which would normally be considered noncompatible, explained in the accompanying narrative?	X		Compatible land uses that would normally be considered noncompatible are explained in Section 5. See Tables 5-3 and 5-6.
<b>V. Narrative Support Of Map Data:</b> [150.21(a), A150.1, A150.101, A150.103]			
A. 1. Are the technical data and data sources on which the NEMs are based adequately described in the narrative?	X		Technical data and data sources on which the NEMs are based are adequately described in the narrative. See Sections 4.3 through 4.5 and Appendices B and F.
2. Are the underlying technical data and planning assumptions	X		The underlying technical data and planning assumptions are

# 14 CFR PART 150 NEM CHECKLIST – PART I

AIRPORT NAME: Fort Lauderdale-Hollywood International Airport

REVIEWER: \_\_\_\_\_

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
reasonable?			reasonable. See Sections 3 and 4.3 through 4.5; and Appendices B and F.
B. Calculation of Noise Contours:			
1. Is the methodology indicated?	X		The methodology is indicated. See Section 4.2.
a. Is it FAA approved?	X		The methodology is FAA-approved. AEDT 2d was used.
b. Was the same model used for both maps? ( <i>Note: The same model also must be used for NCP submittals associated with NEM determinations already issued by FAA where the NCP is submitted later, unless the airport sponsor submits a combined NEM/NCP submittal as a replacement, in which case the model used must be the most recent version at the time the update was started.</i> )	X		The same model was used for both maps. AEDT 2d was used for both the Existing Conditions NEM (2018) and the Future Conditions NEM (2023).
c. Has AEE approval been obtained for use of a model other than those that have previous blanket FAA approval?		X	Not applicable.
2. Correct use of noise models:			
a. Does the documentation indicate, or is there evidence, the airport operator (or its consultant) has adjusted or calibrated FAA-approved noise models or substituted one aircraft type for another that was not included on the FAA's pre-approved list of aircraft substitutions?	X		AEDT 2d was used for this NEM Report, and no aircraft substitutions were made. No user-defined flight profiles were used.
b. If so, does this have written approval from AEE, and is that written approval included in the submitted document?	X		Not applicable.
3. If noise monitoring was used, does the narrative indicate that Part 150 guidelines were followed?		X	No noise monitoring was conducted as part of this NEM report.
4. For contours below DNL 65 dB, does supporting documentation include an explanation of local reasons? ( <i>Note: A narrative explanation, including evidence the local jurisdiction(s) have adopted a noise level less than DNL 65 dB as sensitive for the local community(ies), and including a table or other depiction of the differences from the Federal table, is highly desirable but not specifically required by the rule. However, if the airport sponsor submits NCP measures within the locally significant noise contour, an explanation must be included if it wants the FAA to consider the measure(s) for approval for purposes of eligibility for Federal aid.</i> )		X	DNL 65, 70, and 75 contours are shown on the NEMs. No contours below DNL 65 were produced.
C. Noncompatible Land Use Information:			
1. Does the narrative (or map graphics) give estimates of the number of people residing in each of the contours (DNL 65, 70 and 75, at a minimum) for both the existing condition and forecast year maps?	X		The narrative gives estimates of the number of people residing in each of the DNL 65, 70, and 75 contours for both the existing condition and forecast year maps. See Tables 5-2 and 5-5.
2. Does the documentation indicate whether the airport operator used Table 1 of Part 150?	X		The documentation indicates the airport operator used Table 1 of Part 150. See Sections 3.3.1, 5.2, and 5.3; Table 3-2; and Appendix E. However, the "Residential" land use category from Table 1 of Part 150 was divided into subcategories including



# 14 CFR PART 150 NEM CHECKLIST – PART I

AIRPORT NAME: Fort Lauderdale-Hollywood International Airport

REVIEWER: \_\_\_\_\_

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
			Single and Two Family Residential, and Multi-Family Residential.
a. If a local variation to table 1 was used:			
(1) Does the narrative clearly indicate which adjustments were made and the local reasons for doing so?	X		The narrative clearly indicates which adjustments were made to Table 1 of Part 150 and the local reasons for doing so. Section 3.3 discusses Table 1 and indicates how the compatibility guidelines apply to the conformed land uses developed for Broward County. Further detail can be found in Appendix E.
(2) Does the narrative include the airport operator's complete substitution for table 1?	X		Section 3.3 discusses Table 1 and indicates how the compatibility guidelines apply to the conformed land uses developed for Broward County. Further detail can be found in Appendix E.
3. Does the narrative include information on self-generated or ambient noise where compatible or noncompatible land use identifications consider non-airport and non-aircraft noise sources?	X		Chapter 3 includes information on self-generated and ambient noise and implications for how non-airport and non-aircraft noise sources affect compatible or noncompatible land use identifications.
4. Where normally noncompatible land uses are not depicted as such on the NEMs, does the narrative satisfactorily explain why, with reference to the specific geographic areas?	X		No such land uses are depicted on the NEMs.
5. Does the narrative describe how forecast aircraft operations, forecast airport layout changes, and forecast land use changes will affect land use compatibility in the future?	X		The narrative describes how forecast aircraft operations, forecast airport layout changes, and forecast land use changes will affect land use compatibility in the future. See Section 5.3 and Table 5-4.
<b>VI. Map Certifications: [150.21(b), 150.21(e)]</b>			
A. Has the operator certified in writing that interested persons have been afforded adequate opportunity to submit views, data, and comments concerning the correctness and adequacy of the draft maps and forecasts?	X		The operator has certified in writing that interested persons have been afforded adequate opportunity to submit views, data, and comments concerning the correctness and adequacy of the draft maps and forecasts. See Sponsor's Certification before Table of Contents.
B. Has the operator certified in writing that each map and description of consultation and opportunity for public comment are true and complete under penalty of 18 U.S.C. § 1001?	X		The operator has certified in writing that each map and description of consultation and opportunity for public comment is true and complete under penalty of 18 U.S.C. § 1001. See Sponsor's Certification before Table of Contents.

# TABLE OF CONTENTS

## Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study

Chapter 1 – Introduction	Page
1.1 Introduction .....	1-1
1.2 Need for the Preparation of a New Part 150 Study .....	1-2
1.3 14 CFR Part 150 Study Process.....	1-2
1.4 Preparation of Noise Exposure Maps .....	1-4
1.4.1 NEM Study Years.....	1-4
1.4.2 Technical Approach to Preparing Noise Exposure Maps.....	1-5
1.5 Consultation and Public Involvement.....	1-6
1.6 NEM Report Organization.....	1-7
 Chapter 2 – Airport Overview	
2.1 Airport Location and Setting.....	2-1
2.1.1 Airport History .....	2-1
2.2 Airport Overview.....	2-1
2.2.1 Aviation Role .....	2-1
2.2.2 Airport Facilities Overview .....	2-2
2.2.3 Future/Planned Airport Facilities.....	2-11
2.2.4 Regional Economic Impact .....	2-12
2.2.5 Airspace Classification .....	2-12
2.3 Navigational Aids .....	2-12
2.4 Instrument Approach Procedures and Charted Visual Flight Procedures .....	2-13
2.5 Standard Terminal Arrival and Departure Procedures .....	2-13
2.5.1 Standard Terminal Arrival Routes.....	2-14
2.5.2 Departure Procedures.....	2-15
2.6 Noise Monitoring, Noise Abatement, and Community Outreach Programs.....	2-15
2.6.1 Sound Insulation Program .....	2-16
2.6.2 Aircraft Noise and Operations Monitoring Systems (ANOMS) .....	2-16
2.6.3 Airport Noise Abatement Committee .....	2-17
2.6.4 Aircraft Noise Complaints / Comments.....	2-17
2.6.5 Community Outreach .....	2-18
2.6.6 Noise Abatement Measures.....	2-18
 Chapter 3 – Land Use	
3.1 Introduction .....	3-1
3.2 Land Use Data Collection .....	3-1
3.2.1 Land Use Data Collection Area .....	3-1
3.2.2 Study Area.....	3-2
3.2.3 Local Agency and Government Coordination.....	3-2
3.3 Land Use Compatibility .....	3-2
3.3.1 Aircraft Noise and Land Use Compatibility .....	3-2
3.3.2 Local Ambient Noise Environment.....	3-5
3.3.3 Land Uses Within the Study Area.....	3-5
3.3.4 Noise Sensitive Sites .....	3-9
3.4 Land Use Control Regulations.....	3-9

<b>Chapter 4 – NEM Development</b>	<b>Page</b>
4.1 Introduction .....	4-1
4.2 FAA Noise Model and Metrics .....	4-1
4.2.1 Aviation Environmental Design Tool (AEDT).....	4-1
4.2.2 Day Night Average Sound Level.....	4-2
4.3 Data for Developing Noise Exposure Map .....	4-2
4.3.1 Aircraft Activity Levels .....	4-2
4.3.2 Forecasted Annual Aircraft Operations.....	4-2
4.3.3 Aircraft Fleet Mix .....	4-3
4.3.4 Aircraft Operations by Time of Day.....	4-6
4.3.5 Departure Stage Length.....	4-7
4.4 Meteorological Conditions.....	4-9
4.5 Airport Operational Information.....	4-9
4.5.1 Runway Use .....	4-9
4.5.2 Flight Tracks and Utilization .....	4-10
4.5.3 Departure and Arrival Profiles.....	4-11
<b>Chapter 5 – 2018 and 2023 Noise Exposure</b>	
5.1 Introduction .....	5-1
5.2 2018 Noise Exposure.....	5-1
5.2.1 Land Use Compatibility – 2018.....	5-2
5.2.2 Population within 2018 DNL Contours.....	5-3
5.3 2023 Noise Exposure.....	5-9
5.3.1 Land Use Compatibility – 2023.....	5-9
5.3.2 Population within 2023 DNL Contours.....	5-10
5.4 Noise Sensitive Sites .....	5-12
5.5 Comparison of 2018 and 2023 NEMs.....	5-17
<b>Chapter 6 – Consultation and Public Involvement</b>	
6.1 Introduction .....	6-1
6.2 Technical Committee .....	6-1
6.3 Public Information Workshops, Draft FLL NEM Report, and Public Comments.....	6-4
6.3.1 Study Kick-Off Public Information Workshops.....	6-4
6.3.2 Draft NEMs and Public Information Workshop .....	6-5
6.3.3 Public Comments .....	6-6
6.4 Other Public Outreach and Meetings.....	6-6
6.4.1 Study-Specific Meetings .....	6-6
6.4.2 Newsletters.....	6-7
6.4.3 Elected Officials .....	6-7
6.4.4 FLL 14 CFR Part 150 Information Website .....	6-8



<b>List of Tables</b>	<b>Page</b>
Table 2-1	FLL Runway Characteristics .....2-9
Table 2-2	FLL Navigational Aids ..... 2-12
Table 2-3	FLL Instrument Approach Procedures ..... 2-13
Table 2-4	FLL Standard Terminal Arrival Routes..... 2-14
Table 2-5	FLL Departure Procedures..... 2-15
Table 2-6	Permanent Noise Monitor Locations..... 2-16
Table 2-7	FLL Aircraft Noise Complaints (January 2015 to December 2017) ..... 2-18
Table 3-1	14 CFR Part 150 Land Use Compatibility Guidelines in Aircraft Noise Exposure Areas.....3-3
Table 3-2	Consolidated Land Use Categories Within the Study Areas .....3-6
Table 4-1	Annual Aircraft Operations by AEDT Aircraft Type.....4-3
Table 4-2	Annual Aircraft Operations (All Aircraft) by Time of Day .....4-7
Table 4-3	AEDT Departure Stage Length Categories .....4-8
Table 4-4	Departure Stage Length (All Aircraft).....4-9
Table 4-5	Arrival Runway Use (All Fixed-Wing Aircraft) ..... 4-10
Table 4-6	Departure Runway Use (All Fixed-Wing Aircraft)..... 4-10
Table 5-1	Land Uses Exposed to DNL 65 and Higher – 2018 .....5-3
Table 5-2	Noise Sensitive Sites Exposed to DNL 65 and Higher – 2018.....5-4
Table 5-3	Housing Units and Population Not in Current FLL Sound Insulation Program – 2018.....5-4
Table 5-4	Land Uses Exposed to DNL 65 and Higher – 2023..... 5-10
Table 5-5	Noise Sensitive Sites Exposed to DNL 65 and Higher – 2023..... 5-11
Table 5-6	Housing Units and Population Not in Current FLL Sound Insulation Program – 2023..... 5-11
Table 5-7	Noise Sensitive Sites Exposed to Aircraft Noise of DNL 65 and Higher – 2018 and 2023 ..... 5-12
Table 5-8	Change in Land Use Exposure – 2018 to 2023..... 5-17
Table 5-9	Change in Noise Sensitive Sites Exposed – 2018 to 2023 ..... 5-18
Table 6-1	FLL 14 CFR Part 150 Technical Committee Participant List.....6-2
Table 6-2	First Round of Public Information workshops For FLL 14 CFR Part 150 Study .....6-4

<b>List of Figures</b>	<b>Page</b>
Figure 2-1	Airport Location Map .....2-3
Figure 2-2	Airport Vicinity Map .....2-5
Figure 2-3	Airport Diagram .....2-7
Figure 2-4	Noise Monitor Locations..... 2-19
Figure 2-5	Noise Complaint Locations in 2017 ..... 2-21
Figure 3-1	Generalized Existing Land Uses.....3-7
Figure 3-2	Generalized Noise Sensitive Uses – Children’s Day Care..... 3-11
Figure 3-3	Generalized Noise Sensitive Uses – Group Care ..... 3-13
Figure 3-4	Generalized Noise Sensitive Uses – Historic Structures..... 3-15
Figure 3-5	Generalized Noise Sensitive Uses – Hospitals ..... 3-17
Figure 3-6	Generalized Noise Sensitive Uses – Libraries..... 3-19
Figure 3-7	Generalized Noise Sensitive Uses – Nursing Homes ..... 3-21
Figure 3-8	Generalized Noise Sensitive Uses – Religious Centers..... 3-23
Figure 3-9	Generalized Noise Sensitive Uses – Public and Private Schools and Colleges ..... 3-25
Figure 4-1	Stage Length Comparison for Boeing 777-300 .....4-8
Figure 4-2	AEDT Flight Tracks – Runways 10L and 10R ..... 4-13
Figure 4-3	AEDT Flight Tracks – Runways 28L and 28R ..... 4-15
Figure 5-1	2018 DNL Contours and Generalized Existing Land Uses.....5-5
Figure 5-2	2018 DNL Contours and Dwellings Outside of the Sound Insulation Program .....5-7
Figure 5-3	2023 DNL Contours and Generalized Existing Land Uses..... 5-13
Figure 5-4	2023 DNL Contours and Dwellings Outside of the Sound Insulation Program ..... 5-15
Figure 5-5	2018 and 2023 DNL Contours and Generalized Existing Land Uses ..... 5-19

## Appendices

Appendix A	Glossary and Acronyms
Appendix B	Aircraft Activity Forecast
Appendix C	Airport Facilities and Airspace
Appendix D	Aircraft Noise
Appendix E	Land Use
Appendix F	Radar Flight Tracks
Appendix G	Consultation and Correspondence
Appendix H	Technical Committee Meetings
Appendix I	Public Outreach
Appendix J	Public Comments and Responses
Appendix K	Official Noise Exposure Maps

# CHAPTER 1

## Introduction

### 1.1 Introduction

Broward County, through its 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) to evaluate opportunities to improve the compatibility of FLL with the surrounding communities. The preparation of a Part 150 Study is a voluntary action on the part of BCAD.<sup>1</sup> However, once a Part 150 Study is undertaken, an airport sponsor<sup>2</sup> is obligated to prepare an update whenever there is a significant change to the noise environment. This study takes into consideration the recently completed upgrade and extension to FLL's south parallel runway, Runway 10R/28L, and the resulting changes in 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 Runway 10R/28L ongoing Environmental Impact Statement (EIS) process. This study revises the NEMs that were approved by the FAA in the 1994 Part 150 Study.

The three primary objectives of this study are listed below. This report, entitled "Noise Exposure Map Report", implements Objective 1 and includes the NEMs. The Noise Compatibility Program, which will be prepared following the adoption of the Noise Exposure Maps, addresses Objectives 2 and 3.<sup>3</sup>

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
2	Identify and evaluate potential future operational, land use, and program management measures that could be implemented to reduce noise impacts to noise sensitive land uses.	Noise Compatibility Program
3	Develop a comprehensive NCP that consists of Airport Sponsor recommendations to the FAA to reduce future noise impacts to the surrounding communities.	Noise Compatibility Program

<sup>1</sup> 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.

<sup>2</sup> The FAA refers to those entities receiving Airport Improvement Program (AIP) grants as "sponsors".

<sup>3</sup> A glossary of terminology related to this Part 150 Study, and acronyms list, can be found in Appendix A.



## 1.2 Need for the Preparation of a New Part 150 Study

While a new Part 150 Study was initiated in 2007 during the EIS for the expansion of Runway 10R/28L, it was ultimately suspended with the intent to reinstate the study after the runway was operational. As part of the EIS, noise mitigation measures were identified and the noise mitigation program implementation is ongoing. In November of 2013, the City of Dania Beach and Broward County entered into interlocal agreement which included a provision for the voluntary nighttime closure of the expanded runway. The agreement indicated that the voluntary nighttime closure would remain in effect until a determination was made by the FAA through a new Part 150 Study and that the Part 150 study would be commenced no sooner than 18 months after the runway opening. This would allow for the stabilization of the operational environment. This Part 150 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
- Consolidation of the airline industry including upgauging of the commercial aircraft fleet
- Changes in aircraft operation levels, runway utilization patterns and flight procedures
- Passage of the Airport Noise and Capacity Act of 1990 (ANCA) 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 FAA Modernization and Reform Act of 2012 (FMRA) 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.

Updating these noise contours will provide more up to date and relevant information which will in turn allow BCAD and local jurisdictions to effectively develop mitigation and abatement strategies, land use planning initiatives and goals.

## 1.3 14 CFR Part 150 Study Process

The Part 150 process begins with project initiation and the 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 non-compatible uses. Upon acceptance of the NEM's by the FAA, the NCP phase is initiated. NCP development includes identification and evaluation of noise abatement, mitigation and administrative measures and 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 NEMs.

In 2016, BCAD initiated the Part 150 Study at FLL. At its onset, key issues were identified through input from BCAD and FLL stakeholders including affected jurisdictions, aviation officials, aircraft operators, local communities, and interested members of the public. Input was received at meetings with Airport 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 the Study included an inventory of 2016 operational activity, which was supplemented with information from BCAD, the FAA, and 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: 6:00 a.m. to 10:29 p.m. or Night: 10:30 p.m. to 5:59 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, a noise prediction model, the Aviation Environmental Design Tool (AEDT) Version 2d SP2 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).

### Project Initiation

- Establish the Technical Committee
- Coordinate with stakeholders
- Conduct community workshops
- Establish project website

### Prepare Noise Exposure Maps

- Collect and review operational data and develop aviation activity forecast.
- Assemble land use data to develop base maps.
- Develop AEDT inputs and model noise impacts to prepare 2018 and 2023 NEMs.
- Determine non-compatible land uses.
- Conduct NEM Public Workshop.
- Submit the NEMs to the FAA for acceptance.

### Prepare Noise Compatibility Program

- Identify potential noise abatement measures available to BCAD, the FAA, and FLL's airlines and airport tenants that would reduce the extent of aircraft noise exposure over existing and future noise-sensitive land uses.
- Consult with the FAA and solicit input from airlines, airport tenants and users, local planning agencies, local elected officials, communities, and the public. Use input to develop recommended noise measures (e.g., sound insulation, land use controls).
- Develop a process and timetable for program implementation.
- Develop a future 2023 NEM with program implementation (if the NCP measures will change the DNL 65 contour) to depict and document the benefits to be derived from implementation of the noise abatement measures.
- Prepare and submit the NCP to the FAA for approval.

## 1.4 Preparation of 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 Day-Night Average Sound Level (DNL) values. Aircraft noise DNL values represent the sound produced by a 24-hour period of aircraft activity. For 14 CFR 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.

### 1.4.1 NEM Study Years

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 Airport Noise and Operations Management System (ANOMS).<sup>4</sup> The aircraft operations forecast used for the FLL Part 150 Study was approved by the FAA on April 10, 2017, as shown in **Appendix B**.

The second NEM depicts noise exposure levels anticipated five years in the future, which represents forecast conditions without the Noise Compatibility Program (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 NEM represents conditions five years after the NEM date of submittal to the FAA. The NEMs provide the noise exposure baseline against which the effectiveness of measures within the NCP are evaluated.

## 1.4.2 Technical Approach to Preparing Noise Exposure Maps

Subsequent chapters of this report describe 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. A brief overview of the technical approach is provided below.

### 1.4.2.1 Data Collection and Verification

A wide range of data and information related to the operation of the Airport was collected to provide a complete understanding of aircraft noise at FLL and its effects on local communities including:

#### *Aircraft Activity*

Information was collected related to the types of aircraft that operate at the Airport, the number of annual operations generated by these aircraft, the times of day that these aircraft operate, and the flight paths and flight profiles used by these aircraft for departures and arrivals. FLL is also currently preparing a Master Plan, which includes a forecast of aviation activity already reviewed and approved by the FAA. This forecast provided the number of annual aircraft operations modeled for the 2018 and 2023 NEMs.

#### *Approach and Departure Procedures*

The regional and local airspace structure was reviewed along with air traffic control procedures used to direct flights by the FAA in and out of FLL.

#### *Land Use*

Existing land use information was collected along with land use changes proposed during the next five-year period.

### 1.4.2.2 Aircraft Noise Modeling

Using the FAA's AEDT, noise exposure contours were developed for the year 2018 (Existing Conditions NEM) and the year 2023 (Future Conditions NEM). This process involved compiling

---

<sup>4</sup> An aircraft operation is defined as one arrival flight or one departure flight.

information and generating detailed input data for AEDT that represent aircraft activity and operating conditions at FLL.

#### 1.4.2.3 Preparation of NEMs

Using Geographic Information System (GIS) software, 2018 and 2023 NEMs were developed in accordance with the criteria and guidelines found in 14 CFR Part 150.

#### 1.4.2.4 Aircraft Noise Impact Analysis

Using GIS software, the type and amount (acreage) of incompatible land uses were identified for the 2018 NEM and the 2023 NEM. The analysis also determined the number of people, households, and noise-sensitive sites that are incompatible with aircraft noise exposure levels they receive.

### 1.5 Consultation and Public Involvement

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 the FLL 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 6**.
- Public Workshops were held in November 2017 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.
- A Public Workshop was held in January 2019 to present the Draft NEMs. This Public Workshop provided information related to the Part 150 Study process, the NEMs, project schedule, and the next phase of the Study (the Noise Compatibility Program). Comment



forms were available at the workshop for those that wished to submit comments in writing and a court reporter was available to for verbal comments.

- For stakeholders, agencies, and the general public, a Study website<sup>5</sup> 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 Study Team. The website also allowed for the submission of questions and comments related to “the correctness and adequacy...of the maps” as stated above.

Additional information related to public outreach activities is included in **Chapter 6**.

## 1.6 NEM Report Organization

This report provides the NEMs for FLL and the technical documentation required by 14 CFR Part 150. This report is organized as follows:

### **Chapter 1 Introduction**

### **Chapter 2 Fort Lauderdale-Hollywood International Airport Overview**

This chapter provides background information regarding the Airport and the history of noise abatement at FLL

### **Chapter 3 Land Use**

This chapter describes the FLL Part 150 Study land use study area and methods for collecting data, land uses in the study area, and noise sensitive sites.

### **Chapter 4 NEM Development**

This chapter describes the development of the noise exposure maps, the noise model and noise modeling inputs.

### **Chapter 5 2018 and 2023 Noise Exposure**

This chapter presents the 2018 and 2023 Noise Exposure Maps and information on land use compatibility and aircraft noise-related impacts.

### **Chapter 6 Consultation and Public Involvement**

This chapter documents stakeholder and public outreach engagement efforts undertaken during the Part 150 Study process.

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

Appendix A Glossary and Acronyms

Appendix B Aircraft Activity Forecast

Appendix C Airspace

<sup>5</sup> <http://www.fllpart150.com/>

Appendix D	Aircraft Noise
Appendix E	Land Use
Appendix F	Radar Flight Tracks
Appendix G	Consultation and Correspondence
Appendix H	Technical Committee Meetings
Appendix I	Public Outreach
Appendix J	Public Comments and Responses
Appendix K	Official Noise Exposure Maps

## CHAPTER 2

---

# Fort Lauderdale-Hollywood International Airport Overview

## 2.1 Airport Location and Setting

The Fort Lauderdale-Hollywood International Airport (FLL or the Airport) is located on 1,400 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 2-1**. The Airport and its environs are depicted on **Figure 2-2**.

### 2.1.1 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 US Navy constructed three runways and a control tower and operated it 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, in 1956, commercial service began at the Airport. The third runway, (crosswind runway), was decommissioned in May 6, 2013 and the south runway underwent a significant expansion in 2014. In addition to the changes to the runways, FLL has undergone numerous terminal and facility updates.

## 2.2 Airport Overview

### 2.2.1 Aviation Role

In 2016, FLL was the third busiest commercial service airport in the State of Florida, based on passenger traffic, and one of the fastest growing airports in the US.<sup>6</sup> FLL provides scheduled domestic and international service for both passengers and air cargo and also supports a wide range of general aviation activities.

---

<sup>6</sup> *FAA Calendar Year 2016 Enplanements at All Commercial Service Airports* (October 10, 2017). Retrieved from [https://www.faa.gov/airports/planning\\_capacity/passenger\\_allcargo\\_stats/passenger/](https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/)

The FAA’s National Plan of Integrated Airport Systems (NPIAS) identifies FLL as a Large Hub Primary Commercial Service Airport.<sup>7</sup> Large hubs are those airports that each account for at least one percent of total U.S. passenger enplanements.

## 2.2.2 Airport Facilities Overview

This section provides an overview of FLL’s facilities, airspace, and approach and departure procedures. The configuration of the major airfield and landside facilities at FLL is described in the following sections and shown on **Figure 2-3**.

### 2.2.2.1 Passenger Terminal Facilities

There are four terminals, housing eight concourses and 66 gates which, together comprise the passenger Terminal Area at FLL. They are:

- Terminal One: Concourses A, B, and C – 23 gates
- Terminal Two: Concourse D – 9 gates
- Terminal Three: Concourses E and F – 20 gates
- Terminal Four: Concourses G - 14 gates

Terminals one and two stand as independent structures. While terminals three and four stand as separate buildings, they are connected by a walkway. Passengers can access each terminal via Terminal Drive which encircles three parking structures. Each terminal has independent TSA Security checkpoints. Terminals One and Four accommodate arriving international passenger and therefore have Customs and Border Protection (CBP) services. As part of a large Capital Improvement Program, referred to as the Fort Lauderdale-Hollywood International Airport Improvements and Renovations Program (FLLAIR) plan, the airport has been undergoing numerous terminal and facility upgrades. The FLLAIR plan includes improving and modernizing the terminals by offering more food and shopping choices, seating, and bathrooms; adding destinations through more gates that can handle both international and domestic flights; and minimizing flights delays. Improvements to the current passenger facilities at FLL have included the addition of Concourse A, modernization of Terminals One Two, and Three, expansion of Terminal Four to include Concourse G, and the construction of elevated walkways between terminals and garages.

### 2.2.2.2 Runways

FLL has one pair of parallel runways, each of which are utilized for both general aviation and commercial traffic:

- Runway 10L/28R
- Runway 10R/28L

---

<sup>7</sup> *Report to Congress – National Plan of Integrated Airport Systems (NPIAS) 2019 - 2023*. Federal Aviation Administration, September 26, 2018.







**This Page Intentionally Blank**





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

**Figure 2-2**  
 Airport Vicinity Map  
 Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**



**This Page Intentionally Blank**



Runway 10L/28R is 9,000 feet long, 150 feet wide, and located north of the Airport terminal facilities. This runway is constructed of asphalt and is grooved. Runway 10L has a displaced threshold of 576 feet which reduces the available landing distance for Runway 10L to 8,424 feet. Runway 28R has a displaced threshold of 606 feet reducing the landing distance available (LDA) for Runway 28R to 8,394 feet. The takeoff distance available (TODA) for both runway ends is 9,000 feet.

Runway 10R/28L is 8,000 feet long, 150 feet wide, and located south of the Airport terminal facilities. This runway is the newest at the Airport and was opened for operation on September 18, 2014. It is constructed of concrete and is grooved. Runway 10R/28L has no displaced thresholds, leaving the entire 8,000 feet available for both takeoff and landing on both runway ends. Runway 10R/28L has considerable elevation change between the west end (10 feet MSL) and the east end (65 feet MSL) to bridge US 1 and provide adequate obstacle clearance with the existing rail line. Categorized information regarding runway characteristics is shown in **Table 2-1**.

Each runway end also features an Engineered Materials Arresting System (EMAS). An EMAS is a bed of engineered materials constructed at the end of a runway intended to decrease the risk of a runway excursion. Engineered materials are defined in FAA Advisory Circular No 150/5220-22B as "high energy absorbing materials of selected strength, which will reliably and predictably crush under the weight of an aircraft".

As previously noted, the Airport operated with a crosswind runway, Runway 13/31, until it was decommissioned May 6, 2013.

TABLE 2-1				
FLL RUNWAY CHARACTERISTICS				
Runway Characteristics	Runway 10L – 28R		Runway 10R – 28 L	
	10L	28R	10R	28L
Runway Length (Feet)	9,000		8,000	
Runway Width (Feet)	150		150	
Displaced Arrival Threshold (Feet)	576	606	0	0
Runway Landing Distance Available (Feet)	8,424	8,394	8,000	8,000
Runway Takeoff Distance Available (Feet)	9,000	9,000	8,000	8,000
EMAS Length (Feet)	380	214	562.9	562.9
Approach Surface Slope	50:1	50:1	50:1	50:1
Runway End Elevation (Feet above MSL)	5.5	5.2	10.1	65.1
Runway Markings	Precision	Precision	Precision	Precision
Runway Lighting	HIRL, PAPI	HIRL, PAPI	HIRL, PAPI	HIRL, PAPI

Part 77 Runway Category and Navigational Aids	Precision ILS	Precision ILS	Precision ILS	Precision ILS
Runway Approach Lighting	MALSR	MALSR	MALSF	MALSF
<p>NOTES:</p> <p>MSL = Mean Sea Level</p> <p>HIRL = High Intensity Runway Lighting</p> <p>PAPI = Precision Approach Path Indicator</p> <p>MALSR = Medium Intensity Approach Light System with Runway Alignment Indicator Lights</p> <p>MALSF = Medium Intensity Approach Lighting System with Sequenced Flashers</p> <p>ILS = Instrument Landing System</p> <p>SOURCES: FAA Airport Master Record, Form 5010; AirNav.com accessed March 28, 2018.</p>				

### 2.2.2.3 Helipads

A review of ANOMS data indicated that helicopters normally ingress to and egress from five areas at FLL. One of these areas is a helipad depicted with the letter “H” symbol on Figure 2-2. It is located just north of Taxiway A on the National Jets, Inc., aircraft parking ramp. Helicopter operations not arriving or departing the helipad will ingress and egress at the four runway ends at FLL.

### 2.2.2.4 Taxiways

As shown on Figure 2-3, a series of taxiways connects the two runways to the passenger terminal complex, the air cargo aprons, Fixed Base Operator (FBO) facilities, and general aviation areas. There are three primary taxiways which are located parallel to the runways. These primary taxiways move aircraft parallel to the active runways when departing aircraft position for takeoff, or when arriving aircraft taxi to their gates after arrival. Each of these primary taxiways also has individual connectors that connect the main runway with the parallel taxiway.

### 2.2.2.5 Airport Traffic Control Tower

The Airport is serviced by an FAA-staffed airport traffic control tower (ATCT) located to the west of the terminal facilities and between the two parallel runways. The ATCT operates 24 hours a day, 365 days a year. Radar approach and departure control is operated by the Miami Terminal Radar Approach Control (TRACON) facility.

### 2.2.2.6 General Aviation Facilities

General Aviation (GA) refers to all types of aviation that are not considered military, cargo, scheduled commercial passenger air service, and non-scheduled air transportation for hire. GA activity at FLL is comprised of business, or corporate, activity as well as personal, private activity.

There are four Fixed Base Operators (FBOs) which provide service to GA operators at FLL. These FBOs provide aircraft ground handling, aircraft fueling, pilot’s lounges, passenger lounges, rental cars, and crew/service centers. Between the two runways, to the west of the commercial terminal facilities are Sheltair and Signature Flight Support. To the north of the airfield are Jetscape, National Jets, and an additional Sheltair location.

### 2.2.2.7 Air Cargo Facilities

FLL serves as a leading air cargo center for both domestic and international traffic. Freight and air mail is processed through the cargo center for and by FedEx, and UPS Cargo is processed by a network of facilities located north of Runway 10L/28R as shown on Figure 2-3.

### 2.2.2.8 Aircraft Maintenance

While FLL is not home to any full-service Maintenance, Repair and Overhaul (MRO) facilities, many of the FBOs and other general aviation facilities provide maintenance services for both GA jet and propeller aircraft. Additionally, Embraer Executive Jets, Bombardier Aerospace, and Gulfstream International operate and maintain service centers at the Airport.

### 2.2.2.9 Other Aviation-Related Facilities

In addition to the passenger terminals, cargo facilities, and general aviation facilities, a number of aviation-related support facilities are located on Airport property. These facilities include:

- Aircraft Rescue and Fire Fighting (ARFF)
- Airport Surveillance Radar
- Airport Police Department
- U.S. Post Office Airport Mail

## 2.2.3 Future/Planned Airport Facilities

As previously noted, BCAD has implemented a Capital Improvement Program referred to as the FLLAIR plan. The projects included in the FLLAIR plan are based on the 2010 Master Plan for FLL. It is estimated that the FLLAIR plan projects will be completed by 2020. The FLLAIR plan included the expansion of the south runway to its current configuration as well as various terminal improvements. Among them is the expansion of Terminal 4, Concourse G, in the south terminal area. This project adds four gates and improves the ability of most gates to handle domestic or international arrivals. An additional 5-gate Remote Gate Concourse (RGC) is currently being planned east of Terminal 4 to provide some near term capacity relief. The RGC gates are being sized to support Airbus A321 or Boeing 737 aircraft. Timing of construction is not yet defined, but it is expected that this facility could be in place near the end of the planning period. There are also a series of FBO expansions and improvements being planned west of the terminal area between the two runways.

BCAD is in the process of updating FLL's Master Plan. The Master Plan will provide a plan for building new facilities, roads, garages, and utilities at FLL. There are currently no planned changes in runway end or threshold locations that would affect the arrival or departure profile of aircraft landing or departing the Airport. However, a temporary closure of Runway 10L/28R is planned in 2019 to allow for the runway to be reconstructed. While the runway is closed, all aircraft operating at the airport will be required to use the south runway (Runway 10R/28L). The airport will return to normal operation upon project completion.

## 2.2.4 Regional Economic Impact

FLL is a significant driver of the regional economy. The Airport's operating activity produced direct economic contributions and an equally significant multiplier effect to the regional economy. The Florida Department of Transportation's (FDOT) Florida Statewide Economic Impact Study, August 2014, summarizes the direct contribution and regional benefit generated by FLL. The report notes that FLL employed 139,920 people and had a \$13 billion impact on the regional economy.<sup>8</sup>

## 2.2.5 Airspace Classification

FAA controlled airspace is referred to as Class A, B, C, D, or E and uncontrolled airspace as Class G. Generally speaking, Class A airspace begins at 18,000 feet above mean sea level, continues upward, and is used to manage en route aircraft traffic. Class B airspace surrounds the nation's busiest airports such as Miami International Airport. Class C airspace surrounds airports with high traffic levels, but not as high as Class B airports. FLL is located in Class C airspace. Class D airspace surrounds those airports with an air traffic control tower (ATCT) but whose traffic levels are less than the threshold for Class C airspace. Class E airspace is any other controlled airspace where pilots are in radio contact with some portion of the FAA air traffic control network. This network consists of air route traffic control centers, terminal approach control facilities, ATCTs, and flight service stations. Additional information about airspace classifications can be found in **Appendix C** of this report.

## 2.3 Navigational Aids

Navigational aids ("NAVAIDS"), airport lighting, and airport markings help users of FLL to safely navigate around the Airport and through local airspace. The NAVAIDS available to pilots using FLL are summarized in **Table 2-2**.

TABLE 2-2 FLL NAVIGATIONAL AIDS	
Navigational Aids	Description
<b>Instrument Landing Systems (ILS)</b>	<p>An ILS is a type of precision ground-based electronic landing navigation aid that has been in use in the U.S. for more than 50 years. An ILS guides pilots to runways during periods of limited visibility or inclement weather. An ILS has several components, including:</p> <ul style="list-style-type: none"> <li>• Localizer antenna (LOC) that provides lateral course guidance to the runway</li> <li>• Glide slope antenna (GS) that provides vertical course guidance</li> <li>• Marker beacons along the extended runway centerline</li> <li>• Approach lighting system</li> </ul> <p>Non-precision LOC instrument approach procedures are often available when a GS is not installed or for approaches from the opposite end of the runway ("back-course" approach).</p>

<sup>8</sup> *Florida Statewide Economic Impact Study, August 2014*, Florida Department of Transportation. <http://www.florida-aviation-database.com/dotsite/economicimpact/FLL.pdf>. Accessed August 17, 2017.

<b>Area Navigation (RNAV)</b>	RNAV is a method of Instrument Flight Rules (IFR) navigation that permits aircraft operation on any desired flight path using the combination of both GPS and ground-based navigational aids. RNAV routes and terminal procedures, including departure procedures and standard terminal arrivals, are designed with RNAV systems in mind to save time and fuel, reduce aircraft dependence on air traffic control (ATC) vectoring, and provide for more efficient use of the airspace.
<b>Global Positioning System (GPS)</b>	The GPS, operated by the Department of Defense, uses a network of satellites that create reference points to enable aircraft equipped with GPS receivers to determine their latitude, longitude, and altitude. GPS systems can be used during all phases of flight.
<b>Required Navigation Performance (RNP)</b>	RNP is similar to Area Navigation (RNAV); but, RNP requires on-board navigation performance monitoring and alerting capability to ensure that the aircraft stays within a specific containment area.
<b>Very High Frequency Omni-Directional Range (VOR)</b>	A VOR is a ground-based electronic system that provides azimuth information for high and low altitude routes and airport approaches. DME determines a slant range distance from an aircraft to the DME. VORs can be stand-alone or equipped with DME. These navigational aids provide navigational fixes on an aeronautical chart.
<b>Distance Measuring Equipment (DME)</b>	
<b>SOURCE:</b> FAA, 2017. Adapted by Environmental Science Associates	

## 2.4 Instrument Approach Procedures and Charted Visual Flight Procedures

Instrument approach procedures (IAPs) are flight procedures developed and published by the FAA that pilots use to navigate their aircraft to the runway. The most currently published (IAPs) for FLL are listed in **Table 2-3**.

TABLE 2-3 FLL INSTRUMENT APPROACH PROCEDURES			
Runway 10L – 28R		Runway 10R – 28 L	
10R	28L	10L	28R
ILS or LOC RNAV (GPS)	ILS or LOC RNAV (GPS)	ILS or LOC RNAV (RNP) Y <sup>1</sup> RNAV (GPS) Z	ILS or LOC RNAV (RNP) Z RNAV (GPS) Y
<b>SOURCE:</b> Federal Aviation Administration, 2017.			
1. When two or more straight-in approaches with the same type of guidance exist for a runway, a letter suffix is added to the title of the approach so that it can be more easily identified. These approach charts start with the letter Z and continue in reverse alphabetical order.			

## 2.5 Standard Terminal Arrivals and Departure Procedures

The airspace surrounding FLL is structured so that arriving aircraft can be safely and efficiently transitioned from the en route environment to the approach control environment and eventually to the airfield. Likewise, the airspace is structured so that departing aircraft can transition from the airfield to the terminal environment and ultimately to the en route environment. Standard Terminal



Arrivals (STARs) and Departure Procedures (DPs) simplify and expedite Instrument Flight Rules (IFR) arrival and departure procedures in airspace. As discussed previously, aircraft flying in and out of FLL follow these routes, depending on the operational flow of the Airport.

It should be noted that the FAA is currently considering improvements to the way that aircraft navigate complex metropolitan areas, such as the South-Central Florida Metroplex. While existing procedures are safe, they no longer are the most efficient due to advances in technology. The FAA is in the process of developing more direct and efficient satellite-based routes into and out of central and south Florida's major airports. Implementation of the South-Central Florida Metroplex project does have the potential to alter some of the current operational procedures at FLL. The FAA is preparing an Environmental Assessment of the South-Central Florida Metroplex project and will make an environmental determination on the proposed procedures in 2020, if appropriate. After the FAA finalizes and implements the Metroplex procedures, and as needed, the FLL Part 150 Study Noise Exposure Maps and Noise Compatibility Plan can be updated.

## 2.5.1 Standard Terminal Arrivals

The Miami TRACON and FLL ATC use nine STARs to route aircraft into FLL. There are currently five RNAV (GPS) arrival procedures and four conventional arrival procedures,<sup>9</sup> as shown in **Table 2-4**. **Appendix C** includes a copy of the charts and descriptions of the STARs.

TABLE 2-4 FLL STANDARD TERMINAL ARRIVALS		
Procedure Name	Procedure Type	Arrival Direction
BLUFI FOUR	Conventional	North/ Northwest
CURSO FIVE	RNAV	West/ Southwest
DEKAL FIVE	Conventional	East
DVALL THREE	Conventional	Southwest
FISEL SEVEN	RNAV	North
FORTL SEVEN	Conventional	West/ Northwest
GISSH FIVE	Conventional	North/ Northeast
JINGL SIX	RNAV	West/ Northwest
WAVUN THREE	RNAV	East/ Southeast
<b>NOTE:</b> RNAV = Area Navigation		
<b>SOURCE:</b> Federal Aviation Administration, October 2018		

<sup>9</sup> FAA's *Instrument Procedures Handbook* (FAA-H-8083-16A) notes that STARs based on conventional NAVAIDs essentially have the same procedure design and obstacle clearance criteria as that for en route procedures. STAR procedures typically include standardized descent gradients and allow for deceleration segments. RNAV STARs serve the same purpose as conventional STARs, but are only used by aircraft equipped with Flight Management System or GPS. An RNAV STAR typically includes flyby (or flyover) waypoints. These waypoints may be assigned crossing altitudes and speeds to optimize the descent and deceleration profiles.

## 2.5.2 Departure Procedures

Aircraft departing FLL are often assigned a specific Departure Procedure (DP). A DP is a published procedure that provides a standard route from the runway to the appropriate en route airspace structure. In some cases, a DP may have an associated en route transition, which is a published procedure segment that connects the end of the DP to one of several en route structures. DPs are designed to separate departing aircraft from arriving aircraft, provide for efficient interception of an outbound course, simplify the issuance of departure clearances, and reduce radio communication. Due to the dual runway configuration and parallel spacing at FLL, aircraft departing simultaneously on the two parallel runways currently require a 15 degree divergence in heading to ensure adequate separation. This divergence has resulted in an increase in aircraft overflying areas in the vicinity of the north runway that may have experienced limited overflights prior to the expansion of the south runway.

DPs at FLL include a mix of RNAV and conventional procedures. **Table 2-5** summarizes the DPs for FLL. **Appendix C** includes these charts and descriptions of each procedure listed in the charts.

TABLE 2-5 FLL DEPARTURE PROCEDURES	
Procedure Name	Procedure Type
ARKES FOUR	RNAV
BAHMA FIVE	RNAV
BEECH FIVE	RNAV
FORT LAUDERDALE SIX	Conventional
PREDA FOUR	RNAV
THNDR FOUR	RNAV
ZAPPA FOUR	RNAV
<b>NOTE:</b> RNAV = Area Navigation	
<b>SOURCE:</b> Federal Aviation Administration, March 2018	

## 2.6 Noise Monitoring, Noise Abatement, and Community Outreach Programs

Historically, the Broward County Aviation Department has been active in addressing aircraft noise concerns. BCAD implemented programs to monitor aircraft noise levels and assist local communities in understanding the effects of aircraft noise. These include the installation of a noise monitoring system in the communities around FLL, and implementation of a sound insulation program including a team of architects, engineers, consultants, and acoustical specialists to successfully plan and complete sound improvements to properties.

## 2.6.1 Sound Insulation Program

The FAA *Record of Decision for the Development and Expansion of Runway 9R/27L and Other Associated Airport Projects at FLL* (2008) required BCAD to implement noise mitigation measures. Beginning in 2012, BCAD implemented a soundproofing program for properties within the City of Dania Beach which fall within the DNL (Day-Night Average Sound Level) 65+ noise contours area. These properties and adjacent approved areas are eligible for Voluntary Sound Insulation Program improvements in accordance with mitigation requirements in the *Final Environmental Impact Statement for the Development and Expansion of Runway 9R/27L and Other Associated Airport Projects at Fort Lauderdale-Hollywood International Airport*. The improvements are acoustical treatments designed to reduce aircraft noise experienced inside of a residential structure. The 2008 EIS estimated 1,706 units were within the DNL 65+ contours identified in the EIS for the expansion of Runway 10R/28L. Ultimately, 1,858 units were invited to participate in the Sound Insulation Program with 1,224 units participating; more than 700 homes have already been completed and noise attenuation measures are currently being implemented on nearly 500 homes. Overall, the program includes expenditures of approximately \$175 million. There were no noise-sensitive public facilities identified within the DNL 65+ contours during the 2008 EIS.

## 2.6.2 Aircraft Noise and Operations Monitoring System (ANOMS)

FLL's Aircraft Noise and Operations Monitoring System (ANOMS) consists of two basic elements: a radar system put in place for acquiring flight track information and eleven permanent noise monitoring stations. The noise monitoring sites (see **Table 2-6** and **Figure 2-4**) were chosen for the permanent noise monitors with the intent to differentiate between aircraft and other noise by referencing programmed algorithm thresholds. The ANOMS main server collects data from both the Passive Secondary Surveillance Radar (PASSUR) and the noise monitors in place. This data collected and analyzed by FLL's full-time Noise Officer who is responsible for operating and maintaining ANOMS, assisting with the implementation of noise abatement measures, and addressing public concerns regarding airport noise.

**TABLE 2-6**  
**PERMANENT NOISE MONITOR LOCATIONS**

	Address	City
1	3640 Southwest 55 <sup>th</sup> Avenue	Davie, FL
2	4548 Southwest 37 <sup>th</sup> Avenue	Dania Beach, FL
3	4609 Southwest 28 <sup>th</sup> Avenue	Dania Beach, FL
4	805-B Northwest 13 <sup>th</sup> Avenue	Dania Beach, FL
5	325 Northeast 3 <sup>rd</sup> Avenue	Dania Beach, FL
6	1021 Southwest 32 <sup>nd</sup> Court	Fort Lauderdale, FL
7	1750 Southwest 32 <sup>nd</sup> Street	Fort Lauderdale, FL
8	3411 Southwest 27 <sup>th</sup> Street	Fort Lauderdale, FL

9	3900 Southwest 100 <sup>th</sup> Avenue	Davie, FL
10	2343 Southwest 27 <sup>th</sup> Avenue	Fort Lauderdale, FL
11	6503 N Ocean Dr.	Hollywood, FL

**SOURCE:** Fort Lauderdale-Hollywood International Airport Noise Monitoring system website. Accessed, August 2017

## 2.6.3 Airport Noise Abatement Committee

BCAD established the Airport Noise Abatement Committee (ANAC) in 1992. The ANAC was formed to provide a platform to share airport noise-related information with interested parties.<sup>10</sup> According to the Charter, the purpose of the ANAC is:

The 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 take to maximize the effectiveness of the Noise Compatibility Program, as implemented.<sup>11</sup>

The ANAC has 20 members and meets quarterly (the second Monday of March, June, September, and December) at BCAD's office.

## 2.6.4 Aircraft Noise Complaints / Comments

As part of its noise program, BCAD collects and manages noise complaint information related to FLL. A noise comment hotline was created in response to the increased complaints resulting from the south runway expansion. There are three means of filing an aircraft noise complaint: (1) by completing and submitting the form on BCAD's website, 2) by leaving a voicemail on the Airport noise complaint hotline, or 3) by submitting a comment via the Airport's application (for iPhone/Android mobile devices).<sup>12</sup> Each noise complaint received is compiled in a database, verified for accuracy, and analyzed for reporting purposes.

BCAD provides noise complaint reports to the FAA on a monthly basis for informational purposes. **Table 2-7** provides the number of noise complaints and individual households submitting complaints for January 2015 through December 2017. **Figure 2-5** depicts the locations of complaints received in 2017.

<sup>10</sup> <http://www.broward.org/Airport/NoiseInformation/Pages/ANACCommittee.aspx>

<sup>11</sup> <http://www.broward.org/Airport/NoiseInformation/Documents/Anacchartermar2018.pdf>

<sup>12</sup> The airport noise complaint hotline can be reached by calling 1-866-822-7910. The noise complaint form is located at: <http://www.broward.org/Airport/NoiseInformation/Pages/BCADNoiseCommentForm.aspx>. The app can be downloaded from the link at <http://www.broward.org/airport/noiseInformation/Pages/default.aspx>.

TABLE 2-7 FLL AIRCRAFT NOISE COMPLAINTS (JANUARY 2015 TO DECEMBER 2017)		
Year	Number of Noise Complaints	Number of Distinct Households
2015	5,741	203
2016	11,369	337
2017	73,076	504
SOURCE: BCAD and PlaneNoise, 2018.		

## 2.6.5 Community Outreach

BCAD continues to participate in local community and town meetings to discuss and answer citizen questions related to aircraft noise. The ANAC serves as one method of outreach to communities and other stakeholders. Other outreach initiatives undertaken by BCAD to address noise concerns include the Quieter Skies Report,<sup>13</sup> which started in 2007, and provides an overview of efforts to reduce noise at FLL and a website that provides information regarding the Noise Mitigation Program,<sup>14</sup> which was implemented as a result of the south runway expansion Environmental

Impact Statement. An extensive public outreach program is also part of FLL Part 150 Study process (see **Chapter 6** for additional information).

## 2.6.6 Noise Abatement Measures

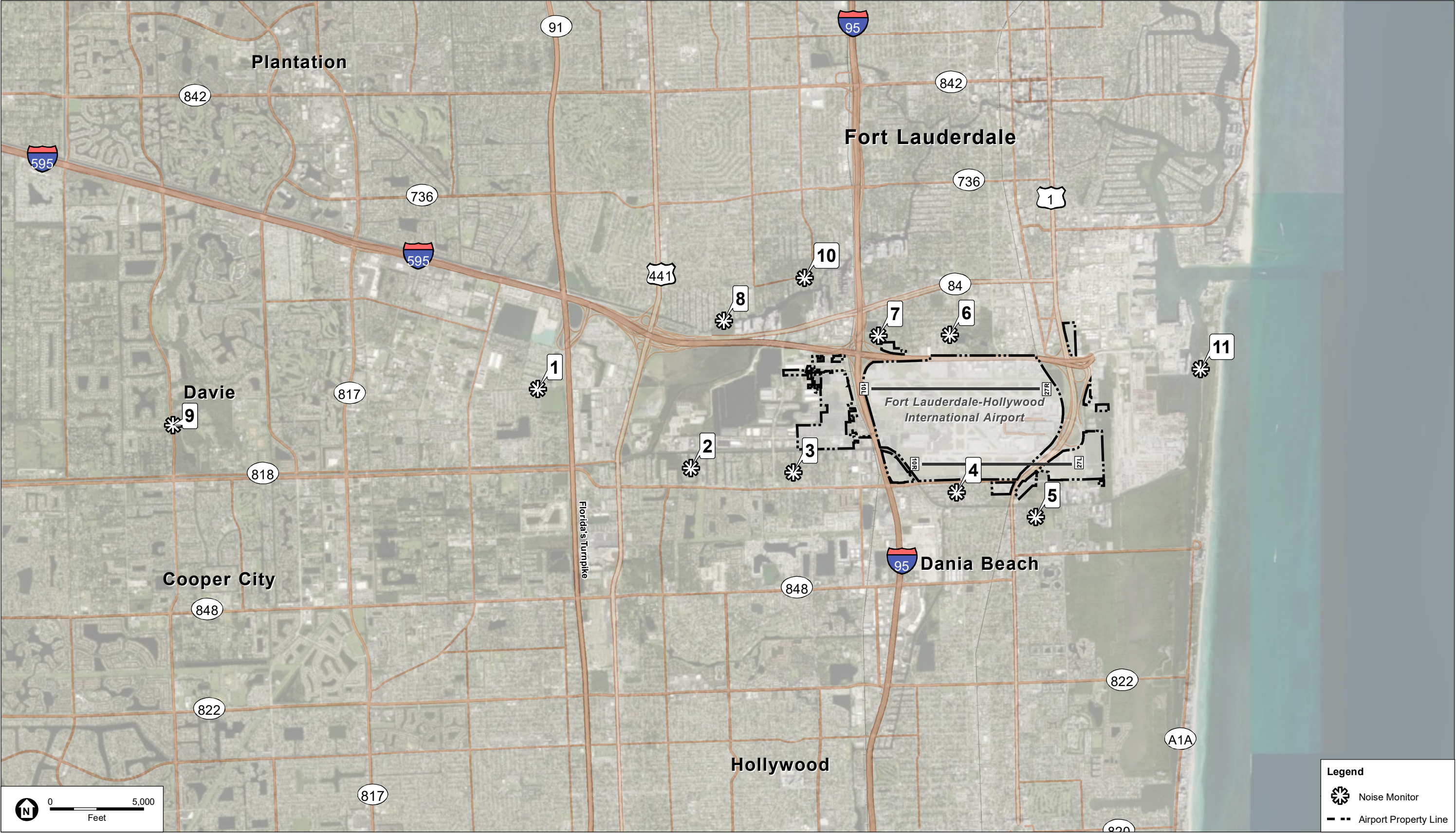
FLL's noise abatement measures for operational activity is particularly focused on nighttime noise disturbances. In April 2014, in conjunction with the opening of the expanded Runway 10R/28L (south runway), BCAD implemented a voluntary user program involving the nighttime use of the reconstructed runway. This voluntary program strongly discourages any flights using Runway 10R/28L between 10:30 p.m. and 6 a.m.

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.

<sup>13</sup> <http://www.broward.org/Airport/NoiseInformation/Pages/QuieterSkies.aspx>

<sup>14</sup> <http://www.fllnoisemitigation.com>





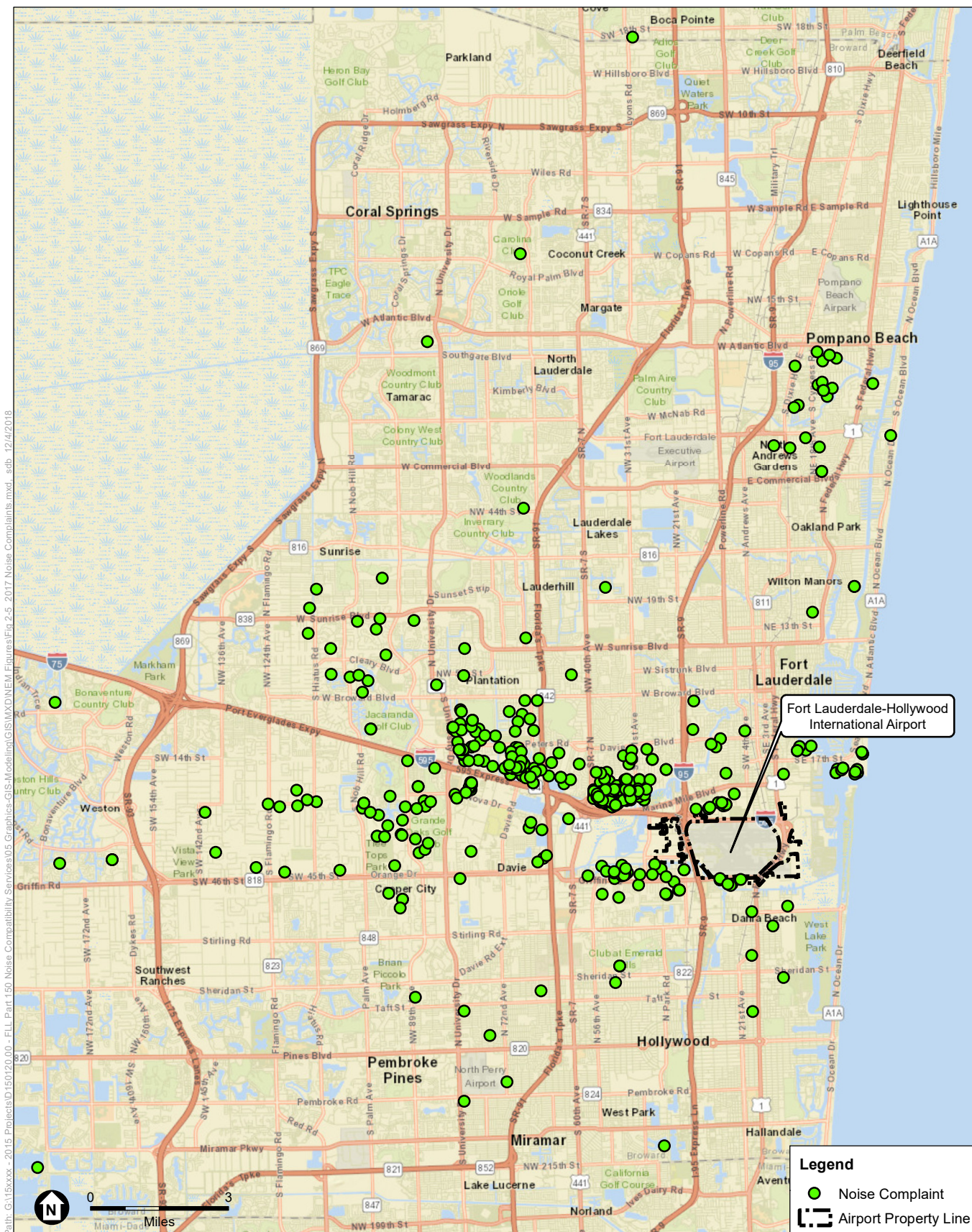
SOURCE: Esri; BCAD; ESA, 2018

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

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



**This Page Intentionally Blank**



SOURCE: Esri; ANOMS and PlaneNoise, 2018; ESA, 2018

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

**Figure 2-5**  
Noise Complaint Locations in 2017  
Fort Lauderdale-Hollywood International Airport

**This Page Intentionally Blank**

# CHAPTER 3

---

## Land Use

### 3.1 Introduction

Title 14 CFR Part 150 requires the review of land uses located in the airport environs to understand the relationship between those land uses and the noise exposure associated with arriving and departing flights at an airport. This includes delineation of land uses within the DNL 65 and higher contours on the NEMs and identification of noise sensitive uses that may be incompatible with that level of noise exposure. Identification of a noise sensitive use within the DNL 65 contour does not necessarily mean that the use is either considered incompatible or that it is eligible for mitigation. Rather, identification merely indicates that the use is generally considered incompatible, and requires further investigation. Factors that influence compatibility and/or eligibility may include but not be limited to previous sound reduction treatments, current interior noise levels, structure condition, ambient and self-generated noise levels, whether a given use is considered temporary or permanent, and the timeframe within which a given structure was constructed.<sup>15</sup> These factors will be more thoroughly evaluated during the NCP and subsequent implementation phase.<sup>16</sup>

### 3.2 Land Use Data Collection

Various types of land use information were collected to provide the basis for the evaluation of land use compatibility and noise exposure in this study.

#### 3.2.1 Land Use Data Collection Area

The FLL Part 150 Study required the development of a database of existing land uses located in the airport environs affected by noise and flight activity. This process defined a broad data collection area that conforms to 14 CFR Part 150 criteria. The Land Use Data Collection Area for this study considered a number of factors, including:

- The most recent set of noise contours for FLL<sup>17</sup> to ensure that the 2018 Existing Conditions and 2023 Future Conditions DNL 65 contours developed for the Part 150 Study would be encompassed.

---

<sup>15</sup> On March 27, 1998, FAA issued a policy on 14 CFR Part 150 airport noise compatibility programs that limits approval of remedial mitigation measures, e.g., soundproofing, property acquisitions, and relocation, etc., to land uses that were in place as of October 1, 1998 unless an airport can demonstrate that DNL contours were not published prior to that date. New non-compatible uses resulting from airport expansion may be eligible for consideration.

<sup>16</sup> Determination of eligibility would be made when the FLL Noise Compatibility Program has been approved, program protocols have been established, and the implementation phase has been initiated.

<sup>17</sup> *Final Environmental Impact Statement for the Development and Expansion of Runway 9R/27L and Other Associated Airport Projects at Fort Lauderdale-Hollywood International Airport* (2008).



- Land use within a radial distance of 30,000 feet from each runway end at FLL for capture of flight tracks per 14 CFR Part 150 requirements.
- Flight track data associated with arrivals and departure operations at FLL in 2016.

After BCAD's review, the Land Use Data Collection Area was further refined through the use of political and jurisdictional boundaries and man-made and/or natural features including:

- Major roadways and transportation corridors.
- Readily identifiable geographic features such as the Everglades, shorelines, and large expanses of open space.

### 3.2.2 Study Area

A Study Area was identified for more detailed collection and review of land use data and information. The FLL Part 150 Study Area included areas with the potential to be located within or in proximity to FLL's 2018 Existing and/or 2023 Future DNL 65 and higher contours.

### 3.2.3 Local Agency and Government Coordination

The following jurisdictions and agencies were consulted to document existing land uses, discuss applicable land use studies and data, and identify future projects which may affect land use in the FLL Part 150 Study area:

- City of Fort Lauderdale
- City of Hollywood
- City of Dania Beach
- City of Plantation
- City of Cooper City
- City of Weston
- Town of Davie
- Town of Southwest Ranches
- Broward County School Board

## 3.3 Land Use Compatibility

### 3.3.1 Aircraft Noise and Land Use Compatibility

Guidelines regarding the compatibility of land uses within various DNL contour intervals are specified in *Appendix A of 14 CFR Part 150*. These guidelines are consistent with land use guidelines developed by other federal agencies, such as the U.S. Environmental Protection Agency and the U.S. Department of Housing and Urban Development. The noise metric used for land use



compatibility is the Day-Night Average Sound Level (DNL), which represents average noise levels over a 24-hour period. DNL values are expressed in A-weighted decibels (dBA), which is a sound pressure level metric that emphasizes sound at the frequency range where the human ear is most sensitive. In the calculation of DNL, sound events occurring during the nighttime (10:00 P.M. to 7:00 A.M.) are increased by a 10 decibel-weighting to represent the increased sensitivity of people to noise that occurs at night. 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. Further details on aircraft noise are presented in **Appendix D** of this report.

The FAA has determined that the major land uses listed in 14 CFR Part 150, Appendix A, Table 1 (presented here as **Table 3-1**) 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.

As shown in Table 3-1, noise sensitive land uses such as single and multi-family residential, mobile home parks, transient lodging (e.g., hotels), daycares, public and private schools, and outdoor music venues are considered incompatible with noise levels of DNL 65 or higher. Other noise sensitive land uses such as hospitals, nursing homes, churches, auditoriums, and concert halls are considered compatible with noise levels of DNL 65 to 75, provided that appropriate noise attenuation is designed into the building’s structure. Commercial, manufacturing, and recreational land (parks, amusement parks, zoos, etc.) are generally less sensitive to noise and are considered compatible with noise levels up to DNL 70 without noise attenuation and up to DNL 80 with appropriate levels of noise attenuation. For this FLL Part 150 Study, the identification of compatible and incompatible land uses within the DNL 65 and higher contours was documented using the guidance provided in Table 3-1 to the extent that it was readily applied to the area land use categories.

<b>TABLE 3-1</b> <b>14 CFR PART 150 LAND USE COMPATIBILITY GUIDELINES</b> <b>IN AIRCRAFT NOISE EXPOSURE AREAS</b>						
Land Use	Yearly Day-Night Noise Level (DNL) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
<b>Residential</b>						
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
<b>Public Use</b>						
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

**TABLE 3-1  
14 CFR PART 150 LAND USE COMPATIBILITY GUIDELINES  
IN AIRCRAFT NOISE EXPOSURE AREAS (CONTINUED)**

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
<b>Commercial Use</b>						
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
<b>Manufacturing &amp; Production</b>						
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
<b>Recreational</b>						
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
<i>Numbers in parenthesis refer to notes.</i>						
<p>* 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.</p>						
<p><b>Key to Table</b>  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.</p>						

**TABLE 3-1**  
**14 CFR PART 150 LAND USE COMPATIBILITY GUIDELINES**  
**IN AIRCRAFT NOISE EXPOSURE AREAS (CONTINUED)**

**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*.

### 3.3.2 Local Ambient Noise Environment

One important consideration in evaluating land use compatibility relative to aircraft noise is the overall noise environment in proximity to the airport. 14 CFR Part 150, Appendix A, Section 101 indicates that “if the self-generated noise from a given use and/or the ambient noise from other non-aircraft and non-airport uses is equal to or greater than the noise from aircraft and airport sources,” the land use is considered compatible.

Ambient (background) noise levels generally increase as intensity of development increases; ranging from a quiet rural setting to suburban to urban to a dense urban environment, which typically has the loudest ambient noise levels. Fort Lauderdale and surrounding cities include land that can generally be classified as suburban and urban and with the exception of major highway corridors, the local ambient noise environment in near proximity to the airport is generally less than the noise from aircraft and airport sources. Further away from the city, rural areas such as Southwest Ranches have a lower ambient noise level.

### 3.3.3 Land Uses Within the Study Area

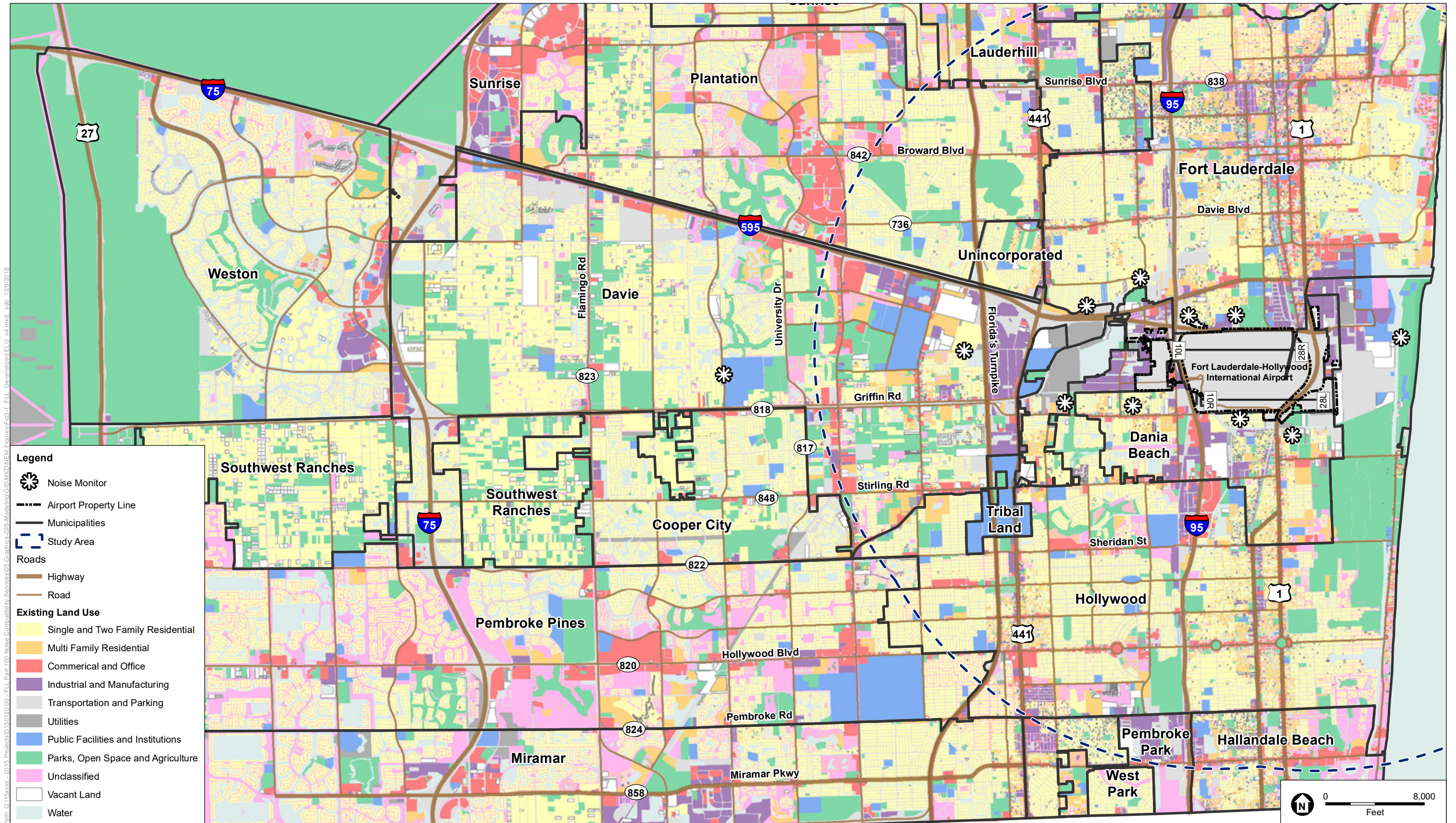
Land in the Study Area is developed and largely urbanized. The predominant land use in the vicinity of FLL is primarily industrial and manufacturing; parks, open space, and agriculture. However, there are residential areas located immediately to both the south and west of the Runway 10R end. Commercial and some residential development is found along major road corridors. Land uses in the Study Area are summarized in **Table 3-2** and depicted on **Figure 3-1**. Data used to identify land uses in the Study Area were collected from a number of sources including various government entities: Broward County GIS Department, Broward County Tax Assessor records, the Florida Geographic Data Library (FGDL), and various readily available on-line data and mapping sources. A more detailed discussion of land uses is provided in **Appendix E**.

Based on the criteria established in 14 CFR Part 150 and the land use compatibility guidelines shown in **Table 3-1**, eligibility for mitigation will be evaluated in the NCP. Unclassified land uses shown on the figure are land uses which have no designation in the Broward County or local land

use databases. All unclassified parcels located within the DNL 65 contour were further investigated and resolved.

TABLE 3-2 CONSOLIDATED LAND USE CATEGORIES WITHIN THE STUDY AREA		
Consolidated Land Use Categories	Typical Uses	Compatibility with the DNL 65 Contour
Single and Two Family Residential	Single family homes, two-family homes, and duplex buildings.	Generally considered incompatible.
Multi-Family Residential	Apartment buildings, cooperative apartment buildings, condominiums, public housing complexes, and assisted living facilities.	Generally considered incompatible.
Commercial and Office	Retail, including shopping malls, shopping centers, stores, shops, entertainment, restaurants, bars, galleries, and service establishments. Business, professional, and healthcare services.	Generally considered compatible.
Industrial and Manufacturing	Piers, docks and marinas, bulk fuel storage, heavy manufacturing and assembly plants, light manufacturing and processing facilities, warehouse and storage, truck terminals, junkyards, sand and gravel pits, and wholesale nurseries and greenhouses.	Generally considered compatible.
Transportation and Parking	Roadways and highways (including rights-of-way), parking lots, and garages.	Generally considered compatible.
Utilities	Electric power generation and transmission lines, water supply and treatment facilities.	Generally considered compatible.
Public Facilities and Institutions	Schools and universities, libraries, museums, cultural facilities, places of worship, government buildings, auditoriums, hospitals and hospice facilities, nursing homes, police and fire protection, post offices, correctional institutions, and animal shelters.	Generally considered compatible with the exception of specific noise sensitive uses (schools, hospitals, churches, nursing homes).
Parks, Open Space, and Agriculture	Parks, recreation areas (parks, amusement parks, zoos, etc.), playgrounds, athletic fields, conservation land, preserves, farms, and public land.	Generally considered compatible with the exception of outdoor music venues, and any farms (agriculture) with homes.
Vacant	No present use	Potentially incompatible if it were to be developed with an incompatible use.
Unclassified	No land use identified by Broward County	Potentially incompatible if developed with an incompatible use.
SOURCES: Kimley-Horn and Associates, Arora Engineers, Environmental Science Associates, 2018.		





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

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

**Figure 3-1**  
Generalized Existing Land Uses  
Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**

### 3.3.4 Noise Sensitive Sites

In addition to identifying and mapping land uses, 14 CFR Part 150 also requires the identification of noise sensitive public buildings and properties eligible for inclusion in the National Register of Historic Places. The FLL Part 150 Study identified the following noise sensitive uses within the Land Use Data Collection Area:

- Places of worship;
- Schools, colleges, and universities;
- Libraries;
- Hospitals;
- Nursing homes;
- Group care facilities;
- Daycares; and
- Historic properties and sites.

The Broward County GIS department, Broward County Tax Assessor records, the Florida Geographic Data Library (FGDL), and various readily available on-line data and mapping sources were used to identify these noise-sensitive sites. Information sources for the identification of historic resources included the National Register of Historic Places and the Florida State Register of Historic Places.

The locations of noise sensitive uses in the Land Use Data Collection Area are depicted in **Figures 3-2 through 3-9**. As indicated previously, inclusion of these properties within the DNL 65 contour does not necessarily mean that a use is either considered incompatible or that it is eligible for mitigation. Inclusion merely indicates that the use is generally considered incompatible, but requires further investigation during the NCP and subsequent implementation phase.

## 3.4 Land Use Control Regulations

The identification of land use controls was undertaken to provide an understanding of existing land use control regulations (e.g., zoning ordinances) within each political jurisdiction inside the Study Area. Review of the permitted uses by zoning district for each jurisdiction's zoning provisions found that there have been occasions where one or more uses permitted in a zoning district (i.e., mixed use) have been identified as potentially being incompatible, depending on the results of the noise analysis. These concerns will be explored in the NCP phase of the FLL Part 150 Study by identifying and evaluating land use management measures that may be considered to avoid the establishment of additional incompatible land uses in areas exposed to aircraft noise of DNL 65 or higher.

**This Page Intentionally Blank**

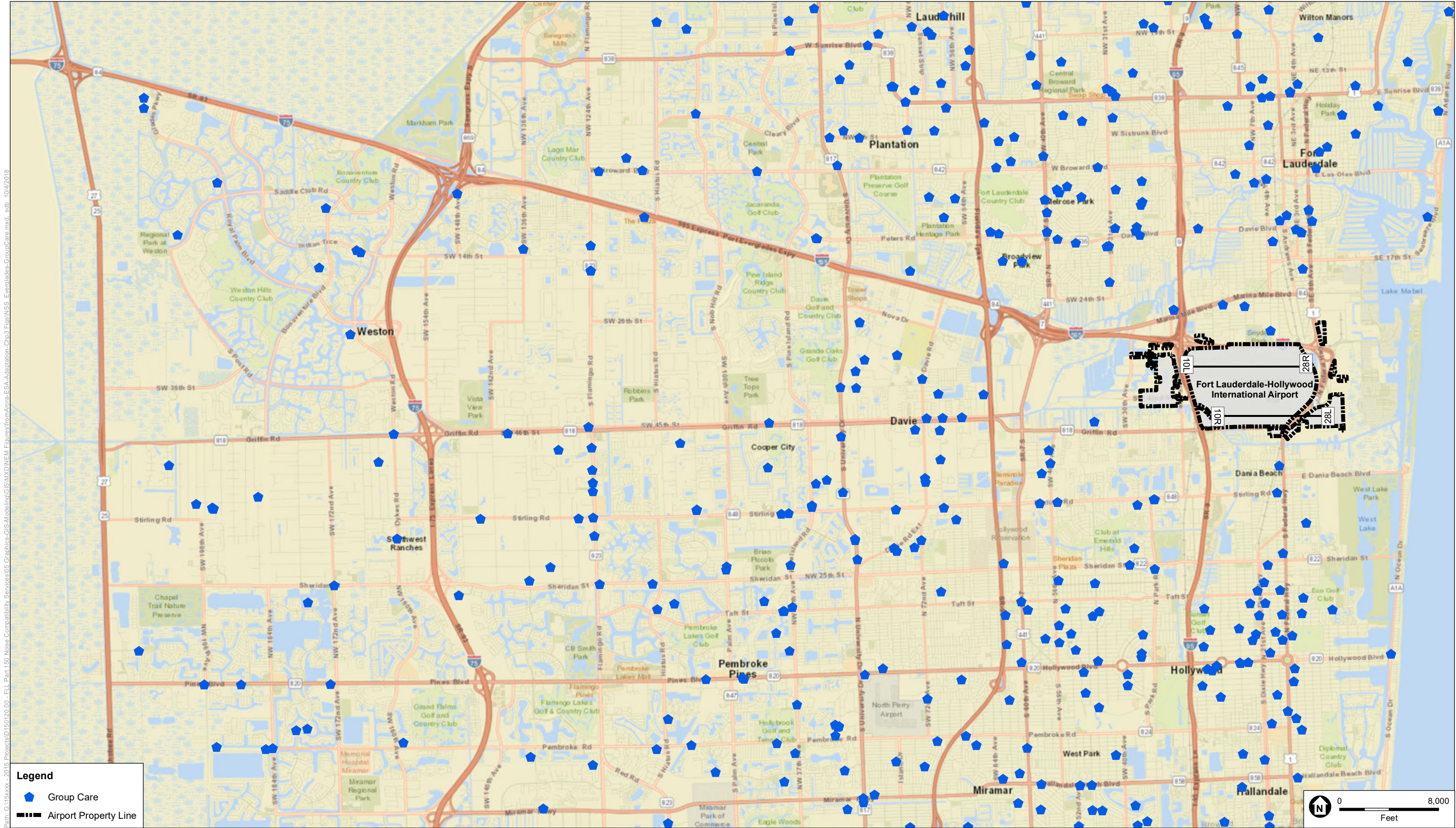






**This Page Intentionally Blank**





SOURCE: Esri; Broward County, Florida; Florida Geographic Data Library; Adapted by Arora Engineers and ESA, 2018

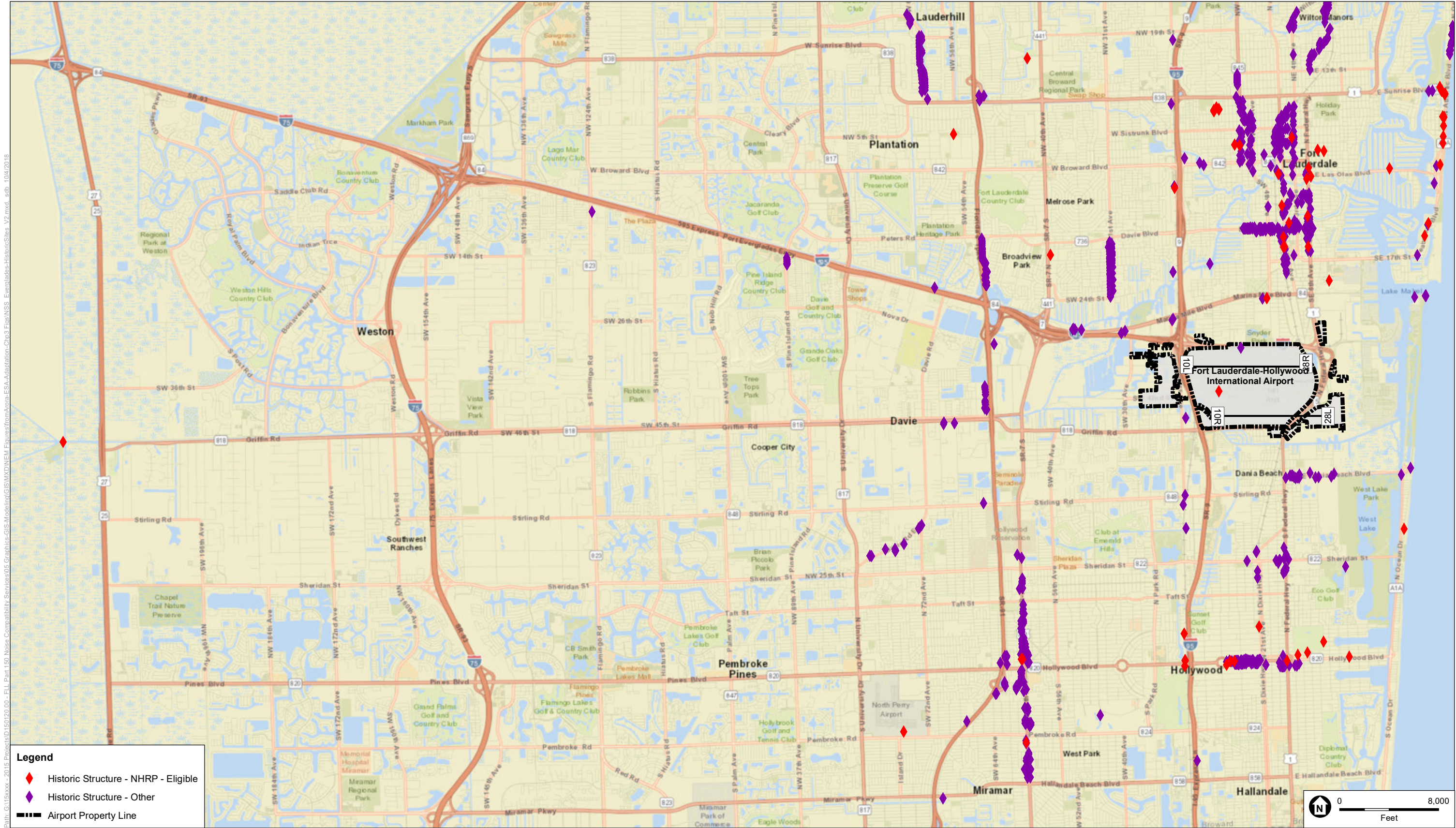
Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

**Figure 3-3**  
Generalized Noise Sensitive Uses - Group Care  
Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**





SOURCE: Esri; Broward County, Florida; Florida Geographic Data Library; Adapted by Arora Engineers and ESA, 2018

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

**Figure 3-4**  
Generalized Noise Sensitive Uses - Historic Structures  
Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**

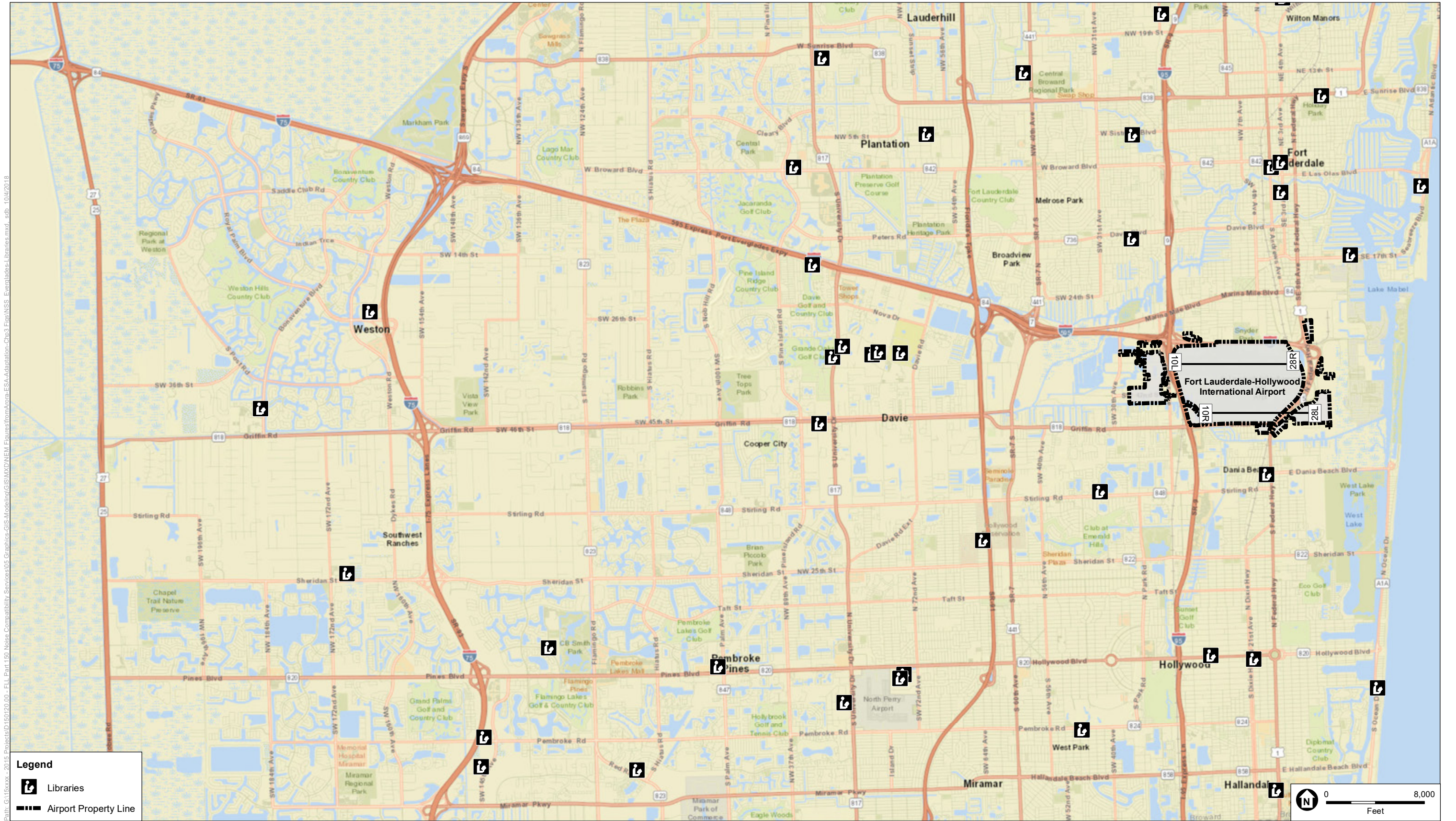






**This Page Intentionally Blank**





SOURCE: Esri; Broward County, Florida; Florida Geographic Data Library; Adapted by Arora Engineers and ESA, 2018

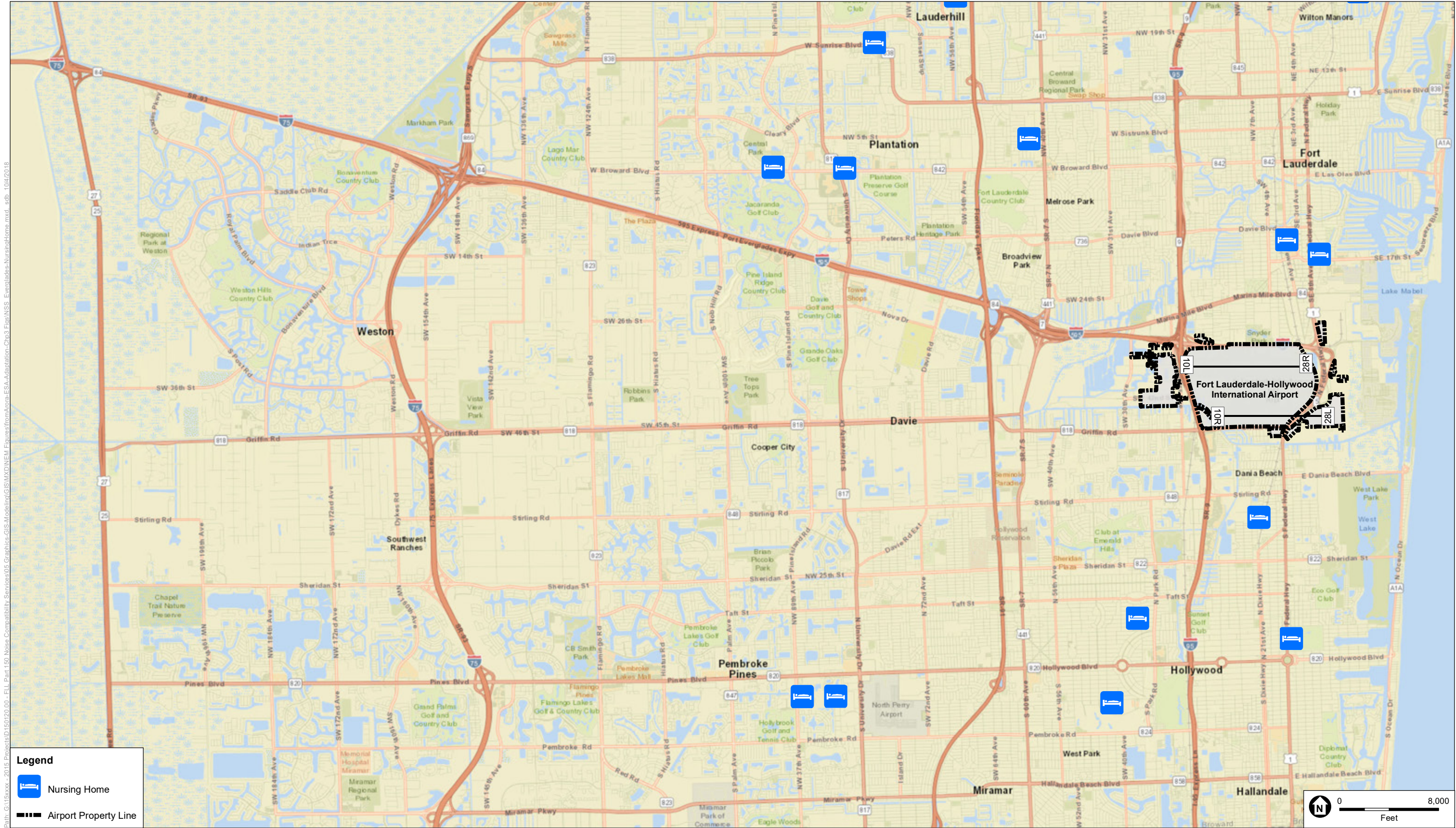
Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

**Figure 3-6**  
Generalized Noise Sensitive Uses - Libraries  
Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**





SOURCE: Esri; Broward County, Florida; Florida Geographic Data Library; Adapted by Arora Engineers and ESA, 2018

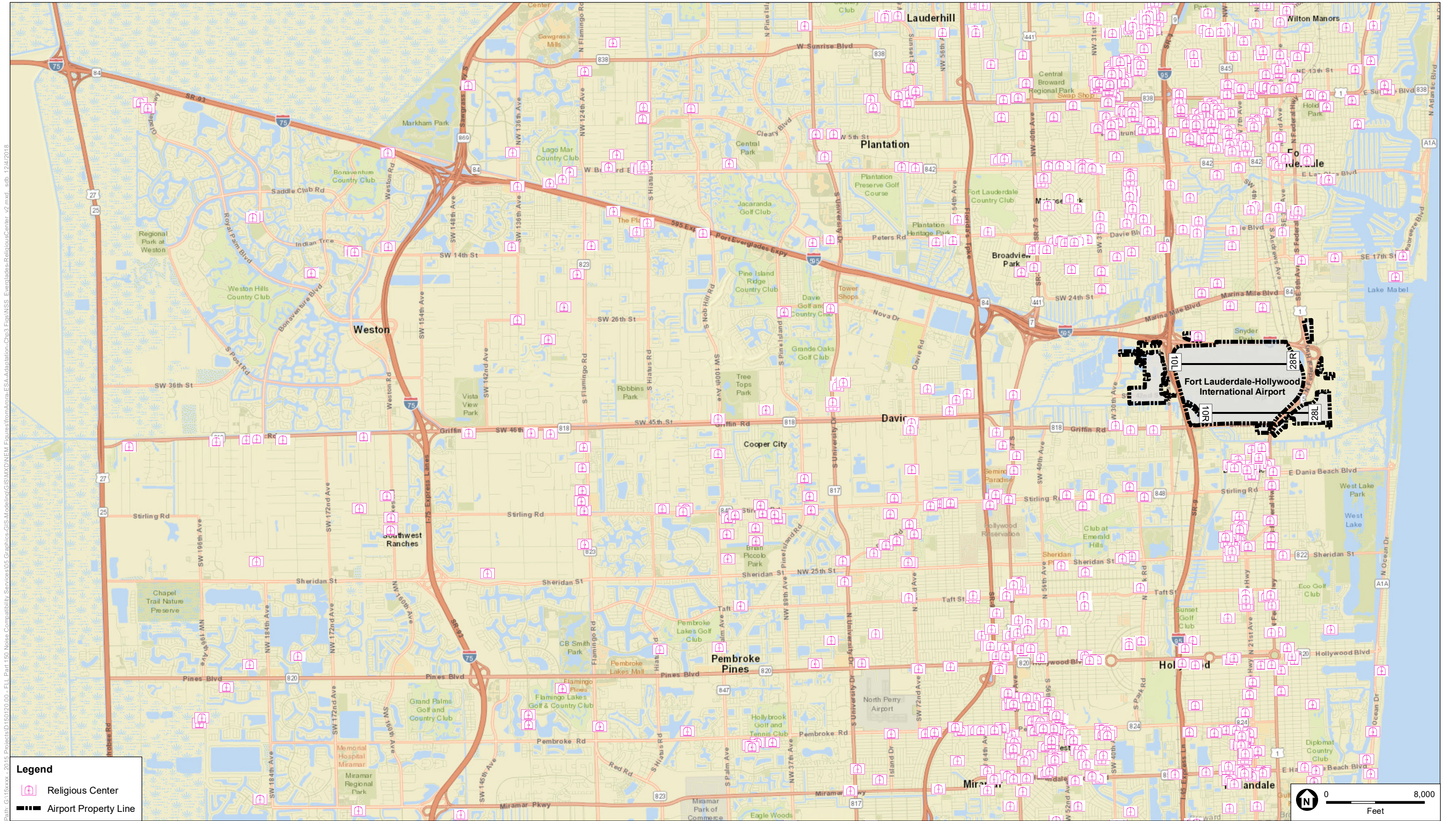
Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

**Figure 3-7**  
Generalized Noise Sensitive Uses - Nursing Home  
Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**





SOURCE: Esri; Broward County, Florida; Florida Geographic Data Library; Adapted by Arora Engineers and ESA, 2018  
 NOTE: Places of worship may have multiple buildings, which may result in multiple symbols for each parcel.

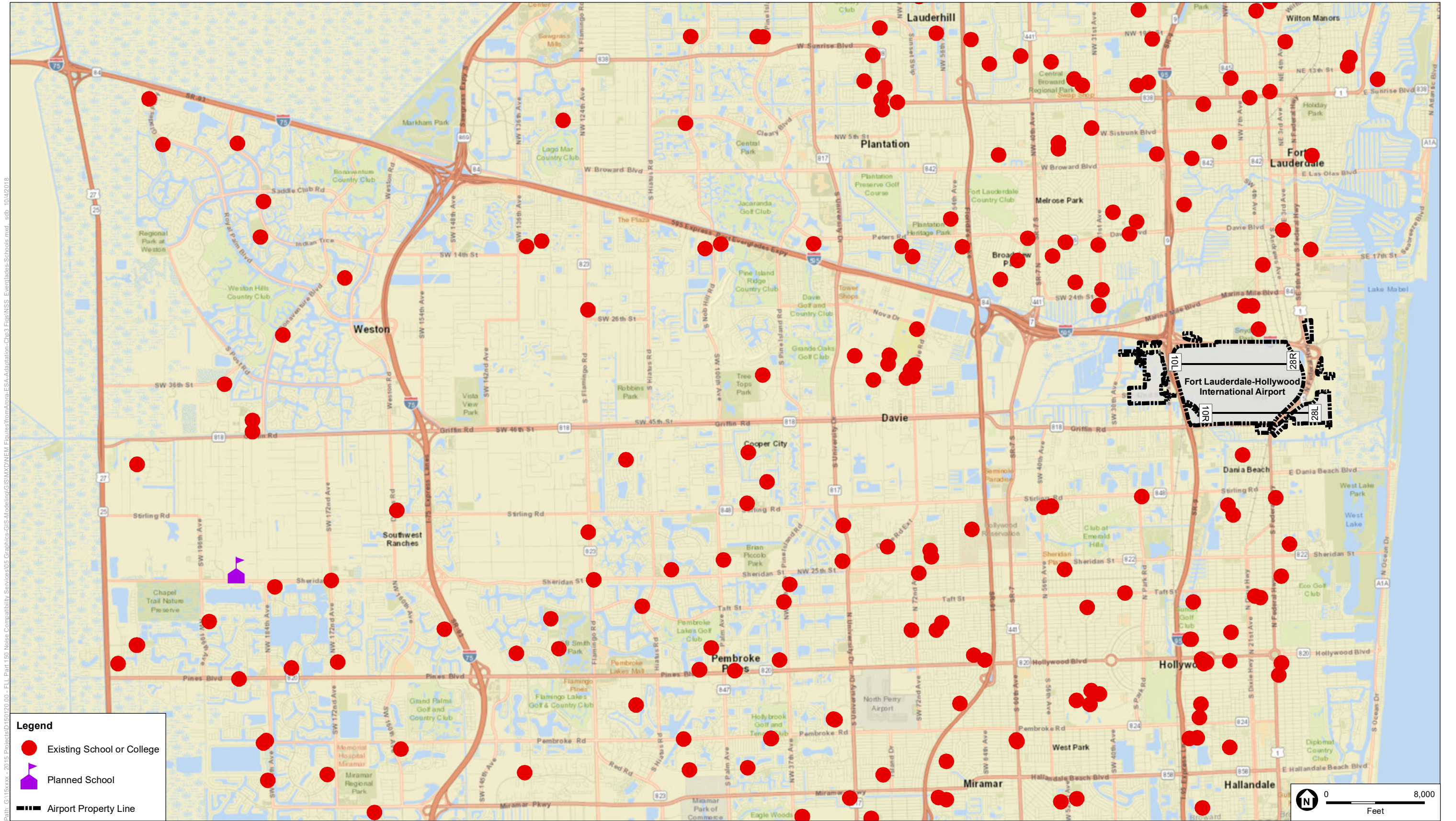
Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

**Figure 3-8**  
 Generalized Noise Sensitive Uses - Religious Center  
 Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**





SOURCE: Esri; Broward County School District Facility Planning and Real Estate Department, 04/2018; Adapted by Arora Engineers and ESA, 2018

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

**Figure 3-9**  
Generalized Noise Sensitive Uses - Public/Private Schools and Colleges  
Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**

# CHAPTER 4

---

## NEM Development

### 4.1 Introduction

This chapter summarizes the methods and data used to conduct the aircraft noise analysis and produce the noise exposure contours that are depicted on the NEMs. This chapter will provide information on the noise model used to calculate noise exposure, the noise metric used in this study, information used as inputs into the noise model, and information on noise monitors near FLL. Noise monitor data were not used as input into the noise model, as the FAA does not allow noise monitor data to be used to “calibrate” the noise model.

### 4.2 FAA Noise Model and Metrics

#### 4.2.1 Aviation Environmental Design Tool (AEDT)

The FAA’s Aviation Environmental Design Tool (AEDT) replaced the Integrated Noise Model<sup>18</sup> (INM) and Emissions and Dispersion Modeling System (EDMS) as the required model to calculate noise exposure, fuel burn, and emissions for federal actions that are required to comply with the National Environmental Policy Act (NEPA) and for 14 CFR Part 150 studies as of May 29, 2015. AEDT 2d was released on September 27, 2017 and was the latest FAA-approved noise model available at the time of the FLL 14 CFR Part 150 Study. This model was used to calculate noise exposure for the existing conditions (2018) and the five-year future year (2023) scenarios in this study.

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 profiles to develop noise exposure contours. During an annual average 24-hour period, referred to as “annual average day” (AAD), AEDT accounts for each aircraft flight along flight tracks departing from, or arriving to, an airport. The flight tracks are coupled with information in the model’s database relating to noise levels at varying distances and flight performance data for each type of aircraft. In general, the model computes and sums noise levels at grid locations 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. AEDT can also compute noise levels at user-defined points.

---

<sup>18</sup> Previous noise studies at FLL, including the EIS, were conducted using INM.

## 4.2.2 Day Night Average Sound Level

Day-Night Average Sound Level (DNL), expressed in A-weighted decibels<sup>19</sup> (dBA), accounts for the noise levels of all individual aircraft events, the number of times those events occur, and the period of day/night in which they occur. The calculation of DNL logarithmically averages aircraft sound levels at grid locations over a 24-hour period, with a 10-decibel adjustment added to those noise events occurring between 10:00 P.M. and 7:00 A.M. Because of the increased sensitivity to noise during normal sleeping hours and because ambient (without aircraft) sound levels during nighttime are typically lower than during daytime hours, the 10-decibel adjustment, or “weighting,” represents the added intrusiveness of sounds occurring during nighttime hours.

The DNL metric is the noise descriptor required by the FAA for aircraft noise exposure analyses under NEPA, FAA Order 1050.1F, and land use compatibility planning under 14 CFR Part 150.<sup>20</sup> A more detailed discussion of the AEDT and noise metrics is provided in **Appendix D**

## 4.3 Data for Developing Noise Exposure Map

The following sections summarize the information used to develop the noise exposure maps.

### 4.3.1 Aircraft Activity Levels

In accordance with 14 CFR Part 150, the FLL NEMs were prepared for two scenarios: existing conditions (2018) and a five-year future year (2023). To obtain aircraft activity levels for the development of the NEMs, either an existing forecast needed to be identified or a new forecast developed. Aviation activity forecasts for air carrier operations were developed in 2017 as part of the Airport Master Plan Update and provided by Ricondo & Associates, Inc.<sup>21</sup>

### 4.3.2 Forecasted Annual Aircraft Operations

The number of annual aircraft operations modeled for the 2018 study year and 2023 study year was obtained from the Accelerated Baseline Forecast scenario developed in Airport Master Plan Update. The Accelerated Baseline scenario projected 335,000 annual aircraft operations at FLL in 2018 and 364,765 annual aircraft operations in 2023. By comparison, the FAA’s 2014 Terminal Area Forecast (TAF) projected 311,559 operations in 2018 and 343,194 operations in 2023.<sup>22</sup> The FAA considers an airport’s forecasts consistent with the agency’s TAF if, “For all classes of airports, forecasts for total enplanements, based aircraft, and total operations are considered consistent with the TAF if they meet the following criterion: Forecasts differ by less than 10 percent

<sup>19</sup> When assessing the effect of sound on humans, sound is measured using an electronic filter that de-emphasizes frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear’s decreased sensitivity to extremely low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting, and A-weighted sound levels are expressed in units of A-weighted decibels (dBA).

<sup>20</sup> U.S. Department of Transportation. Federal Aviation Administration. Order 1050.1F, *Environmental Impacts: Policies and Procedures*. July 16, 2015.

<sup>21</sup> Ricondo & Associates, Inc. *Airport Master Plan Update – Demand/Capacity Assessment and Facility Requirements – Draft*. July, 2017.

<sup>22</sup> U.S. Department of Transportation. Federal Aviation Administration. *Terminal Area Forecast*. January, 2017.



in the 5-year forecast period, and 15 percent in the 10-year forecast period.”<sup>23</sup> The FLL Airport Master Plan Update forecast varies from the TAF by less than 10 percent in the 5 year period and less than 15 percent in the 10 year period. See **Appendix B** for the FAA forecast approval letter.

### 4.3.3 Aircraft Fleet Mix

The FLL Accelerated Baseline Forecast and information from BCAD’s Airport Noise and Operations Management System (ANOMS) was used to determine the types of aircraft (fleet mix) projected to operate at FLL in 2018 and 2023 and the number of operations generated by each aircraft type in those years. In addition, the FAA’s Civilian Aircraft Registry and FLL’s ANOMS data were utilized to identify different aircraft type and engine combinations. This information was then used to identify the corresponding aircraft within AEDT. Details pertaining to AEDT aircraft operations are included in **Appendix B-2**.

Table 4-1 Annual Aircraft Operations by AEDT Aircraft Type				
Aircraft Category	AEDT Aircraft Type	AEDT Engine Code	2018 Operations	2023 Operations
Widebody	7478	2GE045	2	3
	Airbus A300B4-600 Series	CF680C	36	45
	Airbus A300F4-600 Series	1PW056	922	344
	Airbus A310-300 Series	1PW027	65	81
	Airbus A330-300 Series	1PW059	545	170
	B787-8R	2GE048	967	1,324
	Boeing 747-400 Series	1GE024	7	9
	Boeing 767-200 Series	2GE039	7	9
	Boeing 767-200 Series	5PW074	136	211
	Boeing 767-300 Series	1RR011	2,158	3,357
	Boeing 767-400	3GE058	25	32
	Boeing 777-200 Series	1PW041	11	20
	Boeing 777-300 ER	7GE099	5	9
	Boeing 777-300 Series	6GE091	40	149
	Boeing DC-10-10 Series	3GE076	842	262
	Boeing DC-10-30 Series	1GE009	155	48
	Boeing MD-11	1PW056	121	38
	Boeing MD-11	CF680C	251	78
<b>Subtotal Widebody</b>			6,298	6,190
Narrowbody	Airbus A319-100 Series	7CM050	20,696	6,438
	Airbus A320-200 Series	2CM018	13,368	18,296
	Airbus A320-200 Series	3IA007	71,509	97,873

<sup>23</sup> FAA Director of Airport Planning and Programming (APP-1) guidance paper, *Review and Approval of Aviation Forecasts*, June 2008.

	Airbus A321-200 Series	11A005	29,250	40,035
	Boeing 717-200 Series	4BR002	2,213	275
	Boeing 727-100 Series	1PW010	39	48
	Boeing 727-200 Series	1PW015	19	24
	Boeing 737-100 Series	1PW006	7	9
	Boeing 737-300 Series	1CM004	6,383	794
	Boeing 737-400 Series	1CM005	92	115
	Boeing 737-500 Series	CFM3B4	2,339	2,910
	Boeing 737-700 Series	1CM007	35,364	33,002
	Boeing 737-800 Series	4CM039	37,974	51,975
	Boeing 757-200 Series	1RR012	1,458	453
	Boeing 757-200 Series	4PW073	6,984	2,172
	Boeing 757-300 Series	XPW204	1,047	326
	Boeing DC-9-30 Series	1PW008	8	11
	Boeing MD-81	4PW068	15	5
	Boeing MD-82	1PW018	91	28
	Boeing MD-83	4PW068	4,712	1,466
	Boeing MD-90	11A004	1,522	1,894
	Airbus A319-100 Series	7CM050	20,696	6,438
	Airbus A320-200 Series	2CM018	13,368	18,296
	Airbus A320-200 Series	31A007	71,509	97,873
	Airbus A321-200 Series	11A005	29,250	40,035
	Boeing 717-200 Series	4BR002	2,213	275
	Boeing 727-100 Series	1PW010	39	48
	Boeing 727-200 Series	1PW015	19	24
	Boeing 737-100 Series	1PW006	7	9
	Boeing 737-300 Series	1CM004	6,383	794
	Boeing 737-400 Series	1CM005	92	115
	Boeing 737-500 Series	CFM3B4	2,339	2,910
	Boeing 737-700 Series	1CM007	35,364	33,002
	Boeing 737-800 Series	4CM039	37,974	51,975
	Boeing 757-200 Series	1RR012	1,458	453
	Boeing 757-200 Series	4PW073	6,984	2,172
	Boeing 757-300 Series	XPW204	1,047	326
	Boeing DC-9-30 Series	1PW008	8	11
	Boeing MD-81	4PW068	15	5
	Boeing MD-82	1PW018	91	28
	Boeing MD-83	4PW068	4,712	1,466
	Boeing MD-90	11A004	1,522	1,894
<b>Subtotal Narrowbody</b>			<b>235,089</b>	<b>258,149</b>
Regional Jet	Bombardier Challenger 600	5GE084	3,965	4,028
	Bombardier Challenger 601	1GE034	8	10

	Bombardier CRJ-900	6GE092	928	1,155
	Bombardier Global 5000 Business	4BR009	625	832
	Bombardier Global Express	4BR002	419	688
	Embraer ERJ145	6AL008	1,329	1,362
	Embraer ERJ145-LR	6AL007	485	473
	Embraer ERJ170	6GE095	471	59
	Embraer ERJ175	6GE095	2	3
	Embraer ERJ190	6GE094	20,337	25,305
<b>Subtotal Regional Jet</b>			<b>28,572</b>	<b>33,915</b>
General Aviation	1985 1-ENG COMP	TIO540	857	966
	Aerospatiale SA-350D Astar (AS-350)	TPE3	8	10
	Aerospatiale SA-355F Twin Star (AS-355)	250B17	8	10
	Agusta A119	250B17	24	27
	Bell 206 JetRanger	250B17	11	12
	Bell 214B-1	T53L13	5	5
	Bell 407 / Rolls-Royce 250-C47B	250B17	10	11
	Bell 430	250B17	15	16
	Boeing DC-3	R1820	16	18
	Bombardier Learjet 25	CJ6106	17	19
	Bombardier Learjet 35	1AS002	7,395	7,597
	Bombardier Learjet 60	PW 305 SER	288	325
	Britten-Norman BN-2 Islander	250B17	28	31
	Cessna 150 Series	O200	557	628
	Cessna 172 Skyhawk	IO360	599	675
	Cessna 182	IO360	219	247
	Cessna 182 Float	TSIO36	2	3
	Cessna 206	TIO540	545	615
	Cessna 208 Caravan	PT6A14	7,975	8,383
	Cessna 441 Conquest II	TPE8	257	290
	Cessna 500 Citation I	1PW035	1,594	1,693
	Cessna 550 Citation II	1PW036	2,174	2,214
	Cessna 560 Citation V	1PW037	757	854
	Cessna 560 Citation V	PW530	195	220
	Cessna 560 Citation XLS	BIZMEDIUMJET_F	1,575	1,558
	Cessna 650 Citation III	1AS001	281	317
	Cessna 680 Citation Sovereign	7PW080	703	792
	Cessna 750 Citation X	6AL021	2,427	2,407
	Cessna 750 Citation X	AE 3007C2	23	26
	CESSNA CITATION 510	PW615F	390	440
	Dassault Falcon 20-C	1AS002	108	122
	Dassault Falcon 900	TFE 731 SER	120	135
	DeHavilland DHC-2 Mk III Beaver Float	PW610F	2	3



DeHavilland DHC-6-300 Twin Otter	PT6A42	4,033	4,084
DeHavilland DHC-8-100	PW120A	11	12
DeHavilland DHC-8-300	PW123B	1,716	1,641
EADS Socata TBM-700	PT6A-66 SER	90	101
Eclipse 500 / PW610F	PW610F-A	126	142
Embraer EMB120 Brasilia	PW118	7	8
Eurocopter EC-130	TPE3	18	20
Gulfstream G400	6RR042	2,310	2,314
Gulfstream G500	3BR001	1,282	1,258
Gulfstream II-B	1RR016	170	191
Hughes 500D	250B17	2	3
Israel IAI-1121 Commodore	CJ6102	702	791
Mitsubishi MU-300 Diamond	1PW037	791	808
Piper PA-24 Comanche	TIO540	614	693
Piper PA-28 Cherokee Series	IO320	6	7
Piper PA-30 Twin Comanche	IO320	97	109
Piper PA-42 Cheyenne Series	PT6A41	1,871	1,950
Raytheon Beech 1900-D	PT67D	56	63
Raytheon Beech 55 Baron	TIO540	3,832	4,320
Robinson R22B	IO320	6	7
Robinson R44 Raven / Lycoming O-540-F1B5	TIO540	10	11
Saab 340-B	CT7-5	18,065	17,269
Shorts 330	PT6A45	23	26
Sikorsky S-76 Spirit	T70070	13	15
T-38 Talon	J855HA	2	0
<b>Subtotal General Aviation</b>		65,041	66,512
<b>Total All Aircraft</b>		335,000	364,765
<b>NOTE:</b> An aircraft operation is equivalent to one arrival/landing or one departure/takeoff. <b>SOURCE:</b> Ricondo & Associates, Inc., 2017; Environmental Science Associates, 2018.			

### 4.3.4 Aircraft Operations by Time of Day

As discussed previously, aircraft operations modeled in AEDT are assigned as occurring during daytime or nighttime. **Table 4-2** summarizes time of day splits in which aircraft arrivals and departures are expected to occur in 2018 and 2023 (by percent of total operations). The 2016 ANOMS data served as the primary source for the operational splits and time of day information since ANOMS captures actual arrival and departure times, versus scheduled times. This accounts for delayed arrivals and departures that sometimes occur at FLL. While it is expected that the time of day splits for 2023 will be similar to the base conditions, the expected fleet changes result in some small differences, as shown in **Table 4-2**. A detailed breakout of operation times of day, by aircraft type, is provided in **Appendix B-2**.

**TABLE 4-2**  
**ANNUAL AIRCRAFT OPERATIONS (ALL AIRCRAFT) BY TIME OF DAY**

Study Year	Arrivals			Departures	
	Day	Night		Day	Night
2018	84.5%	15.5%		89.5%	10.5%
2023	84.1%	15.9%		89.1%	10.9%

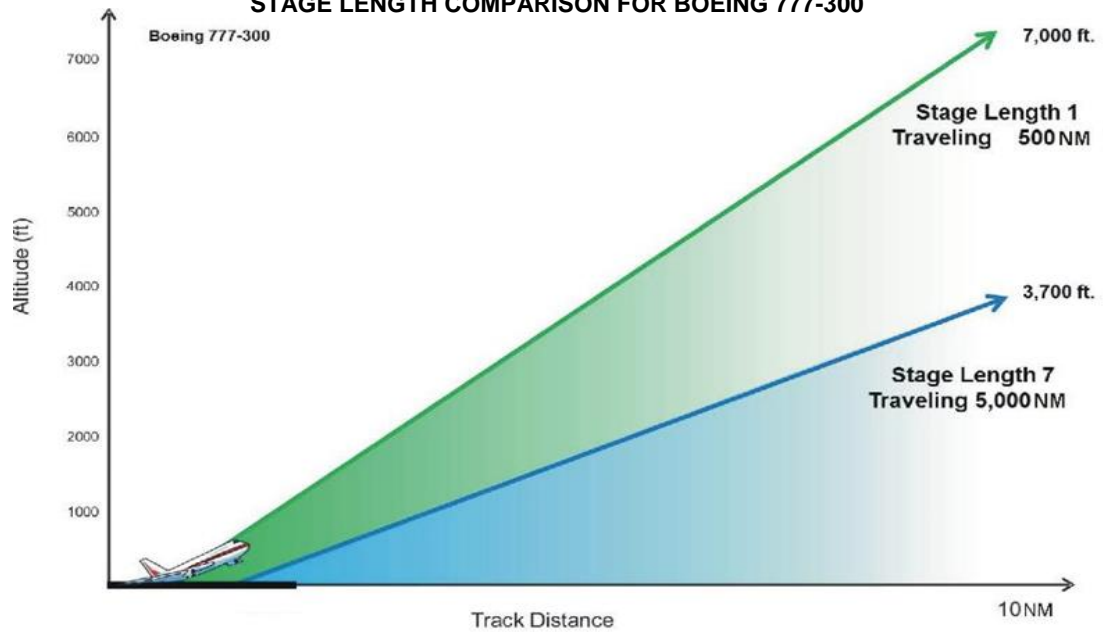
**NOTE:** An Aircraft operation is equivalent to one arrival/landing or one departure/takeoff.  
**SOURCE:** Environmental Science Associates, 2018; Broward County Aviation Department, Airport Noise and Operations Management System (ANOMS) data for calendar year 2016.

### 4.3.5 Departure Stage Length

Noise exposure from aircraft departures varies depending on takeoff weight. For example, a fully loaded aircraft departing on a long-haul flight typically weighs more on departure than the same fully loaded aircraft departing on a short-haul flight, due to the weight of the additional fuel needed to travel a longer distance (see **Figure 4-1**). A heavier aircraft typically requires higher power (thrust settings) to reach its takeoff speed and uses more runway length. Heavier aircraft also climb at a slower rate than lighter aircraft. Therefore, more land area can be exposed to higher levels of aircraft noise by departures of heavier aircraft. To account for this variance in aircraft weight, AEDT contains up to nine departure climb profiles (corresponding to different departure weights), depending on the type of aircraft. These profiles represent aircraft origin-to-destination trip lengths from 500 nautical miles to over 6,500 nautical miles. The trip distances for each stage length are shown in **Table 4-3**.

Calendar year 2016 ANOMS operations data were analyzed to determine existing departure stage lengths at FLL by aircraft type and assist with projecting stage lengths in 2018 and 2023. **Table 4-4** summarizes the projected departure stage lengths for all aircraft at FLL in 2018 and 2023, respectively. A breakout of stage length by aircraft type is provided in **Appendix B-2**.

**FIGURE 4-1  
STAGE LENGTH COMPARISON FOR BOEING 777-300**



**TABLE 4-3  
AEDT DEPARTURE STAGE LENGTH CATEGORIES**

Stage Length Category	Departure Route/ Trip Length (nautical Miles)
1	0 - 500
2	501 - 1,000
3	1,001 - 1,500
4	1,501 - 2,500
5	2,501 - 3,500
6	3,501 - 4,500
7	4,501 - 5,500

**SOURCE:** Federal Aviation Administration, 2018



**TABLE 4-4**  
**DEPARTURE STAGE LENGTH (ALL AIRCRAFT)**

Study Year	Stage Length Category						
	1	2	3	4	5	6	7
<b>2018</b>	<b>28.72%</b>	<b>50.38%</b>	<b>15.53%</b>	<b>4.87%</b>	<b>0.25%</b>	<b>0.23%</b>	<b>0.02%</b>
<b>2023</b>	<b>27.78%</b>	<b>48.77%</b>	<b>17.35%</b>	<b>5.60%</b>	<b>0.31%</b>	<b>0.15%</b>	<b>0.04%</b>

**NOTE:** Values may not add to 100 percent due to rounding. No aircraft exceeded a departure stage length of 7.  
**SOURCE:** Environmental Science Associates, 2018; Broward County Aviation Department, Airport Noise and Operations Management System (ANOMS) data for calendar year 2016.

## 4.4 Meteorological Conditions

AEDT accounts for the influences of meteorological conditions on aircraft performance and atmospheric sound absorption, using temperature and relative humidity to calculate atmospheric absorption coefficients, which in turn are used to adjust standard aircraft performance noise-power-distance curve levels. For example, hotter temperatures reduce the climb performance of aircraft and result in more land area exposed to higher levels of aircraft noise by departures. For both the 2018 and 2023 NEMs, the AEDT default meteorological data for FLL was used. This included 30-year averages recorded at the station: 75 degrees Fahrenheit, 73.3 percent relative humidity, and sea level pressure of 1017.1 millibars. AEDT default meteorological data for FLL also included a default headwind of 7.94 knots.

## 4.5 Airport Operational Information

### 4.5.1 Runway Use

Runway use refers to the frequency with which aircraft utilize each runway end for departures and arrivals. The more often a runway is used, the more noise is generated in areas located off each end of the runway. Runway utilization data were derived from ANOMS data for calendar year 2016. ANOMS data for 2016 were utilized because 2017 had runway closures that affected runway utilization, which would have been inaccurately reflected if used for 2018 and 2023. **Tables 4-5 and 4-6** provide a summary of arrival and departure runway utilization. For existing condition (2018), Runway 10L/28R was projected to be used for approximately two thirds of daytime activity and more than 90 percent of nighttime activity. As activity increases at the airport through 2023 and the gate improvements in the south terminal area are completed, it is expected that the 10R/28L will begin to support a larger percentage of aircraft operations. A detailed breakout of arrival and departure runway utilization by aircraft category, is provided in **Appendix B-2**.

**TABLE 4-5**  
**ARRIVAL RUNWAY USE (ALL FIXED-WING AIRCRAFT)**

Arrivals (Time of Day)	Runway			
	10L	28R	10R	28L
<b>2018</b>				
Daytime Arrivals	52.6%	12.5%	28.0%	6.9%
Nighttime Arrivals	73.8%	17.6%	7.4%	1.2%
<b>2023</b>				
Daytime Arrivals	51.8%	12.0%	28.9%	7.2%
Nighttime Arrivals	73.5%	17.6%	7.6%	1.3%
<b>NOTE:</b> Does not include helicopter operations. Values may not add to 100 percent due to rounding. <b>SOURCE:</b> Environmental Science Associates, 2018; Broward County Aviation Department, ANOMS data for calendar year 2016.				

**TABLE 4-6**  
**DEPARTURE RUNWAY USE (ALL FIXED-WING AIRCRAFT)**

Departures (Time of Day)	Runway			
	10L	28R	10R	28L
<b>2018</b>				
Daytime Departures	49.2%	12.5%	31.6%	6.7%
Nighttime Departures	64.3%	16.5%	15.8%	3.4%
<b>2023</b>				
Daytime Departures	46.9%	11.8%	34.0%	7.2%
Nighttime Departures	62.7%	16.0%	17.4%	3.8%
<b>NOTE:</b> Does not include helicopter operations. Values may not add to 100 percent due to rounding. <b>SOURCE:</b> Environmental Science Associates, 2018; Broward County Aviation Department, ANOMS data for calendar year 2016.				

## 4.5.2 Flight Tracks and Utilization

Flight tracks refer to the route an aircraft follows when arriving to or departing from a runway. To identify flight tracks that represent annual average day conditions at FLL, aircraft arrival and departure data from ANOMS were reviewed for calendar year 2016. The 2016 data were used to develop the flight tracks for use in AEDT. The 2016 data provided information on the following parameters:

- Arrival and departure paths

- Arrival and departure times
- Arrival and departure profiles
- Departure stage lengths

Flight corridors utilized by arriving and departing aircraft to and from each runway end were reviewed and a series of centerlines of the flight corridors (backbone tracks) were established. These tracks were dispersed within AEDT to generate sub-tracks in order to distribute the aircraft within each of the primary flight corridors based on the actual distribution of radar tracks. The AEDT flight tracks are depicted on **Figures 4-2 through 4-3**. Additional graphics that provide a more detailed depiction of FLL's arrival and departure flight tracks are provided in **Appendix F**, and large-scale drawings are included in **Appendix K**. The flight tracks and their respective utilization rates are forecast to remain constant for the 2018 and 2023 study years. Flight track utilization, by time of day, is provided in **Appendix B-2, Tables B-2.13 and B-2.14**.

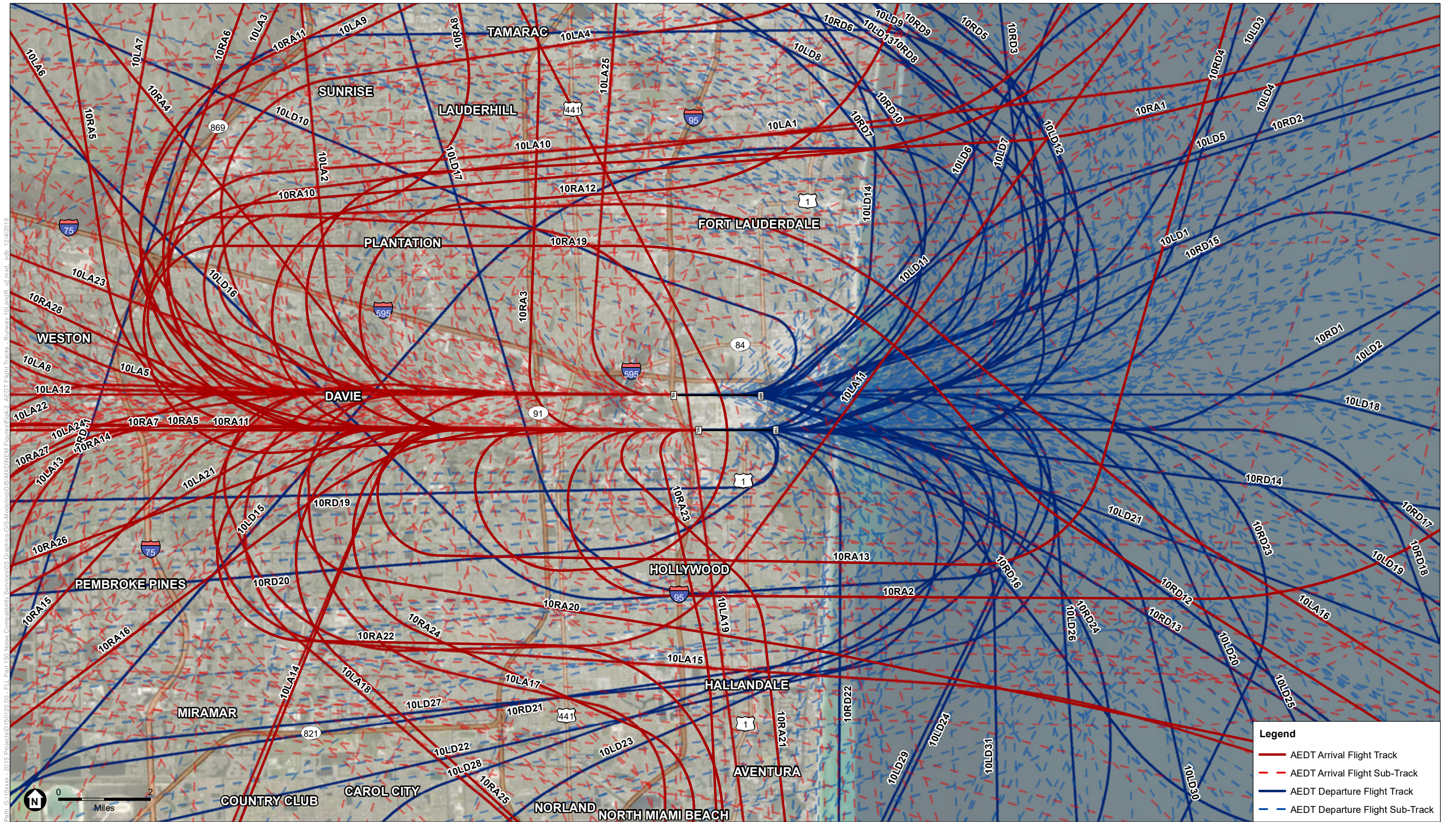
### 4.5.3 Departure and Arrival Profiles

Aircraft arrival and departure flight profile data contained in ANOMS were reviewed. Based on this review, it was determined that no modifications to AEDT's standard departure and arrival profiles were necessary for the FLL 14 CFR Part 150 Study.



**This Page Intentionally Blank**





SOURCE: AEDT 2d; ESA, 2018; World Imagery (Aerial)  
 NOTE: AEDT flight sub-tracks are used to replicate radar track dispersion.

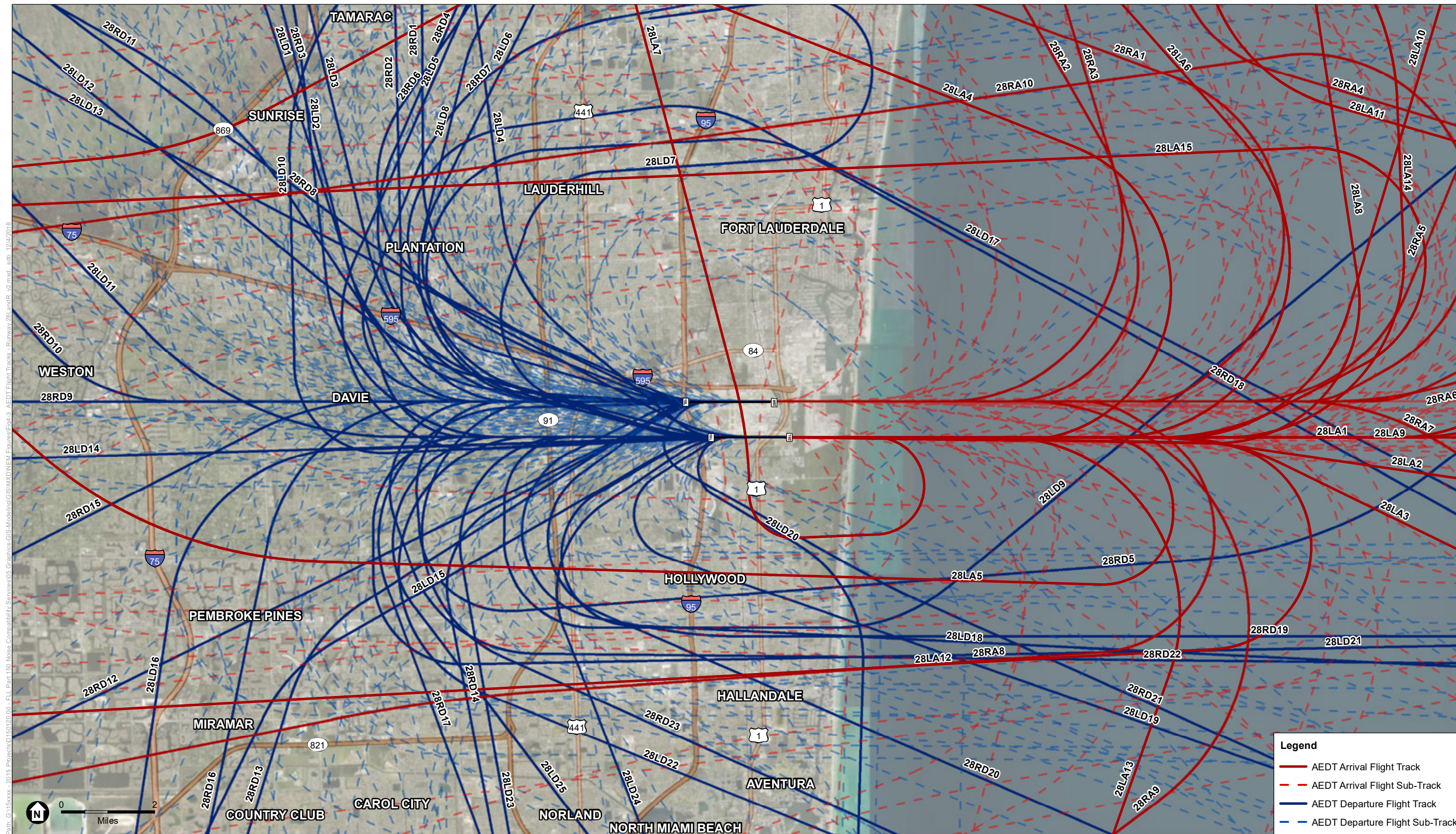
Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

**Figure 4-2**  
 AEDT Flight Tracks - Runways 10L and 10R  
 Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**





SOURCE: AEDT 2d; ESA, 2018; World Imagery (Aerial)  
 NOTE: AEDT flight sub-tracks are used to replicate radar track dispersion.

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

**Figure 4-3**  
 AEDT Flight Tracks - Runways 28L and 28R  
 Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**

# CHAPTER 5

---

## 2018 and 2023 Noise Exposure

### 5.1 Introduction

This chapter presents the 2018 Existing Conditions and 2023 Future Conditions DNL contours for FLL. As discussed in **Chapter 4**, the contours show how noise from aircraft operations is distributed over the surrounding area. This chapter identifies land use compatibility using FAA guidelines, identifies noise sensitive locations, and quantifies the types of land uses and population within the DNL 65 and higher contours.

14 CFR Part 150 requires that the aircraft noise exposure for the year of submittal (in this case 2018) and for a future year (2023) be developed. The DNL 65, DNL 70, and DNL 75 contours are the only contours required by the FAA for inclusion in a 14 CFR Part 150 Study and for the agency's acceptance of the NEMs. Specific elements that are required to be included on the existing and future NEMs and required supplemental graphics are identified in 14 CFR Part 150. These include depictions of noise sensitive sites within the DNL 65 contour. The official FLL 2018 and 2023 NEMs are included in **Appendix K** of this report. The 2023 Future Conditions NEM reflects noise exposure levels around FLL that would occur without the implementation of a Noise Compatibility Program.

### 5.2 2018 Noise Exposure

**Figure 5-1** depicts the 2018 Existing Conditions DNL contours superimposed on an existing land use map. In accordance with 14 CFR Part 150, the DNL 65, DNL 70, and DNL 75 contours are shown. Furthermore, the contours accurately represent noise based on airport and operational data that are representative of the year 2018, as described in **Section 4.3**. The figure also depicts community and geographic reference points, such as FLL's boundary and runways, political boundaries, area roads and highways, and waterbodies. This figure assists in understanding the geographic relationship of FLL's DNL contours to the surrounding community.

The long, relatively narrow shape of the contours extending off of Runways 10L and 10R are consistent with runways that are primarily used for arrivals. The wider, more varied shape of the contours located off of the ends of Runways 28R and 28L are consistent with runways that are heavily used by departures. The largest concentration of noise exposure occurs off the approach and departure ends of the north runway. Small bumps in the sides of the DNL contours, particularly to the north and south, reflect the influence of departure turns.



## 5.2.1 Land Use Compatibility – 2018

The total area encompassed by the 2018 DNL 65 and greater contour is approximately 3,446 acres. Land uses located within the 2018 DNL 65 and higher contours were identified by overlaying the contours on parcel-level land use data provided by Broward County. Using geographic information system (GIS) software, the types and amount of land uses were calculated. The total acres for each land use category within the DNL 65 and higher contours are shown in **Table 5-1**. Broward County and the Cities of Dania Beach, Fort Lauderdale, and Hollywood and the Town of Davie are the public agencies with zoning and planning authority for land within the 2018 DNL 65 contour.

The FAA’s Land Use Compatibility Guidelines discussed in Section 3.3 show that noise-sensitive land uses such as residential, mobile home parks, transient lodging (e.g., hotels and motels), schools, and outdoor music venues are not compatible with noise levels of DNL 65 or higher. Other noise-sensitive land uses such as hospitals, nursing homes, churches, auditoriums, and concert halls are generally compatible with noise levels between DNL 65 and DNL 75 when measures that achieve an outdoor-to-indoor Noise Level Reduction (NLR) of 25 to 30 decibels are incorporated into the structures.<sup>24</sup> Commercial, manufacturing, and recreational land (parks, amusement parks, zoos, etc.) are generally less sensitive to noise and considered compatible with noise levels up to DNL 70 (parks are compatible up to DNL 75). Commercial and manufacturing properties are compatible with noise levels up to DNL 80 with NLR of 25 to 30 decibels.

As shown in **Table 5-1**, the 2018 NEM DNL 65 and higher contours contain approximately 31 acres of Single and Two-Family Residential land use, and 0.3 acres of Multi-Family Residential land uses. Aside from water (approximately 198 acres), the majority of the non-residential land uses exposed to aircraft noise of DNL 65 and higher in 2018 are Utilities (approximately 150 acres), Transportation and Parking (approximately 2,341 acres), Industrial and Manufacturing (282 acres), Public Facilities and Institutions (approximately 123 acres). There are approximately 89 acres of Parks, Open Space, and Agriculture within the 2018 DNL 65 contour including a portion of John U. Lloyd Beach State Park to the east of the airport and Snyder Park to the north of the airport. Within the DNL 65 – 70 contours, there are approximately 77 acres of Parks, Open Space, and Agriculture. And approximately 13 acres within the DNL 70 – 75 contours. Per 14 CFR Part 150, recreational land, within the DNL 65 – 75 contours, is considered to be compatible (see **Table 3-1**).

<sup>24</sup> Normal residential construction can be expected to provide an outdoor to indoor NLR of 20 dB.

**TABLE 5-1**  
**LAND USES EXPOSED TO DNL 65 AND HIGHER - 2018**

Land Use Category <sup>1</sup>	Land Uses exposed to DNL 65 and Higher (acres) <sup>2</sup>				Housing Units <sup>3</sup>	Population <sup>3</sup>
	DNL 65-70	DNL 70-75	DNL 75+	Total		
Single and Two Family Residential	30.8	0.0	0.0	30.8	226	475
Multi-Family Residential	0.3	0.0	0.0	0.3	12	22
Utilities	143.2	7.2	0.0	150.4	-	-
Commercial and Office	11.9	2.7	0.0	14.6	-	-
Industrial and Manufacturing	240.8	41.2	0.0	282.0	-	-
Transportation and Parking	1,282.3	598.8	459.6	2,340.6	-	-
Public Facilities and Institutions	121.3	1.2	0.0	122.6	-	-
Parks, Open Space, and Agriculture	76.7	12.7	0.0	89.4	-	-
Vacant	214.1	3.2	0.0	217.3	-	-
Water (Off Airport Property)	154.4	43.0	0.0	197.5	-	-
<b>Total</b>	<b>2,276.0</b>	<b>710.0</b>	<b>459.6</b>	<b>3,445.7</b>	<b>238</b>	<b>497</b>

**NOTE:** Land uses acreage present within the DNL 70-75 contours may be shown as 0.0 due to rounding. Totals may not add up, due to rounding.

**SOURCES:**

<sup>1</sup> Land Use Categories derived from October 2017 Broward County parcel data with land use information

<sup>2</sup> Noise contours from Environmental Science Associates (ESA)

<sup>3</sup> Housing units and population estimates derived from 2010 Census block-level data.

## 5.2.2 Population within 2018 DNL Contours

**Table 5-2** presents the estimated number of households, population, and the noise sensitive sites exposed to DNL 65 and higher in 2018. Based on demographic data by census block from the U.S. Census Bureau's 2010 Decennial Census and parcel data gathered through the Florida Geographic Data Library (FGDL), 238 housing units are exposed to aircraft noise of DNL 65 and higher in 2016.

The population exposed to aircraft noise of DNL 65 and higher was determined by calculating the average number of persons per household in each individual census block within the DNL 65 and higher contours and multiplying that number by the number of households within each census block (or portion thereof located within the DNL 65 and higher contours). The population within each individual block (or portion thereof) was then summed to quantify the total number of persons within the DNL 65 and higher contours. The total population exposed to aircraft noise of DNL 65 and higher was estimated to be approximately 497 persons.

**TABLE 5-2**  
**NOISE SENSITIVE SITES EXPOSED TO DNL 65 AND HIGHER - 2018**

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

**SOURCES:**<sup>1</sup> Noise contours from Environmental Science Associates (ESA)<sup>2</sup> Housing units and population estimates derived from 2010 Census block-level data.<sup>3</sup> Public school data from Broward County Public Schools; private schools from Florida Geographic Data Library (FGDL).<sup>4</sup> All other noise sensitive site data from Florida Geographic Data Library (FGDL).

Of the 238 housing units exposed to aircraft noise of DNL 65 and higher in 2018,<sup>25</sup> 148 are included in the footprint of the ongoing FLL Sound Insulation Program (see **Section 2.6.1**). The remaining 90 units (**Table 5-3**), a combination of mobile or manufactured homes and single family residences, are located at the westernmost tip of the DNL 65 contour along the extended approach to Runway 10L as depicted in **Figure 5-2**.

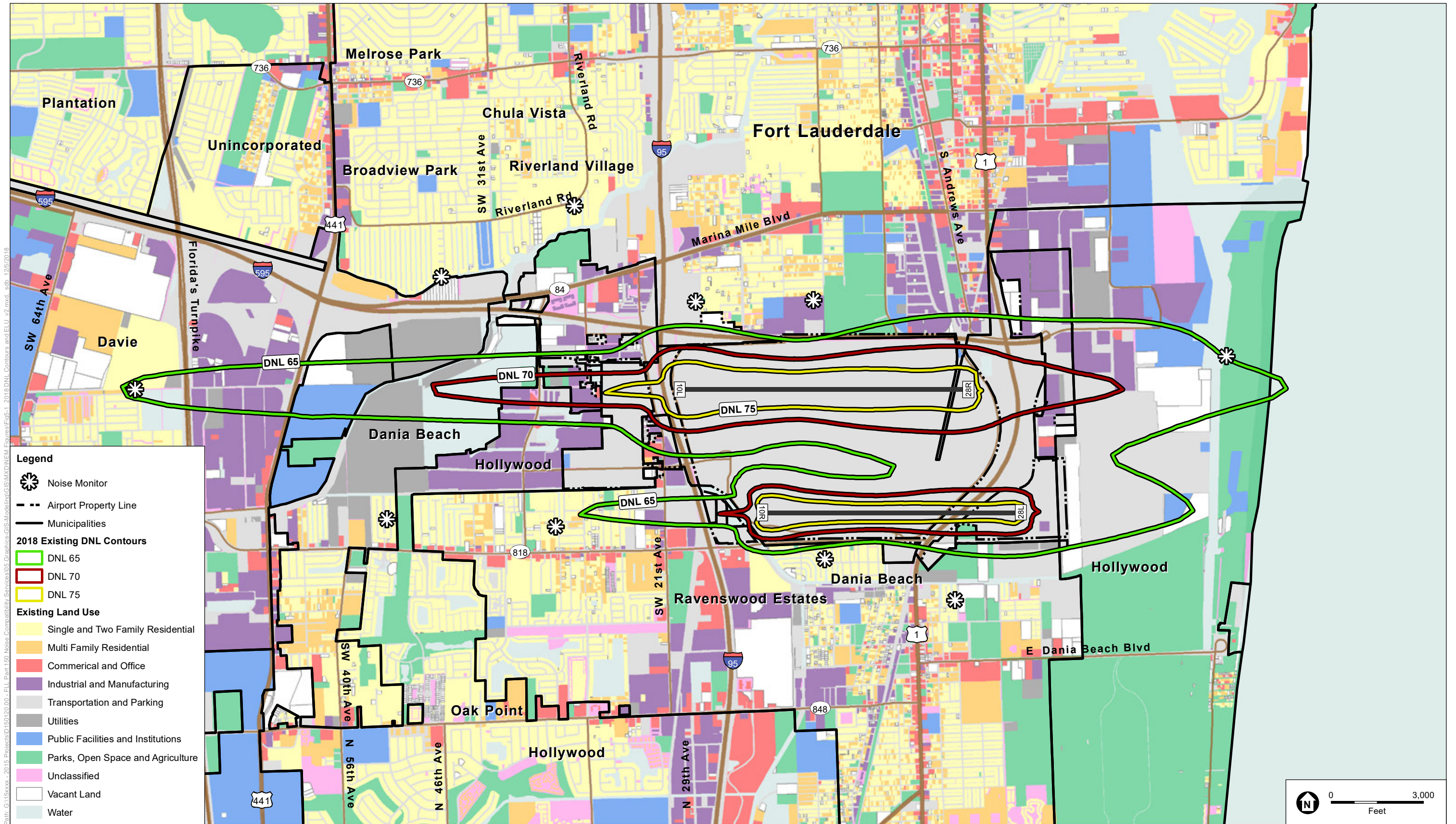
**TABLE 5-3**  
**HOUSING UNITS AND POPULATION NOT**  
**IN CURRENT FLL SOUND INSULATION PROGRAM<sup>1</sup> - 2018**

Noise Level <sup>2</sup>	Housing Units <sup>3</sup>	Population <sup>3</sup>
<b>DNL 65-70</b>	<b>90</b>	<b>190</b>
<b>DNL 70-75</b>	<b>0</b>	<b>0</b>
<b>DNL 75+</b>	<b>0</b>	<b>0</b>
<b>TOTAL:</b>	<b>90</b>	<b>190</b>

**SOURCES:**<sup>1</sup> FLL Sound Insulation Program housing unit data from Broward County Aviation Department. All housing units within the existing SIP boundary were excluded from this table regardless if they received treatment, elected to not participate or were deemed compatible through interior testing or determined ineligible.<sup>2</sup> Noise contours from Environmental Science Associates (ESA)<sup>3</sup> Housing units and population estimates derived from 2010 Census block-level data.

<sup>25</sup> A housing unit was included in the counts if any part of the related parcel is located within the DNL 65 dB contour boundary. These counts may include residences that are part of the existing sound insulation program as well as those deemed compatible due to noise testing. Potential eligibility for any future noise program consideration will depend on the specific recommendations of the NCP and may include increases in the number of units due to block rounding (etc.), and decreases due to testing and consideration of other factors (year of construction, etc.).





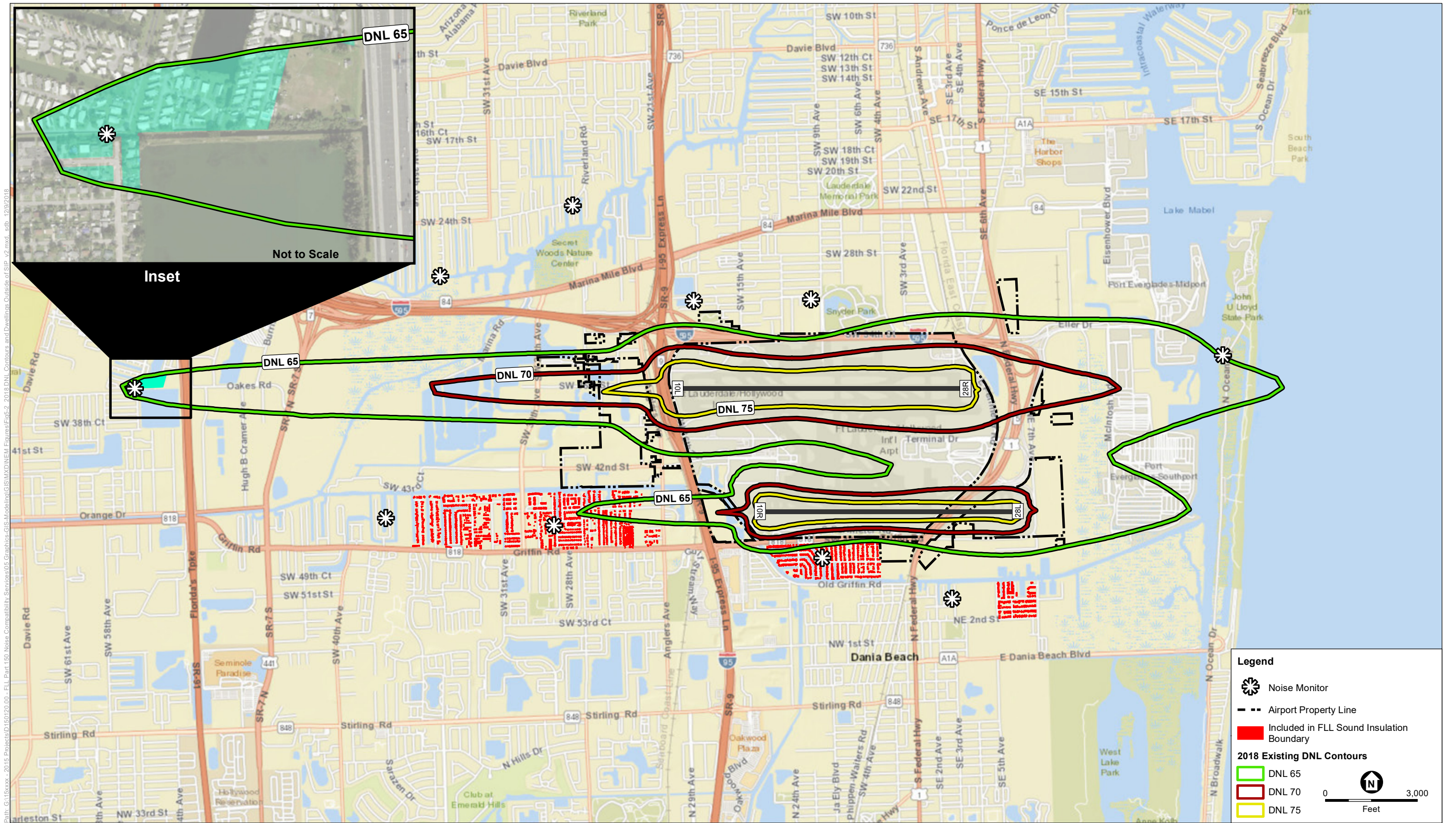
SOURCE: Esri; Broward County GIS Parcel Data Set, October 2017; AEDT 2d; Adapted by Arora Engineers and ESA, 2018

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

**Figure 5-1**  
2018 DNL Contours and Generalized Existing Land Uses  
Fort Lauderdale-Hollywood International Airport

**This Page Intentionally Blank**





SOURCE: Esri; AEDT 2d; ESA, 2018

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

**Figure 5-2**  
2018 DNL Contours and Dwellings Outside of the Sound Insulation Program  
Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**

## 5.3 2023 Noise Exposure

The 2023 Future Conditions DNL contours are depicted on **Figure 5-3**. Similar to **Figure 5-1**, the 2023 contours are superimposed over a future land use map. In accordance with 14 CFR Part 150, the 2023 contours reflect the anticipated noise conditions based on airport and operational data that are representative of the year 2023, as described in **Section 4.3**. As discussed in **Section 4.5.1**, the planned terminal improvements and additional gates are expected to affect airfield operations and increase the use of Runway 10R/28L in the year 2023. Compared to the 2018 contours, the size and shape of the 2023 contours are similar, but reflect an increase in noise exposure relative to increased use of the south runway. The increase in contour size is primarily associated with arrivals to Runways 10R and 28L, which extend the contours to the west and east (respectively) reflecting the increase in activity between 2018 and 2023.

### 5.3.1 Land Use Compatibility – 2023

The total area encompassed by the 2023 DNL 65 and higher noise contours is approximately 3,888 acres. The type and amount of land uses within the DNL 65 and higher contours are provided in **Table 5-4**. As shown the table, the 2023 DNL 65 and higher contours contain approximately 77 acres of Single Family and Two-Family Residential land use, and approximately 0.3 acres of Multi-Family Residential.

Excluding water (approximately 214 acres), the majority of the non-residential land uses exposed to aircraft noise of DNL 65 and higher in 2023 are Utilities (approximately 154 acres), Transportation and Parking (approximately 2,612 acres), Industrial and Manufacturing (approximately 296 acres) and Public Facilities and Institutions (approximately 129 acres). There are approximately 129 acres of Parks, Open Space, and Agriculture within the 2023 DNL 65 contour. Similar to 2018, this includes a portion of John U. Lloyd Beach State Park to the east of the airport and Snyder Park to the north of the airport. Within the DNL 65 – 70 contours, there are approximately 113 acres of Parks, Open Space, and Agriculture., and approximately 16 acres within the DNL 70 – 75 contours. Per 14 CFR Part 150, recreational land within the DNL 65 – 75 contours is considered to be compatible (see **Table 3-1**). There is no land designated Parks, Open Space, and Agriculture that is exposed to aircraft noise of greater than DNL 75.

**TABLE 5-4**  
**LAND USES EXPOSED TO DNL 65 AND HIGHER - 2023**

Land Use Category <sup>1</sup>	Land Uses exposed to DNL 65 and Higher (acres) <sup>2</sup>				Housing Units <sup>3</sup>	Population <sup>3</sup>
	DNL 65-70	DNL 70-75	DNL 75+	Total		
Single and Two Family Residential	76.9	0.0	0.0	76.9	536	1,099
Multi-Family Residential	0.3	0.0	0.0	0.3	12	22
Utilities	146.8	7.4	0.0	154.2	-	-
Commercial and Office	13.9	2.7	0.0	16.7	-	-
Industrial and Manufacturing	248.6	47.8	0.0	296.4	-	-
Transportation and Parking	1,429.3	679.6	503.3	2,612.1	-	-
Public Facilities and Institutions	128.0	1.3	0.0	129.3	-	-
Open Space, Cemeteries, and Outdoor Recreation	113.2	15.6	0.0	128.8	-	-
Vacant	255.6	4.2	0.0	259.8	-	-
Water (Off Airport Property)	166.3	47.2	0.0	213.5	-	-
<b>Total</b>	<b>2,579.0</b>	<b>805.7</b>	<b>503.3</b>	<b>3,888.0</b>	<b>548</b>	<b>1,121</b>

**NOTE:** Land use acreages present within the DNL 70-75 contours may be shown as 0.0 due to rounding. Totals may not add up, due to rounding.

**SOURCES:**

<sup>1</sup> Land Use Categories derived from October 2017 Broward County parcel data with land use information

<sup>2</sup> Noise contours from Environmental Science Associates (ESA)

<sup>3</sup> Housing units and population estimates derived from 2010 Census block-level data.

## 5.3.2 Population within 2023 DNL Contours

**Table 5-5** presents the estimated number of households, population and the noise sensitive sites exposed to DNL 65 and higher in 2023. Based on demographic data by census block from the U.S. Census Bureau's 2010 Decennial Census and parcel data gathered through the Florida Geographic Data Library (FGDL), the total number of households and population exposed to aircraft noise of DNL 65 and higher would be 548 and 1,121 respectively. When compared to 2018, this represents an increase of approximately 310 housing units and 624 people, as a result of the forecasted increase in aircraft operations at FLL.



**TABLE 5-5**  
**NOISE SENSITIVE SITES EXPOSED TO DNL 65 AND HIGHER - 2023**

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

**SOURCES:**<sup>1</sup> Noise contours from Environmental Science Associates (ESA)<sup>2</sup> Housing units and population estimates derived from 2010 Census block-level data.<sup>3</sup> Public school data from Broward County Public Schools; private schools from Florida Geographic Data Library (FGDL).<sup>4</sup> All other noise sensitive site data from Florida Geographic Data Library (FGDL).

Of the 548 housing units exposed to aircraft noise of DNL 65 and higher in 2023, 440 are included in the footprint of the ongoing FLL Sound Insulation Program (**Section 2.6.1**). Similar to the 2018 contour, 90 of the remaining 106 units are located both at the westernmost tip of the DNL 65 contour along the extend approach to Runway 10L (**Table 5-6** and **Figure 5-4**). The other 16 units, mobile homes, are located south-southwest of the Runway 10R landing threshold.

**TABLE 5-6**  
**HOUSING UNITS AND POPULATION NOT**  
**IN CURRENT FLL SOUND INSULATION PROGRAM<sup>1</sup> - 2023**

Noise Level <sup>2</sup>	Housing Units <sup>3</sup>	Population <sup>3</sup>
<b>DNL 65-70</b>	<b>106</b>	<b>231</b>
<b>DNL 70-75</b>	<b>0</b>	<b>0</b>
<b>DNL 75+</b>	<b>0</b>	<b>0</b>
<b>TOTAL:</b>	<b>106</b>	<b>231</b>

**SOURCES:**<sup>1</sup> FLL Sound Insulation Program housing unit data from Broward County Aviation Department. All housing units within the existing SIP boundary were excluded from this table regardless if they received treatment, elected to not participate or were deemed compatible through interior testing or deemed ineligible.<sup>2</sup> Noise contours from Environmental Science Associates (ESA)<sup>3</sup> Housing units and population estimates derived from 2010 Census block-level data.

## 5.4 Noise Sensitive Sites

**Table 5-7** presents information regarding noise sensitive facilities (e.g., schools, religious facilities, hospitals, and structures listed in the National Register of Historic Places) exposed to noise levels of DNL 65 and higher. As shown previously in **Tables 5-2** and **5-5**, there are no schools or places of worship currently exposed or expected to be exposed to aircraft noise of DNL 65 and higher. There are three historic structures that are exposed to aircraft noise levels of DNL 65 and higher in 2018 and 2023, one of which is listed in the National Register of Historic Places.

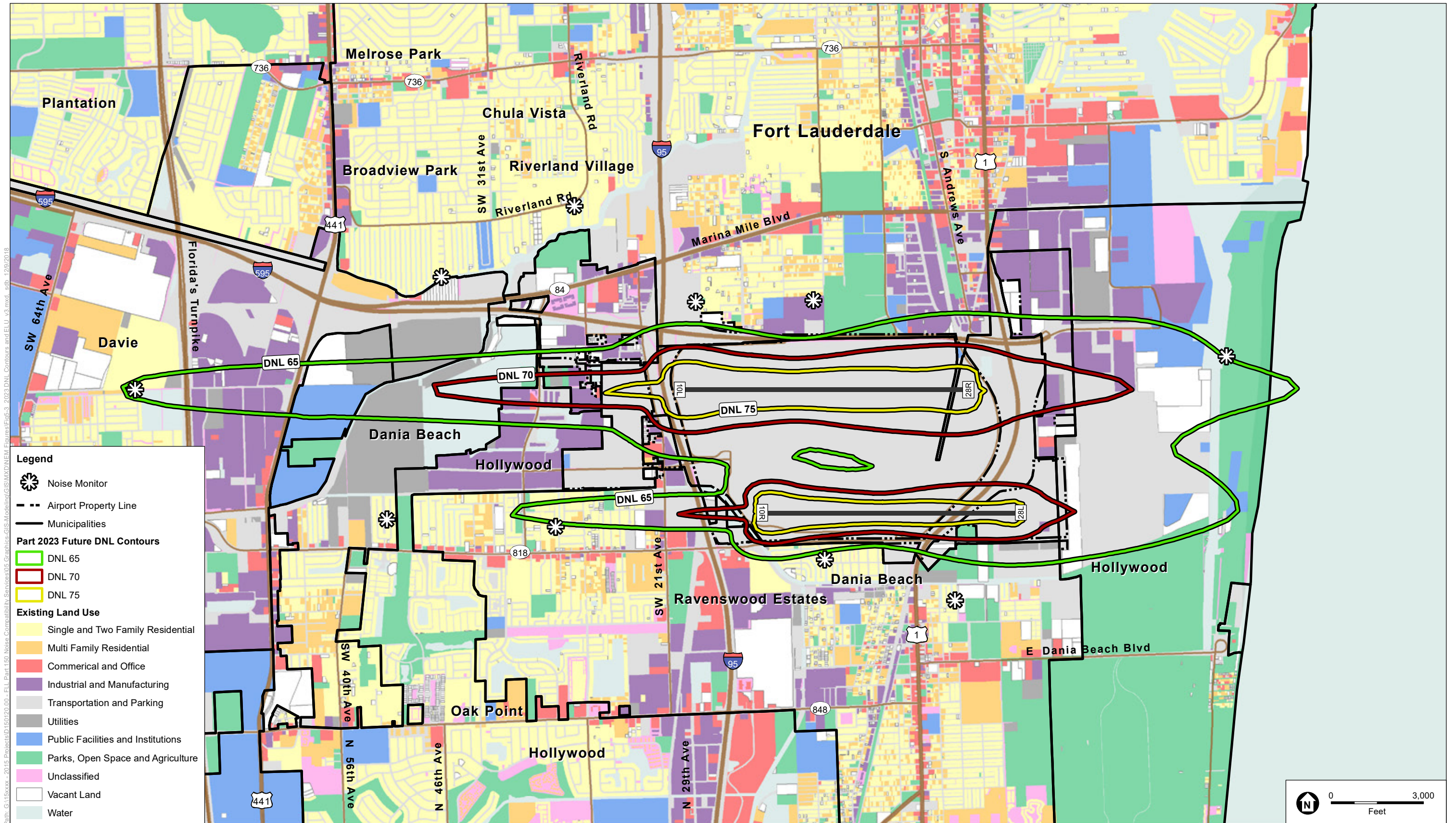
**TABLE 5-7**  
**NOISE SENSITIVE SITES EXPOSED TO**  
**AIRCRAFT NOISE OF DNL 65 AND HIGHER – 2018 AND 2023**

Name	Address	Facility Type	Within 2018 DNL 65 and Higher?	2018 DNL Value if Yes	Within 2023 DNL 65 and Higher?	2023 DNL Value if Yes
Link Trainer NAS Ft Lauderdale	4000 W Perimeter Rd	Historic Structure – NHRP – Listed	Y	67.3	Y	67.2
GB Airlink	850 SW 34 <sup>th</sup> St	Historic Structure	Y	65.8	Y	65.7
North Coast Trailer Park	4500 Ravenwood Rd	Historic Structure	Y	67.8	Y	69.0

**SOURCE:**

<sup>1</sup> Historic Structure - noise sensitive site data from Florida Geographic Data Library (FGDL).





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

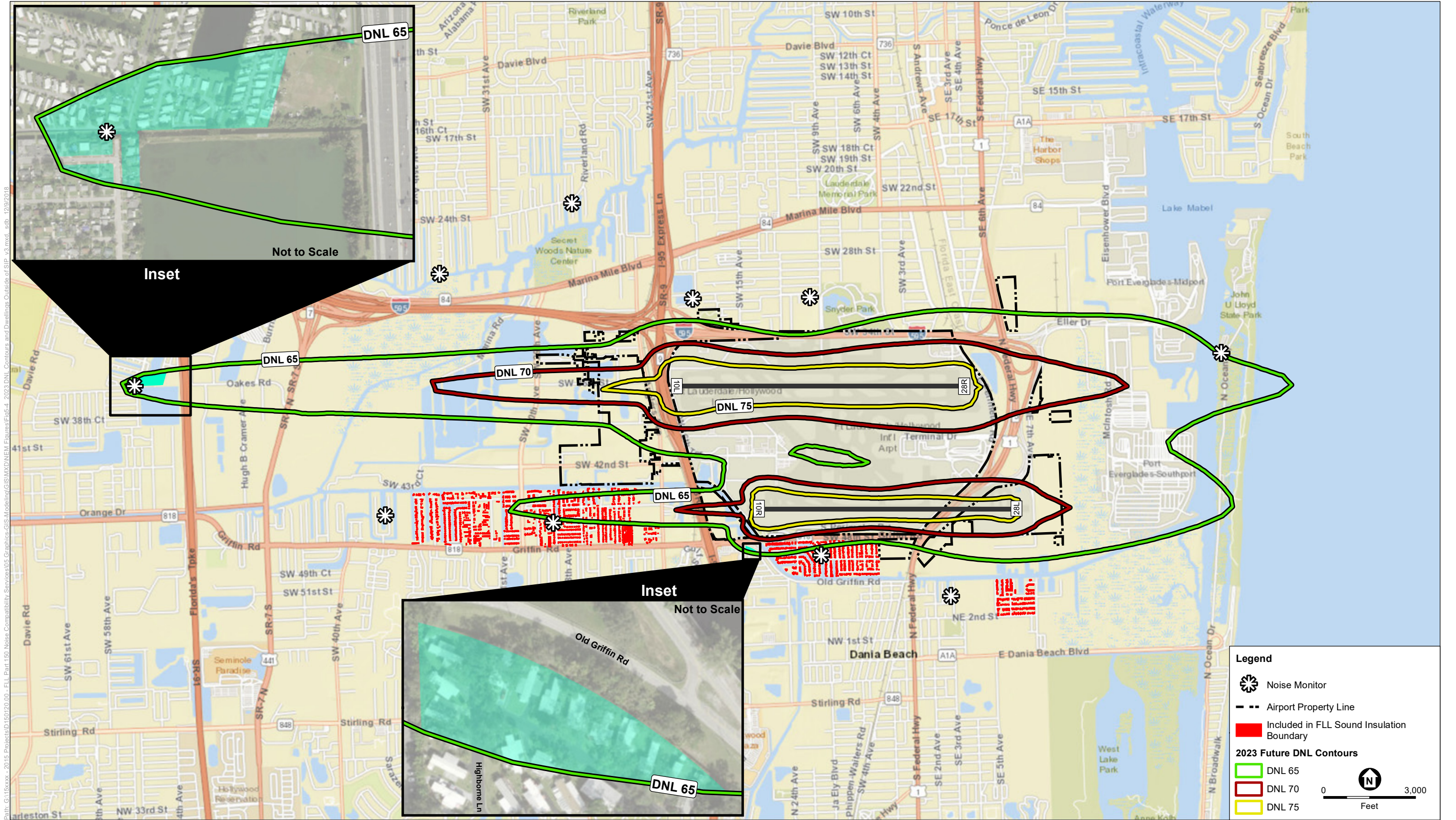
Fort Lauderdale-Hollywood International Airport 14 CFR Part 150 Study . 150120

**Figure 5-3**  
2023 DNL Contours and Generalized Existing Land Uses  
Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**





SOURCE: Esri; AEDT 2d; ESA, 2018

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

**Figure 5-4**  
2023 DNL Contours and Dwellings Outside of the Sound Insulation Program  
Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**



## 5.5 Comparison of 2018 and 2023 NEMs

A comparison of the 2023 to the 2018 DNL contours shows that the land area encompassed by the DNL 65 and higher contours in 2023 would be approximately 16 acres greater than the area encompassed by the 2018 contours (see **Table 5-8**). The amount of Single and Two-Family Residential and Multi-Family Residential land uses exposed to aircraft noise levels of DNL 70 and higher would not increase in 2023. With respect to housing units, approximately 290 more units and 640 more people would be exposed to noise levels of DNL 65 or higher in 2023, when compared to 2018 (see **Table 5-9**). All but 16 of those additional units are included in the footprint of the existing FLL Sound Insulation Program. **Figure 5-5** shows a comparison of the 2018 and 2023 DNL contours overlaid on the same map and the areas where sound exposure is expected to increase based on projected operating conditions.

**TABLE 5-8**  
**CHANGE IN LAND USE EXPOSURE – 2018 TO 2023**

Land Use Category <sup>1</sup>	Net Change in Acreage by Land Use (acres) <sup>2</sup>			
	DNL 65-70	DNL 70-75	DNL 75+	Total
Single and Two Family Residential	46.1	0	0	46.1
Multi-Family Residential	0	0	0	0
Utilities	3.6	0.2	0	3.8
Commercial and Office	2	0	0	2.1
Industrial and Manufacturing	7.8	6.6	0	14.4
Transportation and Parking	147	80.8	43.7	271.5
Public Facilities and Institutions	6.7	0.1	0	6.7
Open Space, Cemeteries, and Outdoor Recreation	36.5	2.9	0	39.4
Vacant	41.5	1	0	42.5
<b>Total Change</b>	<b>11.9</b>	<b>4.2</b>	<b>0</b>	<b>16</b>

**NOTE:** Land uses acreage present DNL 70-75 contour may be shown as 0.0 due to rounding.

**SOURCES:**

<sup>1</sup> Land Use Categories derived from October 2017 Broward County parcel data with land use information

<sup>2</sup> Noise contours from Environmental Science Associates (ESA)

<sup>3</sup> Housing units and population estimates derived from 2010 Census block-level data.

**TABLE 5-9**  
**CHANGE IN NOISE SENSITIVE SITES EXPOSED – 2018 TO 2023**

Noise Level <sup>1</sup>	Total Area (Acres)	Housing Units <sup>2</sup>	Population <sup>2</sup>	Religious	Schools <sup>3</sup>	Hospitals	Historic Resources	Day Cares	Group Care	Libraries	Nursing Homes
<b>DNL 65-70</b>	303	289	643	0	0	0	0	0	0	0	0
<b>DNL 70-75</b>	96	0	0	0	0	0	0	0	0	0	0
<b>DNL 75+</b>	44	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>442</b>	<b>289</b>	<b>643</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**SOURCES:**

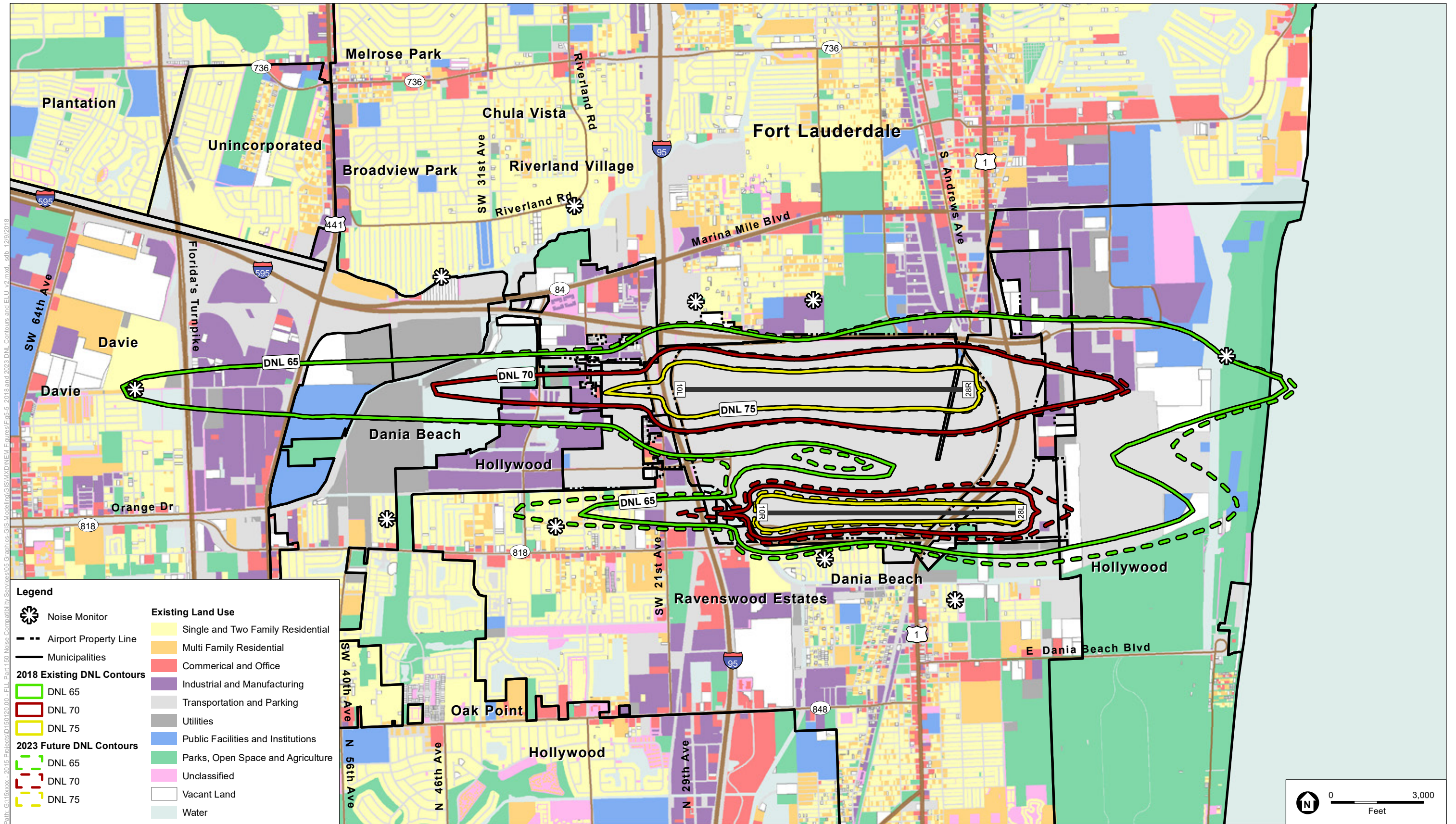
<sup>1</sup> Noise contours from Environmental Science Associates (ESA)

<sup>2</sup> Housing units and population estimates derived from 2010 Census block-level data.

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

<sup>4</sup> All other noise sensitive site data from Florida Geographic Data Library (FGDL).





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 5-5**  
2018 and 2023 DNL Contours and Generalized Existing Land Uses  
Fort Lauderdale-Hollywood International Airport



**This Page Intentionally Blank**

# CHAPTER 6

## Consultation and Public Involvement

---

### 6.1 Introduction

Title 14 Code of Federal Regulations (CFR) Part 150 §150.21(b) and §150.105(a) require that Noise Exposure Maps (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 dB 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.”*

Consultation required by 14 CFR Part 150 includes the following entities:

- Aviation users (e.g., airlines, fixed base operators, based aircraft operators);
- Jurisdictional authorities with land located within the DNL 65 or greater contours (Broward County is the sole land use agency for land located within the DNL 65 and higher contours); and
- Interested parties (i.e., the public).

The 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 the NEMs. Agency consultation and public involvement efforts undertaken for this 14 CFR Part 150 Study are discussed in this chapter.

### 6.2 Technical Committee

At the beginning of the Study process, the BCAD formed a Technical Committee (TC), the purpose of which is to provide input into the 14 CFR PART 150 Study prepared for FLL. 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 the FLL 14 CFR Part 150 Study are listed below in **Table 6-1**.

**TABLE 6-1**  
**FLL 14 CFR PART 150 TECHNICAL COMMITTEE PARTICIPANT LIST**

Organization Represented	Representative	Alternative Representative
<b>BCAD</b>		
Airport Noise Office	Winston Cannicle	Will Castillo
Airport Manager's Office	Will Castillo	Mike Paciatto
PIO	Gregory Meyer	Allan Siegel
Airport Operations	John Pokryfke	Michael Nonnemacher
Airport Business	Tom Nazzaro	Yasmin Govin
<b>Community Forum</b>		
Airport Noise Abatement Committee (ANAC)	Gary Luedtke	Deborah Van Valkenburgh
<b>Airlines and/or Airline Associations</b>		
JetBlue	Jason Annunziata	
Spirit Airlines	Michael Shiver	
Southwest Airlines	Edwin Solley	
Delta Airlines	Julia Lundrigan	
FedEx	Mary Morrissey	
UPS	Kevin Hoffman	
<b>Airline Business Organizations</b>		
National Business Aviation Association	Gregory Voos	Alex Gertson
<b>Chamber of Commerce/Economic Development</b>		
Greater Fort Lauderdale Chamber of Commerce	Dan Lindblade, CAE	
Greater Hollywood Chamber of Commerce	Anne Hotte	
Greater Dania Beach Chamber of Commerce	Ms. Randie Shane	
Greater Fort Lauderdale Alliance Economic Development Agency	Bob Swindell	
Broward Workshop	Sam Robbin	
<b>Planning Organizations/ Local Jurisdictions</b>		
City of Dania Beach	Marc LeFerrier	Brad Kaine
City of Fort Lauderdale (1)	Edward Rebholz	
City of Fort Lauderdale (2)	Angelina Pluzhnyk Evans	Geoff Rames
City of Hollywood	Lorie Mertens-Black	
Town of Davie (1)	Richard Lemack	Phillip Holste
Town of Davie (2)	Charles Taylor	
City of Plantation	Peter Dokuchitz	
City of Cooper City	Matt Wood	
Town of Southwest Ranches	John Eastman	Mark Modrich
City of Weston	John R. Flint	
<b>Federal/ State Agencies</b>		
FAA - Orlando Airports District Office	Peter Green	None
Miami Air Traffic Management/TRACON	Bob Hildebidle	None
FLL Airport Traffic Control Tower	Theodore (TJ) DelNegri	Sid Cooley
South Florida Flight Standards Division (FSDO)	Mark Hemmerle	None
<b>Other Organizations</b>		
Broward County School Board	Chris Akagboosu	

**SOURCE:** Environmental Science Associates, 2018; BCAD, 2018.



The TC's role is advisory in nature and its purpose is solely limited to this Study. The TC may offer opinions, advice and guidance to the Study Team, but the BCAD has the sole discretion to accept or reject the TC recommendations. In addition to providing input and technical advice for the Study, a responsibility of each TC member is to inform their respective organizations of the Committee's discussions.

While membership on the TC is focused on key stakeholders, the TC meetings were noticed in advance and open to the public. In order to promote balanced and constructive interaction among the TC members, members of the public are asked to refrain from commenting during TC member discussions. Meeting notes document the TC meeting discussions.

A summary of the TC Meetings, including dates and topics discussed is provided below. Meeting announcements are sent to all TC members (see **Table 6-1** for a list of members) and posted on the project website. All TC meeting materials including agendas, sign-in sheets, presentations, and meeting notes are provided in **Appendix H**.

#### *TC Meeting #1 (May 26, 2017) – Introduction to the Technical Advisory Committee*

The meeting focused on TC member introductions, educating members of the TC about the purpose and objectives of the study and the TC's role in the Study, and introducing the charter and participation agreement. The project schedule was also reviewed during the meeting.

#### *TC Meeting #2 (August 23, 2017) – Data Collection Process*

At the second TC meeting the Study Team provided an introduction to AEDT, noise metrics, and modeling inputs. The TC reviewed and discussed the flight track analysis process, and example radar and flight tracks were presented to the TC.

#### *TC Meeting #3 (March 7, 2018) – Land Use and Aircraft Operational Data*

At the third TC meeting the Study Team discussed the first round of public information workshops and then presented a review of land use around FLL. The Study Team also presented aircraft operational inputs for AEDT.

#### *TC Meeting #4 (November 7, 2018) – Noise Exposure Maps*

This TC meeting focused on the results of the noise modeling conducted for this Part 150 Study. The Noise Exposure Maps were presented, and the residential impacts were discussed. The Study Team also provided information regarding the public release of the Noise Exposure Map Report and the Public Information Workshop details. The next phase of the study (NCP) was also discussed.

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

This TC meeting 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 recommended operational, land use, and programmatic measures to consider during the NCP development.

## 6.3 Public Information Workshops, Draft FLL NEM Report, and Public Comments

During the course of the FLL 14 CFR Part 150 Study, the BCAD accepted comments from the public and held several Public Information Workshops. The first round of Public Information Workshops was held at the beginning of the Study process, and additional Public Information Workshops were held after the release of the Draft NEM Report. Details of the Workshops, release of the Draft NEM Report, and public comments are provided below.

### 6.3.1 Study Kick-Off Public Information Workshops

The first round of public information workshops for the FLL 14 CFR Part 150 Study was held throughout the week of November 13, 2017. Due to the number of communities involved and anticipated public attendance, a series of workshops were conducted to provide opportunities to attend on a variety of dates at multiple locations. **Table 6-2** below lists the location and time of each workshop:

TABLE 6-2 FIRST ROUND OF PUBLIC INFORMATION WORKSHOPS FOR FLL 14 CFR PART 150 STUDY		
Date	Location	Time
Monday, November 13, 2017	<b>Southwest Ranches Town Hall</b> 13400 Griffin Road, Southwest Ranches, FL 33330	6:00 PM – 8:30 PM
Tuesday, November 14, 2017	<b>Anne Kolb Nature Center</b> 751 Sheridan St., Hollywood, FL 33019	6:00 PM – 8:30 PM
Wednesday, November 15, 2017	<b>Deicke Auditorium</b> 5701 Cypress Road, Plantation, FL 33317	6:00 PM – 8:30 PM
Thursday, November 16, 2017	<b>Signature Grand</b> B6900 FL-84, Davie, FL 33317	6:00 PM – 8:30 PM
Friday, November 17, 2017	<b>BCPS Boardroom</b> 600 SE 3 <sup>rd</sup> Avenue, 1 <sup>st</sup> Floor, Fort Lauderdale, FL 33301	6:00 PM – 8:30 PM
<b>SOURCE:</b> Environmental Science Associates, 2018.		

In attendance were a number of members of the general public, press and public officials (see sign-in sheets included in **Appendix I-1**). The purpose of the first round of public information workshops was to inform the public about the 14 CFR Part 150 Study being initiated for FLL, discuss the Study process and requirements, and solicit input to be considered during the Study by inviting the public to submit written comments at the workshop as well as via e-mail to the FLL Part 150 Study e-mail address. The information presented provided an overview of the Study process, the need for the Study, what the potential outcomes could be, how to provide comments

and stay involved, and other relevant information related to the Study. Workshop informational materials included presentation boards and a handout (provided in both English and Spanish). Copies of the public information workshop notice, sign-in sheets, presentation materials, handouts, and comments received are provided in **Appendix I-1**.

### 6.3.2 Draft NEMs and Public Information Workshop

A Notice of Availability of the Draft Part 150 Study NEMs and Notice of a Public Information Workshop was published in the El Sentinel newspaper on December 13, 2018 and the Sun Sentinel on December 16, 2018. The Notice was also placed on Study website the same day at: <http://www.fllpart150.com/meetings/>

Copies of the Draft NEM report are available for public review during regular business hours at the locations listed below. The draft NEM report is also available electronically (in PDF format) for download on the Study website at <http://www.fllpart150.com/resources/>.

- **Broward County Aviation Department Administration Office:** 2200 SW 45th Street, Suite 101; Dania Beach, Florida 33312.
- **Dania Beach-Paul DeMaio Library:** 1 Park Avenue East, Dania Beach, Florida 33004
- **West Regional Library:** 8601 W Broward Boulevard, Plantation, Florida 33324
- **Davie/Cooper City Branch Library:** 4600 SW 82nd Avenue, Davie, Florida 33328
- **Southwest Regional Library:** 16835 Sheridan Street, Fort Lauderdale, Florida, 33331
- **Riverland Branch Library:** 2710 W Davie Boulevard, Fort Lauderdale, Florida 33312

The comment period begins December 16, 2018 and ends on January 23, 2019 (5:00 PM Eastern). The Draft NEM Report will be available at the above locations until the close of the comment period. Anyone wishing to submit comments may do so at any time during the comment period. Comments on the Draft NEMs should be mailed to: Broward County Aviation Department, Attn: Noise Office – FLL Part 150 Study, 2200 SW 45th Street, Suite 101, Dania Beach, Florida 33312. Comments may be also be submitted online at <http://www.fllpart150.com/comments/>.

#### Public Information Workshop

A Public Information Workshop was held on January 16, 2019. The workshop was an “open house” format and include displays and information related to the Part 150 Study process, the NEMs, project schedule, and the next phase of the Study (which is the Noise Compatibility Program). No formal presentation was given during the workshop. This workshop format provided attendees with the maximum opportunity for one-on-one interaction and sharing of information and concerns with BCAD. Attendees were welcome to attend at any time during the workshop. Comment forms were available at the workshop for those that wished to submit comments in writing and a court reporter was available to submit comments verbally. The Public Information Workshop details are provided below.



**Date:** Wednesday, January 16, 2019

**Time:** 6:00PM - 8:30PM

**Location:** Signature Grand, 6900 FL-84 Davie, Florida 33317

### 6.3.3 Public Comments

All public, local government organization, and stakeholder comments received to date are included in **Appendix J**. Comment responses were developed subsequent to the NEM public information workshop and this Chapter and Appendix J was updated prior to submission to the FAA. There were more than 500 comments submitted since the project commenced, including comments received at the Public Information Workshops in November 2017 and January 2019, in addition to comments submitted through the Study website throughout the NEM phase of the Study. The most common topics (unranked) of the public comments include the following concerns:

- Early morning and late night flights.
- Changes in aircraft flight paths occurring after opening of the new runway.
- Nighttime use of south runway.
- Low altitude of overflights.
- High frequency of overflights.
- Seasonal and west-flow operations.
- Quality of life.
- Arrivals and Departures
- Overflight impacts on horses.

## 6.4 Other Public Outreach and Meetings

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

### 6.4.1 Study-Specific Meetings

Additional meetings to discuss the 14 CFR Part 150 Study were held with local, regional, and federal agencies and government officials throughout the development of the NEMs. Coordination meetings were held with the following entities:

- Study Kick-off Meetings with Local Jurisdictions (Oct./Nov. 2016)
  - Cooper City, Dania Beach, Davie, Fort Lauderdale, Hollywood, Plantation, Southwest Ranches, and Weston

- ANAC Briefing (Sept. 2016)
- Meetings with Land Use Agencies and School Board (Nov. 2017)
  - Cooper City, Dania Beach, Davie, Fort Lauderdale, Hollywood, Plantation, Southwest Ranches, Weston, and the Broward County School Board
- FAA Air Traffic Control Tower Meeting (April 2018)
- FAA Briefing (Feb., Aug., and Oct. 2018)

Several of these meetings included presentations, which are included in **Appendix G**.

### 6.4.2 Newsletters

Another component of the public outreach program implemented by the BCAD included periodic newsletters that kept the public and interested parties informed about the Study. The newsletters were posted on the FLL 14 CFR Part 150 Study project website in PDF format. Copies of the newsletters are provided in **Appendix I-2**.

### 6.4.3 Elected Officials

Several elected officials were actively engaged through the NEM development process. The elected official email contact list included 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
- Town of Davie
- Town of Southwest Ranches

Separate from the Part 150 Study process, BCAD initiated a Part 150 Study Coordination Committee (SCC) (see **Appendix G** for the County Resolution and approval). The purpose of the SCC is to facilitate dissemination and sharing of information that is developed during the Part 150 Study process on a timely basis to the political subdivisions of the respective Committee members. BCAD coordinated with the above jurisdictions to identify key points of contact with planning departments and other key agencies and solicit a representative to serve on the SCC. The Part 150

Study Team briefed the SCC during their first meeting in August 2017; this presentation is included in **Appendix G**.

#### 6.4.4 FLL 14 CFR Part 150 Information Website

A website<sup>26</sup> was developed and published for the FLL 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 NEM Report and NEMs, and Study newsletters;
- Relevant links;
- Frequently Asked Questions;
- BCAD contact information; and
- Comment Form.

---

<sup>26</sup> <http://www.fllpart150.com/>