MIAMI-OPA LOCKA EXECUTIVE AIRPORT

Calendar Year 2023 Noise Contours Technical Noise Report

April 2024

ESA

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1 Introduction

This report provides the analysis and overview of the noise modeling data preparation and resulting contours for the calendar year 2023 at Miami-Opa Locka Executive Airport (OPF). The Federal Aviation Administration's (FAA's) Aviation Environmental Design Tool version 3f (AEDT) was used to develop the Day-Night Average Sound Level (DNL) contours for the calendar year 2023. These contours were compared to the OPF 2017 noise contours that were previously modeled using the AEDT 2d.

The OPF 2023 noise contours were prepared using aircraft activity information from calendar year 2023. Information was gathered from Miami-Dade Aviation Department's (MDAD's) Airport Noise and Operations Monitoring System (ANOMS) and the FAA's Operations Network (OPSNET). A detailed discussion of the model inputs used to develop these contours is included in the following sections.

2 Aircraft Operations and Fleet Mix

ANOMS data provided information for noise contour development including the date, time of day, operation type (departure, arrival, or touch and go), runway used, flight and/or tail number, aircraft type, airline, and destination/origin for operations occurring at OPF. The ANOMS system recorded a total of 96,157 airport operations in 2023 while the FAA's OPSNET data, which reflect operations counts collected by OPF air traffic controllers, reported 173,897 airport operations at OPF during the same timeframe.[1]

Due to system limitations, the ANOMS is not able to capture every operation. While the ANOMS recorded operations less than OPSNET, the OPSNET numbers were used for the total operational count in the development of the 2023 noise contours. As a result, the ANOMS fleet data was scaled to the operations reflected in OPSNET. This is consistent with the approach taken in developing the 2017 noise contours and equates to an average of approximately 476 daily operations (defined as either an arrival, departure, or touch and go) at OPF during the calendar year 2023.

An attempt was made to reconcile the deficit in fleet information between the ANOMS fleet data set and the total operations included in ATADS. Data was downloaded from the FAA's Traffic Flow Management System Counts (TFMSC) for calendar year 2023 at OPF and compared to the ANOMS and ATADS data sets. Unfortunately, the TFMSC data set had an even larger deficit, reporting a total of only 69,365 operations at OPF in 2023. As a result, the ANOMS fleet data was considered more complete for the purpose of scaling.

Fleet mix defines the various types of aircraft and allows the development of very specific input data, such as engine, airframe, gross weight, and departure stage length for each aircraft. The AEDT aircraft database contains noise and performance data for 300 different types of aircraft and helicopters. The AEDT also has the functionality to allow the modeler to select different airframes and engine types, resulting in a database of over 3,600 unique aircraft. As described above, ANOMS data provided a representative list of aircraft that utilized OPF for the calendar year 2023. The AEDT aircraft database was used to build a fleet mix representative of aircraft in operation at OPF during

[1] https://aspm.faa.gov/opsnet/sys/airport.asp, accessed February 16, 2023.

calendar year 2023. AEDT fleet mix is presented in **Appendix A-1** through **Appendix A-4** for various airport operational parameters, described below.

3 Stage Length

Departure destination information provided by the ANOMS was analyzed to determine departure stage lengths. An aircraft's stage length (or trip length) refers to the distance an aircraft flies from its origin airport (OPF) to its intended destination. Stage length is important in noise modeling since the longer the distance an aircraft will fly to its destination, the greater the fuel load required and overall weight and, as a result, the lower its departure profile will be. **Table 1** provides the trip distance to its associated stage length. The stage length information used to develop the OPF 2023 noise contours is included in **Appendix A-1**.

Table 1. Stage Length

Stage Length	Trip Length (nmi)
1	0 – 500
2	500 – 1,000
3	1,000 – 1,500
4	1,500 – 2,500
5	2,500 – 3,500
6	3,500 – 4,500
7	4,500 – 5,500
8	5,500 – 6,500
9	6,500 – 11,000
M	Maximum Range at Maximum Takeoff Weight

SOURCE: FAA, 2023.

4 Time of Day

Day-night use percentages are also included in the development of DNL contours. For the DNL metric, noise events occurring between the hours of 10:00:00 p.m. and 6:59:59 a.m. receive a 10 dB "penalty". A 10 dB penalty means each nighttime noise event is equivalent to 10 daytime events. This penalty attempts to account for the higher sensitivity to noise in the nighttime and the expected decrease in background noise levels at night in comparison with background noise levels during the day.

OPF has a day and night percentage split of arrivals, departures, and touch ago goes at approximately 92 percent and 8 percent, 93 percent and 7 percent, and 98 percent and 2 percent, respectively, as shown in **Table 2**. A detailed breakdown of time-of-day percentages by AEDT aircraft type are shown in **Appendix A-2**.

Table 2. Day-Night Arrival and Departure Percentages

	Arrival		Departure		Touch and Go		
	Day	Night	Day	Night	Day	Night	Total
Total	37,393	3,374	38,667	3,046	13,393	283	96,156
Percentage	91.7%	8.3%	92.7%	7.3%	97.9%	2.1%	100.0%

SOURCE: MDAD ANOMS, 2023; ESA, 2024.

5 Runway Use

The primary factor affecting runway use at airports is weather, in particular the wind direction and wind speed. Additional factors that may affect runway use include the position of the facility or ramp relative to the runways. Some airports have a preferred or preferential runway system that balances noise concerns with the safest and most efficient use of the airport. If a certain runway is used predominantly for departures while another runway is used for arrivals, the noise contours will differ to reflect this type of activity. **Table 3** shows the runway use percentages by day-night arrivals, departures, and touch and go for fixed-wing aircraft and helicopters. The data shows that OPF most commonly operates day and night in an east flow condition utilizing Runways 09R, 09L, and 12 with a total of 74.9 percent of the time. This is a result of the strong ocean breezes and the performance needs of aircraft to depart into the wind. In addition, Runway 09L-27R was used for 67 percent of the time due to the locations of fixed base operators (FBOs). During the nighttime hours, Runway 12 has the highest percentage of runway operations for arrival and departure operations.

Helicopter takeoff and landing locations were consolidated to one location north of Runway 12-30 because the ANOMS radar tracks indicated the majority of helicopters depart from and arrive to this area. All helicopter takeoff and landing activity was assigned to this location, labeled as H1 throughout Appendix A.

Table 3. 2023 Fixed-Wing Runway Use

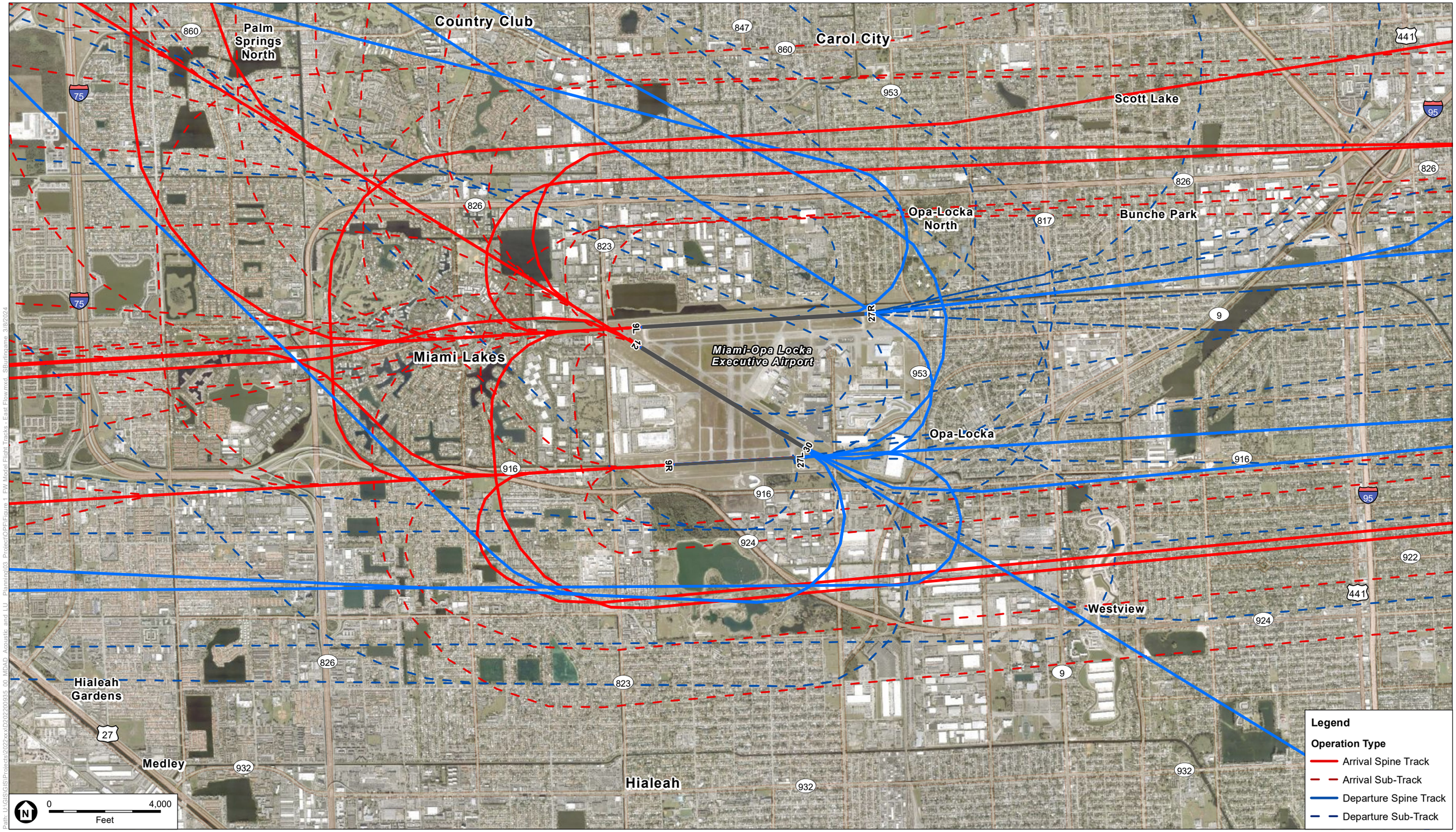
	Arrival		Departure		Touch and Go		
Runway	Day	Night	Day	Night	Day	Night	Overall
09L	60.4%	11.8%	62.4%	21.6%	35.6%	17.1%	51.1%
09R	4.0%	0.2%	2.6%	1.7%	25.0%	45.1%	9.7%
12	11.0%	74.7%	9.5%	27.8%	15.0%	16.3%	14.1%
27L	1.3%	0.2%	0.7%	0.6%	9.7%	11.3%	3.6%
27R	21.9%	5.0%	15.1%	4.4%	12.1%	3.9%	15.8%
30	1.5%	8.2%	9.8%	43.9%	2.7%	6.2%	5.8%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

SOURCE: MDAD ANOMS, 2023; ESA, 2024.

6 Flight Tracks

Flight track and flight track use percentages are a key element in the development of the DNL contours. Radar flight tracks obtained from ANOMS were compared to the 2017 modeled flight

tracks and modified as necessary. The flight track use percentages were updated from the 2017 modeling as the metroplex had changed the overall use of the airspace around OPF. Dispersion of aircraft operations across sub-tracks is presented in **Appendix A-3**. The flight track locations are depicted in **Figure 1** through **Figure 3**.



Path: U:\GIS\GIS\Projects\2022xx\ID202200935_00_MDAD_Acoustic_and_LU_Planning\03_Project\OPF\Figure 1_FW Model Flight Tracks - East Flow.mxd, SBurlingame, 3/8/2024

SOURCE: AEDT 3f; ESA, 2024.
AEDT = Aviation Environmental Design Tool.

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Figure 1
Fixed-Wing Model Flight Tracks - East Flow

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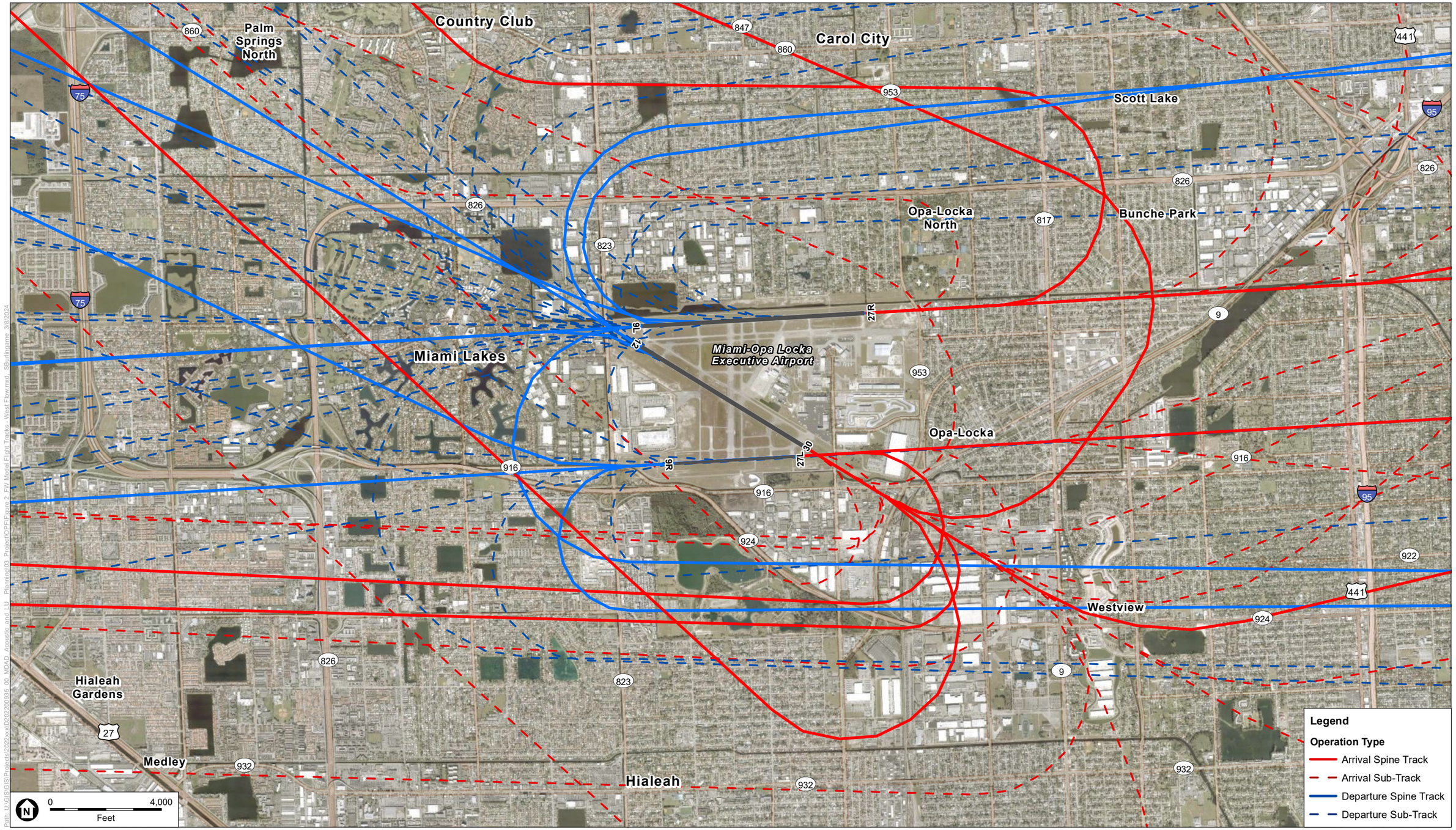

Path: U:\GIS\GIS\Projects\2022xx\ID202200935_00_MDAD_Acoustic_and_LU_Planning\03_Project\OPR\Figure 2_FW Model Flight Tracks - West Flow.mxd_SBurlingame_3/8/2024

SOURCE: AEDT 3f; ESA, 2024.
AEDT = Aviation Environmental Design Tool.

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Figure 2
Fixed-Wing Model Flight Tracks - West Flow

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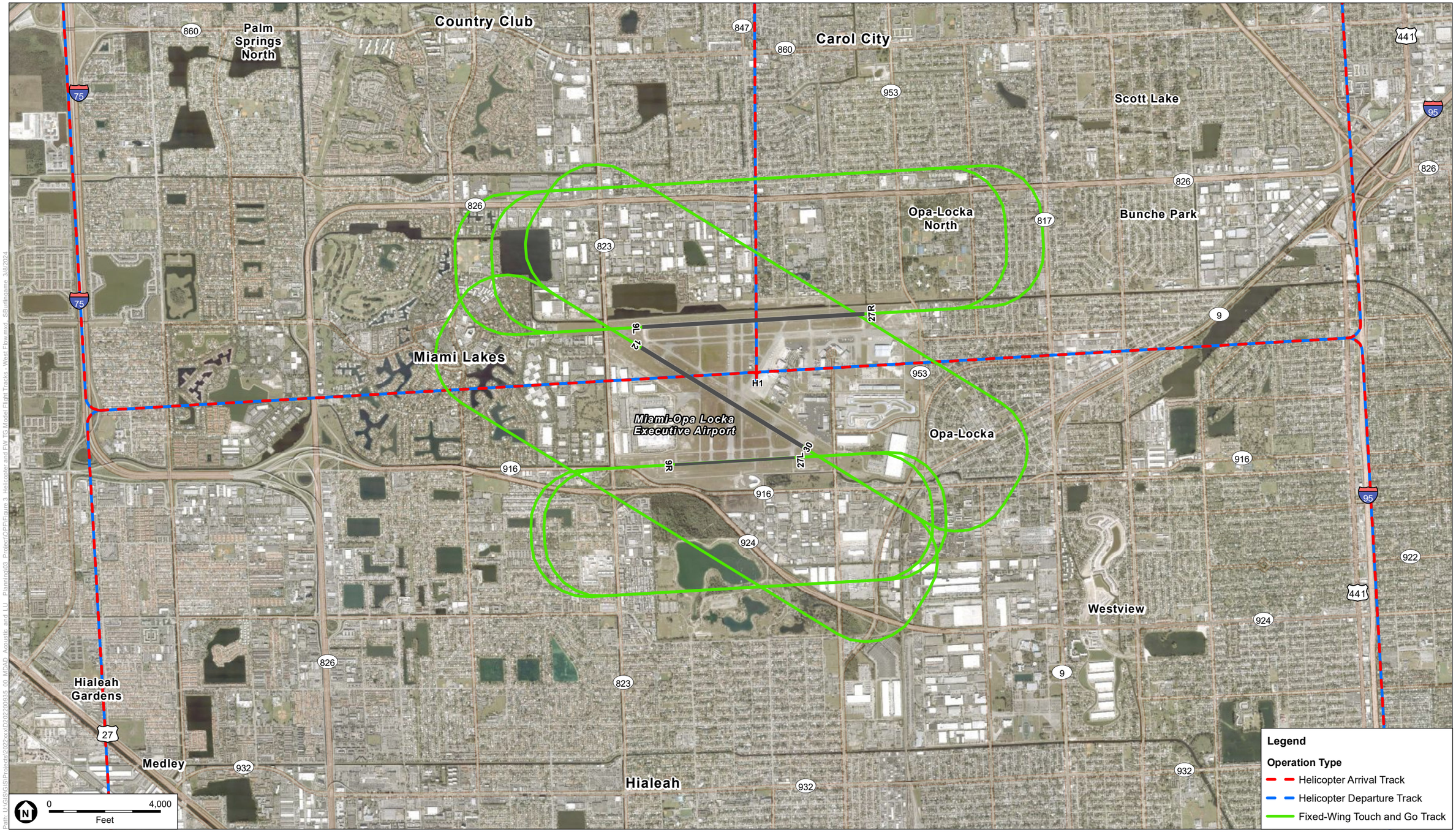

Path: U:\GIS\GIS\Projects\2022\xx\D2022009935 00 MDAD Acoustic and LU Planning\03 Project\OP\Figure 3 Helicopter and FW TG Model Flight Tracks - West Flow.mxd SBurlingame 3/8/2024

SOURCE: AEDT 3f; ESA, 2024.
AEDT = Aviation Environmental Design Tool.

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Figure 3
Helicopter and Fixed-Wing Touch and Go Model Flight Tracks

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7 Meteorological Conditions

AEDT has several settings that affect aircraft performance profiles and sound propagation based on meteorological data. Meteorological settings include 10-year average temperature, barometric pressure, and relative humidity at the airport. AEDT includes the following values for annual average weather conditions at OPF:

- Temperature: 77.39° F
- Pressure: 1016.86 millibars
- Sea-level Pressure: 1017.42 millibars
- Relative Humidity 73.58%
- Dew Point: 68.27° F
- Wind Speed: 7.42 Knots

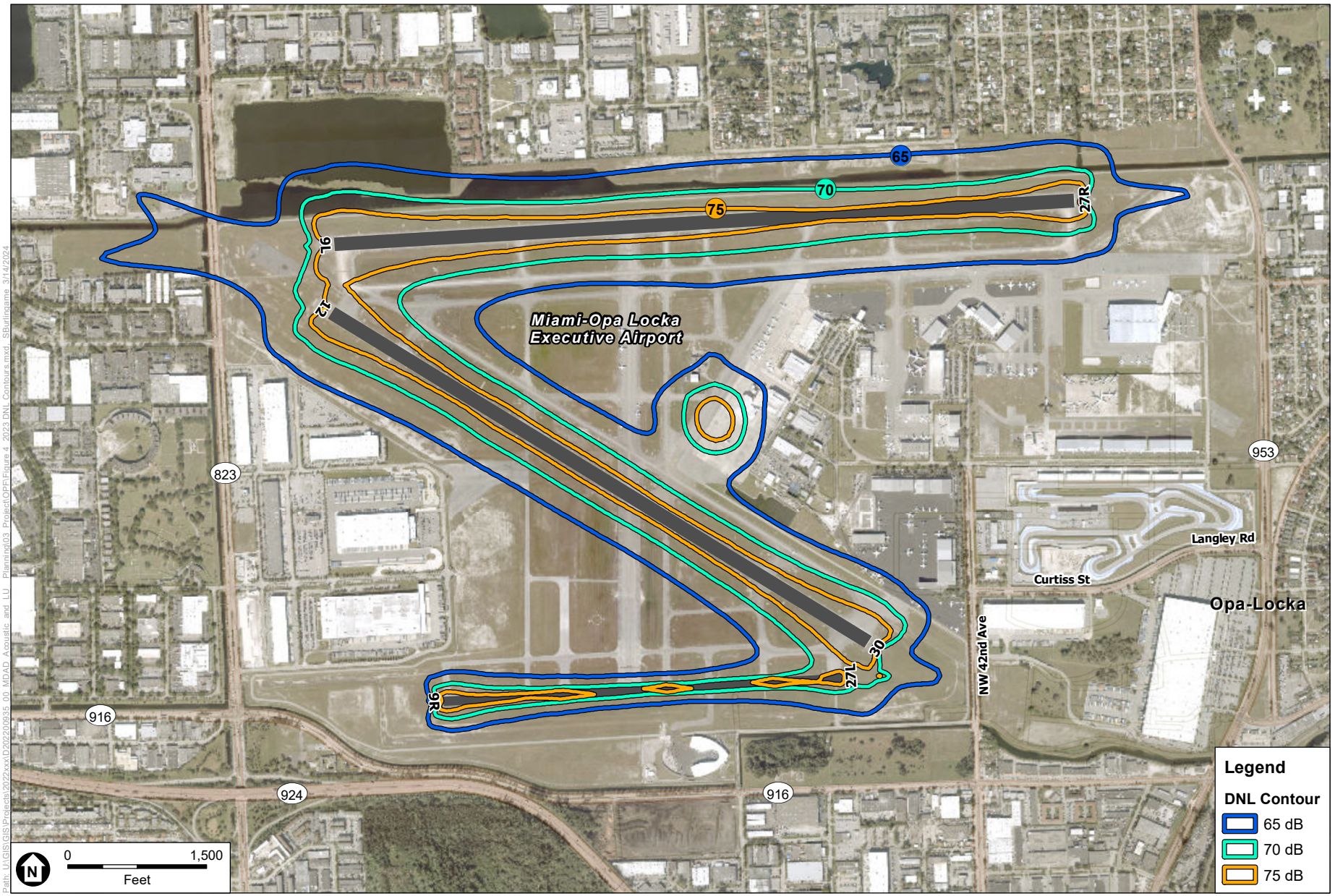
8 Terrain

Terrain data describes the elevation of the ground surrounding the airport and on airport property. If the AEDT user selects the use of terrain data, AEDT uses terrain data to adjust the ground level under the flight paths. The terrain data does not affect the aircraft's performance or noise levels, but does affect the vertical distance between the aircraft and a "receiver" on the ground. This in turn affects how noise propagates over ground. ESA obtained 1/3 arcsecond terrain data from the United States Geological Survey (USGS) National Map Viewer and it was used with the terrain feature of the AEDT in generating the noise contours.[2]

9 2023 DNL Contours

The information described above was compiled and incorporated into the AEDT. The AEDT calculates noise using a defined network of grid points at ground level around an airport. It computes the noise generated by each aircraft operation, by aircraft type and engine thrust level along each flight track. Corrections are applied for atmospheric acoustical attenuation, acoustical shielding of the aircraft engines by the aircraft itself, and aircraft speed variations. The noise exposure levels for each aircraft are then summed at each grid point. The cumulative noise exposure levels at all grid points are then used to develop noise exposure contours for selected values (e.g. DNL 65, 70 and 75 dB). Using the results of the grid point analysis, noise contours of equal noise exposure can then be plotted. The 2023 OPF noise contours for DNL 65, 70, and 75 dB are shown in **Figure 4**. These contours represent the noise exposure to areas surrounding OPF on an average annual day. The overall shape of the noise contours reflect the east and west orientation of the runways at OPF. The area of the contours in square miles is shown in **Table 5**. Each contour area is inclusive of the subsequent contour areas. Therefore, the cumulative footprint of all three contours is approximately 0.91 square miles.

[2] USGS terrain data obtained on February 12, 2024.



SOURCE: Esri; AEDT 2d and 3f; ESA, 2024.
AEDT = Aviation Environmental Design Tool.
DNL = Day-Night Average Sound Level.
dB = Decibel.

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Figure 4
2023 DNL Contours

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Table 4. 2023 DNL Contour Areas

DNL	Contour Area (Sq. Mi.)
≥ 65	0.91
≥ 70	0.43
≥ 75	0.19

SOURCE: AEDT 3f; ESA 2024.

As stated previously, OPF typically operates in an east flow condition due to the predominant winds at the airport. The narrower more defined contour bands to the west of the airport reflect the influence of the high number of arriving aircraft from the west, while the wider bands of contours to the east reflect the higher number of aircraft departures to the east.

10 2017 and 2023 DNL Contour Comparison

In order to determine the changes in noise exposure that occur over time, it is helpful to compare previous contours to existing contours. The OPF 2023 DNL contours were produced with AEDT 3f and the 2017 DNL contours were produced with AEDT 2d, as such every effort was made to ensure that the differences in models did not unduly influence the contour shapes.

A comparison of the OPF 2017 and 2023 DNL contours is shown in **Figure 5**. Noise exposure areas of increase and decrease between the OPF DNL 2017 and DNL 2023 are depicted in **Figure 6**. **Table 5** compares the area coverage of 2017 and 2023 contours.

Table 5. DNL Contour Area Comparison

	DNL Contour Area (Sq. Mi.)		
DNL	2023	2017	Difference
≥ 65	0.91	1.00	-0.09
≥ 70	0.43	0.47	-0.04
≥ 75	0.19	0.23	-0.04

SOURCE: AEDT 2d; AEDT 3f; ESA 2024.

As presented in **Table 5**, the 2023 DNL contours are slightly smaller than the 2017 DNL contours. **Table 6** compares the aircraft operations during 2017 and 2023. The number of total aircraft operations increased by 37,537 (approximately 28%) from 2017 to 2023.

Table 6. Aircraft Operations Comparison

	Arrival		Departure		Touch and Go		
Year	Day	Night	Day	Night	Day	Night	Total
2017	48,250	2,497	48,250	2,497	33,151	1,715	136,360
2023	56,026	5,846	57,366	4,506	49,385	767	173,897
Difference	7,776	3,349	9,116	2,009	16,234	(948)	37,537

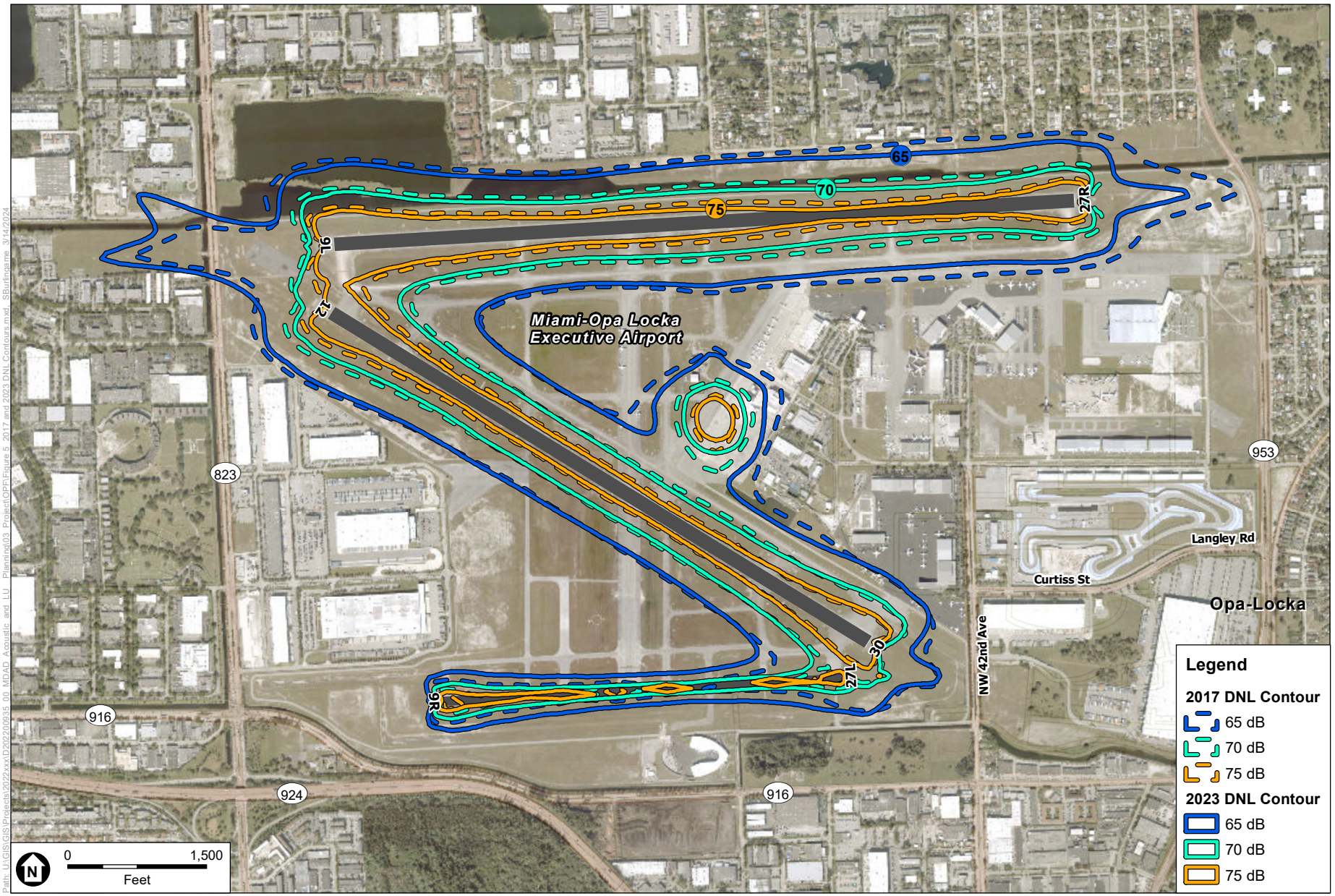
SOURCE: L&B, 2020; MDAD ANOMS, 2023; ESA, 2024.

Table 7 compares overall runway use between 2017 and 2023. The decrease in noise exposure on Runway 09L and 27R is due to the minimal air carrier reported at the airport for 2023. The increase in exposure around Runway 09R and 27L is a result of the 7.1 percent and 2.8 percent increased runway use, respectively, compared to 2017.

Table 7. Overall Runway Use Comparison

Runway	2017	2023	Difference
Fixed Wing			
09L	62.1%	51.1%	-11.0%
09R	2.6%	9.7%	7.1%
12	15.1%	14.1%	-1.0%
27L	0.7%	3.5%	2.8%
27R	14.1%	15.8%	1.7%
30	5.4%	5.8%	0.4%
Helicopter			
H1	100.0%	100.0%	0.0%

SOURCE: AEDT 2d and 3f; ESA 2024.



SOURCE: Esri; AEDT 2d and 3f; ESA, 2024.
AEDT = Aviation Environmental Design Tool.
DNL = Day-Night Average Sound Level.
dB = Decibel.

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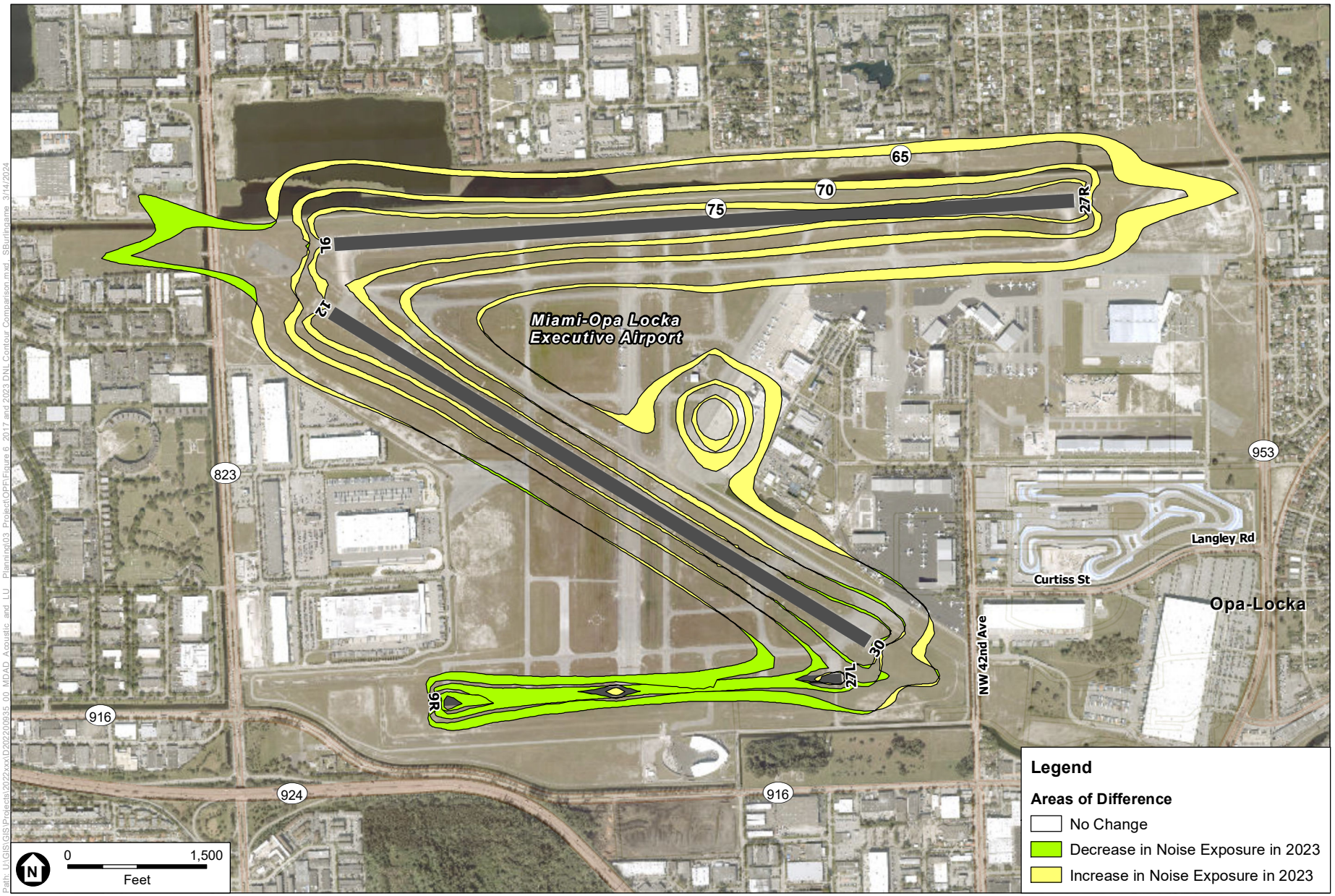
Figure 5
2017 and 2023 DNL Contours



SOURCE: Esri; AEDT 2d and 3f; ESA, 2024.
AEDT = Aviation Environmental Design Tool.

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Figure 6
2017 and 2023 DNL Contour Comparison

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Appendix A-1

Departure Operations and Stage Length Percentages

AEDT ANP	Total Operations	Departure Stage Length Percentage									
		1	2	3	4	5	6	7	8	9	M
737700	95.96	13%	37%	15%	19%	1%	13%	0%	0%	0%	0%
767300	55.86	11%	63%	16%	5%	0%	5%	0%	0%	0%	0%
A320-211	21.48	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%
BD-700-1A10	1652.32	24%	35%	13%	12%	<1%	12%	1%	<1%	0%	0%
BD-700-1A11	580.07	29%	40%	13%	13%	<1%	5%	<1%	0%	0%	0%
BEC58P	3385.09	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
C130	295.38	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CIT3	302.20	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CL600	5353.13	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CL601	394.83	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA172	4576.71	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA182	259.23	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA208	3148.06	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA20T	126.04	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA441	113.15	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA500	118.88	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA510	1443.69	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA525C	2528.50	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA55B	3727.24	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA560U	601.54	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA560XL	1936.38	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA680	1932.28	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CNA750	2413.32	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
COMSEP	2731.03	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DC3	38.98	96%	4%	0%	0%	0%	0%	0%	0%	0%	0%
DHC6	2136.62	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DHC8	621.98	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ECLIPSE500	637.35	77%	23%	<1%	0%	0%	0%	0%	0%	0%	0%
EMB145	42.02	15%	62%	15%	8%	0%	0%	0%	0%	0%	0%
FAL900EX	1415.69	25%	45%	14%	15%	<1%	1%	0%	0%	0%	0%
G650ER	750.49	28%	40%	9%	15%	<1%	7%	<1%	<1%	<1%	0%
GASEPF	828.86	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%

AEDT ANP	Total Operations	Departure Stage Length Percentage									
		1	2	3	4	5	6	7	8	9	M
GASEPV	1064.15	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
GIV	4100.38	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
GV	2115.41	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
IA1125	497.59	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
LEAR35	4720.65	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
MU3001	754.79	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PA30	220.56	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SF340	962.13	97%	3%	0%	0%	0%	0%	0%	0%	0%	0%

SOURCE: MDAD ANOMS, 2023; ESA, 2024.

Appendix A-2

2023 Annual Operations

	Arrival			Departure			Touch and Gos			
AEDT ANP	Day	Night	Total	Day	Night	Total	Day	Night	Total	Subtotal
					Fixed-Wing					
737700	79.47	16.49	95.96	88.8	7.16	95.96	-	-	-	191.92
767300	45.83	10.03	55.86	45.57	10.29	55.86	-	-	-	111.71
A320-211	20.05	1.43	21.48	21.48	-	21.48	-	-	-	42.97
BD-700-1A10	1,417.28	235.03	1,652.32	1,522.51	129.81	1,652.32	-	-	-	3,304.63
BD-700-1A11	498.97	81.1	580.07	512.46	67.61	580.07	-	-	-	1,160.14
BEC58P	2,204.42	1,180.67	3,385.09	2,245.63	1,139.46	3,385.09	1,258.21	35.39	1,293.60	8,063.78
C130	267.43	27.95	295.38	273.74	21.64	295.38	222.21	20.5	242.71	833.47
CIT3	296.33	5.87	302.2	295.04	7.16	302.2	-	-	-	604.4
CL600	4,890.05	463.08	5,353.13	5,100.27	252.85	5,353.13	-	-	-	10,706.25
CL601	383.82	11.01	394.83	377.25	17.58	394.83	-	-	-	789.65
CNA172	4,274.43	302.28	4,576.71	4,452.90	123.8	4,576.71	42,507.99	452.17	42,960.16	52,113.57
CNA182	250.59	8.64	259.23	252.07	7.16	259.23	-	-	-	518.47
CNA208	3,095.31	52.74	3,148.06	3,082.17	65.88	3,148.06	-	-	-	6,296.11
CNA20T	120.48	5.56	126.04	126.04	-	126.04	-	-	-	252.07
CNA441	107.42	5.73	113.15	101.54	11.6	113.15	-	-	-	226.29
CNA500	104.02	14.86	118.88	107.42	11.46	118.88	-	-	-	237.75
CNA510	1,356.55	87.14	1,443.69	1,390.70	52.99	1,443.69	-	-	-	2,887.39
CNA525C	2,399.71	128.8	2,528.50	2,417.03	111.48	2,528.50	-	-	-	5,057.01
CNA55B	3,516.54	210.7	3,727.24	3,548.84	178.4	3,727.24	232.84	21.25	254.09	7,708.57
CNA560U	559.61	41.93	601.54	577.19	24.35	601.54	-	-	-	1,203.08
CNA560XL	1,839.56	96.82	1,936.38	1,860.48	75.91	1,936.38	-	-	-	3,872.77
CNA680	1,830.33	101.96	1,932.28	1,866.13	66.15	1,932.28	135.4	12.5	147.9	4,012.47
CNA750	2,166.44	246.88	2,413.32	2,287.28	126.04	2,413.32	-	-	-	4,826.64
COMSEP	2,628.59	102.44	2,731.03	2,625.09	105.94	2,731.03	3,306.74	58.98	3,365.72	8,827.79
DC3	38.98	-	38.98	38.9	0.07	38.98	-	-	-	77.95
DHC6	2,012.42	124.2	2,136.62	1,985.51	151.11	2,136.62	385.57	35.38	420.95	4,694.18
DHC8	621.98	-	621.98	616.58	5.41	621.98	-	-	-	1,243.97
ECLIPSE500	617.25	20.1	637.35	610.13	27.21	637.35	-	-	-	1,274.69
EMB145	38.68	3.35	42.02	40.91	1.12	42.02	-	-	-	84.05
FAL900EX	1,223.54	192.15	1,415.69	1,310.22	105.47	1,415.69	-	-	-	2,831.38
G650ER	626.88	123.61	750.49	673.15	77.34	750.49	-	-	-	1,500.98

	Arrival			Departure			Touch and Gos			
AEDT ANP	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**	**Subtotal**
GASEPF	785.93	42.93	828.86	759.69	69.17	828.86	758.86	78.64	837.5	2,495.23
GASEPV	1,039.57	24.58	1,064.15	1,032.64	31.51	1,064.15	-	-	-	2,128.30
GIV	3,549.00	551.38	4,100.38	3,792.15	308.23	4,100.38	211.99	19.34	231.33	8,432.10
GV	1,797.46	317.96	2,115.41	1,901.43	213.98	2,115.41	-	-	-	4,230.83
IA1125	469.55	28.03	497.59	477.31	20.28	497.59	-	-	-	995.18
LEAR35	4,368.81	351.84	4,720.65	4,431.34	289.31	4,720.65	-	-	-	9,441.30
MU3001	715.75	39.04	754.79	714.69	40.1	754.79	-	-	-	1,509.58
PA30	216.12	4.44	220.56	206.24	14.32	220.56	-	-	-	441.13
SF340	903.22	58.91	962.13	917.15	44.98	962.13	365.58	32.62	398.2	2,322.45
					Helicopter					
B212	246.96	93.91	340.87	259.23	81.64	340.87	-	-	-	681.74
B429	164.71	-	164.71	164.71	-	164.71	-	-	-	329.41
R44	584.35	4.3	588.65	588.65	-	588.65	-	-	-	1,177.30
S76	472.64	181.89	654.53	519.32	135.21	654.53	-	-	-	1,309.06
SA330J	581.65	170.28	751.92	607.27	144.66	751.92	-	-	-	1,503.85
SA350D	511.64	42.64	554.28	452.59	101.69	554.28	-	-	-	1,108.55
SA365N	85.82	31.62	117.44	88.8	28.64	117.44	-	-	-	234.89

SOURCE: MDAD ANOMS, 2023; ESA, 2024.

Appendix A-3

2023 Flight Track Utilization

2023 Arrival Flight Track Utilization			2023 Departure Flight Track Utilization			2023 Touch and Go Flight Track Utilization		
Runway	**Track ID**	**Day/Night**	**Runway**	**Track ID**	**Day/Night**	**Runway**	**Track ID**	**Day/Night**
09L	09LA01	84.4%	09L	09LD01	77.8%	09L	09LT01	100.0%
	09LA02	4.7%		09LD02	19.1%		**Total**	**100.0%**
	09LA03	9.4%		09LD03	3.1%	09R	09RT01	100.0%
	09LA04	1.6%		**Total**	**100.0%**		**Total**	**100.0%**
	Total	**100.0%**	09R	09RD01	86.4%	12	12T01	100.0%
09R	09RA01	79.4%		09RD02	3.4%		**Total**	**100.0%**
	09RA02	10.3%		09RD03	10.2%	27L	27LT01	100.0%
	09RA03	3.4%		**Total**	**100.0%**		**Total**	**100.0%**
	09RA04	6.9%	12	12D01	63.9%	27R	27RT01	100.0%
	Total	**100.0%**		12D02	19.0%		**Total**	**100.0%**
12	12A01	80.7%		12D03	7.6%	30	30T01	100.0%
	12A02	6.4%		12D04	7.6%		**Total**	**100.0%**
	12A03	6.4%		12D05	1.9%			
	12A04	6.4%		**Total**	**100.0%**			
	Total	**100.0%**	27L	27LD01	82.7%			
27L	27LA01	83.1%		27LD02	3.5%			
	27LA02	16.9%		27LD03	13.8%			
	Total	**100.0%**		**Total**	**100.0%**			
27R	27RA01	87.6%	27R	27RD01	80.0%			
	27RA02	3.1%		27RD02	15.4%			
	27RA03	9.3%		27RD03	3.1%			
	Total	**100.0%**		27RD04	1.5%			
30	30A01	86.9%		**Total**	**100.0%**			
	30A02	6.6%	30	30D01	90.1%			
	30A03	3.3%		30D02	8.3%			
	30A04	3.3%		30D03	1.7%			
	Total	100.0%		Total	100.0%			
H1	H1A01	16.7%	H1	H1D01	16.7%			
	H1A02	16.7%		H1D02	16.7%			
	H1A03	16.7%		H1D03	16.7%			
	H1A04	16.7%		H1D04	16.7%			
	H1A05	16.7%		H1D05	16.7%			

2023 Arrival Flight Track Utilization			2023 Departure Flight Track Utilization			2023 Touch and Go Flight Track Utilization		
Runway	**Track ID**	**Day/Night**	**Runway**	**Track ID**	**Day/Night**	**Runway**	**Track ID**	**Day/Night**
	H1A06	16.7%		H1D06	16.7%			
	Total	**100.0%**		**Total**	**100.0%**			

SOURCE: MDAD ANOMS, 2023; ESA, 2024.

Notes:

1. Jet aircraft are using only straight-in and straight-out flight tracks.