Chapter 3
Aviation Noise

As part of the voluntary Part 150 noise compatibility study process, the Federal Aviation Administration (FAA) requires that the prevailing noise conditions at an airport be defined using a computer noise simulation model. The FAA mandates the use of the Aviation Environmental Design Tool (AEDT) for use in noise compatibility studies. The latest version, AEDT Version 3g, is used for the purposes of this study. The AEDT is designed to predict annual average aircraft noise conditions at a given geographic location and produce noise exposure contours, which are then superimposed on a map depicting land uses in the airport vicinity to graphically represent aircraft noise conditions. The information provided by the existing land use, zoning, and general plan maps presented in Chapter One – Inventory is used to identify areas within the noise exposure contours that are currently, or have the potential to be, exposed to significant aircraft noise levels, per FAA guidance.

To achieve an accurate representation of an airport's noise conditions, the AEDT incorporates a combination of industry-standard information and user-supplied inputs that are airport-specific. The AEDT accepts user-provided input for aircraft profiles and aircraft characteristics, although the FAA reserves the right to accept or deny the use of such data depending on their statistical validity. Any user characteristics must be approved by FAA prior to completion of the analysis. The software provides noise characteristics, standard flight profiles, and manufacturer-supplied flight procedures for aircraft within the U.S. civil and military fleets, including those that commonly operate at Wilmington International Airport (ILM). As each aircraft has different design and operating characteristics (number and type of engines, weight, and thrust levels), each aircraft emits different noise levels. The most common way to spatially represent the noise levels emitted by an aircraft is with a noise exposure contour.

Based on AEDT-provided and user inputs, the model then calculates 24-hour aircraft sound exposure values within a grid covering the airport and surrounding areas. Each grid value – represented by the day-night average sound level (DNL) metric – at an intersection point on the grid represents a noise level for that geographic location. To create the noise contours, a line linking equal values – similar to those on a topographic map – is drawn to connect points of the same DNL noise value. In the same way that a topographic contour represents the same elevation, the noise contour identifies equal noise exposure. For more information regarding the DNL noise metric, consult the **Resource Library** located in **Appendix C**.
Model user inputs include airport-specific information, including runway configuration, flight paths, aircraft fleet mix, runway use distribution, elevation, atmospheric conditions, and numbers of daytime, evening, and nighttime operations. **Exhibit 3A** depicts the various AEDT input categories for developing noise exposure contours. Specific modeling assumptions for ILM are discussed in the following sections.

HOW WILL THE NOISE EXPOSURE CONTOURS BE USED?

The 65 DNL and greater noise exposure contours developed in this chapter for 2023 and 2028 will be used in Chapter Four – Noise Impacts to identify the areas impacted by airport noise, based on federal guidance. These noise exposure contours will also become the official Noise Exposure Maps (NEMs) for ILM, consistent with Title 14, Code of Federal Regulations (CFR), Part 150 (14 CFR Part 150 or Part 150).

AIRCRAFT NOISE MODELING ASSUMPTIONS

The aircraft noise modeling assumptions used in this study are based on airport-specific information: operational fleet mix and database selection; time-of-day; runway use; and flight tracks. Each aircraft noise modeling assumption is explained in more detail below.

AIRPORT INFORMATION

Airport-specific information is needed to model noise exposure conditions. **Table 3A** summarizes modeling assumptions for runways, temperature, relative humidity, and airport elevation. As discussed in Chapter One – Inventory, Wilmington International Airport has two runways: Runway 6-24, which is 8,016 feet long, and Runway 17-35, which is 7,754 feet long. The runway lengths are not anticipated to change during the time horizon for this study; therefore, this condition was used for both the 2023 and 2028 conditions. The elevation of each runway end (21.0 feet above mean sea level [MSL] for Runway 6; 20.2 feet MSL for Runway 24; 30.9 feet MSL for Runway 17; and 18.3 feet MSL for Runway 35) was input to indicate the altitude at which the flight tracks originate and terminate. The AEDT adjusts noise calculations based on atmospheric conditions specific to the airport's geographic location and elevation. As outlined in the *AEDT User Guide*, local temperature, relative humidity, and atmospheric pressure values – which affect atmospheric absorption of noise – are adjusted according to the methods specified in the Society of Automotive Engineers' *Application of Pure-Tone Atmospheric Absorption Losses to One-Third Octave Band Data* (SAE-ARP-5534).

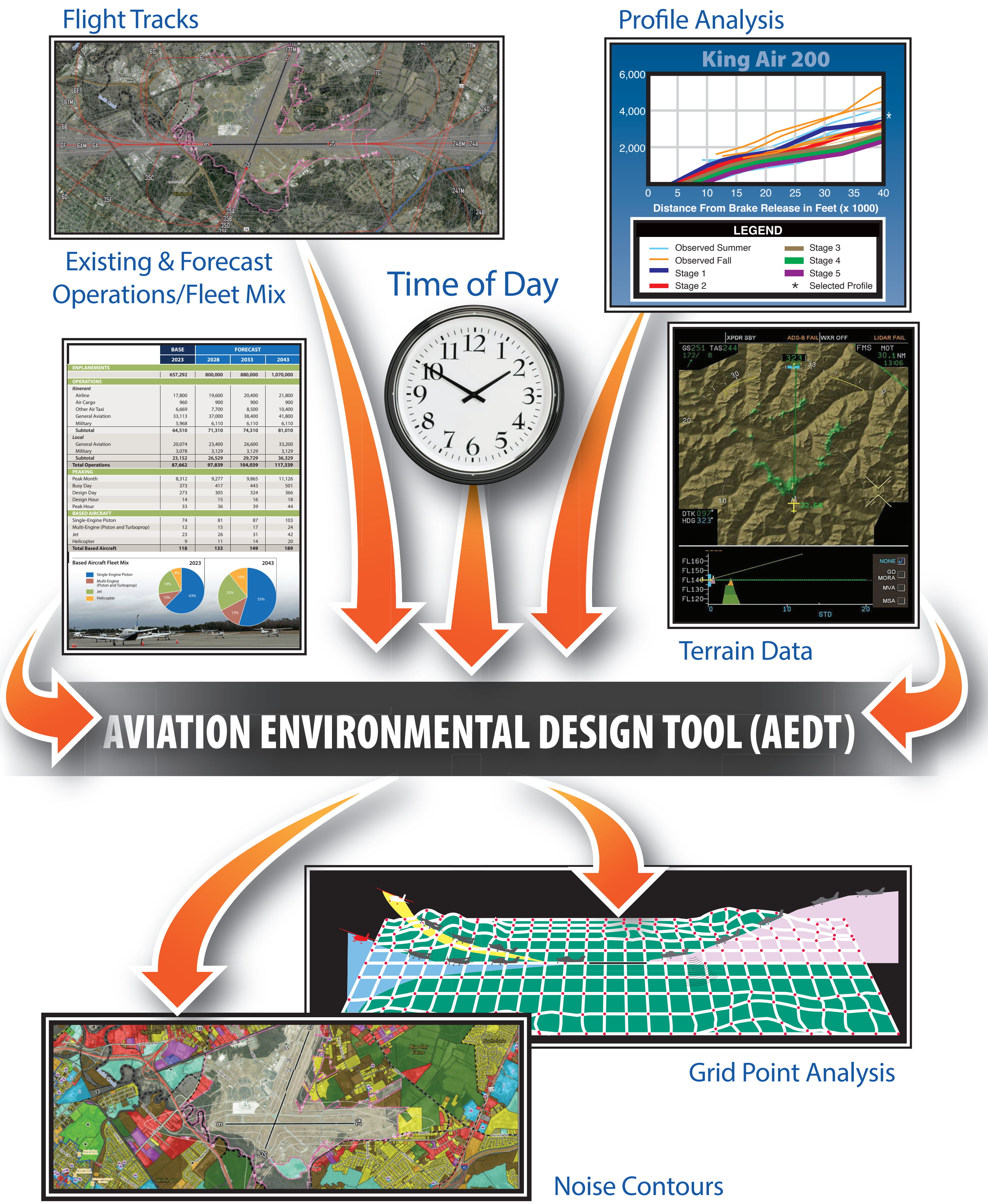


Exhibit 3A
AEDT Process

TABLE 3A | ILM AEDT Input Assumptions

AEDT Input	Model Value
Runway 6-24 Dimensions	8,016 feet x 150 feet
Runway 17-35 Dimensions	7,754 feet x 150 feet
Runway 6 End Elevation	21.0 feet MSL
Runway 24 End Elevation	20.2 feet MSL
Runway 17 End Elevation	30.9 feet MSL
Runway 35 End Elevation	18.3 feet MSL
Average Annual Temperature (2013-2022)	64.36°F
Relative Humidity	73.86%
Airport Elevation	31.0 feet MSL
Average Wind Speed	6.74 knots
AEDT = Aviation Environmental Design Tool MSL = mean sea level	

Source: Aviation Environmental Design Tool, Version 3g Airport Database, 33623

OPERATIONAL FLEET MIX AND DATABASE SELECTION

The ILM NEMs were prepared for two study periods: existing condition (2023), and at least a five-year forecast (2028) per 14 CFR Part 150. Operations totals used in the modeling are presented in **Table 3B**. As indicated in the table, existing condition (2023) operations are based on the FAA-approved forecast presented in Chapter 2 and Automatic Dependent Surveillance-Broadcast (ADS-B) data collected from February through December 2023. The 2028 operations are based on the FAA-approved forecasts from Chapter 2. The forecast approval letter is included as **Appendix E**.

Based on the annual operations levels presented in **Table 3B**, a detailed fleet mix, or summary of the types of aircraft operating at Wilmington International Airport, was prepared. The fleet mix presents the total number of operations by aircraft type for the existing condition and forecast years. For each aircraft, an AEDT noise designator was selected to provide representative noise exposure during the modeling process. The AEDT aircraft fleet database includes approximately 3,000 airframe and engine combinations.

A **fleet mix** is a summary of the types of aircraft that operate at an airport.

TABLE 3B | Annual Operations Summary for ILM

Operations	Existing (2023)[1]	Forecast (2028)[1]
Itinerant		
Airline	17,800	19,600
Air Cargo	960	900
Other Air Taxi	6,669	7,700
General Aviation	33,113	37,000
Military	5,968	6,110
Total Itinerant Operations	***64,510***	***71,310***
Local		
General Aviation	20,074	23,400
Military	3,078	3,129
Total Local Operations	***23,152***	***26,529***
TOTAL OPERATIONS	**87,662**	**97,839**

[1]Forecast is contained in Chapter 2 of this study.

Each aircraft type in the AEDT has a unique noise footprint which can be depicted spatially. To illustrate this concept, single-event noise contours, generated by one departure and one arrival of a given aircraft type, are presented on **Exhibit 3B**. In contrast to the DNL noise contours used for the NEMs, these contours depict the sound exposure level (SEL) for aircraft that operate at ILM. The SEL is used when computing an aircraft's acoustical contribution to a cumulative noise metric, such as DNL. The noise footprint of an aircraft is influenced by a variety of factors, including the shape of the airframe, engine type, and aircraft weight.

The types of aircraft operating at the airport were identified using the FAA's Traffic Flow Management System Counts (TFMSC) database and were then grouped based on similar noise characteristics. In cases where a specific aircraft is not available within the AEDT, designators were selected based on the FAA's approved list of substitutes. No user-defined aircraft or profiles requiring FAA approval were used in the AEDT modeling. **Table 3C** summarizes the operational fleet mix assumptions. It is important to note that all substitutions made for designators, as listed in **Table 3C**, follow FAA guidance and approved practices.

As indicated in the table, single-engine piston itinerant general aviation operations are divided into two categories based on propeller type: variable pitch and fixed pitch. The general aviation single-engine variable-pitch propeller model (GASEPV) represents many single-engine general aviation aircraft, including the Cessna 206, Piper PA-24 Comanche, and Piper PA-32 Cherokee Six. The general aviation single-engine fixed-pitch propeller model (GASEPF) also represents several single-engine general aviation aircraft. These include the Cessna 150 Series and the Piper PA-28 Cherokee Series.

Itinerant operations are based on the FAA's TFMSC reports, data collected through ADS-B, and analysis of the airlines' flight schedules.

The AEDT fleet database identifies the BEC58P – the Beech Baron light twin-engine aircraft – as a comparable aircraft to the Beech 55 Baron, Beech 58 Baron, Beech 60 Duke, Piper PA-34 Seneca, Cessna 310, Cessna 340, and Cessna 402, among others. The BEC58P designator was used to model local multi-engine piston aircraft operations.

Itinerant general aviation turboprop operations included the following:

- ATR 42 and ATR 72 operated by FedEx, modeled with the Bombardier de Havilland DHC-8 (DHC8);
- Cessna 208 (CNA208) operated by UPS;
- Pilatus PC-12 (Pilatus PC-12) which is represented in AEDT by a Cessna 208 airframe combined with a Pratt and Whitney model PT6A-67 engine; and
- Beechcraft Super King Air 200, 300, and 350, modeled with the Bombardier de Havilland DHC-6 (DHC6).

TABLE 3C | ILM Operational Fleet Mix

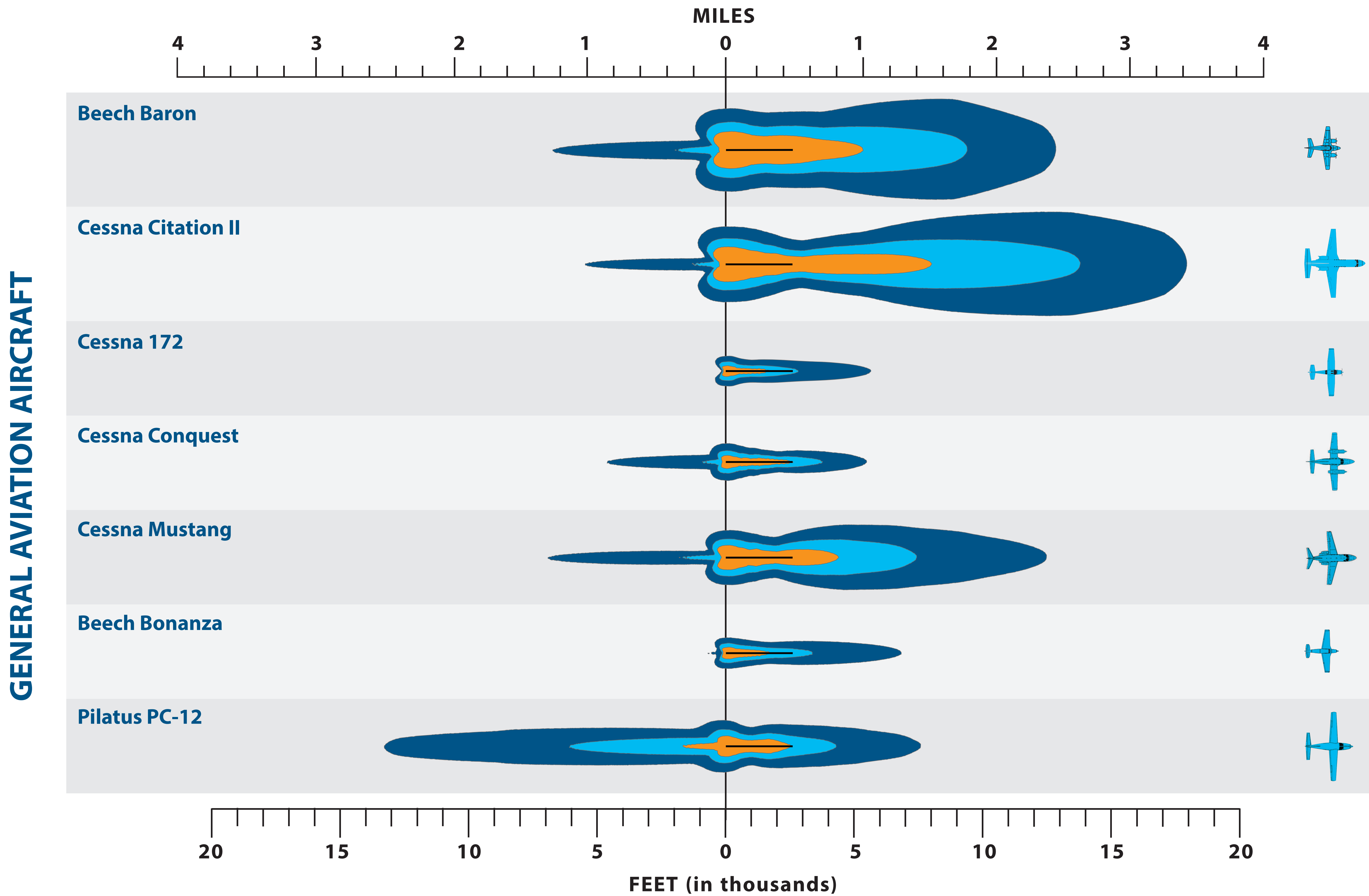
Aircraft Type[1]	AEDT Designator[2]	2023 Operations[3]	2028 Operations[3]
Itinerant Operations			
Single-Engine Piston, Fixed	GASEPF	15,653	17,490
Single-Engine Piston, Variable	GASEPV	15,653	17,490
Multi-Engine Piston	BEC58P	1,330	1,487
Turboprop	DHC8	608	571
Turboprop	CNA208	352	329
Turboprop	Pilatus PC-12	327	378
Turboprop	DHC6	1,219	1,407
Turbojet, Medium	CNA525C	1,225	1,414
Turbojet, Medium	CNA55B	990	1,143
Turbojet, Medium	CNA560XL	615	710
Turbojet, Medium	CNA680	472	545
Turbojet, Medium	CL600	455	525
Turbojet, Medium	CNA750	371	428
Turbojet, Medium	CNA510	275	318
Turbojet, Medium	ECLIPSE500	248	286
Turbojet, Medium	MU3001	181	209
Turbojet, Medium	LEAR35	168	194
Turbojet, Medium	FAL900EX	123	142
Turbojet, Large	A320-232	819	980
Turbojet, Large	737800	196	392
Turbojet, Large	737700	2,136	2,646
Turbojet, Large	A319-131	1,406	2,058
Turbojet, Large	717200	1,246	1,568
Turbojet, Large	CRJ9-ER	8,153	9,212
Turbojet, Large	EMB170	2,100	2,744
Turbojet, Large	EMB145	1,744	0
Helicopter, Small	B407	279	312
Helicopter, Medium	B206L	198	221
Military, Turboprop	DHC6	905	927
Military, Turboprop	C130E	1,289	1,320
Military, Turboprop	CNA208	173	177
Military, Helicopter	CH47D	247	253
Military, Turbojet	AV8B	191	0
Military, Turbojet	F-18	191	0
Military, Turbojet	F-35	381	781
Military, Turbojet	CNA560E	328	336
Military, Turbojet	737700	175	179
Military, Turbojet	737800	2,088	2,138
Total Itinerant Operations		***64,510***	***71,310***
Local Operations			
Single-Engine Piston, Fixed	GASEPF	9,537	11,115
Single-Engine Piston, Variable	GASEPV	9,537	11,115
Multi-Engine Piston	BEC58P	1,000	1,170
Military, Turboprop	C130E	3,078	3,129
Total Local Operations		***23,152***	***26,529***
TOTAL OPERATIONS		**87,662**	**97,839**

GA = General Aviation

1 Coffman Associates analysis. No user-defined aircraft or profiles requiring FAA approval were used in the AEDT modeling.

2 FAA Traffic Flow Management System Counts, Wilmington International Airport, January through December 2023; Automatic Dependent Surveillance-Broadcast data collected from February through December 2023.

3 The FAA approved the forecast contained in Chapter 2 – Forecasts, which was prepared as part of this study. (See **Appendix E**.)



The contours represent sound exposure levels (SEL) of 85, 90 and 95 dB for one arrival and one departure of each aircraft type.
The outer contour represents 85 dB SEL. The inner contour represents 95 dB SEL.

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Air charter and small business jet itinerant operations were modeled using the designators listed below:

- Cessna CitationJet (CNA525C)
- Cessna Citation Bravo (CNA55B)
- Cessna Citation Excel (CNA560XL)
- Cessna Citation Sovereign (CNA680)
- Bombardier Challenger 600 (CL600)
- Cessna Citation X (CNA750)
- Cessna Citation Mustang (CNA510)
- Eclipse 500 (ECLIPSE500)
- Mitsubishi MU300 Diamond (MU3001)
- Learjet 45 (LEAR35)
- Dassault Falcon 900 (FAL900EX)

Commercial airline operations were grouped by number of seats and modeled as follows:

- 177-199 seats (B737-800; B757-200; A321), modeled with Airbus A320-200 Series (A320-232)
- 155-174 seats (B737-800; A320), modeled with the Boeing 737-800 Series (737800)
- 135-154 seats (B737-700; A320), modeled with the Boeing 737-700 Series (737700)
- 114-134 seats (B737-700; A319), modeled with Airbus A319-100 Series (A319-131)
- 95-114 seats (B717-200; A220; ERJ 190), modeled with Boeing 717-200 Series (717200)
- 70-79 seats (CRJ 900; ERJ 175), modeled with Bombardier CRJ-900 (CRJ9-ER)
- 60-69 seats (CRJ 700; ERJ 170), modeled with Embraer ERJ170 (EMB170)
- 40-45 seats (CRJ 200; ERJ 140,145), modeled with Embraer ERJ145 (EMB145)

Itinerant military operations included the following:

- AV-8B Harrier, modeled with NOISEMAP
- F-18 Hornet (F-18), modeled with NOISEMAP
- F-35 Lightning II, modeled with NOISEMAP
- Cessna UC-35A, modeled with the Cessna Citation V (CNA560E)
- Boeing 717-700C, modeled with the Boeing 737 (737700)
- Boeing P-8 Poseidon, modeled with the Boeing 737-800 (737800)
- Bell V-22 Osprey, modeled with the Boeing CH-47 Chinook (CH47D); and
- UH-60 Blackhawk (UH60)

Additionally, civilian itinerant helicopters were modeled using the Bell 407 (B407) and the Bell OH-58 Kiowa, modeled with the Bell 206 Long Ranger (B206L), which is operated by the New Hanover County Sheriff's Department.

Local operations were modeled with the previously discussed GASEPF, GASEPV, and BEC58P. Local military operations were modeled using the C130E.

NOISEMAP MODELING

The latest version of AEDT (Version 3g) does not contain flight profile information for the F-35 or AV-8B; therefore, the noise exposure from itinerant F-35 and AV-8B operations was computed using the Department of Defense's (DoD) NOISEMAP (NMAP) software, Version 7.370. Fighter jet traffic at ILM is limited to itinerant operations as required by U.S. DoD training mission and operational need. Typically, fighter jets that utilize ILM do so to refuel when traveling to and from offshore training military operations areas (MOAs) and nearby military installations, including MCAS Beaufort and MCAS Cherry Point. Flight tracks and profiles for the NOISEMAP modeling at ILM were based on information contained in the document *Continuing Environmental Review Statement (CERS) for F-35 basing at Marine Corps Air Station Cherry Point, North Carolina*, and additional data provided by the United States Marine Corps (USMC) liaison and ILM's military refueling fixed-base operator. The noise grid output of the NMAP model was combined with the AEDT output in AEDT to generate the average annual daily DNL contours. See **Appendix H – Military Noise Modeling Inputs** for more details.

TIME-OF-DAY

As previously discussed, noise contours depict locations with equal noise exposure. The DNL noise metric, which is required for Part 150 studies, weighs operations occurring during the nighttime hours (10:00 p.m. to 7:00 a.m.) more heavily. In calculating aircraft noise exposure, the AEDT increases the noise levels for nighttime operations by 10 (dB). For the purposes of this study, time-of-day assumptions for activity are based on interviews with Airport Traffic Control Tower (ATCT) staff and radar flight track data. **Table 3D** summarizes the time-of-day percentages for all operation types assumed for this study. The same evening and nighttime percentages were applied to the 2028 scenario.

TABLE 3D | ILM Time-of-Day Operations Percentages

	2023		2028	
Aircraft Category and Type	**Day %**	**Night %**	**Day %**	**Night %**
Turbojet (Airlines) B757-300; B767-300; A330 (200+ seats)	77.2	22.8	77.2	22.8
Turbojet (Airlines) B737-800; B757-200; A321 (177-179 seats)	98.6	1.4	98.6	1.4
Turbojet (Airlines) B737-800; A320 (155-174 seats)	88.2	11.8	88.2	11.8
Turbojet (Airlines) B737-700; A320 (135-154 seats)	86.3	13.7	86.3	13.7
Turbojet (Airlines) B737-700; A319 (115-134 seats)	99.3	0.7	99.3	0.7
Turbojet (Airlines) B717-200; A220: ERJ 190 (95-114 seats)	72.6	27.4	72.6	27.4
Turbojet (Airlines) Q400; ERJ 190-E2 (80-94 seats)	80.3	19.7	80.3	19.7
Turbojet (Airlines) CRJ 900; ERJ 175 (70-79 seats)	99.0	1.0	99.0	1.0
Turbojet (Airlines) CRJ 700; ERJ 170 (60-69 seats)	77.2	22.8	77.2	22.8
Turbojet (Airlines) CRJ 200; ERJ 140,145 (40-59 seats)	98.6	1.4	98.6	1.4
Turboprop	94.6	5.4	94.6	5.4
Piston	96.1	3.9	96.1	3.9
Helicopter	96.1	3.9	96.1	3.9
Military	97.7	2.3	97.7	2.3

Note: Night = 10:00 p.m. to 7:00 a.m.
Sources: ADS-B Data (2023); Coffman Associates analysis

RUNWAY USE

Runway use is generally influenced by the prevailing wind direction, as aircraft normally land and take off into the wind. **Table 3E** summarizes runway use percentages based on communication with airport and ATCT staff, as well as a review of ADS-B data. Runway 6-24 is used notably more than Runway 17-35. The assumptions in **Table 3E** were used for the existing and future conditions.

TABLE 3E | ILM Runway Use Percentages

ARRIVALS			
Runway 6	Runway 24	Runway 17	Runway 35
29.16%	39.57%	15.31%	15.95%
DEPARTURES			
Runway 6	Runway 24	Runway 17	Runway 35
31.27%	38.85%	13.60%	16.28%

Sources: 1200.aero ADS-B data; Coffman Associates analysis

FLIGHT TRACKS

Flight patterns can be categorized into the following types: arrivals, departures, and local (or touch-and-go). Arrivals and departures correspond to itinerant traffic traveling to or from the airport, while local operations represent those conducted within the local traffic pattern. The touch-and-go nomenclature refers to an aircraft landing briefly on the runway and then resuming flight; pilots use this technique to practice landings or other procedures. These paths are included in the model to indicate where each aircraft type operates. The AEDT arrival, departure, local, and helicopter flight tracks for this study are based on radar flight track data obtained from 1200.aero ADS-B for 48 randomly selected days. The randomly selected data set contains one day from each day of the week for each of the eleven months of available data (February through December 2023).

Exhibits 3C and **3D** illustrate the existing and future conditions of the arrival and departure flight tracks, based on radar flight track data for fixed-wing aircraft (which include all aircraft operating at the airport, except helicopters). The AEDT allows for flight tracks to be dispersed, accounting for variances in flight paths due to wind conditions and/or pilot technique. Only the backbone (or center track) is shown on the exhibits.

Existing and future condition flight tracks for local touch-and-go activity are illustrated on **Exhibit 3E**. The local activity and flight tracks were also dispersed. As indicated on the exhibit, much of the activity occurs southeast of Runway 6-24 in three pattern sizes, and northwest of Runway 6-24 in two pattern sizes.

Exhibit 3F illustrates existing and future condition flight tracks for helicopters. The helicopter tracks are the same for arrival and departure, with two distinct helipad locations modeled.

Military arrival and departure flight tracks modeled in NOISEMAP are presented in **Appendix H**.

As illustrated on the exhibits, fixed-wing arrivals and departures on both ends of the runway represent various flight paths, depending on the aircraft's origin or destination. The flight tracks delineated in Exhibits 3C, 3D, 3E, 3F, and 3G are the same for existing and future conditions.

The existing flight track assumptions are based on current operating conditions at the airport and were developed using radar flight track data from 1200.aero ADS-B collected from February 2023 through January 2024. The future operating conditions only considered increased flight activity following the FAA-approved forecast contained in Chapter 2 – Forecasts. Had there been any imminently planned changes to the airfield or changes to how aircraft operate in the vicinity of the airport, those operating conditions would have been captured; however, no such changes to the user inputs were required in this case. The 2028 noise exposure contours are based on the same flight tracks as the existing condition 2023 noise exposure contours.

Flight Track Assignments

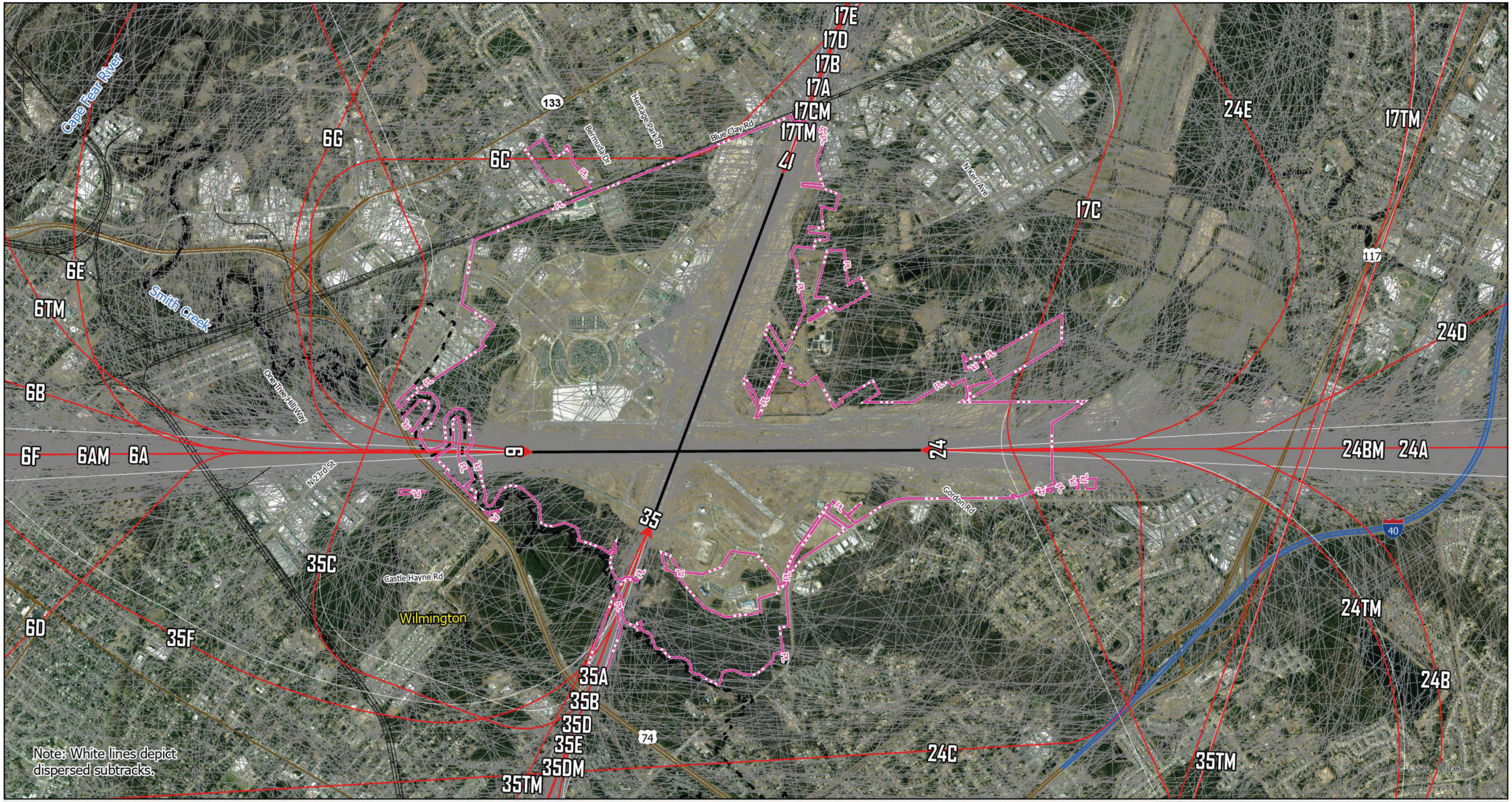
The previously discussed operational conditions and runway utilization are used to assign aircraft activity to each flight track. Ultimately, this information determines the geographic distribution of the noise generated by operations at the airport. Based on an evaluation of aircraft operating characteristics, runway utilization, and flight track data, percentages were assigned to each consolidated flight track. The total number of operations for each aircraft is distributed among the available flight tracks to represent the operational conditions at the airport.

Table 3F summarizes the flight track use distributions for arrival, departure, and touch-and-go operations.

TABLE 3F | ILM Flight Track Use Percentages by Aircraft Category and Type

AIRCRAFT CATEGORY AND TYPE	DEPARTURES							
	RUNWAY 6		RUNWAY 24		RUNWAY 17		RUNWAY 35	
	Track	%	Track	%	Track	%	Track	%
Turbojet, Turboprop, Single-Engine Piston, and Multi-Engine Piston	6A	70%	24A	70%	17A	60%	35A	70%
	6B	5%	24B	5%	17B	10%	35B	10%
	6C	5%	24C	5%	17C	10%	35C	10%
	6D	5%	24D	5%	17D	5%	35D	5%
	6E	5%	24E	5%	17E	5%	35E	5%
	6F	5%	24F	5%	17F	5%	–	–
	6G	5%	24G	5%	17G	5%	–	–
AIRCRAFT CATEGORY AND TYPE	**ARRIVALS**							
	RUNWAY 6		RUNWAY 24		RUNWAY 17		RUNWAY 35	
	Track	%	Track	%	Track	%	Track	%
Turbojet, Turboprop, Single-Engine Piston, and Multi-Engine Piston	6A	60%	24A	70%	17A	80%	35A	70%
	6B	5%	24B	5%	17B	5%	35B	5%
	6C	5%	24C	5%	17C	5%	35C	10%
	6D	10%	24D	10%	17D	5%	35D	5%
	6E	5%	24E	10%	17E	5%	35E	5%
	6F	10%	–	–	–	–	35F	5%
	6G	5%	–	–	–	–	–	–
AIRCRAFT CATEGORY AND TYPE	**TOUCH-AND-GOS**							
	RUNWAY 6		RUNWAY 24		RUNWAY 17		RUNWAY 35	
	Track	%	Track	%	Track	%	Track	%
Single-Engine Piston and Multi-Engine Piston	6TA	100%	24TA	60%	17TA	100%	35TA	60%
	–	–	24TB	40%	–	–	35TB	40%
Turbojet, Turboprop	6TM	100%	24TM	100%	17TM	100%	17TM	100%
Military	6TM	100%	24TM	100%	17TM	100%	17TM	100%

(Continues)



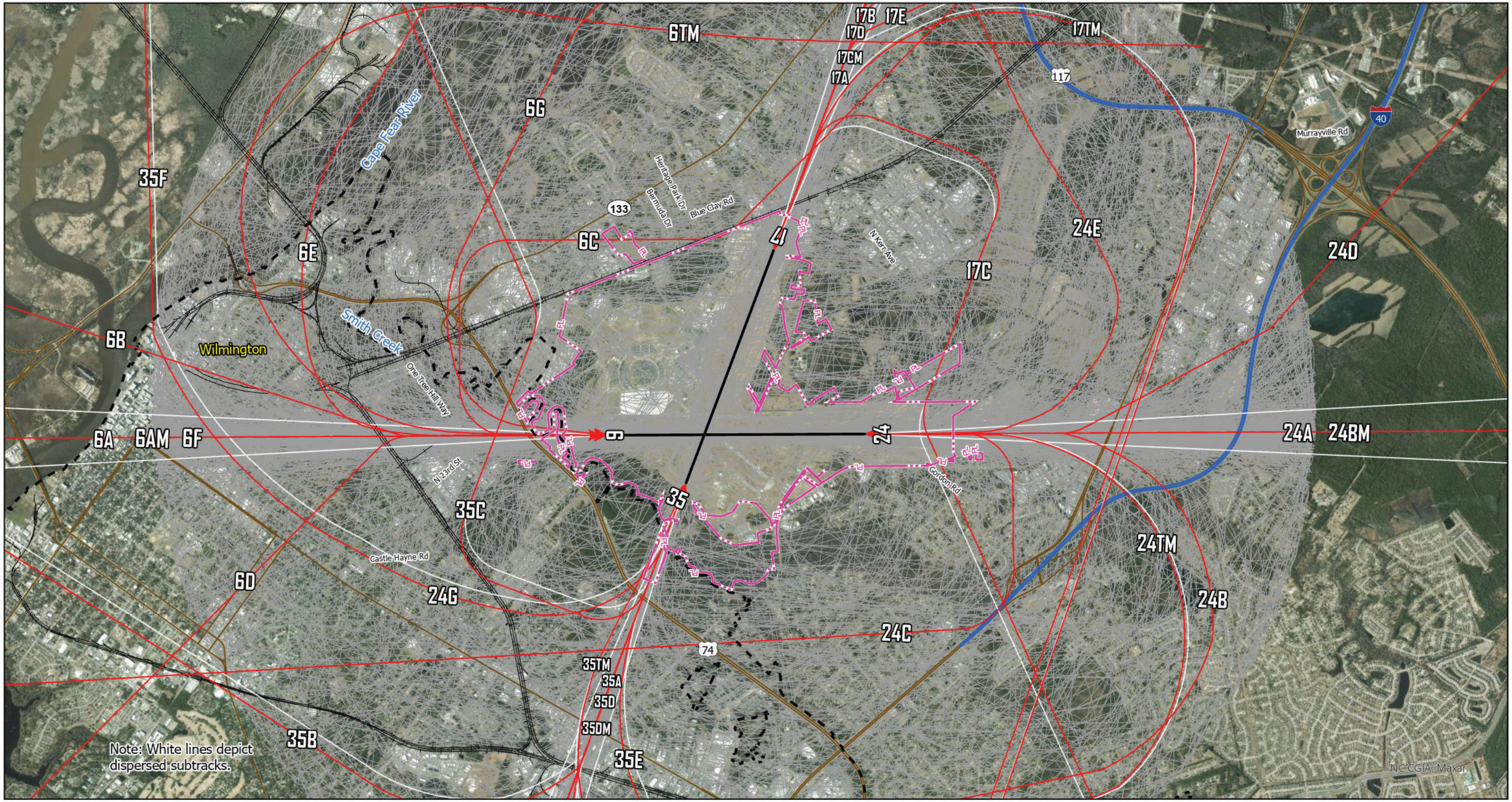
Airport Property Boundary
Interstate
Highway
Railroads
Runway Centerline
ADS-B Arrival Tracks
Arrival Tracks

Automatic Dependent Surveillance Broadcast (ADS-B) data collected by 1200 Aero (2023)

N
0 2,000
Scale in Feet

Source: New Hanover County Aerial (2023), New Hanover County Gov. Parcels, New Hanover County Tax Department Assessment and Dwelling Data (2023), TIGER/Line, Coffman Associates Analysis

Exhibit 3C
ARRIVAL TRACKS



Airport Property Boundary
Runway Centerline
Wilmington City Limits
Railroads
Interstate
Highway
Arrival Tracks
ADS-B Arrival Tracks

Automatic Dependent Surveillance Broadcast (ADS-B) data collected by 1200 Aero (2023)

0 3,000
Scale in Feet

Source: New Hanover County Aerial (2023), New Hanover County Gov. Parcels, New Hanover County Tax Department Assessment and Dwelling Data (2023), TIGER/Line, Coffman Associates Analysis

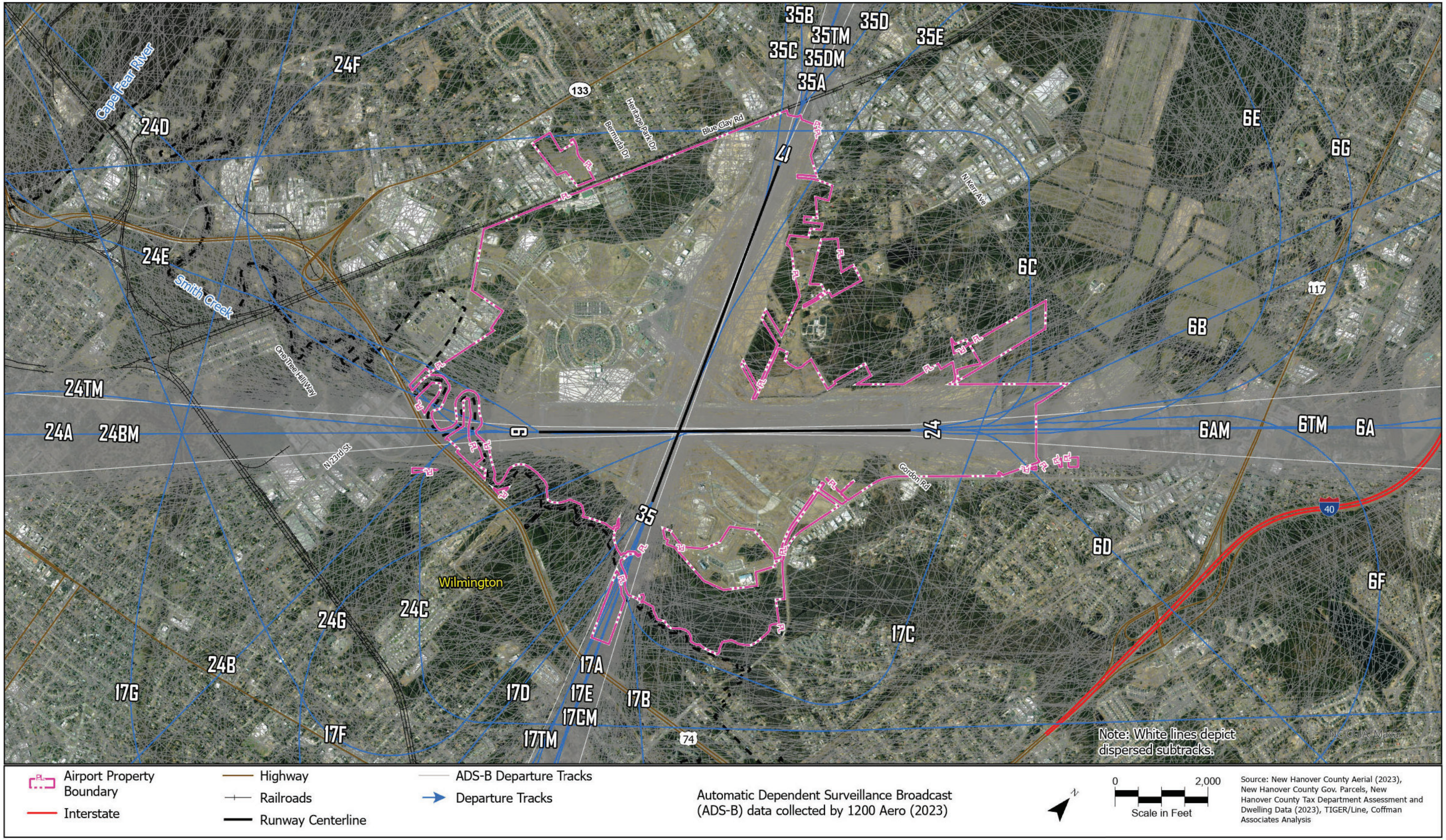
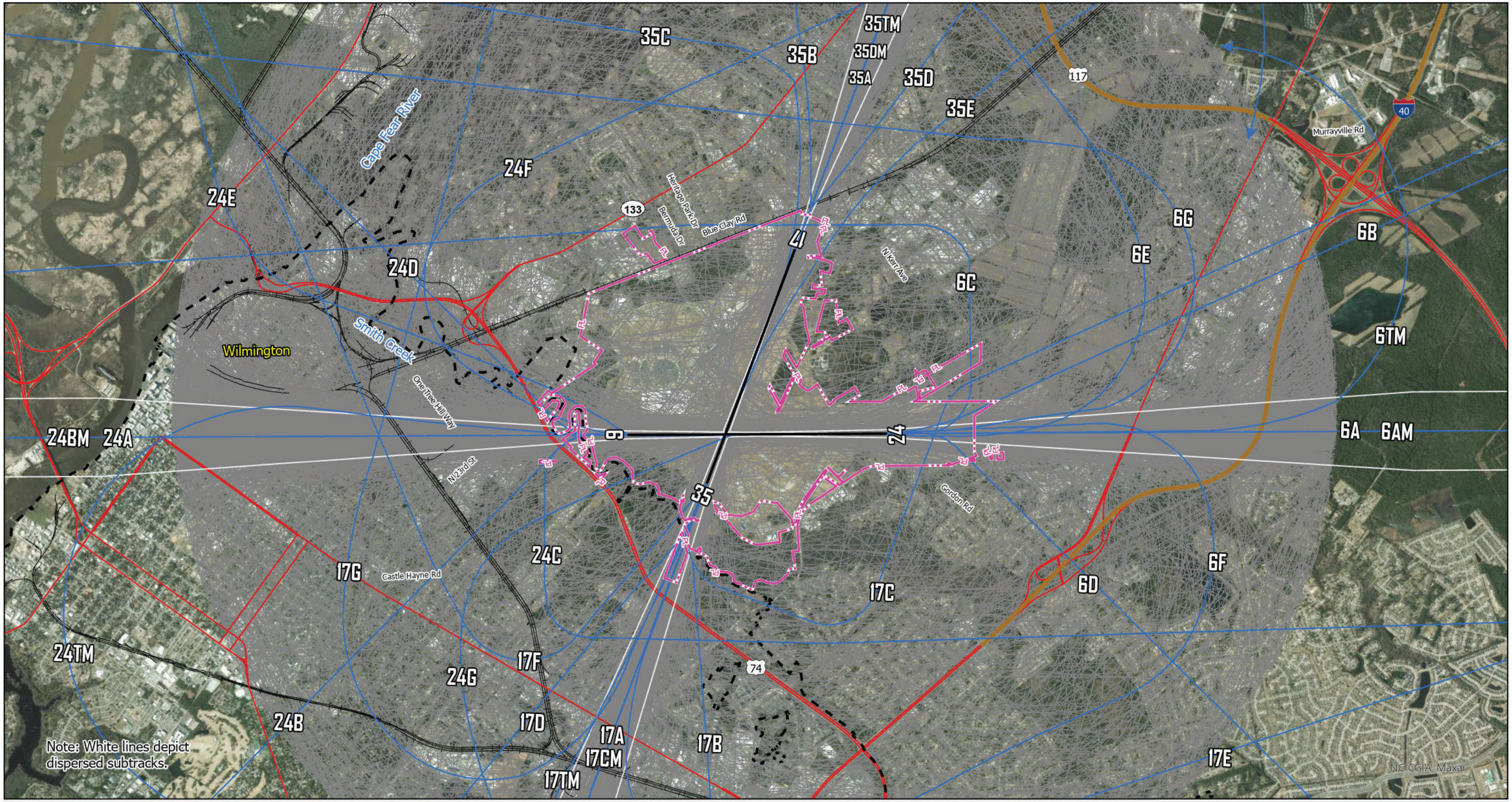


Exhibit 3D
DEPARTURE TRACKS



Airport Property Boundary
Runway Centerline
Wilmington City Boundary
Railroads
Interstate
Highway
Departure Tracks
ADS-B Departure Tracks

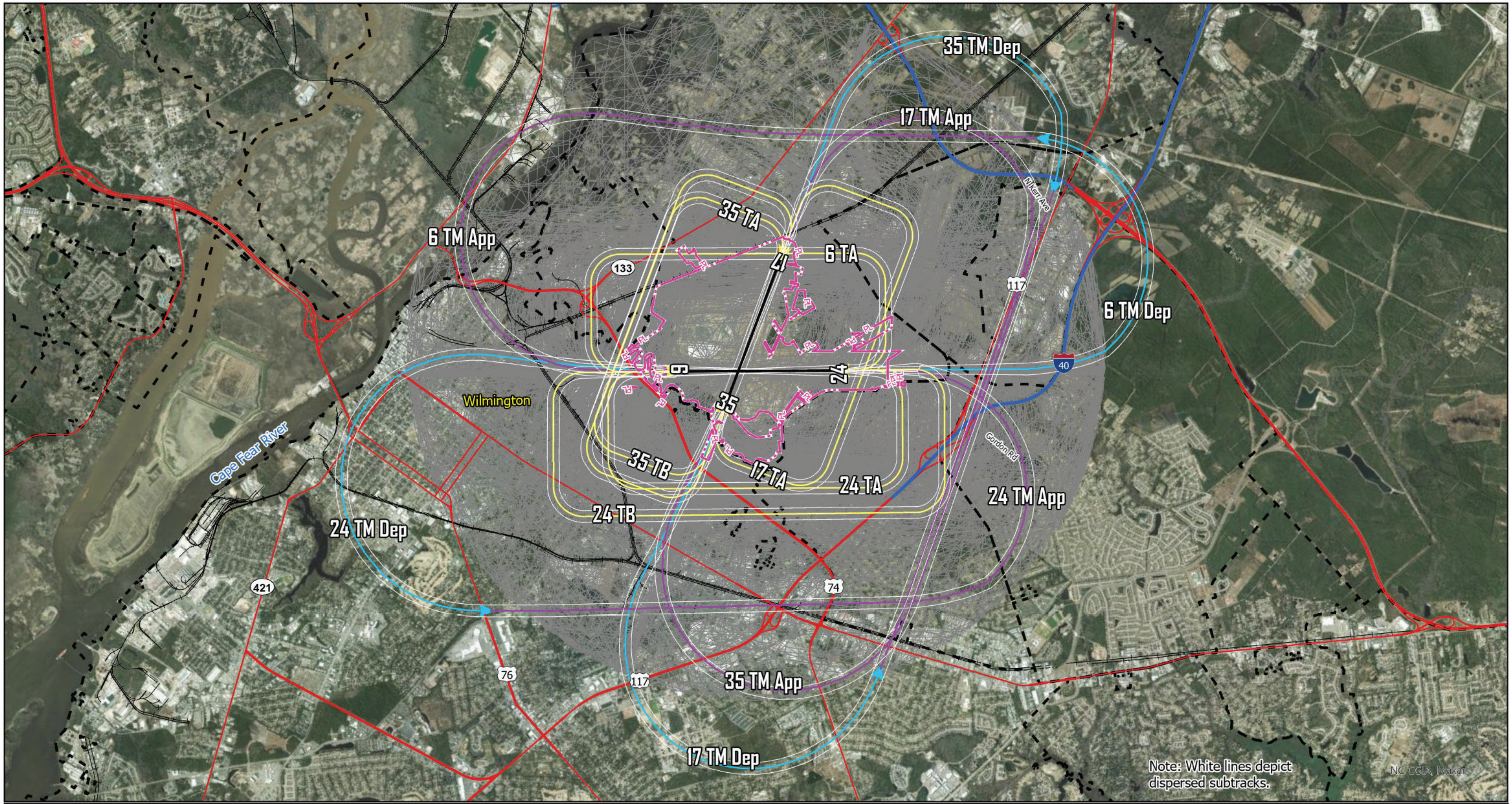
Automatic Dependent Surveillance Broadcast (ADS-B) data collected by 1200 Aero (2023)

N

0 3,000
Scale in Feet

Source: New Hanover County Aerial (2023), New Hanover County Gov. Parcels, New Hanover County Tax Department Assessment and Dwelling Data (2023), TIGER/Line, Coffman Associates Analysis

Exhibit 3D
DEPARTURE TRACKS



Airport Property Boundary
Interstate
Highway
Railroads
Runway Centerline
ADS-B Touch-and-Go Tracks
Touch-And-Go Tracks
Touch-And-Go Departure Tracks
Touch-And-Go Arrivial Tracks

Automatic Dependent Surveillance Broadcast (ADS-B) data collected by 1200 Aero (2023)

N

0 5,800
Scale in Feet

Source: New Hanover County Aerial (2023), New Hanover County Gov. Parcels, New Hanover County Tax Department Assessment and Dwelling Data (2023), TIGER/Line, Coffman Associates Analysis

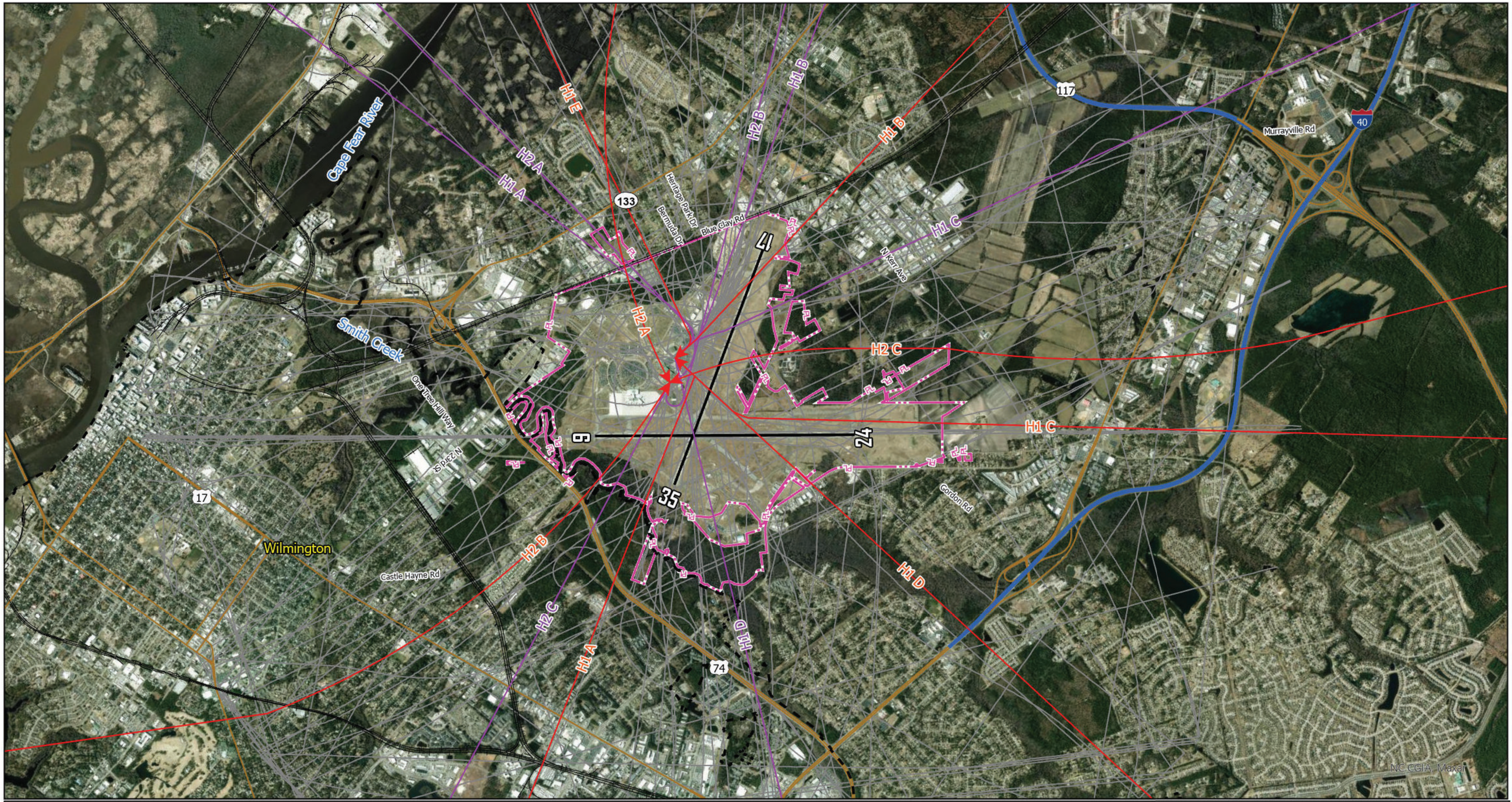
Airport Property Boundary
Runway Centerline
Wilmington City Boundary
Railroads
Interstate
Highway
ADS-B Helicopter Tracks
Helicopter Arrival
Helicopter Departure

Automatic Dependent Surveillance Broadcast (ADS-B) data collected by 1200 Aero (2023)

N

0 2,000
Scale in Feet

Source: New Hanover County Aerial (2023), New Hanover County Gov. Parcels, New Hanover County Tax Department Assessment and Dwelling Data (2023), TIGER/Line, Coffman Associates Analysis



Airport Property Boundary
Runway Centerline
Wilmington City Boundary
Railroads
Interstate
Highway
ADS-B Helicopter Tracks
Helicopter Arrival
Helicopter Departure

Automatic Dependent Surveillance Broadcast (ADS-B) data collected by 1200 Aero (2023)

N

0 3,000
Scale in Feet

Source: New Hanover County Aerial (2023), New Hanover County Gov. Parcels, New Hanover County Tax Department Assessment and Dwelling Data (2023), TIGER/Line, Coffman Associates Analysis

Exhibit 3F
HELICOPTER TRACKS

TABLE 3F | ILM Flight Track Use Percentages by Aircraft Category and Type (continued)

AIRCRAFT CATEGORY AND TYPE	ARRIVALS AND DEPARTURES					
	HELIPAD H1			HELIPAD H2		
	Track	Arrival %	Departure %	Track	Arrival %	Departure %
Helicopter	H1A	20%	25%	H2A	34%	34%
	H1B	20%	25%	H2B	33%	33%
	H1C	20%	25%	H2C	33%	33%
	H1D	20%	25%	–	–	–
	H1E	20%	–	–	–	–

Source: 1200.aero ADS-B data (February 2023–January 2024), Coffman Associates analysis

AEDT OUTPUT

In accordance with standards set forth in 14 CFR Part 150, noise exposure contours were calculated using the AEDT at the 65, 70, and 75 dB DNL levels for the 2023 and 2028 conditions.

The extent and shape of the noise contours are influenced by the previously discussed modeling assumptions. For comparative purposes, the contour area for each range and timeframe is presented in **Table 3G**. Noise exposure is expected to decrease due to changes to the military fleet mix.

TABLE 3G | ILM Comparative Areas of Noise Exposure

	Area (Acres)	
	2023	2028
65-70 DNL	658.49	618.30
70-75 DNL	311.31	283.30
75+ DNL	331.21	295.45
Total	**1,301.01**	**1,197.05**

Acreages represent only those areas between the stated contour ranges.
Source: Coffman Associates analysis

The following sections present the noise contours for the 2023 and 2028 scenarios. As illustrated on the exhibits, the area of noise exposure is greatest near the runway ends, which is reflective of the typical flight procedures at all airports. In some cases, the contours may extend off airport property. Additionally, depending on specific airport operating characteristics, sideline noise – which is represented by the portion of the contour running parallel to the runway – may also extend off airport property. Additionally, **Table 3H** presents the total acres that extend off airport property for each contour.

TABLE 3H | ILM Contour Area Extending Off Existing Airport Property

	Area (Acres)	
	2023	2028
65-70 DNL	265.30	215.75
70-75 DNL	18.49	9.86
75+ DNL	0.00	0.00
Total	**283.79**	**225.61**

Acreages represent only those areas between the stated contour ranges.
Source: Coffman Associates analysis

2023 NOISE EXPOSURE CONTOURS

As indicated on **Exhibit 3G** and in **Table 3H**, the 65 DNL and 70 DNL contours extend off airport property. In Chapter 4 – Noise Impacts, these areas will be evaluated for potential noise impacts when considering FAA land use compatibility thresholds. As shown by the checklist in Appendix J, Noise Exposure Maps are required to show continuous contours for at least the 65, 70, and 75 dB DNL. Additional information regarding land use compatibility guidelines can be found in Chapter Four – Noise Impacts and **Appendix C – Resource Library**. These sections describe in more detail the importance of the 65 dB DNL contour and the rationale behind these data requirements.

Typically, the initial takeoff roll is the loudest component of aircraft operations, and therefore the contours will be widest on the runway end with the most aircraft departing. However, as shown above, in **Table 3E**, the runway end distribution is very similar for Runways 6 and 25, as well as Runways 17 and 35, with about twice as much activity occurring on Runway 6-24. Therefore, as shown on **Exhibit 3G**, the width of the contours is relatively uniform along each runway, and the contours for Runway 6-24 are wider and larger. At each runway end, the contour elongates, which is indicative of departure noise as an aircraft gains altitude after leaving the ground.

As indicated in **Table 3H**, the total area of the 2023 noise contours located off the airport property is 283.79 acres.

2028 NOISE EXPOSURE CONTOURS

The 2028 noise exposure contours are depicted on **Exhibit 3H**. The shape of the contours is largely the same as the previously discussed 2023 scenario. The contours are similarly influenced by relatively equal runway use percentages between Runways 6 and 24 as well as Runways 17 and 35, with a greater percentage of operations occurring on Runway 6-24, resulting in wider and longer contours for Runway 6-24. When compared to the 2023 scenario, the 65, 70, and 75 DNL noise contours decrease in size slightly due to changes in the military operational fleet mix as presented in **Table 3C** and **Appendix H**.

The extent of the contours and the land uses within them will be discussed in more detail in Chapter Four – Noise Impacts.

As indicated in **Table 3H**, the total area of the 2028 noise contours located off airport property is 225.61 acres.

AIRCRAFT NOISE MEASUREMENT PROGRAM

Although not required by the FAA to be part of this Noise Exposure Map document, the airport additionally commissioned optional noise measurement to provide field-collected data for the sake of comparison with the computer-predicted values generated using the AEDT. The locations of noise monitoring sites used in this study and the results are discussed in **Appendix G**.

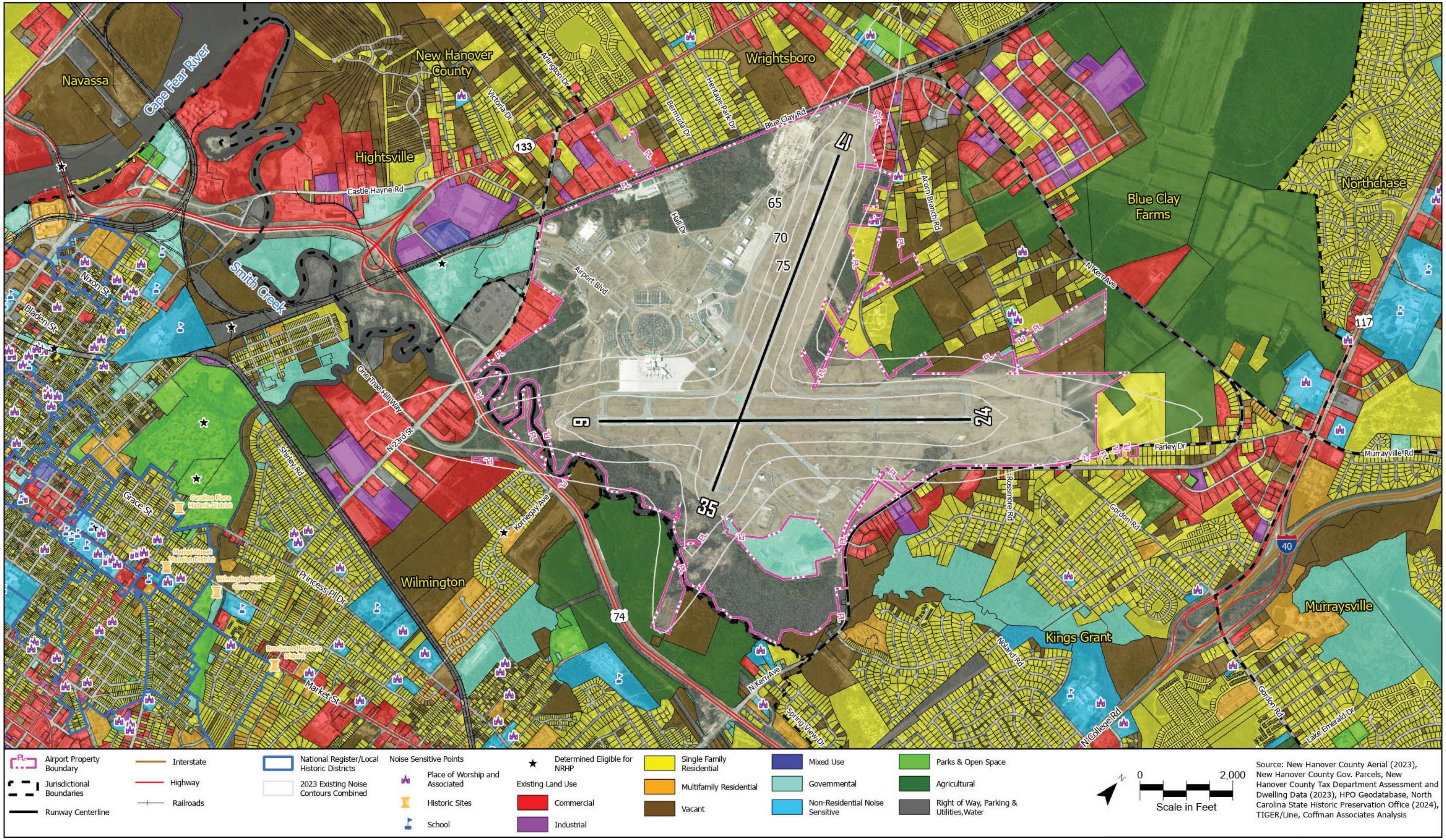


Exhibit 3G
EXISTING 2023 NOISE CONTOURS

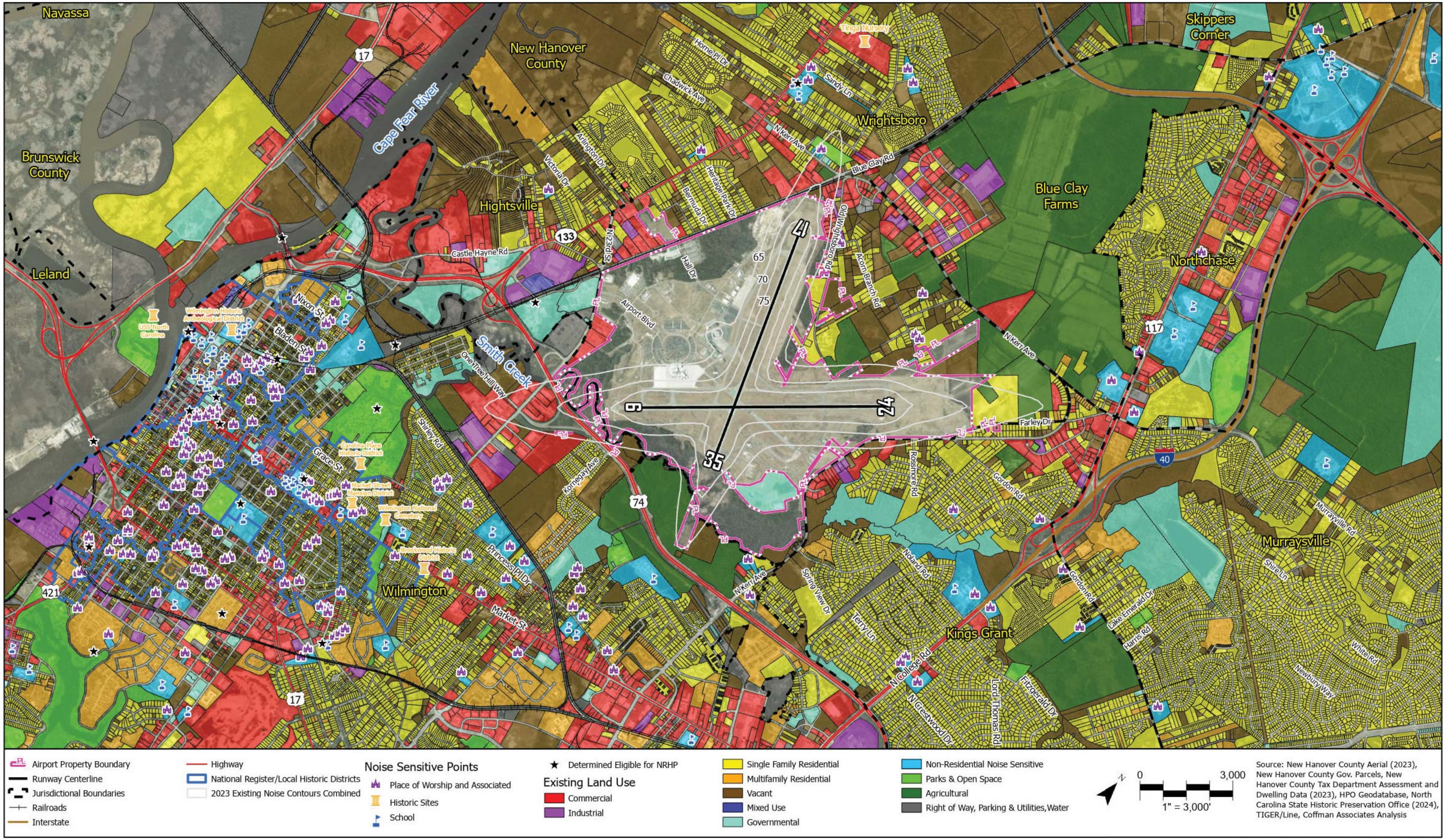


Exhibit 3G
EXISTING 2023 NOISE CONTOURS

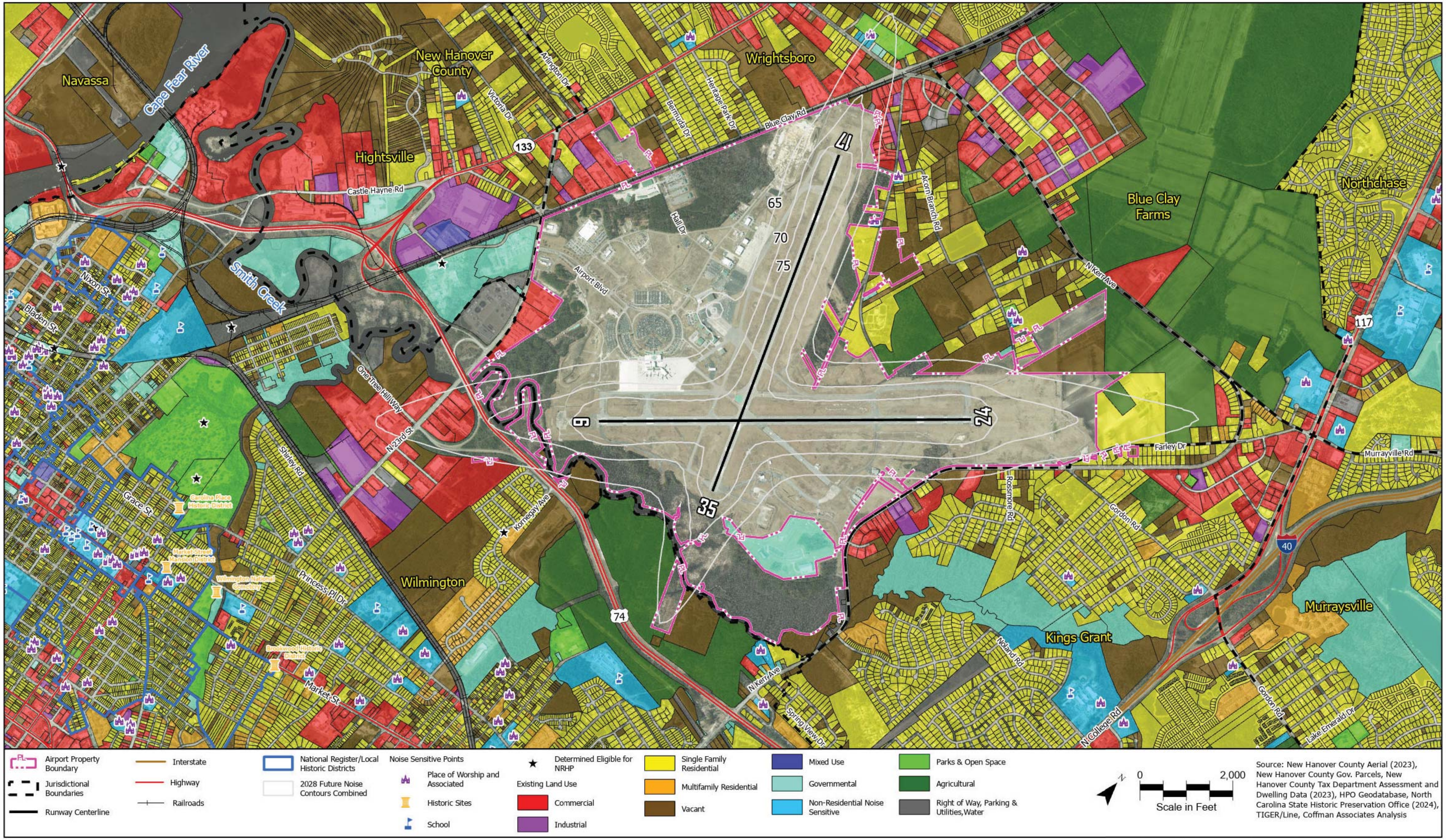


Exhibit 3H
FUTURE 2028 NOISE CONTOURS

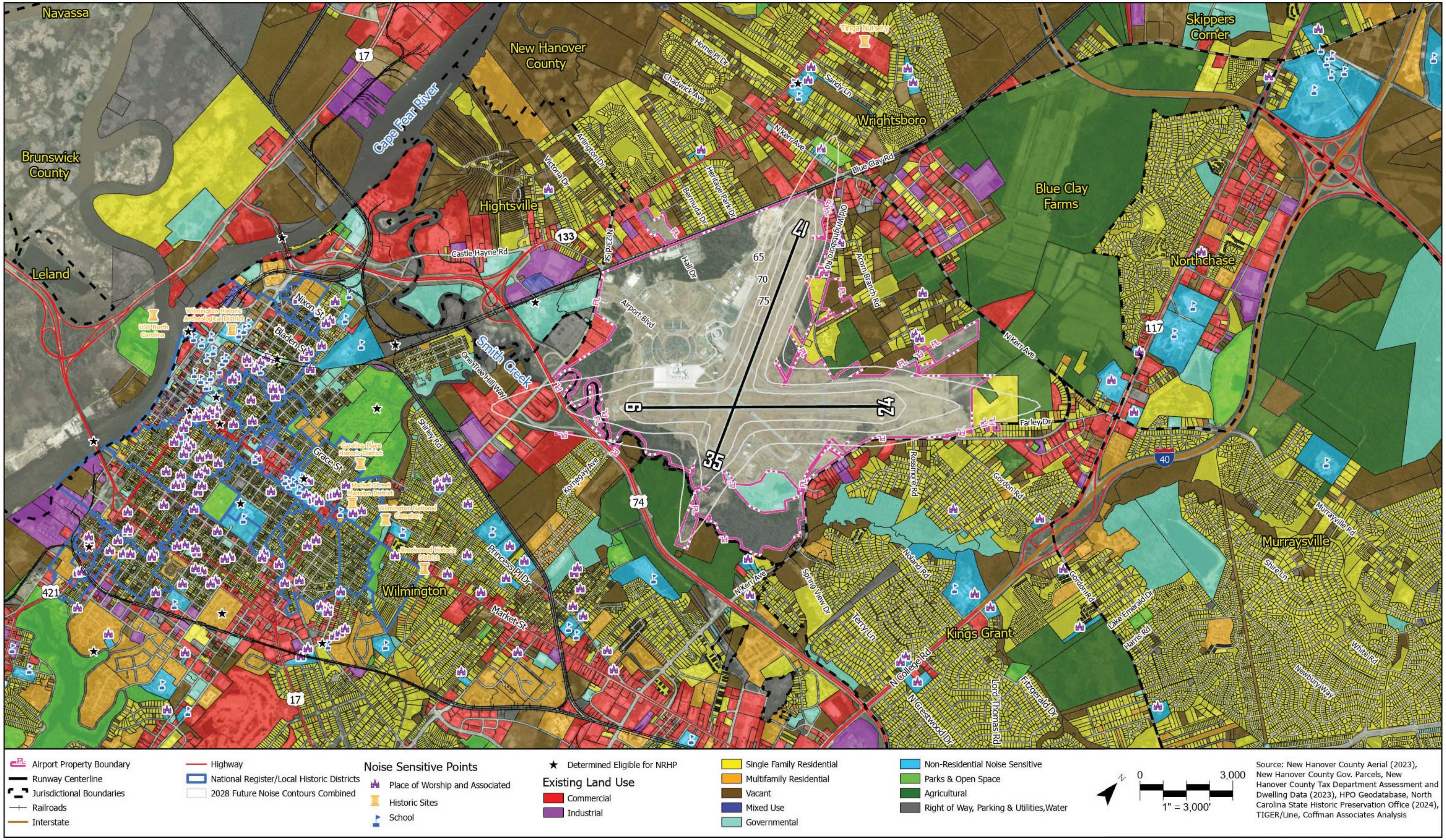


Exhibit 3H
FUTURE 2028 NOISE CONTOURS

SUMMARY

The information presented in this chapter defines the noise patterns for current and future activity at Wilmington International Airport. **Exhibit 3J** shows a comparison of the existing and future noise contours. These contours do not include any additional noise abatement measures currently in use at the airport. This chapter does not attempt to evaluate or otherwise include activity over which the airport has no control, such as additional aircraft transiting the area but not arriving at or departing from the airport.

It should be emphasized that the DNL noise contour lines drawn on the maps represent the conditions of an average day derived from annual information. They do not represent absolute boundaries of acceptability in personal response to noise, nor do they represent the actual noise conditions on any specific day.
As previously discussed, the noise exposure contours developed based on these assumptions will be used in the following ways:

- Depiction on the Noise Exposure Maps which will be submitted to the FAA for consideration;
- Baseline conditions for the evaluation of land use and noise abatement alternatives as part of Wilmington International Airport's Part 150 Noise Compatibility Program; and
- Reference for city and county land use planning efforts related to airport noise.

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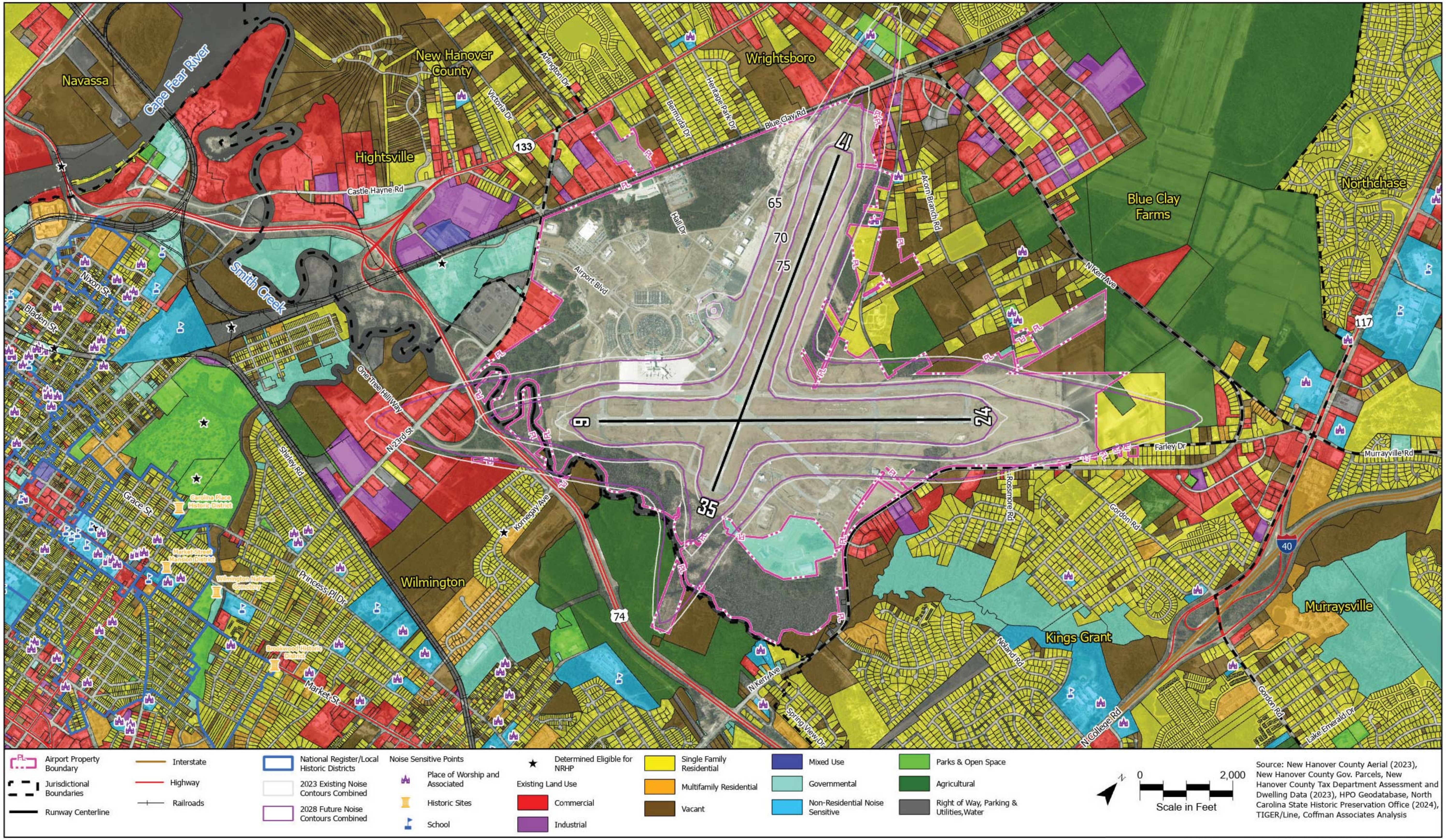

Exhibit 3J
NOISE CONTOUR COMPARISON

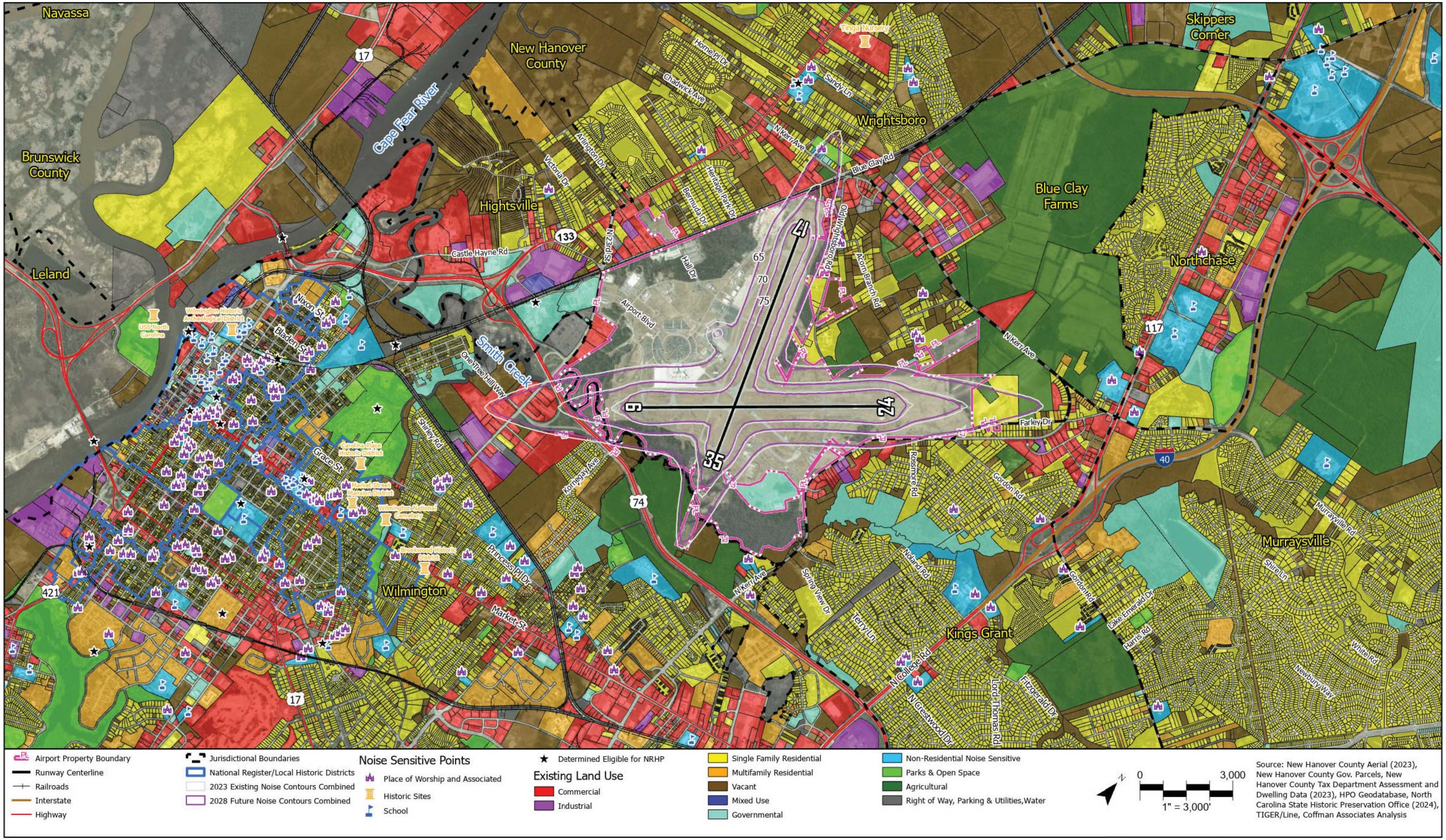

Exhibit 3J
NOISE CONTOUR COMPARISON