



Welcome!

Noise Compatibility Study (Part 150) Update Piedmont Triad International Airport

Citizens Advisory Committee Meeting #3

May 20, 2020



Meeting Agenda

- Welcome and introductions
- Project status
- Noise model input
- Preliminary noise model results
- Noise measurement program results
- Overview of Noise Compatibility Program
- Next steps
- CAC member discussion

Piedmont Triad Airport Authority

- **Kevin Baker, Executive Director**
 - Part 150 Airport Sponsor
- **Alex Rosser, Chief Operating Officer**
 - Part 150 Program Manager
- **Suzanne Akkoush, Project Manager – Noise Program**
 - Part 150 Project Manager

Part 150 Consultant Team

- **Gene Reindel, HMMH Vice President**
 - Part 150 Principal
- **Bob Mentzer, HMMH Principal Consultant**
 - Part 150 Project Manager
- **Kate Larson, HMMH Senior Consultant**
 - Part 150 Assistant Project Manager
- **Ron Miller, Ron Miller & Associates**
 - Part 150 Public Outreach



CAC Members

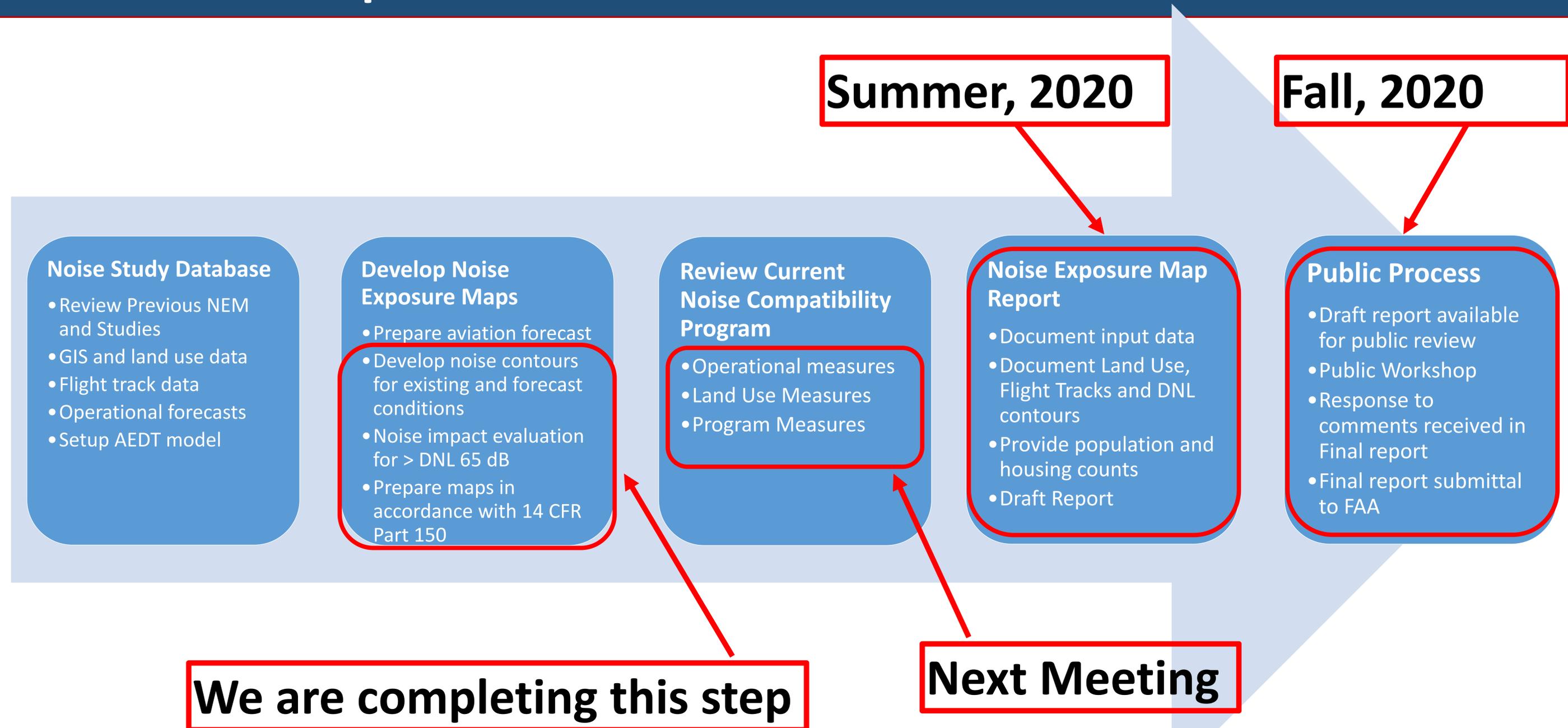
| Name | Jurisdiction | Name | Jurisdiction |
|--------------------------|-----------------|-------------------|--------------|
| Joe Saldarini, Chair | Greensboro | Ed Levick | High Point |
| Janet Mazzurco, Co-Chair | Greensboro | Thad Juszczak | High Point |
| Stan Tennant | Greensboro | Keith Brown | High Point |
| Steve Johnson | Greensboro | Erin Randall | High Point |
| Alyson Best | Greensboro | Bill Nagy | High Point |
| Sebastian King | Guilford County | Michael Lopez | Summerfield |
| Sharon Kasica | Guilford County | Lawrence Straughn | Jamestown |
| Toneq McCullough | Winston-Salem | George McClellan | Oak Ridge |
| Clarence Lambe | Forsyth County | Bob Prescott | Kernersville |



Project Status



Part 150 Update Status



Part 150 Update Public Process

- This is the third of four TAC/CAC meetings
 - First held in June 2019
 - Second held in October 2019
- Two Public workshops
 - First was held June 27, 2019
 - Second will present Study results in fall 2020
- Presentations for all prior meetings available at <https://ptipart150update.com/public-outreach/>



Noise Model Input

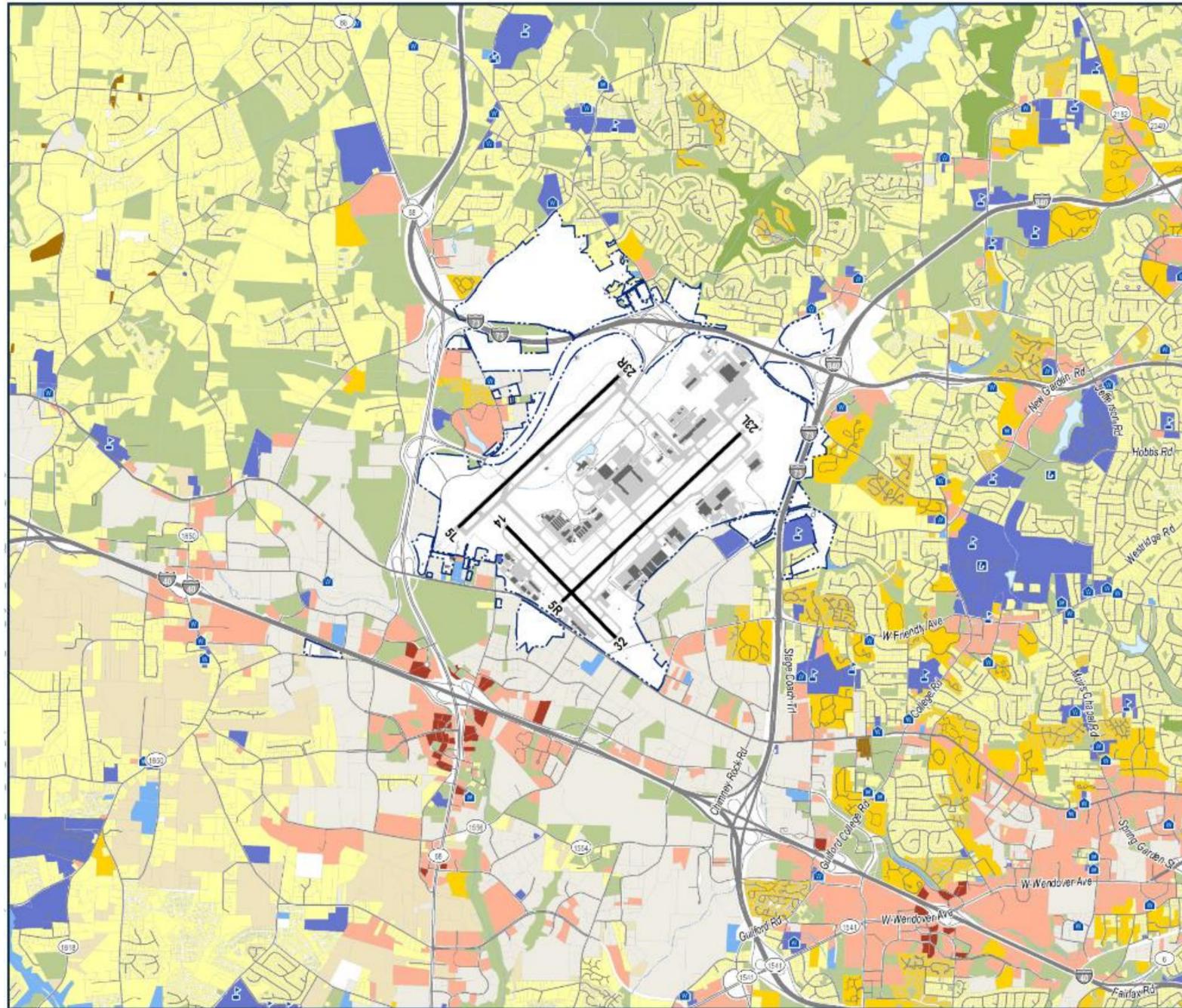


Noise Model Input

Categories of noise model input:

1. Study Area and physical description of the Airport Layout
2. Aircraft noise and performance characteristics
3. Aircraft operations
 - Flight operations (arrival/departure/touch-and-gos)
 - Runup operations (aircraft maintenance)
4. Runway utilization rates
5. Flight track geometry and utilization rates
6. Meteorological and terrain data

Study Area with Updated Land Use



- | | | |
|-------------------------------|----------------------------|-------------|
| Airport Boundary | Airport Buildings | |
| Runway | Taxiway / Apron | |
| County Boundary | | |
| Highways | Major Roads | Local Roads |
| Railroad | Stream / Creek | |
| Residential Use | Commercial Use | |
| Multi-Family Residential Use | Manufacturing / Production | |
| Mobile Home | Golf Course | |
| Transient Lodging | Recreational / Open Space | |
| Mixed Use | Transportation / Utility | |
| Public Use 1 (Non-Compatible) | Vacant / Undeveloped | |
| Public Use 2 (Compatible) | Water | |
| School | Library | |
| Place of Worship | Hospital / Health Care | |

Map has been updated based on input submitted by: PTAA, City of Greensboro, City of High Point, Guilford County, and windshield surveys conducted by HMMH in November, 2019



Thank you to committee member Sharon Kasica for information on locations of area schools – we added in those that were missing.



Modeled Aircraft Operations: Annual Forecasts

FAA-approved PTAA Aviation Forecast

| Year | Commercial | | | | General Aviation | | | Military | | | Total Operations |
|--------------------|--------------------|----------|----------------|--------|------------------|-------|--------|-----------|-------|-------|------------------|
| | Passenger Aircraft | Air Taxi | Cargo Aircraft | Total | Itinerant | Local | Total | Itinerant | Local | Total | |
| 2018 | 32,774 | 10,034 | 6,458 | 49,267 | 24,596 | 5,816 | 30,412 | 1,453 | 383 | 1,836 | 81,514 |
| 2020 | 36,359 | 10,053 | 8,204 | 54,616 | 26,964 | 6,656 | 33,620 | 1,453 | 383 | 1,836 | 90,072 |
| 2025 | 37,265 | 10,099 | 10,456 | 57,821 | 27,413 | 6,767 | 34,180 | 1,453 | 383 | 1,836 | 93,836 |
| Average Annual Day | Commercial | | | | General Aviation | | | Military | | | Total Operations |
| | Passenger Aircraft | Air Taxi | Cargo Aircraft | Total | Itinerant | Local | Total | Itinerant | Local | Total | |
| 2018 | 89.8 | 27.5 | 17.7 | 135.0 | 67.4 | 15.9 | 83.3 | 4.0 | 1.0 | 5.0 | 223.3 |
| 2020 | 99.6 | 27.5 | 22.5 | 149.6 | 73.9 | 18.2 | 92.1 | 4.0 | 1.0 | 5.0 | 246.8 |
| 2025 | 102.1 | 27.7 | 28.6 | 158.4 | 75.1 | 18.5 | 93.6 | 4.0 | 1.0 | 5.0 | 257.1 |



Modeled Aircraft Operations: Aircraft Types

Commercial Passenger

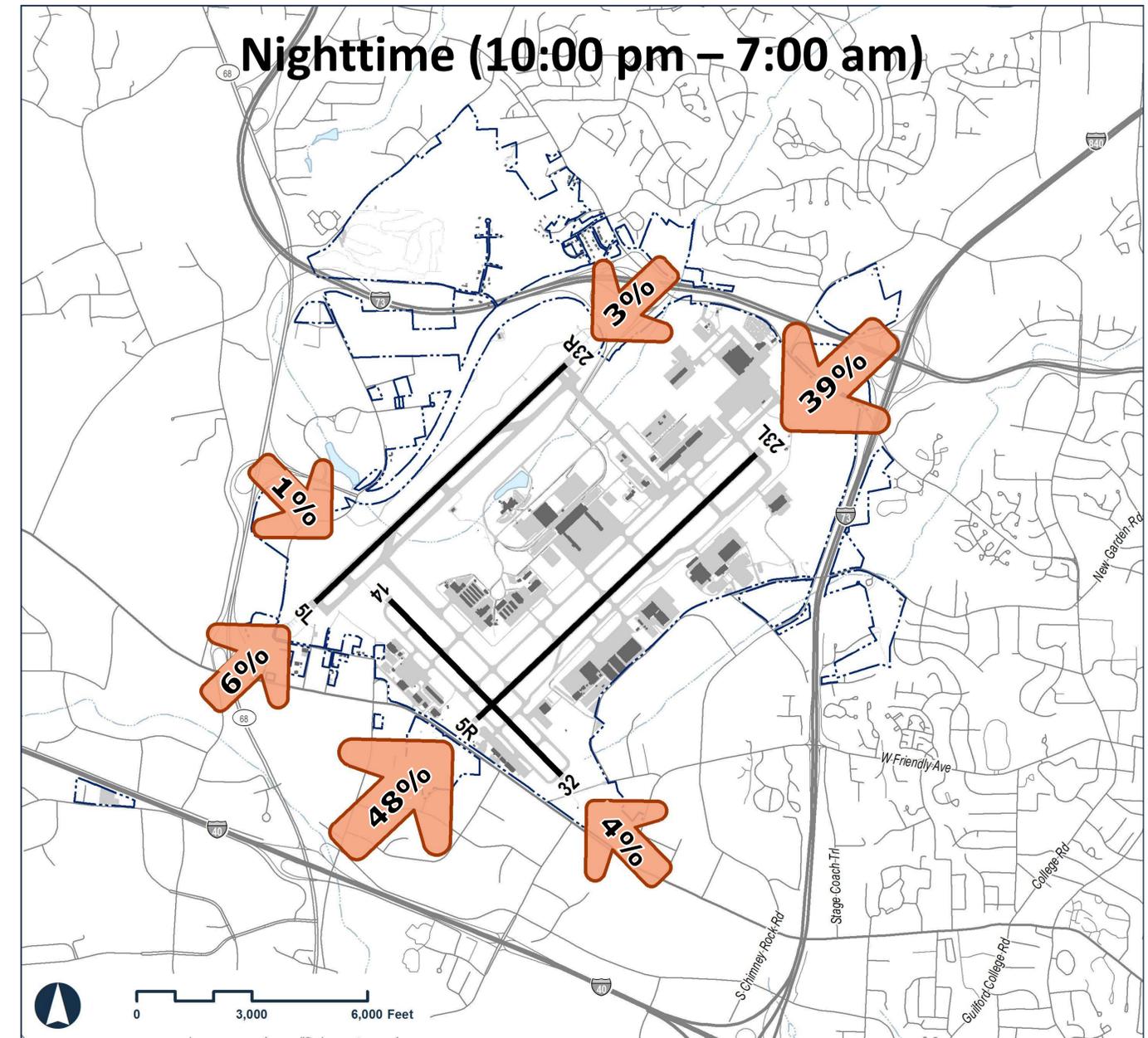
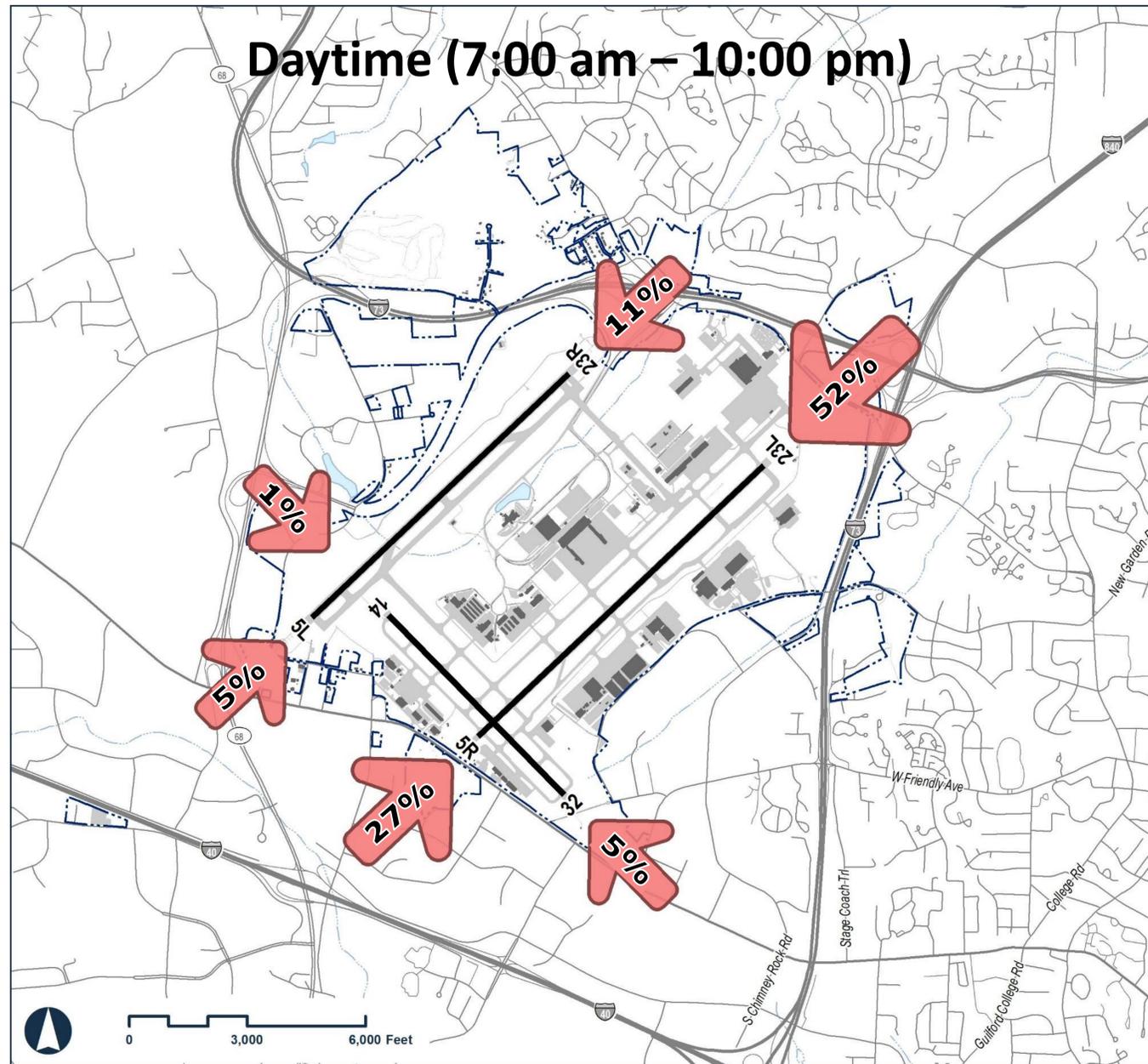
| Aircraft Type | AEDT Type | 2020 Total Operations | 2025 Total Operations | Change from 2020 |
|------------------------------------|-----------|-----------------------|-----------------------|------------------|
| A220-300 or 737-700/LR | 737700 | 10 | 1,019 | 1,009 |
| A319 | A319-131 | 439 | 450 | 11 |
| A320-100/200 | A320-232 | 1,531 | 2,073 | 542 |
| A320-200N | A320-271N | 42 | 43 | 1 |
| A321 | A321-232 | 20 | 20 | 0 |
| B717-200 | 717200 | 2,043 | 2,094 | 51 |
| B737-800 or B737-900 | 737800 | 1,007 | 1,540 | 533 |
| MD-80/1/2/3/8 | MD83 | 1,966 | 0 | -1,966 |
| MD-90 | MD9025 | 3 | 0 | -3 |
| CRJ900 or CRJ700 | CRJ9-ER | 7,780 | 9,658 | 1,878 |
| E175 | EMB175 | 3,622 | 4,490 | 868 |
| CRJ200ER/440 | CL600 | 6,706 | 5,318 | -1,388 |
| ERJ140 | EMB145 | 3,750 | 3,843 | 93 |
| ERJ145 | EMB14L | 7,438 | 6,717 | -721 |
| Commercial Passenger totals | | 36,359 | 37,265 | 906 |

Cargo

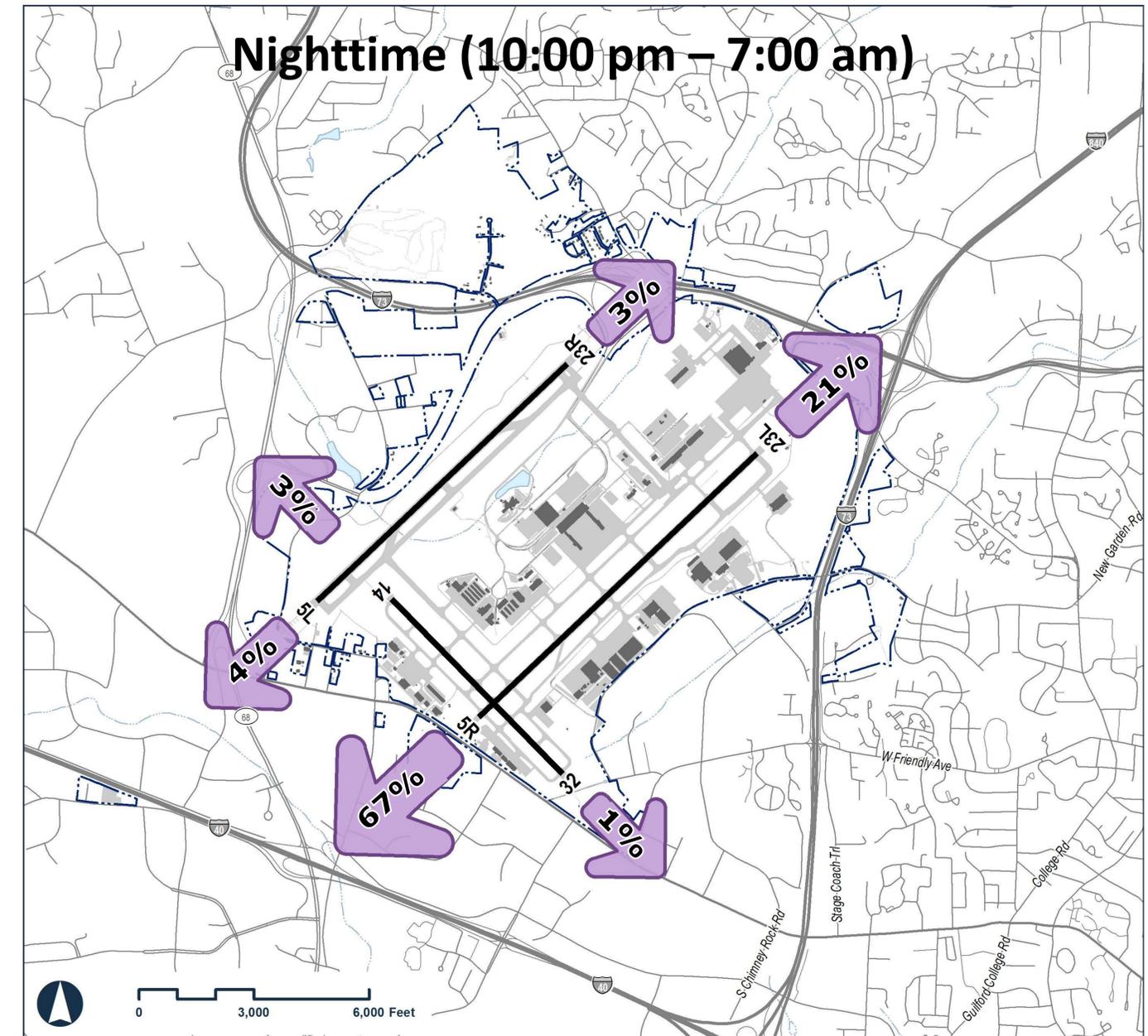
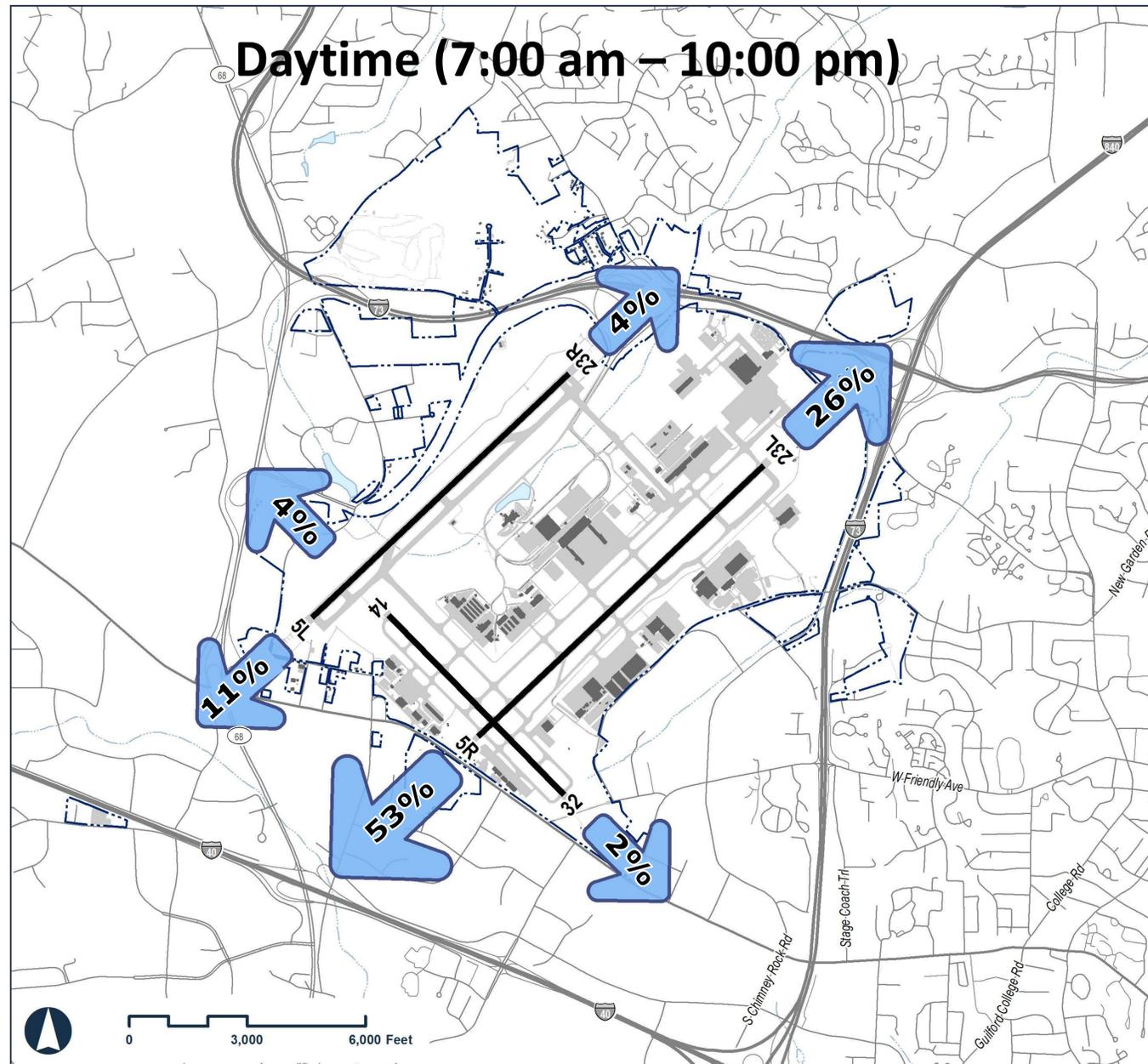
| Aircraft Type | AEDT Type | 2020 Total Operations | 2025 Total Operations | Change from 2020 |
|---------------------|------------|-----------------------|-----------------------|------------------|
| A300 | A300B4-203 | 1,396 | 1,662 | 266 |
| B767(200) | 767CF6 | 948 | 1,041 | 93 |
| B767(300) | 767300 | 267 | 294 | 27 |
| DC10 | DC1030 | 1,521 | 0 | -1,521 |
| B757(PW) | 757PW | 1,332 | 2,609 | 1,277 |
| B757(RR) | 757RR | 1,839 | 3,603 | 1,764 |
| ATR42 | DHC8 | 901 | 1,248 | 347 |
| Cargo totals | | 8,204 | 10,456 | 2,252 |



Modeled Runway Use: Arrivals



Modeled Runway Use: Departures



Modeled Flight Tracks: Runway 5R

Jet Arrivals – Runway 5R

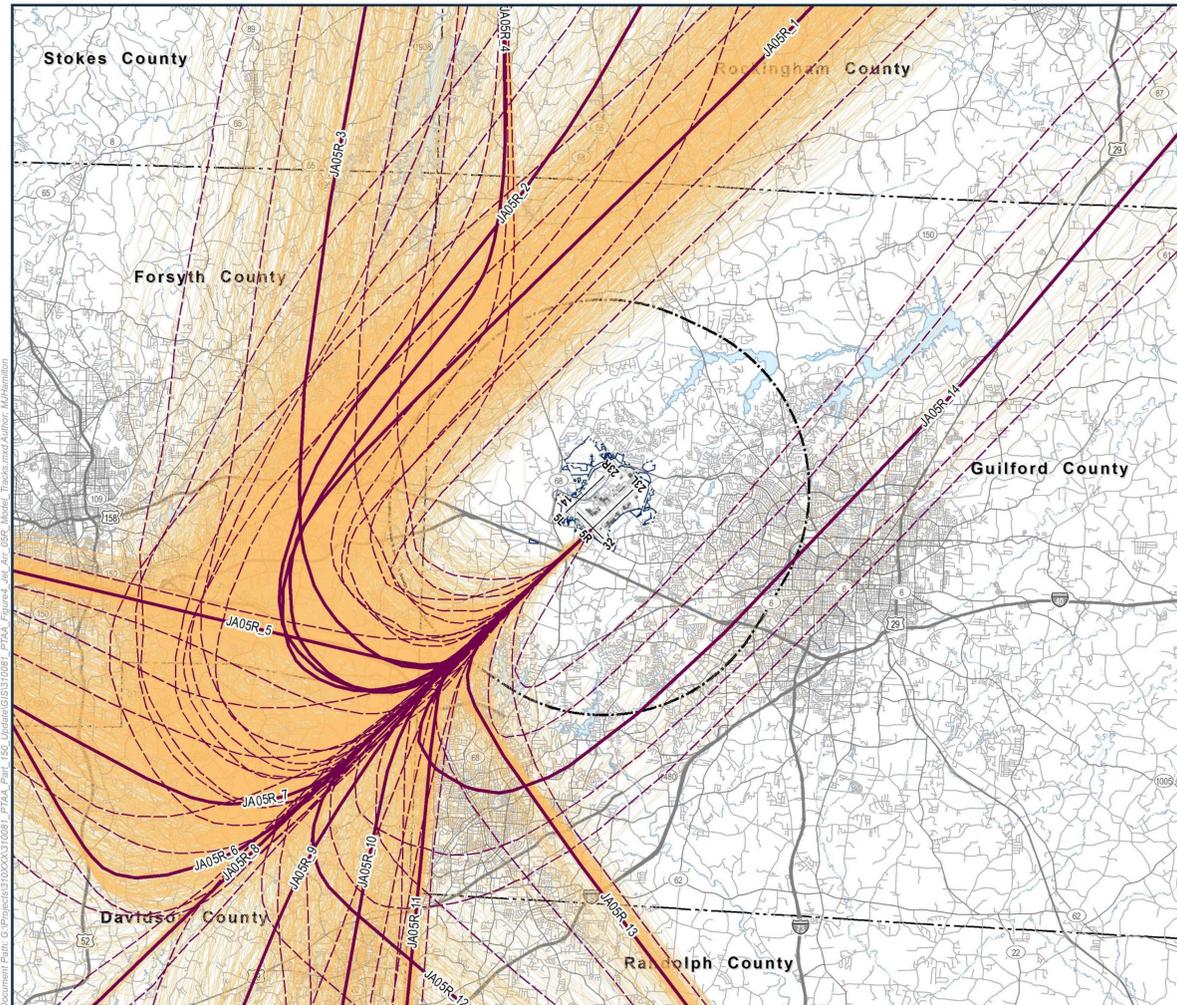


Figure 4
Jet Arrivals to Runway 05R

- Arrival Backbone Model Track
- Arrival Model Subtrack
- Arrival Radar Tracks (5,372)
- Airport Boundary
- Runway
- 30,000 ft. Extent from Runway End
- County Boundary
- Highways
- Railroad
- Airport Buildings
- Taxiway / Apron
- Major Roads
- Water / Stream / Creek
- Local Roads

| Track Bundle | # of tracks | Day Usage | Night Usage | FDX Day | FDX Night |
|--------------|-------------|---------------|---------------|---------------|---------------|
| JA05R_1 | 5 | 20.9% | 17.3% | 1.1% | 23.8% |
| JA05R_2 | 5 | 3.4% | 2.4% | 0.0% | 1.9% |
| JA05R_3 | 5 | 8.3% | 8.0% | 0.0% | 2.4% |
| JA05R_4 | 5 | 14.7% | 5.9% | 0.0% | 1.5% |
| JA05R_5 | 3 | 13.9% | 23.0% | 37.1% | 18.4% |
| JA05R_6 | 3 | 3.7% | 2.1% | 3.4% | 1.5% |
| JA05R_7 | 5 | 16.0% | 14.4% | 56.2% | 21.4% |
| JA05R_8 | 3 | 0.4% | 2.6% | 0.0% | 0.5% |
| JA05R_9 | 3 | 3.6% | 7.5% | 0.0% | 1.0% |
| JA05R_10 | 5 | 5.3% | 3.0% | 0.0% | 0.5% |
| JA05R_11 | 3 | 3.7% | 1.7% | 0.0% | 0.0% |
| JA05R_12 | 3 | 2.6% | 2.5% | 1.1% | 7.8% |
| JA05R_13 | 3 | 3.1% | 6.7% | 1.1% | 19.4% |
| JA05R_14 | 5 | 0.2% | 3.0% | 0.0% | 0.0% |
| Total | 56 | 100.0% | 100.0% | 100.0% | 100.0% |

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Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.

Jet Departures - Runway 5R

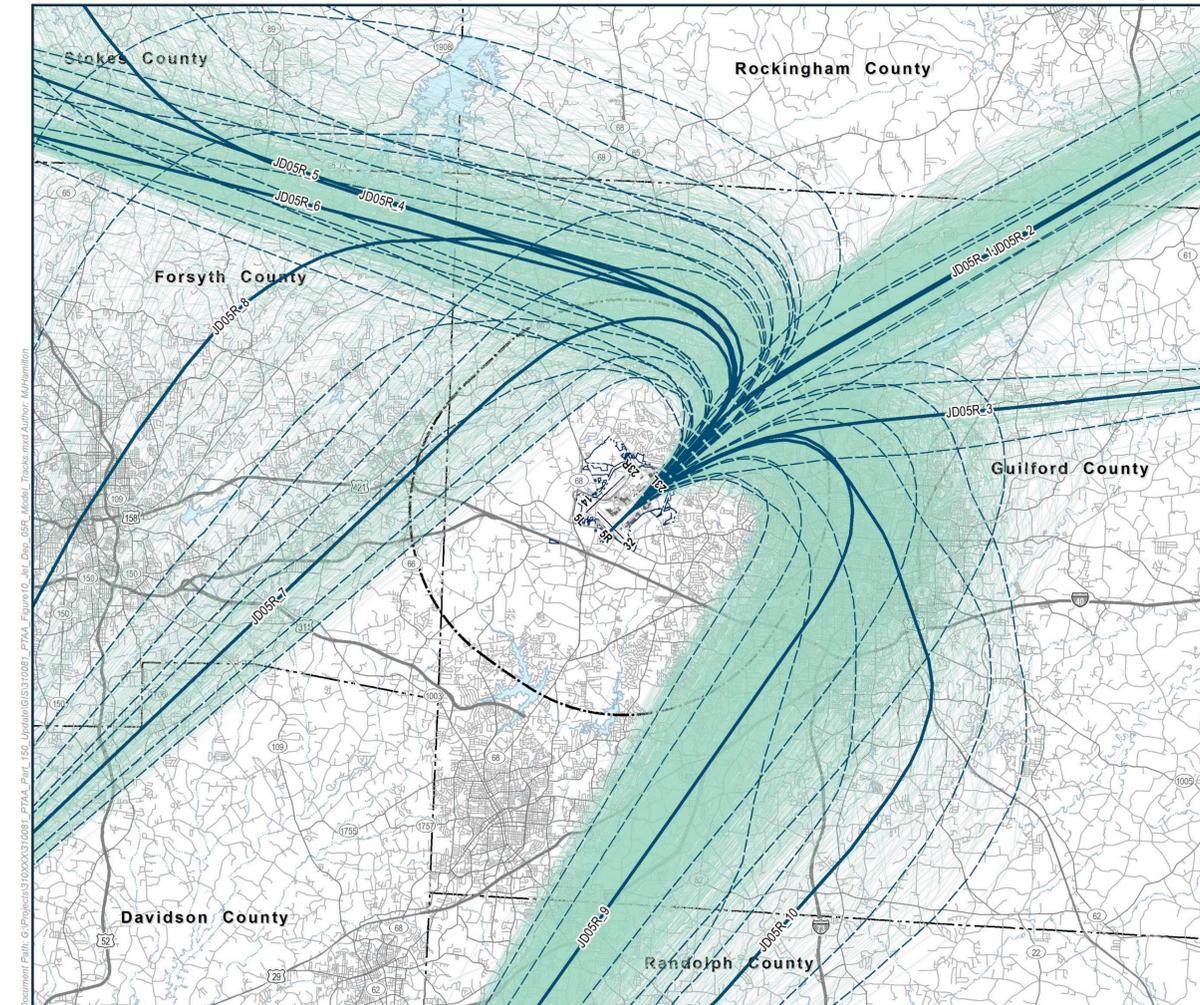


Figure 10
Jet Departures from Runway 05R

- Departure Backbone Model Track
- Departure Model Subtrack
- Departure Radar Tracks (8,248)
- Airport Boundary
- Runway
- 30,000 ft. Extent from Runway End
- County Boundary
- Highways
- Railroad
- Airport Buildings
- Taxiway / Apron
- Major Roads
- Water / Stream / Creek
- Local Roads

| Track Bundle | # of tracks | Day Usage | Night Usage | FDX Day | FDX Night |
|--------------|-------------|---------------|---------------|---------------|---------------|
| JD05R_1 | 5 | 46.7% | 51.7% | 2.6% | 6.8% |
| JD05R_2 | 3 | 1.9% | 0.8% | 0.0% | 0.0% |
| JD05R_3 | 3 | 1.1% | 0.3% | 0.0% | 0.0% |
| JD05R_4 | 5 | 4.8% | 4.1% | 2.6% | 6.8% |
| JD05R_5 | 5 | 2.1% | 1.8% | 9.0% | 6.8% |
| JD05R_6 | 5 | 5.8% | 6.0% | 16.7% | 21.9% |
| JD05R_7 | 5 | 3.9% | 5.1% | 0.0% | 0.0% |
| JD05R_8 | 5 | 3.2% | 4.5% | 0.0% | 0.0% |
| JD05R_9 | 5 | 28.6% | 25.3% | 67.9% | 57.5% |
| JD05R_10 | 5 | 1.9% | 0.5% | 1.3% | 0.0% |
| Total | 46 | 100.0% | 100.0% | 100.0% | 100.0% |

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Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.



Modeled Flight Tracks: Runway 5L

Jet Arrivals – Runway 5L

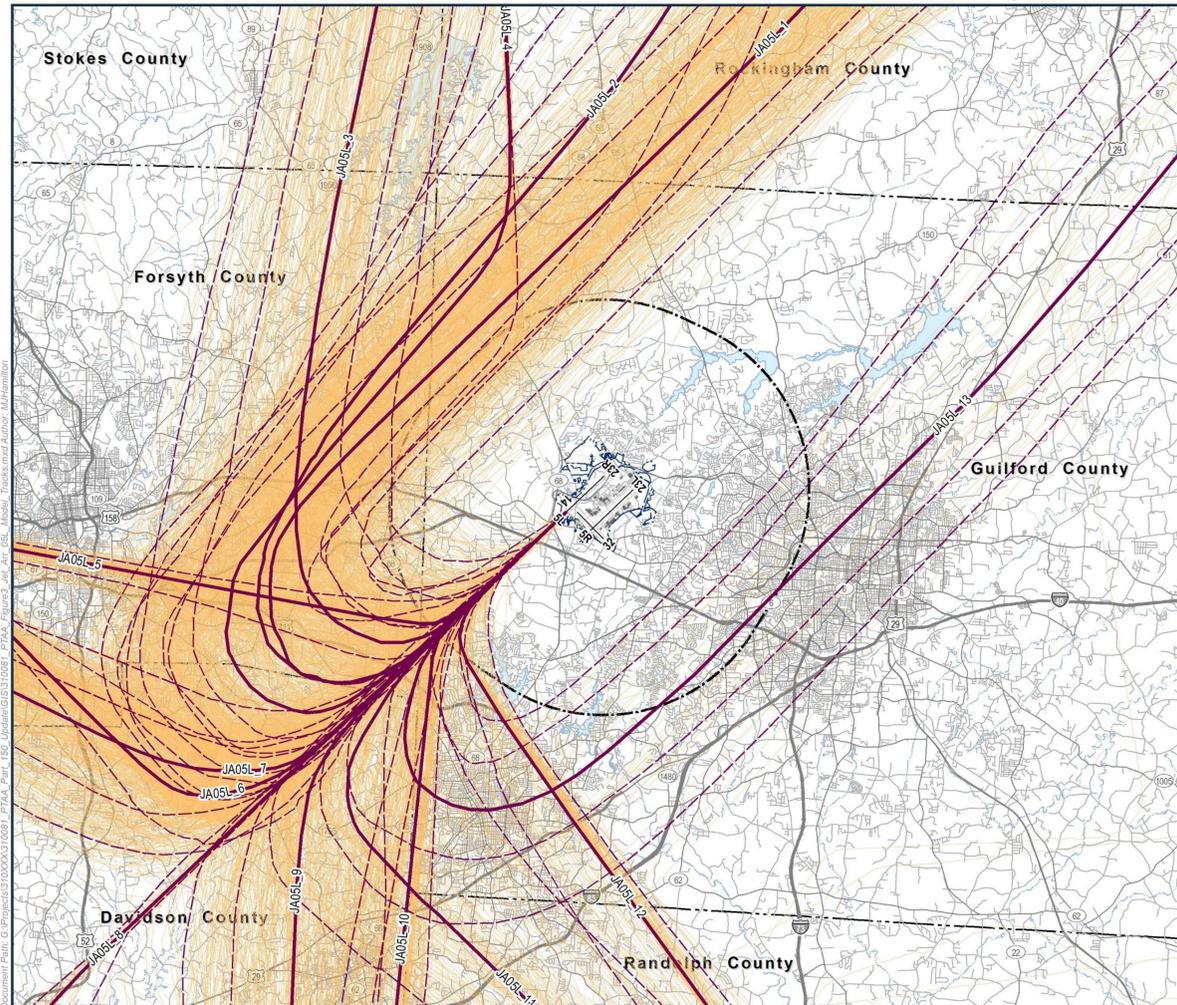


Figure 3
Jet Arrivals to Runway 05L

- Arrival Backbone Model Track
- Arrival Model Subtrack
- Arrival Radar Tracks (3,715)
- Airport Boundary
- Runway
- 30,000 ft. Extent from Runway End
- County Boundary
- Highways
- Railroad
- Airport Buildings
- Taxiway / Apron
- Major Roads
- Local Roads
- Water / Stream / Creek

| Track Bundle | # of tracks | Day Usage | Night Usage | FDX Day | FDX Night |
|--------------|-------------|---------------|---------------|---------------|---------------|
| JA05L_1 | 5 | 18.9% | 27.5% | 0.0% | 22.4% |
| JA05L_2 | 5 | 2.6% | 1.6% | 0.0% | 2.8% |
| JA05L_3 | 5 | 7.7% | 8.0% | 0.0% | 2.3% |
| JA05L_4 | 3 | 12.2% | 5.9% | 0.0% | 0.9% |
| JA05L_5 | 3 | 9.0% | 11.8% | 23.4% | 5.6% |
| JA05L_6 | 3 | 10.7% | 8.3% | 34.0% | 9.3% |
| JA05L_7 | 5 | 16.4% | 17.3% | 42.6% | 24.3% |
| JA05L_8 | 3 | 0.5% | 2.7% | 0.0% | 0.0% |
| JA05L_9 | 5 | 11.0% | 8.5% | 0.0% | 0.0% |
| JA05L_10 | 3 | 3.2% | 1.4% | 0.0% | 0.0% |
| JA05L_11 | 3 | 4.8% | 2.4% | 0.0% | 15.9% |
| JA05L_12 | 3 | 2.6% | 1.1% | 0.0% | 16.4% |
| JA05L_13 | 5 | 0.4% | 3.5% | 0.0% | 0.0% |
| Total | 51 | 100.0% | 100.0% | 100.0% | 100.0% |

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Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.



Jet Departures - Runway 5L

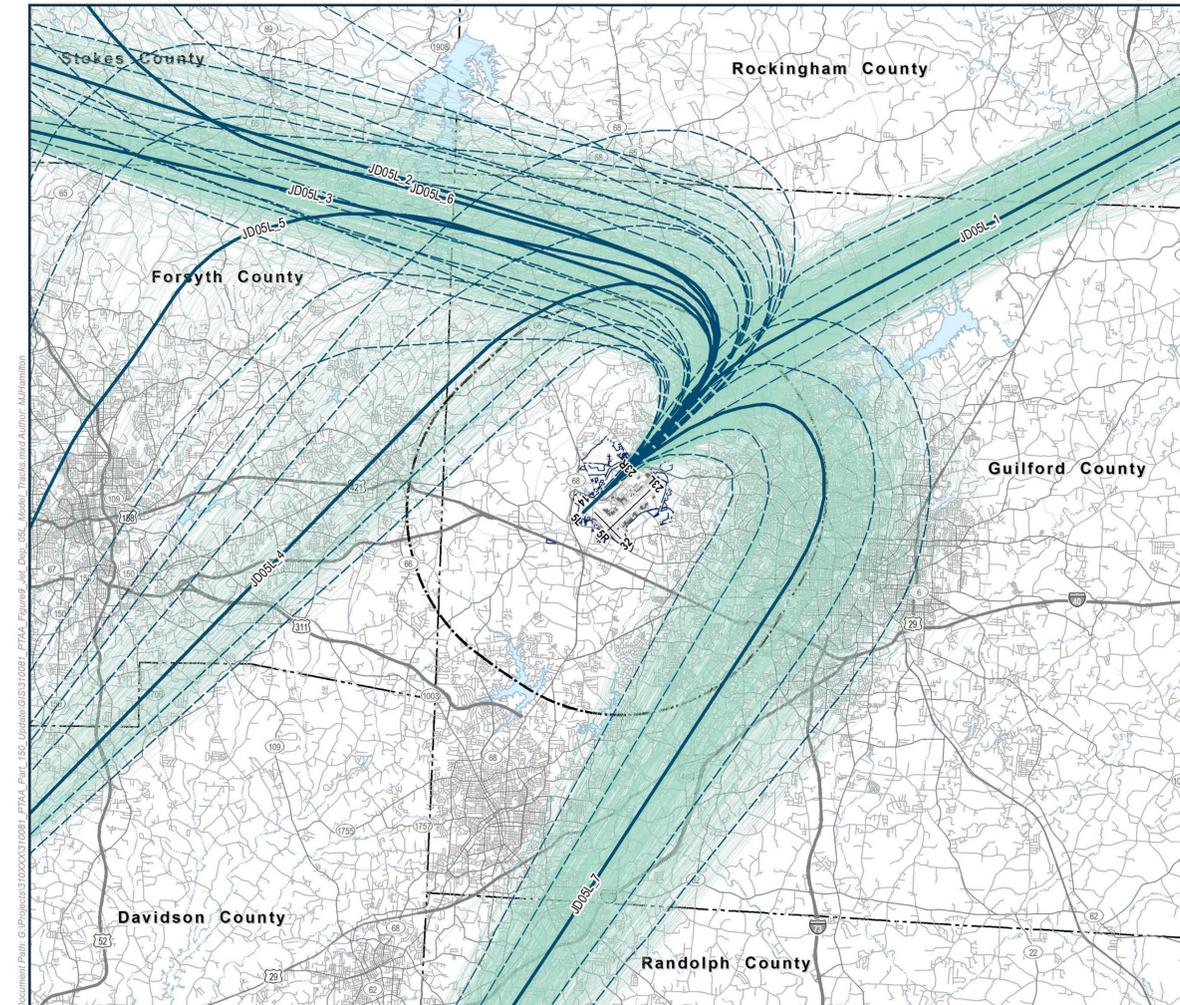


Figure 9
Jet Departures from Runway 05L

- Departure Backbone Model Track
- Departure Model Subtrack
- Departure Radar Tracks (3,063)
- Airport Boundary
- Runway
- 30,000 ft. Extent from Runway End
- County Boundary
- Highways
- Railroad
- Airport Buildings
- Taxiway / Apron
- Major Roads
- Local Roads
- Water / Stream / Creek

| Track Bundle | # of tracks | Day Usage | Night Usage | FDX Day | FDX Night |
|--------------|-------------|---------------|---------------|---------------|---------------|
| JD05L_1 | 5 | 45.1% | 56.0% | 3.2% | 8.8% |
| JD05L_2 | 5 | 4.5% | 3.8% | 6.5% | 8.8% |
| JD05L_3 | 5 | 12.4% | 15.0% | 29.0% | 26.3% |
| JD05L_4 | 5 | 7.5% | 6.4% | 0.0% | 0.0% |
| JD05L_5 | 5 | 2.7% | 3.8% | 0.0% | 0.0% |
| JD05L_6 | 5 | 3.4% | 2.6% | 0.0% | 5.3% |
| JD05L_7 | 5 | 24.5% | 12.4% | 61.3% | 50.9% |
| Total | 35 | 100.0% | 100.0% | 100.0% | 100.0% |

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Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.



Modeled Flight Tracks: Runway 23R

Jet Arrivals – Runway 23R

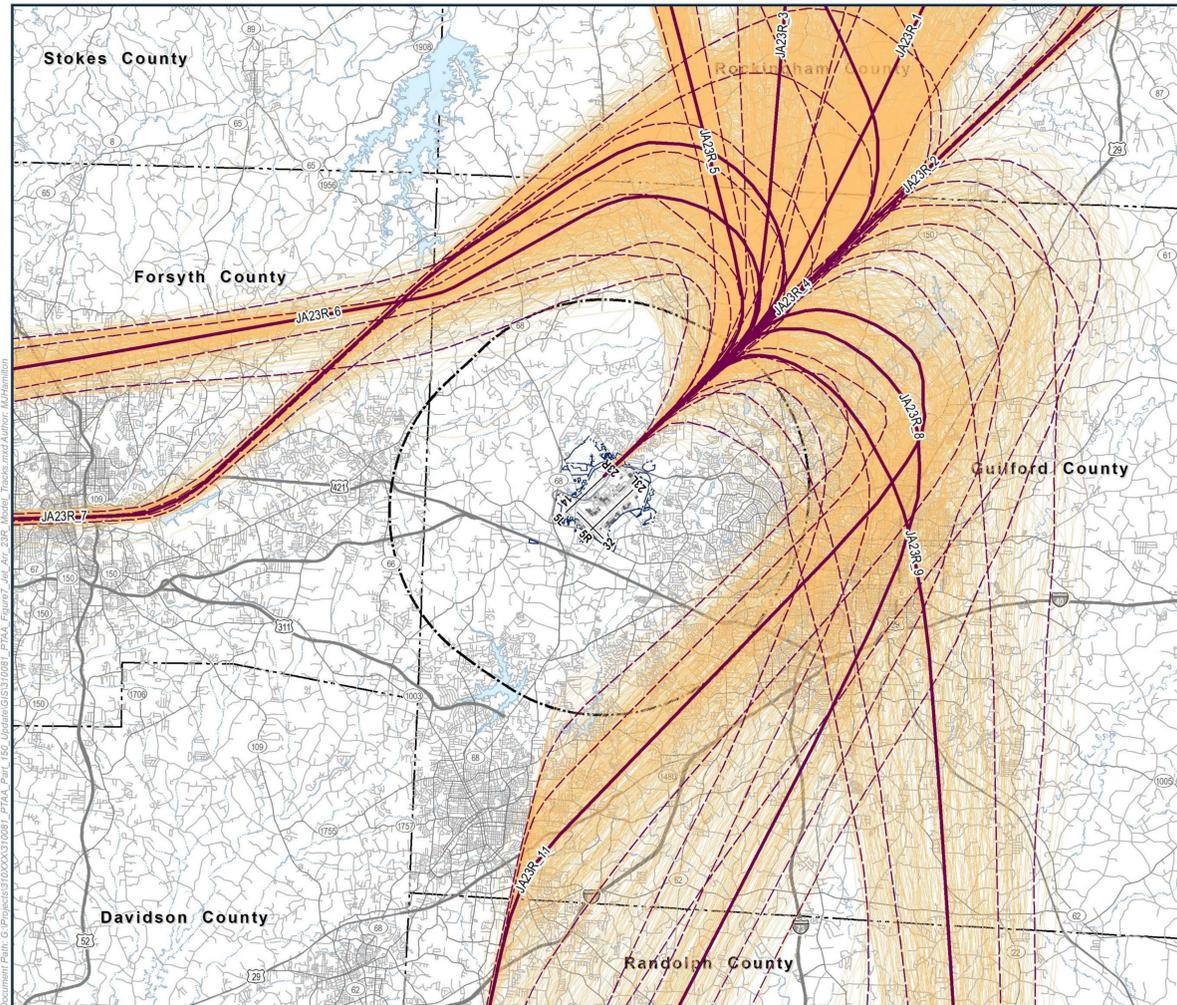


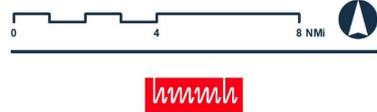
Figure 7
Jet Arrivals to Runway 23R

- Arrival Backbone Model Track
- Arrival Model Subtrack
- Arrival Radar Tracks (4,212)
- Airport Boundary
- Runway
- 30,000 ft. Extent from Runway End
- County Boundary
- Highways
- Railroad
- Airport Buildings
- Taxiway / Apron
- Major Roads
- Local Roads
- Water / Stream / Creek

| Track Bundle | # of tracks | Day Usage | Night Usage | FDX Day | FDX Night |
|--------------|-------------|---------------|---------------|---------------|---------------|
| JA23R_1 | 3 | 19.9% | 31.8% | 0.0% | 5.9% |
| JA23R_2 | 5 | 4.8% | 10.9% | 0.0% | 8.8% |
| JA23R_3 | 3 | 6.1% | 5.1% | 0.0% | 1.5% |
| JA23R_4 | 3 | 5.8% | 5.5% | 0.0% | 1.5% |
| JA23R_5 | 3 | 9.5% | 10.5% | 0.0% | 0.0% |
| JA23R_6 | 5 | 6.6% | 7.0% | 35.8% | 8.8% |
| JA23R_7 | 5 | 23.5% | 18.3% | 64.2% | 54.4% |
| JA23R_8 | 5 | 3.5% | 1.7% | 0.0% | 0.0% |
| JA23R_9 | 5 | 6.1% | 4.6% | 0.0% | 19.1% |
| JA23R_11 | 5 | 14.1% | 4.6% | 0.0% | 0.0% |
| Total | 42 | 100.0% | 100.0% | 100.0% | 100.0% |

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Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.



Jet Departures - Runway 23R

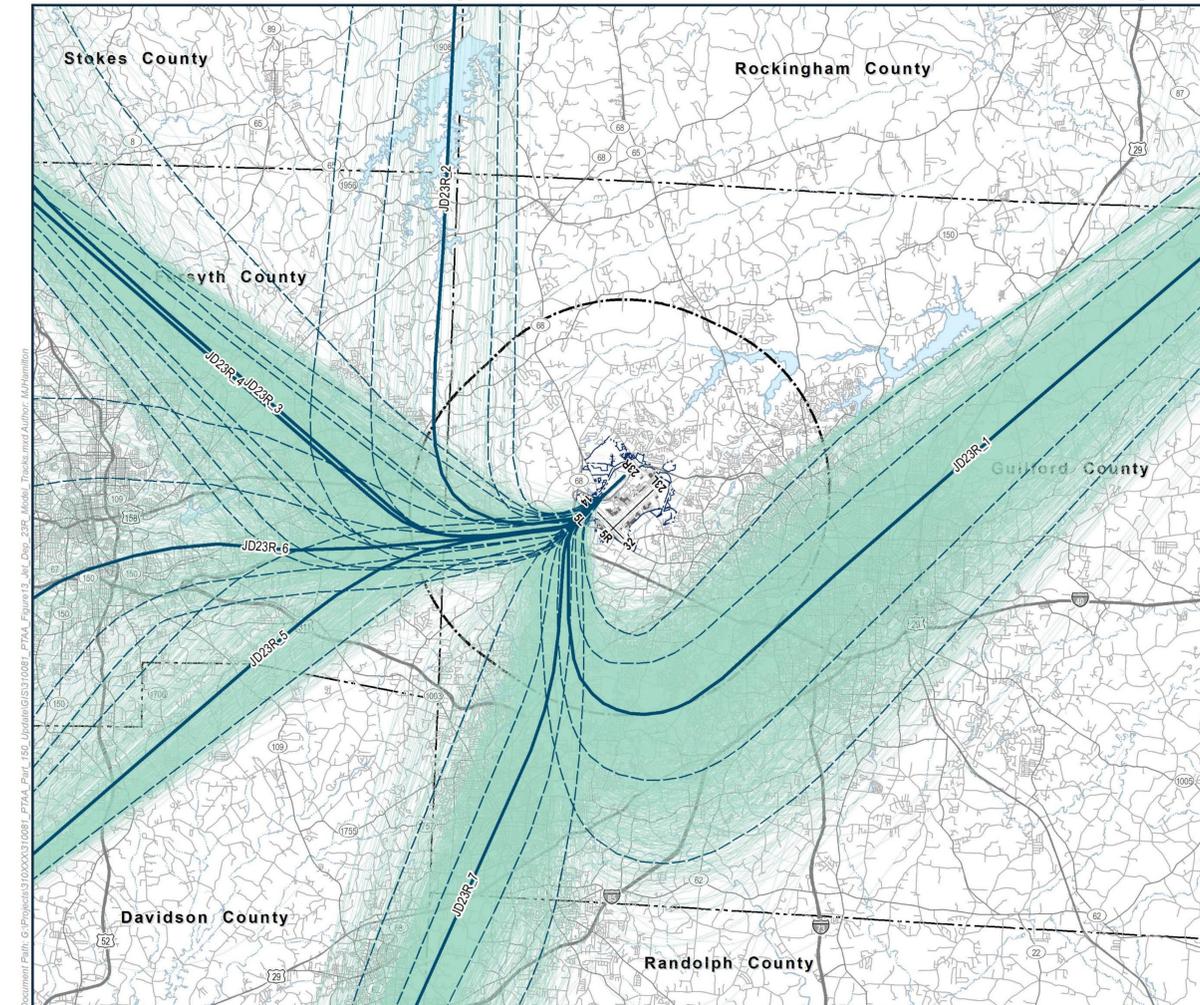


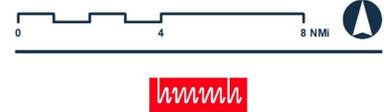
Figure 13
Jet Departures from Runway 23R

- Departure Backbone Model Track
- Departure Model Subtrack
- Departure Radar Tracks (6,924)
- Airport Boundary
- Runway
- 30,000 ft. Extent from Runway End
- County Boundary
- Highways
- Railroad
- Airport Buildings
- Taxiway / Apron
- Major Roads
- Local Roads
- Water / Stream / Creek

| Track Bundle | # of tracks | Day Usage | Night Usage | FDX Day | FDX Night |
|--------------|-------------|---------------|---------------|---------------|---------------|
| JD23R_1 | 5 | 32.5% | 42.9% | 0.0% | 9.8% |
| JD23R_2 | 5 | 0.3% | 6.6% | 0.0% | 0.3% |
| JD23R_3 | 5 | 4.0% | 2.9% | 1.9% | 13.2% |
| JD23R_4 | 5 | 21.1% | 19.9% | 39.3% | 22.7% |
| JD23R_5 | 3 | 9.8% | 7.9% | 0.9% | 0.0% |
| JD23R_6 | 5 | 4.3% | 4.4% | 0.0% | 0.0% |
| JD23R_7 | 5 | 28.0% | 15.4% | 57.9% | 54.0% |
| Total | 33 | 100.0% | 100.0% | 100.0% | 100.0% |

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Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.



Modeled Flight Tracks: Runway 23L

Jet Arrivals - Runway 23L

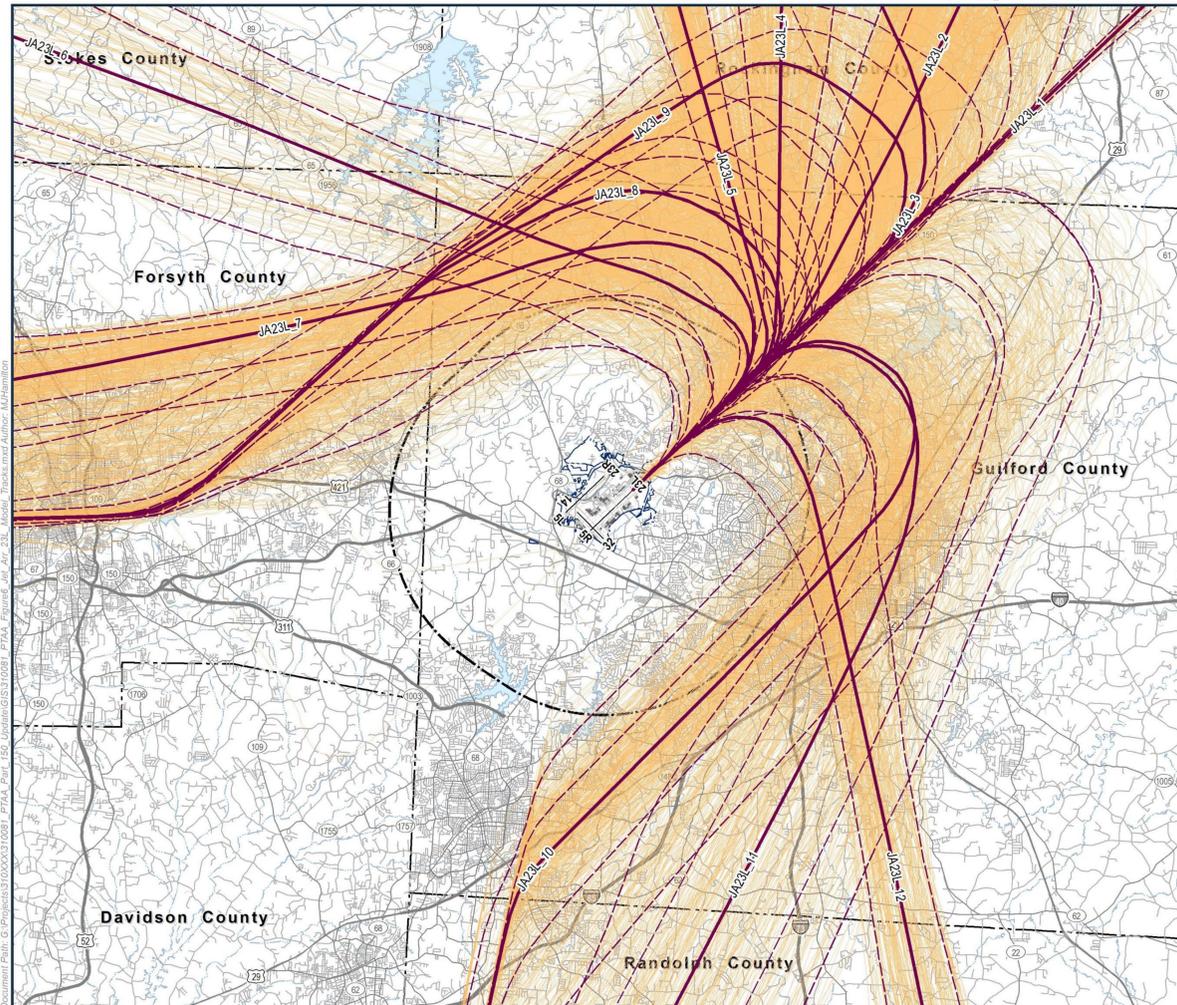


Figure 6
Jet Arrivals to Runway 23L

- Arrival Backbone Model Track
- Arrival Model Subtrack
- Arrival Radar Tracks (4,962)
- Airport Boundary
- Runway
- 30,000 ft. Extent from Runway End
- County Boundary
- Highways
- Railroad
- Airport Buildings
- Taxiway / Apron
- Major Roads
- Local Roads
- Water / Stream / Creek

| Track Bundle | # of tracks | Day Usage | Night Usage | FDX Day | FDX Night |
|--------------|-------------|---------------|---------------|---------------|---------------|
| JA23L_1 | 3 | 1.0% | 5.0% | 0.0% | 0.9% |
| JA23L_2 | 5 | 24.0% | 18.0% | 0.0% | 6.3% |
| JA23L_3 | 3 | 4.1% | 2.3% | 0.0% | 0.9% |
| JA23L_4 | 3 | 6.9% | 2.4% | 0.0% | 0.9% |
| JA23L_5 | 3 | 9.1% | 11.9% | 0.0% | 0.0% |
| JA23L_6 | 5 | 0.3% | 8.1% | 2.3% | 45.5% |
| JA23L_7 | 5 | 8.6% | 14.3% | 18.2% | 13.4% |
| JA23L_8 | 5 | 22.3% | 16.4% | 61.4% | 23.2% |
| JA23L_9 | 5 | 4.1% | 4.5% | 18.2% | 8.0% |
| JA23L_10 | 5 | 11.6% | 7.1% | 0.0% | 0.0% |
| JA23L_11 | 5 | 5.0% | 3.2% | 0.0% | 0.0% |
| JA23L_12 | 3 | 3.0% | 6.8% | 0.0% | 0.9% |
| Total | 50 | 100.0% | 100.0% | 100.0% | 100.0% |

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Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.



Jet Departures - Runway 23L

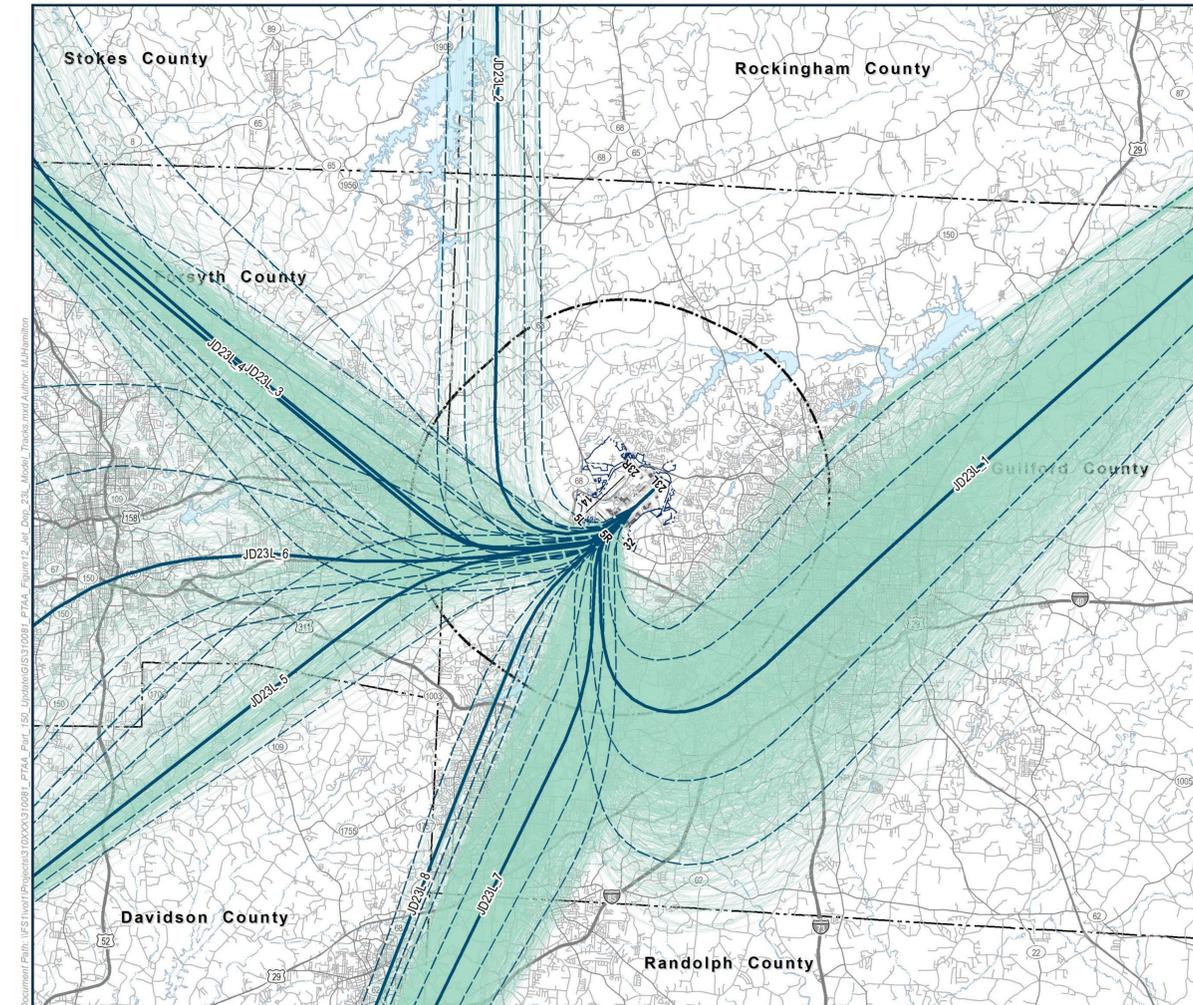


Figure 12
Jet Departures from Runway 23L

- Departure Backbone Model Track
- Departure Model Subtrack
- Departure Radar Tracks (5,503)
- Airport Boundary
- Runway
- 30,000 ft. Extent from Runway End
- County Boundary
- Highways
- Railroad
- Airport Buildings
- Taxiway / Apron
- Major Roads
- Local Roads
- Water / Stream / Creek

DRAFT

Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); AirNav.com; HMMH Inc.

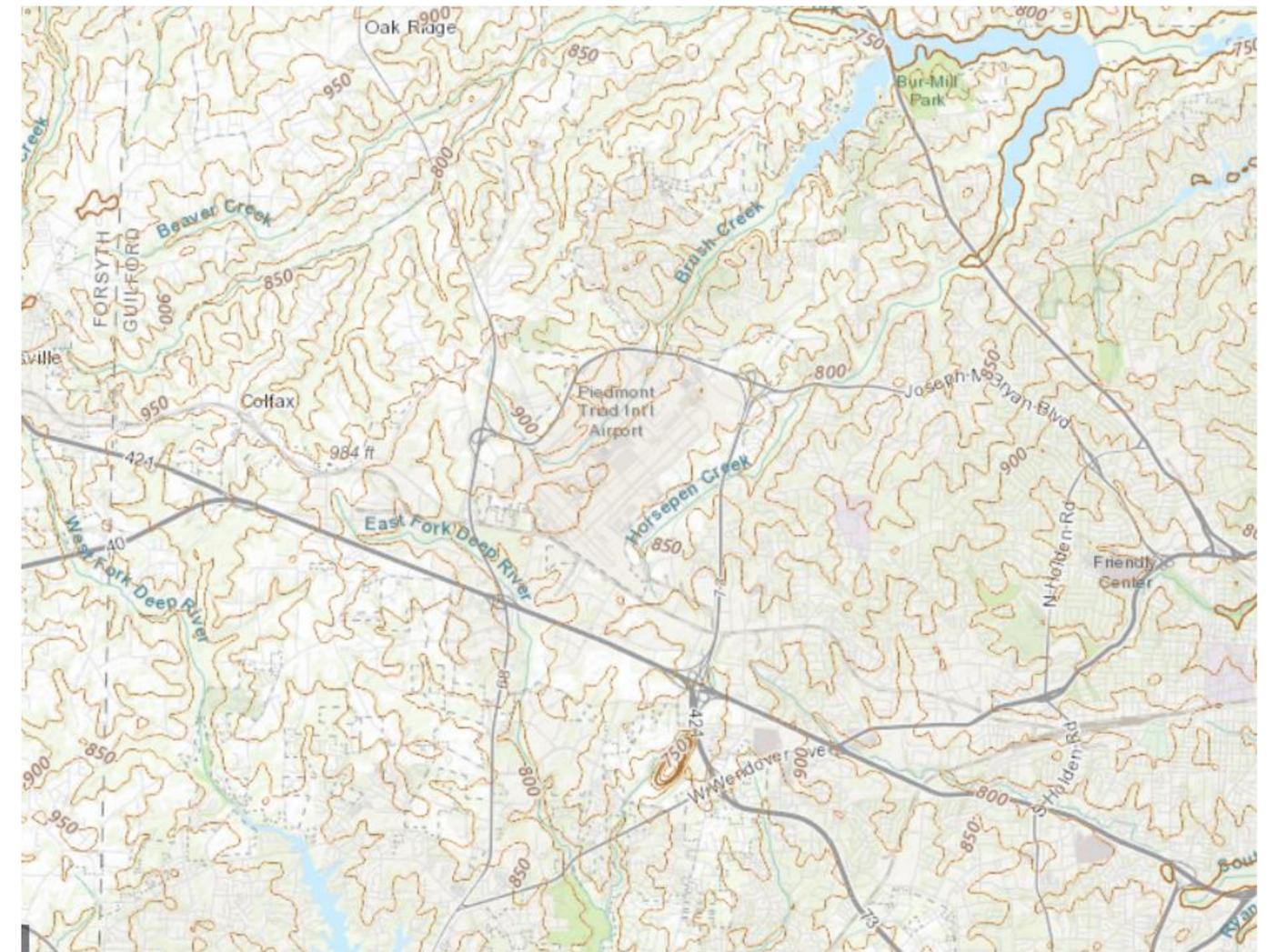


Thank you to committee member Ed Levick for careful review of flight track inputs; an additional model track was added to fill a gap.



Modeled Weather and Terrain Data

- The FAA requires the use of the provided AEDT 30-year average weather information. These data for PTI are:
 - Temperature: 58° F
 - Station Pressure: 985.75 mbar
 - Sea Level Pressure: 1018.04 mbar
 - Dew point: 46.99° F
 - Relative humidity: 67.35%
 - Wind speed 6.15 knots
- Terrain data were obtained from the United States Geological Survey National Elevation Dataset with 1/3 arc second (approximately 33 ft.) resolution covering the Study Area



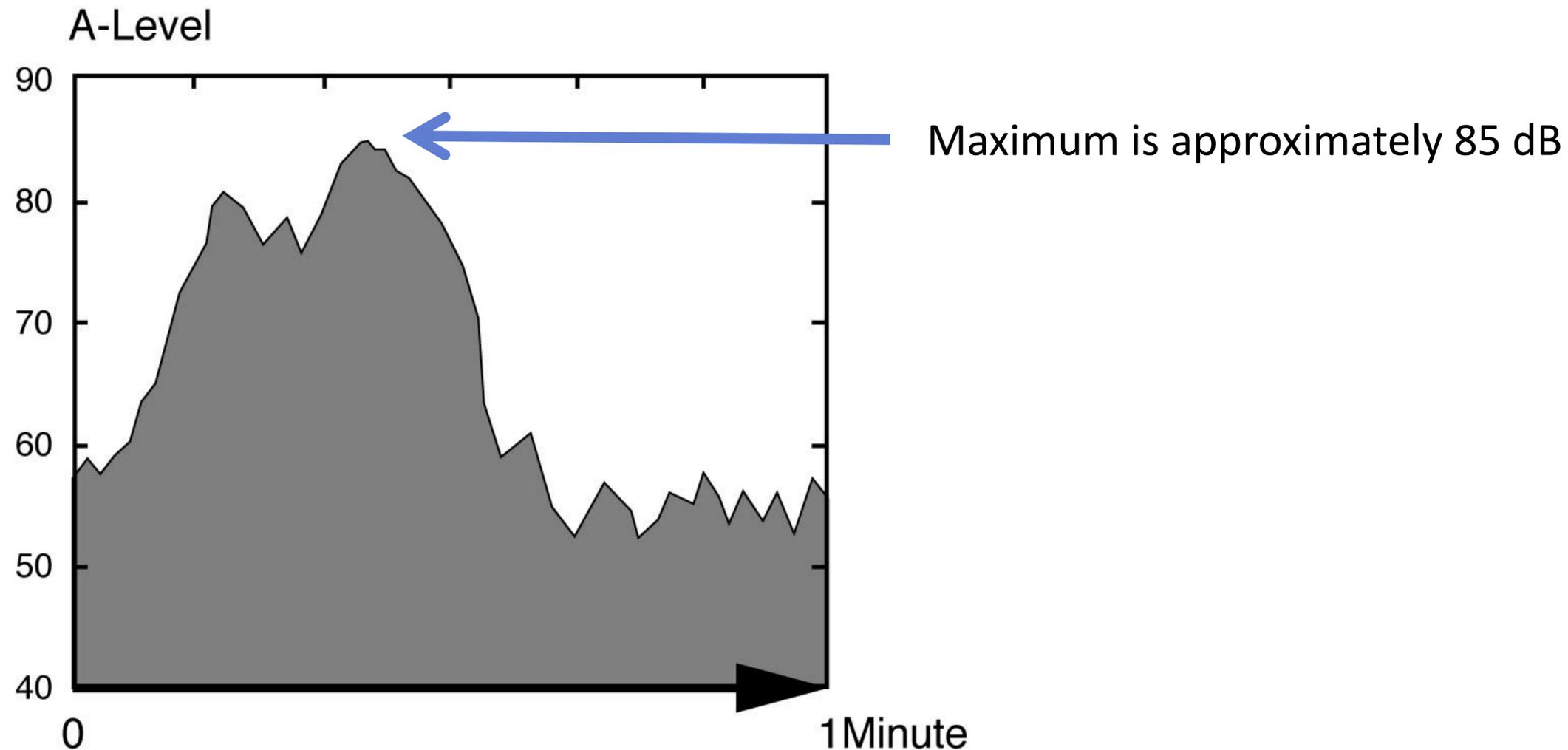
Thank you to committee member Thad Juszczak for the question about weather inputs – the FAA requires the 30-year average data

Preliminary Noise Model Results



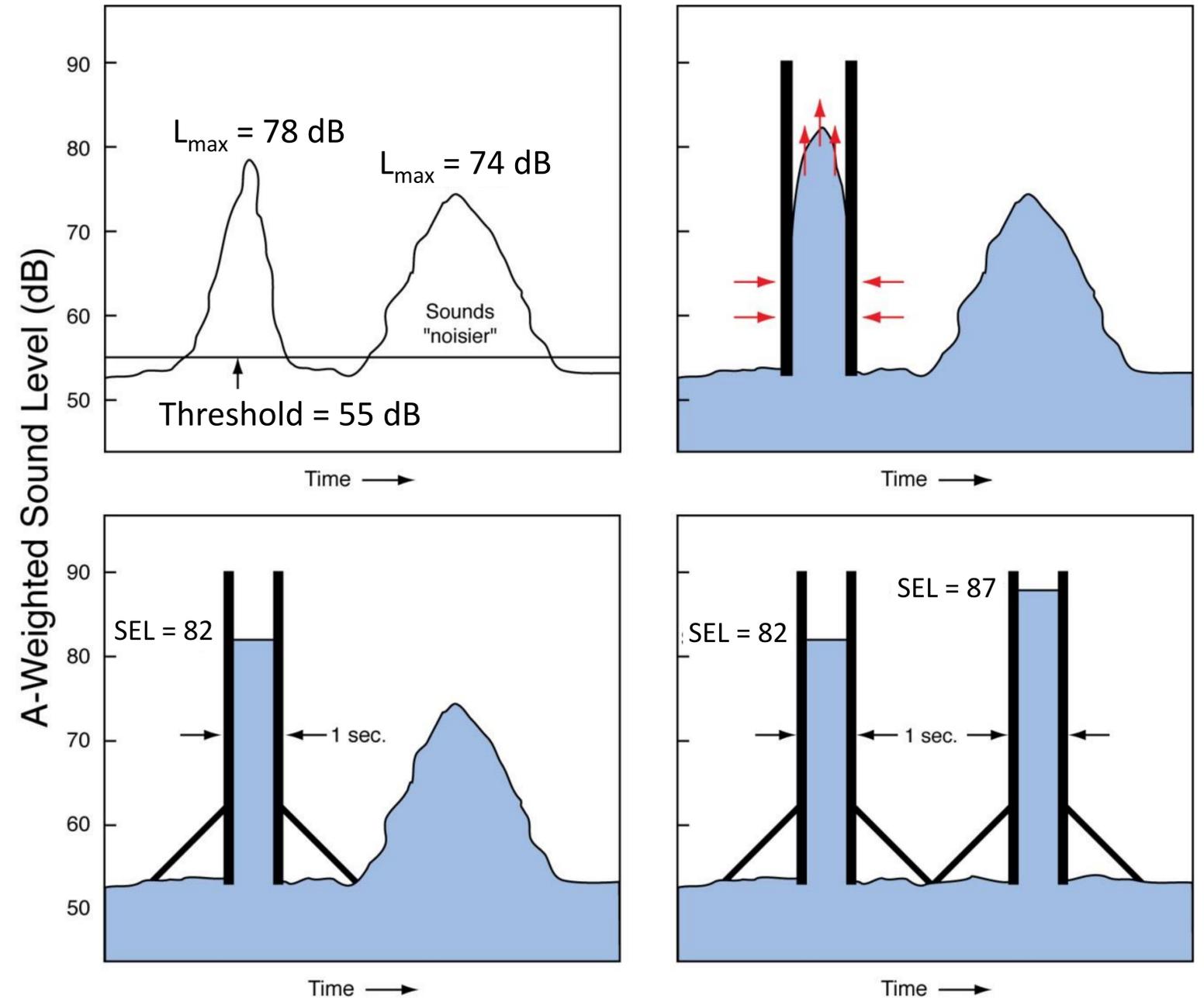
Single Event Noise Metrics: Maximum Sound Level (L_{max})

The simplest way to describe a discrete noise “event” is its maximum sound level (L_{max})



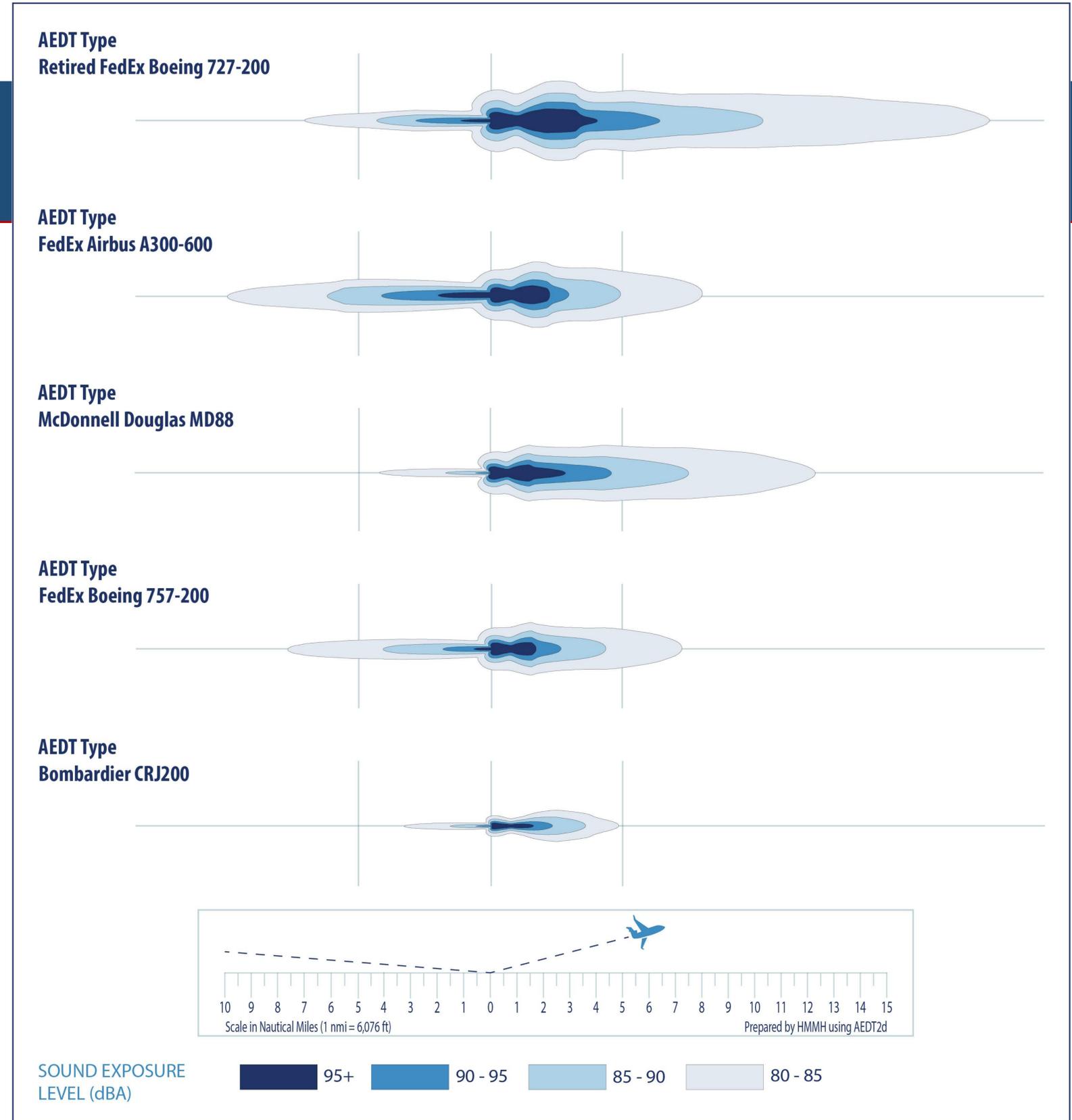
Single Event Noise Metrics: Sound Exposure Level (SEL)

- Duration matters: A longer event may seem “noisier,” even if it has a lower or equal maximum level
- SEL measures the total “noisiness” of an event by taking duration into account
- The FAA’s noise model (AEDT) uses SEL as the basis for calculating the required noise metric Day-Night Average Sound Level



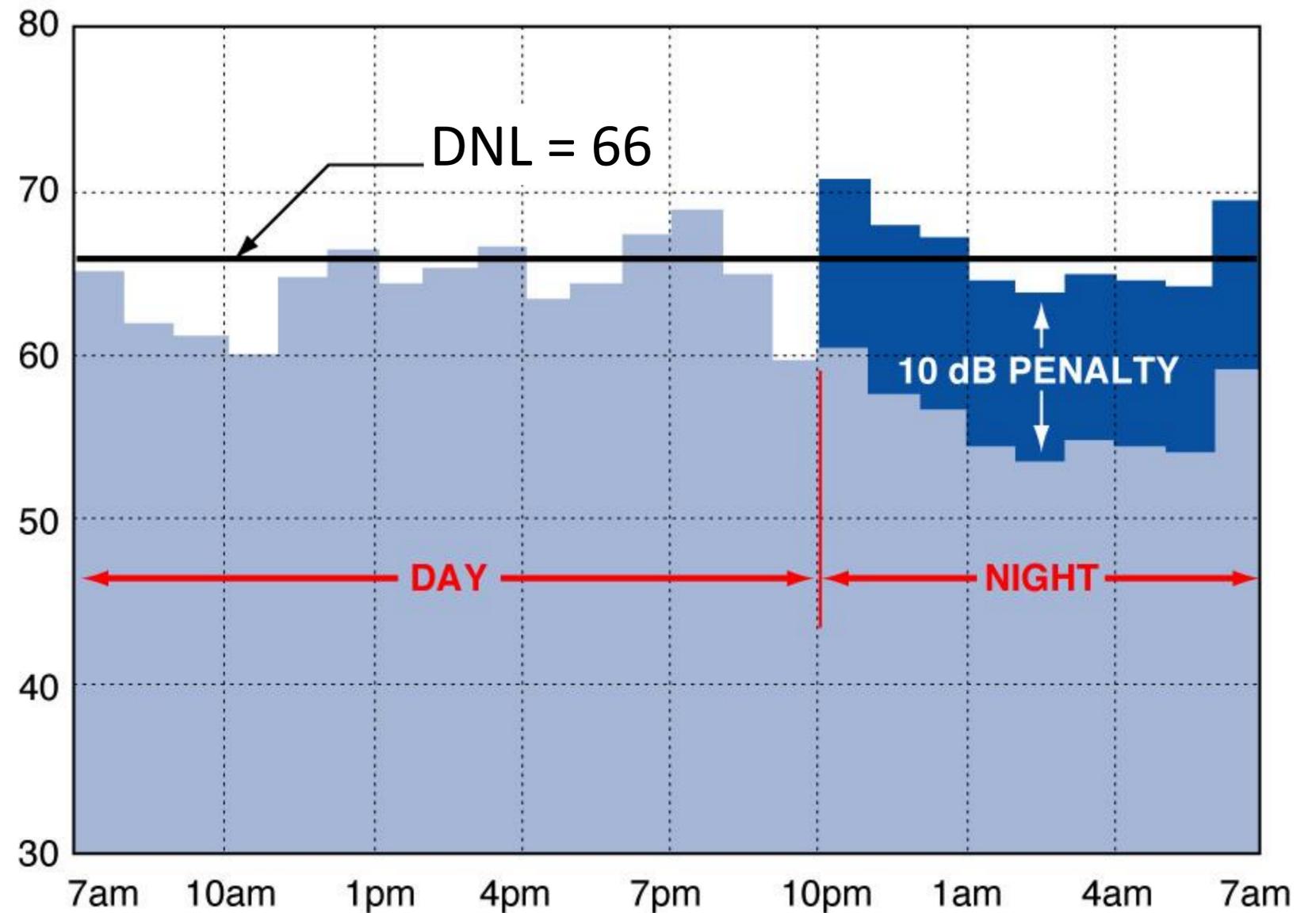
Comparative SELs

- The sound exposure levels created by an aircraft overflight depend on its
 - Engine type
 - Thrust setting profile
 - Altitude profile
 - Airspeed profile
- These graphics compare a typical landing (from left) and takeoff (to right) of different aircraft types

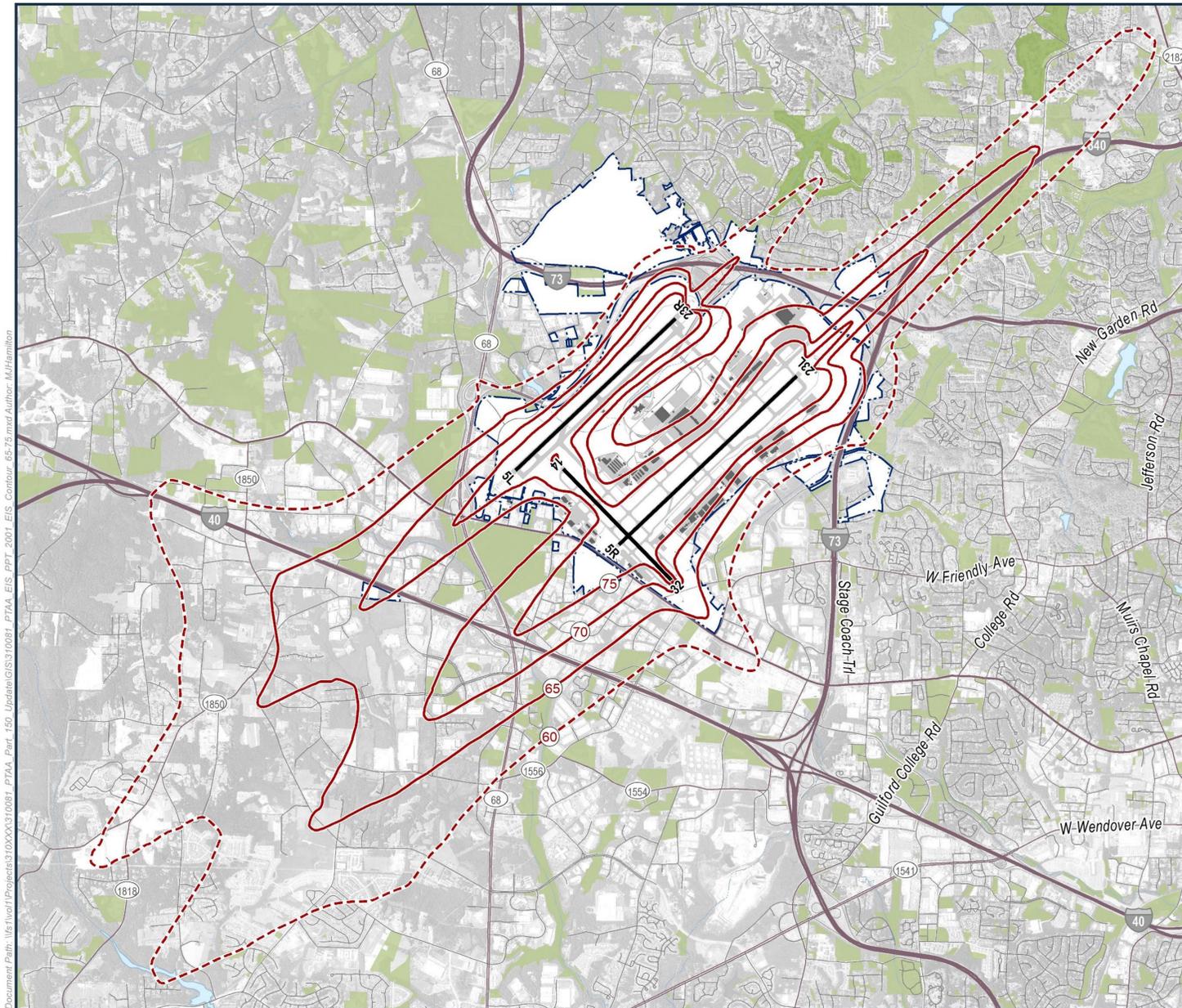


Cumulative Exposure: Day-Night Average Level (DNL)

- Describes 24-hour exposure
- Noise from 10 pm to 7 am is factored up by 10 dB
 - “Penalty” is equal to counting each night aircraft 10 times
- DNL is the only metric that Part 150 requires for land use compatibility



Previous Study Noise Contours: 2001 EIS



2001 EIS DNL Contours

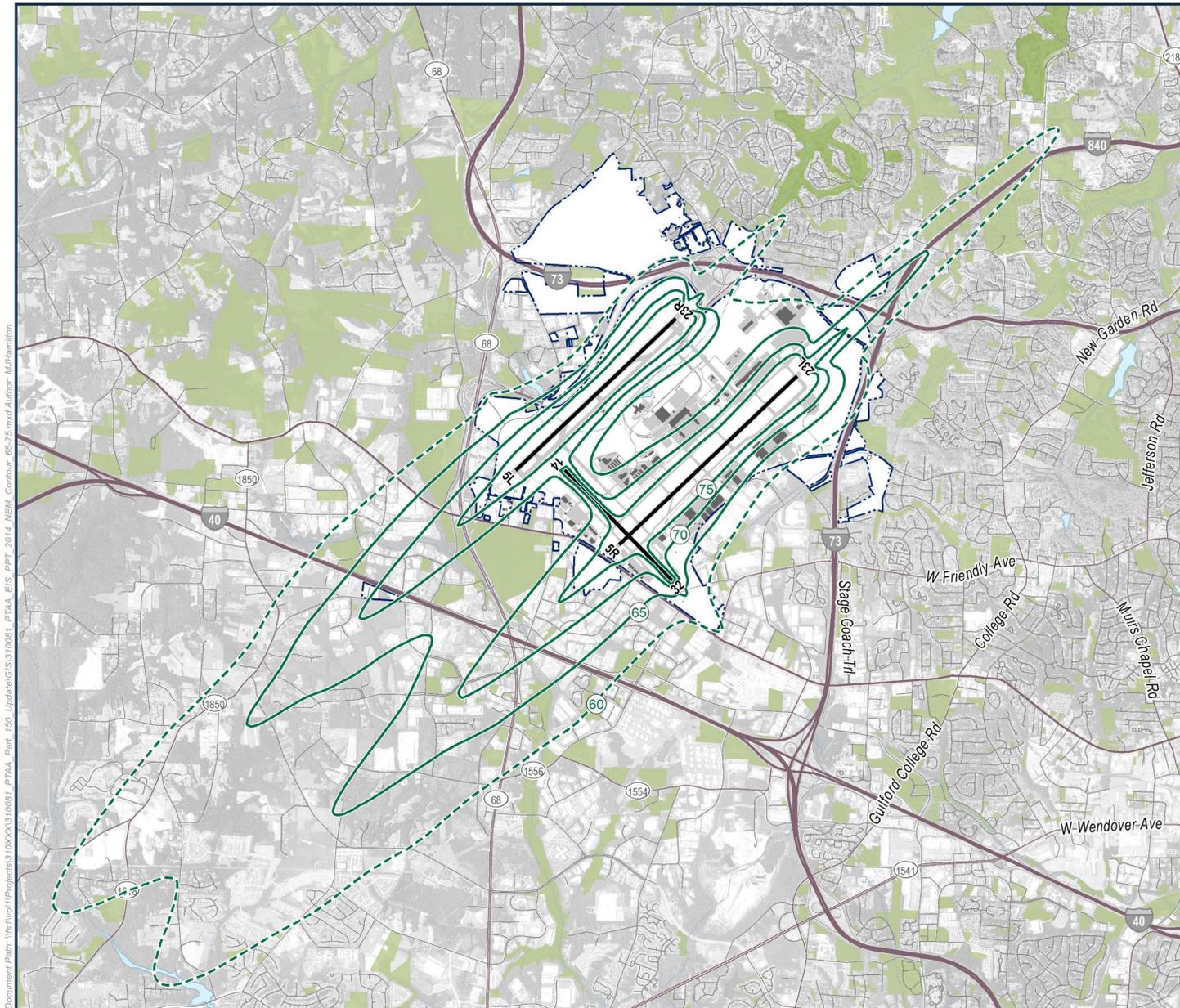
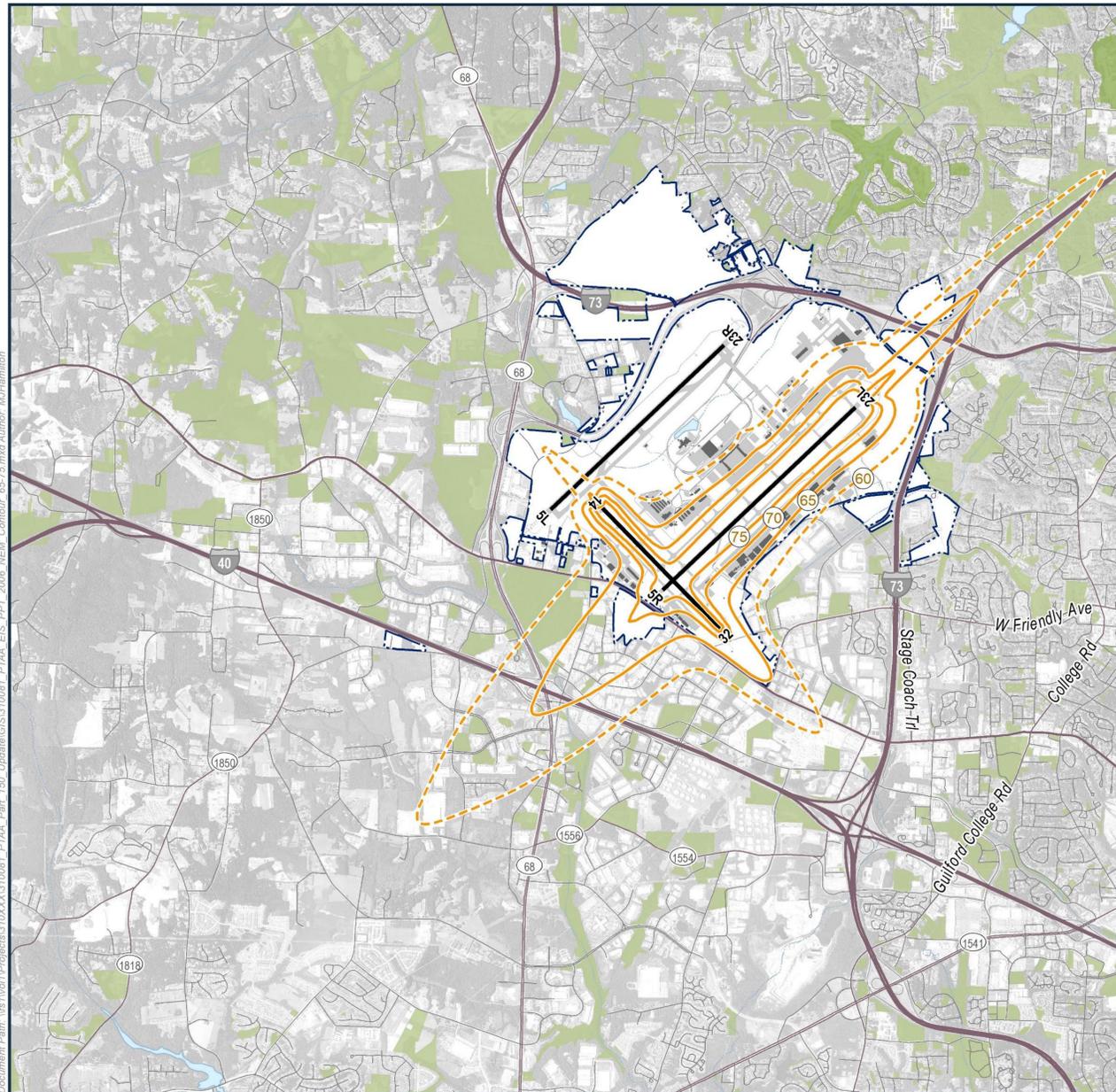
- 2001 EIS Contour (65-75 DNL)
- 2001 EIS Contour (60 DNL, for Informational Purposes Only)
- Airport Boundary
- Runway
- County Boundary
- Highways
- Railroad
- Recreational / Open Space
- Golf Course
- Water
- Airport Buildings
- Taxiway / Apron
- Major Roads
- Local Roads
- Stream / Creek

DRAFT

Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); PTAA; AirNav.com; HMMH Inc.



Previous Study Noise Contours: Original Part 150 NEMs



Original Part 150 NEM contours

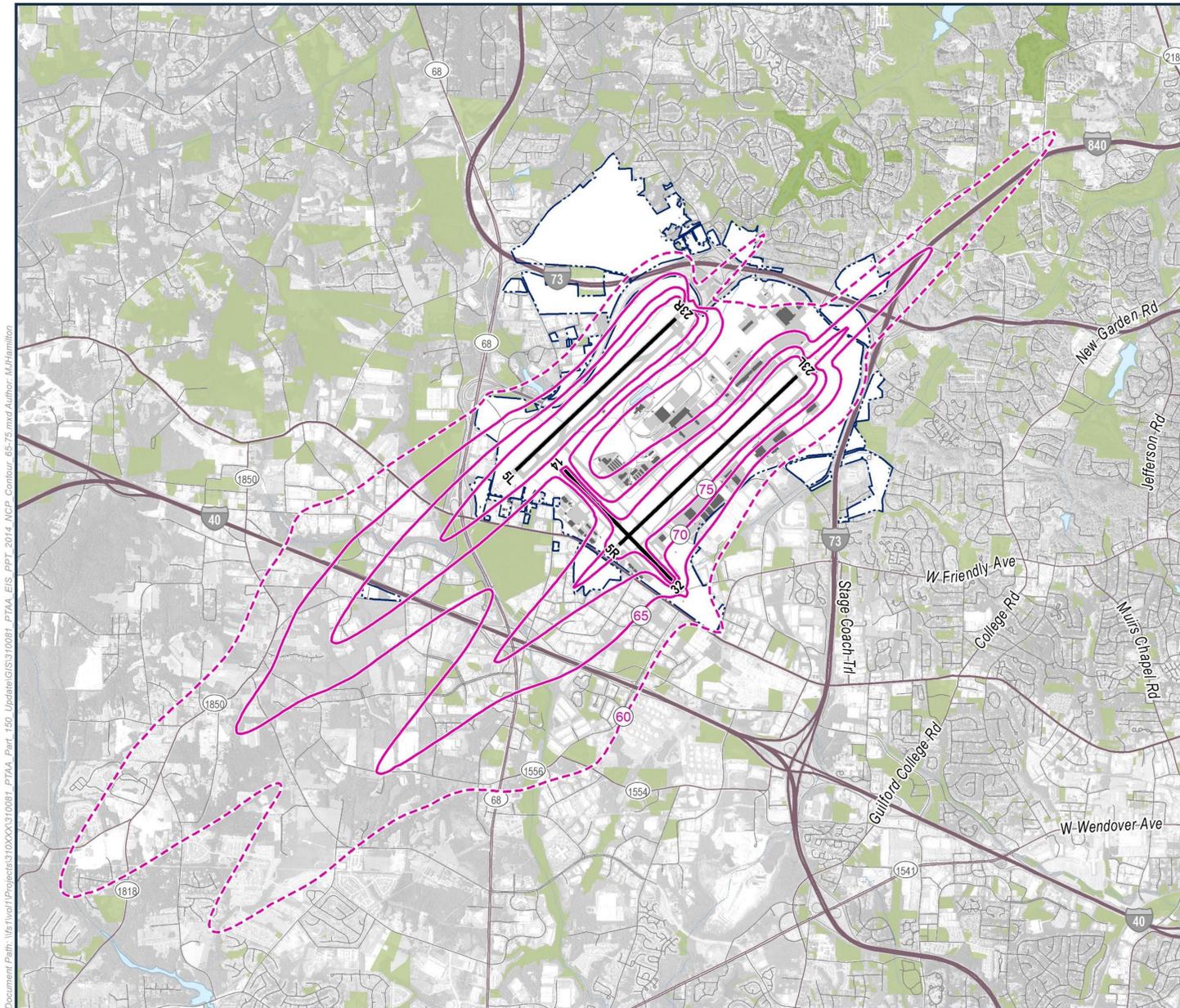
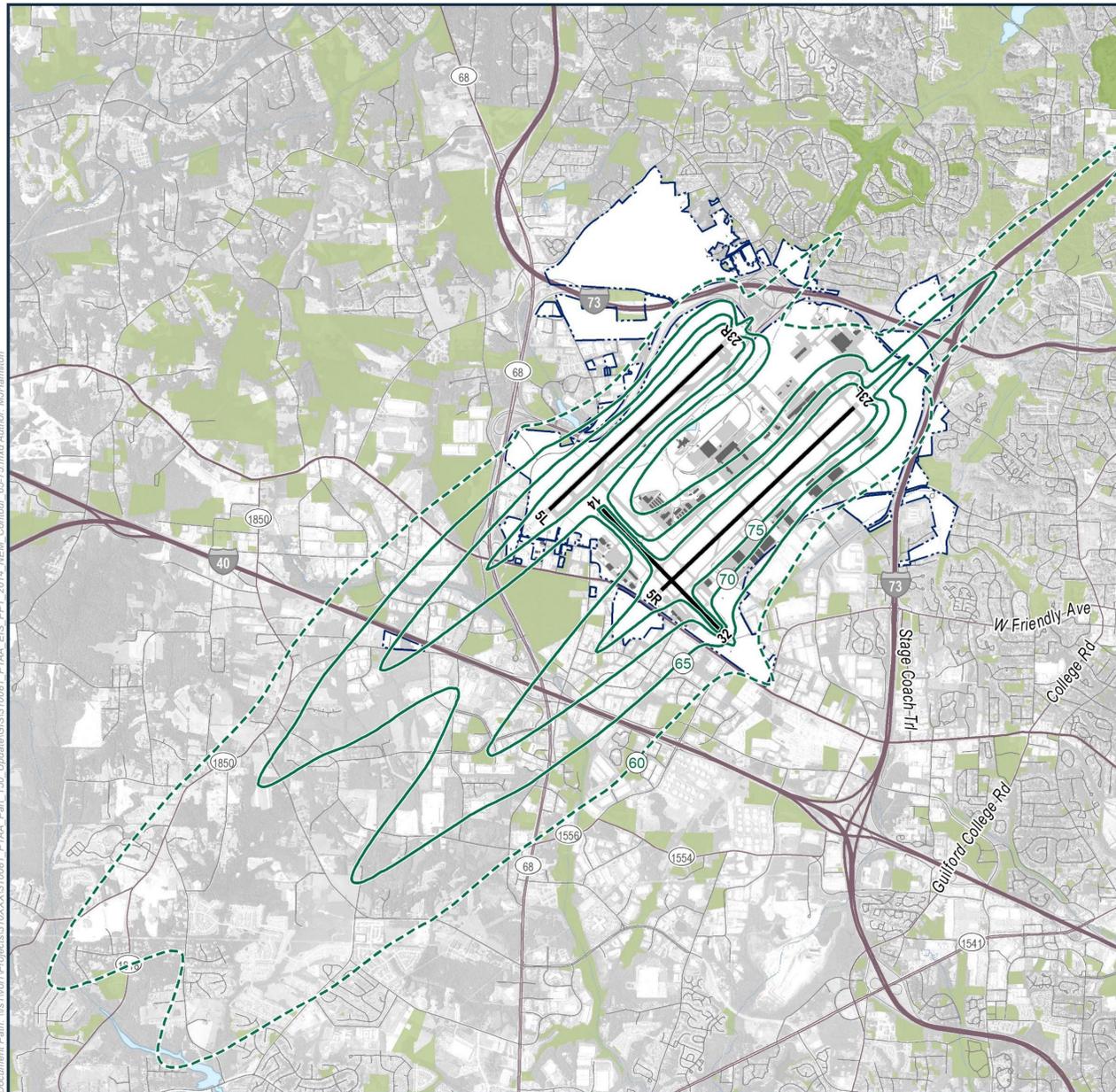
- 2006 NEM Contour (65-75 DNL)
- 2006 NEM Contour (60 DNL, for Informational Purposes Only)
- 2014 NEM Contour - Not Mitigated (65-75 DNL)
- 2014 NEM Contour (60 DNL, for Informational Purposes Only)
- Airport Boundary
- Airport Buildings
- Runway
- Taxiway / Apron
- County Boundary
- Highways
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DRAFT

Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); PTAA; AirNav.com; HMMH Inc.



Previous Study Noise Contours: Original Part 150 forecast



Original Part 150 Forecast NEM with and without NCP

- 2014 NEM Contour - Not Mitigated (65-75 DNL)
 - - - 2014 NEM Contour (60 DNL, for Informational Purposes Only)
 - 2014 Mitigated NEM Contour (65-75 DNL)
 - - - 2014 Mitigated NEM Contour (60 DNL, for Informational Purposes Only)
- Airport Boundary
 - Runway
 - County Boundary
 - Highways
 - Railroad
 - Recreational / Open Space
 - Golf Course
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DRAFT

Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); PTAA; AirNav.com; HMMH Inc.



Current Study Noise Contours: Part 150 Update

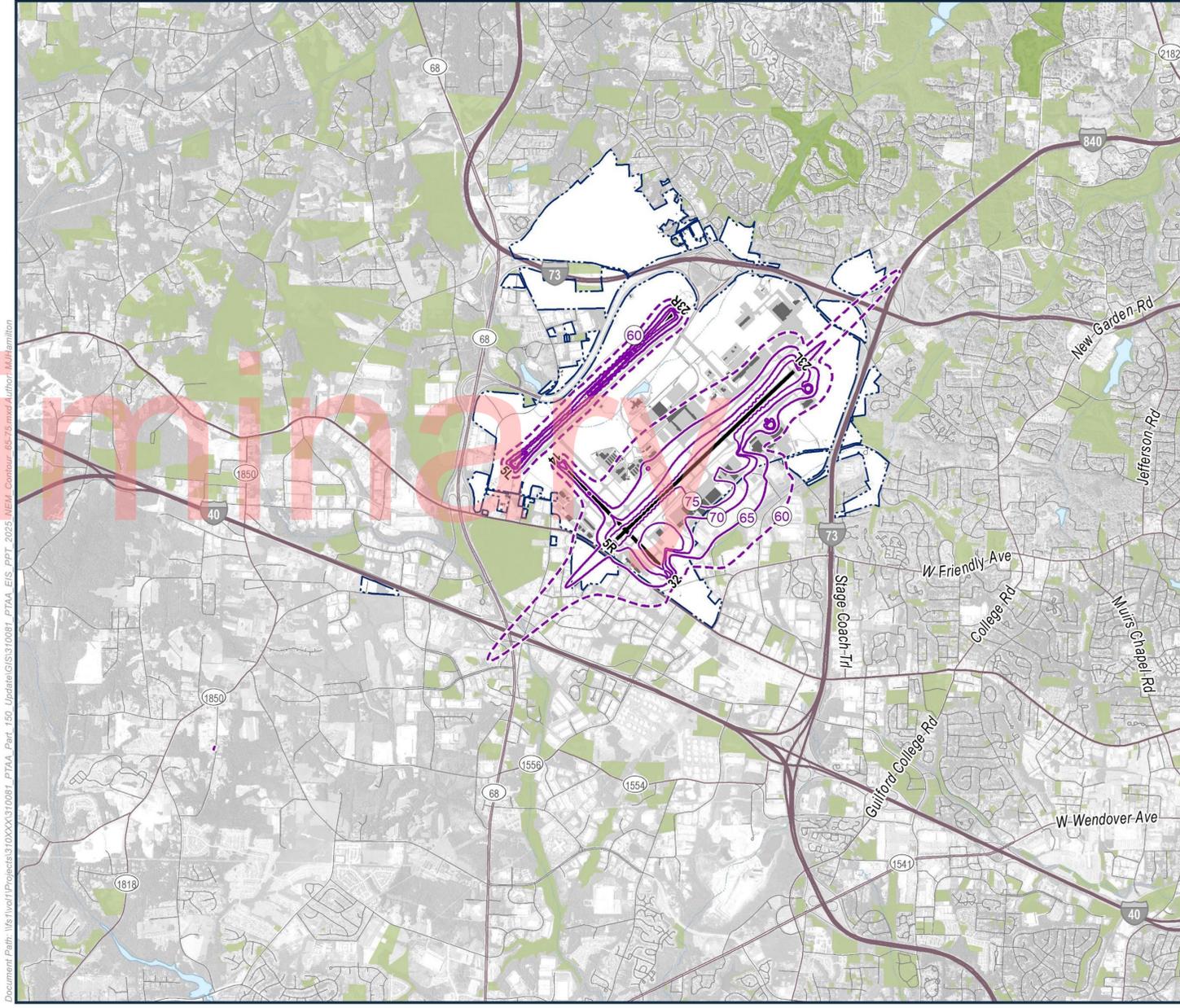
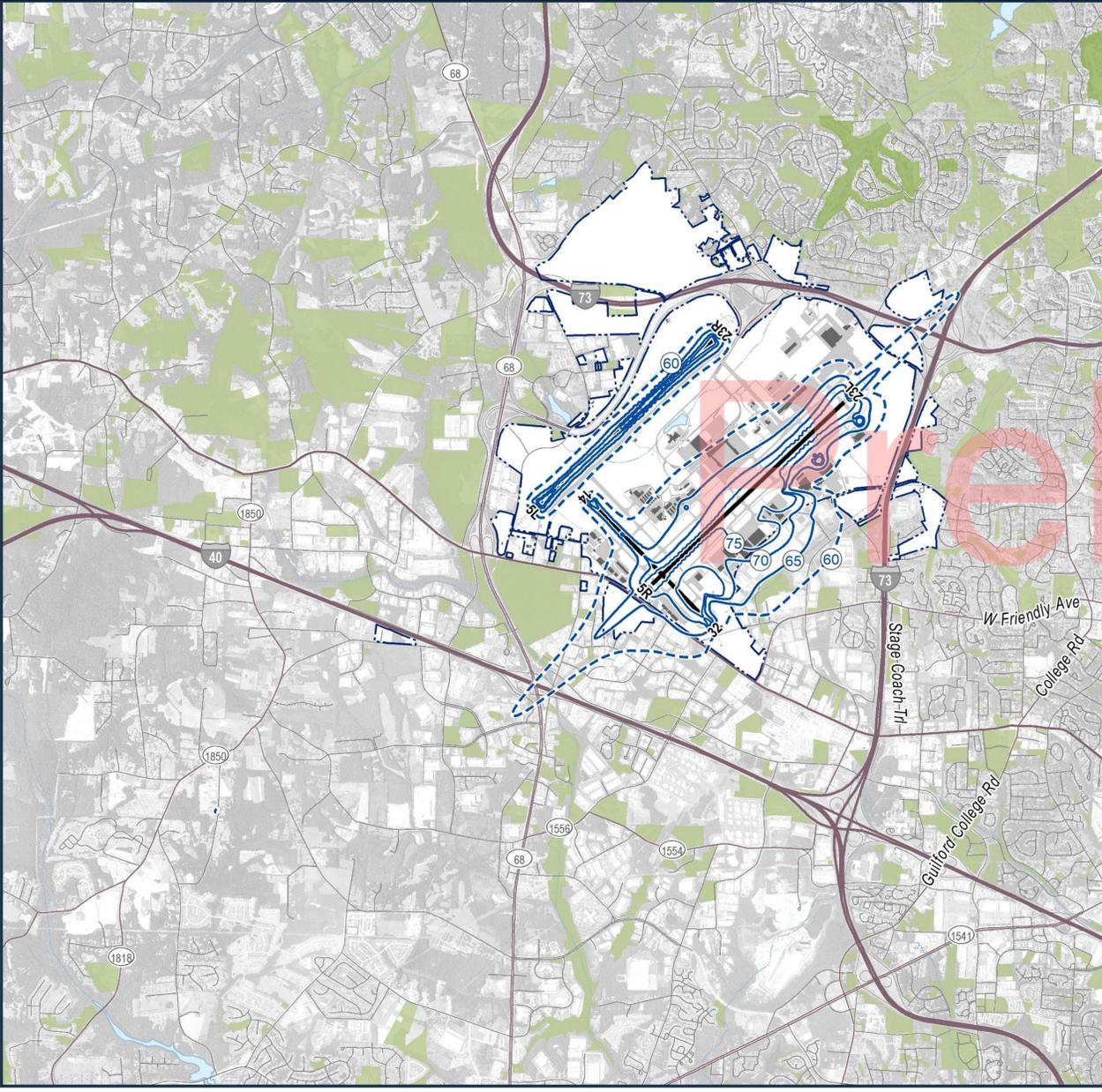


Current NEM Update Contours

- 2020 NEM Contour (65-75 DNL)
- 2020 NEM Contour (60 DNL, for Informational Purposes Only)
- 2025 NEM Contour (65-75 DNL)
- 2025 NEM Contour (60 DNL, for Informational Purposes Only)
- Airport Boundary
- Runway
- County Boundary
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- Golf Course
- Water

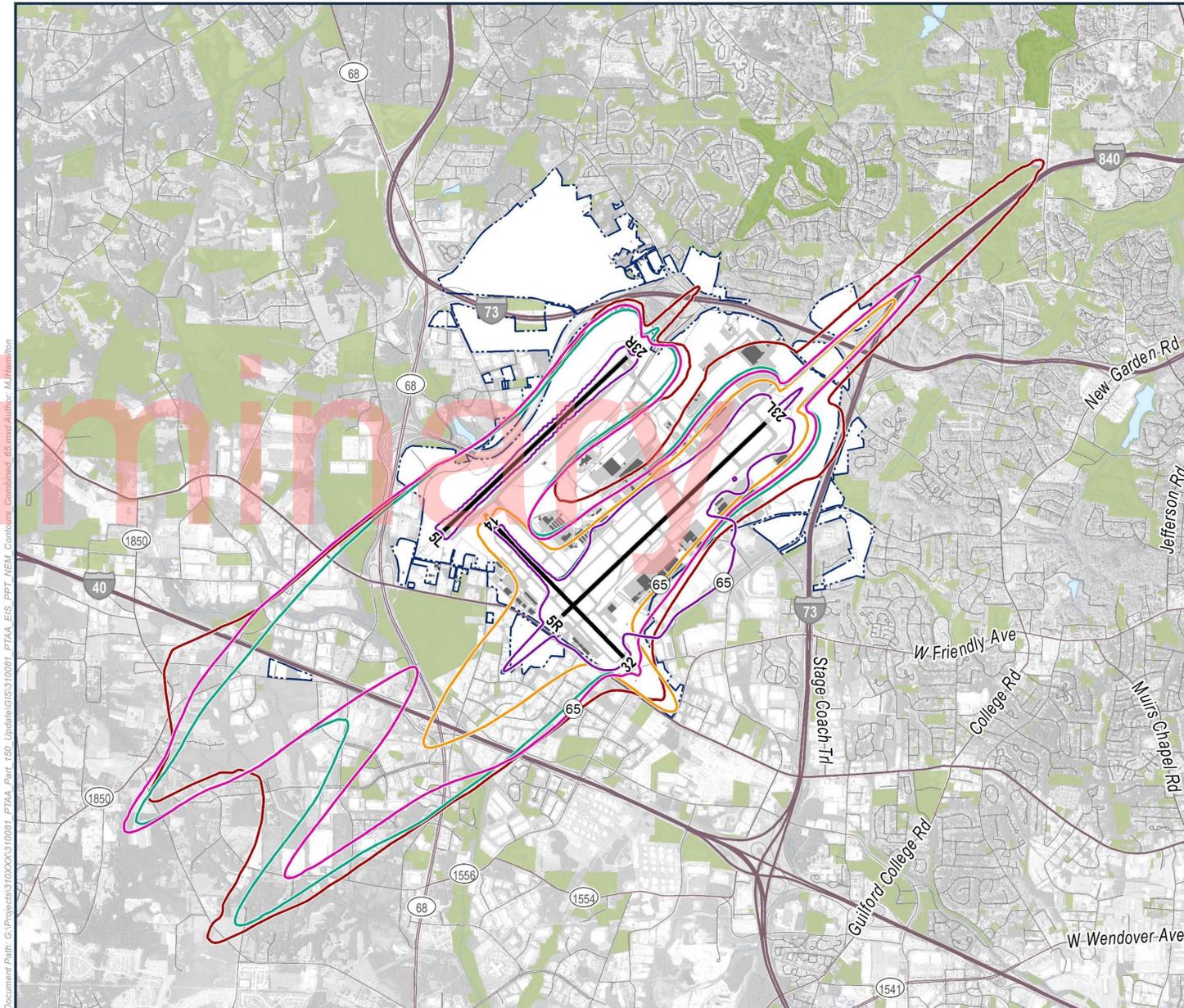
DRAFT

Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); PTAA; AirNav.com; HMMH Inc.



Comparison of 65 DNL contours

- EIS:
 - nearly 600 daily operations
 - 30 daily B-727 or DC-8/9 (Stage 2)
- 2014 Part 150 NEM:
 - nearly 500 daily operations
 - 10 daily B-727 or DC-8/9 (Stage 2)
- 2020 NEM Update:
 - about 250 daily operations
 - no B-727 or DC8/9 (Stage 2)
- 2025 forecast NEM:
 - about 250 daily operations
 - no Stage 2/no MD80s (Stage 3)



Comparison of Past and Current DNL 65 Contours

- 2025 NEM Contour (65 DNL)
- 2020 NEM Contour (65 DNL)
- 2014 NEM Contour (65 DNL)
- 2014 Mitigated NEM Contour (65-75 DNL)
- 2006 NEM Contour (65 DNL)
- 2001 EIS Contour (65 DNL)
- Airport Boundary
- Runway
- County Boundary
- Highways
- Railroad
- Recreational / Open Space
- Golf Course
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- Taxiway / Apron
- Major Roads
- Local Roads
- Stream / Creek

DRAFT

Data Sources: Guilford County GIS; Davidson County GIS; Forsyth County GIS; NC OneMap GeoSpatial Portal; Environmental Systems Research Institute (ESRI); PTAA; AirNav.com; HMMH Inc.



Note: EIS and Original Part 150 assumed full FedEx hub in operation by 2014. NEM update contours include current level of hub operations with small increase for 2025.

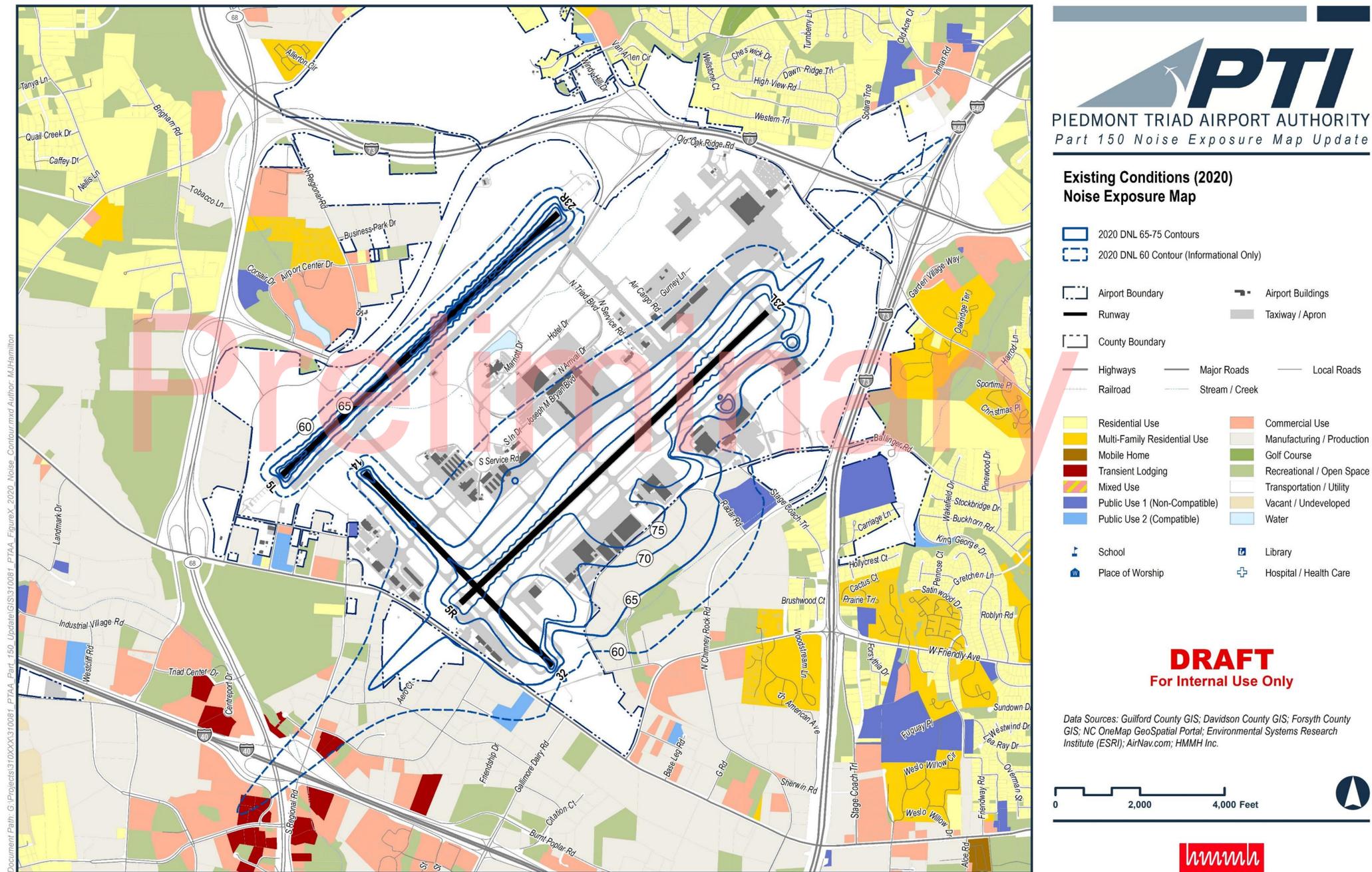


Comparison of Modeled Airport Operations

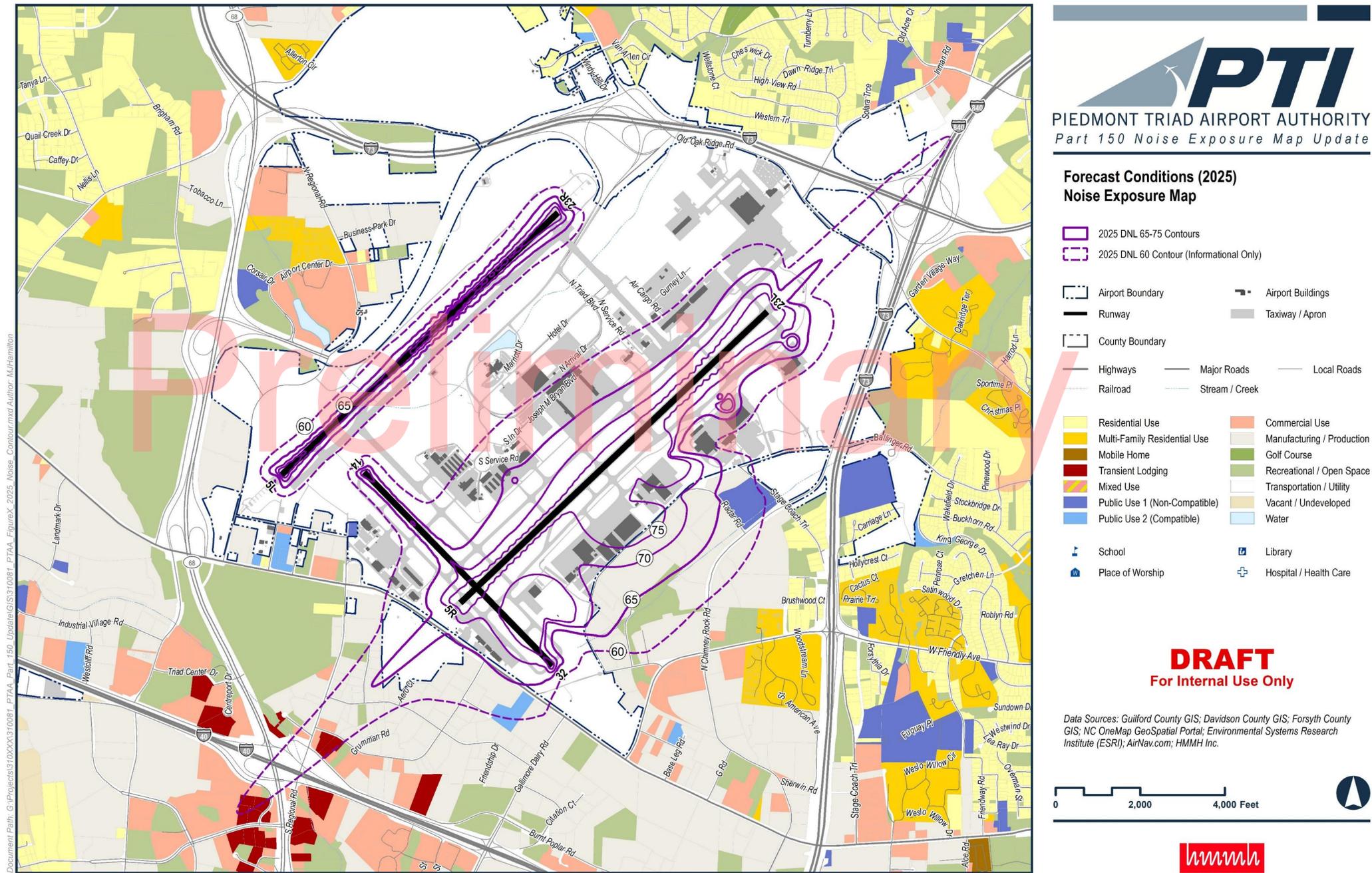
| Average Annual Day | Commercial | | | General Aviation | Military | Total Operations |
|--------------------|------------|----------|-------|------------------|----------|------------------|
| | Passenger | Air Taxi | Cargo | | | |
| 2001 EIS | 242.0 | 18.0 | 138.8 | 174.0 | 3.0 | 575.8 |
| 2006 NEM | 46.0 | 132.2 | 17.3 | 135.6 | 2.8 | 333.8 |
| 2014 NEM | 43.2 | 179.5 | 101.2 | 148.9 | 5.2 | 478.0 |
| 2020 NEM | 99.6 | 27.5 | 22.5 | 92.1 | 5.0 | 246.8 |
| 2025 NEM | 102.1 | 27.7 | 28.6 | 93.6 | 5.0 | 257.1 |



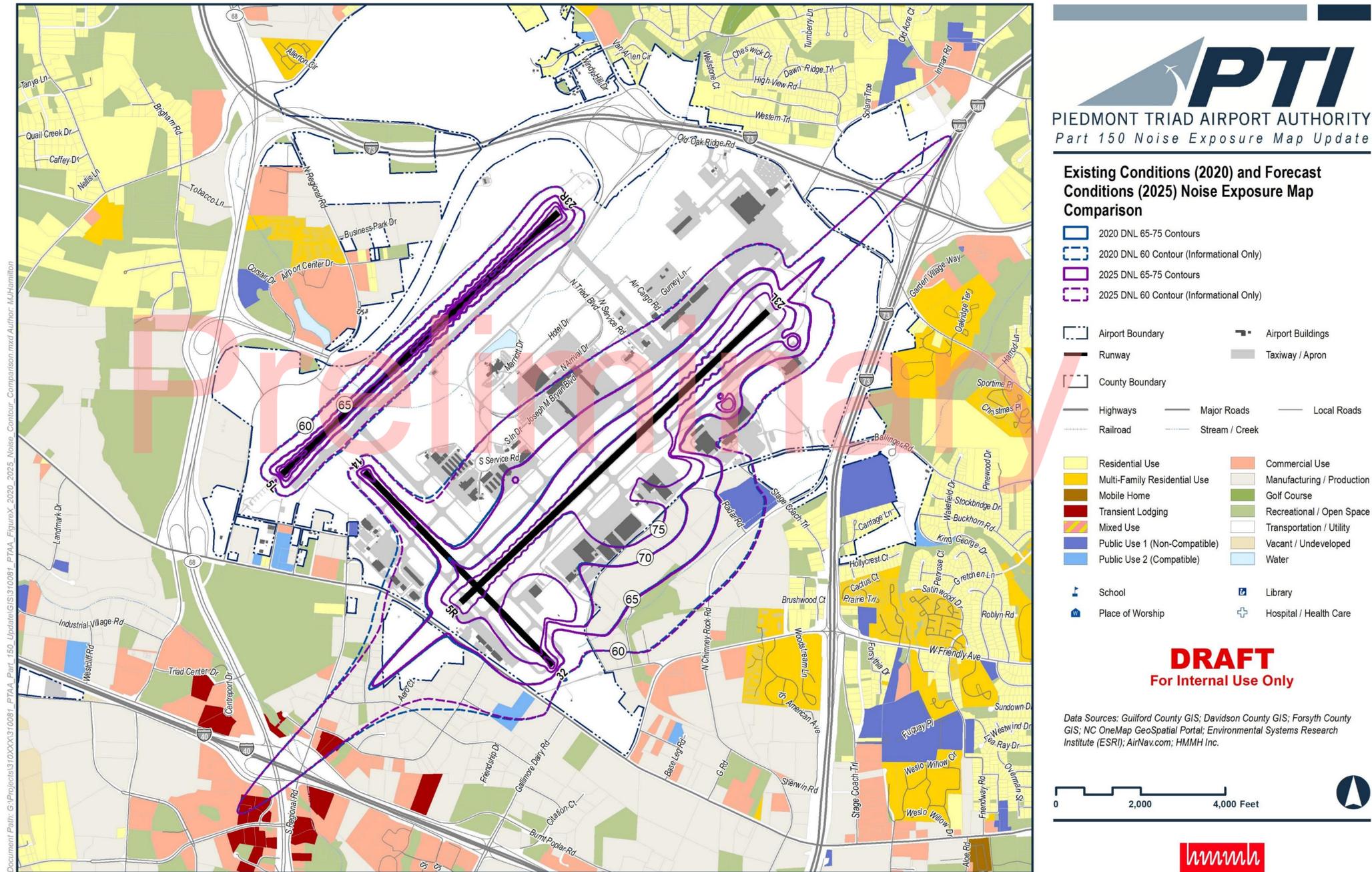
Preliminary Noise Model Results – 2020



Preliminary Noise Model Results – 2025



Preliminary Noise Model Results – 2020/2025



Preliminary Noise Model Results – Land Use

| Noise Level, DNL | Existing Contours - 2020 | | Forecast Contours – 2025 | |
|---------------------|--------------------------|-----------------------------------|--------------------------|-----------------------------------|
| | Estimated Population | Estimated Number of Housing Units | Estimated Population | Estimated Number of Housing Units |
| 65-70 dB | 0 | 0 | 0 | 0 |
| 70-75 dB | 0 | 0 | 0 | 0 |
| 75+ dB | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 |

Noise Measurement Program Results



Noise Measurement Program

- Six temporary (portable) noise monitors collected data from November 11 through November 17, 2019
 - Measurements of individual aircraft noise events
 - Measurements of hourly and daily (DNL) noise levels
- Two HMMH staff spent time at each temporary location, observing and logging aircraft noise events



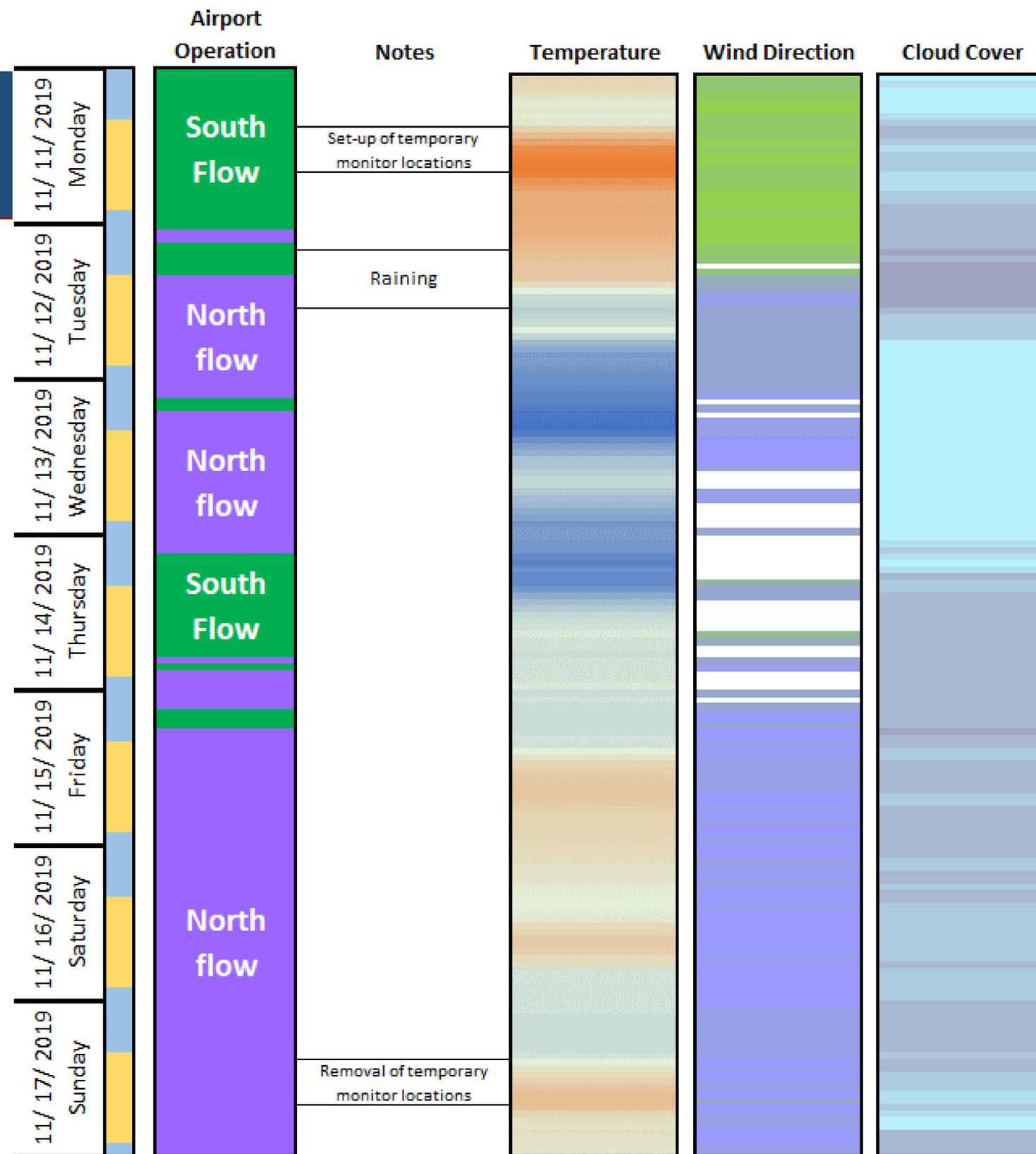
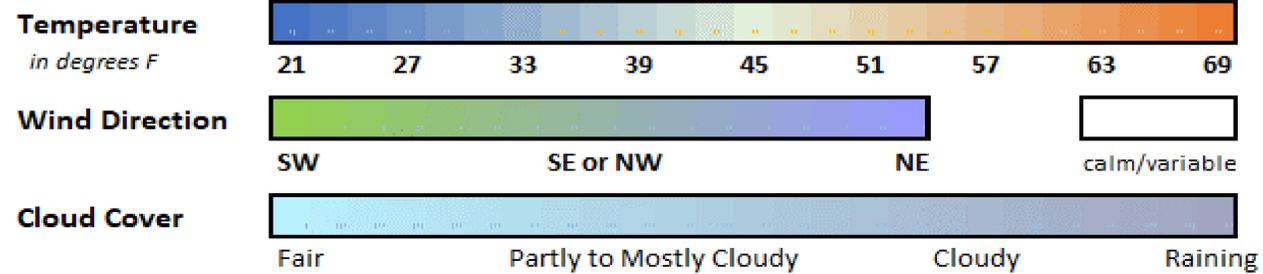
Note: Measured noise levels are NOT used to generate or modify contours

Noise Measurement Program

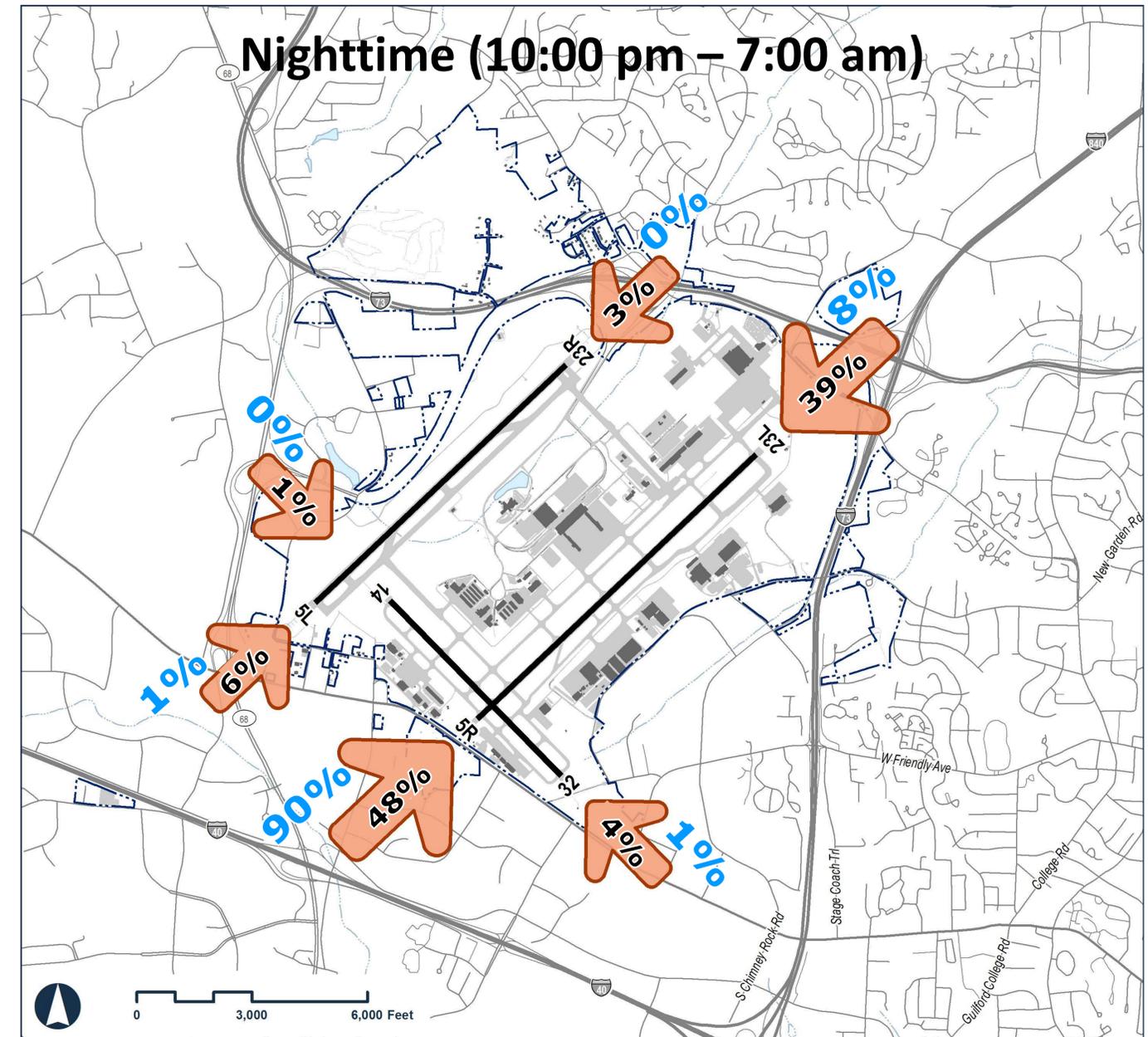
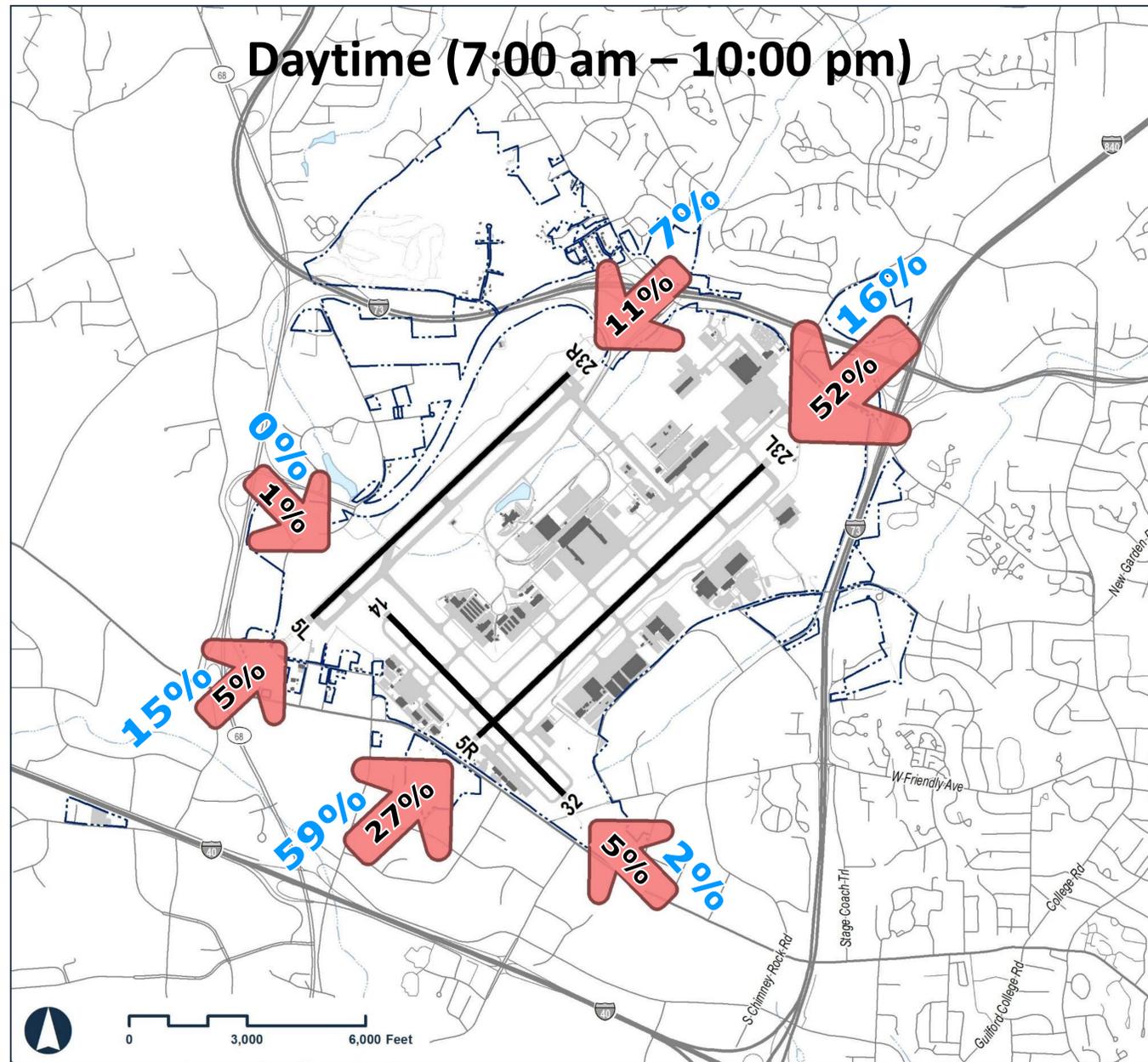
- Weather data for the week correlate with the airport operational direction

Legend:

daytime - 7:00am to 10:00pm
 nighttime - 10:00pm to 7:00am



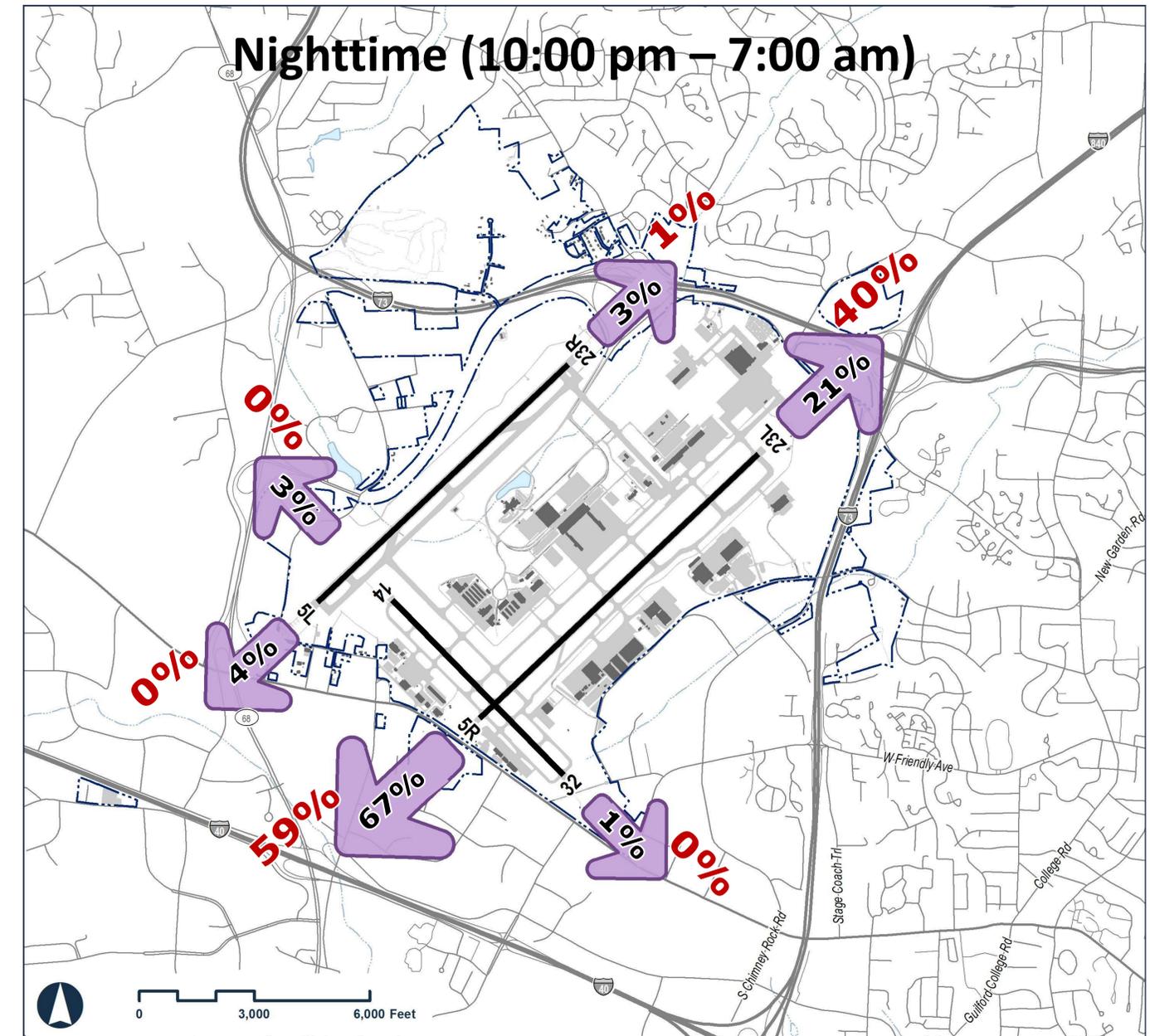
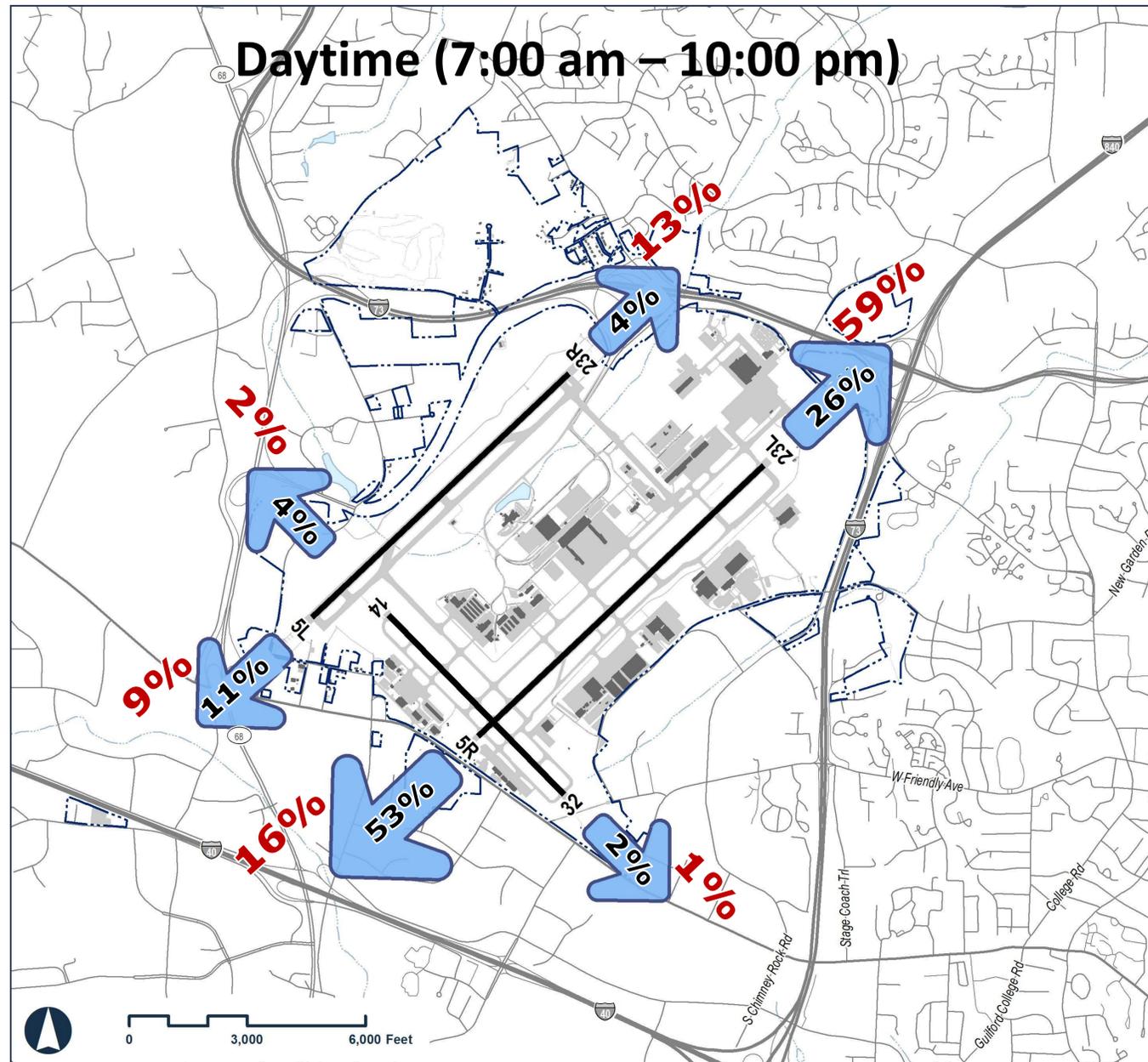
Runway Use during Measurement Program: Arrivals



Annual average modeled runway use shown within the arrows; actual use from Nov. 12-16, 2019 indicated beside each



Runway Use during Measurement Program: Departures



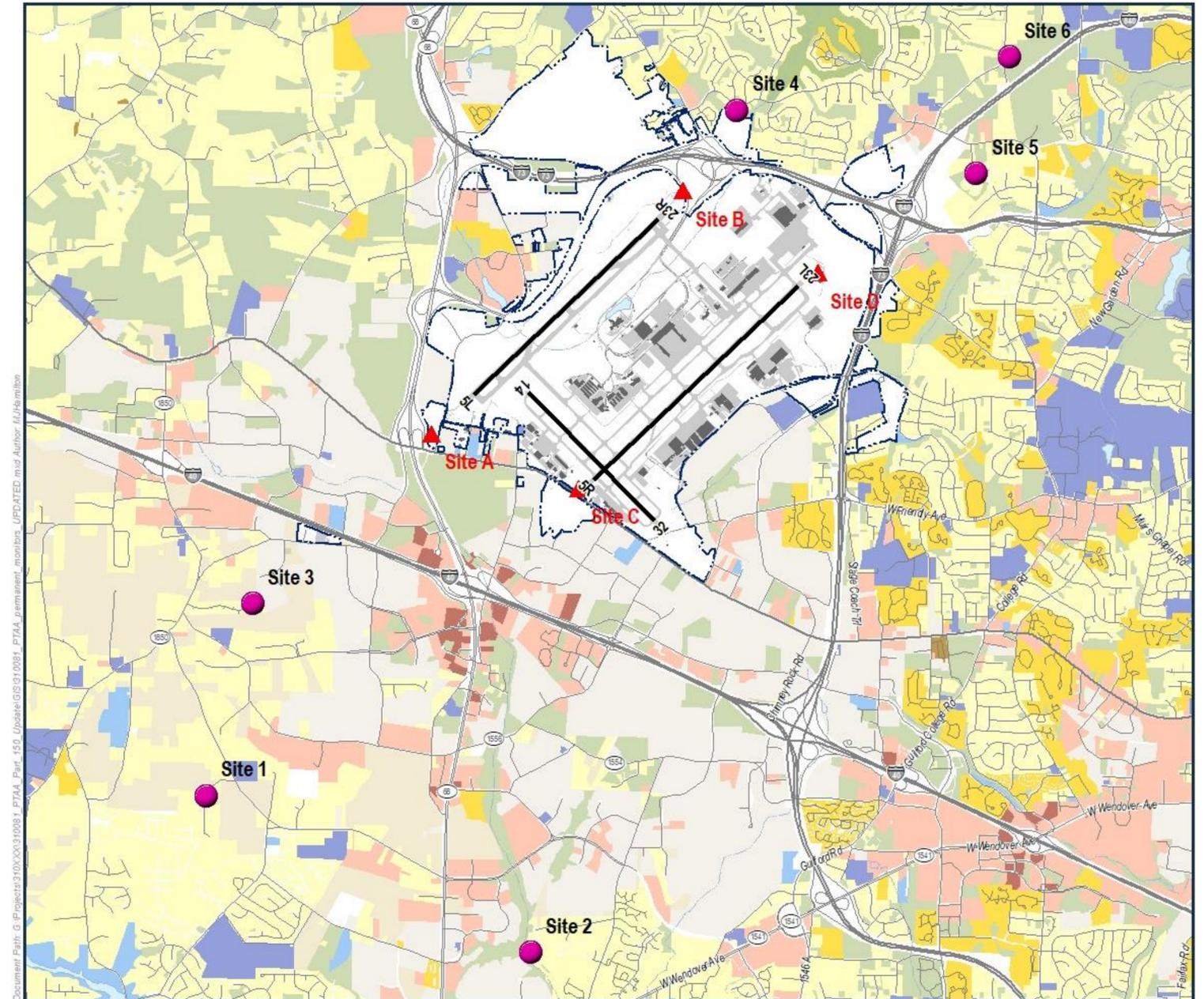
Annual average modeled runway use shown within the arrows; actual use from Nov. 12-16, 2019 indicated beside each



Noise Monitor Locations

| Label | Location |
|--------|---|
| Site 1 | 4532 Walpole Rd, High Point, NC 27265 |
| Site 2 | 1701 River Knoll Ct, Greensboro, NC 27409 |
| Site 3 | 3625 Dairy Point Dr, High Point, NC 27265 |
| Site 4 | 6502 Lytham Ct, Greensboro, NC 27409 |
| Site 5 | 4703 Clarkson Rd, Greensboro, NC 27409 |
| Site 6 | 3600 Lewiston Rd, Greensboro, NC 27409 |
| Site A | Approach end of Runway 5L |
| Site B | Approach end of Runway 23R |
| Site C | Approach end of Runway 23L |
| Site D | Approach end of Runway 5R |

Note: Site B was not operational during the measurement program

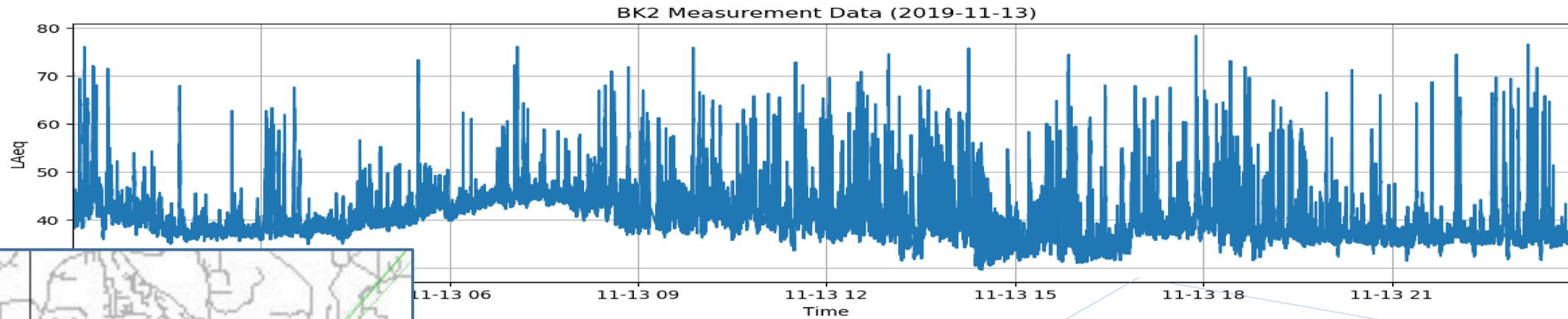


Identification of Aircraft Noise Events

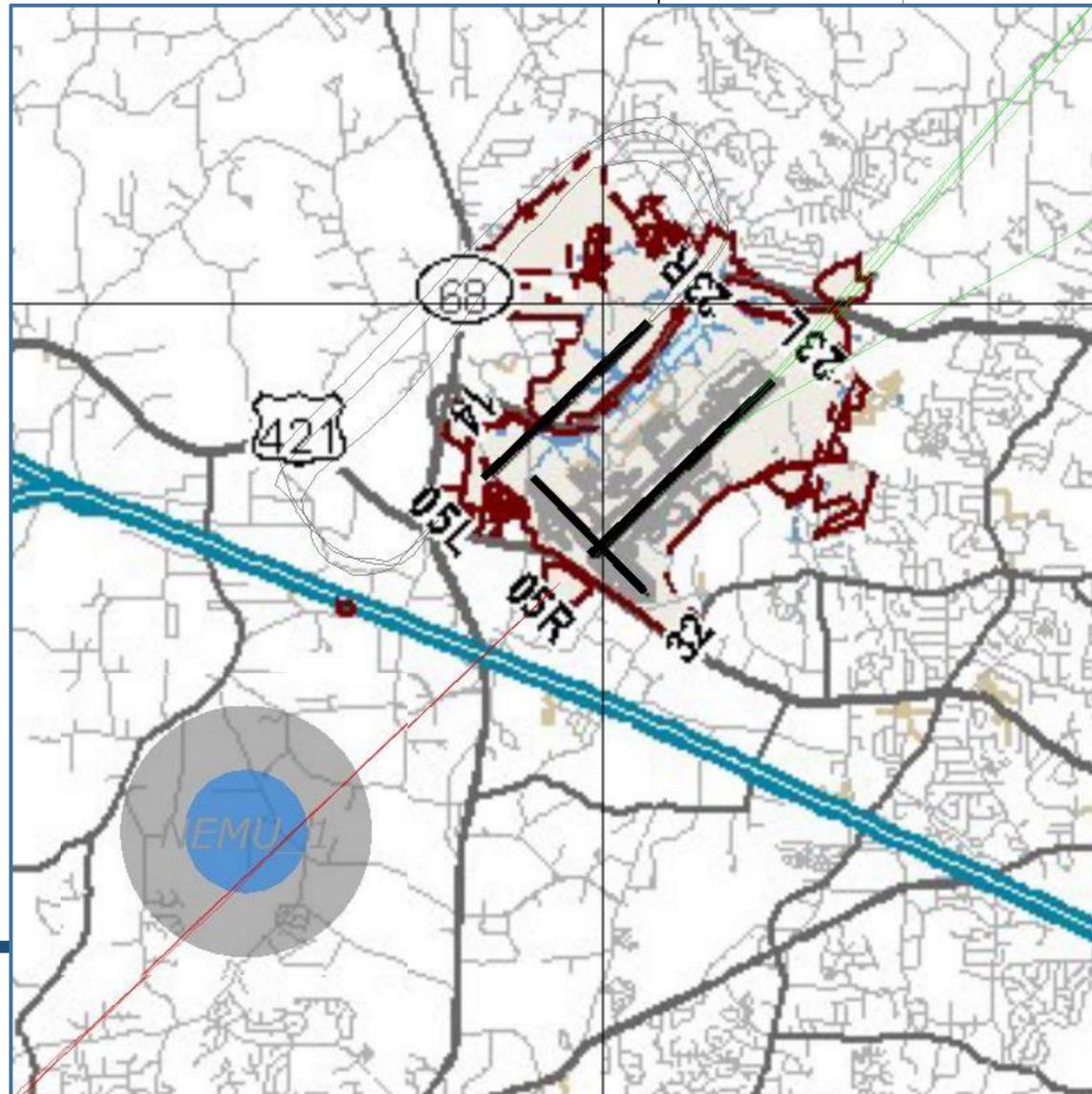
- The portable noise monitors measure all noise once per second, while the permanent monitors measure all noise in half-second intervals
- Noise events are determined based on a set threshold and minimum duration
- Noise events are correlated to aircraft operations in the vicinity of the noise measurement site by time
- Noise energy from the noise events correlated to aircraft operations is combined to determine the daily noise exposure levels from aircraft operations

Identification of Aircraft Noise Events

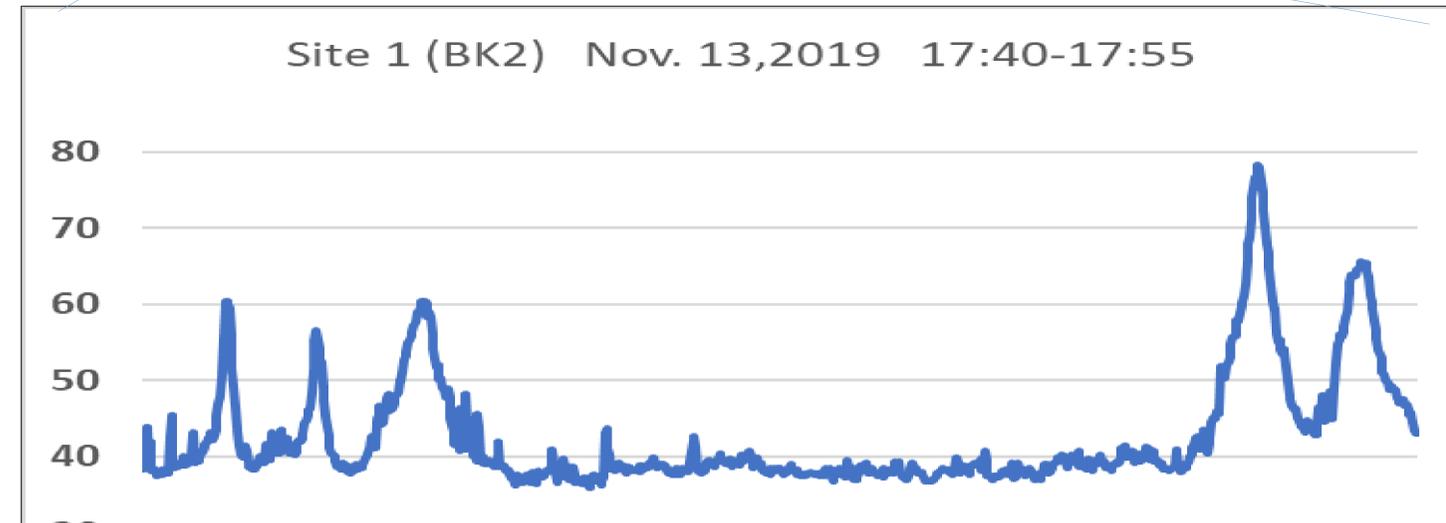
A monitor samples the noise environment every second



This graph shows the time history for a full day



If an aircraft operation is within 5,000 feet of the site at the time of the event, the event is attributed to that operation



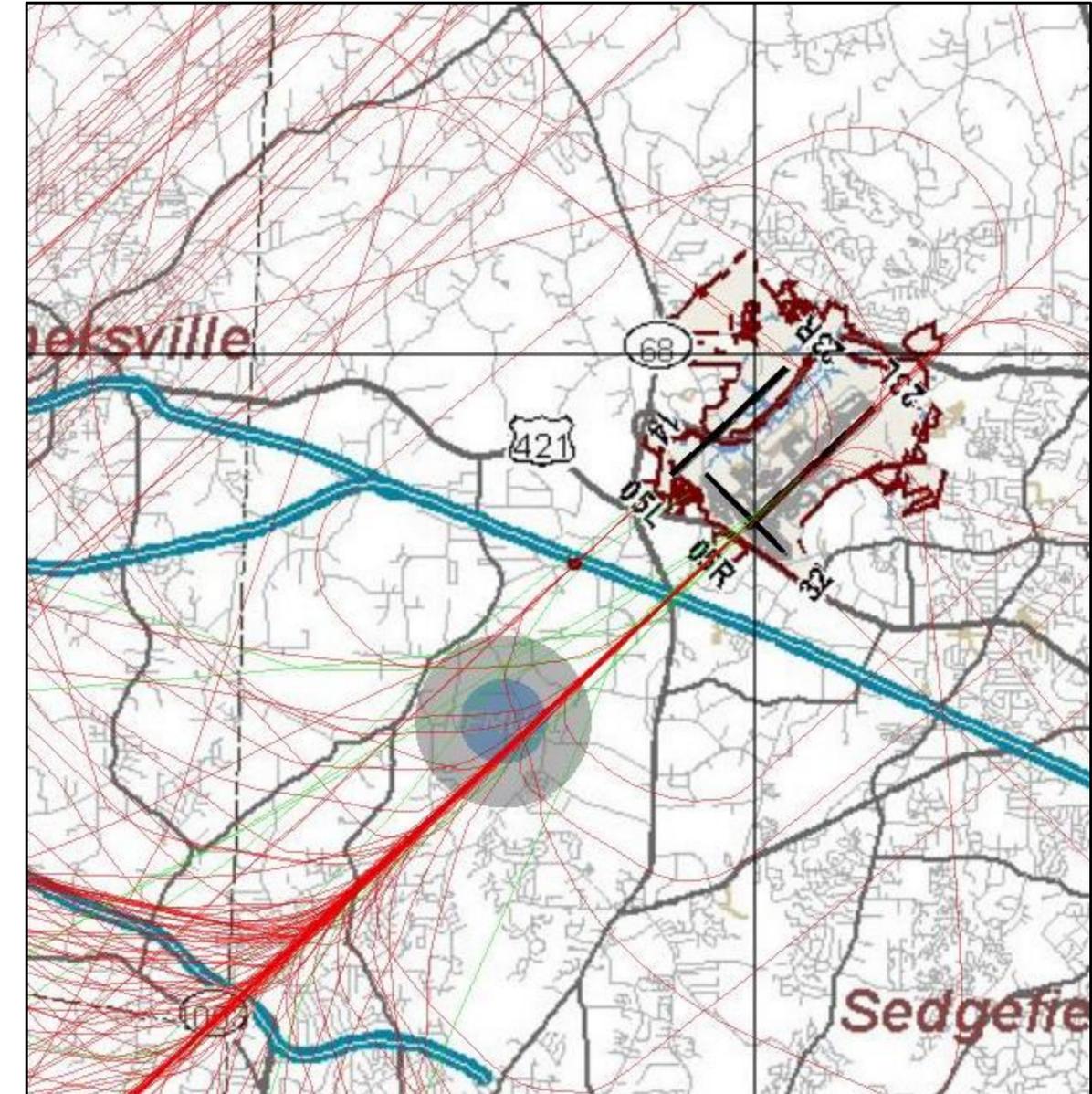
Noise events are visible in this 15-minute excerpt; sound level rises above 50 dB threshold for at least 10 seconds

| STARTTIME | Aircraft | Operation | Runway | DURATION | LMAX | SEL |
|-----------|----------|-----------|--------|----------|------|------|
| 17:43:03 | E135 | A | 05R | 26 | 60.4 | 71.5 |
| 17:52:41 | MD88 | A | 05R | 12 | 78.4 | 86.1 |
| 17:54:02 | CRJ9 | A | 05R | 26 | 65.6 | 76.8 |

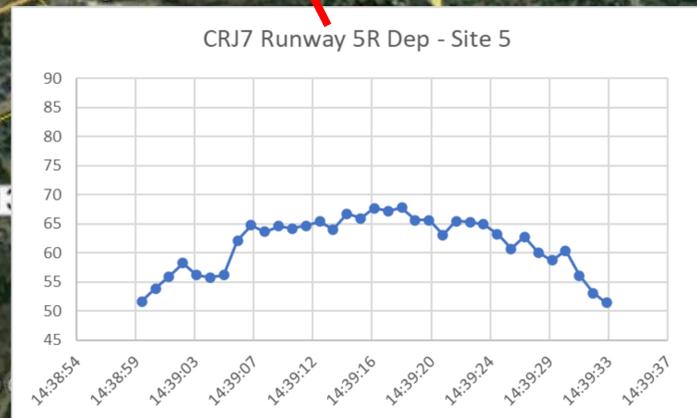
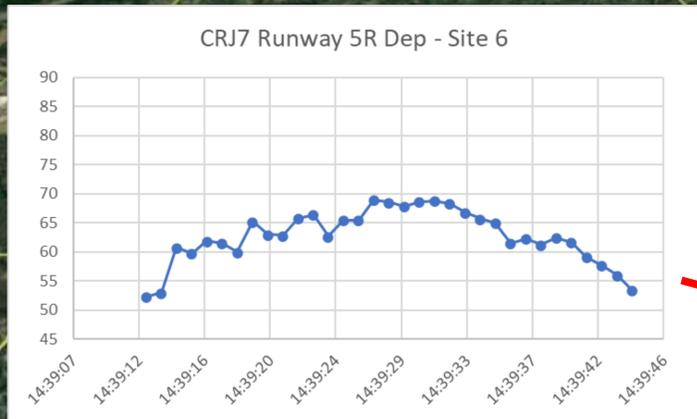
Measured Noise Levels – Single Aircraft Events

| Aircraft Category | Operation | Number Events | Max SEL | Min SEL | Median SEL |
|-------------------|-----------|---------------|---------|---------|------------|
| MD88 | Arrival | 12 | 89.4 | 71.5 | 84.1 |
| | Departure | 2 | 91.8 | 84.4 | 88.1 |
| Other Large Jet | Arrival | 19 | 84.3 | 72.7 | 80.7 |
| | Departure | 1 | 81.3 | 81.3 | 81.3 |
| Regional Jet | Arrival | 52 | 85.4 | 69.2 | 77.6 |
| | Departure | 2 | 72.9 | 72.7 | 72.8 |
| Honda Jet | Arrival | 18 | 80 | 68.5 | 73.3 |
| | Departure | 0 | 0 | 0 | 0 |
| Other Small Jet | Arrival | 12 | 79.5 | 73.2 | 75.9 |
| | Departure | 0 | 0 | 0 | 0 |
| | Other | 1 | 69.6 | 69.6 | 69.6 |
| Non-jet | Arrival | 19 | 80.4 | 69 | 75.0 |
| | Departure | 4 | 75.8 | 71.2 | 72.1 |
| | Other | 4 | 84.2 | 69.6 | 76.4 |
| Total | Arrival | 132 | 89.4 | 68.5 | 77.6 |
| | Departure | 9 | 91.8 | 71.2 | 72.9 |
| | Other | 5 | 84.2 | 69.6 | 73.2 |
| Total | | 146 | | | |

Site 1
(as an example)



Sample Aircraft Noise Events



CRJ7

| SITECODE | Event Start | LMAX | LEQ | SEL | ALT (AGL) | Range (ft) |
|----------|-------------|-------|------|------|-----------|------------|
| Site_D | 14:38:00 | 78.4 | 74.8 | 86.5 | 997 | 243 |
| NEMU_5 | 14:38:58 | 67.73 | 64.5 | 78.7 | 2004 | 1621 |
| NEMU_6 | 14:39:12 | 68.96 | 64.4 | 80.8 | 2274 | 295 |

MD88

| SITECODE | Event Start | LMAX | LEQ | SEL | ALT (AGL) | Range (ft) |
|----------|-------------|-------|------|-------|-----------|------------|
| Site_D | 14:32:21 | 97.3 | 93.5 | 102.3 | 800 | 40 |
| NEMU_5 | 14:32:25 | 88.89 | 85.1 | 95.9 | 1692 | 118 |
| NEMU_6 | 14:32:28 | 79.76 | 75.1 | 86.6 | 1736 | 3379 |

Measured Noise Levels – DNL

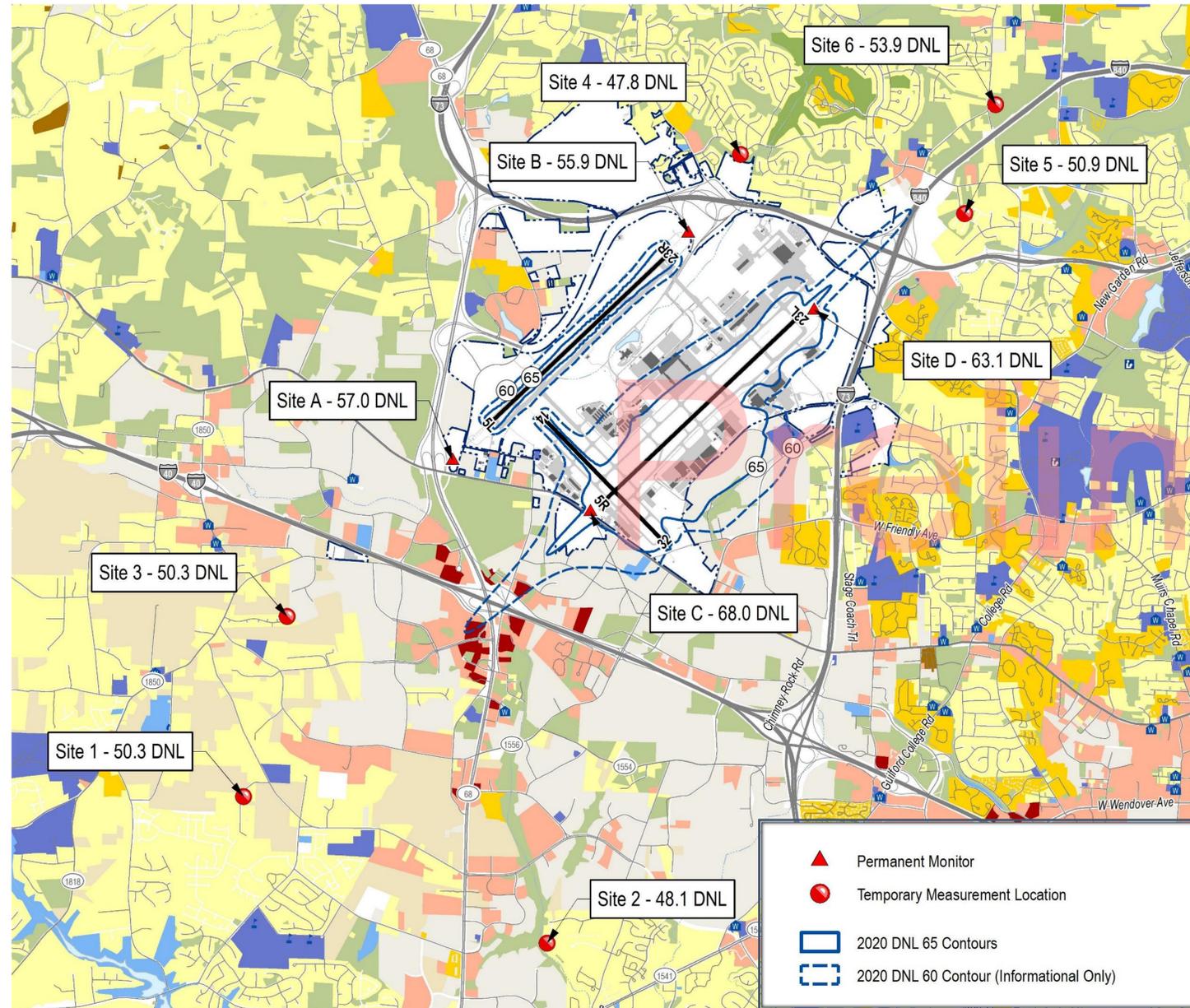
- All measured aircraft DNL are well below 65 dB, except those on Airport property aligned with Runway 5R/23L

| Site | DNL | Tuesday, 12-Nov | Wednesday, 13-Nov | Thursday, 14-Nov | Friday, 15-Nov | Saturday, 16-Nov | 5-day* Average Measured DNL |
|------|----------|--------------------|----------------------|---------------------|-------------------|---------------------|--------------------------------|
| 1 | Aircraft | 49 | 50 | 54 | 52 | 52 | 52 |
| | Total | 56 | 57 | 56 | 58 | 61 | 58 |
| 2 | Aircraft | 57 | 46 | 54 | 51 | 31 | 53 |
| | Total | 58 | 50 | 55 | 54 | 52 | 55 |
| 3 | Aircraft | 53 | 48 | 51 | 47 | 54 | 51 |
| | Total | 57 | 56 | 56 | 58 | 60 | 58 |
| 4 | Aircraft | 38 | 43 | N/A | 46 | 43 | 44 |
| | Total | 57 | 53 | N/A | 52 | 57 | 56 |
| 5 | Aircraft | 57 | 58 | 51 | 57 | 57 | 57 |
| | Total | 68 | 65 | 61 | 58 | 67 | 65 |
| 6 | Aircraft | 52 | 55 | 55 | 54 | 52 | 54 |
| | Total | 61 | 56 | 58 | 57 | 57 | 58 |
| A | Aircraft | 59 | 56 | 56 | 52 | 54 | 56 |
| | Total | 66 | 64 | 65 | 64 | 64 | 65 |
| C | Aircraft | 75 | 74 | 76 | 76 | 69 | 75 |
| | Total | 77 | 78 | 78 | 79 | 74 | 78 |
| D | Aircraft | 69 | 65 | 70 | 66 | 62 | 67 |
| | Total | 76 | 70 | 74 | 69 | 66 | 72 |

Note: Site B was not operational during the measurement program



Measured vs Modeled Noise Levels – DNL



AEDT calculated DNL contours and DNL values at monitor locations for 2020 Existing case

Comparison of the 5-day average measured Aircraft-only DNL to AEDT calculated DNL

| Site | Average Measured DNL | AEDT-Calculated DNL | Difference (Measured – AEDT) |
|------|----------------------|---------------------|------------------------------|
| 1 | 52 | 50 (56) | 2 (-4) |
| 2 | 53 | 48 (52) | 5 (1) |
| 3 | 51 | 50 (49) | 1 (2) |
| 4 | 44 | 48 (49) | -4 (-5) |
| 5 | 57 | 51 (58) | 6 (-1) |
| 6 | 54 | 54 (57) | 0 (-3) |
| A | 56 | 57 (52) | -1 (4) |
| B | N/A | 56 (52) | N/A |
| C | 75 | 68 (68) | 7 (7) |
| D | 67 | 63 (67) | 4 (0) |

Measured vs Modeled

- 5-day measured average DNL generally higher than modeled for 2020
- Sites A and 4 measured lower than modeled
 - Both of these sites are close to the extended centerline of Runway 5L-23R
 - Less jet use of Runway 5L-23R during the measurements than the modeled annual average
- Sites C, D, 5 and 2 measured 4 to 7 dB higher than modeled
 - Sites C, D and 5 all near the extended centerline of Runway 5R-23L
 - Site 2 is south of the airport under the departure path that follows Route 68
 - Less use of Runway 23L and more use of Runway 5R during the measurements than the modeled annual average
 - Also much more use of MD88 aircraft during the measurements than modeled for 2020
 - In 2018 there were less than 10 average daily MD88 operations
 - 2020 forecast assumed retirement of some MD88s; reduced to around 5 daily
 - During the measurements, there were an average of 15 MD88 daily operations
- We believe runway use and higher use of MD88 aircraft resulted in the differences

Noise Compatibility Program Review



Review of Noise Compatibility Program (NCP)

The FAA approved, in whole or in part, all 20 PTAA-recommended NCP measures in the previous Part 150 Study.

Noise Abatement Measures

1. Evaluate Noise Barriers *
2. Preferred Night Runway Use **
3. Night Runway Use Assignments **
4. Night Southbound Departure Corridor from Runway 23L **
5. Night Departure Procedures from Runway 23R **
6. Night Northbound Departure Corridor from Runway 23L **
8. Departures from Runway 05L **
9. Departures from Runway 05R **
10. Restrictions on Use of APUs
11. Noise Abatement Departure Profiles **
12. Noise Abatement Approach Procedure **
13. Altitude for Downwind Legs **

Land Use Measures

1. Acquire Noise-Sensitive Properties where DNL Exceeds 70 dB
2. Sound Insulation of Noise-Sensitive Structures where DNL Exceeds 65 dB
3. Optional Acquisition of Avigation Easements for Noise-Sensitive Structures where DNL Exceeds 65 dB
4. Other Assistance for Owners of Residential Property where DNL Exceeds 65 dB *
5. Pursue Compatible Use Zoning where DNL Exceeds 65 dB

Programmatic Measures

1. Establish a Noise Monitoring Function at PTI
2. Publish DNL Contours at 60 dB and Above
3. Install and Operate an Aircraft Noise and Operations Monitoring System

Note: There is no Noise Abatement Measure number 7 since it was included in Noise Abatement Measure number 5 during the course of the original study.

** - Approved for further study.*

*** - Approved as voluntary measures subject to traffic, weather, and airspace safety and efficiency.*



Next Steps



Schedule of TAC Meetings & Public Workshops

| Meeting | Date | Topic |
|--------------------------------|-----------------------------|--|
| CAC Meeting #1 | June 27, 2019 | Introduction to the Part 150 process |
| Public Information Workshop #1 | June 27, 2019 | Introduction to the Part 150 study |
| CAC Meeting #2 | October 2, 2019 | Noise modeling inputs |
| CAC Meeting #3 | May 20, 2020 (today) | Noise modeling results and review of NCP measures |
| NCP Review Meeting | Early summer 2020 | Review of Existing NCP |
| CAC Meeting #4 | Fall 2020 | Presentation of the Part 150 Report |
| Public Information Workshop #2 | Fall 2020 | Presentation of the study results |



Next Steps

- Determine whether to amend the NCP
 - If amending NCP, then prepare the proposed amendments for the documentation
 - Note: PTAA is not updating the NCP, but only amending with this project
- Preparation of draft Part 150 Update documentation
- Schedule NCP Review Meeting
- Schedule final TAC/CAC meetings and Public Workshop to present the draft document



CAC Member Discussion



Adjournment

- NCP Review Meeting **early summer 2020** (exact date and time to be determined)
- Next CAC meeting **fall 2020** (exact date and time to be determined)
- Project contacts and websites
 - Suzanne Akkoush, Project Manager – Part 150 Study
 - Address emails to Part150@gsoair.org
 - Part 150 Website (PTIPart150Update.com) provides most relevant information
 - Will be updated regularly for public outreach purposes
 - TAC will receive direct notices
 - PTAA noise information website provides broader information
 - <https://flyfrompti.com/noise-information/>

Thanks for participating and attending!

