14 CFR Part 150 Noise Compatibility Program Update

John Glenn Columbus International Airport

Draft – June 2021

PREPARED FOR
Columbus Regional Airport Authority

PRESENTED BY
Landrum & Brown, Incorporated

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STATEMENT OF CERTIFICATION AND PUBLIC NOTIFICATION

The Noise Exposure Maps and accompanying documentation for the Noise Exposure Maps for the John Glenn Columbus International Airport submitted in accordance with 14 CFR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief. I verify that the data used to develop the Existing (2020) Noise Exposure Map and the Future (2025) Noise Exposure Map is representative of the best available information and reasonable assumptions at the time the noise modeling began. It is acknowledged that the current impacts of the COVID-19 public health emergency resulted in a decline in air travel demand and aviation activity. The data used to prepare the Existing (2020) Noise Exposure Map and the Future (2025) Noise Exposure Map was developed prior to the COVID-19 public health emergency. Therefore, operating levels used to prepare the Existing (2020) Noise Exposure Map do not necessarily reflect conditions at the time of submittal. It is expected that aviation activity will return to previously forecast levels; although, there may be some delay in reaching operating levels originally forecast for the Future (2025) Noise Exposure Map condition.

Interested persons have been afforded adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft Noise Exposure Maps and descriptions of the forecast of aircraft operations.

_____ Date _____

Joseph R. Nardone
President & CEO
Columbus Regional Airport Authority

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AIRPORT NAME: John Glenn Columbus International Airport REVIEWER: _____

	Yes / No / NA	Page No.\Other Reference
I. IDENTIFICATION AND SUBMISSION OF MAP DOCUMENT:		
A. Is this submittal appropriately identified as one of the following, submitted under 14 CFR Part 150:		
1. a NEM only	No	N/A
2. a NEM and NCP	Yes	Letter of Transmittal
3. a revision to NEMs which have previously been determined by FAA to be in compliance with Part 150?	Yes	Letter of Transmittal
B. Is the airport name and the qualified airport operator identified?	Yes	Letter of Transmittal, Chapter 1, page 1-1
C. Is there a dated cover letter from the airport operator which indicates the documents are submitted under Part 150 for appropriate FAA determinations?	Yes	Letter of Transmittal
II. CONSULTATION: [150.21(b), A150.105(a)]		
A. Is there a narrative description of the consultation accomplished, including opportunities for public review and comment during map development?	Yes	Chapter 1, Pages 1-5 to 1-7, Appendix G, Public Involvement
B. Identification:		
1. Are the consulted parties identified?	Yes	Appendix G, Public Involvement
2. Do they include all those required by 150.21(b) and A150.105(a)?	Yes	Chapter 1, Pages 1-5 to 1-7, and Appendix G
C. Does the documentation include the airport operator's certification, and evidence to support it, that interested persons have been afforded adequate opportunity to submit their views, data, and comments during map development and in accordance with 150.21(b)?	Yes	Sponsor's Certificatation
D. Does the document indicate whether written comments were received during consultation and, if there were comments, that they are on file with the FAA region?	Pending	Appendix G will contain the responses to comments made at the public hearing.

AIRPORT NAME: John Glenn Columbus International Airport REVIEWER: _____

	Yes / No / NA	Page No.\Other Reference
III. GENERAL REQUIREMENTS: [150.21]		
A. Are there two maps, each clearly labeled on the face with year (existing condition year and 5-year)?	Yes	Exhibits NEM-1 & NEM-2
B. Map currency:		
1. Does the existing condition map year match the year on the airport operator's submittal letter?	Yes	Letter of Transmittal & Exhibit NEM-1
2. Is the 5-year map based on reasonable forecasts and other planning assumptions and is it for the fifth calendar year after the year of submission?	Yes	Chapter 1, Pages 1-4 to 1-5; Appendix C, page C-52; and Appendix H, Page H-1
3. If the answer to 1 and 2 above is no, has the airport operator verified in writing that data in the documentation are representative of existing condition and 5-year forecast conditions as of the date of submission?	N/A	N/A
C. If the NEM and NCP are submitted together:		
1. Has the airport operator indicated whether the 5-year map is based on 5-year contours without the program vs. contours if the program is implemented?	Yes	Letter of Transmittal & Chapter 4, Page 4-49
2. If the 5-year map is based on program implementation:		
a. are the specific program measures which are reflected on the map identified:	Yes	Chapter 4
b. does the documentation specifically describe how these measures affect land use compatibilities depicted on the map?	Yes	Chapter 4
3. If the 5-year NEM does not incorporate program implementation, has the airport operator included an additional NEM for FAA determination after the program is approved which shows program implementation conditions and which is intended to replace the 5-year NEM as the new official 5-year plan?	N/A	N/A

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	Yes / No / NA	Page No.\Other Reference
IV. MAP SCALE, GRAPHICS, AND DATA REQUIREMENTS: [A150.101, A150.103, A150.105, 150.21(a)]		
A. Are the maps of sufficient scale to be clear and readable (they must not be less than 1" to 8,000'), and is the scale indicated on the maps?	Yes	Exhibits NEM-1 & NEM-2
B. Is the quality of the graphics such that required information is clear and readable?	Yes	Exhibits NEM-1 & NEM-2
C. Depiction of the airport and its environs.		
1. Is the following graphically depicted to scale on both the existing condition and 5-year maps:		
a. airport boundaries	Yes	Exhibits NEM-1 & NEM-2
b. runway configurations with runway end numbers	Yes	Exhibits NEM-1 & NEM-2
2. Does the depiction of the off-airport data include:		
a. a land use base map depicting streets and other identifiable geographic features	Yes	Exhibits NEM-1 & NEM-2
b. the area within the 65 Ldn (or beyond, at local discretion)	Yes	Exhibits NEM-1 & NEM-2
c. clear delineation of geographic boundaries and the names of all jurisdictions with planning and land use control authority within the 65 Ldn (or beyond, at local discretion)	Yes	Exhibits NEM-1 & NEM-2
D. 1. Continuous contours for at least the Ldn 65, 70, and 75?	Yes	Exhibits NEM-1 & NEM-2
2. Based on current airport and operational data for the existing condition year NEM, and forecast data for the 5-year NEM?	Yes	Letter of Transmittal, Exhibits NEM-1 & NEM-2

AIRPORT NAME: John Glenn Columbus International Airport REVIEWER: _____

	Yes / No / NA	Page No.\Other Reference
E. Flight tracks for the existing condition and 5-year forecast time frames (these may be on supplemental graphics which must use the same land use base map as the existing condition and 5-year NEM), which are numbered to correspond to accompanying narrative?	Yes	Appendix C, Exhibits C-10, C-11, C-12, C-13, C-14, C-15, and C-16
F. Locations of any noise monitoring sites (these may be on supplemental graphics which must use the same land use base map as the official NEMs)	Yes	Exhibit B-1
G. Noncompatible land use identification:		
1. Are noncompatible land uses within at least the 65 Ldn depicted on the maps?	Yes	NEM-1, NEM-2, and Appendix B,
2. Are noise sensitive public buildings identified?	Yes	Exhibit D-1 and Table D-2
3. Are the noncompatible uses and noise sensitive public buildings readily identifiable and explained on the map legend?	Yes	Exhibits NEM-1 & NEM-2
4. Are compatible land uses, which would normally be considered noncompatible, explained in the accompanying narrative?	Yes	Exhibits NEM-1 & NEM-2, and Chapter 3
V. NARRATIVE SUPPORT OF MAP DATA: [150.21(a), A150.1, A150.101, A150.103]		
A. 1. Are the technical data, including data sources, on which the NEMs are based adequately described in the narrative?	Yes	Chapter 3, Appendix C
2. Are the underlying technical data and planning assumptions reasonable?	Yes	Chapter 3, Appendix C
B. Calculation of Noise Contours:		
1. Is the methodology indicated?		
a. is it FAA approved?	Yes	Chapter 3, Appendix C
b. was the same model used for both maps?	Yes	Appendix C, Page C-22
c. has AEE approval been obtained for use of a model other than those which have previous blanket FAA approval?	N/A	N/A

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	Yes / No / NA	Page No.\Other Reference
2. Correct use of noise models:		
a. does the documentation indicate the airport operator has adjusted or calibrated FAA-approved noise models or substituted one aircraft type for another?	No	Appendix B, Page B-11
b. if so, does this have written approval from AEE?	N/A	N/A
3. If noise monitoring was used, does the narrative indicate that Part 150 guidelines were followed?	Yes	Appendix B, Page B-2
4. For noise contours below 65 Ldn, does the supporting documentation include explanation of local reasons? (Narrative explanation is highly desirable but not required by the Rule.)	Yes	Chapter 3, Page 3-1
C. Noncompatible Land Use Identification:		
1. Does the narrative give estimates of the number of people residing in each of the contours (Ldn 65, 70 and 75, at a minimum) for both the existing condition and 5-year maps?	Yes	Chapter 3
2. Does the documentation indicate whether Table 1 of Part 150 was used by the airport operator?	Yes	Appendix A, Table A-1
a. If a local variation to Table 1 was used:		
(1) does the narrative clearly indicate which adjustments were made and the local reasons for doing so?	N/A	N/A
(2) does the narrative include the airport operator's complete substitution for Table 1?	N/A	N/A
3. Does the narrative include information on self-generated or ambient noise where compatible/noncompatible land use identifications consider non-airport/aircraft sources?	N/A	N/A

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	Yes / No / NA	Page No.\Other Reference
4. Where normally noncompatible land uses are not depicted as such on the NEMs, does the narrative satisfactorily explain why, with reference to the specific geographic areas?	N/A	N/A
5. Does the narrative describe how forecasts will affect land use compatibility?	Yes	Chapter 3, Page 3-6, Appendix D
VI. MAP CERTIFICATIONS: [150.21(b), 150.21(e)]		
A. Has the operator certified in writing that interested persons have been afforded adequate opportunity to submit views, data, and comments concerning the correctness and adequacy of the draft maps and forecasts?	Yes	Sponsor's Certificate
B. Has the operator certified in writing that each map and description of consultation and opportunity for public comment are true and complete?	Yes	Sponsor's Certificate

AIRPORT NAME: John Glenn Columbus International Airport REVIEWER: _____

	Yes / No / NA	Page No.\Other Reference
I. IDENTIFICATION AND SUBMISSION OF PROGRAM:		
A. Submission is properly identified:		
1. 14 CFR Part 150 NCP?	Yes	Letter of Transmittal
2. NEM and NCP together?	Yes	Letter of Transmittal
3. Program revision?	Yes	Letter of Transmittal
B. Airport and Airport Operator's name identified?	Yes	Letter of Transmittal & Chapter 1, Page 1-1
C. NCP transmitted by airport operator cover letter?	Yes	Letter of Transmittal
II. CONSULTATION: [150.23]		
A. Documentation includes narrative of public participation and consultation process?	Yes	Chapter 1, pages 1-5 to 1-7 and Appendix G
B. Identification of consulted parties:		
1. all parties in 150.23(c) consulted?		Chapter 1, pages 1-5 to 1-7 and Appendix G
2. public and planning agencies identified?	Yes	Chapter 1, pages 1-5 to 1-7 and Appendix G
3. agencies in 2., above, correspond to those indicated on the NEM?	Yes	Chapter 1, pages 1-5 to 1-7 and Appendix G
C. Satisfies 150.23(d) requirements:		
1. documentation shows active and direct participation of parties in B., above?	Yes	Exhibits NEM-1 & NEM-2
2. active and direct participation of general public?	Yes	Chapter 1, pages 1-5 to 1-7 and Appendix G
3. participation was prior to and during development of NCP and prior to submittal to FAA?	Yes	Chapter 1, pages 1-5 to 1-7 and Appendix G
4. indicates adequate opportunity afforded to submit views, data, etc.?	Yes	Chapter 1, pages 1-5 to 1-7 and Appendix G
D. Evidence included of notice and opportunity for a public hearing on NCP?	Pending	Appendix G will include a copy of the public hearing notice.
E. Documentation of comments:		
1. includes summary of public hearing comments, if hearing was held?	Pending	Appendix G will include a summary of comments.

AIRPORT NAME: John Glenn Columbus International Airport REVIEWER: _____

	Yes / No / NA	Page No.\Other Reference
2. includes copy of all written material submitted to operator?	Pending	Appendix G
3. includes operator's responses / disposition of written and verbal comments?	Pending	Appendix G will contain the responses to comments made at the public hearing.
F. Informal agreement received from FAA on flight procedures?	N/A	Chapter 4
III. NOISE EXPOSURE MAPS: [150.23, B150.3; 150.35(f)] (This section of the checklist is not a substitute for the Noise Exposure Map checklist. It deals with maps in the context of the Noise Compatibility Program submission.)		
A. Inclusion of NEMs and supporting documentation:		
1. Map documentation either included or incorporated by reference?	Yes	Attached to Checklist, Exhibits NEM-1 & NEM-2, Appendix C
2. Maps previously found in compliance by FAA?	Yes	Letter of Transmittal
3. Compliance determination still valid?	Yes	Letter of Transmittal
4. Does 180-day period have to wait for map compliance finding?	Yes	None
B. Revised NEMs submitted with program: (Review using NEM checklist if map revisions included in NCP submittal)		
1. Revised NEMs included with program?	Yes	Attached to Checklist, Exhibits NEM-1 & NEM-2
2. Has airport operator requested FAA to make a determination on the NEM(s) when NCP approval is made?	Yes	Letter of Transmittal

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	Yes / No / NA	Page No.\Other Reference
C. If program analysis uses noise modeling:		
1. AEDT or FAA-approved equivalent?	Yes	Appendix C
2. Monitoring in accordance with A150.5?	Yes	Appendix B
D. Existing condition and 5-year maps clearly identified as the official NEMs?	Yes	Attached to Checklist, Exhibits NEM-1 & NEM-2
IV. CONSIDERATION OF ALTERNATIVES: [B150.7, 150.23(e)]		
A. At a minimum, are the alternatives below considered?		
1. land acquisition and interests therein, including air rights, easements, and development rights?	Yes	Appendix F, Alternative LU-A
2. barriers, acoustical shielding, public building soundproofing	Yes	Chapter 4, Measures NA-2, NA-8 & NA-9
3. preferential runway system	Yes	Chapter 4, Measure NA-3 & NA-4; and Appendix E Alternatives NA-E & NA-F
4. flight procedures	Yes	Chapter 4, Measures NA-6 & NA-7, Appendix E, Alternatives NA-A, NA-B, NA-C, and NA-D
5. restrictions on type/class of aircraft (at least one restriction below must be checked)		
a. deny use based on Federal standards	No	N/A
b. capacity limits based on noisiness	No	N/A
c. noise abatement takeoff/approach procedures	No	N/A
d. landing fees based on noise or time of day	No	N/A
e. nighttime restrictions	Yes	Appendix E, Alternative NA-G

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	Yes / No / NA	Page No.\Other Reference
6. other actions with beneficial impact	Yes	Chapter 4; Appendix E
7. other FAA recommendations	No	N/A
B. Responsible implementing authority identified for each considered alternative?	Yes	Chapter 4
C. Analysis of alternative measures:		
1. measures clearly described?	Yes	Chapter 4, Appendices E & F
2. measures adequately analyzed?	Yes	Chapters 4, Appendices E & F
3. adequate reasoning for rejecting alternatives?	Yes	Appendices E & F
D. Other actions recommended by the FAA: Should other actions be added? (list separately on back of this form actions and discussions with airport operator to have them included prior to the start of the 180-day cycle)	No	N/A
V. ALTERNATIVES RECOMMENDED FOR IMPLEMENTATION: [150.23(e), B150.7(c); 150.35(b), B150.5]		
A. Document clearly indicates:		
1. alternatives recommended for implementation?	Yes	Chapter 4
2. final recommendations are airport operator's not those of consultant or third party?	Yes	Letter of Transmittal
B. Do all program recommendations:		
1. relate directly or indirectly to reduction of noise and noncompatible land uses?	Yes	Chapter 4
2. contain description of contribution to overall effectiveness of program?	Yes	Chapter 4
3. noise/land use benefits quantified to extent possible?	Yes	Chapter 4
4. include actual/anticipated effect on reducing noise exposure within noncompatible area shown on NEM?	Yes	Chapter 4
5. effects based on relevant and reasonable expressed assumptions?	Yes	Chapter 4

AIRPORT NAME: John Glenn Columbus International Airport REVIEWER: _____

	Yes / No / NA	Page No.\Other Reference
6. have adequate supporting data to support its contribution to noise/land use compatibility?	Yes	Chapter 4
C. Analysis appears to support program standards set forth in 150.35(b) and B150.5?	Yes	Chapter 4
D. When use restrictions are recommended:		
1. Are alternatives with potentially significant noise/compatible land use benefits thoroughly analyzed so that appropriate comparisons and conclusions can be made?	N/A	N/A
2. Use restriction coordinated with APP-600 prior to making determination on start of 180-days?	N/A	N/A
E. Do the following also meet Part 150 analytical standards:		
1. formal recommendations which continue existing practices?	Yes	Chapter 4
2. new recommendations or changes proposed at end of Part 150 process?	No	N/A
F. Documentation indicates how recommendations may change previously adopted plans?	Yes	Chapter 4
G. Documentation also:		
1. identifies agencies which are responsible for implementing each recommendation?	Yes	Chapter 4, Table 4-1
2. indicates whether those agencies have agreed to implement.	Yes	Letter of Transmittal
3. Indicates essential government actions necessary to implement recommendations.	Yes	Chapter 4
H. Timeframe:		
1. includes agreed-upon schedule to implement alternatives?	Yes	Chapter 4, Page 4-54
2. indicates period covered by the program?	Yes	Chapter 4, Page 4-54

AIRPORT NAME: John Glenn Columbus International Airport REVIEWER: _____

	Yes / No / NA	Page No.\Other Reference
I. Funding/Costs:		
1. includes costs to implement alternatives?	Yes	Chapter 4, Table 4-1 and Table 4-3
2. includes anticipated funding sources?	Yes	Chapter 4
VI. PROGRAM REVISION: [150.23(e)(9)] Supporting documentation includes provision for revision?	Yes	Chapter 4, Measure PM-5 and Page 4-54

OFFICIAL NOISE EXPOSURE MAPS

The following pages contain small-scale representations of the official Noise Exposure Maps (NEMs) for Existing (2020) and Future (2025) conditions and supporting maps for the John Glenn Columbus International Airport. The official NEMs and supplemental maps, at a scale of 1 inch equals 2,000 feet, are included at the back of this document. The Existing (2020) NEM is based on data developed between 2018 and 2020 as further explained in this document in Chapter Three, *Baseline Noise Exposure* and Appendix C, *Noise Methodology*.

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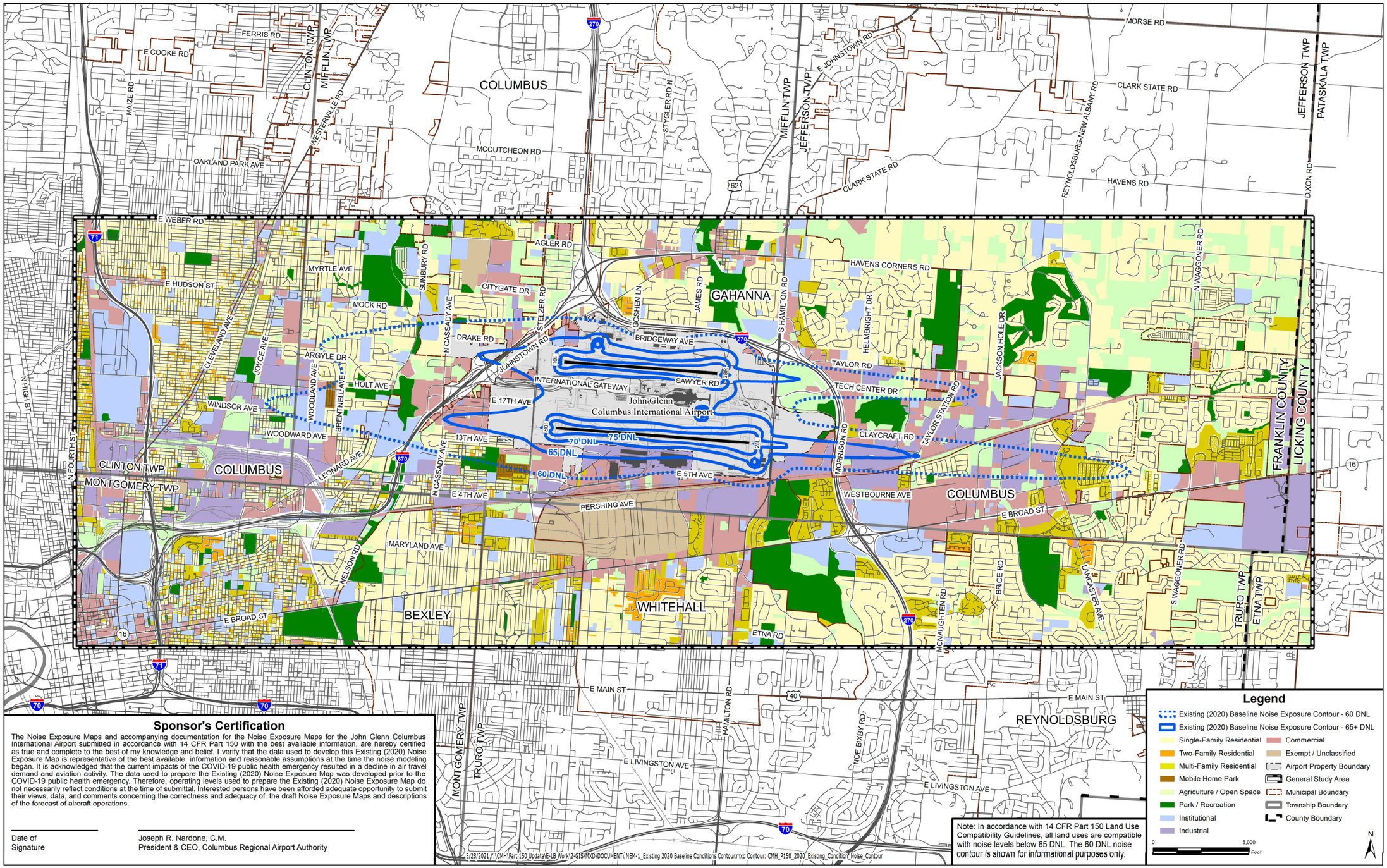
NEM-1 Existing (2020) Noise Exposure Map



Sponsor's Certification

The Noise Exposure Maps and accompanying documentation for the Noise Exposure Maps for the John Glenn Columbus International Airport submitted in accordance with 14 CFR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief. I verify that the data used to develop this Existing (2020) Noise Exposure Map is representative of the best available information and reasonable assumptions at the time the noise modeling began. It is acknowledged that the current impacts of the COVID-19 public health emergency resulted in a decline in air travel demand and aviation activity. The data used to prepare the Existing (2020) Noise Exposure Map was developed prior to the COVID-19 public health emergency. Therefore, operating levels used to prepare the Existing (2020) Noise Exposure Map do not necessarily reflect conditions at the time of submittal. Interested persons have been afforded adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft Noise Exposure Maps and descriptions of the forecast of aircraft operations.

Date of Signature

Joseph R. Nardone, C.M.
President & CEO, Columbus Regional Airport Authority

Legend

- Existing (2020) Baseline Noise Exposure Contour - 60 DNL
- Existing (2020) Baseline Noise Exposure Contour - 65+ DNL
- Single-Family Residential
- Two-Family Residential
- Multi-Family Residential
- Mobile Home Park
- Agriculture / Open Space
- Park / Recreation
- Institutional
- Industrial
- Commercial
- Exempt / Unclassified
- Airport Property Boundary
- General Study Area
- Municipal Boundary
- Township Boundary
- County Boundary

0 5,000 Feet

N

Note: In accordance with 14 CFR Part 150 Land Use Compatibility Guidelines, all land uses are compatible with noise levels below 65 DNL. The 60 DNL noise contour is shown for informational purposes only.

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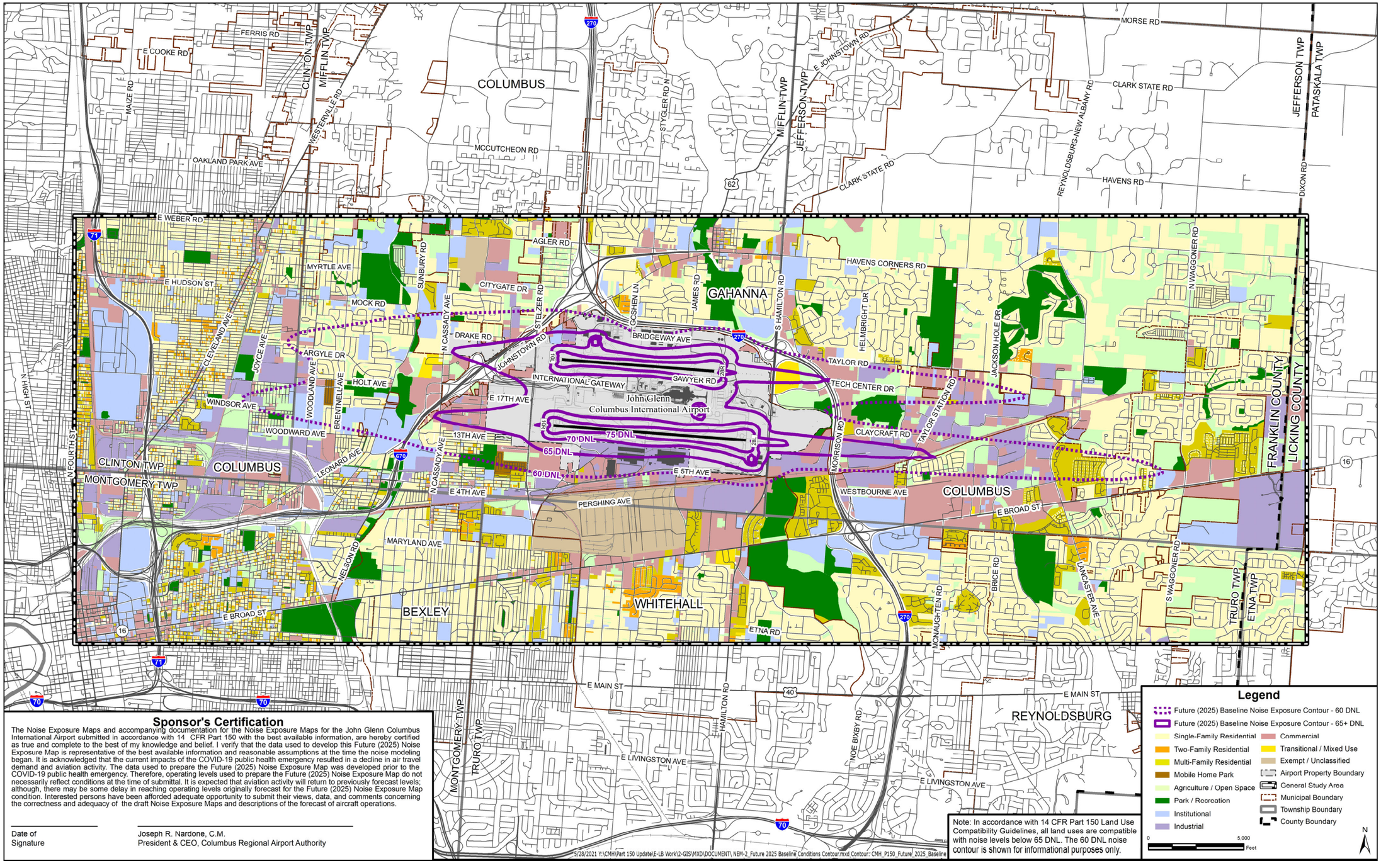
NEM-2 Future (2025) Noise Exposure Map



Sponsor's Certification

The Noise Exposure Maps and accompanying documentation for the Noise Exposure Maps for the John Glenn Columbus International Airport submitted in accordance with 14 CFR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief. I verify that the data used to develop this Future (2025) Noise Exposure Map is representative of the best available information and reasonable assumptions at the time the noise modeling began. It is acknowledged that the current impacts of the COVID-19 public health emergency resulted in a decline in air travel demand and aviation activity. The data used to prepare the Future (2025) Noise Exposure Map was developed prior to the COVID-19 public health emergency. Therefore, operating levels used to prepare the Future (2025) Noise Exposure Map do not necessarily reflect conditions at the time of submittal. It is expected that aviation activity will return to previously forecast levels; although, there may be some delay in reaching operating levels originally forecast for the Future (2025) Noise Exposure Map condition. Interested persons have been afforded adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft Noise Exposure Maps and descriptions of the forecast of aircraft operations.

Date of Signature

Joseph R. Nardone, C.M.
President & CEO, Columbus Regional Airport Authority

Legend

- Future (2025) Baseline Noise Exposure Contour - 60 DNL
- Future (2025) Baseline Noise Exposure Contour - 65+ DNL
- Single-Family Residential
- Two-Family Residential
- Multi-Family Residential
- Mobile Home Park
- Agriculture / Open Space
- Park / Recreation
- Institutional
- Industrial
- Commercial
- Transitional / Mixed Use
- Exempt / Unclassified
- Airport Property Boundary
- General Study Area
- Municipal Boundary
- Township Boundary
- County Boundary

0 5,000 Foot

N

Note: In accordance with 14 CFR Part 150 Land Use Compatibility Guidelines, all land uses are compatible with noise levels below 65 DNL. The 60 DNL noise contour is shown for informational purposes only.

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Appendices

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List of Exhibits, *(Continued)*

GLOSSARY

Airport Improvement Program (AIP) – A Federal funding program for airport improvements. AIP is periodically reauthorized by Congress with funding appropriated from the Aviation Trust Fund. Proceeds to the Trust Fund are derived from excise taxes on airline tickets, aviation fuel, etc.

Airport Layout Plan (ALP) – A scaled drawing of existing and proposed land and facilities necessary for the operation and development of the airport. The ALP shows boundaries and proposed additions to all areas owned or controlled by the airport operator for airport purposes, the location and nature of existing and proposed airport facilities and structures, and the location on the airport of existing and proposed non-aviation areas and improvements thereon.

Airport operations – Landings (arrivals) and takeoffs (departures) from an airport.

Airport Surveillance Radar (ASR) – A radar system which allows air traffic controllers to identify an arriving or departing aircraft's distance and direction from an airport.

Airport Traffic Control Tower (ATCT) – The airport traffic control facility located on an airport that is responsible for traffic separation within the immediate vicinity of the airport and on the surface of the airport to provide for safe and efficient flow of aircraft.

Air Route Traffic Control Center (ARTCC or Center) – A FAA facility established to provide air traffic control service to aircraft operating on Instrument Flight Rules (IFR) flight plans within controlled airspace during the en route portion of flight.

Air Traffic Control (ATC) – A service operated to promote the safe, orderly, and expeditious flow of air traffic.

Ambient noise – The total sum of noise from all sources in a given place and time.

Approach Light Systems (ALS) – A series of lights that assists the pilot when aligning aircraft with the extended runway centerline on final approach.

Area Navigation (RNAV) – RNAV enables aircraft to fly on any desired flight path within the coverage of ground- or space – based navigation aids, within the limits of the capability of aircraft self-contained systems, or a combination of both capabilities.

Attenuation – Acoustical phenomenon whereby sound energy is reduced between the noise source and the receiver. This energy loss can be attributed to atmospheric conditions, terrain, vegetation, other natural features, and man-made features (e.g., sound insulation).

Automated Radar Terminal System (ARTS) – Computer-aided radar display subsystems capable of associating alphanumeric data – such as aircraft identification, altitude, and airspeed – with aircraft radar returns.

Aviation Environmental Design Tool (AEDT) – FAA developed software system that models aircraft performance in space and time to estimate fuel consumption, emissions, noise, and air quality consequences.

A-weighted sound (dBA) – A system for measuring sound energy that is designed to represent the response of the human ear to sound. Energy at frequencies more readily detected by the human ear is more heavily weighted in the measurement, while frequencies less well detected are assigned lower weights. A-weighted sound measurements are commonly used in studies where the human response to sound is the object of the analysis.

Bank – A cluster of arrivals or departures in a short period of time, characteristic of an airline hub operation.

Baseline Condition – The existing condition or conditions prior to future development or the enactment of additional noise abatement procedures, which serve as a foundation for analysis.

Building Restriction Line (BRL) – A line drawn on an airport layout plan, which distinguishes, between areas that are suitable for buildings and areas that are unsuitable. The BRL is drawn to exclude the runway protection zones, the runway visibility zones required for clear line of sight from the airport traffic control tower, and all airport areas with a clearance of less than 35 feet (10.5 meters) beneath the Federal Aviation Regulation (FAR) Part 77 surfaces.

Commuter aircraft – Commuters are commercial operators that provide regularly scheduled passenger or cargo service with aircraft seating less than 60 passengers. A typical commuter flight operates over a trip distance of less than 300 miles.

Connecting passenger – An airline passenger who transfers from an arriving aircraft to a departing aircraft in order to reach his or her ultimate destination.

Controlled airspace – Airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification. Controlled airspace is designated as Class A, Class B, Class C, Class D, or Class E. Aircraft operators are subject to certain pilot qualifications, operating rules, and equipment requirements as specified in FAR Part 91, depending upon the class of airspace in which they are operating.

Crosswind leg – A flight path at right angles to the approach runway end off of its upwind end.

Day-night average sound level (DNL) – A noise measure used to describe the average sound level over a 24-hour period, typically an average day over the course of a year. In computing DNL, an extra weight of 10 decibels is assigned to noise occurring between the hours of 10:00 p.m. and 7:00 a.m. to account for increased annoyance when ambient noise levels are lower and people are trying to sleep. DNL may be determined for individual locations or expressed in noise contours.

Decibel (dB) – Sound is measured by its pressure or energy in terms of decibels. The decibel scale is logarithmic. A ten-decibel increase in sound is equal to a tenfold increase in sound energy.

DGPS antenna – Differential Global Positioning System is a way to correct the various inaccuracies in the GPS system by placing a reference antenna on a point that has been accurately surveyed. This antenna receives the same GPS signals as an aircraft but corrects the GPS signal for any inaccuracies.

Displaced Threshold – A threshold that is located at a point on the runway other than the designated beginning of the runway. The portion of pavement behind a displaced threshold may be available for takeoffs in both directions and landings from the opposite direction.

Distance measuring equipment (DME) – A flight instrument that measures the line-of-sight distance of an aircraft from a navigational radio station in nautical miles.

Double-clear zone – The double-clear zone is an area on the ground, up of land up to 1,250 feet from each side of the runway centerline and extending 5,000 feet beyond each end of the primary runway surface. It is also known as the approach transitional area for runways serving or anticipated to serve turbojet aircraft or having an existing or planned precision instrument runway.

Easement – The legal right of one party to use part of the rights of a piece of real estate belonging to another party. This may include, but is not limited to, the right of passage over, on or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity.

Enplanements – The number of passengers boarding an aircraft at an airport. Does not include arriving or through passengers.

En route system – That part of the National Airspace System where aircraft are operating between origin and destination airports.

En route control – The control of IFR traffic en route between two or more adjacent approach control facilities.

Environmental Assessment (EA) – A concise document that assesses the environmental impacts of a proposed Federal Action. It discusses the need for, and environmental impacts of, the proposed action and

alternatives. An environmental assessment should provide sufficient evidence and analysis for a Federal determination whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). Public participation and consultation with other Federal, state, and local agencies is a cornerstone of the EA process.

Environmental Impact Statement (EIS) – An EIS is a document that provides a discussion of the significant environmental impacts which would occur as a result of a proposed project, and informs decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts. Public participation and consultation with other Federal, state, and local agencies is a cornerstone of the EIS process.

Equivalent sound level (Leq) – The average A-weighted sound level over any specified time period.

Federal Aviation Administration (FAA) – The FAA is the Federal agency responsible for insuring the safe and efficient use of the nation's airspace, for fostering civil aeronautics and air commerce, and for supporting the requirements of national defense. The activities required to carry out these responsibilities include: safety regulations; airspace management and the establishment, operation, and maintenance of a system of air traffic control and navigation facilities; research and development in support of the fostering of a national system of airports, promulgation of standards and specifications for civil airports, and administration of Federal grants-in-aid for developing public airports; various joint and cooperative activities with the Department of Defense; and technical assistance (under State Department auspices) to other countries.

Federal Aviation Regulations (FAR) – The body of Federal regulations relating to aviation. Published as Title 14 of the Code of Federal Regulations.

Final approach – A flight path that follows the extended runway centerline. It usually extends from the base leg to the runway.

Finding of No Significant Impact (FONSI) – If, following the preparation of an environmental assessment, the Federal agency determines a proposed project will not result in any significant environmental impact, a finding of no significant impact (FONSI) is issued by the Federal Agency. A FONSI is a document briefly explaining the reasons why an action will not have a significant effect on the human environment and for which an EIS, therefore, is not necessary.

Fixed-base operator (FBO) – A business located on the airport that provides services such as hangar space, fuel, flight training, repair, and maintenance to airport users.

Flight track utilization – The use of established routes for arrival and departure by aircraft to and from the runways at the airport.

FMS/GPS – Flight Management System/Global Positioning System equipment onboard an aircraft takes advantage of various radio navigation and/or GPS routes to guide the aircraft.

Glide slope (GS) – Provides vertical guidance for aircraft during approach and landing. The glide slope consists of the following:

> Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS, or
>
> Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

Geographic Information Systems (GIS) – An information system that is designed for storing, integrating, manipulating, analyzing, and displaying data referenced by spatial or geographic coordinates.

Global Positioning System (GPS) – A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude. The accuracy of the system can be further refined by using a ground receiver at a known location to calculate the error in the satellite range data. This is known as differential GPS (DGPS).

Grid analysis – A type of aircraft noise analysis that evaluates the noise levels at individual points rather than through generation of noise contours.

Ground effect – Noise attenuation attributed to absorption or reflection of noise by man-made or natural features on the ground surface.

Hub – An airport that services airlines that have hubbing operations.

Hubbing – A method of airline scheduling that times the arrival and departure of several aircraft in a close period of time in order to allow the transfer of passengers between different flights of the same airline in order to reach their ultimate destination. Several airlines may conduct hubbing operations at an airport.

Infill – Urban development occurring on vacant lots in substantially developed areas. May also include the redevelopment of areas to a greater density

Instrument approach – A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

Instrument flight rules (IFR) – That portion of the Federal Aviation Regulations (14 CFR 91) specifying the procedures to be used by aircraft during flight in Instrument Meteorological Conditions. These procedures may also be used under visual conditions and provide for positive control by ATC. (See also VFR).

Instrument Landing System (ILS) – An electronic system installed at some airports which helps to guide pilots to runways for landing during periods of limited visibility or adverse weather.

Instrument meteorological conditions (IMC) – Weather conditions expressed in terms of visibility, distance from clouds, and cloud ceilings during which all aircraft are required to operate using instrument flight rules (IFR).

Integrated Noise Model (INM) – A computer model developed, updated and maintained by the FAA to predict the noise exposure generated by aircraft operations at an airport. INM has been replaced by AEDT as the approved computer noise model.

Knots – Airspeed measured as the distance in nautical miles (6,076.1 feet) covered in one hour. (Approximately equal to 1.15 miles per hour.)

Land and Hold Short Operations (LAHSO) – An air traffic control procedure intended to increase overall airport capacity without compromising safety. LAHSO include landing and holding short of an intersecting runway, taxiway, or some other designated point on a runway or taxiway.

Land use compatibility – The ability of land uses surrounding the airport to coexist with airport-related activities with minimum conflict.

Landing and takeoff (LTO) cycle – The time that an aircraft is in operation at or near an airport. An LTO cycle begins when an aircraft starts its final approach (arrival) and ends after the aircraft has made its climb-out (departure).

Ldn – See **DNL**. Ldn is used in place of DNL in mathematical equations only.

Leq – Equivalent Sound Level. The steady A-weighted sound level over any specified period of time (not necessarily 24 hours) that has the same acoustic energy as the fluctuating noise during that period (with no consideration of nighttime weighting). It is a measure of cumulative acoustical energy. Because the time interval may vary, it should be specified by a subscript (such as Leq_8 for an 8-hour exposure to noise) or be clearly understood from the context.

Local passenger – A passenger who either enters or exits a metropolitan area on flights serviced by the area's airport. A local passenger is the opposite of a connecting passenger.

Localizer – The component of an ILS which provides lateral course guidance to the runway.

Loudness – The subjective assessment of the intensity of sound.

Mean sea level (MSL) – The average height of the surface of the sea for all stages of the tide; used as a reference for elevations. Also called sea level datum.

Merge – Combining noise events that exceed a given threshold level and occur within a selected period of time.

Missed approach – A prescribed procedure to be followed by aircraft that cannot complete an attempted landing at an airport.

Narrow-body aircraft – A commercial passenger jet having a single aisle and maximum of three seats on each side of the aisle. Common narrow-body aircraft include A320, B717, B727, B737, B757, DC9, MD80, and MD90.

National Airspace System (NAS) – The common network of U.S. airspace; air navigation facilities, equipment, services, airports, or landing areas; aeronautical charts, information, and services; rules, regulations, and procedures; technical information, manpower, and materials, all of which are used in aerial navigation.

National Environmental Policy Act of 1969 (NEPA) – The original legislation establishing the environmental review process for proposed Federal actions.

Nautical mile – A measure of distance equal to one minute of arc on the earth's surface (6,076.1 feet or 1,852 meters).

NAVAIDs (Navigational Aids) – Any facility used by an aircraft for navigation.

Navigational fix – A geographical position determined by reference to one or more radio navigational aids.

Noise abatement – A measure or action that minimizes the amount of impact of noise on the environs of an airport. Noise abatement measures include aircraft operating procedures and use or disuse of certain runways or flight tracks.

Noise berm – A manmade soil structure designed to interrupt the direct transmission of noise from a source to a noise-sensitive area.

Noise contour – A map feature representing average annual noise levels summarized by lines connecting points of equal noise exposure.

Noise Compatibility Program (NCP) – Program developed in accordance with FAR Part 150 guidance that contains provisions for the abatement of aircraft noise through aircraft operating procedures, air traffic control procedures, or airport facility modifications. It also includes provisions for land use compatibility planning and may include actions to mitigate the impact of noise on incompatible land uses and recommendations for amending local land use controls to affect future land uses and development. The program must contain provisions for updating and periodic revision.

Noise Compatibility Study – The process, methods, and procedures provided in the FAR Part 150 guidance to develop a Noise Compatibility Program, including the development of noise exposure maps, a noise compatibility program, and public participation.

Noise Exposure Map (NEM) – A geographic depiction of an airport, its noise contours for existing conditions and as forecast for five years in the future, and surrounding area developed in accordance with FAR Part 150 guidance. Documentation of the Noise Exposure Maps must include airport operating characteristics for existing conditions and all reasonable and foreseeable airport operating characteristics for the future condition.

Nondirectional beacon (NDB) – A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his bearing to and from the station. When the radio beacon is installed in conjunction with the ILS marker, it is normally called a compass locator.

Nonprecision approach – A standard instrument approach procedure providing runway alignment but no glide slope or descent information.

Operation – A takeoff or landing by an aircraft.

Outer fix – An air traffic control term for a point in the airspace from which aircraft are normally cleared to the approach fix or final approach course.

Performance-Based Navigation (PBN) - comprised of Area Navigation (RNAV) and Required Navigation Performance (RNP) and describes an aircraft's capability to navigate using performance standards.

Positive control – The separation of all air traffic within designated airspace as directed by air traffic controllers.

Precision Approach Path Indicator (PAPI) – Provides visual approach slope guidance to aircraft during an approach. It is similar to a VASI but provides a sharper transition between the colored indicator lights.

Precision Approach Procedure – A standard instrument approach procedure in which an electronic glide slope/glide path is provided (e.g., ILS and PAR***.***

Precision Approach Radar (PAR) – Navigational equipment located on the ground adjacent to the runway, and consisting of one antenna, which scans the vertical plane, and a second antenna, which scans the horizontal plane. The PAR provides the controller with a picture of the descending aircraft in azimuth, distance, and elevation, permitting an accurate determination of the aircraft's alignment relative to the runway centerline and the glide slope.

Primary Commercial Service Airport – A commercial airport which enplanes 0.01 percent or more of the total annual U.S. enplanements.

Primary Runway – The runway on which the majority of operations take place.

Profile – The position of the aircraft during an approach or departure in terms of altitude above the runway and distance from the runway end.

Propagation – Sound propagation is the spreading or radiating of sound energy from the noise source. It usually involves a reduction in sound energy with increased distance from the source. Atmospheric conditions, terrain, natural objects, and manmade objects affect sound propagation.

Public use airport – An airport open to public use without prior permission, and without restrictions within the physical capabilities of the facility. It may or may not be publicly owned.

Reliever airport – An airport which, when certain criteria are met, relieves the aeronautical demand on a busier air carrier airport.

Required Navigation Performance (RNP) – Similar to Area Navigation (RNAV) with the addition of an onboard performance monitoring and alerting capability. RNP enables the aircraft navigation system to monitor the navigation performance it achieves and inform the crew if the requirement is not met during an operation. This onboard monitoring and alerting capability enhances the pilot's situational awareness and can enable reduced obstacle clearance.

Run-up – A routine procedure for testing aircraft systems by running one or more engines at a high power setting. Engine run-ups are normally conducted by airline maintenance personnel checking an engine or other on board systems following maintenance.

Runway End Identifier Lights (REIL) – Two synchronized flashing lights, one on each side of the runway threshold, which identify the approach end of the runway.

Runway Protection Zone (RPZ) – An area, trapezoidal in shape and centered about the extended runway centerline, designated to enhance the safety of aircraft operations. It begins 200 feet (60 M) beyond the end of the area usable for takeoff or landing. The RPZ dimensions are functions of the aircraft, type of operation and visibility minimums. (Formerly known as the clear zone).

Runway Safety Area (RSA) – A defined surface surrounding the runway prepared or suitable for reducing the risk or damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

Runway threshold – The beginning of that portion of the runway usable for landing.

Runway use program – A noise abatement runway selection plan crafted to further noise abatement efforts for communities around airports. A runway selection plan is developed into a runway use program. It typically applies to all turbojet aircraft 12,500 pounds or heavier. Turbojet aircraft less than 12,500 pounds are included only if the airport proprietor determines that the aircraft creates a noise problem. These programs are coordinated with the FAA in accordance with FAA Order 8400.9, *National Safety and Operational Criteria for Runway Use Programs*, and are administered as either "formal" or "informal" programs.

> **Formal** – An approved runway use program outlined in a Letter of Understanding between the FAA–Flight Standards, FAA–Air Traffic Service, the airport proprietor, and the users. It is mandatory for aircraft operators and pilots as provided for in FAR Section 91.87.
>
> **Informal** – An approved runway use program that does not require a Letter of Understanding. Participation in the program by aircraft operators and pilots is voluntary.

Single event – One noise event. For many kinds of analysis, the sound from single events is expressed using the Sound Exposure Level (SEL) metric.

Slant-range distance – The distance along a straight line between an aircraft and a point on the ground.

Sound – Sound is the result of vibration in the air. The vibration produces alternating bands of relatively dense and sparse particles of air, spreading outward from the source in the same way as ripples do on water after a stone is thrown into it. The result of the movement is fluctuation in the normal atmospheric pressure or sound waves.

Sound exposure level (SEL) – A standardized measure of a single sound event, expressed in A-weighted decibels, that takes into account all sound above a specified threshold set at least 10 decibels below the maximum level. All sound energy in the event is integrated over one second.

Special Use Airspace – Airspace of defined dimensions identified by an area on the earth's surface wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations, which are not part of those activities.

Standard instrument departure procedure (SID) – A planned IFR air traffic control departure procedure published for pilot use in graphic and textual form. SIDs provide transition from the terminal to the en route air traffic control structure.

Standard terminal arrival route (STAR) – A planned IFR air traffic control arrival procedure published for pilot use in graphic and textual form. STARs provide transition from the en route air traffic control structure to an outer fix or an instrument approach fix in the terminal area.

Statute mile – A measure of distance equal to 5,280 feet.

TACAN – Tactical Air Navigation. A navigational system used by the military. TACAN provides both azimuth and distance information to a receiver on board an aircraft.

Terminal Radar Approach Control (TRACON) – An FAA Air Traffic Control Facility which uses radar and two-way communication to provide separation of air traffic within a specified geographic area in the vicinity of one or more airports.

Terminal Radar Service Area (TRSA) – Airspace surrounding certain airports where ATC provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft.

Through passenger – An airline passenger who arrives at an airport and departs without deplaning the aircraft.

Time Above (TA) – The amount of time that sound exceeds a given decibel level during a 24-hour period (e.g., time in minutes that the sound level is above 75 dBA).

Touchdown Zone Lighting (TDZ) – A system of two rows of transverse light bars located symmetrically about the runway centerline, usually at 100-foot intervals and extending 3,000 feet along the runway.

Traffic pattern – The traffic flow for aircraft landing and departure at an airport. Typical components of the traffic pattern include: upwind leg, crosswind leg, downwind leg, base leg, and final approach.

UNICOM – A nongovernment communication facility, which may provide airport information at certain airports. Aeronautical charts and publications show the locations and frequencies of UNICOMs.

Upwind Leg – A flight path parallel to the approach runway in the direction of approach.

Vector – Compass heading instructions issued by ATC in providing navigational guidance by radar.

Very High Frequency Omnidirectional Range (VOR) Station – A ground-based radio navigation aid transmitting signals in all directions. A VOR provides azimuth guidance to pilots by reception of electronic signals.

Very High Frequency Omnidirectional Range Station with Tactical Air Navigation (VORTAC) - A navigational aid providing VOR azimuth and TACAN distance measuring equipment (DME) at one site.

Visual approach – An approach conducted on an IFR flight plan, which authorizes the pilot to proceed visually and clear of clouds to the airport.

Visual approach slope indicator (VASI) – A visual aid to final approach to the runway threshold, consisting of two wing bars of lights on either side of the runway. Each bar produces a split beam of light – the upper segment is white, the lower is red.

Visual flight rules (VFR) – Rules and procedures specified in 14 CFR 91 for aircraft operations under visual conditions. Aircraft operations under VFR are not generally under positive control by ATC. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate a type of flight plan.

Visual meteorological conditions (VMC) – Weather conditions expressed in terms of visibility, distance from cloud, and cloud ceiling equal to or greater than those specified in 14 CFR 91.155 for aircraft operations under Visual Flight Rules (VFR).

Wide-body aircraft - A commercial jet with a wingspan generally greater than 155 feet and, in passenger configuration, having two aisles with 8 to 11 seats across in a row. Common wide-body aircraft include the A300, A310, B747, B767, B777, DC-10, and MD-11.

Yearly Day-Night Average Sound Level – see DNL