



# **DENVER INTERNATIONAL AIRPORT**

**2024 IGA NOISE RELEASE STUDY**

**JULY 15, 2024**



## INTRODUCTION

This Noise Release Study was prepared pursuant to Section 4.5.3 “Noise Studies” of the Intergovernmental Agreement dated April 21, 1988, between Adams County and the City & County of Denver related to the Denver International Airport (“airport”). Section 4.5.3 provides that the airport shall conduct a noise study complying in form with 14 CFR 150, subparts A and B, for the purpose of determining whether Noise Release Conditions have occurred with respect to land use in Adams County adjacent to the boundaries of the airport. The first study of this type by the airport under the terms of the Intergovernmental Agreement (“IGA”) was completed and transmitted to Adams County on February 28, 2000. Subsequent studies, per IGA requirements, have been completed every two years starting in 2002. This current study (2024) continues the mandated every-two-year schedule.

Part 150 is a regulation developed under the Aviation Safety and Noise Abatement Act of 1979 (49 USC 2101 et. seq.) and addresses noise compatibility planning activities of operators of all public use airports. The Denver International Airport is a public use airport. Subpart A covers the general scope of Part 150 and its purpose and Subpart B covers the development of noise exposure maps and noise compatibility programs. The purposes and process of both subparts have been modified to comply with the objectives of the IGA as it relates to Noise Release Conditions as that term is defined within the IGA.

## DENVER INTERNATIONAL AIRPORT STATISTICS

Denver International Airport is located approximately 23 miles northeast of downtown Denver. The airport and its access corridor occupy 53 square miles of land which had previously been used primarily for agricultural purposes.

DEN currently has six operating runways, five of which are 12,000’ long, with the sixth at 16,000’ in length. The airport also currently has a 1.5 million square foot main terminal building, with three remote concourses of varying sizes. Both the airfield and the terminal/concourse complex can be expanded to accommodate future growth. DEN has been designed to ultimately support as many as 12 runways, as well as a doubling of the current size of the main terminal, and the construction of two additional concourses.

DEN opened on February 28, 1995, replacing Stapleton International Airport as Denver’s primary commercial airport. DEN is served by a variety of domestic and international air carriers and is the second largest hub for United Airlines. DEN is also the home and hub for Frontier Airlines, as well as a hub for Southwest Airlines. Passenger traffic at DEN continues to recover from passenger downturn due to the pandemic, with 77,837,917 passengers passing through the airport in 2023. This was the highest yearly total in the history of DEN and represented a 12.3% increase over the 69,286,461 passengers that used the airport in 2022. The continued recovery has been due to the strong demand for travel and an increase in the share of connecting passengers and places DEN among the top recovering markets of peer large-hub airports worldwide. This 12.3% increase made DEN the third-busiest airport in the United States and sixth-busiest in the world in 2023. The total number of aircraft operations for 2023 was 662,010. This was 7.5% higher than the 615,733 recorded in 2022.<sup>1</sup>

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<sup>1</sup> Year to Date Operations and Traffic Report [https://www.flydenver.com/app/uploads/2024/02/den\\_Passenger\\_Traffic\\_December\\_2023.pdf](https://www.flydenver.com/app/uploads/2024/02/den_Passenger_Traffic_December_2023.pdf)



## LAND USES

The current land uses within the Adams County Noise Overlay Zone are agricultural and rural residential. Two residential subdivisions, Van Aire and Green Estates, lie within the Noise Overlay Zone (please see 2022 Noise Release Study - Figure 1). The outside boundary of the Noise Overlay Zone was based on the projected 60 Ldn contour for the airport. Both subdivisions continue to remain outside of the airport's operating 60 Ldn contour.

The Adams County 2012 Comprehensive Plan states as a matter of policy that agricultural uses will be encouraged within the 60 Ldn contour. See enclosed Noise Exposure Maps (Figures 1 & 2) for depictions of existing land uses as approved by FAA per FAR Part 150 process.

## NOISE MEASUREMENT METHODOLOGY

For the purpose of this study, the City and County of Denver contracted with HNTB Corporation to prepare a set of Noise Exposure Maps. These maps illustrate the location of the 55, 60, and 65 Ldn contour lines for the years 2023 and 2028.

HNTB prepared the contour maps using the FAA's Aviation Environmental Design Tool (AEDT) version 3f. AEDT is a computer model that uses aircraft operations data, correlated with known acoustical information for each type of aircraft, to calculate noise contours. Contours for the 2023 base case were generated based upon actual 2023 DEN operations data. For the 2028 projection, HNTB utilized data from the 2023 contour, airline retirement and replacement plan, changes in flight procedures, FAA forecast, and the 2022 InterVISTAS forecast approved by the FAA in January 2023.

## NOISE CONTOURS

Figures 1 and 2 in this 2024 Study Report illustrate the location of the 55, 60, and 65 Ldn noise contours for the years 2023 and 2028.

Each of the contour lines encloses a geographic region within which the same average annual sound level (due to aircraft) exists. These levels are expressed in terms of a measurement unit called Ldn (also sometimes referred to as DNL). These Ldn levels represent the average annual aircraft-produced sound exposure within each contour line. Additionally, the Ldn metric includes a 10 decibel weighting factor which is applied to any events which occur during the nighttime hours, defined for this purpose as 10:00 pm to 7:00 am.

It should be noted that the 2023 Ldn contours depicted in Figure 1 may not be identical to the contours contained in the DEN Noise Abatement Office's 2023 Annual Noise Report. AEDT was used to calculate the contours for the Noise Release Study, while the contours in the 2023 Annual Report were calculated by a program called ARTSMAP. AEDT is designed primarily to predict future aircraft noise, while ARTSMAP calculates noise based upon thousands of actual radar flight tracks and is therefore more useful for calculating existing noise than for predicting future noise.



## LAND USE IMPACTS 2028

The projections for 2028 indicate that the contours will expand and contract very slightly in all directions as compared to 2023. These fluctuations are due to projected fleet mix changes to quieter aircraft operations by utilizing the Boeing 737 MAX over the noisier Boeing 737NG aircraft. In 2023 and 2028, the Boeing aircraft family represented and will represent the dominant of aircraft types in terms of overall operations. It should be noted that the FEIS projections were based on the airport operating at full capacity with 12 runways; therefore, the current contour of the Noise Overlay Zone should be maintained until full build-out of the airport.

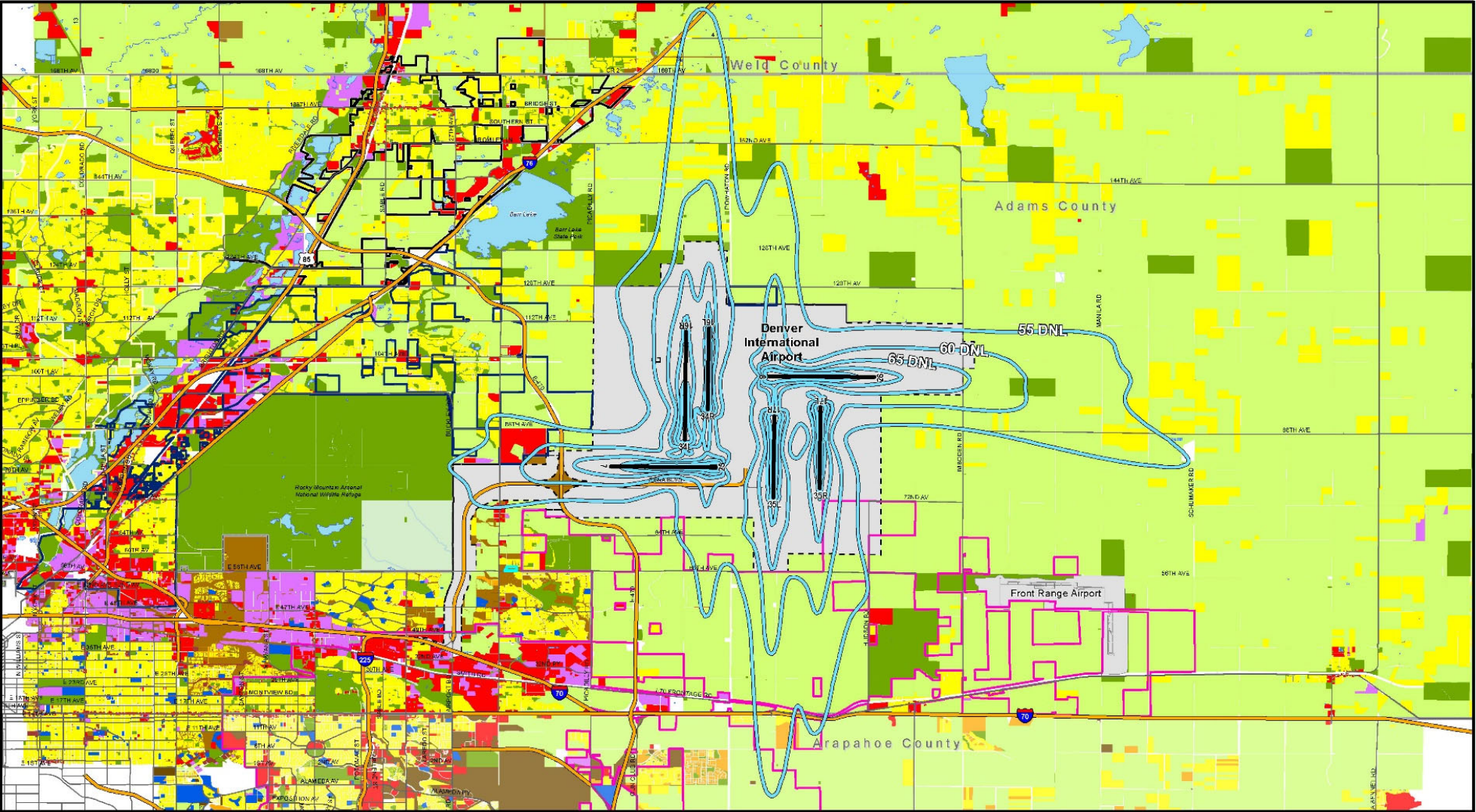
It should also be noted that on both the 2023 and 2028 contour maps, numerous areas to the east and north of the airport are colored yellow, indicating residential land use. Most of the areas so designated are not residentially zoned, but are rather agricultural zones within which Adams County permits one home to be built on a parcel of land having a minimum size of 35 acres. The source of all Adams County land use data used on these maps is Adams County.

# **FIGURE 1**

## **2023 IGA DNL NOISE CONTOURS**



# Denver International Airport



- Legend**
- |                              |                        |                            |
|------------------------------|------------------------|----------------------------|
| 2023 Base Year Noise Contour | Commercial             | County Boundary            |
| Airport Property             | Industrial             | Aurora Jurisdiction        |
| Residential                  | Public / Institutional | Commerce City Jurisdiction |
| Agricultural                 | Vacant Residential     | Brighton Jurisdiction      |
| Exempt / Parks / Open Space  | Vacant                 | Thornton Jurisdiction      |



Sources: Adams County GIS, Weld County GIS, City of Denver GIS, Arapahoe County GIS, and NPS

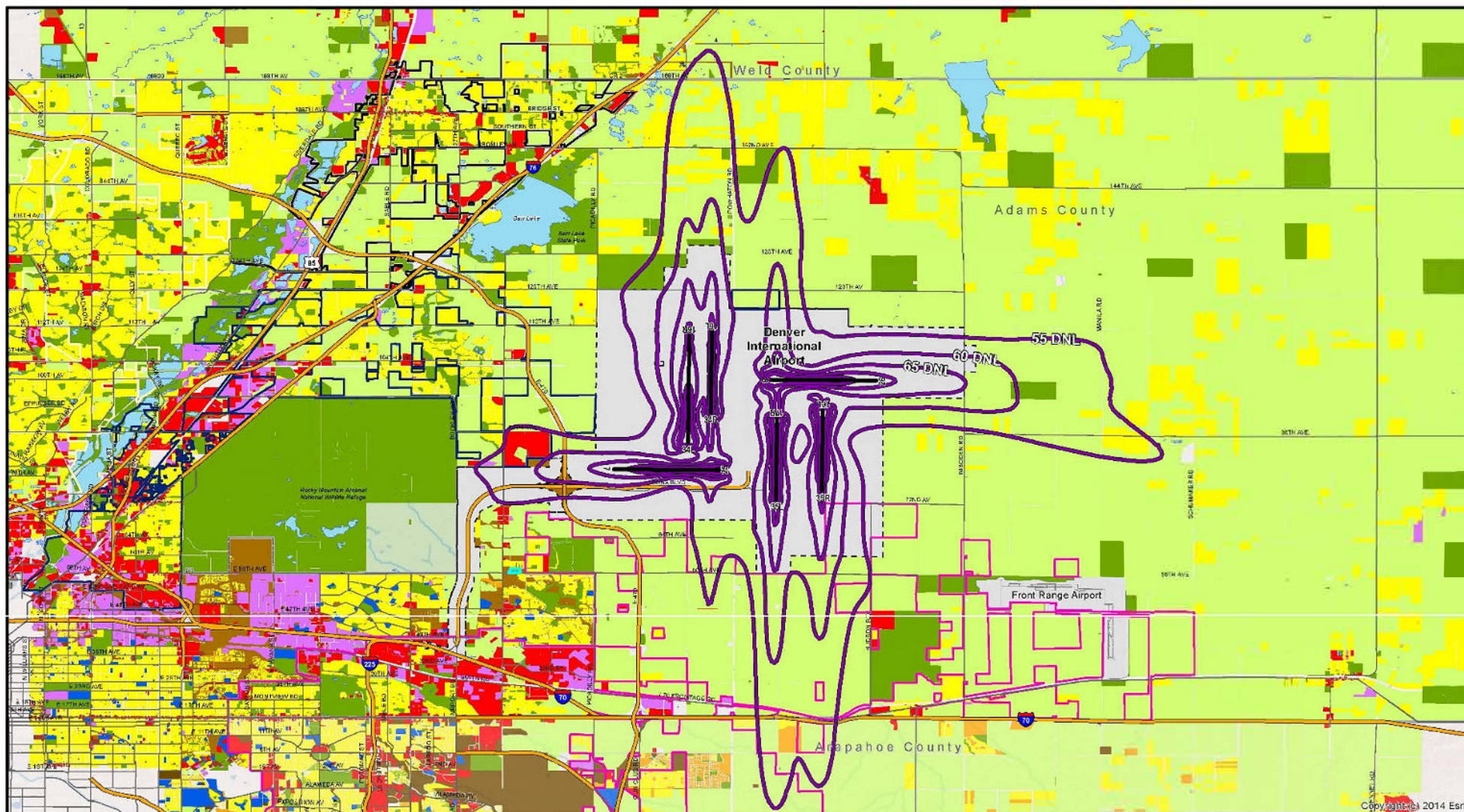
**Figure 1**  
**2023 Base Year Noise Contours**

# **FIGURE 2**

## **2028 IGA DNL NOISE CONTOURS**



# Denver International Airport



## Legend

- |                                    |                        |                            |
|------------------------------------|------------------------|----------------------------|
| 2028 Future Scenario Noise Contour | Commercial             | County Boundary            |
| Airport Property                   | Industrial             | Aurora Jurisdiction        |
| Residential                        | Public / Institutional | Commerce City Jurisdiction |
| Agricultural                       | Vacant Residential     | Brighton Jurisdiction      |
| Exempt / Parks / Open Space        | Vacant                 | Thornton Jurisdiction      |



Sources: Adams County GIS, Weld County GIS, City of Denver GIS, Arapahoe County GIS, and NPS

**Figure 2**  
**2028 Future Scenario Noise Contours**