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DENVER
THE MILE HIGH CITY

June 29, 2018

Heidi Miller, County Attorney
4430 S. Adams County Parkway
Brighton, Colorado 80601

Adams County Planning Department
4430 S Adams County Pkwy
Brighton, Colorado 80601

RE: 1988 Intergovernmental Agreement on a New Airport
DEN's 2017/2022 Noise Release Study

Greetings:

Enclosed (or attached if delivered electronically) please find a copy of DEN's 2017/2022 Noise Release Study. Section 4.5.3 of the 1988 Intergovernmental Agreement on a New Airport between Denver and Adams County requires that DEN perform this study every two years. Though not required by the IGA, this copy is being provided to you by the DEN Noise Office for your information and files.

The report also will be posted on DEN's noise management web page,
https://www.flydenver.com/about/administration/noise_management

Sincerely,

Debra Overn
Assistant City Attorney

Encl.

311 for City Services
Denver gets it done!

# DENVER INTERNATIONAL AIRPORT 2018 IGA NOISE RELEASE STUDY

June 22, 2018

DENVER INTERNATIONAL AIRPORT

# 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 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, were completed in 2002, 2004, 2006, 2008, 2010, 2012, 2014, and 2016. This current study (2018) thus 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 17 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 is currently beginning the first major gate expansion in its history, which will add 39 additional aircraft gates distributed across all three concourses. Completion of all additional gates is anticipated to occur by 2021, and the expansion will increase DEN's total gate capacity by 30%.

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 at record levels, with 61,379,396 passengers passing through the airport in 2017. This was the highest yearly total in the history of DEN, and represented a 5.3% increase over the 58,266,515 passengers that used the airport in 2016, continuing a now 10 year period of greater than 50 million annual passengers (50 million annual passengers was the forecast capacity of the presently-existing terminal and airfield infrastructure). The total number of aircraft operations for 2017 was 582,486. This was 1.7% higher than the 572,520 recorded in 2016.

## 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 2000 Noise Release Study - Figure 1). The outside boundary of the Noise Overlay Zone was based on the projected 60 $L_{dn}$ contour for the airport. Both subdivisions continue to remain outside of the airport's operating 60 $L_{dn}$ contour.

The Adams County 2012 Comprehensive Plan states as a matter of policy that agricultural uses will be encouraged within the 60 $L_{dn}$ 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 $L_{dn}$ contour lines for the years 2017 and 2022.

HNTB prepared the contour maps using the FAA's Aviation Environmental Design Tool (AEDT) version 2b. 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 2017 base case were generated based upon actual 2017 DEN operations data. For the 2022 projection, HNTB used operations and fleet mix data developed by Ricondo & Associates for its January 2016 DEN Master Plan Forecast Refinement.

## NOISE CONTOURS

Figures 1 and 2 in this 2018 Study Report illustrate the location of the 55, 60, and 65 $L_{dn}$ noise contours for the years 2017 and 2022.

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 $L_{dn}$ (also sometimes referred to as DNL). These $L_{dn}$ levels represent the average annual aircraft-produced sound exposure within each contour line. Additionally, the $L_{dn}$ 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 2017 $L_{dn}$ contours depicted in Figure 1 may not be identical to the contours contained in the DEN Noise Abatement Office's 2017 Annual Noise Report.

AEDT was used to calculate the contours for the Noise Release Study, while the contours in the 2017 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 2022

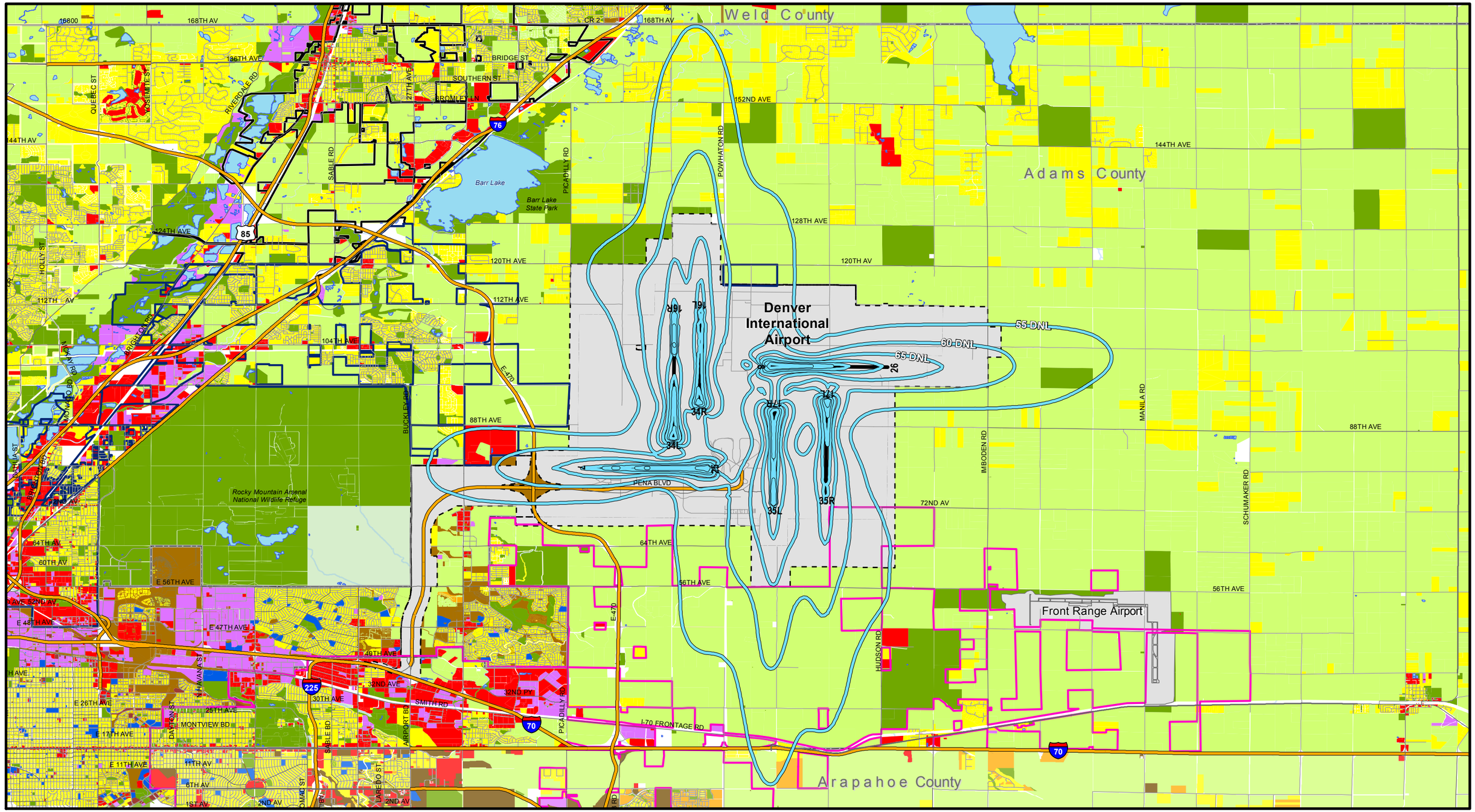
The projections for 2022 indicate that the contours will shrink slightly as compared to the base year in most directions, but expand significantly to the east. It should be noted that the FEIS projections were based on the airport operating at full capacity with 12 runways; therefore the current contour of the Noise Overlay Zone should be maintained until full build-out of the airport.

It should also be noted that on both the 2017 and 2022 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
# 2017 IGA DNL NOISE CONTOURS

DENVER INTERNATIONAL AIRPORT

# Denver International Airport




## Legend

- 2017 IGA DNL Noise Contour
- Airport Property
- Residential
- Agricultural
- Exempt / Parks / Open Space
- Commercial
- Industrial
- Public / Institutional
- Vacant Residential
- Vacant
- County Boundary
- Aurora Jurisdiction
- Commerce City Jurisdiction
- Brighton Jurisdiction
- Thornton Jurisdiction

**Figure 1**
**2017 Base Year IGA Noise Contour**

N

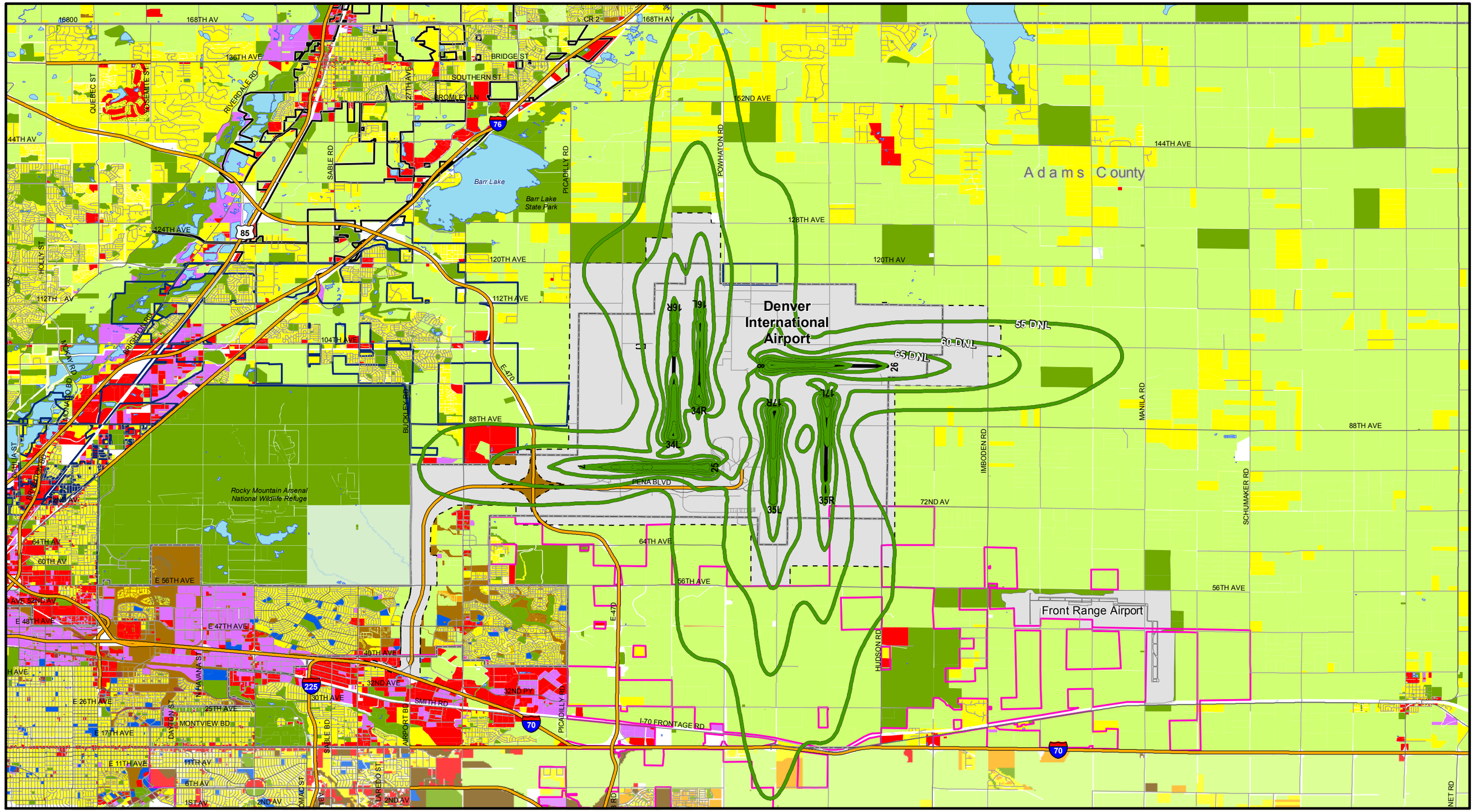
0 3,000 6,000 12,000 Feet

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

# FIGURE 2
# 2022 IGA DNL PROJECTED NOISE CONTOURS

DENVER INTERNATIONAL AIRPORT

# Denver International Airport




## Legend

- 2022 IGA DNL Noise Contour
- Airport Property
- Residential
- Agricultural
- Exempt / Parks / Open Space
- Commercial
- Industrial
- Public / Institutional
- Vacant Residential
- Vacant
- County Boundary
- Aurora Jurisdiction
- Commerce City Jurisdiction
- Brighton Jurisdiction
- Thornton Jurisdiction

**Figure 2**
**2022 Future Year IGA Noise Contour**

N

0 3,000 6,000 12,000 Feet

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