



# **Denver International Airport**

**Noise Release Study  
February 28, 2004**

## **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. As the IGA requires subsequent studies to be completed every two years, the second study was completed and transmitted on February 28, 2002. This current study is the third completed thus far, and continues to follow the every-two-year schedule.

Part 150 is a regulation promulgated 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.

DIA currently has six operating runways, five of which are 12,000’ long, with the sixth at 16,000’ in length. The sixth runway began operating on September 4, 2003 and is depicted as Runway 16R-34L on the Airport Layout Plan (see 2000 Noise Release Study – Figure 2). The airport also currently has a 1.4 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. DIA 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.

DIA opened on February 28, 1995, replacing Stapleton International Airport as Denver’s primary commercial airport. DIA is served by a variety of domestic and international air carriers, and is

the second largest hub for United Airlines. DIA is also the home and hub for Frontier Airlines. Passenger traffic at DIA has continued to recover from the effects of September 11, with 37,505,138 passengers using the airport in 2003. This made DIA the 5<sup>th</sup> busiest airport in the United States. The number of aircraft operations has also increased slightly to 510,275.

## **LAND USES**

The current land uses within the Adams County Noise Overlay Zone are agricultural and rural residential. Two residential subdivisions, Stonehouse Farms and a small part of Green Estates, lie within the Noise Overlay Zone (2000 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 1999 Comprehensive Plan projects that the land uses around the airport will remain the same and states as a matter of policy that agricultural uses will be encouraged around DIA. See enclosed Noise Exposure Maps (Figures 1 & 2) for depictions of existing and future land uses as approved by FAA per FAR Part 150 process.

## **NOISE MEASUREMENT METHODOLOGY**

For the purposes 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 2003 and 2008.

HNTB prepared the contour maps using the FAA's Integrated Noise Model (INM). INM is a computer model which uses aircraft operations data, correlated with known acoustical information for each type of aircraft, to calculate noise contours. Contours for the 2003 base case were generated based upon actual 2003 DIA operations data. For the 2008 projection, HNTB used the 2003 data as well as forecasts of aircraft operations levels and fleet mix for the year 2008.

## **NOISE CONTOURS**

Figures 1 and 2 in this 2004 Study Report illustrate the location of the 55, 60, and 65  $L_{dn}$  noise contours for the years 2003 and 2008.

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 2003  $L_{dn}$  contours depicted in Figure 1 may not be identical to the contours contained in the DIA Noise Abatement Office's 2003 annual noise report. The Integrated Noise Model (INM) was used to calculate the contours for the Noise Release Study, while the contours in the 2003 Annual Report were calculated by a program called ARTSMAP. INM is limited in the number of individual aircraft flight paths it can use in the calculation process and is designed primarily to predict future aircraft noise. ARTSMAP calculates noise based upon thousands of actual radar flight tracks and is not very useful for predicting future noise.

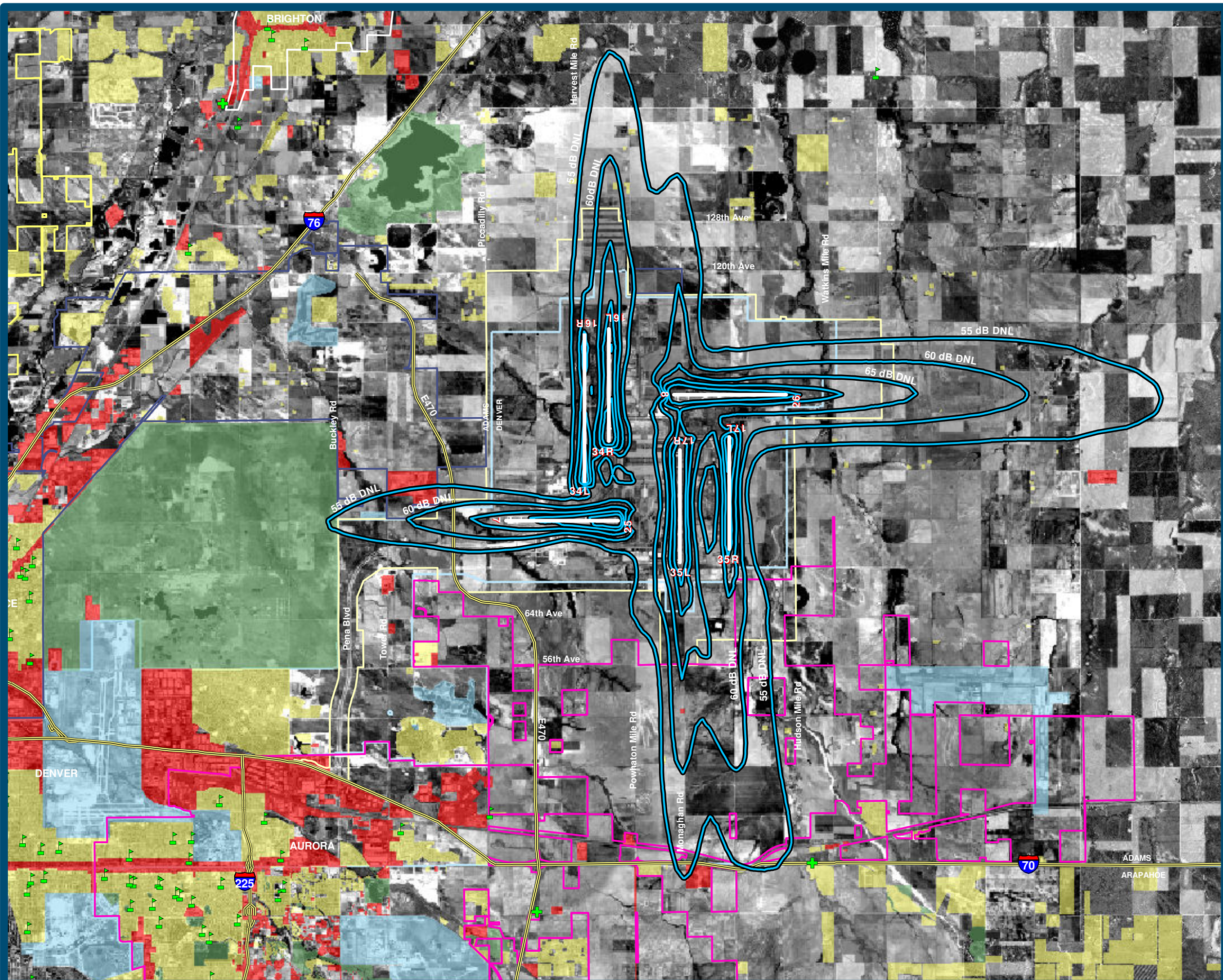
### **LAND USE IMPACTS 2008**

The projections for 2008 indicate that the contours will change little from the Year 2003 beyond airport boundaries, with the exception of a slight expansion to the south of Runways 17L/35R and 17R/35L. The 60  $L_{dn}$  contour for 2008 will, however, continue to lie within the operating 60  $L_{dn}$  of the airport, therefore the impact of aircraft noise on land area will be reduced compared to the original projections of the Federal Environmental Impact Statement. In addition, both Stonehouse Farms and Green Estates remain outside the 60  $L_{dn}$  contour. It should be noted, however, 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.



# **Figure 1**

**2003 DNL Contours**



- ### Legend
- 2003 DNL Contours
  - Residential
  - Public
  - Parks / Open Space
  - Commercial/Industrial
  - DIA Property Boundary
  - County Boundary
  - Aurora Jurisdiction
  - Commerce City Jurisdiction
  - Brighton Jurisdiction
  - Thornton Jurisdiction
  - School
  - Place of Worship

February 2004

0 0.5 1 2 Miles



### Denver International Airport 2004 IGA Noise Release Study

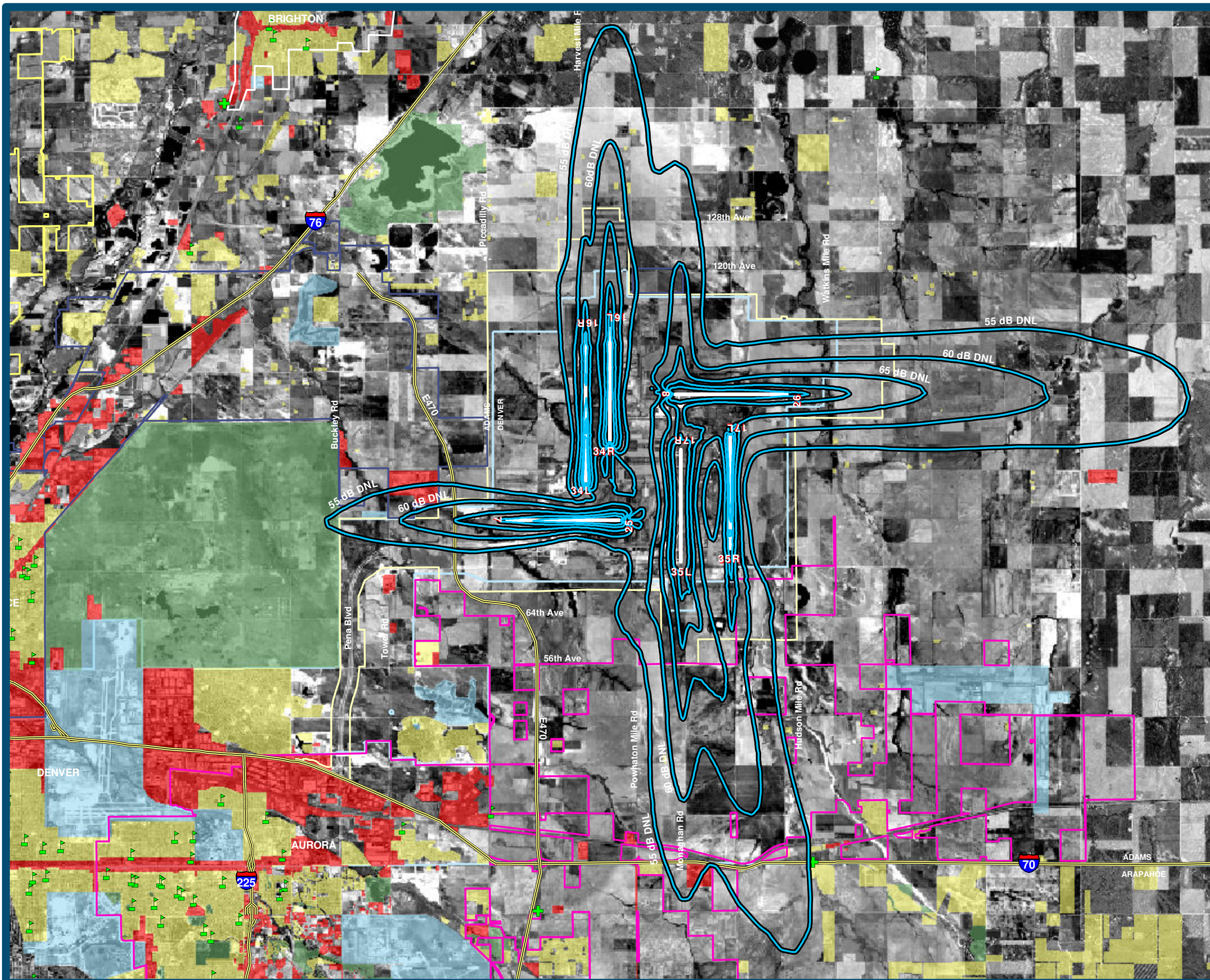
### 2003 DNL Contours



Date of Photos - 1997 and October 2000

# **Figure 2**

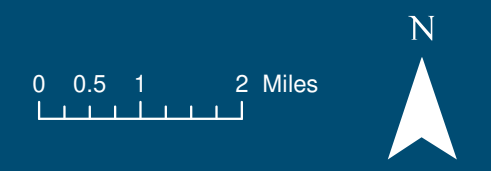
**2008 DNL Contours**



**Legend**

- 2008 DNL Contours
- Residential
- Public
- Parks / Open Space
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**2008 DNL Contours**



Date of Photos - 1997 and October 2000