Environmental Overview

Introduction

The following narrative presents an analysis and inventory of environmental information gathered through correspondence with various state and federal agencies that have an interest in the area surrounding the Airport site. The purpose of this analysis and inventory is to provide preliminary information concerning environmental resources in an effort to define and identify critical resources that would need to be addressed prior to the implementation of any of the proposed Airport planning recommendations. This process of information gathering within an Airport Master Plan is also necessary to identify potential projects that may require environmental clearance (e.g., an environmental assessment) prior to implementation or construction.

Development recommendations involving the future configuration of the Airport have been reviewed in previous chapters. The primary changes proposed in the Airport layout include the implementation of a new instrument approach procedure, visual approach landing aids, planning of new aircraft access taxiways and apron, the construction of a new access roadway, and the planning of additional commercial and general aviation aircraft storage facilities. In addition, RPZ easement acquisition is recommended for land use control and approach protection within the Runway 8 and Runway 8G runway protection zones and associated approach surfaces.

Existing Conditions Summary

As presented in the *INVENTORY OF EXISTING CONDITIONS* chapter, Boulder Municipal Airport is located in north-central Colorado, within Boulder County and the Denver metropolitan area, approximately 3 miles northeast of the Central Business District (CBD) of the City of Boulder. In addition, the Airport is located approximately 13 miles west Interstate 25 and approximately 18 miles north of Interstate 70. The airport

property is primarily situated on rolling terrain with several drainage features (i.e., lakes, creeks, ponds, and ditches, etc.) located in and around the Airport. Hayden Lake and the Boulder and Whiterock Ditch, are the predominant water features located directly west of, and adjacent to the airport property. In addition, Boulder Creek extends south and east of the Airport, through an area known as Sawhill Lakes (i.e., an area of numerous water-filled gravel pits) which are concentrated along the extended runway centerline.

Currently, Boulder County, which includes Boulder Municipal Airport, is in non-attainment for 8-Hour Ozone standards. According to U.S. Environmental Protection Agency (EPA) guidance and planning standards, ground-level ozone is the principal component of smog, which is created by a chemical reaction between volatile organic compounds (VOCs) and nitrogen dioxide (NOx). A non-attainment area is typically defined as a locality where air pollution levels persistently exceed the National Ambient Air Quality Standards (NAAQS), and the EPA normally makes this designation only after air quality standards have been exceeded for several consecutive years.

The Airport Reference Point (ARP) is located at Latitude 40° 02' 21.947" N and Longitude 105° 13' 32.958" W. The Airport has an elevation of 5,288 feet above mean sea level (AMSL) and consists of approximately 179 acres. The surrounding terrain is generally rolling plains and valleys, with the foothills and mountains being located to the west of the Airport. The climate of Boulder County is influenced by the mountains in the west and the high plains to the east, with cold winters and warm summers. Average annual precipitation is approximately 19.15 inches; with over 50% of the precipitation falling as snow (the region receives an average of 83.1 inches of annual snowfall). Mean annual temperature ranges from 87.5° F in July to 20.4° F in January.

Generally, the land to the east and directly west of the Airport is characterized as open space. There are several residential properties located north of the Airport, and two mobile home communities located to the south and southwest of the Airport. Additionally, a jail complex and large business park are located directly south of the Airport. According to the current Colorado Solid Waste Facilities list, the nearest landfill in the vicinity of the Airport is located approximately fifteen (15) miles south of Boulder, along State Highway 93. In addition, the Valmont Butte site, which was purchased by the City of Boulder in September 2001, is a 102-acre land parcel located near 63rd Street and Valmont Road. The purchase was a joint acquisition of three City departments that included Open Space & Mountain Parks (OSMP), Fire, and Public Works. The OSMP Department owns 27-acres of land located on the northern and western sections of the site, and the north section of the site includes the Valmont dike. The OSMP Department intends to preserve the land per the OSMP Charter.

The City of Boulder and its service area (Areas I & II) had an estimated population of 111,500 people in 2004, which is projected to increase by 13,350 people by the year 2030

(to a total population of 124,850 people). The City of Boulder police department and sheriff's offices provide crime protection to the area, with Airport fire protection being provided by the City of Boulder Fire Department located approximately 2 miles southwest of the Airport.

The primary surface transportation access to the Airport is provided by way of Valmont Road from the south, and Colorado State Highway 157, which is located west of airport. Access to the facility's glider operating area, which is located on the north side of the Airport, is provided via Independence Road.

Biological communities found within the Airport environs are typical of the Great Plains/Foothill Boundary area along the eastern edge of the Rocky Mountains. Grassland is the predominant habitat, and this unique location at the foothills of the Rocky Mountains provided the necessary climatic and soil conditions to support all three of the major Great Plains grassland types (i.e., shortgrass, mixed grass and tall grass prairie).

It is generally possible to associate various wildlife species with dominant plant types, although wildlife species are usually not confined to one specific area, and, the influences of man have sharply curtailed the historic ranges of most native species. Animal species generally found in the area surrounding the Airport include mule deer, squirrel, raccoon, striped skunk, prairie dog, coyote, rabbits, sparrows, meadowlarks, sandpipers, hawks, and doves. In addition, the eastern edge of the Rocky Mountains also defines the western boundary of the North American Central Flyway for waterfowl within North America.

Environmental Analysis

Noise

In predicting the approximate noise impacts that could occur from the operation of Boulder Municipal Airport, several assumptions were made to estimate the number of operations, type of aircraft, and the Airport configuration that would be most reasonable to model for the 2003 base year, and for the end of the planning period, year 2023. If FAA recommended land use development is strictly controlled within these contours, then most noise related land use problems should be alleviated before they develop. However, this is not to say that the City would stop receiving noise complaints due to overflights by aircraft from well outside of the 65 DNL noise contour. The two sets of total operations, defined by aircraft type, which were used as a basis for generating the noise contours, are shown in the following table entitled *EXISTING AND FUTURE OPERATIONS BY AIRCRAFT TYPE, 2003 & 2023*. It should also be noted that due to the

reported noise impacts generated by the tow plane operations at the Airport, these operations were doubled prior to data input into the noise model in efforts to generate a potential worst case scenario for the noise contour development.

Table F1
EXISTING AND FUTURE OPERATIONS BY AIRCRAFT TYPE, 2003 & 2023
Boulder Municipal Airport Master Plan

Operations By Type	**2003** [a]	**2023**
General Aviation [1] [2]	*68,242*	*87,754*
Air Taxi [3]	535	702
Single Engine	39,803	50,327
Multi-Engine	4,500	5,792
Turboprop	3,000	3,861
Glider	19,304	25,449
Business Jet	650	1,097
Helicopter	450	527
Military	*20*	*20*
TOTAL	**68,262**	**87,774** [4]

[a] Actual.
[1] Total includes general aviation-related air taxi operations.
[2] Operational estimates were prepared by Barnard Dunkelberg & Company.
[3] As presented in the *Forecasts of Aviation Activity* chapter, the Airport has a limited amount of Air Taxi service and these operations have been included in the general aviation operations category.
[4] Current Master Plan forecast total.

Day-Night Sound Level. Noise is generally defined as unwanted sound and, as such, the determination of acceptable levels is subjective. The day-night sound level (DNL) methodology is used to determine both the noise levels resulting from existing conditions (i.e., current estimated operational counts) and the potential noise levels that could be expected to occur in the future based upon the forecast operational counts for the end of the planning period. The basic unit in the computation of DNL is the Sound Exposure Level (SEL). A SEL is computed by adding the decibels adjusted dB(A) level for each second of a noise event above a certain threshold. For example, a noise monitor located in a quiet residential area [40 dB(A)] receives the sound impulses of an approaching aircraft and records the highest dB(A) reading for each second of the event as the aircraft approaches and departs the site. Each of these one-second readings is then added logarithmically to compute the SEL. Table F2, entitled *COMPARATIVE NOISE*

LEVELS, depicts the typical dB(A) values of noise commonly experienced by people. This illustrates the relative impact of single event noise in "A" weighted level.

Table F2
COMPARATIVE NOISE LEVELS
Boulder Municipal Airport Master Plan

Activity	dB(A) Levels
Rustling Leaves	20
Room in Quiet Dwelling at Midnight	32
Soft Whisper (at 5 feet)	34
Men's Clothing Department of Large Store	53
Window Air Conditioner	55
Conversational Speech	60
Household Department of Large Store	62
Busy Restaurant	65
Typing Pool	65
Vacuum Cleaner in House (at 10 feet)	69
Cessna 172 Single Engine Aircraft (1,000 feet overhead) (1)	**74.3**
Ringing Alarm Clock (at 2 feet)	80
Loudly Reproduced Orchestral Music in Large Room	82
Printing Press Plant (medium size automatic)	86
Heavy City Traffic	92
Heavy Diesel-Propelled Vehicle (at 25 feet)	92
Air Grinder	95
Cut-off Saw	97
Home Lawn Mower	98
Turbine Condenser	98
150 Cubic Foot Air Conditioner	100
Banging of Steel Plate	104
Air Hammer	107
Jet Airliner (500 feet overhead)	115

Note: Prolonged levels over 85 dB(A) represent beginning of hearing damage.
Adapted from Impact of Noise on People, Federal Aviation Administration, 1977, unless noted otherwise.
(1) Measured dBA reading obtained from FAA Advisory Circular 36-1H Noise Levels for U.S. Certificated and Foreign Aircraft.

The computation of DNL involves the addition, weighting, and averaging of each SEL to achieve the DNL level in a particular location. The SEL of any single noise event occurring between the hours of 10:00 p.m. and 7:00 a.m. is automatically weighted by adding 10 dB(A) to the SEL to account for the assumed additional irritation perceived during that time period. All SELs are then averaged over a given time period (day, week, year) to achieve a level characteristic of the total noise environment. Very simply, a DNL level for a specified area over a given time is approximately equal to the average dB(A) level that has the same sound level as the intermittent noise events. Thus, a DNL 65 level describes an area as having a constant noise level of 65 dB(A) that is the approximate average of single noise events even though the area would experience noise events much higher than 65 dB(A) and periods of quiet.

The main advantage of DNL is that it provides a common measure for a variety of differing noise environments. The same DNL level can describe both an area with very few high level noise events and an area with many low level events. DNL is thus constructed because it has been found that the total noise energy in an area predicts community response.

DNL levels usually are depicted as grid cells or contours. Grid cells are squares of land of a specific size that are entirely characterized by a noise level. Contours are interpolations of noise levels based on the centroid of a grid cell and drawn to connect all points of similar level. Contours appear similar to topographical contours and form concentric "footprints" about a noise source. These footprints of DNL contours drawn about an airport are used to predict community response to the noise from aircraft using that airport.

Computer Modeling. The DNL noise contours were generated using the Integrated Noise Model (INM) Version 6.1, specifically developed by the Federal Aviation Administration (FAA) to plot noise contours for airports. The original version was released in 1977 with the current version being released in March of 2003. The program is provided with standard aircraft noise and performance data that can be tailored to the characteristics of individual airports.

The INM program requires the input of the physical and operational characteristics of the airport. Physical characteristics include runway coordinates, airport altitude, and temperature. Operational characteristics include aircraft mix, flight tracks, and approach profiles. Optional data that is contained within the model includes departure profiles, approach parameters, and aircraft noise curves. All of these options were incorporated in order to model the noise environment at Boulder Municipal Airport. In addition, the actual input data for the INM program is included for reference in Appendix Five of this document.

Land Use Compatibility Matrix. The Land Use Compatibility Matrix, presented on the following page, indicates those land uses that are compatible within certain DNL noise contours. It identifies land uses as being compatible, incompatible, or compatible if sound attenuated. The matrix, which was developed by the FAA, can act as a guide to the town and county for land use planning and control and a tool to compare relative land use impacts that would result from various airfield planning alternatives. It must be remembered that the DNL noise contours do not delineate areas that are either free from excessive noise or areas that will be subjected to excessive noise. In other words, it cannot be expected that a person living on one side of a DNL noise contour will have a markedly different reaction than a person living nearby, but on the other side. What can be expected is that the general aggregate community response to noise within the DNL 65 noise contour, for example, will be less than the public response from the DNL 75 noise contour.

This study generated the 55, 60, 65, 70, and 75 DNL noise contours to determine land use compatibility. The area between the 55 and 65 DNL noise contours is an area within which most land uses are compatible, but is an area where single event noise complaints are often received. The area between the 65 and 70 DNL noise contours is an area of significant noise exposure where many types of land uses are normally unacceptable and where land use compatibility controls are recommended. Finally, the area inside the 70 and 75 DNL noise contour identifies land uses that are subjected to a significant level of noise and the sensitivity of various uses to noise is increased.

2003 Noise Contours. Using the existing 2003 aircraft operation base counts and types previously presented in Table F1 (including a doubling of the tow plane operations), noise contours were generated and are presented in Figure F2 entitled *2003 EXISTING NOISE CONTOURS WITH GENERALIZED EXISTING LAND USE*. As can be seen, each of the noise contours extends beyond airport property to varying degrees, with a small area of existing rural residential development (i.e., potentially nine houses located on the north side of Independence Road) being within the 65 DNL noise contour. The 75 DNL noise contour encompasses approximately 73 acres, the 70 DNL noise contour encompasses approximately 108 acres, the 65 DNL noise contour encompasses approximately 184 acres, the 60 DNL noise contour encompasses approximately 372 acres, and the 55 DNL noise contour encompasses approximately 952 acres.

2023 Noise Contours. The 2023 aircraft operation counts and types presented in Table F1 (including a doubling of the tow plane operations), were used to generate the noise contours that are illustrated in Figure F3 entitled *2023 FUTURE NOISE CONTOURS WITH GENERALIZED EXISTING LAND USE*. In comparison, the 2023 noise contours are very similar in size to the 2003 contours, with the 65 DNL noise contour being smaller by approximately 20 acres due to a quieter aircraft fleet in the future. In addition, the 65 DNL noise contour would continue to encompass the existing rural residential

LAND USE	YEARLY DAY-NIGHT NOISE LEVEL (DNL) IN DECIBELS					
	BELOW 65	65-70	70-75	75-80	80-85	OVER 85
RESIDENTIAL						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
PUBLIC USE						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
COMMERCIAL USE						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade-general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
MANUFACTURING AND PRODUCTION						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to NOTES.

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

TABLE KEY

SLUCM	Standard Land Use Coding Manual.
Y(Yes)	Land Use and related structures compatible without restrictions.
N(No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30 or 35	Land Use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 dB must be incorporated into design and construction of the structure.

NOTES

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB to 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve an NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

(3) Measures to achieve an NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

(4) Measures to achieve an NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

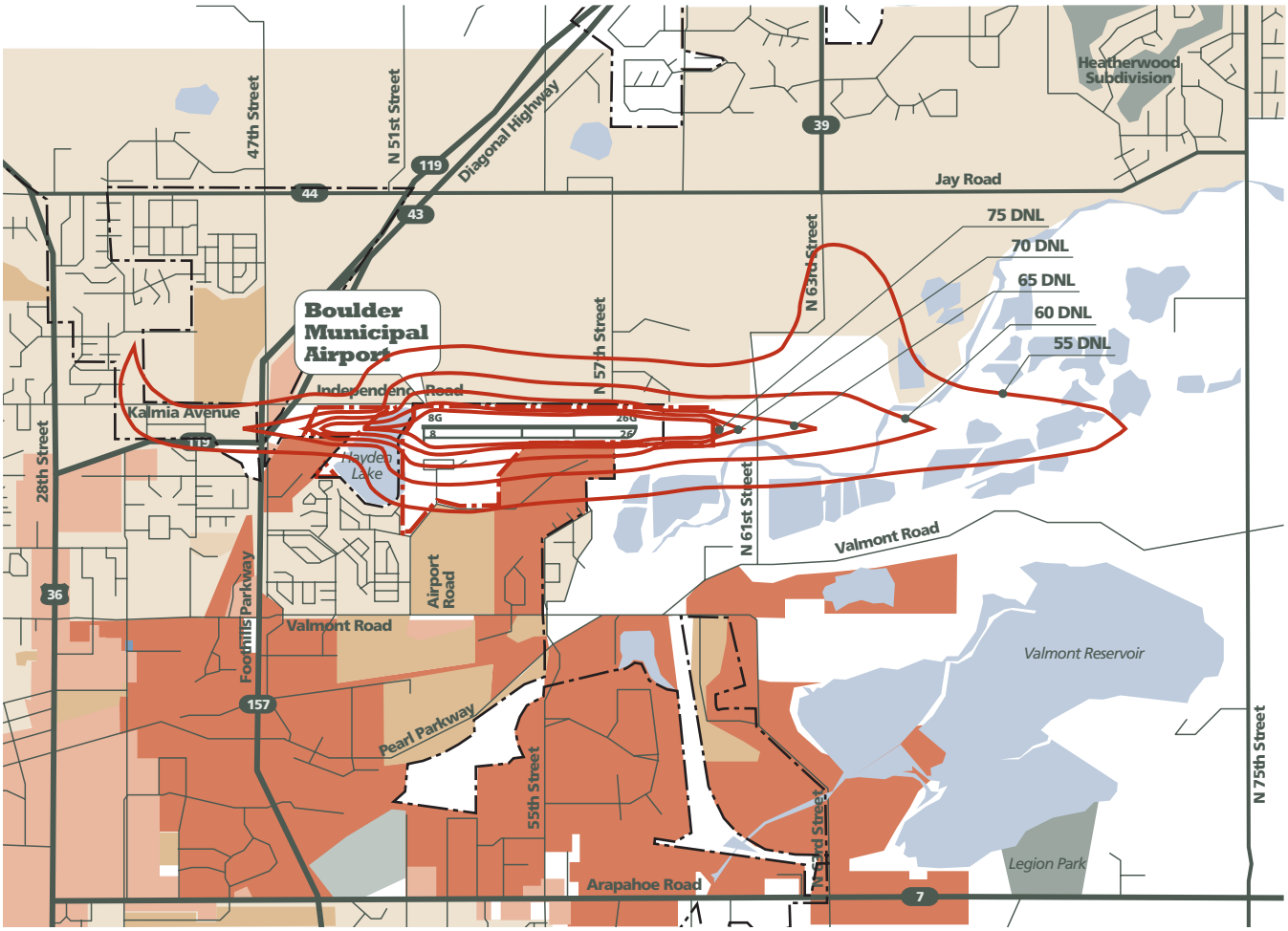
(5) Land use compatible provided that special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25 dB.

(7) Residential buildings require an NLR of 30 dB.

(8) Residential buildings not permitted.

Figure F1 **Land Use Compatibility Matrix**



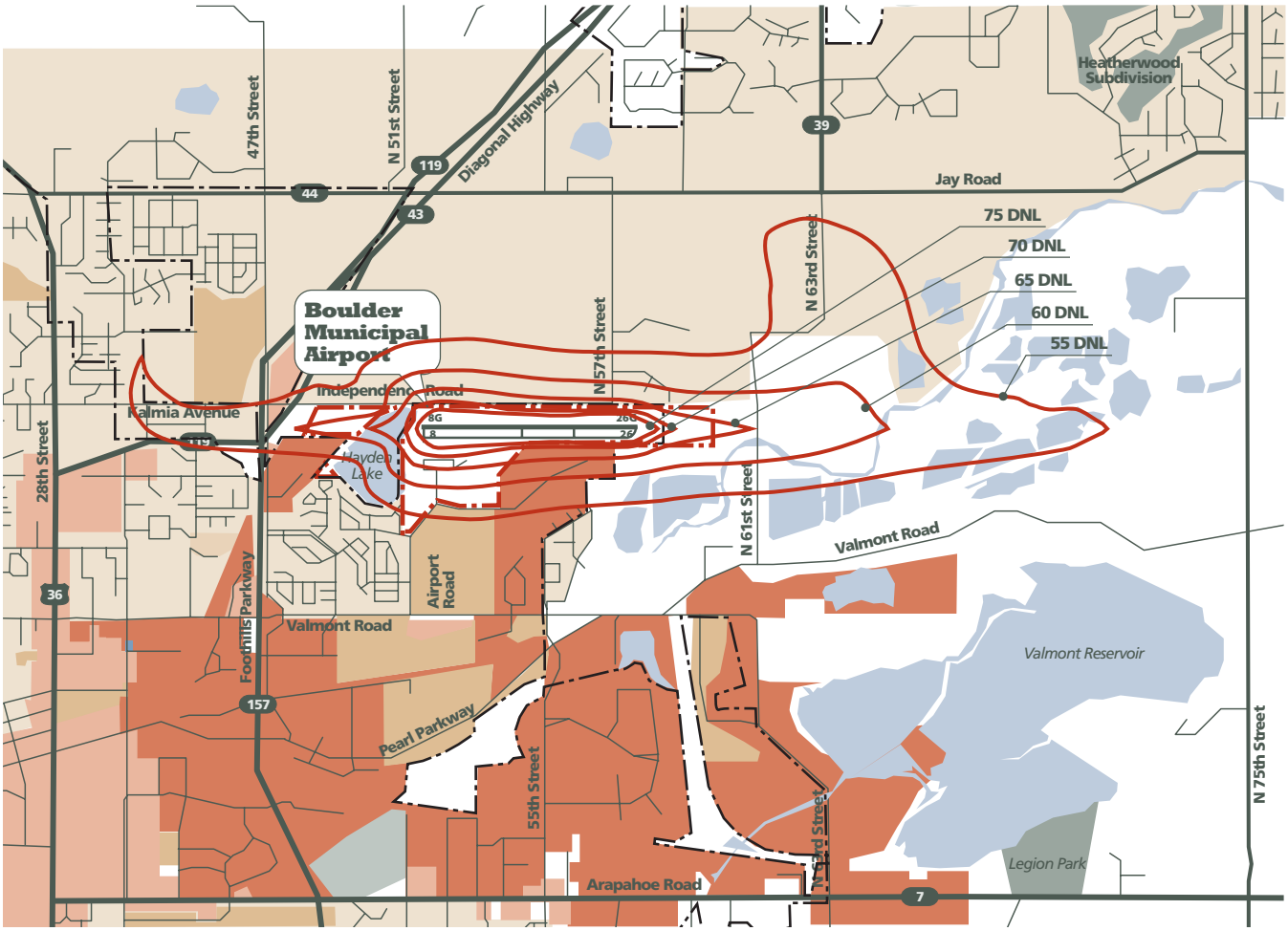
Approximate Scale: 1"=3,600'

Figure F2 **2003 Existing DNL Noise Contours with Generalized Existing Land Use**

Boulder Municipal Airport
Airport Master Plan Update

- Agricultural
- Industrial
- Commerical/Business
- Residential
- Public
- Open Area
- City Boundary
- Airport Boundary

DNL Noise Contours: Barnard Dunkelberg & Company.
Source: *Base Map*: Microsoft Street & Trips 2006. *Existing Land Use*: Barnard Dunkelberg & Company Land Use Survey, 2004.



Approximate Scale: 1"=3,600'

Figure F3 2023 Future DNL Noise Contours with Generalized Existing Land Use

- Agricultural
- Industrial
- Commerical/Business
- Residential
- Public
- Open Area
- City Boundary
- Airport Boundary

Boulder Municipal Airport
Airport Master Plan Update

DNL Noise Contours: Barnard Dunkelberg & Company.
Source: *Base Map*: Microsoft Street & Trips 2006. *Existing Land Use*: Barnard Dunkelberg & Company Land Use Survey, 2004.

development located north of Independence Road, essentially remaining unchanged. The future 75 DNL noise contour encompasses 60 acres, the 70 DNL noise contour encompasses 90 acres, the 65 DNL noise contour encompasses approximately 165 acres, the 60 DNL noise contour encompasses approximately 386 acres, and the 55 DNL noise contour encompasses approximately 1,079 acres.

Nationally, the aircraft fleet, particularly the jet fleet, is becoming quieter. The majority of the business jet aircraft that produce the greatest noise levels will, by age, be removed from service during the twenty-year planning period on which this study is based. In addition, the National Business Aviation Association (NBAA) passed a voluntary resolution to eliminate the operation of all Stage 1 business jets in 2005, and all newly manufactured business jets comply with Stage 3 noise reduction criteria. In addition, propeller upgrades are available for some of the general aviation fleet[1] to reduce noise, and some general aviation aircraft manufacturers are opting to utilize de-rated engines in their aircraft, which allow engine operation at lower revolutions per minute (rpms) to achieve improved noise reduction levels.

As can be seen from the noise contours generated on the previous illustrations, the projected increase in operations at the Airport through the twenty-year planning period are essentially offset by the projected retirement from the fleet of the older and noisier business jet aircraft[2]. In addition, the future contour represents the conditions at the Airport considering no major airside facility additions or modifications, just the natural growth in airport operations. If a major facility change were proposed, then an environmental document would have to be prepared prior to implementation of the proposed project. The environmental document would be prepared in response to the National Environmental Policy Act (NEPA), which requires environmental documentation for any major Federal protect—in other words, a project that is funded or approved by a Federal agency. Since there is no project being proposed at this time that would result in a different set of noise contours, no NEPA document is required. Additionally, there is no expectation of a major facility change since the forecasts estimate that the Airport will remain the same type of facility and operate at the same levels as it does today or possibly higher as it did in the early 1990s.

Airport Environs Land Use Planning. Noise impacts are significant components in establishing sensible land use planning practices within the environs of the Airport, in many cases encompassing a greater area than those covered by other considerations. Therefore, detailed land use planning practices and mechanisms are appropriate and should be employed in terms of establishing a proper and realistic set of land use

[1] The existing commercial glider tow plane operator and glider clubs at Boulder have installed 4-blade noise reducing propellers on their aircraft.

[2] The Airport did have an older Stage II business jet (i.e., Learjet 25) based at the facility that was sold in late 2004 and is no longer hangared at Boulder.

recommendations for the Airport environs[3]. These practices are essential to ensure longevity of growth in aviation activity beyond that programmed in this Master Plan Update for Boulder Municipal Airport.

As presented in the previous chapter, the City of Boulder (i.e., Airport Sponsor) has been proactive in the establishment of Ordinance No. 5200, which defines a series of overlay zoning designations (i.e., four separate zones) that make up an "Airport Influence Zone". These zones, which are designed to promote land use compatibility in the vicinity of the Airport were developed by the City of Boulder in response to specified FAA grant assurances which specify that the Airport Sponsor "will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft".

Air and Water Quality

The proposed Airport development outlined in this Master Plan is not expected to have a significant impact on the long-term quality of the air and water in the vicinity of the Airport. The forecast 2023 annual operations (i.e., 87,774) are below the threshold (180,000 general aviation operations, according to FAA Order 5050.4A) required to do an air quality analysis.

The Clean Air Act (42 U.S.C. §§ 7401-7671q) requires the adoption of National Ambient Air Quality Standards (NAAQS) to protect the public health and welfare from the effects of air pollution. Current standards are set for sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter equal to or less than 10 microns in size (PM_{10}), fine particulate matter equal to or less than 2.5 microns in size ($PM_{2.5}$), and lead (Pb).

According to the Office of Air Quality Planning and Standards (OAQPS) within the U.S. Environmental Protection Agency (EPA), Boulder County was designated as non-attainment in consideration of NAAQS standards for 8-Hour Ozone. A non-attainment area is defined as a locality where air pollution levels persistently exceed the NAAQS. The EPA normally makes this designation only after air quality standards have been exceeded for several consecutive years. The Clean Air Act Amendments of 1990 require Federal agencies to ensure that their actions conform to the appropriate State Implementation Plan (SIP). The SIP is a plan that provides for implementation, maintenance, and enforcement of the NAAQS, and includes emission limitations and control measures to attain and maintain the NAAQS. Conformity is defined as demonstrating that a project

[3] Planning options to modify the City's Airport Influence Overlay Zoning Map were examined in the Airport Plans chapter of this document.

conforms to the SIP's purpose of eliminating or reducing the severity and number of violations of the ambient air quality standards and achieving expeditious attainment of such standards. Therefore, prior to implementation, individual airport construction projects will be subject to an air quality conformance analysis to determine if State of Colorado conformity requirements are to be met.

During construction of Airport improvements, short-term air quality impacts may be expected from heavy equipment pollutant emissions, fugitive dust resulting from the movement of earth for cut and fill, any open burning that may occur on the Airport, and the operation of concrete batch plants. Compliance with all local, state, and federal air quality regulations would be required of all contractors.

The most significant hydrological features in the immediate area of the Airport are Hayden Lake, the Boulder and Whiterock Ditch, and Boulder Creek. Airport development is not expected to impact the quality of this water resource, but any construction projects requiring earthwork would likely result in some erosion and sedimentation. However, the contractors would be required to follow guidelines outlined in the Federal Aviation Administration's Advisory Circular 150/5370-10A, *Standards for Specifying Construction of Airports*, which is the FAA's guidance to Airport sponsors concerning protection of the environment during construction. Final plans and specifications for any project will incorporate the provisions of AC 150/5370-10A to ensure minimal impact due to erosion, air pollution, sanitary waste, and the use of chemicals. Additionally, the Airport's existing stormwater permit and associated Stormwater Management Plan (SWMP) will have to be updated in response to any changed impacts to stormwater quality resulting from the implementation of airport projects (see letter from the Water Quality Control Division of the Colorado Department of Public Health & Environment in Appendix Two). Also, any diversion of surface water that may result from the implementation of Airport projects must be made in priority with a water right decreed for the proposed uses, or in accordance with a water court approved plan (see letter from the Colorado Division of Water Resources in Appendix Two).

Historical, Architectural, Archaeological, and Cultural Resources

The Colorado Historical Society and the Office of Archeology and Historic Preservation have been contacted regarding properties documented within the project area that meet the criteria for listing on the National Register of Historic Places. The Colorado Historical Society has identified two potentially historic resources with or adjacent to the airport boundary. These include the North Boulder Farmers Ditch and the Boulder & Left Hand Ditch (see letter from the Colorado Historical Society in Appendix Two). In addition, prior to any ground disturbing activity, local tribes will need to be contacted pursuant to Section 106 of the National Historic Preservation Act. Should construction

activity expose previously unidentified archaeological resources, work must be discontinued pursuant to Section 106, and the Office of Archaeology and Historical Preservation would be contacted.

Threatened or Endangered Species

The Endangered Species Act, as amended, requires each federal agency to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species. The U.S. Fish and Wildlife Service and the Colorado Division of Wildlife have been contacted and, based on information currently available, the identified master plan projects are not likely to adversely affect federally-listed candidate, proposed, threatened or endangered species (see letter from the U.S. Fish and Wildlife Service in Appendix Two). If it is determined later that a federally listed, proposed, or candidate species is located within the project area, a biological assessment would need to be performed to determine if the species would be impacted or if any critical habitat of such species would be impacted. Should a biological assessment determine any impacts to such species or habitat, then appropriate mitigation measures would be coordinated with the U.S. Fish and Wildlife Service and the Colorado Division of Wildlife.

It should also be restated that the City of Boulder has developed mapping to identify Seasonal Wildlife Closure Areas to assist in the protection of nesting and roosting sites of raptors (i.e., prairie falcons, peregrine falcons, golden eagles, and osprey). A map of the Seasonal Wildlife Closure Areas was presented in the *INVENTORY OF EXISTING CONDITIONS* chapter of this document. According to the City of Boulder/Boulder Municipal Airport website, flight operations over the closure areas between February 1st and July 31st are requested to maintain a minimum altitude of 1,000 feet above the terrain.

In addition, the City of Boulder has identified three goals that should be utilized when considering strategies to protect wildlife in the urban area. These include:

- Goal 1: Protect the biodiversity and overall health of natural ecosystems, focusing on native species.
- Goal 2: Utilize an ecosystem management approach to the protection of city-owned natural lands in all policy decisions.
- Goal 3: Encourage humane treatment of wildlife in the management of conflicts between wildlife and human safety uses.

Therefore, the City of Boulder is committed to protecting prairie dogs and a number of prairie dog management techniques have been implemented at the Boulder Municipal

Airport in order to protect prairie dogs and maintain the safety for pilots and their aircraft and to ensure that mandates from the FAA are met. The specific FAA design guidelines that are typically impacted by prairie dogs include the grading criteria of the runway and taxiway safety areas. These safety areas are to be:

1. Cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;
2. Drained by grading or storm sewers to prevent water accumulation;
3. Capable, under dry conditions, of supporting snow removal equipment, and the occasional passage of aircraft without causing structural damage to the aircraft;
4. Free of objects, except for objects that need to located in the safety area because of their function. Objects higher than 3 inches above grade should be constructed, to the extent practicable, on low impact resistant supports. Other objects, such as manholes, should be constructed at grade.

Airport staff must continue efforts to reduce encroachment by prairie dogs and other wildlife onto Airport property. Prairie dogs should be removed from Airport property as soon as possible to minimize damage potential within airfield safety areas and the undermining of airfield pavements.

Management of prairie dogs at the Airport will be done in accordance with policies and guidance established by city policy or plans. When prairie dog removal is necessary, the airport staff will make every effort to relocate as many prairie dogs as possible; however, the city currently does not have any areas of OSMP land available for prairie dog relocation at this time or in the foreseeable future.

Until relocation sites are available, airport staff will use the following decision-making process in determining the appropriate removal method:

1. Minimize conflicts with wildlife through non-removal methods where possible (barriers).
2. Remove animals on a portion of the site and construct barriers to prevent colonization in undesirable areas of the site.
3. Relocate if receiving sites are available.
4. Trap and donate prairie dogs to the U.S. Fish and Wildlife Service for use in the black-footed ferret reintroduction program, raptor rehabilitation program or an equivalent program.
5. If lethal control is necessary, trap and euthanize the animals in a humane manner[4].

[4] At present, the Airport uses CO_2 cartridges that are placed into the prairie dog holes, and then covered.

Wetlands

Wetlands are basically defined as areas inundated by surface or groundwater with a frequency sufficient to support vegetation or aquatic life requiring saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, sloughs, river overflows, mud flats, and natural ponds. Wetlands also include estuarine areas, tidal overflows, shallow lakes and ponds with emergent vegetation and wetland ecosystems, including those areas that affect, or are affected by, the wetland itself (e.g., adjacent uplands or regions upstream and downstream).

The U.S. Army Corps of Engineers has been contacted regarding the presence of any wetlands that may be impacted by Airport development, and there was no indication that the specified property was found to have jurisdictional wetlands (see letter from the Department of the Army Corps of Engineers, Denver Regulatory Office, in Appendix Two). However, it should be noted that this finding is premised solely upon available office resources, and not upon onsite review of the subject property. To verify this preliminary information prior to any project implementation, the Department of the Army will likely require that an onsite investigation be conducted to determine if the proposed Airport improvement projects would require the issuance of a Department of the Army Permit prior to construction. In addition, the project will also have to comply with all regulations presented in *The City of Boulder Wetlands Protection Ordinance* (B.R.C. 1981, Title 9, Chapter 9). As part of any project implementation, project staff will apply for the Wetlands Permit to insure compliance with all sections of this code.

Wild and Scenic Rivers

According to a listing of Wild and Scenic Rivers compiled and managed by the U.S. Army Corps of Engineers, the Bureau of Land Management, the National Park Service, the U.S. Forest Service, and the U.S. Fish & Wildlife Service, the nearest wild and scenic river in the vicinity of Boulder Municipal Airport is located approximately 40 miles to north (i.e., the Cache la Poudre River). Therefore, there will not be any impacts to this nationally significant river resource as a result of the proposed Airport development.

Section 4(f) Property

Section 4(f) of the Department of Transportation Act (recodified at 49 USC, Subtitle I, Section 303) provides that no publicly owned park, recreation area, wildlife or waterfowl refuge, or land of a historic site that is of national, state, or local significance will be used, acquired, or affected by programs or projects requiring Federal assistance for implementation. The nearest City Park (i.e., Valmont City Park) is located at Valmont Road and Airport Road, which is approximately one-half (0.5) mile south of the Airport.

There is also a paved multi-use bicycle trail (i.e., the Cottonwood Trail) that extends along the west side of Hayden Lake, follows the Four-Mile Canyon Creek, and continues southwestward to the Foothills Parkway Multi-Use Trail. In addition, the Cottonwood Trailhead is located on the north side of Independence Road, just north of Hayden Lake, and extends northwestward to intersect with Jay Road. It is anticipated that the planning projects recommended in this Master Plan Update will not impact the current use of such properties (i.e., the Cottonwood Trail that intersects the northwest corner of the Runway 8 RPZ). A response letter from the Colorado State Parks Natural Areas Program was not received and available for inclusion in Appendix Two.

It should also be noted, that any future park or recreation improvements to be undertaken in the vicinity of the Airport must be coordinated with Airport staff and the Federal Aviation Administration, with the improvements being developed in a manner that is compatible with the Airport.

Environmental Justice

There are no federal projects proposed by this Airport Master Plan that would trigger the requirement for additional analysis to determine if any one racial or economic group of people living within the vicinity of the Airport is disproportionately affected.

Hazardous Substances and Wastes

No hazardous substances and/or wastes will be generated from any development proposed by this Airport Master Plan. However, construction activities can generate hazardous wastes, and some construction materials constitute hazardous substances. These include fuel, oil, lubricants, paints, solvents, concrete-curing compounds, fertilizers, herbicides, and pesticides. Proper practices can be implemented to prevent or minimize the potential for these hazardous substances to be released into the environment and are included below.

Chemicals, petroleum-based products and waste materials, including solid and liquid waste, should be stored in areas specifically designed to prevent discharge into storm water runoff. Areas used for storage of toxic materials should be designed with full enclosure in mind, such as the establishment of a dike around the perimeter of the storage area.

Construction equipment maintenance should be performed in a designated area and control measures, such as drip pans to contain petroleum products, should be implemented. Spills should be cleaned up immediately and disposed of properly.

Farmland

Information regarding the occurrence of any prime and unique farmland on, or in, the vicinity of the Airport was requested from the District Conservationist with the Natural Resources Conservation Service (NRCS). According to information obtained from the Colorado NRCS website (i.e., www.co.nrcs.usda.gov/), the nearest Prime Farmland soil is located approximately one mile southeast of the Airport. In addition, there are "Farmlands of Statewide Importance" located north of the Airport (the northside of Independence Road) and east of the Airport (adjacent to Airport property along the extended runway centerline. A farmlands map for Boulder County has been included for reference in Appendix Two. Based upon the farmland boundaries presented on this map, it's not expected that Airport plans, as depicted in the Airport Master Plan, will have an impact on prime farmland within Boulder County, and the submittal of Farmland Conversion Impact Rating Form AD-1066 will not be required.

According to information obtained from the NRCS (i.e., the Soil Survey of Boulder County Area, Colorado), there are two (2) primary soil associations that are found on Airport property: the Nederland-Valmont association and the Niwot-Loveland-Calkins association.

The Nederland-Valmont association is made up of nearly level to moderately steep old high terraces, alluvial fans, and benches. The soils were formed in gravelly and cobbly alluviam, with slopes ranging from 1 to 25 percent and elevations ranging from 5,300 to 6,500 feet. This association makes up about 20 percent of the area, and is represented by about 25 percent Nederland soils and 25 percent Valmont soils, with the remaining 50 percent consisting of Nunn, Hargreave, Kutch, Laporte, Longmont, Renohill, and Samsil soils, including Terrace escarpments.

The Niwot-Loveland-Calkins association consists of narrow, nearly level areas adjacent to major streams. The soils of this association were formed from loamy alluviam, with slopes ranging from 0 to 3 percent and elevations ranging from 4,900 to 5,500 feet. This association makes up about 10 percent of the area, and is represented by about 35 percent Niwot soils, 15 percent Loveland soils, and 10 percent Calkins soils. The remaining 40 percent of the soils consist of Ascalon, Heldt, Manter, McClave, Nunn, and Valmont.