

## Inventory of Existing Conditions

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### Introduction

**Boulder Municipal Airport is located in the City of Boulder, Colorado. Nestled at the foot of the Rocky Mountains, the Airport has served an important niche in the general aviation market for the City and its surrounding region. Boulder Municipal Airport is open to the general public and to visiting aircraft. The Airport does not have commercial passenger activity and has been in continuous operation at this site since 1928.**

Boulder Municipal Airport is located three miles northeast of the City of Boulder, in north-central Colorado. The Airport is located within the Denver metropolitan area, on the eastern fringe of the Rocky Mountain range. The Airport provides a safe operating environment for a variety of general aviation aircraft types, ranging from gliders and small powered aircraft to corporate jet aircraft. The airport's relative location within the region is illustrated in Figure A1, *AIRPORT LOCATION MAP*.

The City of Boulder is located at the base of the eastern Front Range of the Rocky Mountains in Colorado. Boulder is surrounded by several communities, including Superior, Broomfield, Louisville, Lafayette, Erie, Longmont, and Lyons. Although Boulder has not grown significantly in the last ten years, the exponential growth of the surrounding communities has influenced the City of Boulder and the regional transportation system.

While airport planning documents related to the layout of airport facilities have been kept up-to-date, an overall master planning study of airport facilities has not been completed since 1994. During this time, aviation issues on a local, regional, and national level have changed, and the FAA also recommends that an Airport Master Plan be updated every 5-10 years.

This Airport Master Plan Update is intended to provide a comprehensive evaluation of the Airport, and result in a well-conceived long-term facilities and operational plan for



the Airport. This initial *INVENTORY* chapter examines three basic elements. These elements are:

- Airport facilities (runways, taxiways, aircraft parking aprons, hangars, ground access, etc.);
- Relationship of the Airport to the Airspace System; and,
- The Airport environs.

In addition, the last section in this chapter identifies issues that will, to some degree, influence future activity and facilities at the Airport.

## **Airport History**

The Airport has been an important part of Boulder’s history since its origin as “Hayden Field” in the 1920s. In its early years, a small group of aviation pioneers started up the “Silver Wing Aircraft Company”, one of the first aircraft manufacturers in the nation. Their premier aircraft, a two-seat plane with silver wings, was test flown on April 14, 1928 in front of a crowd of 1,000 spectators. Although the factory was located near 28<sup>th</sup> St and Pine St, the company built the airfield’s first hangar and secured the title to the Hayden Lake tract to officially designate the strip as an airport. In addition to constructing the Silver Wing aircraft, they also ran Boulder’s first flight school.

On May 19, 1938, Boulder citizens gathered to witness the first Air Mail flight, ushering in the era of trans-continental mail flights.

On June 1, 1943, the City of Boulder purchased 36 acres of the Hayden Field property and re-named it Boulder Municipal Airport. Shortly after its purchase, the city graded the primary runway, installed runway markers, and built the first city-owned hangar.

During World War II, the airport was home to the Army Air Corps’ Civilian Pilot Training Program. The Airport trained U.S. Navy aircrew on how to maintain the V-12 engine, used in the famous Mustang fighter plane. They also trained pilots how to fly the J-3 trainer and surveillance plane, contributing an essential service to the war effort. At that time, the airport had three runways. The primary runway was in the same location as the current Runway 08/26, but the field also had two diagonal runways composed of grass.

Between 1953 and 1969, numerous improvements were made at the Airport. In 1953, the Airport installed runway lights and a flashing beacon. In 1958, the Civil Aeronautical Administration (now known as the Federal Aviation Administration) gave the Airport its first grant of \$50,000, which helped the City fund a \$100,000 project to pave the primary

runway. In 1958 and 1959, the City of Boulder purchased an additional 37 acres of land that now consists of the main hangar area and eastern end of the runway. Between 1964 and 1969, the airport saw the construction of two T-hangars and two service hangars.

In the 1977, Boulder once again became home to a ground-breaking airplane manufacturer known as Pete Bartoe Jr.. Graduate of the University of Colorado School of Engineering and former President of Ball Brothers Research Corporation (now known as Ball Aerospace), Bartoe shook up the aviation industry by designing and building the “Jet Wing” at Boulder Municipal Airport. The jet was the first to incorporate a unique wing design that allowed it to travel as slow as 45 mph, which was significantly slower than any jet had flown before. Bartoe’s design opened up jet use for smaller airports and contributed to future designs of Navy aircraft carrier based aircraft.

Bartoe followed up his Jet Wing creation with an equally impressive bi-plane called the “Skyote”. Its small size, impressive power, and gravity-defying acrobatic capabilities quickly made it a sought-after asset. Though neither plane were built for mass production, Bartoe and his ingenious design group put Boulder on the aviation map.

As early as 1975, gliding became a popular aspect of aviation at the Airport. In fact, Boulder has established itself as one of the prominent gliding locations in the United States due to its short distance from the mountains and its “mountain wave” weather pattern. During its rich history, Boulder has been the starting place of several record breaking glider flights. On Dec 29, 1976, a Schweitzer 1-34 sailplane set a new altitude record by reaching a height of 44,100 feet above sea level. On Jun 7, 2004, a Ventus 2b sailplane conducted the first 1000 km glider flight out of Boulder, and was only the second time 1000 km had been surpassed by anyone in the State. Once released from its Boulder-based tow plane, the 8 hour and 38 minute flight to New Mexico and back was conducted entirely without a motor.

Aviation awards of all types have been awarded to pilots and aircraft based at Boulder Municipal Airport. In 1976, a female pilot from the Boulder Aerobatic Club won numerous awards and was named one of the nation’s top 5 pilots, allowing her to represent the U.S. at the World Aerobatic Championships in Kiev, U.S.S.R. Other members of her aerobatic team also won awards at regional and national contests, quickly making a name for themselves and Boulder Municipal Airport.

The Airport has also served an important role to the community over the years by providing a home for critical service and research-oriented groups. The Boulder chapter of the Civil Air Patrol (CAP) not only owns a glider that is used to train cadets on the fundamentals of flight, but they launch critical search and rescue missions from the Airport using their single-engine surveillance airplane.

The summer of 1994 was one of the driest on record, causing the wildfire threat to be high. Boulder County's fires were contained before they got too large partly because of a single engine air tanker stationed at the Airport.

Government agencies in the area, such as the National Center for Atmospheric Research (NCAR) and the National Oceanic and Atmospheric Administration (NOAA), have also called the Airport home. Its location allows them to easily launch research aircraft into the skies and gather critical data on the Earth's atmosphere and weather patterns.

The Airport also serves as a critical staging area during City/County of Boulder disasters. The large, open acreage not only allows for more efficient rescue operations and material storage, but its location provides an advantageous staging area for recovery efforts and command post operations.

### **Airport Role and Facilities**

As previously described, Boulder Municipal Airport began operating as a small dirt landing strip in 1928, and now serves the general aviation needs of the community by providing many aviation-related services, including: business-related flying, law enforcement/fire/rescue flying services, recreational flying, flight training, air charters for medical services, search and rescue, and parachuting, along with other aviation-related activities. The facility, which was originally configured to include a northeast/southwest oriented crosswind runway, has developed into one of the internationally recognized soaring facilities within the western United States.

According to a study completed by the Colorado Aeronautics Division (*THE ECONOMIC IMPACT OF AIRPORTS IN COLORADO, 2003*), Boulder Municipal Airport generated \$56,986,000 in economic activity, \$24,033,000 in wages, and 675 jobs in 2002. Economic activity was defined as the “economic contribution” of the Airport to the regional and state economy in terms of total jobs, wages, and economic activity (business sales).

The Airport is owned and operated by the City of Boulder. The Airport is classified as a general aviation airport by the FAA's National Plan of Integrated Airport Systems (NPIAS). The Colorado Department of Transportation Division of Aeronautics classifies airport as an “intermediate” airport in the Statewide Airport Inventory and Implementation Plan (Airport System Plan). As shown in the previous illustration, entitled *AIRPORT LOCATION MAP*, Boulder Municipal Airport is located northwest of the City of Denver, approximately 13 miles west of Interstate 25, and approximately 18 miles north of Interstate 70. The Airport is also situated on the east side of Foothills Parkway (Highway 119 at the northern limits of the City of Boulder), which is depicted along with

the Airport's more immediate surroundings in Figure A2, entitled *AIRPORT VICINITY MAP*.

## Airside Facilities

Boulder Municipal Airport is operated with one primary runway, oriented in an east-west direction, along with a parallel landing strip, similarly oriented, for glider/sailplane operations located north of the primary runway. Figure A3, entitled *EXISTING AIRPORT LAYOUT*, provides a graphic presentation of the existing airport facilities.

The Airport Reference Point (ARP) for Boulder Municipal Airport 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). The Airport encompasses approximately 136 acres.

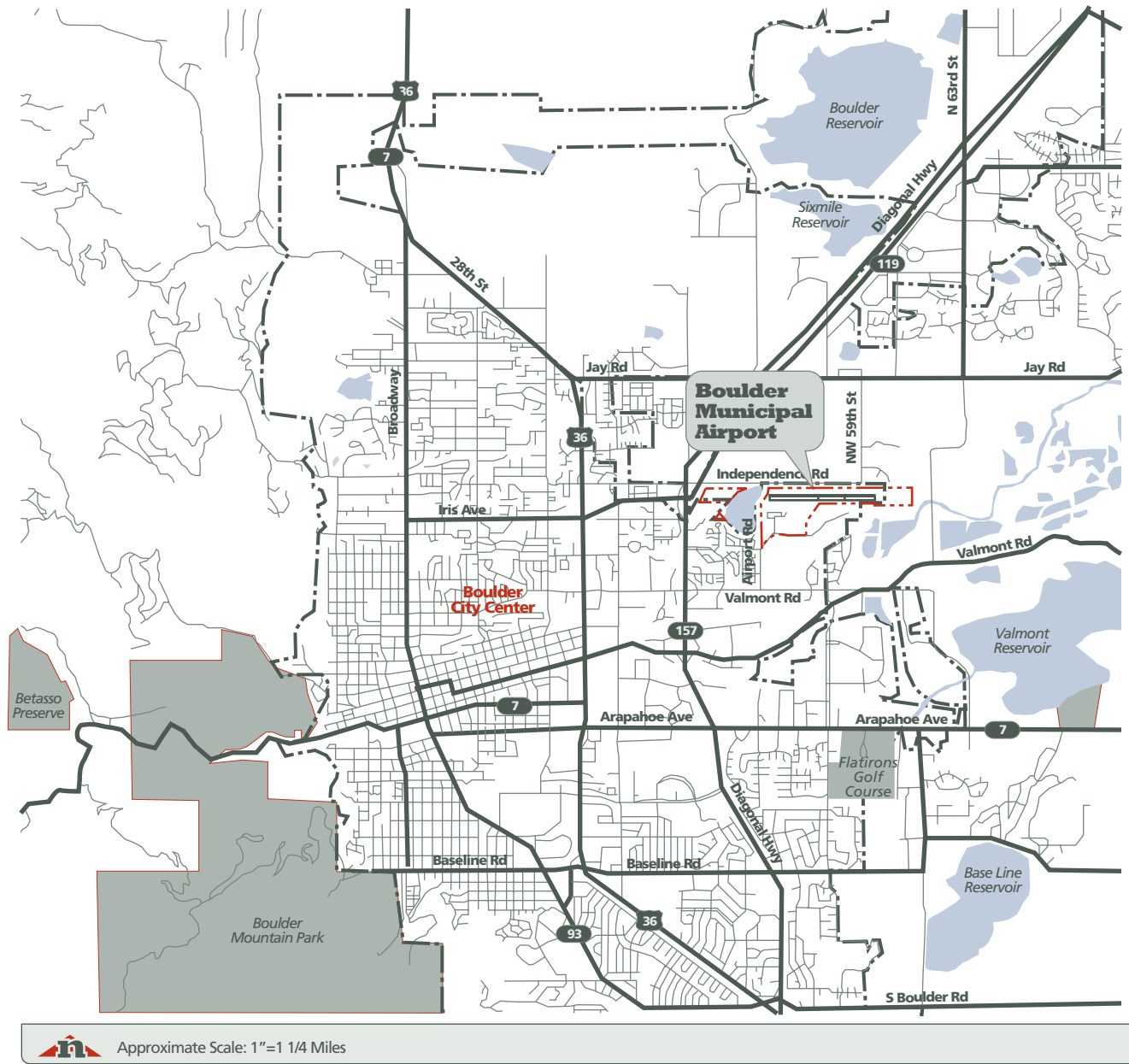
**Runway.** The primary runway at the Airport has a designation of 08/26. It is 4,100 feet in length and 75 feet in width. The runway is constructed of asphalt and has a gross weight bearing capacity of 16,000 pounds single wheel and 30,000 pounds dual wheel main landing gear configuration. The runway was reconstructed in 2003 and is currently rated in excellent condition.

Runway 08 has a displaced threshold of 200 feet. The published declared distances are as follows:

- Runway 08
  - ❖ Take-off Run Available (TORA) – 4,100 feet
  - ❖ Take-off Distance Available (TODA) – 4,100 feet
  - ❖ Accelerate-Stop Distance Available (ASDA) – 4,100 feet
  - ❖ Landing Distance Available (LDA) – 3,900 feet
- Runway 26
  - ❖ Take-off Run Available (TORA) – 4,100 feet
  - ❖ Take-off Distance Available (TODA) – 4,100 feet
  - ❖ Accelerate-Stop Distance Available (ASDA) – 3,900 feet
  - ❖ Landing Distance Available (LDA) – 3,900 feet

Runway 08/26 has an MIRL (Medium Intensity Runway Lights) runway edge lighting system. Runway 26 has a 4-box visual approach slope indicator (VASI) on its left side.

**Glider Landing Strip.** In addition to the primary runway, there is a parallel landing strip for glider operations (referred to as Runway 8G/26G). The asphaltic-turf landing strip is located approximately 220 feet north of the Runway 08/26 centerline, and is 4,100 feet in length and 25 feet in width.

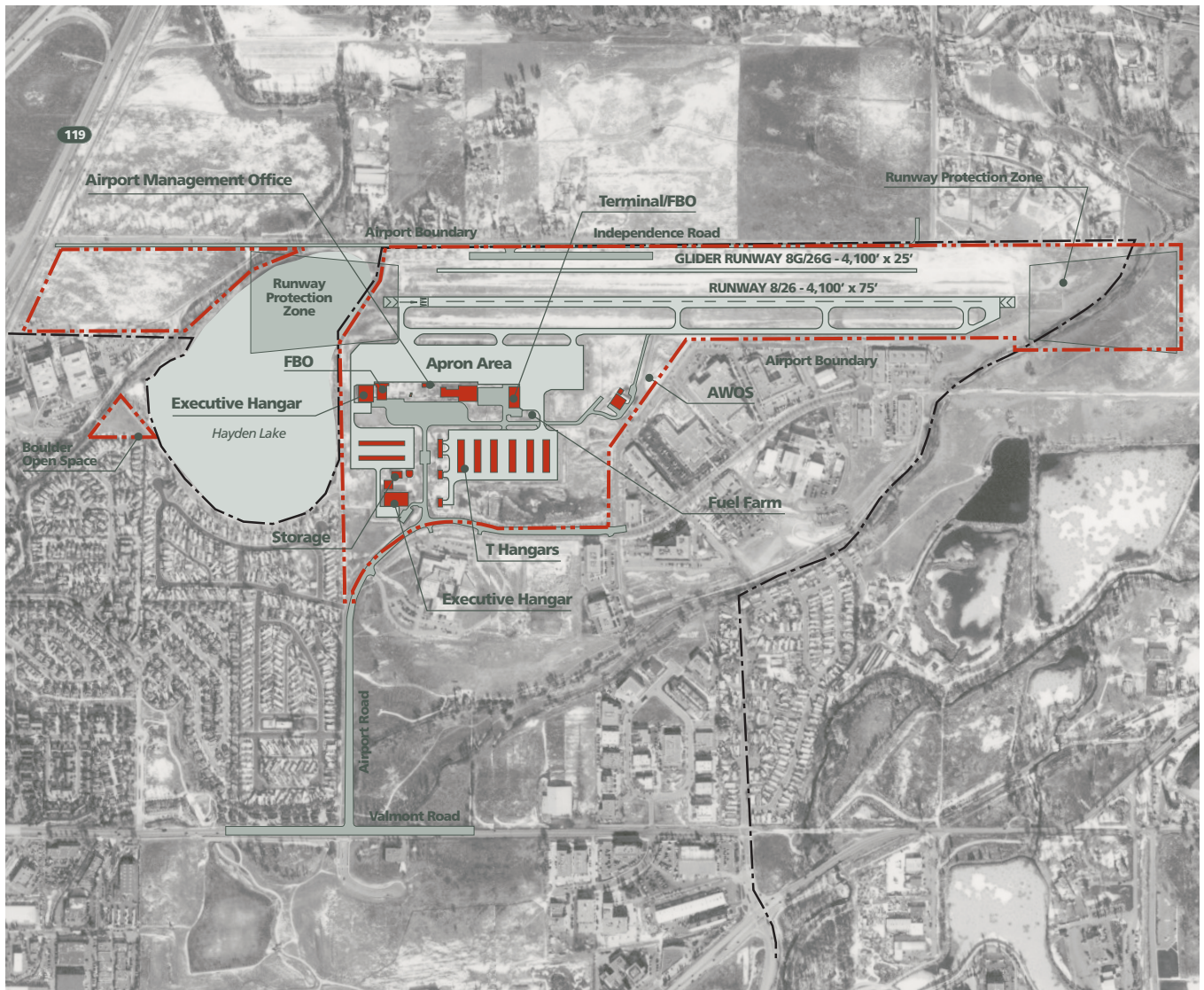


**Figure A2** Airport Vicinity Map

-  City Boundary
-  Airport Boundary

## Boulder Municipal Airport Airport Master Plan Update

Source: Microsoft Street & Trips 2006.



Approximate Scale: 1"=1,200'

**Figure A3 Existing Airport Layout**

-  City Boundary
-  Airport Property Line

## Boulder Municipal Airport Airport Master Plan Update



**Taxiway.** In addition to the runway and landing strip, the airside facilities at Boulder Municipal Airport consist of a taxiway system that provides access between the runway surfaces and the landside aviation use areas.

A 35-foot wide full parallel taxiway (i.e., Taxiway “A”) serves Runway 08/26. The taxiway is constructed of asphalt, and has four connector taxiways that connect to the runway and three connector taxiways that join the aircraft parking apron areas to the parallel taxiway. The parallel taxiway is located on the south side of the runway and is separated from the runway by 200 feet (centerline to centerline). The taxiway system is also equipped with a medium intensity taxiway lighting system (MITL).

### Landside Facilities

The primary landside development area at the Airport consists of a linear layout, running west to east along the south side of the parallel taxiway. These facilities include a terminal area, aircraft parking aprons, Fixed Base Operator (FBO) facilities, general aviation aircraft storage hangars, fuel storage facilities, and access roadways.

**Aprons.** The main aircraft parking apron at Boulder Municipal Airport is located south of the parallel taxiway. This apron consists of approximately 284,000 square feet of aircraft parking and movement space (1,420 feet by 200 feet).

**Hangars and Aircraft Storage.** The Airport has two facilities for Fixed Based Operators (FBO). The FBO facilities are located on the south side of the runway, at the north end of the primary general aviation apron. The layout and location of the various hangar types are illustrated in Figure A3, entitled *EXISTING AIRPORT LAYOUT*.

The apron provides a total of 130 aircraft tiedown locations on paved areas and available for leasing to airport tenants. Additional tiedowns are located on the turf area east of the paved apron. The north side of the Airport, used solely for glider operations, currently has 24 glider tiedowns, 42 glider-trailer parking positions, and 6 tow plane tiedowns.

The Airport has 8 T-hangar structures, which contain 10 storage units in each, with an additional 10 maintenance/storage hangars located on airport property. The combined square footage of these five hangars is approximately 173,700 square feet.

**Glider Facilities.** Currently, a commercial glider operator and two glider clubs are based out of Boulder Municipal Airport. They share the parallel landing strip (Runway 8G/26G) and have their own tie down area. Landside facilities include an area north of the landing strip, vehicle parking, and several clubhouse facilities for the glider operations.

**Fuel Storage Facility.** Currently, aviation fuels are stored in three (3) underground storage tanks (USTs): two AvGas tanks have a storage capacity of 10,000 gallons each, and the Jet A tank also has a storage capacity of 10,000 gallons. In addition, a new self-serve fueling facility was installed at the Airport in 2005.

**Automated Weather Observing System.** The Airport is served by an Automated Weather Observing System III Precipitation/Thunderstorm (AWOS III P/T), which was installed in 2001 and is located 2,400 feet west of the Runway 26 threshold, and 525 feet south of the runway centerline. This facility measures the following weather parameters: wind speed, wind gusts, wind direction, wind variable direction, temperature, dew point, altimeter setting, density altitude, visibility, sky condition, and cloud height and type. The system is also capable of tracking precipitation and thunderstorm activity within 30 miles of the Airport. The AWOS III provides a minute-by-minute update to airborne pilots via VHF radio frequency. The radio frequency for Boulder Municipal Airport AWOS III P/T is 118.825 MHz, with a telephone access number of (303) 541-9540.

**Aircraft Rescue and Fire Fighting (ARFF) Facility.** Boulder Municipal Airport currently does not have on-airport fire fighting facilities, with the exception of typical safety devices such as fire extinguishers. Airport fire protection services are provided by the City of Boulder Fire Department. The nearest fire station is located approximately 2 miles southwest of the Airport. On-airport ARFF facilities are not required by the FAA at general aviation airports.

#### Existing Ground Access and Parking Facilities

**Ground Access.** From a regional perspective, ground access to Boulder Municipal Airport is provided by Airport Road (located just south of the Airport), by way of Valmont Road and Colorado State Highway 157, which is located adjacent to the west side of the Airport. Access to the airport's glider facilities can be made north of the Airport, on Independence Road.

**Parking Facilities.** There are several vehicular parking areas associated with the airport facilities located adjacent to the terminal building/FBO facilities, as well as next to the flight training school facilities and executive hangars. Parking facilities are also located on the north side of the Airport, where the glider operations are located.

#### Airspace System/Navigation and Communication Aids

As with all airports, Boulder Municipal Airport functions within the local, regional, and national system of airports and airspace. The following narrative provides a brief description of Boulder Municipal Airport's role as an element within these systems.

## Air Traffic Service Areas and Aviation Communications

Within the continental United States, there are some twenty-two geographic areas that are under Air Traffic Control (ATC) jurisdiction. Air traffic services within each area are provided by air traffic controllers in Air Route Traffic Control Centers (ARTCC). The airspace overlying Boulder Municipal Airport is contained within the Denver ARTCC jurisdiction. The Denver ARTCC includes the airspace in all of Colorado and portions of Kansas, Nebraska, Wyoming, Utah, Arizona, and New Mexico.

Boulder Municipal Airport can be found on both the Denver and Cheyenne sectional charts. Aviation communication facilities associated with the Airport include an Aeronautical Advisory Station (UNICOM) on frequency 122.725 (Aviation Services), air traffic control service (Denver Approach) on frequency 126.1, Boulder Automated Weather Observing System (AWOS) on frequency 118.825, and FSS on frequency 122.2 and 122.4. Boulder Municipal Airport does not have an air traffic control tower.

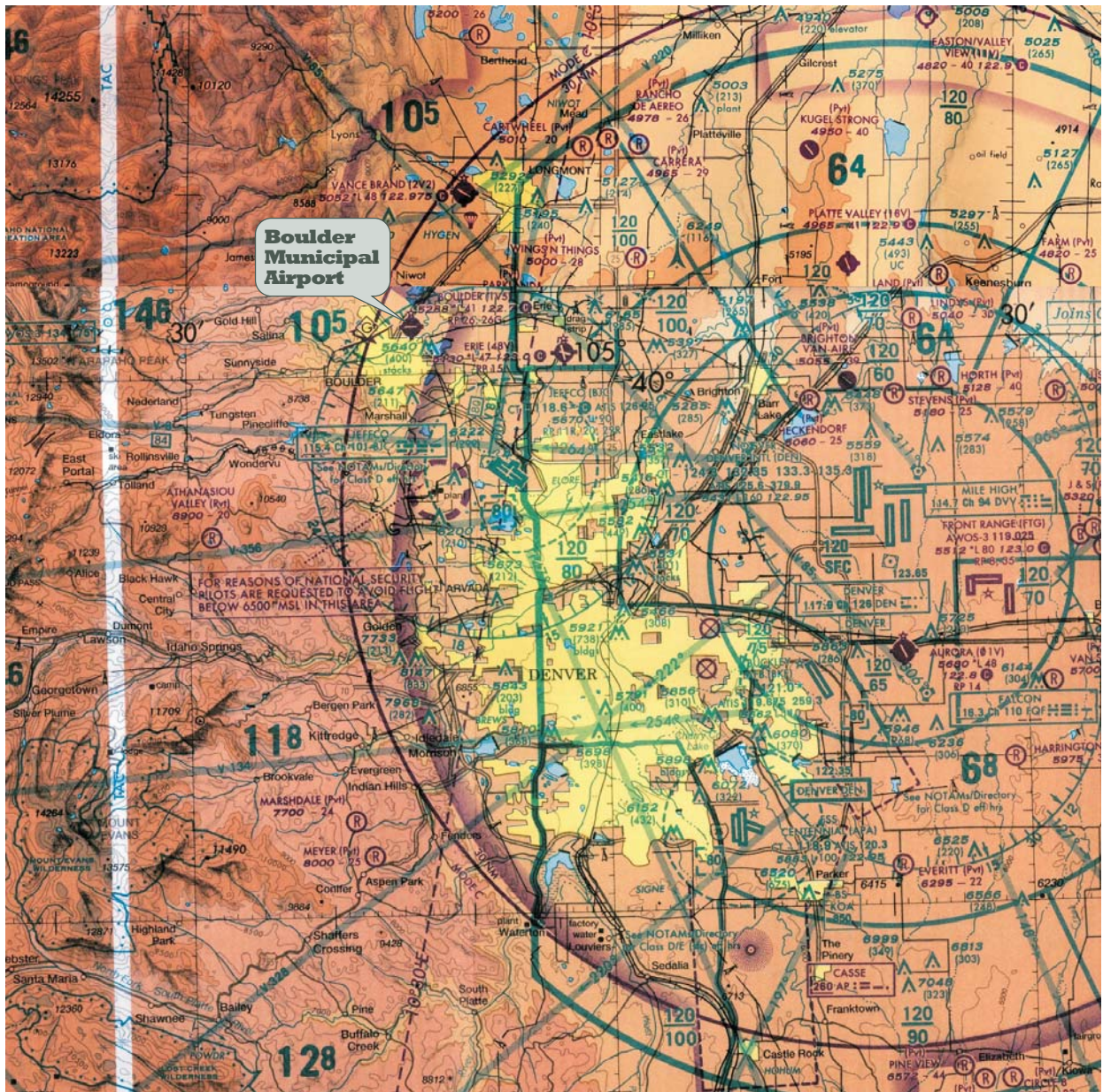
## Surrounding Terrain Description

The airfield property is located in the northeast portion of the City of Boulder, east of and adjacent to Hayden Lake (approximately 250 feet from the threshold of Runway 08). Rapidly rising terrain associated with the Rocky Mountains is located less than 4 miles west of the Airport.

## Airspace

The following illustration, *AIRSPACE/NAVAIDS SUMMARY*, depicts the surrounding airports, local airspace, and navigational facilities in the vicinity of Boulder Municipal Airport. Local airspace surrounding Boulder Municipal Airport is represented by a combination of Class G and Class E airspace. Because Boulder does not have an existing instrument approach, the Class G airspace that overlays the Airport extends from the surface up to 1,200 feet above ground level (AGL). The floor of the Class E airspace over Boulder is established at 1,200 feet AGL and extends upward to 18,000 feet above mean sea level (AMSL). Radio communications and transponders are not required to operate within these airspace areas under Visual Flight Rule (VFR) conditions; however, Instrument Flight Rule (IFR) flights must be capable of communicating with air traffic control (ATC), Denver Approach, and be Mode C Transponder equipped (capable of reporting altitude).

The primary controlled airspace influence in the vicinity of Boulder Municipal Airport is the Denver Class B Airspace, which is irregularly shaped and extends in concentric circles around Denver International Airport. The Denver Class B Airspace consists of controlled airspace extending upward from various floor elevations to a ceiling of 12,000



Approximate Scale: 1"= 11.5 Nautical Miles

**Figure A4** Airspace/NAVAIDS Summary

## Boulder Municipal Airport Airport Master Plan Update

Source: Sectional Aeronautical Charts: Denver & Cheyenne–January 2004.

feet AMSL, within which all aircraft are subject to specific operating rules (an ATC clearance must be obtained to enter the airspace); specified requirements on pilot qualification (a pilot must have a private pilot certificate or better; student pilots are allowed in this airspace classification if they have approval from their certified flight instructor and have had specialized instruction on flying in Class B airspace); and, aircraft equipment (a transponder with automatic altitude reporting and a two-way radio).

Boulder Municipal Airport is located approximately 6 nautical miles west of the western edge of the Denver Class B Airspace. In addition, a Mode C Veil is specified around Class B airspace<sup>1</sup>, within 30 nautical miles (NMs) of the Class B airport (i.e., Denver International Airport), and Boulder Municipal Airport is contained within this boundary. An altitude reporting Mode C transponder is required within this area when operating between the surface and 10,000 feet MSL. However, aircraft which were not originally equipped with an engine driven electrical system (including gliders) are excluded from this provision. In addition, radio communication with ATC is not required within the Mode C Veil, as long as the aircraft remains outside of the Class B airspace.

Military airports, military operations areas, and restricted areas can also impact airspace use in the vicinity of a civil airport. There is only one military airport within a 30 NM radius of Boulder Municipal Airport, which is Buckley Air Force Base (AFB). Buckley AFB is located approximately 23 NMs southeast of Boulder Municipal Airport. There are no Military Operations Areas (MOAs) in the vicinity of the Airport; however, there is National Security Area airspace located approximately 8 NMs south of Boulder Municipal Airport. Within this circular area, which includes approximately 6,000 acres, pilots are requested to avoid overflights below 6,500 feet MSL.

## Navigational Aids

A variety of navigational facilities is currently available to pilots around Boulder Municipal Airport, whether located at the field or at other locations in the region. Many of these navigational aids are available to en-route air traffic as well. The navigational aids (NAVAIDS) available for use by pilots in the vicinity of the Airport are Very High Frequency Omnidirectional Range Station with Distance Measuring Equipment (VOR-DME) and non-directional beacon (NDB) facilities, and these facilities are well positioned to serve the users of the Airport.

A VOR-DME system transmits a very high frequency signal, 360 degrees in azimuth oriented from magnetic north. This DME equipment is used to measure, in nautical miles, the slant range distance of an aircraft from the navigation aid. The Jeffco VOR-DME (115.4) is located approximately 8.5 NMs southeast of the Airport, the Denver

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<sup>1</sup> Criteria specified per Federal Aviation Regulations (FAR) Part 91.215.

VOR-DME (117.7) is located approximately 29.0 NMs southeast of the Airport, and the Kremmling VOR-DME (113.8) is located approximately 56.0 NMs west of the Airport.

A non-directional beacon (NDB) is an L/MF radio beacon transmitting non-directional signals, whereby the pilot of an aircraft equipped with direction finding equipment can determine his bearing to or from the radio beacon and track to or from the station. The operation of the NDB is very simple; however, precisely flying an NDB approach can be difficult. Therefore, NDB approach minimums are typically specified higher than other types of non-precision approaches. The Casse NDB (260.0) is located approximately 39.0 NMs southwest of the Airport, while the Greeley NDB (348.0) is located approximately 32.0 NMs northeast of the Airport.

In addition, several existing visual navigational aids are located on the Airport and available to pilots. These include a rotating beacon and a lighted wind cone with segmented circle, which is located on the south side of Taxiway “A”, near the Taxiway “A-4” connector. Three (3) additional wind socks are located in the vicinity of the east and west ends of the Airport. In addition, Runway 26 is equipped with Visual Approach Slope Indicators Lights (VASIs), which provide visual descent guidance, and are configured for a 3.5-degree glide path angle.

There is also a network of low-altitude published federal airways (i.e., Victor airways) in the vicinity of Boulder Municipal Airport, which traverse the area and span between the regional ground-based VOR/DME and VORTAC equipment. Victor airways include the airspace within parallel lines located 4 NMs on either side of the airway and extend 1,200 feet above the terrain to, but not including, 18,000 feet AMSL. When an aircraft is flying on a federal airway below 18,000 feet AMSL, the aircraft is operating within Class E airspace. In addition, the FAA has designated several VFR flyways located underneath or adjacent to the Denver Class B Airspace. These flyways are designed to assist VFR pilots in avoiding the major controlled traffic flows throughout the Denver area. The “south flow” flyway that is located along the western edge of the Denver Metropolitan Area is positioned approximately 5 NMs east of Boulder Municipal Airport, and extends southward from Longmont to the Chatfield Reservoir. This corridor permits VFR traffic to transit underneath the western boundary of the Denver Class B Airspace without requiring Air Traffic Control (ATC) clearances.

Boulder Municipal Airport does not currently have a published instrument approach. However, the FAA is in the process of certifying and implementing new Global Positioning System (GPS) instrument approach technology [i.e., both Wide Area Augmentation Systems (WAAS) and Local Area Augmentation Systems (LAAS)], and the cost of establishing new or improved instrument approaches at airports will be significantly reduced.

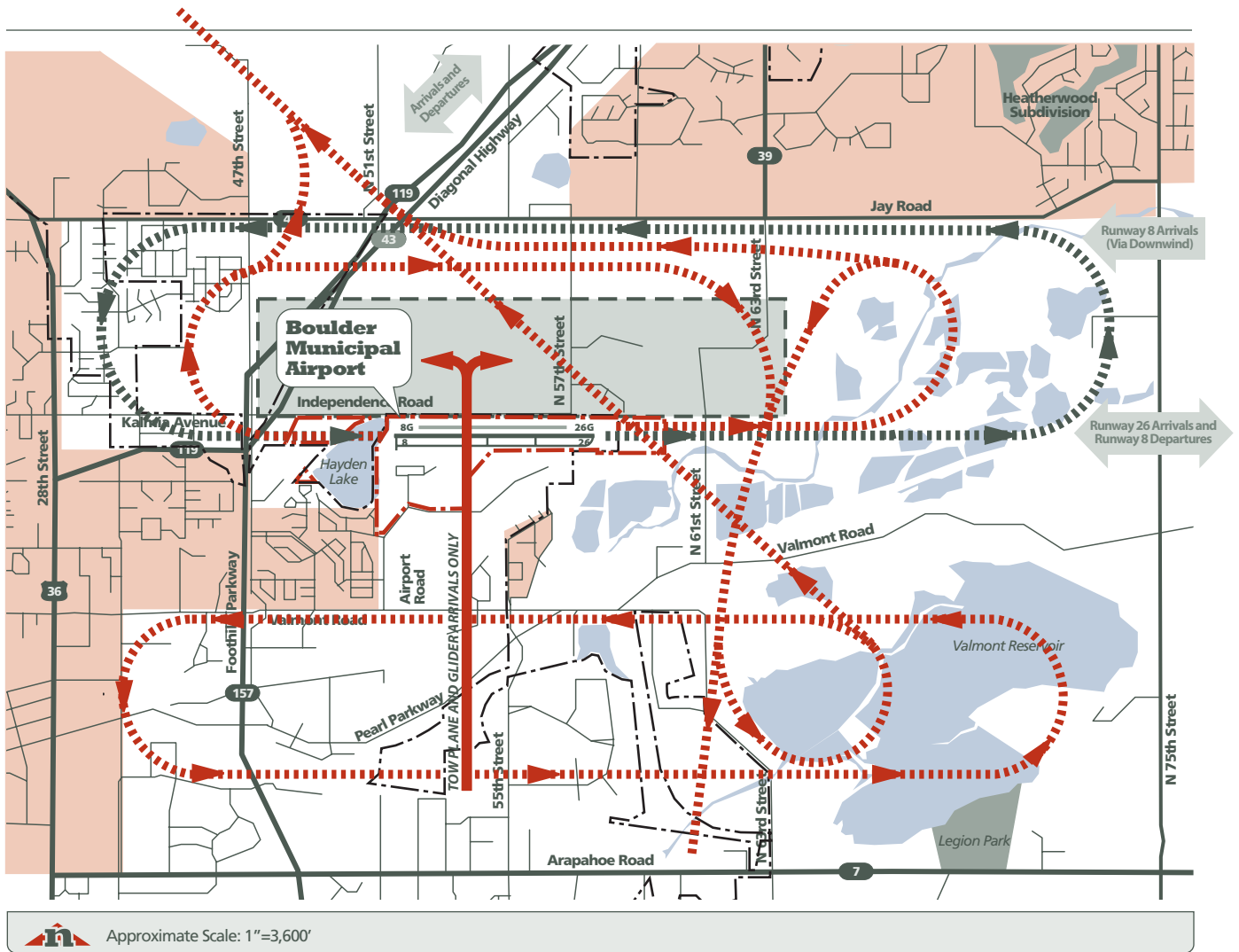
Navigation and communication aids will be evaluated in detail in following chapters, and future recommendations will be identified.

## Noise Abatement Procedures

There are several voluntary Noise Abatement Approach and Landing Departure and Pattern Procedures at Boulder Municipal Airport. Generally, aircraft operators are requested to avoid flying above the more densely populated residential areas. These areas are indicated in Figure A5, *AIRPORT TRAFFIC PATTERNS*. Generally, they include areas northwest and southwest of the Airport, unless an altitude of 7,500 feet or higher is maintained. Additionally, all downwind legs should be south of Jay Road. The general traffic pattern altitude is 6,300 feet above mean sea level (AMSL) (1,000 feet above ground level [AGL]).

Aircraft are requested to comply with the following procedures, unless weather conditions or aircraft limitations are present:

- All traffic pattern entries should be conducted in conformity with the City of Boulder Airport Noise Abatement procedures. All aircraft should be flown at or above 7,500 feet MSL over noise sensitive areas (outside of the traffic pattern) and at reduced power settings. These areas should be avoided when possible. Please ask for a copy of the City's procedures if you are not familiar with these areas.
- All downwind legs should be south of Jay Road and all base legs should be east of 30th Street for Runway 08 landings.
- Pilots are requested to operate their aircraft at the most reduced power settings in the airport traffic pattern or while entering the pattern consistent with safety. This should result in a reduced number of extended final approaches.
- Pilots should climb to at least five hundred feet AGL after takeoff before turning crosswind. All runway 08 departures should be straight out to the east. The Gunbarrel area should be avoided on departure.
- Runway 08 should be used for most operations (except night landings) and recommended when the wind is less than 5 knots from the west and expected to remain less than 5 knots, at the pilot's discretion and consistent with safe operating procedures.
- Pilots are requested to avoid making touch and go landings at Boulder Municipal Airport before 8 a.m. and after 5 p.m.



**Figure A5** Airport Traffic Patterns

- City Boundary
- Noise Sensitive Areas
- Glider Traffic Pattern
- Powered Aircraft Flight Track
- Glider/Tow Plane Flight Track
- Arrival/Departure Corridor

## Boulder Municipal Airport Airport Master Plan Update

Source: Base Map: Microsoft Street & Trips 2006. Traffic Patterns and Noise Sensitive Areas: Boulder Municipal Airport Noise Abatement Plan.



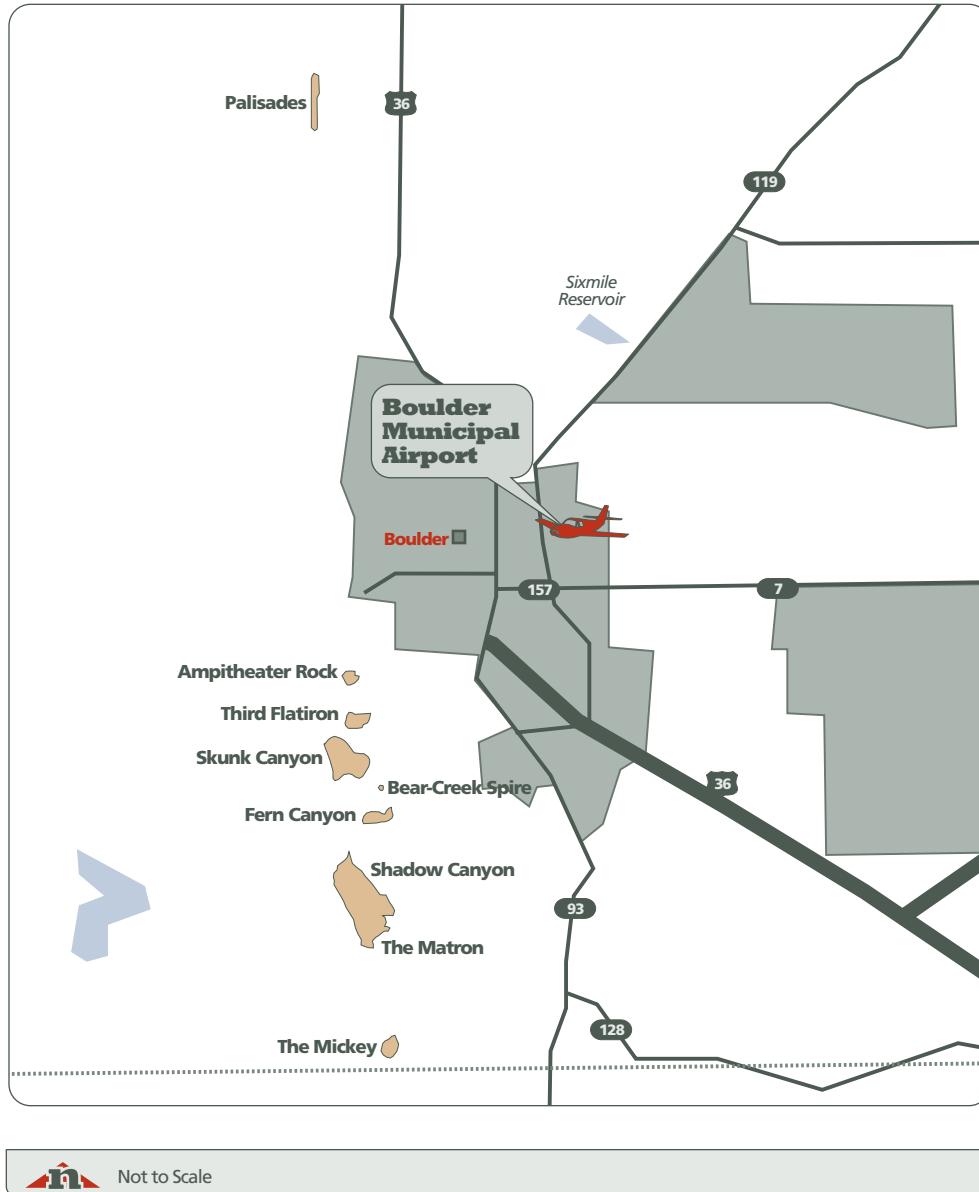
- Pilots using Boulder Municipal Airport are requested to avoid flight operations between 11 p.m. and 7 a.m.
- Straight in approaches to Runway 26 are recommended at night (winds and weather permitting).
- Early morning flight operations (before 7 a.m.) are discouraged. Early morning departures are requested to depart straight out to the east, reducing power setting consistent with safe operating procedures.

These procedures became effective in 1995 (August 1), and are published on the Airport's website.

The Airport also has existing systems in place for addressing and documenting aircraft noise reports that are received. Aircraft noise reports are directed to the Airport Manager's office. If staff is present, the call is taken, logged into the database, and responded to in the appropriate manner. If staff is not available to take the call, the voicemail service records the aircraft noise report and it is later entered into the data base and responded to by the Airport Manager. Aircraft noise reports can also be submitted through the Airport's Webpage. The aircraft noise reports database was started in 1987, and approximately 2145 complaints have been received to date, an average of 119 complaints per year.

### Wildlife Overflight Issues

In order to protect the nesting and roosting sites of raptors (prairie falcons, peregrine falcons, golden eagles, and osprey), the City of Boulder requests that aircraft and gliders voluntarily avoid flying near these areas to limit potential disturbance from February 1<sup>st</sup> through July 31<sup>st</sup> each year. The areas that pilots are requested to avoid are depicted on Figure A6, *SEASONAL RAPTOR CLOSURE AREAS*.



**Figure A6** Seasonal Raptor Closure Areas

## Boulder Municipal Airport Airport Master Plan Update

## Airport Environs

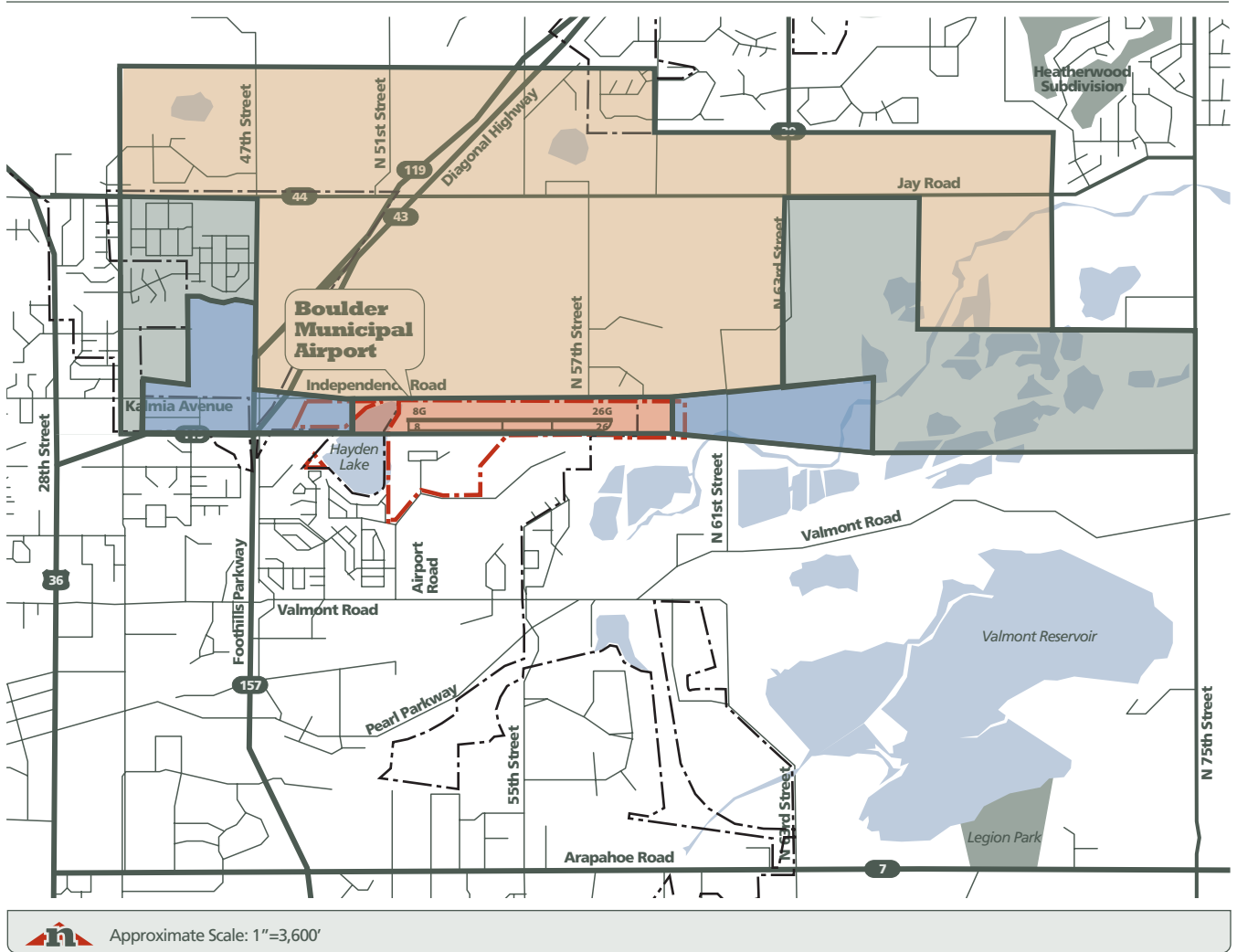
Boulder Municipal Airport is located within the city limits of Boulder, and adjacent to unincorporated Boulder County. Because the operation of an airport influences surrounding land use and surrounding land use has an influence on the operation of an airport, it is critical in any airport planning study to gain an understanding of existing and proposed land use types in the area near the airport. The following text and illustrations describe existing land use, existing zoning, and future land use in the airport environs.

### Existing Land Use and Zoning

Generally, the land to the east and directly west of the Airport is characterized as open space. Open space designations highlight that the long-term use of the land is planned to serve one or more open space functions, and may not reflect the current use of the land while in private ownership. Several residential properties are located north of the Airport, and two mobile home communities are located to the south and southwest of the Airport. Additionally, a jail complex is located south of the Airport.

The City has established an Airport Influence Overlay Zone and associated regulations that provide regulation for the types of development on the area surrounding the Airport to ensure compatible land uses in close proximity to the Airport. The use of the land within this airport influence overlay zone affects the safe and efficient operation of the Airport and aircraft that use the Airport, as well as affects the influences from airport operations such as noise, vibrations, fumes, dust, smoke, fuel particles, and other annoyances. Boulder Municipal Airport currently has four zones with respect to the Airport Influence Overlay Zone, shown on the illustration entitled *AIRPORT INFLUENCE OVERLAY ZONE MAP*. The four zones are listed as having the following guidelines:

- Zone Four: An aviation easement may be required as a condition of obtaining a new building permit, and all new utility lines will be placed underground.
- Zone Three: An aviation easement may be required as a condition of obtaining a new building permit, and all new utility lines will be placed underground. All applications for development will be submitted to the Airport Manager for review and comment.
- Zone Two: An aviation easement may be required as a condition of obtaining a new building permit, and all new utility lines will be placed underground. No new residential use is permitted, including nursing homes, group homes, congregate care facilities, group care facilities, and residential care facilities. Schools, hospitals, churches, libraries, hotels/motels, and day care facilities will be permitted only if permitted by the underlying zoning and determined to be situated and designed in a manner that alleviates safety concerns. All



**Figure A7** Airport Influence Overlay Zone Map

- Zoning Area 1
- Zoning Area 2
- Zoning Area 3
- Zoning Area 4
- City Boundary

## Boulder Municipal Airport Airport Master Plan Update

Source: Base Map: Microsoft Street & Trips 2006. Influence Area: City of Boulder Airport Influence Overlay Zoning Map.

applications for development will be submitted to the Airport Manager for review and comment.

- Zone One: No new construction will be permitted with the exception of airport construction. All new utility lines will be placed underground.

Another factor to consider with respect to land use compatibility is the potential for interference with navigation such as large objects in the flight path or safety zones and lighting that may reduce visibility and confuse or disorient pilots. The existing land use pattern in the area surrounding the Airport is generally compatible with airport operations. Hayden Lake has some large tree growth; however, the area is monitored and plant material that is determined to be an aviation hazard is trimmed to meet FAA requirements.

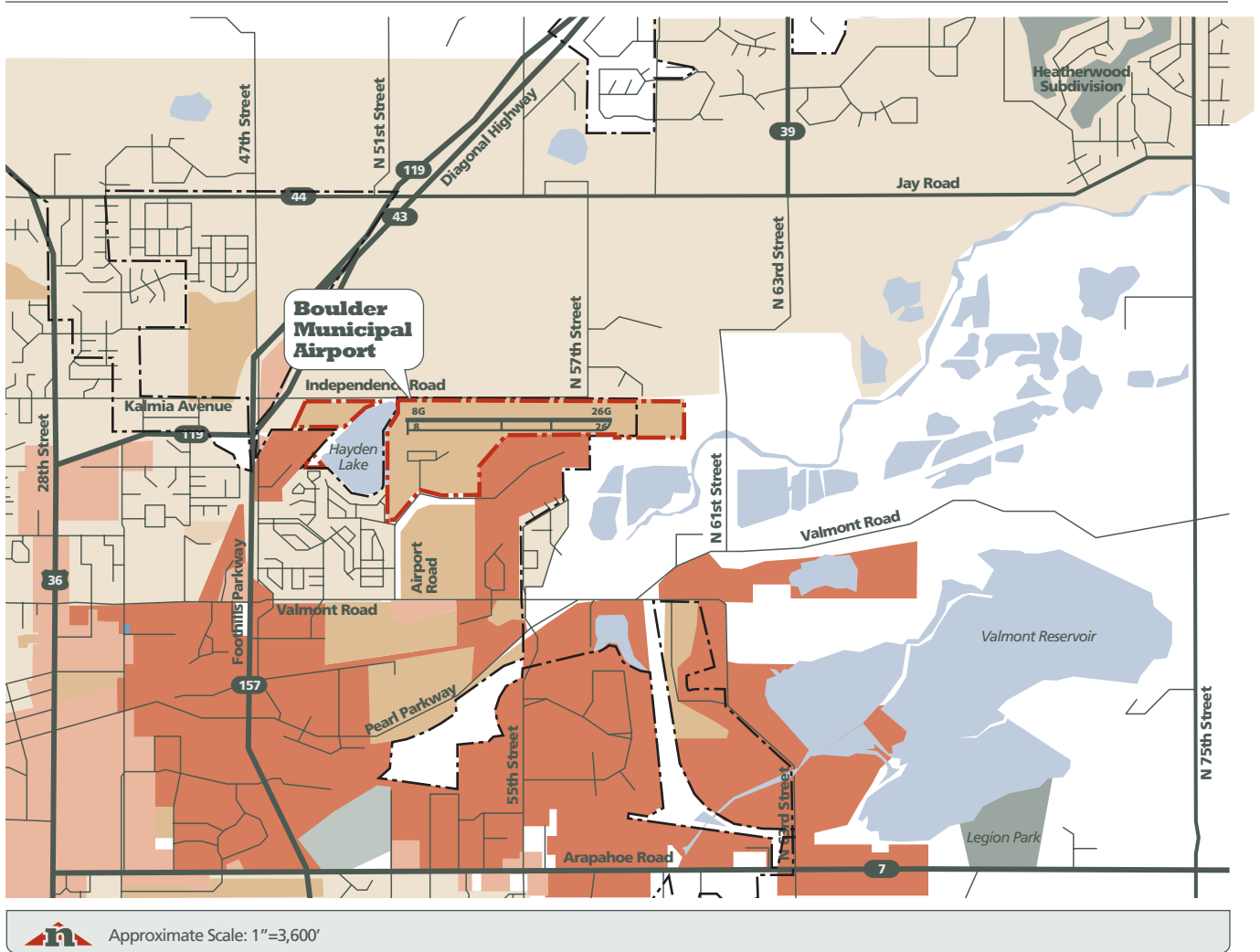
The Boulder County Land Use Code identifies airport hazards as “*any structure, object of natural growth, or use of land which obstructs the airspace required for the flight of aircraft in landing or taking off at an airport, or is otherwise hazardous to such landing or takeoff of aircraft.*” Additionally, the Boulder County Land Use Code provides specific language with respect to Airport Protection Surfaces.

### Existing Zoning

The following illustration, entitled *GENERALIZED EXISTING ZONING MAP*, provides a general idea of the land use zoning pattern in the area surrounding the Airport. The area illustrated encompasses portions of both the City of Boulder and unincorporated Boulder County, with the map depicting the zoning for both jurisdictions.

Zoning is the public regulation of the use of land. It involves the adoption of ordinances that divide a community into various districts or zones. Each district will allow a certain use of land within that zone, such as residential, commercial, and industrial (and many others). Typical zoning regulations address such things as the height of a building, number of people that can occupy a building, lot area, setbacks, parking, signage, and density.

Review of the existing land use types in the vicinity of the Airport reveals that the predominant land use for the Airport is classified as a P-E, defined by the City of Boulder as an established public use area where development is stable and few changes are anticipated or encouraged. Additional land uses within the area surrounding the Airport include:



**Figure A8** Generalized Existing Zoning Map

- |   |  |
|---|--|
|  Agricultural        |  Public             |
|  Industrial          |  Open Area          |
|  Commercial/Business |  Corporate Boundary |
|  Residential         |  |

## Boulder Municipal Airport Airport Master Plan Update

Source: Base Map: Microsoft Street & Trips 2006. Zoning: City of Boulder, Zoning Districts, 2002 & Boulder County, Zoning District Maps, 2001.

### *Commercial/Business/Industrial*

- IG-D: Developing industrial manufacturing area primarily used for research, development, manufacturing, and service industrial uses in buildings on large lots.
- TB-D: Transitional business areas, which have been or are to be, primarily used for commercial and complementary residential uses, including, without limitation, temporary lodging and office uses.
- IM-D: Developing industrial manufacturing areas primarily used for research, development, manufacturing, and service industrial uses in buildings on large lots.
- IS-D: Developing service industrial areas primarily used to provide to the community a wide range of repair and service uses and small-scale manufacturing uses.

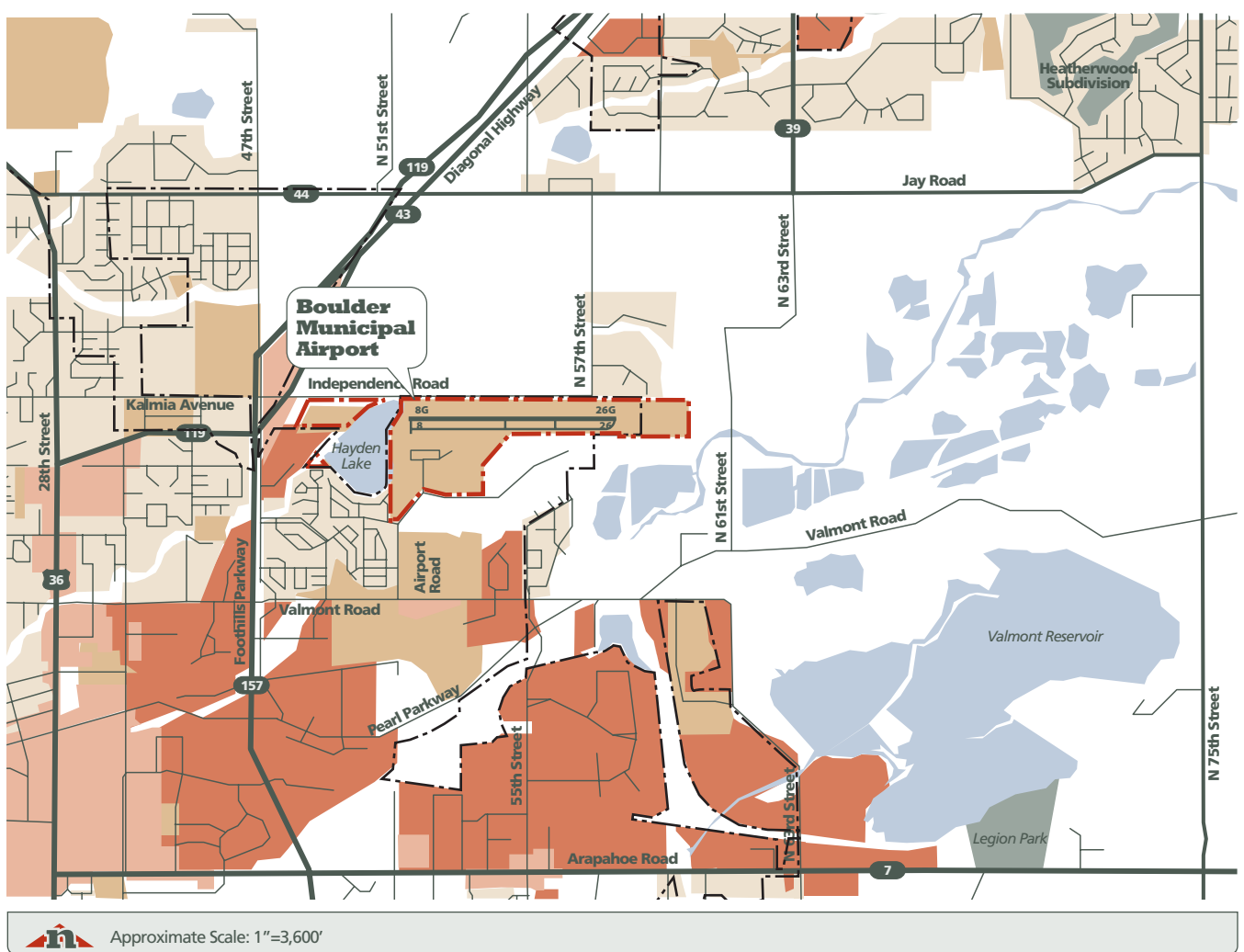
### *Residential*

- MH-E: Residential mobile homes in an established area where development is stable and few changes are anticipated or encouraged.
- MR-D: Medium density residential areas, which have been or are to be, primarily used for attached residential development, where each unit generally has direct access to ground level, and where complementary uses may be permitted under certain conditions.

## Future Land Use Planning

The future land use for the area surrounding Boulder Municipal Airport is depicted in Figure A9, *GENERALIZED FUTURE LAND USE*. This information was taken from the City of Boulder's Planning and Development Services website and the Boulder Valley Comprehensive Plan Land Use Map (November 2001).

The Boulder Valley Comprehensive Plan is a joint planning effort between the City of Boulder and Boulder County. It provides for shared land use decision making in the region by providing future growth and development guidance for the City of Boulder and county land that borders the City. The plan outlines the long-term future development pattern and sets the City of Boulder's land use and development policy to guide day-to-day development review decisions. Additionally, it is an important and effective tool to help manage the growth of Boulder.



**Figure A9** Generalized Future Land Use

- |   |  |
|---|--|
|  Agricultural        |  Public             |
|  Industrial          |  Open Area          |
|  Commercial/Business |  Corporate Boundary |
|  Residential         |  |

## Boulder Municipal Airport Airport Master Plan Update

Source: Base Map: Microsoft Street & Trips 2006. Future Land Use: City of Boulder, Boulder Valley Comprehensive Plan, 2001.



The area covered under the Comprehensive Plan consists of Boulder Valley, generally defined as those areas bound by the mountains on the west, 95<sup>th</sup> Street on the east, Davidson Mesa and the Coal Creek drainage on the southeast, the county line to the south, Mineral Road on the northeast, and Neva Road and Niwot Road on the north.

The City of Boulder has implemented growth management tools to control the scale, location, type, intensity, and timing of new development and redevelopment in order to achieve community goals and policies. The City and County retain a strong desire to preserve and enhance the physical, social, and economic assets of the community, and are focused on maintaining a community that is healthy, vibrant, and sustainable for its current and future generations. Furthermore, the City of Boulder is committed to improving resource conservation practices in all city operations, and will integrate environmental impact considerations in all decision making processes.

Additionally, the Boulder Valley Comprehensive Plan maintains that Boulder Municipal Airport “*shall continue as a small-scale general aviation airport. The City shall seek to mitigate noise, safety, and other impacts of airport operation while assuring that new development in proximity will be compatible with existing and planned use of the airport.*”

The Airport will continue to maintain the *Public* land use designation. The Boulder Valley Comprehensive Plan designates this land use for a wide range of public, private, and non-private uses that provide a community service, including municipal and public utility services (such as the Airport, water reservoirs, and water/wastewater treatment facilities). Other uses can include educational facilities, government offices, libraries, jails, government laboratories, cemeteries, churches, hospitals, retirement complexes, and other uses as allowed by zoning.

### Wildlife Issues

In addition to the previously discussed raptor overflight issues, Boulder Municipal Airport also monitors the influence of prairie dog habitat on aviation.

The City of Boulder has been committed to protecting prairie dogs since 1999, after several events during the 1990s raised awareness about the importance of prairie dogs in the grassland ecosystem, and their vanishing habitat. Numerous prairie dog management techniques have been implemented at Boulder Municipal Airport in order to protect prairie dogs and maintain the safety for pilots and their aircraft, and to ensure that safety mandates from the FAA are met. In the past, the Airport installed chain-link fencing (four feet in height) around certain portions of the Airport to reduce encroachment by prairie dogs and other wildlife. Most recently, the Airport has filled the holes left by vacated prairie dogs.

The City of Boulder holds three goals that should be utilized when considering strategies to protect wildlife in the urban area:

- 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.

## **Financial Inventory**

The primary goal of this task is to gather materials that summarize the financial management of the Airport. In addition, it is important to develop an understanding of the financial structure, constraints, requirements, and opportunities for airport activities as related to the development of a capital improvement program. The documents that have been gathered and reviewed for this financial inventory will be used to formulate a reasonable and financially sound Capital Improvement Program, with which to fund projects identified in the master planning process.

An airport is both a public service and a business, and must be operated as both. Financial assistance to public airports is often provided by the city, county, state, federal, and private sources, where available. In return, the airport provides jobs and supplies economic benefits to the area that it serves, as well as providing a major element of the public transportation system. This is the public service component. From a business standpoint, the airport has the ability to generate certain revenues and, therefore, the obligation to do so. The most successful and satisfactory method of accomplishing this is through a combination of fair and equitable fees and charges associated with the use of airport facilities. It is a federal requirement that airport generated revenues be used at the airport. Airport revenues can be derived from leases, rental rates, airfield fees and charges, airlines, cargo operators, and other operating revenue.

In consideration of these issues, the Airport's financial statements have been gathered for fiscal years 1999 through 2002. A review of the financial documentation for Boulder Municipal Airport indicates that the Airport is operationally self-supporting. The Airport is operated as an enterprise fund, with its income and expenses held separately from other City of Boulder funds. Major sources of revenue for the Airport include: leases, rents and royalties, miscellaneous charges for service, and interest from pooled investments, including federal and state grants.

Table A1  
**REVENUE AND EXPENSE SUMMARY, 1999-2002**  
*Boulder Municipal Airport Master Plan Update*

<b>Year</b>	<b>Revenues</b>	<b>Expenses</b>
1999	\$310,481	\$280,445
2000	\$378,529	\$318,326
2001 <sup>1</sup>	\$2,126,879	\$2,120,458
2002	\$476,808	\$458,336

**Source:** Airport staff from audited airport financial records.  
*1. This number includes both State and Federal Airport Improvement Plan (AIP) funds. Over \$1.7 million dollars in Federal funds was largely responsible for the high revenues and expenses in this year.*

For example, in 2001, a State of Colorado Division of Aeronautics grant (\$30,000) was received to assist with the installation of the Automated Weather Observing System (AWOS III P/T). The Airport's share was \$62,500 for the AWOS-III P/T system. In addition, the Airport's 2002-2008 Capital Improvement Program, on file with the FAA and the State of Colorado Aeronautics Division, has also been received and reviewed. The following improvements are listed on the Capital Improvement Program for Boulder Municipal Airport:

- Rehabilitate Medium Intensity Runway Lights (MIRL) *COMPLETE*
- Rehabilitate Medium Intensity Taxiway Lights (MITL) *COMPLETE*
- General Aviation Apron security and lighting *ONGOING*
- Master Plan Update *ONGOING*
- Seal Pavement Cracks *ONGOING*
- Apron Overlay (Phase 1) *FUTURE FAA/STATE PROJECT*
- Apron Overlay (Phase 2) *FUTURE FAA/STATE PROJECT*
- Rehabilitate Taxiway *FUTURE FAA/STATE PROJECT*
- Construct Equipment Building *FUTURE FAA/STATE PROJECT*

The current CIP on file with the FAA covers seven years and programs a total estimated expenditure of \$2,541,110, with the local share expected to be approximately \$187,425, the FAA's federal share will be approximately \$849,500, and the State of Colorado Department of Aeronautics' share to be \$187,425. It should also be noted that the

current CIP will be updated in conjunction with the revised project list that is prepared for this Master Plan Update.

## **Airport Lease Review**

The City of Boulder executes more than 30 leases for the use of land, hangars, and tie-downs at Boulder Municipal Airport. The city's goal within the airport leasing program is to remain financially self-sufficient while developing and maintaining quality, long-term capital improvements identified in the Airport Master Plan to support airport users and operations. The city is currently reviewing its leasing program to evaluate how well it is meeting this goal, as well as to ensure fair and equitable practices.

Upon initial review, the majority of the leases include typical provisions set forth to ensure that the City of Boulder can collect reasonable compensation for the lease of land and facilities at Boulder Municipal Airport. A general listing of these provisions is listed as follows:

- 1) Lease rate escalation clauses
- 2) Reasonable lease term lengths
- 3) Property reversion clause
- 4) Insurance requirements
- 5) Maintenance requirements
- 6) Termination provisions

In reference to the property reversion clause, the majority of the Airport's leases specify that the ownership of new buildings or hangars constructed on the Airport must transfer to the City of Boulder upon their completion. Due to the typical methods of financing and investment considerations associated with hangar development on airports, it is recognized that the Airport's existing property reversion clause has limited the construction of new aircraft storage facilities at Boulder Municipal Airport. A more typical arrangement is for private developers to retain ownership of the hangar for the term of the lease (e.g., 20 to 30 years), with the leasehold improvements becoming the property of the Lessor (i.e., the City of Boulder) at the end of the lease term, at the discretion of the Lessor. Extending lease terms past the current 20-year maximum should be considered if the city wishes to encourage private development to replace its aging facilities. A review of neighboring airports found that a 30-year lease is a more common practice when development is being funded by private sources.

Lease terms of 3 years or more would still be sent to City Council for approval, and all site plans for the hangar, apron/taxiway construction, grading, drainage, and other

improvements would continue to be reviewed and approved by the City of Boulder prior to construction.

In addition to examining lease terms, the City of Boulder is also reviewing its lease renewal process. It was found that many leases are in holdover status for months or years before a new lease is signed. This reduces the effectiveness of the leasing program in regards to managing occupancy rates, income, and maintenance. Part of the problem was due to confusion regarding a new state-wide Possessory Use Tax, which places a tax on businesses that are making a profit on public land, based on the amount of their land lease. Initially, tenants were reducing their tax by remaining in month-to-month leases but the Boulder County Assessors Office said that the courts have dictated month-to-month leases are viewed the same as a 1-year lease.

Boulder Municipal Airport is also responsible for meeting the requirements set forth in the FAA Airport Improvement Program, which includes compliance with the Wendall H. Ford Aviation Investment and Reform Act for 21st Century (AIR-21), the 49 CFR, and the United States Code (USC). When airport owners or sponsors, planning agencies, or other organizations accept funds from FAA-administered airport financial assistance programs, they must agree to certain obligations (or assurances). These obligations require the recipients to maintain and operate their facilities safely and efficiently and in accordance with specified conditions. The duration of these obligations depends on the type of recipient, the useful life of the facility being developed, and other conditions stipulated in the assurances.

One such assurance that needs to be examined more closely by the Airport is the enforcement of aviation-related use. Land and facilities on Airport property must be used for aviation-related purposes only, unless previously released by the FAA. Periodic and unannounced “Field Audits” are conducted by the FAA to ensure compliance with grant assurances.

### **Evaluation of Rates, Fees, and Charges**

The following table, entitled *SUMMARY OF AIRPORT FEES*, presents a listing of fees for Boulder Municipal Airport and various airports in the immediate vicinity of Boulder. Fees associated with the operation of the Airport are identified, reviewed, and compared to other airports in the region to assess their “competitiveness”, though this is not intended to serve as an in-depth comparative market survey. The intent of this effort is only to provide a summary of fees at Boulder Municipal Airport in comparison to adjacent airports within the region. Subsequent reviews of the fee structure at Boulder may indicate the need to raise certain rates, or implement fees not currently charged. However, the sponsor typically makes decisions concerning the level of airport fees with input from the airport’s tenant and user community. The goal is to establish fees at a

Table A3  
**SUMMARY OF EXISTING AIRPORT FEES<sup>(1)</sup>**  
*Boulder Municipal Airport Master Plan Update*

Airport/ Location	Ground Leases		FBO Revenue (% of Gross)	Fuel Flowage Fee	Average Tiedown Fee		Average Montly Aircraft Hangar Rent	
	Improved (/ft <sup>2</sup> /yr)	Unimproved (/ft <sup>2</sup> /yr)			Monthly	Nightly	(Small)	(Large)
Boulder Municipal/ Boulder, CO	\$0.30 <sup>(2)</sup>	\$0.127 <sup>(2)</sup>	20% <sup>(3)</sup>	\$0.06	\$39	\$5	\$200-260	N/A
Centennial/ Englewood, CO	N.A.	\$0.05/FBO \$0.29/Non	25% <sup>(6)</sup>	\$0.10	\$100	\$10	\$350	\$475
Front Range/ Watkins, CO	\$0.34	\$0.23	Varies <sup>(5)</sup>	\$0.05	\$55	\$5	\$280-380	N/A
Ft. Collins-Loveland/ Fort Collins, CO	\$0.30	\$0.30	1%	\$0.06	\$25 single \$35 twin	\$2.50	\$120-255	N/A
Greeley-Weld County/ Greeley, CO	\$0.18	\$0.18	None	\$0.06	\$30	\$30	\$170	N/A
Jeffco/ Denver, CO <sup>(4)</sup>	\$0.3347	\$0.2109	None	\$0.06 100ll \$0.08 JetA	\$75	N.A.	\$198-266	\$343
Vance Brand/ Longmont, CO	\$0.1825	\$0.1825	10%	\$0.06	\$35 single \$45 twin	\$7 single \$9 twin	\$215-385	\$700 <sup>(7)</sup>
National Average <sup>(4)</sup>	\$1.46	\$0.35	N.A.	N.A.	\$54.05	\$7.69	\$203.80	\$463.30

**Sources:** American Association of Airport Executives Airport Rates & Charges Survey 2001-2002 Volume 4 (General Aviation), American Association of Airport Executives Survey of Airport Rates & Charges 1999/2000 Volume 2 (General Aviation).

N.A. Not Available. N/A Not Applicable.

<sup>(1)</sup> Information was obtained from the City of Boulder Staff.

<sup>(2)</sup> In addition to standard construction costs, the City of Boulder imposes both development and permitting fees.

<sup>(3)</sup> 20% applies only to tiedown fee revenue. No other revenue has a fee associated with it.

<sup>(4)</sup> Information was obtained from 1999/2000 survey document.

<sup>(5)</sup> Charges or percentage varies with the item.

<sup>(6)</sup> 25% reflects tie-down rate. Other revenue is charged at a 3-10% rate.

<sup>(7)</sup> 2,000 square foot hangar.

level that will support airport operations and that is fair and equitable to tenants and users.

Overall, the existing airport fees for Boulder are on par with those for surrounding airports within the region, with the rental rate for unimproved ground being slightly higher than neighboring airports, but lower than the national average.

## Issues Inventory

Identification of the current and future planning issues, which may impact the use of a public facility, is an important step in the planning process. This is particularly true of an airport where infrastructure investment is great, where the issues are complex, and where the entire airport facility, along with its environs, should be planned in unison to minimize incompatibility between the airport and its surroundings.

The following list identifies the most significant issues facing Boulder Municipal Airport. Some of these issues have been gleaned from the meetings conducted in Boulder early in the planning effort, some from specific information gathered during the inventory process, while others relate to general airport planning principles. A goal of this plan is to evaluate these, along with other issues that will arise, and incorporate them into the formulation of the future plans for Boulder Municipal Airport:

- Understanding of existing/future Airport demand
- The Airport's role in the local economy and in the general aviation marketplace
- Airport compatibility with surrounding community
- Aircraft noise
- Airport infrastructure development
- Economic impact of operating the Airport
- General Aviation security measures
- Aircraft storage, current hangar use, and analysis of current leasing practices
- Aircraft flight paths
- Airport impact on wildlife
- "Right-sizing" the Airport for the community and defining its niche
- Maintain financial self sufficiency of the Airport
- Minimize noise impacts on residents and conduct flight pattern analysis

- Evaluate airport environmental issues (i.e., aircraft noise, overflight of raptor nesting areas, prairie dog habitat expansion)