Contents

Contents *iii*
Tables *v*
Illustrations *vi*

Inventory of Existing Conditions

Introduction A.1
Airport Role and Facilities A.4
Airspace System/Navigation and Communication Aids A.10
Airport Environs A.15
Financial Inventory A.20
Summary A.21

Forecasts of Aviation Activity

Introduction B.1
Historical Airport Activity Summary B.4
Aviation Activity Forecasts B.7
General Aviation Operations Forecast B.8
Military Operations Forecast B.9
Based Aircraft Forecast B.11
Summary B.13

Capacity Analysis and Facility Requirements

Introduction C.1
Airfield Capacity Methodology C.3
Airfield Capacity Analysis C.13
Capacity Summary C.14
Facility Requirements C.14
Airfield Requirements C.15
Landside Requirements C.27
Planning Issues Identification/Verification C.30
Summary C.32

Alternatives Analysis and Development Concepts

Introduction	D.1
Development Assumptions	D.1
Goals for Development	D.2
Airside & Landside Development Alternatives and Concepts	D.3
Alternatives Analysis and Development Concepts Summary	D.19
Conceptual Airport Development Plan	D.20

Airport Plans

Introduction	E.1
Airport Layout Drawing	E.2
Airport Airspace Drawing	E.5
Inner Portion of the Approach Surface Drawing	E.7
Threshold Siting Surface Drawing	E.7
Departure Surface Drawing	E.8
Terminal Area Drawings	E.13
Land Use Drawing	E.13
Airport Property Map	E.13

Environmental Overview

Introduction	F.1
Existing Conditions Summary	F.2
Environmental Analysis	F.4

Implementation Plan

Introduction	G.1
Implementation Schedule and Project List	G.2
Cost Estimates	G.2
Capital Improvement Program (CIP)	G.5
Phasing Plan	G.5
Financial Plan and Implementation Strategy	G.7
Summary – Master Plan Capital Improvement Program Financial Implications	G.10

Appendix

Tables

Table	A1	**AIRPORT FUEL SALES, 2000-2004**	A.9
Table	A2	**INSTRUMENT APPROACH PROCEDURES**	A.14
Table	A3	**REVENUE AND EXPENSE SUMMARY, 2000-2005**	A.20
Table	B1	**POPULATION INFORMATION, 2000-2025**	B.3
Table	B2	**HISTORICAL AVIATION ACTIVITY, 1995-2004**	B.5
Table	B3	**EXISTING OPERATIONS BY AIRCRAFT TYPE, 2004**	B.5
Table	B4	**HISTORIC BASED AIRCRAFT, 1995-2004**	B.6
Table	B5	**GENERAL AVIATION OPERATIONS FORECAST SCENARIOS, 2004-2025**	B.9
Table	B6	**MILITARY OPERATIONS FORECAST, 2004-2025**	B.9
Table	B7	**SUMMARY OF OPERATIONS FORECAST BY AIRCRAFT TYPE, 2004-2025**	B.10
Table	B8	**SUMMARY OF LOCAL AND ITINERANT OPERATIONS FORECAST, 2004-2025**	B.11
Table	B9	**BASED AIRCRAFT FORECAST SCENARIOS, 2004-2025**	B.12
Table	B10	**BASED AIRCRAFT FORECAST BY TYPE, 2004-2025**	B.12
Table	B11	**SUMMARY OF AVIATION ACTIVITY FORECASTS, 2004-2025**	B.13
Table	C1	**GEORGE AFB ALL WEATHER WIND COVERAGE SUMMARY**	C.6
Table	C2	**MARCH AFB ALL WEATHER WIND COVERAGE SUMMARY**	C.7
Table	C3	**MARCH AFB IFR WIND COVERAGE SUMMARY**	C.8
Table	C4	**AIRCRAFT CLASS MIX FORECAST, 2004-2025**	C.10
Table	C5	**ARC B-I (SMALL AIRCRAFT ONLY) DIMENSIONAL STANDARDS FOR RUNWAY 08/26 (IN FEET)**	C.16
Table	C6	**ARC B-II DIMENSIONAL STANDARDS FOR RUNWAY 08/26 (IN FEET)**	C.18
Table	C7	**RUNWAY 08/26 TAKEOFF LENGTH REQUIREMENTS**	C.23
Table	C8	**RUNWAY PROTECTION ZONE DIMENSIONS**	C.26
Table	C9	**GENERAL AVIATION FACILITY REQUIREMENTS, 2004-2025**	C.28
Table	C10	**FUEL STORAGE REQUIREMENTS, 2004-2025**	C.29
Table	C11	**FACILITY REQUIREMENTS SUMMARY, 2004-2025**	C.32
Table	D1	**AIRSIDE & LANDSIDE DEVELOPMENT ALTERNATIVES SUMMARY**	D.19
Table	F1	**EXISTING AND FUTURE OPERATIONS BY AIRCRAFT TYPE, 2004 & 2025**	F.4
Table	F2	**COMPARATIVE NOISE LEVELS**	F.6
Table	F3	**THREATENED AND ENDANGERED SPECIES OCCURRING IN OR NEAR BIG BEAR**	F.18
Table	F4	**SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS**	F.22
Table	G1	**PHASE I (1-5 YEARS) DEVELOPMENT PLAN PROJECTS**	G.3
Table	G2	**PHASE II (6-10 YEARS) DEVELOPMENT PLAN PROJECTS**	G.4
Table	G3	**PHASE III (11-20 YEARS) DEVELOPMENT PLAN PROJECTS**	G.4

Illustrations

Figure	A1	**AIRPORT LOCATION MAP**	A.3
Figure	A2	**AIRPORT VICINITY MAP**	A.5
Figure	A3	**EXISTING AIRPORT LAYOUT**	A.8
Figure	A4	**AIRSPACE/NAVAIDS SUMMARY**	A.13
Figure	A5	**GENERALIZED EXISTING LAND USE DISTRICT MAP**	A.18
Figure	A6	**AIRPORT SAFETY REVIEW AREAS**	A.19
Figure	C1	**GEORGE AFB ALL WEATHER WIND ROSE: 13-, & 10.5-KNOT CROSSWIND COMPONENTS**	C.6
Figure	C2	**MARCH AFB ALL WEATHER WIND ROSE: 13-, & 10.5-KNOT CROSSWIND COMPONENTS**	C.7
Figure	C3	**MARCH AFB IFR WEATHER WIND ROSE: 13-, & 10.5-KNOT CROSSWIND COMPONENTS**	C.9
Figure	C4	**REPRESENTATIVE AIRCRAFT BY AIRPORT REFERENCE CODE (ARC) DESIGNATION**	C.11
Figure	C5	**EXISTING ARC B-I (SMALL AIRCRAFT ONLY) DIMENSIONAL CRITERIA (NOT LOWER THAN ¾-MILE VISIBILITY MINIMUMS)**	C.17
Figure	C6	**POTENTIAL ARC B-II DIMENSIONAL CRITERIA (NOT LOWER THAN ¾-MILE VISIBILITY MINIMUMS)**	C.19
Figure	D1	**ALTERNATIVE ONE DEVELOPMENT PLAN**	D.6
Figure	D2	**ALTERNATIVE ONE-A DEVELOPMENT PLAN/EAST AREA DETAIL**	D.9
Figure	D3	**ALTERNATIVE TWO DEVELOPMENT PLAN**	D.12
Figure	D4	**ALTERNATIVE TWO-A DEVELOPMENT PLAN/EAST AREA DETAIL**	D.15
Figure	D5	**CONCEPTUAL AIRPORT DEVELOPMENT PLAN**	D.22
Figure	E1	**AIRPORT LAYOUT DRAWING**	E.4
Figure	E2	**AIRPORT AIRSPACE DRAWING**	E.9
Figure	E3	**INNER APPROACH SURFACE DRAWING-RUNWAY 08/26**	E.10
Figure	E4	**THRESHOLD SITING SURFACE DRAWING-RUNWAY 08/26**	E.11
Figure	E5	**DEPARTURE SURFACE DRAWING-RUNWAY 26**	E.12
Figure	E6	**TERMINAL AREA - WEST DRAWING**	E.14
Figure	E7	**TERMINAL AREA - EAST DRAWING**	E.15
Figure	E8	**LAND USE DRAWING**	E.16
Figure	E9	**AIRPORT PROPERTY MAP**	E.17
Figure	F1	**LAND USE COMPATIBILITY MATRIX**	F.10
Figure	F2	**EXISTING (2004) NOISE CONTOUR**	F.11
Figure	F3	**FUTURE (2025) NOISE CONTOUR**	F.12
Figure	G1	**PHASING PLAN**	G.6

Inventory of Existing Conditions

INTRODUCTION. Big Bear City Airport is located in the City of Big Bear City, California. Situated in the San Bernardino Mountain Range, 6,752 feet above sea level, the Airport serves several of the surrounding small communities, as well as what is known as Southern California's only Four Season Resort, Big Bear, with general aviation air service. Big Bear City Airport is open to the general public and to visiting aircraft 24 hours a day. Although the Airport does not have any commercial passenger activity, it does provide services such as aircraft parts and maintenance, sightseeing flights, aircraft charter, aircraft sales and rentals, a flight school, and aerial photography. The Airport has been in continuous operation at this site since 1928.

Big Bear City Airport is located in Southern California, approximately 40 miles outside of the Los Angeles metropolitan area, on the southern boundary of the San Bernardino Mountain Range. The Airport provides a safe operating environment for general aviation aircraft, ranging from gliders to small corporate jets. The airport's relative location within the region is illustrated in Figure A1, *AIRPORT LOCATION MAP.*

The City of Big Bear Lake and the unincorporated portion of San Bernardino County known as Big Bear City are both located among the peaks of the San Bernardino Mountain Range near Big Bear Lake. Big Bear City is surrounded by several communities, including Sugarloaf,

Fawnskin, Lake Arrowhead, Erwin Lake, and Baldwin Lake. Although Big Bear City has not grown significantly in the last ten years, the exponential growth of the surrounding communities has influenced Big Bear City 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 never been completed. The FAA typically requires a Master Plan and associated Airport Layout Plan (ALP) to be on file prior to receiving federal aid. The FAA also recommends that an Airport Master Plan be updated every 5-10 years.

Although no formal master plan had been initiated, the Big Bear Airport District has been making improvements to the airport facilities in order to stay ahead of operations at the Airport.

This Airport Master Plan Report 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 of Existing Conditions* chapter examines three basic elements involved with the existing and future development of Big Bear City Airport. 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.**

Subsequent chapters will detail the airport's forecasts of aviation activity, the ability of airport facilities to safely and efficiently meet the needs associated with the projected aviation activity, the compatibility of the Airport with surrounding land uses, and recommended future development within and around the airport property.

Approximate Scale 1" = 25 Miles

Figure A1 **Airport Location Map**

Master Plan Big Bear City Airport
Big Bear City, California

Source: Microsoft Street & Trips 2005.

Airport Role and Facilities

Big Bear City Airport is owned and operated by the Big Bear Airport District. The Airport is classified as a general aviation airport by the FAA's National Plan of Integrated Airport Systems (NPIAS). As shown in the previous illustration, entitled *AIRPORT LOCATION MAP*, Big Bear City Airport is located south of State Highway 38 and North of State Highway 18, on the western edge of Big Bear City, adjacent to the City of Big Bear Lake. Big Bear Lake lies directly to the west, while Baldwin Lake lies to the east. More detail is depicted, along with the airport's more immediate surroundings, in Figure A2, entitled *AIRPORT VICINITY MAP*.

Big Bear City 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, transport of mail and newspapers, along with other aviation-related activities.

According to a study completed by the Aeronautics Program of the California Department of Transportation (*BIG BEAR CITY AIRPORT ECONOMIC IMPACT REPORT, 1992*), Big Bear City Airport generated over $14,000,000 in economic activity and 123 jobs. 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). According to airport management, it is estimated that the Airport currently generates over $21,000,000 in economic activity to the region.

Approximate Scale 1" = 5 Miles

Figure A2 **Airport Vicinity Map**

Source: Google Maps— Map Data: NAVTEQ 2005.

Airside Facilities

Big Bear City Airport is operated with one primary runway, oriented in an east-west direction. Two parallel taxiways, one partial and one full, provide access to the runway from the general aviation development areas. Figure A3, entitled *EXISTING AIRPORT LAYOUT*, provides a graphic presentation of the existing airport facilities.

The Airport Reference Point (ARP) for Big Bear City Airport is located at Latitude 34° 15' 49.0300" N and Longitude 116° 51' 16.1100" W. The Airport has an elevation of 6,752 feet above mean sea level (AMSL) and encompasses approximately 117 acres.

Runway. The primary runway at the Airport has a designation of 08/26. It is 5,850 feet in length and 75 feet in width. The runway is constructed of asphalt and has a gross weight bearing capacity of 12,500 pounds single wheel main landing gear configuration. The runway asphalt is currently in excellent condition, having been reconstructed in 2004. The runway is equipped with Medium Intensity Runway Lights (MIRL), a 2-light Precision Approach Path Indicator system (PAPI) that provides a 4.0-degree approach slope to each runway end, and is marked with standard non-precision markings on each end.

Runway 08 has a displaced threshold of 370 feet, due to the location of Division Drive, which is located approximately 480 feet from the displaced threshold. Runway 26 has a displaced threshold of 600 feet, to account for trees located approximately 1,000 feet off of the runway approach end. In addition, Runway 08 has a published right-hand traffic pattern, with Runway 26 having a standard left-hand pattern.

Taxiway. In addition to the runway, the airside facilities at Big Bear City Airport consist of a taxiway system that provides access between the runway surface and the landside aviation use areas.

A 45-foot wide full-parallel taxiway serves Runway 08/26 (Taxiway "A"). The taxiway is constructed of asphalt, and has five connector taxiways that connect to the runway. The parallel taxiway is located on the south side of the runway and is separated from the runway by 200 feet (centerline to centerline). For night use, the taxiway system is equipped with a Medium Intensity Taxiway Lighting system (MITL).

In addition to the full-length parallel taxiway to the south of the runway, there is also a 40-foot wide partial parallel taxiway (Taxiway "B") to the north that provides access to the general aviation area on the north side of the field. Taxiway "B" is constructed of asphalt and has four

connector taxiways that connect the taxiway to the runway. The partial parallel taxiway is separated from the runway by 180-185 feet (centerline to centerline) and is also equipped with an MITL system.

Landside Facilities

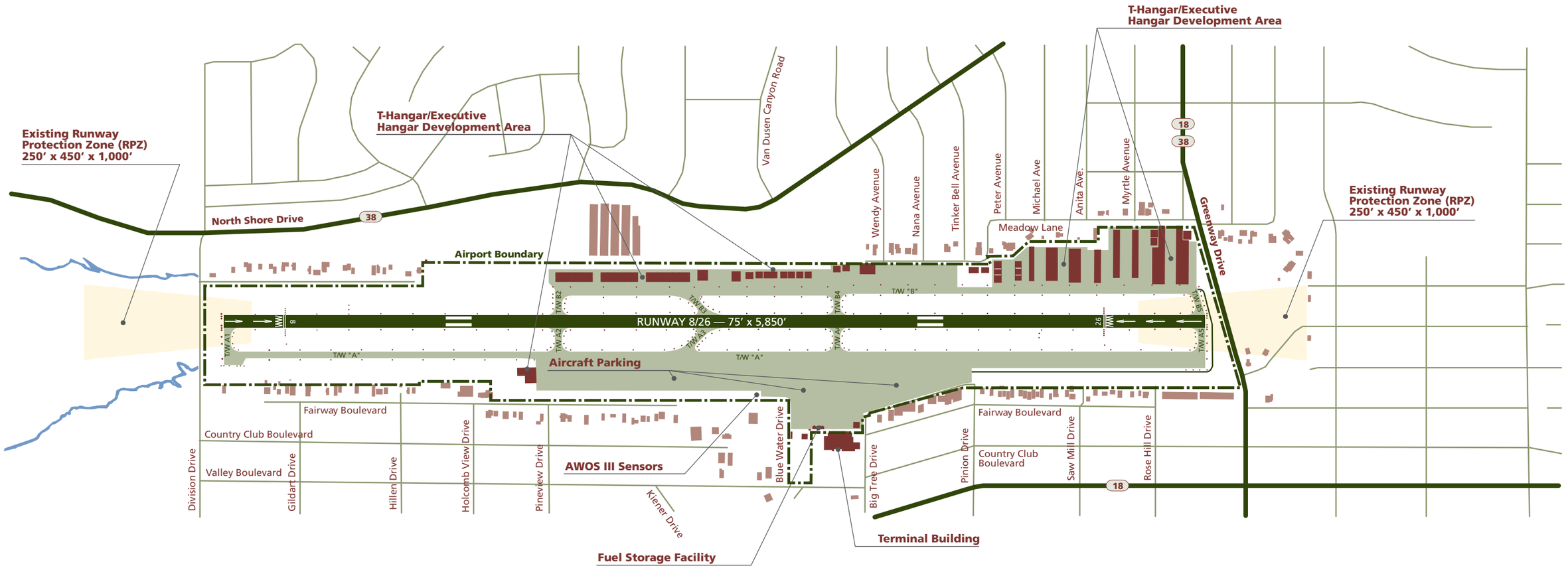
The primary landside development area at the Airport consists of a linear layout, running west to east along the parallel taxiways. These facilities include a terminal area, aircraft parking aprons, Fixed Base Operator (FBO) facilities, general aviation aircraft storage hangars, fuel storage facilities,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

Aprons. The main aircraft parking apron at Big Bear City Airport is located south of Taxiway "A". This apron consists of approximately 450,000 square feet of aircraft parking and movement space, providing approximately 218 aircraft tiedown positions.

Hangars and Aircraft Storage. The Airport currently has four Fixed Based Operators (FBO) on the field: Big Bear Airport District, Callaway Aviation, Vonesh Aviation, and Wing Waxers. Big Bear Airport District is the only fuel provider on the field, while the other three provide primarily maintenance and pilot services. In addition to the four FBOs located on the field, Pacific Crest Aviation, a full-service flight school, is located in the main terminal. The layout and location of the various hangar types are illustrated in Figure A3, entitled *EXISTING AIRPORT LAYOUT.*

The Airport provides a total of 270 paved aircraft tiedown locations. 240 tiedowns are located on the south side of the field on the main apron, while an additional 30 paved tiedowns are located on the north side of the field adjacent to Taxiway "B".

The Airport has approximately 105 hangar spaces in 31 separate buildings. The Airport has three maintenance/storage hangers located on airport property, as well as numerous storage units in leased hangars. The combined square footage of the three main maintenance hangers is approximately 2,450 square feet.



Approximate Scale 1" = 600'

Figure A3 **Existing Airport Layout**

Master Plan Big Bear City Airport
Big Bear City, California

Source: VSA Airport Engineers & Constructors: Big Bear City Airport Layout Plan, 2002.

Fuel Storage Facility. The airport's fuel storage facility, which is owned and operated by Big Bear City, is located on the south side of the runway, directly northwest of the terminal building on the general aviation ramp. Currently, aviation fuels are stored in two above-ground storage tanks: one 10,000-gallon 100LL AvGas tank and one 5,000-gallon Jet A tank[1]. The AvGas is distributed from a fuel pump located on the apron and the Jet A is delivered via a fuel truck. The City is responsible for maintaining the storage tanks to current Environmental Protection Agency (EPA) standards. The fuel sales records for the past five years are presented in the following table, entitled *AIRPORT FUEL SALES, 2000-2004.*

Table A1
AIRPORT FUEL SALES, 2000-2004

Year	AvGas (gallons)	Jet A (gallons)	Total (gallons)
2000 (1)	89,421	21,344	110,765
2001 (1)	98,724	25,357	124,081
2002 (1)	131,147	42,560	173,707
2003 (1)	123,904	28,620	152,524
2004 (1)	148,086	22,515	170,601

Source: Big Bear City Airport management records. (1) Fuel sales are based on the Big Bear City fiscal year, which ends on June 30th.

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 2005 and is located approximately 3,000 feet east of the Runway 08 end of pavement, and 450 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 the Big Bear City Airport AWOS III P/T is 135.925 MHz.

Aircraft Rescue and Firefighting (ARFF) Facility. The Airport does not presently have an Aircraft Rescue and Fire Fighting (ARFF) facility on the field; however, fire protection services for the

[1] Airport management has indicated that the existing Jet A fuel tank is undersized and that the Airport is considering an upgrade to a 10,000-gallon storage facility.

Airport are provided by the Big Bear City Fire Station No. 291, located approximately three blocks south of the east end of the Airport.

Existing Ground Access and Parking Facilities

Ground Access. From a regional perspective, ground access to the terminal and main entrance to Big Bear City Airport is provided by West Big Bear Boulevard, by way of State Highway 18, which is located on the south side of the Airport. The aviation facilities located on the north side of the Airport are accessed via North Shore Drive, by way of State Highway 38.

Parking Facilities. There are numerous automobile parking areas associated with the airport facilities located adjacent to the general aviation terminal building and FBO facilities, as well as next to the flight training school facilities and executive hangars on the north side of the Airport.

Airspace System/Navigation and Communication Aids

As with all airports, Big Bear City Airport functions within the local, regional, and national system of airports and airspace. The following narrative provides a brief description of Big Bear City 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 Big Bear City Airport is contained within the Los Angeles ARTCC jurisdiction. The Los Angeles ARTCC includes the airspace in Southern California and portions of Nevada, Utah, and Arizona.

Big Bear City Airport can be found on the Los Angeles sectional chart. Aviation communication facilities associated with the Airport include an Aeronautical Advisory Station (UNICOM) on frequency 123.05 (Big Bear Airport District), Los Angeles Center (Approach/ Departure Control) on frequency 126.35, Southern California Approach on frequencies 127.25 and 119.65, Joshua Approach on frequency 124.55, Big Bear City Automated Weather Observing System (AWOS) on frequency 135.925, and Riverside FSS on frequency 122.2. Big Bear City Airport does not have an air traffic control tower (ATCT).

Surrounding Terrain Description

The airfield property is located in the central portion of Big Bear City, east of Big Bear Lake and west of Baldwin Lake. The Airport is located in a valley surrounded by rapidly rising terrain associated with the San Bernardino Mountain Range. Aircraft access to the facility from the west through the Cajun Pass area is the recommended route, due to its relatively flat mountainous terrain and clearance of leeward mountains.

Airspace

The following illustration, *AIRSPACE/NAVAIDS SUMMARY*, depicts the surrounding airports, local airspace, and navigational facilities in the vicinity of Big Bear City Airport. Local airspace surrounding Big Bear City Airport is represented by a combination of Class G and Class E airspace. The Class E Surface Airspace is typically represented as a five-statute mile radius circular area around the Airport and includes any extension necessary to include instrument approach and departure paths. Class E Airspace includes the controlled airspace extending upward from 700-1,200 feet above the airport elevation. These areas are generally designated at outlying airports with low activity and with non-precision instrument approach procedures providing high minimum descent altitudes. 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), which is currently Southern California Approach for south and westbound traffic, Los Angeles Center for eastbound traffic, and Joshua Approach for northbound traffic. All IFR traffic must also be Mode C Transponder equipped (capable of reporting altitude).

Military airports, military operations areas, and restricted areas can also impact airspace use in the vicinity of a civil airport. There are two military airports located within a 35-NM radius of Big Bear City Airport; March Air Reserve Base (KRIV) is located approximately 31 NMs to the southwest and Twenty-nine Palms EAF Airport (KNXP) is located approximately 34 NMs east of Big Bear City Airport. There are no Military Operations Areas (MOAs) in the vicinity of the Airport; however, there is a Restricted Area (R-2501W) located approximately 24 NMs northeast of the Airport. All civil operations in this area are restricted to an unlimited altitude and control is maintained by the Los Angeles Center on frequency 128.15.

Navigational Aids

A variety of navigational facilities is currently available to pilots around Big Bear City 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 VOR-DME, VORTAC, and NDB facilities.

A VOR-DME system is a Very High Frequency Omnidirectional Range Station with Distance Measuring Equipment transmitting very high frequency signals, 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 Palm Springs VORTAC (115.5) is located approximately 31.7 NMs southeast of the Airport, the Victorville VOR-DME (109.4) is located approximately 33.1 NMs northwest of the Airport, the Homeland VOR (113.4) is located approximately 33.5 NMs southwest of the Airport, and the Riverside VOR-DME (112.4) is located approximately 35.0 NMs southwest 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 Petis NDB (397.0) is located approximately 28.0 NMs southwest of the Airport, while the San Jacinto NDB (227.0) is located approximately 29.0 NMs southwest 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-2" connector[2]. Three additional supplemental wind socks are located in the vicinity of the east and west ends of the Airport. In addition, both runway ends are equipped with Precision Approach Path Indicators (PAPIs), which provide descent guidance for the visual segment of the approach, and are configured for a 4.0-degree glide path angle.

[2] Airport management has current plans to relocate the existing segmented circle to an infield area location of the Airport to improve pilot visibility.

Approximate Scale 1" = 7.5 Nautical Miles

Figure A4 **Airspace/NAVAIDS Summary**

Source: Los Angeles Sectional Aeronautical Chart — 76th Edition, December 04.

There is also a network of low-altitude published federal airways (i.e., Victor airways) in the vicinity of Big Bear City 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 four 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.

Big Bear City Airport currently only has one published instrument approach to the Airport. Runway 26 is equipped with an RNAV Global Positioning System (GPS) approach. The Runway 26 RNAV approach allows for 2000-foot ceilings and either a 1 ¼-mile visibility minimum or a 1 ½-mile visibility minimum, depending on approach speeds. 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.

Table A2
INSTRUMENT APPROACH PROCEDURES

Approach	Designated Runway(s)	Ceiling Minimum (AGL)	Visibility Minimums (1)
RNAV	Runway 26	1932′ AGL	1-¼ Mile (1)/ 1-½ Mile (2)

Source: U.S. Terminal Procedures, Southwest (SW), Vol. 3 of 4, 17 March 2005. (1) Category A aircraft.
(2) Category B aircraft.

Noise Abatement Procedures

There are several voluntary Noise Abatement Approach, Departure, and Pattern Procedures at Big Bear City Airport. Aircraft that are departing Runway 26 are asked to execute a 10-degree left turn at the end of the runway and perform a maximum climb consistent with their aircraft's performance and weather conditions, remaining south of a strobe light located north of the field. However, any aircraft departing Runway 26 making a downwind departure or remaining in a closed pattern are requested to climb to 7,500 feet MSL or higher prior to making a left crosswind turn.

Aircraft departing Runway 08 are also requested to execute a 10-degree left turn at the end of the runway and to maintain a maximum climb consistent with the performance of their aircraft and weather conditions. In addition, traffic for Runway 08 is specifically requested to avoid over flying the school (identified as a round building) and the adjacent playgrounds. Also, seaplane landings are forbidden on Big Bear Lake at all times.

Airport Environs

An understanding of the existing land uses, zoning patterns, and the various land use planning and control documents used to guide development of property surrounding the Airport is an important element in the airport planning process.

Big Bear City Airport is located within the unincorporated portion of San Bernardino County known as Big Bear City. However, the Airport is adjacent to the City of Big Bear Lake, which bounds airport property to the west. The land uses associated with the immediate areas surrounding the Airport are generally medium density residential and open space with some mixed light industrial and commercial land uses. Overall, residential is the dominant land use in the vicinity of the Airport. 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

Big Bear City Airport occupies 117 acres of land within the city limits of Big Bear City. The Airport is bounded to the west by Big Bear Lake; on the north by State Highway 38, residential, and commercial development; on the east by State Highways 18 and 38, a local park, and residential development; and, on the south by State Highway 18, residences, and commercial businesses.

Land Use Zoning

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 things such as the height of a building, number of people that can occupy a building, a lot area, setbacks, parking, signage, and density.

The San Bernardino County Planning Department prepared an Airport Comprehensive Land Use Plan for Big Bear Airport in 1992 that supplements the San Bernardino County General Plan that was completed in 1989. The Airport is classified as "institutional", with a small portion incorporating floodway and high density residential land uses. The Plan establishes land uses for the planning area in the vicinity of the Airport, and includes an overlay zoning boundary that is defined by three Safety Review Areas, which include:

- **Safety Review Area 1: Those areas at the end of a runway that correspond with the FAA designated runway protection zones (RPZ).**
- **Safety Review Area 2: Those areas within the 65 CNEL (community noise equivalency level) noise contours.**
- **Safety Review Area 3: The area within one mile of the outer boundaries of the Airport ownership (for airports without an adopted 65 CNEL noise contour.)**

The Safety Review Areas for Big Bear City Airport are defined in the following text.

Safety Review Area 1 encompasses high density residential and institutional land use districts at the approach end of Runway 26 and overlays a floodway district at the approach end of Runway 08. Land uses normally acceptable within the Safety Review
Area 1 include agriculture; however, land uses such as livestock and animal breeding, golf courses, riding stables, water recreation, and cemeteries are considered acceptable, aside from new construction or development. Although the floodway district at the approach end of Runway 08 is acceptable, the residential and institutional land uses are not compatible with airport operations.

Safety Review Area 2 is zoned for a single-use institutional, with the primary purpose of identifying existing lands and structures committed to public facilities and public need. The Plan indicates that this land use district is compatible with the aviation activity at the Airport.

Safety Review Area 3 encompasses high, medium, and low density single family residential, high density multi-family residential, commercial, several small areas of industrial and institutional, floodway, and resource conservation. There are two areas within Area 3 that require special consideration: beneath the extension of the approach surface (outer 4,000 feet) and beneath the transitional surfaces. The land use districts below the approach surfaces to Runway 26 are high density single family residential and high density commercial. Land use districts below the approach surface to Runway 08 are high density single family residential and floodway. Land

use districts under the transitional surfaces are high and medium density single family residential, high density multi-family residential, commercial, and industrial.

The following illustration, entitled *GENERALIZED EXISTING LAND USE DISTRICT 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 Big Bear Lake and Big Bear City, with the map depicting the zoning for both jurisdictions. In addition, Figure A6, entitled *AIRPORT SAFETY REVIEW AREAS*, depicts the existing Safety Review Areas in the vicinity of the Airport. In addition, the San Bernardino County General Plan is currently being updated with the preparation of various Draft Community Plans within the County. The Big Bear Valley Community Plan was completed in April 2005 and includes 137 square miles of unincorporated area surrounding the City of Big Bear Lake, including the community of Big Bear City. It is critical that the findings of this new planning study include the location and operation of Big Bear City Airport upon surrounding land uses within the airport environs.

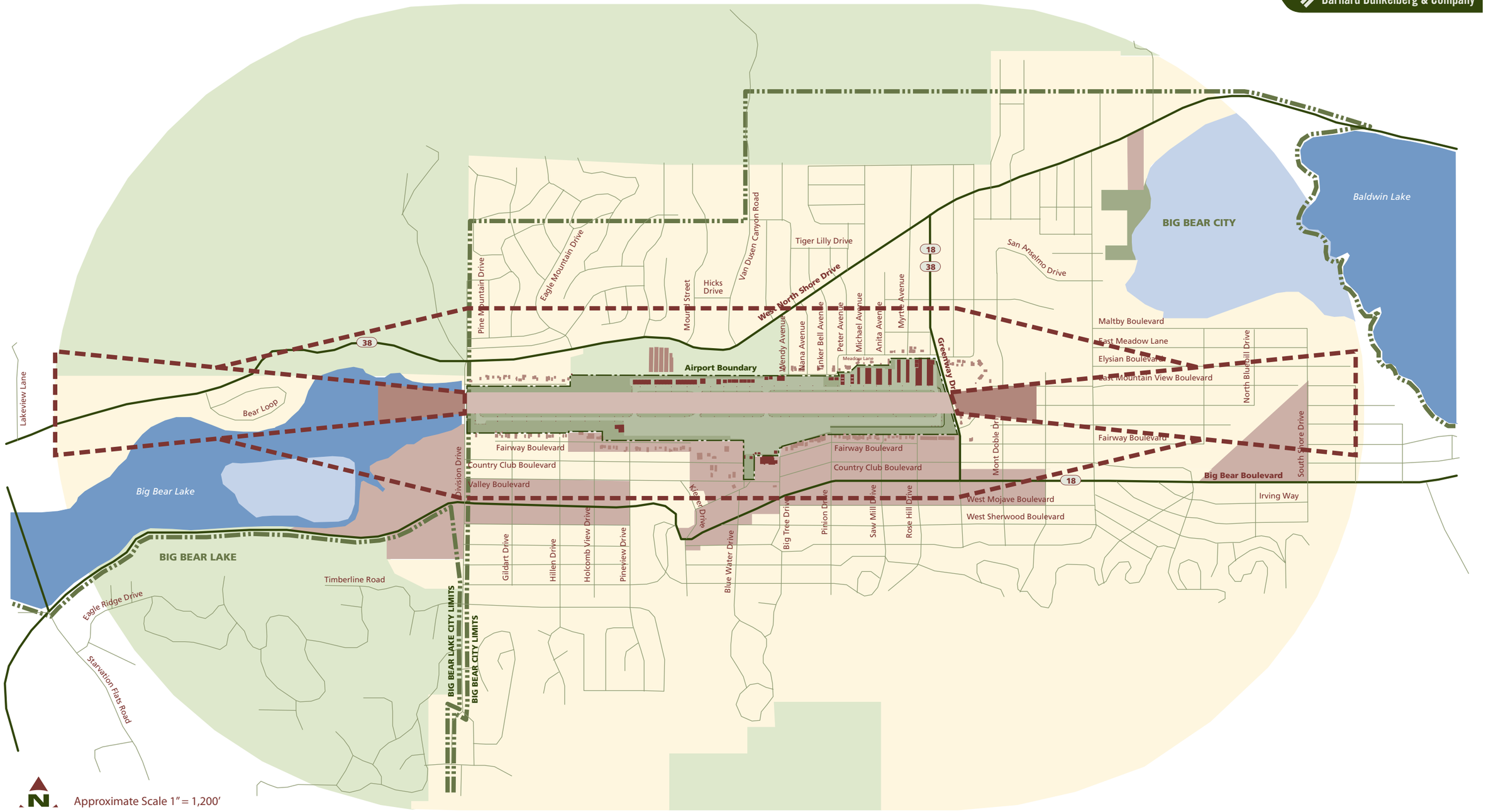


Figure A5 **Generalized Existing Land Use District Map**

- Residential
- Commercial
- Institutional
- Resource Conservation
- Floodway

Master Plan Big Bear City Airport
Big Bear City, California

Source Existing Zoning: San Bernadina County Planning Department, Big Bear City Airport Comprehensive Plan, Febraury 1992.
Source: Base Map: Google Maps— Map Data: NAVTEQ 2005.

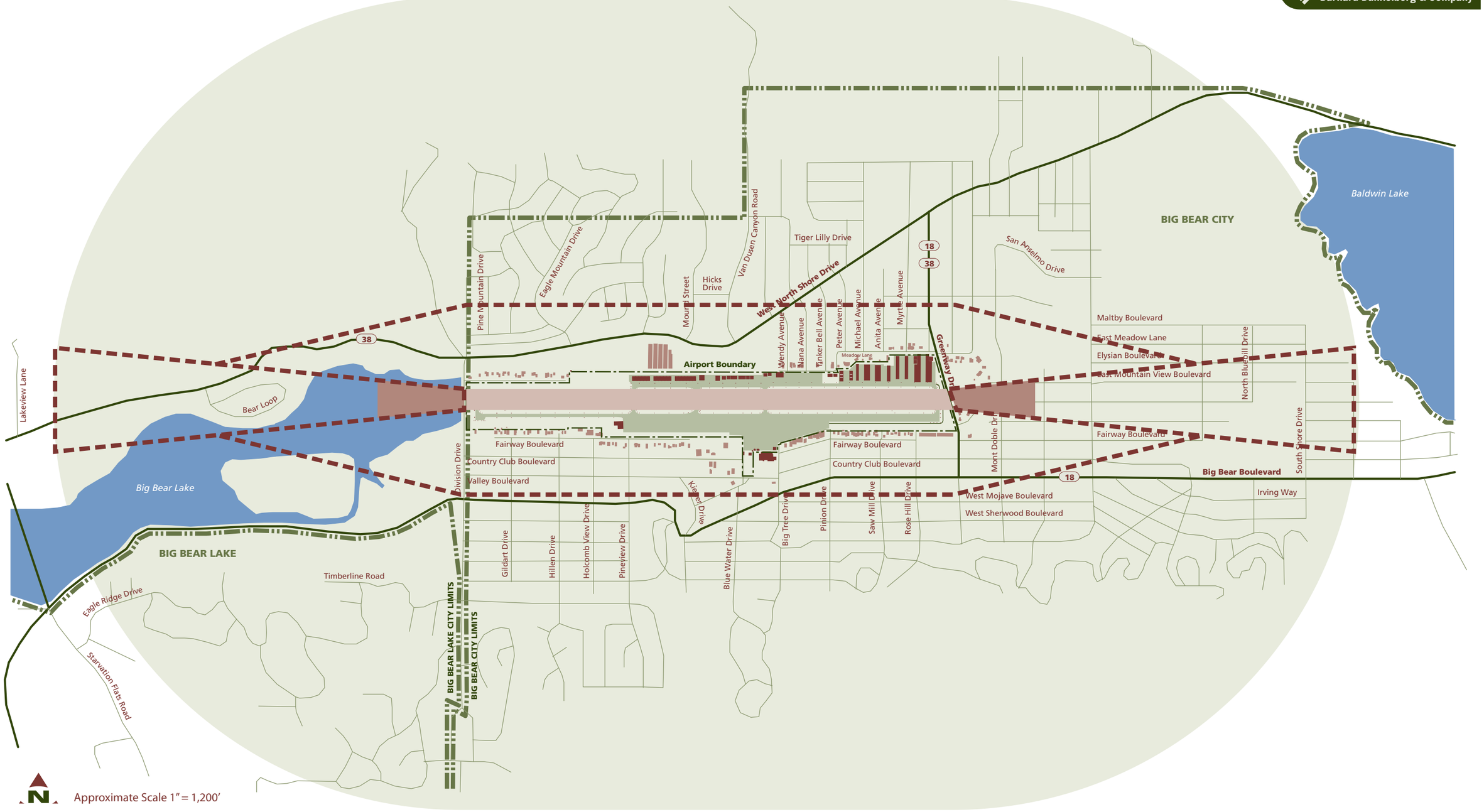


Figure A6 **Airport Safety Review Areas**

- Safety Review Area 1
- Safety Review Area 2
- Safety Review Area 3

Source Existing Zoning: San Bernadina County Planning Department, Big Bear City Airport Comprehensive Plan, Febraury 1992.
Source: Base Map: Google Maps— Map Data: NAVTEQ 2005.

Master Plan Big Bear City Airport
Big Bear City, California

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.

With this in mind, the airport's financial statements have been gathered for fiscal years 2000-2005. In addition, Federal and State capital improvement grant information has been compiled, including current funding policies and a historical review of previous grants received. The airport's current five-year Capital Improvement Program has also been received and reviewed.

The review of the financial documentation for Big Bear City Airport indicates that the Airport is self-supporting between generated airport revenues and Special Use District tax proceeds, and that no moneys from the General Funds of the City of Big Bear Lake, Big Bear City, or San Bernardino County are used to support operational or capital expenditures at Big Bear City Airport.

As identified in the 2005 Profit and Loss Budget Overview for the Big Bear City Airport District, major sources of revenue for the Airport include: tax revenues, fuel sales, airport fees, commercial leases, and hangar and tiedown rentals. Major expenditures include: salaries and wages, personnel benefits, professional services, utilities, supplies, and repair and maintenance.

Table A3
REVENUE AND EXPENSE SUMMARY, 2000-2005

Year	Revenues	Expenses
2000	$1,026,601	$811,181
2001	$1,199,850	$908,390
2002	$1,407,782	$1,119,226
2003	$1,101,566	$624,311
2004	$1,293,682	$662,305
2005	$1,484,992	$877,439

Source: Airport staff from audited airport financial records.

Some of the improvements indicated in the current five-year Capital Improvement Program (CIP) for the Airport include:

- **Rehabilitate Taxiways up to the North Hangars (approx. 200,000 SF)**
- **Environmental Assessment - North Taxiway Extension**
- **Rehabilitate North Parallel Taxiway (approx. 3,900 SF)**
- **Safety Area Improvements**
- **Construction of Snow Removal Equipment Storage**
- **North Parallel Taxiway Extension (2,000 feet to the west)**
- **Rehabilitate South Parallel Taxiway**
- **Concrete Drainage Channel Extension**

The airport's current CIP on file with the FAA covers five years and programs a total estimated expenditure of $3,480,000; with the local share being $174,000 and the federal share being approximately $3,306,000.

Summary

The goal of this chapter is to provide general background information pertaining to the Airport, its aviation-operating environment, its physical surroundings, and its financial situation. The *Inventory of Existing Conditions* chapter is vital from the standpoint that it will be used as a reference in the analysis and design process that is required to prepare the airport's future development plan.

Forecasts of Aviation Activity

INTRODUCTION. Forecasting is a key element in the master planning process. The forecasts are essential for analyzing existing airport facilities and identifying future needs and requirements of the facilities. Forecasting, by its very nature, is not exact, but it does establish some general estimates for future aviation activity levels and provides a defined rationale for various changes at the Airport as demands increase. The amount and kind of aviation activity occurring at an airport are dependent upon many factors, but are usually reflective of the services available to aircraft operators, the meteorological conditions under which the Airport operates (daily and seasonally), the businesses located on the Airport or within the community the Airport serves, and the general economic conditions prevalent within the surrounding area.

Aviation activity forecasting generally commences by utilizing the present time as an initial point and baseline, supplemented with historical trends obtained from previous years' activity and recorded information. This data has evolved from a comprehensive examination of historical airport records from airport personnel, FAA Form 5010-1 data, *FAA Terminal Area Forecasts*

(TAF), and the *FAA Aerospace Aviation Forecasts Fiscal Year 2005-2025*. These documents were assembled in different years, making the base year data quite variable, and emphasizing the need for establishing a well-defined and well-documented set of base information from which to project future aviation activity trends.

Prior to an examination of current and future activity levels at the Airport, there are conditions and assumptions that should be noted that form the basis or foundation for the development of the forecasts contained here. These variables represent a variety of physical, operational, and socioeconomic considerations, and, to varying degrees, relate to and affect aviation activity at Big Bear City Airport.

Socioeconomic Conditions

Historically, the socioeconomic conditions of a particular area affect aviation activity within that region. It is usually helpful to incorporate an analysis of local and regional socioeconomic data into the forecast for future aviation demands at an airport. Typically, the most often analyzed indicators are population, employment, and income. Socioeconomic data was obtained from recognized sources, including local, regional, state, and federal planning organizations.

Regional Socioeconomic Conditions. The existing socioeconomic condition of a particular region has historically impacted aviation activity within that area. The two primary socioeconomic indicators, which are often analyzed in the forecast of aviation activity, are population and employment statistics. However, in resort area, the impact of the tourism industry must also be carefully examined with respect to seasonal variations in visitation patterns. According to the *City of Big Bear Lake General Plan, Land Use Element – Economic Development Issue*, tourism is a primary influencing factor on the regional economy. This report cites "Big Bear Lake is predominately a weekend resort community with a tourist-based economy. Weekend occupancy for lodging in the City was high, and mid-week was low. This situation remains unchanged since discretionary travel is based on disposable income, and fluctuations in tourism may result from the general economic conditions within the market area. Seasonal fluctuations in tourism are also evident, with spring being the slowest season. Visitors peak in the summer (July-September) and in the winter (January-March). Although tourism is high in the winter due to the ski season, retail sales tend to be low during this time. Visitors accounted for about 70 percent of the sales tax generated in the City…and residents accounted for 30 percent." This report goes on to cite "Because of its proximity to a large metropolitan area, Big Bear attracts visitors whose primary objective is to escape the crowds and smog of nearby cities. Unlike 'destination resorts', which depend upon attractions that lure visitors from around the country, if

not the world, Big Bear Lake's visitors are likely to be neighbors from surrounding hill communities or from the valleys below."

Community Support. Big Bear City Airport benefits from the support of the surrounding cities and county governments, as well as local industry and residents. The Airport is recognized as a vital county asset, which contributes to the stability and the future of the area's economy. The overall position of the county is one of continued growth and development, with a recognized focus that the Airport assists in maintaining and attracting additional economic and aviation-related development to the area.

Population. The San Bernardino Associated Governments (SANBAG) is the council of governments and transportation planning agency for San Bernardino County. SANBAG is responsible for cooperative regional planning and, as such, has published present and forecasted population data for the region. The City of Big Bear Lake is the 3rd smallest city in San Bernardino County (out of a total of 24 Cities) and is the largest incorporated community near the Airport. Because demographic statistics are easily available for the City of Big Bear Lake and San Bernardino County, data related to these two areas is provided below. These statistics are only provided to give a general understanding of economic and population trends in the area.

Obviously, the Airport serves a regional role, impacting an area inclusive of, but well beyond, the City of Big Bear Lake. SANBAG predicts an average annual growth rate of 1.46% for the City of Big Bear Lake, and an average annual growth rate of 1.76% for San Bernardino County (through the year 2025). The following table, entitled *POPULATION INFORMATION 2000-2025*, provides a summary of the population information for the City of Big Bear Lake and San Bernardino County.

Table B1
POPULATION INFORMATION, 2000-2025

	City of Big Bear Lake	San Bernardino County
2000	5,478	1,727,452
2005	6,090	1,919,215
2010	6,443	2,059,420
2015	6,851	2,229,700
2020	7,256	2,397,709
2025	7,642	2,558,729

Source: San Bernardino Associated Governments (SANBAG), September 2005.

Employment. According to demographic information provided by SANBAG, the City of Big Bear Lake had a labor force of 5,758 in 2000, while San Bernardino County had a labor force of 594,923 in 2000. Employment is forecast to increase to 8,344 by the year 2025 in the City of Big Bear Lake and 1,074,861 in San Bernardino County. This represents a county-wide increase of 60.66%, or roughly 2.43% annually.

Economy. The four largest employment sectors in the City of Big Bear Lake are: Arts, entertainment, recreation, accommodation and food services, retail trade, educational, health and social services, and construction. The City of Big Bear Lake had a median household income of $35,615 in 2000. As of 2000, there were approximately 2,355 households in the City of Big Bear Lake and approximately 530,498 in San Bernardino County.

The airspace in Southern California is one of the most congested in the world. According to the Southern California Association of Government's Regional Aviation Plan for the 2001 Regional Transportation Plan, the region supports the world's largest regional aviation system in terms of airports and aircraft operations. The region is home to 65 airports, including 6 air carrier airports, 3 commuter airports, 45 general aviation airports, and 11 existing or recently closed military installations.

Historical Airport Activity Summary

With no on-site air traffic control tower facilities, there are limited historical records that provide accurate information concerning the aviation activity present at Big Bear City Airport. A tabulation of the best available historical aviation activity information since 1995 is presented in the following table, entitled *HISTORICAL AVIATION ACTIVITY, 1995-2004*.

Table B2
HISTORICAL AVIATION ACTIVITY, 1995-2004

Year	Itinerant GA Operations	Itinerant Military Operations	Total Itinerant Operations	Local GA Operations	Total Operations
1995	32,850	150	33,000	12,000	45,000
1996	22,250	150	22,400	12,600	35,000
1997	22,250	150	22,400	12,600	35,000
1998	22,250	150	22,400	12,600	35,000
1999	19,800	140	20,190	11,260	31,450
2000	19,800	140	20,190	11,260	31,450
2001	19,800	140	20,190	11,260	31,450
2002	19,800	140	20,190	11,260	31,450
2003	19,800	140	20,190	11,260	31,450
2004	17,440	2000	19,440	12,960	32,400

Source: FAA Terminal Area Forecasts Summary Report, FAA Airport Master Records (Form 5010), and airport personnel.

Existing Operations by Aircraft Type

According to airport personnel, approximately 75.5% of all airport operations are single engine operations. The following table, entitled *EXISTING OPERATIONS BY AIRCRAFT TYPE, 2004*, indicates the percentage of operations for each aircraft type.

Table B3
EXISTING OPERATIONS BY AIRCRAFT TYPE, 2004

Aircraft Type	Operations	Percentage[1]
Single Engine	24,462	75.5%
Multi-Engine Piston	4,131	12.75%
Turbo-prop	486	1.5%
Business Jet	810	2.5%
Helicopter	486	1.5%
Military	2,025	6.25%
Total	**32,400**	**100%**

Source: [1] Big Bear City Airport personnel. Represents the approximate total percentage of operations at the Airport.

Based Aircraft

Historic based aircraft numbers were obtained from discussions with airport management, Federal Aviation Administration Airport Master Records (Form 5010), and the FAA's APO Terminal Area Forecast Detail Report, and are presented in the following table, entitled *HISTORIC BASED AIRCRAFT, 1995-2004*. Discussions with the Airport Manager indicate that there currently are 129 aircraft and 4 ultra lights based at Big Bear City Airport:

- **Single Engine: 123**
- **Multi-Engine Piston: 6**
- **Ultra Light: 4**

Table B4
HISTORIC BASED AIRCRAFT, 1995-2004

Year	Single Engine	Multi- Engine	Helicopter	Ultra Light	Military	Total
1995[1]	130	6	0	2	0	**136**
1996[1]	118	6	0	1	0	**124**
1997[2]	---	---	---	---	---	**131**
1998[1]	123	6	0	1	0	**129**
1999[1]	123	6	0	1	0	**129**
2000[2]	---	---	---	---	---	**131**
2001[2]	---	---	---	---	---	**131**
2002[2]	---	---	---	---	---	**131**
2003[2]	---	---	---	---	---	**131**
2004[1]	123	6	0	4	0	**129**

Source: [1] Data obtained from historical FAA 5010 Airport Master Record. The 5010 does not differentiate between multi-engine piston and multi-engine turbo-prop. [2] Data obtained from historical APO Terminal Area Forecast Detail Report. --- Data not available.

Aviation Activity Forecasts

Factors and Conditions

Prior to the development of aviation activity forecasts, several factors that have an influence, either positive or negative, in the planning process should be considered.

There are some broad factors that can have a negative impact on the Airport, and the aviation industry, and these are considered in the planning process. The first issue is the overall condition of the general aviation industry in the United States. Beginning in 1978, many sectors of the general aviation industry have been in recession, and the FAA has identified several factors that precipitated this downturn, including economic recessions, fuel crises, the termination of the GI Bill, and the repeal of the Investment Tax Credit.

More obvious contributing factors include the rising expense of owning and operating an aircraft (i.e., costs of insurance, fuel, and maintenance), competition from discount air carriers since airline deregulation, changes in disposable discretionary income, increases in airspace restrictions affecting fair-weather flying, reductions in personal leisure time, and shifts in personal preference as to how leisure time is spent. These factors have restricted the single engine light aircraft segment of the industry in particular.

However, there are a number of bright spots having a positive impact in certain segments of the general aviation industry. They include the passage of the General Aviation Revitalization Act of 1994. This legislation has caused renewed interest and optimism among US aircraft manufacturers, who are either re-entering the single engine aircraft market after several years' absence, or are increasing future production schedules to meet expected renewed demand. The growth in the amateur-built aircraft market, and the strength of the used aircraft market, indicate that demand for inexpensive personal aircraft is still relatively strong.

The FAA's efforts to aid general aviation revitalization include streamlining the certification process for new entry-level aircraft and implementing measures to provide regulatory relief and reduce user costs (i.e., reduced rules, improving the delivery of FAA services by decreasing excess layers of management, and the elimination of unneeded programs and processes). Also, groups such as the Aircraft Owners & Pilots Association (AOPA) are sponsoring programs that aggressively promote the benefits of general aviation and learning to fly.

On a more recent note, sine the 9/11 terrorist attacks, Temporary Flight Restrictions (TFRs, and the lingering concerns of some regarding the use of general aviation aircraft in potential future acts of terrorism, have had an added short-term negative impact on the industry. On the

positive side for GA, heightened airport security has had a dramatic impact on the "nuisance factor" of commercial air travel; as a result, some travelers have turned to general aviation as a more efficient means of air travel.

General Aviation Operations Forecast

General information regarding expectations for the Airport is included in the FAA Terminal Area Forecast (TAF) Detail Report. The TAF for Year 2006 through year 2020 remained unchanged from 1999. In developing the general aviation activity forecasts, local, state, and national trends were reviewed. Included in this assessment, and, as presented in the following table, entitled *GENERAL AVIATION OPERATIONS FORECAST SCENARIOS, 2004-2025*, are the forecasts contained in the FAA Terminal Area Forecast Detail Report and three forecast scenarios developed for this study.

- **TAF: FAA's Terminal Area Forecast Detail Report obtained 09/01/05.**
- *Scenario One:* **Projects an annual average growth rate of 1.25%, which is equal to the nationwide general aviation forecast contained in the FAA Aviation Forecasts Fiscal Years 2002-2014. This is the selected operations forecast for this study.**
- *Scenario Two:* **Illustrates an average annual growth rate of approximately 0.68 %, which was obtained from the TAF and represents total general aviation operations growth for all airports in the United States.**
- *Scenario Three:* **Calculates an average annual growth rate of approximately 1.76%, which is the estimated annual population growth rate for San Bernardino County through the year 2025.**

By selecting Scenario One as the preferred forecast scenario, it is recognized that the conditions in Big Bear City, the City of Big Bear Lake, and the surrounding area should mirror aviation-related influences in the nation. It also recognizes an assumption that there are no identified significant local influences that are expected to negatively or positively impact the amount of aviation activity at the Airport.

Table B5
GENERAL AVIATION OPERATIONS FORECAST SCENARIOS, 2004-2025

Year	TAF	Scenario One 1.25%	Scenario Two 0.63%	Scenario Three 1.76%
2004	31,450	30,400	30,400	30,400
2005	31,450	30,780	30,592	30,935
2008	31,450	31,948	31,174	32,596
2010	31,450	32,751	31,568	33,754
2015	31,450	34,851	32,575	36,831
2020	31,450	37,084	33,614	40,187
2025	31,450	39,461	34,686	43,861

Source: BARNARD DUNKELBERG & COMPANY.

Military Operations Forecast

The level of military operations at Big Bear City Airport has increased from historic levels during recent years. There are two important components in determining military aircraft use at an airport. The first is Department of Defense (DOD) funding, which has been increasing in recent years as a result of the War on Terrorism and heightened Homeland Security initiatives. The second is a fueling contract the Airport or FBO may have with the DOD. The Airport does not have a military fueling contract; however, it does experience a healthy amount of military helicopter traffic. This traffic primarily originates from neighboring Twenty Nine Palms Airport and Fort Irwin that utilized Big Bear City Airport to perform military high altitude familiarization and training operations and, therefore, frequent the Airport with some regularity. There is no identified trend that would indicate a change in the existing levels or patterns of military activity. Therefore, it is anticipated that the amount of military activity will remain at approximately the existing level for the remainder of the 20-year planning period. This forecast is presented in the following table, entitled *MILITARY OPERATIONS FORECAST, 2004-2025.*

Table B6
MILITARY OPERATIONS FORECAST, 2004 -2025

Year	Operations
2004[1]	2,025
2010	1,998
2015	2,027
2020	2,052
2025	2,073

Source: BARNARD DUNKELBERG & COMPANY. [1] Actual.

Operations Forecast by Aircraft Type

The knowledge of the types of aircraft expected to use the Airport will assist in determining the amount and type of facilities needed to meet the aviation demand. The following table, entitled *SUMMARY OF OPERATIONS FORECAST BY AIRCRAFT TYPE, 2004-2025*, depicts the approximate level of use by aircraft types that are projected to use Big Bear City Airport. As expected nationally, the use of larger general aviation aircraft (turbo-props and jets) is forecast to increase more rapidly than is the use of smaller general aviation aircraft (single engine piston) at the Airport.

Table B7
SUMMARY OF OPERATIONS FORECAST BY AIRCRAFT TYPE, 2004-2025

Aircraft Type	2004[1]	2010	2015	2020	2025
Single Engine	24,867 *(76.75%)*	26,436 *(76.15%)*	27,841 *(75.55%)*	29,293 *(74.95%)*	30,826 *(74.35%)*
Multi-Engine Piston	4,131 *(12.75%)*	4,605 *(13.25%)*	4,975 *(13.5%)*	5,374 *(13.75%)*	5,805 *(14%)*
Turbo-Prop	486 *(1.5%)*	591 *(1.7%)*	700 *(1.9%)*	821 *(2.1%)*	954 *(2.3%)*
Business Jet	405 *(1.25%)*	487 *(1.40%)*	571 *(1.55%)*	664 *(1.70%)*	767 *(1.85%)*
Helicopter	486 *(1.5%)*	608 *(1.75%)*	737 *(2.0%)*	879 *(2.25%)*	1,037 *(2.5%)*
Military	2,025 *(6.25%)*	1,998 *(5.75%)*	2,027 *(5.5%)*	2,052 *(5.25%)*	2,073 *(5.0%)*
Total	**32,400** ***(100%)***	**34,751** ***(100%)***	**36,851** ***(100%)***	**39,084** ***(100%)***	**41,461** ***(100%)***

Source: [1]Big Bear City Airport personnel.

Local and Itinerant Operations Forecast

As can be seen in the following table, entitled *SUMMARY OF LOCAL AND ITINERANT OPERATIONS FORECAST 2004-2025*, itinerant operations at Big Bear City Airport are expected to increase slightly over local operations, as more and more general aviation operations are increasingly utilized for business-related purposes.

Table B8
SUMMARY OF LOCAL AND ITINERANT OPERATIONS FORECAST, 2004-2025

Year	Local	Itinerant	Total
2004	12,960 *(40.0%)*	19,440 *(60.0%)*	32,400 *(100%)*
2010	13,553 *(39.0%)*	21,198 *(61.0%)*	34,751 *(100%)*
2015	14,003 *(38.0%)*	22,848 *(62.0%)*	36,851 *(100%)*
2020	14,461 *(37.0%)*	24,623 *(63.0%)*	39,084 *(100%)*
2025	14,926 *(36.0%)*	26,535 *(64.0%)*	41,461 *(100%)*

Source: BARNARD DUNKELBERG & COMPANY.

Based Aircraft Forecast

The number and type of aircraft anticipated to be based at an airport are vital components in developing a plan for the Airport. Generally, there is a relationship between aviation activity and based aircraft, stated in terms of operations per based aircraft (OPBA). Sometimes, a trend can be established from historical information of operations and based aircraft. The national trend has been changing with more aircraft being used for business purposes and less for pleasure flying. This impacts the OPBA in that business aircraft are usually flown more often than pleasure aircraft. It is expected that the number of operations per based aircraft will increase at the Airport as more aircraft based there are used for business purposes.

Several based aircraft forecast scenarios are presented in the following table, entitled *BASED AIRCRAFT FORECAST SCENARIOS, 2004-2025*. These include the Terminal Area Forecast Detail Report, and three forecast scenarios developed for this study.

- **TAF: FAA's Terminal Area Forecast Detail Report obtained 09/1/2005. As the following table illustrates, the TAF does not highlight any increase in based aircraft for the Airport.**
- **Scenario One: Projects an average annual growth rate of 0.98%, which is equal to the nationwide general aviation forecast for based aircraft contained in the FAA Aviation Forecasts Fiscal Years 2002-2014. This conservative forecast is the selected forecast for this study.**
- **Scenario Two: Illustrates an average annual growth rate of approximately 1.76%, which is the estimated annual population growth rate for San Bernardino County through the year 2025.**
- **Scenario Three: Due to the previously mentioned factors for the San Bernardino region, it is anticipated that growth in based aircraft will increase faster than that projected by the FAA, but not as fast as the projected population growth for the region. Therefore, this scenario postulates a growth factor of the two scenarios**

combined.

Table B9
BASED AIRCRAFT FORECAST SCENARIOS, 2004-2025

Year	TAF[1]	Scenario One 0.98%	Scenario Two 1.76%	Scenario Three 1.37%
2004	131	133	133	133
2005	131	134	135	135
2008	131	138	141	141
2010	131	140	146	145
2015	131	145	161	155
2020	131	150	176	165
2025	---	156	191	175

Source: BARNARD DUNKELBERG & COMPANY. [1] TAF does not account for ultra light aircraft in its figures.

Based Aircraft Forecast by Aircraft Type

The mix of based aircraft is shown on the following table, entitled *BASED AIRCRAFT FORECAST BY TYPE, 2004-2025*. It is expected that single engine aircraft will continue to be the dominant aircraft type based at the Airport; although a slight increase in multi-engine turbine and multi-engine piston aircraft is forecasted.

Table B10
BASED AIRCRAFT FORECAST BY TYPE, 2004-2025

Aircraft Type	2004	2010	2015	2020	2025
Single Engine	123 *(92.5%)*	129 *(92.0%)*	133 *(91.5%)*	136 *(90.5%)*	141 *(90.0%)*
Multi-Engine Piston	6 *(4.5%)*	7 *(5.0%)*	8 *(5.5%)*	9 *(6.0%)*	10 *(6.5%)*
Ultra Light	4 *(3.0%)*	4 *(3.0%)*	4 *(3.0%)*	4 *(2.5%)*	4 *(2.5%)*
Helicopter	0 *(0.0%)*	0 *(0.0%)*	0 *(0.0%)*	1 *(1.0%)*	1 *(1.0%)*
TOTAL	**133** ***(100%)***	**140** ***(100%)***	**145** ***(100%)***	**150** ***(100%)***	**156** ***(100%)***

Source: BARNARD DUNKELBERG & COMPANY.

Summary

A summary of the aviation forecasts prepared for this study is presented in the following table, entitled *SUMMARY OF AVIATION ACTIVITY FORECASTS, 2004-2025*. This information will be used in the following chapters to analyze facility requirements, to aid development of alternatives, and to guide the preparation of the plan and program of future airport facilities. In other words, the aviation activity forecasts are the foundation from which future plans will be developed and implementation decisions will be made.

Table B11
SUMMARY OF AVIATION ACTIVITY FORECASTS, 2004-2025

Operations	2004	2010	2015	2020	2025
Single Engine Piston	24,867	26,436	27,841	29,293	30,826
Multi-Engine Piston	4,131	4,605	4,975	5,374	5,805
Turbo-Prop	486	591	700	821	954
Business Jet	405	487	571	664	767
Helicopter	486	608	737	879	1,037
GA Operations	30,400	32,751	34,851	37,084	39,461
Military Operations	2,000	2,000	2,000	2,000	2,000
Total Operations	**32,400**	**34,751**	**36,851**	**39,084**	**41,461**
Local Operations	12,960	13,553	14,003	14,461	14,926
Itinerant Operations	19,440	21,198	22,848	24,623	26,535
Based Aircraft by Type					
Single Engine	123	129	133	136	141
Multi-Engine Piston	6	7	8	9	10
Ultra Light	4	4	4	4	4
Helicopter	0	0	0	1	1
TOTAL	**133**	**140**	**145**	**150**	**156**

Source: BARNARD DUNKELBERG & COMPANY.

Capacity Analysis and Facility Requirements

INTRODUCTION. The capacity of an airfield is primarily a function of the major aircraft operating surfaces that compose the facility and the configuration of those surfaces (runways and taxiways). However, it is also related to, and considered in conjunction with, wind coverage, airspace utilization, and the availability and type of navigational aids. Capacity refers to the number of aircraft operations that a facility can accommodate on either an hourly or yearly basis. It does not refer to the size or weight of aircraft. Facility requirements are analyzed to determine those facilities needed to meet the forecast demand and aircraft fleet provided they are consistent with the established role and goals of the Airport. Evaluation procedures will focus on the airport's appropriate Airport Reference Code (ARC)/ dimensional criteria, runway length, pavement strength, instrument approach capability, and layout of aircraft storage facilities.

Knowledge of the types of aircraft currently using, and those aircraft expected to use, Big Bear City Airport provides information concerning the appropriate Airport Reference Code (ARC) designation for the facility. FAA Advisory Circular 150/5300-13, *Airport Design*, provides guidelines for this ARC determination, which is based on the "Design Aircraft" that is judged the most critical aircraft using, or projected to use, the airport. The ARC relates aircraft operational and physical characteristics to design criteria that are applied to various airport components. Under this methodology, safety margins are provided in the physical design of airport facilities.

There are two components in determining the ARC for an airport, an operational component and a physical component. The first component, depicted by a capital letter, is the Aircraft Approach Category and relates to aircraft approach speed (operational component). The second component, depicted by a Roman numeral, is the Airplane Design Group (ADG) and relates to airplane wingspan (physical component).

Currently, a large number of single engine training aircraft utilize the Airport on a regular basis; however, this traffic is supplemented by a fair number of multi-engine, turbo-prop, and jet aircraft that are operated for both business and recreational purposes. In addition, the Airport accommodates a significant number of military helicopter training operations that originate from neighboring Twenty Nine Palms Airport and Fort Irwin.

Runway 08/26

All of the general aviation fixed wing aircraft including single and multi-engine piston aircraft, turbo-prop aircraft, and jets utilize Runway 08/26. The airport's current Airport Layout Plan identifies the Beech King Air B100 as the "Design Aircraft" for this runway, which specifies an ARC of B-I (Small Aircraft Only). The King Air B100 is a small size twin-engine general aviation turbo-prop aircraft that has an approach speed of 111 knots and a wingspan of 45.8 feet. According to current operational estimates, approximately 500 turbo-prop operations were conducted at the Airport in 2004, in addition to approximately 400 business jet operations. While there are a small number of Airplane Design Group (ADG) I turbo-prop and jet aircraft, the majority of these operations are estimated to include ARC B-II and C-II aircraft. FAA guidance defines a "substantial use threshold" on federally funded projects for critical design airplanes (i.e., the design aircraft) to have at least 500 or more annual itinerant operations at the Airport. For Big Bear City Airport, it is estimated that this operational activity will increase to approximately 475 and 1,500 operations, respectively, by the end of the planning period, which could support the ARC B-II upgrade. For planning purposes, the runway and taxiway dimensional design criteria for ARC B-II aircraft should be considered based on current operations, which could support a design standards upgrade.

Airfield Capacity Methodology

This section addresses the evaluation method used to determine the capability of the airside facilities to accommodate aviation operational demand. Evaluation of this capability is expressed in terms of potential excesses and deficiencies in capacity. The methodology utilized for the measurement of airfield capacity in this study is described in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay.* From this methodology, airfield capacity is defined in the following terms:

- *Hourly Capacity of Runways:* The maximum number of aircraft that can be accommodated under conditions of continuous demand during a one-hour period.
- *Annual Service Volume (ASV):* A reasonable estimate of an airport's annual capacity (i.e., the level of annual aircraft operations that will result in an average annual aircraft delay of approximately one to four minutes).

The capacity of an airport's airside facilities is a function of several factors. These include the layout of the airfield, local environmental conditions, specific characteristics of local aviation demand, and air traffic control requirements. The relationship of these factors and their cumulative impact on airfield capacity are examined in the following paragraphs.

Airfield Layout

The layout or "design" of the airfield refers to the arrangement and interaction of the airfield components, which include the runway system, taxiways, and ramp entrances. As previously described, Big Bear City Airport operates around a single runway (i.e., Runway 08/26). This runway is served by a full-length south side parallel taxiway system (i.e., Taxiway "A") with five connector taxiways and a partial parallel taxiway on the north side of the runway (i.e., Taxiway "B") with four connector taxiways.

The majority of the airport's existing hangar facilities is located on the north side of the runway and extends westward from the east end of the runway to the Taxiway "B-2" connector. These facilities include various T-hangars, individual executive/corporate hangars, and FBO facilities. In addition, the airport's existing general aviation terminal building, fueling facilities, and aircraft parking apron are located on the south side of the runway. These facilities also extend westward from the east end of the runway to the Taxiway "A-2" connector.

Environmental Conditions

Climatological conditions specific to the location of an airport not only influence the layout of the airfield, but also impact the utilization of the runway system. Variations in the weather, resulting in limited cloud ceilings and reduced visibility typically lower airfield capacity, while changes in wind direction and velocity typically dictate runway usage and influence runway capacity.

Meteorological data from Big Bear City Airport for use in this study was unavailable from the National Climatic Data Center. Therefore, comparative data obtained for Southern California Logistics Airport (formally George Air Force Base[1]) and March Inland Port Airport (formally March Air Force Base[2]) have been included for reference purposes only.

Wind Coverage. Surface wind conditions (i.e., direction and speed) generally determine the desired alignment and configuration of the runway system. Runways, which are not oriented to take advantage of prevailing winds, will restrict the capacity of the Airport. Wind conditions affect all airplanes in varying degrees; however, the ability to land and takeoff in crosswind conditions varies according to pilot proficiency and aircraft type. Generally, the smaller the aircraft, the more it is affected by the crosswind component.

As mentioned previously, wind data for Big Bear City Airport was unavailable for analysis; therefore, comparative wind data to construct all weather wind roses were obtained for the period January 1982-December 1991 from observations taken at George AFB, and for the period January 1995-December 2004 from observations taken at March AFB. There were approximately 82,503 observations available for analysis at George AFB and 78,003 observations available for analysis at March AFB. The allowable crosswind component is dependent upon the Airport Reference Code (ARC) for the type of aircraft that utilize the Airport on a regular basis. According to the existing Airport Layout Plan, the current Airport Reference Code (ARC) for Runway 08/26 is ARC B-I (Small Aircraft Only); however, based upon the forecast operational activity, it is recommended that ARC B-II requirements also be considered.

For ARC B-I (Small Aircraft Only) and B-II classifications, the standards specify that the 10.5-knot and 13-knot crosswind components be utilized for analysis. Therefore, the 10.5-knot and 13-knot crosswind components have been analyzed for Big Bear City Airport. The following illustration, entitled *GEORGE AFB ALL WEATHER WIND ROSE: 13- & 10.5-KNOT CROSSWIND*

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[1] George AFB is located 33 nautical miles northwest of Big Bear City Airport, at elevation 2,885' AMSL.

[2] March AFB is located 30 nautical miles southwest of Big Bear City Airport, at an elevation of 1,535' AMSL.

COMPONENTS, illustrates a comparative analysis of the all weather wind coverage provided at Big Bear City Airport.

The desirable wind coverage for an airport's runway system is 95%. This means that the runway orientation and configuration should be developed so that the maximum crosswind component is not exceeded more than 5% of the time annually. The following table, entitled *GEORGE AFB ALL WEATHER WIND COVERAGE SUMMARY*, quantifies the wind coverage offered by the airport's existing runway system, including the coverage for each runway end. Based on the comparative all weather wind analysis for Big Bear City Airport, utilizing the FAA Airport Design Software supplied with AC 150/5300-13, the existing single runway configuration likely provides adequate wind coverage (i.e., in excess of 95%) for the 13-knot crosswind components according to the George AFB data.

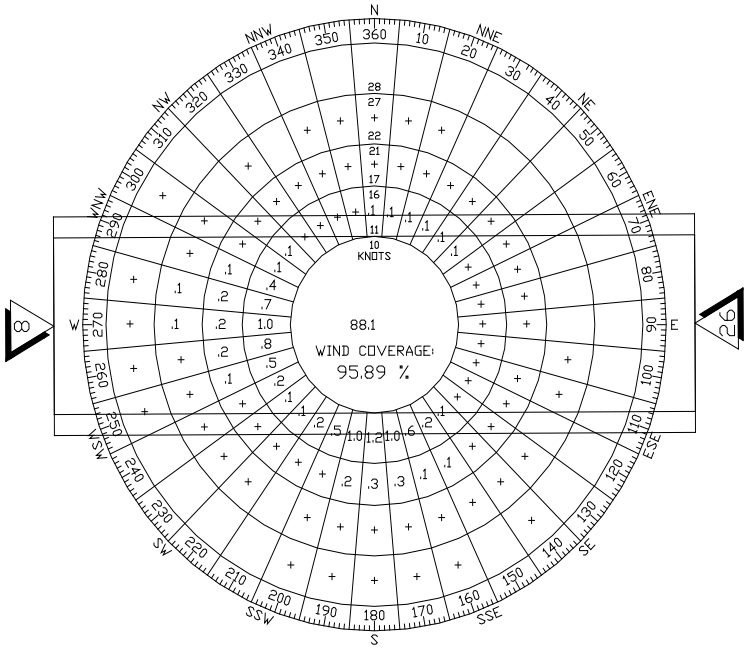
Based on the second comparative all weather wind analysis for Big Bear City Airport, utilizing the FAA Airport Design Software supplied with AC 150/5300-13, the existing single runway configuration likely provides adequate wind coverage (i.e., in excess of 95%) for the 13-knot crosswind components according to the March AFB data. Therefore, no additional runways are required from a *wind coverage* standpoint.

Table C1
GEORGE AFB ALL WEATHER WIND COVERAGE SUMMARY

Runway Designation	13-Knot Crosswind Component w/ 5-Knot Tailwind	10.5-Knot Crosswind Component w/ 5-Knot Tailwind
Runway 08/26	95.89%	93.67%
Runway 08	81.44%	79.47%
Runway 26	93.18%	91.30%

Source: Wind analysis tabulation provided by BARNARD DUNKELBERG & COMPANY utilizing the FAA Airport Design Software supplied with AC 150/5300-13.

Figure C1
GEORGE AFB ALL WEATHER WIND ROSE: 13-, & 10.5-KNOT CROSSWIND COMPONENTS



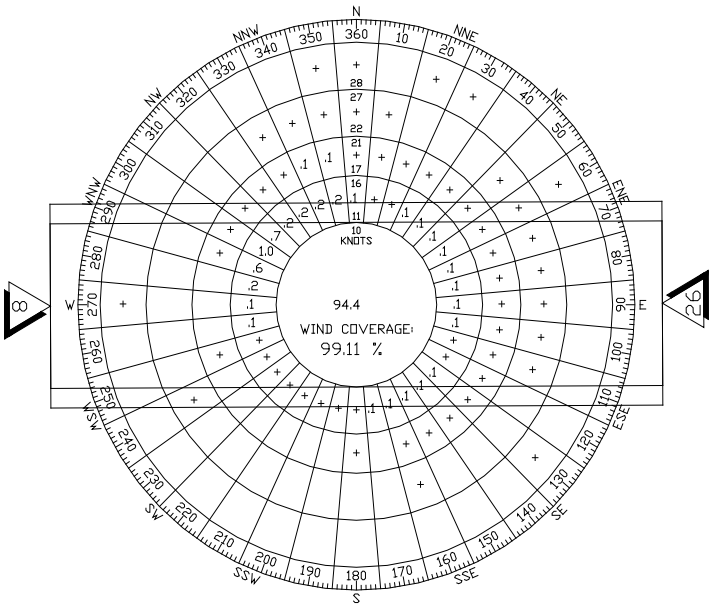
Source: National Oceanic and Atmospheric Administration, National Climatic Data Center. Station # 72382 – George AFB, California. Period of Record – January 1982-December 1991. Total Observations: 82,503.

Table C2
MARCH AFB ALL WEATHER WIND COVERAGE SUMMARY

Runway Designation	13-Knot Crosswind Component w/ 5-Knot Tailwind	10.5-Knot Crosswind Component w/ 5-Knot Tailwind
Runway 08/26	99.11%	98.35%
Runway 08	74.47%	74.02%
Runway 26	94.23%	93.67%

Source: Wind analysis tabulation provided by BARNARD DUNKELBERG & COMPANY utilizing the FAA Airport Design Software supplied with AC 150/5300-13.

Figure C2
MARCH AFB ALL WEATHER WIND ROSE:
13-, & 10.5-KNOT CROSSWIND COMPONENTS



Source: National Oceanic and Atmospheric Administration, National Climatic Data Center. Station # 72286 – March AFB, California. Period of Record – January 1995-December 2004. Total Observations: 78,003.

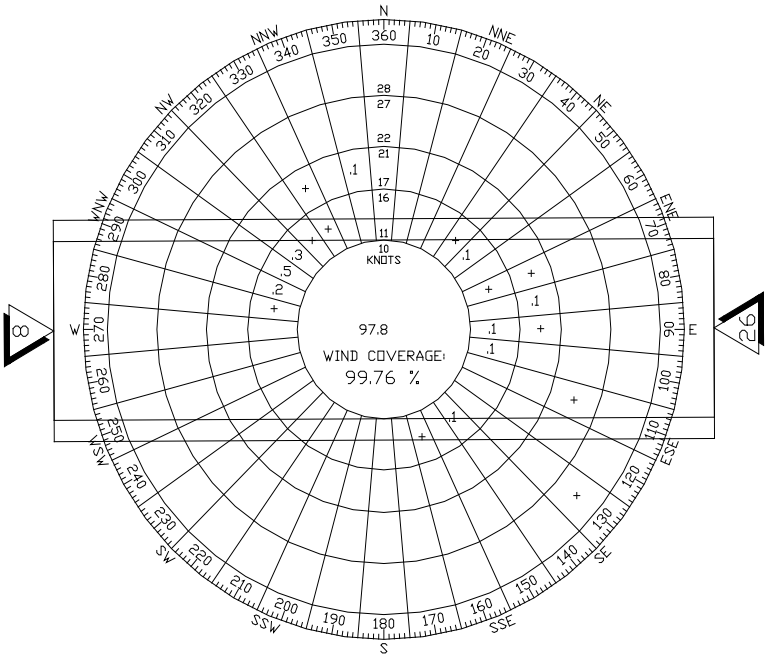
The Airport is currently served by a straight-in RNAV (GPS) approach to Runway 26. In an effort to evaluate the effectiveness of this approach, and analyze the potential benefits of implementing lower approach visibility minimums, an Instrument Flight Rules (IFR) wind rose has been constructed. The following table and illustration quantify the wind coverage offered by each runway end in consideration of the existing non-precision approach minimums (ceiling equal to or greater than 1,932 feet and visibility equal to or greater than 1-¼ statute mile).

Table C3
MARCH AFB IFR WIND COVERAGE SUMMARY

Runway Designation	Wind Coverage Provided Under IFR Conditions [1] 13-Knot Maximum Crosswind & 5-Knot Tailwind	Wind Coverage Provided Under IFR Conditions [1] 10.5-Knot Maximum Crosswind & 5-Knot Tailwind
Runway 08/26	99.76%	99.55%
Runway 08	80.68%	80.56%
Runway 26	97.24%	97.14%

Source: Wind analysis tabulation provided by BARNARD DUNKELBERG & COMPANY utilizing the FAA Airport Design Software supplied with AC 150/5300-13. [1] Ceiling of less than 1,900 feet, but equal to or greater than 1,900 feet and/or visibility less than three statute miles, but equal to or greater than 1-½ statute miles.

Figure C3
MARCH IFR WEATHER WIND ROSE: 13- & 10.5-KNOT CROSSWIND COMPONENTS



Source: National Oceanic and Atmospheric Administration, National Climatic Data Center. Station # 72286 – March AFB, California. Period of Record – January 1995-December 2004. Total Observations: 78,003.

The IFR wind coverage summary illustrates that Runway 26 likely provides better wind coverage than Runway 08 for each crosswind component, and, therefore, this information will be incorporated into the formulation of various future airside development alternatives and the ultimate development recommendations for the Airport.

Characteristics of Demand

Certain site-specific characteristics related to aviation use and aircraft fleet makeup impact the capacity of the airfield. These characteristics include runway use, aircraft mix, percent arrivals, touch-and-go operations, and exit taxiways.

Aircraft Mix. The capacity of a runway is dependent on the type and size of the aircraft that utilize the facility. Aircraft are categorized into four classes: Classes A and B consist of small

single engine and twin-engine aircraft (both prop and jet), weighing 12,500 pounds or less, which are representative of the general aviation fleet. Class C and D aircraft are large jet and propeller aircraft typical of those utilized by the airline industry and the military. Aircraft mix is defined as the relative percentage of operations conducted by each of these four classes of aircraft. In consideration of the forecasts presented in the previous chapter, an aircraft mix table has been generated. The following table, entitled *AIRCRAFT CLASS MIX FORECAST, 2004-2025*, presents the projected operational mix for the selected forecasts. In addition, the following illustration, entitled *REPRESENTATIVE AIRCRAFT BY AIRPORT REFERENCE CODE (ARC) DESIGNATION*, has been included for reference and comparison.

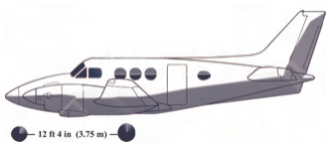
Table C4
AIRCRAFT CLASS MIX FORECAST, 2004-2025

	VFR Conditions			IFR Conditions		
Year	**Class A & B**	**Class C**	**Class D**	**Class A & B**	**Class C**	**Class D**
2004[1]	99.7%	0.3%	---	50.0%	50.0%	---
2010	99.6%	0.4%	---	50.0%	50.0%	---
2015	99.5%	0.5%	---	50.0%	50.0%	---
2020	99.4%	0.6%	---	50.0%	50.0%	---
2025	99.2%	0.8%	---	50.0%	50.0%	---

Class A - Small Single Engine, < 12,500 pounds **Class B** - Small Twin-Engine, < 12,500 pounds
Class C - 12,500 - 300,000 pounds **Class D** - > 300,000 pounds
[1] Existing percentage breakdown was estimated by BARNARD DUNKELBERG & COMPANY.

Percent Arrivals. Runway capacity is also significantly influenced by the percentage of all operations that are arrivals. Because aircraft on final approach are typically given absolute priority over departures, higher percentages of arrivals during peak periods of operations will reduce the Annual Service Volume (ASV). The operations mix occurring on the runway system at Big Bear City Airport reflects a general balance of arrivals to departures; therefore, it will be assumed in the capacity calculations that arrivals equal departures during the peak period.

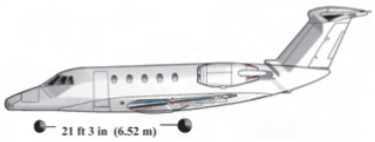
ARC A-I
Single-Engine Aircraft - 2 to 6 seats
Beech Bonanza
Beech Baron B55
Cessna-150



ARC B-I
Twin-Piston Aircraft - 4 to 10 seats
Beech King Air B100
Piper 31-310 Navajo
Beech Baron 58

ARC B-I
Very Light Jet/Small Cabin 4-6 seats
Citation Mustang
Eclipse 500
Adam Aircraft A700

ARC B-II
Twin-Turboprop Aircraft - 6 to 10 seats
Includes most commercial turboprop aircraft.
Beech Super King Air B200
Cessna 441 Conquest
Grumman Gulfstream I



ARC B-II
Business Jet/Small Cabin - 6 to 12 seats
Cessna Citation II/III/VII
Dassault Falcon 50
Dassault Falcon 900

Figure C4 **Representative Aircraft By Airport Reference Code (ARC) Designation**

Source: Aircraft Ground Service Guide, 2002 and aircraft manufacturer.

Touch-and-Go Operations. A touch-and-go operation refers to an aircraft maneuver in which the aircraft performs a normal landing touchdown followed by an immediate takeoff, without stopping or taxiing clear of the runway. These operations are normally associated with training activity and are included in local operations' figures when reported by an air traffic control tower. According to airport management, local operations are estimated to represent approximately 40% of the total annual operations being conducted at the Airport, and flight training represents a majority of this activity. It is anticipated that the existing level of flight training will continue through the planning period. However, the Airport will likely accommodate an increasing percentage of business-related itinerant general aviation operations in the future; thus, the overall percentage of touch-and-go operations is projected to decrease slightly as a percentage of the total through the planning period.

Runway Use. The use configuration of the runway system is defined by the number, location, and orientation of the active runway(s) and relates to the distribution and frequency of aircraft operations to those facilities. Both the prevailing winds in the region and the existing runway facility at Big Bear City Airport combine to dictate the utilization of the existing runway system. According to airport management observations, which are generally supported by the all weather wind coverage data, Runway 26 is utilized 60% of the time annually. As identified previously, the wind coverage also typically favors Runway 26 during instrument flight rule conditions, which is supported by the airport's existing instrument approach procedure.

Exit Taxiways. The capacity of a runway system is greatly influenced by the ability of an aircraft to exit the runway as quickly and safely as possible. Therefore, the quantity and design of the exit taxiways can directly influence aircraft runway occupancy time and the capacity of the runway system.

Due to the location of the existing exit taxiways serving the runway system at Big Bear City Airport, the number of available exit taxiways for use in the capacity calculation is adequate. Based upon the mix index of aircraft operating at the Airport under VFR conditions, the capacity analysis, as described in the FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, gives credit to only those runway exit taxiways located between 2,000 and 4,000 feet from the landing threshold. Therefore, landings to both Runway 08 and Runway 26 each received an exit rating of two. A taxiway exit rating of four is the maximum rating that can be received, and no credit given for an exit within 750 feet of another exit. Based upon the location of the existing exit taxiways, only one additional exit taxiway could be added to the midfield area in consideration of the specified design criteria. However, given the airport's existing and projected operational

levels, the future location of all taxiway improvements (if any) will be evaluated in conjunction with the formulation of airside development alternatives.

Air Traffic Control Rules

The FAA specifies separation criteria and operational procedures for aircraft in the vicinity of an airport contingent upon aircraft size, availability of radar, sequencing of operations and noise abatement procedures, both advisory and/or regulatory, which may be in effect at the Airport. Typically, the impact of air traffic control on runway capacity is most influenced by aircraft separation requirements dictated by the mix of aircraft utilizing the Airport. In addition, Big Bear City Airport does not have an Air Traffic Control Tower (ATCT); therefore, approach and departure control is provided by the Los Angeles ARTCC.

Airfield Capacity Analysis

As previously described, the determination of capacity for Big Bear City Airport uses the methodology described in the FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, along with the Airport Design Computer Program that accompanies AC 150/5300-13. Unfortunately, the FAA's methodology for calculating capacity incorporates numerous assumptions, some of which do not apply to Big Bear. The assumptions that are incorporated into the FAA's capacity calculations are: arrivals equal departures; the percent of touch-and-go operations is between 0-50% of total operations; there is a full-length parallel taxiway with ample exits and no taxiway crossing problems; there are no airspace limitations; the Airport has at least one runway equipped with an ILS and the necessary air traffic control facilities to carry out operations in a radar environment; IFR weather conditions occur roughly 10% of the time; and, approximately 80% of the time, the Airport is operated with the runway use configuration that produces the greatest hourly capacity. Since Big Bear City Airport does not have an ILS or an ATCT, the capacity calculations using the FAA methodology would be overstated, and the capacity would be less than that stated in the Advisory Circular.

Applying information generated from the preceding analyses, capacity and demand are formulated in terms of the following results:

- Hourly Capacity of Runways (VFR and IFR)
- Annual Service Volume (ASV)

The FAA's methodology to estimate hourly capacity and ASV for long-range planning purposes is presented in FAA Advisory Circular 150/5060-5. Based on a single runway use configuration

with a specified mix index ranging from 0- 20, the maximum possible VFR and IFR hourly capacities at Big Bear City Airport would be at 98 and 59 operations, respectively, with a projected ASV of less than 230,000 operations per year. However, because Big Bear City Airport does not conform to several of the assumptions listed above (i.e., the Airport does not have an air traffic control tower or precision instrument approach), this means that operational capacity at Big Bear would be less than the figures presented above. General planning principles suggest that airport operators should begin to consider future capacity enhancements when an airport reaches 60% of its ASV. For Big Bear City Airport, this planning threshold would not be reached until traffic volumes approach 138,000 operations (60% of 230,000 ASV). Since existing traffic levels are only about 32,400 operations, it is not anticipated that operational capacity will be an issue at the Airport within the 20-year planning period of this study. Furthermore, given the existing development constraints on, and in the vicinity of, the Airport, it is unlikely that an additional runway could ever be constructed to accommodate significant gains in operational capacity demands.

Capacity Summary

This section has analyzed the capacity of existing facilities at Big Bear City Airport. Both adequate airfield and ground access facilities are critical components in the ability of the Airport as a whole to efficiently serve the public. Capacity deficiencies that cause delays associated within one area will often be reflected in the ability or inability of the entire facility to function properly.

The following Facility Requirements section will delineate the various facilities required to properly accommodate future demand. That information, in addition to the capacity analysis, will provide the basis for formulating the alternative development scenarios for the Airport, ensuring that the new Recommended Development Plan can adequately accommodate the long-term aviation development requirements of the region.

Facility Requirements

In efforts to identify future demand at the Airport for those facilities required to adequately serve future needs, it is necessary to translate the forecast aviation activity into specific types and quantities. This section addresses the actual physical facilities and/or improvements to existing facilities needed to safely and efficiently accommodate the projected demand that will be placed on the Airport. This section consists of two separate analyses: those requirements dealing with *airside* facilities and those dealing with *landside* facilities.

Airfield Requirements

The analysis of airfield requirements focuses on the determination of needed facilities and spatial considerations related to the actual operation of aircraft on the Airport. This evaluation includes the delineation of airfield dimensional criteria, the establishment of design parameters for the runway and taxiway system, and an identification of airfield instrumentation and lighting needs.

Airfield Dimensional Criteria

The types of aircraft that currently operate at Big Bear City Airport, and those that are projected to utilize the facility in the future, have an impact on the planning and design of airport facilities. This knowledge assists in the selection of FAA specified design standards for the Airport, which includes runway/taxiway dimensional requirements; runway length; and, runway, taxiway, and apron strength. These standards apply to the "Design Aircraft", which either currently utilizes the Airport or which is projected to utilize the Airport in the future. As previously mentioned, the Beech King Air B100 is currently identified as the Airport's existing "Design Aircraft" for Runway 08/26 with regard to physical dimensions (i.e., 45.8 foot wingspan) and an approach speed of 111 knots. However, based upon the airport's forecast operational activity, which includes over 500 annual operations by a combination of ADG II turbo-props and Category B & C business jets within the 20-year planning period, it is recommended that the dimensional design requirements for ARC B-II aircraft be protected to allow future implementation if demand and activity grow as projected in the *Forecasts of Aviation Activity* chapter of this document.

According to FAA Advisory Circular 150/5300-13, *Airport Design*, the first step in defining an airport's design geometry is to determine its Airport Reference Code (ARC). A runway/airport that accommodates aircraft with an approach speed as great as 91 knots, but less than 121 knots, and with wingspans as great as 49 feet, but less than 79 feet, should be designed utilizing ARC B-II dimensional criteria. In addition, the airport's existing design standards have been reviewed to ensure FAA compliance.

The previously mentioned aircraft are the "Design Aircraft" to establish dimensional criteria only (i.e., runway/taxiway separation, runway/taxiway safety areas, aircraft parking separation, etc.), and are not intended to be used solely to dictate runway length requirements; although, they may be used in determining runway length. The following tables, entitled *ARC B-I (SMALL AIRCRAFT ONLY) DIMENSIONAL STANDARDS FOR RUNWAY 08/26 (In Feet)* and *ARC B-II DIMENSIONAL STANDARDS FOR RUNWAY 08/26 (In Feet)*, compare existing conditions against the dimensional design requirements that would apply to Big Bear City Airport depending on the Airport Reference Code and approach visibility minimums that are possible in the future.

Table C5
ARC B-I (SMALL AIRCRAFT ONLY) DIMENSIONAL STANDARDS FOR RUNWAY 08/26 (In Feet)

Item	Existing Dimension	ARC B-I (Small) with ≥ ¾ Mile Visibility Minimums [1]	ARC B-I (Small) with < ¾ Mile Visibility Minimums
Runway Width	75	60	75
Runway Centerline to Parallel Taxiway Centerline (Taxiway "A")	200	150	200
Runway Centerline to Parallel Taxiway Centerline (Taxiway "B")	175	150	200
Runway Centerline to A/C Parking (Southside)	271	125	400
Runway Centerline to A/C Parking (Northside)	227	125	400
Runway Centerline to Holdline	**125**	125	200
Runway Safety Area Width	120	120	300
Runway Safety Area Length Beyond RW End	240 [2]	240	600
Runway Object Free Area Width	400	400	800
Runway Object Free Area Length Beyond RW End	240 [2]	240	600
Runway Obstacle Free Zone Width	250	250	300
Runway Obstacle Free Zone Length Beyond Runway End	200	200	200
Taxiway Width	40	25	25
Taxiway Centerline to Parallel Taxiway Centerline	N.A.		69
Taxiway Safety Area Width	N.D.	49	49
Taxiway Object Free Area Width	N.D.	89	89
Taxilane Object Free Area Width	N.D.	79	79
Threshold Siting Surface Criteria			
Runway 08 [3]	---	Criteria Met	Criteria Met
Runway 26 [4]	---	Criteria Met	Criteria Met

Source: AC 150/5300-13, Federal Aviation Administration. Existing dimensions delineated in **bold** text reflect potential non-standard criteria. [1] Existing runway approach visibility minimums. [2] Existing RSA and ROFA boundary can be accommodated on existing airport property by displaced thresholds and reduced ASDA & LDA runway lengths. [3] Applies existing runway type 3 criteria for Appendix 2, AC 150/5300-13 Change 9. [4] Applies existing runway type 5 criteria from Appendix 2, AC 150/5300-13 Change 9.

north

0 150' 300' 600' 900'
GRAPHIC SCALE IN FEET

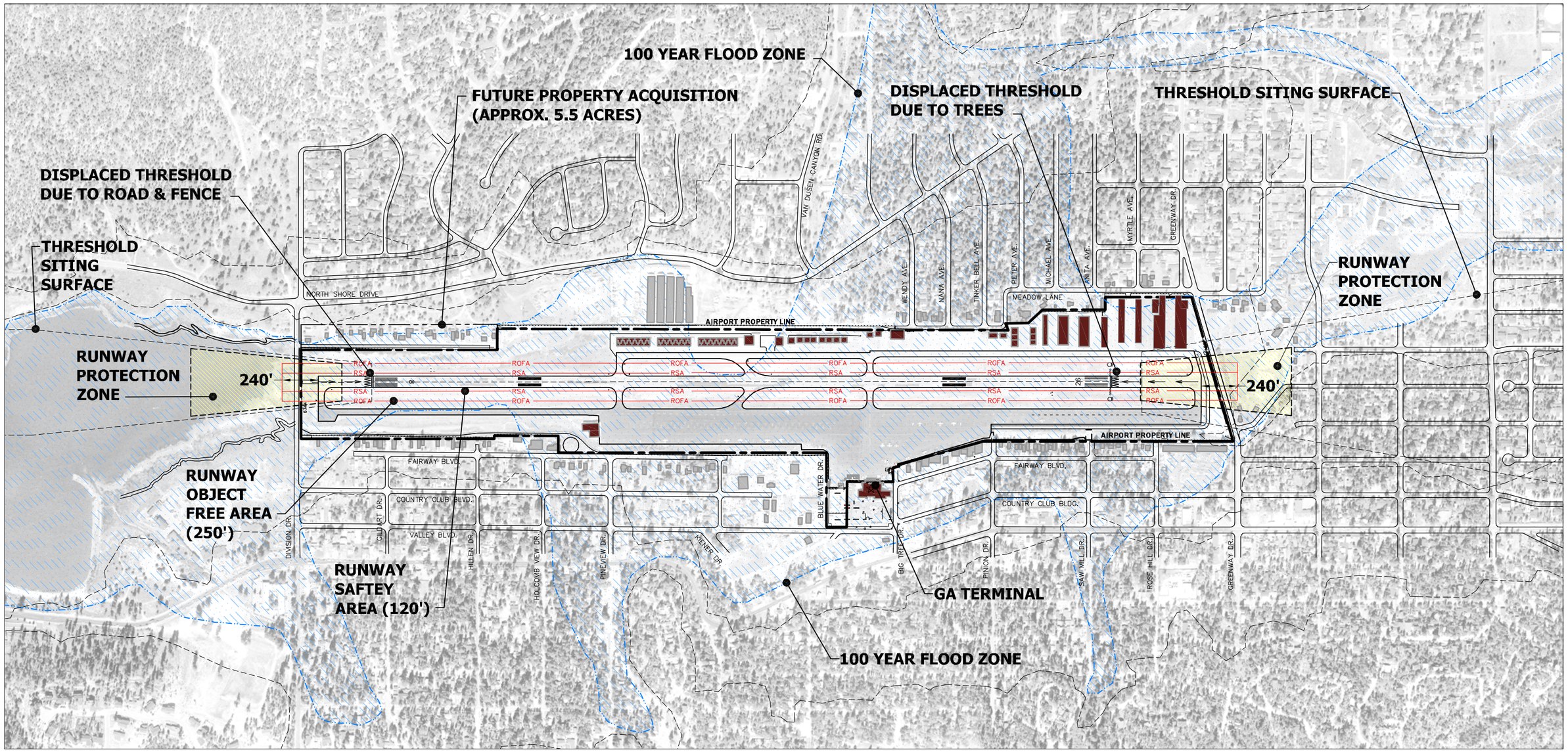
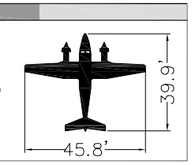


Figure C5 Existing ARC B-I (Small Aircraft) Dimensional Criteria (Not Lower Than 3/4 Mile Visibility Minimums)

DESIGN AIRCRAFT

BEECH KINGAIR B100
ARC B–I (Small Aircraft)
WEIGHT : 11,800 lbs.



SOURCE: AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
AIRPORT LAYOUT PLAN BY VSA AIRPORTS, PALM SPRINGS, CA 10/02.
FEMA FIRM SAN BERNARDINO COUNTY, 7315 OF 9400 3/96

Master Plan Big Bear City Airport
Big Bear City, California

Table C6
ARC B-II DIMENSIONAL STANDARDS FOR RUNWAY 08/26 (In Feet)

Item	Existing Dimension	ARC B-II with ≥ ¾ Mile Visibility Minimums [1]	ARC B-II with < ¾ Mile Visibility Minimums
Runway Width	75	75	100
Runway Centerline to Parallel Taxiway Centerline (Taxiway "A")	**200**[2]	240	300
Runway Centerline to Parallel Taxiway Centerline (Taxiway "B")	**175**[2]	240	300
Runway Centerline to A/C Parking (Southside)	271	250	400
Runway Centerline to A/C Parking (Northside)	**227** [2]	250	400
Runway Centerline to Holdline	**125** [2]	200	250
Runway Safety Area Width	**120** [3]	150	300
Runway Safety Area Length Beyond Runway End			
Runway 08	600	300	600
Runway 26	300	300	600
Runway Safety Area Length Prior to Landing Threshold			
Runway 08	600	300	600
Runway 26	300	300	600
Runway Object Free Area Width	**250** [2]	500	800
Runway Object Free Area Length Beyond RW End			
Runway 08	600	300	600
Runway 26	300	300	600
Runway Obstacle Free Zone Width	**250** [2]	400	400
Runway Obstacle Free Zone Length Beyond Runway End	200	200	200
Taxiway Width	40	35	35
Taxiway Centerline to Parallel Taxiway Centerline	N.A.		105
Taxiway Safety Area Width	N.D.	79	79
Taxiway Object Free Area Width	N.D.	131	131
Taxilane Object Free Area Width	N.D.	115	115
Threshold Siting Surface Criteria			
Runway 08 [4]	---	Criteria Met	Criteria Met
Runway 26 [5]	---	Criteria Met	Criteria Met

Source: AC 150/5300-13, Federal Aviation Administration. Existing dimensions delineated in **bold** text reflect potential non-standard criteria. [1] Existing runway approach visibility minimums. [2] Modification of Standards would be required to comply with ARC B-II standard. [3] Additional RSA width can be accommodated on existing airport property. [4] Applies existing runway type 3 criteria for Appendix 2, AC 150/5300-13 Change 9. [5] Applies existing runway type 5 criteria for Appendix 2, AC 150/5300-13 Change 9.

north

0 150' 300' 600' 900'
GRAPHIC SCALE IN FEET

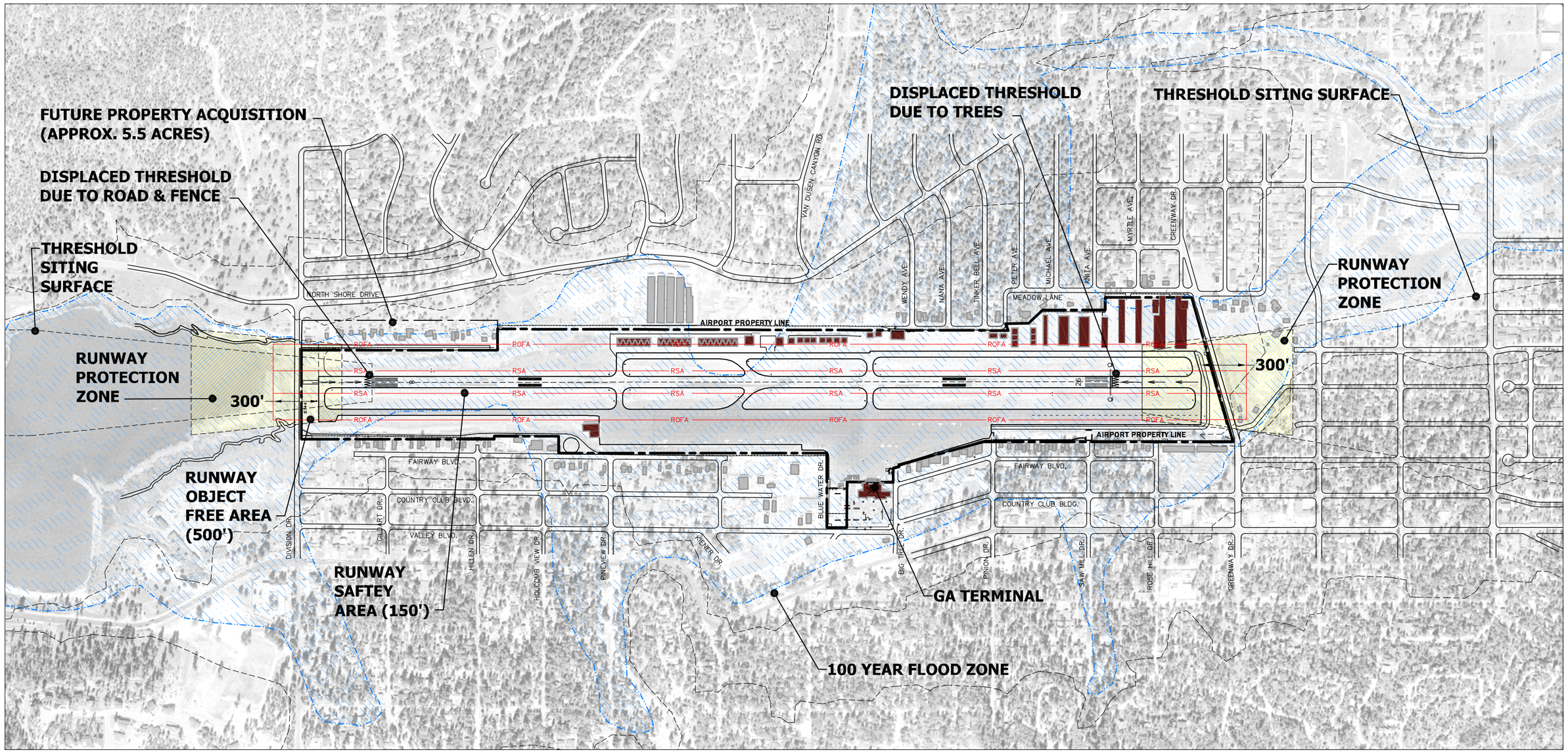
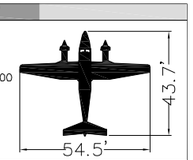


Figure C6 Potential ARC B-II Dimensional Criteria (Not Lower Than 3/4 Mile Visibility Minimums)

DESIGN AIRCRAFT

BEECH SUPER KINGAIR B200
ARC B–II
WEIGHT : 12,500 lbs.



SOURCE: AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
AIRPORT LAYOUT PLAN BY VSA AIRPORTS, PALM SPRINGS, CA 10/02.
FEMA FIRM SAN BERNARDINO COUNTY, 7315 OF 9400 3/96

As can be noted in the previous tables and delineated in the previous illustrations, Runway 08/26 at Big Bear City Airport is in compliance with these FAA specified ARC B-I (Small Aircraft Only) design standards. However, Runway 08/26 at Big Bear City Airport does not meet many of the FAA specified ARC B-II, greater than ¾ mile visibility minimums, dimensional criteria. These non-standard conditions include runway centerline to parallel taxiway centerline separation, runway centerline to aircraft parking on the north side of the Airport, runway centerline to hold line separation, runway safety area width, runway object free area width, and runway obstacle free zone width. Various alternatives will be evaluated in the following *Alternatives Analysis* chapter of this document to determine the preferred recommendations that are needed to meet potential future standards.

Objects Affecting Navigable Airspace. The criteria contained in Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, apply to existing and proposed manmade objects and/or objects of natural growth and terrain (i.e., obstructions). These guidelines define the critical areas in the vicinity of airports that should be kept free of obstructions. Secondary areas may contain obstructions if they are determined to be non-hazardous by an aeronautical study and/or if they are marked and lighted as specified in the aeronautical study determination. Airfield navigational aids, as well as lighting and visual aids, by nature of their location, may constitute obstructions. However, these objects do not violate FAR Part 77 requirements, as they are essential to the operation of the Airport.

Existing obstructions to the FAR Part 77 primary surface at Big Bear City Airport include the hangars north of Runway 08/26. It is recommended that these hangars be evaluated (i.e., airspaced) to determine if obstruction lights will be required. Additional potential obstructions will be identified and evaluated in conjunction with the preparation of this Airport Master Plan and will include recommendations for disposition and/or mitigation of identified obstructions. It should also be noted that all existing objects will be evaluated in consideration of the ultimate planned approaches and associated FAR Part 77 surfaces.

Runways

In consideration of the forecasts of future aviation activity, the adequacy of the runway system must be analyzed from several perspectives. These include runway orientation and airfield capacity, which were analyzed in the previous section, as well as runway length, pavement strength, and runway visibility, which will be evaluated in the following sections. The analysis of these various aspects pertaining to the runway system will provide a basis for recommendations of future improvements.

Runway Orientation. Big Bear City Airport currently operates with one runway, Runway 08/26, which provides a generally east-west orientation. As presented in a previous section, according to both comparative wind roses, the existing runway configuration provides excellent wind coverage (i.e., in excess of 98%) for the 10.5-knot crosswind component and 99% for the 13-knot crosswind component according to the March AFB data. Therefore, no additional runways need to be evaluated from a *wind coverage* standpoint.

Airfield Capacity. The evaluation of airfield capacity, as presented in previous sections, indicates that the Airport will not exceed the capacity of the existing runway/taxiway system before the end of the planning period.

During 2004, aircraft operations at Big Bear City Airport totaled 32,400, which is substantially short of the general planning threshold (60% of the ASV) that would trigger consideration of capacity enhancements. In addition, 43,861 annual operations are forecast to occur at the Airport by the end of the planning period, which is also well below the planning threshold criteria (60% of the ASV). Therefore, no additional runway facilities will be required at the Airport to increase operational capacity.

Runway Length. The determination of runway length requirements for Big Bear City Airport is based on several factors. These factors include:

- **Airport elevation;**
- **Mean maximum daily temperature of the hottest month;**
- **Runway gradient;**
- **Critical aircraft type expected to use the Airport; and,**
- **Stage length of the longest nonstop trip destination.**

The runway length operational requirements for aircraft are greatly affected by elevation, temperature, and runway gradient. The calculations for runway length requirements at Big Bear City Airport are based on an elevation of 6,752 feet AMSL, 80.7 degrees Fahrenheit NMT (mean normal maximum temperature of the hottest month), and a maximum difference in runway elevation at the centerline of one foot.

Generally, for design purposes, runway length requirements at general aviation airports are premised upon a combination of the most demanding aircraft within the general aviation fleet that are operating, or are projected to operate, at the Airport in the future. For Big Bear City

Airport, this fleet is dominated by small aircraft weighing 12,500 pounds maximum takeoff weight (MTOW) or less, with a few larger aircraft (i.e., the business jets that operate at the Airport) weighing less than 60,000 pounds MTOW. As can be seen in the following table, entitled *RUNWAY 08/26 TAKEOFF LENGTH REQUIREMENTS*, there are four runway lengths shown for small aircraft (i.e., less than ten passenger seats) type runways. Each of these provides the required length to accommodate a certain type of aircraft that will utilize the runway. The lengths range from 5,640 to 7,980 feet in length.

There are also four different lengths given for large aircraft (i.e., aircraft weighing between 12,500-60,000 pounds). The specified large aircraft runway lengths pertain to those general aviation aircraft, generally jet-powered, of 60,000 pounds or less maximum certificated takeoff weight. The runway length requirements for large aircraft range between 7,210-11,010 feet for Big Bear City Airport. Currently, this family of aircraft could be restricted at times from operating at the Airport at the longer stage lengths, due to the existing runway length of only 5,850 feet. The runway length requirements shown in Table C7 are dependent on meeting the operational requirements of a certain percentage of the fleet at a certain percentage of the useful load, (i.e., 75% of the fleet at 60% useful load). The useful load of an aircraft is defined as the difference between the maximum allowable structural gross weight and the operating weight empty. In other words, it is the load that can be carried by the aircraft composed of passengers, fuel, and cargo. Generally speaking, the following aircraft comprise 75% of the large aircraft fleet weighing less than 60,000 pounds: Learjets, Sabreliners, Citations, Falcons, Hawkers, and the Westwind.

An important factor to note when considering the generalized large aircraft runway takeoff length requirements presented in the previous table is that the actual length necessary for a runway is a function of elevation, temperature, and aircraft stage length. As temperatures change on a daily basis, the runway length requirements change accordingly. The cooler the temperature, the shorter the runway necessary; therefore, for example, if an airport is designed to accommodate 75% of the fleet at 90% useful load, this does not mean that, at certain times a larger aircraft cannot use the airport or that aircraft cannot use it with heavier loadings than that represented by 90% of the maximum useful load.

Following an examination of the various runway lengths provided in the previous table, it should be noted that Runway 08/26, with an existing length of 5,850 feet, could accommodate over 75% of the small aircraft fleet. As mentioned previously, pilots operating from Big Bear City Airport can adjust the operating weight of their aircraft based upon the specific payload requirements of their flight and the runway length available for takeoff. In addition, the specific

Table C7
RUNWAY 08/26 TAKEOFF LENGTH REQUIREMENTS

Runway Requirement	Runway Takeoff Length (Feet) Dry Pavement	Wet Pavement
Existing Condition		
Runway 08/26[1]	5,850	5,850
Small Aircraft with less than 10 seats [2]		
75% of Small Aircraft	5,640	5,640
95% of Small Aircraft	7,980	7,980
100% of Small Aircraft	7,980	7,980
Small Aircraft with more than 10 seats	7,980	7,980
Large Aircraft less than 60,000 pounds		
75% of fleet/60% useful load	7,210	7,210
100% of fleet/60% useful load	8,610	8,610
75% of fleet/90% useful load	11,010	11,010
100% of fleet/90% useful load	11,010	11,010

Runway lengths based on 6,752 feet AMSL, 80.7˚F NMT, and maximum difference in runway end elevation of one foot. [1] The physical length of the runway (end to end of pavement) is approximately 5,850 feet with a 370-foot displaced threshold on Runway 08 and a 600-foot displaced threshold on Runway 26. [2] The majority of aircraft operating at the Airport is contained within the Small Aircraft Category (i.e., ≤12,500 lbs.).

performance capabilities of general aviation aircraft are documented through the aircraft certification process and defined by Federal Aviation Regulations (FAR) Part 23. Therefore, both takeoff and landing procedures conducted at Big Bear City Airport must comply with these regulations to ensure the safety of these operations. Based on the airport's existing and projected operational activity, it is concluded that the existing runway length is deficient, with approximately 7,980 feet being required to accommodate 100% of the small aircraft fleet. This existing deficiency will be evaluated in the following *Alternatives Analysis and Development Concepts* chapter of this document. Therefore, the existing 5,850-foot runway length will be examined in conjunction with the previously identified dimensional criteria deficiencies to identify potential alternative airfield development recommendations.

Runway Pavement Strength. As identified in the *Inventory of Existing Conditions* chapter of this document, Runway 08/26 is rated in excellent condition, with an existing gross weight bearing capacity of 12,500 pounds single wheel main gear configuration. According to the projected operational fleet mix, this pavement may require a strengthening project within the planning period of this study to accommodate the larger general aviation aircraft fleet. In addition, all existing airfield pavement should be tested periodically to properly ascertain existing pavement strengths.

Runway Line-of-Sight. According to existing runway line-of-sight standards, any two points located five feet above the runway centerline must be mutually visible for the entire length of the runway. If the runway has a full-length parallel taxiway, the visibility requirement is reduced to a distance of one-half the runway length. Big Bear City Airport does comply with the runway line-of-sight standards for the entire length of the runway.

Taxiways

Taxiways are constructed primarily to enable the movement of aircraft between the various functional areas on the airport and the runway system. Some taxiways are necessary simply to provide access between aircraft parking aprons and runways; whereas, other taxiways become necessary to provide more efficient and safer use of the airfield. As described earlier, the taxiway system at Big Bear City Airport does not meet the required separation standards from Runway 08/26.

Taxiway improvements that will be considered for development at Big Bear City Airport will include the relocation of one or both of the parallel taxiways, as well as the extension of Taxiway "B" to the end of Runway 08. Additional taxiway improvements to be analyzed include the potential future extension of access taxiways and/or taxilanes to serve additional hangar development and expansion areas on the Airport. In the *Alternatives Analysis and Development Concepts* chapter, the existing access taxiway system will be evaluated with respect to existing and future departure ends of the runway, and every effort should be made to physically separate the airport roadways from taxiways to prohibit unauthorized vehicles from accessing the airport's aircraft movement areas, and to assist in the safety and security monitoring of the Airport.

Instrumentation and Lighting

Electronic landing aids, including instrument approach capabilities and associated equipment, airport lighting, and weather/airspace services, were detailed in the *Inventory of Existing Conditions* chapter of this document. The Airport is equipped with an existing RNAV (GPS) instrument approach to Runway 26, which offers visibility minimums ranging from 1-¼ to 1-½ miles, depending upon the category of aircraft.

At present, Global Positioning System (GPS) approaches are anticipated to be the FAA's standard approach technology. With GPS, the cost of establishing new or improved instrument approaches at many airports can be significantly reduced due to the lack of required ground instrumentation. Because of the expected continued use of sophisticated general aviation and corporate aircraft at Big Bear City Airport, the ability to implement improved instrument approaches should be considered, including an identification of the potential impacts on the

airport's design (i.e., the configuration of the safety and object clearing standards surrounding the runway system and FAR Part 77 airspace criteria).

Visual Landing Aids (Lights). Presently, the runway at Big Bear City Airport is equipped with Medium Intensity Runway Lights (MIRLs), with Precision Approach Path Indicators (PAPIs) located on the left side of each runway end. Based upon the previous discussion regarding improved instrument approach capabilities and visibility minimums, it is recommended that the existing MIRLs and PAPIs should be retained at the Airport, in addition to the programming of Runway End Identifier Lights (REILs) at both runway ends. Based upon the existing site constraints of the Airport, which limit the lateral separation dimension from the runway centerline, the installation of an Approach Lighting System (ALS) to improve the approach capabilities and visibility minimums to Runway 26 will not be considered.

Runway Protection Zones (RPZs). The function of the RPZ is to enhance the protection of people and property on the ground off the end of runways. This is achieved through airport control of the property within the RPZ area. This control can be exercised through either fee simple ownership or the purchase of an RPZ easement. The RPZ is trapezoidal in shape and centered about the extended runway centerline. Its inner boundary begins 200 feet beyond the end of the area usable for takeoff or landing. The dimensions of the RPZ are functions of the type of aircraft that regularly operate at the airport, in conjunction with the specified visibility minimums of the approach (if applicable).

The RPZs, as shown on the existing airport layout plan, are based on dimensional standards for ARC B-I (small aircraft only). Because the determined operations by aircraft type include aircraft weighing over 12,500 pounds and aircraft with wingspans over 49 feet, this ARC may not be applicable and the RPZ dimensions may have to be increased to ARC B-II standards with visual and not less than one mile approach visibility minimums.

Any larger RPZ dimensions may also necessitate additional RPZ easement or property acquisition at both runway ends with the required acreage being dependent upon the ultimate location of the runway thresholds. The following table, entitled *RUNWAY PROTECTION ZONE DIMENSIONS*, lists existing RPZ dimensional requirements, along with the requirements for improved approach capabilities and/or more demanding approach category aircraft.

Table C8
RUNWAY PROTECTION ZONE DIMENSIONS

Item	Width at Runway End (feet)	Width at Outer End (feet)	Length (feet)
Existing RPZ Dimensions:			
Runway 08	250	450	1,000
Runway 26	250	450	1,000
Required B-I/B-II RPZ Dimensions:			
Runway 08	500	700	1,000
Runway 26	500	700	1,000
Required RPZ Dimensions for Various Visibility Minimums:			
Visual and not lower than One mile (Statute), Small Aircraft Exclusively [1]	250	450	1,000
Not lower than One Mile (Statute), Approach Categories A & B	500	700	1,000
Not lower than One Mile (Statute), Approach Categories C & D 500	1,010	1,700	
Not lower than ¾-Mile (Statute), All Aircraft	1,000	1,510	1,700
Lower than ¾-Mile (Statute), All Aircraft	1,000	1,750	2,500

Source: FAA Advisory Circular 150/5300-13, *Airport Design*. [1] Existing criteria depicted on the current ALP.

Future Lighting. As mentioned previously, Runway 08/26 is equipped with Medium Intensity Runway Lights (MIRLs). These lights should be maintained in conjunction with the existing/proposed instrument approach procedures. In addition, Medium Intensity Taxiway Lights (MITLs), which are presently in place on Taxiway "A" and "B", should be maintained.

Glide path indicator lights are a system of lights that provide visual vertical approach slope guidance to aircraft during an approach to the runway. Precision Approach Path Indicators (PAPIs) or Visual Approach Slope Indicators (VASIs) are designed for day and nighttime use during VFR (i.e., good weather) conditions. The existing Precision Approach Path Indicators (PAPIs) are recommended to be retained at each runway end.

Runway End Identifier Lights (REILs) are a system of lights that provides an approaching aircraft a rapid and positive identification of the approach end of the runway. At present, Runway 08/26 is not equipped with REILs and it is recommended that REILs be considered for installation. The need for a future Approach Lighting System (ALS) would be contingent on the installation of a lower visibility minimum approach into the Airport, which is not anticipated to occur.

Landside Requirements

Landside facilities are those facilities that support the airside facilities, but are not actually a part of the aircraft operating surfaces. These consist of such facilities as terminal buildings, hangars, aprons, access roads and support facilities. Following a detailed analysis of these facilities, current deficiencies can be noted in terms of accommodating both existing and future aviation needs at the Airport.

General Aviation Requirements

The aircraft based at Big Bear City Airport are stored in one of four areas: T-hangars, executive hangars, large FBO storage hangars, or apron tiedowns. Currently, there are 133 aircraft based at the Airport. The majority of these aircraft are stored in approximately 105 hangar spaces, in 31 separate buildings. Over the course of the 20-year planning period, the number of based aircraft is forecast to increase to 156, indicating that an increase in storage facilities to accommodate approximately 23 new aircraft will be required. It is assumed that future storage spaces will reflect many of the same characteristics of current storage patterns, with the majority of the based aircraft fleet being stored in hangars.

Tiedown Storage Requirements/Based Aircraft. Aircraft tiedowns are provided for those aircraft that do not require, or desire to pay the cost for, hangar storage. Space calculations for these areas are based on 300 square yards of apron for each aircraft tiedown. This amount of space allows for aircraft parking and circulation between the rows of parked aircraft. Based upon existing aircraft storage practices and demand for new hangar facilities, it is projected that a significant number of new aircraft, as well as existing based aircraft that are currently stored on the apron, would prefer to have enclosed hangar storage. As a result, it is projected that the based aircraft apron requirements will generally decline through the planning period as additional hangar storage facilities are constructed at the Airport, with the excess-based aircraft apron then being available for transition to use as itinerant aircraft apron and T-hangar facilities.

Tiedown Storage Requirements/Itinerant Aircraft. In addition to the needs of the based aircraft tiedown areas addressed in the preceding section, transient aircraft also require apron parking areas at Big Bear City Airport. This storage is provided in the form of transient aircraft tiedown space. In calculating the area requirements for these tiedowns, an area of 400 square yards per aircraft has been used. As previously described, it is projected that the forecast decreasing demand for based aircraft apron would be available for use to accommodate a portion of the forecast increase in demand for itinerant aircraft apron and T-hangars through the planning period, and the development plan for the Airport will designate adequate areas for future apron development to satisfy the additional demand.

The accompanying table shows the type of facilities and the number of units or square yards needed for that facility in order to meet the forecast demand for each development phase. It is expected that most of the owners of aircraft that will be newly based at the Airport will desire some type of indoor storage facility. The actual type of hangar storage facility to accommodate based aircraft has been identified as T-hangars, executive hangars, and larger corporate and/or FBO-type hangars; although, the actual number, size, and location of the larger hangar types will depend on user needs and financial feasibility. In addition, access and perimeter roadway locations and auto parking requirements are not included in this tabulation because the amount of land necessary for these facilities will be a function of the location of other facilities, as well as the most effective routing of roadways. The following table, entitled *GENERAL AVIATION FACILITY REQUIREMENTS, 2004-2025*, depicts the area required for general aviation landside facilities during all stages of development. This will assist in the development of detailed facility staging discussed in later chapters of this document.

Table C9
GENERAL AVIATION FACILITY REQUIREMENTS, 2004-2025

	Total Number Required (In yd^2)				
Facility	**2004** [(1)]	**2009**	**2014**	**2019**	**2025**
Itinerant/GA Apron	---	11,542	12,440	13,407	14,448
Based A/C GA Apron	---	9,570	8,910	7,920	6,930
Total Apron (yd^2) [(1)]	50,000	21,112	21,350	21,327	21,378
Hangar Space					
T-hangars (no./yd^2)	96/50,336	105/54,692	112/58,564	118/61,468	127/66,308
Exec./Corp. (no./yd^2)	6/5,802	6/5,802	6/5,802	8/7,744	8/7,744
Total	**106,138**	**81,606**	**85,716**	**90,539**	**95,430**

Source: BD&Co. Projections based on FAA AC 150/5300-13. [(1)] Actual.

Support Facilities Requirements

In addition to the aviation and airport access facilities described above, there are several airport support facilities that have quantifiable requirements and that are vital to the efficient and safe operation of the Airport. The support facilities at Big Bear City Airport that require further evaluation include the fuel storage facility, the adjacent access roadway system, and airport infrastructure development.

Fuel Storage Facility. According to fuel sale estimates provided by airport management, there has been an average of 146,335 gallons of AvGas and Jet A fuel sold per year at Big Bear City Airport over the past five years. Based on 2004 total operation counts, this equates to just over four and one-half gallons per operation. Typically, as operations increase, fuel storage requirements can be expected to increase proportionately. By applying the ratio of gallons sold per operation over the 20-year planning period, an estimate of future fuel storage needs can be calculated. Jet aircraft, which use Jet A fuel, typically take on more fuel than aircraft using AvGas and, as such, it is assumed that the ratio of gallons per operation is higher. As can be seen in the following table, entitled *FUEL STORAGE REQUIREMENTS, 2004-2025*, it appears that the capacity of both types of fuel may need to be increased. Therefore, adequate expansion area will be reserved in the vicinity of the existing fuel farm to accommodate additional fuel storage tanks.

Table C10
FUEL STORAGE REQUIREMENTS, 2004-2025

	2004 [1]	2010	2015	2020	2025
Annual Operations	*32,400*	*34,751*	*36,854*	*39,084*	*41,461*
Annual Operations (AvGas)	28,188	30,233	32,063	34,003	36,071
Average AvGas Fuel Ratio (Gal.)	5	5	5	5	5
Total Annual AvGas Storage Required (Gal.)	140,940	151,167	160,315	170,015	180,355
Storage Capacity (Gal.)	10,000	10,000	10,000	10,000	10,000
Minimum Delivery Frequency (Deliveries per Year)	14.1	15.1	16.0	17.0	18.0
Annual Operations (Jet A)	4,212	4,518	4,791	5,081	5,390
Average Jet A Fuel Ratio (Gal.)	10	10	10	10	10
Total Annual Jet A Fuel Storage Required (Gal.)	42,120	45,176	47,910	50,809	53,899
Storage Capacity (Gal.)	5,200	5,200	5,200	5,200	5,200
Minimum Delivery Frequency (Deliveries per Year)	8.1	8.7	9.2	9.8	10.4

[1] Base year estimates.

Access Roadway Development. Due to the close proximity of the terminal area to State Highway 18, roadway access to the Airport is very good. The Airport is accessed via Big Tree Drive, north from State Highway 18. Improvements and/or changes to the existing airport access system are not recommended with the possible exception of an eastbound left-turn lane on Big Bear Boulevard at the intersection of Big Tree Drive.

Potential Land Acquisition and Airport Infrastructure Development. Future development of both aviation and/or aviation-related development areas outside of airport property will require land acquisition and the removal and/or improvement of the existing infrastructure in these areas. The projected cost of this land acquisition and/or infrastructure development should be incorporated into the future development costs for the Airport.

Planning Issues Identification/Verification

Identification of the current and future airport planning issues, which may influence the use of a public facility, is an important step in the planning process. A preliminary list of these issues has been identified to assist in the key decision points of this Airport Master Plan.

The following list identifies those issues that will be considered in the preparation of the airside and landside planning alternatives for Big Bear City Airport and, ultimately, provides the basis for the formulation of the future plan for this facility. These issues, which have been organized into airside, landside, and airport management categories, are referenced in more than one category, due to their complexity or boundary relationships.

Airside Issues:

- **Verify Appropriate Future Airport Design Standards**
- **Resolve Existing/Future Non-Standard Design Criteria**
- **Identify/Confirm Future Instrument Approach Procedure Needs and Capabilities**
- **Maintain Airport Infrastructure Development**
- **Recognize Environmental Issues in Consideration of Future Airport Development (i.e., Aircraft Noise, Aircraft Overflights, Floodplain and Drainage, Land Use Compatibility with Surrounding Development, etc.)**

Landside Issues:

- **Verify Appropriate Future Airport Design Standards**
- **Identify Future General Aviation Development Areas to Accommodate Existing/Future Demand (Hangars and Tiedown Apron)**

- **Coordinate Future Roadway Improvements Surrounding Airport to Coordinate Design and Development Considerations**
- **Maintain Airport Infrastructure Development**
- **Maintain Aviation Security**
- **Promote Financial Self Sufficiency of the Airport**
- **Recognize Environmental Issues in Consideration of Future Airport Development (i.e., Aircraft Noise, Aircraft Overflights, Floodplain and Drainage, Land Use Compatibility with Surrounding Development, etc.)**

Airport Management Issues:

- **Identify Future General Aviation Development Areas to Accommodate Existing Demand (Hangars and Tiedown Apron)**
- **Maintain Aviation Security**
- **Promote Airport Compatibility with Surrounding Community**
- **Promote Financial Self Sufficiency of the Airport**
- **Recognize Environmental Issues in Consideration of Future Airport Development (i.e., Aircraft Noise, Aircraft Overflights, Floodplain and Drainage, Land Use Compatibility with Surrounding Development, etc.)**

Summary

The need for facilities, which has been identified in this chapter, can now be utilized to formulate the overall future Development Plan of the Airport. The following table summarizes the projected facility requirements necessary to accommodate the projected operational demands through 2025. The formulation of this plan will begin by establishing goals for future airport development and an analysis of development alternatives, whereby demand for future airport facilities can be accommodated. These alternatives will be presented in the following chapter, entitled *Alternatives Analysis and Development Concepts.*

Table C11
FACILITY REQUIREMENTS SUMMARY, 2004-2025

Facility	2004[1]	2010	2015	2020	2025
Dimensional Standards					
Runway 08/26	ARC B-I (Small Aircraft)	ARC B-II[2]	same	same	same
Runway Length/Width (In Feet)					
Runway 08/26	75 x 5,850	same	same	same	same
Instrument Approach Enhancement					
Runway 26	1 Mile Vis. Mins.	same	same	same	same
Approach Lighting System					
Runway 08/26	none	same	same	same	same
General Aviation Apron Requirements (in yds.)					
Itinerant	---	11,542	12,440	13,407	14,448
Based	---	9,570	8,910	7,920	6,930
Total	50,000	21,112	21,350	21,327	21,378
General Aviation Aircraft Storage Facilities (in yds.)					
T-hangars	96/50,336	105/54,692	112/58,564	118/61,468	127/66,308
Exec.Corp.	6/5,802	6/5,802	6/5,802	8/7,744	8/7,744

[1] Actual. [2] Potential ARC B-II upgrade requirement to be determined following FAA review.

Alternative Analysis and Development Concepts

INTRODUCTION. The purpose of this chapter is to present the Development Plan Alternatives and/or recommendations for Big Bear City Airport in terms of both their concept and reasoning. Therefore, several basic assumptions have been established, which are intended to direct the future development and maintenance of the Airport. These assumptions are supported by the aviation activity forecasts and include a commitment for continued airport development, which supports the economic development needs of the region.

Development Assumptions

The first assumption states that the airport's existing runway length of 5,850 feet will be maintained, and there are no plans to extend the runway within the 20-year planning period. Due to existing land use and environmental considerations, an extension of the runway at Big Bear City Airport has been determined to be impractical. Also, due to the existing and forecast operations by aircraft type, and relatively short length-of-haul for the majority of airport users, an extension of Runway 08/26 is not recommended.

The second assumption states that if the airfield dimensional criteria are to be upgraded in accordance with Airport Reference Code (ARC) B-II design standards, FAA modifications and/or

waivers to design standards may be required for the runway-to- taxiway centerline separation distances, due to the existing location airport infrastructure including the taxiways, apron, and hangars.

The third assumption states that the airport's existing runway approach visibility minimum to Runway 26 will be maintained (i.e., one mile) and the existing runway approach visibility minimum for Runway 08 will be improved (from visual to one mile).

The fourth assumption states that the improvement of the Runway Safety Areas (RSAs) and the Runway Object Free Areas (ROFAs) off the ends of both runways is needed to correct non-standard conditions and that modifications and/or waivers to FAA design standards are not an option for the RSA dimensions.
The fifth assumption states that the existing demand for new aircraft storage facilities will necessitate that adequate areas should be reserved to accommodate long-term general aviation storage capabilities of the Airport and that some amount of land acquisition may be required for such facilities.

The sixth assumption states that all proposed development will be in accordance with the San Bernardino County General Plan.

Goals for Development

Accompanying these assumptions are several goals, which have been established for purposes of directing the plan and establishing continuity in the future development of the Airport. These goals take into account several categorical considerations relating to the needs of the facility, both in the short-term and the long-term, including safety, noise, capital improvements, land use compatibility, financial and economic conditions, public interest and investment, and community recognition and awareness. While all are project-oriented, some obviously represent more tangible activities than others; however, all are deemed important and appropriate to the future of the Airport.

The following goals are intended to guide the preparation of this Airport Master Plan and direct the future development of Big Bear City Airport:

- **Plan the Airport to safely accommodate the forecast aircraft fleet with facilities properly sized to accommodate forecast demand.**
- **Program facilities to be constructed when demand is realized (construction is to be**

driven by actual demand, not forecast demand).

- **Ensure that the future development of the Airport will continue to accommodate a variety of general aviation activities, ranging from small general aviation users to small corporate aviation operators.**
- **Enhance the self-sustaining capability of the Airport and ensure the financial feasibility of all future development.**
- **Develop land acquisition priorities, if necessary (i.e., fee simple and/or easement) related to airport safety, future airport development, and land use compatibility.**
- **Encourage the protection of existing public and private investment in land and facilities, and advocate the resolution of any potential land use conflicts, both on and off airport property.**
- **Plan and develop the Airport to be environmentally compatible with the community and minimize environmental impacts on both airport property and property adjacent to the Airport.**
- **Provide effective direction for the future development of the Airport through the preparation of a rational plan and adherence to the adopted development program.**
- **Integrate the airport's ground transportation access requirements with the area's regional transportation goals.**
- **Promote compliance with existing overlay zoning regulations in the vicinity of the Airport to encourage land use compatibility and ensure appropriate zoning requirements within the airport environs.**

Airside & Landside Development Alternatives and Concepts

Introduction

Various development options have been identified for evaluation and are presented in the following development plan analysis. It is important to note that a final Recommended Conceptual Airport Development Plan will be prepared based on the analysis of these planning issues, and the recommended plan will likely represent a combination of the various development concepts presented. However, prior to the presentation of the development options, a listing of the key airport airside and landside planning issues has been generated, and is presented in the following text:

Airside Planning Issues

- **ARC Dimensional Criteria**
- **Parallel Taxiway System**
- **Non-Standard Conditions**
- **Potential Modifications and/or Waivers to FAA Design Standards**
- **Displaced Thresholds and Declared Distances**
- **Runway/Taxiway Pavement Strength**
- **Instrument Approach Criteria**
- **Runway Lighting & NAVAIDS**
- **Potential Floodplain Impacts**

Landside Planning Issues

- **General Aviation Development**
- **Airport Access Roadways**
- **Aviation-Compatible Development**
- **Property/Easement Acquisition**
- **Support Facilities**
- **Development Projects/Phasing**

Airside Development Alternatives

To accommodate the projected operational demand at Big Bear City Airport through the year 2025 (i.e., the end of the 20-year planning period), two airside development alternatives for the Airport have been prepared and are presented in the following illustrations and described below. Both the forecast operations and the goals of Big Bear City, relative to aviation development and economic enhancement, have been incorporated into this planning effort.

- **Alternative One.** Maintain the existing ARC B-I (Small Aircraft Only) design standards, implement declared distances criteria, and extend Taxiway "B" to serve the end of Runway 08.

- **Alternative Two.** Upgrade the existing ARC to B-II design standards, apply for modifications to standards for runway/taxiway separations and hangar penetrations of the Runway Object Free Area (ROFA) north of Runway 08/26, apply declared distances criteria, and extend Taxiway "B" to serve the end of Runway 08.

A variation of each alternative including some optional development has also been analyzed and is presented in Alternatives One-A and Two-A. These alternatives are described as follows:

- **Alternative One-A.** Apply the same development as described in Alternative One with the addition of the relocation of Greenway Drive, and the extension of the Runway 26 RSA and ROFA lengths.
- **Alternative Two-A.** Apply the same development as Alternative Two with the addition of the relocation of Greenway Drive, and extension/widening of the Runway 26 RSA and ROFA.

Alternative One. Maintain the existing ARC B-I (Small Aircraft Only) design standards, implement declared distances criteria, and extend Taxiway "B" to serve the end of Runway 08.

Runway 08/26 Airside Development.

- *ARC Dimensional Criteria:* Maintain the existing ARC B-I (Small Aircraft Only) design standards.
- *Runway System:* Implement and publish the following declared distances criteria for Runway 08/26 to provide adequate RSAs and ROFAs off both ends of the runway.

	TORA	TODA	ASDA	LDA
Runway 08	5,850′	5,850′	5,610′	5,240′
Runway 26	5,850′	5,850′	5,710′	5,110′

TORA: Takeoff Run Available. TODA: Takeoff Distance Available. ASDA: Accelerate Stop Distance Available. LDA: Landing Distance Available.

- *Runway Lighting:* Maintain the Medium Intensity Runway Lights (MIRLs) serving Runway 08/26. Additionally, the existing Precision Approach Path Indicator (PAPI) lights that serve each runway end should be maintained.

north

0 150' 300' 600' 900'
GRAPHIC SCALE IN FEET

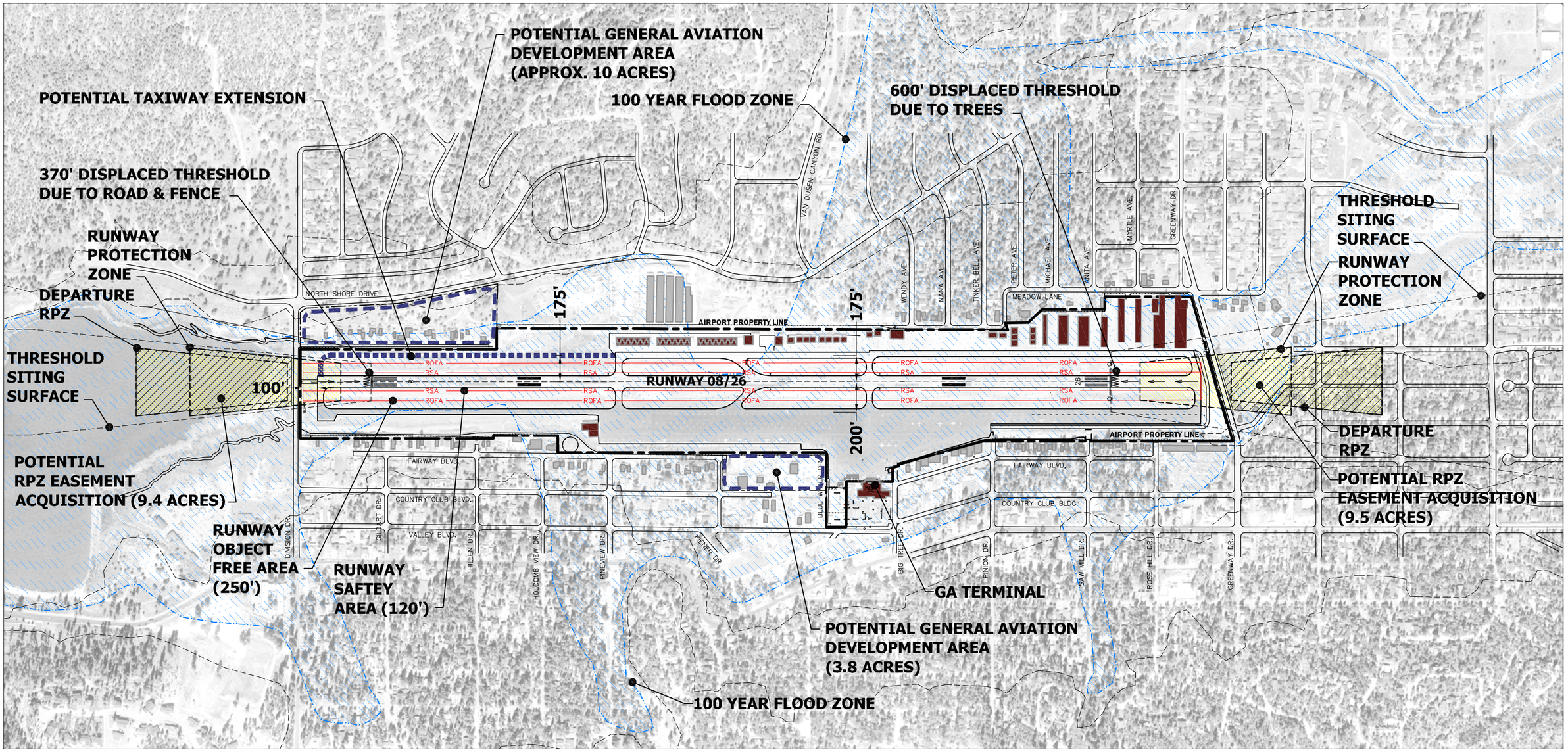
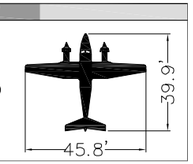


Figure D1 Alternative One Development Plan

DECLARED DISTANCES	TORA	TODA	ASDA	LDA
RUNWAY 08	5,850'	5,850'	5,610'	5,240'
RUNWAY 26	5,850'	5,850'	5,710'	5,110'

DESIGN AIRCRAFT

BEECH KINGAIR B100
ARC B-I (Small Aircraft)
WEIGHT : 11,800 lbs.



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Master Plan Big Bear City Airport
Big Bear City, California

- *Taxiway System:* Maintain the existing full-length parallel taxiway south of the runway (Taxiway "A") and extend the partial parallel taxiway north of the runway (Taxiway "B") to the end of Runway 08, including a connector taxiway.
- *Taxiway Lighting:* Maintain the Medium Intensity Runway Lights (MITLs) serving both taxiways and install MITLs on the Taxiway "B" extension.
- *Pavement:* Maintain existing gross weight bearing capacity of 12,500 pounds single wheel gear configuration.
- *Property/Easement Acquisition:* Purchase RPZ/avigation easements for the approximate 18.9 acres of uncontrolled approach and departure Runway Protection Zones (RPZs) associated with each runway end.

Alternative One Development Projects.

The major projects associated with the Alternative One development include:

Airside Projects:	*Cost Estimate*
1) Acquire RPZ/avigation easement for Runway 08 RPZ (9.4 acres).	$0
2) Acquire avigation easement for Runway 26 RPZ (9.5 acres).	$1,797,600
3) Acquire ten acres of residential property adjacent to the northwest quadrant of the Airport for the extension of Taxiway "B" and future general aviation development.	$9,685,800
4) Acquire 3.8 acres of commercial property adjacent to the General Aviation Terminal Building for future general aviation development.	$3,221,900
5) Construct a 1,970-foot taxiway extension of Taxiway "B" and a 120-foot connector taxiway to Runway 08, including MITLs.	$1,800,000
6) Relocate approximately 1,300 feet of perimeter fence north of the Taxiway "B" extension.	$100,000
7) Install obstruction lights on hangars north of the runway, and the hangar located west of the aircraft parking apron.	$40,000

The estimated planning level cost estimates for the implementation of the Alternative One development projects totals approximately $16,645,300. A graphic layout of Alternative One was shown in the previous illustration, entitled *ALTERNTIVE ONE DEVELOPMENT PLAN*.

Alternative One-A. Apply the same development as described in Alternative One with the addition of the relocation of Greenway Drive and the extension of the Runway 26 RSA and ROFA.

Runway 08/26 Airside Development.

- *ARC Dimensional Criteria:* Maintain the existing ARC B-I (Small Aircraft Only) design standards.

- *Runway System: Re*-align a segment of Greenway Drive, extend the Runway 26 RSA/ROFA lengths, and implement/publish the following declared distances criteria for Runway 08/26 to provide adequate RSAs and ROFAs off both ends of the runway.

	TORA	TODA	ASDA	LDA
Runway 08	5,850′	5,850′	**5,850′**	**5,480′**
Runway 26	5,850′	5,850′	5,710′	5,110′

TORA: Takeoff Run Available. TODA: Takeoff Distance Available. ASDA: Accelerate Stop Distance Available. LDA: Landing Distance Available.

- *Runway Lighting:* Maintain the Medium Intensity Runway Lights (MIRLs) serving Runway 08/26. Additionally, the existing Precision Approach Path Indicator (PAPI) lights that serve each runway end should be maintained.

- *Taxiway System:* Maintain the existing full-length parallel taxiway south of the runway (Taxiway "A") and extend the partial parallel taxiway north of the runway (Taxiway "B") to serve the end of Runway 08.

- *Taxiway Lighting:* Maintain the Medium Intensity Runway Lights (MITLs) serving both taxiways and install MITLs on the Taxiway "B" extension.

- *Pavement:* Maintain existing gross weight bearing capacity of 12,500 pounds single wheel gear configuration.

- *Property/Easement Acquisition:* Purchase RPZ/avigation easements for the approximate 13.1 acres of uncontrolled approach and departure Runway Protection Zones (RPZs) associated with each runway end. Also, purchase approximately 9.1 acres of property in fee for the re-alignment of Greenway Drive and the inner approach area of Runway 26.

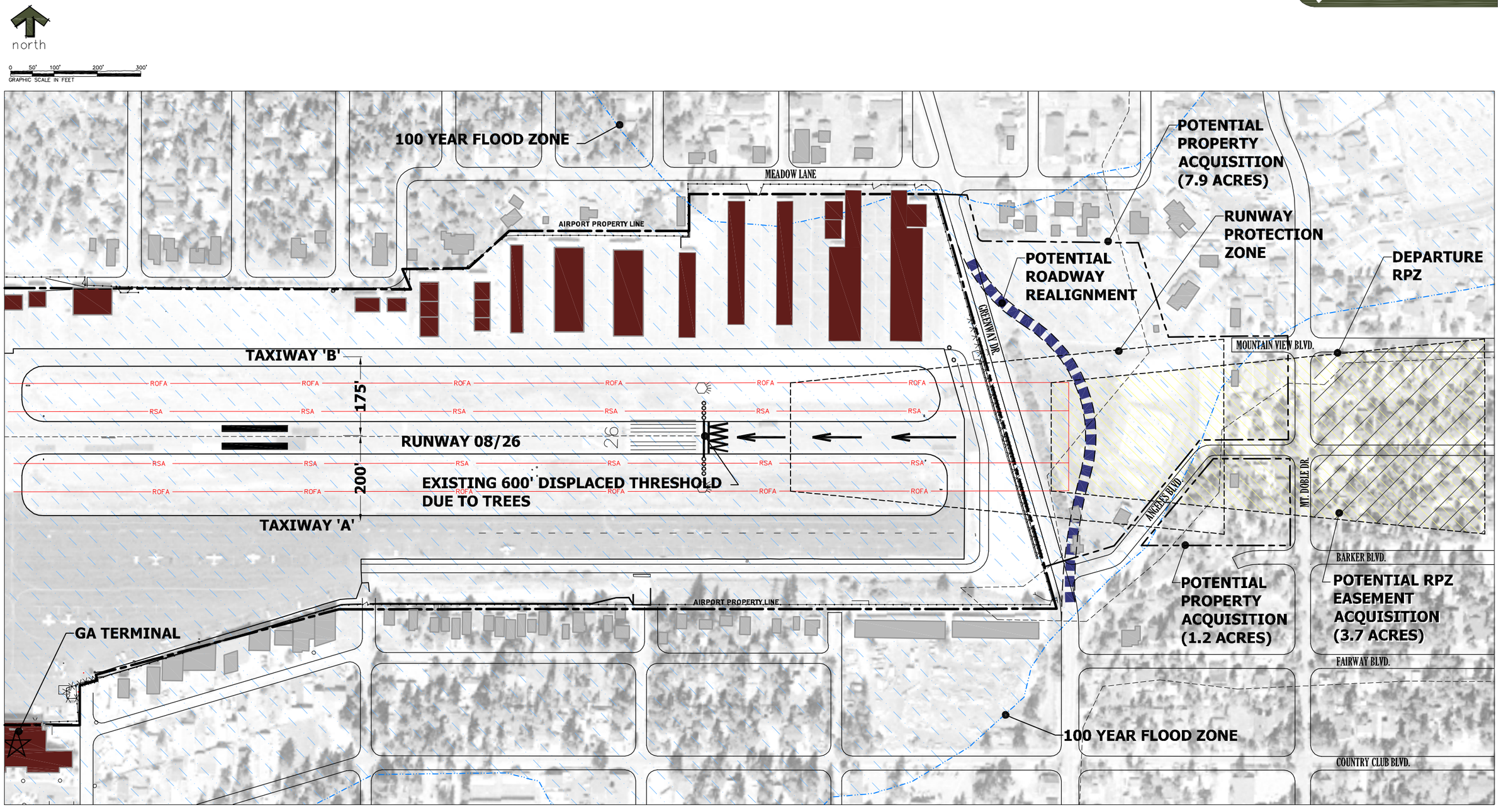


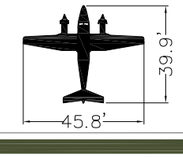
Figure D2 Alternative One-A Development Plan/East Area Detail

DECLARED DISTANCES

	TORA	TODA	ASDA	LDA
RUNWAY 08	5,850'	5,850'	**5,850'**	**5,480'**
RUNWAY 26	5,850'	5,850'	5,710'	5,110'

DESIGN AIRCRAFT

BEECH KINGAIR B100
ARC B-I (Small Aircraft)
WEIGHT : 11,800 lbs.



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Alternative One-A Development Projects.

The major projects associated with the Alternative One-A development include:

Airside Projects:	*Cost Estimate*
1) Acquire RPZ/avigation easement for Runway 08 RPZ (9.4 acres).	$0
2) Acquire RPZ/avigation easement for Runway 26 RPZ (3.7 acres).	$1,284,000
3) Acquire ten acres of residential property adjacent to the northwest quadrant of the Airport for the extension of Taxiway "B" and future general aviation development.	$9,685,800
4) Acquire 3.8 acres of commercial property adjacent to the General Aviation Terminal Building for future general aviation development.	$3,221,900
5) Construct a 1,970-foot taxiway extension of Taxiway "B" and a 120-foot connector taxiway to Runway 08, including MITLs.	$1,800,000
6) Relocate approximately 1,300 feet of perimeter fence north of the Taxiway "B" extension.	$100,000
7) Install obstruction lights on hangars north of the runway, and the hangar located west of the aircraft parking apron.	$40,000
8) Acquire 9.1 acres of land for Runway 26 RSA and ROFA lengths.	$6,865,000
9) Re-align 890 feet of Greenway Drive around ROFA and remove previous section of Greenway Drive and grade RSA.	$948,700
10) Relocate 900 feet of perimeter fence around the Runway 26 ROFA.	$44,500

The estimated planning level cost estimates for the implementation of the Alternative One-A development projects totals approximately $23,989,900. A graphic layout of Alternative One-A was shown in the previous illustration, entitled *ALTERNATIVE ONE-A DEVELOPMENT PLAN/EAST AREA DETAIL*.

The major positive aspect of Alternative One is that this option does not include the significant capital developments costs of upgrading the ARC for the Airport. This alternative also improves the safety and utility of the Airport by providing a full-length parallel taxiway on the north side of the runway and eliminates the need for aircraft located on the north side of the Airport to have to taxi across the active runway to access the Runway 08 end. Alternative One-A includes these positive aspects in addition to providing additional useable runway available for takeoff and landing on Runway 08 by relocating Greenway Drive and extending the RSA and ROFA boundaries to the east.

The negative aspects of Alternative One and Alternative One-A are that the existing ARC B-I (Small Aircraft Only) standards do not provide the airport's existing ARC B-II aircraft operators with the same "level of safety" as that provided to the small aircraft fleet. While the Airport has safely and efficiently accommodated a significant amount of ARC B-II traffic in the past, the

forecast increase in this type of traffic should be evaluated by the FAA to determine the appropriate design standard for the Airport.

Alternative Two. **Upgrade the existing ARC B-I (Small Aircraft Only) design standards to ARC B-II standards, apply for modifications to standards for runway/taxiway separations and hangar penetrations of the ROFA north of Runway 08/26, implement declared distances criteria, and extend Taxiway "B" to the end of Runway 08.**

Runway 08/26 Airside Development.

- *ARC Dimensional Criteria:* Upgrade the existing ARC B-I (Small Aircraft Only) to ARC B-II design standards.
- *Runway System:* Implement and publish the following declared distances for Runway 08/26 to provide adequate RSAs and ROFAs off both ends of the runway.

	TORA	TODA	ASDA	LDA
Runway 08	5,850′	5,850′	5,550′	5,180′
Runway 26	5,850′	5,850′	5,650′	5,050′

TORA: Takeoff Run Available. TODA: Takeoff Distance Available. ASDA: Accelerate Stop Distance Available. LDA: Landing Distance Available.

- *Runway Lighting:* Maintain the Medium Intensity Runway Lights (MIRLs) serving Runway 08/26, and the existing Precision Approach Path Indicator (PAPI) lights that serve each runway end should be maintained. Additionally, Runway End Identifier Lights (REILs) would be installed to Runway 26.
- *Taxiway System:* Maintain the existing full-length parallel taxiway south of the runway (Taxiway "A") and extend the partial parallel taxiway north of the runway (Taxiway "B") to serve the end of Runway 08.
- *Taxiway Lighting:* Maintain the Medium Intensity Runway Lights (MITLs) serving both taxiways and install MITLs on the Taxiway "B" extension.
- *Pavement:* Maintain existing gross weight bearing capacity of 12,500 pounds single wheel gear configuration.
- *Property/Easement Acquisition:* Purchase RPZ/avigation easements for the approximate 30.5 acres of uncontrolled approach and departure Runway Protection Zones (RPZs) associated with each runway end.

north

0 150' 300' 600' 900'
GRAPHIC SCALE IN FEET

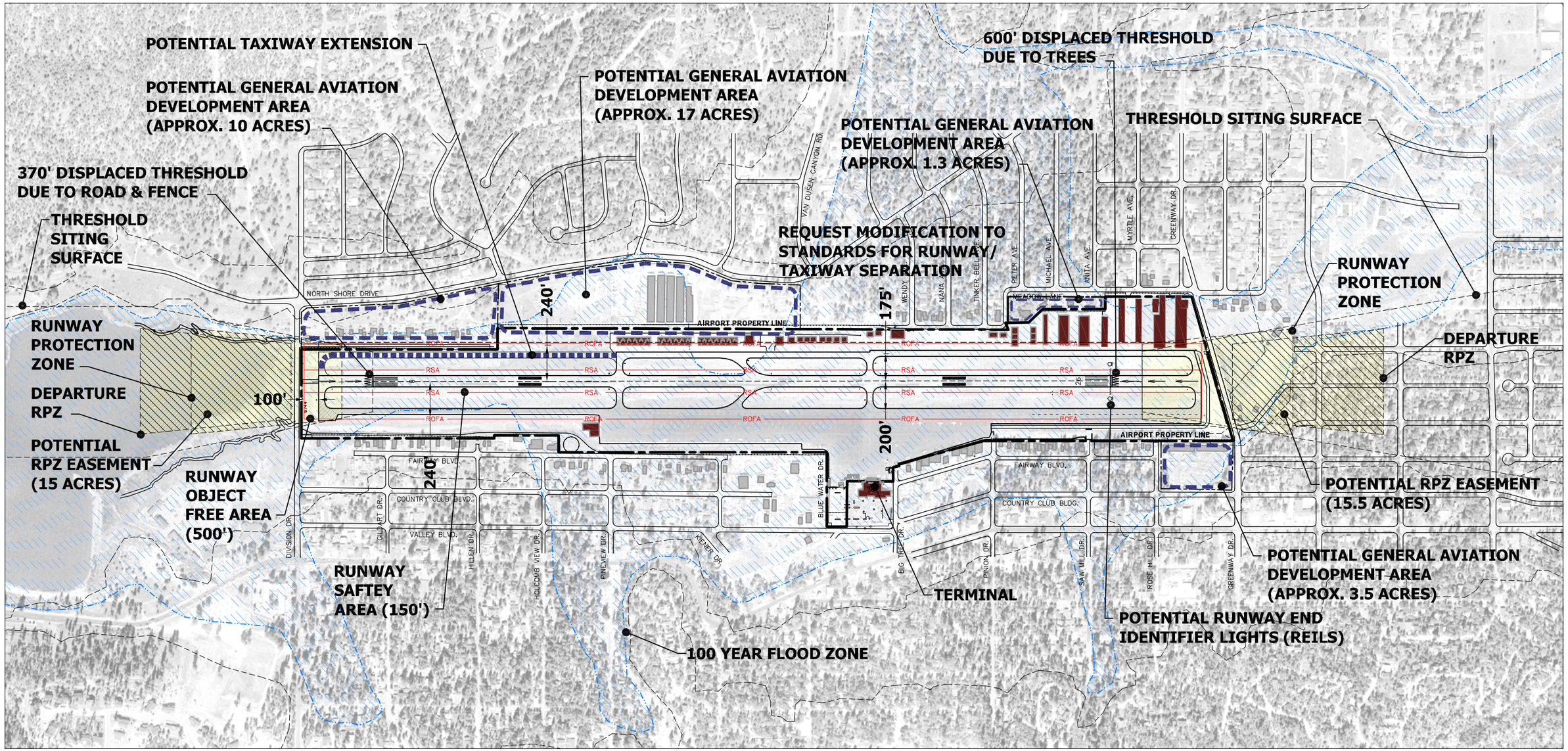
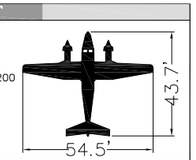


Figure D3 Alternative Two Development Plan

DECLARED DISTANCES	TORA	TODA	ASDA	LDA
RUNWAY 08	5,850'	5,850'	5,550'	5,180'
RUNWAY 26	5,850'	5,850'	5,650'	5,050'

DESIGN AIRCRAFT

BEECH SUPER KINGAIR B200
ARC B-II
WEIGHT : 12,500 lbs.



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Alternative Two Development Projects.

The major projects associated with the Alternative Two development include:

Airside Projects:	*Cost Estimate*
1) Acquire RPZ/avigation easement for Runway 08 RPZ (15 acres).	$0
2) Acquire RPZ/avigation easement for Runway 26 RPZ (15.5 acres).	$2,632,200
3) Acquire ten acres of residential property adjacent to the northwest quadrant of the Airport for the extension of Taxiway "B" and future general aviation development.	$9,685,800
4) Acquire 17 acres of industrial property adjacent to the north quadrant of the Airport for future general aviation development.	$1,712,000
5) Acquire 1.3 acres of property adjacent to the northeast quadrant of the Airport for the expansion of future general aviation development.	$2,448,200
6) Acquire 3.5 acres of commercial property adjacent to the southeast quadrant of the Airport for future general aviation development.	$3,082,000
7) Construct a 1,970-foot taxiway extension of Taxiway "B" and a 120-foot connector taxiway to Runway 08, including MITLs.	$1,800,000
8) Relocate approximately 1,300 feet of perimeter fence north of the Taxiway "B" extension.	$100,000
9) Install obstruction lights on hangars north of the runway and the hangar located west of the aircraft parking apron.	$40,000
10) Install Runway 26 REILs.	$25,000
11) Modify existing RSA, detention areas, and drainage structures located west of Runway 08.	$500,000

The estimated planning level cost estimates for the implementation of the Alternative Two development projects totals approximately $22,025,200. A graphic layout of Alternative Two was presented in the previous illustration, entitled *ALTERNATIVE TWO DEVELOPMENT PLAN*.

Alternative Two-A. Apply the same development as Alternative Two, with the addition of the relocation of Greenway Drive and extension/widening the Runway 26 RSA and ROFA.

Runway 08/26 Airside Development.

- *ARC Dimensional Criteria:* Maintain the existing ARC B-I (Small Aircraft Only) design standards.
- *Runway System:* Re-align segment of Greenway Drive, extend/widen the Runway 26 RSA & ROFA boundaries, implement, and publish the following declared distances criteria for Runway 08/26 to provide standard RSA and ROFA dimensions.

	TORA	TODA	ASDA	LDA
Runway 08	5,850′	5,850′	**5,850′**	**5,480′**
Runway 26	5,850′	5,850′	5,650′	5,050′

TORA: Takeoff Run Available. TODA: Takeoff Distance Available. ASDA: Accelerate Stop Distance Available. LDA: Landing Distance Available.

- *Runway Lighting:* Maintain the Medium Intensity Runway Lights (MIRLs) serving Runway 08/26. Additionally, the existing Precision Approach Path Indicator (PAPI) lights that serve each runway end should be maintained.
- *Taxiway System:* Maintain the existing full-length parallel taxiway south of the runway (Taxiway "A") and extend the partial parallel taxiway north of the runway (Taxiway "B") to the end of Runway 08.
- *Taxiway Lighting:* Maintain the Medium Intensity Runway Lights (MITLs) serving both taxiways and install MITLs on the Taxiway "B" extension.
- *Pavement:* Maintain existing gross weight bearing capacity of 12,500 pounds single wheel gear configuration.
- *Property/Easement Acquisition:* Purchase RPZ/avigation easements for the approximate 21.1 acres of uncontrolled approach and departure Runway Protection Zones (RPZs) associated with each runway end. Also, purchase approximately 11.6 acres of property in fee for the re-alignment of Greenway Drive and the inner approach area of Runway 26.

Alternative Two-A Development Projects.

The major projects associated with the Alternative Two-A development include:

Airside Projects:		*Cost Estimate*
1)	Acquire avigation easement for Runway 08 RPZ (15 acres).	$0
2)	Acquire avigation easement for Runway 26 RPZ (6.1 acres).	$1,926,000
3)	Acquire ten acres of land north of Runway 08 for the parallel taxiway extension and potential general aviation development.	$9,685,800
4)	Acquire 17 acres of industrial property adjacent to the north quadrant of the Airport for future general aviation development.	$13,751,800
5)	Acquire 1.3 acres of property adjacent to the northeast quadrant of the Airport for the expansion of future general aviation development.	$2,448,200
6)	Acquire 3.5 acres of commercial property adjacent to the southeast quadrant of the Airport for future general aviation development.	$3,082,000
7)	Construct a 1,970-foot taxiway extension of Taxiway "B" and a 120-foot connector taxiway to Runway 08, including MITLs.	$1,800,000
8)	Relocate approximately 1,300 feet of perimeter fence north of the Taxiway "B" extension.	$100,000
9)	Install obstruction lights on hangars north of the runway and the hangar located west of the aircraft parking apron.	$40,000
10)	Acquire 11.6 acres of land for Runway 26 RSA, ROFA, RPZ, and road re-alignment.	$8,922,800
11)	Relocate 1,210 feet of Greenway Drive around ROFA, remove previous section of Greenway Drive and grade RSA.	$1,289,900
12)	Relocate 1,210 feet of perimeter fence around the Runway 26 ROFA.	$60,500
13)	Modify existing RSA, detention areas, and drainage structures west of Runway 08.	$500,000

The estimated planning level cost estimates for the implementation of the Alternative Two-A development projects totals approximately $43,607,000. A graphic layout of Alternative Two-A was presented in the previous illustration, entitled *ALTERNATIVE TWO-A*.

The major positive aspect of Alternative Two is that the alternative improves the safety and utility of the Airport by upgrading the ARC to accommodate the existing and forecast airport users and aircraft types. Alternative Two-A includes this same positive aspect in addition to providing additional usable runway available for takeoff and landing on Runway 08, due to the relocation of Greenway Drive and the modification of the RSA and ROFA boundaries.

The primary negative aspect of Alternative Two and Alternative Two-A is that both alternatives would require FAA approval of Modifications to Standards for both the ARC B-II runway/taxiway separation standards and the ARC B-II ROFA, which would be penetrated by hangars located on

the north side of the runway. Alternative Two-A also has the highest capital development cost and the most number of acres of land acquisition required for implementation.

Landside Development Concept

General Aviation Development. As identified in previous sections, adequate future aviation-use development property is not available on existing airport property to accommodate the projected based aircraft requirements. Therefore, future general aviation development options have been evaluated for four areas adjacent to airport property. A detailed analysis of these areas is not required; however, it is recommended that the Airport Sponsor initiate discussions with property owners to identify the potential availability of these properties for acquisition. These four areas, which have been identified for potential acquisition and general aviation development, were presented in the previous illustration, entitled *ALTERNATIVE TWO DEVELOPMENT PLAN.*

It should be emphasized that the future development of aircraft storage facilities at the Airport will be demand dictated. Therefore, the number, size, and location of these hangars will vary depending on the demand for specific facilities, and the development plans must be flexible to accommodate a variety of user groups. In addition, there are important development guidelines that the Airport Sponsor should consider when making hangar placement determinations at the Airport. These include:

- **Each executive hangar should be supplied with taxiway access that is separated from automobile access and adjacent automobile parking. This is most efficiently accomplished when a row of hangars is developed and provided with taxiway access on one side and automobile access and parking on the other side.**

- **Each T-hangar should be nested and developed with taxiway access to both sides of the hangar. Controlled automobile access should be provided to the taxiway/apron area near the T-hangars, and a public access parking area should be provided near the T-hangar facilities to accommodate both users and visitors.**

Airport Access Roadways. Ground access is an important element in the overall ability of an airport to function properly. Not only is it vital that airport users have easy access to and from the airport's general aviation facilities using ground transportation, but also surface transported freight must be easily shipped to and from the businesses located on and/or in the vicinity of the airport. Also, because airports are employment centers, proper access for people employed on airport property must be provided.

Based upon input received from Big Bear City, the existing roadway system provides adequate access to and from the Airport, with the exception of the intersection of Big Bear Boulevard

(State Route 18) and Big Tree Drive. The Airport has indicated that a significant queue of traffic can build during busy hours at this intersection. It is recommended that the Airport request a left-hand turning lane be considered by CalTrans at this intersection for traffic traveling east on Big Bear Boulevard and turning left onto Big Tree Drive. The other roadway project to be included in the Capital Development Plan for the Airport is the re-alignment of a segment of Greenway Boulevard, as presented on Alternatives One-A and Two-A, to accommodate the existing/future RSA and ROFA boundaries.

Aviation-Compatible Development. The siting requirements for aviation-compatible facilities can vary significantly, with some facilities requiring large development sites for initial construction and future expansion capability, while others require only small shops or small portions of larger facilities. Depending upon the specific operation, these facilities may, or may not, require direct airside access, but all must be provided convenient landside access and adequate vehicular parking for both customers and employees. Any of the four identified general aviation development areas could also be utilized for aviation-compatible development, and all of the parcels have adequate landside access.

Property/Easement Acquisition. Where possible, the Big Bear Airport District should make every attempt to acquire property and/or easements in the following areas surrounding Big Bear City Airport.

Airside Development Areas: The primary area identified for potential property acquisition, consisting of approximately ten acres, to accommodate future airside improvements includes the area immediately north of the future Taxiway "B" extension. In Alternative One and One-A, the purpose of this acquisition is to acquire property out to the Taxiway Object Free Area (TOFA) for the Taxiway "B' extension. In Alternative Two and Two-A, the purpose of this acquisition is to acquire property out to the expanded ROFA and remove the perimeter fence and road from the ROFA. The second area identified for potential property acquisition to accommodate future airside development is the existing park land located east of Greenway Drive. This property acquisition, which could range from 9.1-11.6 acres, would be needed for the extension of the RSA and ROFA boundaries in Alternatives One-A and Two-A off the end of Runway 26.

Runway Protection Zones: RPZ and/or aviation easements should also be acquired for the RPZ areas off the ends of both runways to ensure the safety of persons and property on the ground in these critical safety areas.

Landside Development Areas: Property acquisition to accommodate landside expansion could take place at any of the four identified general aviation development areas that were described previously. A mix of aircraft storage hangars and/or aviation-compatible development could be pursed within any of these areas that the Big Bear Airport District is able to acquire.

Alternatives Analysis and Development Concepts Summary

The proposed development alternatives for Big Bear City Airport are intended to present the Big Bear Airport District with a variety of options for future facility expansion. A comparative summary of the four planning alternatives for Big Bear City Airport is presented in the following table, entitled *AIRSIDE & LANDSIDE DEVELOPMENT ALTERNATIVES SUMMARY*.

Table D1
AIRSIDE & LANDSIDE DEVELOPMENT ALTERNATIVES SUMMARY

	Existing	Alternative One	Alternative Two
Runway 08/26			
Dimensions	75′ x 5,850′	75′ x 5,850′	75′ x 5,850′
Airport Reference Code	B-I (Sm. Aircraft)	B-I (Sm. Aircraft)	B-II
Declared Distances			
Runway 08 TORA	Not Published	5,850′	5,850′
Runway 26 TORA		5,850′	5,850′
Runway 08 TODA	Not Published	5,850′	5,850′
Runway 26 TODA		5,850′	5,850′
Runway 08 ASDA	Not Published	5,610′	5,550′
Runway 26 ASDA		5,710′	5,650′
Runway 08 LDA	Not Published	5,240′	5,180′
Runway 26 LDA		5,110	5,050′
Instrument Approach	Visual & RNAV GPS/ 1 -Mile Vis.	Visual & RNAV GPS/ 1 -Mile Vis.	Visual & RNAV GPS/ 1 -Mile Vis.
Runway Lighting	MIRLs, PAPIs (Each RW. End)	MIRLs, PAPI s (Each RW. End), RW 26 REILs	MIRLs, PAPIs (Each RW. End)
Parallel Taxiway	TW "A" Full TW "B" Partial	TW "A" Full TW "B" Full	TW "A: Full TW "B" Full
Property Acquisition			
Adjacent to Northwest Quadrant of Airport	-	10 Acres	10 Acres
Easement Acquisition			
Runway 08 RPZ Easement	-	9.4 Acres	15.0 Acres
Runway 26 RPZ Easement	-	9.5 Acres	15.5 Acres

Source: BARNARD DUNKELBERG & COMPANY.

Table D1 (Continued)
AIRSIDE & LANDSIDE DEVELOPMENT ALTERNATIVES SUMMARY

	Existing	Alternative One-A	Alternative Two-A
Runway 08/26			
Dimensions	75′ x 5,850′	75′ x 5,850′	75′ x 5,850′
Airport Reference Code	B-I (Sm. Aircraft)	B-I (Sm. Aircraft)	B-II
Declared Distances			
Runway 08 TORA	Not Published	5,850′	5,850′
Runway 26 TORA		5,850′	5,850′
Runway 08 TODA	Not Published	5,850′	5,850′
Runway 26 TODA		5,850′	5,850′
Runway 08 ASDA	Not Published	5,850′	5,850′
Runway 26 ASDA		5,710′	5,650′
Runway 08 LDA	Not Published	5,480′	5,480′
Runway 26 LDA		5,110	5,050′
Instrument Approach	Visual & RNAV GPS/ 1 -Mile Vis.	Visual & RNAV GPS/ 1 -Mile Vis.	Visual & RNAV GPS/ 1 -Mile Vis.
Runway Lighting	MIRLs, PAPIs (Each RW. End)	MIRLs, PAPI s (Each RW. End)	MIRLs, PAPIs (Each RW. End)
Parallel Taxiway	TW "A" Full TW "B" Partial	TW "A" Full TW "B" Full	TW "A: Full TW "B" Full
Property Acquisition			
Adjacent to Northwest Quadrant of Airport	-	10 Acres	10 Acres
Runway 26 RSA/ROFA	-	9.1 Acres	11.6 Acres
Easement Acquisition			
Runway 08 RPZ Easement	-	9.4 Acres	3.7 Acres
Runway 26 RPZ Easement	-	3.7 Acres	6.1 Acres

Source: BARNARD DUNKELBERG & COMPANY.

Conceptual Airport Development Plan

Following a careful assessment of the potential impacts of each alternative, in conjunction with a detailed FAA evaluation, the Big Bear Airport District selected Alternative One-A as the preferred alternative for the future development of Big Bear City Airport. Alternative One-A was utilized to produce the following figure, entitled *CONCEPTUAL AIRPORT DEVELOPMENT PLAN*. This plan addresses the non-standard RSA and ROFA off the Runway 26 end with the acquisition of Big Bear City Park and the relocation of Greenway Drive. The non-standard RSA and ROFA off the Runway 08 end are addressed with the implementation of Declared Distances. It is very important that, once approved on the Airport Layout Plan, these Declared Distances be

published in the Airport Facility Directory (AFD) to provide notification to pilots using the Airport.

Following the confirmation of the Sponsor's Recommended Conceptual Airport Development Plan, the appropriate state and federal agencies were provided with copies of the plan requesting their overview of potential environmental impacts. These comments are incorporated in the narrative of Chapter F, *Environmental Overview*, and are also included in the Appendix.

north

0 50' 100' 200' 300'
GRAPHIC SCALE IN FEET

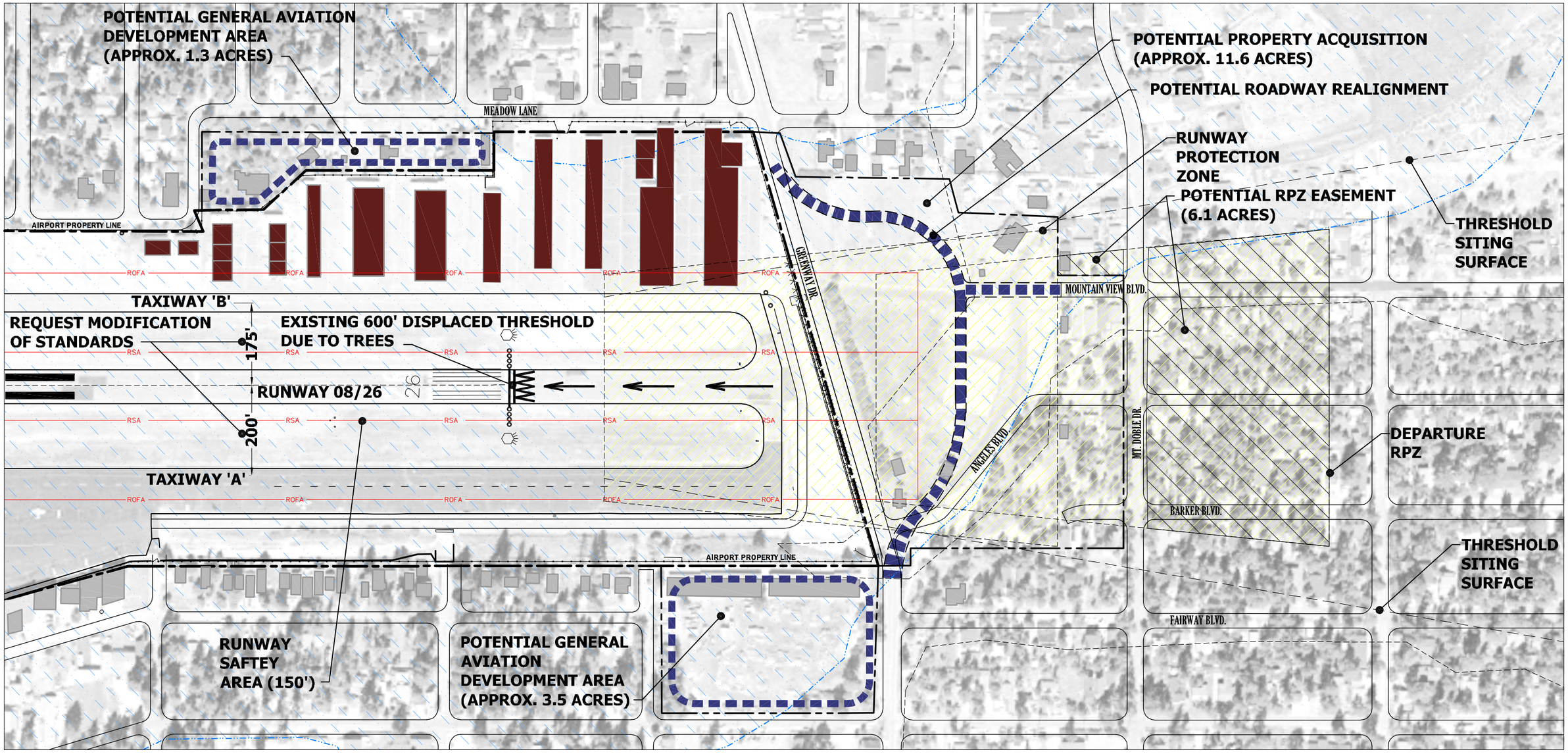


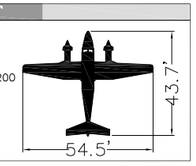
Figure D4 Alternative Two-A Development Plan/East Area Detail

DECLARED DISTANCES

	TORA	TODA	ASDA	LDA
RUNWAY 08	5,850'	5,850'	**5,850'**	**5,480'**
RUNWAY 26	5,850'	5,850'	5,650'	5,050'

DESIGN AIRCRAFT

BEECH SUPER KINGAIR B200
ARC B-II
WEIGHT : 12,500 lbs.



SOURCE: AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
AIRPORT LAYOUT PLAN BY VSA AIRPORTS, PALM SPRINGS, CA 10/02.
FEMA FIRM SAN BERNARDINO COUNTY, 7315 OF 9400 3/96

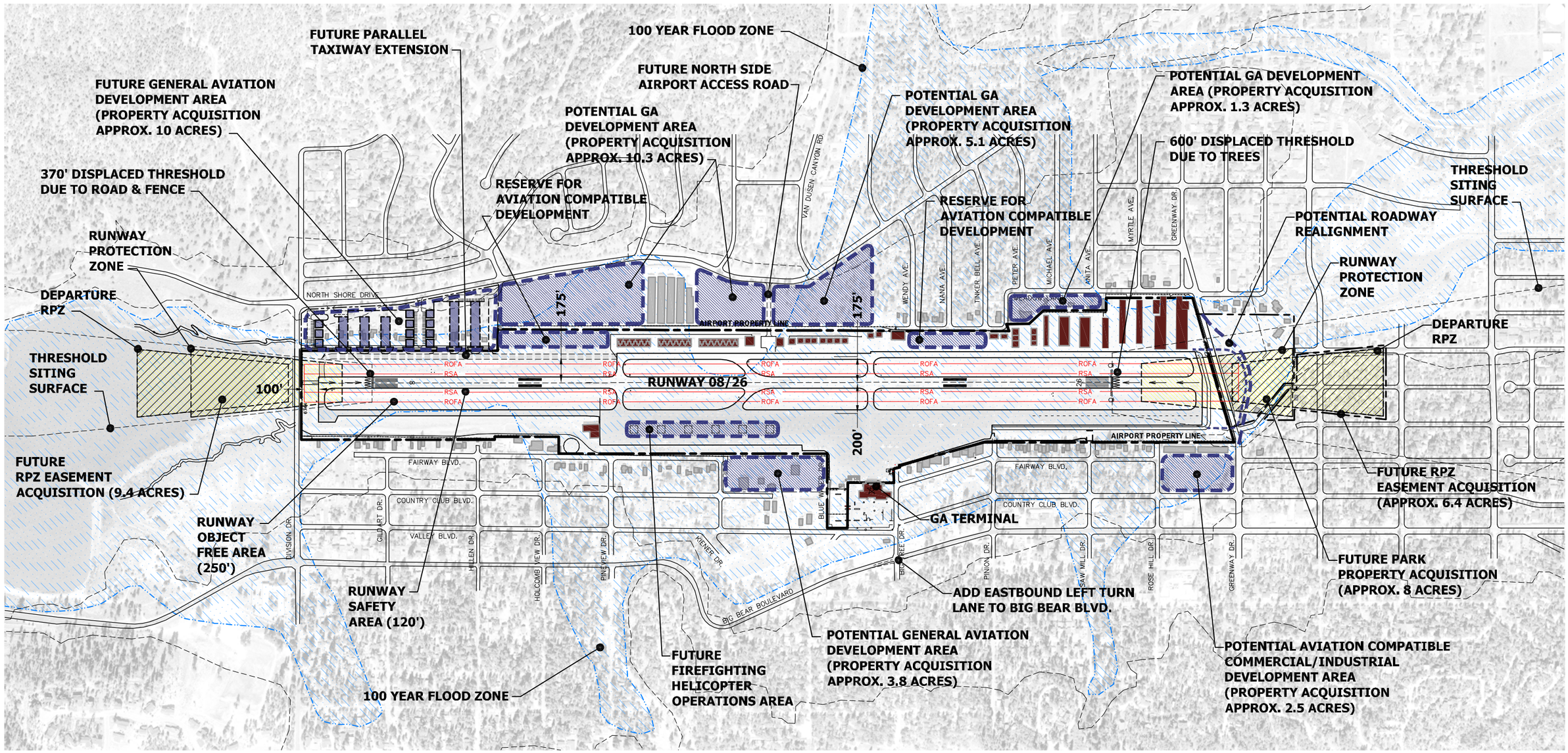


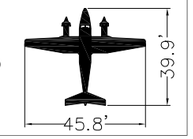
Figure D5 Conceptual Airport Development Plan

DECLARED DISTANCES

	TORA	TODA	ASDA	LDA
RUNWAY 08	5,850'	5,850'	5,850'	5,480'
RUNWAY 26	5,850'	5,850'	5,710'	5,110'

DESIGN AIRCRAFT

BEECH KINGAIR B100
ARC B–I (Small Aircraft)
WEIGHT : 11,800 lbs.



SOURCE: AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
AIRPORT LAYOUT PLAN BY VSA AIRPORTS, PALM SPRINGS, CA 10/02.
FEMA FIRM SAN BERNARDINO COUNTY, 7315 OF 9400 3/96

Master Plan Big Bear City Airport
Big Bear City, California

Airport Plans

INTRODUCTION. The ultimate development plan and program for Big Bear City Airport have evolved from various factors, influences, and considerations. Among these are existing and future aviation demand, aircraft operational characteristics, facility requirements, and environmental considerations. Additionally, the general direction or thrust of future airport development, as expressed by the Big Bear Airport District, airport staff, airport users, and other interested parties, served as a basis for the airport planning process.

Because previous chapters have established and quantified the future development needs of Big Bear City Airport, the resulting elements of the recommended Development Plan are categorically reviewed and detailed here in a narrative and graphic format.

A brief written description of the individual elements represented in the set of *Airport Plans* is accompanied by a graphic description presented in the form of the *Airport Layout Drawing*, the *Airport Airspace Drawing*, the *Inner Portion of the Approach Surface Drawing*, the *Threshold Siting Surface Drawing*, the *Departure Surface Drawing*, the *Terminal Area Drawings*, the *Land Use Drawing*, and the *Airport Property Map*.

Airport Layout Drawing

The Airport Layout Drawing is a graphic depiction of ultimate airport facilities, representing the unified, long-range development scheme required to enable the Airport to accommodate the forecast future demand. However, it is recognized that future demand for facilities cannot be accurately predicted, particularly during the latter stages of the 20-year planning period. Therefore, development flexibility is provided in the plan and emphasis is placed on the initial five-year planning period, where the projections are more definable and the magnitude of program accomplishments are more pronounced. Furthermore, carefully guided development and continued maintenance during the initial years of the planning period are essential to the proper expansion of the facility and the continued enhancement of aviation development. The drawing provides detailed information on airport and runway design criteria that is necessary to define relationships with applicable standards. The following illustration, entitled *AIRPORT LAYOUT DRAWING*, and the following paragraphs describe the major components of the future airport development plan presented in the Airport Layout Drawing.

Runway/Taxiway System

Runway. As explained in the preceding chapter, Runway 08/26 is recommended to be maintained at its existing length (5,850 feet) and its existing width (75 feet). This length will provide a runway sufficient to accommodate 75% of the general aviation small aircraft fleet.

Taxiway. The parallel taxiway on the south side of Runway 08/26 (Taxiway "A") will be maintained. Additionally, the partial parallel taxiway on the north side of Runway 08/26 (Taxiway "B") will be maintained and an extension of the taxiway to the end of Runway 08 is planned. It has been determined that the X-Ray hangars located at the northwest corner of the Airport penetrate the Taxiway "B" Object Free Area (TOFA), which extends 44.5 feet from the taxiway centerline. However, the second phase of the Taxiway "B" rehabilitation scheduled for 2008 will relocate the Taxiway "B" centerline approximately five feet to the south, providing the full TOFA between the centerline and the X-Ray hangars.

Approaches. The instrument approach visibility minimums for the Airport will remain visual for Runway 08 and one mile for Runway 26.

Lighting. It is recommended that the Medium Intensity Runway Lights (MIRLs) and the existing Precision Approach Path Indicator (PAPI) lights that serve each runway end be maintained. Additionally, it is recommended that the Medium Intensity Taxiway Lights (MITLs) serving both taxiways be maintained and MITLs on the Taxiway "B" extension be installed.

Design Standards. Due to the existing investment in airport infrastructure (i.e., hangars, taxiways, perimeter fencing, drainage systems, etc.) that would have to be relocated/reconstructed, and the number of modifications to airport design standards required to upgrade, the Airport Reference Code (ARC) for Runway 08/26 will be maintained at B-I (Small Aircraft Only).

Property Acquisition. To help ensure land use compatibility and to provide additional development areas for aircraft storage facilities, several parcels adjacent to airport property were recommended for acquisition. Following a review of these various property acquisition recommendations by the Big Bear Airport District, the decision was made to reject all recommendations related to private property acquisition. The only parcel identified for acquisition on the following *AIRPORT LAYOUT DRAWING* is the Big Bear City Park parcel east of the Airport. The acquisition of this parcel is intended to serve the dual purpose of acquiring RPZ land and relocating Greenway Drive to meet Runway Safety Area (RSA) and Runway Object Free Area (ROFA) standards.

Airport Sponsor control of the inner approach areas to the runway will help protect these areas from both incompatible development and potential development that may present obstruction or hazards to air navigation. Therefore, it is recommended that the Big Bear Airport District pursue both fee simple acquisition of the Runway Protection Zones (RPZs) or RPZ easements. The majority of the uncontrolled RPZ for the Runway 08 end overlays a portion of Big Bear Lake and an RPZ easement would provide adequate protection. For the Runway 26 end, the uncontrolled portion of the RPZ that overlays the Big Bear City Park is recommended for fee simple acquisition and easements should be pursued for the balance of the RPZ area.

RUNWAY END COORDINATES

ITEM	RUNWAY 8/26 EXISTING	RUNWAY 8/26 FUTURE
RUNWAY END COORDINATES	LAT.34°15'49.50"N / LAT.34°15'49.78"N LON.116°51'56.56"W / LON.116°50'46.89"W	SAME
RUNWAY END ELEVATION	6750.1'/6751.4'	SAME
DISPLACED THRESHOLD COORDINATES	LAT.34°15'49.52"N / LAT.34°15'49.75"N LON.116°51'56.15"W / LON.116°50'54.03"W	SAME
DISPLACED THRESHOLD ELEVATION	6750.2'/6751.6'	SAME

REVISIONS

		DATE
1.	REVALIDATED. APPROVAL WAS TO VERIFY THERE HAVE BEEN NO SIGNIFICANT CHANGES AT THE AIRPORT SINCE THE 1998 APPROVAL DATE.	01/15/2003
2.	UNCONDITIONAL APPROVAL. PLAN WAS SUBMITTED IN CONJUNCTION WITH THE COMPLETION OF SEVERAL AIRPORT IMPROVEMENT PROJECTS, IN ADDITION TO SOME FACILITY RELOCATIONS SINCE THE LAST PUBLISHED ALP.	11/20/1998

BUILDING LEGEND

NO.	HANGARS	DESCRIPTION	TOP ELEV.	NO.	HANGARS	DESCRIPTION	TOP ELEV.
1	--	TERMINAL	6787.0'	S	--	EXECUTIVE PARCEL	6771.0'
2	--	ELECTRICAL BUILDING	6762.0'	T	--	CIVIL AIR PATROL	6777.0'
3	--	STORAGE BUILDING	6762.0'	N_1	--	CORPORATE HANGAR	6776.0'
4	--	MAINTENANCE BUILDING	6772.0'	N	1-15	NORTH T-HANGARS	6778.0'
X_1	1-13	X-RAY HANGARS	6767.5'	N	16-25	NORTH T-HANGARS	6778.0'
X_2	14-27	X-RAY HANGARS	6767.5'	N	26-35	NORTH T-HANGARS	6778.0'
A	1-9	T-HANGARS	6766.0'	Y_1	--	AERO-HAVEN	6769.5'
B	1-9	T-HANGARS	6766.0'	Y_2	--	HANGAR	6777.0'
C	1-6	T-HANGARS	6766.0'	Y_3	--	HANGAR	6777.0'
D	1-10	NUNO HANGARS	6771.0'	CAP	--	HANGAR	6781.5'
E	1-10	EXECUTIVE PARCEL	6769.0'				
F	1-5	EXECUTIVE PARCEL	6769.0'	A	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
J	--	CIVIL AIR PATROL	6767.0'	B	EXECUTIVE	EXECUTIVE PARCEL	6770.5'
K	--	AIRPORT MAINT. HANGAR	6771.0'	C	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
L	--	AIRPORT MAINT. HANGAR	6771.0'	D	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
M	--	AIRPORT MAINT. HANGAR	6771.0'	E	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
N	--	VONESH AVIATION PARCEL	6771.0'	F	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
O	--	VONESH AVIATION PARCEL	6771.0'	G	EXECUTIVE	EXECUTIVE PARCEL	6770.5'
P	--	VONESH AVIATION PARCEL	6771.0'	H	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
Q	--	EXECUTIVE PARCEL	6775.5'	I	EXECUTIVE	CALLAWAY AVIATION	6775.5'
R	--	EXECUTIVE PARCEL	6769.5'				

AIRPORT DATA

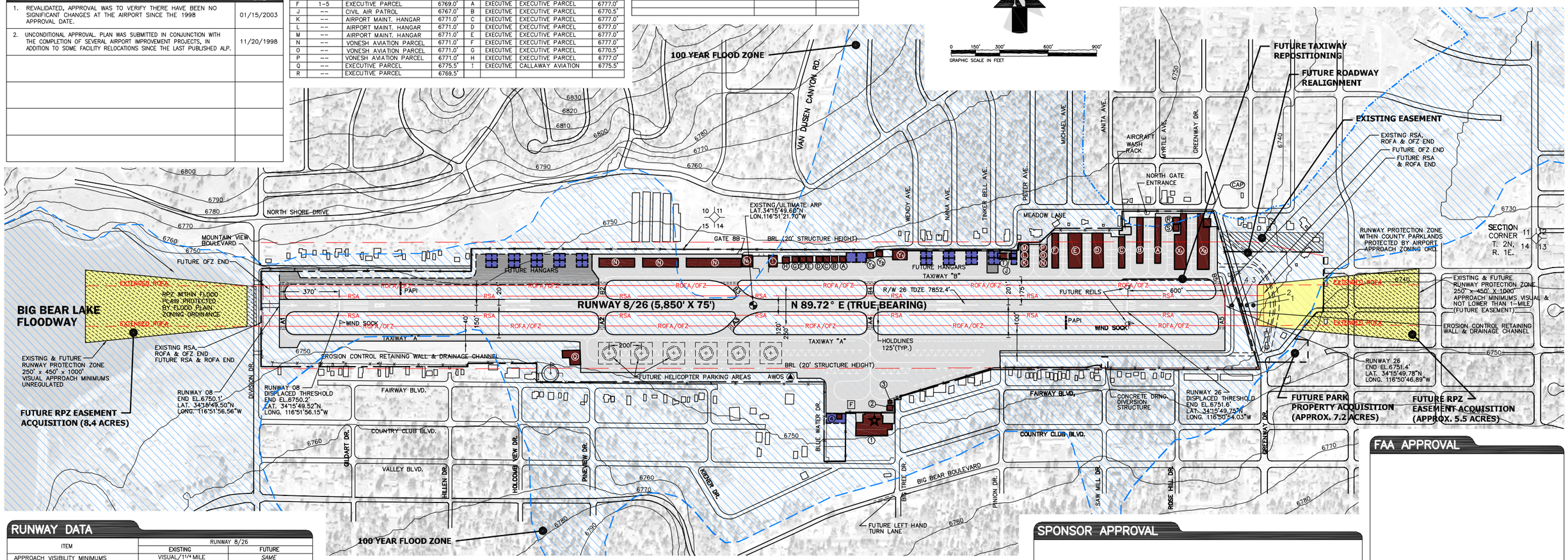
	EXISTING	FUTURE
LOCATION – COUNTY	SAN BERNADINO	SAME
– TOWNSHIP/RANGE	T.2 NORTH/R.1 EAST	SAME
AIRPORT ELEVATION (AMSL) NAVD 88	6752.4'	SAME
AIRPORT REFERENCE POINT (ARP) NAD 83	LAT.34°15'49.60"N LON.116°51'21.70"W	SAME SAME
AIRPORT REFERENCE CODE	B-I (SMALL)	SAME
NPIAS SERVICE LEVEL/ROLE	GA	SAME
MEAN MAX. TEMPERATURE (HOTTEST MONTH)	80.7°F (JULY)	SAME
AIRPORT & TERMINAL NAVAIDS	ROTATING BEACON, GPS	SAME

OFZ OBJECT PENETRATIONS

NO.	OBJECT DESCRIPTION	TOP ELEVATION	PENETRATION	PROPOSED DISPOSITION
1	BUSH	6743.0'	1.0'	TO BE RELOCATED
2	ROAD (N)	6758.0'	6.8'	TO BE RELOCATED
3	FENCE	6753.0'	1.0'	TO BE RELOCATED
4	PERIMETER ROAD (N)	6756.0'	4.8'	TO BE RELOCATED

DEVIATIONS TO FAA AIRPORT DESIGN STANDARDS

DESCRIPTION	AIRPLANE DESIGN GROUP EXISTING	AIRPLANE DESIGN GROUP FUTURE	STANDARD EXISTING	STANDARD FUTURE	NON-STANDARD CONDITION EXISTING	NON-STANDARD CONDITION FUTURE	REMARKS
RUNWAY 08 RSA & ROFA LENGTH BEYOND RUNWAY END	B-I (SMALL)	SAME	240'	SAME	100'	NO CHANGE	DUE TO PHYSICAL CONSTRAINTS OF EXISTING CONDITIONS (LAKE AND HIGH ALTITUDE), THE EXISTING NON-STANDARD CONDITION TO REMAIN IN PLACE AS MOST PRACTICABLE OPERATIONAL ALTERNATIVE.
RUNWAY 08 OBSTACLE FREE ZONE LENGTH BEYOND RUNWAY END	B-I (SMALL)	SAME	200'	SAME	100'	NO CHANGE	DUE TO PHYSICAL CONSTRAINTS OF EXISTING CONDITIONS (LAKE AND HIGH ALTITUDE), THE EXISTING NON-STANDARD CONDITION TO REMAIN IN PLACE AS MOST PRACTICABLE OPERATIONAL ALTERNATIVE.
RUNWAY 26 RSA & ROFA LENGTH BEYOND RUNWAY END	B-I (SMALL)	SAME	240'	SAME	0'	240'	TO BE RESOLVED WITH THE REALIGNMENT OF GREENWAY DRIVE
RUNWAY 26 OBSTACLE FREE ZONE LENGTH BEYOND RUNWAY END	B-I (SMALL)	SAME	200'	SAME	0'	200'	TO BE RESOLVED WITH THE REALIGNMENT OF GREENWAY DRIVE



FAA APPROVAL

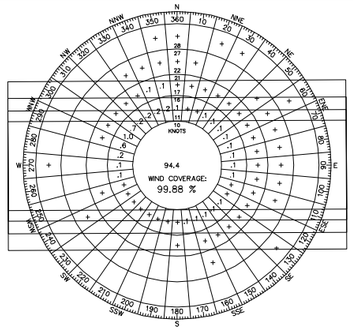
SPONSOR APPROVAL

Signature Date

RUNWAY DATA

ITEM	RUNWAY 8/26 EXISTING	RUNWAY 8/26 FUTURE
APPROACH VISIBILITY MINIMUMS	VISUAL/1¼ MILE	SAME
FAR PART 77 CATEGORY	VISUAL/NON-PRECISION	SAME
FAR PART 77 APPROACH SURFACES	20:1/20:1	SAME
RUNWAY LENGTH & WIDTH	5,850' X 75'	SAME
TRUE BEARING	N 89.72° E	SAME
PAVEMENT TYPE	ASPHALT	SAME
PAVEMENT STRENGTH (X 1,000 LBS.)	12.5 SWG	SAME
RUNWAY LIGHTING	MIRL	SAME
RUNWAY MARKING	NPI	SAME
TAXIWAY LIGHTING	MIRL	SAME
NAVIGATIONAL AIDS (ELECTRONIC)	ROTATING BEACON, GPS	SAME
VISUAL AIDS (LIGHTING)	PAPI	PAPI, REILS
AIRPORT REFERENCE CODE	B-I (SMALL)	SAME
CRITICAL AIRCRAFT	KING AIR B100	SAME
WINGSPAN	45.8'	SAME
UNDERCARRIAGE WIDTH	13'	SAME
APPROACH SPEED	111 KNOTS	SAME
MAXIMUM TAKE-OFF SPEED (LBS.)	11,800	SAME
RUNWAY PROTECTION ZONE	250'x450'x1,000'/250'x450'x1,000'	SAME
EFFECTIVE GRADIENT % (PER AVIATION DATA SHEET)	0.055	SAME
MAXIMUM GRADIENT	TBD	SAME
LINE OF SIGHT	CRITERIA MET	SAME
DISPLACED THRESHOLD DISTANCE FROM RWY END	370'/600'	SAME
DISTANCE TO HOLD BARS	125'	SAME
RUNWAY HIGH/LOW POINT ELEVATION	6752.4'/6750.1'	SAME
TOUCHDOWN ZONE ELEVATION (TDZE)	N/A / 6752.4'	SAME
RWY SAFETY AREA WIDTH	120'	SAME
RWY SAFETY AREA BEYOND R/W END	100'/0'	100'/240'
RWY OBJECT FREE AREA WIDTH	250'	SAME
RWY OBJECT FREE AREA BEYOND R/W END	100'/0'	100'/240'
RWY OBSTACLE FREE ZONE WIDTH	250'	SAME
RWY OBSTACLE FREE ZONE BEYOND R/W END	100'/0'	100'/200'
TAXIWAY SAFETY AREA WIDTH	49'	SAME
TAXIWAY OBJECT FREE AREA WIDTH	89'	SAME
TAXIWAY SURFACE TYPE	ASPHALT	SAME
TAXIWAY WINGTIP CLEARANCE	20'	SAME
RUNWAY C/L TO PARALLEL TAXIWAY C/L	TAXIWAY 'A' – 201' TAXIWAY 'B' – 175'	TAXIWAY 'A' – SAME TAXIWAY 'B' – 150'/175'

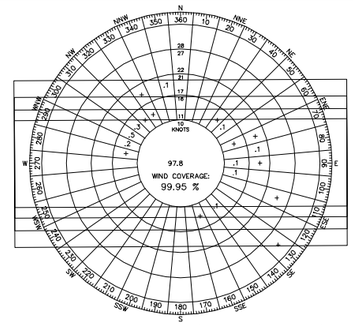
ALL WEATHER WINDROSE



RUNWAY	10.5-KNOT	13-KNOT	16-KNOT	20-KNOT
08/26	98.35%	99.11%	99.64%	99.88%
08	74.02%	74.47%	74.87%	75.01%
26	93.67%	94.23%	94.68%	94.90%

SOURCE: Wind analysis tabulation provided by Barnard Dunkelberg & Company utilizing the FAA Airport Design Software supplied with FAA AC 150/5300-13, Airport Design.
– Period of Record: 1995-2004. Station 72286.
– March AFB, CA.
– Total Observations – 78,003

IFR WINDROSE



RUNWAY	10.5-KNOT	13-KNOT	16-KNOT	20-KNOT
08/26	99.55%	99.76%	99.82%	99.95%
08	80.56%	80.68%	80.72%	80.82%
26	97.14%	97.24%	97.28%	97.39%

SOURCE: Wind analysis tabulation provided by Barnard Dunkelberg & Company utilizing the FAA Airport Design Software supplied with FAA AC 150/5300-13, Airport Design.
– Ceiling of less than 1,900 feet, but equal to or greater than 1,900 feet and/or visibility less than 3 statute miles, but equal to or greater than 1 1/2 statute mile.
– Period of Record: 1995-2004. Station 72286.
– March AFB, CA.

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE		
BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE ABANDONED		
PAVED ROADS		
SIDEWALK		SAME
RPZ EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY SAFETY AREA	RSA (E)	RSA (F)
RUNWAY OBJECT FREE AREA	ROFA (E)	ROFA (F)
EXTENDED RUNWAY OBJECT FREE AREA	EXTENDED ROFA	SAME
RUNWAY OBJECT FREE ZONE	OFZ	OFZ
FUEL STORAGE AREA	F	SAME
AIRPORT BEACON		SAME
LIGHTED WIND CONE		SAME
HOLDLINES		SAME
PRECISION APPROACH PATH INDICATOR (PAPI)		
WATER		SAME
RUNWAY END IDENTIFIER LIGHTS (REILS)		
100 YEAR FLOODZONE		SAME
CULVERT		SAME
AIRPORT REFERENCE POINT (ARP)		SAME
SECTION CORNER		SAME
AWOS		SAME
TOPOGRAPHIC CONTOUR	6750	SAME

NOTES

1. THIS DRAWING REFLECTS PLANNING STANDARDS SPECIFIC TO THIS AIRPORT, AND IS NOT A PRODUCT OF DETAILED ENGINEERING DESIGN ANALYSIS. IT IS NOT INTENDED TO BE USED FOR CONSTRUCTION DOCUMENTATION OR NAVIGATION.
2. AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
3. EXISTING COORDINATES AND ELEVATIONS ARE NAVD 88 AND WERE OBTAINED FROM http:ovmwww.jccbi.gov, MAY 2007.
4. THE MAJORITY OF THE AIRCRAFT STORAGE HANGARS ON AIRPORT PROPERTY PENETRATE EITHER THE PRIMARY OR TRANSITIONAL SURFACES AS DEFINED BY FAR PART 77 AND THESE PENETRATIONS SHOULD BE VERIFIED BY AN OBSTRUCTION SURVEY. FAA FORM 7460-1, NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION SHOULD BE COMPLETED AND COORDINATED WITH FAA PRIOR TO CONSTRUCTION OF ANY FUTURE FACILITIES AS INDICATED ON THIS ALP.
5. THE CONTENTS OF THIS PLAN DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.
6. EFFECTIVE GRADIENT, MAXIMUM GRADIENT, AND RUNWAY HIGH & LOW POINTS REQUIRE FURTHER FIELD SURVEY FOR VERIFICATION.
7. PRIMARY AIRPORT CONTROL & SECONDARY AIRPORT CONTROL (PACs & SACs) HAVE NOT BEEN ESTABLISHED. A PACs & SACs SURVEY WILL BE CONDUCTED IN ORDER TO PROVIDE VERIFICATION OF EFFECTIVE GRADIENT, MAXIMUM GRADIENT, AND HIGH & LOW POINTS.

Big Bear City Airport

Big Bear City, California

Figure E1

Airport Layout Drawing

Barnard Dunkelberg & Company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
Sep 2008

SCALE
1" = 300'

SHEET NO.
E.4

Landside Development Area

As illustrated on the *AIRPORT LAYOUT DRAWING*, various development areas for landside facilities are also allocated. It is recognized that the development of these areas will be demand driven and, where appropriate, options have been provided for the type of facilities that could be developed in a certain area. There are two areas located on the north side of the runway, adjacent to, and in between, the existing hangar facilities that should be reserved for potential general aviation development.

Aircraft Storage Facilities. The future development of aircraft storage facilities (i.e., T-hangars, individual hangars, or large storage hangars) at Big Bear City Airport will be demand driven. Therefore, the number, size, and location of these hangars will vary depending upon the demand for the particular type. Because of existing infrastructure and the nature of the existing surrounding land uses, the primary areas considered for additional aircraft storage facilities are the previously described infill areas on the north side of Runway 08/26. These potential development areas could accommodate a mix of T-hangars and box hangars; however, demand for corporate and box-style hangars is anticipated to be greater than demand for T-hangars. Consequently, only future corporate and box-style hangars are shown on the plan.

Access and Parking. The existing access route to the Big Bear City Airport terminal area includes Big Bear Boulevard (State Highway 18) and turning left or right onto Big Tree Drive, which connects to the airport parking area. The left turning traffic often creates a queue of vehicles along Big Bear Boulevard, due to the lack of a left-hand turning lane on the two-lane highway. It is recommended that a left-hand turning lane be considered at this un-signalized intersection. There are also two north side access gates at the northeast end of the Airport providing access to existing and planned aircraft parking facilities.

Airport Airspace Drawing

In order to protect airspace and approaches from hazards that could affect the safe and efficient operation of aircraft, federal criteria contained in Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, have been established to provide guidance in controlling the height of objects in close proximity to airports. FAR Part 77 criteria specify a set of imaginary surfaces that, when penetrated by an object (structure, tree, or terrain), designate the object as being an obstruction.

The *AIRPORT AIRSPACE DRAWING*, illustrated in the following figure, is based on FAR Part 77 criteria and provides plan and profile views of the imaginary surfaces as they relate to Big Bear

City Airport. The drawing is based on the ultimate runway length, the ultimate planned approaches to each runway end, and the ultimate airport elevation. Therefore, Runway 08/26 is based on utility runway criteria (i.e., aircraft weighing less than 12,500 pounds, gross weight) with a visual approach to Runway 08 and a non-precision instrument approach, having visibility minimums not-lower-than one mile to Runway 26. Based on these criteria, a brief description of each imaginary surface, and the appropriate dimensions and slopes, are described in the following narrative.

The primary surface, a surface longitudinally centered on the runway, is 500 feet in width and extends 200 feet beyond each runway end. The elevation of any point on the primary surface is the same as the elevation on the nearest point on the runway centerline. Transitional surfaces extend upward and outward at right angles to the runway centerline, and the runway centerline extended, at the edges of the primary surface with a slope of 7:1. The horizontal surface is a horizontal plane established at 150 feet above the airport elevation. Swinging arcs with radii of 5,000 feet from the center of each end of the primary surface, and connecting the arcs by lines tangent to these arcs, establish the perimeter of the horizontal surface.

At the periphery of the horizontal surface, the conical surface extends outward and upward at a slope of 20:1 for a horizontal distance of 4,000 feet. Finally, approach surfaces are longitudinally centered on the extended runway centerlines, extending outward and upward from each end of the primary surface. For the Runway 08 approach surface, the inner edge is 250 feet in width and expands uniformly to a width of 1,250 feet at the outer edge. For the Runway 26 approach surface, the inner edge is 500 feet in width and expands uniformly to a width of 2,000 feet at the outer edge. The approach surfaces extend for a horizontal distance of 5,000 feet at a slope of 20:1. As illustrated in Figure E2, each of the previously described imaginary surfaces at Big Bear City Airport is penetrated by either terrain, trees, or fixed objects, many of which are obstruction-lighted. The future removal or lighting of as many of these obstructions as possible should be a high priority for the Big Bear Airport District, and the proposed disposition of each obstruction will be noted in the obstruction data block for both the Airport Airspace Drawing and the Inner Portion of the Approach Surface Drawing. Finally, the majority of the aircraft storage hangars on airport property penetrate either the primary or transitional surfaces as defined by FAR Part 77, and these penetrations should also be verified by an obstruction survey. FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, should be completed and coordinated with FAA prior to construction of any future facilities as indicated on the Airport Layout Plan.

Inner Portion of the Approach Surface Drawing

To provide a more detailed view of the inner portions of the Part 77 imaginary approach surfaces and the Runway Protection Zones (RPZs), detailed drawings have been prepared. As mentioned in previous chapters, the RPZs are trapezoidal in shape, centered about the extended runway centerline, and typically begin 200 feet beyond the end of the runway. The displaced thresholds at both ends of Runway 08/26 require RPZs that start 200 feet beyond the departure ends of Runway 08/26. Generally speaking, the Airport Sponsor, as either fee simple acquisition or as an easement, should control the RPZs (fee simple ownership is recommended). If an RPZ easement is acquired, it reflects the purchase of air rights over the ground, including the ability to control height of objects and land use on the property. It is recognized that, due to the proximity of Big Bear Lake to the west end of the Airport, acquisition of the RPZs off the Runway 08 end is not necessary. However, on the east end of the Airport, acquisition of Big Bear City Park would provide adequate protection for a portion of the RPZ; however, easements should be pursued for the remaining portion of the RPZ.

These drawings also illustrate the inner portion of the FAR Part 77 approach surfaces associated with each runway end. The *INNER PORTION OF THE APPROACH SURFACE DRAWINGS* provide large-scale drawings with both plan and profile delineation. They are intended to facilitate identification of roadways, utility lines, railroads, structures, and other possible obstructions that may lie within the confines of, or near, the specified approach surfaces.

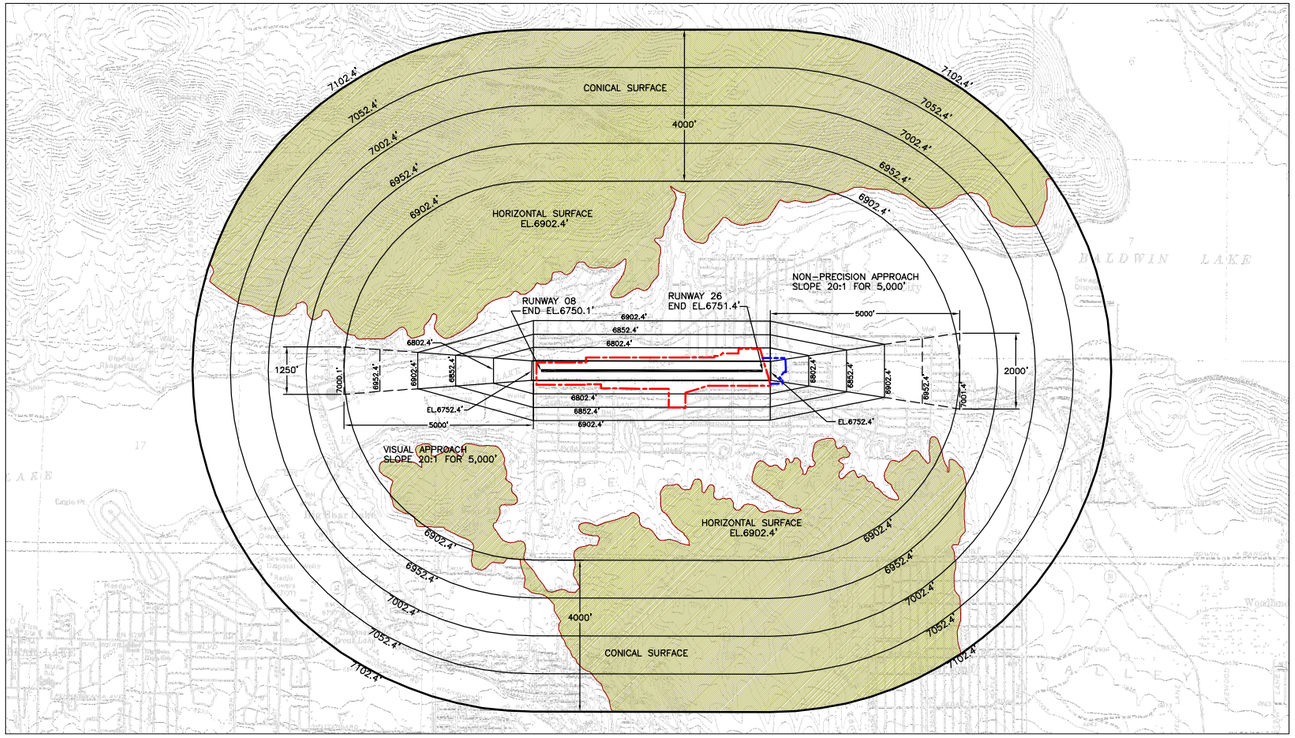
As with the *AIRPORT AIRSPACE DRAWING*, the *INNER PORTION OF THE APPROACH SURFACE DRAWINGS* are based upon the ultimate planned runway configuration and length, the ultimate planned approaches to each runway end, and the ultimate runway end elevation. Again, Runway 08/26 is based on utility runway criteria with both visual and non-precision instrument approaches with visibility minimums not-lower-than one mile. Base upon these parameters, the specified approach surface slope gradient to each runway end is 20:1.

Threshold Siting Surface Drawing

The *THRESHOLD SITING SURFACE DRAWING*, presented in Figure E4, depicts existing and future Approach Threshold Siting Surface Slopes (20:1) to the existing displaced landing thresholds at each end of Runway 08/26. The FAA Advisory Circular (AC) 150/5300-13, Change 13 requires these approach slopes to be clear of obstructions. Both landing thresholds on Runway 08/26 have previously been displaced to prevent obstructions to these slopes as indicated on Figure E4.

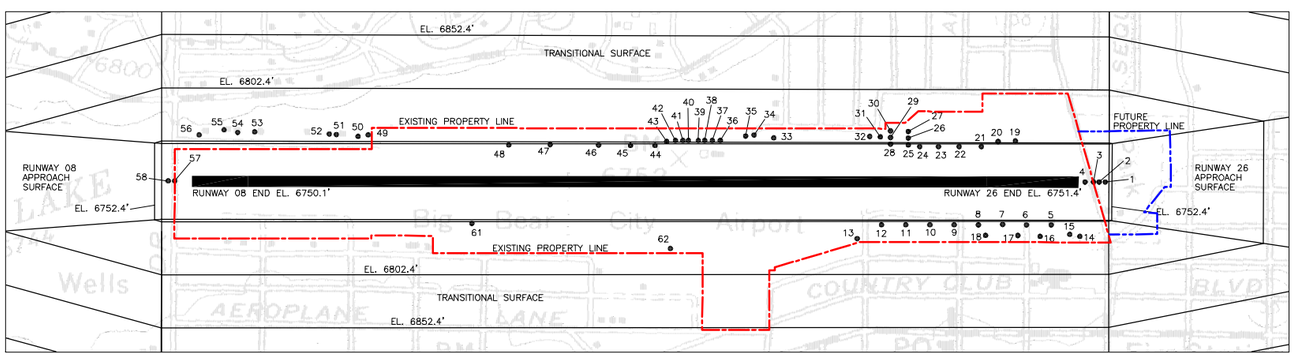
Departure Surface Drawing

The *DEPARTURE SURFACE DRAWING*, presented in Figure E5, depicts the existing departure surface required for all runways with instrument departure procedures according to FAA AC 150/5300-13, Change 11. The existing published instrument departure procedure at Big Bear City Airport is for Runway 08 departures. Consequently, a departure surface slope of 40:1 is required off the end of Runway 26, as shown in Figure E5. The Departure Surface starts at the Departure End of the Runway (DER), which corresponds to the end of the physical pavement at the Runway 26 end. The existing perimeter service road and Greenway Drive both penetrate this defined surface; however, if both roads are relocated as shown on the ALP, the new roadway alignments would comply with the specified departure surface criteria.



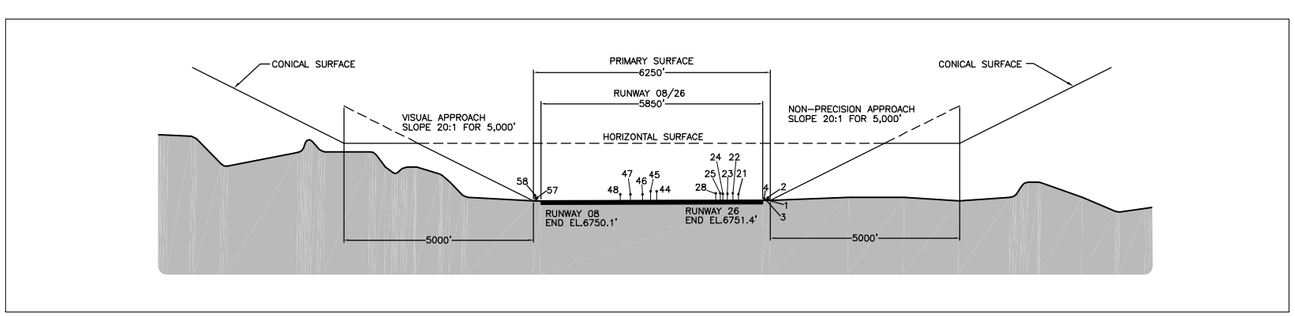
CONICAL SURFACE PLAN VIEW

1" = 2000'



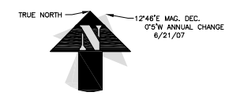
OBSTRUCTION DETAIL PLAN VIEW

1" = 500'



RUNWAY 08/26 EXTENDED APPROACH PROFILE VIEW

HORIZONTALLY 1" = 2000'
VERTICALLY 1" = 200'



OBSTRUCTIONS

NO.	OBJECT DESCRIPTION	TOP ELEVATION	PENETRATION	SURFACE PENETRATED	PROPOSED DISPOSITION
1	BUSH	6743.0'	1.0'	PRIMARY SURFACE	TO BE RELOCATED
2	ROAD (N)	6758.0'	6.8'	PRIMARY SURFACE	TO BE RELOCATED
3	FENCE	6753.0'	1.0'	PRIMARY SURFACE	TO BE RELOCATED
4	PERIMETER ROAD (N)	6756.0'	4.8'	PRIMARY SURFACE	TO BE RELOCATED
5	LIGHT POLE	6792.0'	36.7'	TRANSITIONAL SURFACE	TO BE REMOVED
6	LIGHT POLE	6792.0'	36.7'	TRANSITIONAL SURFACE	EXISTING OB LIGHT
7	LIGHT POLE	6792.0'	36.7'	TRANSITIONAL SURFACE	EXISTING OB LIGHT
8	LIGHT POLE	6792.0'	36.7'	TRANSITIONAL SURFACE	EXISTING OB LIGHT
9	LIGHT POLE	6792.0'	36.7'	TRANSITIONAL SURFACE	EXISTING OB LIGHT
10	LIGHT POLE	6792.0'	36.7'	TRANSITIONAL SURFACE	EXISTING OB LIGHT
11	LIGHT POLE	6792.0'	36.7'	TRANSITIONAL SURFACE	EXISTING OB LIGHT
12	LIGHT POLE	6792.0'	36.7'	TRANSITIONAL SURFACE	EXISTING OB LIGHT
13	LIGHT POLE	6792.0'	36.7'	TRANSITIONAL SURFACE	EXISTING OB LIGHT
14	TREE	6792.0'	25.7'	TRANSITIONAL SURFACE	TO BE TRIMMED
15	TREE	6792.0'	27.7'	TRANSITIONAL SURFACE	TO BE TRIMMED
16	TREE	6792.0'	25.7'	TRANSITIONAL SURFACE	TO BE TRIMMED
17	TREE	6792.0'	26.7'	TRANSITIONAL SURFACE	TO BE TRIMMED
18	TREE	6792.0'	26.7'	TRANSITIONAL SURFACE	TO BE TRIMMED
19	T-HANGAR (A)	6766.0'	13.0'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
20	T-HANGAR (B)	6766.0'	13.0'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
21	T-HANGAR (C)	6766.0'	14.0'	PRIMARY SURFACE	INSTALL OB LIGHT
22	HANGAR (D)	6771.0'	19.0'	PRIMARY SURFACE	INSTALL OB LIGHT
23	HANGAR (E)	6769.0'	17.0'	PRIMARY SURFACE	INSTALL OB LIGHT
24	HANGAR (F)	6769.0'	17.0'	PRIMARY SURFACE	INSTALL OB LIGHT
25	HANGAR (N)	6771.0'	19.0'	PRIMARY SURFACE	INSTALL OB LIGHT
26	HANGAR (O)	6771.0'	14.4'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
27	HANGAR (P)	6771.0'	6.6'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
28	HANGAR (K)	6771.0'	19.0'	PRIMARY SURFACE	INSTALL OB LIGHT
29	HANGAR (L)	6771.0'	14.4'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
30	HANGAR (M)	6771.0'	6.6'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
31	HANGAR (J)	6767.0'	9.6'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
32	HANGAR (T)	6767.0'	9.6'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
33	HANGAR (Y_1)	6769.5'	13.5'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
34	HANGAR (Y_2)	6770.0'	11.5'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
35	HANGAR (Y_3)	6770.0'	12.4'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
36	HANGAR (A)	6767.0'	13.4'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
37	HANGAR (B)	6770.5'	16.9'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
38	HANGAR (C)	6767.0'	13.4'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
39	HANGAR (D)	6767.0'	13.4'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
40	HANGAR (E)	6767.0'	13.4'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
41	HANGAR (F)	6767.0'	13.4'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
42	HANGAR (G)	6770.5'	16.9'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
43	HANGAR (H)	6767.0'	13.4'	TRANSITIONAL SURFACE	INSTALL OB LIGHT
44	HANGAR (I)	6775.5'	23.5'	PRIMARY SURFACE	EXISTING OB LIGHT
45	HANGAR (N_1)	6776.0'	24.0'	PRIMARY SURFACE	INSTALL OB LIGHT
46	T-HANGARS (N)	6768.0'	16.0'	PRIMARY SURFACE	INSTALL OB LIGHT
47	T-HANGARS (N)	6768.0'	16.0'	PRIMARY SURFACE	INSTALL OB LIGHT
48	T-HANGARS (N)	6768.0'	16.0'	PRIMARY SURFACE	INSTALL OB LIGHT
49	RESIDENCE	6779.0'	20.7'	TRANSITIONAL SURFACE	TO BE REMOVED
50	RESIDENCE	6779.0'	21.7'	TRANSITIONAL SURFACE	TO BE REMOVED
51	RESIDENCE	6777.0'	19.7'	TRANSITIONAL SURFACE	TO BE REMOVED
52	RESIDENCE	6777.0'	18.7'	TRANSITIONAL SURFACE	TO BE REMOVED
53	RESIDENCE	6782.0'	20.7'	TRANSITIONAL SURFACE	TO BE REMOVED
54	RESIDENCE	6782.0'	21.7'	TRANSITIONAL SURFACE	TO BE REMOVED
55	RESIDENCE	6782.0'	19.7'	TRANSITIONAL SURFACE	TO BE REMOVED
56	RESIDENCE	6777.0'	19.7'	TRANSITIONAL SURFACE	TO BE REMOVED
57	FENCE	6758.0'	8.0'	PRIMARY SURFACE	INSTALL OB LIGHT
58	ROAD (N)	6765.0'	15.0'	PRIMARY SURFACE	INSTALL OB LIGHT
59	HANGAR (Q)	6775.5'	21.6'	TRANSITIONAL SURFACE	EXISTING OB LIGHT
60	AWOS	6782.0'	4.6'	TRANSITIONAL SURFACE	EXISTING OB LIGHT

NOTE: (N) Fifteen feet (15') is added to public roads and ten feet (10') is added to perimeter roads to determine clearance per FAR Part 77 Criteria.

REVISIONS

	DATE

NOTES

1. THIS DRAWING REFLECTS PLANNING STANDARDS SPECIFIC TO THIS AIRPORT, AND IS NOT A PRODUCT OF DETAILED ENGINEERING DESIGN ANALYSIS. IT IS NOT INTENDED TO BE USED FOR CONSTRUCTION DOCUMENTATION OR NAVIGATION.
2. TOPOGRAPHIC INFORMATION TAKEN FROM USGS 7.5 MINUTE SURVEY MAPS, "Big Bear City, California",1994, "Big Bear Lake, California", 1994, "Moonridge, California",1983, and "Fawnskin, California", 1994.
3. THE LOCATION AND HEIGHTS OF OBSTRUCTIONS ARE ESTIMATES. AN OBSTRUCTION SURVEY HAS NOT BEEN COMPLETED FOR THE BIG BEAR CITY AIRPORT.
4. TERRAIN PROFILE DETERMINED FROM THE HIGHEST POINT ALONG THE LENGTH AND ACROSS THE WIDTH OF THE EXTENDED APPROACH SURFACE.
5. THERE ARE ADDITIONAL FAR PART 77 OBSTRUCTIONS LOCATED OFF AIRPORT PROPERTY THAT SHOULD BE VERIFIED BY AN OBSTRUCTION SURVEY.
6. THE MAJORITY OF THE AIRCRAFT STORAGE HANGARS ON AIRPORT PROPERTY PENETRATE EITHER THE PRIMARY OR TRANSITIONAL SURFACES AS DEFINED BY FAR PART 77 AND THESE PENETRATIONS SHOULD BE VERIFIED BY AN OBSTRUCTION SURVEY. FAA FORM 7460-1, NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION SHOULD BE COMPLETED AND COORDINATED WITH FAA PRIOR TO CONSTRUCTION OF ANY FUTURE FACILITIES AS INDICATED ON THIS ALP.

Big Bear City Airport

Big Bear City, California

Figure E2

Airport Airspace Drawing

Barnard Dunkelberg & Company

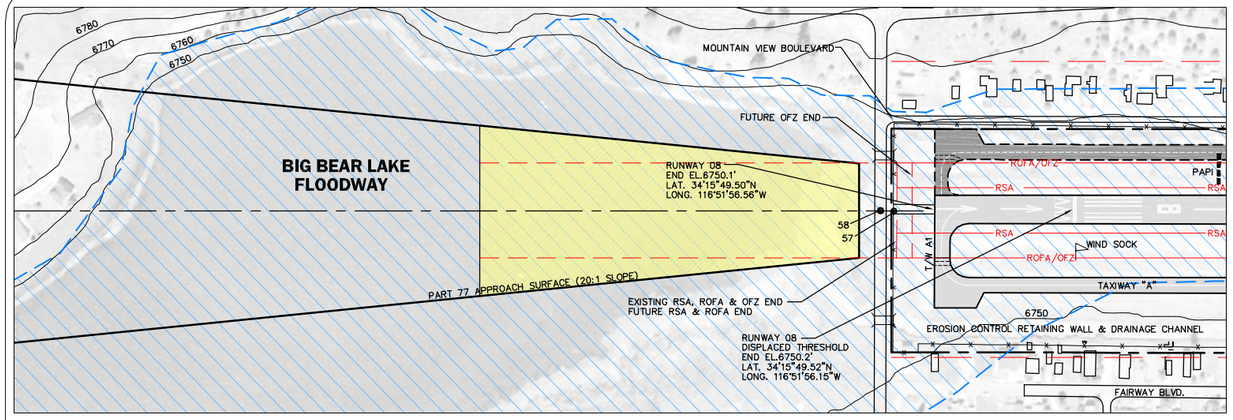
TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
Sep 2008

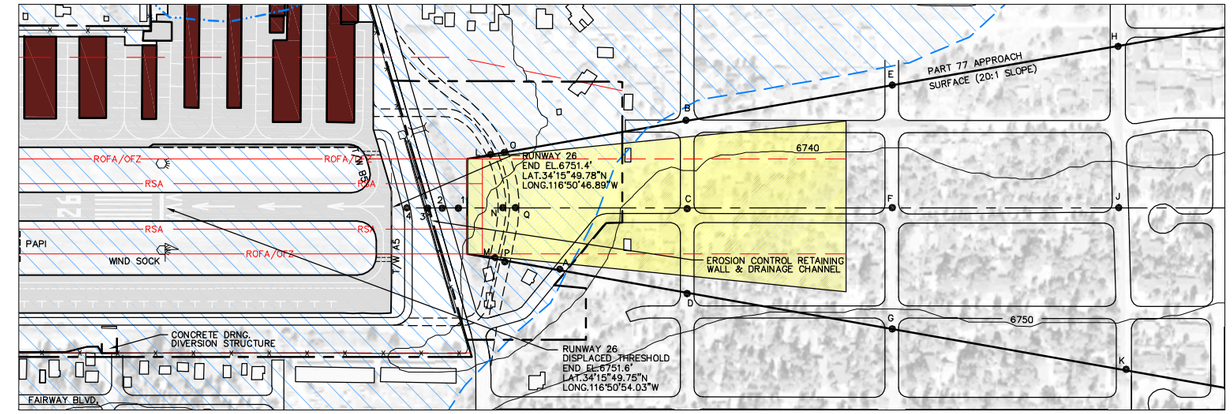
SCALE
as noted

SHEET NO.
E.9



Runway 08 - Plan View

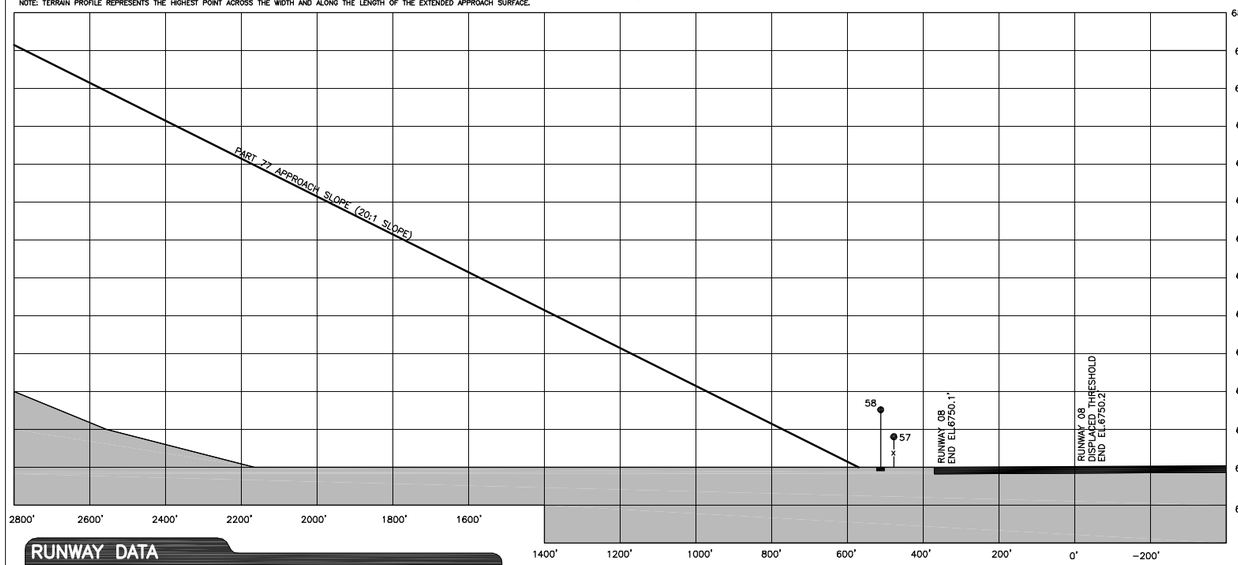
1" = 200'



Runway 26 - Plan View

1" = 200'

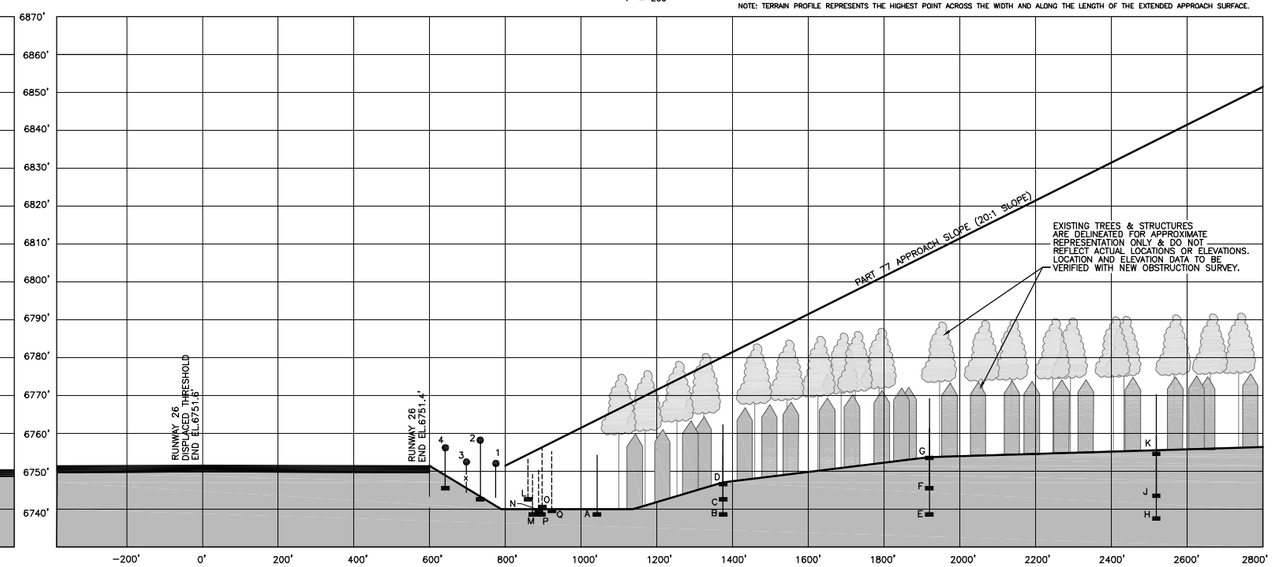
NOTE: TERRAIN PROFILE REPRESENTS THE HIGHEST POINT ACROSS THE WIDTH AND ALONG THE LENGTH OF THE EXTENDED APPROACH SURFACE.



Runway 08 - Profile View

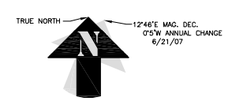
1" = 200' HORIZONTALLY
1" = 20' VERTICALLY

NOTE: TERRAIN PROFILE REPRESENTS THE HIGHEST POINT ACROSS THE WIDTH AND ALONG THE LENGTH OF THE EXTENDED APPROACH SURFACE.



Runway 26 - Profile View

1" = 200' HORIZONTALLY
1" = 20' VERTICALLY



RUNWAY DATA

ITEM	RUNWAY 8/26 EXISTING	RUNWAY 8/26 FUTURE
APPROACH VISIBILITY MINIMUMS	VISUAL/1¼ MILE	*SAME*
FAR PART 77 CATEGORY	VISUAL/NON-PRECISION	*SAME*
FAR PART 77 APPROACH SURFACES	20:1/20:1	*SAME*
RUNWAY LENGTH & WIDTH	5,850' X 75'	*SAME*
TRUE BEARING	N 89.72° E	*SAME*
PAVEMENT TYPE	ASPHALT	*SAME*
PAVEMENT STRENGTH (X 1,000 LBS.)	12.5 SWG	*SAME*
RUNWAY LIGHTING	MIRL	*SAME*
RUNWAY MARKING	NPI	*SAME*
TAXIWAY LIGHTING	MIRL	*SAME*
NAVIGATIONAL AIDS (ELECTRONIC)	ROTATING BEACON, GPS	*SAME*
VISUAL AIDS (LIGHTING)	PAPI	*PAPI, REILS*
AIRPORT REFERENCE CODE	B-I (SMALL)	*SAME*
CRITICAL AIRCRAFT	KING AIR B100	*SAME*
WINGSPAN	45.8'	*SAME*
UNDERCARRIAGE WIDTH	13'	*SAME*
APPROACH SPEED	111 KNOTS	*SAME*
MAXIMUM TAKE-OFF SPEED (LBS.)	11,800	*SAME*
RUNWAY PROTECTION ZONE	250'x450'x1,000'/250'x450'x1,000'	*SAME*
EFFECTIVE GRADIENT % (PER AVIATION DATA SHEET)	0.055	*SAME*
MAXIMUM GRADIENT	TBD	*SAME*
LINE OF SIGHT	CRITERIA MET	*SAME*
DISPLACED THRESHOLD DISTANCE FROM RWY END	370'/600'	*SAME*
DISTANCE TO HOLD BARS	125'	*SAME*
RUNWAY HIGH/LOW POINT ELEVATION	6752.4'/6750.1'	*SAME*
TOUCHDOWN ZONE ELEVATION (TDZE)	N/A / 6752.4'	*SAME*
RWY SAFETY AREA WIDTH	120'	*SAME*
RWY SAFETY AREA BEYOND R/W END	100'/0'	*100'/240'*
RWY OBJECT FREE AREA WIDTH	250'	*SAME*
RWY OBJECT FREE AREA BEYOND R/W END	100'/0'	*100'/240'*
RWY OBSTACLE FREE ZONE WIDTH	250'	*SAME*
RWY OBSTACLE FREE ZONE BEYOND R/W END	100'/0'	*100'/200'*
TAXIWAY SAFETY AREA WIDTH	49'	*SAME*
TAXIWAY OBJECT FREE AREA WIDTH	89'	*SAME*
TAXIWAY SURFACE TYPE	ASPHALT	*SAME*
TAXIWAY WINGTIP CLEARANCE	20'	*SAME*
RUNWAY C/L TO PARALLEL TAXIWAY C/L	TAXIWAY "A" - 201' TAXIWAY "B" - 175'	*TAXIWAY "A" - SAME* *TAXIWAY "B" - 150'/175'*

ROAD CLEARANCES

NO.	DESCRIPTION	ELEVATION	CLEARANCE	DISPOSITION
A	ROAD	6739.0'	9.3' CLEARANCE	TO REMAIN
B	ROAD	6739.0'	26.0' CLEARANCE	TO REMAIN
C	ROAD	6743.0'	22.1' CLEARANCE	TO REMAIN
D	ROAD	6747.0'	17.8' CLEARANCE	TO REMAIN
E	ROAD	6739.0'	52.3' CLEARANCE	TO REMAIN
F	ROAD	6746.0'	46.2' CLEARANCE	TO REMAIN
G	ROAD	6754.0'	38.2' CLEARANCE	TO REMAIN
H	ROAD	6738.0'	84.1' CLEARANCE	TO REMAIN
J	ROAD	6744.0'	78.1' CLEARANCE	TO REMAIN
K	ROAD	6755.0'	67.1' CLEARANCE	TO REMAIN
L	FUTURE PERMETER ROAD	6743.0'	1.0' CLEARANCE	N/A
M	FUTURE PERMETER ROAD	6739.0'	5.8' CLEARANCE	N/A
N	FUTURE PERMETER ROAD	6740.0'	5.6' CLEARANCE	N/A
O	FUTURE ROAD	6741.0'	0.1' CLEARANCE	N/A
P	FUTURE ROAD	6739.0'	2.0' CLEARANCE	N/A
Q	FUTURE ROAD	6740.0'	2.4' CLEARANCE	N/A

NOTE: Fifteen feet (15') is added to public roads and ten feet (10') is added to private roads to determine clearance per FAR Part 77 Criteria.

RUNWAY END COORDINATES

ITEM	RUNWAY 8/26 EXISTING	RUNWAY 8/26 FUTURE
RUNWAY END COORDINATES	LAT.34°15'49.50"N / LAT.34°15'49.78"N LON.116°51'56.56"W / LON.116°50'46.89"W	*SAME*
RUNWAY END ELEVATION	6750.1'/6751.4'	*SAME*
DISPLACED THRESHOLD COORDINATE	LAT.34°15'49.52"N / LAT.34°15'49.75"N LON.116°51'56.15"W / LON.116°50'54.03"W	*SAME*
DISPLACED THRESHOLD ELEVATION	6750.2'/6751.6'	*SAME*

OBSTRUCTIONS

NO.	OBJECT DESCRIPTION	TOP ELEVATION	PENETRATION	SURFACE PENETRATED	PROPOSED DISPOSITION
1	BUSH	6753.0'	1.0'	PRIMARY SURFACE	TO BE RELOCATED
2	ROAD (N)	6758.0'	6.8'	PRIMARY SURFACE	TO BE RELOCATED
3	FENCE	6753.0'	1.0'	PRIMARY SURFACE	TO BE RELOCATED
4	PERIMETER ROAD (N)	6756.0'	4.8'	PRIMARY SURFACE	TO BE RELOCATED
57	FENCE	6758.0'	8.0'	PRIMARY SURFACE	INSTALL OB LIGHT (if required)
58	ROAD (N)	6765.0'	15.0'	PRIMARY SURFACE	INSTALL OB LIGHT (if required)

NOTE: (N) Fifteen feet (15') is added to public roads and ten feet (10') is added to perimeter roads to determine clearance per FAR Part 77 Criteria.

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE	X	X
BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE ABANDONED		
PAVED ROADS		
SIDEWALK		SAME
RPZ EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	*BRL*
RUNWAY SAFETY AREA	RSA (E)	RSA (F)
RUNWAY OBJECT FREE AREA	ROFA (E)	ROFA (F)
EXTENDED RUNWAY OBJECT FREE AREA	EXTENDED ROFA	SAME
RUNWAY OBJECT FREE ZONE	OFZ	OFZ
FUEL STORAGE AREA		SAME
AIRPORT BEACON		SAME
LIGHTED WIND CONE		SAME
HOLDLINES		SAME
PRECISION APPROACH PATH INDICATOR (PAPI)		
WATER		SAME
RUNWAY END IDENTIFIER LIGHTS (REILS)		
100 YEAR FLOODZONE		SAME
CULVERT		SAME
AIRPORT REFERENCE POINT (ARP)		SAME
SECTION CORNER		SAME
AWOS		SAME
TOPOGRAPHIC CONTOUR	6750	SAME

NOTES

1. THIS DRAWING REFLECTS PLANNING STANDARDS SPECIFIC TO THIS AIRPORT, AND IS NOT A PRODUCT OF DETAILED ENGINEERING DESIGN ANALYSIS. IT IS NOT INTENDED TO BE USED FOR CONSTRUCTION DOCUMENTATION OR NAVIGATION.
2. AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
3. EXISTING COORDINATES AND ELEVATIONS ARE NAVD 88 AND WERE OBTAINED FROM http:ovnwww.jccbi.gov, MAY 2007.
4. THE MAJORITY OF THE AIRCRAFT STORAGE HANGARS ON AIRPORT PROPERTY PENETRATE EITHER THE PRIMARY OR TRANSITIONAL SURFACES AS DEFINED BY FAR PART 77 AND THESE PENETRATIONS SHOULD BE VERIFIED BY AN OBSTRUCTION SURVEY. FAA FORM 7460-1, NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION SHOULD BE COMPLETED AND COORDINATED WITH FAA PRIOR TO CONSTRUCTION OF ANY FUTURE FACILITIES AS INDICATED ON THIS ALP.

Big Bear City Airport

Big Bear City, California

Figure E3

Inner Approach Surface Drawing - Runway 08/26

Barnard Dunkelberg & Company

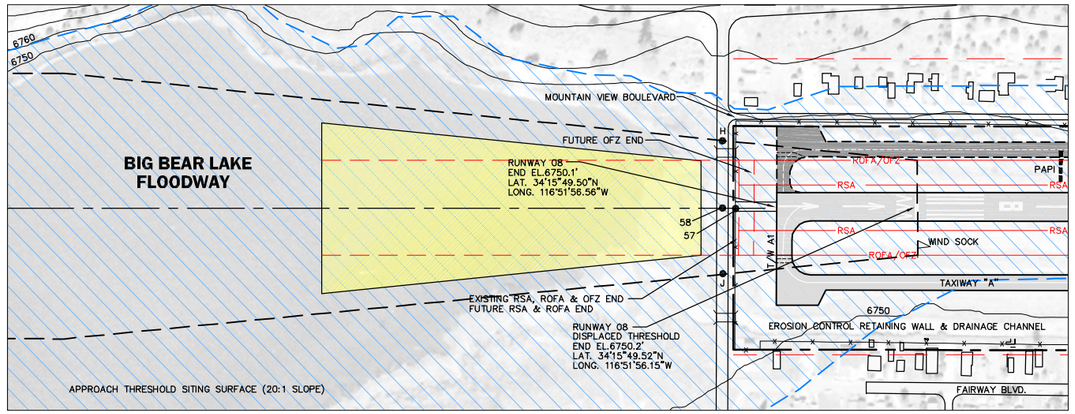
TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
Sep 2008

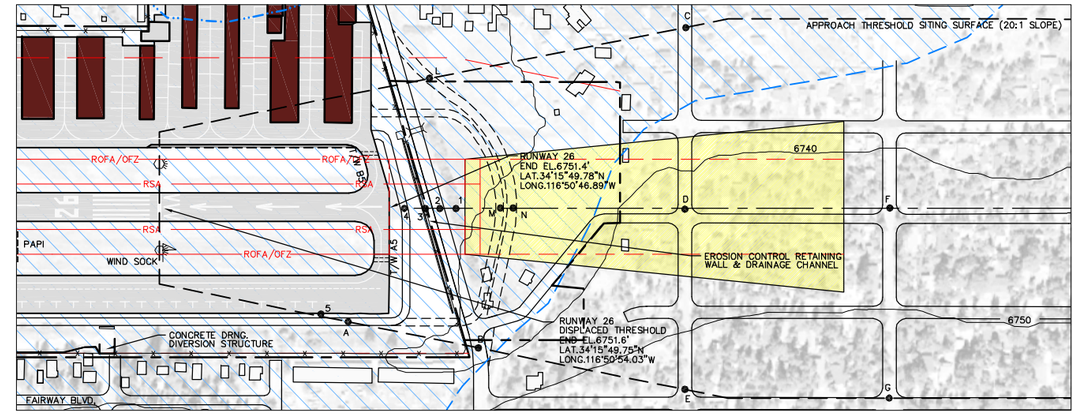
SCALE
as noted

SHEET NO.
E.10



Runway 08 - Plan View

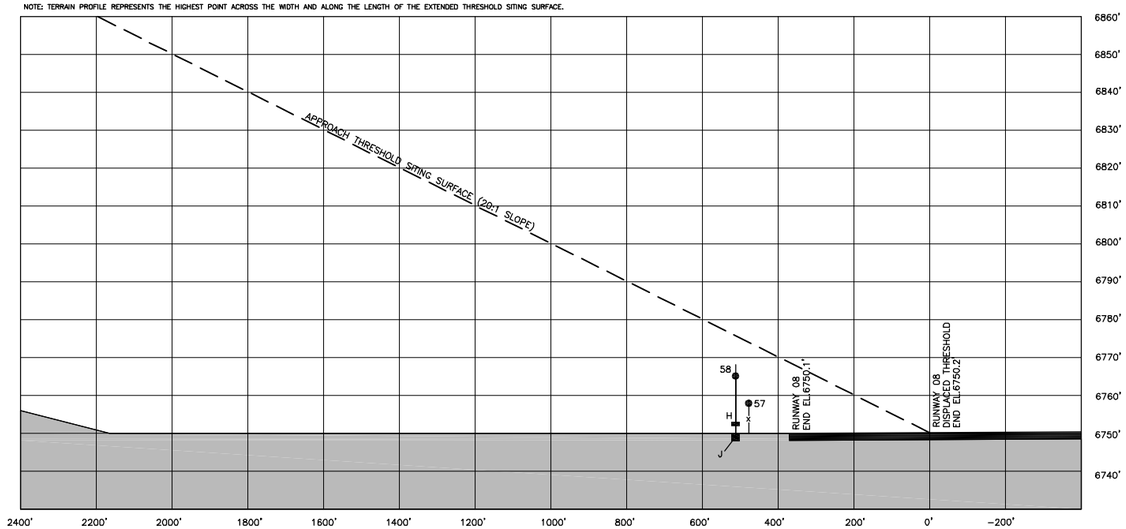
1" = 200'



Runway 26 - Plan View

1" = 200'

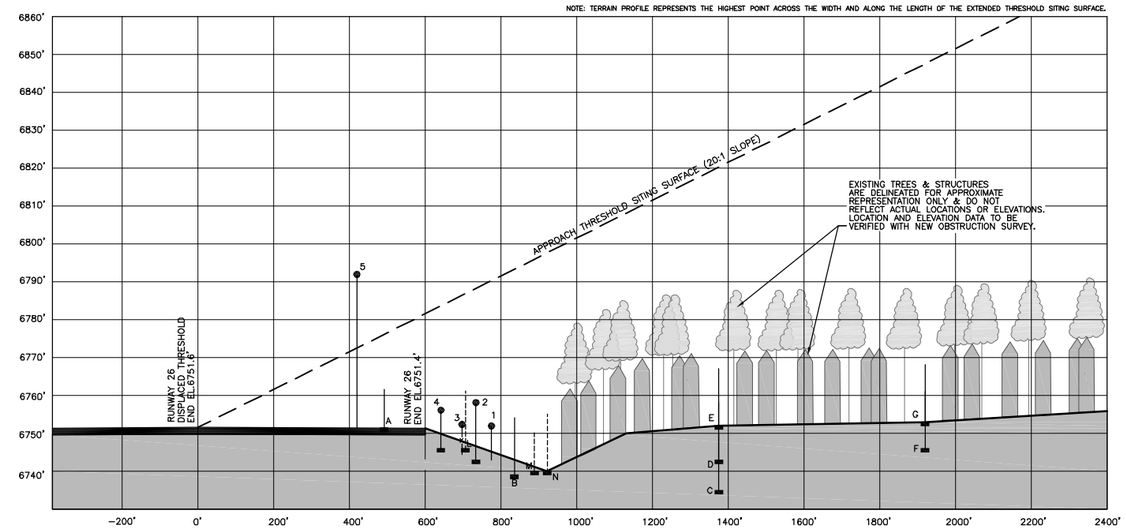
NOTE: TERRAIN PROFILE REPRESENTS THE HIGHEST POINT ACROSS THE WIDTH AND ALONG THE LENGTH OF THE EXTENDED THRESHOLD SITING SURFACE.



Runway 08 - Profile View

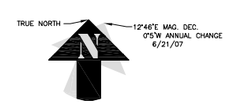
1" = 200' HORIZONTALLY
1" = 20' VERTICALLY

NOTE: TERRAIN PROFILE REPRESENTS THE HIGHEST POINT ACROSS THE WIDTH AND ALONG THE LENGTH OF THE EXTENDED THRESHOLD SITING SURFACE.



Runway 26 - Profile View

1" = 200' HORIZONTALLY
1" = 20' VERTICALLY



RUNWAY DATA

ITEM	RUNWAY 8/26 EXISTING	RUNWAY 8/26 FUTURE
APPROACH VISIBILITY MINIMUMS	VISUAL/1¼ MILE	*SAME*
FAR PART 77 CATEGORY	VISUAL/NON-PRECISION	*SAME*
FAR PART 77 APPROACH SURFACES	20:1/20:1	*SAME*
RUNWAY LENGTH & WIDTH	5,850' X 75'	*SAME*
TRUE BEARING	N 89.72° E	*SAME*
PAVEMENT TYPE	ASPHALT	*SAME*
PAVEMENT STRENGTH (X 1,000 LBS.)	12.5 SWG	*SAME*
RUNWAY LIGHTING	MIRL	*SAME*
RUNWAY MARKING	NPI	*SAME*
TAXIWAY LIGHTING	MIRL	*SAME*
NAVIGATIONAL AIDS (ELECTRONIC)	ROTATING BEACON, GPS	*SAME*
VISUAL AIDS (LIGHTING)	PAPI	*PAPI, REILS*
AIRPORT REFERENCE CODE	B-I (SMALL)	*SAME*
CRITICAL AIRCRAFT	KING AIR B100	*SAME*
WINGSPAN	45.8'	*SAME*
UNDERCARRIAGE WIDTH	13'	*SAME*
APPROACH SPEED	111 KNOTS	*SAME*
MAXIMUM TAKE-OFF SPEED (LBS.)	11,800	*SAME*
RUNWAY PROTECTION ZONE	250'x450'x1,000'/250'x450'x1,000'	*SAME*
EFFECTIVE GRADIENT % (PER AVIATION DATA SHEET)	0.055	*SAME*
MAXIMUM GRADIENT	TBD	*SAME*
LINE OF SIGHT	CRITERIA MET	*SAME*
DISPLACED THRESHOLD DISTANCE FROM RWY END	370'/600'	*SAME*
DISTANCE TO HOLD BARS	125'	*SAME*
RUNWAY HIGH/LOW POINT ELEVATION	6752.4'/6750.1'	*SAME*
TOUCHDOWN ZONE ELEVATION (TDZE)	N/A / 6752.4'	*SAME*
RWY SAFETY AREA WIDTH	120'	*SAME*
RWY SAFETY AREA BEYOND R/W END	100'/0'	*100'/240'*
RWY OBJECT FREE AREA WIDTH	250'	*SAME*
RWY OBJECT FREE AREA BEYOND R/W END	100'/0'	*100'/240'*
RWY OBSTACLE FREE ZONE WIDTH	250'	*SAME*
RWY OBSTACLE FREE ZONE BEYOND R/W END	100'/0'	*100'/200'*
TAXIWAY SAFETY AREA WIDTH	49'	*SAME*
TAXIWAY OBJECT FREE AREA WIDTH	89'	*SAME*
TAXIWAY SURFACE TYPE	ASPHALT	*SAME*
TAXIWAY WINGTIP CLEARANCE	20'	*SAME*
RUNWAY C/L TO PARALLEL TAXIWAY C/L	TAXIWAY 'A' – 201' TAXIWAY 'B' – 175'	*TAXIWAY 'A' – SAME* *TAXIWAY 'B' – 150'/175'*

ROAD CLEARANCES

NO.	DESCRIPTION	ELEVATION	CLEARANCE	DISPOSITION
A	PRIVATE ROAD	6752.0'	14.5' CLEARANCE	TO REMAIN
B	ROAD	6739.0'	39.2' CLEARANCE	TO REMAIN
C	ROAD	6735.0'	70.1' CLEARANCE	TO REMAIN
D	ROAD	6743.0'	62.1' CLEARANCE	TO REMAIN
E	ROAD	6752.0'	53.1' CLEARANCE	TO REMAIN
F	ROAD	6746.0'	87.4' CLEARANCE	TO REMAIN
G	ROAD	6753.0'	79.4' CLEARANCE	TO REMAIN
H	ROAD	6753.0'	87.4' CLEARANCE	TO REMAIN
J	ROAD	6749.0'	79.4' CLEARANCE	TO REMAIN
L	FUTURE ROAD	6746.0'	25.7' CLEARANCE	N/A
M	FUTURE PERIMETER ROAD	6740.0'	45.9' CLEARANCE	N/A
N	FUTURE ROAD	6740.0'	45.6' CLEARANCE	N/A

NOTE: Fifteen feet (15') is added to public roads and ten feet (10') is added to private roads to determine clearance per FAR Part 77 Criteria.

RUNWAY END COORDINATES

ITEM	RUNWAY 8/26 EXISTING	RUNWAY 8/26 FUTURE
RUNWAY END COORDINATES	LAT.34°15'49.50"N / LAT.34°15'49.78"N LON.116°51'56.56"W / LON.116°50'46.89"W	*SAME*
RUNWAY END ELEVATION	6750.1'/6751.4'	*SAME*
DISPLACED THRESHOLD COORDINATE	LAT.34°15'49.52"N / LAT.34°15'49.75"N LON.116°51'56.15"W / LON.116°50'54.03"W	*SAME*
DISPLACED THRESHOLD ELEVATION	6750.2'/6751.6'	*SAME*

OBSTRUCTIONS

NO.	OBJECT DESCRIPTION	TOP ELEVATION	THRESHOLD SITING SURFACE PENETRATION	PROPOSED DISPOSITION
1	BUSH	6743.0'	NONE	TO BE RELOCATED
2	ROAD (N)	6758.0'	NONE	TO BE RELOCATED
3	FENCE	6753.0'	NONE	TO BE RELOCATED
4	PERIMETER ROAD (N)	6756.0'	NONE	TO BE RELOCATED
5	LIGHT POLE	6792.0'	19.4'	TO BE REMOVED
57	FENCE	6758.0'	NONE	INSTALL OB LIGHT
58	ROAD (N)	6765.0'	NONE	INSTALL OB LIGHT

NOTE: (N) Fifteen feet (15') is added to public roads and ten feet (10') is added to perimeter roads to determine clearance per FAR Part 77 Criteria.

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE		
BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE ABANDONED		
PAVED ROADS		
SIDEWALK		SAME
RPZ EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY SAFETY AREA	RSA (E)	RSA (F)
RUNWAY OBJECT FREE AREA	ROFA (E)	ROFA (F)
EXTENDED RUNWAY OBJECT FREE AREA	EXTENDED ROFA	SAME
RUNWAY OBJECT FREE ZONE	OFZ	OFZ
FUEL STORAGE AREA	F	SAME
AIRPORT BEACON		SAME
LIGHTED WIND CONE		SAME
HOLDLINES		SAME
PRECISION APPROACH PATH INDICATOR (PAPI)		
WATER		SAME
RUNWAY END IDENTIFIER LIGHTS (REILS)		
100 YEAR FLOODZONE		SAME
CULVERT		SAME
AIRPORT REFERENCE POINT (ARP)		SAME
SECTION CORNER		SAME
AWOS		SAME
TOPOGRAPHIC CONTOUR	6750	SAME

NOTES

1. THIS DRAWING REFLECTS PLANNING STANDARDS SPECIFIC TO THIS AIRPORT, AND IS NOT A PRODUCT OF DETAILED ENGINEERING DESIGN ANALYSIS. IT IS NOT INTENDED TO BE USED FOR CONSTRUCTION DOCUMENTATION OR NAVIGATION.
2. AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
3. EXISTING COORDINATES AND ELEVATIONS ARE NAVD 88 AND WERE OBTAINED FROM http://www.jccbi.gov, MAY 2007.
4. THE MAJORITY OF THE AIRCRAFT STORAGE HANGARS ON AIRPORT PROPERTY PENETRATE EITHER THE PRIMARY OR TRANSITIONAL SURFACES AS DEFINED BY FAR PART 77 AND THESE PENETRATIONS SHOULD BE VERIFIED BY AN OBSTRUCTION SURVEY. FAA FORM 7460-1, NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION SHOULD BE COMPLETED AND COORDINATED WITH FAA PRIOR TO CONSTRUCTION OF ANY FUTURE FACILITIES AS INDICATED ON THIS ALP.

Big Bear City Airport

Big Bear City, California

Figure E4

Threshold Siting Surface Drawing - Runway 08/26

Barnard Dunkelberg & Company

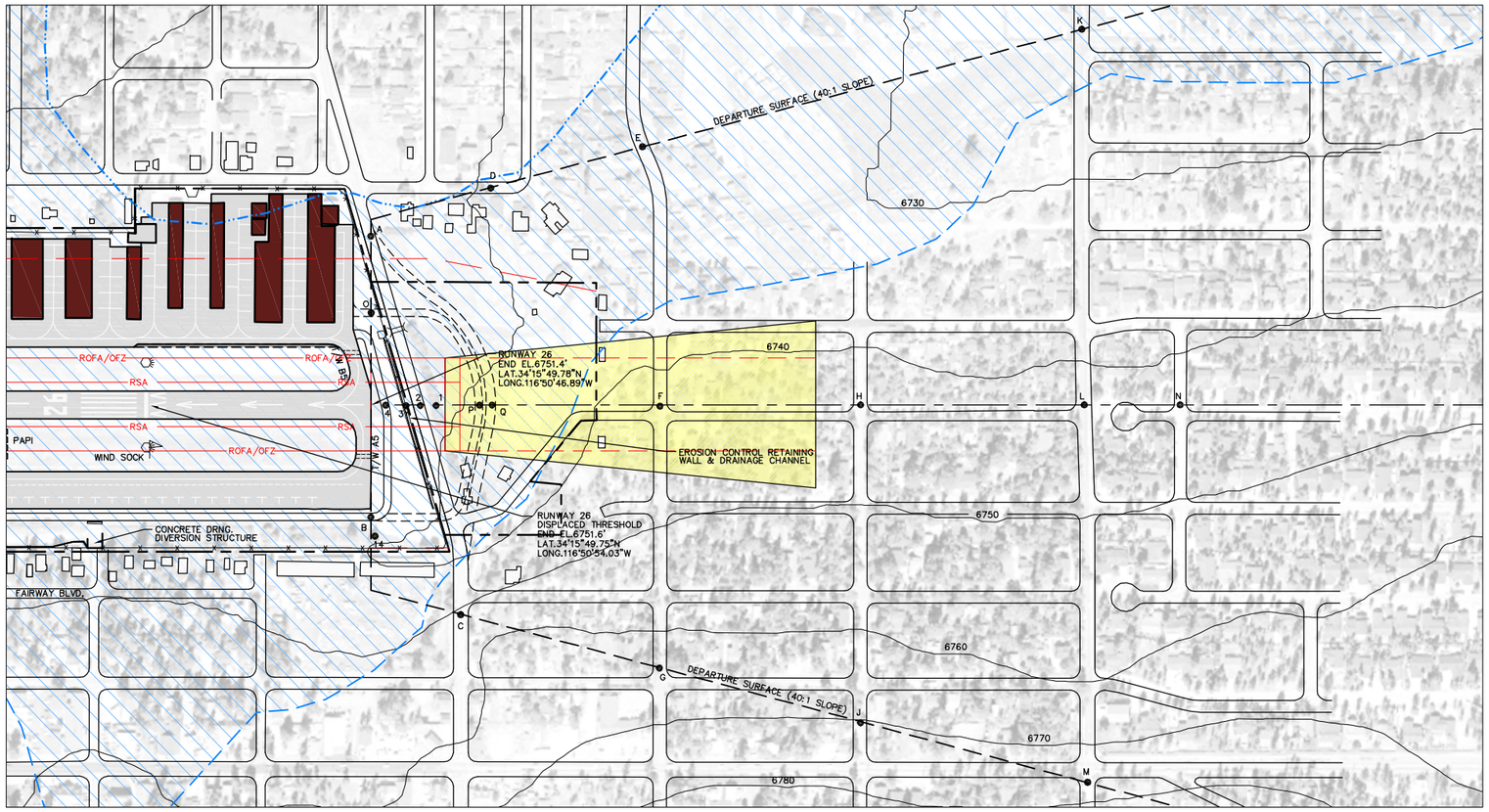
TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

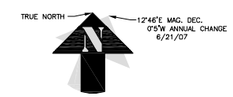
DATE
Sep 2008

SCALE
as noted

SHEET NO.
E.11



Runway 26 - Plan View



OBSTRUCTIONS

NO.	OBJECT DESCRIPTION	TOP ELEVATION	DEPARTURE PENETRATION	PROPOSED DISPOSITION
1	BUSH	6743.0'	NONE	TO BE RELOCATED
2	ROAD (N)	6758.0'	3.4'	TO BE RELOCATED
3	FENCE	6753.0'	NONE	TO BE RELOCATED
4	PERIMETER ROAD (N)	6756.0'	3.7'	TO BE RELOCATED
14	TREE	6792.0'	40.4'	TO BE TRIMMED/REMOVED
A	ROAD (N)	6743.0'	6.8'	NONE
B	PRIVATE ROAD (N)	6751.0'	9.6'	TO BE RELOCATED
C	ROAD (N)	6750.0'	7.7'	NONE
G	ROAD (N)	6764.0'	8.3'	NONE
J	ROAD (N)	6770.0'	0.7'	NONE
O	FUTURE PRIVATE ROAD (N)	6751.0'	9.6'	NONE

NOTE: (N) Fifteen feet (15') is added to public roads and ten feet (10') is added to perimeter roads to determine clearance per FAR Part 77 Criteria.
- FAA AC 150/5300-13, Appendix 2, Paragraph 4(1)(a) states that "No object should penetrate a surface beginning at the elevation of the runway at the Departure End of Runway (DER) or end of clearway, and slopes at 40:1. Penetrations by existing obstacles of 35 feet or less would not require Takeoff Distance Available (TODA) reduction or other mitigations found in paragraph 4; however, they may affect new or existing departure procedures."

RUNWAY DATA

ITEM	RUNWAY 8/26 EXISTING	RUNWAY 8/26 FUTURE
APPROACH VISIBILITY MINIMUMS	VISUAL/1¼ MILE	*SAME*
FAR PART 77 CATEGORY	VISUAL/NON-PRECISION	*SAME*
FAR PART 77 APPROACH SURFACES	20:1/20:1	*SAME*
RUNWAY LENGTH & WIDTH	5,850' X 75'	*SAME*
TRUE BEARING	N 89.72° E	*SAME*
PAVEMENT TYPE	ASPHALT	*SAME*
PAVEMENT STRENGTH (X 1,000 LBS.)	12.5 SWG	*SAME*
RUNWAY LIGHTING	MIRL	*SAME*
RUNWAY MARKING	NPI	*SAME*
TAXIWAY LIGHTING	MIRL	*SAME*
NAVIGATIONAL AIDS (ELECTRONIC)	ROTATING BEACON, GPS	*SAME*
VISUAL AIDS (LIGHTING)	PAPI	*PAPI, REILS*
AIRPORT REFERENCE CODE	B-I (SMALL)	*SAME*
CRITICAL AIRCRAFT	KING AIR B100	*SAME*
WINGSPAN	45.8'	*SAME*
UNDERCARRIAGE WIDTH	13'	*SAME*
APPROACH SPEED	111 KNOTS	*SAME*
MAXIMUM TAKE-OFF SPEED (LBS.)	11,800	*SAME*
RUNWAY PROTECTION ZONE	250'x450'x1,000'/250'x450'x1,000'	*SAME*
EFFECTIVE GRADIENT % (PER AVIATION DATA SHEET)	0.055	*SAME*
MAXIMUM GRADIENT	TBD	*SAME*
LINE OF SIGHT	CRITERIA MET	*SAME*
DISPLACED THRESHOLD DISTANCE FROM RWY END	370'/600'	*SAME*
DISTANCE TO HOLD BARS	125'	*SAME*
RUNWAY HIGH/LOW POINT ELEVATION	6752.4'/6750.1'	*SAME*
TOUCHDOWN ZONE ELEVATION (TDZE)	N/A / 6752.4'	*SAME*
RWY SAFETY AREA WIDTH	120'	*SAME*
RWY SAFETY AREA BEYOND R/W END	100'/0'	*100'/240'*
RWY OBJECT FREE AREA WIDTH	250'	*SAME*
RWY OBJECT FREE AREA BEYOND R/W END	100'/0'	*100'/240'*
RWY OBSTACLE FREE ZONE WIDTH	250'	*SAME*
RWY OBSTACLE FREE ZONE BEYOND R/W END	100'/0'	*100'/200'*
TAXIWAY SAFETY AREA WIDTH	49'	*SAME*
TAXIWAY OBJECT FREE AREA WIDTH	89'	*SAME*
TAXIWAY SURFACE TYPE	ASPHALT	*SAME*
TAXIWAY WINGTIP CLEARANCE	20'	*SAME*
RUNWAY C/L TO PARALLEL TAXIWAY C/L	TAXIWAY 'A' – 201' TAXIWAY 'B' – 175'	*TAXIWAY 'A' – SAME* *TAXIWAY 'B' – 150'/175'*

RUNWAY END COORDINATES

ITEM	RUNWAY 8/26 EXISTING	RUNWAY 8/26 FUTURE
RUNWAY END COORDINATES	LAT.34°15'49.50"N / LAT.34°15'49.78"N LON.116°51'56.56"W / LON.116°50'46.89"W	*SAME*
RUNWAY END ELEVATION	6750.1'/6751.4'	*SAME*
DISPLACED THRESHOLD COORDINATE	LAT.34°15'49.52"N / LAT.34°15'49.75"N LON.116°51'56.15"W / LON.116°50'54.03"W	*SAME*
DISPLACED THRESHOLD ELEVATION	6750.2'/6751.6'	*SAME*

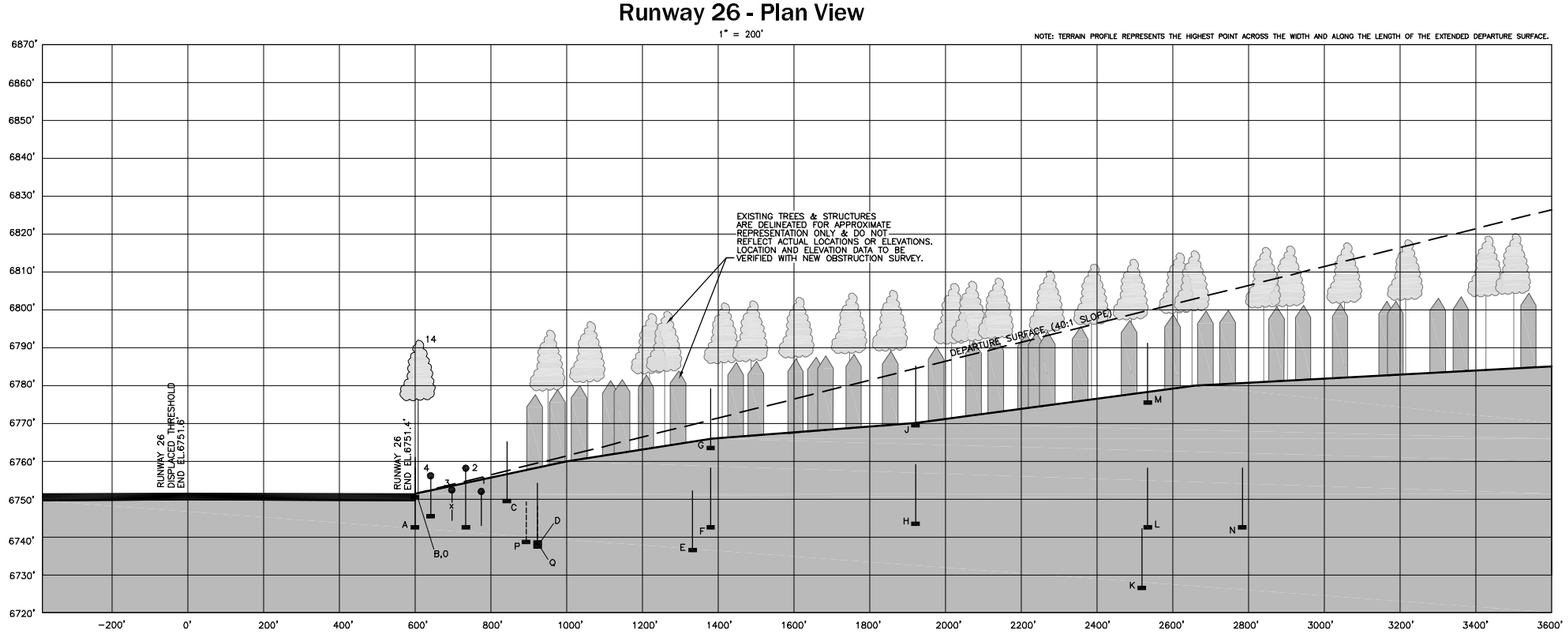
DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE		
BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE ABANDONED		
PAVED ROADS		
SIDEWALK		SAME
RPZ EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	*BRL*
RUNWAY SAFETY AREA	RSA (E)	RSA (F)
RUNWAY OBJECT FREE AREA	ROFA (E)	ROFA (F)
EXTENDED RUNWAY OBJECT FREE AREA	EXTENDED ROFA	SAME
RUNWAY OBJECT FREE ZONE	OFZ	OFZ
FUEL STORAGE AREA		SAME
AIRPORT BEACON		SAME
LIGHTED WIND CONE		SAME
HOLDLINES		SAME
PRECISION APPROACH PATH INDICATOR (PAPI)		
WATER		SAME
RUNWAY END IDENTIFIER LIGHTS (REILS)		
100 YEAR FLOODZONE		SAME
CULVERT		SAME
AIRPORT REFERENCE POINT (ARP)		SAME
SECTION CORNER		SAME
AWOS		SAME
TOPOGRAPHIC CONTOUR	6750	SAME

ROAD CLEARANCES

NO.	DESCRIPTION	ELEVATION	CLEARANCE	DISPOSITION
D	ROAD (N)	6739.0'	5.3' CLEARANCE	TO REMAIN
E	ROAD (N)	6737.0'	17.6' CLEARANCE	TO REMAIN
F	ROAD (N)	6743.0'	12.8' CLEARANCE	TO REMAIN
H	ROAD (N)	6744.0'	26.7' CLEARANCE	TO REMAIN
K	ROAD (N)	6727.0'	57.2' CLEARANCE	TO REMAIN
L	ROAD (N)	6743.0'	41.6' CLEARANCE	TO REMAIN
M	ROAD (N)	6776.0'	8.6' CLEARANCE	TO REMAIN
N	ROAD (N)	6743.0'	47.8' CLEARANCE	TO REMAIN
P	FUTURE PRIVATE ROAD (N)	6739.0'	9.4' CLEARANCE	N/A
Q	FUTURE ROAD	6738.0'	11.3' CLEARANCE	N/A

NOTE: Fifteen feet (15') is added to public roads and ten feet (10') is added to private roads to determine clearance per FAR Part 77 Criteria.



Runway 26 - Profile View

1" = 200' HORIZONTALLY
1" = 20' VERTICALLY

NOTES

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2. AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
3. EXISTING COORDINATES AND ELEVATIONS ARE NAVD 88 AND WERE OBTAINED FROM http://www.jcbi.gov, MAY 2007.
4. THE MAJORITY OF THE AIRCRAFT STORAGE HANGARS ON AIRPORT PROPERTY PENETRATE EITHER THE PRIMARY OR TRANSITIONAL SURFACES AS DEFINED BY FAR PART 77 AND THESE PENETRATIONS SHOULD BE VERIFIED BY AN OBSTRUCTION SURVEY. FAA FORM 7460-1, NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION SHOULD BE COMPLETED AND COORDINATED WITH FAA PRIOR TO CONSTRUCTION OF ANY FUTURE FACILITIES AS INDICATED ON THIS ALP.

Big Bear City Airport

Big Bear City, California

Figure E5

Departure Surface Drawing - Runway 26

Barnard Dunkelberg & Company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
Sep 2008

SCALE
as noted

SHEET NO.
E.12

Terminal Area Drawings

One integral component of the general aviation facilities provided by an airfield is aircraft storage facilities (i.e., T-hangars, executive hangars, and aircraft tiedowns). As discussed in the *Inventory of Existing Conditions* chapter of this report, Big Bear City Airport was home to approximately 133 aircraft in 2004; however, this number is forecast to increase to 156 by the end of the planning period. In addition, there is recognition that there is unmet existing demand for aircraft storage hangars. Therefore, to accommodate these needs, the development plan for the Airport, as illustrated on the *TERMINAL AREA PLAN – WEST* and *TERMINAL AREA PLAN – EAST*, identifies potential infill areas for new hangar development north of Runway 08/26.

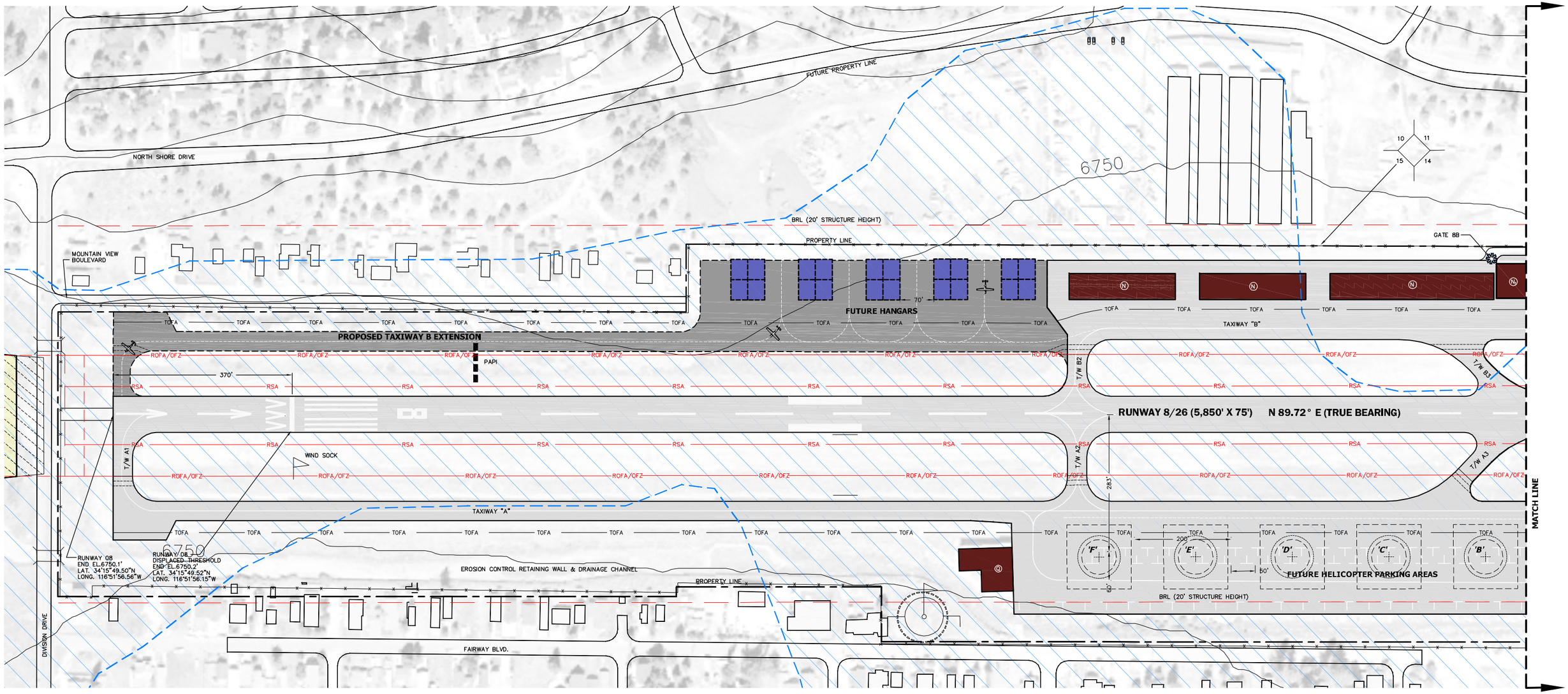
Figures E6 and E7 depict the existing/planned aircraft parking and hangar development areas at Big Bear City Airport. The existing transient and based aircraft parking layout for the primary aircraft parking area located adjacent to the terminal should be maintained. The only recommended change to this layout is the addition of six 50-foot square helicopter parking areas positioned along the west end of this apron. It is also recommended that the existing tiedown layout be maintained so that this area can continue to accommodate small aircraft parking when not needed for helicopter parking.

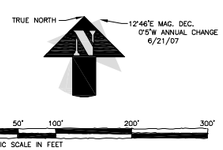
Land Use Drawing

The *LAND USE DRAWING*, presented in the following figure, depicts existing and recommended use of all land within the ultimate airport property line and near the Airport. The purpose of the *LAND USE DRAWING* is to provide airport management a plan for leasing revenue-producing areas on the Airport and guidance to local authorities for establishing appropriate land use zoning in the vicinity of the Airport.

Airport Property Map

The *AIRPORT PROPERTY MAP*, which is presented in another following illustration, indicates how various tracts of land within the airport boundaries were acquired (e.g., federal funds, surplus property, local funds, etc.). The purpose of this drawing is to provide information for analyzing the current and future aeronautical use of land acquired with federal funds.





AIRPORT DATA

	EXISTING	FUTURE
LOCATION – COUNTY	SAN BERNADINO	*SAME*
– TOWNSHIP/RANGE	T.2 NORTH/R.1 EAST	*SAME*
AIRPORT ELEVATION (AMSL) NAVD 88	6752.4'	*SAME*
AIRPORT REFERENCE POINT (ARP) NAD 83	LAT.34°15'49.60"N LON.116°51'21.70"W	*SAME* *SAME*
AIRPORT REFERENCE CODE	B-I (SMALL)	*SAME*
NPIAS SERVICE LEVEL/ROLE	GA	*SAME*
MEAN MAX. TEMPERATURE (HOTTEST MONTH)	80.7°F (JULY)	*SAME*
AIRPORT & TERMINAL NAVAIDS	ROTATING BEACON, GPS	*SAME*

BUILDING LEGEND

NO.	HANGARS	DESCRIPTION	TOP ELEV.	NO.	HANGARS	DESCRIPTION	TOP ELEV.
1	--	TERMINAL	6787.0'	S	--	EXECUTIVE PARCEL	6771.0'
2	--	ELECTRICAL BUILDING	6762.0'	T	--	CIVIL AIR PATROL	6777.0'
3	--	STORAGE BUILDING	6762.0'	N_1	--	CORPORATE HANGAR	6776.0'
4	--	STORAGE BUILDING	6772.0'	N	1–15	NORTH T-HANGARS	6778.0'
X_1	1–13	X-RAY HANGARS	6767.5'	N	16–25	NORTH T-HANGARS	6778.0'
X_2	14–27	X-RAY HANGARS	6767.5'	N	26–35	NORTH T-HANGARS	6778.0'
A	1–9	T-HANGARS	6766.0'	Y_1	--	AERO-HAVEN	6769.5'
B	1–9	T-HANGARS	6766.0'	Y_2	--	HANGAR	6777.0'
C	1–6	T-HANGARS	6766.0'	Y_3	--	HANGAR	6777.0'
D	1–10	NUNO HANGARS	6771.0'	CAP	--	HANGAR	6781.5'
E	1–10	EXECUTIVE PARCEL	6769.0'				
F	1–5	EXECUTIVE PARCEL	6769.0'	A	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
J	--	CIVIL AIR PATROL	6767.0'	B	EXECUTIVE	EXECUTIVE PARCEL	6770.5'
K	--	AIRPORT MAINT. HANGAR	6771.0'	C	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
L	--	AIRPORT MAINT. HANGAR	6771.0'	D	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
M	--	AIRPORT MAINT. HANGAR	6771.0'	E	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
N	--	VONESH AVIATION PARCEL	6771.0'	F	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
O	--	VONESH AVIATION PARCEL	6771.0'	G	EXECUTIVE	EXECUTIVE PARCEL	6770.5'
P	--	VONESH AVIATION PARCEL	6771.0'	H	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
Q	--	EXECUTIVE PARCEL	6775.5'	I	EXECUTIVE	CALLAWAY AVIATION	6775.5'
R	--	EXECUTIVE PARCEL	6769.5'				

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE	X	X
BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE ABANDONED		
PAVED ROADS		
SIDEWALK		SAME
RPZ EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY SAFETY AREA	RSA (E)	RSA (F)
RUNWAY OBJECT FREE AREA	ROFA (E)	ROFA (F)
EXTENDED RUNWAY OBJECT FREE AREA	EXTENDED ROFA	SAME
RUNWAY OBJECT FREE ZONE	OFZ	OFZ
FUEL STORAGE AREA	F	SAME
AIRPORT BEACON		SAME
LIGHTED WIND CONE		SAME
HOLDLINES		SAME
PRECISION APPROACH PATH INDICATOR (PAPI)		
WATER		SAME
RUNWAY END IDENTIFIER LIGHTS (REILS)		
100 YEAR FLOODZONE		SAME
CULVERT		SAME
AIRPORT REFERENCE POINT (ARP)		SAME
SECTION CORNER		SAME
AWOS		SAME
TOPOGRAPHIC CONTOUR	6750	SAME

NOTES

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Big Bear City Airport

Big Bear City, California

Figure E6

Terminal Area - West Drawing

Barnard Dunkelberg & Company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
Sep 2008

SCALE
1" = 100'

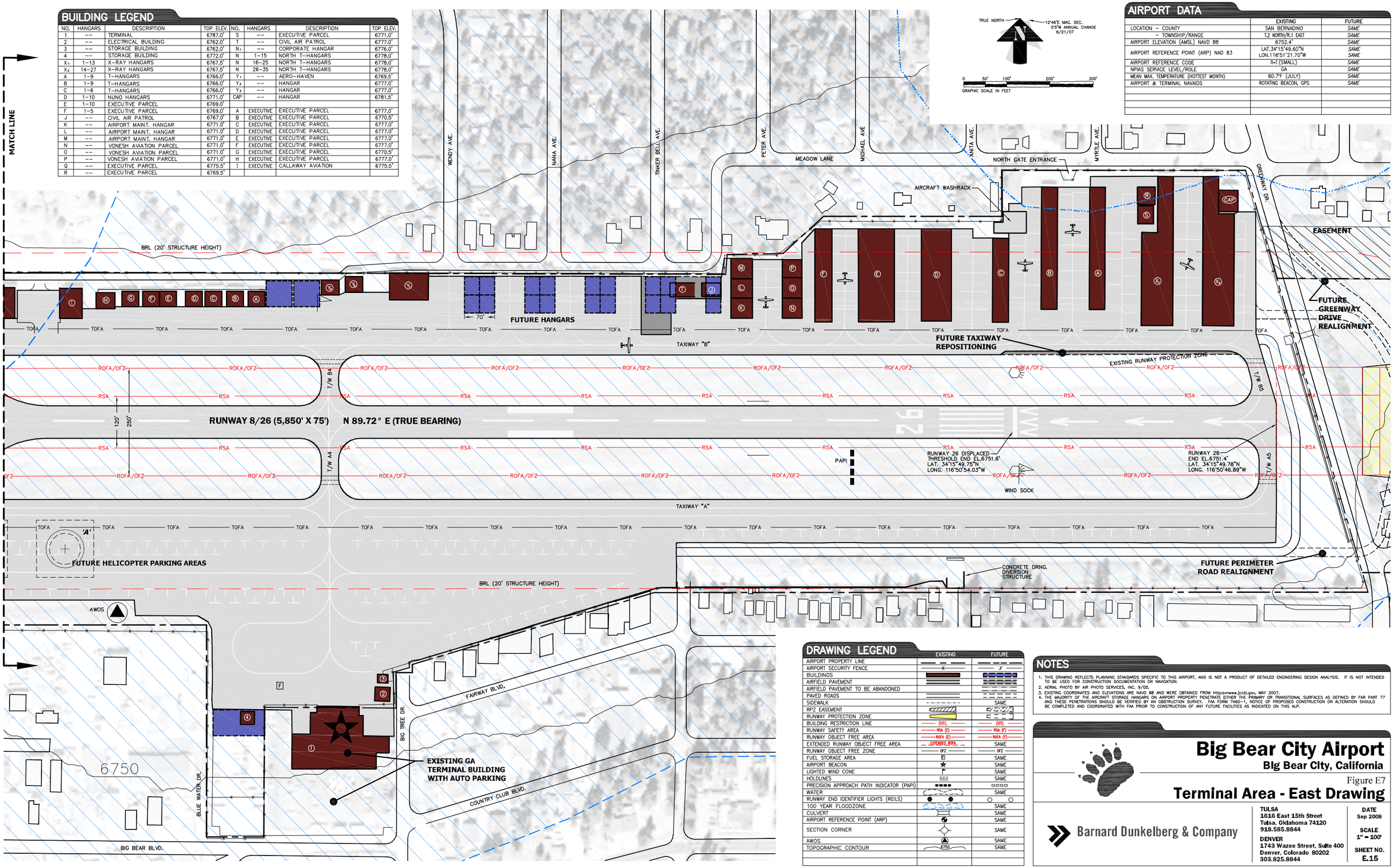
SHEET NO.
E.14

BUILDING LEGEND

NO.	HANGARS	DESCRIPTION	TOP ELEV.	NO.	HANGARS	DESCRIPTION	TOP ELEV.
1	--	TERMINAL	6787.0'	S	--	EXECUTIVE PARCEL	6771.0'
2	--	ELECTRICAL BUILDING	6762.0'	T	--	CIVIL AIR PATROL	6777.0'
3	--	STORAGE BUILDING	6762.0'	N_1	--	CORPORATE HANGAR	6776.0'
4	--	STORAGE BUILDING	6772.0'	N	1-15	NORTH T-HANGARS	6778.0'
X_1	1-13	X-RAY HANGARS	6767.5'	N	16-25	NORTH T-HANGARS	6778.0'
X_2	14-27	X-RAY HANGARS	6767.5'	N	26-35	NORTH T-HANGARS	6778.0'
A	1-9	T-HANGARS	6766.0'	Y_1	--	AERO-HAVEN	6769.5'
B	1-9	T-HANGARS	6766.0'	Y_2	--	HANGAR	6777.0'
C	1-6	T-HANGARS	6766.0'	Y_3	--	HANGAR	6777.0'
D	1-10	NUNO HANGARS	6771.0'	CAP	--	HANGAR	6781.5'
E	1-10	EXECUTIVE PARCEL	6769.0'				
F	1-5	EXECUTIVE PARCEL	6769.0'	A	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
J	--	CIVIL AIR PATROL	6767.0'	B	EXECUTIVE	EXECUTIVE PARCEL	6770.5'
K	--	AIRPORT MAINT. HANGAR	6771.0'	C	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
L	--	AIRPORT MAINT. HANGAR	6771.0'	D	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
M	--	AIRPORT MAINT. HANGAR	6771.0'	E	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
N	--	VONESH AVIATION PARCEL	6771.0'	F	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
O	--	VONESH AVIATION PARCEL	6771.0'	G	EXECUTIVE	EXECUTIVE PARCEL	6770.5'
P	--	VONESH AVIATION PARCEL	6771.0'	H	EXECUTIVE	EXECUTIVE PARCEL	6777.0'
Q	--	EXECUTIVE PARCEL	6775.5'	I	EXECUTIVE	CALLAWAY AVIATION	6775.5'
R	--	EXECUTIVE PARCEL	6769.5'				

AIRPORT DATA

	EXISTING	FUTURE
LOCATION – COUNTY	SAN BERNADINO	SAME
– TOWNSHIP/RANGE	T.2 NORTH/R.1 EAST	SAME
AIRPORT ELEVATION (AMSL) NAVD 88	6752.4'	SAME
AIRPORT REFERENCE POINT (ARP) NAD 83	LAT.34°15'49.60"N LON.116°51'21.70"W	SAME SAME
AIRPORT REFERENCE CODE	B-I (SMALL)	SAME
NPIAS SERVICE LEVEL/ROLE	GA	SAME
MEAN MAX. TEMPERATURE (HOTTEST MONTH)	80.7°F (JULY)	SAME
AIRPORT & TERMINAL NAVAIDS	ROTATING BEACON, GPS	SAME



DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE		
BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE ABANDONED		
PAVED ROADS		
SIDEWALK		SAME
RPZ EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY SAFETY AREA	RSA (E)	RSA (F)
RUNWAY OBJECT FREE AREA	ROFA (E)	ROFA (F)
EXTENDED RUNWAY OBJECT FREE AREA	EXTENDED ROFA	SAME
RUNWAY OBJECT FREE ZONE	OFZ	OFZ
FUEL STORAGE AREA		SAME
AIRPORT BEACON		SAME
LIGHTED WIND CONE		SAME
HOLDLINES		SAME
PRECISION APPROACH PATH INDICATOR (PAPI)		
WATER		SAME
RUNWAY END IDENTIFIER LIGHTS (REILS)		
100 YEAR FLOODZONE		SAME
CULVERT		SAME
AIRPORT REFERENCE POINT (ARP)		SAME
SECTION CORNER		SAME
AWOS		SAME
TOPOGRAPHIC CONTOUR	6750	SAME

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Big Bear City Airport

Big Bear City, California

Figure E7

Terminal Area - East Drawing

Barnard Dunkelberg & Company

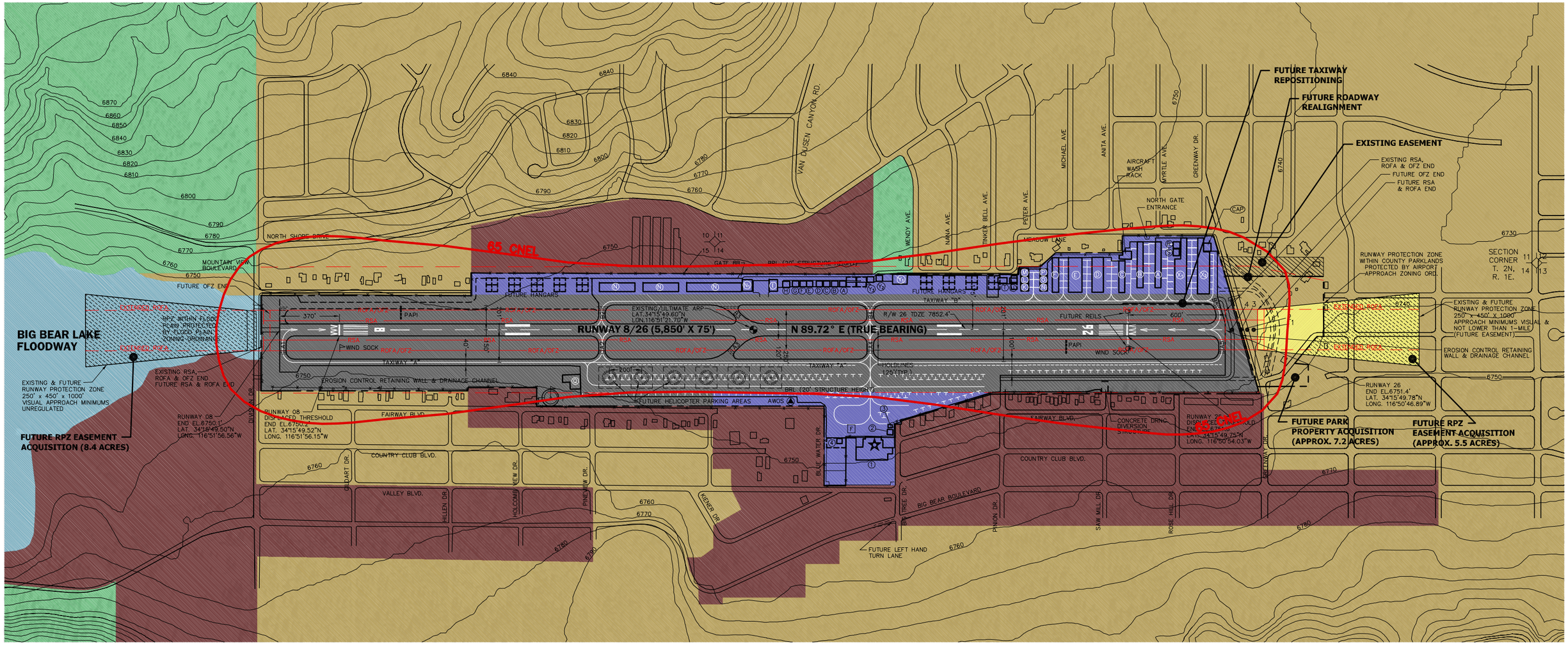
TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
Sep 2008

SCALE
1" = 100'

SHEET NO.
E.15



LAND USE LEGEND

- RUNWAY PROTECTION ZONES
  –PORTIONS OF RPZ EXTEND OFF AIRPORT PROPERTY–
- AIRPORT OPERATIONS AREA
  (APPROX. 86 ACRES)
- AERONAUTICAL DEVELOPMENT AREA
  (APPROX. 61 ACRES)
- RESIDENTIAL
- COMMERCIAL
- RESOURCE CONSERVATION
- 65 CNEL NOISE CONTOUR

TRUE NORTH — 12°46'E MAG. DEC. 0°5'W ANNUAL CHANGE 6/21/07

0 150' 300' 600' 900'
GRAPHIC SCALE IN FEET

REVISIONS

	DATE

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE	X	X
BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE ABANDONED		
PAVED ROADS		
SIDEWALK		SAME
RPZ EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY SAFETY AREA	RSA (E)	RSA (F)
RUNWAY OBJECT FREE AREA	ROFA (E)	ROFA (F)
EXTENDED RUNWAY OBJECT FREE AREA	EXTENDED ROFA	SAME
RUNWAY OBJECT FREE ZONE	OFZ	OFZ
FUEL STORAGE AREA	F	SAME
AIRPORT BEACON		SAME
LIGHTED WIND CONE		SAME
HOLDLINES		SAME
PRECISION APPROACH PATH INDICATOR (PAPI)		
WATER		SAME
RUNWAY END IDENTIFIER LIGHTS (REILS)		
100 YEAR FLOODZONE		SAME
CULVERT		SAME
AIRPORT REFERENCE POINT (ARP)		SAME
SECTION CORNER		SAME
AWOS		SAME
TOPOGRAPHIC CONTOUR	6750	SAME

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Big Bear City Airport

Big Bear City, California

Figure E8

Land Use Drawing

Barnard Dunkelberg & Company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
Sept 2008

SCALE
1" = 300'

SHEET NO.
E.16

GRANT DEED #1 PROPERTY

PARCEL NUMBER	GRANTORS	TYPE OF INSTRUMENT	DATE ACQUIRED	ACREAGE
1-1	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	6.38±
1-2	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.47±
1-3A	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.16±
1-3B	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.47±
1-4	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.20±
1-5	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.54±
1-6	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.25±
1-7	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.18±

GRANT DEED #2 PROPERTY

PARCEL NUMBER	GRANTORS	TYPE OF INSTRUMENT	DATE ACQUIRED	ACREAGE
2-1A	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	7.18±
2-1B	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	18.22±
2-1C	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	21.27±
2-1D	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	6.20±
2-1E	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	15.29±
2-1F	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	2.90±
2-2	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	10.05±
2-3	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	3.25±
2-4	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.25±
2-5	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.31±
2-6	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.47±

GRANT DEED #2 PROPERTY

PARCEL NUMBER	GRANTORS	TYPE OF INSTRUMENT	DATE ACQUIRED	ACREAGE
2-7	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.56±
2-8A	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.16±
2-8B	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.16±
2-9	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.16±
2-10	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	1.94±
2-11	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	
2-12	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.20±
2-13	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.18±
2-14	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.55±
2-15	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.55±
2-16	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.44±

GRANT DEED #2 PROPERTY

PARCEL NUMBER	GRANTORS	TYPE OF INSTRUMENT	DATE ACQUIRED	ACREAGE
2-17	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.32±
2-18	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.23±
2-19	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	1.10±
2-20	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.61±
2-21	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.71±
2-22	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	5.10±
2-23	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	1.61±
2-24	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	2.05±
2-25	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	0.17±
2-26	SAN BERNADINO COUNTY	FEE SIMPLE	07/07/1993	1.00±

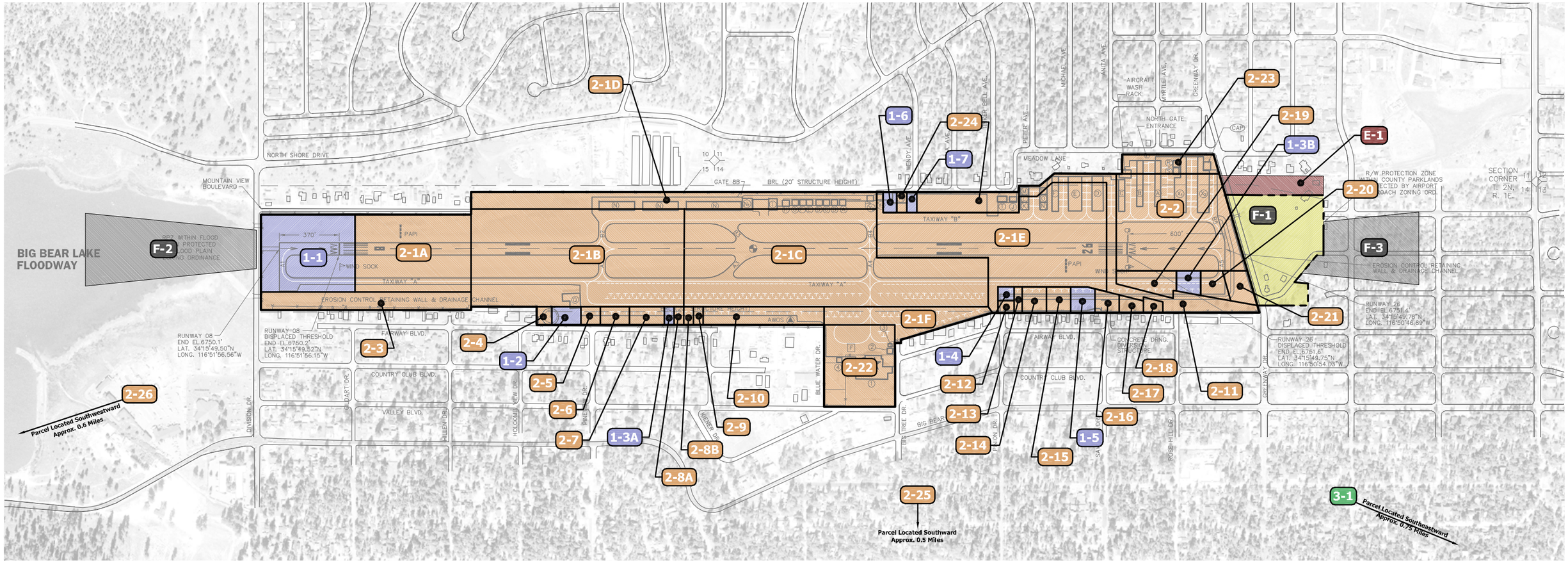
GRANT DEED #3 PROPERTY

PARCEL NUMBER	GRANTORS	TYPE OF INSTRUMENT	DATE ACQUIRED	ACREAGE
3-1	SAN BERNADINO COUNTY	FEE SIMPLE	03/30/2000	0.50±

EASEMENT

PARCEL NUMBER	GRANTORS	TYPE OF INSTRUMENT	DATE ACQUIRED	ACREAGE
E-1	BIG BEAR VALLEY HISTORICAL SOCIETY	EASEMENT	06/03/2008	1.70±

SOURCE:
PROPERTY INFORMATION OBTAINED FROM THE BIG BEAR AIRPORT DISTRICT. JULY 2007.



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DRAWING LEGEND

	EXISTING
EXISTING AIRPORT PROPERTY LINE	
FUTURE AIRPORT PROPERTY LINE	
AIRPORT SECURITY FENCE	
BUILDINGS	
AIRFIELD PAVEMENT	
AIRFIELD PAVEMENT TO BE ABANDONED	
PAVED ROADS	
SIDEWALK	
BUILDING RESTRICTION LINE	BRL
FUEL STORAGE AREA	F
AIRPORT BEACON	
LIGHTED WIND CONE	
HOLDLINES	
PRECISION APPROACH PATH INDICATOR (PAPI)	
VISUAL APPROACH SLOPE INDICATOR (VASI)	
RUNWAY END IDENTIFIER LIGHTS (REILS)	
CULVERT	
AIRPORT REFERENCE POINT (ARP)	
SECTION CORNER	
AWOS	

FUTURE PROPERTY ACQUISITION

PARCEL NUMBER	GRANTORS	TYPE OF INSTRUMENT	DATE ACQUIRED	ACREAGE
F-1		FEE SIMPLE	TO BE ACQUIRED	7.2±
F-2		EASEMENT	TO BE ACQUIRED	8.4±
F-3		EASEMENT	TO BE ACQUIRED	5.5±

TRUE NORTH
12°46'E MAG. DEC.
0°5'W ANNUAL CHANGE
6/21/07

0 150' 300' 600' 900'
GRAPHIC SCALE IN FEET

REVISIONS

	DATE

Big Bear City Airport

Big Bear City, California

Figure E9

Airport Property Map

Barnard Dunkelberg & Company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
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DATE
Sep 2008

SCALE
1" = 300'

SHEET NO.
E.17

Environmental Overview

INTRODUCTION. The following narrative presents an analysis and inventory of environmental information gathered through correspondence with various local, 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. In California, projects will have to comply with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Due to some of the environmental concerns outlined in this chapter, it is likely that some kind of environmental review, such as an Initial Study (IS), would need to be completed before some of the Master Plan recommendations are implemented.

Development recommendations involving the future configuration of the Airport have been reviewed in previous chapters. The primary projects proposed for the Airport include the following:

1. The extension of Taxiway "B" to the end of Runway 08, including Medium Intensity Taxiway Lights (MITLs).
2. Hangar development within the "infill" areas along the north side of Runway 08/26.
3. The installation of obstruction lighting on some of the hangars along the north side of Runway 08/26.
4. The construction of six helicopter parking areas on the existing south aircraft parking apron (with each parking area to be 50 feet by 50 feet square).
5. The purchase of Big Bear City Park (7.2 acres).
6. The removal/relocation of three buildings in the southern portion of the park.
7. The re-alignment of Greenway Drive and the extension of the Runway 26 RSA and ROFA, including the associated re-alignment of the perimeter fence.
8. The re-alignment of the perimeter service road and drainage around the Runway 26 ROFA.

Existing Conditions Summary

As presented in the *Inventory of Existing Conditions* chapter, Big Bear City Airport is located in Southern California approximately 40 miles outside of the Los Angeles metropolitan area, on the southern boundary of the San Bernardino Mountain Range. The Airport provides a safe operating environment for general aviation aircraft, ranging from gliders to small corporate jets.

The City of Big Bear Lake, and the unincorporated portion of San Bernardino County known as Big Bear City, are both located amid the peaks of the San Bernardino Mountain Range near Big Bear Lake. Big Bear City is surrounded by several communities, including Sugarloaf, Fawnskin, Lake Arrowhead, Erwin Lake, and Baldwin Lake. Although Big Bear City has not grown significantly in the last ten years, the exponential growth of the surrounding communities has influenced Big Bear City and the regional transportation system.

Currently, portions of San Bernardino County are listed as non-attainment areas for Carbon Monoxide (CO), Ozone (O3), and Particulate Matter (both PM2.5 and PM10) standards. A non-attainment area is typically defined as a locality where air pollution levels persistently exceed the National Ambient Air Quality Standards (NAAQS) as defined by the EPA. 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 34˚ 15' 49.03" N and Longitude 116˚ 51' 16.11" W. The Airport has an elevation of 6,748 feet above mean sea level (AMSL) and consists of approximately 117 acres. The local area is home to the mountain lion, coyote, bald eagle, deer, black bear, and hawk. In the winter, bald eagles are commonly present in the area and, throughout the year, you can see white pelicans, coots, great white herons, and mergansers.

Big Bear averages approximately 320 days of sunshine a year and temperatures can vary greatly, average daytime temperatures range from 48.0 degrees in January to 81.0 degrees in July. Precipitation occurs mostly between November and April with possible heavy snowfall in January and February. A normal winter season can bring 120 inches of snowfall. Summers are pleasantly warm and dry with the exception of possible mountain thunderstorms later in the season. Late spring and summer provide a colorful array of natural flowering vegetation, including the lupine, Indian paintbrush, and the California wild rose. The corn lily, lemon lily, and leopard lily can be observed by the adventuresome hiker along streams, in meadows, and nestled among the mountain trails. A high desert climate is characteristic of the eastern part of Big Bear and Cactus Flats. This area contains pockets of marshes, springs, meadows, and wetlands, making Big Bear one of the most diversified habitats in the world.

Big Bear City Airport is located within the unincorporated portion of San Bernardino County known as Big Bear City. However, the Airport is adjacent to the City of Big Bear Lake, which bounds airport property to the west. The land uses associated with the immediate areas surrounding the Airport are generally medium density residential and open space with some mixed light industrial and commercial land uses. The Airport is bounded to the west by Big Bear Lake; on the north by State Highway 38, residential, and commercial development; on the east by State Highways 18 and 38, a local park, and residential development; and, on the south by State Highway 18, residences, and commercial businesses. Overall, residential is the dominant land use in the vicinity of the Airport.

The City of Big Bear Lake is the 3rd smallest city in San Bernardino County (22nd out of a total of 24 Cities) and is the largest incorporated community near the Airport. The San Bernardino

Associated Governments forecasts the population of the City of Big Bear Lake to increase approximately 1.6% annually through 2025, and the population of San Bernardino County to increase approximately 1.9% annually through 2025. Police protection is provided via contract with the San Bernardino County Sheriff, and airport fire protection services are currently provided by the Community Services District. Ground access to the airport terminal and main entrance to the Airport is provided by Big Tree Drive and West Big Bear Boulevard, by way of State Highway 18, which is located on the south side of the Airport. The aviation facilities located on the north side of the Airport are accessed via North Shore Drive, by way of State Highway 38.

Environmental Analysis

Noise and Compatible Land Use

In predicting the approximate noise impacts that could occur from the operation of Big Bear City Airport, several assumptions were made to estimate the number of operations, types of aircraft, and the airport configuration that would be most reasonable to model for the 2004 base year, and for the end of the planning period, year 2025. 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 Airport would not receive noise complaints due to overflights by aircraft from well outside of the 65 Community Noise Exposure Level (CNEL) 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, 2004 & 2025*.

Table F1
EXISTING AND FUTURE OPERATIONS BY AIRCRAFT TYPE, 2004 & 2025

Operations By Type	2004 [(a)]	2025
General Aviation		
Single Engine	24,867	30,826
Multi-Engine	4,156	5,805
Turbo-Prop	486	954
Business Jet	405	767
Helicopter	486	1,037
Military		
Helicopter	2,000	2,000
TOTAL	**32,400**	**41,389**

Source: *BARNARD DUNKELBERG & COMPANY*. (a) Actual.

Noise Levels. 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 normally 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. In California, the Community Noise Exposure Level (CNEL) is currently accepted by the FAA as the appropriate measure of cumulative noise exposure. The basic unit in the computation of both DNL and CNEL is the Sound Exposure Level (SEL). An 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.

The computation of DNL/CNEL involves the addition, weighting, and averaging of each SEL to achieve the DNL/CNEL 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. The difference between DNL and CNEL is that the SEL of any single noise event occurring between the hours of 7:00 p.m. and 10:00 p.m. is automatically weighted by adding 5 dB(A) to the SEL.

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 CNEL 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 CNEL 65 level describes an area as having a constant noise level of 65 dB(A), which 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 CNEL is that it provides a common measure for a variety of differing noise environments. The same CNEL level can describe both an area with very few high level noise events and an area with many low level events. CNEL is thus constructed because it has been found that the total noise energy in an area predicts community response.

Table F2
COMPARATIVE NOISE LEVELS

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

Notes: 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 dB(A) reading obtained from FAA Advisory Circular 36-1H Noise Levels for U.S. Certificated and Foreign Aircraft.

CNEL 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 CNEL contours drawn about an airport are used to predict community response to the noise from aircraft using that airport.

Computer Modeling. The CNEL noise contours were generated using the Integrated Noise Model (INM) Version 7.0, 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 April 2007. The program uses 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 elevation, 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 characteristics were incorporated in order to model the noise environment at Big Bear City Airport.

Land Use Compatibility Matrix. The Land Use Compatibility Matrix, presented on the following page, indicates those land uses that are compatible within certain DNL/CNEL 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 Airport District 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/CNEL 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/CNEL 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/CNEL 65 noise contour, for example, will be less than the public response from the DNL/CNEL 75 noise contour.

This study generated the 55, 60, 65, and 70 CNEL noise contours to determine land use compatibility. The area between the 55 and 65 CNEL 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 CNEL 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 CNEL noise contour identifies land uses that are subjected to a significant level of noise and the sensitivity of various uses to noise is increased.

2004 Noise Contours. Using the existing 2004 aircraft operation base counts and types previously presented in Table F1, noise contours were generated and are presented in Figure F2, entitled *2004 EXISTING NOISE CONTOURS.* As can be seen in the illustration, the 65 CNEL extends off airport property in every direction. However, the 65 CNEL contour extends off airport property over residential areas to the north and south of the runway. This contour encompasses

approximately 102 residential properties that are incompatible with the noise levels within this contour. The 65 CNEL contour encompasses approximately 149.1 acres.

2025 Noise Contours. The 2025 aircraft operation counts and types, presented in Table F1, were used to generate the noise contours that are illustrated in Figure F3, entitled *2025 FUTURE NOISE CONTOURS*. The 2025 65 CNEL noise contour contains approximately 171.1 acres. The 2025 noise contour is very similar in size and shape to the 2004 contour, with the future 65 DNL noise contour being larger by approximately 22 acres due to the projected increase in total operations. As in the 2004 base case, the 65 CNEL noise contour does extend off airport property. The 2025 65 CNEL contour encompasses approximately 31 more residences than the 2004 65 CNEL noise contour. This means that about 133 houses would be considered to be significantly affected by noise produced at the Airport in the future. According to the FAA, the location of these houses within the 65 CNEL contour makes these houses incompatible land uses with the Airport.

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 20-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 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 following illustrations, the projected increase in operations at the Airport through the 20-year planning period only minimally affects the noise contours and is offset by the projected retirement of the older and noisier business jet aircraft from the fleet. 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 project—in other words, a project that is funded or approved by a federal agency. In addition to NEPA, California has its own environmental review guidelines dictated by the California Environmental Quality Act (CEQA). Since there is no project being proposed at this time that would result in a different set of noise contours, no NEPA or CEQA document is required due to noise impacts.

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 experience only moderate increases in annual aircraft operations.

Separate from the proposed projects, the Airport District should consider undertaking a Part 150 Noise and Land Use Compatibility Study, due to the current land use incompatibility issues. A Part 150 Study would be able to examine a broad range of noise reduction measures to reduce noise compatibility issues within the surrounding community. In an agency coordination response letter (see Appendix), the California Environmental Health Services Division recommended that additional noise studies should be completed to determine impacts to sensitive noise receptors around the Airport. While the projects would probably not significantly affect the noise for any noise sensitive areas, because several incompatible land uses already exist in the 65 CNEL contour, additional studies could help to develop a better noise compatibility plan.

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 recommendations for the airport environs. These practices are essential to ensure longevity of growth in aviation activity beyond that programmed in this Master Plan for Big Bear City Airport.

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 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 a 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 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 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 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.

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.

Figure F1 **Land Use Compatibility Matrix**

Source: FAR Part 150 Guidelines.

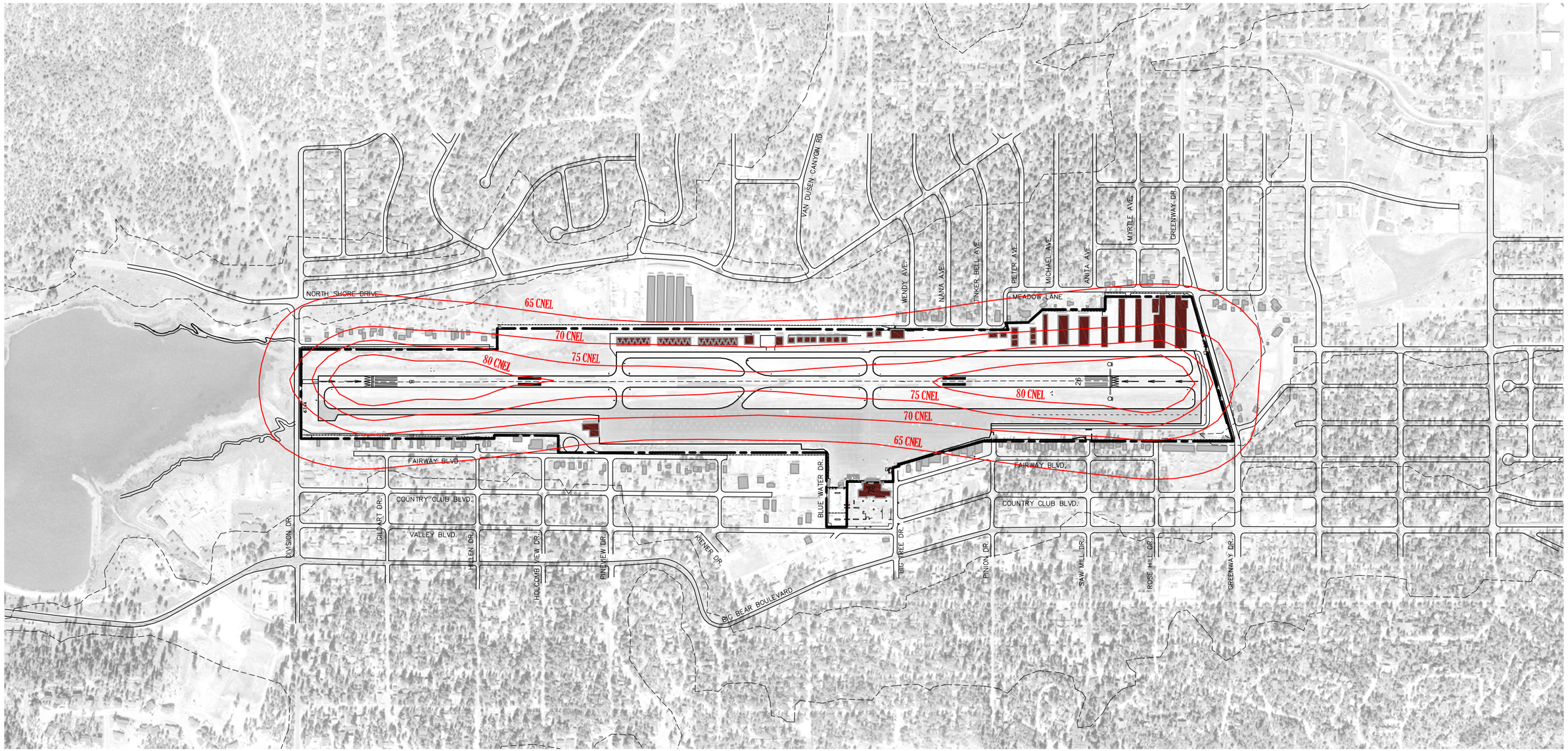


Figure F2 Existing (2004) Noise Contour

Master Plan Big Bear City Airport
Big Bear City, California

SOURCE: AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
AIRPORT LAYOUT PLAN BY VSA AIRPORTS, PALM SPRINGS, CA 10/02.
FEMA FIRM SAN BERNARDINO COUNTY, 7315 OF 9400 3/96

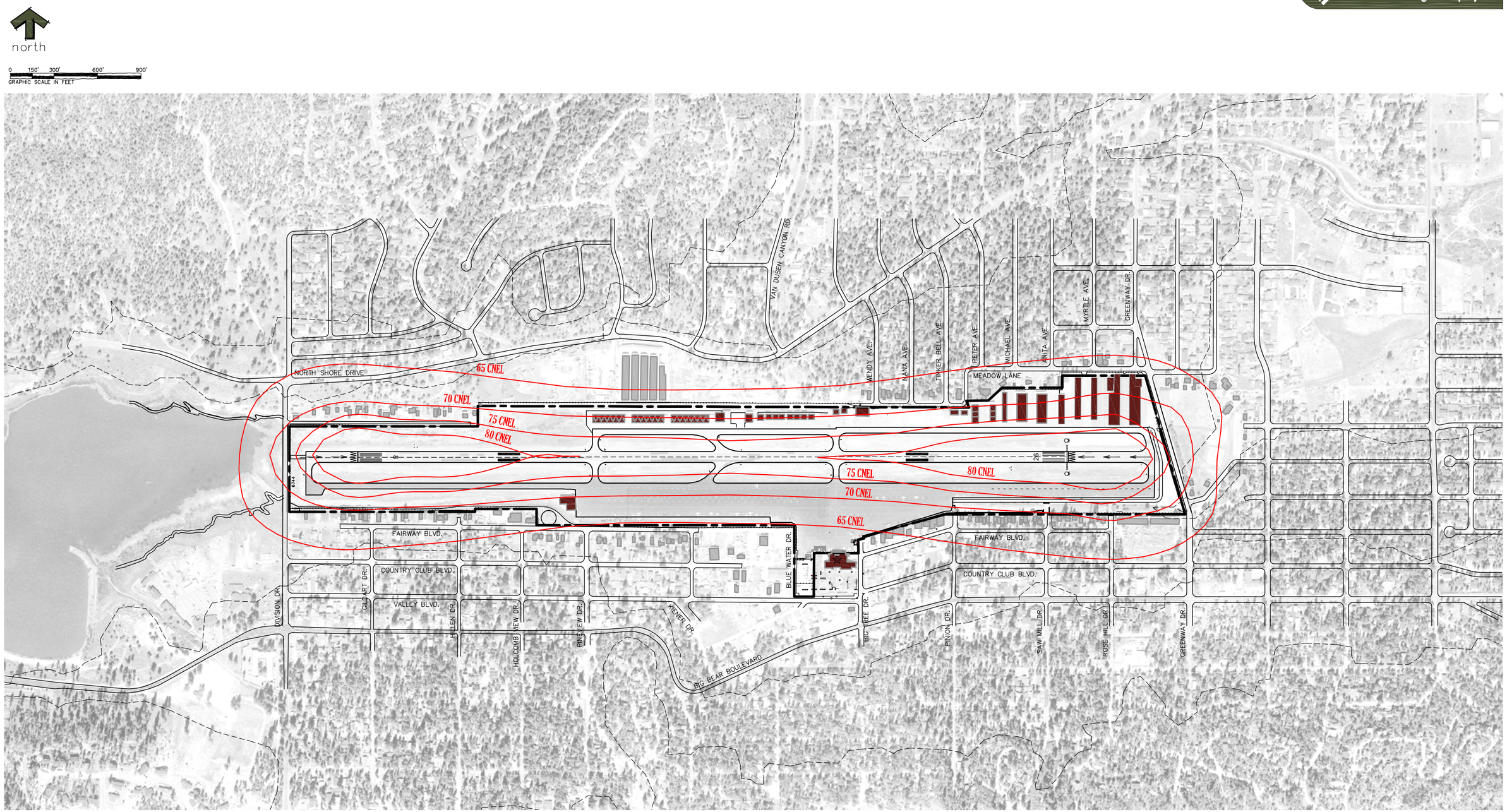


Figure F3 Future (2025) Noise Contour

Master Plan Big Bear City Airport
Big Bear City, California

SOURCE: AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
AIRPORT LAYOUT PLAN BY VSA AIRPORTS, PALM SPRINGS, CA 10/02.
FEMA FIRM SAN BERNARDINO COUNTY, 7315 OF 9400 3/96

As presented in the *Inventory of Existing Conditions* chapter, the San Bernardino County Planning Department prepared an Airport Comprehensive Land Use Plan for Big Bear City Airport in 1992 that supplements the San Bernardino County General Plan that was completed in 1989. The Airport is classified as "institutional", with a small portion incorporating floodway and high density residential land uses. The Plan establishes land uses for the planning area in the vicinity of the Airport, and includes an overlay zoning boundary that is defined by three Safety Review Areas, which includes:

- **Safety Review Area 1:** Those areas at the end of a runway that correspond with the FAA designated runway protection zones (RPZ).
- **Safety Review Area 2:** Those areas within the 65 CNEL (community noise equivalency level) noise contours.
- **Safety Review Area 3:** The area within one mile of the outer boundaries of the airport ownership (for airports without an adopted 65 CNEL noise contour).

The Safety Review Areas for Big Bear City Airport are defined in the following text:

Safety Review Area 1 encompasses high density residential and institutional land use districts at the approach end of Runway 26 and overlays a floodway district at the approach end of Runway 08. Land uses normally acceptable within the safety review area 1 include agriculture; however, land uses such as livestock and animal breeding, golf courses, riding stables, water recreation, and cemeteries are considered acceptable, aside from new construction or development. Although the floodway district at the approach end of Runway 08 is acceptable, the residential and institutional land uses are not compatible with airport operations.

Safety Review Area 2 is zoned for a single use - institutional, with the primary purpose of identifying existing lands and structures committed to public facilities and public need. The Plan indicates that this land use district is compatible with the aviation activity at the Airport. Safety Review Area 3 encompasses high, medium, and low density single family residential, high density multi-family residential, commercial, several small areas of industrial and institutional, floodway, and resource conservation. There are two areas within Area 3 that require special consideration: beneath the extension of the approach surface (outer 4,000 feet) and beneath the transitional surfaces. The land use districts below the approach surfaces to Runway 26 are high density single family residential and high density commercial. Land use districts below the approach surface to Runway 08 are high density single family residential and floodway. Land

use districts under the transitional surfaces are high and medium density single family residential, high density multi-family residential, commercial, and industrial.

This Airport Comprehensive Land Use Plan specifically states that the plan is directed towards the protection of areas around airports to the extent such areas are not already devoted to incompatible uses and, recognizing that residential development in areas previously subdivided for such use in ministerial, the plan exempts residential structures, and/or residentially developed or vacant residential land use districts existing at the time of plan adoption from the provisions of incompatibility. However, the Big Bear Airport Comprehensive Land Use Plan prohibits any further subdividing of property for residential land use within the safety review areas.

Air 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 2025 annual operations (i.e., 41,461) are well below the threshold (180,000 general aviation operations, according to "Air Quality Procedures for Civilian Airports and Air Force Bases", Report No. FAA EE 82 21) 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 ten microns in size (PM_{10}), fine particulate matter equal to or less than 2.5 microns in size ($PM_{2.5}$), and lead (Pb).

Currently, portions of San Bernardino County are listed as non-attainment areas for Carbon Monoxide (CO), Ozone (O_3), and Particulate Matter (both $PM_{2.5}$ and PM_{10}) standards. A non-attainment area is typically defined as a locality where air pollution levels persistently exceed the National Ambient Air Quality Standards (NAAQS); the EPA normally makes this designation only after air quality standards have been exceeded for several consecutive years.
The South Coast Air Quality Management District (SCAQMD) recommended that any environmental review, such as an Initial Study (IS) or an Environmental Impact Report (EIR), includes an air quality analysis. This analysis should compare the impacts of the proposed projects to the region and local significance thresholds. This analysis should follow the California Environmental Quality Act (CEQA) Air Quality Handbook and should outline the potential pollutants from the proposed projects, including construction activities and changes to operations. It should calculate air quality impacts from the proposed project and should include both direct and indirect sources, such as additional vehicular traffic. It would have to pay special

attention to the pollution sources that do not meet current NAAQS. SCAQMD also recommended that the lead agency for any environmental documents should quantify $PM_{2.5}$ emissions and compare these results with the recommended significance thresholds that are outlined in the handbook.

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.

Additionally, in the event that mitigation measures are required, SCAQMD recommends that the project utilize all feasible mitigation measures, including those that go beyond what is required by law. The SCAQMD CEQA Air Quality Handbook outlines many of the available options to consider for mitigation measures.

Water Quality

Water quality considerations related to airport development often include increased surface runoff and erosion and pollution from fuel, oil, solvents, and deicing fluids. Potential pollution could come from petroleum products spilled on the surface and carried through drainage channels off of the airport. State and federal laws and regulations have been established to safeguard these facilities. These regulations include standards for above ground and underground storage tanks, leak detection, and overflow protection. The significant hydrological features in the vicinity of Big Bear City Airport include Big Bear Lake to the west and Baldwin Lake to the east.

In accordance with Section 402(p) of the Clean Water Act, a National Pollution Discharge Elimination System (NPDES) General Permit is required from the Environmental Protection Agency for construction projects that disturb one or more acres of land. Applicable contractors will be required to comply with the requirement and procedures of the NPDES General Permit, including the preparation of a Notice of Intent and a Storm Water Pollution Prevention Plan (SWPPP), prior to the initiation of construction activities. Contractors would also 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.

The California Environmental Protection Agency (CEPA) was contacted regarding potential impacts to water quality. They indicated that there might be issues with water quality due to the proximity of the Airport to several important lakes and marshes. The Airport drains west into Big Bear Lake through the Stanfield Marsh Wildlife Area and east toward Baldwin lake. These lakes are recognized as important areas by the Water Quality Control Plan for the Santa Ana Basin. Additionally, wetlands, marsh areas, and waters of the State receive runoff from the Airport. CEPA recommends that all appropriate non-point source pollutant control management measures and Best Management Practices (BMPs) be used so that water quality impacts to the area are avoided. The Agency also recommends that the Master Plan incorporate drainage features to avoid erosive flow and excessive sedimentation.

CEPA also noted that impacts to the Waters of the United States should be avoided. Where this is not possible, a Clean Water Act Section 404 permit and section 401 Water Quality Standards Certification must be obtained, and mitigation measures must be implemented through coordination with the Army Corps of Engineers. In addition, waters that are not under the jurisdiction of the Army Corps of Engineers might be subject to Regional Board waste discharge requirements issued pursuant to the California Water Code section 13000. Big Bear Lake is also on the list of impaired waters under the Clean Water Act Section 303 (d) as prepared by the State Water Resources Control Board. Under this act, Total Maximum Daily Loads (TMDLs) for water quality indicators such as sedimentation, mercury, copper, noxious plants, nutrient, and PCBs are measured and integrated into a program to bring the water into compliance; any proposed projects would need to look at compliance with these TMDLs.

Historical, Architectural, Archaeological, and Cultural Resources

The National Historic Preservation Act of 1966 requires that an initial review be made in order to determine if any properties in, or eligible for inclusion in, the National Register of Historic Places are within the area of a proposed action's potential environmental impact (the area within which direct and indirect impacts could occur and thus cause a change in historic, architectural, archaeological, or cultural properties). The Archaeological and Historic Preservation Act of 1974 provides for the survey, recovery, and preservation of significant scientific, prehistorical, historical, archaeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally funded, or federally licensed project.

The California Department of Parks and Recreation was contacted regarding properties documented within the project area that meet the criteria for listing on the National Register of Historic Places; however, no response was received.

The California Native American Heritage Commission was also contacted, as required under Section 106 of the National Historic Preservation Act. They indicated that a record search of the Sacred Lands File (SLF) failed to indicate the presence of Native American cultural resources in the project area. The Commission also recommended consultation with Native American tribes in the area to supplement this information. Additionally, should construction activity expose previously unidentified archaeological resources, work must be discontinued pursuant to Section 106 and the Office of Historic Preservation must be contacted.

Fish, Wildlife, and Plants

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 California Department of Fish and Game have been contacted and they indicated that site-specific information was not available for the project area. A list of threatened, endangered, and candidate species that occur or may occur around Big Bear is included in Table F3. The Fish and Wildlife Service recommended that the Airport seek assistance to conduct a more site-specific survey to assess the actual potential for direct, indirect, and cumulative impacts that could result from the proposed projects.

Table F3
THREATENED AND ENDANGERED SPECIES OCCURRING IN OR NEAR BIG BEAR

Common Name	Scientific Name	Status
Plants		
Bear Valley sandwort	*Arenaria ursine*	T
Cushenbury milk-vetch	*Astragalus albens*	E (CH)
Ash-grey paintbrush	*Castilleja cinerea*	T
Southern mountain wild-buckwheat	*Eriogonum kennedyi* var. *austromontanum*	T
Cushenbury buckwheat	*Eriogonum ovalifolium* var. *vineum*	E (CH)
Parish's daisy	*Erigeron parishii*	T (CH)
San Bernardino Mountains bladderpod	*Lesquerella kingii* ssp. *Bernandina*	E(CH)
Cushenbury oxytheca	*Oxytheca parishii* var. *goodmaniana*	E (CH)
San Bernardino bluegrass	*Poa atropurpurea*	E
Pedate checker-mallow	*Sidalcea pedata*	E
California taraxacum	*Taraxacum californicum*	E
Slender-petaled mustard	*Thelypodium stenopetalum*	E
Fish		
Unarmored threespine stickleback	*Gasterosteu aculeatus williamsoni*	E
Amphibians		
Mountain yellow-legged frog	*Rana muscosa*	E
Birds		
Southwestern willow flycatcher	*Empidonax traillii extimus*	E
Bald eagle	*Haliaeetus leucocephalus*	T

E: Endangered T; Threatened CH: Critical Habitat Designated. **Source**: *U.S. Fish and Wildlife Service.*

Section 7 of 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 species or threatened species or result in the destruction or adverse modification of critical habitat of such species . . ." The species in Table F3 are currently listed for San Bernardino County, but do not necessarily occur in the vicinity of Big Bear City Airport, or within the project area.

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 California Department of Fish and Game.

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 was contacted regarding the presence of any wetlands that may be impacted by airport development; however, no response was received. Wetlands on and surrounding the Airport, according to the U.S. Fish and Wildlife Service National Wetlands Inventory, include freshwater emergent wetlands located on the west side of airport property and west of airport property associated with Big Bear Lake.

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, there are 14 rivers or creeks listed as Wild and/or Scenic in the State of California. The majority of these rivers are located in central or Northern California. The closest river listed as Wild and Scenic is Sespe Creek, which is located north of Ventura, California, approximately 120 nautical miles west of Big Bear City. Proposed airport development will have no impact to any nationally significant river resource.

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. There are a number of local parks in the vicinity of the Airport, including a park located off the approach end of Runway 26. The Airport District plans to acquire this park; however, this park has not been used or maintained for a number of years and does not likely possess historical value. The Bighorn Mountain and Whitewater River National Recreation Lands are located north of Big Bear City, and Hart Bar State Park and the San Gorgonio Wilderness area are both located south of Big Bear City; however, it is not anticipated that these areas will be affected by the proposed airport development included in this Airport Master Plan.

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 Materials, Pollution Prevention, and Solid Waste

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 in the following paragraphs.

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.

Floodplains

Floodplains are defined by Executive Order 11988, *Floodplain Management*, as the lowland and relatively flat areas adjoining coastal water, including at a minimum that area subject to a 1% or greater chance of flooding in any given year; that is, an area which would be inundated by a 100-year flood. If a project impacts a 100-year floodplain, mitigating measures must be investigated in order to avoid significant changes to the drainage system.

Due to the airport's location between Big Bear Lake and Baldwin Lake, almost the entire airport property is located within the 100-year floodplain, according to the 1996 Federal Emergency Management Association (FEMA) Flood Insurance Rate Map (FIRM) for San Bernardino County. Consequently, most of the projects identified in the Airport Master Plan will impact the floodplain and mitigating measures must be developed. Currently, there are two large culverts located at the west end of the Airport that drain storm water from airport property under Division Drive and into Big Bear Lake. However, during high lake conditions, water from Big

Bear Lake actually back flows through these culverts onto airport property and collects in the low area north of Runway 08 and in the infield area between Runway 08 and Taxiway "A". The proposed project having the greatest potential impact on this 100-year floodplain is the extension of Taxiway "B" to the end of Runway 08.

Construction Impacts

Local, state, and federal ordinances and regulations address the impacts of construction activities, including construction noise, dust and noise from heavy equipment traffic, disposal of construction debris, and air and water pollution.

Construction operations for the proposed development will cause specific impacts resulting solely from, and limited exclusively to, the construction period. Construction impacts are distinct in that they are temporary in duration and the degree of adverse impacts decreases as work is concluded. The following construction impacts can be expected:

- **A temporary increase in particulate and gaseous air pollution levels, as a result of dust generated by construction activity and by vehicle emissions from equipment and worker's automobiles;**
- **Increases in solid and sanitary wastes from the workers at the site;**
- **Traffic volumes that would increase in the airport vicinity, due to construction activity (workers arriving and departing, delivery of materials, etc.);**
- **Increase in noise levels at the Airport during operation of heavy equipment; and,**
- **Temporary erosion, scarring of land surfaces, and loss of vegetation in areas that are excavated or otherwise disturbed to carry out future developments.**
- **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 the NRCS Web Soil Survey, the prime and unique status of the soils on, and surrounding, airport property is not available. However, due to the density of structures north, south, and east of the Airport, the soil map units in these areas would likely be considered "land already in urban development" and cannot be considered prime farmland. Correspondence with the National Resources Conservation Service confirmed the fact that none of the soils located within the area are considered to be prime farmland.

According to the NRCS Web Soil Survey (i.e., the Soil Survey of San Bernardino National Forest Area, California), there are three soil associations that are found on airport property. These include Morical, very deep-Hecker families complex (2-15% slopes), and Morical, very deep-Hecker families complex (15-30% slopes). The third soil association included in the Web Soil Survey was "Water" areas at the west end of the Airport near Big Bear Lake. Due to the low probability of existing prime or unique farmland in the vicinity of Big Bear City Airport, it is unlikely that the proposed development included in this Airport Master Plan will require prior submittal of Farmland Conversion Impact Rating Form AD-1066.

Impact Summary

The potential environmental impacts associated with the projects included in this Airport Master Plan are summarized in the following table, entitled *SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS*.

Table F4
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Category	Impact	Notes
Noise and Compatible Land Use	●	Increased aircraft operations and incompatible residential land use
Air Quality	◉	Short-term during construction
Water Quality	◉	Stormwater permit and Stormwater Management Plan (SWMP)
Historical, Architectural, Archaeological, and Cultural Resources	○	
Fish, Wildlife, and Plants	○	
Wetlands	◉	Potential wetlands impacts near Taxiway "B" extension
Wild and Scenic Rivers	○	
Section 4(f)	○	
Environmental Justice	○	
Hazardous Materials, Pollution Prevention, and Solid Waste	○	
Floodplains	●	The majority of airport property is included in the 100-year floodplain
Construction Impacts	◉	Temporary
Farmland	○	

○ No Impact ◉ Potential Moderate Impact ● Significant Impact

Implementation Plan

INTRODUCTION. The long-term development program or Capital Improvement Program (CIP)/Needs Assessment for Big Bear City Airport is intended to establish a strategy to fund airport improvements and maximize the potential to receive federal and state matching funds, while also establishing a financially prudent plan for improvement funding on a local level. This programming effort is a critical component of the Airport Master Plan process for the Federal Aviation Administration (FAA), the California Department of Transportation (CalTrans) and the Airport Sponsor (Big Bear Airport District). From the FAA and State perspectives, the CIP provides a detailed listing of projects and costs that is critical for their use in establishing priorities and budgeting expenditures at this Airport when compared with the needs of other airports. From the Airport Sponsor's perspective, the CIP identifies improvement needs and allows budgeting/funding allocation decisions to be made with a comprehensive understanding of the financial implications.

The overall concept is to maximize the opportunities to receive federal and state matching funds, within the context of, and in recognition of, the amount of local funds that are available for capital needs. Although the CIP will be used for programming by the FAA, there is no financial commitment

for the Federal Government or the Sponsor to provide funding for the CIP. If federal matching funds are unavailable for a certain project during the specified time frame, the project will almost certainly be unaffordable using only local money and, thus, the improvement project will not go forward until adequate matching funds are available. The potential improvements necessary to accommodate the future needs of Big Bear City Airport have been placed into three phases: Phase I (1-5 years), Phase II (6-10 years), and Phase III (11-20 years). The suggested program for the phasing of these projects is provided in Tables G1, G2, and G3. The proposed improvements are illustrated graphically by time period on the PHASING PLAN (see Figure G1).

Implementation Schedule and Project List

Using the documentation previously presented regarding anticipated facility demands, along with a preliminary engineering analysis focusing on pavement rehabilitation needs, a list of capital improvement projects has been assembled. The projects for the first five years are listed in priority order by year. In the second and third phases (years 6-20), the projects are listed without year designators. Big Bear City Airport's proposed phased capital improvement program, entitled *DEVELOPMENT PLAN PROJECTS*, is presented as Tables G1, G2, and G3 of this chapter. It is anticipated that the project phasing will invariably be altered as local and federal priorities evolve over the coming months and years.

The details of the Development Program, including a capital improvement project list, project cost estimates, project phasing, and a financial plan, were formulated in consideration of comments received from Airport District staff and Board Members, the Study Advisory Committee, the FAA, CalTrans, and the public.

Cost Estimates

Cost estimates for individual projects, based on current costs, have been prepared for the improvement projects that have been identified as potentially being needed during the 20-year planning period. These estimates are intended to be used for planning purposes only and should not be construed as construction cost estimates, which can only be compiled following the preparation of detailed engineering design documents.

Table G1
PHASE I (1-5 YEARS) DEVELOPMENT PLAN PROJECTS
Big Bear City Airport Master Plan

	Project Description	Total Costs	A) Federal Costs	B) CalTrans Costs	C) Sponsor Costs
	Year 1 (FFY 2009)				
A.1	Construct Maintenance Building	$500,000	$0	$0	$500,000
A.2	Schedule II - Rehabilitate Taxiway "B" and Hangar Taxiways, Phase 3 East Section	$780,960	$741,912	$18,548	$20,500
A.3	Schedule IV - Install New Emergency Standby Generator	$121,000	$114,950	$2,874	$3,176
A.4	Construct Six 50 x 50 Helicopter Parking Areas	$750,000	$712,500	$17,813	$19,688
A.5	Envionmental Review for Bear City Park Acquisition	$100,000	$95,000	$2,375	$2,625
	YEAR 1 TOTAL	**$2,251,960**	**$1,664,362**	**$41,609**	**$545,989**
	Year 2 (FFY 2010)				
A.6	Purchase Bear City Park	$750,000	$712,500	$17,813	$19,688
A.7	NEPA/CEQA EIR for Parallel Taxiway "B" Extension	$300,000	$285,000	$7,125	$7,875
A.8	Rehabilitate Parallel Taxiway "A", West Section	$1,400,000	$1,330,000	$33,250	$36,750
A.9	Fog Seal Runway	$70,000	$66,500	$1,663	$1,838
A.10	Fog Seal North Taxiway and Ramp	$60,000	$57,000	$1,425	$1,575
	YEAR 2 TOTAL	**$2,580,000**	**$2,451,000**	**$61,275**	**$67,725**
	Year 3 (FFY 2011)				
A.11	Rehabilitate Parallel Taxiway "A", East Section	$1,450,000	$1,377,500	$34,438	$38,063
A.12	Paving of Apron Area West of Hangar T	$45,000	$42,750	$1,069	$1,181
A.13	Remove Hangars T and J, Construct 18 box Hangars (42' x 35')	$661,500	$0	$0	$661,500
A.14	Fog Seal South Taxiways and Aprons	$75,000	$71,250	$1,781	$1,969
	YEAR 3 TOTAL	**$2,231,500**	**$1,491,500**	**$37,288**	**$702,713**
	Year 4 (FFY 2012)				
A.15	Construct a 1,970-Foot Taxiway Extension of Taxiway "B" and a 120-foot Connector Taxiway to Runway 08, including MITLs	$1,800,000	$1,710,000	$42,750	$47,250
A.16	D) FAR Part 150 Noise and Land Use Compatibility Study	$350,000	$332,500	$8,313	$9,188
	YEAR 4 TOTAL	**$2,150,000**	**$2,042,500**	**$51,063**	**$56,438**
	Year 5 (FFY 2013)				
A.17	Complete Obstruction Survey	$20,000	$19,000	$475	$525
A.18	Complete Obstruction Chart	FAA Funded	TBD	$0	$0
A.19	Obstruction Light Installation on approximately 27 Hangars	$30,000	$28,500	$713	$788
A.20	Obstruction Removal/Trimming of Trees	$30,000	$28,500	$713	$788
	YEAR 5 TOTAL	**$80,000**	**$76,000**	**$1,900**	**$2,100**
	Sub-Total/Phase I	**$9,293,460**	**$7,725,362**	**$193,134**	**$1,374,964**

Notes
Cost estimates, based upon 2006 data, are intended for preliminary planning purposes and do not reflect a detailed engineering evaluation.
Unless otherwise noted, cost estimates include contingency and engineering.
A) Federal Aviation Administration matching funds – Airport Improvement Program (AIP).
B) California Department of Transportation (CalTrans) paid at grant closeout.
C) Sponsor/local funding – Current revenues, cash reserves, bonds, private/third party funding, etc.
D) Federal Aviation Administration matching funds - AIP Noise Compatibility Program.

Table G2
PHASE II (6-10 YEARS) DEVELOPMENT PLAN PROJECTS
Big Bear City Airport Master Plan

	Project Description	Total Costs	A) Federal Costs	B) CalTrans Costs	C) Sponsor Costs
B.1	Acquire RPZ/Avigation Easement for Runway 08 RPZ (9.4 Acres)	$0	$0	$0	$0
B.2	Acquire RPZ/Avigation Easement for Runway 26 RPZ (3.7 Acres)	$1,284,000	$1,219,800	$30,495	$33,705
B.3	Construct 4 Taxilanes west of N Hangars	$180,000	$171,000	$4,275	$4,725
B.4	Construct 12 Box Hangars (42' x 35')	$444,000	$0	$0	$444,000
B.5	Construct Left Hand Turn Lane on Big Bear Boulevard At the Intersection of Big Tree Drive	CalTrans Funded	$0	TBD	$0
B.6	Construct 2 Box Hangars (60' x 60')	$180,000	$0	$0	$180,000
	Sub-Total/Phase II	**$2,088,000**	**$1,390,800**	**$34,770**	**$662,430**

Notes
Cost estimates, based upon 2006 data, are intended for preliminary planning purposes and do not reflect a detailed engineering evaluation.
Unless otherwise noted, cost estimates include contingency and engineering.
A) Federal Aviation Administration matching funds – Airport Improvement Program (AIP).
B) California Department of Transportation (CalTrans) paid at grant closeout.
C) Sponsor/local funding – Current revenues, cash reserves, bonds, private/third party funding, etc.

Table G3
PHASE III (11-20 YEARS) DEVELOPMENT PLAN PROJECTS
Big Bear City Airport Master Plan

	Project Description	Total Costs	A) Federal Costs	B) CalTrans Costs	C) Sponsor Costs
C.1	Realign 890 feet of Greenway Drive around ROFA and Remove Previous Section of Greenway Drive, including RSA Grading	$948,700	$901,265	$22,532	$24,903
C.2	Relocate 1,000 feet of Perimeter Fence around the Runway 26 ROFA	$44,500	$42,275	$1,057	$1,168
C.3	Relocate Perimeter Service Road and Drainage around Runway 26 ROFA and Re-Grade RSA	$80,000	$0	$0	$0
C.4	Construct 2 Taxilanes west of N Hangars	$90,000	$0	$0	$0
C.5	Construct 8 Box Hangars (42' x 35')	$296,000	$0	$0	$296,000
	Sub-Total/Phase III	**$1,459,200**	**$943,540**	**$23,589**	**$322,072**
	GRAND TOTALS	**$12,840,660**	**$10,059,702**	**$251,493**	**$2,359,465**

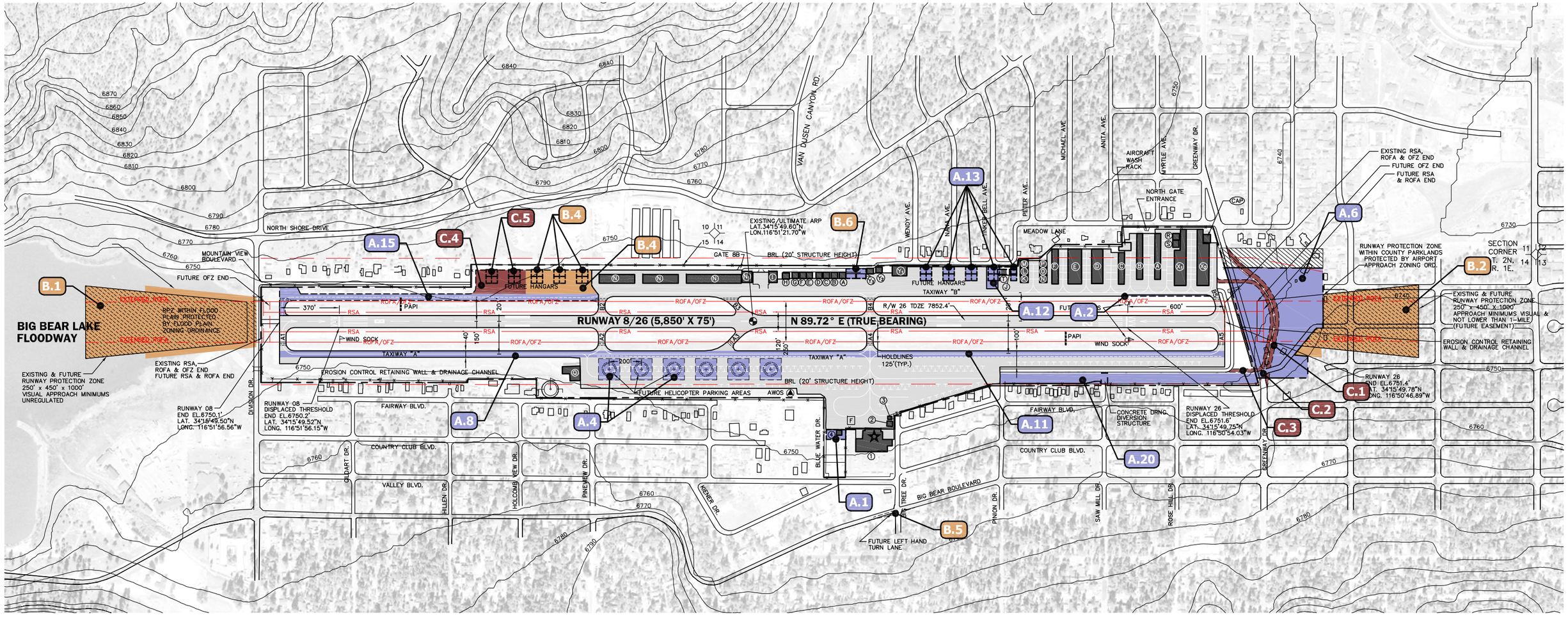
Notes
Cost estimates, based upon 2006 data, are intended for preliminary planning purposes and do not reflect a detailed engineering evaluation.
Unless otherwise noted, cost estimates include contingency and engineering.
A) Federal Aviation Administration matching funds – Airport Improvement Program (AIP).
B) California Department of Transportation (CalTrans) paid at grant closeout.
C) Sponsor/local funding – Current revenues, cash reserves, bonds, private/third party funding, etc.

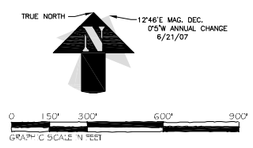
Capital Improvement Program (CIP)

To assist in preparation of the FAA's effort to provide grant funding to the most needed projects, airport staff keeps on file and up to date with the FAA, an Airport Capital Improvements Program (ACIP), which is similar in format to Table G1. The purpose of the proposed project list, phasing, and costs is to provide a progressive projection of capital needs, which can then be utilized in local, state, and federal financial programming. It is realized that as soon as this long-range planning document is published, the project list starts to be out of date and; therefore, it will always differ to some degree with the airport's ACIP on file with the FAA. A project must be listed on the ACIP for it to be funding eligible for AIP funds.

Phasing Plan

The following illustration indicates the suggested phasing for projects. These are suggested schedules and variance from them may be necessary, especially during the latter time periods. Attention has been given to the first five years, as they are the most critical and the scheduled projects outlined in that time frame include many critical projects. The demand for certain facilities, especially in the latter time frame, and the economic feasibility of their development, are to be the prime factors influencing the timing of individual project construction. Care must be taken to provide for adequate lead-time for detailed planning and construction of facilities in order to meet aviation demands. It is also important to minimize the disruptive scheduling where a portion of the facility may become inoperative due to construction, and to prevent extra costs resulting from improper project scheduling.





NOTES

1. THIS DRAWING REFLECTS PLANNING STANDARDS SPECIFIC TO THIS AIRPORT, AND IS NOT A PRODUCT OF DETAILED ENGINEERING DESIGN ANALYSIS. IT IS NOT INTENDED TO BE USED FOR CONSTRUCTION DOCUMENTATION OR NAVIGATION.
2. AERIAL PHOTO BY AIR PHOTO SERVICES, INC. 9/05.
3. EXISTING COORDINATES AND ELEVATIONS TAKEN FROM http://www.jccbi.gov, MAY 2007.
4. THE MAJORITY OF THE AIRCRAFT STORAGE HANGARS ON AIRPORT PROPERTY PENETRATE EITHER THE PRIMARY OR TRANSITIONAL SURFACES AS DEFINED BY FAR PART 77 AND THESE PENETRATIONS SHOULD BE VERIFIED BY AN OBSTRUCTION SURVEY. FAA FORM 7460-1, NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION SHOULD BE COMPLETED AND COORDINATED WITH FAA PRIOR TO CONSTRUCTION OF ANY FUTURE FACILITIES AS INDICATED ON THIS ALP.
5. THE CONTENTS OF THIS PLAN DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.
6. EFFECTIVE GRADIENT, MAXIMUM GRADIENT, AND RUNWAY HIGH & LOW POINTS REQUIRE FURTHER VERIFICATION.

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE		
BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE ABANDONED		
PAVED ROADS		
SIDEWALK		
AVIGATION EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY SAFETY AREA	RSA (E)	RSA (F)
RUNWAY OBJECT FREE AREA	ROFA (E)	ROFA (F)
RUNWAY OBJECT FREE ZONE	OFZ	OFZ
FUEL STORAGE AREA	F	

DRAWING LEGEND (cont.)

	EXISTING	FUTURE
AIRPORT BEACON		
LIGHTED WIND CONE		
ASOS		
HOLDLINES		
PRECISION APPROACH PATH INDICATOR (PAPI)		
VISUAL APPROACH SLOPE INDICATOR (VASI)		
WATER		
RUNWAY END IDENTIFIER LIGHTS (REILS)		
100 YEAR FLOODZONE		
CULVERT		
AIRPORT REFERENCE POINT (ARP)		
SECTION CORNER		
AWOS		

AIRPORT DATA

	EXISTING	FUTURE
LOCATION – COUNTY	SAN BERNADINO	*SAME*
– TOWNSHIP/RANGE	T.2 NORTH/R.1 EAST	*SAME*
AIRPORT ELEVATION (AMSL) NAVD 88	6752.4'	*SAME*
AIRPORT REFERENCE POINT (ARP) NAD 83	LAT.34°15'49.60"N LON.116°51'21.70"W	*SAME* *SAME*
AIRPORT REFERENCE CODE	B-I (SMALL)	*SAME*
NPIAS SERVICE LEVEL/ROLE	GA	*SAME*
MEAN MAX. TEMPERATURE (HOTTEST MONTH)	80.7°F (JULY)	*SAME*
AIRPORT & TERMINAL NAVAIDS	ROTATING BEACON, GPS	*SAME*

Figure G1 Phasing Plan

PHASE I

PHASE II

PHASE III

Master Plan Big Bear City Airport

Big Bear City, California

Financial Plan and Implementation Strategy

Funding sources for the Capital Improvement Program depend on many factors, including Airport Improvement Program (AIP) project eligibility, the ultimate type and use of facilities to be developed, debt capacity of the Airport, the availability of other financing sources, and the priorities for scheduling project completion. For planning purposes, assumptions were made related to the funding source of each capital improvement. The projects costs provided in the previous tables are identified with likely funding sources. The information below is provided for background on the various funding entities.

Sources of Capital Funding

Following is a short description of capital improvement funding sources to provide background and context when reviewing the previously presented *DEVELOPMENT PLAN PROJECTS* tables.

Federal Airport Improvement Program (AIP) Grants. The Federal Government initially embarked on a grant-in-aid program to promote the development of a system of airports shortly after World War II. Over the years, the program has been through several iterations and names. The current program was established by the Airport and Airway Improvement Act of 1982 and is known as the Airport Improvement Program (AIP). Funds obligated for the AIP are drawn from the Airport and Airway Trust Fund, which is supported by the user fees, fuel taxes, and other similar aviation revenue sources.

The FAA currently provides grants on a 95%/5% federal/local split basis to general aviation airports similar to Big Bear City Airport for public-use improvement projects. On an entitlement grant basis, under current funding guidelines, the Airport receives $150,000 annually in dedicated grant funds. There are also discretionary funds available through AIP. Discretionary grants are over and above entitlement funding, and are provided to airports for projects that have a high federal priority for enhancing safety, security, and capacity of the Airport, and would be difficult to fund otherwise. The dollar amounts of individual discretionary grants can vary significantly in comparison to entitlement funding, and are awarded at the FAA's sole prerogative. Discretionary grant applications are evaluated based on need, the FAA's project priority ranking system, and the FAA's assessment of a project's significance within the national airport and airway system. However, this currently authorized program expired in September 2007 and these formulas are subject to change in 2008 with FAA re-authorization.

FAA Facilities & Equipment Funds. Within the FAA's budget appropriation, money is available in the Facilities and Equipment (F&E) Fund to purchase navigational aids (such as Instrument

Landing Systems and Approach Lighting) and air safety-related technical equipment, including Air Traffic Control Towers (ATCTs). Each F&E development project is evaluated independently through a cost/benefit analysis to determine funding eligibility and priority ranking. The qualified projects are totally funded (i.e., 100%) by the FAA, with the remaining projects likely being AIP eligible. In addition, the Airport can apply for NAVAIDS maintenance funding through the F&E program for those facilities that are not F&E funded. It is possible that some of the proposed landing aid-related development projects for Big Bear City Airport would qualify for F&E funding, if sufficient funds are available.

California Department of Transportation (CalTrans) Division of Aeronautics. The Division of Aeronautics administers three state aid programs for airports: (1) Annual Grants, (2) AIP Matching, and (3) Acquisition and Development (A&D) Grants. The sole funding source for these grants is the excise tax revenue on general aviation (GA) gasoline ($0.18 per gallon) and for jet fuel ($0.02 per gallon).

In addition, the Division administers the Local Airport Loan Program.

Annual Grants. These are State grants ($10,000 annually) to eligible airports for use at the Sponsor's discretion subject to applicable laws and regulations, with prior approval from the Department.

The Annual Grant can fund projects for "airport and aviation purposes" as defined in Section 21681(f) of the State Aeronautics Act. Also, the Annual Grant can fund fueling facilities, restrooms, showers, and wash racks, including operation and maintenance expenses. The Annual Grant can provide part of the Sponsor's match for projects that are funded by FAA grants, as long as the project is otherwise eligible for State funding.

AIP Matching Grants. These are State grants to eligible airports for eligible projects subject to programming and allocation by the California Transportation Commission (CTC). This grant assists the Sponsor in meeting the local match for Airport Improvement Program (AIP) grants from the FAA. The State grant is 2.5% of the AIP amount. Generally, state matching is limited to projects that primarily benefit general aviation.

Acquisition and Development (A&D) Grants. In general, the Sponsor must meet the same eligibility requirements as for the Annual Grant. An A&D grant cannot be used as a local match for an FAA grant. The minimum amount of an A&D grant is $10,000. The maximum amount that can be allocated to an airport in a single fiscal year is $500,000.

The amount available for A&D grants is what is left in the Aeronautics Account after funding Annual Grants and AIP Matching. The local match can vary from 10-50% of the project's cost. The match rate is set annually by the CTC. (A 10% rate has been utilized for the past 15+ years.) The Annual Grant may not be used for the local match to an A&D grant.

Local Airport Loan Program. The Local Airport Loan Account is a revolving fund that was initiated with seed money from the Aeronautics Account. As principal and interest payments are returned to the Loan Account, additional loans can be provided to airports. Loans are available for revenue generation projects such as hangars and fueling facilities. Loans can be made for airport development projects also and can be made to assist the Sponsor with the local match for an AIP project.

No limit on the size of a loan has been established. The Division determines the amount for each individual loan in accordance with the feasibility of the project and the Sponsor's financial status.

Private Third-Party Financing. Many airports use private third-party financing when the planned improvements will be primarily used by a private business or other organizations. Such projects are not ordinarily eligible for federal funding. Projects of this kind typically include hangars, FBO facilities, fuel storage, exclusive aircraft parking aprons, industrial aviation use facilities, non-aviation office/commercial/industrial developments, and various other projects. Private development proposals are considered on a case-by-case basis. Often, airport funds for infrastructure, preliminary site work, and site access are required to facilitate privately-developed projects on airport property.

Airport Revenues. The Airport generates revenue through ground leases, facility leases, commercial aviation fees, fuel fees, etc. At many airports, generating the necessary cash flow to balance the operations and maintenance can be a difficult task.

Generation of money to adequately fund capital costs associated with the operation of an airport is often a significant challenge. Many smaller general aviation airports rely on supplemental money from local general funds to assist with funding major projects. Careful planning will be required to ensure that the airport's capital needs are met with the scarce dollars that are available. In addition, the importance of continuing the process to find and develop new revenue sources to help support the operation and improvement of the Airport should be emphasized.

Summary - Master Plan Capital Improvement Program Financial Implications

If aviation demands continue to indicate that improvements are needed, and if the proposed improvements prove to be environmentally acceptable, the capital improvement financial implications discussed above are likely to be acceptable for the FAA and the Big Bear Airport District. However, it must be recognized that this is only a programming analysis and not a commitment on the part of the FAA or the Airport Sponsor. If the cost of an improvement project is not financially feasible, it will not be initiated.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92009

In Reply Refer To:
FWS-SB-5287.1

APR 17 2007

received 4/23/07

Ryan Hayes
Barnard Dunkelberg and Company, Inc.
1743 Wazee Street, Suite 400
Denver, Colorado 80202

Re: Request for Information on Endangered, Threatened, Proposed, and Candidate Species for the Big Bear City Airport Master Plan, Big Bear City, San Bernardino County, California

Dear Mr. Hayes:

This letter is in response to your inquiry received on April 16, 2007, concerning federally endangered, threatened, proposed, and candidate species that may occur in and around the Big Bear City Airport in the unincorporated city of Big Bear City, San Bernardino County, California. The proposed project is an updated airport master plan with associated potential development projects. To assist you in evaluating the potential occurrence of these species within the areas of interest, we are providing the enclosed list.

Section 7 of the Endangered Species Act of 1973 (Act), as amended, requires Federal agencies to consult with the U.S. Fish and Wildlife Service should it be determined that their actions may affect federally listed threatened or endangered species. Section 9 of the Act prohibits the "take" (e.g., harm, harassment, pursuit, injury, kill) of federally listed wildlife. "Harm" is further defined to include habitat modification or degradation where it kills or injures wildlife by impairing essential behavioral patterns including breeding, feeding, or sheltering. Take incidental to otherwise lawful activities can be authorized under sections 7 (Federal consultations) and 10 (habitat conservation plans) of the Act.

If a proposed project is authorized, funded, or carried out by a Federal agency and may affect a listed species, then the Federal agency must consult with us on behalf of the applicant, pursuant to section 7 of the Act. In other words, any activity on private land that requires Federal involvement (such as the issuance of a section 404 permit under the Clean Water Act by the U.S. Army Corps of Engineers) and may affect listed species must be reviewed by us to insure that the continued existence of the species would not be jeopardized. During the section 7 process, measures to avoid and minimize project effects to listed species and their habitat will be identified and incorporated into a biological opinion that may include an incidental take statement that authorizes incidental take by the Federal agency and applicant.

TAKE PRIDE® IN AMERICA

We do not have site-specific information for the project area. Therefore, we recommend that the project proponent seeks assistance from a biologist familiar with the habitat conditions and associated species in and around the project site to assess the actual potential for direct, indirect and cumulative impacts likely to result from the proposed project.

Should you have any questions regarding the species list provided, or your responsibilities under the Act, please contact Eric Porter of my staff at (760) 431-9440.

Sincerely,

for Karen A. Goebel
Assistant Field Supervisor

Enclosure

Federally Listed, Proposed and Candidate Species Which Occur or May Occur in and around Big Bear San Bernardino County, California

Common Name	Scientific Name	Status
PLANTS		
Bear Valley sandwort	*Arenaria ursina*	T
Cushenbury milk-vetch	*Astragalus albens*	E (CH)
ash-grey paintbrush	*Castilleja cinerea*	T
southern mountain wild-buckwheat	*Eriogonum kennedyi* var. *austromontanum*	T
Cushenbury buckwheat	*Eriogonum ovalifolium* var. *vineum*	E (CH)
Parish's daisy	*Erigeron parishii*	T (CH)
San Bernardino Mountains bladderpod	*Lesquerella kingii* ssp. *bernandina*	E (CH)
Cushenbury oxytheca	*Oxytheca parishii* var. *goodmaniana*	E (CH)
San Bernardino bluegrass	*Poa atropurpurea*	E
pedate checker-mallow	*Sidalcea pedata*	E
California taraxacum	*Taraxacum californicum*	E
slender-petaled mustard	*Thelypodium stenopetalum*	E
FISH		
unarmored threespine stickleback	*Gasterosteus aculeatus williamsoni*	E
AMPHIBIANS		
mountain yellow-legged frog	*Rana muscosa*	E
BIRDS		
southwestern willow flycatcher	*Empidonax traillii extimus*	E
bald eagle	*Haliaeetus leucocephalus*	T

E: endangered CH: critical habitat designated
T: threatened C: candidate

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
25864-K Business Center Drive
Redlands, CA 92374
(909) 799-7407
(909) 799-1438 (FAX)

received 4/23/07

April 13, 2007

Bernard Dunkelberg & Company
Attn: Ryan Hayes
1743 Wazee Street, Suite 400
Denver, Colorado 80202

Dear Ryan,

This letter is in response to your request for prime farmland information for the Big Bear City Airport Master Plan that your company is preparing.

I have included soils information for the Master Plan update. There are no soils within your Master Plan update that meet the Natural Resources Conservation Service definition of prime or unique farmland. I have also included a soils map for your use.

Some other natural resource concerns that you may wish to consider in your update include water quality and quantity. These are important issues in the Big Bear Valley. Some things to consider that will improve water quality include buffers and natural swales that channel and filter runoff from the taxi ways, parking areas, and structures. Water quantity can be addressed with recommendations to use smart controllers to irrigate landscaping that will shut off the irrigation when there is rain.

Wind and water erosion, during and after construction, is another resource concern. Using best management practices during and after construction not only benefits air and water quality, but will help with flight safety. Any trees removed during construction should have a site plan that will address any erosion hazard which often can be mitigated by simply mulching the branches and limbs on site and then covering the bare soil with the mulch

Additional issues include threatened and endangered species that may or may not occur in areas planned for expansion and any cultural resources that might be in those expansion areas.

If you have any questions, please give me a call at the above number.

Sincerely,

James R. Earsom

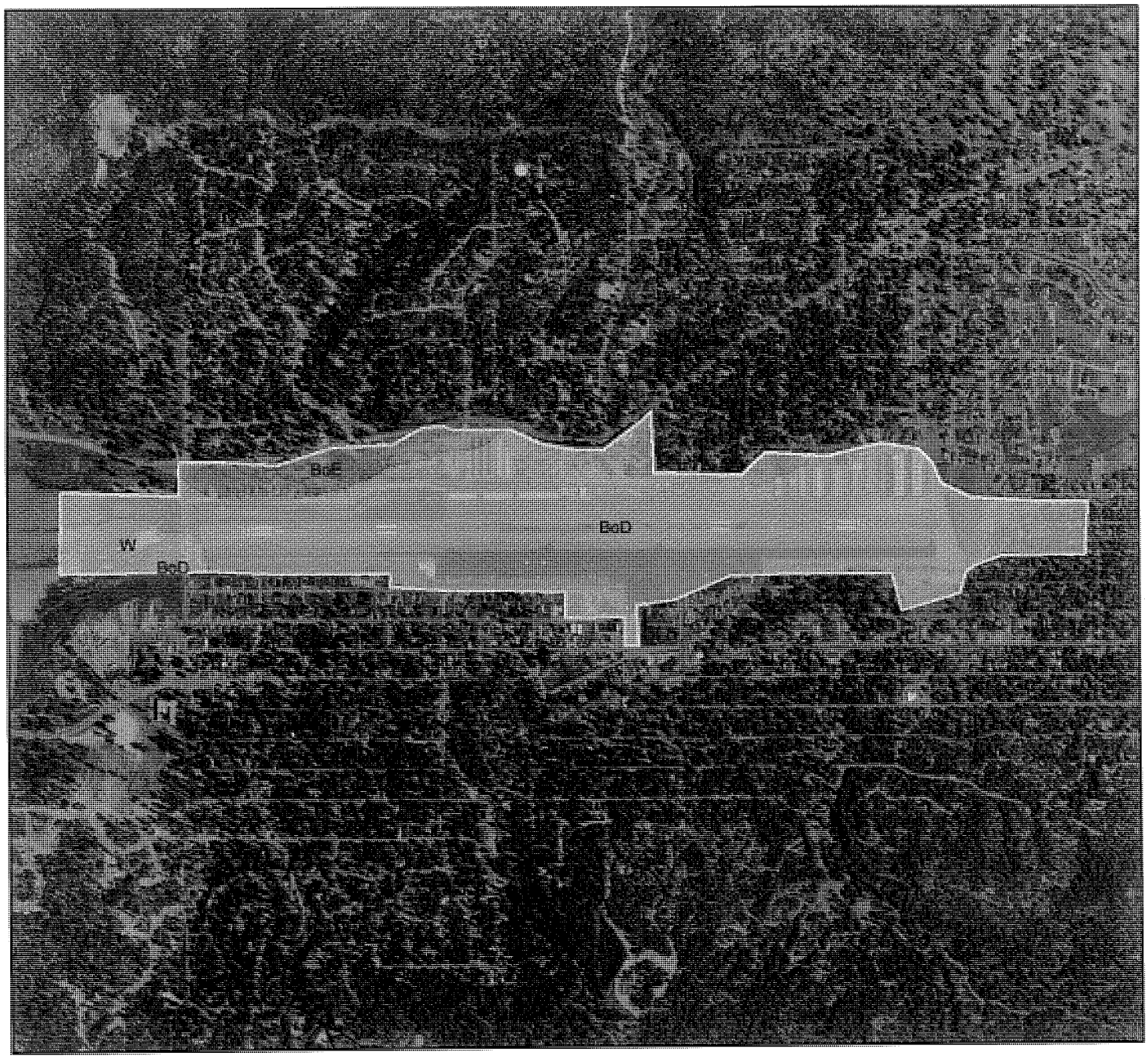
JAMES R. EARSOM
District Conservationist

Soils Inventory Map

Date: 4/13/2007

Customer(s): RYAN HAYES
District: INLAND EMPIRE RESOURCE CONSERVATION DISTRICT
Approximate Acres: 177.8

Field Office: REDLANDS SERVICE CENTER
Agency: Natural Resources Conservation Service
Assisted By: James R Earsom
State and County: CA, SAN BERNARDINO



Legend

Soils Map

Soil Name

- Morical, very deep-Hecker families complex, 15 to 30 percent slopes
- Morical, very deep-Hecker families complex, 2 to 15 percent slopes
- Water areas

690 0 690 1,380 2,070 2,760 Feet

N

Soils Inventory Report

RYAN HAYES

Map Unit Symbol	Map Unit Name	Acres	Percent
BoD	Morical, very deep-Hecker families complex, 2 to 15 percent slopes	153.9	86%
BoE	Morical, very deep-Hecker families complex, 15 to 30 percent slopes	14.5	8%
W	Water areas	9.8	5%
	Total:	178.2	

Brief Soil Descriptions (CA)

San Bernardino National Forest Area, California

[Absence of an entry indicates that the feature is not a concern or that data were not estimated. Data applies to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by on-site investigation.]

BoD - Morical, very deep-Hecker families complex, 2 to 15 percent slopes

Composition

- Morical family, very deep and similar soils: 50 percent of the unit
- Hecker family and similar soils: 25 percent of the unit

Setting

Landform(s): alluvial plain remnants, terraces
Elevation: 5000 to 7798 feet
Precipitation: 25 to 35 inches
Slope gradient: 2 to 15 percent
Air temperature: 46 to 54 °F
Frost-free period: 120 to 175 days

Characteristics of Morical family, very deep and similar soils

Average total avail. water in top five feet (in.): 7.4
Available water capacity class: Moderate
Parent material: alluvium
Restrictive feature(s): none
Depth to Water table: none within the soil profile
Drainage class: well drained
Flooding hazard: none
Ponding hazard: none
Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, irrigated:
Land capability class, non-irrigated: 6e
Hydric soil: no
Hydrologic group: B
Runoff class: high
Potential frost action: low

Saturated hydraulic conductivity class: Moderately High

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available Water Capacity (inches)	pH	Salinity (mmhos/cm)	SAR
H1 -- 0 to 6	Gravelly loam	0.7 to 0.8	6.1 to 7.3	0 - 0	0 - 0
H2 -- 6 to 36	Gravelly clay loam	4.2 to 4.5	6.1 to 7.3	0 - 0	0 - 0
H3 -- 36 to 60	Gravelly sandy loam	1.9 to 2.4	6.1 to 7.3	0 - 0	0 - 0

Ecological class(es):

Characteristics of Hecker family and similar soils

Average total avail. water in top five feet (in.): 4.2
Available water capacity class: Low
Parent material: alluvium
Restrictive feature(s): none
Depth to Water table: none within the soil profile
Drainage class: well drained
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, irrigated:
Land capability class, non-irrigated: 6e
Hydric soil: no
Hydrologic group: B
Runoff class: medium
Potential frost action: low

Saturated hydraulic conductivity class: Moderately High

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available Water Capacity (inches)	pH	Salinity (mmhos/cm)	SAR
H1 -- 0 to 6	Gravelly fine sandy loam	0.5 to 0.6	6.1 to 7.3	0 - 0	0 - 0
H2 -- 6 to 50	Very gravelly fine sandy loam	2.6 to 4.0	6.1 to 7.3	0 - 0	0 - 0
H2 -- 6 to 50	Very gravelly sandy clay loam	2.6 to 4.0	6.1 to 7.3	0 - 0	0 - 0
H3 -- 50 to 60	Extremely gravelly loam	0.5 to 0.7	6.1 to 7.3	0 - 0	0 - 0
H3 -- 50 to 60	Extremely gravelly sandy loam	0.5 to 0.7	6.1 to 7.3	0 - 0	0 - 0

Ecological class(es):

BoE - Morical, very deep-Hecker families complex, 15 to 30 percent slopes

Composition

- Morical family, very deep and similar soils: 50 percent of the unit
- Hecker family and similar soils: 25 percent of the unit

Setting

Landform(s): alluvial plain remnants, terraces
Elevation: 5000 to 7798 feet
Precipitation: 25 to 35 inches
Slope gradient: 15 to 30 percent
Air temperature: 46 to 54 °F
Frost-free period: 120 to 175 days

Characteristics of Morical family, very deep and similar soils

Average total avail. water in top five feet (in.): 7.4
Available water capacity class: Moderate
Parent material: alluvium
Restrictive feature(s): none
Depth to Water table: none within the soil profile
Drainage class: well drained
Flooding hazard: none
Ponding hazard: none
Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, irrigated:
Land capability class, non-irrigated: 6e
Hydric soil: no
Hydrologic group: B
Runoff class: very high
Potential frost action: low

Saturated hydraulic conductivity class: Moderately High

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available Water Capacity (inches)	pH	Salinity (mmhos/cm)	SAR
H1 -- 0 to 6	Gravelly loam	0.7 to 0.8	6.1 to 7.3	0 - 0	0 - 0
H2 -- 6 to 36	Gravelly clay loam	4.2 to 4.5	6.1 to 7.3	0 - 0	0 - 0
H3 -- 36 to 60	Gravelly sandy loam	1.9 to 2.4	6.1 to 7.3	0 - 0	0 - 0

Ecological class(es):

Characteristics of Hecker family and similar soils

Average total avail. water in top five feet (in.): 4.2
Available water capacity class: Low
Parent material: alluvium
Restrictive feature(s): none
Depth to Water table: none within the soil profile
Drainage class: well drained
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, irrigated:
Land capability class, non-irrigated: 6e
Hydric soil: no
Hydrologic group: B
Runoff class: high
Potential frost action: low

Saturated hydraulic conductivity class: Moderately High

Representative soil profile:

Horizon -- Depth (inches)	Texture	Available Water Capacity (inches)	pH	Salinity (mmhos/cm)	SAR
H1 -- 0 to 6	Gravelly fine sandy loam	0.5 to 0.6	6.1 to 7.3	0 - 0	0 - 0
H2 -- 6 to 50	Very gravelly fine sandy loam	2.6 to 4.0	6.1 to 7.3	0 - 0	0 - 0
H2 -- 6 to 50	Very gravelly sandy clay loam	2.6 to 4.0	6.1 to 7.3	0 - 0	0 - 0
H3 -- 50 to 60	Extremely gravelly loam	0.5 to 0.7	6.1 to 7.3	0 - 0	0 - 0
H3 -- 50 to 60	Extremely gravelly sandy loam	0.5 to 0.7	6.1 to 7.3	0 - 0	0 - 0

Ecological class(es):

W - Water areas

Composition

- Water: 95 percent of the unit

Setting

Landform(s):
Elevation:
Precipitation:
Slope gradient:
Air temperature:
Frost-free period:

Characteristics of Water

Average total avail. water in top five feet (in.):
Available water capacity class: NA
Parent material:
Restrictive feature(s):
Depth to Water table:
Drainage class:
Flooding hazard:
Ponding hazard:
Soil loss tolerance (T factor):
Wind erodibility group (WEG):
Wind erodibility index (WEI):
Land capability class, irrigated:
Land capability class, non-irrigated:
Hydric soil:
Hydrologic group:
Runoff class:
Potential frost action:

Saturated hydraulic conductivity class: NA

Ecological class(es):

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

April 13, 2007

received 4/13/07

Mr. Ryan Hayes
BARNARD DUNKELBERG & COMPANY
1743 Wazee Street, Suite 400
Denver, CO 80202

Sent by FAX to: 303-825-8855
Number of pages: 32

Re: Cultural Resource Identification Study/Sacred Lands File Search for Proposed Big Bear City Airport Master Plan-Environment Review; San Bernardino County, California

Dear Mr. Hayes:

The Native American Heritage Commission was able to perform a record search of its Sacred Lands File (SLF) for the affected project area. The SLF failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the Sacred Lands File does not guarantee the absence of cultural resources in any 'area of potential effect (APE).'

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the nearest tribes that may have knowledge of cultural resources in the project area. A List of Native American contacts are attached to assist you. The Commission makes no recommendation of a single individual or group over another. It is advisable to contact the person listed; if they cannot supply you with specific information about the impact on cultural resources, they may be able to refer you to another tribe or person knowledgeable of the cultural resources in or near the affected project area (APE).

Lack of surface evidence of archeological resources does not preclude the existence of archeological resources. Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton, Program Analyst

Attachment: Native American Contact List

Native American Contacts
San Bernardino County
April 13, 2007

Ramona Band of Mission Indians
Joseph Hamilton, vice chairman
P.O. Box 391670 Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105
(951) 763-4325 Fax

Morongo Band of Mission Indians
Britt W. Wilson, Cultural Resource Coordinator
11581 Potrero Road Cahuilla
Banning , CA 92220 Serrano
britt_wilson@morongo.org
(951) 849-8807
(951) 755-5200/323-0822-cell
(951) 922-8146 Fax

San Manuel Band of Mission Indians
Henry Duro, Chairperson
6569 Community Center Drive Serrano
Highland , CA 92346
(909) 864-8933
(909) 864-3370 Fax

San Manuel Band of Mission Indians
Ann Brierty, Environmantal Department
101 Pure Water Lane Serrano
Highland , CA 92346
abrierty@sanmanuel-nsn.gov
(909) 863-5899 EXT-4321

(909) 862-5152 Fax

Twenty-Nine Palms Band of Mission Indians
Mike Darrell, Chairperson
46-200 Harrison Place Chemehuevi
Coachella , CA 92236
tribal-epa@worldnet.att.net
(760) 775-5566
(760) 775-4639 Fax

Serrano Band of Indians
Goldie Walker
6588 Valeria Drive Serrano
Highland , CA 92346
(909) 862-9883

Chemehuevi Reservation
Charles Wood, Chairperson
P.O. Box 1976 Chemehuevi
Chemehuevi Valley , CA 92363
chemehuevit@yahoo.com
(760) 858-4301
(760) 858-5400 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American with regard to cultural resources for the proposed Big Bear City Airport Master Plan-Environmental Review; San Bernardino county, California for which a Sacred Lands File search was requested

California Regional Water Quality Control Board
Santa Ana Region

Linda S. Adams
Secretary for Environmental Protection

3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (951) 782-4130 • FAX (951) 781-6288 • TDD (951) 782-3221
www.waterboards.ca.gov/santaana

Arnold Schwarzenegger
Governor

received 5-10-07

May 2, 2007

Ryan Hayes
Barnard Dunkelberg & Company
1743 Wazee Street, Suite 400
Denver, CO 80202

Big Bear City Airport Master Plan – Environmental Review

Dear Mr. Hayes:

In a letter dated April 5, 2007, to Regional Board staff, you stated that proposed projects related to the Master Plan for the Big Bear City Airport have the potential to cause environment impacts, and requested that Regional Board staff comment on any water quality issues or other areas of concern to our agency. Thank you for the opportunity to comment on the Master Plan. We have the following comments:

1) Runoff from the Airport drains west into Big Bear Lake through the Stanfield Marsh Wildlife area and/or east toward Baldwin Lake. These lakes support a wide range of beneficial uses recognized by the Water Quality Control Plan for the Santa Ana Basin (Basin Plan), including WILD, COLD, REC1, REC2 and RARE[1]. In addition, wet meadows and marsh areas, also waters of the state although not listed in the Basin Plan, border the airport and receive runoff from it. All these water areas are important habitat areas for waterfowl, the bald eagle, federally and state listed endangered plants, and a federally listed endangered fish. Appropriate non-point source (NPS) pollutant control management measures and Best Management Practice (BMPs) should be incorporated into the Master Plan such that water quality impacts to these fragile areas are avoided. Oil and grease, fuel, solvents, trash, nutrients and fertilizers, and sediment are some of the NPS pollutants that could occur in runoff from the airport master plan area.

2) The master plan should incorporate drainage features such that post development runoff flows do not result in hydraulic conditions of concern, such as erosive flow velocities or excessive sedimentation. Post development hydrograph (magnitude, duration, time of concentration, etc.) of runoff from the plan area should not be changed over the present condition. If possible, excess storm flows should be retained on site and allowed to infiltrate and recharge groundwater, or to be released gradually to enhance the adjacent wet meadows and marshes.

[1] These terms are defined in the Basin Plan at http://www.waterboards.ca.gov/santaana/pdf/R8BPlan.pdf

3) All construction impacts to waters of the United States or the State (which includes wetlands such as wet meadows) should be avoided. If avoidance of waters of the United States is not possible, then a Clean Water Act Section 404 permit and Section 401 Water Quality Standards Certification must be obtained prior to any construction, and appropriate mitigation must be completed. If the master plan involves facilities that come under the jurisdiction of the U.S. Army Corps of Engineers (USACE), early consultation with appropriate staff from the USACE and this Regional Water Quality Control Board is strongly encouraged to identify appropriate mitigation measures. This will allow for needed mitigation to be evaluated thoroughly throughout the environmental analysis and review process. If possible, adjacent meadow and marsh areas should be enhanced and/or restored as part of the master plan. Unavoided impacts to waters of the state that are not within USACE jurisdiction may be subject to Regional Board waste discharge requirements issued pursuant to the California Water Code Section 13000, *et seq.*

4) Big Bear Lake is on the Clean Water Act Section 303 (d) list of impaired waters, prepared by the State Water Resources Control Board. The lake is listed for sedimentation/siltation, mercury, copper, other metals, noxious aquatic plants, nutrients, and PCBs,. As a result, several Total Maximum Daily Loads (TMDLs) have been, or will be, developed for the Lake. Therefore, implementation of the airport master plan needs to consider that all activities at the airport that potentially could affect TMDL compliance will be subject to strict NPS pollutant management measures or other controls.

5) The Airport lies between Big Bear Lake and Baldwin Lake. The natural drainage between the two lakes must be not altered by the proposed project. To the extent possible, the master plan should include enhancement or restoration of previously "improved" drainages in the area, by eliminating engineered features that minimize the drainages' value for recreation or wildlife habitat.

If you have any questions, please call me at (951) 782-3234 or Dave Woelfel at (951) 782-7960.

Sincerely,

Mark G. Adelson
Chief, Regional Planning Section

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

May 3, 2007

received
5-10-07

Mr. Ryan Hayes
Barnard Dunkelberg and Company
1743 Wazee Street, Suite 400
Denver, CO 80202

Dear Mr. Hayes:

Big Bear City Airport Master Plan – Environmental Review

In response to your April 5, 2007 letter on the above-mentioned project, the South Coast Air Quality Management District (SCAQMD) recommends analysis of the air quality topics identified in the following paragraphs, as applicable. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the Initial Study (IS) and Draft Environmental Impact Report (EIR). Please send the SCAQMD a copy of the IS and Draft EIR upon their completion. **In addition, please send with the IS and Draft EIR all appendices or technical documents related to the air quality analysis and electronic versions of all air quality modeling and health risk assessment files. Without all files and supporting air quality documentation, the SCAQMD will be unable to complete its review of the air quality analysis in a timely manner. Any delays in providing all supporting air quality documentation will require additional time for review beyond the end of the comment period.**

Air Quality Analysis

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, the lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2002 Model. This model is available on the SCAQMD Website at: www.aqmd.gov/ceqa/models.html.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis.

The SCAQMD has developed a methodology for calculating PM2.5 emissions from construction and operational activities and processes. In connection with developing PM2.5 calculation methodologies, the SCAQMD has also developed both regional and localized significance thresholds. The SCAQMD requests that the lead agency quantify PM2.5 emissions and compare the results to the recommended PM2.5 significance thresholds. Guidance for calculating PM2.5 emissions and PM2.5 significance thresholds can be found at the following internet address: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html.

In addition to analyzing regional air quality impacts the SCAQMD recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LST's can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the proposed project, it is recommended that the lead agency perform a localized significance analysis by either using the LSTs developed by the SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at http://www.aqmd.gov/ceqa/handbook/LST/LST.html.

It is recommended that lead agencies for projects generating or attracting vehicular trips, especially heavy-duty diesel-fueled vehicles, perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on the SCAQMD's CEQA webpages at the following internet address: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/mobile_toxic.html. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additional mitigation measures can be found on the SCAQMD's CEQA webpages at the following internet address: www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Other measures to reduce air quality impacts from land use projects can be found in the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. This document can be found at the following internet address: http://www.aqmd.gov/prdas/aqguide/aqguide.html. In addition, guidance on siting incompatible land uses can be found in the California Air Resources Board's Air Quality and Land Use Handbook: A Community Perspective, which can be found at the following internet address: http://www.arb.ca.gov/ch/handbook.pdf. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. Please call Charles Blankson, Ph.D., Air Quality Specialist, CEQA Section, at (909) 396-3304 if you have any questions regarding this letter.

Sincerely,

Steve Smith

Steve Smith, Ph.D.
Program Supervisor, CEQA Section
Planning, Rule Development and Area Sources

SS:JK
LAC070417-03CB
Control Number

received
5-29-07

April 18, 2007

Barnard Dunkelberg & Company
Attn. Ryan Hayes
1743 Wazee Street, Suite 400
Denver, CO 80202

Via U.S. Mail

SUBJECT: BIG BEAR CITY AIRPORT MASTER PLAN

Dear Mr. Ryan:

This letter is written in response to your correspondence to Pamela Bennett Chief of Environmental Health (EHS). The letter was forwarded to Dan Avera the current Chief of EHS.

Our Department has concerns regarding the Big Bear Airport Master Plan in the following areas:

1) Any grading for the airport should have conducted vector surveys, control, or an eradication programs,
2) Any food facilities should have plans reviewed and approved,
3) Noise control measures, mitigations should be implemented and further noise studies completed to determine impacts to sensitive receptors surrounding the airport, i.e. Residents, schools, hospitals, hotel/motel/bed & breakfast etc. The Master plan map showed some residents within the 60 dB(A) noise contour from the San Bernardino County General Plan, Noise Element. I have enclosed a copy of the general plan noise exposure map for Big Bear City Airport.

Any questions regarding water, gas, and electricity should be directed to the appropriate utility company serving the area. Questions regarding septic issues may be directed to the Environmental Health Services Division.
Additionally, Environmental Health may make further project specific comments when the project is officially sent from planning to EHS for comments.

If you have any questions regarding this matter, please contact the undersigned at 909-387-4666.

Sincerely,

Corwin Porter
Supervisor, Water, Wastewater, Land use

CP:ar

Enclosure

N:\sdw\Letters\Big Bear Airport Response 04-18-07.doc

Ryan Hayes

From: Michael Armstrong [ARMSTRON@scag.ca.gov]

Sent: Thursday, May 31, 2007 5:20 PM

To: Ryan Hayes

Subject: Bib Bear City Airport Master Plan--Environmental Review

Dear Mr. Hayes,

We have identified no issues that are of regional concern to our agency regarding the proposed projects in your Airport Master Plan for Big Bear City Airport. Please let me know if you would like to present these projects to our Aviation Technical Advisory Committee which meets on the second Thursday of the month on a bi-monthly basis either at SCAG or at various airports in the region. This would give you an opportunity to inform other airport managers in the region about the master planning process for Big Bear City Airport, and obtain input from those managers. Sincerely,

Michael Armstrong
Aviation Program Manager
Southern California Association of Governments
818 W 7th Street 12th Floor
Los Angeles CA 90017-3435
213-236-1914 (P)
213-236-1963 (F)

Ryan Hayes

From: Sandy Hesnard [sandy_hesnard@dot.ca.gov]
Sent: Friday, June 01, 2007 1:45 PM
To: Ryan Hayes
Cc: jlerner@arb.ca.gov; philip_crimmins@dot.ca.gov; Scott.Morgan@OPR.CA.GOV; Kurt O Haukohl
Subject: Re: FW: Big Bear City Airport conceptual development plan

Attachments: Big Bear-revsied CDP-04.03.07.pdf

Big Bear-revsied CDP-04.03.07....

Hello Ryan:

The Division of Aeronautics has technical expertise in the areas of airport operations, safety and airport land use compatibility. We are a funding agency for airport projects and we have permit authority for public-use and special-use airports and heliports.

We believe that airport staff and airport master plans as well as airport land use commissions and airport land use compatibility plans are key to protecting an airport and the people residing and working in the vicinity of an airport. Consideration given to ensuring compatible land uses in the vicinity of the airport should help to prevent future conflicts between the airport and its neighbors and is a desirable component in an airport master plan process.

Big Bear Airport currently operates with a public-use airport permit issued by the Division. It does not appear that the proposed projects shown on the airport layout plan (ALP) will trigger the need for an amended State airport permit, however, we will require evidence of compliance with CEQA prior to releasing State funds for any of the projects.

Environmental issues of concern to the Division generally include airport-related noise and safety impacts to the surrounding community and potential impacts to airport operations. If the master plan environmental will be the sole document for any of the projects, it must thoroughly address impacts related to those projects. We request copies of all future environmental documentation during the public review process for the master plan update.

The proposed hangars and any other structures should not be at a height that penetrates the Federal Aviation Regulation Part 77 imaginary surfaces.
For certain projects, the Federal Aviation Administration (FAA) may require submission of a Notice of Proposed Construction or Alteration (Form 7460-1), available on-line at http://forms.faa.gov/forms/faa7460-1.pdf. We also recommend that the guidance in the FAA Advisory Circular 150/5370-2E, Operational Safety on Airports During Construction, be incorporated into the project design in order to identify any permanent or temporary construction-related impacts (e.g. construction cranes, etc.) to the airport/heliport imaginary surfaces. This advisory circular is available at http://faa.gov.

The airport master plan update should be coordinated with the Division's San Bernardino County airport master plan coordinator, Philip Crimmins.
Philip can be reached at (916) 654-6223.

The Division's Aviation Safety Officer for Big Bear Airport, Kurt Haukohl, will review the ALP when he is back in the office after June 12. Kurt can be reached at (916) 654-5284.

Information concerning environmental, funding and permitting is also available on the Division's website at http://www.dot.ca.gov/hq/planning/aeronaut/.

The CEQA Guidelines are available at http://ceres.ca.gov/topic/env_law/ceqa/guidelines/. The environmental checklist is in Appendix G.

The FAA Airport Master Plan Advisory Circular 150/5070-6B addresses NEPA and is available on-line at
http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/2d32126b62be8a8c862572e20052e5e9/$FILE/150_5070_6b_chg1.pdf
.

Sincerely,

Sandy Hesnard

Sandy Hesnard
Division of Aeronautics
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(916) 654-5314 fax (916) 653-9531
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Scott.Morgan@OPR.
CA.GOV

05/30/2007 09:00
AM

To
sandy.hesnard@dot.ca.gov,
jlerner@arb.ca.gov

cc
Ryan@bd-c.com,
philip_crimmins@dot.ca.gov

Subject
FW: Big Bear City Airport
conceptual development plan

Sandy and Jim: Big Bear Airport is developing a new master plan, they are looking for some pre-ceqa feedback. Please see the attached "conceptual development plan" (map) and provide any comments you may have to the consulting firm. Thank you.

Scott Morgan
Senior Planner, State Clearinghouse
Governor's Office of Planning and Research 916-322-2960

From: Ryan Hayes [mailto:Ryan@bd-c.com]
Sent: Tuesday, May 29, 2007 3:43 PM
To: scott.morgan@opr.ca.gov
Cc: Peter Van Pelt
Subject: Big Bear City Airport conceptual development plan

Scott,
Thanks for the call back. Attached is the conceptual development plan for the Big Bear City Airport Master Plan.
REH

Ryan E. Hayes
Barnard Dunkelberg & Company
Airport and Environmental Consultants