Caldwell, Idaho

CALDWELL INDUSTRIAL AIRPORT

AIRPORT MASTER PLAN

FINAL

AIRPORT MASTER PLAN

for

CALDWELL INDUSTRIAL AIRPORT
Caldwell, Idaho

Prepared for

THE CITY OF CALDWELL

by

Coffman Associates, Inc.,
and
Kimley-Horn and Associates, Inc.

Approved by Caldwell City Council
November 1, 2010

FINAL PRINTING
MARCH 2011

SPECIAL MEETING
CALDWELL CITY COUNCIL
WORKSHOP
NOVEMBER 1, 2010
6:30 P.M.

NEW BUSINESS:

(PUBLIC HEARING [LEGISLATIVE]: A REQUEST BY THE PUBLIC WORKS DEPARTMENT FOR APPROVAL OF THE PROPOSED CALDWELL INDUSTRIAL AIRPORT MASTER PLAN)

The Mayor declared the public hearing open.

Brent Orton, 621 Cleveland Blvd, presented a PowerPoint presentation outlining the Airport Master Plan. He noted that a Planning Advisory Committee was organized for the purpose of gaining community input concerning the document. Members on the committee consisted of Rob Oates, City Council/Airport Commission; Ken Frazee, City of Caldwell – Engineering; Brian Billingsley, City of Caldwell – Planning and Zoning; Ed Priddy, Tri-Cedar Management; Martin Koch, Hartwell Corporation; Theresa Hardin, Caldwell Chamber of Commerce; Bill Hinkle, Hinkle Aviation; Catherine Webber, Silverhawk Aviation; Bob McGee, Airport Commission; Bruce Fisher, FAA Northwest Mountain Region; Bill Statham, ITD Division of Aeronautics; and Anita Shore, Shore and Shore Aviation. He noted that several workshops were conducted by the City in 2010 concerning this matter. The document is available for viewing on the City of Caldwell website.

Councilman Oates expressed appreciation to the consultants who met with the Advisory Committee and compiled the information for the Airport Master Plan. He stated that consultants were professional in their approach and very knowledgeable of the process.

MOVED by Oates, SECONDED by Blacker to close the public hearing.

MOTION CARRIED

MOVED by Oates, SECONDED by Blacker to approve the Airport Master Plan and advise City staff to forward the document to the FAA for their approval.

MOTION CARRIED

The Mayor thanked all who were involved in creating the Airport Master Plan document. He noted that the document will help guide the planning and financial decisions for the Airport in the future.

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INTRODUCTION

INTRODUCTION

The Caldwell Industrial Airport (EUL) Master Plan Study Update was undertaken to evaluate the airport's capabilities and role; to forecast future aviation demand; and to plan for the timely development of new or expanded facilities that may be required to meet that demand. The ultimate goal of the master plan is to provide systematic guidelines for the airport's overall maintenance, development, and operation.

The City of Caldwell has contracted with Coffman Associates, Inc., a national airport consulting firm specializing in airport planning studies. The airport's current engineer, Kimley-Horn and Associates, provided technical assistance during the study.

The master plan is intended to be a proactive document which identifies and then plans for future facility needs well in advance of the actual need for the facilities. This is done to ensure that the City of Caldwell can coordinate project approvals, design, financing, and construction to avoid experiencing detrimental effects due to inadequate facilities.

An important result of the master plan is reserving sufficient areas for future facility needs. This protects development areas and ensures they will be readily available when required to meet future needs. The result is a detailed land use concept which outlines specific uses for all areas of airport property.

The preparation of this master plan is evidence that the City of Caldwell recognizes the importance of air transportation to the community as well as the unique challenges operating an airport presents. The investment in

an airport yields many benefits to the community and the region. With a sound and realistic master plan, Caldwell Industrial Airport can maintain its important link to the national air transportation system for the community and maintain the existing public and private investments in its facilities.

MASTER PLAN OBJECTIVES

The overall objective of the *Airport Master Plan Update* is to provide the City with guidance for future development of the airport, meeting the needs of existing and future users, while also being compatible with the environment. The most recent Master Plan was completed in 1997 and a Development Plan was prepared in 2004. The Airport Layout Plan for the airport was last updated in 2005. This *Airport Master Plan Update* identifies and provides justification for new priorities. This plan was closely coordinated with other existing or ongoing planning studies for the area, and with aviation plans developed by the FAA and the state. Coordination between the Sponsor, the Idaho Transportation Department (ITD) – Division of Aeronautics, and the Federal Aviation Administration (FAA) – Northwest Mountain Region, and other airport stakeholders was essential throughout the master planning process. Specific objectives of the study included:

- Research factors likely to affect air transportation demand in the Caldwell area over the next 20 years and develop new operational and basing forecasts.

- Determine projected needs of airport users, taking into consideration recent FAA design standards, global positioning (GPS) aircraft approach capability, and transitions in the type of aircraft flown by corporate and general aviation users.

- Recommend improvements which will enhance Caldwell Industrial Airport's ability to satisfy future aviation needs: potential for a runway extension, ultimate configuration of the northeast development area, future fire station siting, and revenue enhancement opportunities.

- Establish a schedule of development priorities, a financial program for implementation of development, and analyze potential funding sources, consistent with FAA planning.

- Update all airport mapping and airport layout plan drawings.

- Develop active and productive public involvement throughout the planning process.

MASTER PLAN ELEMENTS AND PROCESS

To achieve the objectives described above, the *Airport Master Plan Update* was prepared in a systematic fashion

pursuant to the scope of services that has been coordinated with the sponsor and the FAA. The study has nine elements:

1.0 **Study Initiation** - Development of the scope of services, budget, and schedule. A kickoff meeting with a planning advisory committee (PAC) was held at the study's initiation to obtain a more comprehensive understanding of local issues.

2.0 **Inventory** - Inventory of facility and operational data, wind data, distribution of user surveys, environmental inventory, population and economic data, airport financial data, and new aerial photography and mapping. All of the inventory data was organized in a working paper which was distributed to the PAC for review and comment.

3.0 **Forecasts** - Forecasts for based aircraft, operations, and peaking characteristics of the airport over a 20-year period. The forecasts were organized in a working paper which was distributed to the PAC for review and comments and forwarded to the FAA for review and approval.

4.0 **Facility Requirements** - After establishing critical aircraft and physical planning criteria, facility needs assessments were developed for airside and landside facilities. The facility requirements were organized in a working paper, distributed to the PAC, and a meeting was held with the advisory committee to review previous working paper submittals.

5.0 **Airport Development Alternatives** - Potential airside and landside alternatives were developed for meeting long-term needs. Each of the alternatives was subjected to engineering and environmental analysis and summarized in a working paper. Following distribution of the working paper to the PAC, a review meeting was held to discuss the alternatives and preliminary master plan concept.

6.0 **Airport Plans/Land Use Compatibility** - Airport layout plans were developed to depict existing and proposed facilities. The drawings set will meet the requirements of the FAA Northwest Mountain Region. In addition, noise exposure contours were developed for existing and future conditions to determine the extent of critical noise exposure in the airport vicinity. The analysis was summarized in an appendix for distribution to the PAC.

7.0 **Environmental Overview** - Environmental concerns and potential mitigation requirements were identified consistent with the *National Environmental Policy Act* (NEPA). The working paper appears as an appendix to the master plan report.

8.0 **Financial Management and Development Program** - Development schedules and cost estimates were prepared for the development program, and a financial analysis was included to identify potential federal and state aid for specific projects. Following development of the financial management working paper, a final meeting was held with the PAC, and a public information workshop was held for the general public.

9.0 **Final Reports** - Final report documentation will include technical reports (printed and digital formats), and full size/full color copies of report exhibits and drawings produced for the study. The FAA will review and approve the final airport layout plan drawings.

STUDY COORDINATION

The study process included local participation through the formation of a Planning Advisory Committee (PAC). The PAC consisted of federal, state, and local agencies, airport tenants, and general public representatives. The sponsors decided the final makeup of the committee, with the assistance of the consultant. The study schedule called for four points in the process where the PAC convened to discuss draft working paper submittals. A kick-off meeting was held on January 14, 2010 to discuss the draft inventory chapter. Subsequent meetings were held to discuss forecasts and facility requirements (March 11, 2010), alternatives (May 27, 2010), and the recommended concept/financial program (August 26, 2010). Following the final meeting with the PAC, an "open house" workshop for the general public was held to present the preliminary findings and to solicit public comment. **Exhibit IA** presents the key study elements, meeting intervals, project schedule and documentation.

RECOMMENDATIONS

The recommended master plan concept addresses both airside and landside needs for a 20-year planning horizon. A significant area of concentration in the master plan is the future development of the east side of the airport. The City has made a significant investment in a much needed terminal building and adjacent development opportunities abound. The master plan identifies a long term landside development layout that maximizes the available property for aviation development. To maximize development potential, the Canyon Hill Lateral will need to be relocated and some property will need to be acquired.

On the airside, the airport currently meets FAA design standards for a design aircraft represented by turboprop and smaller business jet aircraft. Ultimately, the airport could experience a transition to a larger design aircraft represented by medium and large business jets. When this occurs, currently forecast in the intermediate planning horizon, the City will need to

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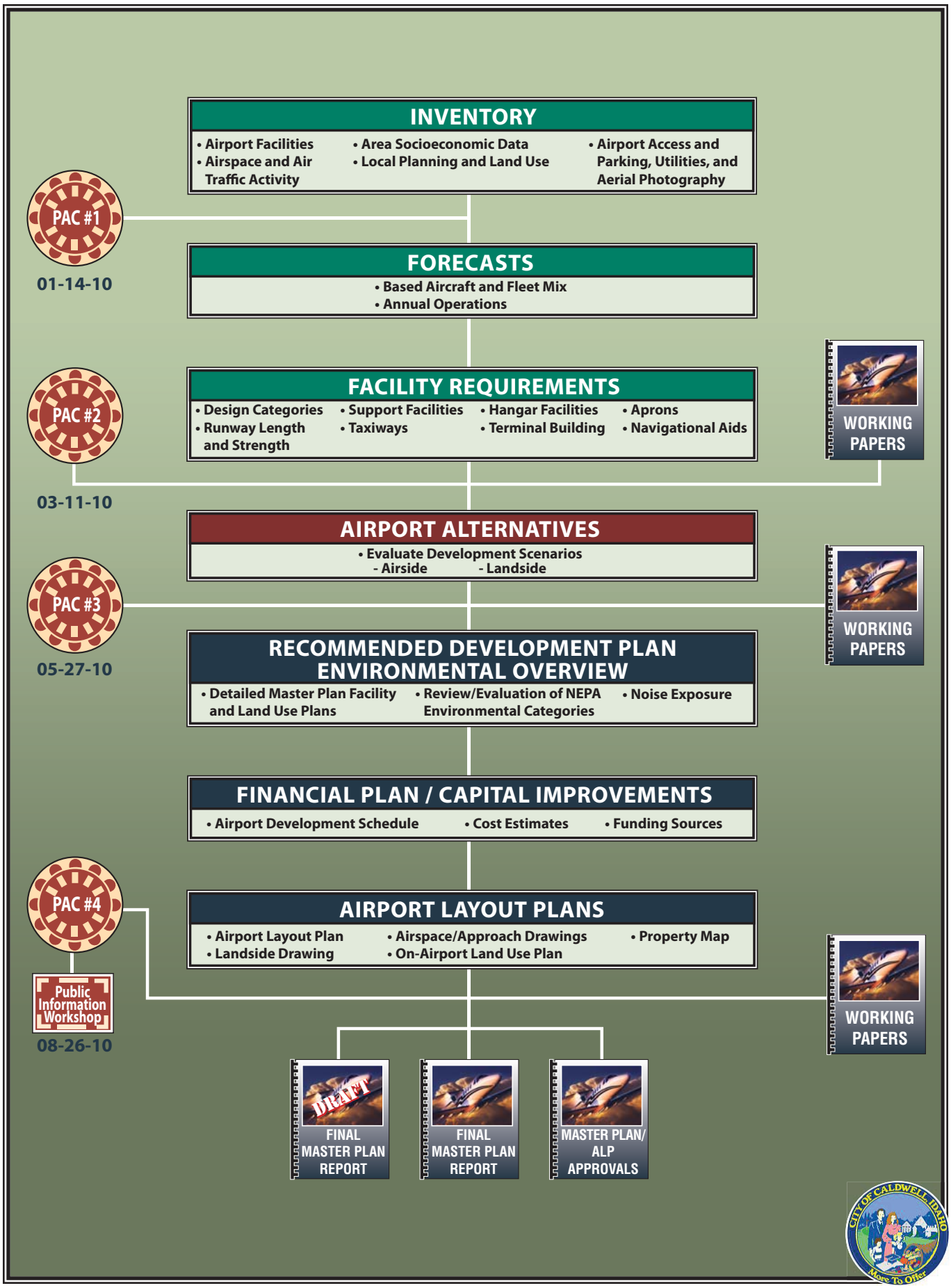

Exhibit IA
PROJECT WORK FLOW

program improvements which could include the extension of the runway to an ultimate length of 6,800 feet.

Development grants are projected to cover approximately 86 percent of the projects included in the capital improvement program. The federal grant program is supported directly by aviation users through the collection of fuel taxes and other user fees.

Chapter One

INVENTORY

CALDWELL INDUSTRIAL AIRPORT

CHAPTER 1

AIRPORT MASTER PLAN

INVENTORY

The initial step in the preparation of the airport master plan update for Caldwell Industrial Airport is the collection of information that will provide a basis for the analysis to be completed in subsequent chapters. For the master plan, information is gathered regarding not only the airport, but also the region it serves. This chapter will begin with background information related to the location and history of the airport; the area transportation network, and regional climate. This will be followed by a discussion of current and future land uses in the airport area. An overview of the national aviation system for general aviation airports and the role of Caldwell Industrial Airport in the national system are also presented. Finally, an inventory of the existing facilities at the airport will be discussed.

The information outlined in this chapter was obtained through on-site inspections of the airport, including interviews with airport management, airport tenants, and representatives of various government agencies. Information was also obtained from existing studies. Additional information and documents were provided by the Federal Aviation Administration (FAA), the City of Caldwell, and the Idaho Transportation Department - Division of Aeronautics. A list of primary document sources is provided at the end of this chapter.

BACKGROUND INFORMATION

It is important in any master plan to establish a baseline understanding of the airport setting including its location, geography, access to ground transportation, role in the national aviation system, climate and administration.

LOCATION

Caldwell Industrial Airport encompasses 532 (October 2009) acres of property and is located approximately three miles to the southeast of the City of Caldwell central business district (CBD). The City of Caldwell is the county seat for Canyon County, Idaho. The City of Caldwell is located in the southwest portion of the state approximately 20 miles from the border with Oregon. The airport elevation is 2,432 feet above mean sea level (MSL).

The City of Caldwell is located within an area referred to as Treasure Valley that stretches from Vale, Oregon to Boise, Idaho. The region includes the valley lands where several tributaries, including the Boise River, drain into the Snake River. Until 1959, the region was referred to as the Lower Snake River Valley, when community leaders suggested the name change to be more reflective of the abundance of resources and opportunities in the region. The Treasure Valley is bounded by the Owyhee, Weiser, and Boise mountains which rise to 9,000 feet MSL in places. **Exhibit 1A** is a location map for the airport.

AIRPORT HISTORY AND DEVELOPMENT

In 1928, the City of Caldwell purchased 160 acres, located to the immediate northwest of downtown Caldwell, from Webber J. Apell, who ran a flight school for eight years on the property. During the 1930s, the City made improvements to the airport including construction of the first hangar in 1939. The runway was first paved in 1952. By the late 1960s, residential growth was encroaching upon the airport, and the City undertook a feasibility study to relocate the airport. The current airport site was identified for a replacement airport and construction began in 1975.

In recent years, the airport has experienced a significant level of growth and investment from state and federal sources as well as private developers. **Table 1A** presents a history of capital improvement grants received by the airport since 1994. During the past decade, the airport has relocated Aviation Way and constructed several taxilanes to provide developable land on the west side of the airport. The airport has also undertaken an aggressive land acquisition program to ultimately allow for further landside development on the east side of the airport. A new access taxiway and aircraft apron was recently constructed on the east side of the runway and the City is currently constructing a new terminal building on the east side.

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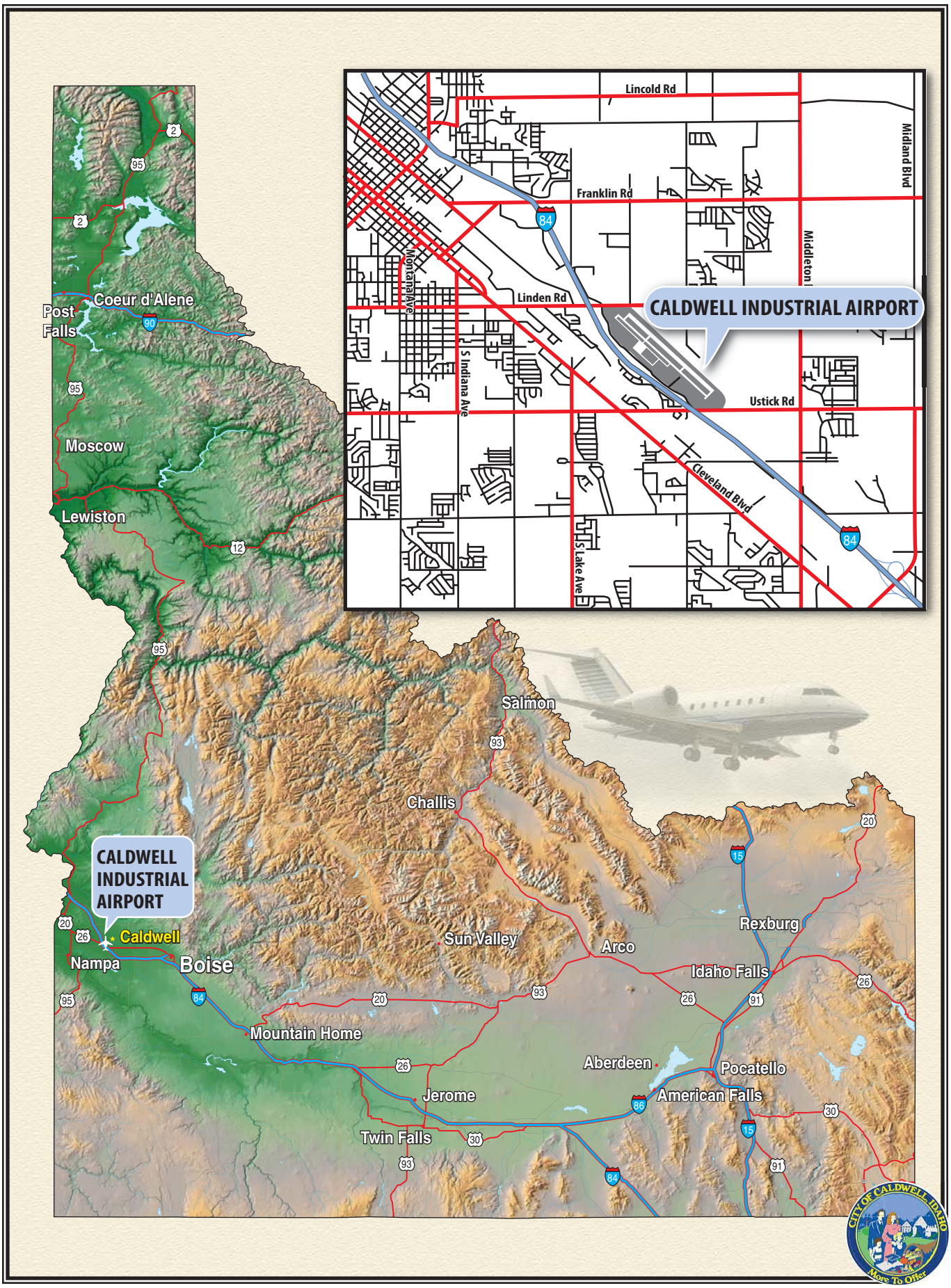

Exhibit 1A
LOCATION MAP

TABLE 1A
Grant History
Caldwell Industrial Airport

Fiscal Year	Project Number	Description	FAA Grant	State Grant	Local Share	Project Total
1994	3-16-0045-07	Master Plan Update & Land Appraisals	$68,400	$6,570	$6,570	$81,540
1996	3-1630045-08	Rehabilitate Pavements	$172,600	$9,589	$9,588	$191,777
1997	3-16-0045-09	Land Acquisition & Taxiway Rehabilitation	$271,172	$14,955	$15,076	$301,203
1997	SP-0045-03	Hangar Taxiway, Access Road, Fencing	-	$30,803	$30,803	$61,606
1998	3-16-0045-10	Taxiway & Apron Const., Drainage, Road Relocation (Ph1)	$1,889,185	$83,964	$125,946	$2,099,095
1999	3-16-0045-11	Road Relocation (Ph2); Taxiway Const & Fencing	$186,210	$5,173	$15,517	$206,900
1999	3-16-0045-12	Road Relocation (Ph3); Taxiway Const & Fencing	$453,500	$12,598	$37,791	$503,889
2001	3-16-0045-13	Land Acquisition; Taxiway Const., Fence & Gates	$974,784	$34,455	$73,854	$1,083,093
2004	3-16-0045-14	Land Acquisition; Taxiway Const., Fence	$1,242,585	$24,805	$40,594	$1,307,984
2005	3-16-0045-15	Land Acquisition; Taxiway Const, Pavement Rehabilitation	$1,000,000	$26,315	$26,317	$1,052,632
2006	3-16-0045-16	Rehabilitate Runway; Lighted Signs & Markings	$495,000	$13,026	$13,026	$521,052
2007	3-16-0045-17	Land Acquisition, Eastside Taxiway	$450,000	$11,843	$11,843	$473,686
2008	3-16-0045-18	Construct East Side Taxiway	$704,729	$18,546	$18,546	$741,821
2009	3-16-0045-19	Master Plan Update	$150,000	$3,948	$3,946	$157,894
2009	3-16-0045-20	Land Acquisition; Construct Eastside Taxiway	$501,848	$13,206	$13,207	$528,261
2009	3-16-0045-21	Master Plan Update	$95,100	$2,502	$2,503	$100,105

Source: Idaho Transportation Department - Division of Aeronautics

STREET NETWORK

The airport is bordered on the north by Linden Street and to the south by Ustick Road. Aviation Way connects these two roads and defines the western boundary of the airport. Interstate 84 passes on the western side of the airport. Interstate-84 (I-84) experiences approximately 36,000 vehicle trips per day (2002). The closest interstate interchange is at Franklin Road, approximately two miles to the northwest. State Highways 19, 20/26, 30, and 55, also pass through the City. The east side of the airport is primarily farmland. Ustick Road to the south is a principal arterial road and Linden Road to the north is a minor arterial road.

As is typical of developed valley regions, there is a complex system of irrigation canals. To the immediate west of the airport is the Notus Canal. To the east is the Canyon Hill Lateral and to the southeast is the Highline Canal. A portion of the Notus Canal that traversed airport property has been relocated to the edge of Aviation Way to allow for more hangar development.

PUBLIC TRANSPORTATION

ValleyRide is the transit services division of Valley Regional Transit (VRT), the regional public transportation authority for Ada and Canyon Counties in Idaho. ValleyRide offers fixed-line

bus service in the valley from Caldwell to Boise with stops in between. The closest bus stop is on Franklin Road. Greyhound Lines has a stop in downtown Caldwell as well.

The Union Pacific Railroad mainline operates through the middle of the City, but does not provide freight service to the community on a regular basis. Approximately 35 freight trains a day pass through the community. Passenger rail service is not currently available in the city. Several taxi services are available in the City.

AIRPORT ADMINISTRATION

Caldwell Industrial Airport is owned by the City of Caldwell and operated under the Public Works Department. A full time airport manager is employed by the city to manage day to day operations at the airport.

Administrative and financial oversight of the airport is the responsibility of the Caldwell City Council, with guidance provided by an eight-member Airport Commission. The Commission members are appointed by the mayor with the consent and approval of the Council. The Commission members serve four-year terms. One of the eight members is a City Council member who serves a one-year term. Two alternate members are also appointed. The Commission meets once a month where a majority present represents a quorum.

The Airport Commission serves in an advisory capacity, reviewing policy and providing recommendations to the City Council. It is the duty of the Commission to recommend and make suggestions to the Council:

1. For the general use of all lands encompassed in the airport boundaries.
2. For the sale or lease of any lands for which requests are made to the City.
3. For capital improvements and construction on said airport lands, including plans for future development.
4. For the general maintenance and operation of the airport including recommendations for the operating contract.
5. For consideration of the construction of a county or regional airport on a participating basis and change of land in connection with the Caldwell Industrial Airport. (Specific to establishment of the airport.)

REGIONAL CLIMATE

Weather conditions must be considered in the planning and development of an airport, as daily operations are affected by local weather patterns. Temperature is a significant factor in determining runway length needs, while local wind patterns (both direction and speed) dictate the optimal orientation of the runway.

Caldwell, Idaho experiences distinct seasonal temperature changes from average highs in low 90s in the summer months and average lows below 32 degree in the winter months. Average precipitation is only about 11

inches annually and snow fall averages approximately 20 inches. A summary of climactic data is presented in **Table 1B**.

TABLE 1B
Climate Summary
Caldwell, Idaho

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
High Temp. Avg.	37	45	55	64	73	80	87	93	79	66	50	39
Low Temp. Avg.	22	27	33	38	45	52	58	58	47	38	30	23
Precip. Avg.(in.)	1.2	1	1.3	1	1.1	0.7	0.4	0.5	0.6	0.7	1.1	1.2
Snowfall (in.)	6.6	3.5	1.5	0.6	0.1	0	0	0	0	0.4	2.4	6
Wind Speed(mph)	7.9	8.9	10	9.9	9.4	9	8.3	8.1	8.1	8.2	8.3	8
Sunshine (%)	40	50	63	67	70	75	86	85	84	65	44	38

Source: www.city-data.com

AREA LAND USE

Land uses in the vicinity of the airport can have a significant impact on airport operations and growth potential. The following section identifies baseline information relating to both existing and future land uses in the vicinity of Caldwell Industrial Airport. By understanding the land use issues surrounding the airport, more appropriate recommendations can be made for the future of the airport. Land uses immediately adjacent the airport are commercial, industrial, or undeveloped farm land. **Exhibit 1B** presents the draft comprehensive plan for the City of Caldwell (*Draft Comprehensive Plan Map*-Sept. 22, 2009).

The City of Caldwell has established an Airport Zone around the airport in order to create an environment for developing the range of facilities necessary for the safe and efficient operations of the airport. Regulating land use in the Airport Zone is specific to airport requirements. Development in the Airport Zone must meet two specific criteria: 1) non-noise-sensitive and; 2) compatible with airport operations and activities. In addition, activities must coincide with federal aviation standards. **Exhibit 1C** presents a detailed map of the airport overlay zone surrounding Caldwell Industrial Airport.

Two Airport Zones have been defined. Airport Overlay Zone 1 is established to contribute to the safe operation of the airport, to facilitate orderly development around the airport, and to protect the possibility of future expansion of the airport. Airport Overlay Zone 2 is the Noise Abatement Limitation zone which is established to control and minimize impacts on development surrounding the airport. It is the intent of this zone to encourage land use patterns appropriate in the vicinity of the airport.

Height restrictions are necessary to ensure that objects will not impair flight safety or decrease the operational capability of the airport. Title 14 of the Code of Federal Regulations (CFR) Part 77, *Objects Affecting Navigable Airspace*, defines a series of

imaginary surfaces surrounding airports. The imaginary surfaces consist of the approach zone, conical zones, transitional zones, and horizontal zones. Objects such as trees, towers, buildings, or roads, which penetrate any of these surfaces, are considered by the FAA to be an obstruction to air navigation. Current City of Caldwell ordinances are based on the height restriction guidelines set forth in 14 CFR Part 77. Height restrictions can be accomplished through height and hazard zoning, avigation easements, or fee simple acquisition. **Exhibit 1D** presents the height limitation contour map from the Caldwell City Ordinance.

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists on several levels: local, regional, state, and national. Each level has a different emphasis and purpose. An airport master plan is the primary local airport planning document. The last master plan was completed in 1997. The most recent airport specific planning document was the *2004 Caldwell Industrial Airport Development Plan*. This master plan will provide a vision of both the airfield and landside facilities over the course of the next 20 years.

At the regional level, aviation planning is often included as part of the long range transportation plans as developed by the regional metropolitan planning organization (MPO). The MPO for the region, including Canyon County, is the Community Planning Association of Southwestern Idaho (COMPASS). Currently, COMPASS utilizes information provided by the Idaho Transportation Department – Division of Aeronautics for regional aviation planning.

At the state level, the Caldwell Industrial Airport is included in the *Idaho Airport System Plan* (IASP). The purpose of the IASP is to ensure that the state has an adequate and efficient system of airports to serve its aviation needs. The IASP defines the specific role of each airport in the state's aviation system and establishes funding needs. An update to the IASP was begun in 2008 and is nearing completion as of this writing (12-09). There are 119 public-use airports in Idaho; 75 of which are included in the IASP. Caldwell Industrial Airport is one of the 68 general aviation facilities included in the study.

The IASP presents a classification system for airports in the state. The five classifications are:

- **Commercial Service Airports**: Commercial service airports accommodate scheduled major/national or regional/commuter commercial air carrier service in addition to air cargo, business aviation, and all types of general aviation.

- **Regional Business Airports:** Regional business airports accommodate regional economic activities, connecting to state and national economies, and serve all types of general aviation aircraft. They also accommodate local business activi-

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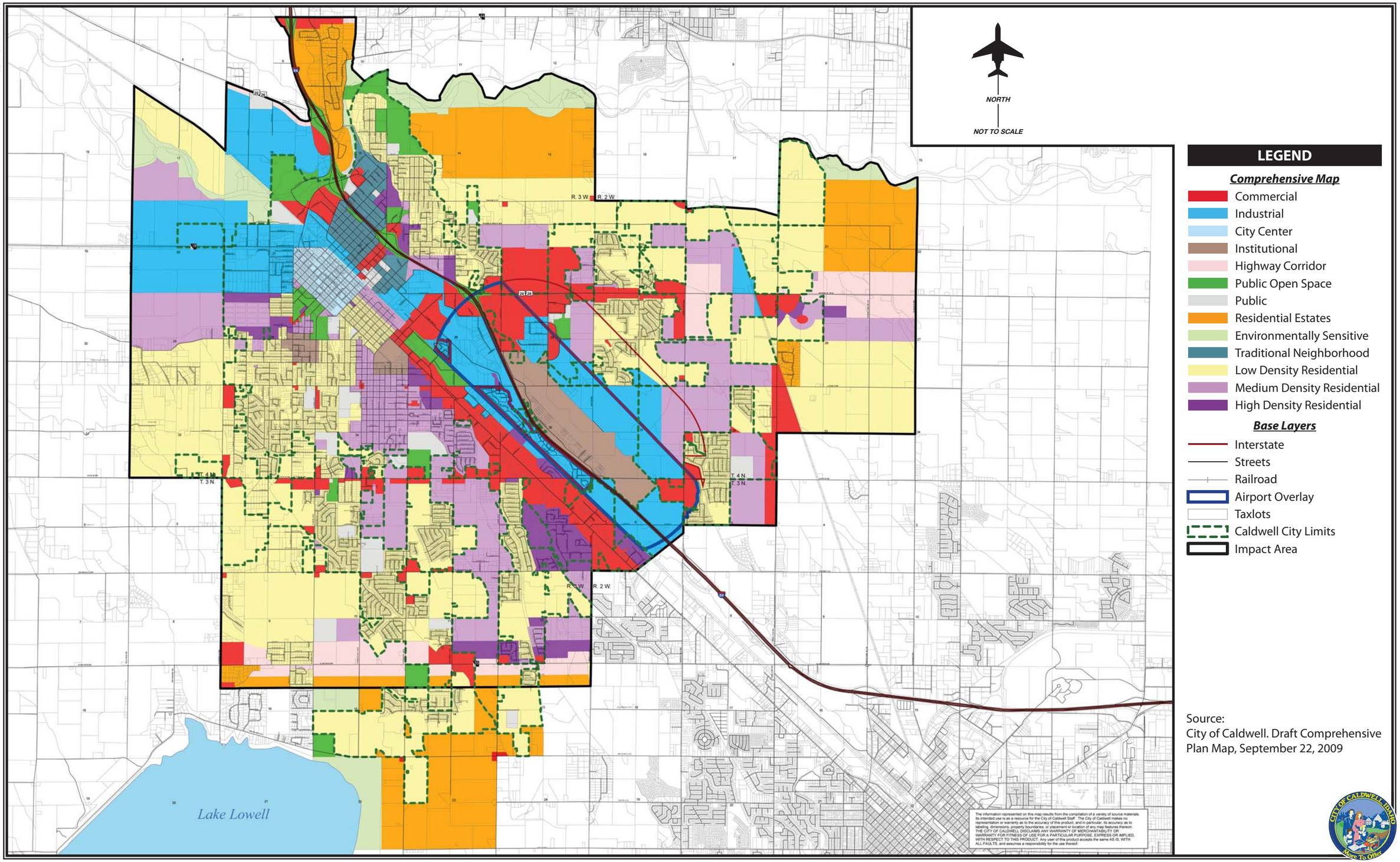

Source:
City of Caldwell. Draft Comprehensive Plan Map, September 22, 2009

Exhibit 1B
COMPREHENSIVE PLAN MAP

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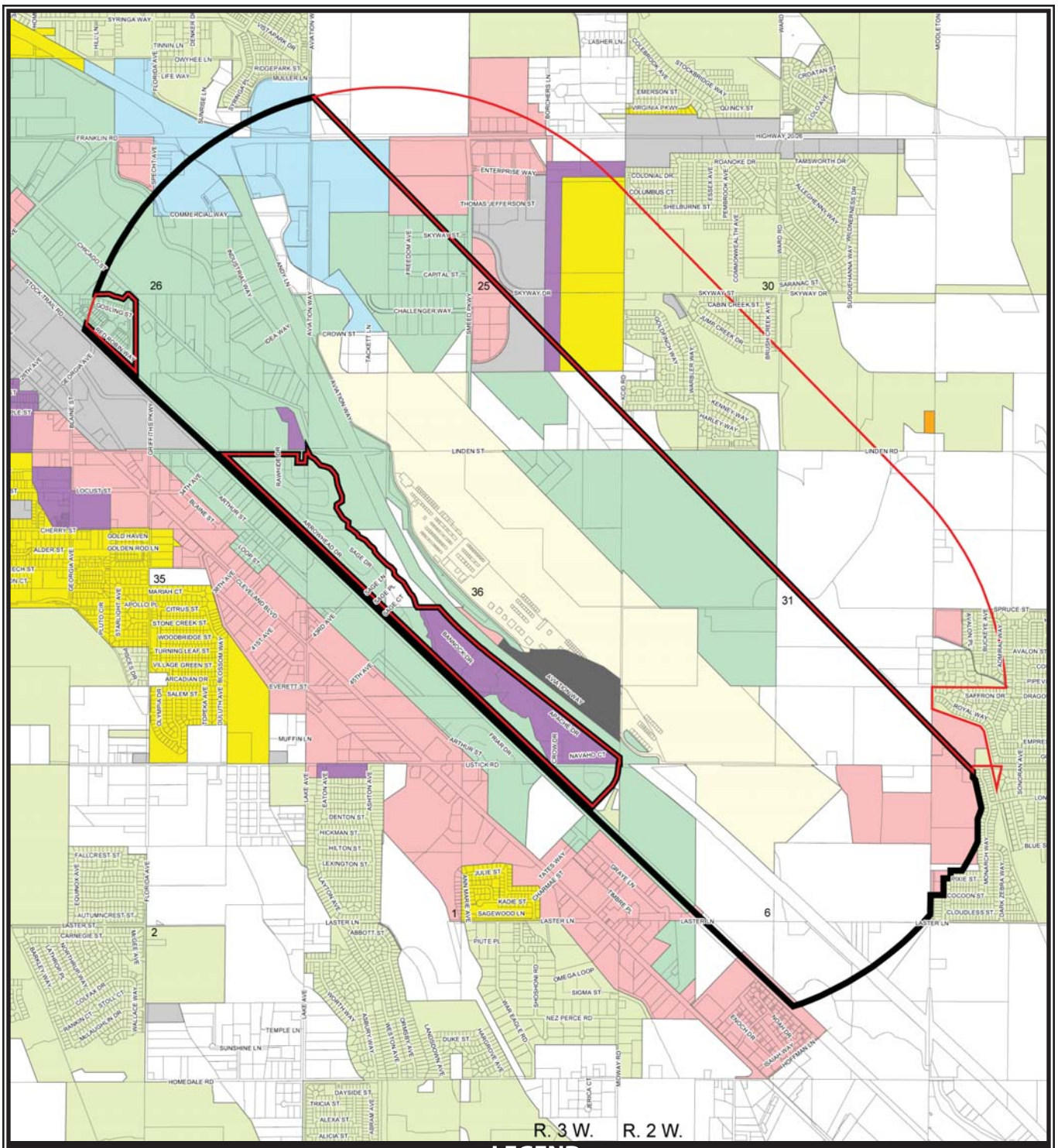

LEGEND

- Neighborhood Commercial
- Community Commercial
- Service Commercial
- Interchange or Freeway Commercial
- City Center
- College District
- Industrial Park
- Light Industrial
- Heavy Industrial
- Single Family Residential
- Combined Medium Density Residential
- Multifamily High Density Residential
- Semi-Rural Residential 2
- Airport District
- Hospital District
- Airport Overlay Zone 2
- Airport Overlay Zone 1
- Parcels

NORTH

0 2500

SCALE IN FEET

Exhibit 1C
AIRPORT OVERLAY ZONING MAP

EUL Exhibit 1D 01/07/10

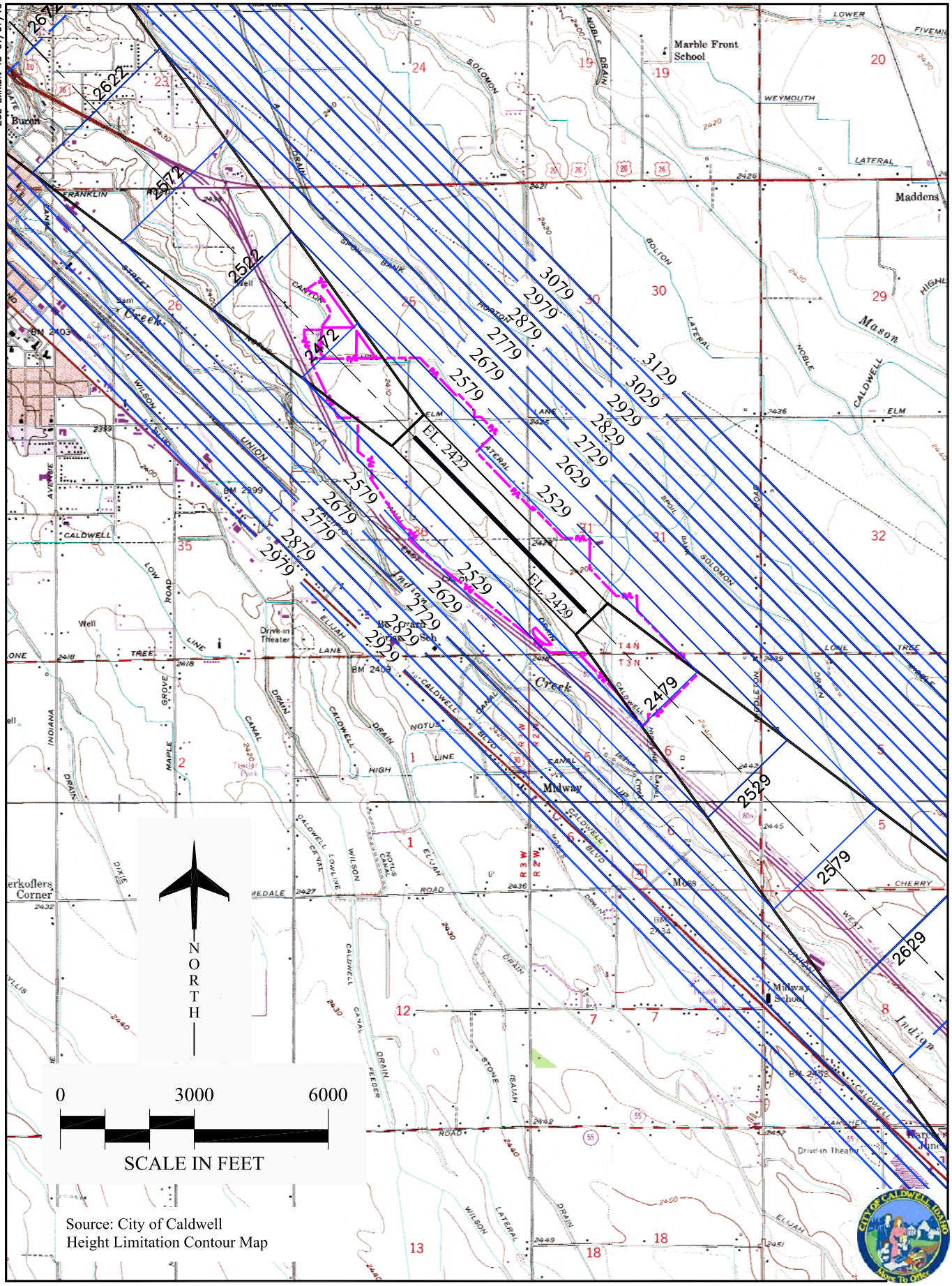

Exhibit 1D
HEIGHT LIMITATION CONTOUR MAP

ties and various types of general aviation users.

- **Community Business Airports**: Community business airports serve a limited role in regional economies, primarily supporting community economies. They accommodate a variety of general aviation activities such as business, recreational, and personal flying.

- **Local Recreational Airports:** Local recreational airports serve a supplemental role in local economies, primarily serving recreational, personal flying, and limited local business activities.

- **Basic Service:** Basic service airports serve a limited role in the local economy, primarily serving recreational and personal flying.

Caldwell Industrial Airport is considered a Regional Business Airport. **Table 1C** presents the minimum recommended objectives for development of these airports.

TABLE 1C
Idaho Airport Role Criteria for Regional Business Airports

Airport Criteria	Minimum Objectives
Runway Length	To accommodate 75 percent of large aircraft at 60 percent useful load
Runway Width	75 feet
Runway Strength	Single-wheel landing gear - 30,000 pounds
Taxiway	Full or Partial Parallel
Instrument Approach	Non-Precision Approach, Near Precision Approach or LPV desired
Visual Aids	Rotating Beacon, Lighted Wind Cone, REILs, PAPIs, VASIs, ALS
Runway Lighting	MIRL, HIRL as required
Weather Reporting Facilities	On-site ASOS or AWOS
Services	Phone, Restroom, FBO, Maintenance Facilities, AvGas and Jet A Fuel, Rental Car Access
Facilities	Terminal with Public Restrooms and Pilots Lounge; Hangar Storage for 60% of Based Aircraft and 25% of Transient Aircraft; Apron (Tie-Downs) for 40% of Based Fleet and 50% of Transient; Auto Parking

ASOS: Automated Surface Observation System
AWOS: Automated Weather Observation System
LPV: Localizer Performance with Vertical Guidance
REIL: Runway End Identification Lighting
PAPI: Precision Approach Path Indicator
VASI: Visual Approach Slope Indicator
ALS: Approach Lighting System
MIRL/HIRL: Medium/High Intensity Runway Lighting
FBO: Fixed Base Operator

Source: Idaho Airport System Plan (Draft 2008)

At the national level, the Caldwell Industrial Airport is one of 38 Idaho airports included in the *National Plan of Integrated Airport Systems* (NPIAS). The NPIAS includes a total of 3,356 existing airports which are significant

to national air transportation. Of this total, 2,834 are general aviation or reliever airports. Reliever airports are high-capacity general aviation airports located in metropolitan areas. These specialized airports serve as an attractive alternative for general aviation pilots than more congested commercial service airports. Caldwell is the only designated reliever airport in Idaho and provides general aviation relief for Boise Airport.

The NPIAS is published and used by the Federal Aviation Administration (FAA) in administering the Airport Improvement Program (AIP), which is the source of federal funds for airport improvement projects across the country. The AIP program is funded exclusively by user fees and user taxes, such as those on fuel and airline tickets. The 2009-2013 NPIAS estimates $49.7 billion is needed for airport development across the country over the next five years. An airport must be included in the NPIAS to be eligible for federal funding assistance through the AIP.

The NPIAS supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility by identifying specific airport improvements. The current issue of the NPIAS identifies approximately $17 million in development needs over the next five years for Caldwell Industrial Airport. This figure is not a guarantee of federal funding; instead, this figure represents development needs as presented to the FAA in the annual airport capital improvement program.

Municipalities that apply for and accept AIP grants for their aviation facilities must provide grant assurances. These assurances include maintaining the airport facility safely and efficiently in accordance with specific conditions. The duration of the assurances depends on the type of airport, the useful life of the facility being developed, and other factors. Typically, the useful life for an airport development project is a minimum of 20 years. Thus, when an airport accepts AIP grants, they are obligated to maintain that facility in accordance with FAA standards for at least that long.

Of the $49.7 billion in airport development needs nationally, approximately 10 percent is designated for the 270 reliever general aviation airports, as shown in **Table 1D**. Reliever airports average 230 based aircraft and account for 28 percent of the national general aviation fleet. The eligible 2,564 general aviation airports account for 19 percent of the development needs and average 35 based aircraft and account for 41 percent of the nation's general aviation fleet.

AIRSIDE FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities which are needed for the safe and efficient movement of aircraft, such as runways, taxiways, lighting, and navigational aids. The landside category includes those facilities necessary to provide a safe transition from surface-to-air transportation and to support aircraft servicing, storage, maintenance, and operational safety on the ground.

TABLE 1D
NPIAS Distribution of Activity

Number of Airports	Airport Type	% of Enplanements	% of Based Aircraft	% NPIAS Costs
522	Commercial Service	99.9	21	71
270	Relievers	0	28	10
2,564	General Aviation	0	41	19
3,356	Existing NPIAS Airports	99.9	90	100
16,459	Non-NPIAS Airports	0.1	10	0

Source: 2009-20013 National Plan of Integrated Airport Systems (NPIAS)

Existing airside facilities are identified on **Exhibit 1E**. **Table 1E** summarizes airside facility data for Caldwell Industrial Airport.

TABLE 1E
Airside Facility Data
Caldwell Industrial Airport

	RUNWAY 12-30
Runway Length (feet)	5,500
Runway Width (feet)	100
Runway Surface Material (Condition)	Asphalt/Good Condition
Runway Markings-Condition (Runway)	Non-precision/Good Condition
Runway Lighting	Medium Intensity Runway Lighting
Runway Load Bearing Strength (pounds)	
Single Wheel Loading (SWL)	72,000 pounds
Dual Wheel Loading (DWL)	86,000 pounds
Taxiway Lighting	Medium Intensity Taxiway Lighting
Taxiway, Taxilanes & Apron Lighting	Centerline Marking, Tie-down area marking
Traffic Pattern	Right(30)/Left(12)
Visual Approach Aids	PAPI-4L
Instrument Approach Aids	RNAV/LPV GPS (12) NDB (30) RNAV/LPV GPS (30)
Weather and Navigational Aids	Automated Weather Observation System (AWOS-3) Lighted Wind Cone Airport Beacon Segmented Circle

GPS - Global Positioning System
NDB - Non-Directional Beacon
RNAV - Area Navigation
LPV - Localizer Performance with Vertical Guidance
PAPI - Precision Approach Path Indicator

Source: Airport/Facility Directory - Northwest U.S. (October 22, 2009); Airport records.

RUNWAY

Caldwell Industrial Airport is served by a single runway oriented from the northwest to the southeast and designated Runway 12-30. The runway is 5,500 feet long, 100 feet wide, and constructed of asphalt, which is in good condition. The pavement has been strength-rated at 72,000 pounds single wheel loading (SWL), and 86,000 pounds dual wheel loading (DWL). These strength ratings refer to the configuration of the aircraft landing gear. For example, SWL indicates an aircraft with a single wheel on each landing gear.

PAVEMENT CONDITIION

Since the mid-1980s, the Idaho Transportation Department - Division of Aeronautics has participated in pavement management and repair at 45 airports in the state. Every three years, on a rotating schedule, the pavement at each of these airports is inspected. The information and data generated ensures airport sponsors are in compliance with the requirements of FAA Grant Assurance Number 11, which states that any airport requesting federal funds for pavement improvement projects must have implemented a pavement maintenance management program.

The most recent inspection at Caldwell Industrial Airport was on November 6, 2007. The inspections are conducted in compliance with FAA Advisory Circular (AC) 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*. The inspection data is entered into the MicroPAVER software for analysis. The MicroPAVER database ensures that the airport complies with the "record keeping and information retrieval" requirements of the FAA grant assurances.

The MicroPAVER software calculates a Pavement Condition Index (PCI) for each section of pavement on the airfield (runways, taxiway, and aprons). The program also generates forecasts of pavement conditions 5 and 10 years into the future. The pavement condition index map for Caldwell Industrial Airport is presented on **Exhibit 1F**.

As of November 2007, the majority of pavement composing the taxiway system was in "excellent" condition. The runway was in "very good" condition. By 2017, the majority of the runway and taxiway system is forecast to still be in "good" or "very good" condition. The northern portion of the parallel taxiway is forecast to be in "fair" condition by 2017. Generally, the runways and taxiways should be maintained at 70 PCI or greater and the other pavements should be at 55 or better. The MicroPAVER software also produces detailed reports on what on-going routine maintenance should be performed in order to maintain these condition levels.

TAXIWAYS

The runway is accessible from full-length parallel Taxiway A which is situated to the southwest and 400 feet from the runway, centerline to centerline. Partial parallel Taxiway C is lo-

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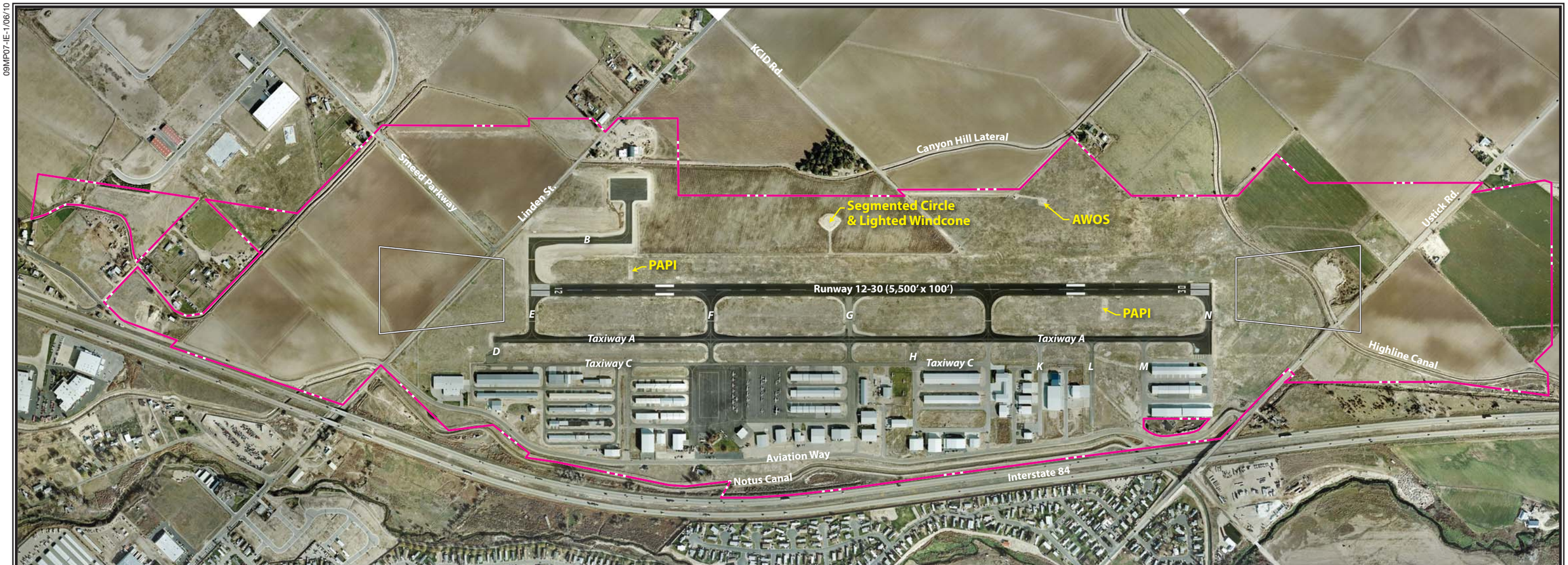


LEGEND

Airport Property Line

Runway Protection Zone (RPZ)

NORTH

0 800 1600

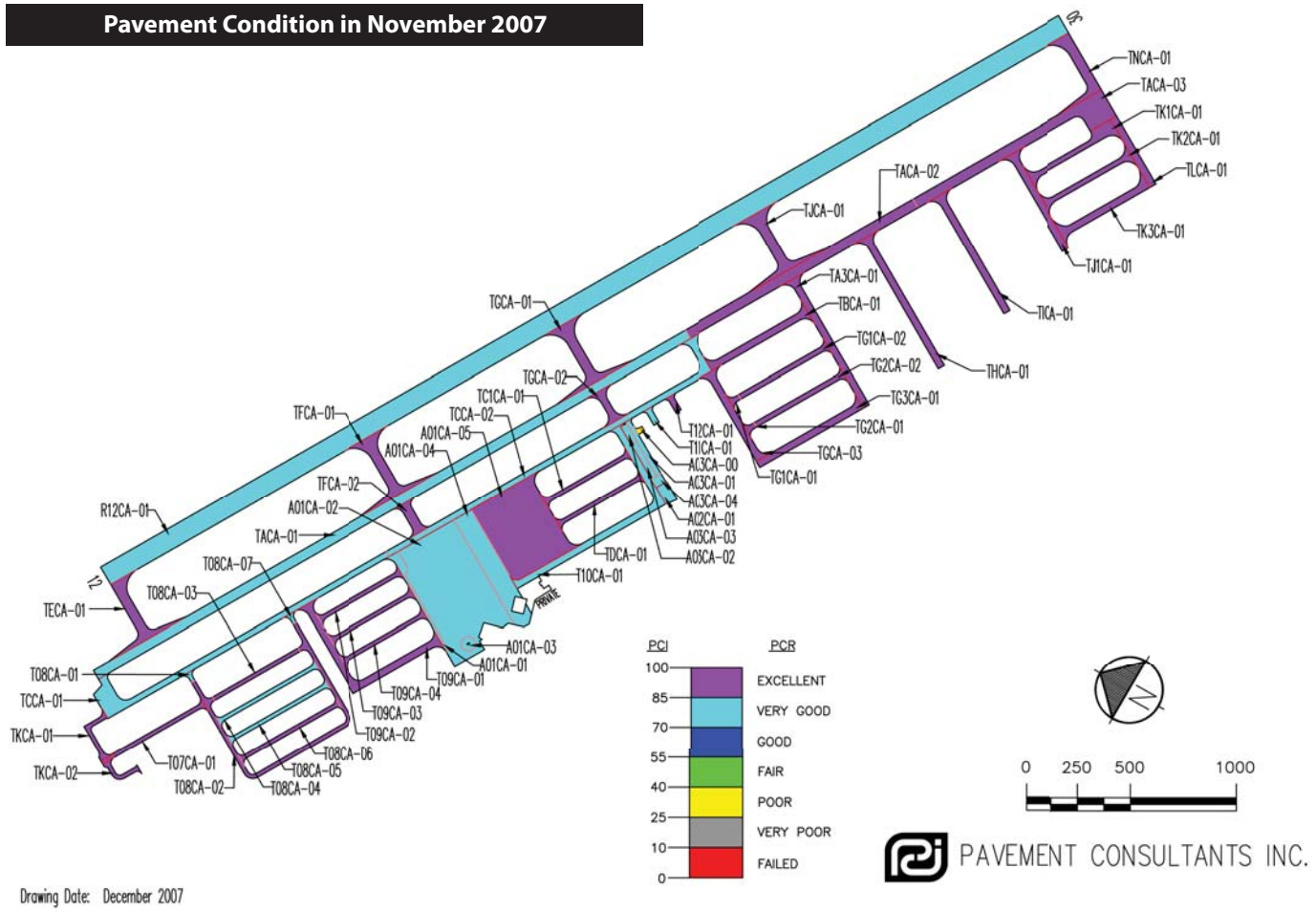
SCALE IN FEET

Photo Date: November 16, 2009

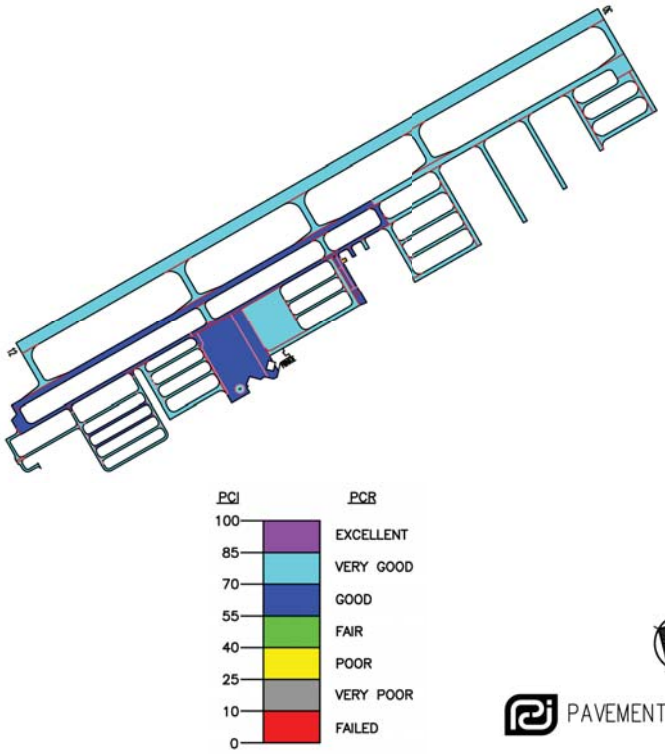
Exhibit 1E
AIRSIDE FACILITIES

09MP07-1F-11/24/09

Pavement Condition in November 2007



Predicted Pavement Condition in 2012



Predicted Pavement Condition in 2017

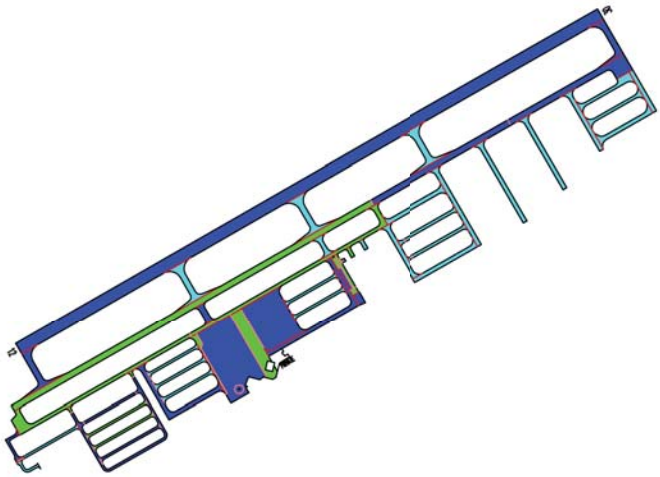


Exhibit 1F
CURRENT AND FUTURE PAVEMENT CONDITION

cated an additional 200 feet to the southwest of parallel Taxiway A. The Runway 12 threshold taxiway is Taxiway E and the Runway 30 threshold taxiway is Taxiway N. There are three additional runway entrance/exit taxiways labeled Taxiways F, G, and J (from northwest to southeast). Taxiway B is the recently constructed partial parallel located on the northeast side of the airport. This taxiway provides access to the new apron fronting the new terminal building.

Taxiways D, H, and J connect between Taxiway A and Taxiway C. Taxiways K, L, and M extend from Taxiway C into hangar areas. The parallel taxiways and the runway entrance/exit taxiways are 50 feet wide. Other taxiways vary in width between 30 and 40 feet.

PAVEMENT MARKINGS

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. Both runway ends have non-precision markings that include the runway centerline, threshold, designation, and aiming point. The runway hold lines are located 250 feet from the runway centerline on each of the taxiways. Taxiway and apron centerline markings assist pilots when moving on these surfaces. In addition, most aircraft tie-down areas are outlined with white striping.

AIRFIELD LIGHTING

Airfield lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. A variety of lighting systems are installed at the airport for this purpose. These lighting systems, categorized by function, are summarized as follows:

Identification Lighting: The location of the airport at night is universally identified by a rotating beacon. The rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The beacon is located in the northwest corner of airport property.

Runway and Taxiway Lighting: Runway and taxiway lighting utilizes light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility in order to maintain safe and efficient access to and from the runway and aircraft parking areas.

The runway is equipped with medium intensity runway lighting (MIRL). These are lights set atop a pole that is approximately one foot above the ground. The light poles are frangible, meaning if one is struck by an object, such as an aircraft wheel, they can easily break away, thus limiting the potential damage to an aircraft. Runway threshold lighting identifies each runway end.

Medium intensity taxiway lighting (MITL) is associated with the taxiways. These lights are mounted on the same type of structure as the runway lights.

Visual Approach Lighting: Pilots approaching either runway end can visually interpret the Precision Approach Path Indicator lights (PAPIs) to determine if they are on the correct glide path to the runway. The PAPIs at Caldwell Industrial Airport provide four lights, each of which is either red or white depending on the elevation of the aircraft. Two white lights followed by two red lights indicate that the aircraft is on the correct three-degree glide path.

Airfield Signs: Airfield identification signs assist pilots in identifying their location on the airfield and direct them to their desired location. The airfield signs, including the runways, taxiways, and distance-to-go markers, are lighted at Caldwell Industrial Airport.

Pilot-Controlled Lighting: The PAPIs operate continuously while the runway and taxiway lights are turned to low intensity at night. Through a series of clicks of their radio transmitter, pilots can increase the intensity of these lights from the air. Typically, the airfield lights will revert to low intensity after approximately 15 minutes.

WEATHER AND COMMUNICATION AIDS

Caldwell Industrial Airport has a lighted wind cone located within the segmented circle. An unlighted wind cone is located on the west side of the main terminal area apron. The wind cones provide information to pilots regarding wind conditions, such as direction and speed. The segmented circle provides traffic pattern information to pilots.

Caldwell Industrial Airport is equipped with an Automated Weather Observation System (AWOS-3). The AWOS automatically records weather conditions such as wind speed, wind gust, wind direction, temperature, dew point, altimeter setting, visibility, fog/haze condition, precipitation, and cloud height. This information is then transmitted at regular intervals (usually once per hour). Aircraft in the vicinity can receive this information if they have their radio tuned to the correct frequency (135.075 MHz). In addition, pilots and individuals can call a published telephone number and receive the information via an automated voice recording.

Caldwell Industrial Airport utilizes a common traffic advisory frequency (CTAF). This radio frequency (122.7 MHz) is used by pilots in the vicinity of the airport to communicate with each other about approaches or take-

offs from the airport. In addition, a UNICOM frequency is also available (122.7 MHz) where a pilot can obtain fixed base operator (FBO) information. Boise Approach and Departure clearance is available via frequency 119.6 MHz. Additional communication with the Boise Flight Services Station is available via the Butte Remote Communication Outlet. The RCO provides ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering enroute clearances, departure clearances, and acknowledging instrument flight rule cancellation or departure/landing times.

NAVIGATIONAL AIDS

Navigational aids are electronic devices that transmit radio frequencies, which pilots of properly equipped aircraft can translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying in the vicinity of Caldwell Industrial Airport include non-directional beacons (NDBs), a very high frequency omnidirectional range (VOR) facility, and the global positioning system (GPS).

The NDB transmits nondirectional radio signals whereby the pilot of an aircraft equipped with direction-finding equipment can determine their bearing to or from the NDB facility in order to track to the beacon station. The Meridian NDB is approximately 4.8 nautical miles (nm) to the southeast of the airport. The Ustik NDB is approximately 14.2 nm to the southeast of the airport and the Ontario NDB is 28 nm to the northwest of the airport. These facilities can be used by pilots to track to the region. Other navigational aids can then be utilized to track to the airport.

The very high omnidirectional range (VOR), in general, provides azimuth readings to pilots of properly equipped aircraft transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility (VOR/DME) to provide distance, as well as direction, information to the pilot. Military tactical air navigation aids (TACANs) and civil VORs are commonly combined to form a VORTAC. The VORTAC provides distance and direction information to both civil and military pilots. The BOI VOR is located 20 nm to the southeast at the Boise Airport.

GPS is an additional navigational aid for pilots. GPS was initially developed by the United States Department of Defense for military navigation around the world. GPS differs from an NDB or VOR in that pilots are not required to navigate using a specific ground-based facility. GPS uses satellites placed in orbit around the earth that transmit electronic radio signals, which pilots of properly equipped aircraft use to determine altitude, speed, and other navigational information. With GPS, pilots can navigate directly to any airport in the country and are not required to navigate using a ground-based navigational facility.

Loran-C is another point-to-point navigation system available to pilots. Where GPS utilizes satellite-based

transmitters, Loran-C uses a system of ground-based transmitters.

AREA AIRSPACE

The Federal Aviation Administration (FAA) Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. airspace, including air navigational facilities; airports and landing areas; aeronautical charts; associated rules, regulations, and procedures; technical information; and personnel and material. System components shared jointly with the military are also included as part of this system.

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the nation's airspace. The U.S. airspace structure provides for categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G as described below. **Exhibit 1G** generally illustrates each airspace type in three-dimensional form.

- Class A airspace is controlled airspace and includes all airspace from 18,000 feet mean sea level (MSL) to Flight Level 600 (approximately 60,000 feet MSL).

- Class B airspace is controlled airspace surrounding high-activity commercial service airports (i.e., Denver International Airport).

- Class C airspace is controlled airspace surrounding lower-activity commercial service (i.e., Boise Airport) and some military airports.

- Class D airspace is controlled airspace surrounding low-activity commercial service and general aviation airports with an ATCT. (i.e., Joslin Field – Magic Valley Regional Airport).

All aircraft operating within Classes A, B, C, and D airspace must be in constant contact with the air traffic control facility responsible for that particular airspace sector.

- Class E airspace is controlled airspace surrounding an airport that encompasses all instrument approach procedures and low-altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio contact with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist.

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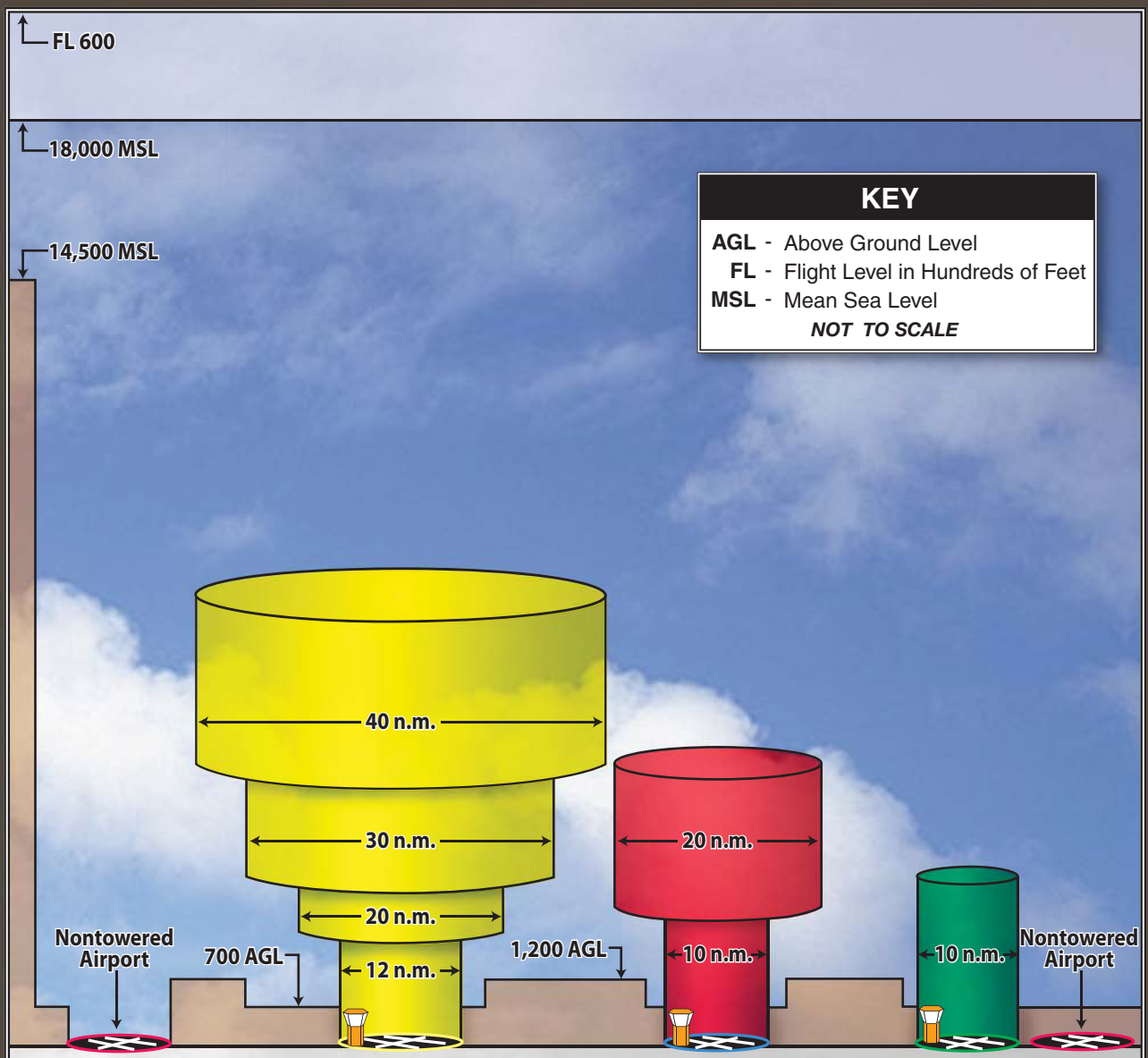

CLASSIFICATION	DEFINITION
CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600.
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.

Source: "Airspace Reclassification and Charting Changes for VFR Products," National Oceanic and Atmospheric Administration, National Ocean Service. Chart adapted by Coffman Associates from AOPA Pilot, January 1993.

Exhibit 1G
AIRSPACE CLASSIFICATION

- Class G airspace is uncontrolled airspace that does not require communication with an air traffic control facility.

Caldwell Industrial Airport falls within Class E airspace, which is depicted on the sectional chart presented on **Exhibit 1H**.

Victor Airways

Victor Airways are designated navigational routes extending between VOR facilities. Victor Airways have a floor of 1,200 feet above ground level and extend upward to an altitude of 18,000 feet MSL. Victor Airways are eight nautical miles wide. There are eight designated Victor Airways leading to/from the BOI VOR facility located at Boise Airport. The Victor Airway designated V-500 passes two miles to the north of Caldwell Industrial Airport on radial 278°.

Military Operations Areas (MOAs)

A Military Operations Area (MOA) is an area of airspace designated for military training use. This is not restricted airspace as civil pilots can use the airspace. However, they should be on alert for the possibility of military traffic. A pilot may need to be aware that military aircraft can be found in high concentrations, conducting aerobatic maneuvers, and possibly operating at high speeds and lower elevations. The activity status of an MOA is advertised by a *Notice to Airmen* (NOTAM) and noted on sectional charts.

Several MOAs are located in the vicinity of Caldwell Industrial Airport. To the south and southeast are the Owyhee MOA, the Jarbridge MOA, and the Paraside East MOA, which are primarily associated with activity originating from Mountain Home Air Force Base (AFB). To the south west is the Saddle A MOA.

Military Training Routes

A Military Training Route, or MTR, is a specified training route for military pilot proficiency. Aircraft operate on the MTR at speeds in excess of 250 knots and up to 10,000 feet MSL. Several MTRs are located to the north and west of Caldwell Industrial Airport. General aviation pilots should be aware of the locations of the MTRs and exercise special caution if they need to cross them.

Restricted Areas

According to the FAA, "Restricted areas denote the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles. Penetration of restricted areas without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants." The restricted area designated R-3202 A&B is approximately 20 miles south of Boise. The restricted area designated R-3202

is located to the immediate southeast of Mountain Home AFB.

Caldwell Industrial Airport has been established as one of five "drop zones" in Idaho and one of 288 in the United States (www.dropzone.com). Each of these sites is so designated on aeronautical sectional charts with a small parachute. There are at least two companies, Skydive Idaho and Skydown Sport Skydiving, which utilize Caldwell Industrial Airport for parachute jumps. An annual NOTAM (Notice to Airmen) that simply alerts pilots to the possibility of parachute activity is posted for established drop zones. To establish a drop zone (and thereby have the drop zone on the aeronautical chart), the airport parachute operation must meet three criteria: 1) been in operation for at least one year; 2) operate year round (at least on weekends) and; 3) log 4,000 or more jumps each year.

INSTRUMENT APPROACH PROCEDURES

Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic navigational aids to assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. The capability of an instrument approach is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance that the pilot must be able to see to complete the approach. Cloud ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for a pilot to complete the approach. If the observed visibility or cloud ceiling is below the minimums prescribed for the approach, the pilot cannot complete the instrument approach.

Three instrument approaches have been approved for Caldwell Industrial Airport. The detail for the instrument approaches is presented in **Table 1F**.

The airport has an array of GPS approaches to both runway ends. The most sophisticated approach is the Localizer Performance with Vertical Guidance (LPV) approach to both Runway 30 and Runway 12, which provides for cloud ceilings as low as 300 feet and visibility not lower than 1 mile. This approach is available to all general aircraft categories from the smallest single engine piston aircraft to the largest business jets. Several variants to the GPS approach are also available, including circling approaches.

An NDB approach utilizing the Meridian NDB is available to Runway 30. The minimum cloud ceiling is 700 feet and the visibility minimum varies as a function of the aircraft approach speed. Slower single engine piston aircraft have a visibility minimum not lower than 1 mile, while faster business jets require as much as two miles visibility.

Local Operating Procedures

Caldwell Industrial Airport is situated at 2,432 feet MSL. Helicopters are instructed to utilize the outer taxiway

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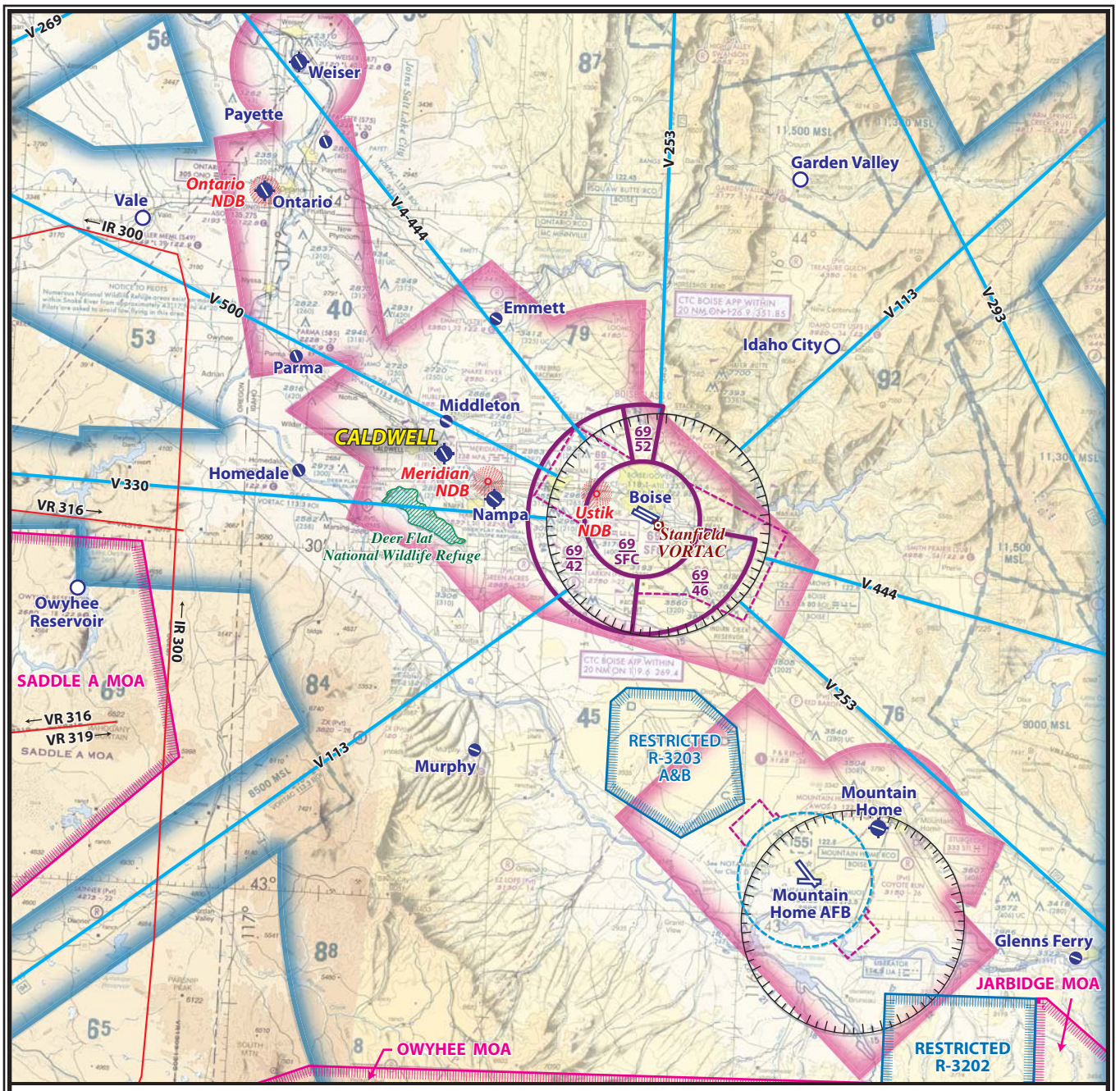


LEGEND

- Airport with other than hard-surfaced runways
- Airport with hard-surfaced runways 1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- VORTAC
- Non-Directional Radiobeacon (NDB)
- Compass Rose
- Military Operations Area (MOA)
- Restricted Areas
- Class E Airspace with floor 700' above surface
- Class E Airspace with floor 1200' or greater above surface
- Wilderness Areas
- Military Training Routes
- Victor Airways
- Class E (sfc) Airspace
- Class D Airspace
- Class C Airspace

Note: Not to be used for navigation

Source:
Klamath Falls North & Salt Lake City North Sectional Chart, US Department of Commerce, National Oceanic and Atmospheric Administration, May 7, 2009

NORTH

NOT TO SCALE

Exhibit 1H
AREA AIRSPACE

while fixed wing aircraft are instructed to utilize the inner taxiway where possible. There is frequent parachute and ultralight activity in the area. The airport utilizes a non-standard right-hand traffic pattern for Runway 30 and standard left-hand traffic pattern for Runway 12. This traffic pattern for Runway 30 is intended to keep aircraft away from the more populated areas of the city to the west.

Runway use is dictated by prevailing wind conditions. Ideally, it is desirable for aircraft to land directly into the wind. The prevailing wind condition is from the northwest leading to greater usage of Runway 30 approximately 60 percent of the time.

TABLE 1F
Instrument Approach Data
Caldwell Industrial Airport

	WEATHER MINIMUMS BY AIRCRAFT TYPE					
	Categories A & B		Category C		Category D	
	CH	VIS	CH	VIS	CH	VIS
RNAV (GPS) RWY 30						
LPV	300' Cloud Height / 1-mile Visibility					
LNAV/VNAV DA	400' Cloud Height / 1¼-mile Visibility					
LNAV MDA	500'	1-mile	500'	1¼-mile	500'	1½-mile
Circling	700'	1-mile	700'	1¾-mile	700'	2-mile
RNAV (GPS) RWY 12						
LPV DA	300' Cloud Height / 1-mile Visibility					
LNAV/VNAV DA	600' Cloud Height / 2-mile Visibility					
LNAV MDA	500'	1-mile	500'	1¼-mile	500'	1¼-mile
Circling	700'	1-mile	700'	1¾-mile	700'	2-mile
NDB RWY 30						
Straight-In	700'	1	700'	1¾-mile	700'	2-mile
Circling	700'	1	700'	1¾-mile	700'	2-mile
DME MINIMUMS						
LNAV MDA	600'	1	600'	½-mile	600'	1½-mile
Circling	700'	1	700'	1¾-mile	700'	2-mile

Aircraft Categories are based on 1.3 times the stall speed in landing configuration as follows:

Category A:	0-90 knots (Cessna 172)
Category B:	91-120 knots (Beechcraft KingAir)
Category C:	121-140 knots (Canadair Challenger)
Category D:	141-166 knots (Gulfstream IV)

Abbreviations:
CH - Cloud Height (in feet above ground level)
VIS - Visibility Minimums (in miles)
LPV - Localizer performance with vertical guidance
LNAV - Lateral Navigation
VNAV - Vertical Navigation
MDA - Minimum Decision Altitude
DA - Decision Altitude

Source: U.S. Terminal Procedures, Southwest (October 22, 2009)

The FAA Airport/Facility Directory identifies several conditions for pilots to be aware of in the vicinity of the airport. Linden Road is approximately 400 feet from Runway 12 and 250 feet left of the centerline. A 22:1 approach slope is recommended to clear the road. There is a 363-foot tall communications tower approximately 1.4 miles to the north of the airport.

Aircraft taking off on Runway 12 are instructed to maintain a standard minimum climb of 300 feet per nautical mile on heading 119° to 5,600 feet MSL before proceeding on course. Departures on Runway 30 are instructed to climb via heading 299° to 4,400 feet MSL before proceeding on course. Pilots should also be aware of various trees and poles in the vicinity of the runway ends.

LANDSIDE FACILITIES

Landside facilities are the ground-based facilities that support the aircraft and pilot/passenger handling functions. These facilities typically include the FBOs, aircraft storage hangars, aircraft maintenance hangars, aircraft parking aprons, and support facilities such as fuel storage, automobile parking, roadway access, and aircraft rescue and firefighting. Landside facilities are identified on **Exhibit 1J**.

AIRPORT BUSINESSES

The Caldwell Industrial Airport supports both aeronautical and non-aeronautical related businesses. **Table 1G** presents a list of businesses with operations at the airport. Many of these businesses are directly related to aviation such as the two fixed base operators that are providing services to aviation users of the airport. Other businesses have aircraft based at the airport that are utilized in support of their core business function but are not providing aviation-related services to the general public.

AIRCRAFT PARKING APRON

The airport has a main central aircraft apron that encompasses approximately 39,000 square yards of pavement. Approximately two-thirds of the apron is dedicated to approximately 56 locally based aircraft tie-down positions. The remaining third of the apron is identified for transient aircraft parking. A new apron was constructed in 2009 in the northeast portion of the airport fronting the new terminal building. This apron is approximately 6,000 square yards.

AIRPORT HANGARS AND BUILDINGS

The Caldwell Industrial Airport offers the full range of aircraft hangar types. There are three T-hangar buildings with 23 positions. There are numerous connected-box and stand-alone box hangars. There are also several large conventional and commercial hangars. Most of the hangars are privately owned and managed. There are 264 hangars at the airport as identified through physical count. There are estimated to be 452 potential hangar po-

sitions that could be used to store aircraft. The number of potential hangar positions was developed by cross referencing hangar occupancy with hangar leases. **Exhibit 1J** includes a listing of the hangar facilities as well as estimates of the hangar space available at the airport.

TABLE 1G
Airport Businesses
Caldwell Industrial Airport

Company Name	Business Type
Airport Café	Restaurant
Aero-Flight	Flight Training, FAA Examiner
Airplane Over Idaho	Aircraft Storage – Museum
Aviation Maintenance Center	Aircraft Maintenance
Dreamland Aviation	FBO-Aircraft Storage
Highland Appraisal	Office/Aircraft Storage
Hinkle Aviation	Flight Training
Jackson Aviation	Flight Training/Charter
PAC Industries	Aircraft Covering - Kit Construction
Performance Air	Aircraft Maintenance & Construction
Rapid Refueling	FBO-Avgas
Sky Down	Sky Diving
Sky Rider, LLC	Aircraft Kit Construction
Shore & Shore Aviation	Aircraft Maintenance
Silverhawk Aviation, LLC	FBO-Fuel, Storage
Valley Air Photos	Aerial Photography
West One	Aircraft Sales
White Cloud Aviation, LLC	Light Aircraft Service

Source: City of Caldwell website accessed on 10-6-09.

AUTOMOBILE PARKING

Most of the automobile parking at the airport is associated with individual hangars or buildings. The individual box and conventional hangars have dedicated parking spaces. The connected box hangars and T-hangars do not have marked parking spaces. Typically, users of these hangars will drive their vehicle to the hangar and park in the hangar or immediately adjacent to it. This is a common practice at general aviation airports.

Public parking is available for airport visitors to the public facilities. A parking lot providing approximately 50 spaces is available to the immediate west of the current terminal building. The new terminal building is planned to have 36 parking spaces, including three handicap spaces.

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)

As a general aviation reliever airport, Caldwell Industrial Airport is not required to have on-airport emergency response. In case of emergency, the City of Caldwell fire department will respond. Fire Station No. 1 is the

closest to the airport and is located at 310 S. 7th Street, approximately three miles to the northwest of the airport.

The fire department maintains 100 gallons of aqueous film-foaming foam (AFFF) in 3 percent concentrate form at Fire Station No. 1. An additional 600 gallons of AFFF concentrate is available to be delivered to the airport within 5 to 10 minutes. When mixed with water, approximately 3,500 gallons of AFFF can be applied by the first responders from Fire Station No. 1. The fire department does not currently maintain a supply of sodium or potassium based dry chemical.

The fire department will periodically conduct airport/aircraft fire rescue drills. Currently, these drills are lead by a firefighter who had previous ARFF training while serving in the Air Force. The City of Caldwell has plans to build a third fire station on or adjacent to the airport within the next three to five years.

AIRPORT MAINTENANCE

Maintenance equipment is stored in an airport owned structure that is located northwest of Linden Street along Aviation Way. The airport has snow removal equipment, including a work truck that can be outfitted with a plow and a separate front loader. A contract handyman operates the airport maintenance equipment as needed.

UTILITIES

Water and sanitary sewer service is provided by the City of Caldwell to the south side of the runway. A 10-inch water main is located along the north side of the runway. Idaho Power Company provides electricity and data services to the airport. Intermountain Gas Company provides natural gas services. Data communications and telephone service is provided by Quest Communications.

FUEL FACILITIES

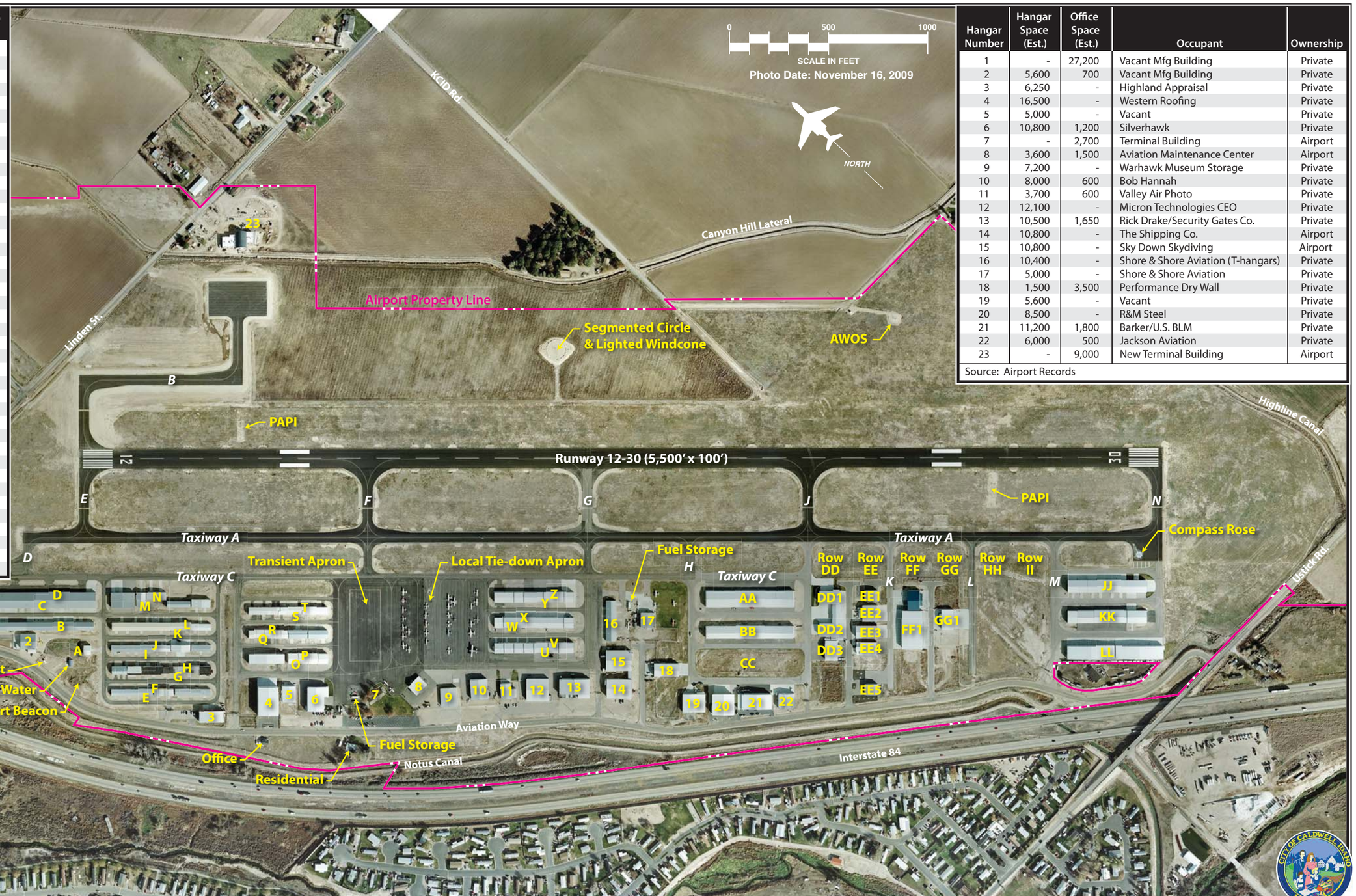
There are two fuel providers at the airport. Silverhawk Aviation is a full service FBO that provides both Avgas and Jet A fuel. They own and maintain a 10,000 gallon aboveground Avgas tank and a 2,500 gallon Jet A refueling truck. Rapid Refueling owns and maintains a 10,000 gallon aboveground fuel tank with self-serve capability. Both fuel retailers pay a fuel flowage fee on a per gallon basis to the airport. **Table 1H** presents fueling information.

FENCING

The perimeter fence is six feet high chain-link topped with three strand barbed wire. The fencing currently extends along the entirety of Aviation Way and extends approximately ½-mile to the east along both Ustick Road and Linden Street. There are six

09MP07-1J-1/4/10

Hangar Type	Row/Max Units	Area (s.f.) Est.
Box	A/1	1,600
Box	B/10	19,600
Box	C/10	20,000
Box	D/11	20,000
T-Hangar	E/8	10,000
T-Hangar	F/7	10,000
T-Hangar	G/8	10,000
Box	H/6	10,000
Box	I/8	10,000
Box	J/7	10,000
Box	K/8	10,000
Box	L/6	10,000
Box	M/2	6,800
Box	M-N/8	10,500
Box	N/2	6,800
Box	O/7	8,700
Box	P/1	8,700
Box	Q/8	8,000
Box	R/8	8,000
Box	S/6	8,000
Box	T/7	8,000
Box	U-V/7	20,000
Box	W-X/8	20,000
Box	Y-Z/8	20,000
Box	AA/20	34,500
Box	BB/7	27,600
Box	CC/18	NA
Box	DD1/2	6,800
Box	DD2/2	6,800
Box	DD3/2	6,500
Box	EE1/1	3,500
Box	EE2/2	5,600
Box	EE3/3	6,000
Box	EE4/2	5,600
Box	EE5/1	2,800
Conventional	FF1/6	20,000
Box	GG1/2	4,000
Box	JJ/8	24,000
Box	KK/16	26,000
Conventional	LL/8	28,000



Hangar Number	Hangar Space (Est.)	Office Space (Est.)	Occupant	Ownership
1	-	27,200	Vacant Mfg Building	Private
2	5,600	700	Vacant Mfg Building	Private
3	6,250	-	Highland Appraisal	Private
4	16,500	-	Western Roofing	Private
5	5,000	-	Vacant	Private
6	10,800	1,200	Silverhawk	Private
7	-	2,700	Terminal Building	Airport
8	3,600	1,500	Aviation Maintenance Center	Airport
9	7,200	-	Warhawk Museum Storage	Private
10	8,000	600	Bob Hannah	Private
11	3,700	600	Valley Air Photo	Private
12	12,100	-	Micron Technologies CEO	Private
13	10,500	1,650	Rick Drake/Security Gates Co.	Private
14	10,800	-	The Shipping Co.	Airport
15	10,800	-	Sky Down Skydiving	Airport
16	10,400	-	Shore & Shore Aviation (T-hangars)	Private
17	5,000	-	Shore & Shore Aviation	Private
18	1,500	3,500	Performance Dry Wall	Private
19	5,600	-	Vacant	Private
20	8,500	-	R&M Steel	Private
21	11,200	1,800	Barker/U.S. BLM	Private
22	6,000	500	Jackson Aviation	Private
23	-	9,000	New Terminal Building	Airport

Source: Airport Records

Exhibit 1J
LANDSIDE FACILITIES

access gates along Aviation Way that are operable through a key card system. The airport administration issues key cards to authorized users. There is no fencing on the northeast side of the airport.

TABLE 1H
Fuel Information
Caldwell Industrial Airport

Capacity	Fuel Type	Tank Type	Age	Operator
10,000	Avgas	Aboveground	2002	Silverhawk
2,500	Jet A	Truck	1980s	Silverhawk
10,000	Avgas	Aboveground/Self-serve	1997	Rapid Refueling

FUEL FLOWAGE

Year	Avgas (gallons) Silverhawk	Jet A (gallons) Silverhawk	Avgas (gallons) Rapid Refueling
2004	80,000	8,000	71,712
2005	84,000	9,000	69,072
2006	88,000	10,000	67,607
2007	92,000	11,000	58,887
2008	94,000	12,000	68,078

Source: Airport Records

REGIONAL AIRPORTS AND SERVICE AREA

The proximity of other airports is largely the defining factor when describing an airport's service area. A review of public-use airports in the region was made to identify and distinguish the types of air services provided in the region. Information pertaining to each airport was obtained from FAA Form 5010, *Airport Master Record*, as well as the web site www.airnav.com.

It is important to consider the capabilities and limitations of other airports when planning for future changes or improvements at Caldwell Industrial Airport. The following are those public-use airports with asphalt or concrete runways that can serve general aviation aircraft. These airports are listed by their proximity to Caldwell Industrial Airport. **Table 1J** identifies the major characteristics of each airport.

Nampa Municipal Airport (S67) is a public-use airport located approximately six nautical miles southeast of Caldwell Industrial Airport. A single runway measuring 5,000 feet in length and designated Runway 11-29 is available for use. There are approximately 330 based aircraft. A full range of general aviation services are available, including aircraft maintenance and fuel. A straight-in GPS instrument approach is available to Runway 11. The airport does not have an airport traffic control tower.

TABLE 1J
Public-Use Airports Near Caldwell Industrial Airport

Airport Name	Distance (nm)	Type	Longest Runway	Based Aircraft	Annual Operations	Instrument Approaches
Nampa Municipal (S67)	6 SE	GA	5,000	330	105,500	Yes
Homedale Municipal (S66)	12 W	GA	2,900	15	7,000	No
Emmett Municipal (S78)	13 NNE	GA	3,250	21	12,000	No
Parma Airport (50S)	15 WNW	GA	2,700	4	3,500	No
Boise Airport (BOI)	19 E	Commercial	10,000	291	134,000	Yes
Murphy Airport (1U3)	26 S	GA	2,500	NA	6,100	No
Ontario Municipal (ONO)	28 NW	GA	5,011	77	13,000	Yes
Weiser Municipal (S87)	37 N	GA	4,000	54	4,000	Yes

Source: FAA Form 5010, www.airnav.com

Boise Airport/Gowan Field (BOI) is the commercial service airport serving western Idaho. In 2007, the airport had approximately 1.7 million enplanements ranking as the 72nd busiest airport in the country. The airport is served by seven air carriers including Delta/Northwest, Frontier, Horizon Air, SkyWest, Southwest, United, and U.S. Airways. The airport serves a significant general aviation population as well. There are nearly 300 based aircraft, including 21 business jets, 20 helicopters, 38 multi-engine piston powered aircraft, and 166 single engine piston aircraft. In addition, Boise Airport is home to 46 military aircraft and the Idaho Air National Guard. The airport provides a parallel runway system, with one being 10,000 feet in length. Numerous instrument approaches are available, including precision approaches to both ends of Runway 10R-28L.

Ontario Municipal Airport (ONO) is located approximately 28 nautical miles to the northwest in Oregon. The single runway is 5,011 feet long. There are approximately 77 based aircraft, including three business jets. GPS instrument approaches are available to both ends of Runway 14-32. Full general aviation services are available.

Weiser Municipal Airport (S87) is located approximately 37 nautical miles north of Caldwell. Runway 12-30 is 4,000 feet long and approximately 54 aircraft are based at the airport. A circling GPS instrument approach is available. Limited general aviation services are available as Jet A fuel is not offered.

AIRPORT SERVICE AREA

The definition of an airport service area is subjective at best. The service area is loosely defined as a baseline geographical area from which future aviation demand (particularly based aircraft) is most likely to originate. With that said, some aircraft owners need to consider factors other than proximity to the airport when determining where to base their aircraft. For example, owners of business jets

would need an airport with adequate runway length regardless of their proximity to the airport. The definition of the airport service area helps to limit the factors that can ultimately influence the aviation demand forecasts, to be developed in the next chapter.

Caldwell Industrial Airport is located within the Treasure Valley in southwest Idaho. The Nampa Municipal Airport is the closest general aviation airport providing a similar level of services to Caldwell. Nampa Municipal Airport would limit the southeast extent of the primary service area for Caldwell. There are no comparable airports within 20 miles in the other directions.

In an effort to further define the airport service area an analysis of hangar leases for the airport was conducted. By utilizing the FAA aircraft registration database and cross referencing owner names or business names, it was determined that as much as 50 percent of the aircraft based at Caldwell Industrial Airport are registered to an address in Ada County. This information seems reasonable as there are more based aircraft (480) at the airport than there are registered aircraft in Canyon County (413). Therefore, the primary service area for Caldwell Industrial Airport would include Canyon County.

HISTORICAL AIRPORT ACTIVITY

At airports primarily serving general aviation activity, the number of based aircraft and the total annual operations (takeoffs and landings) are the primary indicators of aeronautical activity. These indicators will be used in subsequent analyses in this master plan update to project future aeronautical activity and determine future facility needs.

ANNUAL OPERATIONS

Aircraft operations are classified as local or itinerant. Local operations consist mostly of aircraft training operations conducted within the airport traffic pattern and touch-and-go and stop-and-go operations. Itinerant operations are arriving or departing aircraft which are not conducting operations within the airport traffic pattern.

Aircraft operations are further classified in three general categories: air taxi, general aviation, and military. Air taxi operations normally consist of the use of general aviation type aircraft for the "on-demand" commercial transport of persons and property in accordance with 14 CFR Part 135 and Subchapter K of 14 CFR Part 91. General aviation operations include a wide range of aircraft use ranging from personal to business and corporate uses. General aviation operations comprise the majority of operations at Caldwell Industrial Airport. Military use of the airport is limited.

Table 1K presents the historic operations at Caldwell Industrial Airport, as documented by the FAA, since 2002. Currently, local operations are estimated to account for approximately 75 percent of total operations. From 2002 to 2007, local operations were recorded by the FAA as 25 percent of

total operations. Between 2007 and 2008, the FAA revised figures so that the operational split more closely aligned with the high level of training activity at the airport. The FAA also began to recognize a limited number of operations by military aircraft. The overall operations count has shown a steady annual increase of approximately three percent.

BASED AIRCRAFT

Identifying the current number of based aircraft is critical to master plan analysis yet it can be challenging because reported based aircraft has not always been verified. Since the vast majority of hangar space is privately owned and leased, obtaining historical lease records is also difficult.

TABLE 1K
Historical Operations
Caldwell Industrial Airport

	Itinerant				Local			
Year	Air Taxi & Commuter	GA	Military	Subtotal	GA	Military	Subtotal	Total
2002	4,000	67,474	0	71,474	47,958	0	47,958	119,432
2003	4,000	69,535	0	73,535	49,423	0	49,423	122,958
2004	4,000	71,562	0	75,562	50,863	0	50,863	126,425
2005	4,000	73,622	0	77,622	52,327	0	52,327	129,949
2006	4,000	75,340	0	79,340	53,548	0	53,548	132,888
2007	4,000	77,097	0	81,097	54,797	0	54,797	135,894
2008	2,000	35,000	325	37,325	110,000	0	110,000	147,325
2009	2,000	35,817	325	38,142	112,566	0	112,566	150,708

Source: FAA APO Terminal Area Forecast (Dec 2009)

There are a number of data sources available for historical and current based aircraft numbers. The following list shows the source and the most recent corresponding based aircraft figure:

- 2009 FAA *Terminal Area Forecast*: 151 based aircraft in 2009
- 2008 FAA *Terminal Area Forecast*: 555 based aircraft in 2009
- 2009 FAA Form 5010 *Airport Master Record*: 121 based aircraft in 2009
- 2008 *Idaho Aviation System Plan*: 535 based aircraft in 2007
- GCR & Associates through FAA contract: 122 based aircraft in 2009

As can be seen there is wide range of opinions and perspectives on the number of based aircraft at Caldwell Industrial Airport. For the year 2009, the range of estimated based aircraft is from 121 to 555. In an effort to more accurately establish a baseline of based aircraft, the airport engineer with the assistance of airport management undertook a physical count of the aircraft at the airport. These findings are presented in **Table 1L**.

More than half of the hangars at the airport were physically inspected in October 2009. From this inspection, an estimate of 480 based aircraft for 2009 has been determined. This information will serve as the baseline based aircraft figure to be utilized in the aviation demand forecast to be developed in the next chapter.

TABLE 1L
Based Aircraft Physical Count – 2009
Caldwell Industrial Airport

	Private Hangar Inspections	Commercial Hangar Inspections	Tie-Down Inspections	Airport Totals
Number of Hangars	227	37	-	264
Number of Hangars Inspected	116	27	-	143
Percent of Hangars Inspected	51.1%	73.0%	-	54.2%
Actual Counted Aircraft				
Single Engine	148	58	20	226
Multi-engine	3	4	7	14
Turboprop	1	4	0	5
Jets	3	0	0	2
Helicopters	0	11	0	11
Total Counted	155	77	27	259
Estimated Aircraft based on Inspection Counts				
Single Engine	290	114	20	424
Multi-engine	6	8	7	21
Turboprop	2	8	0	10
Jets	3	0	0	3
Helicopters	0	22	0	22
Total Based Aircraft	**301**	**152**	**27**	**480**

Source: Airport Management and Kimley-Horn and Associates physical inspections (10-09)

ENVIRONMENTAL INVENTORY

A review of the potential environmental impacts associated with proposed airport projects is an essential consideration in the Airport Master Plan process. The intent of this inventory is to identify potential environmental sensitivities or resources that might be impacted by future improvements at the airport. The information contained in this section was obtained from official internet resources, agency maps, and previous environmental studies undertaken at the airport.

Research was done for each of the 23 environmental impact categories described within the FAA's *Environmental Desk Reference for Airport Actions*. It was determined that the following resources are not present with the airport environs or cannot be inventoried:

Resources That Were Not Present:

- Coastal Resources (Coastal Barriers and Coastal Zones) – the airport is inland and not subject to any coastal restrictions.
- Department of Transportation Act: Section 4(f) - no publicly owned land from a park, recreational area, or wildlife and waterfowl refuge of national, state, or local significance; or any land from a historic site of national, state, or local significance is present within the airport environs.
- Wild and Scenic Rivers – no wild or scenic rivers are located in proximity to the airport. The nearest designated wild or scenic river is the Owyhee River, located approximately 23 miles northwest of the airport.

Resources That Were Not Inventoried:

- Construction Impacts
- Energy Supply and Natural Resources
- Noise
- Social Impacts

The following sections provide a discussion of the remaining resource categories.

AIR QUALITY

The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O_3), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Oxide (NO), Particulate matter (PM_{10} and $PM_{2.5}$), and Lead (Pb). Various levels of review apply within both NEPA and permitting requirements. Potentially significant air quality impacts, associated with an FAA project or action, would be demonstrated by the project or action exceeding one or more of the NAAQS for any of the time periods analyzed.

The airport is located in Canyon County, Idaho. According to the EPA *Green Book Nonattainment Areas for Criteria Pollutants*, Canyon County is an attainment area for all criteria pollutants.

COMPATIBLE LAND USE

The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts. Typically, significant impacts will occur over noise-sensitive areas within the 65 DNL noise contour, based upon the FAA's Integrated Noise Model (INM).

Land to the north, east, and south of the airport is primarily used for agricultural operations with scattered residences located throughout the area. To the west of the airport is located a residential area and commercial development separated from the airport by Interstate 84.

As previously discussed, the City of Caldwell has adopted an Airport Overlay Zone to ensure that only compatible land uses are developed within the airport vicinity. The extent of the Overlay Zone is depicted on **Exhibit 1C**.

Compatible land use also addresses nearby features that could pose a threat to safe aircraft operations by attracting wildlife (e.g., landfills, ponds, other water features). No landfills are located within the immediate vicinity of the airport; however, three canals traverse airport property.

FARMLAND

Under the *Farmland Protection Policy Act* (FPPA), federal agencies are directed to identify and take into account the adverse effects of federal programs on the preservation of farmland, to consider appropriate alternative actions which could lessen adverse effects, and to assure that such federal programs are, to the extent practicable, compatible with state or local government programs and policies to protect farmland. The FPPA guidelines developed by the Natural Resource Conservation Service (NRCS), with oversight by the U.S. Department of Agriculture (USDA), apply to farmland classified as prime or unique, or of state or local importance as determined by the appropriate government agency, with concurrence by the Secretary of Agriculture.

According to the NRCS Web Soil Survey for Canyon County, eight soil types are present at the airport, all of which are silt-loam varieties. Soils on the southern portion of the airport property are not classified as prime farmland and the soils on the northern side of the airport are classified as prime farmland only if irrigated.

FISH, WILDLIFE, AND PLANTS

A number of regulations have been established to ensure that projects do not negatively impact protected plants, animals, or their designated habitat. Section 7 of the *Endangered Species Act* (ESA), as amended, applies to federal agency actions and sets forth requirements for consultation to determine if the proposed action may affect a federally endangered or threatened species. The *Sikes Act* and various amendments authorize states to prepare statewide wildlife conservation plans for resources under their jurisdiction.

According to the U.S. Fish and Wildlife Service (USFWS) and the Idaho Governor's Office, two federally listed species have potential habitat in Canyon County. These species are listed in **Table 1M.**

TABLE 1M
Threatened or Endangered Species in Canyon County, Idaho

Common Name	Species	Federal Status
Snake River physa snail	*Haitia (Physa) natricina)*	Endangered
Slickspot peppergrass	*Lepidium papilliferum*	Threatened

Source: USFWS Idaho Fish and Wildlife Office, accessed January 2010.

The Snake River physa snail is a freshwater mollusk found in the middle Snake River of southern Idaho. The Snake River is located approximately ten miles west of the airport; therefore, this habitat is not present at the airport. The slickspot peppergrass habitat is limited to semi-arid sagebrush-steppe habitat.

The 2006 Environmental Assessment (EA) related to east side development projects describes the airport as an area primarily used for agricultural production or that has been urbanized; as a result; native vegetation is minimal. Due to urbanization of the area, sagebrush no longer exists in the area; therefore, suitable habitat for the slickspot peppergrass is not present.

FLOODPLAINS

Executive Order 11988 directs federal agencies to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by the floodplains.

A review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map number 1600360002C, which includes the airport property, indicates the airport is not located within a designated 100-year floodplain. The nearest floodplain is located on the west side of Interstate 84 and is associated with Indian Creek.

HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

Federal, state, and local laws regulate hazardous materials use, storage, transport, and disposal. These laws may extend to past and future landowners of properties containing these materials. In addition, disrupting sites containing hazardous materials or contaminates may cause significant impacts to soil, surface water, groundwater, air quality, and the organisms using these resources.

The EPA's *Enviromapper for Envirofacts* was consulted regarding the presence of impaired waters or regulated hazardous sites within the vicinity of the airport. Indian Creek, located west of Interstate 84, is designated as an impaired stream. Additionally, one EPA-regulated facility is located at the airport. The site is listed as a small quantity generator under the *Resource Conservation and Recovery Act*. Additionally, two registered underground storage tanks are located on the west side of the runway.

HISTORICAL, ARCHITECTUAL, AND CULTURAL RESOURCES

Determination of a project's environmental impact to historic and cultural resources is made under guidance in the *National Historic Preservation Act* (NHPA) *of 1966*, as amended, the *Archaeological and Historic Preservation Act* (AHPA) *of 1974*, the *Archaeologi-*

cal Resources Protection Act (ARPA), and the *Native American Graves Protection and Repatriation Act* (NAGPRA) *of 1990*. In addition, the *Antiquities Act of 1906*, the *Historic Sites Act of 1935*, and the *American Indian Religious Freedom Act of 1978* also protect historical, architectural, archaeological, and cultural resources. Impacts may occur when the proposed project causes an adverse effect on a property which has been identified (or is unearthed during construction) as having historical, architectural, archaeological, or cultural significance. In Idaho, the State Historic Preservation Officer has oversight on Idaho laws and regulations regarding historical, architectural, archaeological, and cultural resource laws and regulations.

Previous environmental documentation prepared for the airport indicates that the Canyon Hill Lateral and the Highland Canal are both considered eligible for listing on the National Register of Historic Places due to their historical significance in the areas of irrigation, agriculture, and settlement.

LIGHT EMMISSIONS AND VISUAL IMPACTS

Airport lighting is characterized as either airfield lighting (i.e., runway, taxiway, approach and landing lights) or landside lighting (i.e., security lights, building interior lighting, parking lights, and signage). Generally, airport lighting does not result in significant impacts unless a high intensity strobe light, such as Runway End Identifier Lighting (REIL), would produce glare on any adjoining site, particularly residential uses. The airport does not currently have strobing lights associated with REILs or approach landing systems. The existing light features of the airport were described in detail previously in this chapter.

ENVIRONMENTAL JUSTICE

Environmental justice is defined as insuring that an action does not unfairly impact a minority race or families living under the poverty level. A review of U.S. Census Bureau data indicates that the Census blockgroups containing the airport do not contain low income or minority populations of over 50 percent; however, the blockgroup that includes the area northwest of the intersection of Interstate 84 and Linden Road has a minority population over 50 percent. The population of the remaining blockgroups in the airport vicinity does not exceed 50 percent for low income or minority populations.

WATER QUALITY

The *Clean Water Act* provides the authority to establish water quality standards, control discharges, develop waste treatment management plans and practices, prevent or minimize the loss of wetlands, and regulate other issues concerning water quality. Water quality concerns related to airport development most often relate to the potential for surface runoff and soil erosion, as well as the storage and handling of fuel, petroleum products, solvents, etc.

Four water bodies are located within the immediate vicinity of the airport. These include the Canyon Hill Lateral, Highline Canal, and Notus Canal located east of Interstate 84 and Indian Creek, located west of Interstate 84. Portions of the Canyon Hill Lateral, Highline Canal, and Notus Canal cross airport property as indicated on **Exhibit 1J**. Indian Creek is located near the airport and is designated as an impaired waterway under Section 303d of the *Clean Water Act*. No water bodies on airport property are designated as impaired.

WETLANDS AND WATERS OF THE U.S.

The U.S. Army Corps of Engineers regulates the discharge of dredged and/or fill material into waters of the United States, including adjacent wetlands, under Section 404 of the *Clean Water Act*. Wetlands are defined in Executive Order 11990, *Protection of Wetlands*, as "those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetation or aquatic life that requires saturated or seasonably saturated soil conditions for growth and reproduction." Wetlands can include swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mud flats, natural ponds, estuarine areas, tidal overflows, and shallow lakes and ponds with emergent vegetation. Wetlands exhibit three characteristics: the soil is inundated or saturated to the surface at some time during the growing season (hydrology), has a population of plants able to tolerate various degrees of flooding or frequent saturation (hydrophytes), and soils that are saturated enough to develop anaerobic conditions during the growing season (hydric).

A review of the National Wetlands Inventory does not indicate the presence of wetlands on airport property. Additionally, the NRCS Web Soil Survey indicates that no hydric soils are present at the airport.

Coordination with the U.S. Army Corps of Engineers undertaken during the 2006 EA indicates that the Canyon Hill Lateral is considered a water of the U.S. and is, therefore, regulated under Section 404 of the *Clean Water Act*.

DOCUMENT SOURCES

A variety of sources were utilized in the inventory process. These sources include official web sites, various studies and publication, personal interviews, and various reference materials. The following is a list of the primary document sources.

Airport/Facility Directory, Northwest, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, effective December 17, 2009.

Salt Lake City Sectional Aeronautical Chart, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, effective October 22, 2009.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration, 2009-2013.

U.S. Terminal Procedures, Northwest, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, effective October 22, 2009.

2008 Idaho Airport System Plan. Prepared by Wilbur Smith Associates.

Caldwell Industrial Airport Development Plan, March 2004. Prepared by W&H Pacific.

Caldwell Industrial Airport – Airport Master Plan, 1997. Prepared by Toothman-Orton Engineering Company.

City of Caldwell Comprehensive Plan, revised December 17, 2007.

Caldwell Industrial Airport Land Acquisition and East Side Development Environmental Assessment, January 2006.

A number of internet Web sites were also used to collect information for the inventory chapter. These include the following:

FAA 5010 Airport Master Record Data:
www.airnav.com

Community Planning Association of Southwest Idaho (COMPASS)
www.compassidaho.org/index.html

U.S. Census Bureau:
www.census.gov

The City of Caldwell , Idaho
www.cityofcaldwell.com

Canyon County, Idaho
www.canyonco.org/index.aspx

Idaho Transportation Department – Division of Aeronautics
http://itd.idaho.gov/aero/

Bureau of Economic Analysis, U.S. Department of Commerce
http://www.bea.gov/bea/regional/data.htm

Chapter Two

FORECASTS

FORECASTS

An important factor when planning the future needs of an airport involves a definition of aviation demand that may reasonably be expected to occur in both the near term (five years) and long term (20 years). For a general aviation airport such as Caldwell Industrial Airport (EUL), forecasts of based aircraft and operations (takeoffs and landings) serve as the basis for facility planning.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. The FAA reviews such forecasts with the objective of comparing them to the FAA *Terminal Area Forecasts* (TAF) and the *National Plan of Integrated Airport Systems* (NPIAS). In addition, aviation activity forecasts are an important input to the benefit-cost analyses associated with some airport development projects.

FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, dated December 4, 2004, says forecasts should be:

- Realistic
- Based on the latest available data
- Reflective of current conditions at the airport
- Supported by information in the study
- Able to provide adequate justification for airport planning and development

The forecast process for an airport master plan consists of a series of basic steps that vary depending upon the issues to be addressed and the level of effort required to develop the forecast.

The steps include a review of previous forecasts, determination of data needs, identification of data sources, collection of data, selection of forecast methods, preparation of the forecasts, and evaluation and documentation of the results.

FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, outlines six standard steps involved in the forecast process, including:

1) Obtain existing FAA and other related forecasts for the area served by the airport.

2) Determine if there have been significant local conditions or changes in the forecast factors.

3) Make and document any adjustments to the aviation activity forecasts.

4) Where applicable, consider the effects of changes in uncertain factors affecting demand for airport services.

5) Evaluate the potential for peak loads within the overall forecasts of aviation activity.

6) Monitor actual activity levels over time to determine if adjustments are necessary in the forecasts.

Aviation activity can be affected by many influences on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over 20 years with any certainty. Therefore, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The following forecast analysis for Caldwell Industrial Airport was produced following these basic guidelines. Existing forecasts are examined and compared against current and historic activity. The historical aviation activity is then examined along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation-demand projections for Caldwell Industrial Airport that will permit the airport to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

SOCIOECONOMIC CHARACTERISTICS

A variety of historical and forecast socioeconomic data has been collected for use in various elements of this master plan. This information provides essential background information for use in determining aviation service level requirements. Aviation forecasts are related to the population base and the economic strength of the region; therefore, it is necessary to have an understanding of the socioeconomic outlook for the airport service area. As discussed in the previous chapter, the primary service area for the airport is Canyon County with the recognition that Ada County will also contribute to activity at Caldwell Industrial Airport.

This section will present baseline statistical information related to socioeconomic indicators such as population, employment, households, and income. With this information, analysis will be undertaken to develop forecasts of future aviation that can be reasonably expected at Caldwell Industrial Airport.

Population is one of the most important elements to consider when planning for the future needs of the airport. Several sources were examined for population data including the U.S. Census Bureau, demographics produced by the State of Idaho, Woods & Poole Economics, and the local Metropolitan Planning Organization (MPO) called the Community Planning Organization of Southwest Idaho (COMPASS).

DEMOGRAPHICS

A variety of historical and forecast socioeconomic data has been collected for use in various elements of this master plan. This data provides essential background information for use in determining aviation service level requirements. Aviation forecasts are related to the population base and the economic strength of the region; therefore, it is necessary to have an understanding of socioeconomic outlook for the airport service area.

This section will present baseline statistical information related to socioeconomic indicators such as population, employment, and income. With this information, analysis will be undertaken to develop forecasts of future aviation demand that can be reasonably expected at Caldwell Industrial Airport.

The local MPO – COMPASS – produces a long range transportation plan, called *Communities in Motion*, for a six-county area which includes Canyon and Ada counties. This plan is updated at least every four years. The most recent version was approved by the COMPASS Board of Directors in 2006. COMPASS plans to complete an update by August 2010. Where possible, local data primarily sourced from COMPASS, is utilized in this forecasting effort.

Historical Population

Population is an important element to consider when planning for the future needs of the airport. Canyon County is the second most populous county in the state and when combined with neighboring Ada County, which is the largest county, they have an estimated 2009 population of nearly 600,000.

The historic population growth in the region has been some of the highest in the country. As can been seen in **Table 2A**, from 2000 to 2009 the City of Caldwell added more than 18,000 people for a nine-year growth rate of 41 percent. This equates to a yearly growth rate of 6.09 percent. Since 1990, the City of Caldwell has more than doubled in size.

Canyon and Ada counties have also experienced positive long term growth

trends. Canyon County has seen the addition of nearly 60,000 people or a growth rate of nearly 32 percent since 2000. Ada County has seen a growth of 27 percent since 2000.

TABLE 2A
Historical Population

	City of Caldwell	Ada County	Canyon County
1990 (Census)	18,586	205,775	90,076
2000 (Census)	25,967	300,904	131,441
AAGR 1990-2000	3.40%	3.87%	3.85%
2002	28,857	323,161	144,417
2003	30,716	333,809	152,174
2004	33,059	346,211	159,531
2005	35,086	361,484	167,141
2006	38,028	383,314	175,781
2007	40,873	395,974	184,251
2008	42,640	402,550	187,170
2009	44,210	408,190	190,920
AAGR 2000-2009	6.09%	3.45%	4.23%

AAGR: Average Annual Growth Rate
Source: COMPASS Population Estimates (2/23/2009) from Caldwell EDC

Socioeconomic Forecast

The 2006 *Communities In Motion* long range transportation plan provides socioeconomic forecasts for entities within the region. **Table 2B** presents the forecast for population, households, and employment as developed with a base year of 2005 for the City of Caldwell and Canyon and Ada counties.

As can be seen from the table, the growth trend in all categories is strong. Population and housing are forecast to grow at an annual rate above 1.5 percent from 2005 to 2030. Employment is forecast to grow at an even stronger rate.

Exhibit 2A presents two maps representing the forecast growth in population in Canyon and Ada counties. As can be seen in red, Caldwell is forecast to have high population growth. In fact, the Interstate 84 corridor between Caldwell and Boise is forecast to have significant growth.

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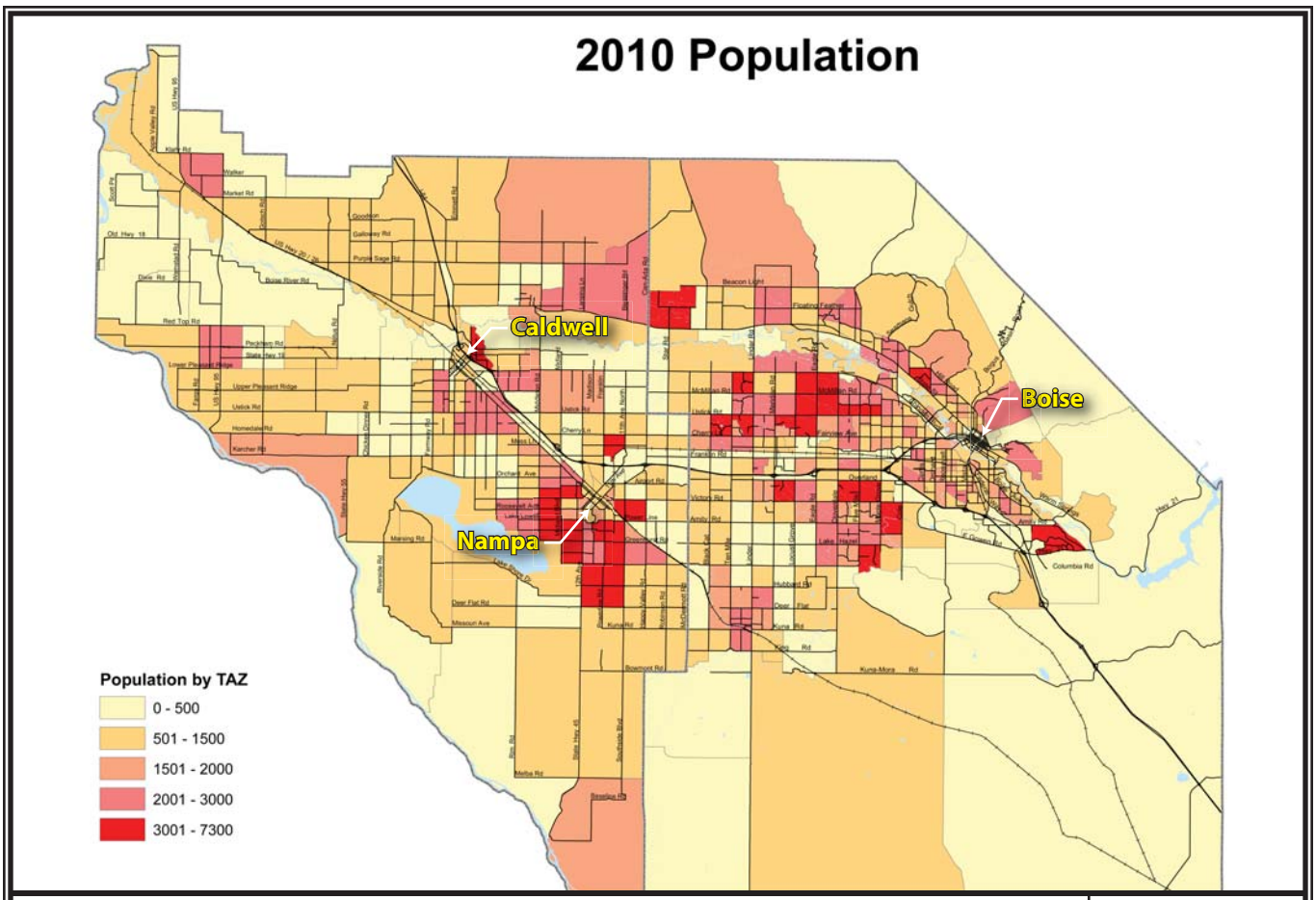

TAZ - Traffic Analysis Zone

Source: Idaho Airport System Plan (2008)

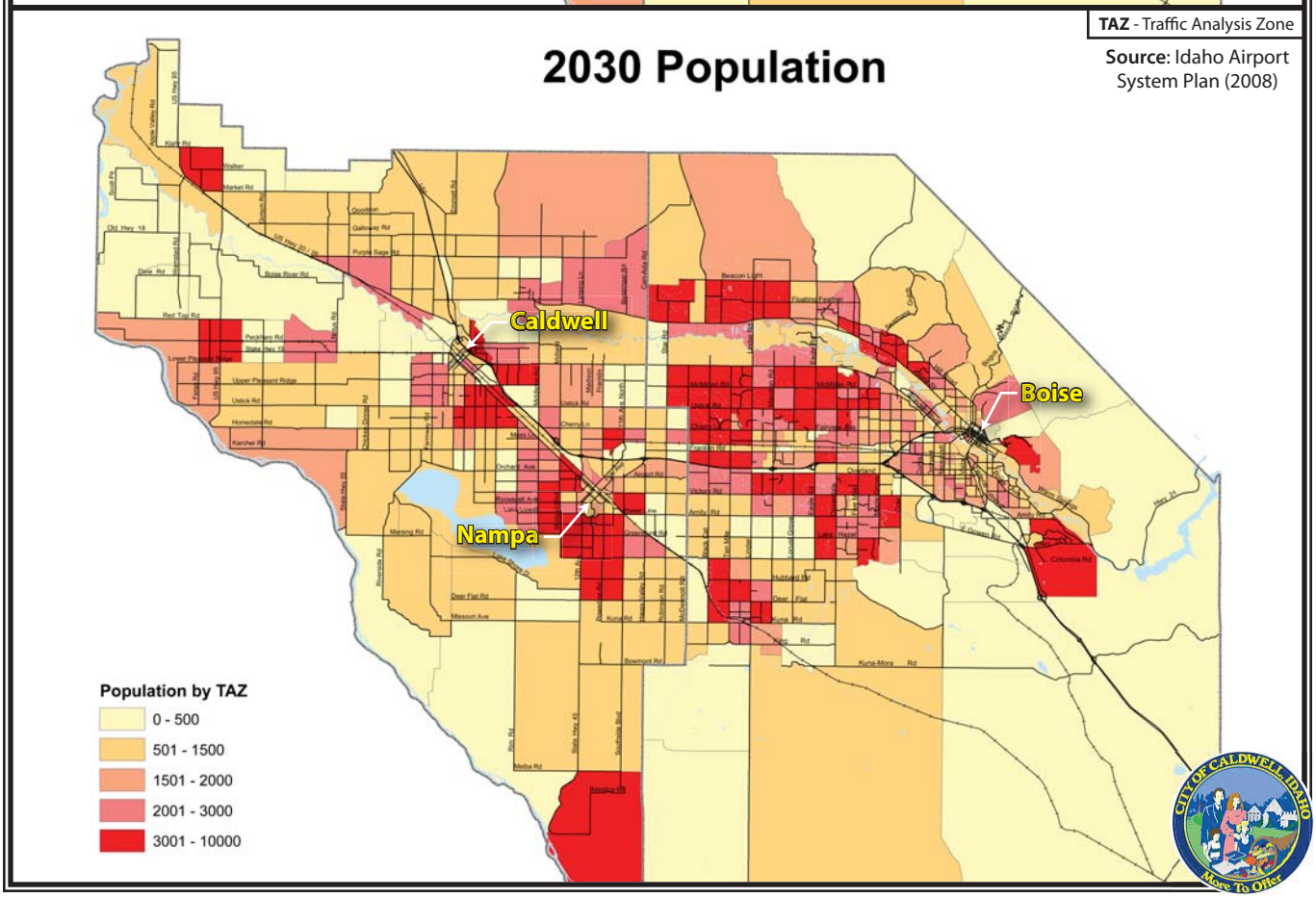

Exhibit 2A
POPULATION FORECAST

TABLE 2B Socioeconomic Forecast Data	Population	Households	Employment
2005			
Caldwell	38,716	13,470	14,383
Canyon County	167,888	57,553	48,447
Ada County	357,018	134,366	188,930
2010			
Caldwell	48,468	16,987	16,075
Canyon County	200,441	68,859	59,764
Ada County	401,819	149,812	211,908
2015			
Caldwell	55,673	19,589	18,732
Canyon County	225,503	77,695	75,012
Ada County	454,866	168,696	233,533
2020			
Caldwell	60,434	21,266	21,449
Canyon County	242,908	83,777	88,874
Ada County	491,723	182,559	257,421
2030			
Caldwell	67,939	23,942	26,839
Canyon County	268,164	92,689	114,409
Ada County	556,838	207,005	312,010
SUMMARY			
Average Annual Growth Rate 2005-2030			
Caldwell	1.70%	1.73%	2.60%
Canyon County	1.47%	1.50%	3.30%
Ada County	1.64%	1.63%	1.95%

Source: Communities in Motion (COMPASS) Community Choices Projections (Updated 3-21-06)

Income

Table 2C presents historical per capita personal income (PCPI) for the two counties and the state. Both Canyon and Ada counties showed a decline in PCPI between 2005 and 2009. This is reflective of the impact of the recession that began in December 2007 and continued through 2009. The short term forecast is for this trend to reverse and for growth to resume through the long term planning period.

Ada County has a higher PCPI than both Canyon County and the state as a whole. With the City of Boise as the state capital and state center of business and industry, it is to be expected that income levels would be higher.

TABLE 2C Income Trend and Projection						
Year	**Ada County**	**AAGR**	**Canyon County**	**AAGR**	**State of Idaho**	**AAGR**
Historic Trend						
2000	$36,313	NA	$21,373	NA	$26,099	NA
2005	$37,765	0.79%	$20,041	-1.28%	$27,861	1.32%
2009*	$35,862	-1.28%	$19,146	-1.14%	$27,882	0.02%
Projection						
2015	$38,684	1.27%	$19,873	0.62%	$29,717	1.07%
2020	$41,679	1.50%	$21,147	1.25%	$31,756	1.34%
2030	$49,464	1.73%	$24,796	1.60%	$36,981	1.53%

*Estimate
Source: Woods & Poole - CEDDS 2010; Per Capita Personal Income ($2004)

AVIATION TRENDS

The forecasts developed for the airport must also consider national, regional, and local aviation trends. The following section describes the trends in aviation. This information is utilized both in statistical analysis and to aid the forecast preparer in making any manual adjustments to the forecasts.

NATIONAL TRENDS

Each year, the FAA publishes its national aviation forecast. Included in this publication are forecasts for large air carriers, regional air carriers, general aviation, and FAA workload measures. The forecasts are prepared to meet budgeting and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public. The current edition, FAA *Aerospace Forecasts - Fiscal Years 2009-2025*, has been utilized in the generation of the aviation demand forecasts to follow.

Historically, aviation activity has closely followed the national economic outlook. With each passing month of 2008, "consumer confidence dipped as energy prices spiked, housing foreclosures climbed, credit tightened, and unemployment surged." This chain of events resulted in lower than expected demand for air travel. Nonetheless, the FAA continues to forecast long term aviation growth.

The economic downturn has dampened the near-term prospects for the general aviation industry. After several consecutive years of growth, general aviation activity fell 5.6 percent in 2008. Worldwide shipments of new general aviation aircraft declined in 2008 for the first time since 2002 (down 6.7 percent). Piston aircraft shipments fell 20.7 percent, but turbine aircraft shipments increased by 16.7 percent. Total billings for general aviation aircraft were up 14.4 percent

in 2008, demonstrating the sharp difference in demand between piston and turbine aircraft.

Economic Outlook

The FAA uses the most recent Administration forecasts to project domestic aviation demand. The National Bureau of Economic Research indicated that the U.S. officially entered a recession in December 2007. The Bureau of Economic Analysis reported that real gross domestic product (GDP) fell at an annual rate of 3.8 percent in the fourth quarter of 2008. The question for forecasters is how long the recession will continue. The combination of structural changes, particularly in the banking and housing sectors, monetary policy, and passage of the *American Recovery and Reinvestment Act*, were projected to lead the economy out of recession beginning in the second half of 2009. Initially, the recovery was expected to be modest over the second half of 2009 with positive growth occurring through 2010 and beyond. The third quarter of 2009 showed a 2.6 percent growth in annual GDP and the fourth quarter showed a 6.4 percent increase in GDP.

Between 2010 and 2013, U.S. GDP is projected to be above trend (3.8 percent) with rates ranging from 2.4 percent to 4.5 percent. Beyond 2013, U.S. GDP is forecast to balance around 2.6 percent.

General Aviation Industry Trends

In the years since the passage of the *General Aviation Revitalization Act of 1994* (Act) (federal legislation which limits the liability on general aviation aircraft to 18 years from the date of manufacture), it is clear that the Act has successfully infused new life into the general aviation industry. This legislation sparked an interest to renew the manufacturing of general aviation aircraft due to the reduction in product liability, as well as renewed optimism for the industry. After the passage of this legislation, annual shipments of new aircraft rose every year between 1994 and 2000. According to the General Aviation Manufacturers Association (GAMA), between 1994 and 2000 general aviation aircraft shipments increased at an average annual rate of more than 18 percent, increasing from 1,132 shipments in 1994, to 3,147 shipments in 2000.

According to figures published by GAMA, worldwide manufacturers of general aviation aircraft delivered 3,969 aircraft in 2008. This represented the first year-over-last decline in shipments since 2001. **Table 2D** presents historical data related to aircraft shipments. After years of sustained growth, piston aircraft shipments declined in 2008, while turbine aircraft continued to grow.

TABLE 2D
Annual General Aviation Airplane Shipments
Manufactured Worldwide and Factory Net Billings

Year	Total	SEP	MEP	TP	J	Net Billings ($ billions)
2000	3,147	1,877	103	415	752	13,496
2001	2,998	1,645	147	422	784	13,868
2002	2,677	1,591	130	280	676	11,778
2003	2,686	1,825	71	272	518	9,998
2004	2,961	1,999	52	319	591	11,918
2005	3,590	2,326	139	375	750	15,156
2006	4,053	2,513	242	412	886	18,815
2007	4,272	2,417	258	459	1138	21,811
2008	3,969	1,943	176	535	1315	24,837

SEP - Single Engine Piston; MEP - Multi-Engine Piston; TP - Turboprop; J - Turbofan/Turbojet
Source: General Aviation Manufacturers Association 2008 Stat Book

The trend in general aviation manufacturing and billing over the previous eight years is clear. After a drop in total aircraft manufactured from 2001 through 2003, strong growth has occurred each year beginning in 2004. From 2003 through 2007, worldwide net billings have grown by 55 percent. In 2007, business jet manufacturing reached more than 1,000 units for the first time. Also notable is the resurgence of both turboprop and multi-engine piston aircraft.

Many capable general aviation and reliever airports have seen an upward trend in activity by business jets. There are numerous factors that have led to this trend including the growth of fractional aircraft ownership and a desire by frequent travelers to save time by avoiding commercial service airports. **Table 2E** presents growth trends in fractional aircraft ownership.

TABLE 2E
Fractional Aircraft and Share Owners

Year	Number of Aircraft	Number of Shares
2000	574	2,810
2001	689	3,601
2002	780	4,244
2003	286	4,516
2004	870	4,765
2005	945	4,828
2006	984	4,863
2007	1,030	5,168
2008	1,094	5,179

Source: GAMA 2008 Stat Book

Honeywell Corporation also tracks the general aviation industry. Their second quarter publication, dated August 4, 2009, shows a steep decline in aircraft production. In the first half of 2009, total general aviation shipments fell 45.8 percent, from 1,918 units in 2008 to 1,039 in 2009. Total billings were down 21.7 percent. Piston-powered shipments totaled 434 units compared to 1,034 units delivered in the first half of 2008, a 58 percent decline. Turboprops were down 13.6 percent from 221 in the first half of 2008 to 191 in 2009. Business jet shipments totaled 414 units in the first half of 2009, a 37.6 percent decrease over the 663 units delivered in the first half of 2008.

In October 2009, Honeywell published its 18th annual Aerospace Business Aviation Outlook. In the report, it was noted that business jet shipments for 2009 are expected to be approximately 800, down from 1,139 in 2008. Deliveries in 2010 are expected to decline further to below 700. The report indicates that potential buyers of general aviation aircraft are delaying that purchase until the economy has clearly turned around. Honeywell anticipates that this pent-up demand will improve the outlook for order intake and new jet deliveries beyond the 2011 timeframe.

FAA General Aviation Forecasts

The FAA forecasts of general aviation activity assume that business use of general aviation aircraft will continue to expand at a more rapid pace than that for personal/sport use. Corporate use of fractional and charter aircraft continues to be practical alternatives to commercial travel due to time savings.

The active general aviation fleet is projected to increase at an average annual rate of 1.0 percent over the 17-year FAA forecast period, growing from 234,015 in 2008 to 275,230 by 2025. The more expensive and sophisticated turbine fleet is projected to grow 4.8 percent annually from 11,400 in 2008 to 25,165 in 2025. Conversely, the number of active piston-powered aircraft is projected to decrease from a total of 165,720 in 2008 to 164,550 in 2025. Multi-engine piston aircraft, representing 11 percent of total piston aircraft, is forecast to decline 1.0 percent annually, while single engine piston aircraft are forecast to grow 0.1 percent over the same timeframe. **Exhibit 2B** presents the FAA forecast for U.S. active general aviation aircraft.

FAA forecasts of general aviation operations (takeoffs and landings) are categorized as local and itinerant with local operations being those within the traffic pattern airspace of an airport and itinerant being those aircraft with a destination away from the airport. General aviation activity at FAA air traffic facilities (including FAA contract towers) fell 5.6 percent in 2008. This was the steepest decline since 2003. Itinerant general aviation operations have been steadily declining since 2000 from a high of 22.844 million to a current low of 17.368 million in 2008. Itinerant operations are forecast to continue to contract at 3.5 per-

cent annually through 2010, then grow at 1.5 percent from 2010-2020.

Local operations are forecast to follow a similar trend, contracting at 2.6 percent from 2008-2010, and then growing at 0.3 percent annually thereafter. Air taxi and commuter operations are forecast to follow a similar trend to itinerant general aviation activity, contracting 2.9 percent from 2008-2010, followed by an average annual growth rate of 1.5 percent through 2025.

As discussed, general aviation activity typically follows the state of the national economy. As of this writing (January 2010), there are indications that some sectors of the economy are beginning to improve. Monthly job losses have declined significantly. The stock market has rebounded to reclaim nearly half the losses experienced in the winter of 2008-2009. At the same time, unemployment continues to rise and is expected to peak at above 10 percent nationally before a reversal is forecast.

The conclusion to be drawn is that the recession has had a severe and negative impact on general aviation activity across the country. Some economic indicators are beginning to reverse the trend. The FAA forecasts do take into account the economic collapse that occurred in late 2008 and they forecast the economy showing growth again in 2010.

REGIONAL AND LOCAL AVIATION

On the regional and state levels, Caldwell Industrial Airport is included in the *Idaho Airport System Plan (2008)* (ISAP). Forecasts for based aircraft and operations are presented in the plan. A total of 535 based aircraft were used as the baseline figure for 2007. Approximately 147,000 total operations were identified for the same year. **Table 2F** presents a summary of the ISAP aviation demand forecasts.

TABLE 2F
Idaho Airport System Plan Forecasts (2008)
Caldwell Industrial Airport

	2007	2012	2017	2027	AAGR
Based Aircraft	535	566	600	672	1.15%
Operations	147,325	156,000	165,200	185,200	1.15%

Source: Idaho Airport System Plan (2008)

AVIATION FORECAST METHODOLOGY

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth. However, the judgment of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and assessment of the local situation,

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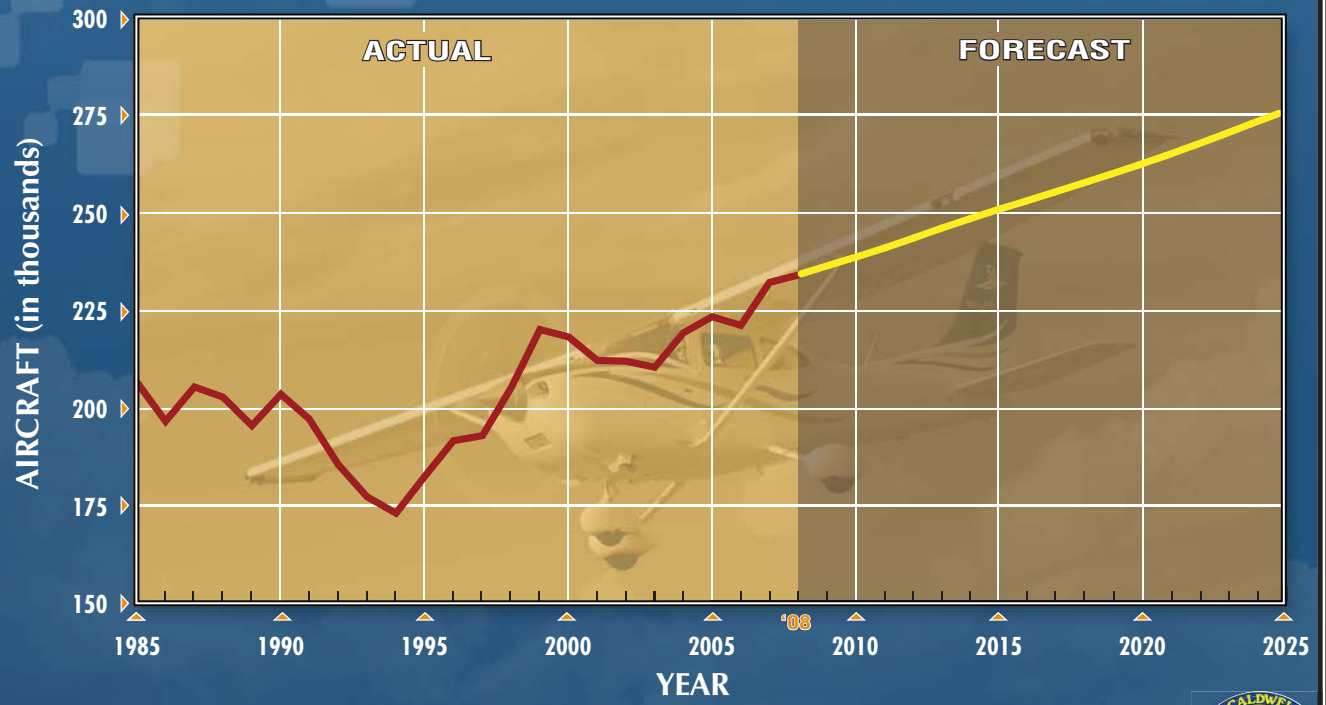
U.S. ACTIVE GENERAL AVIATION AIRCRAFT

(in thousands)

	2008	2015	2020	2025
FIXED WING				
PISTON				
Single Engine	146.6	143.5	144.9	148.5
Multi-Engine	19.1	17.9	17.0	16.0
TURBINE				
Turboprop	9.6	10.5	11.5	12.2
Turbojet	11.4	17.1	20.9	25.2
ROTORCRAFT				
Piston	3.1	4.6	5.3	5.9
Turbine	7.1	9.0	9.9	10.9
EXPERIMENTAL	24.1	29.1	32.0	34.6
SPORT AIRCRAFT	7.0	12.7	14.4	15.9
OTHER	6.0	6.1	6.0	6.0
TOTAL	234.0	250.5	261.8	275.2



Source: FAA Aerospace Forecasts, Fiscal Years 2009-2025.

Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

Exhibit 2B
U.S. ACTIVE GENERAL AVIATION
AIRCRAFT FORECASTS

is important in the final determination of the preferred forecast.

Beyond five years, the predictive reliability of the forecasts can diminish. Therefore, it is prudent for the airport to update the forecasts, reassess the assumptions originally made, and revise the forecasts based on the current airport and industry conditions. Facility and financial planning usually require at least a 10-year preview, since it often takes several years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

A wide range of factors are known to influence the aviation industry and can have significant impacts on the extent and nature of activity occurring in both the local and national markets. Technological advances in aviation have historically altered and will continue to change the growth rates in aviation demand over time. A recent example is the substantial growth in the production and delivery of business jet aircraft, which resulted in a growth rate that far exceeded expectations. Such changes are difficult to predict but over time reasonable growth trends can be identified. Using a broad spectrum of demographic, economic, and industry data, forecasts for Caldwell Industrial Airport have been developed. Several standard statistical methods have been employed to generate various projections of aviation demand.

Trend line projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical demand data, then extending them into the future, a basic trend line projection is produced. A basic assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections.

Correlation analysis provides a measure of a direct relationship between two separate sets of historic data. Should there be a reasonable correlation between the data, further evaluation using regression analysis may be employed.

Regression analysis measures the statistical relationship between dependent and independent variables yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures association between the changes in a dependent variable and independent variable(s). If the r-squared (r^2) value (coefficient determination) is greater than 0.90, it indicates good predictive reliability. A value below 0.90 may be used with the understanding that the predictive reliability is lower.

Market share analysis involves a historical review of airport activity as a percentage, or share, of a larger regional, state, or national aviation market. A historical market share

trend is determined providing an expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections, but can provide a useful check on the validity of other forecasting techniques.

Utilizing these statistical methods, available existing forecasts, and analyst expertise, forecasts of aviation demand for Caldwell Industrial Airport have been developed. The remainder of this chapter presents the aviation demand forecasts and includes activity in two broad categories: based aircraft and annual operations.

GENERAL AVIATION FORECASTS

The number of based aircraft is the most basic indicator of general aviation demand. By developing a forecast of based aircraft, the needs of the airport can be forecast more accurately. One method of forecasting based aircraft at an airport is to examine local aircraft ownership, or aircraft registrations in the airport's service area. The primary service area for aircraft basing at Caldwell Industrial Airport is Canyon and Ada counties.

REGISTERED AIRCRAFT

The owner of an aircraft is required to register that aircraft and receive a unique N-number to be prominently painted on the aircraft. The N-number is often referred to as the tail number since most aircraft have the number painted on the tail. This aircraft data is maintained by the FAA and is available to the public. A review of this database provides historical information regarding the number and type of aircraft registered within the approximate airport service area. Utilizing this historical aircraft registration data, forecasts of future aircraft registrations can be made. With a forecast of registered aircraft, a projection of based aircraft can be made.

Aircraft registration data for Canyon and Ada counties was obtained going back to 1995 and is presented in **Table 2G**. In 1995, there were 947 registered aircraft in the two counties which has grown to 1,296 by 2009. In 2008, there were 1,306 aircraft registrations so 2009 represented the first year-over-last decline in registrations since 1995. There has been an average of slightly more than 23 new aircraft registrations per year since 1995.

The historic annual growth rate in registered aircraft in the two counties shows a distinction between growth from 1995 to 2004 and growth since 2004. From 1995 to 2004, both Canyon and Ada counties experienced annual growth rates greater than two percent. Since 2004, Canyon County growth has soared to 3.78 percent, while Ada County growth slowed to 1.1 percent. No matter how it is analyzed, aircraft registration growth in the Treasure Valley area has been significant and sustained.

TABLE 2G
Canyon and Ada Counties Registered Aircraft

Year	Canyon County	Ada County	Two-County Region
1995	266	681	947
1996	259	703	962
1997	277	732	1,009
1998	290	717	1,007
1999	285	744	1,029
2000	294	772	1,066
2001	305	807	1,112
2002	307	812	1,119
2003	326	843	1,169
2004	343	836	1,179
2005	351	851	1,202
2006	361	855	1,216
2007	393	909	1,302
2008	400	906	1,306
2009	413	883	1,296
AAGR		**1995-2004**	**2004-2009**
Canyon County		2.57%	3.78%
Ada County		2.07%	1.10%
Two-County Region		2.22%	1.91%

AAGR: Average Annual Growth Rate
Source: FAA Aircraft Registry Database; FAA Census of U.S. Civil Aircraft

Exhibit 2C graphically depicts aircraft registrations in the two counties by location between 1995 and 2009. In 1995, 231 aircraft were registered to a zip code within 10 miles of the airport. By 2009, 345 registrations were within 10 miles, equating to a 49.3 percent increase. The number of registered aircraft in a 10-to 20-mile radius of the airport increased from 339 to 516 over the course of 15 years. This exhibit visually shows the significant growth of registered aircraft around Caldwell Industrial Airport.

Several forecasts of registered aircraft for the two-county area have been developed and are presented on **Table 2H**. The first simply considers the historical growth trend since 2000, which is 1.97 percent annually. By extending this trend out over the next 20 years, a forecast of 1,457 registered aircraft by 2015 and 1,953 registered aircraft by 2030 results.

The next forecast considers maintaining a constant number of registered aircraft per 1,000 people in the two-county region (2.163 aircraft per 1,000 people). This results in 1,472 registrations in 2015, 1,589 in 2020, and 1,785 in 2030. This is an annual growth rate of 1.54 percent.

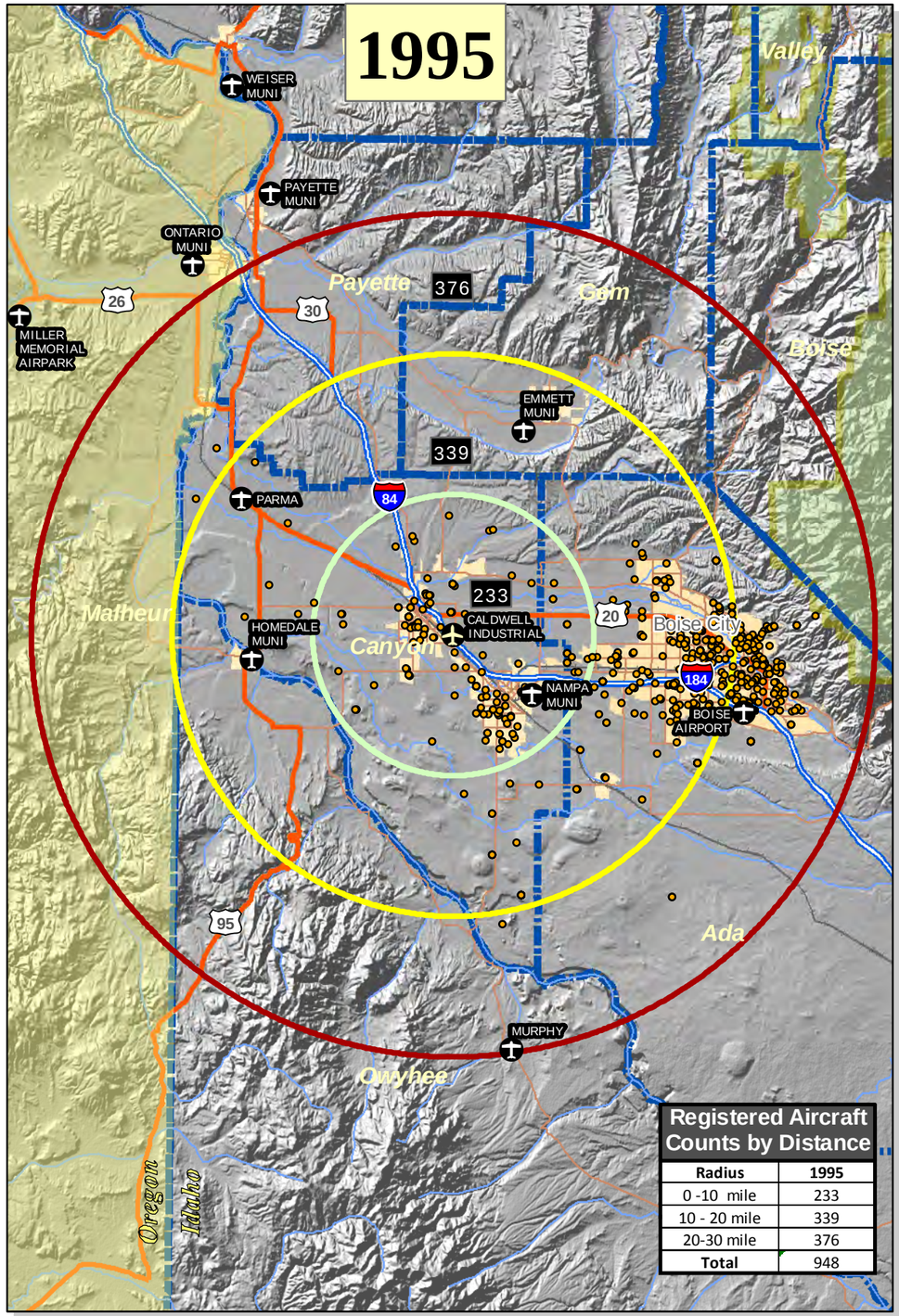
A third forecast compared the percent of registration with the number of U.S. active general aviation aircraft as

forecast by the FAA. Utilizing a constant share of 0.549 percent, 1,361 registrations resulted in 2015, 1,423 in 2020, and 1,569 in 2030. This is an annual growth rate of 0.91 percent.

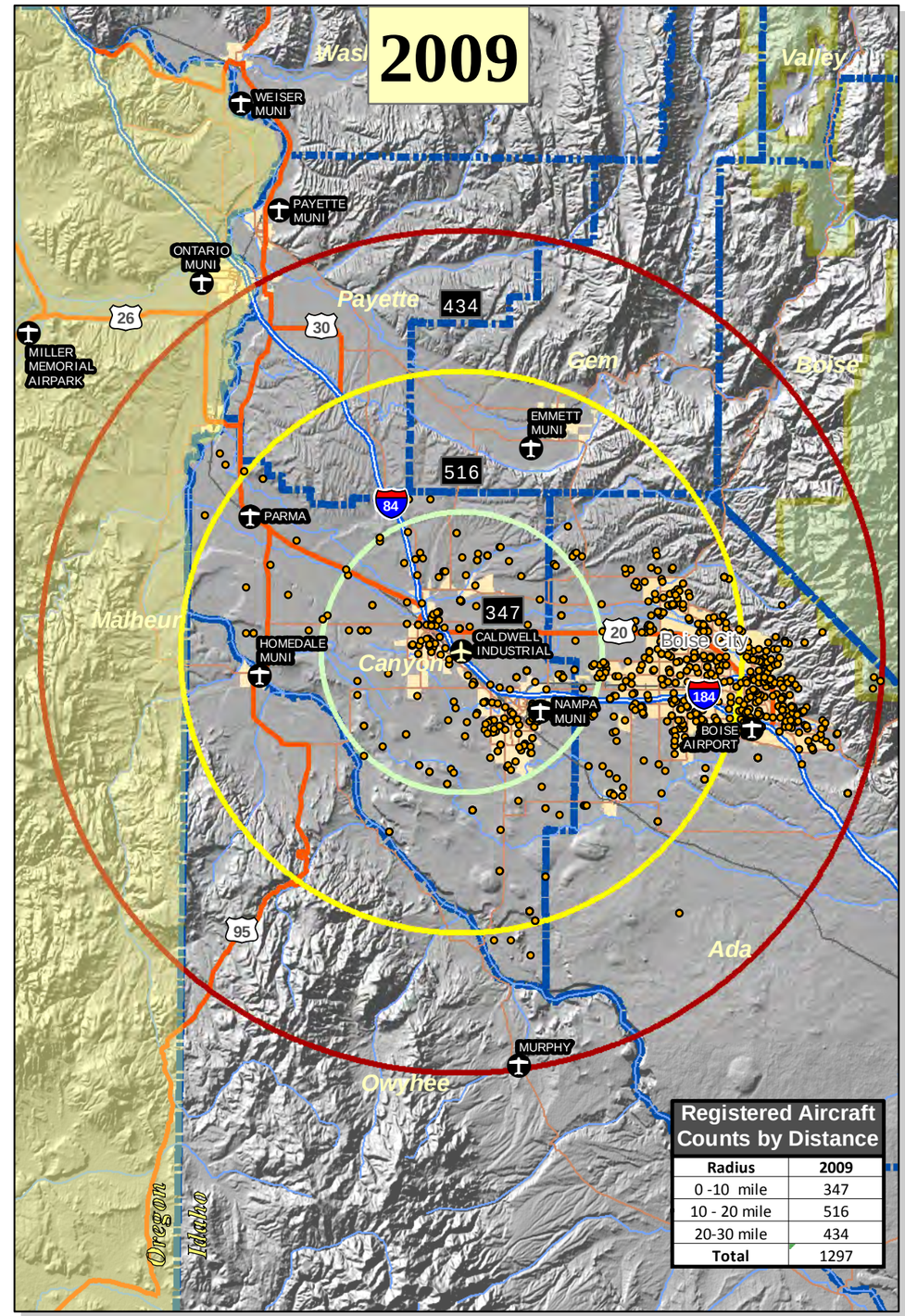
TABLE 2H
Registered Aircraft Projections
Canyon and Ada Counties, Idaho

Year	Two-County Registrations[1]	U.S. Active Aircraft[2]	Percent of U.S. Active Aircraft	Two-County Population[3]	Aircraft Per 1,000 Population
2000	1,066	217,533	0.490%	432,345	2.466
2001	1,112	211,446	0.526%	449,962	2.471
2002	1,119	211,244	0.530%	467,578	2.393
2003	1,169	209,606	0.558%	485,983	2.405
2004	1,179	219,319	0.538%	505,742	2.331
2005	1,202	224,262	0.536%	528,625	2.274
2006	1,216	221,942	0.548%	559,095	2.175
2007	1,302	231,606	0.562%	580,225	2.244
2008	1,306	234,015	0.558%	589,720	2.215
2009	1,296	236,235	0.549%	599,110	2.163
Historical Growth Scenario 1.97% (2000-2009)					
2015	1,457	248,105	0.587%	680,369	2.142
2020	1,607	259,475	0.619%	734,631	2.187
2030	1,953	285,941	0.683%	825,002	2.368
Annual Growth Rate 2009-2030: 1.97%					
Constant Aircraft Per 1,000 Population of Two-County Area					
2015	1,472	248,105	0.593%	680,369	2.163
2020	1,589	259,475	0.612%	734,631	2.163
2030	1,785	285,941	0.624%	825,002	2.163
Annual Growth Rate 2009-2030: 1.54%					
Constant Market Share of U.S. Fleet					
2015	1,361	248,105	0.549%	680,369	2.001
2020	1,423	259,475	0.549%	734,631	1.938
2030	1,569	285,941	0.549%	825,002	1.901
Annual Growth Rate 2009-2030: 0.91%					
Registered v. Year (2000-2009) Trend Line r^2=0.95					
2015	1,484	248,105	0.598%	680,369	2.180
2020	1,620	259,475	0.624%	734,631	2.205
2030	1,893	285,941	0.662%	825,002	2.295
Annual Growth Rate 2009-2030: 1.82%					
Two-County Registered v. Two-County Pop (2000-2009) r^2=0.96					
2015	1,417	248,105	0.571%	680,369	2.082
2020	1,491	259,475	0.575%	734,631	2.030
2030	1,615	285,941	0.565%	825,002	1.957
Annual Growth Rate 2009-2030: 1.05%					
SELECTED FORECAST (Average)					
2015	1,440	248,105	0.580%	680,369	2.116
2020	1,550	259,475	0.597%	734,631	2.110
2030	1,760	285,941	0.616%	825,002	2.133
Annual Growth Rate 2009-2030: 1.47%					

[1]FAA Aircraft Registry Database; FAA Census of U.S. Civil Aircraft
[2]*FAA Aerospace Forecast for Fiscal Years 2009-2025; 2030 extrapolated.*
[3]Historic Population from COMPASS 3-23-09 Population Estimates
[3]Forecast Population from Communities in Motion (COMPASS 2005) Community Choices Projections



Registered Aircraft Counts by Distance	
Radius	1995
0 -10 mile	233
10 - 20 mile	339
20-30 mile	376
Total	948



Registered Aircraft Counts by Distance	
Radius	2009
0 -10 mile	347
10 - 20 mile	516
20-30 mile	434
Total	1297

Registered Aircraft 1995-2009

Canyon County, ID
Ada County, ID

Legend

- Registered Aircraft

Roads

- Limited Access
- Highway
- Major Road
- Waterways
- County Boundary
- National Forest

Buffer Radius

- 30 miles
- 20 miles
- 10 miles

NORTH

0 5 10 15 20
Miles

Exhibit 2C
CANYON COUNTY AND ADA COUNTY, IDAHO REGISTERED AIRCRAFT LOCATION MAP

Several statistical trends and regressions were also considered. For this type of analysis, an r^2 value is generated. This value is a measure of the statistical reliability of the analysis. Generally, r^2 values greater than 0.95 percent indicate a strong correlation between variables and, therefore, a greater statistical reliability.

The first of these statistical analyses is a trend line in which a forecast is developed by statistically "fitting" an "average" line over the historical data and extending that line into the future. This method resulted in a strong statistical correlation with an r^2 value of 0.95 percent. In 2015, 1,484 registrations are forecast, with this growing to 1,893 by 2030. The average annual growth rate is 1.82 percent.

The next analysis utilized socioeconomic data for population as the independent variable and registered aircraft as the dependant variable. When comparing the two-county population to registered aircraft, an r^2 value of 0.96 percent resulted. Registered aircraft are estimated at 1,417 for 2015 and 1,615 for 2030.

The selected forecast is an average of the five forecasts. This forecast considers 1,440 registrations by 2015, 1,550 by 2020, and 1,760 by 2030. The selected forecast results in an annual growth rate of 1.47 percent. **Exhibit 2D** graphically presents the registered aircraft projections and the selected forecast.

Now that registered aircraft has been forecast, a based aircraft forecast for Caldwell Industrial Airport can be developed.

BASED AIRCRAFT

Identifying the current number of based aircraft is critical to the master plan analysis yet it can be challenging because reported based aircraft has not always been verified. Since the vast majority of hangar space is privately owned and leased, obtaining historical lease records is also difficult. As presented in Chapter One – Inventory, there are numerous studies and sources that identify a based aircraft figure for Caldwell Industrial Airport. These figures range from a low of 121 to a high of 555 for 2009.

As discussed in Chapter One, an effort was made by the airport engineer and manager to physically verify the number of based aircraft. More than half of the hangars were physically inspected in October 2009. From this inspection, an estimate of 480 based aircraft has been determined. This information will serve as the baseline based aircraft figure to be utilized in forecasts of aviation demand to follow.

The 480 figure appears to be a conservative estimate of based aircraft when consideration is given to registration in the two-county area and the reported levels of based aircraft at other surrounding airports.

New Based Aircraft Projections

The based aircraft forecast is a function of the registered aircraft forecast

completed above. By maintaining a constant ratio of 37.04 percent of the registered aircraft in the two counties to be based at Caldwell Industrial Airport, a forecast is developed. The actual percentage of area-wide aircraft that base at Caldwell in the future will depend on availability of hangars, rental rates and services offered by airport businesses. The based aircraft forecast figures are rounded to the nearest tenth. The forecast results in 530 based aircraft in 2015, 570 in 2020, and 650 in 2030. **Table 2J** presents this analysis.

TABLE 2J
Based Aircraft Forecasts as a Share of Aircraft Registrations
Caldwell Industrial Airport

Year	2-County Registered Aircraft	Percent Based at Caldwell	Caldwell Based
2009	1,296	37.04%	480*
Based Aircraft Forecast			
2015	1,440	37.04%	530
2020	1,550	37.04%	570
2030	1,760	37.04%	650
Annual Growth Rate 2009-2030: 1.47%			

*Estimate based on physical count in October 2009
Note: Forecast based aircraft figures rounded to nearest 10th

BASED AIRCRAFT FLEET MIX PROJECTIONS

Knowing the aircraft fleet mix expected to utilize the airport is necessary to properly plan facilities that will best serve the level and type of activity occurring at the airport. As detailed previously, the growth areas in the general aviation fleet nationally is in turboprop and jet aircraft, as well as helicopters. Single engine piston-powered aircraft are forecast to grow slightly, while multi-engine piston aircraft are forecast to decrease slightly. Growth within each based aircraft category at the airport has been determined, in part, by comparison with national projections and consideration of local economic conditions.

On the local level, an examination of the registered aircraft fleet mix for the two-county service area was conducted and is presented in **Table 2K**. Over the last 15 years, single engine aircraft have represented approximately 76 percent and have shown relatively steady growth. Multi-engine piston-powered aircraft have represented approximately five percent over the same time period and have shown no growth. Turboprops showed a spike in registrations in 2003, and then fell back to previous levels by 2006. Helicopters have remained flat in terms of growth.

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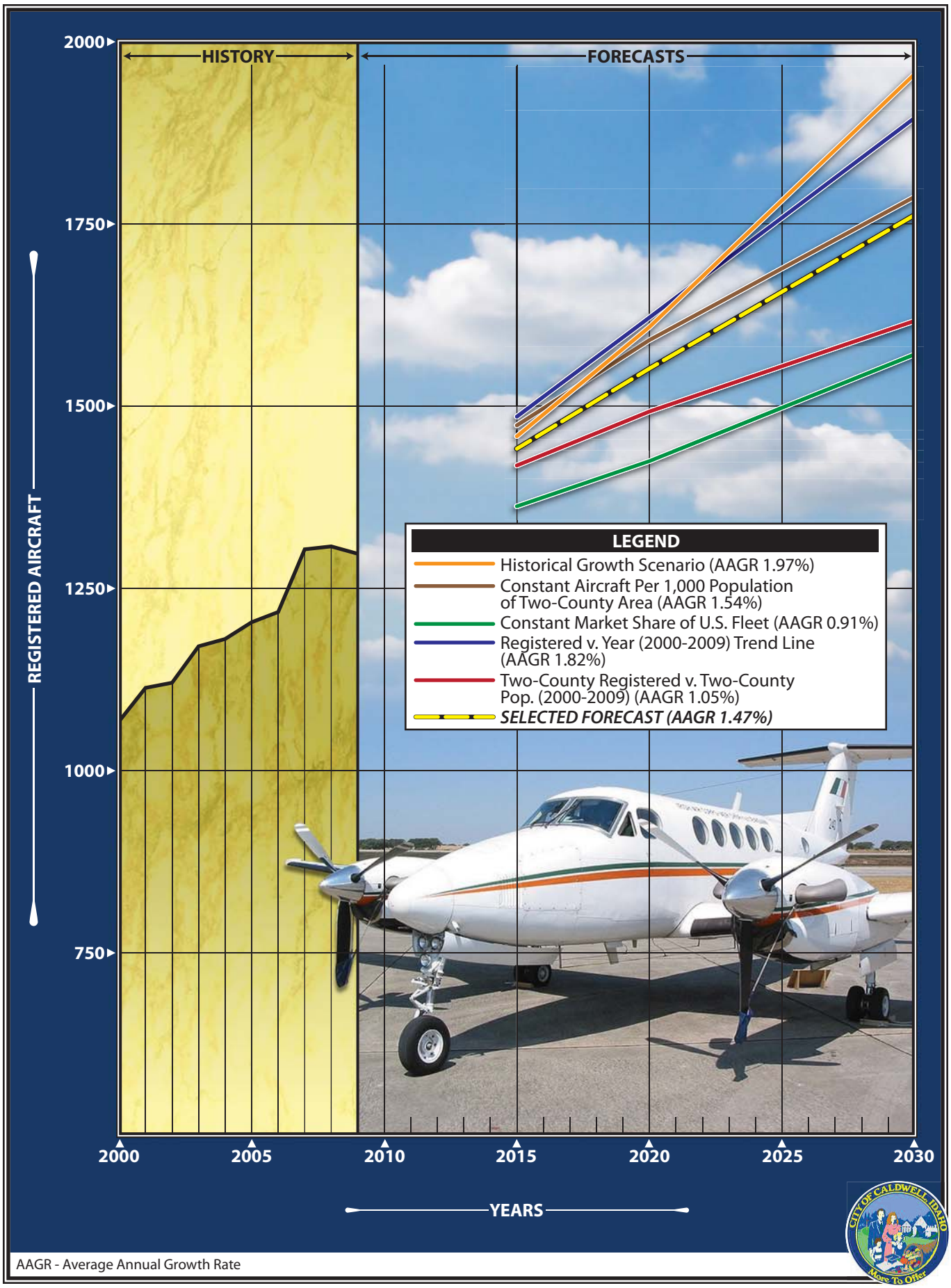

AAGR - Average Annual Growth Rate

Exhibit 2D
REGISTERED AIRCRAFT PROJECTION

TABLE 2K
Registered Aircraft Fleet Mix Projection
Canyon and Ada County, Idaho

Year	SEP	%	MEP	%	TP	%	J	%	R	%	O	%	Total
1995	721	76.14%	78	8.24%	46	4.86%	47	4.96%	9	0.95%	46	4.86%	947
1996	730	75.88%	72	7.48%	50	5.20%	49	5.09%	9	0.94%	52	5.41%	962
1997	773	76.61%	71	7.04%	47	4.66%	50	4.96%	10	0.99%	58	5.75%	1,009
1998	777	77.16%	68	6.75%	46	4.57%	46	4.57%	11	1.09%	59	5.86%	1,007
1999	786	76.38%	65	6.32%	53	5.15%	52	5.05%	9	0.87%	64	6.22%	1,029
2000	820	76.92%	70	6.57%	41	3.85%	59	5.53%	11	1.03%	65	6.10%	1,066
2001	842	75.72%	67	6.03%	56	5.04%	68	6.12%	13	1.17%	66	5.94%	1,112
2002	846	75.60%	68	6.08%	57	5.09%	68	6.08%	14	1.25%	66	5.90%	1,119
2003	844	72.20%	43	3.68%	127	10.86%	72	6.16%	13	1.11%	70	5.99%	1,169
2004	864	73.28%	40	3.39%	116	9.84%	76	6.45%	14	1.19%	69	5.85%	1,179
2005	891	74.13%	38	3.16%	113	9.40%	76	6.32%	13	1.08%	71	5.91%	1,202
2006	979	80.51%	56	4.61%	33	2.71%	56	4.61%	19	1.56%	73	6.00%	1,216
2007	1,034	79.42%	54	4.15%	42	3.23%	52	3.99%	27	2.07%	93	7.14%	1,302
2008	1,001	76.65%	53	4.06%	65	4.98%	66	5.05%	18	1.38%	103	7.89%	1,306
2009	997	76.93%	53	4.09%	63	4.86%	61	4.71%	22	1.70%	100	7.72%	1,296
Avg.		76.19%		5.54%		5.67%		5.35%		1.19%		6.06%	
FLEET MIX PROJECTIONS													
2015	1,128	78.30%	58	4.00%	72	5.00%	72	5.00%	24	1.70%	86	6.00%	1,440
2020	1,198	77.30%	60	3.90%	85	5.50%	85	5.50%	28	1.80%	93	6.00%	1,550
2030	1,325	75.30%	65	3.70%	114	6.50%	114	6.50%	35	2.00%	106	6.00%	1,760

SEP-Single Engine Piston; MEP-Multi-engine Piston; TP-Turboprop; J-Jet; R-Rotor (Helicopter); O-Other(gliders, ultralights, balloons)

Source: Coffman Associates analysis of FAA Aircraft Registry Database

A base year (2009) fleet mix has been estimated from physical inventory by airport management. There are 424 single engine piston aircraft and 21 multi-engine piston aircraft. There are ten turboprop aircraft and 22 helicopters. There are currently three based business jets, represented by an Eclipse very light jet, and two small Cessna Citations. There are a total of 480 based aircraft.

Based in part on national and local fleet mix data, a forecast of the future based aircraft fleet mix at Caldwell Industrial Airport can be made. As presented in **Table 2L**, single engine piston-powered aircraft will continue to account for the vast majority of based aircraft at the airport. Over the course of the 20-year planning period, turboprops and business jets are forecast to grow as a percent of total based aircraft. Single and multi-engine piston-powered aircraft are forecast to drop slightly as a percent of the mix. As a percentage of the fleet mix, helicopters are forecast to remain relatively constant.

TABLE 2L
Based Aircraft Fleet Mix
Caldwell Industrial Airport

Aircraft Type	2009	Percent	2015	Percent	2020	Percent	2030	Percent
Single Engine Piston	424	88.33%	466	87.92%	498	87.37%	560	86.15%
Multi-Engine Piston	21	4.38%	23	4.34%	24	4.21%	27	4.15%
Turboprop	10	2.08%	12	2.26%	14	2.46%	18	2.77%
Jet	3	0.63%	6	1.13%	10	1.75%	16	2.46%
Helicopters	22	4.58%	23	4.34%	24	4.21%	29	4.46%
Total	**480**	**100.00%**	**530**	**100.00%**	**570**	**100.00%**	**650**	**100.00%**

Source: Coffman Associates analysis of FAA Registered Aircraft Database

ANNUAL OPERATIONS

Airport operations can be characterized as local or itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations.

Caldwell Industrial Airport has three Federal Aviation Regulations (FAR) Part 141 FAA certified flight training schools. Silverhawk Aviation Academy provides helicopter training and is a fixed base operator (FBO) at the airport. Hinkle Aviation and Air-O-Drome Aviation provide fixed wing training.

Operations at an airport are further classified as general aviation, air taxi/other, air carrier, or military. Air taxi is generally considered on-demand service that includes charter and fractional activity. This is considered itinerant in nature. Air carrier activity is scheduled passenger operations, which is not currently available at Caldwell Industrial Airport. Military activity is not unusual at general aviation airports and can include both local and itinerant. There is evidence of military activity at the airport. Typically, itinerant operations increase with business and commercial use as business aircraft are used primarily to transport people from one location to another. It is estimated that 70 percent of the operations at the airport are local in nature, with the remaining 30 percent being itinerant.

Caldwell Industrial Airport is a non-towered facility. This means that actual operations counts are not available. Therefore, estimates must be made based on interviews with airport operators and management and from historical documentation and study. Four recent operational forecasts are presented in **Table 2M**.

The Idaho Aviation System Plan operations forecast was developed utilizing a methodology centered on a ratio of operation per based aircraft. The 2007 estimate for based aircraft from the

plan is 535. Therefore, the operations figures are likely somewhat high.

The 2009 *Terminal Area Forecast* (TAF) reflects a growth rate that is substantially higher than other forecasts or methodologies examined. This forecast would likely be the high end for consideration.

TABLE 2M
Existing Total Operations Forecasts
Caldwell Industrial Airport

Year	2008 IASP	2009 TAF	NPIAS Formula	FAA Equation[1]
2009	150,736	150,708	168,000	154,000
2010	152,470	154,170		
2015	161,457	172,731	185,500	159,000
2020	170,962	193,559	199,500	163,000
2025	181,015	216,934		
2030	191,659	243,162	227,500	169,000
AAGR 2009-2030	1.15%	2.30%	1.45%	0.44%

IASP: Idaho Aviation System Plan
NPIAS Formula: 350 operations per based aircraft
TAF: Terminal Area Forecast
[1]Model for Estimating General Aviation Operations at Non-Towered Airports (FAA 2001)
Source: Coffman Associates analysis

The *National Plan of Integrated Airport Systems* (NPIAS) provides a very general formula for estimating operations at non-towered general aviation airports. Reliever airports, such as Caldwell Industrial Airport, can average between 350 and 750 operations per based aircraft. In **Table 2M**, the NPIAS formula is utilized with an estimate of 350 operations per based aircraft.

The last forecast utilizes a statistical regression model approved by the FAA to estimate total operations at non-towered airports. The research paper titled, *Model for Estimating General Aviation Operations at Non-Towered Airports Using Towered and Non-Towered Airport Date (GRA, Inc. 2001),* presents the methodology and formula for the model. Independent variables used in the model include airport characteristics, demographics, and geographic features. The model was derived using a combined data set for small towered and non-towered GA airports and incorporates a dummy variable to distinguish the two airport types. Specifically, the model utilizes the following variables:

- Based aircraft;
- Percent of aircraft based at the subject airport among general aviation airports within 100 miles;
- Number of FAR 141 flight training schools at the airport;
- Population within 100 miles;
- Ratio of population within 25 miles and within 100 miles.

This model factors each of these variables so that both local and national

variables are considered when estimating operations. This model is statistically based and approved by the FAA. The base year forecast of the model appears to be reasonable considering current estimates. The model also reflects the fact that as more based aircraft are added at an airport, operations tend to increase but at a slower rate.

Air Taxi Operations

The air taxi category includes aircraft involved in on-demand passenger, small parcel transport, and air ambulance activity. This category of operations is regulated under FAR Part 135. There are no Part 135 certified carriers based at the airport.

On an annual basis, the FAA surveys general aviation and air taxi activity. The information obtained from the survey enables the FAA to monitor the general aviation fleet so that it can:

- Anticipate and meet demand for National Airspace facilities and services;
- Evaluate the impact of safety initiatives and regulatory changes;
- Build more accurate measures of the safety of the general aviation community.

The data collected are also used by other government agencies, the general aviation industry, trade associations, and private businesses to pinpoint safety problems and to form the basis for critical research and analysis of general aviation issues. This data is consolidated in the annual FAA Aerospace Forecasts. For air taxi operations, the FAA forecasts an annual growth rate of 1.5 percent between 2010 and 2020.

The FAA *Terminal Area Forecast* (TAF) estimates 2,000 air taxi operations at Caldwell Industrial Airport for each year through 2025 (flat-line forecast). Caldwell Industrial Airport is the only designated reliever airport for Boise Airport. As such, it is likely to receive more operations by air taxi operators over time. The air taxi forecast reflects a modest growth rate for Caldwell Industrial Airport as shown in **Table 2N**.

TABLE 2N
Air Taxi Forecast

Year	Caldwell Air Taxi Operations	U.S. Air Taxi/Commuter Operations[2]	Percent of U.S. Air Taxi/Commuter Operations
2009	2000[1]	10,270,800	0.0195%
Air Taxi Forecast (AAGR= 1.62%)			
2015	2,200	11,282,000	0.0195%
2020	2,400	11,985,100	0.0200%
2030	2,800	13,788,266*	0.0203%

AAGR = Average Annual Growth Rate
Sources: [1]*FAATerminal Area Forecast;*
[2]FAA Aerospace Forecasts FY 2009-2025;
*2030 U.S. Air Taxi figure extrapolated at 1.5% annual growth

Military Operations

At some general aviation airports, military operations can be common. Caldwell Industrial Airport does not experience regular military operations. The FAA TAF forecasts 300 itinerant military operations annually from 2008 through 2025. For planning purposes, this master plan will include 300 military itinerant operations for each of the plan years.

Operations Fleet Mix

Estimating the number of operations by aircraft type helps to identify necessary facility requirements and various environmental impacts. Operations by multi-engine, turboprop, and business jet aircraft are generally considered itinerant in nature. Since there is not an airport traffic control tower available to count operations, estimates have been developed based on industry averages and interviews with airport operators.

The operators of flight schools at the airport were interviewed to determine the frequency of operations. Each of them indicated that their student enrollments have declined in the current economic environment, but they did provide operational estimates from years past when activity was more significant. For planning purposes it is important to account for previous peaks in activity so that once the economy rebounds and activity levels return, the airport is positioned to act upon growth.

Table 2P presents the operations activity by aircraft type. Helicopter operations are estimated to account for approximately 10 percent of annual operations. Multi-engine piston activity is estimated at 200 operations per based aircraft, turboprop at 250 operations per based aircraft, and jet activity at 300 operations per based aircraft. These operations estimates account for all activity by that aircraft type and are not estimates of the actual number of operations attributable to a particular based aircraft.

TABLE 2P
Fleet Mix Operations Forecast
Caldwell Industrial Airport

	2009	%	2015	%	2020	%	2030	%
Local Operations								
Piston	96,800	89.80%	99,800	89.67%	102,100	89.48%	103,800	87.74%
Helicopter	11,000	10.20%	11,500	10.33%	12,000	10.52%	14,500	12.26%
Total Local	107,800	100.00%	111,300	100.00%	114,100	100.00%	118,300	100.00%
Itinerant Operations								
Single Piston	34,280	74.20%	33,848	70.96%	33,016	67.52%	31,152	61.44%
Multi-Piston	4,200	9.09%	4,600	9.64%	4,800	9.82%	5,400	10.65%
Turboprop	2,500	5.41%	3,000	6.29%	3,500	7.16%	4,500	8.88%
Jet	900	1.95%	1,800	3.77%	3,000	6.13%	4,800	9.47%
Helicopters	4,320	9.35%	4,452	9.33%	4,584	9.37%	4,848	9.56%
Total Itinerant	46,200	100.00%	47,700	100.00%	48,900	100.00%	50,700	100.00%
Total Operations	154,000		159,000		163,000		169,000	

Source: Coffman Associates analysis

Peaking Operations

Many aspects of facility planning relate to levels of peaking activity – times when the airport is busiest. For example, the appropriate size of a terminal building can be estimated by determining the number of people that could reasonably be expected to use the facility at a given time. The following planning definitions apply to the peak periods:

- **Peak Month** -- The calendar month when peak aircraft operations occur.
- **Design Day** -- The average day in the peak month.
- **Busy Day** -- The busy day of a typical week in the peak month.
- **Design Hour** -- The peak hour within the design day.

It is important to note that only the peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. The peak period forecasts represent reasonable planning standards that can be applied without overbuilding or being too restrictive.

Without the availability of records from a tower, peak periods must be estimated. The forecast of peak month operations assumes approximately 10 percent of annual operations. This is typical for a general aviation airport that does not have extreme seasonal changes to activity levels.

The design day was then calculated by dividing the peak month operations by 30. The busy day has been estimated at 40 percent higher than the average day in the peak month and was calculated by multiplying the design day by 1.4. Design hour operations were calculated at 17.5 percent of design day operations. **Table 2Q** summarizes the general aviation peak activity forecasts.

TABLE 2Q
Peak Operations Forecast
Caldwell Industrial Airport

	2009	2015	2020	2030
Annual Operations	154,000	159,000	163,000	169,000
Peak Month (10%)	15,400	15,900	16,300	16,900
Busy Day	719	742	761	789
Design Day	513	530	543	563
Design Hour (17.5%)	90	93	95	99

Source: Coffman Associates analysis

Annual Instrument Approaches

An instrument approach, as defined by the FAA, is "an approach to an airport with the intent to land by an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude." To qualify as an instrument approach, aircraft must land at the airport after following one of the published instrument approach proce-

dures in less than visual conditions. Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities such as an instrument landing system. It should be noted that practice or training approaches do not count as annual AIAs.

During poor weather conditions, pilots are less likely to fly and rarely would perform training operations. As a result, an estimate of the total number of AIAs can be made based on a percent of itinerant operations regardless of the frequency of poor weather conditions. An estimate of two percent of itinerant operations is utilized to forecast AIAs at Caldwell Industrial Airport as presented in **Table 2R**.

TABLE 2R
Annual Instrument Approach (AIAs) Projections
Columbia Gorge Regional Airport

	AIAs	Itinerant Operations	Ratio
2015	954	47,700	2.00%
2020	978	48,900	2.00%
2030	1,014	50,700	2.00%

Source: Coffman Associates analysis

In the future, Caldwell Industrial Airport will be increasingly utilized by more sophisticated turboprop and jet aircraft (as is the trend nationally). Also, the increased availability of low-cost navigational equipment could allow for smaller and less-sophisticated aircraft to utilize instrument approaches. National trends indicate an increasing percentage of instrument approaches given the greater availability of approaches at airports with GPS and the availability of more cost-effective equipment.

SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the next 20 years. **Exhibit 2E** presents a summary of forecasted data. The baseline year for forecast data is 2009. The forecasting effort extends 20 years to the year 2030.

Caldwell Industrial Airport is a general aviation airport that experienced approximated 154,000 operations in 2009. The airport has a single runway system with a full length parallel taxiway. Both runway ends support sophisticated LPV (localizer performance with vertical guidance) approaches with 300-foot cloud ceilings and 1-mile visibility minimums. Several other instrument approaches are available.

General aviation activity often trends with national and local economies. The country has been in a recessionary period since December 2007, and activity at both commercial service airports and general aviation airports has been down. The Caldwell Industrial Airport has, to date, weathered

the economic downturn fairly well. Operations have continued to trend upward, and hangar construction has continued at the airport.

Forecasts of aviation activity, including based aircraft and operations, is key to determining future facility requirements. Current based aircraft figures vary greatly from a low of 121 to a high of 555. As part of this planning effort, a revised estimate of 480 based aircraft has been identified based on physical inspection of airport hangars. Operations figures are even more difficult to define since there is not an airport traffic control tower. Utilization of FAA approved estimation methods for operations at non-towered airports Caldwell Industrial Airport had approximately 154,000 in 2009. As more aircraft base at an airport, the number of operations tends to increase, but at a slower rate over time. The long term operational forecast is for 169,000 annual operations.

The fleet mix operations, or type and frequency of aircraft use, is important in determining facility requirements and environmental impacts. There are 22 helicopters based at the airport that account for approximately 10 percent of the annual operations. A helicopter flight school is also based at the airport along with two fixed wing flight schools. This leads to approximately 70 percent of the operations being local or training operations and 30 percent being itinerant in nature.

The next step in the master plan process is to use the forecasts to determine development needs for the airport through 2030. Chapter Three – Facility Requirements will address airside elements, such as safety areas, runway, taxiways, lighting, and navigational aids, as well as landside requirements, including hangars, aircraft aprons, and support services. As a general observation, Caldwell Industrial Airport is well-positioned for growth into the future. The local economy is forecast to be strong. The remaining portions of the master plan will lay out how that growth can be accommodated in an orderly, efficient, and cost-effective manner.

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	ACTUAL	FORECAST		
	2009	2015	2020	2030
ANNUAL OPERATIONS				
General Aviation				
Itinerant	43,900	45,200	46,200	47,600
Local	107,800	111,300	114,100	118,300
Military				
Itinerant	300	300	300	300
Local	0	0	0	0
Air Taxi (Itinerant)	2,000	2,200	2,400	2,800
Total Itinerant	**46,200**	**47,700**	**48,900**	**50,700**
Total Local	**107,800**	**111,300**	**114,100**	**118,300**
TOTAL OPERATIONS	***154,000***	***159,000***	***163,000***	***169,000***
BASED AIRCRAFT				
Single Engine	424	466	498	560
Multi-Engine	21	23	24	27
Turboprop	10	12	14	18
Business Jet	3	6	10	16
Helicopter	22	23	24	29
TOTAL BASED AIRCRAFT	***480***	***530***	***570***	***650***
Instrument Approaches (AIAs)	NA	954	978	1,014

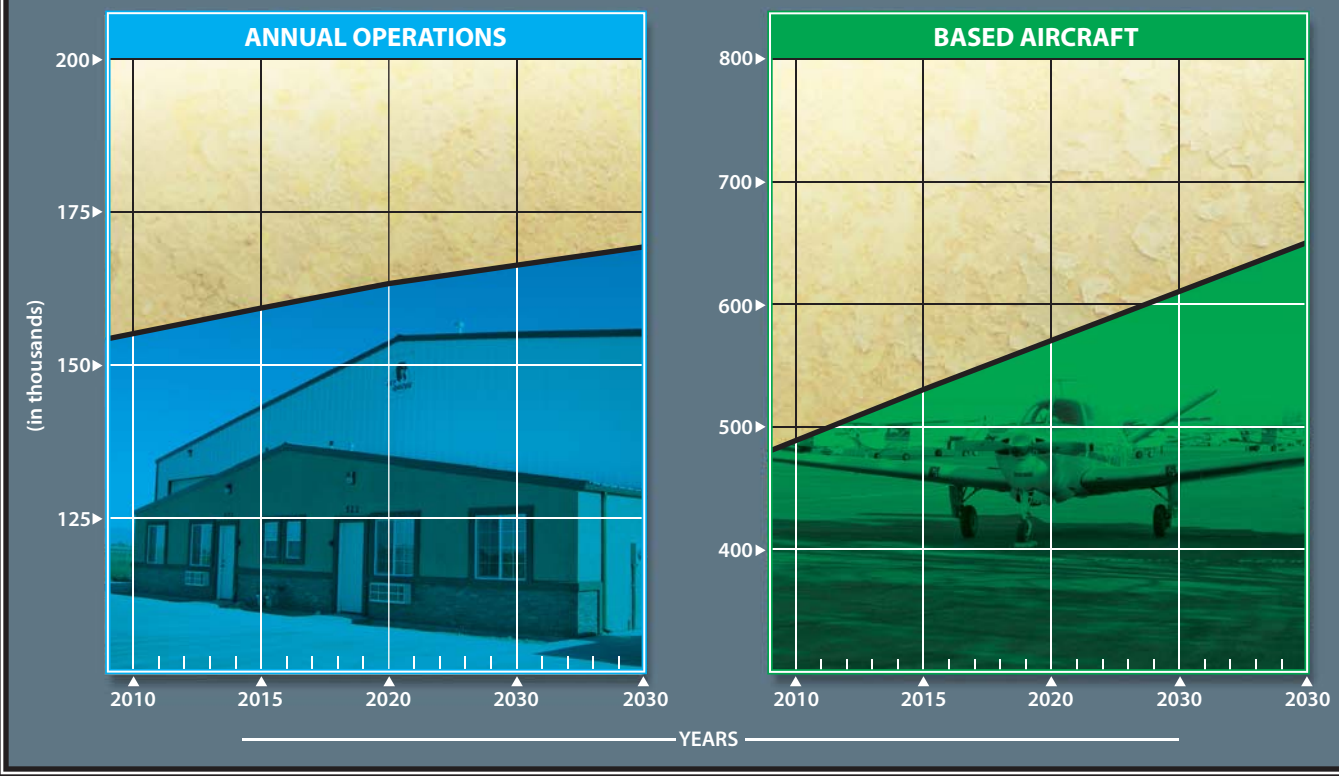

Exhibit 2E
FORECAST SUMMARY

Chapter Three

AIRPORT FACILITY REQUIREMENTS

Airport Facility Requirements

To properly plan for the future of Caldwell Industrial Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve the forecast demand. This chapter uses the results of the forecasts presented in Chapter Two, as well as established planning criteria, to determine the airfield (i.e., runways, taxiways, navigational aids, marking and lighting) and landside (i.e., hangars, aircraft parking apron, and automobile parking) facility requirements.

The objective of this effort is to identify, in general terms, the adequacy of the existing airport facilities, outline what new facilities may be needed, and when these may be needed to accommodate forecast demand. Having established these facility requirements, alternatives for providing these facilities will be evaluated in Chapter Four - Alternatives to determine the most cost-effective and efficient means for implementation.

PLANNING HORIZONS

An updated set of aviation demand forecasts for Caldwell Industrial Airport has been established. These activity forecasts include annual operations, based aircraft, fleet mix, and peaking characteristics. With this information, specific components of the airfield and landside system can be evaluated to determine their capacity to accommodate future demand.

Cost-effective, efficient, and orderly development of an airport should rely more upon actual demand at an airport rather than on a time-based forecast figure. In order to develop a master plan that is demand-based rather than time-based, a series of planning

horizon milestones have been established that take into consideration the reasonable range of aviation demand projections. The short term planning horizon roughly represents the first 5 years, the intermediate term is years 6 through 10, and the long term is years 11 through 20.

It is important to consider that the actual activity at the airport may be higher or lower than what the annualized forecast portrays. By planning according to activity milestones, the resultant plan can accommodate unexpected shifts or changes in the area's aviation demand. It is important for the plan to accommodate these changes so that airport officials can respond to unexpected changes in a timely fashion.

The most important reason for utilizing milestones is that it allows airport management to make decisions and develop facilities according to need generated by actual demand levels. The demand-based schedule provides flexibility in development, as development schedules can be slowed or expedited according to demand at any given time over the planning period. The resultant plan provides airport officials with a financially responsible and needs-based program.

CRITICAL AIRCRAFT

The selection of appropriate Federal Aviation Administration (FAA) design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using or are expected to use the airport. Federally funded projects require that critical design airplanes have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes with similar characteristics. Future standards must be considered now to ensure that short term development does not preclude the long range potential needs of the airport.

The FAA has established a coding system to relate airport design criteria to the operational and physical characteristics of aircraft expected to use the airport. This airport reference code (ARC) has two components. The first component, depicted by a letter, is the aircraft approach category and relates to aircraft approach speed (operational characteristic). The second component, depicted by a Roman numeral, is the airplane design group and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runways and runway-related facilities, while airplane wingspan primarily relates to separation criteria involving taxiways, taxilanes, and landside facilities.

According to FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, an aircraft's approach category is based upon 1.3 times its stall speed in landing configuration at that aircraft's maximum certificated weight. The airplane design group (ADG) is based upon either the aircraft's wingspan or tail height, whichever is greater. For example, an aircraft may fall in ADG II for wingspan but ADG III for tail height. This aircraft would be classified under ADG-III. **Table 3A**

presents the components of the airport reference code.

TABLE 3A
Airport Reference Code

Aircraft Approach Category		
Category	*Speed*	
A	< 91 Knots	
B	91- < 121 Knots	
C	121- < 141 Knots	
D	141- <166 Knots	
E	> 166 Knots	
Airplane Design Group[1]		
Group	*Tail Height (ft)*	*Wingspan (ft)*
I	< 20	< 49
II	20- < 30	49- < 79
III	30- < 45	70- < 118
IV	45- < 60	118- < 171
V	60- < 66	171- < 214
VI	66- < 80	214- < 262

[1] Utilize the most demanding category.
Source: FAA AC 150/5300-13, Airport Design

Exhibit 3A summarizes representative aircraft by ARC. As shown on the exhibit, the airport does not currently, nor is it expected to, regularly serve aircraft in ARCs C-IV, D-IV, or D-V. These large transport aircraft are used by commercial carriers, which do not currently use, nor are they expected to use, the airport through the planning period. Some of the largest business jets, such as the Gulfstream V, fall in ARC D-III and are capable of operating at the airport under certain conditions.

In order to determine airfield design requirements, the critical aircraft and critical ARC should first be determined before appropriate airport design criteria is applied. This begins with a review of aircraft currently using the airport and those expected to use the airport through the 20-year planning period.

CURRENT CRITICAL AIRCRAFT

The critical design aircraft is defined as the most demanding category of aircraft which conduct 500 or more itinerant operations at the airport each year. In some cases, more than one specific make and model of aircraft comprises the airport's critical design aircraft. One category of aircraft may be the most critical in terms of approach speed, while another is most critical in terms of wingspan and/or tail height, which affects runway/taxiway width and separation design standards.

General aviation aircraft using the airport include a variety of small single and multi-engine piston-powered aircraft, turboprops, and occasionally business jet aircraft. While the airport is used by a number of helicopters, they are not included in this determination as they are not assigned an ARC.

The majority of the based aircraft are single and multi-engine piston-powered aircraft which fall within approach categories A and B and ADG I. To determine if the current ARC for the airport is larger than A/B-I, an analysis of both based and transient activity by larger turboprops and business jets was undertaken.

There are several large turboprop aircraft based at the airport, including King Air models 200, 300 and 350. Each of these turboprops falls in ARC B-II. The airport is also home to three

business jets. The first is an Eclipse very light jet which is in ARC A-I. There are two Cessna Citation business jets, both of which fall in ARC B-II. While based aircraft, per se, do not contribute to the current ARC, large turboprops and business jets rarely perform training operations; therefore, the presence of several active turboprops and business jets would contribute to the ARC determination. Turboprops and business jets typically fly more frequently as they are utilized for business and not pleasure. A based turboprop or business jet typically account for between 300 and 500 annual operations. Therefore, the combination of these based aircraft solidifies a baseline ARC of B-II for Caldwell Industrial Airport.

An effort has also been made to identify non-based transient activity to determine if the current ARC is something larger than those aircraft in ARC B-II. This effort focuses on identifying transient business jets operating at the airport since turboprops larger than ARC B-II are extremely rare.

A subscription service provides data on flight plans filed with the FAA (www.airportiq.com). The data available includes aircraft owner, aircraft type, N-number, origin, destination, date, and time-of-day. The database only captures those flight plans that are opened and closed on the ground. It is common for pilots to either open or close a flight plan while in the air, particularly when operating in visual conditions. Therefore, the data captured represents a minimum level of activity when actual activity is higher. Nonetheless, from this database, it can be determined what types of aircraft utilize the airport. **Table 3B** is a sampling of the types of larger aircraft that utilized the airport in 2009.

TABLE 3B
Business Jet Activity (2009)
Caldwell Industrial Airport

Owner	Aircraft Model	Aircraft ARC
Bay Jet LLC	Gulfstream 200 (IAI)	C-II
NJI Sales Inc	Gulfstream IV	D-II
Chief Industries, Inc.	Cessna 550	B-II
JB Holdings, LLC	IAI Astra	C-II
KA 350 LLC	Cessna 525B	B-II
Lynch Flying Services	Cessna 560	B-II
SC Aviation, Inc.	Bae Hawker 125-700A	C-II
Spring Mountain Enterprises	Cessna 650	C-II
SSI Aviation	Lear 31A	C-I
WRI Aviation, LLC	Cessna 550	B-II

Source: www.airportiq.com

As can be seen, a variety of business jets use the airport. Aircraft as large as the Gulfstream IV (D-II) were identified in the database. More common business jet activity is seen from those in ARC C-II and below. Airport management has indicated that some of the largest business jets, including the Gulfstream V (D-III), have utilized the airport in the past. While medium

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A-I

- Beech Baron 55
- **Beech Bonanza**
- Cessna 150
- Cessna 172
- Cessna Citation Mustang
- Eclipse 500
- Piper Archer
- Piper Seneca

B-I *less than 12.500 lbs.*

- Beech Baron 58
- Beech King Air 100
- Cessna 402
- **Cessna 421**
- Piper Navajo
- Piper Cheyenne
- Swearingen Metroliner
- Cessna Citation I

B-II *less than 12.500 lbs.*

- **Super King Air 200**
- Cessna 441
- DHC Twin Otter

B-I, B-II *over 12,500 lbs.*

- Super King Air 350
- Beech 1900
- Jetstream 31
- Falcon 10, 20, 50
- Falcon 200, 900
- **Citation II**, III, IV, V
- Saab 340
- Embraer 120

A-III, B-III

- DHC Dash 7
- **DHC Dash 8**
- DC-3
- Convair 580
- Fairchild F-27
- ATR 72
- ATP

C-I, D-I

- Beech 400
- **Lear 25, 31, 35, 45, 55, 60**
- Israeli Westwind
- HS 125-400, 700

C-II, D-II

- Cessna Citation III, VI, VIII, X
- **Gulfstream II, III, IV**
- Canadair 600
- ERJ-135, 140, 145
- CRJ-200, 700, 900
- Embraer Regional Jet
- Lockheed JetStar

C-III, D-III

- ERJ-170, 190
- Boeing Business Jet
- B 727-200
- **B 737-300 Series**
- MD-80, DC-9
- Fokker 70, 100
- A319, A320
- Gulfstream V
- Global Express

C-IV, D-IV

- **B-757**
- B-767
- C-130
- DC-8-70
- DC-10
- MD-11
- L1011

D-V

- **B-747** Series
- B-777

Note: Aircraft pictured is identified in bold type.

Exhibit 3A
AIRPORT REFERENCE CODES

and large business jets do operate at the airport, their frequency does not approach the 500 operations threshold.

Table 3C presents the number of recorded operations conducted by pilots of business jets over the last seven years. While it is known that not all operations are captured, due to opening or closing of flight plans in the air, it is also known that pilots of business jets are more likely to file a flight plan due to the sophisticated nature of their aircraft.

TABLE 3C
Annual Business Jet Operations
Caldwell Industrial Airport

ARC	2003	2004	2005	2006	2007	2008	2009
A-I	0	0	0	0	0	0	30
B-I	8	4	10	10	12	4	0
B-II	14	18	28	28	60	14	12
C-I	4	8	26	28	18	10	6
C-II	12	24	18	4	0	4	6
C-III	0	0	0	2	0	0	0
D-I	0	0	2	2	0	0	0
D-II	0	0	2	0	2	2	4
D-III	0	0	0	2	2	0	2
Subtotal	**38**	**54**	**86**	**76**	**94**	**34**	**60**

ARC: Airport Reference Code
Source: www.airportiq.com

Given the wide variety of turboprop and business jets that operate at the airport, a critical aircraft falling into ARC B-II is reasonable. By meeting this design standard, the airport can meet the needs of all turboprop aircraft and much of the business jet fleet. Larger business jets can and do operate at the airport, but on a less frequent basis. **Therefore, the current critical aircraft is determined to be in ARC B-II.**

FUTURE CRITICAL AIRCRAFT

The aviation demand forecasts indicate the potential for continued growth in business jet and turboprop activity at the airport. This includes a long term forecast of 16 based business jets and 18 based turboprops.

The type and size of the business jet activity in the future is difficult to precisely identify. Factors such as the forecast population and employment growth in the airport service area, the proximity and level of service of other regional airports, and development at the airport can influence future activity. One factor that should be considered is that Caldwell Industrial Airport is the only reliever to Boise Airport, which would encourage increased business jet activity.

Increased activity by larger business jets would drive the need to meet more stringent design standards, including

any expansion of the runway system. Current data suggests that the critical aircraft will remain in ARC B-II through the planning period, but Caldwell Industrial Airport is fully capable of accommodating larger business jets in ARC C-II. As discussed, this transition would occur if one very active or several moderately active C-II business jets were to base at the airport. The combined activity of such business jets and an increased level of non-based activity by C-II aircraft could lead to the airport realizing 500 annual operations by C-II business jets. **Therefore, this master plan will consider the long term critical aircraft to transition to business jets in ARC C-II.**

AIRFIELD CAPACITY

An airport's airfield capacity is expressed in terms of its annual service volume. Annual service volume is a reasonable estimate of the maximum level of aircraft operations that can be accommodated in a year. Annual service volume accounts for annual differences in runway use, aircraft mix, and weather conditions. The airport's annual service volume was examined utilizing FAA AC 150/5060-5, *Airport Capacity and Delay*.

FACTORS AFFECTING ANNUAL SERVICE VOLUME

Exhibit 3B graphically presents the various factors included in the calculation of an airport's annual service volume. These include the airfield characteristics, meteorological conditions, aircraft mix, and demand characteristics (aircraft operations). These factors are described below.

Airfield Characteristics

The layout of the runways and taxiways directly affects an airfield's capacity. This not only includes the location and orientation of the runways, but the percent of time that a particular runway or combination of runways is in use, and the length, width, weight bearing capacity, and instrument approach capability of each runway at the airport. The length, width, weight bearing capacity, and instrument approaches available to a runway determine which type of aircraft may operate on the runway and if operations can occur during poor weather conditions.

- RUNWAY CONFIGURATION

Runway 12-30 is oriented in a northwest to southeast manner. A full-length parallel taxiway is available along the west side of the runway. This runway can accommodate all small general aviation aircraft and most business jet aircraft.

- RUNWAY USE

Runway use is normally dictated by wind conditions. The direction of take-offs and landings are generally determined by the speed and direction of wind. It is generally safest for aircraft to take off and land into the wind, avoiding a crosswind (wind that is blowing perpendicular to the travel of the aircraft) or tailwind components

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AIRFIELD LAYOUT

Runway Configuration

Runway Use

Number of Exits

WEATHER CONDITIONS

VFR
Visual Flight Rule

IFR
Instrument Flight Rule

PVC
Poor Visibility Conditions

AIRCRAFT MIX

Category A & B Aircraft

Category C Aircraft

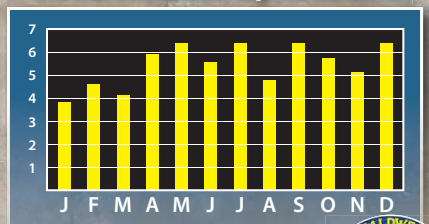
Category D Aircraft

OPERATIONS

Arrivals

Departures

Total Annual Operations



Touch-and-Go Operations

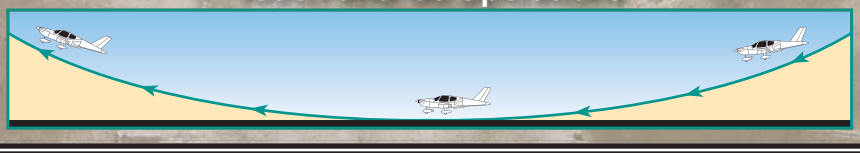


Exhibit 3B
AIRFIELD CAPACITY FACTORS

during these operations. Prevailing winds are from the northwest.

- EXIT TAXIWAYS

Exit taxiways have a significant impact on airfield capacity since the number and location of exits directly determines the occupancy time of an aircraft on the runway. Five entrance/exit taxiways are available for use along the runway. The airfield capacity analysis gives credit to exits located within a prescribed range from a runway's threshold. This range is based upon the mix index of the aircraft that use the runway. For Caldwell Industrial Airport, those exit taxiways located between 2,000 and 4,000 feet of the landing threshold count in the capacity determination. The exits must be at least 750 feet apart to count as separate exits. Under these criteria, operations to both runway ends are credited with two exits. The presence of four or more exit taxiways within the prescribed distance and with proper separation will receive maximum credit for exit taxiways in the capacity and delay model.

Meteorological Conditions

Weather conditions can have a significant effect on airfield capacity. Airport capacity is usually highest in clear weather, when flight visibility is at its best. Airfield capacity is diminished as weather conditions deteriorate and cloud ceilings and visibility are reduced. As weather conditions deteriorate, the spacing of aircraft must increase to provide allowable margins of safety. The increased distance between aircraft reduces the number of aircraft which can operate at the airport during any given period. This consequently reduces overall airfield capacity.

There are three categories of meteorological conditions, each defined by the reported cloud ceiling and flight visibility. Visual Flight Rule (VFR) conditions exist whenever the cloud ceiling is greater than 1,000 feet above ground level, and visibility is greater than three statute miles. VFR flight conditions permit pilots to approach, land, or take off by visual reference.

Instrument Flight Rule (IFR) conditions exist when the reported ceiling is less than 1,000 feet above ground level and/or visibility is less than three statute miles. Under IFR conditions, pilots must rely on instruments for navigation and guidance to the runway. Other aircraft cannot be seen and safe separation between aircraft must be assured solely by following air traffic control rules and procedures. For capacity analysis, IFR conditions are further subdivided with the first segment having a cloud ceiling height between 500 and 1,000 feet or visibility being between one and three miles. Poor Visibility Conditions (PVC) is that portion of IFR observations that exist when the cloud ceiling is less than 500 feet and visibility is less than one mile.

According to meteorological data collected from the on-airport automated weather observation system (AWOS) over a recent 10-year period, VFR conditions exist approximately 95 percent of the time. IFR conditions exist approximately 1.76 percent of the time,

and PVC conditions were present 3.24 percent of the time. **Table 3D** summarizes the meteorological conditions experiences at the airport over a 10-year period of time.

TABLE 3D
Meteorological Conditions
Caldwell Industrial Airport

Condition	Cloud Ceiling Height	Visibility	Observations	Percent of Total
VFR	> 1,000'	> 3 miles	130,747	95.00%
IFR	≥ 500' and ≤ 1,000'	1-3 miles	2,427	1.76%
PVC	< 500'	< 1 mile	4,454	3.24%

Source: National Oceanic and Atmospheric Administration - National Climatic Data Center. 137,628 airport observations from 11/1998 - 11/2008.

Aircraft Mix

Aircraft mix refers to the speed, size, and flight characteristics of aircraft operating at the airport. As the mix of aircraft operating at an airport increases to include larger aircraft, airfield capacity begins to diminish. This is due to larger separation distances that must be maintained between aircraft of different speeds and sizes.

Aircraft mix for the capacity analysis is defined in terms of four aircraft classes. Classes A and B consist of single and multi-engine aircraft weighing less than 12,500 pounds. Aircraft within these classifications are primarily associated with general aviation operations, but does include some turboprop and business jet aircraft (e.g., the Cessna Citation business jet and Beechcraft King Air). Class C consists of multi-engine aircraft weighting between 12,500 and 300,000 pounds. This broad classification includes business jets, turboprops, and large commercial airline aircraft. Most of the business jets in the national fleet are included within this category. Class D includes all aircraft over 300,000 pounds and includes wide bodies and jumbo jets. There are no Class D aircraft currently operating or forecast to operate from the airport. **Exhibit 3B** depicts representative aircraft in each aircraft class.

For the capacity analysis, the percentage of Class C aircraft operating at the airport is critical in determining the annual service volume as this class includes the larger and faster aircraft in the operational mix. The existing and projected operational fleet mix for capacity analysis is summarized in **Table 3E**. Consistent with projections prepared in the previous chapter, the operational fleet mix at the airport is expected to slightly increase its percentage of Class C aircraft as business and corporate use of general aviation aircraft increases at the airport.

TABLE 3E Aircraft Operational Mix (Capacity Analysis) Caldwell Industrial Airport		
	A & B	C
Existing (2009)	97.79%	2.21%
Short	97.36%	2.64%
Intermediate	96.93%	3.07%
Long	95.92%	4.08%

A&B: Aircraft weighing less than 12,500 pounds
C: Aircraft weighing between 12,500 - 300,000 pounds
Source: Aircraft Operational Fleet Mix (Table 2P)

Demand Characteristics

Operations, not only the total number of annual operations, but the manner in which they are conducted, have an important effect on airfield capacity. Peak operational periods, touch-and-go operations, and the percent of arrivals impact the number of annual operations that can be conducted at the airport.

- PEAK PERIOD OPERATIONS

For the airfield capacity analysis, average daily operations and average peak hour operations during the peak month are calculated. These operational levels were calculated previously in Chapter Two for existing and forecast levels of operations. Typical operational activity is important in the calculation of an airport's annual service level as "peak demand" levels occur sporadically. The peak periods used in the capacity analysis are representative of normal operational activity and can be exceeded at various times through the year.

- TOUCH-AND-GO OPERATIONS

A touch-and-go operation involves an aircraft making a landing and then an immediate take-off without coming to a full stop or exiting the runway. These operations are normally associated with general aviation training operations.

Touch-and-go activity is counted as two operations since there is an arrival and a departure involved. A high percentage of touch-and-go traffic normally results in a higher operational capacity because one landing and one takeoff occurs within a shorter time than individual operations. Touch-and-go operations currently account for approximately 70 percent of annual operations.

- PERCENT ARRIVALS

The percentage of arrivals as they relate to the total operations in the design hour is important in determining airfield capacity. Under most circumstances, the lower the percentage of arrivals, the higher the hourly capacity. However, except in unique circumstances, the aircraft arrival-departure split is typically 50-50. At the airport, traffic information indicated no major deviation from this pattern, and arrivals were estimated to account for 50 percent of design period operations.

CALCULATION OF ANNUAL SERVICE VOLUME

The preceding information was used in conjunction with the airfield capacity methodology developed by the FAA to determine airfield capacity for Caldwell Industrial Airport.

Annual Service Volume = C x D x H
C = weighted hourly capacity D = ratio of annual demand to average daily demand during the peak month H = ratio of average daily demand to average peak hour demand during the peak month

Hourly Runway Capacity

The first step in determining annual service volume involves the computation of the hourly capacity of each runway in use configuration. The percentage use of each runway, the amount of touch-and-go training activity, and the number and locations of runway exits become important factors in determining the hourly capacity of each runway configuration.

As the mix of aircraft operating at an airport changes to include a greater utilization of Class C aircraft, the hourly capacity of the runway system is reduced. This is because larger aircraft require longer utilization of the runway for takeoffs and landings, and because the greater approach speeds of the aircraft require increased separation. This contributes to a slight decline in the hourly capacity of the runway system over the planning period.

Annual Service Volume

Once the hourly capacity is known, the annual service volume can be determined. Annual service volume is calculated by the following equation: Following this formula, the current annual service volume for Caldwell Industrial Airport has been estimated at 234,000 operations. The increasing percentage of larger Class C aircraft over the planning period will contribute to a decline in the annual service volume, lowering it to a level of 225,000 operations by the end of the planning period.

Delay

As the number of annual aircraft operations approaches the airfield's capacity, increasing amounts of delay to aircraft operations begin to occur. Delays occur to arriving and departing aircraft in all weather conditions. Arriving aircraft delays result in aircraft holding outside of the airport traffic area. Departing aircraft delays result in aircraft holding at the runway end until they can safely takeoff.

Currently, total annual delay at the airport is estimated at 1,027 hours. If no capacity improvements are made, annual delay can be expected to reach 2,253 hours by the long range planning horizon. This calculates to a current average delay per aircraft of 0.4 minutes and a long term delay of 0.8 minutes per aircraft. The FAA threshold for significant delay is four min-

utes per aircraft. The current level of delay may not be noticeable by pilots and is not forecast to reach the FAA level of significance.

Conclusion

Table 3F summarizes annual service volume and delay measures as calculated for Caldwell Industrial Airport. **Exhibit 3C** compares annual service volume to existing and forecast operational levels. The 2009 total of 154,000 operations represented 65.8 percent of the existing annual service volume. By the end of the long term planning period, total annual operations are expected to represent 75.1 percent of annual service volume.

TABLE 3F
Airfield Demand/Capacity Summary
Caldwell Industrial Airport

		PLANNING HORIZON		
	2009	Short Term	Intermediate Term	Long Term
Operational Demand				
Annual	154,000	159,000	163,000	169,000
Design Hour	90	93	95	99
Capacity				
Annual Service Volume	234,000	232,000	230,000	225,000
Percent Capacity	65.81%	68.53%	70.87%	75.11%
Weighted Hourly Capacity	137	136	134	132
Delay				
Per Operation (Minutes)	0.4	0.5	0.6	0.8
Total Annual (Hours)	1,027	1,325	1,630	2,253

Source: FAA Advisory Circular 150/5060-5, Airport Capacity and Delay

FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS) indicates that improvements for airfield capacity purposes should be considered when operations reach 60 to 75 percent of the annual service volume. This is an approximate level to begin the detailed planning of capacity improvements. Actual implementation may be deferred until such a time that the improvement is considered timely and cost-beneficial. When 80 percent of the annual service volume is reached, capacity improvement projects should become high priority capital improvements and should be addressed as soon as possible. Chapter Four – Alternatives will examine the potential for increasing runway capacity.

AIRFIELD REQUIREMENTS

As indicated earlier, airport facilities include both airfield and landside components. Airfield facilities include those facilities that are related to the arrival, departure, and ground movement of aircraft. These components include:

- Safety Area Design Standards
- Runways
- Taxiways

- Navigational Approach Aids
- Lighting, Marking, and Signage

SAFETY AREA DESIGN STANDARDS

The FAA has established several imaginary surfaces to protect aircraft operational areas and keep them free from obstructions that could affect their safe operation. These include the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and runway protection zone (RPZ).

The entire RSA, OFA, and OFZ should be under the direct ownership of the airport sponsor to ensure these areas remain free of obstacles and can be readily accessed by maintenance and emergency personnel. It is not required that the RPZ be under airport ownership, but it is strongly recommended. An alternative to outright ownership of the RPZ is the purchase of avigation easements (acquiring control of designated airspace within the RPZ) or having sufficient land use control measures in places which ensure the RPZ remains free of incompatible development. The runway currently meets standards for RSA, OFA, and OFZ.

Dimensional standards for the various safety areas associated with the runway are a function of the type of aircraft (ARC) expected to use the runways as well as the instrument approach capability. The runway should meet the design standards for frequent activity by aircraft in ARC B-II. Both runway ends have GPS based LPV (localizer performance with vertical guidance) approaches with 1-mile visibility minimums and 300-foot cloud ceiling heights.

Runway Safety Area (RSA)

The RSA is defined in FAA AC 150/5300-13, *Airport Design,* as a "surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of undershoot, overshoot, or excursion from the runway." The RSA is centered on the runway and dimensioned in accordance to the approach speed of the critical aircraft using the runway. The FAA requires the RSA to be cleared and graded, drained by grading or storm sewers, capable of accommodating the design aircraft and fire and rescue vehicles, and free of obstacles not fixed by navigational purpose.

The FAA has placed a higher significance on maintaining adequate RSA at all airports. Under Order 5200.8, effective October 1, 1999, the FAA established the *Runway Safety Area Program.* The Order states, "The objective of the Runway Safety Area Program is that all RSAs at federally-obligated airports…shall conform to the standards contained in Advisory Circular 150/5300-13, *Airport Design*, to the extent practicable." Each Regional Airports Division of the FAA is obligated to collect and maintain data on the RSA for each runway at the airport and perform airport inspections.

Presented in **Table 3G** are the FAA runway design standards as they apply to Caldwell Industrial Airport. The airport meets the standards associated with ARC B-II. As the airport

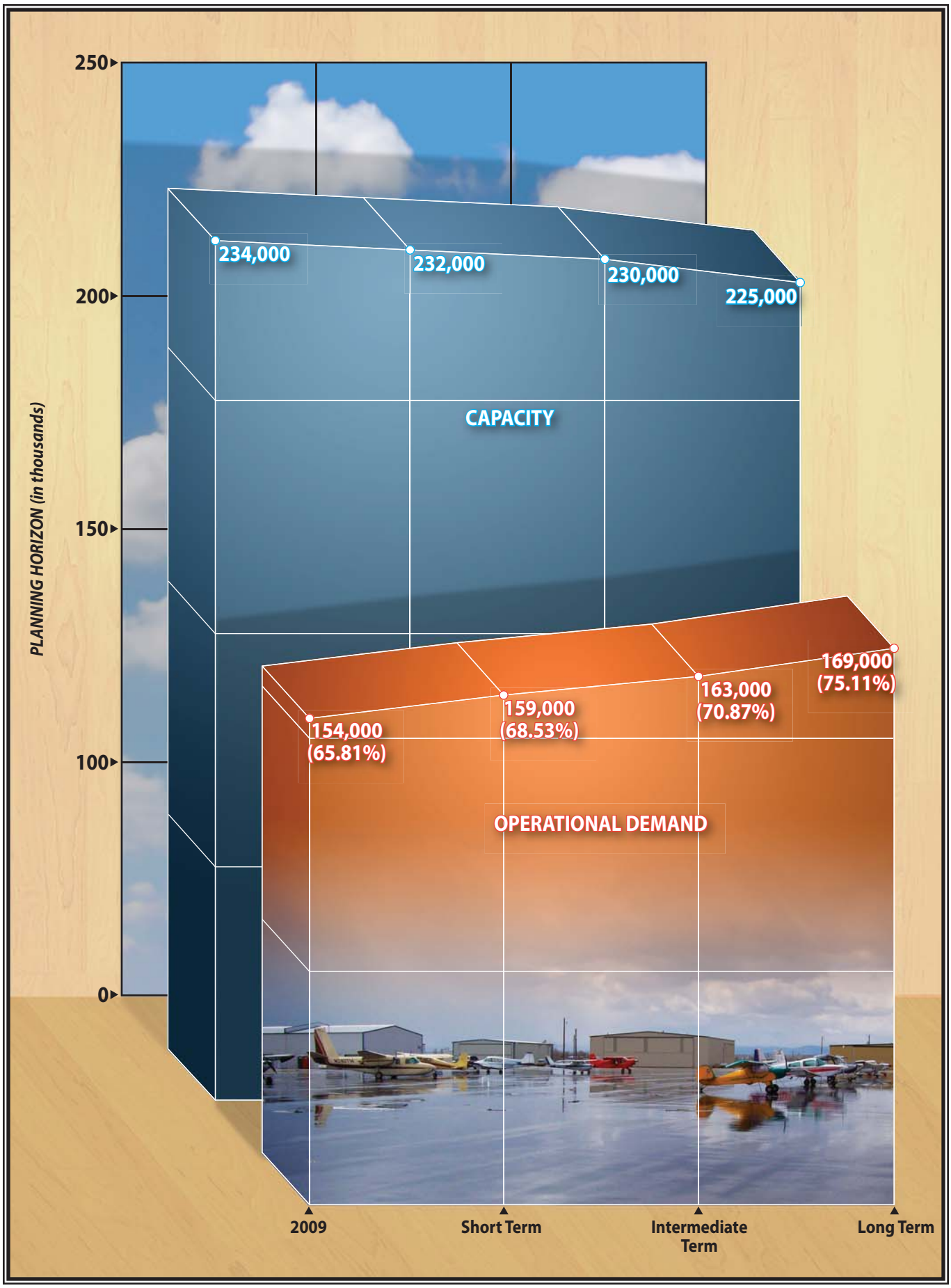


Exhibit 3C
AIRFIELD DEMAND VS. CAPACITY

grows over time, there are two factors that could necessitate the implementation of more restrictive design standards: improved instrument approaches or a transition in critical design aircraft. The airport can control the implementation of an improved instrument approach, but a transition to a more restrictive critical design aircraft is dependent on actual operations at the airport.

TABLE 3G
Runway Design Standards
Caldwell Industrial Airport

	FAA Standards		
Airport Reference Code	**B-II**	**B-II**	**C-II**
Applicable Approach Visibility Minimum	**Not Lower Than ¾-Mile**	**Lower Than ¾-Mile**	**Visual and Not Lower Than 3/4-Mile**
Status	**Currently Applicable**	**Future Consideration**	
RUNWAY DATA			
Runway Width	75	100	100
Runway Shoulder Width	10	10	10
Runway Safety Area			
Width	150	**300**	**500**
Length Beyond End	300	**600**	**1,000**
Length Prior to Landing	300	**600**	**600**
Runway Object Free Area			
Width	500	**800**	**800**
Length Beyond End	300	**600**	**1,000**
Runway Obstacle Free Zone			
Width	400	400	400
Length Beyond End	200	200	200
Runway Centerline to:			
Holding Position	200	250	250
Parallel Taxiway	240	300	300/400*
Aircraft Parking Area	250	400	400/500*

BOLD indicates standard would not be met under current runway configuration.
* Lower than 3/4-mile visibility
Source: FAA AC 150/5300-13, Airport Design

Acquiring an instrument approach with visibility minimums lower than ¾-mile increases the dimensions of the RSA and OFA. The RSA width would increase from 150 feet to 300 feet and the length beyond the runway end would increase from 300 feet to 600 feet. While the width change can be accommodated, the RSA and OFA behind the Runway 12 end would be penetrated by Linden Street.

A transition to the next level of design aircraft (ARC C-II) happens when these aircraft account for more than 500 annual operations. This transition is not forecast to occur during the 20-year scope of the master plan. If it did, the dimensions change substantially. The RSA width goes from 150 feet to 500 feet and the length goes from 300 feet to 1,000 feet. The OFA goes from 500 feet wide to 800 feet

wide and extends from 300 beyond the runway ends to 1,000 feet. The RSA and OFA behind the Runway 12 end would be penetrated by Linden Street, and the OFA on the Runway 30 end would be penetrated by Ustick Road.

Exhibit 3D presents the existing ARC B-II safety area dimensions, as well as the long term ARC C-II safety area dimensions.

Object Free Area (OFA)

The runway OFA is "a two-dimensional ground area, surrounding runways, taxiways, and taxilanes, which is clear of objects except for objects whose location is fixed by function (i.e., airfield lighting)." The OFA does not have to be graded and level like the RSA; instead, the primary requirement for the OFA is that no object in the OFA penetrate the lateral elevation of the RSA. The runway OFA is centered on the runway, extending out in accordance to the critical aircraft design category utilizing the runway.

For a B-II runway with visual approaches or an instrument approach with visibility minimums of not less than 1-mile, such as those at Caldwell Industrial Airport, the FAA calls for the OFA to be 500 feet wide, centered on the runway, and extend 300 feet beyond the runway ends. The length of the OFA beyond the runway ends is the same as the RSA.

The OFA currently meets standard. As discussed above, the dimensions of the OFA change in relation to both the critical aircraft as defined by the ARC and the capability of the instrument approaches. An instrument approach with lower than ¾-mile visibility, and/or a transition to a critical aircraft in approach category C, would bring the OFA into a non-standard condition as shown on the exhibit.

Obstacle Free Zones (OFZ)

The OFZ is an imaginary volume of airspace which precludes object penetrations, including taxiing and parked aircraft. The only allowance for OFZ obstructions is navigational aids mounted on frangible bases which are fixed in their location by function such as airfield signs. The OFZ is established to ensure the safety of aircraft operations. If the OFZ is obstructed, the airport's approaches could be removed or approach minimums could be increased.

For all runways serving aircraft over 12,500 pounds, the OFZ is 400 feet wide, centered on the runway, and extends 200 feet beyond the runway ends. Caldwell Industrial Airport meets this standard.

Runway Protection Zones (RPZ)

The RPZ is a trapezoidal area centered on the runway, typically beginning 200 feet beyond the runway end. The RPZ has been established by the FAA to provide an area clear of obstructions and incompatible land uses, in order to enhance the protection of approaching aircraft as well as people and property on the ground. The RPZ is comprised of the central portion of the RPZ and the controlled activity

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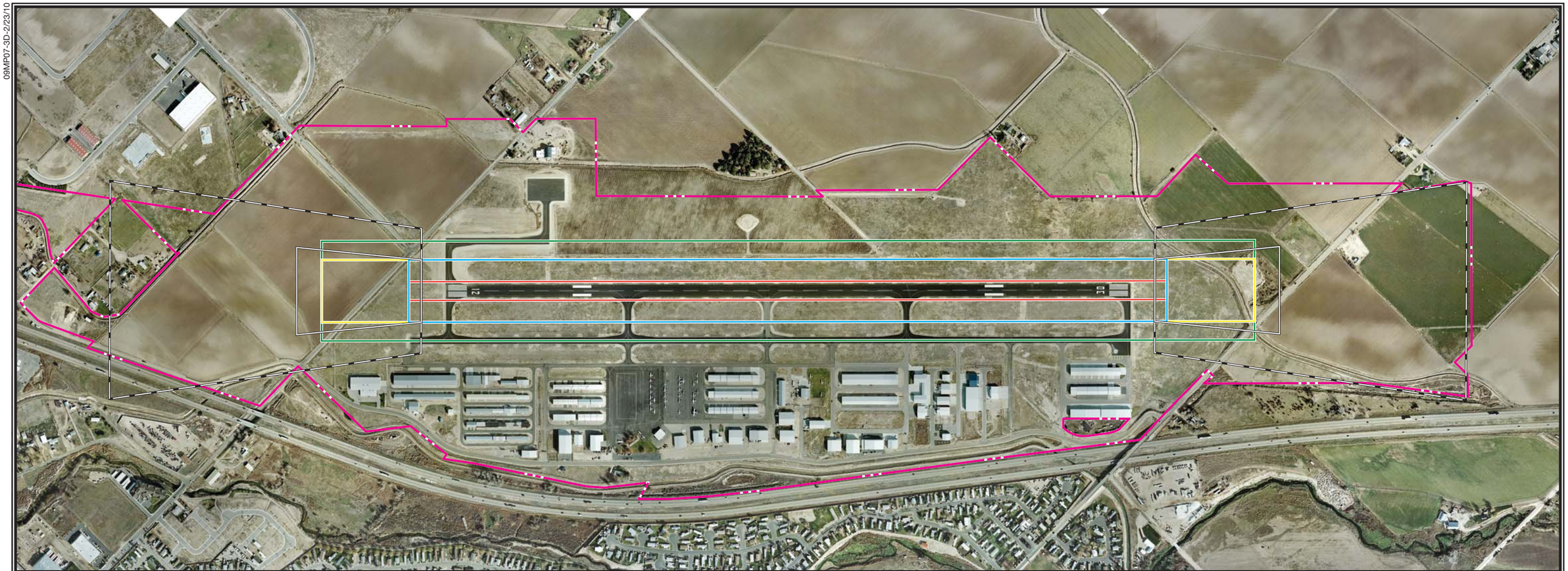

LEGEND

Airport Property Line

ARC B-II

Runway Safety Area (RSA)

Runway Object Free Area (ROFA)

Runway Protection Zone (RPZ)

ARC C-II

Runway Safety Area (RSA)

Runway Object Free Area (ROFA)

Runway Protection Zone (RPZ)

NORTH

0 800 1600

SCALE IN FEET

Photo Date: November 16, 2009

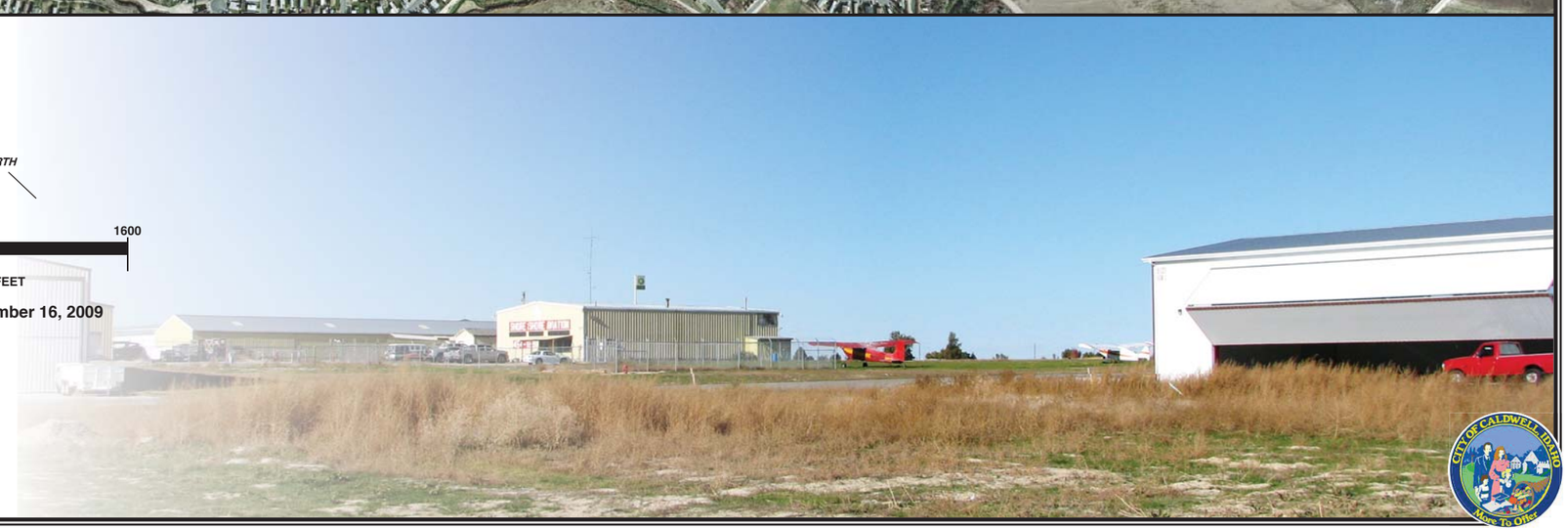

Exhibit 3D
SAFETY AREA DIMENSIONS

area. The dimensions of the RPZ vary according to the visibility minimums serving the runway and the type of aircraft (design aircraft) operating on the runway. The dimensions of the RPZs at Caldwell Industrial Airport are presented in **Table 3H**.

TABLE 3H
Runway Protection Zones
Caldwell Industrial Airport

Airport Reference Code	**B-II (Existing)**	**B-II**	**B/C-II**
Visibility Minimum	Not Lower than 1-mile	Not Lower than 3/4-mile	Lower than 3/4-mile
Inner Width	500	1,000	1,000
Outer Width	700	1,510	1,750
Length	1,000	1,700	2,500

Source: FAA AC 150/5300-13, Airport Design

The central portion of the RPZ extends from the beginning to the end of the RPZ, is centered on the runway centerline, and is the width of the OFA. Only objects necessary to aid air navigation, such as approach lights, are allowed in this portion of the RPZ. Wildlife attractants, fuel farms, places of public assembly, and residences are prohibited from the RPZs. The remaining portions of the RPZ, the controlled activity areas, have strict land use limitations. FAA AC 150/5300-13, *Airport Design* specifically allows surface parking facilities, but they are discouraged. All other uses are prohibited.

As previously discussed, where possible, the airport should have positive control over all safety areas, including the RPZs. Currently, the RPZ, are on airport property and meet the land use requirements.

Runway/Taxiway Separation

The design standards for the separation between runways and parallel taxiways are determined by the critical aircraft and the instrument approach visibility minimums. The current critical aircraft is represented by those aircraft in ARC B-II and the lowest visibility minimum is 1-mile. The current separation standard is 240 feet from the runway centerline to the parallel taxiway centerline. The introduction of an instrument approach with not lower than ½-mile visibility would make the standard 300 feet. If the approaches remain as they are but the critical aircraft transitioned to ARC C-II, then the separation standard is also 300 feet. If the instrument approach were improved to not lower than ½-mile and the critical aircraft transitioned to ARC C-II, then the runway/taxiway separation standard would be 400 feet.

Taxiways A and B are both located 400 feet from the runway centerline. This distance meets the needs of the airport and positions the airport for improved instrument approaches or a possible transition to an ARC C-II design aircraft. The current run-

way/taxiway separation should be maintained.

RUNWAYS

The adequacy of the existing runway system at Caldwell Industrial Airport has been analyzed from a number of perspectives, including runway orientation, runway length, pavement strength, width, and adherence to safety area standards. From this information, requirements for runway improvements were determined for the airport.

Runway Orientation

The airport is served by a single runway, Runway 12-30, which is oriented in a northwest to southeast manner. The runway is 5,500 feet in length and 100 feet wide. For the operational safety and efficiency of an airport, it is desirable for the primary runway to be oriented as closely as possible to the direction of the prevailing wind. This reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off.

FAA AC 150/5300-13, *Airport Design,* recommends that a crosswind runway should be made available when the primary runway orientation provides for less than 95 percent wind coverage for specific crosswind components. The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding 10.5 knots (12 mph) for ARCs A-I and B-I; 13 knots (15 mph) for ARCs A-II and B-II; and 16 knots (18 mph) for ARC C-I through D-II.

Weather data specific to the airport was obtained from the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center. This data was collected from the on-airport AWOS over a continuous 10-year period from 1998 to 2008. A total of 137,628 observations of wind direction and other data points were made.

Runway 12-30 provides 98.60 percent wind coverage for 10.5 knot crosswinds, 99.31 percent coverage at 13 knots, and 99.77 percent at 16 knots. **Exhibit 3E** presents a wind rose of the data developed following FAA guidance.

The single runway and orientation provides adequate wind coverage so a crosswind runway is not planned for the airport.

Runway Length

FAA AC 150/5235-4B, *Runway Length Requirements for Airport Design*, provides guidelines to determine runway lengths for civil airports. The use of this AC is mandatory for airports receiving Federal funding. The AC provides the procedure and rationale for determining runway lengths. The five steps and the applicability to Caldwell Industrial Airport are as follows:

Step 1. *Identify the list of critical design airplanes that will make regular use of the proposed runway and establish a planning period of at least five*

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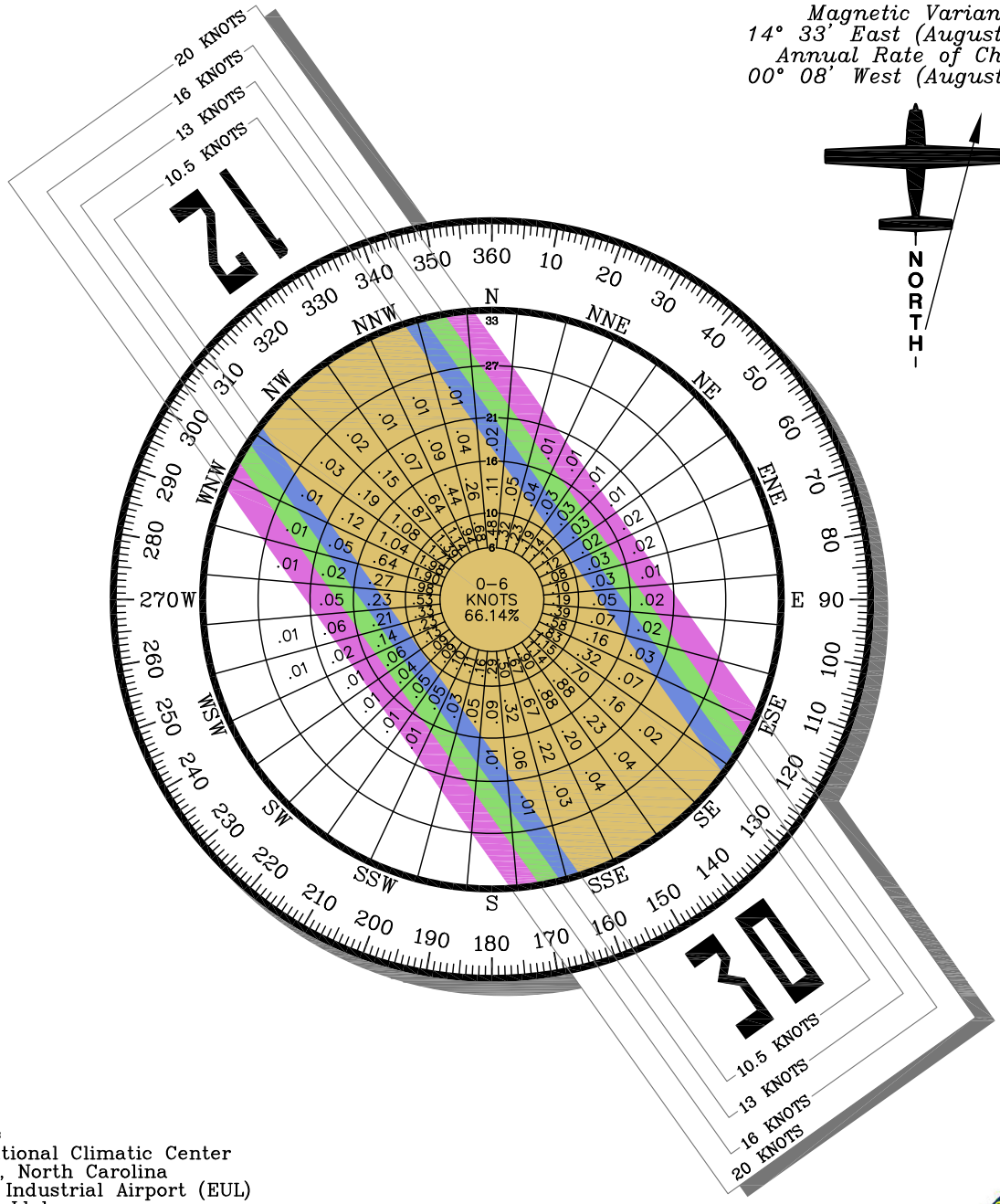
ALL WEATHER WIND COVERAGE

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 12-30	*98.60%*	*99.31%*	*99.77%*	*99.94%*

Magnetic Variance
14° 33' East (August 2009)
Annual Rate of Change
00° 08' West (August 2009)



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Caldwell Industrial Airport (EUL)
Caldwell, Idaho

OBSERVATIONS:
137,628 All Weather Observations
11/1998-11/2008

Exhibit 3E
WIND ROSE

years. Regular use is defined as at least 500 annual itinerant operations.

For Caldwell Industrial Airport, Runway 12-30 is used by all categories of general aviation aircraft, each of which has a different runway length requirement. Small single and multi-engine piston powered aircraft conduct the majority of operations at the airport. To accommodate all small aircraft up to and including those with 10 or more passenger seats, a minimum runway length of 4,700 feet is recommended.

The increased use of the airport by business jets must be considered in this analysis. Business jets have proven to be an asset to corporations by meeting the needs of executives for flexibility in scheduling, speed, and privacy. In response to these types of needs, the AC recommends that "GA airports that receive regular use by large airplanes over 12,500 pounds, in addition to business jets, should provide a runway length comparable to non-GA airports." In 2009, it is estimated that business jets accounted for at least 900 operations. Therefore, the activity level of business jets will be critical for determining future runway length needs at Caldwell Industrial Airport.

Step 2. *Identify the airplanes that will require the longest runway length at maximum certified takeoff weight (MTOW).* When the MTOW of the critical design airplane for runway length is 60,000 pounds or less, runway length requirements are determined according to a "family grouping of airplanes" having similar characteristics and operating weights. Nearly all business jet operations at Caldwell Industrial Airport were conducted by aircraft weighing less than 60,000 pounds.

Step 3. *Determine the methodology for establishing the recommended runway length.* Two methodologies are available: one that considers small aircraft weighing less than 12,500 pounds, and one that considers large aircraft weighing less than 60,000 pounds. Having established in Steps 1 and 2 that business jets weighing less than 60,000 pounds are critical for determining runway length requirements, the appropriate methodology from the AC must be applied.

The design procedure in the AC requires the following information: airport elevation above mean sea level (MSL), mean maximum daily high temperature of the hottest month, and the critical design aircraft under evaluation and their useful load. The airport elevation is 2,431 feet MSL and the mean maximum daily high temperature is 93 degrees.

The critical design aircraft, as defined in the AC, is actually a grouping of aircraft with similar operating characteristics. There are two groupings of business jets, those in the "zero to 75 percent of the national fleet" category and those in the "75 to 100 percent of the national fleet" category. **Table 3J** presents a sampling of the business jets and their MTOW in each category.

TABLE 3J
Representative Business Jets by FAA Category for Runway Length Determination

0-75 percent of the national fleet	MTOW	75-100 percent of the national fleet	MTOW
Lear 35	20,350	Lear 55	21,500
Lear 45	20,500	Lear 60	23,500
Cessna 550	14,100	Hawker 800XP	28,000
Cessna 560XL	20,000	Hawker 1000	31,000
Cessna 650 (VII)	22,000	Cessna 650 (III/IV)	22,000
IAI Westwind	23,500	Cessna 750 (X)	36,100
Beechjet 400	15,800	Challenger 604	47,600
Falcon 50	18,500	IAI Astra	23,500

MTOW: Maximum Take Off Weight
Source: FAA AC 150/5325-4B, Runway Length Requirements for Airport Design

As previously discussed, there are three based business jets at the airport. These include an Eclipse very light jet and two Cessna Citations. The Citations are in the zero to 75 percent category. The Eclipse jet does not contribute to runway length determination. The FAA will only allow usage of the 75-100 percent category if aircraft in this category are currently or are forecast, within the next five years, to conduct at least 500 annual operations.

The methodology in the AC further considers the useful load of airplanes. The term "useful load factor" of an airplane is considered to be the difference between the maximum allowable structural gross weight and the operating empty weight. The useful load, in essence, consists of passengers, cargo, and usable fuel. There are two useful load percentages, namely "60 percent useful load" and "90 percent useful load." Calculations for "100 percent useful load" have not been developed because many of the airplanes in each group are operationally limited in the second segment of climb.

For Caldwell Industrial Airport, the use of the "60 percent useful load" category is recommended. The FAA will not approve use of the "90 percent useful load" category unless it can be documented that business jets operating at the airport regularly (500 times annually) fly out heavy. This condition is most likely to apply to air cargo operators or to long-haul non-stop flights (such as to the east coast from Caldwell).

Step 4. *Determine the recommended runway length.* Using the information obtained in Step 3 above, the recommended runway length for Caldwell Industrial Airport is 5,400 feet.

Step 5. *Apply any necessary adjustments to the runway length obtained in Step 4 to determine the final runway length.* The AC provides runway length adjustments based on runway gradient and under wet and slippery conditions. The runway length obtained in Step 4 is increased 10 feet for every 1-foot of elevation difference between the high and low points of the runway. For Caldwell Industrial Air-

port an additional 60 feet is added to the runway length. This is rounded up to the nearest 100, for a total runway length of 5,500 feet.

Under wet and slippery conditions, the runway length for turbojet-powered airplanes obtained from the "60 percent useful load" category, are increased 15 percent or up to 5,500 feet, whichever is less. **The recommended runway length for Caldwell Industrial Airport is 5,500 feet.**

Table 3K presents a summary of the runway length analysis as obtained from application of 150/5235-4B, *Runway Length Requirements for Airport Design*.

TABLE 3K
Recommended Runway Lengths
Caldwell Industrial Airport

Airport elevation	2,431 feet above mean sea level			
Average high monthly temperature	93 degrees (August)			
Runway gradient*	6 feet			
Runway length for small aircraft under 12,500 pounds				
Small airplanes with less than 10 passenger seats:				
95 percent of these small airplanes.....				4,100
100 percent of these small airplanes.....				4,600
Small airplanes with 10 or more passenger seats.....				4,700
Runway length for business jets under 60,000 pounds				
Fleet Mix Category	**Raw Runway Length**	**Runway Length With Gradient Adjustment**	**Wet Surface Minimum for Jets**	**Final Runway Length**
75% of fleet at 60% useful load	**5,400**	**5,500**	**5,500**	**5,500**
For Comparative Purposes				
100% of fleet at 60% useful load	6,700	6,800	5,500	6,800
75% of fleet at 90% useful load	7,200	7,300	7,000	7,300
100% of fleet at 90% useful load	9,400	9,500	7,000	9,500

*Difference in feet between runway high and low points.
Note: Runway lengths above 30 feet are rounded up to the nearest 100 feet.
Source: FAA AC 150/5325-4B, Runway Length Requirements for Airport Design.

There is not a direct correlation between the "75 percent of the fleet" category and ARC B-II. In fact the runway length associated with the "75 percent category at 60 percent useful load" would accommodate all B-II business jets and many C design group airplanes. Were the airport to realize 500 annual operations by aircraft in the 100 percent category, then a runway length of 6,800 feet is recommended. Anything beyond 5,500 feet will have to be based on haul lengths and load factors. **The alternatives development will consider the long term impacts to extending the runway to a length of 6,800 feet**.

Runway Width

The runway is 100 feet wide. According to the design criteria for ARC B-II

airports, the runways need to be at least 75 feet wide. The runway has been maintained at 100 feet in width due to ever increasing activity by larger turboprop and business jet aircraft. Maintaining the runways at a 100-foot width preserves the growth potential for the airport; therefore, this width should be maintained. The width standard for an ARC C-II runway is 100 feet.

Runway Strength

An important feature of airfield pavement is its ability to withstand repeated use by aircraft. The FAA Airport/Facility Directory places the pavement strength for the runway at 72,000 pounds single wheel loading (SWL) and 86,000 pounds dual wheel loading (DWL). These strength ratings refer to the configuration of the aircraft landing gear. For example, SWL indicates an aircraft with a single wheel on each landing gear.

The existing runway strength is adequate to accommodate the current and future operational fleet mix at the airport. The runway strength can also accommodate frequent operations by large business jets, should that be necessary. The existing runway strength should be maintained.

TAXIWAYS AND TAXILANES

Primary guidance on taxiway design is provided in FAA AC 150/5300-13, *Airport Design*. Additional guidance is available from FAA *Engineering Brief No. 75: Incorporation of Runway Incursion Prevention into Taxiway and Apron Design*. The guidance recommends taxiways to intersect the runway at a 90-degree angle in order to improve pilot situational awareness by increasing visibility to both ends of the runway. Taxiways at Caldwell Industrial Airport meet this recommendation.

When analyzing the taxiways and taxilanes, consideration must be given to the associated taxiway safety area, also referred to as the taxiway object free area (TOFA). The TOFA must meet the same requirements of the runway safety area in that it must be cleared and graded, have appropriate drainage, be capable of supporting vehicles and occasional passage of aircraft, and be free of object penetrations (other than those necessary for navigation such as light stands and signs).

The width of the taxiway/taxilane OFA will vary depending on the type of aircraft expected to utilize the surface. All primary taxiway surfaces should meet the TOFA standard for the critical design aircraft. At Caldwell Industrial Airport, the critical design aircraft falls in ADG II; therefore, the TOFA width is 131 feet, as centered on the taxiway. This standard applies to all taxiways that provide access to the runway system (Taxiways A, B, C, D, E, F, G, J, and N). The taxilane OFA standard is 115 feet. This standard can be applied to all taxilanes that provide access to hangar areas.

Some areas of the airport can be designed to ADG I standards if that area is dedicated to serving only aircraft in that design category. For example, a

taxilane OFA between two rows of t-hangars may be designed to a width of 79 feet, which meets the standard for a taxilane OFA serving ADG I.

Taxiway Width

The taxiway width standard for a critical aircraft in ADG II is 35 feet. The critical design aircraft currently and into the future is anticipated to remain in ADG II; therefore, taxiways should be at least 35 feet wide. Those taxiways that provide direct access to the runway system are currently 50 feet wide. The FAA has supported maintaining this width as evidenced by grant participation in various taxiway maintenance projects and the recently constructed Taxiway B to a width of 50 feet. Those taxiways providing primary access to the runway system should be maintained at 50 feet.

INSTRUMENT NAVIGATIONAL AIDS

Caldwell Industrial Airport has instrument approach procedures to both runway ends. The FAA recently approved LPV (localizer performance with vertical guidance) approaches with visibility minimums of 1-mile and cloud ceiling heights of 300 feet. These GPS-based approaches provide both horizontal and vertical positioning information utilizing the global position system constellation of satellites. These are very good approaches and should be maintained, but to provide a near all weather capability, CAT I approaches should be considered.

CAT I approaches provide for visibility minimums as low as ½-mile and cloud ceiling heights as low as 200 feet. Currently, this capability is only available with an instrument landing system (ILS). An ILS requires extensive ground based systems, including a localizer antenna, glide slope antenna, and an approach lighting system. GPS approaches do not require the ground based systems.

Currently, stand-alone LPV approaches are being implemented with visibility minimums as low as ¾-mile and 250-foot cloud ceiling heights. Some LPV approaches with full CAT I capability are also being approved, but only as an overlay to an existing ILS system. Ultimately, the FAA plans to implement stand-alone LPV approaches with CAT I capability.

Caldwell Industrial Airport should plan to implement CAT I GPS approaches if they become available. This would require the protection of the future runway protection zone and it may require the installation of an approach lighting system. These elements will be considered in the alternatives discussion in Chapter Four.

VISUAL NAVIGATION AIDS

The airport beacon, located on the northwest portion of the airport, provides for rapid identification of the airport. The beacon should be maintained through the planning period.

Runway end identification lights (REIL) are strobe lights set to either

side of the runway. These lights provide rapid identification of the runway threshold. REILs should be installed at runway ends not currently providing an approach lighting system but supporting instrument operations. Both ends of Runway 12-30 should be outfitted with REILs.

Precision approach path indicator (PAPI) lights provide pilots with visual descent information to the runway touchdown zone. Both ends of the runway have PAPIs which should be maintained at the airport. A summary of the airside needs at Caldwell Industrial Airport is presented on **Exhibit 3F**.

LANDSIDE REQUIREMENTS

Landside facilities are those necessary for the handling of aircraft and passengers while on the ground. These facilities provide the essential interface between the air and ground transportation modes. The capacity of the various components of each element was examined in relation to projected demand to identify future landside facility needs. This includes components for general aviation needs such as:

- Aircraft Hangars
- Aircraft Parking Aprons
- General Aviation Terminal
- Auto Parking and Access
- Helicopter Facilities
- Airport Support Facilities

HANGARS

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is toward more sophisticated aircraft (and consequently, more expensive aircraft); therefore, many aircraft owners prefer enclosed hangar space to outside tie-downs.

The demand for aircraft storage hangars is dependent upon the number and type of aircraft expected to be based at the airport in the future. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar construction should coincide with actual demand trends and financial investment conditions.

While a majority of aircraft owners prefer enclosed aircraft storage, a number of based aircraft owners will still tie-down outside for a variety of reasons, including a lack of hangar availability, hangar rental rates, and/or operational needs. Therefore, enclosed hangar facilities do not necessarily need to be planned for each based aircraft. At Caldwell Industrial Airport, it is estimated that 92 percent of the based aircraft are currently stored in hangars, leaving approximately 40 aircraft that are tied-down. In an unconstrained environment, meaning the availability of hangar space meets demand, the percentage of tie-down aircraft is estimated to represent five percent of based aircraft by the long term.

There are three general types of aircraft storage hangars: T-hangars, box-hangars, and conventional hangars. T-hangars are similar in size and will typically house one single engine piston powered aircraft. Some multi-engine aircraft owners may elect to utilize these facilities as well. There

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RUNWAYS

AVAILABLE	SHORT TERM	LONG TERM POTENTIAL
ARC B-II	ARC B-II	ARC C-II
5,500' x 100'	Maintain	6,800' x 100'
72,000# SWL	Maintain	Maintain
86,000# DWL	Maintain	Maintain
B-II Standard Safety Area	Maintain	C-II Standard Safety Areas

TAXIWAYS

AVAILABLE	SHORT TERM	LONG TERM POTENTIAL
Parallel & Runway Entrance / Exit Taxiways at 50'	Maintain	Maintain
All Other Taxiways / Taxilanes 25' - 50'	Uniform 35'	Maintain
East Side Partial Parallel	Extend East Side Parallel to Accomodate Landside Development	Full Length East Side Parallel

NAVIGATIONAL AIDS

AVAILABLE	SHORT TERM	LONG TERM POTENTIAL
AWOS, Segmented Circle	Maintain	Maintain
RNAV (GPS) Runway 30 (300' CH; 1 Mile Visibility)	Maintain	Consider Improved GPS Minimums (Rwy 30)
RNAV (GPS) Runway 12 (300' CH; 1 Mile Visibility)	Maintain	Consider Improved GPS Minimums (Rwy 12)
NA	NA	ATCT

LIGHTING AND MARKING

AVAILABLE	SHORT TERM	LONG TERM POTENTIAL
Rotating Beacon	Maintain	Maintain
Lighted Windcone	Add 2 Lighted Windcones	Maintain
Non-Precision	Maintain	Precision
PAPI	Maintain	Maintain
MIRL	Maintain	HIRL
MITL	Maintain	Maintain
NA	NA	ALS
NA	Add REILs	Maintain

PAPI - Precision Approach Path Indicator
GPS - Global Positioning System
REIL - Runway End Identification Lights
MIRL/HIRL - Medium/High Intensity Runway Lighting
MITL - Medium Intensity Taxiway Lighting
AWOS - Automated Weather Observation System
ATCT - Airport Traffic Control Tower
CAT I - Precision Approach with 200' cloud ceiling
ALS - Approach Landing System
CH - Cloud Height

Exhibit 3F
AIRSIDE FACILITY REQUIREMENTS

are typically many T-hangar units "nested" within a single structure. There are approximately 32 T-hangar positions at the airport. For determining future aircraft storage needs, a planning standard of 1,200 square feet per based aircraft is utilized for T-hangars.

Box hangars are open-space facilities with no interfering supporting structure. Box hangars can vary in size and can either be attached to others or be standalone hangars. Typically, box hangars will house larger multi-engine, turboprop, or jet aircraft. It is estimated that there are currently 291 box hangar positions. For future planning, a standard of 2,500 square feet per aircraft is utilized for box hangars.

Conventional hangars are the familiar large hangars with open floor plans that can store several aircraft. At Caldwell Industrial Airport, there are numerous conventional hangars that provide an estimated 86 aircraft positions. For future planning needs, 2,500 square feet per aircraft is utilized for conventional hangars.

Table 3L presents the estimated number of positions and hangar area needed for aircraft storage based on the demand forecasts. Assumptions have been made on owner preferences for a storage type based on trends at general aviation airports. Currently, T-hangars house approximately eight percent of single engine based aircraft. Over time, in an unconstrained environment, approximately 30 percent of based single engine aircraft are assumed to be stored in T-hangars. Ten percent of multi-engine aircraft are also assumed to be stored in T-hangars through the planning period.

Conventional hangars are estimated to currently house 22 percent of single engine aircraft, 10 percent of multi-engine aircraft and 50 percent of the turboprops, business jets, and helicopters. Over time, as more single aircraft hangars become available, the percentage of single engine aircraft stored in conventional hangars is forecast to represent approximately 10 percent.

Box hangars are currently estimated to house 70 percent of single engine aircraft. As more T-hangars become available, this percentage is forecast to decrease to 60 percent. Approximately 80 percent of multi-engine aircraft and 50 percent of turboprops, business jets, and helicopters are forecast to remain in box hangars at the airport.

A portion of executive and conventional hangars often are utilized for maintenance activities or for office space. A planning standard of 175 square feet per based aircraft is considered for these purposes and is considered in addition to the aircraft storage needs.

Through the 20-year planning period, 132 T-hangar positions encompassing approximately 156,600 square feet of space is forecast. Approximately 79 box hangar positions encompassing 336,350 square feet are forecast to be needed. A total of 53,600 square feet of conventional hangar space is forecast to be needed, but the number of positions is forecast to decrease over time. This is the result of storage options (e.g., more T-hangars), balancing over time to meet consumer desires. In short, aircraft owners currently utilizing conventional hangars are likely to transition to individual storage options as they become available.

TABLE 3L
Hangar Needs
Caldwell Industrial Airport

	Base Year (2009)	Short Term	Intermediate Term	Long Term
Total Based Aircraft	480	530	570	650
Aircraft To Be Hangared	440	493	536	617
T-Hangars (1,200 s.f.)				
Single Engine	30	44	70	159
Multi-Engine	2	2	2	2
Turbo	0	0	0	0
Jet	0	0	0	0
Helicopter	0	0	0	0
Total T-Hangar Positions	32	45	72	162
Total T-Hangar Area Needed	40,400	55,000	87,000	194,000
Total Area Needed by Planning Period		14,600	32,000	107,000
Conventional Hangars (2,500 s.f.)				
Single Engine	86	87	80	53
Multi-Engine	2	2	2	2
Turbo	4	5	6	8
Jet	2	3	5	8
Helicopter	11	12	12	15
Total Conventional Hangar Positions	86	108	105	86
Total Conventional Hangar Area Needed	154,400	271,000	262,000	216,000
Total Area Needed by Planning Period		116,600	-9,000	-46,000
Box Hangars (2,500 s.f.)				
Single Engine	274	305	319	319
Multi-Engine	13	15	16	19
Turbo	4	5	6	8
Jet	2	3	5	8
Helicopter	11	12	12	15
Total Box Hangar Positions	291	339	359	369
Total Box Hangar Area Needed	587,650	848,000	896,000	922,000
Total Area Needed by Planning Period		260,350	308,350	334,350
Maintenance Hangars and Area	50,350	93,000	100,000	114,000
Total Hangar Positions	**409**	**493**	**536**	**617**
Total Hangar Area Needed	**832,800**	**1,267,000**	**1,345,000**	**1,446,000**
Total Area Need by Planning Period		**434,200**	**78,000**	**101,000**

Note: All area measurements represent facility footprints in square feet.
Source: Coffman Associates analysis.

It should be noted that these hangar requirements are general in nature and based on the aviation demand forecasts. The actual need for hangar space will further depend on the actual usage within hangars. For example, some hangars may be utilized entirely for non-aircraft storage; yet from a planning standpoint, they have an aircraft storage capacity. Therefore, the needs of an individual user may differ from the calculated space necessary.

AIRCRAFT PARKING APRON

The aircraft parking apron is an expanse of paved area intended for aircraft parking and circulation. Typically, a main apron is centrally located near the airside entry point, such as a terminal building. Ideally, the main apron is large enough to accommodate transient airport users as well as a portion of locally based aircraft. Often, smaller aprons are available adjacent to FBO hangars and at other locations around the airport. The apron layout at Caldwell Industrial Airport follows this typical pattern.

The main central apron on the west side of the airport encompasses approximately 39,000 square yards of pavement. Approximately two-thirds (26,000 s.y.) of this apron is dedicated to 56 local tie-down positions. The remaining one-third (13,000 s.y.) is utilized for transient operators and helicopter operations. The new terminal building on the east side of the airport is fronted by a 6,000 square yard transient apron.

FAA AC 150/5300-13, *Airport Design*, suggests a methodology by which transient apron requirements can be determined from knowledge of busy-day operations. At Caldwell Industrial Airport, the number of itinerant spaces required was determined to be approximately 13 percent of the busy-day itinerant operations. This results in a current need for 16 itinerant aircraft parking spaces. By the long term planning period, 31 spaces are estimated to be needed.

A planning criterion of 800 square yards per aircraft was applied to determine future transient apron area requirements for single and multi-engine aircraft. For turboprops and business jets (which can be much larger), a planning criterion of 1,600 square yards per aircraft position was used. The current need for transient apron area is 25,800 square yards, where 19,000 square yards is available when including the new east side apron. By the long term planning period, approximately 27,300 square yards is necessary.

For planning purposes, 85 percent of transient spaces are estimated to be needed for non-jet aircraft, which is in line with airport activity levels. This results in a current need for two designated large aircraft spaces. By the long term planning period, there is a need for a total of four large aircraft spaces.

An aircraft parking apron should provide space for the number of locally based aircraft that are not stored in hangars, transient aircraft, and for maintenance activity. For local tie-down needs, an additional five spaces are identified for maintenance activity. Maintenance activity would include the movement of aircraft into and out of hangar facilities and temporary storage of aircraft on the ramp. Currently, a total of 45 local positions are needed (40 based plus five additional).

Total apron parking requirements are presented in **Table 3M**. Currently, there are 22 transient positions available for single and multi-engine aircraft and two for larger business aircraft. The calculated need for transient parking is 25,800 square yards,

and there are 19,000 square yards currently available. The need for transient positions and apron area are both forecast to increase through the planning period.

TABLE 3M
Aircraft Apron Requirements
Caldwell Industrial Airport

			FORECAST		
	Currently Available (2009)	Calculated Need (2009)	Short Term	Intermediate Term	Long Term
Local Apron Positions	56	45	47	44	43
Local Apron Area (s.y.)	26,000	26,000	31,000	29,000	28,000
Transient Apron Positions	22	28	29	30	31
Piston Transient Positions	20	24	25	25	26
Turbine Transient Positions	2	4	4	4	4
Transient Apron Area (s.y.)	19,000	25,800	26,600	27,300	27,300
Total Apron Area (s.y)	45,000	54,800	57,600	56,300	55,300

The apron area designated for local tie-downs and maintenance activity nearly meets the long term planning period need. In the short term, more apron area is forecast to be needed than in the long term, primarily due to the assumption that as more hangars are constructed, a greater percentage of those who currently tie-down will transition to an enclosed hangar.

The transient apron area is approximately 26 percent smaller than is currently needed and 30 percent smaller than the long term projected need. Future airport development should consider additional transient apron area. It should be noted that while it is preferred to designate between itinerant and local apron areas, on busier days, apron area can be cross-utilized to accommodate the mix experienced on that day.

GENERAL AVIATION TERMINAL FACILITIES

General aviation terminal facilities have several functions. Space is required for a pilots' lounge, flight planning, concessions, management, and storage. More advanced airports will have leasable space in the terminal building for such features as a restaurant, FBO line services, and other needs. This space is not necessarily limited to a single, separate terminal building, but can include space offered by FBOs in their hangars for these functions and services.

The methodology used in estimating general aviation terminal facility needs is based on the number of airport users expected to utilize general aviation facilities during the design hour. General aviation space re-

quirements were then based upon providing 120 square feet per design hour itinerant passenger. Design hour itinerant passengers are determined by multiplying design hour itinerant operations by the number of passengers on the aircraft (multiplier). An increasing passenger count (from 1.9 to 2.3) is used to account for the likely increase in the number of passengers utilizing general aviation services. **Table 3N** outlines the general aviation terminal facility space requirements for Caldwell Industrial Airport.

TABLE 3N
General Aviation Terminal Area Facilities
Caldwell Industrial Airport

	Existing	Short Term	Intermediate Term	Long Term
Design Hour Operations	90	93	95	99
Design Hour Itinerant Operations	27	28	29	30
Multiplier	1.9	2.0	2.1	2.3
Total Design Hour Itinerant Passengers	51	56	60	68
General Aviation Building Space (s.f.)	9,000	6,700	7,200	8,200

The new terminal building located on the northeast side of the airport is planned to be completed in the spring of 2010. The facility is approximately 9,000 square feet and will include the typical features including a pilot lounge, flight planning services, and airport administrations offices. **Exhibit 3G** presents the floor plan of the new terminal building. This building would meet the long term forecast need for the airport.

The new airport terminal building will provide a much improved entrance to the community. This grand entrance will provide an immediate positive impression for visitors arriving by aircraft. These visitors certainly would include business decision-makers who may be considering investment in the community. Additional landscaping improvements on the airport perimeter could serve to reinforce the positive first impression that the new terminal building presents.

AUTOMOBILE PARKING

Planning for adequate automobile parking is a necessary element for any airport. Parking needs can effectively be divided between transient airport users and locally based users. Transient users include those employed at the airport and visitors, while locally based users primarily include those attending to their based aircraft. A planning standard of 1.9 times the design hour passenger count provides the minimum number of vehicle spaces needed for transient users. Locally based parking spaces are calculated as one-half the number of based aircraft.

Estimates of the current vehicle parking capacity have been made. Itinerant general aviation spaces are estimated at 475. This is based on an estimate of approximately 190,000 square feet of parking available adjacent to the terminal building and commercial hangars. Local general

aviation parking spaces are estimated at half of the number of based aircraft, or 240 spaces. While dedicated parking for individual hangars is typically not provided, often pilots will park their vehicle in the hangar when they are utilizing their aircraft. Dedicated local general aviation parking area is estimated by identifying vehicle parking associated with non-commercial hangars.

As can be seen in **Table 3P**, the airport appears to have enough parking spaces and area to accommodate current needs and future growth. Any new hangars should, nonetheless, be designed with adequate vehicle parking to accommodate the intended traffic utilizing the hangar. When planning for new individual hangar facilities such as T-hangars, dedicated vehicle parking should be considered.

TABLE 3P
GA Vehicle Parking Requirements
Caldwell Industrial Airport

	Existing	Short Term	Intermediate Term	Long Term
Design Hour Itinerant Passengers	51	56	60	68
GA Itinerant Spaces	475	106	114	129
GA Based Spaces[1]	240[1]	265	285	325
Itinerant Parking Area (s.f.)	190,000	42,000	46,000	52,000
GA Based Parking Area (s.f.)	18,000[2]	106,000	114,000	130,000
Total GA Parking Area (s.f.)	208,000	148,000	160,000	182,000
Total Parking Spaces	715	371	399	454

[1]Estimate of ½-space per based aircraft
[2]Estimate of dedicated parking for based operators

HELICOPTER FACILITIES

Helicopters are an extremely versatile air transportation vehicle. The helicopter has the capability of providing a wide variety of important services to any community that integrates this aircraft into its local transportation system. In addition, to their service in the transportation of people, helicopters have proven to be useful to their communities for disaster relief, air ambulance services, police services, and the movement of high-value assets. FAA AC 150/5390-2B, *Heliport Design*, provides guidance on the need for, and optimal locations of, dedicated helicopter facilities at airports.

According to the AC, "Separate facilities and approach/departure procedures may be necessary when the volume of airplane and/or helicopter traffic impacts operations." Currently, the interaction of fixed wing aircraft and helicopters does not appear to negatively impact operations at the airport. Therefore, a dedicated heliport is not deemed necessary at this time for the airport.

The airport has provided designated activity areas for helicopter operations, including use of the transient apron located near Silverhawk Aviation. This follows recommendations in the AC to locate helicopter parking po-

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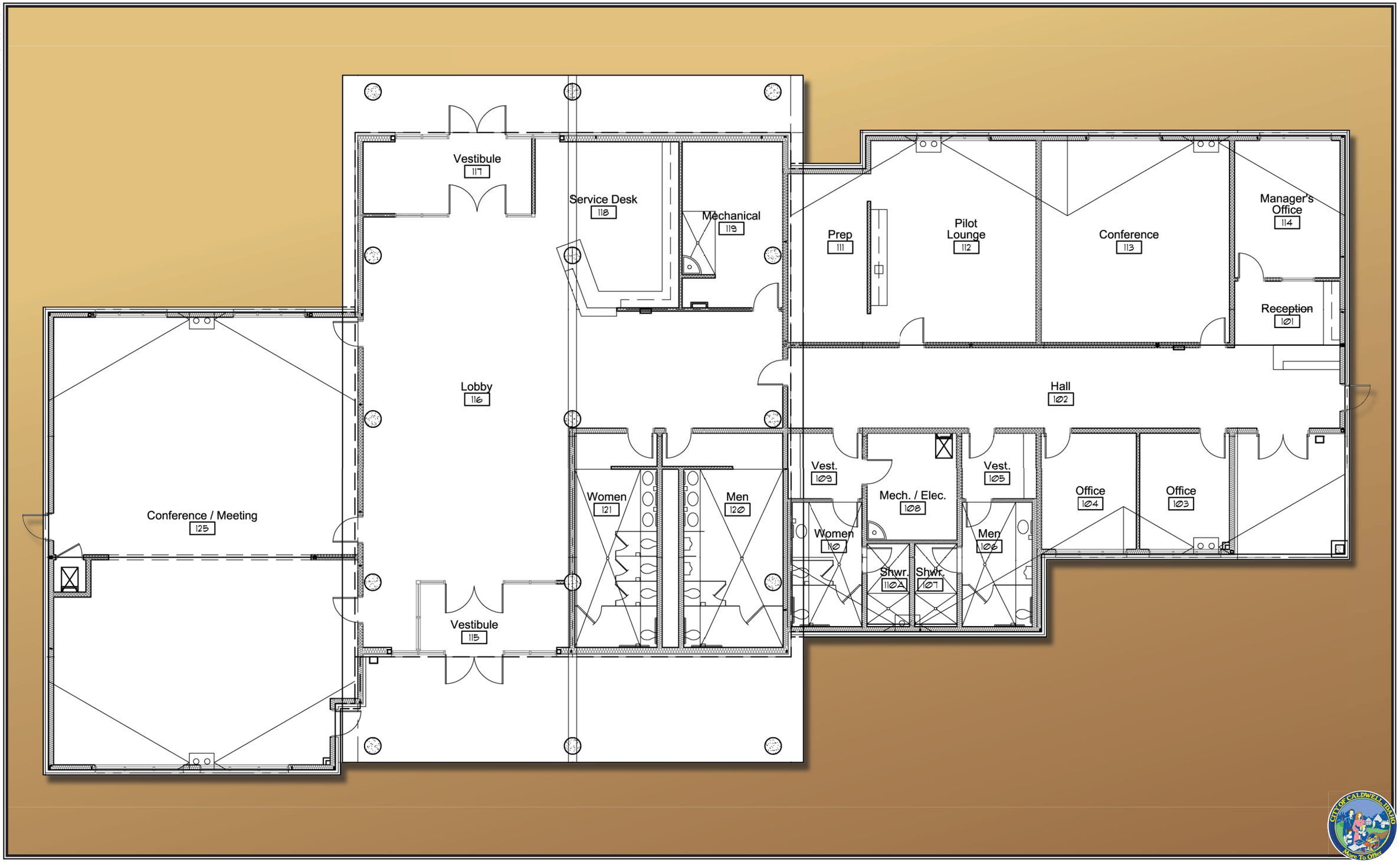

Exhibit 3G
TERMINAL BUILDING LAYOUT

sitions as close to the intended destination or origination of the passengers as conditions and safety permit. As the airport grows and more helicopter activity is realized, the airport may wish to designate helicopter parking with appropriate marking (hardstands).

Exhibit 3H presents a summary of the landside needs for the airport.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within classifications of airside or landside facilities have also been identified. These other areas provide certain functions related to the overall operation of the airport.

AIRCRAFT RESCUE AND FIRE-FIGHTING (ARFF) FACILITIES

Only those airports that are certificated under Title 14 Code of Federal Regulations, Part 139, are required to have on-site firefighting capabilities. Caldwell Industrial Airport is not a Part 139 airport and, therefore, is not required to have on-site fire-fighting capabilities. Instead, local fire departments respond to airport emergencies.

The closest fire station is Fire Station No. 1, located three miles to the northwest. The fire station maintains a supply of aqueous film-foaming foam (AFFF). Additional supplies are available at other nearby locations.

Interviews with fire department personnel and airport management have indicated plans to locate a new fire station on airport property. This fire house would serve the local community primarily and the airport. Appropriate locations will be identified in the alternative development phase of this master plan.

FUEL STORAGE

There are currently two fuel providers on the airfield. Silverhawk has a 10,000 gallon Avgas tank and a 2,500 gallon Jet A delivery truck. Rapid Refueling has a 10,000 gallon Avgas tank that has self-serve capability. The airport collects a fuel flowage fee, but does not own or maintain the storage tanks.

Additional fuel storage capacity should be planned when the airport is unable to maintain an adequate supply and reserve. While each airport determines their own desired reserve, a 14-day reserve is common for general aviation airports. When additional capacity is needed, it should be planned in 10,000 to 12,000 gallon increments. Common fuel tanker trucks have an 8,000-gallon capacity. While the current capacity appears to be adequate to meet the needs of the airport, future operational activity levels could necessitate additional capacity needs. The alternatives chapter will consider locations for additional fuel capacity, especially on the east side of the airport.

AIRPORT TRAFFIC CONTROL TOWER

Caldwell Industrial Airport does not currently have an airport traffic control tower (ATCT). All traffic is coordinated through the local Unicom radio frequency which is monitored by the airport administration and airport FBOs. The current level of operations at the airport may indicate that airport safety could be enhanced if there were an ATCT. The following presents the process and initial analysis for justifying a federally funded ATCT.

Guidance for the establishment of an ATCT is provided in the following documents:

- FAA Advisory Circular 150/5300-13, *Airport Design*;
- FAA Order 6480.7C, *Airport Traffic Control Tower and Terminal Radar Approach Control Facility Design Guidelines*;
- FAA Order 6480.4A, *Air Traffic Control Tower Siting Criteria*;
- FAA Order 8260.3, *United States Standard for Terminal Instrument Procedures (TERPS)*;
- FAA Handbook 7031.2C, *Airway Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services*.
- Federal Aviation Regulations (FAR) Part 170, *Establishment and Discontinuance Criteria for Air Traffic Control Services and Navigational Facilities*;
- FAA Report No. APO 90-7, *Establishment and Discontinuance Criteria for Air Traffic Control Towers.*

Establishment Criteria

Air traffic control towers (ATCTs) are established at airports to provide for a safe, orderly, and expeditious flow of traffic on, and in the vicinity of, an airport. Class D airspace surrounding the airport from the surface to 2,500 feet above the airport elevation (charted in mean sea level) is usually established in conjunction with a new ATCT. Many of the new control towers are part of the Federal Contract Tower Program.

The FAA has the authority to establish control towers or discontinue control tower services through the National Airspace System when activity levels and safety considerations merit such action. Criteria for establishing a control tower was initially developed and published in 1951. Current guidelines lie with the FAA Office of Aviation Policy and Plans (APO-200).

According to FAR Part 170.13, the following criteria, along with general facility establishment standards, must be met before an airport can qualify for a control tower:

1. The airport, whether publicly or privately owned, must be open to and available for use by the public as defined in the Airport and Airway Improvement Act of 1982;
2. The airport must be part of the National Plan of Integrated Airport Systems;

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	BASE YEAR	SHORT TERM	INTERMEDIATE TERM	LONG TERM
Based Aircraft	480	530	570	650
Aircraft to be tied down	40	37	34	33

AIRCRAFT TO BE HANGARED				
Single Engine	392	436	470	531
Multi-Engine (100%)	16	19	20	24
Turbo/Jet (100%)	7	9	12	17
Jet	3	6	10	16
Rotor (50%)	22	23	24	29
Total to be Hangared	**440**	**493**	**536**	**617**

HANGAR POSITIONS				
T-Hangars Positions	32	45	72	162
Box Hangar Positions	291	339	359	369
Conventional Hangar Positions	86	108	105	86

HANGAR AREA				
T-Hangars (s.f.)	40,400	55,000	87,000	194,000
Conventional Hangar (s.f.)	154,400	271,000	262,000	216,000
Box Hangar (s.f.)	587,650	848,000	896,000	922,000
Maintenance Area (s.f.)	50,350	93,000	100,000	114,000

AIRCRAFT PARKING				
Local Apron Positions	56	47	44	43
Local Apron Area (s.y.)	26,000	31,000	29,000	28,000
Transient Apron Positions	22	29	30	31
Piston Transient Positions	20	25	25	26
Turbine Transient Positions	2	4	4	4
Transient Apron Area (s.y.)	19,000	26,600	27,300	27,300
Total Apron Area (s.y)	45,000	57,600	56,300	55,300

AUTO PARKING				
Spaces	715	371	399	454
Area (s.f.)	208,000	148,000	160,000	182,000

TERMINAL BUILDING				
Area (s.f.)	9,000	6,700	7,200	8,200

Source: Coffman Associates Analysis

Exhibit 3H
LANDSIDE REQUIREMENTS

3. The airport owners/authorities must have entered into appropriate assurances and covenants to guarantee that the airport will continue in operation for a long enough period to permit the amortization of the control tower investment;
4. The FAA must be furnished appropriate land without cost for construction of the control tower; and
5. The airport must meet the benefit-cost ratio criteria utilizing three consecutive FAA annual counts and projections of future traffic during the expected life of the tower facility. (An FAA annual count is a fiscal year or a calendar year activity summary. Where actual traffic counts are unavailable or not recorded, adequately documented FAA estimates of the scheduled and nonscheduled activity may be used.)

The FARs specifically states that an airport is not guaranteed to receive a control tower, even if the airport meets all the criteria listed above. This is where the contract tower program comes in. The FAA, responding to an airport sponsor's request for an air traffic control tower, can elect to establish a contract tower. The FAA can either elect to pay for the service in its entirety, or enter into a cost-sharing agreement with the sponsor, depending on the results of the benefit-cost analysis. Typically, the airport sponsor is responsible for 10 percent of the cost of construction and operations.

Benefit-Cost Ratio

The FAA prescribes benefit-cost-based criteria for establishment and discontinuance of control tower facilities as part of its mission to maximize safety and efficiency throughout the airport and airway system consistent with available resources. Decisions to establish and operate control towers have been, and will continue to be, based on benefits exceeding costs of such actions.

The criteria and computation methods used in determining the eligibility of terminal locations for VFR tower establishment and discontinuance is based on economic analysis of the costs and benefits of a control tower. The criterion compares the present value of VFR tower benefits (BPV) at a site with the present value of VFR tower costs (CPV) over a 15-year time frame. A location is eligible for a control tower when the benefits derived from operating the tower exceed the installation and operation costs. This is the same as saying that values of benefits exceed costs, or **BPV/CPV ≥ 1.00.**

Site-specific activity forecasts are used to estimate three categories of tower benefits:

- Benefits from prevented collisions between aircraft;
- Benefits from other prevented accidents; and
- Benefits from reduced flying time.

Explicit dollar values are assigned to the prevention of fatalities and injuries and time saved.

Tower establishment costs include:

- Annual operating costs: staffing, maintenance, equipment, supplies, and leased services.
- Investment costs: facilities, equipment, and operational start-up.

The Federal Contract Tower (FCT) Program

The FCT has been in place since 1982 and currently provides for the contract operation of air traffic control (ATC) services at over 245 airports. Through the program, FAA contracts air traffic control services to the private sector at visual flight (VFR) airports. The primary advantages of the program are enhanced safety and significant cost savings to the federal government. FAA contract towers receive continuous oversight and monitoring by FAA and all contract controllers are certified by the agency.

Initial Analysis

The establishment of a new ATCT follows a two-phase process as outlined in FAA Order 7031.2C, *Airway Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services*. The first phase involves identifying possible candidacy through analysis of operational levels at the airport. The formula presented in **Table 3Q** has been utilized as an initial operational screening test to determine if it is reasonable for the airport to request a full benefit/cost analysis from the FAA.

TABLE 3Q
Airport Traffic Control Tower Initial Qualifying Calculation
Caldwell Industrial Airport

Formula	Current	Short Term Forecast	Intermediate Term Forecast	Long Term Forecast
AC ÷ 38,000 +	0.00	0.00	0.00	0.00
AT ÷ 90,000 +	0.02	0.02	0.03	0.03
GAI ÷ 160,000 +	0.27	0.28	0.29	0.30
GAL ÷ 280,000 +	0.39	0.40	0.41	0.42
MI ÷ 48,000 +	0.01	0.01	0.01	0.01
ML ÷ 90,000 =	0.00	0.00	0.00	0.00
Total	**0.69**	**0.71**	**0.73**	**0.76**

AC = Air Carrier Operations
AT = Air Taxi Operations
GAI = General Aviation Itinerant Operations
GAL = General Aviation Local Operations
MI = Military Itinerant Operations
ML = Military Local Operations
Source: FAA Handbook 7031.2C, Airway Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services.

Experience at airports with similar annual operations to Caldwell Industrial Airport has shown that when the initial results of the formula are above 0.5, there is a possibility that the FAA benefit/cost ratio may be above 1.0 because it considers many additional factors, not just operations, with varying degrees of weight applied. It is recommended that the City notify the FAA of its desire to be included in the ATCT program so that a benefit/cost analysis can be conducted.

The second phase involves complex analysis of the benefits and costs of the establishment of an ATCT. The benefits, which derive from operating the tower, must exceed the installation and operation costs. The costs would include such items as construction, installation, salaries and maintenance. The analysis applies values to the benefits which include accident prevention and increases in efficiency.

Should a benefit/cost analysis be conducted and it is found that the ratio is below 1.0, then under the contract tower cost-sharing program, the airport could qualify for on-going operational FAA funding equal to the benefit/cost ratio. For example, if a benefit/cost ratio of 0.76 results, then the airport could be expected to receive funding to cover 76 percent of the annual operations cost. The City would then be responsible for the remaining 24 percent of the annual operating costs.

Since Caldwell Industrial Airport has not been served by an ATCT, current operational counts are estimates the FAA may require further justification of operational counts. In the past, the FAA has supported the use of acoustical counts or even established a temporary tower to obtain a more accurate operational count. Fuel sales records and manual monitoring of activity can also aid the FAA benefit/cost analysis.

Whether a positive benefit/cost ratio is realized in the short or long term, it is important to identify and reserve an appropriate location on the airport for a new ATCT. The alternatives chapter will include a basic site analysis for locating a new ATCT.

AIRPORT ACCESS

Access to the airport is a concern to the airport sponsor and the community. While Interstate 84 passes to the immediate west of the airport, the nearest exit is at Franklin Road to the north. From this interchange, those going to the airport have to traverse a 2.5 mile winding route to get the airport. There is no reasonable access from the Interstate from the south.

Area transportation planners have, in the past, considered a new Interstate 84 interchange at Middleton Road. Such an interchange could potentially provide more direct access to the airport. A more direct route to the airport would make the development of airport compatible industrial and commercial properties more likely. The airport sponsors should follow development in this regard to insure that any new interchange planned to the south of the airport consider airport area access.

AESTHETICS

The Caldwell Industrial Airport is a major economic engine for the City of Caldwell. It is also the front porch to the city for visitors arriving by general aviation aircraft. Every effort should be made by the City to present a first class facility. The City has already taken the first steps to this goal by building a new terminal building. Perimeter landscaping, particularly at airport access points, also lends to an appealing aesthetic.

ADDITIONAL CONSIDERATIONS

During the master planning process, it is necessary to address additional local issues that may have an impact on the airport. Two such issues are the potential for air cargo activity and providing runway access to adjacent property owners, typically referred to as through-the-fence.

AIR CARGO POTENTIAL

Air cargo is comprised of air freight and air mail. The air cargo industry includes the all-cargo commercial carriers, passenger airlines, freight forwarders and customs brokers, and air freight truckers. Air freight is handled by both passenger airlines (belly freight) and all-cargo airlines. Air mail is now handled primarily by a contract carrier (currently FedEx through 2012) for the United States Postal Service, as air mail on passenger airlines is restricted to packages of 16 ounces or less.

Security restrictions since 9/11 have affected all freight carried in the bellies of passenger airlines. The mail restriction, in addition to the "known shipper" requirements for carrying cargo on passenger airlines, has given the all-cargo airlines a competitive advantage, at least in the short term. How future long term requirements develop could affect the industry. Many airlines rely on cargo to generate incremental revenue. As restrictions on air freight are refined over time, airlines are likely to become competitive in air freight again.

The air cargo industry was deregulated in 1977, one year before passenger airline deregulation. Since deregulation, the composition of the carrier group providing cargo services has changed dramatically. Most notable is the emergence of the integrated all-cargo airlines such as FedEx and UPS. Integrated air carriers are so named because they integrate the functions of traditional all-cargo airlines (airport-to-airport service) and freight forwarders (pickup and delivery services).

During the 1990s, the air-cargo industry experienced unprecedented consolidation. Well-known cargo carriers such as Airborne Express, DHL, and Emery Worldwide, as well as several others were acquired by other air cargo carriers. The all-cargo carriers have developed a "hub and spoke" system similar to the passenger airlines. FedEx utilizes the Memphis International Airport as its main hub, while UPS utilizes Louisville International Airport for their main hub. Both of these all cargo carriers have presence at most major airports in the country.

Freight forwarders are the intermediary between the shippers and cargo carriers, whether it is air, ground, rail, or water. They are an important part of the cargo system as they have the ability to organize cargo transportation efficiently and cost-effectively. The forwarder has the capability to pool shipments to effectively make use of the capacity available.

Obviously, belly freight is only handled at airports with passenger service. Airports with commuter or charter-only service generally have only minor belly freight volumes. The integrated carriers typically choose airports based upon what serves their system best. A regional or national sort facility is going to consider locations with regard to the market it serves, as well as the presence of a sufficient work force. Today, Boise Airport serves this function as FedEx, UPS, and Western Air Express (specialized passenger charter and air cargo carrier) operate at the airport.

Freight forwarders will generally prefer to have the most options available to them. That is why Boise Airport has developed into the primary hub for air cargo in the region. In 2008, Boise Airport loaded and unloaded approximately 45,000 tons of cargo. With the central location of Boise Airport within the Treasure Valley and the capability to accommodate any aircraft, Boise Airport has been the location of choice for the freight forwarders.

For the past ten years, the integrated air cargo carriers have matured. FedEx and UPS have established a business model where air cargo is delivered to a central hub and trucks distribute cargo over great distances. It has proven economical to utilize trucking over several hundred miles rather than utilize smaller air cargo aircraft to smaller airports. Even during 2008 when fuel and oil prices spiked, there was very little interest by the integrated air cargo operators to expand the air portion of the delivery mechanism.

With Boise Airport only 20 miles from Caldwell Industrial Airport, the likelihood of a measurable air cargo operation beginning service at the airport is remote. A small niche operator may consider Caldwell Industrial Airport, but they would likely be able to operate out of a conventional type hangar. The alternatives development will not consider a dedicated air cargo ramp and facility with the understanding that a small air cargo operator could be accommodated with existing facilities or facilities planned for conventional hangars.

THROUGH-THE-FENCE CONSIDERATION

Through-the-fence activity at an airport means that the airport sponsor has granted access rights to the runway and taxiway system to the owner of property that is adjacent to the airport property. While it is within the rights of the airport sponsor to enter into such agreements, it is also the responsibility of the sponsor of federally obligated airports to meet continuing "grant assurances" entered into when accepting federal Airport Improvement Program (AIP) development grants. The pertinent FAA regula-

tions related to through-the-fence operations are:

- FAA Advisory Circular 150/1690-7, *Minimum Standards for Commercial Aeronautical Activities* (8-28-2006) and;
- FAA Order 5190.6B, FAA *Airport Compliance Manual* (9-30-2009).

Section 12.7 of the *Airport Compliance Manual* emphatically states the following:

> "As a general principle, the FAA does not support agreements that grant access to the public landing area by aircraft stored and serviced offsite on adjacent property. Thus, this type of agreement is to be avoided since these agreements can create situations that could lead to violations of the airport's federal obligations. ("Through the fence" access to the airfield from private property also may be inconsistent with Transportation Security Administration security requirements.)
>
> Under no circumstances is the FAA to support any "through-the-fence" agreement associated with residential use since that action will be inconsistent with the federal obligation to ensure compatible land use adjacent to the airport.
>
> ***The federal obligation to make an airport available for the use and benefit of the public does not impose any requirement to permit access by aircraft from adjacent property."***

The *Airport Compliance Manual* identifies numerous potential pitfalls for sponsors considering through-the-fence access:

1) Placing contractual and legal encumbrances or conditions upon the airport property, in violation of Grant Assurance 5, *Preserving Rights and Powers*;
2) Limiting the airport's ability to ensure safe operations in both movement and non-movement areas, in violation of Grant Assurance 19, *Operation and Maintenance*;
3) Creating unjustly discriminatory conditions for on-airport commercial tenants and other users by granting access to off-airport competitors or users in violation of Grant Assurance 22, *Economic Nondiscrimination*;
4) Effectively granting an exclusive right to the through-the-fence operator in violation of Grant Assurance 23, *Exclusive Rights*, if the operator conducts a commercial business and no on-airport operator is able to compete because the terms given are more favorable to the through the fence operator.
5) Affecting the airport's ability to be self-sustaining, in violation of Grant Assurance 24, *Fee and Rental Structure,* because the airport may not be in a position to charge through-the-fence operators adequately for the use of the airfield;
6) Weakening the airport's ability to remove and mitigate hazards

and incompatible land uses, in violation of Grant Assurance 20, *Hazard Removal and Mitigation*, and Grant Assurance 21, *Compatible Land Use*.

7) Making it more difficult for an airport sponsor to implement future security requirements that may be imposed on airports.

The consequences for violating any of the grant assurances, which are typically applicable for 20-years from completion of the grant funded project, are potential loss of eligibility for future AIP grants. Under this scenario, the airport sponsor would be responsible for all future capital improvements.

The FAA will not approve through-the-fence requests under the following conditions:

- If the intended use of the through-the-fence access is for a residential airpark. This violates Grant Assurance 21, *Compatible Land Use* and;
- If the subject land is requested to be released by the airport sponsor from grant obligations, then utilized for aeronautical purposes. The FAA will not release from obligation airport property that may be needed for aeronautical purposes currently or in the future.

In general, the FAA will only consider through-the-fence access if all existing airport property is already developed and the airport is unable to purchase adjacent property. Even under these circumstances the FAA provides an extensive list of steps to follow when drafting through the fence agreements. This list is available in the *Airport Compliance Manual*. The first step should always be to inform and consult with the FAA any consideration for through the fence agreements.

Caldwell Industrial Airport has been actively acquiring property adjacent and to the east of the airport to allow for future landside development. A portion of the property recently acquired is the site of the new terminal building. As part of the alternatives analysis, the adequacy of the existing airport property to accommodate forecast growth will be analyzed. Planning for through-the-fence access will not be supported in this master plan; rather, any additional property needed will be identified for fee simple acquisition.

PARACHUTE ACTIVITY

As presented in Chapter One – Inventory, Caldwell Industrial Airport is one of five "drop zones" in Idaho and one of 288 in the United States (www.dropzone.com). Each of these sites is so designated on aeronautical sectional charts with a small parachute. Established drop zones have an associated annual NOTAM (Notice to Airmen) that simply alerts pilots to the possibility of parachute activity. Parachutists are free to utilize the airport without prior notification.

The FAA regulates skydiving activities under Part 105 *Parachute Operations* of Title 14 of the Code of Federal

Regulations, Part 105 (14 CFR 105). Flight operations for skydiving are conducted under Part 91 *General Operating and Flight Rules* (14 CFR 91). FAA Advisory Circulars (AC) provides additional guidance about aspects of sky diving operations; FAA AC 105-2, *Sport Parachute Jumping,* and FAA AC 90-66, *Recommended Standard Traffic Patterns for Aeronautical Operations at Airports without Operating Control Towers*. In addition, the FAA's *Airports Compliance Handbook* (Order 5190.6A) details an airport's obligation with respect to skydiving and other activities.

According to the *Airports Compliance Handbook*, parachute jumping is an aeronautical activity and requests to use an airport for this purpose or to establish a drop zone within the airport boundaries must be evaluated by the airport operators on the same basis as any other aeronautical activity. Airports that accept federal grants, such as Caldwell Industrial Airport, cannot discriminate against any business conducting aeronautical activities but reasonable limitations may be implemented to ensure safe operation of the airport. Among the reasonable limitations are:

1. The airport owner designates reasonable time periods for jumping and specific areas for drop zones.
2. Jumpers (or requesting organizations) agree to pay a reasonable fee that is not unjustly discriminatory.
3. Jumpers hold a general liability insurance policy that names the airport owner as an additional ensured party, with the amount of insurance to be reasonable and not unjustly unreasonable.

To further quote from the Airports Compliance Handbook, "the airport owner is not required to permit this activity if, in his judgment, it creates a safety hazard to the normal operations of aircraft arriving or departing from the airport, nor is the airport owner required to close the airport to provide a safe environment for parachute jumpers." The FAA Flight Standards and Air Traffic division has the authority to make a final determination of the reasonableness of any airport owner's restrictions.

When Caldwell Industrial Airport was constructed in the mid-1970s, it was a low activity facility that experienced little if any helicopter and jet activity. Today, the airport experiences more than 150,000 annual operations and has a very active helicopter flight school and several based turboprops and business jets. Skydivers should exercise extreme caution when utilizing the Caldwell drop zone.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet aviation demand projected for Caldwell Industrial Airport for the next 20 years. In an effort to provide a more flexible master plan, the yearly forecasts from Chapter Two have been converted to planning horizon levels. The short term roughly corresponds to a five-year time frame, the intermediate term is approximately 10 years, and the long term is 20 years. By uti-

lizing planning horizons, airport management can focus on demand indicators for initiating projects and grant requests rather than on specific dates in the future.

The current and future critical design aircraft (500 or more annual operations), fall in airport reference code B-II. Representative aircraft include many turboprops, such as the King Air 300, and some smaller business jets, such as the Cessna Citation models 500, 550, and 560. The forecasts indicate that operations at the airport will continue to grow with an increase in activity by all aircraft types, including turboprops and business jets.

The future airport reference code is anticipated to remain in ARC B-II, but if several active medium and/or large business jets were to base at the airport, then a transition to ARC C-II would occur. Design standards associated with ARC C-II are more restrictive; for example, the RSA increases in length beyond the runway end from the current 300 feet to 1,000 feet. The RSA width expands from 150 feet to 500 feet. Comparable dimensional changes also occur with the OFA. Long term facility planning will consider the impact of this possible transition in airport reference code.

The runway length of 5,500 feet meets the needs of the current critical design aircraft. To accommodate a greater percentage of medium and large business jets, a runway extension to 6,800 feet is considered. This would likely be an intermediate or long term need unless one or several business jets based at the airport in the short term.

On the landside, the airport has seen exceptional growth in the number of hangars being constructed. Most of the west side of the airport has been developed, with only a few parcels currently available. The City of Caldwell has committed to expanding the airport on the east side. A partial parallel taxiway has been constructed, and a new terminal building is under construction (opening spring 2010). The City is continuing an aggressive property acquisition program that will accommodate this growth to the east side.

The next chapter, Alternatives, will examine potential improvements to the airfield system. Most of the alternatives discussion will focus on those capital improvements that would require federal grant funds. Other projects of local concern will also be presented. On the land side, several facility layouts that meet the forecast demands over the next 20 years will be presented. Ultimately, an overall airport layout vision that is well beyond the 20-year scope of the master plan will be developed.

Chapter Four

ALTERNATIVES

ALTERNATIVES

In the previous chapter, airside and landside facilities required to satisfy the projected demand through the long range planning period were identified. The next step in the planning process is to evaluate reasonable ways these facilities can be provided. There can be countless combinations of design alternatives, but the alternatives presented here have been limited by the negotiated scope of services and are those with the perceived greatest potential for implementation.

Any development proposed for a master plan is evolved from an analysis of projected needs for a set period of time. Though the needs were determined by utilizing industry accepted statistical methodologies, unforeseen future events could impact the timing of the needs identified. The master planning process attempts to develop a viable concept for meeting the needs caused by projected demands for the next 20 years. However, no plan of action should be developed which may be inconsistent with the future goals and objectives of the City of Caldwell and its citizens, who have a vested interest in the development and operation of the airport.

The development alternatives for Caldwell Industrial Airport can be categorized into two functional areas: the **airside** (runways, navigational aids, taxiways, etc.) and **landside** (hangars, apron, and terminal area). Within each of these areas, specific capabilities and facilities are required or desired. In addition, the utilization of airport property to provide revenue support for the airport and to benefit the economic development and well-

being of the regional area must be considered.

Each functional area interrelates and affects the development potential of the others. Therefore, all areas are examined individually and then coordinated as a whole to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors on the existing airport must be evaluated to determine if the investment in Caldwell Industrial Airport will meet the needs of the community, both during and beyond the 20-year planning period.

The alternatives considered in this chapter are compared initially using safety and capacity factors, and subsequently with cost and environmental factors to determine which of the alternatives will best fulfill the local aviation needs. With this information, as well as the input from various airport stakeholders, a final airport concept can evolve into a realistic development plan.

AIRPORT DEVELOPMENT OBJECTIVES

Prior to identifying objectives specifically associated with development of Caldwell Industrial Airport, non-development alternatives are briefly considered. Non-development alternatives include a "no-build" or "do-nothing" alternative, the transfer of services to another existing airport or the development a new airport at a new location.

The Caldwell Industrial Airport plays a critical role in the economic development of the region and plays an important role in the continuity of the national aviation network. There is significant public and private investment at the airport. Pursuit of a non-development alternative would slowly devalue these investments, lead to infrastructure deterioration, and potentially the loss of significant levels of federal funding for airport improvements. Ultimately, the safety of aircraft, pilots, and persons on the ground could be jeopardized. Therefore, the non-development alternatives are not further considered.

It is the goal of this effort to produce a balanced airside and an appropriate landside aircraft storage mix to best serve forecast aviation demands. However, before defining and evaluating alternatives, specific airport development objectives should be considered. As owner and operator, the City of Caldwell provides the overall guidance for the operation and development of the airport. It is of primary concern that the airport is marketed, developed, and operated for the betterment of the community and its users. With this in mind, the following development objectives have been defined for this planning effort:

- To preserve and protect public and private investments in existing airport facilities.

- To develop a safe, attractive, and efficient aviation facility in accordance with applicable federal, state, and local regulations.

- To develop a balanced facility that is responsive to the current and long term needs of all general aviation users.

- To be reflective and supportive of the long term planning efforts currently applicable to the region.

- To develop a facility with a focus on self-sufficiency in both operational and developmental cost recovery.

- To ensure that future development is environmentally compatible.

REVIEW OF PREVIOUS AIRPORT PLAN

The previous airport layout plan (ALP) for Caldwell Industrial Airport was completed in 2004 and the previous master plan was completed in 1997. The 2004 airport layout plan relied on the forecasts from the 1997 master plan and was primarily intended to define the airport role and provide a new landside layout.

The 1997 master plan identified a based aircraft figure of 180 (1995 base year) and a long term 2015 figure of 365. With a current based aircraft figure of 480, the airport has clearly exceeded the growth forecast in 1997.

The 1997 master plan proposed extending the runway to the northwest to an ultimate length of 7,140 feet. This airside plan was carried through on the 2004 ALP. The additional runway length was planned to accommodate increased activity by business jets flying long distances under heavy load conditions.

Exhibit 4A presents the major components of the 2004 ALP plan overlaid onto a recent aerial photograph of the airport. The plan recommended continued hangar build-out of the southwest portion of the airfield. To a great extent this has been undertaken, with just in-fill opportunities available. An east side parallel taxiway was planned to accommodate further hangar expansion to the east side of the airfield. A portion of this taxiway has been completed providing access to a new terminal building which was completed in the spring of 2010. Numerous property parcels were identified for acquisition to accommodate a runway extension and instrument approaches. Some of this property has been acquired.

The assumptions made and conclusions drawn from the previous planning effort will be independently evaluated in this master plan. Some elements from the previous planning efforts may continue to be viable and could be included in this planning effort. Other elements may no longer be viable based on changes to design standards (there have been more than ten updates to design standards since 2004), or changes in the long term vision for the airport, or financial considerations.

The reminder of this chapter will present various alternatives to consider for both the airside and landside development of the airport. Those vi-

able elements from the 2004 ALP report can be considered for inclusion in the recommended concept for this master plan.

AIRSIDE PLANNING ISSUES

Generally, airside issues relate to those airport elements that contribute to the safe and efficient transition of aircraft and passengers from air transportation to the landside facilities at the airport. This includes consideration of the established design standard for the airport, the instrument approach capability, the capacity of the airfield, the length and strength of the runways, and the layout of the taxiways. Each of these elements was introduced in the previous chapters. This chapter will examine airside issues specific to Caldwell Industrial Airport. These will then be applied to several development alternatives. **Exhibit 4B** presents a summary of the airside and landside elements.

CRITICAL DESIGN AIRCRAFT

The critical design aircraft is that aircraft or grouping of general aviation aircraft that account for at least 500 annual itinerant operations at the airport. The critical design aircraft is then categorized based on operational characteristics (approach speed in landing configuration) and physical characteristics (wing span and tail height). The critical design aircraft is then identified by its corresponding airport reference code (ARC).

The determination of the proper ARC for the airport, both currently and in the future, directly correlates to the applicable airport design standards. This includes factors such as the runway length, safety areas, and facility separation standards.

As shown in the previous chapter, the current critical design aircraft falls in ARC B-II. This determination is supported by the presence of several based twin-engine turboprop aircraft (King Air models 200, 300, and 350) as well as two based business jets (Cessna Citations). All of these aircraft are in ARC B-II. It is rare for these types of aircraft to operate locally (training or touch-and-go activity), and utilization rates are typically higher than for single engine piston aircraft; therefore, it can be assumed the combined itinerant operations by these aircraft exceed the 500 operations threshold.

The future critical design aircraft is forecast to fall in ARC C-II. Many factors contribute to this determination. First, the airport is the only designated reliever airport in Idaho, and as such, it is intended to provide relief for Boise Airport for general aviation activity, including turboprop and business jet activity. Second, the Treasure Valley region has shown sustained demographic and economic growth over the last decade. Finally, the approved forecasts (by the FAA) for this master plan show the potential for the airport to realize 16 based business jets by the long term planning horizon.

According to the General Aviation Manufacturing Association, from 1997

09MP07-4A-5/2/10

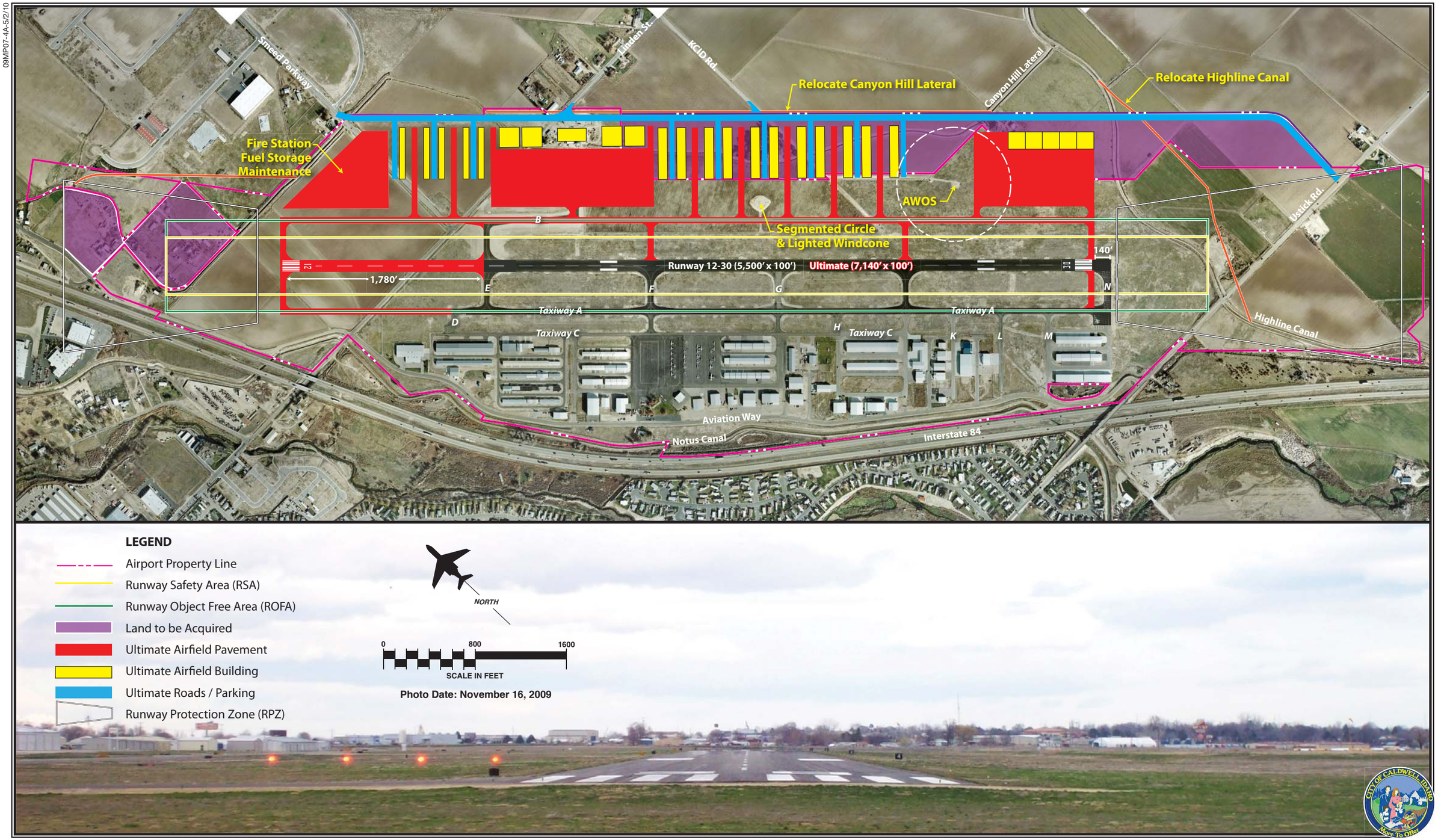

Exhibit 4A
2004 PLANNING CONCEPT

09MP07-IA-10/12/09

Airside Planning Considerations

- Plan airfield to meet safety standards for a current critical design aircraft in airport reference code (ARC) B-II.
- Plan airfield to meet safety standards for a future critical design aircraft in ARC C-II.
- Examine impacts to safety area design standards including the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and the runway protection zone (RPZ) for both ARC B-II and C-II.
- Analyze potential to extend runway 1,300 feet to an ultimate length of 6,800 feet.
- Examine the existing instrument approaches and analyze the potential for improved minimums.
- Identify potential capacity improvements.
- Analyze helicopter activity.
- Plan for full northeast parallel taxiway.

Landside Planning Considerations

- Maximize available property for facility development.
- Identify potential land acquisition needed for both airside and landside development.
- Identify potential location for an airport traffic control tower (ATCT).
- Provide hangar facility layout that maximizes ground movement efficiencies through grouping hangar activity levels.
- Plan facilities to meet separation standards for ARC C-II aircraft.
- Examine locations for additional aircraft apron, automobile parking, fuel storage, and firestation.
- Examine the impact on surface road access of the various airport development alternatives.
- Examine impact to proximate irrigation canals

Exhibit 4B
PLANNING CONSIDERATIONS

through 2009, nearly 10,000 business jets have been delivered. Of this total, approximately 66 percent fall in ARC C-I or larger. This includes business jet models such as the Challenger 300 and 604/605; Citation models 650, 680, and 750; Falcon models 900 and 2000; and Gulfstream models II, IV, and V. Therefore, it is reasonable to suggest that one or several of the forecast based business jets will fall in ARC C-I or larger.

It should be noted that the previous airport planning effort in 2004 indicated a long term ARC of C-III. Airplane Design Group (ADG) III business jets include the Gulfstream V, Embraer 190, and Boeing Business Jet (737 variant). These are large jets with international capability. While some of these have been known to operate at the airport (specifically the Gulfstream V) on occasion, they are not forecast to exceed the 500 operations threshold; therefore, the long term ARC for the airport is planned to ARC C-II.

RUNWAY LENGTH ISSUES

Caldwell Industrial Airport provides a single runway system. Runway 12-30 is 5,500 feet long and 100 feet wide. The runway length has been shown to be adequate to accommodate all small aircraft weighing less than 12,500 pounds. These types of aircraft represent the vast majority of activity at the airport. The airport also receives frequent activity from large turboprops and business jets weighing more than 12,500 pounds but falling within ARC B-II.

The operational fleet mix indicates that the airport currently experiences more than 500 annual business jet operations; therefore, business jet activity is critical to determine runway length requirements. The FAA provides several categories of business jets that are utilized to determine needed runway length. When business jets are the critical design aircraft, as is the case at Caldwell Industrial Airport, the runway length should meet the needs of 75 percent of the business jets at 60 percent useful load. In Chapter Three – Facility Requirements, this was determined to be 5,500 feet (see Table 3K). To accommodate 100 percent of the business jet fleet, a runway length of 6,800 feet was determined.

Table 4A shows the FAA classification of business jets. Of the business jet operations at Caldwell Industrial Airport, the majority are by those in the 75 percent category. All business jets are capable of operating on the runway length available, but the larger business jets may be weight-restricted.

As presented in the previous section, the long term critical aircraft is forecast to fall in ARC C-II. Most of these business jets are in the 75 to 100 percent FAA category for runway length. Therefore, the long term plan will include the potential to reach an ultimate runway length of 6,800 feet and apply ARC C-II design standards. Any extension of the runway must necessarily be justified by a transition to an ARC C-II or larger critical aircraft.

TABLE 4A
Business Jets Planning Statistics

Aircraft Make	Aircraft Model	ARC	MTOW#	Aircraft Make	Aircraft Model	ARC	MTOW#
Airplanes that Make Up 75 Percent of the Fleet				**Airplanes that Make Up 75 Percent of the Fleet**			
Aerospatiale	SN-601 Corvette	B-I	14,550	Hawker	600	C-II	25,000
BAe	125-700	C-II	24,200	Sabreliner	40	B-I	18,650
Beech Jet	400A	C-I	16,100	Sabreliner	60	C-I	20,200
Beech Jet	Premier I	C-I	12,500	Sabreliner	75a/80	C-II	23,300
Cessna	500 Citation/501 Citation S	B-I	11,850	Sabreliner	T-39	B-I	17,760
Cessna	Citation I/II/III	B-I	10,600				
Cessna	525A II (CJ-2)/525B	B-II	12,500	**Airplanes that Make Up 100 Percent of the Fleet**			
Cessna	550 Citation Bravo	B-II	14,800	BAe	Corporate 800/1000		
Cessna	550 Citation II	B-II	15,100	Bombardier	Challenger 600	C-II	41,250
Cessna	551 Citation II/Special	B-II	15,100	Bombardier	Challenger 604	C-II	47,600
Cessna	552 Citation	B-II	15,100	Bombardier	Challenger 300	C-II	38,850
Cessna	560 Citation Encore	B-II	16,830	Cessna	S550 Citation S/II	B-II	12,500
Cessna	560/560 XL Citation Excel	B-II	20,000	Cessna	650 Citation III/IV	C-II	21,000
Cessna	560 Citation V Ultra	B-II	16,300	Cessna	750 Citation X	C-II	36,100
Cessna	650 Citation VII	B-II	22,000	Dassault	Falcon 900C/900EX	C-II	45,500
Cessna	680 Citation Sovereign	C-II	30,300	Dassault	Falcon 2000/2000EX	C-II	41,000
Dassault	Falcon 10	B-I	18,740	IAI	Astra 1125 (G-150)	C-II	23,500
Dassault	Falcon 20	B-II	28,660	IAI	Galaxy 1126 (G-200)	C-II	34,850
Dassault	Falcon 50/50 EX	B-II	37,480	Learjet	45XR	C-I	20,200
Dassault	Falcon 900/900B	B-II	45,500	Learjet	55/55B/55C	C-I	21,500
Eclipse	Eclipse 500	A-I	5,950	Learjet	60	D-I	23,500
IAI	Jet Commander 1121	C-I	23,500	Hawker	125-1000 Horizon	C-II	36,000
IAI	Westwind 1123/1124	C-I	23,500	Hawker	800/800XP	C-II	28,000
Learjet	20 Series	C-I	15,000	Sabreliner	65/75	C-II	24,000
Learjet	31/31A/31A ER	C-I	16,500	**Airplanes over 60,000 pounds**			
Learjet	35/35A/36/36A	C-I	18,300	Bombardier	CL-700 Global Express	C-III	96,000
Learjet	40/45	C-I	20,200	Gulfstream	II	D-II	65,300
Mitsubishi	Mu-300 Diamond	B-I	14,630	Gulfstream	III	C-II	68,700
Raytheon	390 Premier	B-I	12,500	Gulfstream	IV (G-350, G-450)	D-II	71,780
Hawker	400/400XP	C-II	23,300	Gulfstream	V (G-500, G-550)	D-III	89,000

ARC: Airport Reference Code; MTOW: Maximum Certified Takeoff Weight (pounds)
Source: AC 150/5325-4B, Runway Length Requirements for Airport Design

There are two remaining FAA categories of business jets utilized for runway length determination: 75 and 100 percent of business jets at 90 percent useful load. Receiving support from the FAA for these runway lengths requires justification of an operational need that exceeds 500 annual operations. The airport would need to demonstrate to the FAA that the airport has one frequent or several regular operators of business jets that fly long-haul distances with heavy aircraft. This usually indicates frequent international destinations but it could include eastern seaboard destinations.

It should be noted that the 2004 airport planning study showed a long term need for a runway length of 7,140 feet. This was based on a 90 percent useful load factor. There is not currently justification to utilize this loading factor and the FAA discourages planning to this category until justification exists.

The runway length alternatives to follow will consider the feasibility of extending the runway to a length of 6,800 feet. The timeframe for such a need is planned beyond five years (short term) as there is currently no indication of 500 annual operations by business jets in the 75 to 100 percent of the national fleet category. Nonetheless, the airport should constantly monitor what type of business jets are operating and basing at the airport. The introduction of just a few large (75 to 100 percent category) and active business jets could accelerate the need for a runway extension.

RUNWAY SAFETY AREA (RSA) CONSIDERATIONS

The runway safety area (RSA) is a designated area surrounding the runways. According to the FAA, the RSA is to be:

(1) cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;

(2) drained by grading or storm sewers to prevent water accumulation;

(3) capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft, and;

(4) free of objects, except for objects that need to be located in the RSA because of their function (in aiding air navigation).

The dimension of the RSA surrounding the runway is a function of the critical aircraft. The current critical aircraft is in ARC B-II. The existing B-II RSA should be 150 feet wide (centered on the runway) and extend 300 feet beyond each end of the runway.

FAA Order 5300.1F, *Modification of Agency Airport Design, Construction, and Equipment Standards*, indicates in Paragraph 6.d the following:

". . . Runway safety areas at both certificated and non-certificated airports that do not meet dimensional standards are subject to FAA Order 5200.8, *Runway Safety Area Program*. Modification of Standards is not issued for nonstandard runway safety areas."

The FAA placed a greater emphasis on meeting RSA standards with the publication of FAA Order 5200.8, *Runway Safety Area Program,* in 1999, following congressional direction. The Order states in Paragraph 5, "The object of the Runway Safety Area Program is that all RSAs at federally obligated airports and all RSAs at airports certified under 14 Code of Federal Regulations (CFR) Part 139 shall conform to the standards contained in AC 150/5300-13, *Airport Design*, to the extent practicable."

The Order goes on to state in Paragraph 8.b:

"The Regional Airports Division Manager shall review all data collected for

each RSA in Paragraph 7, along with the supporting documentation prepared by the region for that RSA, and make one of the following determinations:

(1) The existing RSA meets the current standards contained in AC 150/5300-13, *Airport Design*.

(2) The existing RSA does not meet the current standards, but it is practicable to improve the RSA so that it will meet current standards.

(3) The existing RSA can be improved to enhance safety, but the RSA will still not meet current standards.

(4) The existing RSA does not meet current RSA standards, and it is not practicable to improve the RSA."

The existing RSA at Caldwell meets the design standard contained in AC 150/5300-13, *Airport Design*. Any changes to the runway environment will need to also meet the design standards. The FAA will not approve a runway extension, for example, that builds into a non-compliant situation. Therefore, the alternatives for extending the runway must consider the impact to the RSA just as much, if not more, than the ability to physically add runway length.

When the airport transitions to a design aircraft represented by ARC C-II, the RSA dimensions become larger. The width is 500 feet, as centered on the runway, and the length beyond the runway end is 1,000 feet. As discussed in Chapter Three – Facility Requirements, this transition would place the RSA and OFA behind both runway ends in non-compliance. Therefore, it would be incumbent upon the airport to plan for meeting the standard.

On the Runway 12 end, Linden Street would traverse the RSA. This road would need to be rerouted outside the RSA or closed. On the Runway 30 end, the RSA would be traversed by the Highline Canal. To satisfy the RSA requirements without impacting the operational length of the runway, the Highline Canal would need to either be rerouted or covered.

OBJECT FREE AREA (OFA)

The OFA is a protected area surrounding the runway that precludes object penetration above the runway elevation except for those elements necessary for air navigation (such as lighting). The ground does not have the same grading and drainage standards as the RSA. The primary purpose of the OFA is to eliminate aircraft wing impact if an aircraft were to veer into the RSA.

The current OFA dimension is 500 feet wide as centered on the runway and extending 300 feet beyond the runway end. The OFA at Caldwell Industrial Airport currently meets this standard. The future OFA for ARC C-II standards is 800 feet wide and 1,000 feet beyond the runway ends.

A transition to ARC C-II with the existing runway configuration would

bring the OFA beyond both runway ends into non-compliance (see Exhibit 3D). On the Runway 12 end, Linden Street would need to be relocated or rerouted outside the OFA. On the Runway 30 end, Ustick Road would be an OFA penetration (but not Highline Canal). The road would likely have to be rerouted.

Under some circumstances, airports that do not and cannot feasibly provide full OFA, can petition the FAA for a modification to standard. This will likely not apply to Caldwell Industrial Airport, as Ustick Road could be rerouted slightly outside the OFA. This potential is not available for airports that propose building into a non-compliant situation. Therefore, any runway extension considered at Caldwell Industrial Airport must also maintain adequate OFA.

OBSTACLE FREE ZONE (OFZ)

The OFZ is a volume of airspace centered on the runway. For Caldwell Industrial Airport, the OFA is 400 feet wide and extends beyond the runway ends 200 feet. Under both the current B-II and future C-II condition, the OFZ standard is met.

RUNWAY PROTECTION ZONE AND INSTRUMENT APPROACHES

The RPZ is a trapezoidal area centered on the runway, typically beginning 200 feet from the runway end. The RPZ is an area that is to be clear of obstructions and incompatible land uses such as residences and places of public assembly. Where possible, the airport should have ownership of the RPZs.

The RPZ is comprised of the central portion of the RPZ and the controlled activity area. The central portion of the RPZ is the length of the RPZ and the width of the OFA, referred to as the extended OFA. According to AC 150/5300-13, *Airport Design*, "Extension of the OFA beyond the standard length to the maximum extent feasible is encouraged." The controlled activity area of the RPZ is the remaining portions not included in the extended OFA.

The RPZs contain a portion of the RSA and OFA, and the standards for these surfaces still apply. The RPZs serving both runway ends are traversed by roads. Where feasible, the roads should be relocated outside the RPZs. On the Runway 12 end, the RPZ is traversed by Linden Street. Since planning is considering an extension to the runway on this end, Linden Street should be closed and traffic rerouted around the RPZ to the greatest extent possible. Existing roads located within the RPZ but clear of the RSA and OFA are acceptable (i.e., "grandfathered"), but planning efforts should be made to remove the roads.

In the airside alternatives, improving the RPZ by reducing the impacts of roads and other land uses will be considered for both the existing layout and when considering a possible runway extension. **Exhibit 4C** shows the impact of each potential RPZ serving Runway 12 in both the existing condi-

tion and if a runway extension of 1,300 feet was planned. Each of the RPZs would extend over several roads including Interstate 84.

The size of the RPZs is a function of the critical design aircraft and the available or planned instrument approach capability. The top portion of **Exhibit 4C** shows three RPZs for the existing ARC B-II runway. The smallest one is the existing 1-mile visibility RPZ. The RPZs for ¾-mile and ½-mile visibilities are also shown. As discussed, the RPZ crosses Linden Street, which would be a grandfathered situation. Approval of improved visibility minimums (¾-mile or ½-mile) may be possible if approach clearance is provided.

The bottom portion of **Exhibit 4C** shows the potential RPZ associated with a runway extension of 1,300 feet. Clearly Linden Street would need to be closed as the runway extension itself would cross the Linden Street alignment. Any extension of the runway also assumes airport acquisition of 11.4 acres of residential property that would fall under the RPZ. Since the extension would only be justified when the airport transitions to ARC C-II, only C design group RPZs are considered.

Interstate 84 (assumed to be fixed in its location) would traverse a corner portion of the potential RPZs serving an extended Runway 12. Only a small portion of the 1-mile RPZ would be encroached upon by the Interstate. Given the current location of Linden Street through the existing RPZ (and extended OFA), this would be a great improvement to the RPZ. While further airspace and approach clearance analysis must be undertaken, a 1-mile visibility minimum RPZ appears feasible on a 1,300-foot extension to Runway 12.

A 1,300-foot extension combined with improved instrument approach visibility minimums would introduce new constraints. Both the ¾-mile and ½-mile RPZs would be further encroached upon by Interstate 84, including larger portions of the extended OFA. In fact, the ½-mile RPZ would introduce two large warehouse/office buildings to the RPZ. Unless the city is willing to buy and raze these structures, a ½-mile instrument approach is not considered feasible to the Runway 12 end. Further airspace and approach clearance analysis would need to be undertaken to determine the clearances for a ¾-mile approach, but the extent of the Interstate 84 intrusion into the RPZ may preclude this approach. For these reasons, the alternatives will focus on maintaining 1-mile visibility approaches to Runway 12.

Under the existing condition on the Runway 30 end, Ustick Road may not be able to be relocated completely outside the RPZ because of the close proximity to the bridge over Interstate 84. Further engineering will be necessary to determine the feasibility based on curvature standards for this arterial road. If the road still clips a portion of the RPZ after relocation, this would likely be acceptable to the FAA since the relocation of the road would be to the maximum extent feasible.

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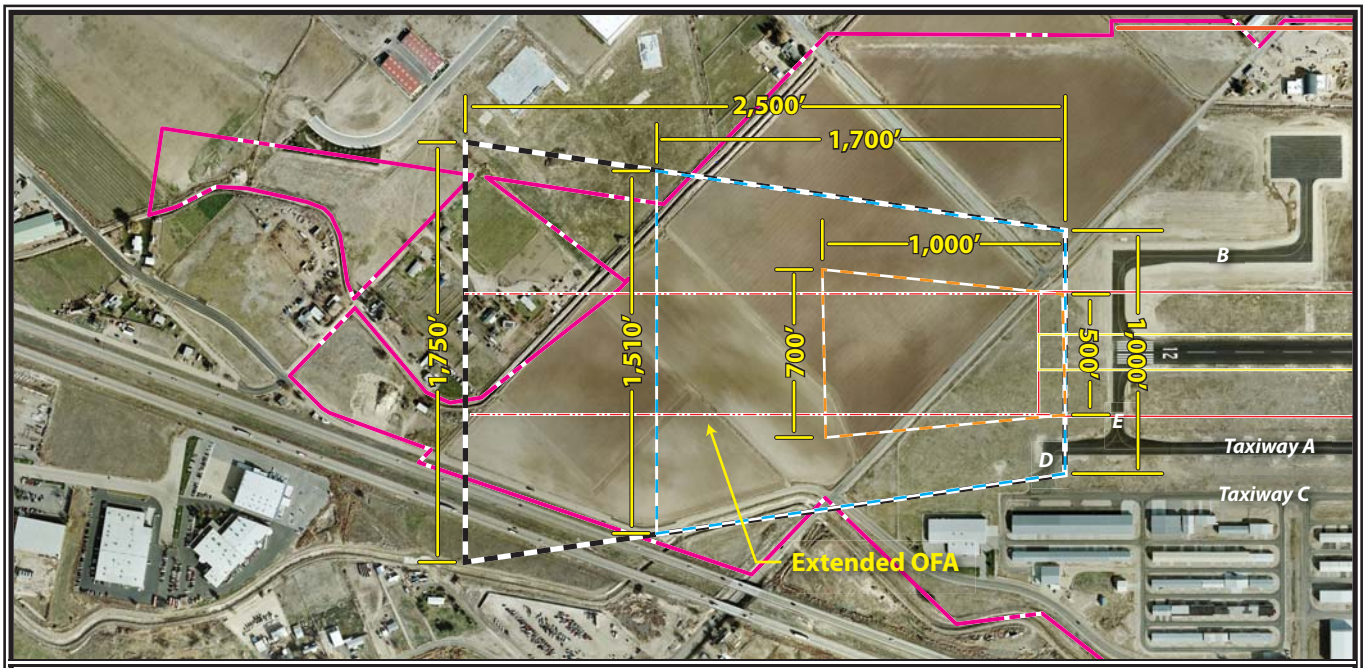

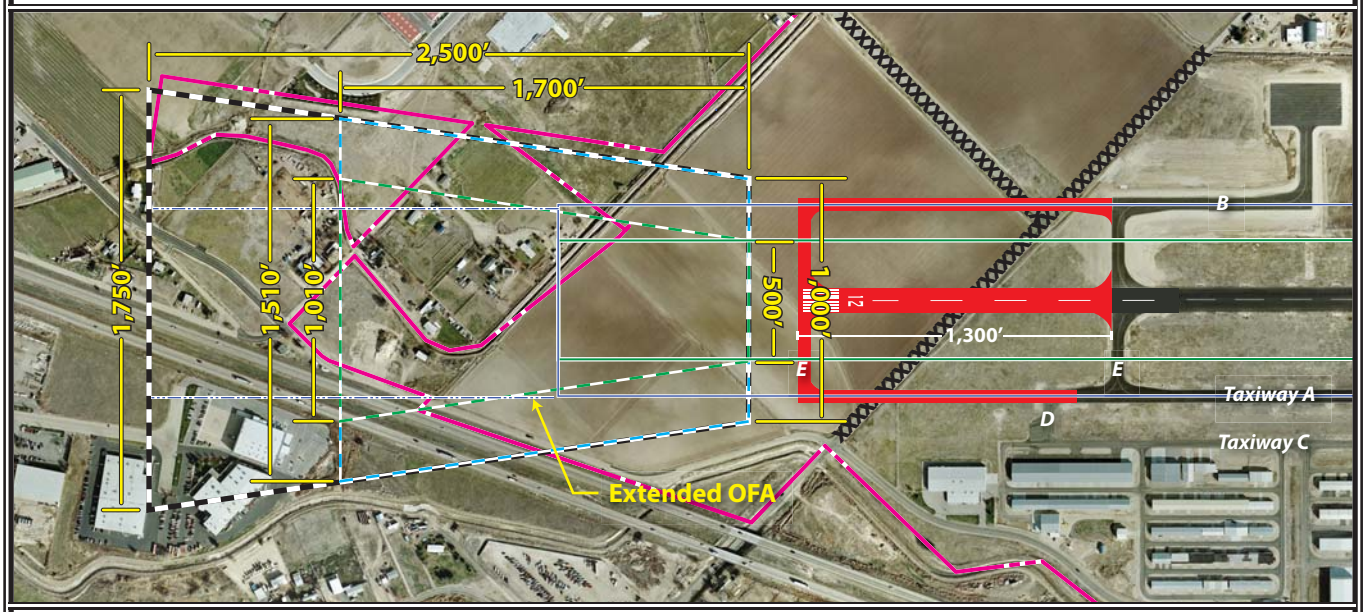

Photo Date: November 16, 2009

LEGEND

- Airport Property Line
- B-II / ≥ ¾ mile Runway Safety Area (RSA)
- C-II / RSA
- B-II / ≥ ¾ mile Object Free Area (OFA)
- C-II OFA
- Ultimate Airfield Pavement
- B / 1 mile Runway Protection Zone (RPZ)
- C / 1 mile RPZ
- B-C / ¾ mile RPZ
- B-C / ½ mile RPZ

NORTH

0 800 1600

SCALE IN FEET

Exhibit 4C
RPZ CONSIDERATIONS

It should be noted that relocating Ustick Road outside the existing Runway 30 RPZ (or as close as possible) will have a secondary benefit. When the airport transitions to ARC C-II, the RSA and OFA extend 1,000 feet beyond the runway end. Relocation of Ustick Road would then clear these surfaces. Of course, the larger RPZ associated with ARC C-II would still be traversed by the relocated Ustick Road, but this would still be an improvement on the current layout as the road would be further from the runway end.

The other alternative is the closure of Ustick Road which is not recommended as this road provides a vital artery from the east side of Interstate 84 to the City of Caldwell on the west. In addition, the City of Caldwell indicated that no extension should be planned that closes Ustick Road, primarily because it is more feasible for the City to close or reroute Linden Street. As mentioned previously, the road should be relocated at least outside the ARC C-II RSA, which appears possible.

The instrument approach to Runway 30 provides for 1-mile visibility minimums and 300-foot cloud ceilings.

TAXIWAY CONSIDERATIONS

The airport has constructed a new terminal building located on the northeast side of the airfield. A portion of Taxiway B has been completed leading to an aircraft apron fronting the terminal building. The partial parallel taxiway has been situated at a distance of 400 feet from the runway centerline. This is the same separation as is provided between the runway and the southwest parallel Taxiway A. Both parallel taxiways have been constructed at a width of 50 feet, meeting airplane design group (ADG) III standards. All other taxiways are planned to a maximum width of 35 feet, meeting the ADG II standards.

Parallel Taxiway B is planned to be extended from its current location near the Runway 12 end to the Runway 30 threshold. This goal should be maintained in order to provide access to new northeast landside hangar development and to eliminate the need for runway crossings, which can lead to runway incursions.

HELICOPTER ACTIVITY

Typically at general aviation airports, helicopter movements utilize the existing runway system. Helicopters will approach the airport and then hover-taxi utilizing the taxiway system to their final destination. At Caldwell Industrial Airport, helicopters are directed to utilize Taxiway A for taxiing, while fixed wing aircraft use Taxiway C.

Some airports that experience a heavy volume of helicopter activity will develop a dedicated helipad. A helipad has very specific design requirements including a defined safety area and trapezoidal protection zones, both of which must be clear. General aviation airports usually do not need a dedicated heliport and one is not planned for Caldwell Industrial Airport.

Segregation of helicopter activity from fixed wing activity is a good strategy. Often airports will identify a preferred location for helicopter training activity. The location is typically set away from the terminal area and in a non-noise-sensitive location. At Caldwell Industrial Airport, this location is at the ends of Taxiway C. In the future, helicopter activity should be separated from fixed wing activity to the greatest extent possible.

AIRSIDE DEVELOPMENT ALTERNATIVES

Three airside alternatives are presented on **Exhibit 4D**. Each of these alternatives considers the impacts when extending the runway by 1,300 feet to an ultimate length of 6,800 feet. Since the current runway length of 5,500 feet meets the needs of the current critical design aircraft (ARC B-II), any extension to the runway must be justified by activity levels (500 operations annually) by an aircraft or group of aircraft represented by ARC C-II or larger. Therefore, any runway extension will necessarily mean the implementation of ARC C-II design standards.

As discussed previously, the RSA and OFA for ARC C-II design standards expand substantially. The RSA standard goes from 150 feet wide to 500 feet wide and from 300 feet beyond the runway to 1,000 feet beyond the runway. The OFA expands from 500 feet wide to 800 feet wide and from 300 feet beyond the end of the runway to 1,000 feet beyond the end of the runway.

The RPZs will also expand when the airport transitions to ARC C-II. The current 1-mile visibility RPZ will extend from 1,000 feet to 1,700 feet and the outer width will go from 700 feet to 1,010 feet. The inner width remains at 500 feet. Lower visibility minimums will need to apply even larger RPZs (refer to **Exhibit 4C**).

AIRSIDE ALTERNATIVE 1

The first airside alternative considers extending Runway 12 by 1,300 feet for a total runway length of 6,800 feet. To accomplish this, Linden Street will need to be rerouted onto Smeed Parkway and the existing link of Linden to Aviation Way will need to be closed. The new section of Smeed Parkway will connect to Linden Street near the new terminal building.

The RSA will then extend 1,000 feet behind Runway 12, encroaching upon the Canyon Hill Lateral and a residential property. The Canyon Hill Lateral will need to be relocated since it will prevent the RSA from meeting standard. The residential property is part of an 11.4-acre residential area that is recommended for acquisition in its entirety. In this alternative, most of this area will fall in the RPZ but for compatibility purposes, the whole area should be acquired.

If the airport is able to acquire the 11.4 acres, nearly the entire RPZ would be on airport property. Only a small portion of the RPZ would extend off airport property and over the westbound lanes of Interstate 84. In essence, this would continue to be pro-

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ODALS: Omni-Directional Approach Lighting System

Exhibit 4D
AIRSIDE ALTERNATIVES

tected land since the Interstate is already there. This RPZ, even with a small portion extending off airport property, would be a vast improvement over the current RPZ that has Linden Street passing through it.

This alternative considers no change to the Runway 30 landing threshold. The impact on this end is the increase in the length of the RSA beyond the end. The 1,000-foot long RSA would encompass a portion of the Highline Canal. The canal through the RSA is planned to be covered. This culvert would need to be strong enough to carry the weight of the critical aircraft, or approximately 60,000 pounds.

The OFA would extend over Ustick Road creating a non-standard situation. As shown on the exhibit, Ustick Road is planned to be rerouted slightly. No additional land acquisition is necessary on this end of the runway. Consideration was given to relocating the Ustick Road entirely outside the RPZ, but this is not considered feasible as this is an arterial road that could not be maintained as such if sharp turns were added to the road. It should be noted, however, that over the years there have been discussions about adding an interchange to Interstate 84 at some point east of Caldwell. If Ustick Road were selected for the interchange, there may be an opportunity to reroute Ustick Road so that it does not impact the long term plans for the airport.

Improved instrument approaches are considered for Runway 30. The current approaches provide for 1-mile visibility minimums. Future planning is considering the possibility of providing ¾-mile visibility minimums. This RPZ would remain entirely on airport property. The threshold siting surface (the critical approach protection surface) has the same dimensions whether it is a 1-mile or a ¾-mile visibility minimum.

For a ¾-mile instrument approach, an approach lighting system is recommended but not required. In order to improve the identification of the runway end, and to improve safety, an omni-directional approach lighting system (ODALS) is planned leading to the Runway 30 threshold.

Consideration was given to the feasibility of a ½-mile visibility instrument approach to the Runway 30 end. Previous discussions with tower personnel at Boise Airport indicated this type of approach would conflict with approaches to Boise Airport. Therefore, ½-mile instrument approaches are not planned.

AIRSIDE ALTERNATIVE 2

The next alternative considers a maximum runway length of 6,000 feet. There are potential constraints that could limit the runway extension to this length. A 6,000-foot runway is a minimum acceptable length for many fractional, charter, and corporate operators and so achieving this length would be beneficial. A 6,000-foot long runway may mean that some aircraft in ARC C-II may have to operate at reduced payloads.

On the Runway 12 end, an extension of 700 feet is considered. This is the

maximum extension possible while keeping the 1-mile RPZ off all roads, including Aviation Way and Interstate 84. Linden Street and a portion of Smeed Parkway would still be impacted (as in Alternative 1). The 11.4 acres of residential property is still recommended for acquisition.

On the Runway 30 end, a different approach is taken to providing full RSA and OFA to ARC C-II standards. The runway is shortened by 200 feet. Ustick Road would remain in its current alignment, thus preserving its role as an arterial access to the City of Caldwell. This alternative considers it not feasible to relocate Ustick Road outside the RPZ. Ustick Road would be grandfathered from the need to be outside the RPZ.

AIRSIDE ALTERNATIVE 3

The third airside alternative presented on **Exhibit 4D** considers an ultimate runway length of 6,800 feet. To achieve this length, 700 feet is added to the Runway 12 end and the remaining 600 feet is added to the Runway 30 end. By segmenting the runway extension in this manner, both planned RPZs can remain completely on airport property.

To add 700 feet to the Runway 12 end, many of the previously discussed actions must be taken. Linden Street and a portion of Smeed Parkway will be impacted. The residential area, encompassing 11.4 acres, located approximately 2,400 feet off the existing Runway 12 end should be acquired.

The challenge on this alternative is the addition of 600 feet to the Runway 30 end. Ustick Road would need to be tunneled under the RSA and potentially under the edges of the RPZ. This could pose some engineering difficulties because Ustick Road is bridged over Interstate 84, and it would need to be tunneled beginning just a few hundred feet from the end of the bridge. Certainly tunneling Ustick Road would be very expensive, as much as $15 million. In addition, the Highline Canal would need to be rerouted outside the RSA.

Like the previous two alternatives, a ¾-mile instrument approach is considered. The entire RPZ for such an approach would remain on existing airport property. An ODALS is also planned to enhance visual identification of the runway end.

AIRSIDE SUMMARY

The primary goal of the alternatives analysis has been to meet FAA design standards and analyze the capability of the airport to support an ultimate runway length of 6,800 feet. Alternatives one and three achieve this goal. Alternative two provides an ultimate runway length of 6,000 feet.

Each of the alternatives fully meets the design standards for RSA, OFA, and OFZ for a future critical aircraft in ARC C-II. Each of the alternatives also improves the RPZ by removing roads and land use incompatibilities.

After review with the Planning Advisory Committee (PAC), including air-

port management, the FAA and the Idaho Transportation Department – Division of Aeronautics, a final airside concept will be selected. The final concept may also be a combination of elements from these three alternatives.

LANDSIDE PLANNING ISSUES

Generally, landside issues relate to those airport facilities necessary, or desired, for the safe and efficient parking and storage of aircraft, movement of passengers and pilots to and from aircraft, airport land use, and overall revenue support functions. In addition, elements such as fueling capability, general aviation services, and emergency response are also considered in the landside functions.

Landside planning issues, previously summarized on **Exhibit 4B**, will focus on facility locating strategies following a philosophy of separating activity levels. The number of structures and the storage capacity available is limited. Therefore, it is important to plan for an appropriate mix of smaller T-hangars, box hangars, and larger conventional hangars.

The orderly development of the airport terminal area (those areas parallel to the runway and along the flight line) can be the most critical, and probably the most difficult, development to control on the airport. A development approach of "taking the path of least resistance" can have a significant effect on the long term viability of an airport. Allowing development without regard to a functional plan can result in a haphazard array of buildings and small ramp areas, which will eventually preclude the most efficient use of valuable space along the flight line.

Activity in the terminal area should be divided into three categories at an airport. The high-activity area should be planned and developed as the area providing aviation services on the airport. An example of a high-activity area is the aircraft parking apron, which provides outside storage and circulation of aircraft. In addition, large conventional hangars housing fixed base operators (FBOs), other airport businesses, or those used for aircraft storage would be considered high-activity uses. A conventional hangar structure in the high-activity area should be a minimum of 6,400 square feet (80 feet by 80 feet). If space is available, it is more common to plan these hangars for up to 200 feet by 200 feet. The best location for high-activity areas is along the flight line near midfield, for ease of access to all areas of the airfield.

The medium-activity category defines the next level of airport use and primarily includes corporate aircraft operators that may desire their own executive or conventional hangar storage on the airport. A hangar in the medium-activity use area should be at least 50 feet by 50 feet, or a minimum of 2,500 square feet. The best location for medium-activity use is off the immediate flight line, but still with ready access to the runway/taxiway system. Typically, these areas will be adjacent to the high-activity areas. Parking and utilities such as water and sewer should also be provided in this area.

The low-activity use category defines the area for storage of smaller single and twin-engine aircraft. Low-activity users are personal or small business aircraft owners who prefer individual space in T-hangars or small executive hangars. Low-activity areas should be located in less-conspicuous areas or to the ends of the flight line. This use category will require electricity, but may not require water or sewer utilities.

In addition to the functional compatibility of the terminal area, the proposed development concept should provide a first-class appearance for Caldwell Industrial Airport. Consideration to aesthetics should be given high priority in all public areas, as the airport can many times serve as the first impression a visitor may have of the community.

The existing west side terminal area at Caldwell Industrial Airport has developed rapidly over the last several years. While the available space has been fully utilized, the layout of hangar types has at times been mixed. For example, most of the larger conventional hangars that house aviation related business are located on the back side of the apron with smaller hangars located in front of them.

It would be preferable to have the high-activity business-use hangars either fronting a main apron, or facing the parallel taxiway, with lower activity T-hangars and box hangars located further to the side or behind these hangars. The result is a smaller main apron and very little apron area associated with individual business-use hangars.

With the new terminal building on the northeast side of the airport, the opportunity exists to formulate an efficient long term facility layout plan. Facilities at general aviation airports should follow a linear configuration parallel to the primary runway. The linear configuration allows for maximizing available space, while providing ease of access to terminal facilities from the airfield. Each landside alternative will address development issues, such as the separation of activity levels and efficiency of layout. Each of the landside alternatives will address the forecast needs from the previous chapter of this plan.

AIRPORT LAND USE

The Caldwell Industrial Airport currently encompasses approximately 533 acres. As the airport has accepted grants for capital improvements from the FAA, the airport sponsor has agreed to certain "grant assurances." Grant assurances related to land use assure that airport property will be reserved for aeronautical purposes. If the airport sponsors wish to sell (release) airport land or lease airport land for a non-aeronautical purpose (land use change), they must petition the FAA for approval. The Airport Layout Plan and the Airport Property Map must then be updated to reflect the sale or land use change of the identified property.

Caldwell Industrial Airport is not in a position to sell or release any land. All current property should be reserved for aviation purposes exclusively. In fact, the airport should continue their efforts to acquire additional property

on the east side of the runway. As a general rule, airports should own the property between 1,200 and 1,500 feet of the runway centerline. All this property should then be reserved for aeronautical purposes.

VEHICULAR ACCESS AND PARKING

A planning consideration for any airport master plan is the segregation of vehicles and aircraft in operational areas (AOAs). This is both a safety and security consideration for the airport. Aircraft safety is reduced and accident potential increased when vehicles and aircraft share the same pavement surfaces. Vehicles contribute to the accumulation of debris on aircraft operational surfaces, which increases the potential for Foreign Object Damage (FOD), which is especially dangerous for turbine-powered aircraft. The potential for runway incursions is increased, as vehicles may inadvertently access active runway or taxiway areas if they become disoriented once on the AOA. Airfield security may be compromised as there is loss of control over the vehicles as they enter the secure AOA. The greatest concern is for public vehicles, such as delivery vehicles and visitors, which may not fully understand the operational characteristics of aircraft and the markings in place to control vehicle access. The best solution is to provide dedicated vehicle access roads to each landside facility that is separated from the aircraft operational areas with security fencing.

The segregation of vehicle and aircraft operational areas is supported by FAA guidance established in June 2002. FAA AC 150/5210-20, *Ground Vehicle Operations on Airports*, states, "The control of vehicular activity on the airside of an airport is of the highest importance." The AC further states, "An airport operator should limit vehicle operations on the movement areas of the airport to only those vehicles necessary to support the operational activity of the airport."

The landside alternatives for Caldwell Industrial Airport have been developed to reduce the need for vehicles to cross an apron or taxiway area. Dedicated vehicle parking areas, which are outside the airport fence line, are considered for all potential hangars.

FUEL FACILITIES

The existing fuel storage is located on the west side of the airfield in aboveground tanks adjacent the terminal building and adjacent to the south end FBO. The new terminal building is located on the northeast side of the airfield. As facilities expand on the east side of the airfield, consideration should be given to a secondary fuel farm on this side of the airport. This would encourage transient operators to utilize the east side and it would limit the need for fuel trucks to cross the airfield environment to fuel aircraft on the east side. The alternatives consider the addition of a fuel farm on the east side of the airport.

BUILDING RESTRICTION LINE

The building restriction line (BRL) identifies suitable building area loca-

tions on the airport. The BRL encompasses the RPZs, the OFA, the runway visibility zone, NAVAID critical areas, areas required for terminal instrument procedures, and other areas necessary for meeting airport line–of-sight.

Two primary factors contribute to the determination of the BRL: type of runway (utility or other-than-utility) and the capability of the instrument approaches. As a reliever airport supporting business jet operations, Caldwell Industrial Airport is an "other-than-utility" airport. The instrument approach provides for visibility minimums greater than ¾-mile.

The BRL is also set by the allowable height of airport buildings. At Caldwell Industrial Airport, the BRL should be at a minimum of 675 feet for 25-foot tall structures and 745 feet from the runway centerline for buildings no taller than 35 feet.

SEPARATION STANDARDS

When planning landside facilities, consideration must be given to the design standards for separating structures. The separation standards are a function of the critical design aircraft for the future condition. As discussed, the Caldwell Industrial Airport may transition from a critical aircraft in ARC B-II to one in ARC C-II. Separation standards are directly related to the wingspan (Airplane Design Group – ADG) of the critical aircraft, which is from 49 feet to 79 feet.

The taxiway object free area (TOFA) is the area required to be clear of object penetrations surrounding taxiways. For ADG II aircraft, the TOFA is 131 feet wide as centered on the taxiway. For ADG II taxilanes, the TOFA is 115 feet.

While these design standards should be implemented for all primary movement areas (e.g., parallel taxiways, aprons), facilities not intended to serve the critical design aircraft, different separation standards can be applied. For example, an area that is planned for nested T-hangars can apply separation standards for smaller single engine aircraft.

AIRPORT TRAFFIC CONTROL TOWER (ATCT)

As discussed in the previous chapter, Caldwell Industrial Airport may need an ATCT to increase safety at the airport. Operational levels indicate this need may be in the short term planning period. The FAA will need to conduct a benefit-cost analysis to determine if the airport qualifies for a tower.

The alternatives chapter will primarily focus on reserving an appropriate site for a future tower. FAA Order 6480.7D, *Airport Traffic Control Tower and Terminal Radar Approach Control Facility Design Guidelines,* presents guidelines on siting a tower and the area requirements for the tower. An area of at least 25,000 square feet will need to be reserved for a tower and dedicated parking.

When siting a tower, the following mandatory elements should be considered:

- Provide maximum visibility of the airport traffic pattern.
- Provide a clear unobstructed and direct view of the approaches to all runway ends and to all taxiway surfaces.
- The site must be large enough to accommodate current and future building needs including vehicle parking.
- The tower must not violate the FAR Part 77 surfaces unless absolutely necessary.
- The tower must not derogate the signal generated by any existing or planned electronic navigational aid.

The following non-mandatory siting requirements should be considered:

- To assure adequate depth perception, the line-of-sight to aircraft movement areas should be perpendicular to the direction of aircraft travel.
- The tower cab should be oriented to prevent an aircraft approach from being aligned with the rising or setting sun.
- The controller's visibility should not be impaired by direct or indirect external lighting sources.
- All aircraft movement areas including parking aprons, tie-down spaces, run-up pads, etc., should be visible from the ATCT.
- Consideration must be given to local weather phenomena to preclude restriction to visibility due to fog or ground haze.
- Exterior noise should be at a minimum and sites should be evaluated for expected noise levels.
- Access to the site should not require controllers to cross a runway or taxiway.
- Consideration should be given to planned airport expansion, especially for the construction of buildings, hangars, runway/taxiway extensions, etc. to preclude the relocation of the ATCT at a later date.

LANDSIDE ALTERNATIVES

The previous section discussed several landside considerations that apply to each of the alternatives. Three landside alternatives follow that implement these elements. There is limited development space available on the west side of the airport. The pattern and type of development has been well established on the west side and only in-fill opportunities exist. The facility layout on the west side is the same for each of the alternatives. As shown,

approximately 40,000 square feet is available for T-hangars, 20,000 square feet for conventional hangars, and 221,000 square feet for box hangars. A total of 281,000 square feet of hangar space is planned on the west side of the airport.

LANDSIDE ALTERNATIVE A

Landside Alternative A, presented on **Exhibit 4E**, presents the optimal development plan where the airport is able to acquire the entire northeast flight line. This includes a triangle-shaped parcel to the north of the new terminal building. In total, approximately 80 acres is recommended for acquisition. This includes the "Settlement," a residential area with approximately 12 small homes, all of which are leased on a monthly basis.

For this layout to be feasible, the Canyon Hill Lateral irrigation canal will need to be relocated outside the airport environment. KCID Road would be extended to ultimately intersect with Ustick Road, providing through access from the east to the west.

The facility layout represents an implementation of grouping similar facilities. On the northeast side are 10 rows of nested T-hangars. Each structure is approximately 25,000 square feet and could accommodate up to 18 individual units for a total of 180 T-hangar units.

Near the new terminal building are three large conventional hangars. Each of these is approximately 32,000 square feet, which is larger than any other individual hangars on the airport but sized consistent with hangars for multiple jet storage. This central high-activity location should be exclusively reserved for large hangars that are intended to house an airport fixed base operator (FBO) or for bulk aircraft storage.

Behind (to the east) the new terminal building is the triangle-shaped 37-acre parcel that could provide much needed expansion capability for the airport. It can also provide some unique development opportunities. The parcel is subdivided into six parcels that could be made available for ground lease. Once leased, the developer could build a custom aviation-related facility. Since a taxiway is planned to provide access to this area, any businesses that chose to locate there would have to be aviation-related.

To the southeast of the new terminal building are several taxilanes providing access to hangar development areas intended for individual aircraft owners. This area replicates the very successful development on the southwest side of the airport. Each of the structures shown represents 36,000 square feet of developable space.

This landside alternative provides for 250,000 square feet of T-hangar space, 288,000 square feet of box hangar space, and 96,000 square feet of conventional hangar space. The parcels behind the new terminal building could accommodate an additional 240,000 square feet of hangar space. This landside layout provides a total of 874,000 square feet of space on the east side and 281,000 square feet of space on the west side.

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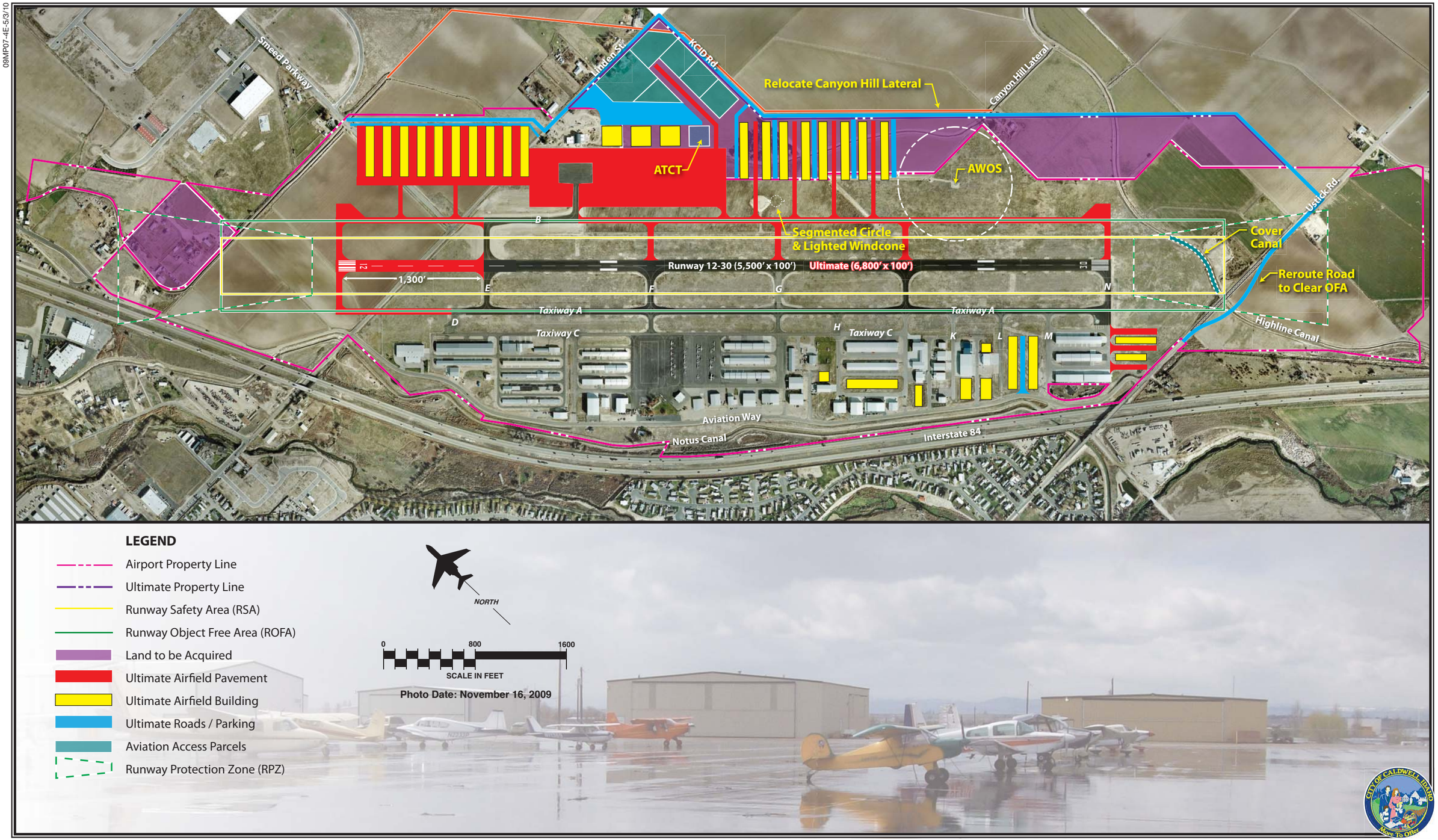

Exhibit 4E
LANDSIDE ALTERNATIVE A

LANDSIDE ALTERNATIVE B

Landside Alternative B, shown on **Exhibit 4F**, considers acquiring only the triangle-shaped parcel near the new terminal building. This area is approximately 37 acres and includes the "Settlement." As with the previous alternative, the Canyon Hill Lateral must be relocated.

The facility layout also includes a nested T-hangar complex to the north of the new terminal building. This complex is the same as that presented in Landside Alternative A and provides 180 units and approximately 250,000 square feet of storage space.

The development around the new terminal building continues to provide for high-activity hangars to be located facing the main apron. A taxiway extends into the triangle parcel and provides access for further hangar development.

The conventional hangars shown represent approximately 177,000 square feet of hangar space. The box hangars located behind the conventional hangars represent 241,000 square feet of storage space. A total of 668,000 square feet of hangar storage space is shown in this landside alternative.

LANDSIDE ALTERNATIVE C

The third landside alternative, as shown on **Exhibit 4G**, demonstrates the development possibilities considering two factors: (1) if relocation of the Canyon Hill Lateral cannot be accomplished in a timely manner; and (2) if financial considerations limit the amount of property that can be acquired. Under this scenario, approximately 13 acres are shown to be acquired, including the "Settlement."

Once again, a complex of nested T-hangars is shown on the northwest portion of the airport. In this case, four buildings are featured representing 100,000 square feet of space and 72 individual units. To the northeast of the new terminal building are located three large conventional hangars, each encompassing 32,000 square feet. These would be intended for high-activity, FBO-type use, or bulk aircraft storage.

Because this alternative considers the Canyon Hill Lateral to remain in its current alignment, hangar and apron development area is limited. To the southeast of the new terminal building, there is approximately 400 feet between the BRL and the Canyon Hill Lateral. This area is shown with four conventional hangars of approximately 20,000 square feet each. Footbridges over the canal provide access from vehicle parking to the hangars. Further to the southeast, adjacent the "Settlement," the canal bends toward the runway, severely limiting further hangar development.

This alternative provides 100,000 square feet of T-hangar space, 96,000 feet of large conventional hangar space, and 80,000 square feet of box hangars.

LANDSIDE SUMMARY

Some portions of the existing hangar layout at Caldwell Industrial Airport follow the normal convention for efficiency of layout, while other areas do not. The rows of box hangars are efficiently located and maximize the limited west side development space. The majority of west conventional hangars, which are typically higher activity hangars, are set back from the main apron and many are located behind lower activity level T-hangars and box hangars. The development alternatives depicted for the east side of the airport place higher activity level hangars facing open apron space, thereby increasing access. T-hangars and box hangars are then set to the sides of the conventional hangars.

As discussed in Chapter Three – Facility Requirements, the airport is forecast to need approximately 392,000 square feet of new hangar space in the next five years and 550,000 square feet over the next 20 years. Dedicated hangar maintenance space would be needed in addition to the aircraft storage space. **Table 4B** presents a summary of the hangar area proposed for each alternative.

TABLE 4B
Landside Hangar Summary
Caldwell Industrial Airport

	Existing Hangar Area (Est.)	Short Term Total Need	Long Term Total Need	West Side In-fill	East Side Alter-native A	East Side Alter-native B	East Side Alter-native C
T-Hangar	40,400	55,000	194,000	40,000	250,000	250,000	100,000
Box Hangar	587,650	848,000	922,000	221,000	288,000	241,000	80,000
Conventional Hangar	154,400	271,000	216,000	20,000	96,000	177,000	96,000
Total	782,450	1,174,000	1,332,000	281,000	634,000	668,000	276,000

Note: All measurements are in square feet.
Source: Coffman Associates

On the west side of the airport, space is available for the development of approximately 281,000 square feet of hangar space. This leaves approximately 111,000 square feet of space that would still need to be constructed to accommodate forecast growth in the short term. Therefore, there is an immediate need to plan and prepare for hangar development on the east side of the airport. By the long term planning period, an additional 158,000 square feet of hangar space is forecast to be needed. Each of the landside alternatives provides a hangar layout that would meet and, in some cases, exceed the long term forecast need.

The landside alternatives are intended to help guide airport development decisions. With the development possibilities for the west side of the airport already established, the most flexibility is available for the undeveloped east side. Large conventional hangars intended to support aviation businesses should be located on the main central apron. Medium-activity private box hangars should be set to the side of the high-activity areas. T-hangars

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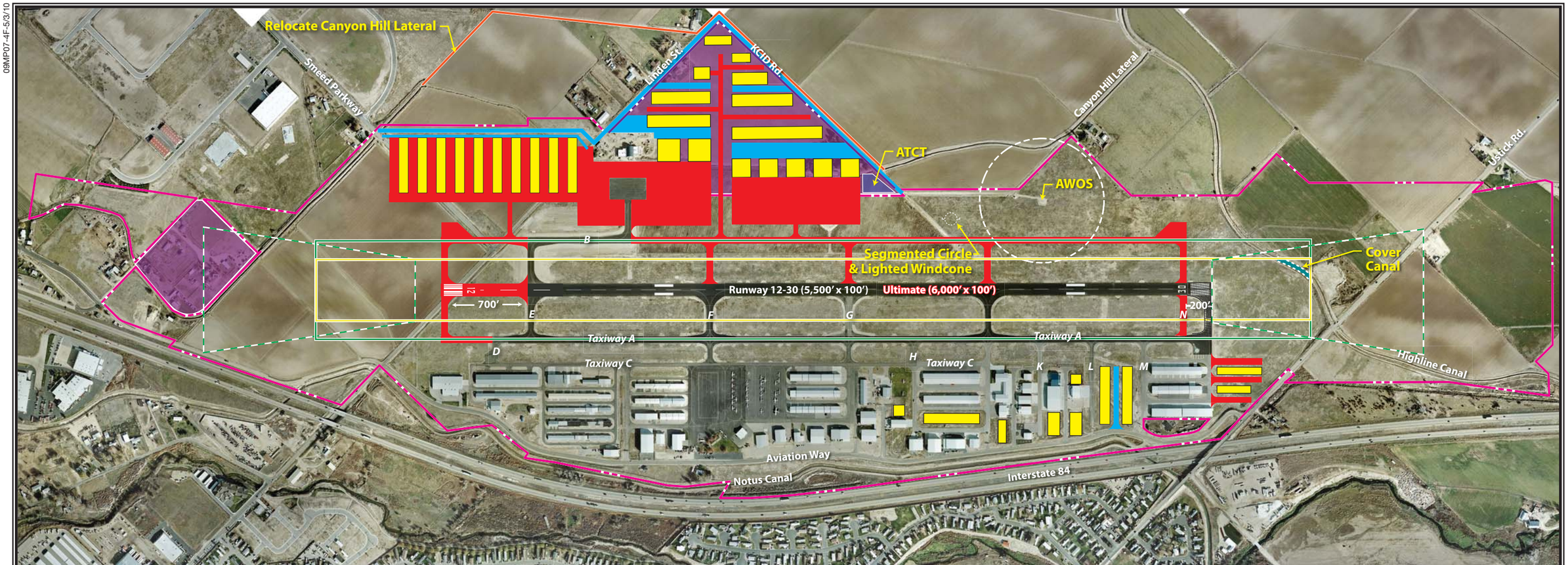

LEGEND

- Airport Property Line
- Ultimate Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Property to be Acquired
- Pavement to be Removed
- Ultimate Airfield Pavement
- Ultimate Airfield Building
- Ultimate Roads / Parking
- Aviation Access Parcels
- Runway Protection Zone (RPZ)

NORTH

0 800 1600

SCALE IN FEET

Photo Date: November 16, 2009

Exhibit 4F
LANDSIDE ALTERNATIVE B

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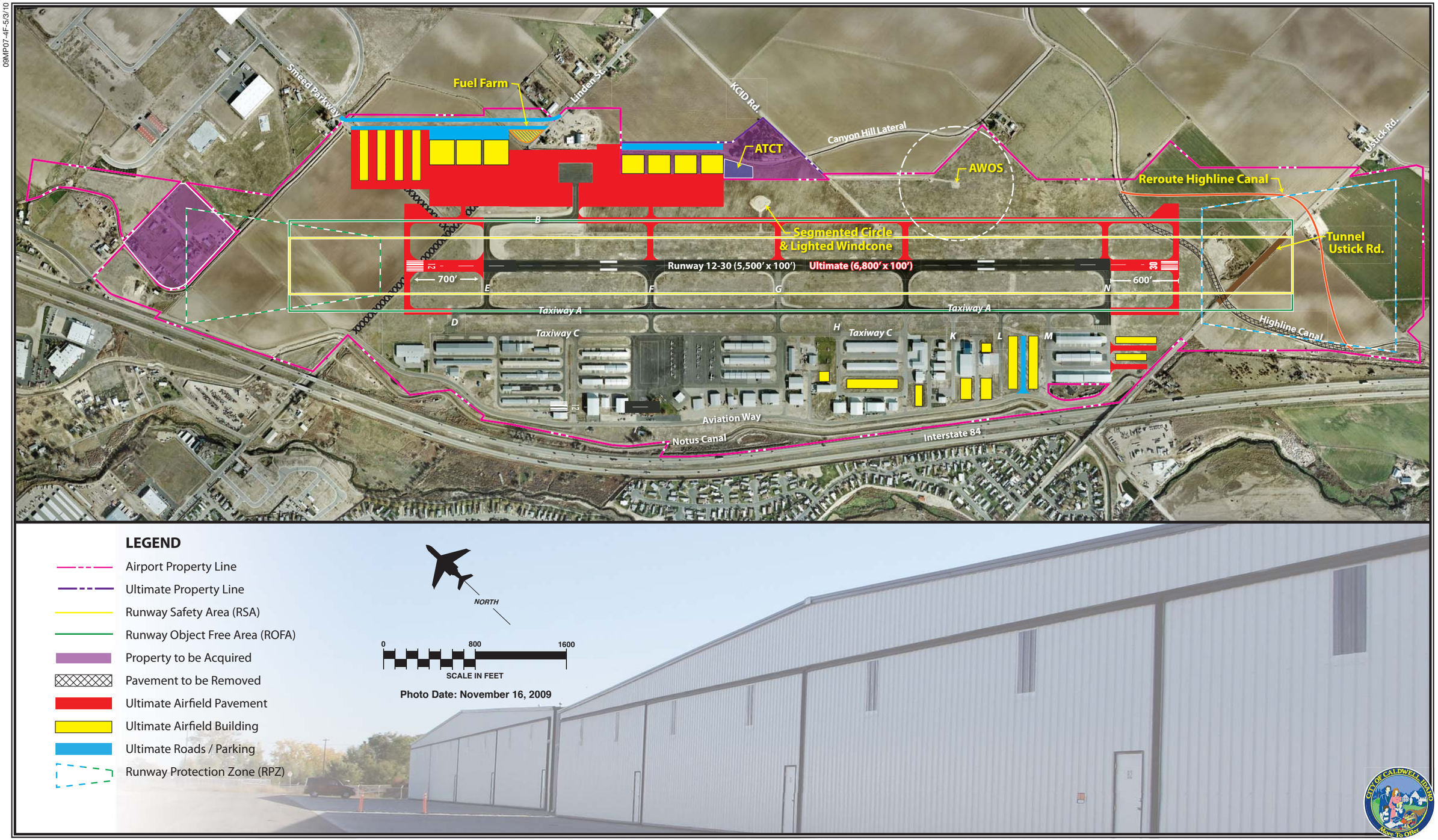

Exhibit 4G
LANDSIDE ALTERNATIVE C

or connected box hangars are low-activity centers and should be co-mingled to the greatest extent possible.

ALTERNATIVES SUMMARY

Caldwell Industrial Airport is a rapidly growing reliever airport as evidenced by the number of based aircraft (480 in 2009) and the number of recently constructed hangars. As determined in the aviation demand forecasts and facility requirements, the airport may also transition from a design standard in ARC B-II to one in ARC C-II. The current airport design meets the standards for ARC B-II but a transition to ARC C-II will require several improvements.

The existing runway length meets the FAA's minimum recommendation of 5,500 feet to serve 75 percent of the business jets at 60 percent useful load. This roughly equates to the aircraft within ARC B-II. The next level of runway length classification is to accommodate 100 percent of the business jets at 60 percent useful load. As previously demonstrated, a runway length of 6,800 feet satisfies this need. Therefore, any runway extension will only be justified by a transition in design standard from ARC B-II to ARC C-II.

Two of the three airfield alternatives showed possibilities for adding 1,300 feet to the runway to accommodate a critical aircraft in ARC C-II. The third showed a runway extension of 500 feet, which reflected potential limitations, such as the location of Ustick Road and RPZs.

A full length parallel taxiway on the east side of the airport has long been planned. In fact, a partial portion of this taxiway has been completed to provide access to the new east side terminal building. The planned full length east side parallel taxiway will increase the safety of ground movements by eliminating the need for aircraft to taxi across the active runway.

The safety areas surrounding the runway currently meet ARC B-II standards. A transition to ARC C-II will introduce Linden Street on the north and the Highline Canal on the south, into the RSA and OFA environment. Each of the alternatives considers closure of this portion of Linden Street. The Highline Canal would need to be either covered (culvert) or rerouted. Ustick Road would also clip a corner of the RSA and OFA and would either need to be slightly rerouted, tunneled, or the runway would need to be shifted.

The landside alternatives primarily focus on future facility locations. It is important to co-locate similar hangar types in order to improve aircraft movement efficiencies. High-activity conventional hangars intended for aviation-related airport businesses, such as an FBO, should be centrally located on the main apron. Box hangars and T-hangars should be located further to the sides of the main apron. An expanded apron is planned for the new terminal building area.

The total hangar area needed through the long term planning period is estimated at 550,000 square feet. On the west side, development has long been planned and these opportunities for development should continue to be promoted. All three alternatives provide for approximately 281,000 square feet of hangar space on the west side of the airport.

On the east side of the airport, the landside alternatives each consider a different land acquisition scenario. Landside Alternative A considers acquisition of the length of the flight line and the triangle-shaped property behind the terminal building. This is approximately 80 acres. While not all of this property would need to be developed within the 20-year scope of the master plan, acquiring this property would protect the airport.

Landside Alternative B considers acquisition of only the triangle-shaped property, approximately 37 acres. Landside Alternative C considers the minimal level of property acquisition, approximately 13 acres.

Both Landside Alternatives A and B assume that the Canyon Hill Lateral can be relocated to allow for future hangar development. Landside Alternative C assumes that the Lateral cannot be easily relocated and must be developed around.

These airside and landside alternatives will be presented to the planning advisory committee (PAC) and made available on the public project website for comment. The next phase of the master plan will present a consolidated recommended master plan concept.

Chapter Five

RECOMMENDED MASTER PLAN CONCEPT

Recommended Master Plan Concept

The airport master planning process for Caldwell Industrial Airport (EUL) has evolved through the development of forecasts of future demand, an assessment of future facility needs, and an evaluation of airport development alternatives to meet those future facility needs. The planning process has included the development of three sets of working papers which were presented to the Planning Advisory Committee (PAC) and discussed at several coordination meetings and a public information workshop.

The PAC is comprised of several constituencies with an investment or interest in Caldwell Industrial Airport. These groups included representatives from the Federal Aviation Administration (FAA), the City of Caldwell, Idaho Transportation Department - Division of Aeronautics, airport businesses, and local and national aviation associations. This diverse group has provided extremely valuable input into the recommended plan.

In the previous chapter, several development alternatives were analyzed to explore options for the future growth and development of Caldwell Industrial Airport. The development alternatives have been refined into a single recommended concept for the master plan. This chapter describes, in narrative and graphic form, the recommended direction for the future use and development of Caldwell Industrial Airport.

RECOMMENDED MASTER PLAN CONCEPT

The recommended master plan primarily incorporates elements from Airside Alternative 1 and Landside Alternative A. This concept provides the ability to meet the increasing demands on the airport by larger corporate aircraft and helicopter operators while also providing adequate space for smaller piston aircraft operators. The recommended master plan concept, as shown on **Exhibit 5A**, presents the ultimate configuration for the airport that preserves and enhances the role of the airport while meeting FAA design standards. A phased program to implement the recommended development concept will be presented in Chapter Six - Capital Improvement Program. The following subsections will describe the recommended master plan concept in detail.

AIRSIDE CONCEPT

The FAA has established design criteria to define the physical dimensions of runways and taxiways, as well as the imaginary surfaces surrounding them which protect the safe operation of aircraft at the airport. These design standards also define the separation criteria for the placement of landside facilities.

As discussed previously, the design criteria primarily center on the airport's critical design aircraft. The critical aircraft is the most demanding aircraft or family of aircraft which currently, or are projected to, conduct 500 or more operations (take-offs and landings) per year at the airport. Factors included in airport design are an aircraft's wingspan, approach speed, tail height and, in some cases, the instrument approach visibility minimums for each runway. The FAA has established the Airport Reference Code (ARC) to relate these critical aircraft factors to airfield design standards.

Analysis conducted in Chapter Three - Facility Requirements concluded that the current critical aircraft is defined by those general aviation aircraft that fall within ARC B-II. This category includes many larger twin engine turboprop aircraft such as the King Air and many smaller business jets, such as the Cessna Citations based at the airport.

The airport has seen rapid growth in the number of business jet operations and is forecast to have up to 16 based business jets within the next 20 years. According to the General Aviation Manufacturers Association, the industry has delivered nearly 10,000 business jets in the last 10 years. Approximately 66 percent of these have fallen in ARC C-I or larger. Because of these trends, the airport is forecast to experience a transition in critical design aircraft to approach category C.

While airfield elements, such as runway length and safety areas, must meet design standards associated ARC C-II, landside elements can be designed to accommodate specific categories of aircraft. For example, a taxilane into a T-hangar area only needs to meet the object free area (OFA) width standard for smaller single and multi-engine piston aircraft expected to utilize the taxilane, not those for the larger business jets representing the overall critical aircraft for the airport.

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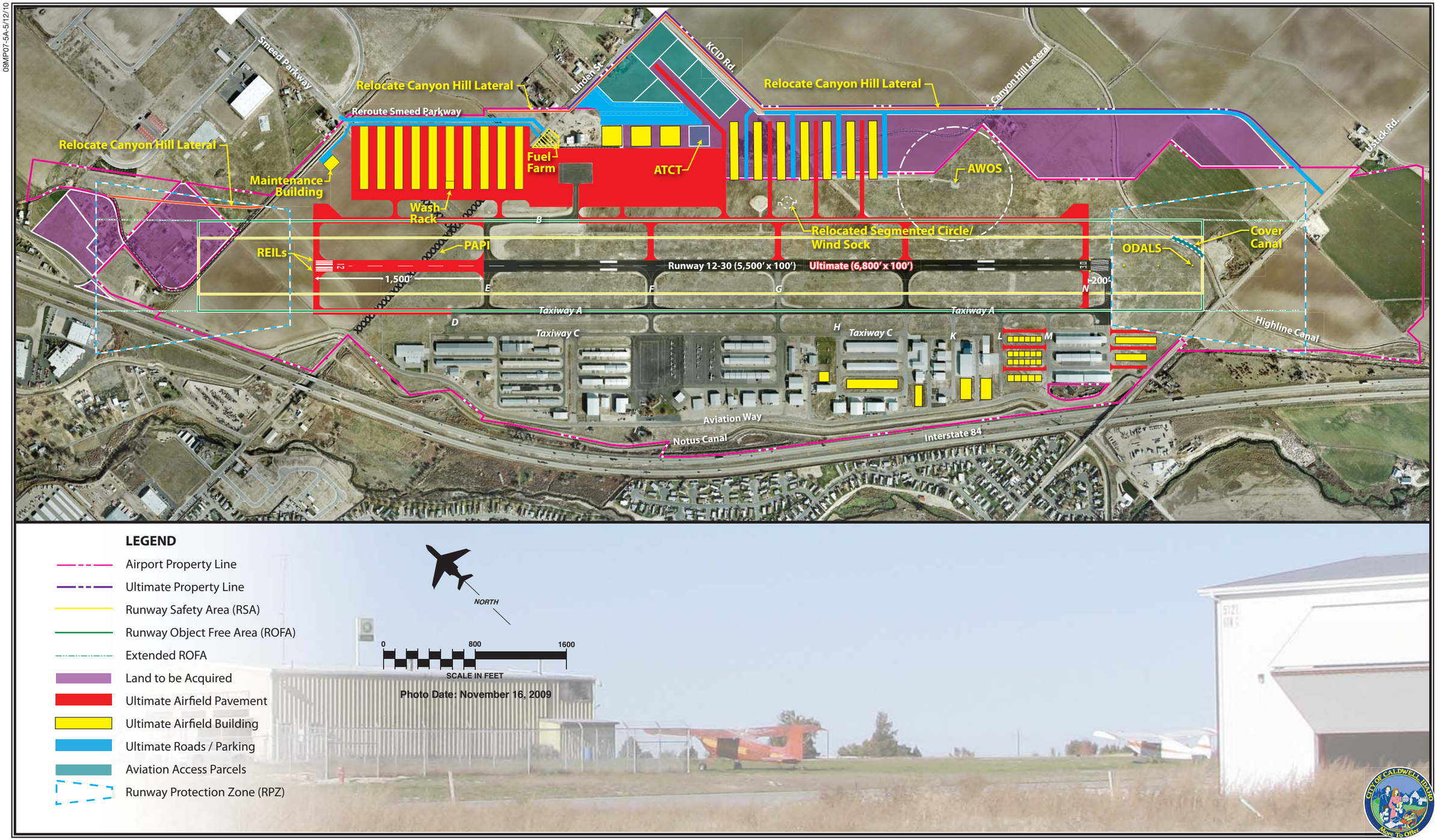

Exhibit 5A
MASTER PLAN CONCEPT

Table 5A presents the design standards to be applied to Runway 12-30 at Caldwell Industrial Airport. The airport currently meets design standards for ARC B-II. When the airport transitions to ARC C-II, several potential non-standard conditions are introduced. The recommended concept for the airport presents a layout that will meet the design standards for ARC C-II.

TABLE 5A
FAA Design Standards
Caldwell Industrial Airport

Design Standard	B-II	C-II
Applicable Approach	**≥ 1 Mile**	**≥ ¾-Mile**
RUNWAYS		
Runway Length	5,500	6,800
Runway Width	75	100
Runway Shoulder Width	10	10
Runway Safety Area		
Width	150	500
Length Beyond End	300	1,000
Length Prior to Landing	300	600
Runway Object Free Area		
Width	500	800
Length Beyond End	300	1000
Runway Obstacle Free Zone		
Width	400	400
Length Beyond End	200	200
Runway Centerline to:		
Holding Position	200	250
Parallel Taxiway	240	300
Aircraft Parking Area	250	400
TAXIWAYS		
Width	35	35
Shoulder Width	10	10
Safety Area Width	79	79
Object Free Area Width	131	131
Edge Safety Margin	7.5	7.5
Taxilane Object Free Area	115	115
Taxiway Centerline to:		
Fixed or Movable Object	65.5	65.5
Parallel Taxiway/Taxilane (Centerline)	105	105
RUNWAY PROTECTION ZONES		
Inner Width	500	1,000
Outer Width	700	1,510
Length	1,000	1,700

All measurements in feet
Source: FAA AC 150/5300-13, Airport Design

Role of the Airport

The Caldwell Industrial Airport is classified by the FAA as a reliever airport. This means the airport should be capable of accommodating general aviation aircraft that might otherwise use Boise Airport, the regional commercial service airport. This includes business jets, most of which fall in ARC C-I or larger. The *Idaho Airport System Plan* identifies Caldwell Industrial Airport as a Regional Business Airport. These are comparable classifications that both identify the need for the airport to be business jet capable.

Runway Length

As discussed extensively in Chapter Three – Facility Requirements, the existing 5,500-foot long runway meets the needs of the current critical design aircraft. The minimum standard for runway length as defined by both the FAA and the *Idaho Airport System Plan* is for an airport such as Caldwell Industrial Airport to provide a runway length that meets the needs of 75 percent of the business jet fleet at 60 percent useful load. The current runway length meets this recommendation.

When the airport begins to realize significant itinerant operations (500 or more annually) by business jets in the 75 to 100 percent category, then a runway length of 6,800 feet is recommended. A transition to a critical aircraft in the 75 to 100 percent category would also require meeting the requirements for larger safety areas.

The recommended master plan concept provides for a 1,500-foot runway extension to the northwest on the Runway 12 end. The Runway 30 end would then be shortened by 200 feet, bringing the total runway length to 6,800 feet. The removal of 200 feet of runway pavement from the Runway 12 end would eliminate any additional impact to Ustick Road.

Runway Safety Area

The Facility Requirements chapter discussed the requirements for the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and the runway protection zones (RPZ). Of particular concern is the RSA, which must meet FAA design standard to the greatest extent possible. The RSA is centered on the runway, is 500 feet wide, and extends 1,000 feet off each runway end.

As discussed, the airport meets the RSA design standards for the current critical aircraft in ARC B-II. Ultimately, it is anticipated that the airport could transition to a critical aircraft in ARC C-II. When this happens, the RSA standards change and it is the airport's responsibility, in consultation with the FAA, to plan for improvements.

The design of the planned runway extension is, in part, an effort to limit the impact to the RSA. On the Runway 30 end, 200 feet of runway is removed in order to allow the full 1,000-foot RSA beyond the end. Without removing this portion of the runway pavement, Ustick Road would impact a corner of the RSA. This pavement for the runway is then added to the Runway 12 end, along with a 1,300-foot extension, bringing the total runway length to 6,800 feet.

The Highline Canal will still traverse a portion of the Runway 30 RSA. As planned, this portion would be covered in some fashion. The key to this RSA remedy is that the culvert would need to be strong enough to support the critical aircraft, such as a large business jet.

The RSA on the Runway 12 end, behind the 1,500-foot runway extension, would extend slightly into a residential area. This area, encompassing approximately 11.4 acres, is planned for acquisition independent of the runway extension. A portion of this area would then need to be graded to meet RSA standards.

Instrument Approaches

The Caldwell Industrial Airport has excellent instrument approaches to the runway. Both ends offer global positioning system approaches with localizer performance with vertical guidance (GPS LPV). The visibility minimums are 1-mile and the cloud ceiling height is 300 feet. These approaches apply to all categories of general aviation aircraft (approach categories A-D).

In the alternatives chapter, analysis was presented regarding potential lower visibility minimums for the approaches. Depending on local weather conditions, lower visibility minimums can extend the times the airport can support activity. For both runway ends, consideration was given to ½-mile and ¾-mile visibility minimums. The potential for obstruction to the threshold siting surface (TSS) is a primary factor in determining the potential for improved approaches.

The TSS for visibility minimums not lower than ¾-mile is a 20:1 slope beginning 200 feet from the runway end. For ½-mile approaches, the TSS is a 34:1 slope beginning at the same location. The TSS has a trapezoidal shape, which is the same for both of these potential approaches. The inner width is 800 feet, the outer width is 3,800 feet, and the length is 10,000 feet. The TSS under each of these scenarios is clear for both ends of the runway.

As discussed, a ½-mile visibility precision approach leading to Runway 30 would conflict with existing approaches to both Nampa Municipal Airport and Boise Airport. A ¾-mile approach is considered feasible as none of the imaginary surfaces surrounding the airport would change from their existing configuration. A potential ½-mile approach would present larger and more restrictive imaginary surfaces.

On the Runway 12 end, the potential TSS dimensions are clear, but other factors, particularly the location of a future RPZ, present possible restrictions.

Runway Protection Zones

The RPZs' function is to enhance the protection of people and property on the ground. This is achieved through airport owner control over the RPZs. Such control includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ. Specific land uses prohibited in the RPZ include residences and plac-

es of public assembly. Roads are strongly discouraged from being located in the RPZ, especially the central portion of the RPZ (defined as the width of the OFA extended to the end of the RPZ). Existing roads are generally grandfathered, but an effort should be made to relocate them if possible.

The recommended master plan concept improves up on the existing condition for the RPZs. On the Runway12 end, Linden Street, which currently traverses the existing RPZ, including the extended OFA, would be closed. The current RPZ does remain on airport property.

When considering a 1,500-foot extension to the Runway 12 end, the RPZ will extend slightly beyond airport property, but no roads would traverse the entire extended object free area, as is currently the case. **Exhibit 5B** shows the applicable RPZs under three different instrument approach visibility minimums.

The 1-mile RPZ has the least impact to the interstate. The ¾-mile RPZ would extend farther across the interstate and would encompass a portion of the parking lot associated with a business on the south side of the interstate. Parking facilities, while discouraged, may be located in the controlled activity area of the RPZ. The ½-mile RPZ would encompass the office building on the south side of the interstate, which would not meet the design parameters of the RPZ. The master plan concept presented assumes a ¾-mile approach to the Runway 12 end.

While introducing a new road to the RPZ (Interstate 84) is not desirable, it is far more desirable than having Linden Street cross through the entire extended OFA, as it currently does. This planned RPZ is far more desirable than the existing condition. Nonetheless, consultation should be undertaken with the FAA regarding any portion of the RPZ crossing over existing roads as a result of a runway extension.

Runway/Taxiway Separation

There are two factors that primarily influence the FAA standards for runway/taxiway separation. The first is the type and frequency of aircraft operations as described by the applicable ARC, and the second is the capability of the instrument approaches available at the airport. The current ARC is B-II, and the airport currently has non-precision instrument approaches with not less than 1-mile visibility minimums. The runway/taxiway separation standard is 240 feet. For a future ARC C-II critical aircraft with 1-mile visibility minimums (and ¾-mile), the standard is 300 feet. Under two conditions, the runway taxiway separation standard is 400 feet; (1) a critical aircraft in airplane design group (ADG) III, and (2) visibility minimums not lower than ½-mile. Neither of these conditions is forecast or planned.

The existing runway/taxiway separation is 400 feet. The new partial parallel on the east side of the airport is also 400 feet. In an effort to enhance safety and to position the airport for growth beyond the scope of this master plan, it is recommended that 400 feet of separation between the runway and the parallel taxiways be maintained.

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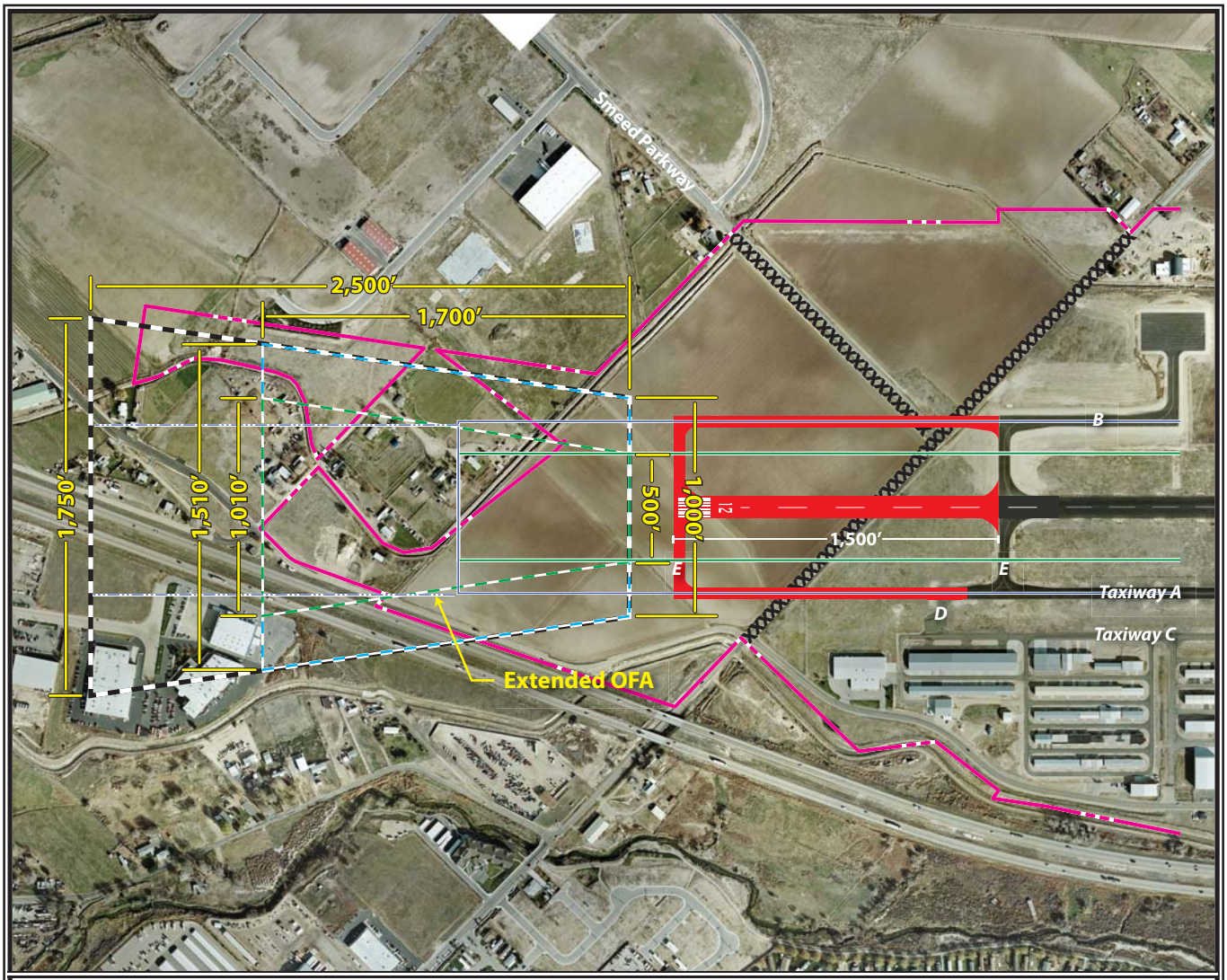


Photo Date: November 16, 2009

LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Ultimate Airfield Pavement
- C / 1 mile RPZ
- B-C / ¾ mile RPZ
- B-C / ½ mile RPZ

NORTH

0 800 1600

SCALE IN FEET

Exhibit 5B
RUNWAY 12 RPZ IMPACTS

Taxiways and Taxilanes

Taxiways and taxilanes can be designed to different design standards depending on the use of these surfaces. At Caldwell Industrial Airport, the parallel taxiway is designed to meet the needs of the future critical aircraft in ARC C-II. Taxilanes that extend into hangar areas, such as the planned T-hangar area, can be designed to lesser standards to accommodate smaller aircraft that would access those areas.

The taxiway width standard for AGD II aircraft is 35 feet and 50 feet for ADG III aircraft. Parallel Taxiway A and the partial parallel Taxiway B are 50 feet wide. At a reliever airport that experiences occasional activity by aircraft in ADG III, it is an added measure of safety to have 50-foot wide taxiways. The benefit/cost to potentially narrowing these taxiways and moving in the edge lights likely would exceed the cost of maintaining the existing condition. All other taxiways and taxilanes should be brought up to and constructed to a uniform 35-foot width.

Visual Approach Aids

Both runway ends currently provide four-unit precision approach path indicator light system (PAPI). PAPIs provide pilots visual confirmation of the appropriate glide path to the runway. As part of the runway extension project, the PAPIs should be relocated in order to maintain a three degree glidepath to the runway touchdown point.

Approach lighting systems provide pilots with alignment information during nighttime operations. On the Runway 30 end, an omni-directional approach lighting system (ODALS) is planned. This relatively simple approach lighting system will enhance the safety of operations to the runway end that experiences the greatest percentage of approaches. More sophisticated approach lighting systems, such as a medium intensity approach lighting system with runway alignment indicator lights (MALSR) are not recommended because they would not provide any additional measurable benefit. Installation of a MALSR provides a credit, allowing for instrument approach visibility minimums as low as ½-mile, but no such approach is planned at Caldwell Industrial Airport.

Airside Conclusion

Design standards for Caldwell Industrial Airport are determined by the frequency of activity by the critical aircraft and the sophistication of the instrument approaches. The current critical aircraft falls in ARC B-II, while the future critical aircraft is forecast to transition to ARC C-II. The instrument approach capability is excellent, providing GPS LPV approaches to both runway ends with 1-mile visibility minimums and 300-foot cloud ceiling heights. The instrument approaches to both runway ends are planned to be improved to visibility minimums of ¾-miles.

The runway is 5,500 feet in length, which meets the design standard for the current critical aircraft in ARC B-II. When the airport transitions to a critical aircraft in ARC C-II, a runway length of 6,800 feet is recommended.

Adding 1,500 feet to the Runway 12 end and removing 200 feet from the Runway 30 end is the recommended method to achieving a total runway length of 6,800 feet. By removing 200 feet from the Runway 30 end, Ustick Road would not be a penetration to the RSA and OFA. On the Runway 30 end, approximately 11.4 acres of property that would penetrate the RSA and OFA, needs to be acquired. There are six residences included on this property.

The planned ¾-mile RPZ serving Runway 30 would remain entirely on airport property. Ustick Road would remain in this RPZ but the shifting of the runway by 200 feet would place the road farther from the runway end.

The ¾-mile RPZ planned to serve the Runway 12 end would be an improvement over the current situation where Linden Street traverses the RPZ. Linden Street is planned to be closed in this location. The RPZ would extend slightly beyond airport property over Interstate 84 and a parking lot. While the airport would not have ownership of this portion of the RPZ, the likelihood of a new incompatibility or an airspace penetration where the interstate currently exists is remote.

The recommended airside concept prepares the airport for a transition from ARC B-II to ARC C-II. This transition is significant as the safety area dimensions and runway length needs change. The concept presented allows the airport to meet the needs while meeting design standards.

LANDSIDE CONCEPT

The primary goal of landside facility planning is to provide adequate aircraft storage space to meet forecast needs, while also maximizing operational efficiencies and land uses. Achieving this goal yields a development scheme which segregates aircraft activity levels while maximizing the airport's revenue potential. **Exhibit 5A** includes the recommended landside development plan for the airport.

The south side of the airport provides in-fill opportunities for hangar construction. The east side of the airport is essentially green space except for the new terminal building which is the anchor for future development. The terminal building is the central focus of any airport, and planning for additional aircraft hangar space should center on this facility. The layout presented expands the terminal area apron to accommodate both transient and local aircraft parking needs.

Hangars

The recommended concept shows the location for certain hangar types. Following the philosophy of separation of activity levels, larger high-activity conventional hangars are located facing the main apron. Lower activity T-hangars and box/executive hangars are farther from the main apron and grouped together. **Table 5B** presents the total hangar area provided in the master plan concept.

TABLE 5B
Hangar Space Planned
Caldwell Industrial Airport

	Current Hangar Supply Estimate	Additional Hangar Space Needed	Future Hangar Space Provided - West	Future Hangar Space Provided - East	Total New Hangar Space
T-Hangar Hangar Area	40,400	153,600	250,000	40,000	290,000
Box Hangar Area	587,650	334,350	288,000	221,000	509,000
Conventional Hangar Area	154,400	61,600	96,000	20,000	116,000
Maintenance Area Reserve	50,350	63,650	(80,000)	(34,000)	(114,000)
Total Aircraft Hangar Storage Area (s.f.)	**832,800**	**613,200**	**554,000**	**247,000**	**801,000**

Note: A portion of future conventional and box hangar space is reserved for maintenance/office purposes and is not available for aircraft storage.

As can be seen from the table, the master plan concept provides more than 801,000 square feet of new aircraft hangar space. The need over the course of the next 20 years is estimated at 613,200 square feet. Therefore, the hangar layout presented represents a vision for the airport that extends beyond the scope of this master plan. The reason for this is to provide airport decision makers with dedicated areas on the airport that should be reserved for certain hangar types. For example, areas intended for T-hangars should remain reserved for T-hangars even beyond the scope of the master plan.

The hangar layout shown on the exhibit meets the separation of activity levels philosophy. To the immediate southeast of the new terminal building, several high-activity conventional hangars are shown facing the main apron. This area should be reserved for aviation-related businesses such as a fixed base operator (FBO) or other high activity aviation business.

A location is also recommended for a future airport traffic control tower (ATCT). The location identified is central to the airfield and should provide good visibility to all primary movement areas. When engineering is undertaken for the ATCT, consideration must be given to the necessary cab height elevation for controllers to visually see over any existing or planned hangars. For example, several rows of box hangars are planned to the southeast of the tower, the elevation of these hangars may need to be restricted in order to provide visual line-of-sight to the parallel taxiway. The other alternative is to construct a taller tower.

Three taxilanes are located farther to the southeast, providing access to seven box hangar structures. This complex is intended to emulate the current development pattern on the south side of the Runway 30 end. This existing development area has been very successful. Many aircraft owners will prefer to have a box hangar, which often has util-

ities, as opposed to T-hangars, which usually don't have water and sewer hook ups.

Behind and to the east of the new terminal area is a triangle shaped parcel that can provide additional airfield access. As shown, a taxiway is extended to this area where six large parcels are identified. The parcel layout is intended to give the airport and any potential developer maximum flexibility when planning hangars.

To the northwest of the new terminal building is a designated T-hangar area. There is a shortage of T-hangars at the airport when considering the current mix of based aircraft, which is dominated by small single engine aircraft.

There are still hangar development opportunities on the south side of the airport. These are in-fill opportunities. As depicted, an additional 221,000 square feet of space is available for box hangar development. A space for a 20,000 square foot conventional hangar is available facing Taxilane H. Two small T-hangars providing approximately 40,000 square feet can be placed on the far southeast corner of the airport.

The in-fill opportunities total approximately 218,000 square feet of space. The short term estimate for needed hangar space is 434,200 square feet (Refer to Table 3L). Therefore, there is a need to continue development on the east side of the airport.

Property Acquisition

Planning for growth of the airport includes the consideration of strategic property acquisition of adjacent lands in order to allow for facility expansion or for the protection of the function and role of the airport. The FAA supports and provides reimbursement for necessary property acquisition. The reimbursements are provided when the land is necessary for airport development or protection. Basically, the FAA supports and funds immediate land acquisition needs but does not support "land-banking" of property that may or may not be needed in the future.

Three areas are recommended for property acquisition, all of which are necessary for aviation purposes (or airport protection from incompatibilities) currently. The first is an 80-acre tract that encompasses the property along the east side flightline of the runway. This parcel includes the 37 acre triangle shaped parcel behind the new terminal building. Airports should own the flightline to their runway regardless of when it may be needed for aviation development. Included in this acquisition is approximately ½-acre of property on the north side of Linden Street across from the terminal building. This portion is needed to accommodate the canal relocation.

The next tract identified is an area of approximately 11.4 acres that is located approximately 2,200 feet from the existing Runway 12 threshold. There are several reasons for acquisition of this property. The first is that there are approximately six homes in this area that present an incompatibility to airport operations. When an extension of the runway is constructed, the RSA, OFA, and RPZ will all extend into this area.

A third area is recommended for acquisition which would fall within the RPZ associated with a runway extension. The area required for acquisition is approximately 3.8 acres of property that currently has one residence. There is an adjacent parcel of approximately 3.7 acres that could be acquired for airport protection purposes, but it does not fall in the planned future RPZ.

Land acquisition necessary for Airport Improvement Program (AIP)-assisted airport development must be accomplished in accordance with the *Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs* (49 CFR Part 24), also referred to as the Uniform Act. The Uniform Act is the Federal law that provides property acquisition policies for the equitable treatment of persons displaced as the result of a federally assisted project. *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects* (Advisory Circular 150/5100-17) provides guidance to assist airport sponsors in meeting the requirements.

Canal Relocation

The Pioneer Irrigation District is a nonprofit district providing irrigated water to more than 34,000 acres in Canyon and western Ada Counties. A system of irrigation canals distributes the water. The recommended master plan concept would require relocation of portions of two canals located in the vicinity of the airport.

The Canyon Hill Lateral located approximately 2,200 feet from the Runway 12 threshold would fall within the RSA once the runway is extended. This portion of the canal is shown to be diverted outside of the RSA.

Another section of the Canyon Hill Lateral currently traverses in front of the new terminal building between it and the aircraft apron. This portion of the canal is planned to be relocated as shown in **Exhibit 5A**.

The Highline Canal closest to the Runway 30 end would traverse a portion of the RSA when the airport transitions to ARC C-II. This portion is planned to be covered so that the RSA can meet standard for grading and support of aircraft or emergency vehicles.

Road Relocation

Several roadway improvements are considered part of the recommended master plan concept. The first is the closure of Linden Street between Aviation Way and the new terminal building. This portion of Linden Street would need to be closed to allow for the planned runway extension.

Smeed Parkway between the intersection with Linden Street and the irrigation canal, a length of approximately 1,300 feet, would be rerouted. This new section of Smeed Parkway would intersect Linden Street near the new terminal building. This relocation is necessary to allow for the completion of the east side parallel taxiway and to allow for aviation-related development adjacent to the taxiway system.

KCID Road currently provides access to areas on the east side of the airport, including the "Settlement" and the airport

automated weather observation system (AWOS). The master plan concept considers improving and extending KCID Road to the southeast so that it intersects with Ustick Road. This planned extension of KCID would provide useful access from the southeast to the new terminal building and any new east side development.

Airport Land Use Compatibility

Land use compatibility is the responsibility of the airport sponsor and must be pursued in order to comply with FAA grant assurances. In effect since 1964, Grant Assurance 21, *Compatible Land Use*, implementing Title 49 United States Code (U.S.C.) § 47107 (a) (10), requires, in part, that the sponsor:

> *"…take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft."*

In all cases, the FAA expects a sponsor to take appropriate actions to the extent reasonably possible to minimize incompatible land. FAA Order 5190.6B, *Airport Compliance Manual*, provides guidance on land use compatibility and other airport compliance issues.

Grant Assurance 20, *Hazard Removal and Mitigation*, states that the airport sponsor "will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, lighting, or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards."

The FAA provides further guidance in Advisory Circular (AC) 150/5200-33, *Hazardous Wildlife Attractants on or near Airport*s. The distance between the airport movement areas and wildlife attractants should be at least 10,000 feet for airports serving turbine-powered aircraft (such as Caldwell Industrial Airport) and should include approach and departure airspace to a distance of five miles. Examples of wildlife attractants (particularly birds) include landfills, waste water treatment facilities, lakes, and wetlands.

The State of Idaho has a vested interest in the protection of airports within the state. *Idaho Code: Title 21, Aeronautics, Chapter 5 – Airport Zoning Act* provides the legal framework for airport sponsors to develop plans and ordinances intended to protect airports from incompatible land uses.

SUMMARY

The recommended master plan concept has been developed with significant input from the PAC. The PAC included representation from various City of Caldwell departments, including Engineering and Planning, the Chamber of Commerce, airport management, and airport businesses. This plan provides the necessary development to accommodate and satisfy the anticipated growth over the next 20 years and beyond.

The airport currently meets design standards for its critical aircraft (that grouping of general aviation aircraft that perform 500 or more annual operations) in ARC B-II. Representative aircraft include turboprops such as the King Air and many small and medium sized business jets, including Cessna Citations. The future critical aircraft could fall in ARC C-II, which significantly impacts the design standards, including runway safety area and runway length.

The future condition plans for a total runway length of 6,800 feet which would meet the FAA recommendation to accommodate a critical aircraft represented by larger business jets such as the Challenger 604, and many Cessna Citation and Dassault Falcon models. The RSA beyond each runway end would increase from 300 feet to 1,000 feet as well.

On the landside, the airport is forecast to grow in based aircraft from 480 to 650 in the next 20 years. To accommodate this growth, numerous hangars are planned. On the west side, in-fill opportunities exist and further development of the east side is planned.

To allow for continued hangar development, the master plan recommends the acquisition of approximately 80 acres on the east side of the airport. This property is primarily along the runway flight line and should be acquired to allow for aviation uses and to protect the airport from encroachment. Two additional parcels located on the extended runway centerline to the northwest are also recommended for acquisition. These parcels are 11.4 acres and 3.8 acres in size and currently have residential housing, which is not compatible with the runway protection zone.

The master plan also recommends the relocation of the Canyon Hill Lateral, an irrigation canal that traverses portions of airport property. Some east side hangar development could proceed with the current canal location but ultimately, the canal should be relocated.

The next chapter of this master plan will consider strategies for funding the recommended improvements and will provide a reasonable schedule for undertaking the projects based on demand over the course of the next 20 years.

Chapter Six

CAPITAL IMPROVEMENT PROGRAM

Capital Improvement Program

The analyses completed in previous chapters evaluated development needs at the airport over the next 20 years and beyond, based on forecast activity and operational efficiency. Next, basic economic, financial, and management rationale is applied to each development item so that the feasibility of each item contained in the plan can be assessed.

The presentation of the capital improvement program (CIP) has been organized into two sections. First, the airport development schedule and CIP cost estimate is presented in narrative and graphic form. Second, capital improvement funding sources on the federal, state, and local levels are identified and discussed.

AIRPORT DEVELOPMENT SCHEDULES AND COST SUMMARIES

Now that the recommended concept has been developed and specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule (implementation timeline) and the associated costs for the plan. This section will examine the overall cost of each project identified in the capital improvement program (CIP) and present a development schedule. The recommended improvements are grouped by planning horizon: short term, intermediate term, and long term. The short term planning horizon is further

subdivided into yearly increments. **Table 6A** summarizes key activity milestones for the three planning horizons.

TABLE 6A
Planning Horizon Summary
Caldwell Industrial Airport

	Base Year (2009)	Short Term	Intermediate Term	Long Term
Based Aircraft	480	530	570	650
ANNUAL OPERATIONS				
General Aviation				
Itinerant	43,900	45,200	46,200	47,600
Local	107,800	111,300	114,100	118,300
Subtotal	151,700	156,500	160,300	165,900
Air Taxi Activity				
Itinerant	2,000	2,200	2,400	2,800
Military Activity				
Itinerant	300	300	300	300
TOTAL OPERATIONS	**154,000**	**159,000**	**163,000**	**169,000**

Source: Coffman Associates analysis

A key aspect of this planning document is the use of demand-based planning milestones. Many projects should be considered based on actual demand levels within the next five years. As short term horizon activity levels are reached, it will then be time to program for the intermediate term based upon the next activity milestones. Similarly, when the intermediate term milestones are reached, it will be time to program for the long term activity milestones.

Many development items included in the recommended concept will need to follow these demand indicators. For example, the plan includes construction of new aprons and taxilanes. Based aircraft will be the primary indicator for these projects. If based aircraft growth occurs as projected, additional hangars should be constructed to meet the demand. Often this potential growth is tracked with a hangar waiting list.

If growth slows or does not occur as forecast, some projects may be delayed. As a result, capital expenditures will be made on an as-needed basis, which leads to a more responsible use of capital assets.

It should be noted that hangar development is not considered part of the CIP. While the city is free to construct hangars and lease the facilities, the CIP assumes that all hangar development will be undertaken by private developers who agree to a land lease.

Some development items do not depend on demand, such as meeting design standards for runway safety area (RSA). Safety related projects should be programmed in a timely manner regardless of the forecast growth in

activity. Other items, such as pavement maintenance, should be addressed in a scheduled manner and are not dependent on reaching aviation demand milestones. These types of projects typically are more associated with day-to-day operations.

As a master plan is a conceptual document, implementation of the capital projects should only be undertaken after further refinement of their design and costs through architectural and engineering analyses. Moreover, some projects may require additional infrastructure improvements (i.e., drainage improvements, extension of utilities, etc.), that may take more than one year to complete.

Once the list of necessary projects was identified and refined, project specific cost estimates were developed. The cost estimates include design, engineering, construction administration, and contingencies that may arise on the project. Capital costs presented here should be viewed only as estimates subject to further refinement during design. Nevertheless, these estimates are considered sufficient for planning purposes. Cost estimates for the larger projects were provided by the current consulting airport engineer. The detail on these estimates is provided in **Appendix B**. Cost estimates for each of the development projects in the CIP are in current (2010) dollars. **Exhibit 6A** presents the proposed CIP for Caldwell Industrial Airport. **Exhibit 6B** presents the CIP overlaid onto the airport aerial photograph and broken out into planning horizons.

SHORT TERM IMPROVEMENTS

2011 Projects

As with all capital projects funded in whole or part by federal funds, environmental considerations must be undertaken. The level of documentation necessary for each project must be determined in consultation with the Federal Aviation Administration (FAA). There are three major levels of environmental review to be considered under the *National Environmental Policy Act* (NEPA): categorical exclusion (CATEX), environmental assessment (EA), or environmental impact statement (EIS). Each level requires more time to complete and more detailed information. Guidance on what level of documentation is required for a specific project is provided in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*.

It is anticipated that several short term projects will need to be addressed in an EA. Property acquisition of more than three acres requires an EA. The proposed relocation of the Canyon Hill Lateral irrigation canal will also require an EA. The extension of the east side parallel taxiway and expansion of the east side aircraft apron may also need to be addressed in the EA.

The first line item in the CIP provides an amount for environmental documentation associated with short term projects. It should be noted that environmental documents typically have a shelf life of three years before they need to be updated if an associated

project has not yet begun. Therefore, this line item may be spread over several years depending on the project considered.

The airport has a need to provide taxilanes to the development area located between Taxiways L and M. This project has become a recent priority as developers are ready to construct several rows of box hangars.

Ongoing maintenance of airport surfaces is considered throughout the plan. It is required by the FAA that airports that accept public funds, such as Caldwell Industrial Airport, maintain the useful life of their pavements. Because of the nature of pavement wear, some years may require a larger investment in rehabilitation; therefore, the CIP simply allocates an average yearly estimate of $15,000 for ongoing pavement maintenance.

2012 Projects

During the master planning process, it was determined that the airport will need to acquire additional property on the east side of the airport in order to facilitate continued growth in hangar and aviation business development. In addition, it is important for the city to protect the future needs of the airport by owning and preserving property along the flight line.

The first project in 2012 is the recommended acquisition of approximately 60 acres. The area includes the 37-acre triangle-shaped parcel adjacent to and behind the new terminal building and approximately 23 acres along the flight line. A portion of the flight line property includes the 500-foot critical area that surrounds the AWOS. The 60-acre property will facilitate the ultimate relocation of the canal and allow for future hangar development.

As the city moves forward on property acquisition, FAA Order 5100.37A, *Land Acquisition and Relocation Assistance for Airport Projects*, and FAA AC 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects*, should be referenced.

In general, property acquisition for aviation uses is eligible for FAA grant funding. The process can be complex but in general at least three independent land appraisals must be obtained. An environmental analysis must also be undertaken. The FAA will then sometimes extend a grant for the land purchase, but more typically the sponsor will have to acquire the property and then request reimbursement from the FAA. The reimbursement could be a single grant, but more often is spread over several years and it could be limited to the sponsor's matching share of future grants. Because of these complexities, a cost for the land is not provided but estimates have ranged between $60,000 and $90,000 per acre.

A line item for preparation of an east side FBO development is included in the CIP. This line item does not include a cost estimate since the project could be undertaken by a private developer. Nonetheless, it is important to highlight the need for FBO facilities on the east side. Without fuel and

09MP07-6A-6/10/10

	PROJECT DESCRIPTION	Estimate Source	Project Cost	FAA Eligible	State Eligible	Total Local
	SHORT TERM PROGRAM (0-5 YEARS)					
	2011					
1	Environmental Documentation (60 Acres, Canal Relocation, Taxiway, Apron)	CA	$200,000	$190,000	$5,000	$5,000
2	Hangar Taxilanes Between Taxiways L and M	KH - Project "Y"	$350,000	$332,500	$8,750	$8,750
3	Annual Pavement Maintenance	KH	$15,000	--	--	$15,000
	2011 TOTAL		***$565,000***	***$522,500***	***$13,750***	***$28,750***
	2012					
4	Property Acquisition - 60 Acres[1]	NA	--	--	--	--
5	East Side FBO Development Area[2]	NA	--	--	--	--
6	Relocate Canyon Hill Lateral (Ph1)	KH - Project "A"	$670,000	$636,500	$16,750	$16,750
7	Annual Pavement Maintenance	KH	$15,000	--	--	$15,000
	2012 TOTAL		***$685,000***	***$636,500***	***$16,750***	***$31,750***
	2013					
8	Relocate Smeed Parkway	KH - Project "D"	$601,000	$570,950	$15,025	$15,025
9	Seal Coat/Crack Fill Runway	KH - Project "E"	$327,000	$310,650	$8,175	$8,175
10	Apron/Taxiway Expansion (Ph1)	CA	$918,000	$872,100	$22,950	$22,950
11	Pavement Maintenance	KH	$15,000	--	--	$15,000
	2013 TOTAL		***$1,861,000***	***$1,753,700***	***$46,150***	***$61,150***
	2014					
12	Seal Coat/Crack Fill West Side Pavements	KH - Project "G"	$244,000	$231,800	$6,100	$6,100
13	Fuel Farm - East Side	KH	$400,000	--	--	$400,000
14	Maintenance Building	KH	$200,000	--	--	$200,000
15	Perimeter Fencing	KH - Project "I"	$638,000	$606,100	$15,950	$15,950
16	Taxilanes West Side T-hangars	KH - Project "J"	$391,000	$371,450	$9,775	$9,775
17	Pavement Maintenance	KH	$15,000	--	--	$15,000
	2014 TOTAL		***$1,888,000***	***$1,209,350***	***$31,825***	***$646,825***
	2015					
18	Mill/Overlay West Apron	KH - Project "K"	$1,371,000	$1,302,450	$34,275	$34,275
19	East Apron Expansion (Ph2)	CA	$1,215,000	$1,154,250	$30,375	$30,375
20	Runway End Identification Lights Runway 30	CA	$42,000	$39,900	$1,050	$1,050
21	Pavement Maintenance REIL (30)	KH	$15,000	--	--	$15,000
	2015 TOTAL		***$2,643,000***	***$2,496,600***	***$65,700***	***$80,700***
	TOTAL SHORT TERM PROGRAM		***$7,642,000***	***$6,818,650***	***$174,175***	***$849,175***
	INTERMEDIATE TERM PROGRAM (6-10 YEARS)	CA				
1	Environmental Documentation (19 Acres)	CA	$200,000	$190,000	$5,000	$5,000
2	Construct East Side Partial Parallel Taxiway (Ph2)	KH - Project "M"	$465,000	$441,750	$11,625	$11,625
3	Taxiway Behind Terminal Area	NA	$551,000	$523,450	$13,775	$13,775
4	Property Acquisition (19 Acres)[1]	KH - Project "L"	--	--	--	--
5	T-Hangar Taxilanes - East Side (Ph1)- Project L	KH - Project "H"	$947,000	$899,650	$23,675	$23,675
6	T-Hangar Tenant Access (Ph1)	KH - Project "W"	$245,000	--	--	$490,000
7	Aircraft Wash Rack	KH - Project "P"	$77,000	--	--	$80,000
8	Runway/Taxiway Extension	KH - Project "X"	$2,445,000	$2,322,750	$61,125	$61,125
9	Cover Highline Canal Within RSA	KH - Project "Q"	$888,000	$843,600	$22,200	$22,200
10	Relocate Canyon Hill Lateral (Ph2)	KH - Project "R"	$362,000	$343,900	$9,050	$9,050
11	Box Hangar Taxilanes (Ph1)	KH - Project "S"	$241,500	$229,425	$6,038	$6,038
12	Relocate Segmented Circle / Wind Sock	KH	$100,000	$95,000	$2,500	$2,500
13	Access Roads Box Hangars (Ph1)	KH	$237,000	--	--	$237,000
14	Install Omni-Directional Approach Lighting System	CA	$125,000	$118,750	$3,125	$3,125
15	Runway End Identification Lights Runway 12	CA	$42,000	$39,900	$1,050	$1,050
16	East Apron Expansion (Ph3)	CA	$1,080,000	$1,026,000	$27,000	$27,000
17	Master Plan Update	CA	$250,000	$237,500	$6,250	$6,250
18	Pavement Maintenance	KH	$75,000	--	--	$75,000
	TOTAL INTERMEDIATE TERM PROGRAM		***$8,330,500***	***$7,311,675***	***$192,413***	***$1,074,413***
	LONG TERM PROGRAM (11-20 YEARS)					
1	Environmental Documentation (28 Acres)	CA	$200,000	$190,000	$5,000	$5,000
2	Construct East Side Parallel Taxiway (Ph3)	KH - Project "O"	$1,438,000	$1,366,100	$35,950	$35,950
3	Expand East Apron (Ph4)	KH - Project "T"	$1,997,000	$1,897,150	$49,925	$49,925
4	Property Acquisition (28 Acres)[1]	NA	--	--	--	--
5	Extend and Improve KCID Road	KH - Project "U"	$963,000	--	--	$965,000
6	Box Hangar Taxilanes (Ph2)	KH - Project "R"	$483,000	$458,850	$12,075	$12,075
7	Access Roads Box Hangars (Ph2)	KH - Project "V"	$291,000	--	--	$290,000
8	T-Hangar Taxilanes - East Side (Ph2)	KH - Project "L"	$947,000	$899,650	$23,675	$23,675
9	T-Hangar Tenant Access (Ph2)	KH - Project "H"	$245,000	--	--	--
10	Airport Traffic Control Tower	KH	$2,750,000	$2,612,500	$68,750	$68,750
11	Pavement Maintenance	KH	$150,000	--	--	$150,000
	TOTAL LONG TERM PROGRAM		***$9,464,000***	***$7,424,250***	***$195,375***	***$1,600,375***
	TOTAL PROGRAM COSTS		***$25,437,000***	***$21,355,000***	***$562,000***	***$3,524,000***

[1]Property Acquisition is eligible for FAA funding but due to complexities involved and potential timeframe cost estimates are not provided.

[2]Development of the East Side FBO area is a high priority but is assumed to be privately undertaken

KH: Kimley-Horn and Associates Estimates (Detail in Appendix B)

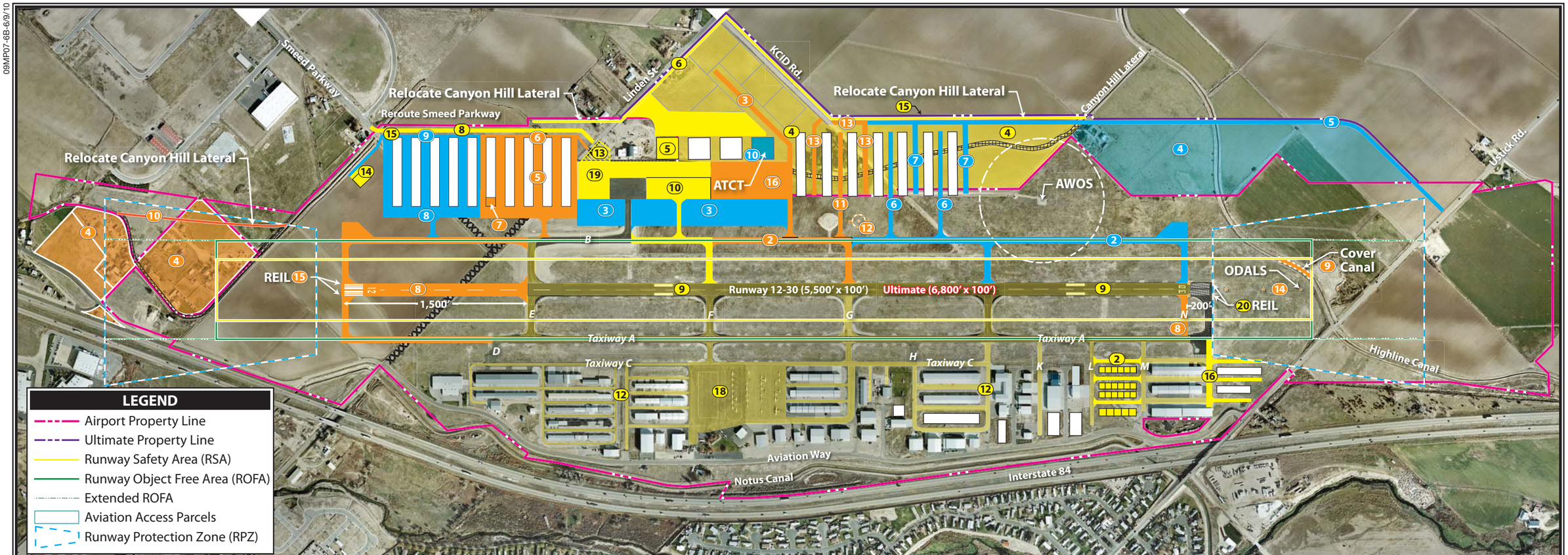
CA: Coffman Associates Estimate

Note: Totals may not equal due to rounding

Exhibit 6A

CAPITAL IMPROVEMENT PROGRAM

09MP07-6B-6/9/10



SHORT TERM PROGRAM (0-5 Years)

2011

1. Environmental Documentation (60 Acres, Canal Relocation, Taxiway, Apron) (NP)
2. Hangar Taxilanes Between Taxiways L and M
3. Annual Pavement Maintenance (NP)

2012

4. Property Acquisition - 60 Acres
5. East Side FBO Development Area
6. Relocate Canyon Hill Lateral (Ph1)
7. Annual Pavement Maintenance (NP)

2013

8. Relocate Smeed Parkway
9. Seal Coat / Crack Fill Runway
10. Apron/Taxiway Expansion (Ph1)
11. Pavement Maintenance (NP)

2014

12. Seal Coat / Crack Fill West Side Pavements
13. Fuel Farm - East Side
14. Maintenance Building
15. Perimeter Fencing
16. Taxilanes West Side T-hangars
17. Pavement Maintenance (NP)

2015

18. Mill/Overlay West Apron
19. East Apron Expansion (Ph2)
20. Runway End Identification Light - Rwy 30
21. Pavement Maintenance (NP)

INTERMEDIATE TERM PROGRAM (6-10 Years)

1. Environmental Documentation (19 Acres) (NP)
2. Construct East Side Partial Parallel Taxiway (Ph2)
3. Taxiway Behind Terminal Area
4. Property Acquisition (19 Acres)
5. T-Hangar Taxilanes - East Side (Ph1) - Project L
6. T-Hangar Tenant Access (Ph1)
7. Aircraft Wash Rack
8. Runway / Taxiway Extension
9. Cover Highline Canal Within RSA
10. Relocate Canyon Hill Lateral (Ph2)
11. Box Hangar Taxilane (Ph1)
12. Relocate Segemented Circle / Wind Sock
13. Access Roads Box Hangars (Ph1)
14. Install Omni-Directional Approach Lighting System
15. Runway End Identification Light - Rwy 12
16. East Apron Expansion (Ph2)
17. Master Plan Update (NP)
18. Pavement Maintenance (NP)

LONG TERM PROGRAM (11-20 Years)

1. Environmental Documentation (28 Acres)
2. Construct East Side Parallel Taxiway (Ph3)
3. Expand East Apron (Ph3)
4. Property Acquisition (28 Acres)
5. Extend and Improve KCID Road
6. Box Hangar Taxilanes (Ph2)
7. Access Roads Box Hangars (Ph2)
8. T-Hangar Taxilanes - East Side (Ph2)
9. T-Hangar Tenant Access (Ph2)
10. Airport Traffic Control Tower
11. Pavement Maintenance (NP)

KEY

Ph1: Phase One
Ph2: Phase Two
NP: Not Pictured

NORTH

0 800 1600
SCALE IN FEET

Photo Date: November 16, 2009

Exhibit 6B
DEVELOPMENT STAGING

services, the new terminal building will not be able to reach its potential as an economic development engine.

Once property is acquired, the next project is the relocation of the Canyon Hill Lateral. Currently, this irrigation canal traverses the east side of the airport. Much of the canal is on airport property but some sections are not. A portion of the canal traverses between the new terminal building and the new east side aircraft apron. This has necessitated the installation of a bridge in order to connect the two. To allow for unencumbered hangar development adjacent to the terminal building, the canal should be relocated. The recommended location of the canal is along the planned future east side property line.

The location of the canal is planned to be on property acquired by the airport. This includes a strip of property on the east side of KCID Road. Only the property owner has the right to relocate a canal or lateral. When planning for the canal relocation, an easement on both sides will need to be unencumbered.

2013 Projects

The first project planned for 2013 is the relocation of Smeed Parkway. This project is necessary for two primary purposes. The first is to facilitate landside development adjacent to the terminal building. The second is in preparation for the planned extension of the runway. Ultimately, the runway extension would require the relocation of the road. Road relocation to accommodate landside development is typically not eligible for FAA grant funding but it is eligible for airfield improvements, such as the planned runway extension.

Several significant pavement preservation projects are considered in the short term planning period. The first is to seal coat and crack fill the runway, parallel taxiway, and connecting taxiways.

The next project planned for 2013 is the expansion of the east side terminal area apron. This project includes an extension of the east side parallel taxiway and a connecting taxiway to the runway. Expanding the apron will be critical to advancing aviation-related development. Any airport business wishing to locate on the east side will also desire to have at least two access points to the apron. Over time, as the east side terminal area attracts more businesses and aircraft, the apron is planned to be further expanded.

2014 Projects

By 2014, it is anticipated that significant portions of the west side taxilanes will be in need of rehabilitation. This first project in 2014 considers crack filling and seal coating of all west side taxilanes other than the main apron.

The next project is the development of a fuel farm on the east side of the airport. As planned, the fuel farm would have two 12,000-gallon tanks and a self-serve capability. The fuel farm could be undertaken by the city, as

shown, or it could be the responsibility of an FBO. Either way, having fuel available on the east side is critical for continued development. An east side fuel farm would be convenient and would reduce the travel time of delivery vehicles.

The airport is in need of a dedicated maintenance facility. Currently, maintenance equipment is stored in an aged structure located at the far northeast end of airport property. The planned new maintenance facility, which is eligible for FAA funding, is located to the northwest of the T-hangar complex, convenient to the airfield.

The airport does not currently have a complete perimeter fence. A single line item is shown for 15,000 linear feet of six-foot high chain-link fencing with 3 strands of barbed-wire on top. Four controlled access gates are included in the estimate. This fence would serve security purposes and as a wildlife fence.

The final project of the 2014 CIP is the construction of taxilanes on the west side. These taxilanes would provide access to the planned T-hangar facilities. This area is the last developable west side property.

2015 Projects

The first planned project for 2015 is a rehabilitation of the west side aircraft apron. This project involves milling the top two inches of the existing pavement and applying an asphalt overlay.

The next project is the construction of a second phase of the east side terminal area apron. This phase of the apron expansion should only be undertaken once the Canyon Hill Lateral has been relocated. Once this project is complete, the east apron is planned to extend to the terminal building and to the planned hangar buildings.

Runway End Identification Lights (REILs) are planned for the Runway 30 end. These strobe-lights, set to the sides of the runway threshold, provide pilots with rapid identification of the runway end. REILs should be installed on runway ends where night time operations are approved and where there may be difficulty discerning the runway end. The airport is near a lighted urban area therefore REILs would likely aid pilots and enhance safety.

Short Term Summary

The short term projects primarily focus on continued east side development which is supported by the aviation demand forecasts. The construction of the new terminal building and aircraft apron shows the foresight that city and airport management have had for airport growth. In order for these investments to pay dividends, leasable space needs to be available on the east side. The next step and a high priority in the CIP is for the airport to acquire the land that will be needed to accommodate growth. Therefore, one of the earliest projects in the CIP is the acquisition of approximately 60 acres of property on the

east side that will allow for hangar and business development.

The current location of the Canyon Hill Lateral irrigation canal is an impediment to airport growth. The canal runs between the new terminal building and the aircraft apron, and it continues across the area planned for hangar development. Relocation of the canal is a high priority in the CIP. Some development can occur without the immediate relocation of the canal, but it will likely be more costly.

Once the property is acquired and the canal is relocated, the aircraft apron is planned for expansion to allow access to FBO-type hangars and businesses. The availability of services on the east side of the field is critical to the success of the development. Further facilitating the growth of the east side is the construction of the next phase of the parallel taxiway, FBO site preparation, and parking lot expansion.

The short term also considers the relocation of a portion of Smeed Parkway. This project meets two primary goals for the airport. First, it provides the space to accommodate the future runway extension and, second, it allows for the development of the T-hangar complex. The final projects in the short term are to invest in rehabilitation of the existing surfaces.

The short term projects total approximately $7.64 million not including land acquisition. Approximately $6.62 million is eligible for FAA grant funding. Through the grant matching program with the State of Idaho, approximately $65,000 would be eligible for state funding. The remaining $80,000 would be the responsibility of the airport sponsor.

INTERMEDIATE TERM IMPROVEMENTS

Planning new projects beyond a five-year timeframe can be challenging. Project need is heavily dependent on local demand and the economic outlook of the aviation industry. Therefore, intermediate term projects are grouped together to represent years 6-10. The use of planning horizons to group potential airport projects provides the airport flexibility to accelerate those projects that are needed immediately and delay those projects that no longer have a high priority. The projects are prioritized based on the aviation forecasts, but these priorities may change.

The second phase of the east side parallel taxiway is considered in the intermediate planning horizon. This portion of the taxiway is planned to provide an additional exit to the runway in the approximate location of Taxiway G. The taxiway will also provide access to future hangar development areas on the east side.

The next intermediate term project is to extend a taxiway from the parallel taxiway along the edge of the east side apron and back behind the terminal area. This taxiway will open up the 37-acre triangle property to further aviation-related development. As discussed, this development area is divided into parcels to allow developers

to design and build custom aviation facilities.

The next project is further property acquisition to the north of the runway end. Approximately 19 acres have been identified for acquisition as these areas will fall under the future RPZ once the runway is extended. While the acquisition of this property is planned for the intermediate planning horizon in anticipation of the runway extension, the city should move forward on acquisition at the earliest financially feasible opportunity in order to protect the approaches and to insure compatible land uses in the vicinity of the airport.

The master plan calls for reserving the area to the northwest of the new terminal building for a complex of nested T-hangars. The first of two phases of taxilane development are planned for the intermediate term. A connecting taxilane is also planned to parallel Taxiway B.

Recent design standards for these facilities recommend providing dedicated access and vehicle parking in order to reduce the potential interaction of vehicles and aircraft on the airport. To this end, an access road is planned to the T-hangar area and access gates should be planned as well as dedicated parking along the access road.

An amenity that is common at airports with significant levels of based aircraft is a dedicated aircraft wash rack. A wash rack is planned to be located in the T-hangar complex and would be accessible by any airport user. A wash rack has specially designed runoff capture capability that reduces the amount of cleaning fluids that could potentially runoff from aircraft cleaning activities.

Several intermediate term projects are necessary based on demand and need for the airport. The runway is planned for extension to an ultimate length of 6,800 feet in this timeframe. This project will only be justified if demand shows that the critical aircraft transitions to ARC C-II. This transition will only occur if medium and large business jets account for 500 or more annual operations. Without meeting this threshold, the FAA likely will not participate in the runway extension. Since Caldwell Industrial Airport is a non-towered facility, airport management and the FBO should be documenting all activity by business jets.

Once the airport transitions to ARC C-II for the critical aircraft, various imaginary safety surfaces surrounding the runway system will expand in size. A portion of private property and the Canyon Hill Lateral would be in the runway safety area (RSA) and the runway protection zone (RPZ). The private property was previously planned to be acquired. The Canyon Hill Lateral is then planned to be relocated as shown on the exhibit.

On the south end of the airport, the transition to ARC C-II would introduce a portion of the Highline Canal to the RSA. The next project presents the option of covering the canal in this location in order to meet RSA standards. Alternately, consideration

could be given to rerouting the canal in this area.

The next project considered is the extension of a taxilane from the east side parallel taxiway. The taxilane would provide airfield access and open up development opportunities. This area is planned to accommodate private hangar development in much the same manner as the southwest side of the airfield, where developers are able to construct custom hangars. The taxilane would have the ability to accommodate two hangar development areas and a third hangar area is planned to face the main apron area. Access roads are then planned to extend from KCID road. The taxilane necessitates relocation of the segmented circle and wind sock.

An omni-directional approach lighting system (ODALS) is also planned for Runway 30. This system is a safety enhancement allowing pilots to more easily identify the runway end and to align their aircraft. The ODALS is located on the Runway 30 end because the airspace is more crowded with approached to Boise Airport crossing to the south of Caldwell. REILs are then planned for the Runway 12 end.

The aviation industry is subject to rapid changes. Therefore, the FAA recommends that airports update their master plans every five to seven years. An update to this master plan is considered in the intermediate planning horizon.

The intermediate term projects total approximately $8.33 million. Approximately $7.31 million is eligible for FAA grant funding with approximately $192,000 eligible for state matching funds. The remaining $1.07 million would be the responsibility of the airport sponsor.

LONG TERM IMPROVEMENTS

Planned long term improvements are just that, long term. These projects may or may not be justified in the next 20 years. The first project is further environmental documentation needed for planned property acquisition. The recommended property acquisition is 28 acres which would require an EA.

The next project is the completion of the east side parallel taxiway. A hold apron at the south end of the taxiway is included in this project. As shown on **Exhibit 6B**, the taxiway is planned to terminate at the relocated Runway 30 threshold, provided the runway shift and extension have been constructed in the intermediate planning horizon.

A final build-out of the east side aircraft apron is also planned. The apron is planned to be extended toward the parallel taxiway to accommodate more locally based and transient aircraft.

The next project is the acquisition of approximately 28 acres on the east side flight line. This property is not planned to be needed for aviation-related development within the scope of this master plan, but the city should acquire the property, when feasible, to protect the long term growth potential for the airport. While the acquisition is shown in the long term, prices will

only increase over time, so when feasible, the airport should acquire this property.

KCID Road is planned to provide an important connection between Ustick Road and Linden/Smeed Parkway. Currently KCID does not connect to Ustick Road, but as aviation development continues, this connection point will be necessary. Improvement of KCID is not eligible for FAA grant funding and would be the responsibility of the city.

Long term planning considers the expansion of the east side box hangar and T-hangar complexes. Two taxilanes and access roads are planned to the box hangar complex. The east side T-hangar complex is planned for expansion to the north with additional access to the parallel taxiway.

The last project shown in the CIP is the construction of an airport traffic control tower (ATCT). As operations increase, a tower would obviously increase the safety of the operators at the airport. The airport will need to petition the FAA to conduct a benefit/cost analysis and the result will need to exceed 1.0. The cost of the tower is shown as being undertaken by the FAA directly but the tower may also be funded through the Airport Improvement Program (AIP), as are most of the projects in the CIP.

The long term projects total approximately $9.46 million, of which approximately $7.42 million is eligible for FAA funding. Approximately $195,000 is eligible for state matching grants and the city would be responsible for the remaining $1.6 million.

CAPITAL IMPROVEMENT SUMMARY

The CIP is intended as a road map to airport improvements to help guide the airport sponsor, the FAA, and the state aviation department on needed projects. The plan as presented will meet the forecast demand over the next 20 years and, in many respects, beyond.

The total 20-year CIP proposes approximately $25.44 million in airport development. Of this total, approximately $21.36 would be eligible for FAA grant funding. Through the state aid to airports program, approximately $562,000 is eligible for state matching funds. The local total for the 20-year CIP is $3.52 million.

It should be noted that items related to property acquisition are identified in the CIP but the cost is not estimated at this time. A line item is also shown for site preparation of the east side terminal area for future FBO development. While the city may undertake this project on their own, it can also be undertaken by a private developer.

CAPITAL IMPROVEMENT FUNDING SOURCES

Financing capital improvements at the airport will not rely solely on the financial resources of the airport or the

city. Capital improvement funding is available through various grant-in-aid programs on both the state and federal levels. Historically, Caldwell Industrial Airport has received federal and state grants. While some years more funds could be available, the CIP was developed with project phasing in order to remain realistic and within the range of anticipated grant assistance. The following discussion outlines key sources of funding potentially available for capital improvements at Caldwell Industrial Airport.

FEDERAL GRANTS

Through federal legislation over the years, various grant-in-aid programs have been established to develop and maintain a system of public use airports across the United States. The purpose of this system and its federally based funding is to maintain national defense and to promote interstate commerce. The most recent legislation affecting federal funding was enacted in late 2003 and is titled, *Century of Flight Authorization Act of 2003,* or Vision 100.

The four-year bill covered FAA fiscal years 2004, 2005, 2006, and 2007. AIP funding was authorized at $3.4 billion in 2004, $3.5 billion in 2005, $3.6 billion in 2006, and $3.7 billion in 2007. This bill provided the FAA the opportunity to plan for longer term projects versus one-year reauthorizations. As of summer 2010, a new multi-year bill has not been passed by Congress, but several continuing resolutions have maintained funding for priority airport projects.

The source for AIP funds is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Aviation Trust Fund also finances the operation of the FAA. It is funded by user fees, including taxes on airline tickets, aviation fuel, and various aircraft parts. The Aviation Trust Fund is also up for reauthorization.

Funding for AIP eligible projects is undertaken through a cost sharing arrangement in which FAA provides up to 95 percent of the cost and the airport sponsor invests the remaining five percent. In exchange for this level of funding, the airport sponsor is required to meet various grant assurances, including maintaining the improvement for its useful life, usually 20 years.

Entitlement Funds

Federal funds are distributed each year by the FAA from appropriations by Congress. A portion of the annual distribution is to commercial service airports based upon minimum enplanement levels of at least 10,000 passengers annually.

General aviation airports can receive up to $150,000 each year in Non-Primary Entitlement (NPE) funds (National Plan of Integrated Airport Systems [NPIAS] inclusion is required for general aviation entitlement funding). These funds can be carried over and combined for up to four years,

thereby allowing for completion of a more expensive project. It should be noted that some versions of the current bills moving through Congress do not include future NPE funds. In the past, Caldwell Industrial Airport has received NPE funding.

Discretionary Funds

The remaining AIP funds are distributed by the FAA based on the priority of the project for which they have requested federal assistance through discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority from airports across the country are given preference in funding. High priority projects include those related to meeting design standards, capacity improvements, and other safety enhancements.

Under the AIP program, examples of eligible development projects include the airfield, public aprons, and access roads. Additional buildings and structures may be eligible if the function of the structure is to serve airport operations in a non-revenue generating capacity, such as maintenance facilities. Some revenue-enhancing structures, such as T-hangars, may be eligible if all airfield improvements have been made but the priority ranking of these facilities is very low.

Whereas entitlement monies are guaranteed on an annual basis, discretionary funds are not assured. If the combination of entitlement, discretionary, and airport sponsor match does not provide enough capital for planned development, projects may be delayed. Other supplemental funding sources are described in the following subsections.

FAA Facilities and Equipment (F&E) Program

The Airway Facilities Division of the FAA administers the Facilities and Equipment (F&E) Program. This program provides funding for the installation and maintenance of various navigational aids and equipment of the national airspace system. Under the F&E program, funding is provided for FAA ATCTs, enroute navigational aids, on-airport navigational aids, and approach lighting systems.

While F&E still installs and maintains some navigational aids, on-airport facilities at general aviation airports have not been a priority. Therefore, airports often request funding assistance for navigational aids through AIP and then maintain the equipment on their own.

STATE AID TO AIRPORTS

The State of Idaho recognizes the valuable contribution to the state's transportation economy that airports make. Therefore, the Idaho Transportation Department – Division of Aeronautics administers several programs for funding airport planning, construction, and maintenance projects. Idaho has provided approximately $500,000 annually for airport development projects in the state over the past sev-

eral years. The following is a summary of the state-administered programs as described in the *Idaho Airport System Plan (2009)*:

- Idaho Airport Aid Program (IAAP) – This program assists sponsors in the preservation and acquisition of existing landing facilities in danger of being lost, aircraft landing projects, aircraft landing development, aircraft operations safety, federal funding match, and other projects which protect prior public investment. Funding comes solely from a seven ($0.07) cent per gallon tax on aviation gasoline and a six ($0.06) cent per gallon tax on jet fuel sold in the state. State funds are issued on a cost sharing grant basis as defined by federal eligibility and population. Caldwell Industrial Airport is eligible for a 50/50 cost share of the local match for federal airport grants.

- Maintenance and Safety Supplies Program – This is a discretionary allocation program that provides funding at no charge or at a reduced fee for maintenance and safety related supplies such as runway or taxiway light bulbs, windsocks, tie-down chains, etc.

- Small Projects Program – This program provides grant funding assistance of less than $2,000 for unscheduled or emergency improvements.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. The goal of the airport is to generate enough revenue to cover all operating and capital expenditures. As with many general aviation airports, this is not always possible and other financing methods will be needed.

There are several alternatives for local financing options for future development at the airport, including airport revenues, direct funding from the airport sponsors, bonds, and leasehold financing. These strategies could be used to fund the local matching share, or complete a project if grant funding cannot be arranged.

There are several municipal bonding options available, including general obligation bonds, limited obligation bonds, and revenue bonds. General obligation bonds are a common form of municipal bond which is issued by voter approval, is secured by the full faith and credit of the community, and future tax revenues are pledged to retire the debt. As instruments of credit and because the community secures the bonds, general obligation bonds reduce the available debt level of the community. Due to the community pledge to secure and pay general obligation bonds, they are the most secure type of municipal bond and are generally issued at lower interest rates and

carry lower costs of issuance. The primary disadvantage of general obligation bonds is that they require voter approval and are subject to statutory debt limits. This requires that they be used for projects that have broad support among the voters, and that they are reserved for projects that have the highest public priorities.

In contrast to general obligation bonds, limited obligation bonds (sometimes referred to as self-liquidating bonds) are secured by revenues from a local source. While neither general fund revenues nor the taxing power of the local community is pledged to pay the debt service, these sources may be required to retire the debt if pledged revenues are insufficient to make interest and principal payments on the bonds. These bonds still carry the full faith and credit pledge of the local community and are considered, for the purpose of financial analysis, as part of the debt burden of the local community. The overall debt burden of the local community is a factor in determining interest rates on municipal bonds.

There are several types of revenue bonds, but in general, they are a form of municipal bond which is payable solely from the revenue derived from the operation of a facility that was constructed or acquired with the proceeds of the bonds. For example, a lease revenue bond is secured with the income from a lease assigned to the repayment of the bonds. Revenue bonds have become a common form of financing airport improvements. Revenue bonds present the opportunity to provide those improvements without direct burden to the taxpayer. Revenue bonds normally carry a higher interest rate because they lack the guarantees of general and limited obligation bonds.

Leasehold financing refers to a developer or tenant financing improvements under a long term ground lease. The obvious advantage of such an arrangement is that it relieves the community of all responsibility for raising the capital funds for improvements. However, the private development of facilities on a ground lease, particularly on property owned by a government agency, produces a unique set of concerns.

In particular, it may be more difficult to obtain private financing as only the improvements and the right to continue the lease can be claimed in the event of a default. Ground leases normally provide for the reversion of improvements to the airport at the end of the lease term, which reduces their potential value to a lender taking possession. Also, companies that want to own their property as a matter of financial policy may not locate where land is only available for lease. Hangar development at the airport is assumed to be undertaken by private developers.

Historical Operating Cash Flow

The airport provided data related to airport revenue and expenses for fiscal years 2003-2004 through 2009-2010. **Table 6B** presents a summary of the operating revenue and expenses. Revenues and expenses that are not di-

rectly related to operating activity were removed. This includes any transfers to the airport from other city departments and any capital improvement grants. As can be seen from an operating perspective, the airport does generate enough revenue to cover operating expenses. This is an excellent position for the airport, as most general aviation airports do not turn an operating profit.

TABLE 6B
Historical Operating Revenue and Expenses
Caldwell Industrial Airport

Fiscal Year	Actual or Budget	Operational Revenue	Operational Expenses	Net Operating Balance
'03-'04	Actual	$226,219	$148,012	$78,207
'04-'05	Actual	$233,529	$181,044	$52,485
'05-'06	Actual	$286,533	$187,454	$99,079
'06-'07	Actual	$319,771	$204,965	$114,806
'07-'08	Actual	$314,920	$230,946	$83,974
'08-'09	Budget	$324,328	$225,451	$98,877
'09-'10	Budget	$280,072	$283,003	-$2,931

Source: City of Caldwell Budget Revenue & Expenditure Detail Reports

The airport also provided data related to yearly capital expenditures, transfers to the airport, and grants. This information is summarized in **Table 6C**. The airport has averaged approximately $841,000 in annual grants for airport development. Total capital expenditures have averaged $1.1 million.

TABLE 6C
Non-Operational Revenue and Expenses
Caldwell Industrial Airport

Fiscal Year	Capital Expenditures	Grant Income	Loans/ Transfers
'03-'04	$944,917	$923,242	$0
'04-'05	$1,247,394	$1,227,984	$0
'05-'06	$1,724,155	$828,757	$500,000
'06-'07	$221,223	$618,950	$37,662
'07-'08	$1,025,624	$601,981	$0
'08-'09	$875,000	$965,450	$0
'09-'10	$1,740,000	$725,000	$1,090,000

Source: City of Caldwell Budget Revenue & Expenditure Detail Reports

Future Operating Cash Flow

Any analysis of a future cash flow position necessarily requires numerous assumptions about the economy and nature of the aviation industry, in general. Future revenues were conservatively projected to grow at two percent annually. Future expenses were projected at 1.5 percent annually. Each year, a net operating balance is reflected. Capital expenditures and

grant revenue have been forecast based on the CIP previously presented. The future cash flow is presented in **Table 6D**.

TABLE 6D
Future Cash Flow
Caldwell Industrial Airport

Fiscal Year	Projected Operational Revenue (2.0% AAGR)	Projected Operational Expenses (1.5% AAGR)	Net Operating Balance	Capital Expenditures	Eligible Grant Income
'11-'12	$330,815	$228,833	$101,982	$565,000	$536,250
'12-'13	$337,431	$232,265	$105,166	$685,000	$653,250
'13-'14	$344,179	$235,749	$108,430	$1,861,000	$1,799,850
'14-'15	$351,063	$239,285	$111,778	$1,888,000	$1,631,175
'15-'16	$358,084	$242,875	$115,210	$2,601,000	$2,521,350
Years 6-10	$1,900,755	$1,270,126	$630,629	$8,188,500	$7,365,638
Years 11-20	$2,207,798	$1,421,160	$786,639	$9,464,000	$7,619,625

AAGR: Average Annual Growth Rate
Source: Coffman Associates

FINANCING CONCLUSION

Caldwell Industrial Airport is in a financially sound position in terms of operating revenue and expenses. For the last several years, they have had a positive net operating balance. The airport has also been able to make significant capital investments. While the federal entitlement for general aviation airports is $150,000 annually, Caldwell Industrial Airport has averaged more than $840,000 annually.

The future cash flow is dependent upon many assumptions, including the addition of more based aircraft and the growth of business at the airport. Nonetheless, a conservative growth scenario has been presented and the long term net operating balance looks positive.

SUMMARY

The best means to begin implementation of the recommendations in this master plan is to first recognize that planning is a continuous process that does not end with completion and approval of this document. Rather, the airport should implement measures that allow them to track various demand indicators such as based aircraft and operations. Operations, particularly by business jets, will be important when providing justification for several projects in the future. The issues upon which this master plan is based will remain valid for a number of years. The primary goal is for the airport to best serve the air transportation needs of the region, while continuing to be economically self-sufficient.

The actual need for facilities is most appropriately established by airport activity levels rather than a specified date. For example, projections have been made as to when additional hangars may be needed at the airport. In reality, however, the timeframe in which the development is needed may be substantially different. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need to accelerate the development. Although every effort has been made in this master planning process to conservatively estimate when facility development may be needed, aviation demand will dictate when facility improvements need to be delayed or accelerated.

The real value of a usable master plan is in keeping the issues and objectives in the minds of the managers and decision-makers so that they are better able to recognize change and its effect. In addition to adjustments in aviation demand, decisions made as to when to undertake the improvements recommended in this master plan will impact the period that the plan remains valid. The format used in this plan is intended to reduce the need for formal and costly updates by simply adjusting the timing. Updating can be done by the manager, thereby improving the plan's effectiveness.

In summary, the planning process requires the airport management to consistently monitor the progress of the airport in terms of aircraft operations and based aircraft. Analysis of aircraft demand is critical to the timing and need for new airport facilities. The information obtained from continually monitoring airport activity will provide the data necessary to determine if the development schedule should be accelerated or decelerated.

Appendix A

GLOSSARY OF TERMS

Glossary of Terms

A

ABOVE GROUND LEVEL: The elevation of a point or surface above the ground.

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): See declared distances.

ADVISORY CIRCULAR: External publications issued by the FAA consisting of nonregulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviation subject.

AIR CARRIER: An operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIRCRAFT: A transportation vehicle that is used or intended for use for flight.

AIRCRAFT APPROACH CATEGORY: A grouping of aircraft based on 1.3 times the stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:

- Category A: Speed less than 91 knots.
- Category B: Speed 91 knots or more, but less than 121 knots.
- Category C: Speed 121 knots or more, but less than 141 knots.
- Category D: Speed 141 knots or more, but less than 166 knots.
- Category E: Speed greater than 166 knots.

AIRCRAFT OPERATION: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA (AOA): A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION: A private organization serving the interests and needs of general aviation pilots and aircraft owners.

AIRCRAFT RESCUE AND FIRE FIGHTING: A facility located at an airport that provides emergency vehicles, extinguishing agents, and personnel responsible for minimizing the impacts of an aircraft accident or incident.

AIRFIELD: The portion of an airport which contains the facilities necessary for the operation of aircraft.

AIRLINE HUB: An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.

AIRPLANE DESIGN GROUP (ADG): A grouping of aircraft based upon wingspan. The groups are as follows:

- Group I: Up to but not including 49 feet.
- Group II: 49 feet up to but not including 79 feet.
- Group III: 79 feet up to but not including 118 feet.
- Group IV: 118 feet up to but not including 171 feet.
- Group V: 171 feet up to but not including 214 feet.
- Group VI: 214 feet or greater.

AIRPORT AUTHORITY: A quasi-governmental public organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.

AIRPORT BEACON: A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.

AIRPORT CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

AIRPORT ELEVATION: The highest point on the runway system at an airport expressed in feet above mean sea level (MSL).

AIRPORT IMPROVEMENT PROGRAM: A program authorized by the Airport and Airway

Improvement Act of 1982 that provides funding for airport planning and development.

AIRPORT LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRPORT LAYOUT PLAN (ALP): A scaled drawing of the existing and planned land and facilities necessary for the operation and development of the airport.

AIRPORT LAYOUT PLAN DRAWING SET: A set of technical drawings depicting the current and future airport conditions. The individual sheets comprising the set can vary with the complexities of the airport, but the FAA-required drawings include the Airport Layout Plan (sometimes referred to as the Airport Layout Drawing (ALD), the Airport Airspace Drawing, and the Inner Portion of the Approach Surface Drawing, On-Airport Land Use Drawing, and Property Map.

AIRPORT MASTER PLAN: The planner's concept of the long-term development of an airport.

AIRPORT MOVEMENT AREA SAFETY SYSTEM: A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.

AIRPORT OBSTRUCTION CHART: A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, buildings, roads and other detail in the vicinity of an airport.

AIRPORT REFERENCE CODE (ARC): A coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP): The latitude and longitude of the approximate center of the airport.

AIRPORT SPONSOR: The entity that is legally responsible for the management and operation of an airport, including the fulfillment of the requirements of laws and regulations related thereto.

AIRPORT SURFACE DETECTION EQUIPMENT: A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport.

AIRPORT SURVEILLANCE RADAR: The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling and other devices to provide safe and expeditious movement of terminal air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER: A facility which provides en route air traffic control service to aircraft operating on an IFR flight plan within controlled airspace over a large, multi-state region.

AIRSIDE: The portion of an airport that contains the facilities necessary for the operation of aircraft.

AIRSPACE: The volume of space above the surface of the ground that is provided for the operation of aircraft.

AIR TAXI: An air carrier certificated in accordance with FAR Part 121 and FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIR TRAFFIC CONTROL: A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight.

AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER: A facility operated by the FAA which is responsible for the central flow control, the central altitude reservation system, the airport reservation position system, and the air traffic service contingency command for the air traffic control system.

AIR TRAFFIC HUB: A categorization of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.

AIR TRANSPORT ASSOCIATION OF AMERICA: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.

ALERT AREA: See special-use airspace.

ALTITUDE: The vertical distance measured in feet above mean sea level.

ANNUAL INSTRUMENT APPROACH (AIA): An approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS): An airport lighting facility which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

APPROACH MINIMUMS: The altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

APPROACH SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

APRON: A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION: The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS): The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS): A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

AUTOMATED WEATHER OBSERVATION STATION (AWOS): Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dew point, etc.)

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AVIGATION EASEMENT: A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

AZIMUTH: Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

B

BASE LEG: A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See "traffic pattern."

BASED AIRCRAFT: The general aviation aircraft that use a specific airport as a home base.

BEARING: The horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE: A barrier used to divert or dissipate jet blast or propeller wash.

BLAST PAD: A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on the airport.

C

CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute Airport Improvement Program funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

CARGO SERVICE AIRPORT: An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.

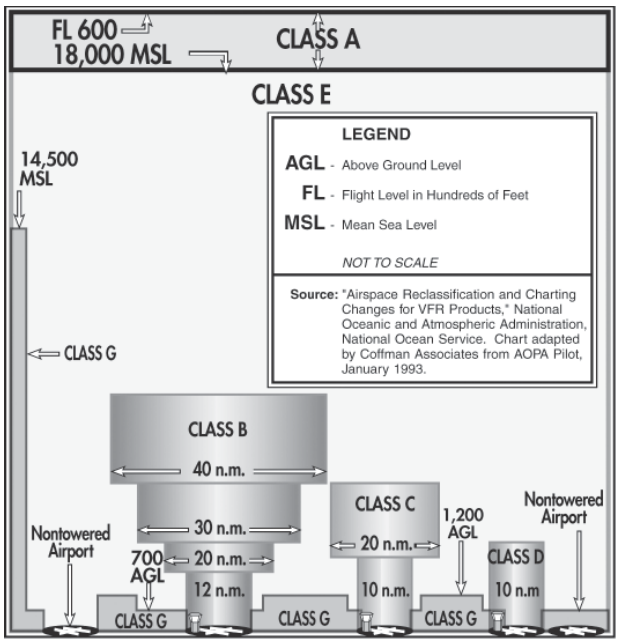
CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 100 feet above the horizontal plane containing the runway threshold.

CATEGORY II: An ILS that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 50 feet above the horizontal plane containing the runway threshold.

CATEGORY III: An ILS that provides acceptable guidance information to a pilot from the coverage limits of the ILS with no decision height specified above the horizontal plane containing the runway threshold.

CEILING: The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

CIRCLING APPROACH: A maneuver initiated by the pilot to align the aircraft with the runway for landing when flying a predetermined circling instrument approach under IFR.



CLASS A AIRSPACE: See Controlled Airspace.

CLASS B AIRSPACE: See Controlled Airspace.

CLASS C AIRSPACE: See Controlled Airspace.

CLASS D AIRSPACE: See Controlled Airspace.

CLASS E AIRSPACE: See Controlled Airspace.

CLASS G AIRSPACE: See Controlled Airspace.

CLEAR ZONE: See Runway Protection Zone.

COMMERCIAL SERVICE AIRPORT: A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.

COMMON TRAFFIC ADVISORY FREQUENCY: A radio frequency identified in the appropriate aeronautical chart which is designated for the purpose of transmitting airport advisory information and procedures while operating to or from an uncontrolled airport.

COMPASS LOCATOR (LOM): A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.

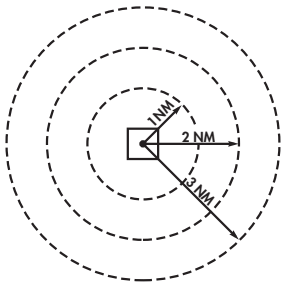
CONICAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONTROLLED AIRPORT: An airport that has an operating airport traffic control tower.

CONTROLLED AIRSPACE: Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- **CLASS A**: Generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.

- **CLASS B**: Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.



- **CLASS C**: Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- **CLASS D**: Generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedure . Unless otherwise authorized, all persons must establish two-way radio communication.

- **CLASS E**: Generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

- **CLASS G**: Generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.

CONTROLLED FIRING AREA: See special-use airspace.

CROSSWIND: A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.

CROSSWIND COMPONENT: The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

CROSSWIND LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

D

DECIBEL: A unit of noise representing a level relative to a reference of a sound pressure 20 micro newtons per square meter.

DECISION HEIGHT: The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.

DECLARED DISTANCES: The distances declared available for the airplane's takeoff runway, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

- **TAKEOFF RUNWAY AVAILABLE (TORA)**: The runway length declared available and suitable for the ground run of an airplane taking off.
- **TAKEOFF DISTANCE AVAILABLE (TODA)**: The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.
- **ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)**: The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.
- **LANDING DISTANCE AVAILABLE (LDA)**: The runway length declared available and suitable for landing.

DEPARTMENT OF TRANSPORTATION: The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration, which was established to promote the coordination of federal transportation programs and to act as a focal point for research and development efforts in transportation.

DISCRETIONARY FUNDS: Federal grant funds that may be appropriated to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety, and security, or mitigating noise.

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

DNL: The 24-hour average sound level, in Aweighted decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 p.m. and 7 a.m. as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG: A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see "traffic pattern."

E

EASEMENT: The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on, or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ELEVATION: The vertical distance measured in feet above mean sea level.

ENPLANED PASSENGERS: The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and nonscheduled services.

ENPLANEMENT: The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.

ENTITLEMENT: Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

ENVIRONMENTAL ASSESSMENT (EA): An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact statement.

ENVIRONMENTAL AUDIT: An assessment of the current status of a party's compliance with applicable

environmental requirements of a party's environmental compliance policies, practices, and controls.

ENVIRONMENTAL IMPACT STATEMENT (EIS): A document required of federal agencies by the National Environmental Policy Act for major projects are legislative proposals affecting the environment. It is a tool for decision-making describing the positive and negative effects of a proposed action and citing alternative actions.

ESSENTIAL AIR SERVICE: A federal program which guarantees air carrier service to selected small cities by providing subsidies as needed to prevent these cities from such service.

F

FEDERAL AVIATION REGULATIONS: The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

FEDERAL INSPECTION SERVICES: The provision of customs and immigration services including passport inspection, inspection of baggage, the collection of duties on certain imported items, and the inspections for agricultural products, illegal drugs, or other restricted items.

FINAL APPROACH: A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See "traffic pattern."

FINAL APPROACH AND TAKEOFF AREA (FATO). A defined area over which the final phase of the helicopter approach to a hover, or a landing is completed and from which the takeoff is initiated.

FINAL APPROACH FIX: The designated point at which the final approach segment for an aircraft landing on a runway begins for a non-precision approach.

FINDING OF NO SIGNIFICANT IMPACT (FONSI): A public document prepared by a Federal agency that presents the rationale why a proposed action will not have a significant effect on the environment and for which an environmental impact statement will not be prepared.

FIXED BASE OPERATOR (FBO): A provider of services to users of an airport. Such services include, but are not limited to, hangaring, fueling, flight training, repair, and maintenance.

FLIGHT LEVEL: A designation for altitude within controlled airspace.

FLIGHT SERVICE STATION: An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facilities.

FRANGIBLE NAVAID: A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

G

GENERAL AVIATION: That portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GENERAL AVIATION AIRPORT: An airport that provides air service to only general aviation.

GLIDESLOPE (GS): Provides vertical guidance for aircraft during approach and landing. The glideslope consists of the following:

1. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or

2. Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM (GPS): A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

GROUND ACCESS: The transportation system on and around the airport that provides access to and

from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.

H

HELIPAD: A designated area for the takeoff, landing, and parking of helicopters.

HIGH INTENSITY RUNWAY LIGHTS: The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

HIGH-SPEED EXIT TAXIWAY: A long radius taxiway designed to expedite aircraft turning off the runway after landing (at speeds to 60 knots), thus reducing runway occupancy time.

HORIZONTAL SURFACE: An imaginary obstruction- limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

I

INITIAL APPROACH FIX: The designated point at which the initial approach segment begins for an instrument approach to a runway.

INSTRUMENT APPROACH PROCEDURE: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR): Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids:

1. Localizer.
2. Glide Slope.
3. Outer Marker.
4. Middle Marker.
5. Approach Lights.

INSTRUMENT METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS: Operations by aircraft that are not based at a specified airport.

K

KNOTS: A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

L

LANDSIDE: The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

LANDING DISTANCE AVAILABLE (LDA): See declared distances.

LARGE AIRPLANE: An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL AREA AUGMENTATION SYSTEM: A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy integrity, continuity, and availability.

LOCAL OPERATIONS: Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

LOCAL TRAFFIC: Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument

approach procedures. Typically, this includes touch and-go training operations.

LOCALIZER: The component of an ILS which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA): A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LONG RANGE NAVIGATION SYSTEM (LORAN): Long range navigation is an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for en route navigation.

LOW INTENSITY RUNWAY LIGHTS: The lowest clas- sification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

M

MEDIUM INTENSITY RUNWAY LIGHTS: The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MICROWAVE LANDING SYSTEM (MLS): An instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS: Aircraft operations that are performed in military aircraft.

MILITARY OPERATIONS AREA (MOA): See special-use airspace

MILITARY TRAINING ROUTE: An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, after an instrument approach, a landing is not affected, and occurring normally:

1. When the aircraft has descended to the decision height and has not established visual contact; or

2. When directed by air traffic control to pull up or to go around again.

MOVEMENT AREA: The runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

N

NATIONAL AIRSPACE SYSTEM: The network of air traffic control facilities, air traffic control areas, and navigational facilities through the U.S.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS: The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

NATIONAL TRANSPORTATION SAFETY BOARD: A federal government organization established to investigate and determine the probable cause of transportation accidents, to recommend equipment and procedures to enhance transportation safety, and to review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.

NAUTICAL MILE: A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

NAVAID: A term used to describe any electrical or visual air navigational aids, lights, signs, and associated supporting equipment (i.e. PAPI, VASI, ILS, etc.)

NAVIGATIONAL AID: A facility used as, available for use as, or designed for use as an aid to air navigation.

NOISE CONTOUR: A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NON-DIRECTIONAL BEACON (NDB): A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his or her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

NON-PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

NOTICE TO AIRMEN: A notice containing information concerning the establishment, condition, or change in any component of or hazard in the National Airspace System, the
timely knowledge of which is considered essential to personnel concerned with flight operations.

O

OBJECT FREE AREA (OFA): An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ): The airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

ONE-ENGINE INOPERABLE SURFACE: A surface emanating from the runway end at a slope ratio of 62.5:1. Air carrier airports are required to maintain a technical drawing of this surface depicting any object penetrations by January 1, 2010.

OPERATION: The take-off, landing, or touch-and-go procedure by an aircraft on a runway at an airport.

OUTER MARKER (OM): An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline, indicating to the pilot that he/she is passing over the facility and can begin final approach.

P

PILOT CONTROLLED LIGHTING: Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.

PRECISION APPROACH: A standard instrument approach procedure which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- **CATEGORY I (CAT I)**: A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.

- **CATEGORY II (CAT II)**: A precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.

- **CATEGORY III (CAT III)**: A precision approach which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI): A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a VASI but provides a sharper transition between the colored indicator lights.

PRECISION APPROACH RADAR: A radar facility in the terminal air traffic control system used to detect and display with a high degree of accuracy the direction, range, and elevation of an aircraft on the final approach to a runway.

PRECISION OBJECT FREE AREA (POFA): An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard which requires the POFA to be kept clear of above ground objects protruding above the runway safety

area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than 3/4 mile visibility.

PRIMARY AIRPORT: A commercial service airport that enplanes at least 10,000 annual passengers.

PRIMARY SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.

PROHIBITED AREA: See special-use airspace.

PVC: Poor visibility and ceiling. Used in determining Annual Service Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one mile.

R

RADIAL: A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.

REGRESSION ANALYSIS: A statistical technique that seeks to identify and quantify the relationships between factors associated with a forecast.

REMOTE COMMUNICATIONS OUTLET (RCO): An unstaffed transmitter receiver/facility remotely controlled by air traffic personnel. RCOs serve flight service stations (FSSs). RCOs were established to provide ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times.

REMOTE TRANSMITTER/RECEIVER (RTR): See remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT: An airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA: See special-use airspace.

RNAV: Area navigation - airborne equipment which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used en route and for approaches to an airport.

RUNWAY: A defined rectangular area on an airport prepared for aircraft landing and takeoff. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. For example, a runway with a magnetic heading of 180 would be designated Runway 18. The runway heading on the opposite end of the runway is 180 degrees from that runway end. For example, the opposite runway heading for Runway 18 would be Runway 36 (magnetic heading of 360). Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY ALIGNMENT INDICATOR LIGHT: A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

RUNWAY END IDENTIFIER LIGHTS (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT: The average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ): An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type and minima.

RUNWAY SAFETY AREA (RSA): A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

RUNWAY VISIBILITY ZONE (RVZ): An area on the airport to be kept clear of permanent objects so that there is an unobstructed line of- site from any point five feet above the runway centerline to

any point five feet above an intersecting runway centerline.

RUNWAY VISUAL RANGE (RVR): An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

S

SCOPE: The document that identifies and defines the tasks, emphasis, and level of effort associated with a project or study.

SEGMENTED CIRCLE: A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER: An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE: The straight line distance between an aircraft and a point on the ground.

SMALL AIRPLANE: An airplane that has a maximum certified takeoff weight of up to 12,500 pounds.

SPECIAL-USE AIRSPACE: Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- **ALERT AREA**: Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

- **CONTROLLED FIRING AREA**: Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

- **MILITARY OPERATIONS AREA (MOA)**: Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

- **PROHIBITED AREA**: Designated airspace within which the flight of aircraft is prohibited.

- **RESTRICTED AREA**: Airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

- **WARNING AREA**: Airspace which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD INSTRUMENT DEPARTURE PROCEDURES: A published standard flight procedure to be utilized following takeoff to provide a transition between the airport and the terminal area or en route airspace.

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO: A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

STOPWAY: An area beyond the end of a takeoff runway that is designed to support an aircraft during an aborted takeoff without causing structural damage to the aircraft. It is not to be used for takeoff, landing, or taxiing by aircraft.

STRAIGHT-IN LANDING/APPROACH: A landing made on a runway aligned within 30 degrees

of the final approach course following completion of an instrument approach.

T

TACTICAL AIR NAVIGATION (TACAN): An ultrahigh frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF RUNWAY AVAILABLE (TORA): See declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA): See declared distances.

TAXILANE: The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY: A defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY SAFETY AREA (TSA): A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TERMINAL INSTRUMENT PROCEDURES: Published flight procedures for conducting instrument approaches to runways under instrument meteorological conditions.

TERMINAL RADAR APPROACH CONTROL: An element of the air traffic control system responsible for monitoring the en-route and terminal segment of air traffic in the airspace surrounding airports with moderate to high levels of air traffic.

TETRAHEDRON: A device used as a landing direction indicator. The small end of the tetrahedron points in the direction of landing.

THRESHOLD: The beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

TOUCH-AND-GO: An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and go is recorded as two operations: one operation for the landing and one operation for the takeoff.

TOUCHDOWN: The point at which a landing aircraft makes contact with the runway surface.

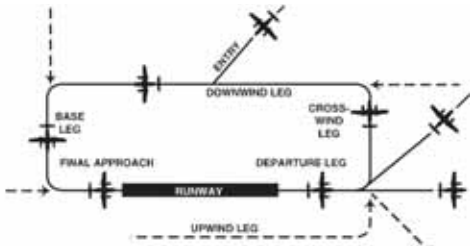
TOUCHDOWN AND LIFT-OFF AREA (TLOF): A load bearing, generally paved area, normally centered in the FATO, on which the helicopter lands or takes off.

TOUCHDOWN ZONE (TDZ): The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE): The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING: Two rows of transverse light bars located symmetrically about the runway centerline normally at 100- foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.



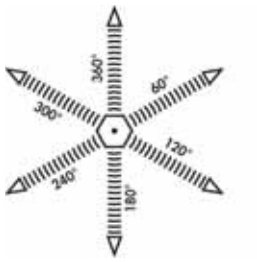
U

UNCONTROLLED AIRPORT: An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

UNCONTROLLED AIRSPACE: Airspace within which aircraft are not subject to air traffic control.

UNIVERSAL COMMUNICATION (UNICOM): A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.

UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."



V

VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE (VOR): A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature.

VERY HIGH FREQUENCY OMNI-DIRECTIONAL RANGE/ TACTICAL AIR NAVIGATION (VORTAC): A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/white, above path if white/white, and below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

VISUAL METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

VOR: See "Very High Frequency Omnidirectional Range Station."

VORTAC: See "Very High Frequency Omnidirectional Range Station/Tactical Air Navigation."

W

WARNING AREA: See special-use airspace.

WIDE AREA AUGMENTATION SYSTEM: An enhancement of the Global Positioning System that includes integrity broadcasts, differential corrections, and additional ranging signals for the purpose of providing the accuracy, integrity, availability, and continuity required to support all phases of flight.

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

AIR-21: Wendell H. Ford Aviation Investment and Reform Act for the 21st Century

ALS: approach lighting system

ALSF-1: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT I configuration)

ALSF-2: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT II configuration)

AOA: Aircraft Operation Area

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and fire fighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

AVGAS: aviation gasoline - typically 100 low lead (100L)

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulation

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity of aircraft with dual-wheel type landing gear

DTWL: runway weight bearing capacity of aircraft with dual-tandem type landing gear

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: midium intensity approach lighting system with indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MSL: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

NM: nautical mile (6,076.1 feet)

NPES: National Pollutant Discharge Elimination System

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rule making

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory committee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

PVC: poor visibility and ceiling

RCO: remote communications outlet

REIL: runway end identifier lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: runway safety area

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with runway alignment indicator lights

STAR: standard terminal arrival route

SWL: runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN: tactical air navigational aid

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TLOF: Touchdown and lift-off

TDZ: touchdown zone

TDZE: touchdown zone elevation

TODA: takeoff distance available

TORA: takeoff runway available

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omni-directional range

VORTAC: VOR and TACAN collocated

Appendix B

CIP COST ESTIMATES

Appendix B
CIP COST ESTIMATES

A 20-year Capital Improvement Program (CIP) based on the findings of this master plan is presented in Chapter Six. The current airport consulting engineer, Kimley-Horn and Associates, provided preliminary cost estimates for most of the proposed projects. The detailed cost estimates, which were summarized in the CIP, are included in this appendix. It should be noted that these cost estimates are subject to further refinement prior to FAA grant approval or construction. Nonetheless, the cost estimates represent a reasonable planning estimate for the projects cited.

Project "A" Relocate Canyon Hill Lateral

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$32,500.00	$32,500.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$20,000.00	$20,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$5,000.00	$5,000.00
4		Miscellanious Structures	20	EA.	$7,500.00	$150,000.00
5	P-152-4.1	Unclassified Excavation Placed in Excavation	23,300	S.Y.	$5.00	$116,500.00
6	P-152-4.2	Unclassified Excavation Placed in Embankment	7,775	C.Y.	$10.00	$77,750.00
8	P-154-5.1	Subbase Course (14")	3,880	C.Y.	$25.00	$97,000.00
17	N/A	Force Account Allowance	1	L.S.	$20,000.00	$20,000.00
			Construction Sub-Total			$518,750.00
			Contingency		5.0%	$25,937.50
			Construction Total			$544,687.50
			Administration		1.0%	$5,446.88
			Construction Inspection		12.0%	$65,362.50
			Engineering		10.0%	$54,468.75
			Project "A" TOTAL			**$669,965.63**

Project "B" Expand East Apron

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$75,000.00	$75,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$60,000.00	$60,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$15,000.00	$15,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	1,420	L.F.	$5.00	$7,100.00
5	P-104-6.2	Bituminous Pavement Removal	100	S.Y.	$2.00	$200.00
6		Install Tie-Downs	42	EA.	$500.00	$21,000.00
7	P-152-4.1	Unclassified Excavation Placed in Embankment	17,000	C.Y.	$7.50	$127,500.00
8	P-152-4.3	Unsuitable Overdepth Excavation	500	C.Y.	$20.00	$10,000.00
9	P-154-5.1	Subbase Course (14")	0	C.Y.	$25.00	$0.00
10	P-208-5.1	Crushed Aggregate Base Course (4")	0	C.Y.	$35.00	$0.00
11	P-208-5.2	Shoulder Crushed Aggregate Base Course (3")	250	C.Y.	$25.00	$6,250.00
12	P-401-8.1a	Bituminous Surface Course (3")	0	Ton	$90.00	$0.00
13	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	600	L.F.	$40.00	$24,000.00
13	D-705-5.1	Pavement Edge Underdrain	2,400	L.F.	$10.00	$24,000.00
14	D-751-5.1	Install Storm Drain Inlet	4	EA.	$4,000.00	$16,000.00
15	P-620-5.1	Yellow Temporary Paint without Glass Beads	1,700	S.F.	$1.00	$1,700.00
16	P-620-5.2	Yellow Taxiway Paint with Glass Beads	1,700	S.F.	$1.00	$1,700.00
17	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00
18		Reflective Markers	30	EA.	$100.00	$3,000.00
19		Paint Removal	1	L.S.	$7,500.00	$7,500.00

Construction Sub-Total		$409,950.00
Contingency	5.0%	$20,497.50
Construction Total		$430,447.50
Administration	1.0%	$4,304.48
Construction Inspection	9.0%	$38,740.28
Engineering	8.0%	$34,435.80
Project "B" TOTAL		**$507,928.05**

Asphalt Area	259,500 S.F.
Perimeter of Asphalt	1,420 L.F.

Note: This project has been divided into four phases.

Project "C" Construct East Side Parallel Taxiway (Ph1)

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$50,000.00	$50,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$40,000.00	$40,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$20,000.00	$20,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	1,050	L.F.	$5.00	$5,250.00
5	P-104-6.2	Bituminous Pavement Removal	200	S.Y.	$2.00	$400.00
6	P-152-4.1	Unclassified Excavation Placed in Embankment	8,000	C.Y.	$7.50	$60,000.00
7	P-152-4.3	Unsuitable Overdepth Excavation	500	C.Y.	$20.00	$10,000.00
8	P-154-5.1	Subbase Course (14")	5,557	C.Y.	$25.00	$138,920.83
9	P-208-5.1	Crushed Aggregate Base Course (4")	1,588	C.Y.	$35.00	$55,562.78
10	P-208-5.2	Shoulder Crushed Aggregate Base Course (3")	450	C.Y.	$25.00	$11,250.00
11	P-401-8.1a	Bituminous Surface Course (3")	2,492	Ton	$90.00	$224,247.99
12		Taxiway Lights	45	EA	$800.00	$36,000.00
13		Conduit and Conductor	5,000	L.F.	$15.00	$75,000.00
14	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	1,000	L.F.	$40.00	$40,000.00
15	D-705-5.1	Pavement Edge Underdrain	4,900	L.F.	$10.00	$49,000.00
16	D-751-5.1	Install Storm Drain Inlet	2	EA.	$4,000.00	$8,000.00
17	P-620-5.1	Yellow Temporary Paint without Glass Beads	3,000	S.F.	$1.00	$3,000.00
18	P-620-5.2	Yellow Taxiway Paint with Glass Beads	3,000	S.F.	$1.00	$3,000.00
19	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$839,631.60
Contingency	5.0%	$41,981.58
Construction Total		$881,613.18
Administration	1.0%	$8,816.13
Construction Inspection	12.0%	$105,793.58
Engineering	10.0%	$88,161.32
Project "C" TOTAL		**$1,084,384.22**

Asphalt Area	128,601	S.F.
	14,289	S.Y.

Note: The scope of this project has been adjusted. The new CIP cost is $918,000.

Project "D" Relocate Smeed Parkway

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$30,000.00	$30,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$25,000.00	$25,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$7,500.00	$7,500.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	500	L.F.	$5.00	$2,500.00
5	P-104-6.2	Bituminous Pavement Removal	4,000	S.Y.	$2.00	$8,000.00
7	P-152-4.1	Unclassified Excavation Placed in Embankment	7,500	C.Y.	$7.50	$56,250.00
8	P-152-4.3	Unsuitable Overdepth Excavation	500	C.Y.	$20.00	$10,000.00
9	P-154-5.1	Subbase Course (14")	2,560	C.Y.	$25.00	$64,000.00
10	P-208-5.1	Crushed Aggregate Base Course (4")	731	C.Y.	$35.00	$25,585.00
12	P-401-8.1a	Bituminous Surface Course (3")	1,147	Ton	$90.00	$103,230.00
13	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	2,000	L.F.	$40.00	$80,000.00
14	D-751-5.1	Install Storm Drain Inlet	10	EA.	$4,000.00	$40,000.00
15	P-620-5.1	Yellow Temporary Paint without Glass Beads	2,000	S.F.	$0.75	$1,500.00
16	P-620-5.2	Yellow Taxiway Paint with Glass Beads	2,000	S.F.	$0.85	$1,700.00
17	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$465,265.00
Contingency	5.0%	$23,263.25
Construction Total		$488,528.25
Administration	1.0%	$4,885.28
Construction Inspection	12.0%	$58,623.39
Engineering	10.0%	$48,852.83
Project "D" TOTAL		**$600,889.75**

Asphalt Area	59,200	S.F.
	6,578	S.Y.

Project "E" Rehabilitate (Seal Coat) Runway & Connecting Taxiways

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$17,500.00	$17,500.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$10,000.00	$10,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$12,500.00	$12,500.00
4	P-208-5.2	Seal Coat	76,096	S.Y.	$1.50	$114,144.33
5	P-605	Small & Medium Crack Repair	10,000	L.F.	$2.00	$20,000.00
6	P-620-5.1	White Temporary Paint without Glass Beads	45,000	S.F.	$0.75	$33,750.00
7	P-620-5.2	White Taxiway Paint with Glass Beads	45,000	S.F.	$0.85	$38,250.00
8	P-620-5.3	Yellow Temporary Paint without Glass Beads	1,500	S.F.	$0.75	$1,125.00
9	P-620-5.4	Yellow Taxiway Paint with Glass Beads	1,500	S.F.	$0.85	$1,275.00
10	N/A	Force Account Allowance	1	L.S.	$5,000.00	$5,000.00

Construction Sub-Total		$253,544.33
Contingency	5.0%	$12,677.22
Construction Total		$266,221.55
Administration	1.0%	$2,662.22
Construction Inspection	12.0%	$31,946.59
Engineering	10.0%	$26,622.16
Project "E" TOTAL		**$327,452.51**

Asphalt Area	684,866	S.F.
	76,096	S.Y.

Project "F" FBO Tenant Parking

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$30,000.00	$30,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$25,000.00	$25,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$12,500.00	$12,500.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	100	L.F.	$5.00	$500.00
5	P-104-6.2	Bituminous Pavement Removal	250	S.Y.	$2.00	$500.00
6	P-152-4.1	Unclassified Excavation Placed in Embankment	8,468	C.Y.	$5.00	$42,340.69
7	P-152-4.3	Unsuitable Overdepth Excavation	300	C.Y.	$20.00	$6,000.00
8	P-154-5.1	Subbase Course (14")	4,883	C.Y.	$15.00	$73,250.46
9	P-208-5.1	Crushed Aggregate Base Course (4")	1,395	C.Y.	$25.00	$34,877.68
10	P-401-8.1a	Bituminous Surface Course (3")	2,190	Ton	$90.00	$197,069.91
11	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	1,000	L.F.	$30.00	$30,000.00
12	D-751-5.1	Install Storm Drain Inlet	4	EA.	$3,500.00	$14,000.00
13	P-620-5.1	Yellow Temporary Paint without Glass Beads	3,000	S.F.	$0.75	$2,250.00
14	P-620-5.2	Yellow Taxiway Paint with Glass Beads	3,000	S.F.	$0.85	$2,550.00
15	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$480,838.74
Contingency	5.0%	$24,041.94
Construction Total		$504,880.68
Administration	1.0%	$5,048.81
Construction Inspection	12.0%	$60,585.68
Engineering	10.0%	$50,488.07
Project "F" TOTAL		**$621,003.23**

Asphalt Area 113,015 S.F.

Note: This project has been removed from the CIP and is assumed to be undertaken provately.

Project "G" Seal Coat West Side Pavements

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$10,000.00	$10,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$12,500.00	$12,500.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$7,500.00	$7,500.00
4	P-208-5.2	Seal Coat	71,539	S.Y.	$1.50	$107,308.33
5	P-605	Small & Medium Crack Repair	15,000	L.F.	$2.00	$30,000.00
8	P-620-5.3	Yellow Temporary Paint without Glass Beads	10,500	S.F.	$0.75	$7,875.00
9	P-620-5.4	Yellow Taxiway Paint with Glass Beads	10,500	S.F.	$0.85	$8,925.00
10	N/A	Force Account Allowance	1	L.S.	$5,000.00	$5,000.00
			Construction Sub-Total			$189,108.33
			Contingency		5.0%	$9,455.42
			Construction Total			$198,563.75
			Administration		1.0%	$1,985.64
			Construction Inspection		12.0%	$23,827.65
			Engineering		10.0%	$19,856.38
			Project "G" TOTAL			**$244,233.41**

Asphalt Area	643,850	S.F.
	71,539	S.Y.

Project "H" Construct Future T-Hangar Tenant Parking

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$25,000.00	$25,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$20,000.00	$20,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$12,500.00	$12,500.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	150	L.F.	$5.00	$750.00
5	P-104-6.2	Bituminous Pavement Removal	75	S.Y.	$2.00	$150.00
6	P-152-4.1	Unclassified Excavation Placed in Embankment	6,328	C.Y.	$5.00	$31,638.91
7	P-152-4.3	Unsuitable Overdepth Excavation	200	C.Y.	$20.00	$4,000.00
8	P-154-5.1	Subbase Course (14")	3,649	C.Y.	$15.00	$54,736.11
9	P-208-5.1	Crushed Aggregate Base Course (4")	1,042	C.Y.	$25.00	$26,062.21
10	P-401-8.1a	Bituminous Surface Course (3")	1,636	Ton	$90.00	$147,259.69
11	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	1,000	L.F.	$30.00	$30,000.00
12	D-751-5.1	Install Storm Drain Inlet	4	EA.	$3,500.00	$14,000.00
13	P-620-5.1	Yellow Temporary Paint without Glass Beads	2,200	S.F.	$0.75	$1,650.00
14	P-620-5.2	Yellow Taxiway Paint with Glass Beads	2,200	S.F.	$0.85	$1,870.00
15	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00
			Construction Sub-Total			$379,616.91
			Contingency		5.0%	$18,980.85
			Construction Total			$398,597.76
			Administration		1.0%	$3,985.98
			Construction Inspection		12.0%	$47,831.73
			Engineering		10.0%	$39,859.78
			Project "Q" TOTAL			**$490,275.24**

Asphalt Area 84,450 S.F.

Note: This project has been phassed into two projects in the CIP.

Project "I" Install Perimeter Fencing

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$17,500.00	$17,500.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$22,500.00	$22,500.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$10,000.00	$10,000.00
4	P-104-6.1	Install 7' Chain Link Fence w/ 3-Strand Wire	15000	L.F.	$21.00	$315,000.00
5		Install 20' Access Gate	4	EA.	$2,500.00	$10,000.00
6		Install Pedistrian Gate	8	EA.	$500.00	$4,000.00
7		Remove Existing Fence	2600	L.F.	$2.00	$5,200.00
8		Automatic Gates	4	EA.	$25,000.00	$100,000.00
9	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00
			Construction Sub-Total			$494,200.00
			Contingency		5.0%	$24,710.00
			Construction Total			$518,910.00
			Administration		1.0%	$5,189.10
			Construction Inspection		12.0%	$62,269.20
			Engineering		10.0%	$51,891.00
			Project "I" TOTAL			**$638,259.30**

Project "J" Taxilanes West Side T-Hangars

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$20,000.00	$20,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$15,000.00	$15,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$10,000.00	$10,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	425	L.F.	$5.00	$2,125.00
5	P-104-6.2	Bituminous Pavement Removal	100	S.Y.	$2.00	$200.00
6	P-152-4.1	Unclassified Excavation Placed in Embankment	10,000	C.Y.	$7.50	$75,000.00
7	P-152-4.3	Unsuitable Overdepth Excavation	400	C.Y.	$20.00	$8,000.00
8	P-154-5.1	Subbase Course (14")	1,361	C.Y.	$25.00	$34,027.78
9	P-208-5.1	Crushed Aggregate Base Course (4")	389	C.Y.	$35.00	$13,609.75
10	P-208-5.2	Shoulder Crushed Aggregate Base Course (3")	225	C.Y.	$25.00	$5,625.00
11	P-401-8.1a	Bituminous Surface Course (3")	610	Ton	$90.00	$54,928.13
12		Taxiway Lights	0	EA	$800.00	$0.00
13		Conduit and Conductor	0	L.F.	$15.00	$0.00
14	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	250	L.F.	$40.00	$10,000.00
15	D-705-5.1	Pavement Edge Underdrain	2,300	L.F.	$10.00	$23,000.00
16	D-751-5.1	Install Storm Drain Inlet	5	EA.	$4,000.00	$20,000.00
17	P-620-5.1	Yellow Temporary Paint without Glass Beads	600	S.F.	$1.00	$600.00
18	P-620-5.2	Yellow Taxiway Paint with Glass Beads	600	S.F.	$1.00	$600.00
19	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$302,715.65
Contingency	5.0%	$15,135.78
Construction Total		$317,851.44
Administration	1.0%	$3,178.51
Construction Inspection	12.0%	$38,142.17
Engineering	10.0%	$31,785.14
Project "J" TOTAL		**$390,957.27**

Asphalt Area	31,500	S.F.
	3,500	S.Y.

Project "K" Mill & Overlay West Apron

NAMPA, IDAHO - NAMPA MUNICIPAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$70,000.00	$70,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$55,000.00	$55,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$25,000.00	$25,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	1,500	L.F.	$5.00	$7,500.00
5	P-104-6.2	Bituminous Pavement Removal	48,337	S.Y.	$2.00	$96,674.00
6		Remove Existing Tie-Downs	54	EA.	$100.00	$5,400.00
7		Install Tie-Downs	54	EA.	$500.00	$27,000.00
8	P-401-8.1a	Bituminous Surface Course (3")	8,429	Ton	$90.00	$758,588.79
9	P-620-5.1	Yellow Temporary Paint without Glass Beads	4,100	S.F.	$0.75	$3,075.00
10	P-620-5.2	Yellow Taxiway Paint with Glass Beads	4,100	S.F.	$0.85	$3,485.00
11	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$1,061,722.79
Contingency	5.0%	$53,086.14
Construction Total		$1,114,808.93
Administration	1.0%	$11,148.09
Construction Inspection	12.0%	$133,777.07
Engineering	10.0%	$111,480.89
Project "K" TOTAL		**$1,371,214.99**

Asphalt Area	435,033	S.F.
	48,337	S.Y.

Project "L" T-Hangar Taxilanes- East Side

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$45,000.00	$45,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$35,000.00	$35,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$12,500.00	$12,500.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	300	L.F.	$5.00	$1,500.00
5	P-104-6.2	Bituminous Pavement Removal	100	S.Y.	$2.00	$200.00
7	P-152-4.1	Unclassified Excavation Placed in Embankment	9,500	C.Y.	$7.50	$71,250.00
8	P-152-4.3	Unsuitable Overdepth Excavation	250	C.Y.	$20.00	$5,000.00
9	P-154-5.1	Subbase Course (14")	6,121	C.Y.	$25.00	$153,029.94
10	P-208-5.1	Crushed Aggregate Base Course (4")	1,749	C.Y.	$35.00	$61,205.85
12	P-401-8.1a	Bituminous Surface Course (3")	2,745	Ton	$90.00	$247,023.11
13	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	1,000	L.F.	$40.00	$40,000.00
14	D-751-5.1	Install Storm Drain Inlet	12	EA.	$4,000.00	$48,000.00
15	P-620-5.1	Yellow Temporary Paint without Glass Beads	2,000	S.F.	$0.75	$1,500.00
16	P-620-5.2	Yellow Taxiway Paint with Glass Beads	2,000	S.F.	$0.85	$1,700.00
17	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$732,908.90
Contingency	5.0%	$36,645.45
Construction Total		$769,554.35
Administration	1.0%	$7,695.54
Construction Inspection	12.0%	$92,346.52
Engineering	10.0%	$76,955.44
Project "H" TOTAL		**$946,551.85**

Asphalt Area	141,662	S.F.
	15,740	S.Y.

Project "M" Construct Taxiway Behind Terminal Area

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$30,000.00	$30,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$22,500.00	$22,500.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$15,000.00	$15,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	200	L.F.	$5.00	$1,000.00
5	P-104-6.2	Bituminous Pavement Removal	100	S.Y.	$2.00	$200.00
6	P-152-4.1	Unclassified Excavation Placed in Embankment	5,000	C.Y.	$7.50	$37,500.00
7	P-152-4.3	Unsuitable Overdepth Excavation	350	C.Y.	$20.00	$7,000.00
8	P-154-5.1	Subbase Course (14")	2,317	C.Y.	$25.00	$57,923.92
9	P-208-5.1	Crushed Aggregate Base Course (4")	662	C.Y.	$35.00	$23,167.25
10	P-208-5.2	Shoulder Crushed Aggregate Base Course (3")	150	C.Y.	$25.00	$3,750.00
11	P-401-8.1a	Bituminous Surface Course (3")	1,039	Ton	$90.00	$93,501.62
12		Reflective Markers	45	EA	$800.00	$36,000.00
13		Conduit and Conductor	0	L.F.	$15.00	$0.00
14	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	1,000	L.F.	$40.00	$40,000.00
15	D-705-5.1	Pavement Edge Underdrain	3,100	L.F.	$10.00	$31,000.00
16	D-751-5.1	Install Storm Drain Inlet	4	EA.	$4,000.00	$16,000.00
17	P-620-5.1	Yellow Temporary Paint without Glass Beads	1,000	S.F.	$1.00	$1,000.00
18	P-620-5.2	Yellow Taxiway Paint with Glass Beads	1,000	S.F.	$1.00	$1,000.00
19	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$426,542.79
Contingency	5.0%	$21,327.14
Construction Total		$447,869.93
Administration	1.0%	$4,478.70
Construction Inspection	12.0%	$53,744.39
Engineering	10.0%	$44,786.99
Project "M" TOTAL		**$550,880.01**

Asphalt Area	53,621	S.F.
	5,958	S.Y.

Project "N" Expand East Apron Phase 2

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$70,000.00	$70,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$60,000.00	$60,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$25,000.00	$25,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	600	L.F.	$5.00	$3,000.00
5	P-104-6.2	Bituminous Pavement Removal	150	S.Y.	$2.00	$300.00
6		Install Tie-Downs	24	EA.	$500.00	$12,000.00
7	P-152-4.1	Unclassified Excavation Placed in Embankment	30,000	C.Y.	$7.50	$225,000.00
8	P-152-4.3	Unsuitable Overdepth Excavation	500	C.Y.	$20.00	$10,000.00
9	P-154-5.1	Subbase Course (14")	7,778	C.Y.	$25.00	$194,444.44
10	P-208-5.1	Crushed Aggregate Base Course (4")	2,222	C.Y.	$35.00	$77,770.00
11	P-208-5.2	Shoulder Crushed Aggregate Base Course (3")	35	C.Y.	$25.00	$875.00
12	P-401-8.1a	Bituminous Surface Course (3")	3,488	Ton	$90.00	$313,875.00
13	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	500	L.F.	$40.00	$20,000.00
13	D-705-5.1	Pavement Edge Underdrain	1,750	L.F.	$10.00	$17,500.00
14	D-751-5.1	Install Storm Drain Inlet	6	EA.	$4,000.00	$24,000.00
15	P-620-5.1	Yellow Temporary Paint without Glass Beads	910	S.F.	$1.00	$910.00
16	P-620-5.2	Yellow Taxiway Paint with Glass Beads	910	S.F.	$1.00	$910.00
17	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00
18		Paint Removal	0	L.S.	$7,500.00	$0.00

Construction Sub-Total		$1,065,584.44
Contingency	5.0%	$53,279.22
Construction Total		$1,118,863.67
Administration	1.0%	$11,188.64
Construction Inspection	9.0%	$100,697.73
Engineering	8.0%	$89,509.09
Project "B" TOTAL		**$1,320,259.13**

Asphalt Area	180,000 S.F.
	20,000 S.Y.
Perimeter of Asphalt	1,420 L.F.

Note: this project has been adjusted slightly for better phasing.

Project "O" Construct East Side Parallel Taxiway (Ph2)

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$60,000.00	$60,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$50,000.00	$50,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$20,000.00	$20,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	1,000	L.F.	$5.00	$5,000.00
5	P-104-6.2	Bituminous Pavement Removal	220	S.Y.	$2.00	$440.00
6	P-152-4.1	Unclassified Excavation Placed in Embankment	12,000	C.Y.	$7.50	$90,000.00
7	P-152-4.3	Unsuitable Overdepth Excavation	300	C.Y.	$20.00	$6,000.00
8	P-154-5.1	Subbase Course (14")	9,076	C.Y.	$25.00	$226,899.38
9	P-208-5.1	Crushed Aggregate Base Course (4")	2,593	C.Y.	$35.00	$90,750.68
10	P-208-5.2	Shoulder Crushed Aggregate Base Course (3")	1,800	C.Y.	$25.00	$45,000.00
11	P-401-8.1a	Bituminous Surface Course (3")	4,070	Ton	$90.00	$366,264.23
12		Reflective Markers	50	EA	$100.00	$5,000.00
14	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	2,200	L.F.	$40.00	$88,000.00
15	D-705-5.1	Pavement Edge Underdrain	4,900	L.F.	$10.00	$49,000.00
16	D-751-5.1	Install Storm Drain Inlet	4	EA.	$4,000.00	$16,000.00
17	P-620-5.1	Yellow Temporary Paint without Glass Beads	1,850	S.F.	$1.00	$1,850.00
18	P-620-5.2	Yellow Taxiway Paint with Glass Beads	1,850	S.F.	$1.00	$1,850.00
19	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$1,132,054.28
Contingency	5.0%	$56,602.71
Construction Total		$1,188,657.00
Administration	1.0%	$11,886.57
Construction Inspection	11.0%	$130,752.27
Engineering	9.0%	$106,979.13
Project "O" TOTAL		**$1,438,274.97**

Asphalt Area	210,044	S.F.
	23,338	S.Y.

Project "P" Runway/Taxiway Extension

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$80,000.00	$80,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$75,000.00	$75,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$20,000.00	$20,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	526	L.F.	$5.00	$2,630.00
5	P-104-6.2	Bituminous Pavement Removal	120	S.Y.	$2.00	$240.00
6	P-152-4.1	Unclassified Excavation Placed in Embankment	19,000	C.Y.	$7.50	$142,500.00
7	P-152-4.3	Unsuitable Overdepth Excavation	500	C.Y.	$20.00	$10,000.00
8	P-154-5.1	Subbase Course (14")	15,863	C.Y.	$25.00	$396,578.09
9	P-208-5.1	Crushed Aggregate Base Course (4")	4,532	C.Y.	$35.00	$158,615.37
10	P-208-5.2	Shoulder Crushed Aggregate Base Course (3")	630	C.Y.	$25.00	$15,750.00
11	P-401-8.1a	Bituminous Surface Course (3")	7,113	Ton	$90.00	$640,162.01
12	L	Reflective Markers	45	EA	$100.00	$4,500.00
		Runway Edge Lights	25	EA	$800.00	$20,000.00
		Taxiway Edge Lights	40	EA	$800.00	$32,000.00
		Conduit and Conductors	6,500	L.F.	$12.00	$78,000.00
14	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	3,200	L.F.	$40.00	$128,000.00
15	D-705-5.1	Pavement Edge Underdrain	9,800	L.F.	$10.00	$98,000.00
16	D-751-5.1	Install Storm Drain Inlet	4	EA.	$4,000.00	$16,000.00
17	P-620-5.1	Yellow/White Temporary Paint w/out Glass Beads	16,800	S.F.	$1.00	$16,800.00
18	P-620-5.2	Yellow/White Taxiway Paint with Glass Beads	16,800	S.F.	$1.00	$16,800.00
		Paint Removal	1	LS	$12,000.00	$12,000.00
19	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$1,973,575.47
Contingency	5.0%	$98,678.77
Construction Total		$2,072,254.24
Administration	1.0%	$20,722.54
Construction Inspection	9.5%	$196,864.15
Engineering	7.5%	$155,419.07
Project "O" TOTAL		**$2,445,260.01**

Asphalt Area	367,118	S.F.
	40,791	S.Y.

Project "Q" Relocate Canyon Hill Lateral

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$10,000.00	$10,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$8,500.00	$8,500.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$1,000.00	$1,000.00
4		Miscellanious Structures	7	EA.	$7,500.00	$52,500.00
5	P-152-4.1	Unclassified Excavation Placed in Excavation	8,400	C.Y.	$7.50	$63,000.00
6	P-152-4.2	Unclassified Excavation Placed in Embankment	11,400	C.Y.	$10.00	$114,000.00
8	P-154-5.1	Subbase Course (14")	1,050	C.Y.	$25.00	$26,250.00
17	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00
			Construction Sub-Total			$285,250.00
			Contingency		5.0%	$14,262.50
			Construction Total			$299,512.50
			Administration		1.0%	$2,995.13
			Construction Inspection		11.0%	$32,946.38
			Engineering		9.0%	$26,956.13
			Project "Q" TOTAL			**$362,410.13**

Project "R" Taxilanes West Side T-Hangars

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$22,500.00	$22,500.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$17,500.00	$17,500.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$10,000.00	$10,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	350	L.F.	$5.00	$1,750.00
5	P-104-6.2	Bituminous Pavement Removal	50	S.Y.	$2.00	$100.00
6	P-152-4.1	Unclassified Excavation Placed in Embankment	3,500	C.Y.	$7.50	$26,250.00
7	P-152-4.3	Unsuitable Overdepth Excavation	250	C.Y.	$20.00	$5,000.00
8	P-154-5.1	Subbase Course (14")	2,511	C.Y.	$25.00	$62,777.47
9	P-208-5.1	Crushed Aggregate Base Course (4")	717	C.Y.	$35.00	$25,108.48
10	P-208-5.2	Shoulder Crushed Aggregate Base Course (3")	300	C.Y.	$25.00	$7,500.00
11	P-401-8.1a	Bituminous Surface Course (3")	1,126	Ton	$90.00	$101,336.29
12		Reflective Markers	40	EA	$100.00	$4,000.00
14	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	750	L.F.	$40.00	$30,000.00
15	D-705-5.1	Pavement Edge Underdrain	3,200	L.F.	$10.00	$32,000.00
16	D-751-5.1	Install Storm Drain Inlet	4	EA.	$4,000.00	$16,000.00
17	P-620-5.1	Yellow Temporary Paint without Glass Beads	900	S.F.	$1.00	$900.00
18	P-620-5.2	Yellow Taxiway Paint with Glass Beads	900	S.F.	$1.00	$900.00
19	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$373,622.23
Contingency	5.0%	$18,681.11
Construction Total		$392,303.34
Administration	1.0%	$3,923.03
Construction Inspection	12.0%	$47,076.40
Engineering	10.0%	$39,230.33
Project "R" TOTAL		**$482,533.11**
Revised Total		**$241,266.56**

Asphalt Area	58,114 S.F.
	6,457 S.Y.

Note: Project revised to one taxilane not the original two.

Project "S" Hangar Access Road

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$12,500.00	$12,500.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$9,000.00	$9,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$3,000.00	$3,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	100	L.F.	$5.00	$500.00
5	P-104-6.2	Bituminous Pavement Removal	75	S.Y.	$2.00	$150.00
7	P-152-4.1	Unclassified Excavation Placed in Embankment	2,500	C.Y.	$7.50	$18,750.00
8	P-152-4.3	Unsuitable Overdepth Excavation	250	C.Y.	$20.00	$5,000.00
9	P-154-5.1	Subbase Course (14")	1,354	C.Y.	$25.00	$33,844.14
10	P-208-5.1	Crushed Aggregate Base Course (4")	387	C.Y.	$35.00	$13,536.30
12	P-401-8.1a	Bituminous Surface Course (3")	607	Ton	$90.00	$54,631.69
13	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	350	L.F.	$40.00	$14,000.00
14	D-751-5.1	Install Storm Drain Inlet	2	EA.	$4,000.00	$8,000.00
15	P-620-5.1	Yellow Temporary Paint without Glass Beads	400	S.F.	$0.75	$300.00
16	P-620-5.2	Yellow Taxiway Paint with Glass Beads	400	S.F.	$0.85	$340.00
17	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$183,552.12
Contingency	5.0%	$9,177.61
Construction Total		$192,729.73
Administration	1.0%	$1,927.30
Construction Inspection	12.0%	$23,127.57
Engineering	10.0%	$19,272.97
Project "S" TOTAL		**$237,057.57**

Asphalt Area	31,330	S.F.
	3,481	S.Y

Project "T" Expand East Apron Phase 3

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$100,000.00	$100,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$80,000.00	$80,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$30,000.00	$30,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	2,700	L.F.	$5.00	$13,500.00
5	P-104-6.2	Bituminous Pavement Removal	600	S.Y.	$2.00	$1,200.00
6		Install Tie-Downs	65	EA.	$500.00	$32,500.00
7	P-152-4.1	Unclassified Excavation Placed in Embankment	19,000	C.Y.	$7.50	$142,500.00
8	P-152-4.3	Unsuitable Overdepth Excavation	500	C.Y.	$20.00	$10,000.00
9	P-154-5.1	Subbase Course (14")	14,875	C.Y.	$25.00	$371,875.00
10	P-208-5.1	Crushed Aggregate Base Course (4")	4,250	C.Y.	$35.00	$148,735.13
11	P-208-5.2	Shoulder Crushed Aggregate Base Course (3")	150	C.Y.	$25.00	$3,750.00
12	P-401-8.1a	Bituminous Surface Course (3")	6,670	Ton	$90.00	$600,285.94
13	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	1,600	L.F.	$40.00	$64,000.00
13	D-705-5.1	Pavement Edge Underdrain	2,100	L.F.	$10.00	$21,000.00
14	D-751-5.1	Install Storm Drain Inlet	4	EA.	$4,000.00	$16,000.00
15	P-620-5.1	Yellow Temporary Paint without Glass Beads	2,000	S.F.	$1.00	$2,000.00
16	P-620-5.2	Yellow Taxiway Paint with Glass Beads	2,000	S.F.	$1.00	$2,000.00
17	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00
18		Paint Removal	0	L.S.	$7,500.00	$0.00

Construction Sub-Total		$1,649,346.06
Contingency	3.5%	$57,727.11
Construction Total		$1,707,073.17
Administration	1.0%	$17,070.73
Construction Inspection	9.0%	$153,636.59
Engineering	7.0%	$119,495.12
Project "T" TOTAL		**$1,997,275.61**

Asphalt Area	344,250	S.F.
	38,250	S.Y.
Perimeter of Asphalt	1,420	L.F.

Note: Project revised to Phase Four.

Project "U" Extend and Improve KCID Road

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$45,000.00	$45,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$35,000.00	$35,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$7,500.00	$7,500.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	150	L.F.	$5.00	$750.00
5	P-104-6.2	Bituminous Pavement Removal	50	S.Y.	$2.00	$100.00
7	P-152-4.1	Unclassified Excavation Placed in Embankment	10,000	C.Y.	$7.50	$75,000.00
8	P-152-4.3	Unsuitable Overdepth Excavation	350	C.Y.	$20.00	$7,000.00
9	P-154-5.1	Subbase Course (14")	7,156	C.Y.	$25.00	$178,888.89
10	P-208-5.1	Crushed Aggregate Base Course (4")	2,044	C.Y.	$35.00	$71,548.40
12	P-401-8.1a	Bituminous Surface Course (3")	3,209	Ton	$90.00	$288,765.00
13	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	350	L.F.	$40.00	$14,000.00
14	D-751-5.1	Install Storm Drain Inlet	0	EA.	$4,000.00	$0.00
15	P-620-5.1	Yellow Temporary Paint without Glass Beads	2,600	S.F.	$0.75	$1,950.00
16	P-620-5.2	Yellow Taxiway Paint with Glass Beads	2,600	S.F.	$0.85	$2,210.00
		Bridge Structure over Canal	1	L.S.	$20,000.00	$20,000.00
17	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00
			Construction Sub-Total			$757,712.29
			Contingency		5.0%	$37,885.61
			Construction Total			$795,597.90
			Administration		1.0%	$7,955.98
			Construction Inspection		11.0%	$87,515.77
			Engineering		9.0%	$71,603.81
			Project "U" TOTAL			**$962,673.46**

Asphalt Area 165,600 S.F.

Project "V" Hangar Access Road

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$15,000.00	$15,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$12,000.00	$12,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$3,000.00	$3,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	300	L.F.	$5.00	$1,500.00
5	P-104-6.2	Bituminous Pavement Removal	75	S.Y.	$2.00	$150.00
7	P-152-4.1	Unclassified Excavation Placed in Embankment	2,250	C.Y.	$7.50	$16,875.00
8	P-152-4.3	Unsuitable Overdepth Excavation	250	C.Y.	$20.00	$5,000.00
9	P-154-5.1	Subbase Course (14")	1,702	C.Y.	$25.00	$42,550.93
10	P-208-5.1	Crushed Aggregate Base Course (4")	486	C.Y.	$35.00	$17,018.67
12	P-401-8.1a	Bituminous Surface Course (3")	763	Ton	$90.00	$68,686.31
13	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	500	L.F.	$40.00	$20,000.00
14	D-751-5.1	Install Storm Drain Inlet	4	EA.	$4,000.00	$16,000.00
15	P-620-5.1	Yellow Temporary Paint without Glass Beads	760	S.F.	$0.75	$570.00
16	P-620-5.2	Yellow Taxiway Paint with Glass Beads	760	S.F.	$0.85	$646.00
17	N/A	Force Account Allowance	1	L.S.	$10,000.00	$10,000.00

Construction Sub-Total		$228,996.91
Contingency	5.0%	$11,449.85
Construction Total		$240,446.75
Administration	1.0%	$2,404.47
Construction Inspection	11.0%	$26,449.14
Engineering	9.0%	$21,640.21
Project "V" TOTAL		**$290,940.57**

Asphalt Area 39,390 S.F.

Project "W" Aircraft Wash Rack

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$5,000.00	$5,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$4,000.00	$4,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$1,750.00	$1,750.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	150	L.F.	$5.00	$750.00
5	P-104-6.2	Bituminous Pavement Removal	50	S.Y.	$2.00	$100.00
7	P-152-4.1	Unclassified Excavation Placed in Embankment	400	C.Y.	$7.50	$3,000.00
8	P-152-4.3	Unsuitable Overdepth Excavation	50	C.Y.	$20.00	$1,000.00
9	P-154-5.1	Subbase Course (14")	268	C.Y.	$25.00	$6,697.53
10	P-208-5.1	Crushed Aggregate Base Course (4")	77	C.Y.	$35.00	$2,678.74
12	P-401-8.1a	Bituminous Surface Course (3")	120	Ton	$90.00	$10,811.25
13	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	250	L.F.	$40.00	$10,000.00
14	D-751-5.1	Install Storm Drain Inlet	2	EA.	$4,000.00	$8,000.00
15	P-620-5.1	Power washer system	1	L.S.	$4,000.00	$4,000.00
16	P-620-5.2	Yellow Taxiway Paint with Glass Beads	0	S.F.	$0.85	$0.00
17	N/A	Force Account Allowance	1	L.S.	$2,500.00	$2,500.00

Construction Sub-Total		$60,287.53
Contingency	5.0%	$3,014.38
Construction Total		$63,301.90
Administration	1.0%	$633.02
Construction Inspection	11.0%	$6,963.21
Engineering	9.0%	$5,697.17
Project "V" TOTAL		**$76,595.30**

Asphalt Area 6,200 S.F.

Project "X" Cover Highline Canal

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$40,000.00	$40,000.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$30,000.00	$30,000.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$7,500.00	$7,500.00
4		Miscellanious Structures	1	L.S.	$10,000.00	$10,000.00
5	P-152-4.1	Unclassified Excavation Placed in Excavation	1,000	S.Y.	$5.00	$5,000.00
6	P-152-4.2	Unclassified Excavation Placed in Embankment	2,000	C.Y.	$10.00	$20,000.00
8	P-154-5.1	Repair Existing Maintenance Road	1	L.S.	$10,000.00	$10,000.00
		Concrete Culvert	400	LF.	$1,400.00	$560,000.00
17	N/A	Force Account Allowance	1	L.S.	$5,000.00	$5,000.00
			Construction Sub-Total			$687,500.00
			Contingency		5.0%	$34,375.00
			Construction Total			$721,875.00
			Administration		1.0%	$7,218.75
			Construction Inspection		12.0%	$86,625.00
			Engineering		10.0%	$72,187.50
			Project "X" TOTAL			**$887,906.25**

Project "Y" Hangar Taxilanes Between T/W L and M

CALDWELL, IDAHO - CALDWELL INDUSTRIAL AIRPORT

AIRPORT IMPROVEMENTS PROJECT

Item No.	Spec. No.	Description	Estimated Quantity	Unit Measure	Unit Price	Total Price
1	P-100-5.1	Contractor Quality Control	1	L.S.	$17,500.00	$17,500.00
2	P-102-3.1	Mobilization/Demobilization	1	L.S.	$12,500.00	$12,500.00
3	P-103-5.1	Airport Safety and Security	1	L.S.	$5,000.00	$5,000.00
4	P-104-6.1	Saw Cut Asphalt Concrete Full Depth	760	L.F.	$5.00	$3,800.00
5	P-104-6.2	Bituminous Pavement Removal	170	S.Y.	$2.00	$340.00
7	P-152-4.1	Unclassified Excavation Placed in Embankment	2,000	C.Y.	$7.50	$15,000.00
8	P-152-4.3	Unsuitable Overdepth Excavation	350	C.Y.	$20.00	$7,000.00
9	P-154-5.1	Subbase Course (14")	1,541	C.Y.	$25.00	$38,515.12
10	P-208-5.1	Crushed Aggregate Base Course (4")	440	C.Y.	$35.00	$15,404.51
11	P-208-5.2	Shoulder Crushed Aggregate Base Course (3")	250	C.Y.	$25.00	$6,250.00
12	P-401-8.1a	Bituminous Surface Course (3")	691	Ton	$90.00	$62,171.66
13	D-701-5.2	Install 12-Inch C-900 PVC Storm Drain Pipe	700	L.F.	$40.00	$28,000.00
13	D-705-5.1	Pavement Edge Underdrain	2,800	L.F.	$10.00	$28,000.00
14	D-751-5.1	Install Storm Drain Inlet	6	EA.	$4,000.00	$24,000.00
15	P-620-5.1	Yellow Temporary Paint without Glass Beads	1,200	S.F.	$1.00	$1,200.00
16	P-620-5.2	Yellow Taxiway Paint with Glass Beads	1,200	S.F.	$1.00	$1,200.00
17	N/A	Force Account Allowance	1	L.S.	$7,500.00	$7,500.00
18		Paint Removal	0	L.S.	$7,500.00	$0.00

Construction Sub-Total		$273,381.29
Contingency	5.0%	$13,669.06
Construction Total		$287,050.36
Administration	1.0%	$2,870.50
Construction Inspection	11.0%	$31,575.54
Engineering	10.0%	$28,705.04
Project "Y" TOTAL		**$350,201.44**

Asphalt Area	35,654	S.F.
	3,962	S.Y.
Perimeter of Asphalt	1,420	L.F.

Appendix C

ENVIRONMENTAL OVERVIEW

Appendix C
ENVIRONMENTAL OVERVIEW

A review of the potential environmental impacts associated with proposed airport projects is an essential consideration in the Airport Master Plan process. The primary purpose of this section is to review the proposed improvement program at Caldwell Industrial Airport to determine whether the proposed actions could, individually or collectively, have the potential to significantly affect the quality of the environment. The information contained in this section was obtained from previous studies, various internet websites, and analysis by the consultant.

Construction of any and all improvements depicted on the Airport Layout Plan (ALP) will require compliance with the *National Environmental Policy Act* (NEPA) *of 1969*, as amended. This includes privately funded projects in addition to those projects receiving federal funding. For projects not "categorically excluded" under FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). In instances where significant environmental impacts are expected, an Environmental Impact Statement (EIS) may be required.

While this portion of the Master Plan is not designed to satisfy the NEPA requirements, it is intended to supply a preliminary review of environmental issues that would need to be analyzed in more detail within the environmental review processes. This evaluation considers all environmental categories required as outlined within FAA Order 1050.1E, *Environmental Impacts, Policies and*

Procedures, and FAA Order 5050.4B, *National Environmental Policy Act* (NEPA) *Implementation Instructions for Airport Actions.*

The following sections provide a description of the environmental resources which could be impacted by the proposed ultimate airport development depicted on Exhibit 5A.

Through a review of previous environmental studies and resource agency websites, it was determined that the following resources are not present within the airport environs or cannot be inventoried:

- Coastal Barriers
- Coastal Zone Management Areas
- Construction Impacts
- Energy Supply, Natural Resources, and Sustainable Design
- Secondary (Induced) Impacts
- Wild and Scenic Rivers

AIR QUALITY

Air quality in a given location is described by the concentrations of various pollutants in the atmosphere. The significance of a pollution concentration is determined by comparing it to the state and federal air quality standards. In 1971, the U.S. Environmental Protection Agency (EPA) established standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O_3), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Oxide (NO), Particulate Matter (PM_{10} and $PM_{2.5}$), and Lead (Pb).

Based on federal air quality standards, a specific geographic area can be classified as either an "attainment," "maintenance," or "non-attainment" area for each pollutant. The threshold for non-attainment designation varies by pollutant. According to the Environmental Protection Agency's (EPA) Greenbook, Canyon County is an attainment area for all criteria pollutants.

Throughout the short, intermediate, and long term phases, planned projects at the airport could result in impacts to air quality. Temporary impacts would generally result during all types of construction. Emissions from the operation of construction vehicles and fugitive dust from excavation are common air pollutants during construction. More permanent air quality impacts will result from the forecasted increase in operations at the airport. These potential impacts may need to be evaluated as part of any required environmental documentation for planned projects. Evaluation typically includes preparation of an air emissions inventory

which includes estimates of on-site construction activity and may also include aircraft-related emissions.

DEPARTMENT OF TRANSPORTATION - SECTION 4(F) RESOURCES

Section 4(f) properties include publicly owned land from a public park, recreational area, or wildlife and waterfowl refuge of national, state, or local significance; or any land from a historic site of national, state, or local significance. As discussed in Chapter Six, property acquisition is planned in the short, intermediate, and long term plans for the airport. No publicly owned land from a park, recreational area, or wildlife and waterfowl refuge of national, state, or local significance; or any land from a historic site of national, state, or local significance is present within the areas planned to be acquired.

FISH, WILDLIFE, AND PLANTS

Biotic resources include the various types of plants and animals that are present in a particular area. The term also applies to rivers, lakes, wetlands, forests, and other habitat types that support plants, birds, and/or fish. Typically, development in areas such as previously disturbed airport property, populated places, or farmland would result in minimal impacts to biotic resources.

The Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) are charged with overseeing the requirements contained within Section 7 of the *Endangered Species Act*. This Act was put into place to protect animal or plant species whose populations are threatened by human activities. Along with the FAA, the FWS and the NMFS review projects to determine if a significant impact to these protected species will result with implementation of a proposed project. Significant impacts occur when the proposed action could jeopardize the continued existence of a protected species or would result in the destruction or adverse modification of federally designated critical habitat in the area

The *Sikes Act* and various amendments authorize states to prepare statewide wildlife conservation plans, and the Department of Defense (DOD) to prepare similar plans, for resources under their jurisdiction. Airport improvement projects should be checked for consistency with the State or DOD Wildlife Conservation Plans where such plans exist.

According to the U.S. Fish and Wildlife Service (USFWS) and the Idaho Governor's Office, two federally-listed species have potential habitat in Canyon County. These species are listed in **Table C1.**

TABLE C1 Threatened or Endangered Species in Canyon County, Idaho		
Common Name	**Species**	**Federal Status**
Snake River physa snail	*Haitia (Physa) natricina)*	Endangered
Slickspot peppergrass	*Lepidium papilliferum*	Threatened
Source: USFWS Idaho Fish and Wildlife Office, accessed January 2010.		

The Snake River physa snail is a freshwater mollusk found in the middle Snake River of southern Idaho. The Snake River is located approximately ten miles west of the airport; therefore, this habitat is not present at the airport.

The slickspot peppergrass habitat is limited to semiarid sagebrush-steppe habitat. Environmental documentation prepared in 2006 for an airport property acquisition project describes the airport as an area primarily used for agricultural production or has been urbanized; as a result, native vegetation is minimal.[1] Due to urbanization of the area, sagebrush no longer exists in the area; therefore, suitable habitat for the slickspot peppergrass is not present. These findings may need to be confirmed prior to the development of projects in the short and intermediate term. Coordination between the FAA and the U.S. Fish and Wildlife Service may be required to determine the presence of threatened or endangered species within these areas.

FLOODPLAINS

As defined in FAA Order 1050.1E, floodplains consist of "lowland and relatively flat areas adjoining inland and coastal water including flood prone areas of offshore islands, including at a minimum, that area subject to one percent or greater chance of flooding in any given year." Federal agencies are directed to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore and preserve the natural and beneficial values served by floodplains. Floodplains have natural and beneficial values, such as providing ground water recharge, water quality maintenance, fish, wildlife, plants, open space, natural beauty, outdoor recreation, agriculture, and forestry. FAA Order 1050.1E (12) (c) indicates that "if the proposed action and reasonable alternatives are not within the limits of a base floodplain (100-year flood area)," that it may be assumed that there are no floodplain impacts. The limits of base floodplains are determined by Flood Insurance Rate Maps (FIRM) prepared by the Federal Emergency Management Agency (FEMA).

[1] Caldwell Industrial Airport Land Acquisition and East Side Development Environmental Assessment, January 2006

A review of FEMA Flood Insurance Rate Map number 1600360002C, which includes the airport property, indicates the airport is not located within a designated 100-year floodplain. The nearest floodplain is located on the west side of Interstate 84 and is associated with Indian Creek. None of the proposed improvements identified within the airport master plan would be located within a 100-year floodplain.

FARMLAND

The *Farmland Protection Policy Act* (FPPA) was enacted to preserve farmland. FPPA guidelines apply to farmland classified as prime or unique, or of state or local importance as determined by the appropriate government agency, with concurrence by the Secretary of Agriculture.

According to information obtained from the United States Department of Agriculture's National Resource Conservation Service (NRCS) website, eight soil types are present within the vicinity of the airport. Within the areas proposed to be acquired in the short, intermediate, and long term development stages, the soils are classified as "Prime, if irrigated." Due to the availability of water from irrigation canals in the area, the NRCS may consider these soils subject to the FPPA. Any environmental documentation required prior to development on these parcels may require coordination with NRCS staff to determine if converting these lands to airport use would result in an impact under FPPA.

HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

Federal, state, and local laws regulate hazardous materials use, storage, transport, and disposal. These laws may extend to past and future landowners of properties containing these materials. In addition, disrupting sites containing hazardous materials or contaminates may cause significant impacts to soil, surface water, groundwater, air quality, and the organisms using these resources.

The EPA's *Enviromapper for Envirofacts*[2] was consulted regarding the presence of impaired waters or regulated hazardous sites. Indian Creek, which is located on the west side of Interstate 84, is designated as an impaired stream under Section 303(d) of the *Clean Water Act*. Due to the distance between the airport and Indian Creek and the buffer provided by Interstate 84, the proposed airport improvements will not disturb or use any portion of Indian Creek. Indirect impacts to Indian Creek may be reduced with implementation of construction best management practices (BMPs). According to the site, there are no SUPERFUND sites within the vicinity of the airport.

[2] http://map24.epa.gov/EMR/Default.aspx, Accessed August 2010.

As previously discussed, property acquisition projects are identified for the short, intermediate, and long range planning horizons. Property acquisition projects may require the preparation of an environmental due diligence audit to determine the presence of any recognized environmental conditions (RECs). An REC is defined by the American Society for Testing and Materials as the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances, or petroleum products into the ground, groundwater, or surface water of a property.

A construction-related National Pollutant Discharge Elimination System (NPDES) permit may be required prior to on-airport construction projects. The permit requires a Notice of Intent for all construction activities disturbing one or more acre of land. In conjunction with the NPDES, a Storm Water Pollution Prevention Plan (SWPPP) may be required to outline the best management practices to be used to minimize impacts to storm water conveyance systems.

HISTORICAL AND CULTURAL RESOURCES

Determination of a project's impact to historical and cultural resources is made in compliance with the *National Historic Preservation Act* (NHPA) *of 1966*, as amended for federal undertakings. A historic property is defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). Properties or sites having traditional religions or cultural importance to Native American Tribes may also qualify.

According to the 2006 Environmental Assessment for Land Acquisition and East Side Development prepared for Caldwell Industrial Airport, the Canyon Hill Lateral Canal and the Caldwell Highline Canal are both considered eligible for listing on the National Register of Historic Places due to their historical significance in the areas of irrigation, agriculture, and settlement. These canals are managed by the Pioneer Irrigation District.

The 2006 Environmental Assessment was undertaken to evaluate the environmental impacts of airport development on the east side of the airport, which includes relocating a portion of the Canyon Hill Lateral Canal. As part of the documentation process, coordination was undertaken with the Idaho State Historic Preservation Office and it was determined that the proposed relocation would constitute an adverse effect to the NRHP-eligible canal. A Memorandum of Agreement was developed between the City of Caldwell, FAA, SHPO, and the Pioneer Irrigation District to take into account the effect of the project on the canal. The MOA stipulates that the existing canal be thoroughly documented with

photographs and a narrative report prior to construction or demolition activities on the site. To date, this project has not been undertaken.

The airport master plan calls for similar alterations to the Canyon Hill Lateral within the short term development period; however, the alignment of the canal has been altered. Prior to implementing the canal improvements, coordination between the City of Caldwell, FAA, SHPO, and the Pioneer Irrigation District will be necessary. Additionally, in the intermediate term, the master plan identifies a portion of the Highline Canal which is planned to be covered to meet FAA runway safety area standards. Coordination between City of Caldwell, FAA, SHPO, and the Pioneer Irrigation District may be necessary prior to implementing this project due to the NHRP eligibility of the Highline Canal.

Additional archaeological field surveys and records research may be needed in conjunction with the property acquisition projects identified in the master plan.

NOISE

Per federal regulation, the Yearly Day-Night Average Sound Level (DNL) is used in this study to assess aircraft noise. DNL is the metric currently accepted by the FAA, EPA, and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three agencies have each identified the 65 DNL noise contour as the threshold of incompatibility. Noise exposure contours are overlaid on maps of existing and planned land uses to determine areas that may be affected by aircraft noise at or above 65 DNL. The noise exposure contours are developed using the FAA-approved Integrated Noise Model which accepts inputs for several airport characteristics including: aircraft type, operations, flight tracks, time of day, and topography.

Exhibit C1 depicts the existing condition noise exposure contours for Caldwell Industrial Airport. As shown on the exhibit, the 65 DNL noise contour does not extend off airport property and does not affect any noise-sensitive land uses. **Exhibit C2** depicts the ultimate condition noise contours, based on long range forecast operations outlined in Chapter Two. As shown on the exhibit, the noise exposure contours do not extend off airport property and do not affect any noise-sensitive land uses.

COMPATIBLE LAND USE

The compatibility of existing and planned land uses in the vicinity of an airport is typically associated with the extent of the airport's noise impacts. Noise impacts are generally evaluated by comparing the extent of the airport's noise exposure contours to the land uses within the immediate vicinity of the airport.

As discussed in Chapter One, two Airport Zones have been defined for the area surrounding the airport. Airport Overlay Zone 1 is established to contribute to the safe operation of the airport, to facilitate orderly development around the airport, and to protect the possibility of future expansion of the airport. Airport Overlay Zone 2 is the Noise Abatement Limitation zone which is established to control and minimize impacts on development surrounding the airport. It is the intent of this zone to encourage land use patterns appropriate in the vicinity of the airport. The areas proposed for acquisition are located within Airport Zone 1. As discussed previously, there are no noise-sensitive land uses within the existing or future 65 DNL noise contours.

Additionally, the proposed extension of Runway 12-30 would relocate the Runway Protection Zone (RPZ) at the Runway 12 end over five existing residences. Federal Aviation Administration (FAA) Advisory Circular 150/5300-13, *Airport Design*, states that the function of an RPZ is to enhance the protection of people and property on the ground. This is achieved through airport owner control over RPZs. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ. Acquisition of the RPZ would allow the airport to control the types of uses within the RPZ and would have the ability to clear this area of potential non-compatible land uses, such as the existing residences.

LIGHT EMISSIONS AND VISUAL IMPACTS

Airport lighting is characterized as either airfield lighting (i.e., runway, taxiway, approach and landing lights) or landside lighting (i.e., security lights, building interior lighting, parking lights, and signage). Generally, airport lighting does not result in significant impacts unless a high intensity strobe light, such as a REIL, would produce glare on any adjoining site, particularly residential uses.

Visual impacts relate to the extent that the proposed development contrasts with the existing environment and whether a jurisdictional agency considers this contrast objectionable. The visual sight of aircraft, aircraft contrails, or aircraft lights at night, particularly at a distance that is not normally intrusive, should not be assumed to constitute an adverse impact.

In the short term, development on the east side of the airport, such as the FBO development area, apron expansion, fuel farm, and maintenance building will include associated security lighting. The additional lighting will alter the existing ambient light levels east of the airport.

09MP07-C1-08/24/10

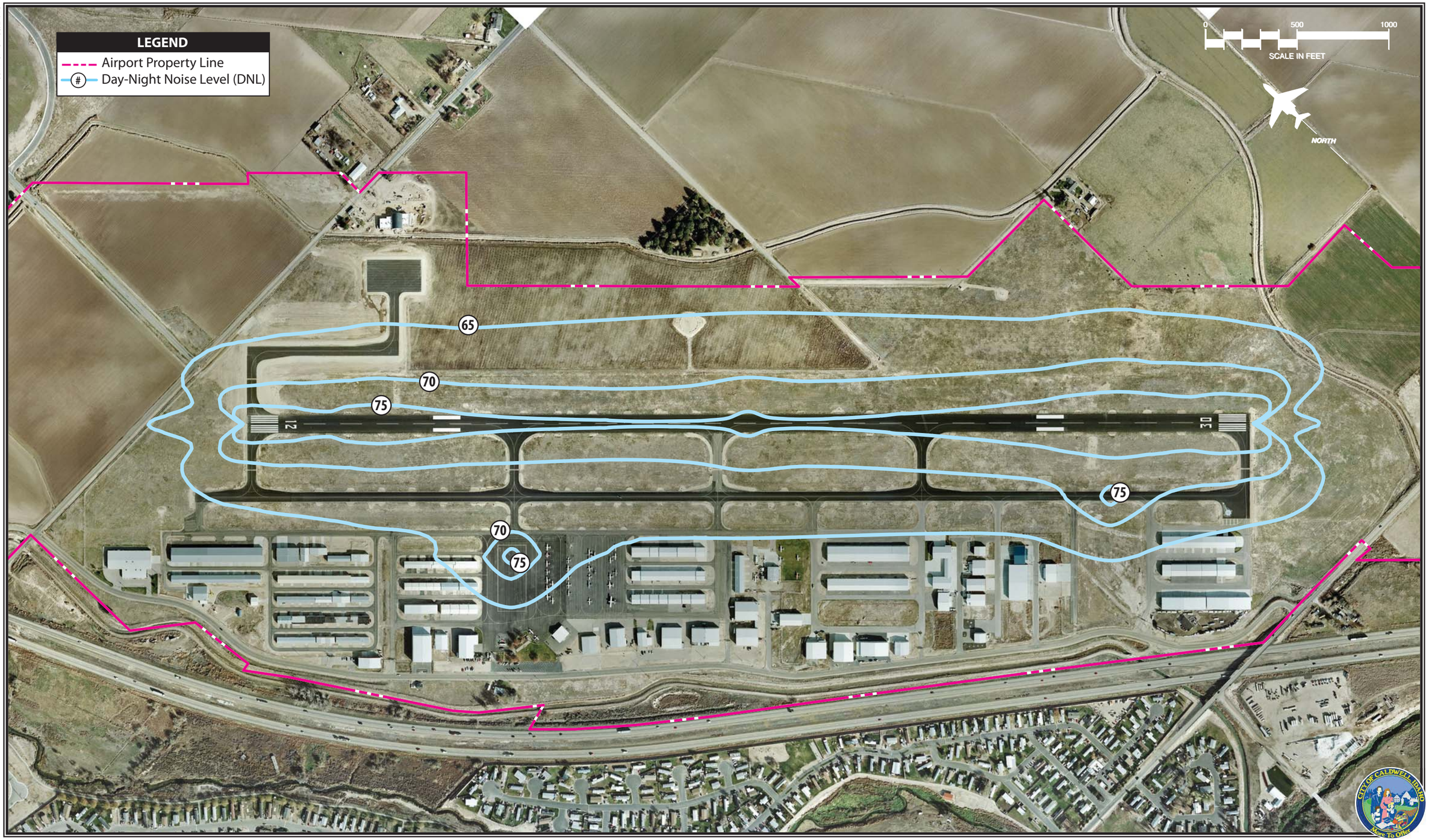


Exhibit C1
EXISTING NOISE CONTOURS

09MP07-C2-7/19/10

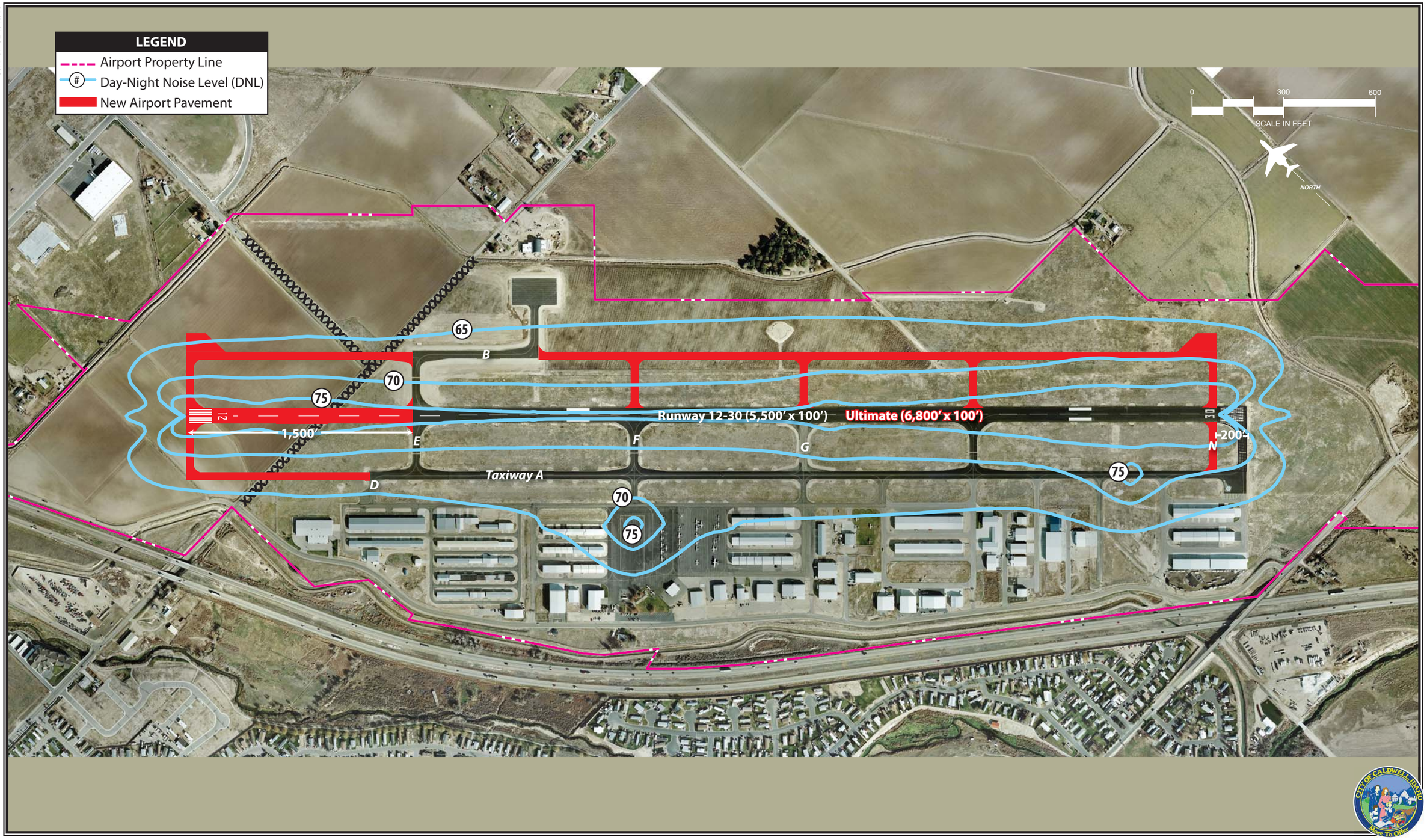


Exhibit C2
FUTURE NOISE CONTOURS

SOCIOECONOMIC IMPACTS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Socioeconomic impacts known to result from airport improvements are often associated with relocation activities or other community disruptions, including alterations to surface transportation patterns, division or disruption of existing communities, interferences with orderly planned development, or an appreciable change in employment related to the project.

The master plan proposes closure of the portion of Linden Road between Interstate 84 and KCID Road for the extension of Runway 12-30. This will eliminate one connecting route between the east and west sides of the Interstate. Additional analysis may be necessary to evaluate the potential impact of this closure on the existing community. The closure could increase travel distances for residents on either side of the Interstate and would increase travel times. As part of associated environmental documentation for this project, coordination with nearby residents may be needed to gather input regarding potential impacts resulting from road closure.

The acquisition of real property or displacing people or businesses is required to conform to the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (URARPAPA). These regulations mandate that certain relocation assistance services be made available to owners/tenants of the properties. As indicated on Exhibit 6B, the master plan identifies property acquisition projects for the short, intermediate, and long term. In the short term, 60 acres are identified for acquisition on the east side of the runway. In the intermediate term, 19 acres are identified for acquisition north of the runway. In the long term, 28 acres are identified for acquisition. Based on a review of the aerial imagery, there are a total of 17 residences within the areas identified for acquisition. This includes 10 in the short term, five in the intermediate term, and two in the long term. The acquisition of these properties will require compliance with URARPAPA and coordination with the FAA and the property owner.

Executive Order 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations,* and the accompanying Presidential Memorandum, and Order DOT 5610.2, *Environmental Justice*, require FAA to provide for meaningful public involvement by minority and low-income populations as well as analysis that identifies and addresses potential impacts on these populations that may be disproportionately high and adverse.

A review of U.S. Census Bureau data indicates that the Census blockgroups including the airport do not contain low income or minority populations of over 50 percent; however, the blockgroup that includes the area northwest of the intersection of Interstate 84 and Linden Road has a minority population over 50 percent. The population of the remaining blockgroups in the airport vicinity does

not exceed 50 percent for low income or minority populations. As previously discussed, the master plan proposes to eliminate a portion of Linden Road between Interstate 84 and KCID Rd. As this road currently connects to an area of high minority population, additional analysis may be required to determine if this closure would result in an impact to the residents of this area. Potential impacts could be related to increased travel distances to employment opportunities or community facilities.

Pursuant to Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks,* federal agencies are directed to identify and assess environmental health and safety risks that may disproportionately affect children. These risks include those that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products to which they may be exposed.

During construction of the projects outlined within the Master Plan, appropriate measures should be taken to prevent access by unauthorized persons to construction project areas. Additionally, best management practices should be implemented to decrease environmental health risks to children.

WATER QUALITY

The *Clean Water Act* provides the authority to establish water quality standards, control discharges, develop waste treatment management plans and practices, prevent or minimize the loss of wetlands, and regulate other issues concerning water quality. Water quality concerns related to airport development most often relate to the potential for surface runoff and soil erosion, as well as the storage and handling of fuel, petroleum products, solvents, etc.

Four water bodies are located within the immediate vicinity of the airport. These include the Canyon Hill Lateral Canal, Highland Canal, and Notus Canal, located east of Interstate 84 and Indian Creek, located west of Interstate 84. Portions of the Canyon Hill Lateral Canal, Highline Canal, and Notus Canal cross airport property. The airport master plan proposes the relocation of Canyon Hill Lateral Canal to the east side of the ultimate airport property. As discussed in the following section, relocation of the canal is potentially exempt from the provisions of the *Clean Water Act* under 33 CFR 323.4(a)(3).

As previously discussed, the reach of Indian Creek located near the airport is designated as an impaired water under Section 303d of the *Clean Water Act*. No water bodies on airport property are designated as impaired. The improvements outlined in the airport master plan will not alter Indian Creek.

During construction of the proposed airport improvements, appropriate best management practices should be implemented in accordance with FAA Advisory Circular 150/5370-10D, *Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control.* Additionally the airport will need to comply with National Pollution DES permit conditions and include the proposed impervious surfaces in an airport stormwater pollution prevention plan following completion.

WETLANDS AND WATERS OF THE U.S.

The U.S. Army Corps of Engineers (USACE) regulates the discharge of dredge and/or fill material into waters of the United States, including adjacent wetlands, under Section 404 of the *Clean Water Act*.

Wetlands are defined by Executive Order 11990, *Protection of Wetlands*, as "those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction." Categories of wetlands includes swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mud flats, natural ponds, estuarine area, tidal overflows, and shallow lakes and ponds with emergent vegetation. Wetlands exhibit three characteristics: hydrology, hydrophytes (plants able to tolerate various degrees of flooding or frequent saturation), and poorly drained soils.

A review of the National Wetlands Inventory does not indicate the presence of wetlands on airport property. Additionally the NRCS Web Soil Survey indicates that no hydric soils are present at the airport. Field surveys may be required to determine the presence of Wetlands or Waters of the U.S. within those areas identified for acquisition.

As previously discussed, the master plan proposes relocating a portion of the Canyon Hill Lateral Canyon. Relocation of this portion of the canal was evaluated as part of the 2006 Environmental Assessment. During the preparation of that document, coordination with the USACE was undertaken to gather input regarding *Clean Water Act* permitting requirements. The USACE indicated that the relocation of the canal, which is used to support agriculture in the area, is exempt from the requirements of Section 404 of the *Clean Water Act* under 33 CFR 323.4(a)(3) which states that construction or maintenance of irrigation ditches are exempt from permitting requirements only if the irrigation ditch does not: convert an area of the waters of the United States into a use to which it was not previously subject, impair flow or circulation, or reduce the reach of waters of the United States. Additionally, the exemption is applicable only if the ditch is not used to convey toxic pollutants. During environmental documentation for the proposed Canyon Hill Lateral, additional coordination will be necessary to reaffirm the use of this exemption for this project.

Appendix D

FORECAST LETTER

U.S. Department
of Transportation

**Federal Aviation
Administration**

Seattle Airports District Office
1601 Lind Avenue, S. W., Ste 250
Renton, Washington 98055-4056

March 11, 2010

Mr. Ken Frazee, P.E.
City of Caldwell
Engineer & Public Works Dept.
621 Cleveland Blvd
Caldwell, ID 83605

Dear Mr. Frazee:

Caldwell Industrial Airport Master Plan Study
Airport Improvement Program (AIP) Project Number 3-16-0045-019
Approval of Activity Forecasts –

I have reviewed the Aviation Activity Forecasts for Caldwell Airport recently submitted by your consultant. I find adequate justification exists for the figures cited in the forecast tables of Chapter 2 and hereby approve the Forecast Summary.

As always, please feel free to contact me with questions at: 425.227.2649 or by e-mail at: bruce.fisher@faa.gov.

Sincerely,

Bruce C. Fisher
Airport Planner, Oregon / Idaho

cc: Mr. Patrick Taylor, Coffman Assoc.

Appendix E

AIRPORT LAYOUT PLAN

As part of this master plan, the Federal Aviation Administration (FAA) requires the development of several technical drawings detailing specific parts of the airport and its environs. These drawings were created on a computer-aided drafting system (CAD) and serve as the official depiction of the current and planned condition of the airport. These drawings will be delivered to the FAA for their review and inspection. The FAA will critique the drawings from a technical perspective to be sure all applicable federal regulations are met. The FAA will use the CAD drawings as the basis and justification for funding decisions.

It should be noted that the FAA requires that any changes to the airfield (i.e., runway and taxiway system, etc.) be represented on the drawings. The landside configuration developed during this master planning process is also depicted on the drawings, but the FAA recognized that landside development is much more fluid and often dependent upon specific developer needs. Thus, an updated drawing set is not typically necessary for future landside alterations.

The following is a description of the CAD drawings included with this master plan.

AIRPORT LAYOUT PLAN

An official Airport Layout Plan (ALP) drawing has been developed for Caldwell Industrial Airport, a draft of which is included in this appendix. The ALP drawing

graphically presents the existing and ultimate airport layout plan. The ALP drawing will include such elements as the physical airport features, wind data tabulation, location of airfield facilities (i.e., runways, taxiways, navigational aids), and existing general aviation development (and commercial development for air carrier airports). Also presented on the ALP are the runway safety areas, airport property boundary, and revenue support areas. The ALP is used by FAA to determine funding eligibility for future capital projects.

The computerized plan provides detailed information on existing and future facility layouts on multiple layers that permit the user to focus on any section of the airport at a desired scale. The plan can be used as base information for design and can be easily updated in the future to reflect new development and more detail concerning existing conditions as made available through design surveys.

FAR PART 77 AIRSPACE DRAWING

Federal Aviation Regulation (F.A.R.) Part 77, *Objects Affecting Navigable Airspace*, was established for use by local authorities to control the height of objects near airports. The FAR Part 77 Airspace Drawing included in this master plan is a graphic depiction of this regulatory criterion. The FAR Part 77 Airspace Drawing is a tool to aid local authorities in determining if proposed development could present a hazard to aircraft using the airport. The FAR Part 77 Airspace Drawing can be a critical tool for the airport sponsor's use in reviewing proposed development in the vicinity of the airport.

The airport sponsors should do all in their power to ensure development stays below the FAR Part 77 surfaces to protect the role of the airport. The following discussion will describe those surfaces that make up the recommended FAR Part 77 surfaces at Caldwell Industrial Airport.

The FAR Part 77 Airspace Drawing assigns three-dimensional imaginary surfaces associated with the airport. These imaginary surfaces emanate from the runway centerline(s) and are dimensioned according to the visibility minimums associated with the approach to the runway end and size of aircraft to operate on the runway. The FAR Part 77 imaginary surfaces include the primary surface, approach surface, transitional surface, horizontal surface, and conical surface. Each surface is described as follows.

Primary Surface

The primary surface is an imaginary surface longitudinally centered on the runway. The primary surface extends 200 feet beyond each runway end. The elevation of any point on the primary surface is the same as the elevation along the nearest as-

sociated point on the runway centerline. Under FAR Part 77 regulations, the primary surface for the runway is 1,000 feet wide.

Approach Surface

An approach surface is also established for each runway end. The approach surface begins at the same width as the primary surface, extends upward and outward from the primary surface end, and is centered along an extended runway centerline. The approach surface leading to each runway is based upon the type of approach available (instrument or visual) or planned.

In an effort to protect the airport from future adjacent incompatible land uses, approach surfaces with instrument approach procedures are planned to each runway end. The approach slope dimensions are based on a non-precision instrument approach with ¾-mile or greater visibility minimums. The approach surface extends from the primary surface at a 34:1 slope to a distance of 10,000 feet and a width of 4,000 feet.

Transitional Surface

Each runway has a transitional surface that begins at the outside edge of the primary surface at the same elevation as the runway. The transitional surface also connects with the approach surfaces of each runway. The surface rises at a slope of 7 to 1, up to a height 150 feet above the highest runway elevation. At that point, the transitional surface is replaced by the horizontal surface.

Horizontal Surface

The horizontal surface is established at 150 feet above the highest elevation of the runway surface. Having no slope, the horizontal surface connects the transitional and approach surfaces to the conical surface at a distance of 10,000 feet from the end of the primary surfaces of each runway.

Conical Surface

The conical surface begins at the outer edge of the horizontal surface. The conical surface then continues for an additional 4,000 feet horizontally at a slope of 20 to 1. Therefore, at 4,000 feet from the horizontal surface, the elevation of the conical surface is 350 feet above the highest airport elevation.

APPROACH SURFACE PROFILE DRAWINGS

The runway profile drawing presents the entirety of the FAR Part 77 approach surface to the runway ends. It also depicts the runway centerline profile with elevations. This drawing provides profile details that the Airspace Drawing does not.

TERMINAL AREA DRAWING

The terminal area drawing is a larger scale plan view drawing of existing and planned aprons, buildings, hangars, parking lots, and other landside facilities. It is prepared in accordance with FAA AC 150/5300-13, *Airport Design*. The terminal area drawing for Caldwell Industrial Airport focuses on planned east side development.

AIRPORT LAND USE DRAWING

The objective of the Airport Land Use Drawing is to coordinate uses of the airport property in a manner compatible with the functional design of the airport facility. Airport land use planning is important for orderly development and efficient use of available space. There are two primary considerations for airport land use planning. These are to secure those areas essential to the safe and efficient operation of the airport and to determine compatible land uses for the balance of the property which would be most advantageous to the airport and community.

In the development of an airport land use plan for Caldwell Industrial Airport, the airport property was broken into several large general tracts. Each tract was analyzed for specific site characteristics, such as tract size and shape, land characteristics, and existing land uses. The availability of utilities and the accessibility to various transportation modes were also considered. Limitations and constraints to development such as height and noise restrictions, runway visibility zones, and contiguous land uses were analyzed next. Finally, the compatibility of various land uses in each tract was analyzed.

The depiction of on-airport land uses on this drawing becomes the official FAA acceptance of current and future land uses. For Caldwell Industrial Airport, all airport property adjacent to the taxiways and runways is planned for aviation purposes.

AIRPORT PROPERTY MAP

The Airport Property Map provides information on property under airport control and is, therefore, subject to FAA grant assurances. The various recorded deeds that

make up the airport property are listed in tabular format. The primary purpose of the drawing is to provide information for analyzing the current and future aeronautical use of land acquired with federal funds.

DEPARTURE SURFACE DRAWING

For runways supporting instrument operations, such as Runway 25, a separate drawing depicting the departure surface is required. The departure service, also called the one engine inoperable (OEI) obstacle identification surface (OIS) is a surface emanating from the departure end of the runway to a distance of 10,200 feet. The inner width is 1,000 feet and the outer width is 6,466 feet. On January 1, 2009, the FAA required that the airport have this drawing completed. The departure surface information should be made available to any commercial operator at the airport.

There are three recommended methods to mitigate penetrations to this surface:

1. The object is removed or lowered.
2. The Takeoff Distance Available (TODA) is decreased (i.e., pilots are instructed to lift off prior to the runway end in order to avoid the obstruction.
3. Instrument departure minimums are raised.

Existing obstacles of 35 feet or less would not require mitigation; instead, new departure procedures may be introduced or existing departure procedures may be altered or no action may be taken.

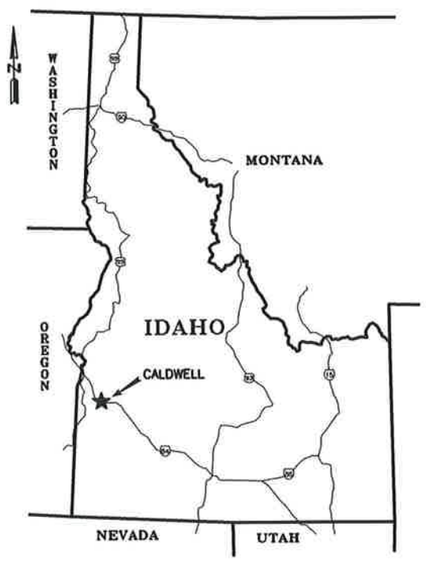
City of Caldwell, Idaho

Caldwell Industrial Airport

AIRPORT MASTER PLAN

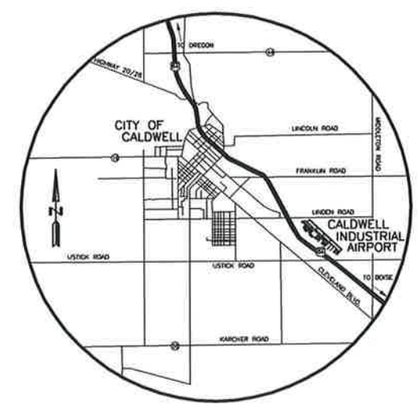
FAA AIP NO. 3-16-0045-019/021

AUGUST 2010



LOCATION MAP

SHEET INDEX	
SHEET	*DESCRIPTION*
SHEET 1	COVER
SHEET 2	AIRPORT LAYOUT DRAWING
SHEET 3	AIRPORT AIRSPACE DRAWING
SHEET 4	INNER PORTION OF THE APPROACH SURFACE DRAWING
SHEET 5	TERMINAL AREA DRAWING
SHEET 6	ON-AIRPORT LAND USE DRAWING
SHEET 7	RUNWAY DEPARTURE SURFACE DRAWING
SHEET 8	AIRPORT PROPERTY MAP



VICINITY MAP

FAA DISCLAIMER

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Kimley-Horn and Associates, Inc.

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Coffman Associates
Airport Consultants
www.coffmanassociates.com

PROJECT NO. 093512000
DRAWING NAME 1-COVER.DWG

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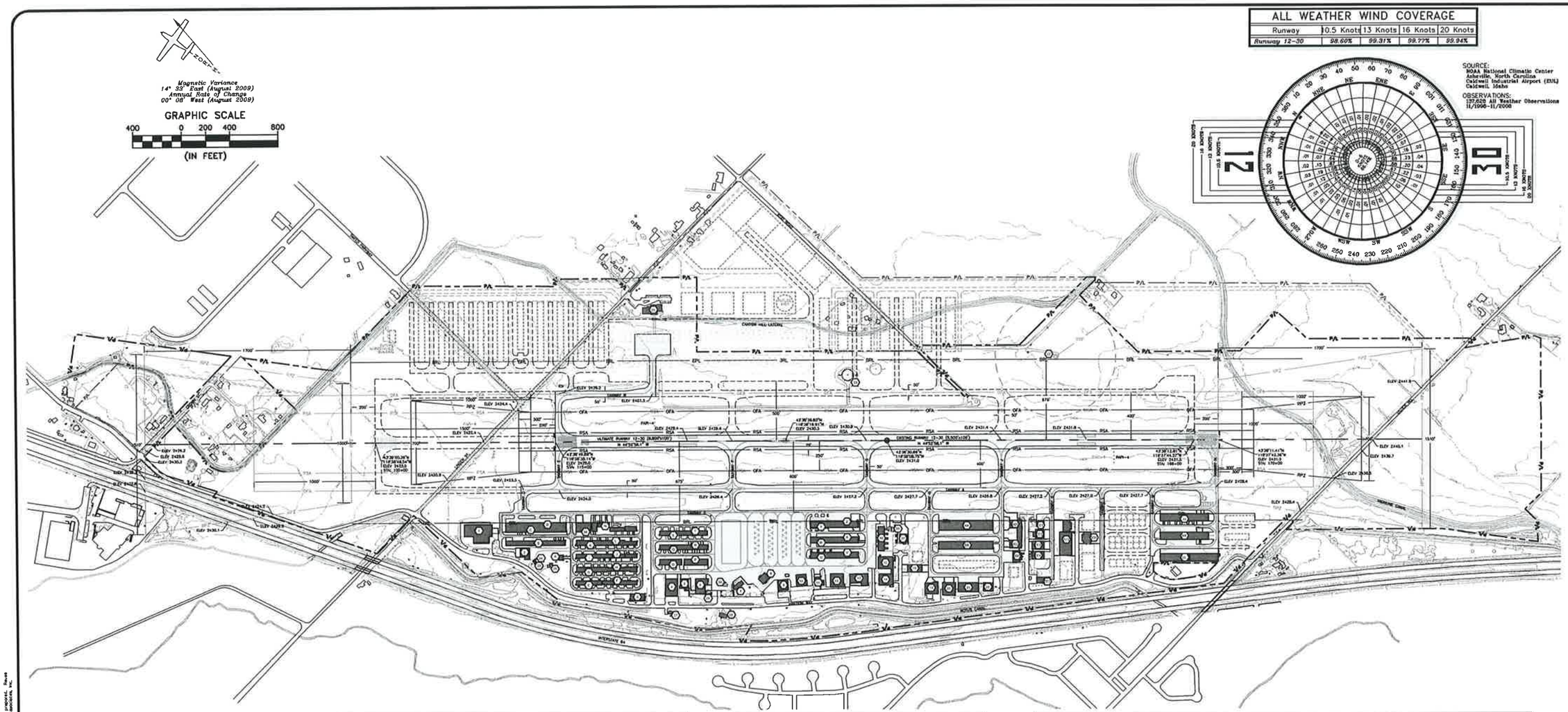

SPONSOR APPROVAL

GARRET NANCOLAS MAYOR, CITY OF CALDWELL DATE

FAA APPROVAL

MANAGER, SEATTLE AIRPORTS DISTRICT OFFICE DATE

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NOTES

1. ALL ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
2. ALL LATITUDE AND LONGITUDE COORDINATES ARE BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. STREET RIGHT-OF-WAY = 80' AND CANAL RIGHT-OF-WAY = 60' ACCORDING TO THE CITY OF CALDWELL STANDARDS.
4. NO MODIFACTIONS TO STANDARDS.
5. NO NON-STANDARD CONDITIONS.

RUNWAY DATA TABLE

DESCRIPTION	EXISTING		ULTIMATE	
	RUNWAY 12	RUNWAY 30	RUNWAY 12	RUNWAY 30
PERCENT EFFECTIVE GRADIENT	0.10%		0.13%	
RUNWAY ORIENTATION	N 44°52'58.1"W		SAME	
PERCENT WIND COVERAGE (10.5,13,16,20 KNOTS)	98.6%, 99.3%, 99.8%, 99.9%		SAME	
RUNWAY END ELEVATION	2426.0	2431.5	2423.0	2431.5
MAXIMUM RUNWAY ELEVATION	2431.8		2431.8	
RUNWAY LENGTH	5,500'		6,800'	
RUNWAY WIDTH	100'		SAME	
RUNWAY SURFACE TYPE	ASPHALT		SAME	
RUNWAY STRENGTH	72K LBS(SWL)/85K LBS(DWL)		SAME	
RUNWAY END COORDINATES	43°38'49.89"N	43°38'11.41"N	43°39'00.39"N	43°38'12.81"N
	116°38'35.14"W	116°37'42.38"W	116°38'49.54"W	116°37'44.27"W
FAR PART 77 APPROACH CATEGORY	NPI ≥3/4MILE	NPI ≥3/4MILE	SAME	SAME
APPROACH TYPE	LPV ≥ 1 MILE	LPV ≥ 1 MILE	LPV ≥3/4MILE	LPV ≥3/4MILE
APPROACH SLOPE	34:1	34:1	SAME	SAME
RUNWAY LIGHTING	MIRL		MIRL	
RUNWAY MARKING	NPI	NPI	SAME	SAME
VISUAL AIDS	PAPI-4	PAPI-4	PAPI-4/REIL	PAPI-4/REIL
RUNWAY SAFETY AREA WIDTH	150'		500'	ODALS
RUNWAY SAFETY AREA LENGTH BEYOND END	300'		1,000'	
RUNWAY SAFETY AREA LENGTH PRIOR TO LANDING	300'		600'	
RUNWAY PROTECTION ZONE LENGTH	1,000'	1,000'	1,700'	1,700'
RUNWAY PROTECTION ZONE INNER WIDTH	500'	500'	1,000'	1,000'
RUNWAY PROTECTION ZONE OUTER WIDTH	700'	700'	1,510'	1,510'

AIRPORT DATA TABLE

DESCRIPTION	EXISTING	ULTIMATE
AIRPORT ELEVATION (MSL)	2431.0	2430.3
AIRPORT REFERENCE POINT DATA	43°38'30.66"N	43°38'36.60"N
	116°38'08.75"W	116°38'16.91"W
MEAN MAXIMUM TEMPERATURE (F°)	93°	SAME
AIRPORT REFERENCE CODE (RUNWAY 12)	B-II	C-II
AIRPORT REFERENCE CODE (RUNWAY 30)	B-II	C-II
DESIGN AIRCRAFT (RUNWAY 12 & 30)	CESSNA CITATION V MODEL 560XL	CESSNA CITATION X MODEL 750

LEGEND

DESCRIPTION	EXISTING	ULTIMATE
AIRPORT PAVEMENT		
STREET & ACCESS ROAD		
AIRPORT BUILDING		
BUILDING RESTRICTION LINE (25' HIGH)	BRL	BRL
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY PROTECTION ZONE (RPZ)	RPZ	RPZ
AIRPORT REFERENCE POINT		
AIRPORT PROPERTY LINE	P/L	P/L
AIRPORT PAVEMENT TO BE REMOVED		
STREET & ACCESS ROAD TO BE REMOVED		
RUNWAY THRESHOLD LIGHTS		
TOPOGRAPHIC CONTOURS (2')		
AIRPORT LIGHTED ROTATING BEACON		
SEGMENTED CIRCLE & LIGHTED WINDCONE		
VISUAL AIDS	PAPI-4	PAPI-4
RUNWAY CENTERLINE ALIGNMENT		
IRRIGATION CANAL/LATERAL		
FENCE & GATE		
TREE & BRUSH/VEGETATION		

AIRPORT FACILITY & BUILDING LIST

#	DESCRIPTION	TOP ELEV.	#	DESCRIPTION	TOP ELEV.
A	BOX HANGAR (1 UNIT)	2441.9	KK	BOX HANGAR (16 UNITS)	2446.8
B	BOX HANGAR (10 UNITS)	2436.7	LL	CONVENTIONAL HANGAR (8 UNITS)	2448.4
C	BOX HANGAR (10 UNITS)	2441.8	1	VACANT MFG. BUILDING	2438.6
D	BOX HANGAR (11 UNITS)	2441.8	2	VACANT MFG. BUILDING	2444.9
E	T-HANGAR (8 UNITS)	2438.9	3	HIGHLAND APPRAISAL	2447.1
F	T-HANGAR (7 UNITS)	2438.9	4	WESTERN ROOFING	2456.2
G	T-HANGAR (8 UNITS)	2438.7	5	VACANT	2444.5
H	BOX HANGAR (6 UNITS)	2438.7	6	SILVERHAWK	2453.1
I	BOX HANGAR (8 UNITS)	2444.3	7	CAFE AND OFFICE SPACE	2440.5
J	BOX HANGAR (7 UNITS)	2444.3	8	AVIATION MAINTENANCE CENTER	2449.8
K	BOX HANGAR (8 UNITS)	2441.4	9	WARHAWK MUSEUM STORAGE	2444.7
L	BOX HANGAR (6 UNITS)	2441.4	10	BOB HANNAH	2450.6
M	BOX HANGAR (6 UNITS)	2444.1	11	VALLEY AIR PHOTO	2446.6
N	BOX HANGAR (6 UNITS)	2444.1	12	MICRON TECHNOLOGIES CEO	2450.7
O	BOX HANGAR (7 UNITS)	2447.0	13	RICK DRAKE/SECURITY GATES CO.	2454.5
P	BOX HANGAR (1 UNIT)	2449.1	14	THE SHIPPING CO.	2451.8
Q	BOX HANGAR (8 UNITS)	2444.6	15	SKY DOWN SKYDIVING	2451.8
R	BOX HANGAR (8 UNITS)	2444.6	16	SHORE & SHORE AVIATION (T-HANGARS)	2443.7
S	BOX HANGAR (6 UNITS)	2440.4	17	SHORE & SHORE AVIATION	2444.3
T	BOX HANGAR (7 UNITS)	2440.4	18	PERFORMANCE DRY WALL	2445.9
U-V	BOX HANGAR (7 UNITS)	2450.4	19	VACANT	2438.1
W-X	BOX HANGAR (8 UNITS)	2449.1	20	R&M STEEL	2448.5
Y-Z	BOX HANGAR (8 UNITS)	2450.0	21	BARKER/U.S. BLM	2447.2
AA	BOX HANGAR (20 UNITS)	2445.7	22	JACKSON AVIATION	2442.3
BB	BOX HANGAR (7 UNITS)	2445.9	23	NEW TERMINAL BUILDING	2462.7
DD1	BOX HANGAR (2 UNITS)	2448.7	24	AIRPORT LIGHTED ROTATING BEACON	2462.6
DD2	BOX HANGAR (2 UNITS)	2448.7	25	ELECTRICAL VAULT	2427.2
DD3	BOX HANGAR (2 UNITS)	2448.3	26	WELL WATER BUILDING	2429.6
EE1	BOX HANGAR (1 UNIT)	2445.1	27	MISC. OFFICE	2437.0
EE2	BOX HANGAR (2 UNITS)	2446.2	28	RESIDENTIAL	2436.4
EE3	BOX HANGAR (3 UNITS)	2448.9	29	ELECTRICAL VAULT	2435.6
EE4	BOX HANGAR (2 UNITS)	2447.3	30	SILVERHAWK FUEL PUMPS	2431.7
EE5	BOX HANGAR (1 UNIT)	2441.2	31	SHORE & SHORE FUEL PUMPS	2432.0
FF1	CONVENTIONAL HANGAR (6 UNITS)	2448.1	32	AWOS	2468.1
GG1	BOX HANGAR (2 UNITS)	2447.6	33	SEGMENTED CIRCLE & LIGHTED WINDCONE	2461.5
JJ	BOX HANGAR (8 UNITS)	2446.8			

NO.	REVISION	BY	DATE	APPR.

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SCALE (H): 1"=400'
SCALE (V): N/A
DESIGNED BY: TJE
DRAWN BY: TJE
CHECKED BY: TWL
DATE: AUGUST 2010

CALDWELL INDUSTRIAL AIRPORT
CITY OF CALDWELL, IDAHO
AIRPORT LAYOUT PLAN

PROJECT NO. 093512000

DRAWING NAME 2-ALP.DWG

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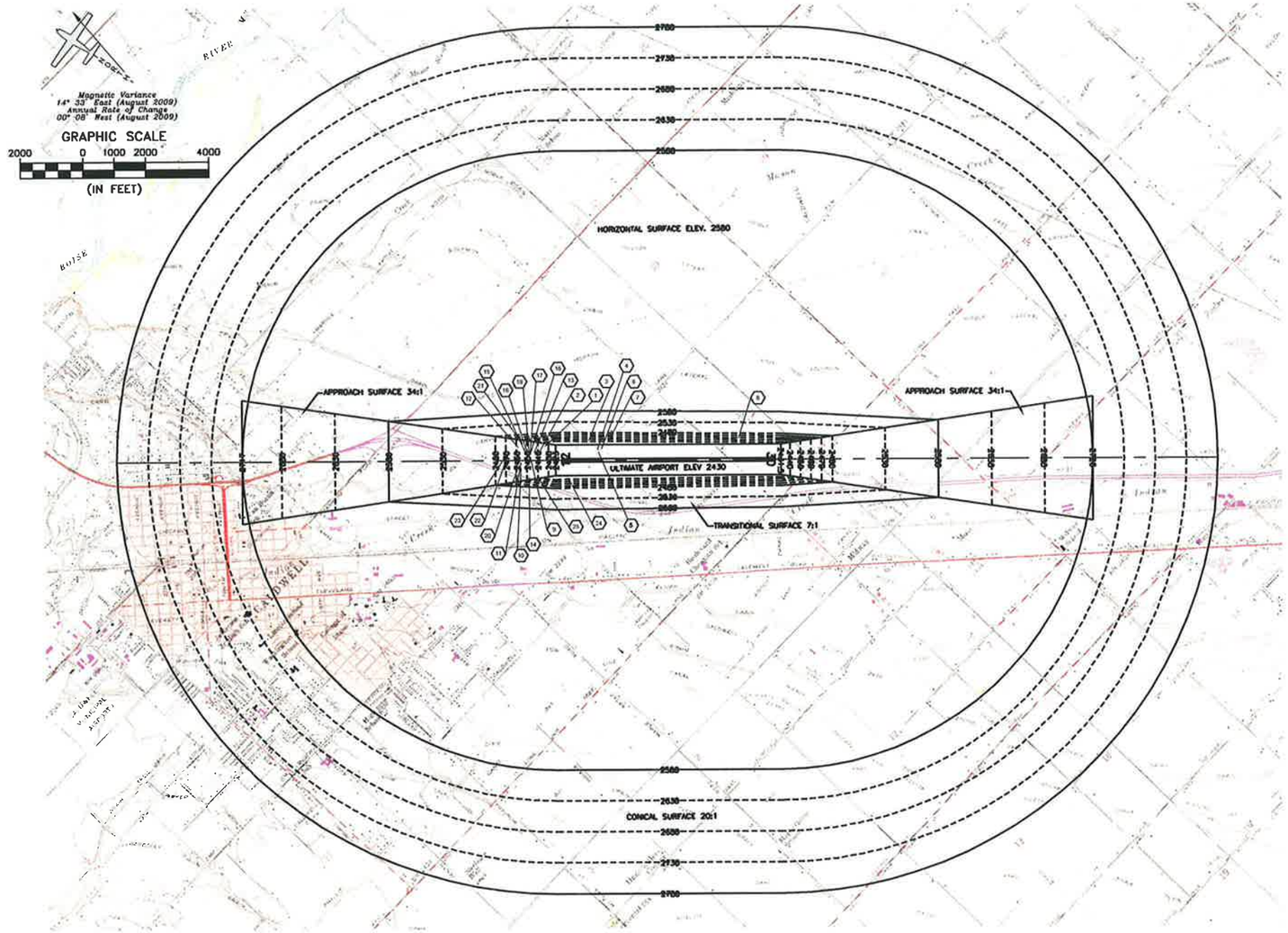
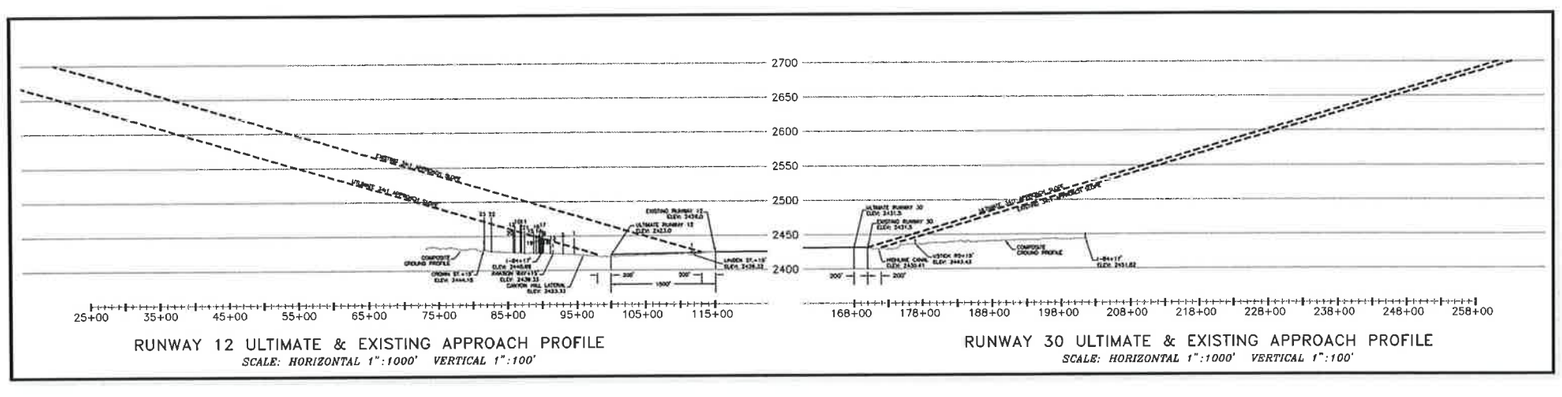


FAR PART 77 OBSTRUCTION DATA

#	DESCRIPTION	STATION	OFFSET	SURFACE	OBJECT ELEVATION	PENETRATION (FEET)	DISPOSITION OF OBSTRUCTIONS
1	TREE	94+57.02	463.30'L	APPROACH	2447.25	14.2	REMOVE
2	TREE	92+94.84	313.40'L	APPROACH	2447.98	10.1	REMOVE
3	POWER POLE	108+72.71	621.34'L	TRANSITIONAL	2455.80	14.2	RELOCATE
4	POWER POLE	111+55.82	339.01'L	PRIMARY	2450.99	26.3	RELOCATE
5	POWER POLE	111+95.10	265.39'L	PRIMARY	2456.08	31.3	RELOCATE
6	POWER POLE	112+94.90	370.44'L	PRIMARY	2455.32	30.5	RELOCATE
7	POWER POLE	115+18.84	601.95'L	TRANSITIONAL	2458.04	18.5	RELOCATE
8	AWOS TOWER	156+50.36	698.55'L	TRANSITIONAL	2468.09	9.8	ALREADY LIGHTED
9	TREE	89+90.76	84.32'L	APPROACH	2458.91	12.1	REMOVE
10	TREE	86+81.52	239.35'R	APPROACH	2467.41	11.5	REMOVE
11	TREE	86+91.55	58.51'R	APPROACH	2468.18	12.6	REMOVE
12	TREE	85+97.17	427.83'L	APPROACH	2465.85	7.5	REMOVE
13	TREE	91+13.50	258.54'L	APPROACH	2443.59	0.4	REMOVE
14	POWER POLE	89+54.96	544.85'R	APPROACH	2454.79	6.9	RELOCATE
15	TREE	85+67.98	159.50'L	APPROACH	2454.82	4.4	REMOVE
16	TREE	89+04.75	200.79'L	APPROACH	2451.85	2.5	REMOVE
17	TREE	89+72.37	192.33'L	APPROACH	2449.03	1.7	REMOVE
18	POWER POLE	90+04.85	284.57'L	APPROACH	2447.91	1.5	RELOCATE
19	POWER POLE	89+42.36	233.74'L	APPROACH	2452.03	3.8	RELOCATE
20	TREE	85+78.60	226.00'R	APPROACH	2459.77	0.9	REMOVE
21	TREE	87+37.92	540.00'L	APPROACH	2458.10	3.9	REMOVE
22	TREE	82+57.49	172.98'L	APPROACH	2477.59	9.2	REMOVE
23	TREE	81+58.96	92.69'L	APPROACH	2478.81	7.6	REMOVE
24	AVIATION WAY +15'	101+95.96	565.53'R	TRANSITIONAL	2434.30	1.4	LIGHT
25	POWER POLE	93+00.22	671.86'R	TRANSITIONAL	2456.40	5.2	RELOCATE



RUNWAY 12 ULTIMATE & EXISTING APPROACH PROFILE
SCALE: HORIZONTAL 1":1000' VERTICAL 1":100'

RUNWAY 30 ULTIMATE & EXISTING APPROACH PROFILE
SCALE: HORIZONTAL 1":1000' VERTICAL 1":100'

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NOTES

1. ALL ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
2. ALL LATITUDE AND LONGITUDE COORDINATES ARE BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. ROAD/STREET CLEARANCES +15'. INTERSTATE CLEARANCES +17'.
4. SEE INNER PORTION OF THE APPROACH PLAN VIEW FOR CLOSE-IN OBSTRUCTIONS.
5. OBSTRUCTION #'S ARE SPECIFIC TO EACH PARTICULAR OBSTRUCTION ON ALL SHEETS, THEREFORE OBSTRUCTION #'S MAY NOT BE LISTED IN SEQUENTIAL ORDER.

NO.	REVISION	BY	DATE	APPR.

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DRAWN BY: TJE
CHECKED BY: TWL
DATE: AUGUST 2010

CALDWELL INDUSTRIAL AIRPORT
CITY OF CALDWELL, IDAHO
AIRPORT AIRSPACE DRAWING

PROJECT NO. 093512000

DRAWING NAME 3-AIRSPACE.DWG

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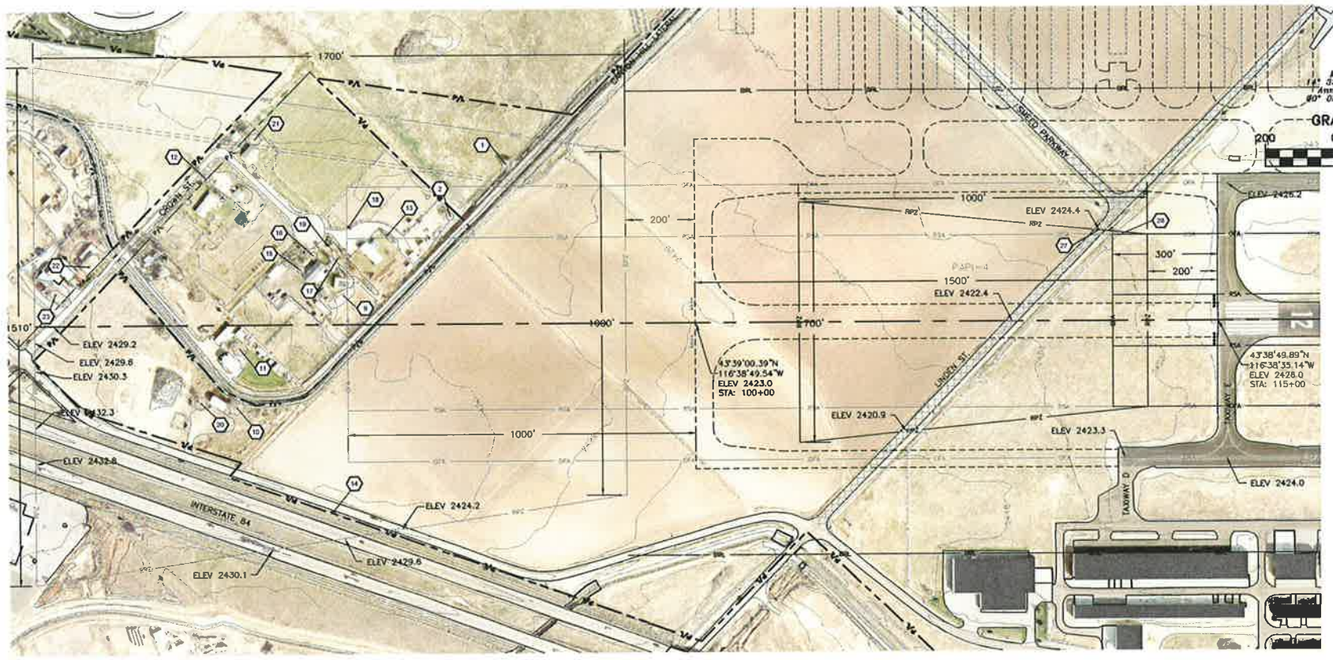
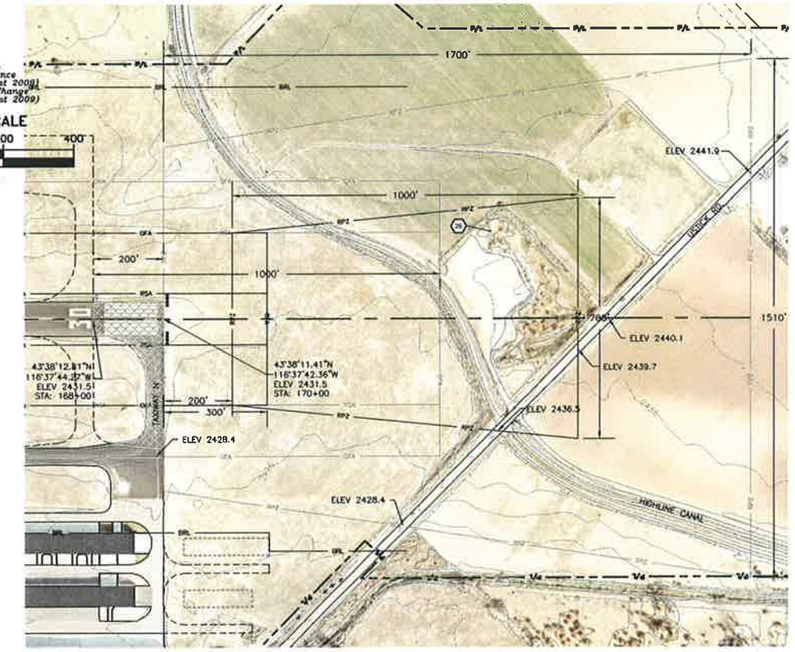
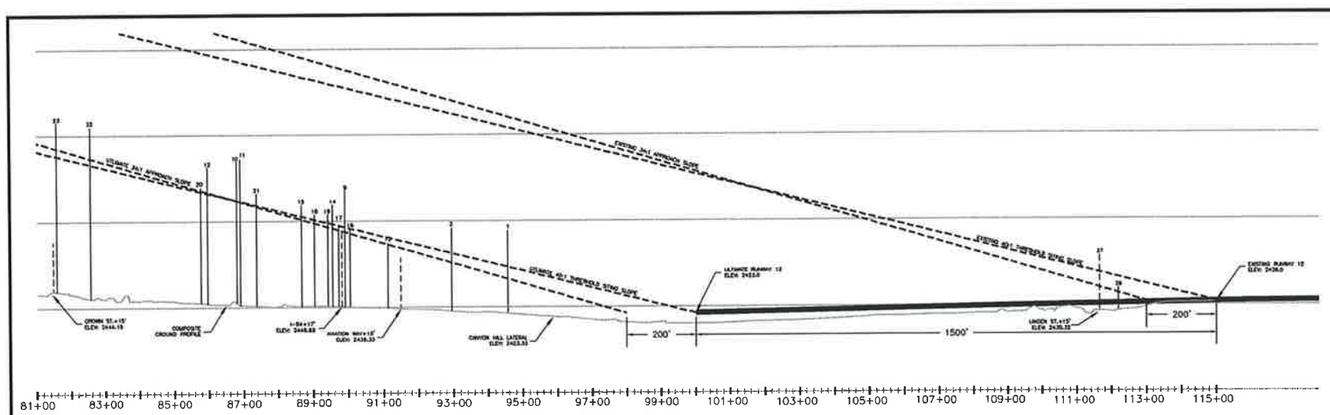
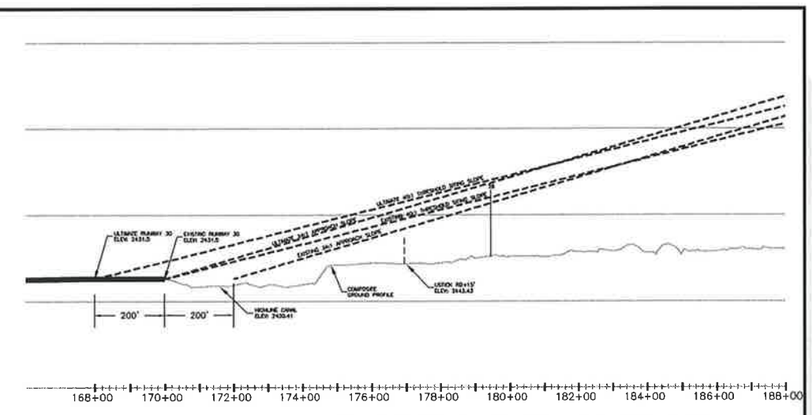






RUNWAY 12 ULTIMATE & EXISTING APPROACH PROFILE

SCALE: HORIZONTAL 1":200' VERTICAL 1":20'



RUNWAY 30 ULTIMATE & EXISTING APPROACH PROFILE

SCALE: HORIZONTAL 1":200' VERTICAL 1":20'

RUNWAY 12 ULTIMATE APPROACH OBSTRUCTION DATA

#	DESCRIPTION	STATION	OFFSET	SURFACE	OBJECT ELEVATION	PENETRATION (FEET)	DISPOSITION OF OBSTRUCTIONS
1	TREE	94+57.02	463.30'L	APPROACH	2447.25	14.2	REMOVE
2	TREE	92+94.84	313.40'L	APPROACH	2447.98	10.1	REMOVE
9	TREE	89+90.76	84.32'L	APPROACH	2458.91	12.1	REMOVE
10	TREE	86+81.52	239.35'R	APPROACH	2467.41	11.5	REMOVE
11	TREE	86+91.55	68.51'R	APPROACH	2468.18	12.6	REMOVE
12	TREE	85+97.17	427.83'L	APPROACH	2465.85	7.5	REMOVE
13	TREE	91+13.50	258.54'L	APPROACH	2443.59	0.4	REMOVE
14	POWER POLE	89+54.96	544.85'R	APPROACH	2454.79	6.9	RELOCATE
15	TREE	88+67.98	159.50'L	APPROACH	2454.82	4.4	REMOVE
16	TREE	89+04.75	200.79'L	APPROACH	2451.85	2.5	REMOVE
17	TREE	89+72.37	192.33'L	APPROACH	2449.03	1.7	REMOVE
18	POWER POLE	90+04.85	284.57'L	APPROACH	2447.91	1.5	RELOCATE
19	POWER POLE	89+42.36	233.74'L	APPROACH	2452.03	3.8	RELOCATE
20	TREE	85+78.60	226.00'R	APPROACH	2459.77	0.9	REMOVE
21	TREE	87+37.92	540.00'L	APPROACH	2458.10	3.9	REMOVE
22	TREE	82+57.49	172.98'L	APPROACH	2477.59	9.2	REMOVE
23	TREE	81+58.96	92.69'L	APPROACH	2478.81	7.6	REMOVE

RUNWAY 12 EXISTING APPROACH OBSTRUCTION DATA

#	DESCRIPTION	STATION	OFFSET	SURFACE	OBJECT ELEVATION	PENETRATION (FEET)	DISPOSITION OF OBSTRUCTIONS
27	UNDEN ST. +15'	111+63.98	263.40'L	APPROACH	2439.32	9.3	RELOCATE ROAD
28	FENCE	112+18.92	249.51'L	APPROACH	2430.00	1.6	LIGHT

RUNWAY 30 ULTIMATE APPROACH OBSTRUCTION DATA

#	DESCRIPTION	STATION	OFFSET	SURFACE	OBJECT ELEVATION	PENETRATION (FEET)	DISPOSITION OF OBSTRUCTIONS
*NO OBSTRUCTIONS							

RUNWAY 30 EXISTING APPROACH OBSTRUCTION DATA

#	DESCRIPTION	STATION	OFFSET	SURFACE	OBJECT ELEVATION	PENETRATION (FEET)	DISPOSITION OF OBSTRUCTIONS
26	TREE	179+44.89	253.20'L	APPROACH	2457.30	3.8	REMOVE

LEGEND

DESCRIPTION	EXISTING	ULTIMATE
AIRPORT PAVEMENT		
STREET & ACCESS ROAD		
AIRPORT BUILDING		
BUILDING RESTRICTION LINE (25' HIGH)	BRL	BRL
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY PROTECTION ZONE (RPZ)	RPZ	RPZ
AIRPORT PROPERTY LINE	P/L	P/L
AIRPORT PAVEMENT TO BE REMOVED		
STREET & ACCESS ROAD TO BE REMOVED		
RUNWAY THRESHOLD LIGHTS		
TOPOGRAPHIC CONTOURS (2')	2500	
RUNWAY CENTERLINE ALIGNMENT		
IRRIGATION CANAL/LATERAL		
FENCE & GATE		
TREE & BRUSH/VEGETATION		

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NOTES

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2. ALL LATITUDE AND LONGITUDE COORDINATES ARE BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. ROAD/STREET CLEARANCES +15'. INTERSTATE CLEARANCES +17'.
4. OBSTRUCTION #'S ARE SPECIFIC TO EACH PARTICULAR OBSTRUCTION ON ALL SHEETS, THEREFORE OBSTRUCTION #'S MAY NOT BE LISTED IN SEQUENTIAL ORDER.

NO.	REVISION	BY	DATE	APPR.

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SCALE (V): 1"=20'
DESIGNED BY: TJE
DRAWN BY: TJE
CHECKED BY: TWL
DATE: AUGUST 2010

CALDWELL INDUSTRIAL AIRPORT
CITY OF CALDWELL, IDAHO
INNER PORTION OF THE APPROACH SURFACE DRAWING

PROJECT NO. 093512000

DRAWING NAME 4-APPROACH.DWG

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Magnetic Variance
14° 33' East (August 2009)
Annual Rate of Change
00° 08' West (August 2009)

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

LEGEND

DESCRIPTION	EXISTING	ULTIMATE
AIRPORT PAVEMENT		
STREET & ACCESS ROAD		
AIRPORT BUILDING		
BUILDING RESTRICTION LINE (25' HIGH)	BRL	BRL
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY PROTECTION ZONE (RPZ)	RPZ	RPZ
AIRPORT REFERENCE POINT		
AIRPORT PROPERTY LINE	P/A	P/L
AIRPORT PAVEMENT TO BE REMOVED		
STREET & ACCESS ROAD TO BE REMOVED		
RUNWAY THRESHOLD LIGHTS		
TOPOGRAPHIC CONTOURS (2')		
AIRPORT ROTATING BEACON		
SEGMENTED CIRCLE & LIGHTED WINDCONE		
VISUAL AIDS	PAPI-4	PAPI-4
RUNWAY CENTERLINE ALIGNMENT		
IRRIGATION CANAL/LATERAL		
FENCE & GATE		
TREE & BRUSH/VEGETATION		

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NOTES

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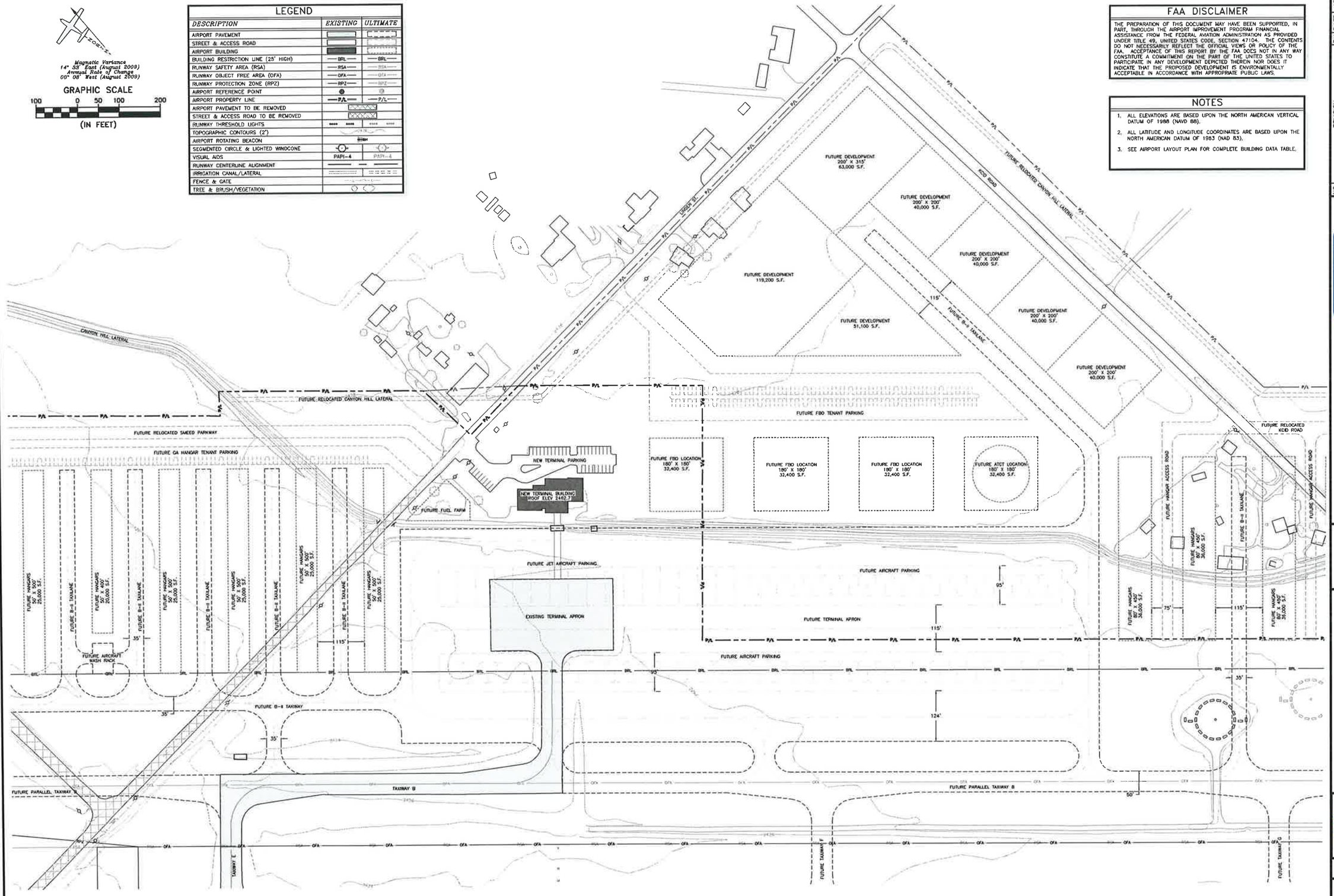
2. ALL LATITUDE AND LONGITUDE COORDINATES ARE BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. SEE AIRPORT LAYOUT PLAN FOR COMPLETE BUILDING DATA TABLE.



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SCALE (V): N/A
DESIGNED BY: TJE
DRAWN BY: TJE
CHECKED BY: TWL
DATE: AUGUST 2010

CALDWELL INDUSTRIAL AIRPORT
CITY OF CALDWELL, IDAHO
TERMINAL AREA DRAWING

PROJECT NO. 093512000

DRAWING NAME 5-TERMINAL.DWG

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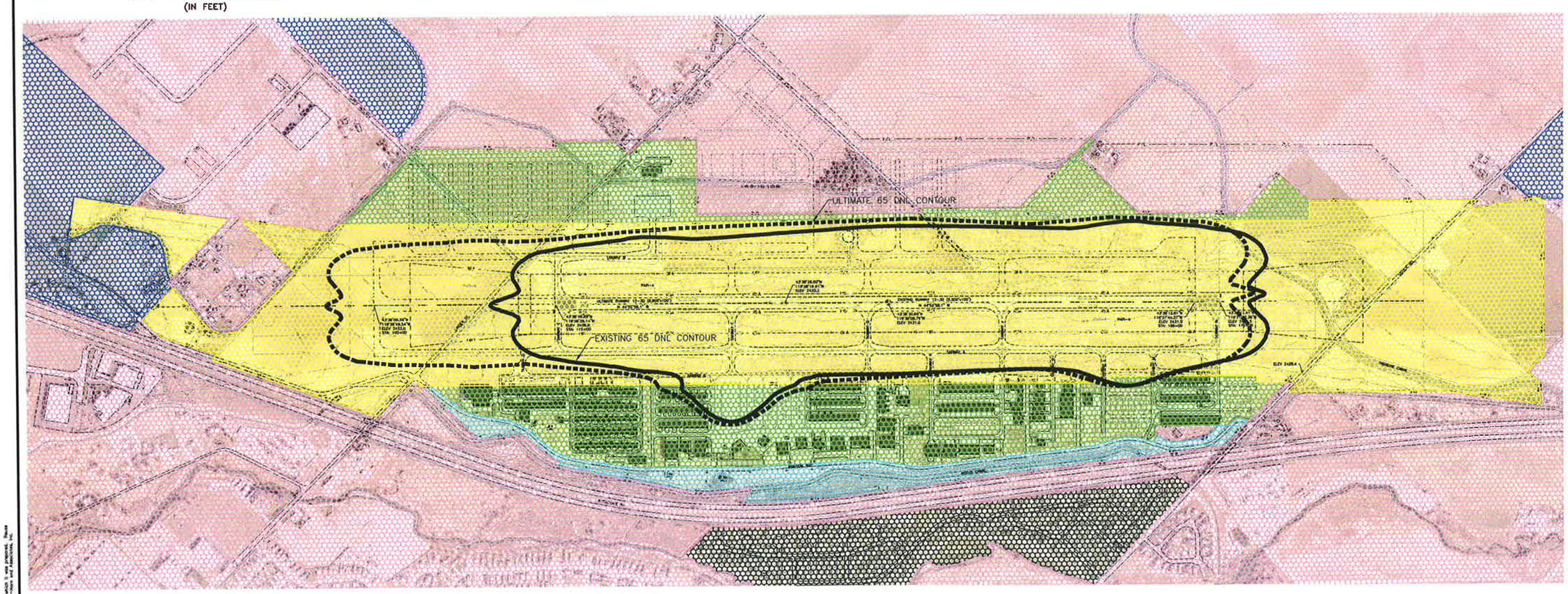
Magnetic Variance
14° 33' East (August 2009)
Annual Rate of Change
00° 08' West (August 2009)

GRAPHIC SCALE

400 0 200 400 800

(IN FEET)



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NOTES

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2. ALL LATITUDE AND LONGITUDE COORDINATES ARE BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. LAND USE PLAN INFORMATION TAKEN FOR CITY OF CALDWELL DRAFT COMPREHENSIVE PLAN MAP, DATED SEPTEMBER 22, 2009.

LEGEND

DESCRIPTION	EXISTING	ULTIMATE
AIRFIELD OPERATIONS ZONE		
GENERAL AVIATION ZONE		
NON-AVIATION REVENUE SUPPORT ZONE		
COMMERCIAL ZONE		
INDUSTRIAL ZONE		
RESIDENTIAL ZONE		
65 DNL CONTOUR		
AIRPORT PAVEMENT		
STREET & ACCESS ROAD		
AIRPORT BUILDING		
BUILDING RESTRICTION LINE (25' HIGH)	BRL	BRL
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY PROTECTION ZONE (RPZ)	RPZ	RPZ
AIRPORT REFERENCE POINT		
AIRPORT PROPERTY LINE	P/L	P/L
AIRPORT PAVEMENT TO BE REMOVED		
STREET & ACCESS ROAD TO BE REMOVED		
RUNWAY THRESHOLD LIGHTS		
TOPOGRAPHIC CONTOURS (2')	2430	
AIRPORT ROTATING BEACON		
SEGMENTED CIRCLE & LIGHTED WINDCONE		
VISUAL AIDS	PAPI-4	PAPI-4
RUNWAY CENTERLINE ALIGNMENT		
IRRIGATION CANAL/LATERAL		
FENCE & GATE		
TREE & BRUSH/VEGETATION		

NO.	REVISION	BY	DATE	APPR.

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Engineering, Planning, and Environmental Consultants
3005 E. Copper Point Dr., Suite 201
Meridian, Idaho 83642 (208) 350-7250

SCALE (H): 1"=400'
SCALE (V): N/A

DESIGNED BY: TJE
DRAWN BY: TJE
CHECKED BY: TWL

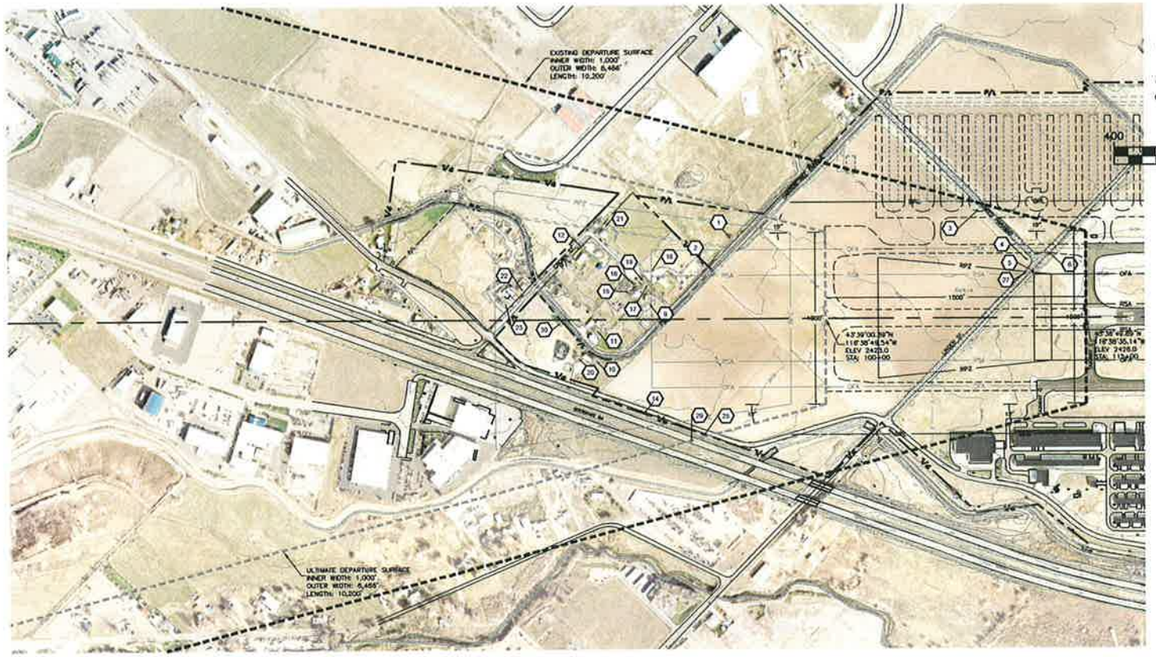
DATE: AUGUST 2010

CALDWELL INDUSTRIAL AIRPORT
CITY OF CALDWELL, IDAHO
ON-AIRPORT LAND USE DRAWING

PROJECT NO.
093512000

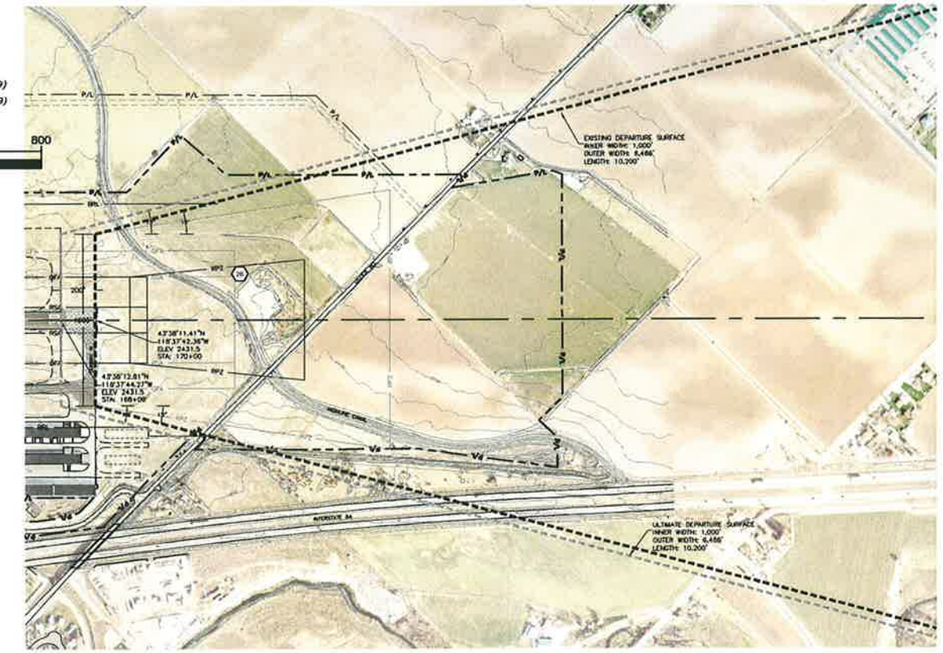
DRAWING NAME
6-LAND.DWG

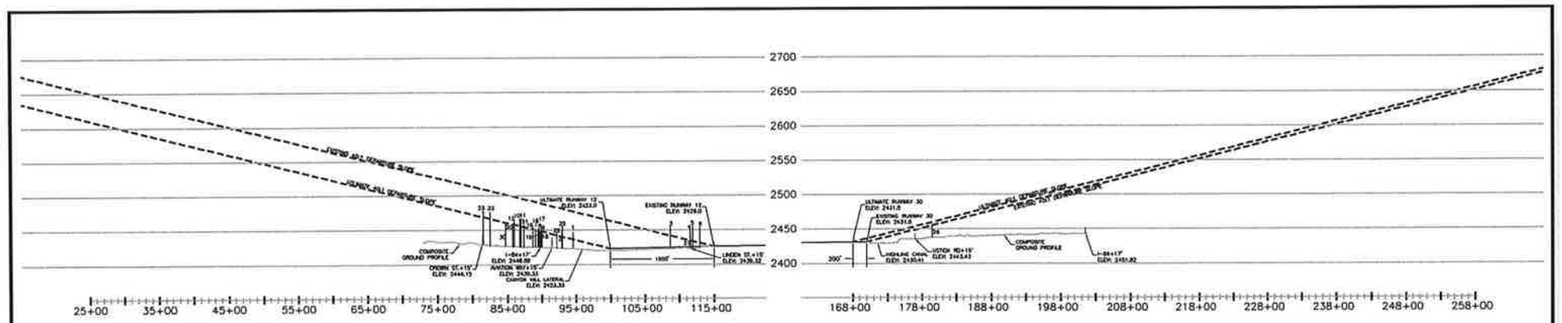
The document, together with the concepts and designs presented herein, as an instrument of service is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written consent and specific verification and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



Magnetic Variance
14° 33' East (August 2009)
Annual Rate of Change
00° 08' West (August 2009)

GRAPHIC SCALE
0 200 400 800
(IN FEET)





RUNWAY 12 ULTIMATE & EXISTING DEPARTURE PROFILE
SCALE: HORIZONTAL 1":1000' VERTICAL 1":100'

RUNWAY 30 ULTIMATE & EXISTING DEPARTURE PROFILE
SCALE: HORIZONTAL 1":1000' VERTICAL 1":100'

RUNWAY 12 ULTIMATE APPROACH OBSTRUCTION DATA

#	DESCRIPTION	STATION	OFFSET	SURFACE	OBJECT ELEVATION	PENETRATION (FEET)	DISPOSITION OF OBSTRUCTIONS
1	TREE	94+57.02	463.30'L	DEPARTURE	2447.25	10.7	REMOVE
2	TREE	92+94.84	313.40'L	DEPARTURE	2447.98	7.4	REMOVE
9	TREE	89+90.76	84.32'L	DEPARTURE	2458.91	10.7	REMOVE
10	TREE	86+81.52	239.35'R	DEPARTURE	2467.41	11.4	REMOVE
11	TREE	86+91.55	68.51'R	DEPARTURE	2468.18	12.5	REMOVE
12	TREE	85+97.17	427.83'L	DEPARTURE	2465.85	7.8	REMOVE
14	POWER POLE	89+54.96	544.85'R	DEPARTURE	2454.79	5.7	RELOCATE
15	TREE	88+67.98	159.50'L	DEPARTURE	2454.82	3.5	REMOVE
16	TREE	89+04.75	200.79'L	DEPARTURE	2451.85	1.5	REMOVE
17	TREE	89+72.37	192.33'L	DEPARTURE	2449.03	0.4	REMOVE
18	POWER POLE	90+04.85	284.57'L	DEPARTURE	2447.91	0.1	RELOCATE
19	POWER POLE	89+42.36	233.74'L	DEPARTURE	2452.03	2.6	RELOCATE
20	TREE	85+78.60	226.00'R	DEPARTURE	2459.77	1.2	REMOVE
21	TREE	87+37.92	540.00'L	DEPARTURE	2458.10	3.5	REMOVE
22	TREE	82+57.49	172.98'L	DEPARTURE	2477.59	11.0	REMOVE
23	TREE	81+58.96	92.69'L	DEPARTURE	2478.81	9.8	REMOVE
25	POWER POLE	93+00.22	565.53'R	DEPARTURE	2456.40	15.9	RELOCATE
29	INTERSTATE 84 + 17'	92+24.80	707.50'R	DEPARTURE	2446.07	3.7	LIGHT
30	TREE	84+76.97	21.75'R	DEPARTURE	2461.94	0.9	REMOVE

RUNWAY 12 EXISTING APPROACH OBSTRUCTION DATA

#	DESCRIPTION	STATION	OFFSET	SURFACE	OBJECT ELEVATION	PENETRATION (FEET)	DISPOSITION OF OBSTRUCTIONS
3	POWER POLE	108+72.71	621.34'L	DEPARTURE	2455.80	14.1	RELOCATE
4	POWER POLE	111+55.82	339.01'L	DEPARTURE	2450.99	16.4	RELOCATE
5	POWER POLE	111+95.10	265.39'L	DEPARTURE	2456.08	22.5	RELOCATE
6	POWER POLE	112+94.90	370.44'L	DEPARTURE	2455.32	24.2	RELOCATE
27	UNDEN ST. +15'	111+63.98	263.40'L	DEPARTURE	2439.32	4.9	RELOCATE ROAD

LEGEND

DESCRIPTION	EXISTING	ULTIMATE
AIRPORT PAVEMENT		
STREET & ACCESS ROAD		
AIRPORT BUILDING		
BUILDING RESTRICTION LINE (25' HIGH)	BRL	BRL
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY PROTECTION ZONE (RPZ)	RPZ	RPZ
AIRPORT PROPERTY LINE	P/L	P/L
DEPARTURE SURFACE		
AIRPORT PAVEMENT TO BE REMOVED		
STREET & ACCESS ROAD TO BE REMOVED		
RUNWAY THRESHOLD LIGHTS		
TOPOGRAPHIC CONTOURS (2')		
RUNWAY CENTERLINE ALIGNMENT		
IRRIGATION CANAL/LATERAL		
FENCE & GATE		
TREE & BRUSH/VEGETATION		

RUNWAY 30 ULTIMATE APPROACH OBSTRUCTION DATA

#	DESCRIPTION	STATION	OFFSET	SURFACE	OBJECT ELEVATION	PENETRATION (FEET)	DISPOSITION OF OBSTRUCTIONS
*NO OBSTRUCTIONS							

RUNWAY 30 EXISTING APPROACH OBSTRUCTION DATA

#	DESCRIPTION	STATION	OFFSET	SURFACE	OBJECT ELEVATION	PENETRATION (FEET)	DISPOSITION OF OBSTRUCTIONS
26	TREE	179+44.89	253.20'L	DEPARTURE	2457.30	2.2	REMOVE

FAA DISCLAIMER

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NOTES

1. ALL ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
2. ALL LATITUDE AND LONGITUDE COORDINATES ARE BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. ROAD/STREET CLEARANCES +15'. INTERSTATE CLEARANCES +17'.
4. OBSTRUCTION #'S ARE SPECIFIC TO EACH PARTICULAR OBSTRUCTION ON ALL SHEETS, THEREFORE OBSTRUCTION #'S MAY NOT BE LISTED IN SEQUENTIAL ORDER.

NO.	REVISION	BY	DATE	APPR.

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DRAWN BY: TJE
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CALDWELL INDUSTRIAL AIRPORT
CITY OF CALDWELL, IDAHO
RUNWAY DEPARTURE SURFACE DRAWING

PROJECT NO.
093512000

DRAWING NAME
7-DEPARTURE.DWG

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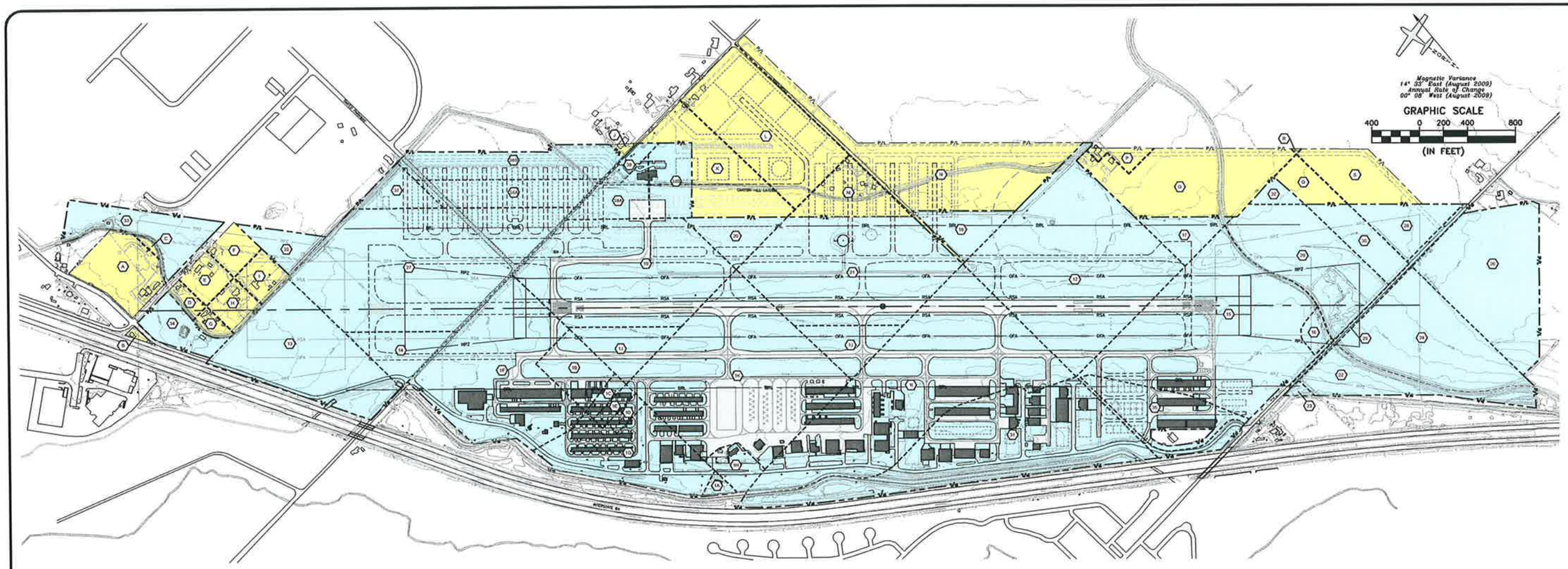

AIRPORT PROPERTY OWNERSHIP INFORMATION

PARCEL #	FAA ADAP /AIP ID	PRIOR OWNER	CURRENT OWNER	OWNERSHIP INTEREST	ACRES OWNED	INSTRUMENT NUMBER	RECORDED DATE OF ACQUISITION	FAA PROJECT NUMBER	FAA PROJECT YEAR	ACQUISITION PURPOSE	EASEMENTS & REMARKS
1A	AREA A	FLORENCE MARGARET HANLEY	CITY OF CALDWELL	FEE	0.77	753828	JULY 1, 1975	ADAP 01	1975	AERONAUTICAL	
1B	AREA A	SHIRLEY M. & LEE CHRISTENSEN	CITY OF CALDWELL	FEE	5.04	753982	JULY 3, 1975	ADAP 01	1975	AERONAUTICAL	PROPERTY TO CENTERLINE OF THE NOTUS CANAL
1C	AREA A	NELSON E. LESLIE & JOYCE ILENE LESLIE	CITY OF CALDWELL	FEE	1.00	753981	JULY 3, 1975	ADAP 01	1975	AERONAUTICAL	
1D	AREA A	LEONARD D. ALLEN & ELIZABETH E. ALLEN	CITY OF CALDWELL	FEE	1.00	754073	JULY 7, 1975	ADAP 01	1975	AERONAUTICAL	
1E	AREA A	JOHN G. TIBECAR & CYNTHIA S. TIBECAR	CITY OF CALDWELL	FEE	1.01	754141	JULY 8, 1975	ADAP 01	1975	AERONAUTICAL	
1F	AREA A	JERRY H. CANNING & ILENE CANNING	CITY OF CALDWELL	FEE	27.31	759468	OCTOBER 8, 1975	ADAP 01	1975	AERONAUTICAL	
1G	AREA A	WALTER EASTEP & RUTH EASTEP	CITY OF CALDWELL	FEE	14.98	762955	DECEMBER 4, 1975	ADAP 01	1975	AERONAUTICAL	NOTUS CANAL, DITCH ROW & WATER RIGHTS
1H	AREA A	RICHARD & MYRTLE A. MATSUNOTO	CITY OF CALDWELL	FEE	2.59	768532	FEBRUARY 27, 1976	ADAP 01	1975	AERONAUTICAL	
1I	AREA A	RICHARD & MYRTLE A. MATSUNOTO	CITY OF CALDWELL	FEE	43.21	768532	FEBRUARY 27, 1976	ADAP 01	1975	AERONAUTICAL	
1J	AREA A	VINSON FARMS, INC.	CITY OF CALDWELL	FEE	10.13	805088	JULY 8, 1977	ADAP 01	1975	AERONAUTICAL	
1K	AREA A	TOM & RICHARD MATSUNOTO	CITY OF CALDWELL	FEE	37.49	NO DEED	NO DEED	ADAP 01	1975	AERONAUTICAL	
12	PARCELS 22	GEORGE GOIRI & DONNA GOIRI	CITY OF CALDWELL	FEE	39.84	865065	MAY 11, 1979	ADAP 03	1977	AERONAUTICAL	
13	PARCEL 1	LENORA GLEE CUNNINGHAM	CITY OF CALDWELL	FEE	21.28	848218	DECEMBER 4, 1978	ADAP 04	1978	APPROACH	EASEMENT OF 0.845 AC.-AREA B-ADAP 01. WATER RIGHTS/DITCHES ROW
14	PARCEL 2	FRED P. HOUSTON & ALPHA J HOUSTON	CITY OF CALDWELL	FEE	4.99	884689	JANUARY 31, 1986	ADAP 04	1978	APPROACH	WATER RIGHTS: ROW FOR EAST LINDEN ST.
15	AREA II	DORSEY & JOANNE CAMPBELL	CITY OF CALDWELL	FEE	38.09	NO DEED	NO DEED	ADAP 05	1980	AERONAUTICAL	
16	PARCEL D	JOHN R. & JEREALD D. ABERASTURI	CITY OF CALDWELL	FEE	1.30	8701514	JANUARY 22, 1987	AIP 02	1986	APPROACH	PROPERTY TO CENTERLINE OF CALDWELL HIGHLINE CANAL
17	PARCEL C	PHILIP D. WHITENER & JOANN WHITENER	CITY OF CALDWELL	1/2 INTEREST FEE	3.60	8702718	FEBRUARY 6, 1987	AIP 02	1986	AERONAUTICAL	
		A. BOYD HARRIS & SARA H. HARRIS	CITY OF CALDWELL	1/2 INTEREST FEE	3.60	8702719	FEBRUARY 6, 1987		1986		
18	PARCEL B	KATSUO WATANABE & SETSUKO WATANABE	CITY OF CALDWELL	FEE	4.70	8702720	FEBRUARY 6, 1987	AIP 02	1986	AERONAUTICAL	ROAD ROW "KCID ROAD"
19	A-1	VINSON FARMS, INC.	CITY OF CALDWELL	FEE	29.20	NO DEED	NO DEED	AIP 02	1986	AERONAUTICAL	
20	A-3	H. R. VINSON & JOANN VINSON	CITY OF CALDWELL	FEE	4.10	NO DEED	NO DEED	AIP 02	1986	AERONAUTICAL	
21	A-2	VINSON FARMS, INC.	CITY OF CALDWELL	FEE	29.16	NO DEED	NO DEED	AIP 02	1986	AERONAUTICAL	
22	--	DWIGHT E LASTER & FREADA N. LASTER	CITY OF CALDWELL	OPTION TO PURCHASE	11.00	8625238	DECEMBER 22, 1988	--	--	APPROACH	ROW USTICK ROAD
23	--	WILLIAM H. OLSON & JOANN OLSON	CITY OF CALDWELL	FEE	0.35	9002623	FEBRUARY 13, 1990	--	--	APPROACH	EASEMENT - EXCEPT ROW USTICK ROAD
24	PARCEL I	NELDA S. STUBBLEFIELD	CITY OF CALDWELL	FEE	19.10	8900840	JANUARY 12, 1989	AIP 04	1988	APPROACH	
25	PARCEL I	NELDA S. STUBBLEFIELD	CITY OF CALDWELL	FEE-ROAD	0.62	9422679	JULY 27, 1994	AIP 04	1988	APPROACH	ROW - 30' USTICK ROAD
26	PARCEL J	DAVE E. HARRIS & LINDA LEE HARRIS	CITY OF CALDWELL	FEE	21.53	8901547	JANUARY 27, 1989	AIP 04	1988	APPROACH	
27	PARCEL K	FREDERICK P. & ALPHA J. HOUSTON	CITY OF CALDWELL	FEE	35.30	9100770	JANUARY 23, 1991	AIP 04	1988	AERONAUTICAL	ROAD EASEMENT # 761406
28	--	LELAND C. EARNEST & MARTHA EARNEST	CITY OF CALDWELL	FEE	5.36	9011333	JUNE 20, 1990	--	--	APPROACH	EXCEPT ROW
29	PARCEL E	JOANNE H. CAMPBELL	CITY OF CALDWELL	FEE	15.49	9122105	NOVEMBER 5, 1991	AIP 04	1988	APPROACH	PROPERTY TO CENTERLINE OF CALDWELL HIGHLINE CANAL
30	PARCEL F	IDA B. MOORE	CITY OF CALDWELL	FEE	5.23	9122107	NOVEMBER 5, 1991	AIP 04	1988	APPROACH	
31	PARCEL 10	FIRST SECURITY BANK OF IDAHO, N.A.	CITY OF CALDWELL	FEE	32.43	8625596	OCTOBER 9, 1988	AIP 09	1997	DEVELOPMENT	EASEMENT 2 (BOR) FOR NOTUS CANAL AND CALDWELL DRAIN
32	LOCAL	JOANNE H. CAMPBELL	CITY OF CALDWELL	FEE	1.32	9721670	JULY 7, 1997	LOCAL	--	AERONAUTICAL	
33	PARCEL 33	RALPH L. & PAMELA WERTENBERGER	CITY OF CALDWELL	FEE	8.125	200104420	FEBRUARY 7, 2001	AIP-13	2001	APPROACH	FORMERLY LISTED AS ONE 10.06 ACRE PROPERTY
	PARCEL 33	RALPH L. & PAMELA WERTENBERGER	CITY OF CALDWELL	FEE	3.069	200104421	FEBRUARY 7, 2001	AIP-13	2001	APPROACH	
34	PARCEL 34	HARVEY L. & BRENDA S. HUDGENS	CITY OF CALDWELL	FEE	5.014	200437253	JULY 9, 2004	AIP-14	2004	AERONAUTICAL	
35	PARCEL O	ERIC C. THOMPSON, ETUX	CITY OF CALDWELL	FEE	6.87	9932696	AUGUST 16, 1999	AIP-11	1999	DEVELOPMENT	EASEMENT 1 (BOR) FOR CALDWELL DRAIN
36a	PARCEL 36a	LEMRICK PROPERTIES, LLC.	CITY OF CALDWELL	FEE	7.16	200623479	JUNE 21, 2006	AIP-17	2007	AERONAUTICAL	
36b	PARCEL 36b	LEMRICK PROPERTIES, LLC.	CITY OF CALDWELL	FEE	8.60	200623479	JUNE 21, 2006	AIP-18	2008	AERONAUTICAL	LOCALLY FUNDED - ELIGIBLE FOR FUTURE AIP REIMBURSEMENT
37	PARCEL 37	LEMRICK PROPERTIES, LLC.	CITY OF CALDWELL	FEE	3.28	200623479	JUNE 21, 2006	LOCAL	--	AERONAUTICAL	LOCALLY FUNDED - FUTURE AIP REIMBURSEMENT WILL BE REQUESTED
38a	PARCEL 38a	TRI CEDARS MANAGEMENT LLC	CITY OF CALDWELL	FEE	4.33	2007010248	FEBRUARY 12, 2007	AIP-20	2009	DEVELOPMENT	
38b	PARCEL 38b	TRI CEDARS MANAGEMENT LLC	CITY OF CALDWELL	FEE	5.02	2007010248	FEBRUARY 12, 2007	AIP-22	2010	DEVELOPMENT	
39	PARCEL 39	TRI CEDARS MANAGEMENT LLC	CITY OF CALDWELL	FEE	1.38	2007010248	FEBRUARY 12, 2007	LOCAL	--	DEVELOPMENT	NOT ELIGIBLE FOR FUTURE AIP

FUTURE AIRPORT PROPERTY ACQUISITION INFORMATION

PARCEL #	FAA ADAP /AIP ID	PROPERTY OWNER	OWNERSHIP INTEREST	ACRES TO ACQUIRE	INSTRUMENT NUMBER	RECORDED DATE	DATE OF ACQUISTION	ACQUISITION PURPOSE	REMARKS
A	TBD	GERALD W. CROWNOVER	FEE	7.148	9940410	OCTOBER 8, 1999	2017-2021	APPROACH	
B	TBD	MARIANA MALDONADO	FEE	0.224	200332394	MAY 30, 2003	2017-2021	APPROACH	
C	TBD	PHILIP H. ANDRE	FEE	0.317	200456836	OCTOBER 13, 2004	2017-2021	APPROACH	
D	TBD	L.E. GALLOP	FEE	0.880	682859	MAY 2, 1972	2017-2021	APPROACH	
E	TBD	DANNY BELL	FEE	2.421	200464059	NOVEMBER 19, 2004	2017-2021	APPROACH	
F	TBD	PEDRO R. ARRENONDO	FEE	2.422	200408735	FEBRUARY 17, 2004	2017-2021	AERONAUTICAL	
G	TBD	RALPH MATTOX	FEE	0.884	NO DEED	NO DEED	2017-2021	APPROACH	
H	TBD	JOSH MILLER	FEE	2.419	9825200	JULY 2, 1998	2017-2021	AERONAUTICAL	
I	TBD	CLINTON G. TACKETT	FEE	2.424	9725337	AUGUST 4, 1997	2017-2021	AERONAUTICAL	
J	TBD	DALLAS P. DILLION	FEE	0.30	9109225	MAY 15, 1991	2012	DEVELOPMENT	
K	TBD	TRI CEDARS MANAGEMENT LLC	FEE	10.972	2008002017	JANUARY 11, 2008	2012	DEVELOPMENT	
L	TBD	TRI CEDARS MANAGEMENT LLC	FEE	20.07	200446606	AUGUST 20, 2004	2012	DEVELOPMENT	
M	TBD	TRI CEDARS MANAGEMENT LLC	FEE	6.271	2007030168	JUNE 10, 2007	2012	DEVELOPMENT	
N	TBD	ARROWAY FARMS INC.	FEE	22.65	8808630	APRIL 11, 1988	2012	DEVELOPMENT	
O	TBD	CLINTON L. SHIPPY	FEE	16.96	9531269	NOVEMBER 7, 1995	2022-2031	DEVELOPMENT	
P	TBD	CLINTON L. SHIPPY	FEE	1.30	9530477	NOVEMBER 7, 1995	2022-2031	DEVELOPMENT	
Q	TBD	IDA B. MOORE	FEE	2.92	672236	N/A	2022-2031	DEVELOPMENT	
R	TBD	LELAND C. EARNETT	FEE	0.05	9006723	APRIL 16, 1990	2022-2031	DEVELOPMENT	
S	TBD	LELAND C. EARNETT	FEE	6.60	9801671	JANUARY 16, 1998	2022-2031	DEVELOPMENT	

LEGEND

DESCRIPTION	EXISTING	ULTIMATE
AIRPORT PAVEMENT		
STREET & ACCESS ROAD		
AIRPORT BUILDING		
BUILDING RESTRICTION LINE (25' HIGH)	BRL	BRL
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
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NOTES

1. ALL ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
2. ALL LATITUDE AND LONGITUDE COORDINATES ARE BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. STREET RIGHT-OF-WAY = 80' AND CANAL RIGHT-OF-WAY = 60' ACCORDING TO THE CITY OF CALDWELL STANDARDS.

NO.	REVISION	BY	DATE	APPR.

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Airport Consultants
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CALDWELL INDUSTRIAL AIRPORT
CITY OF CALDWELL, IDAHO
AIRPORT PROPERTY MAP
EXHIBIT "A"

PROJECT NO. 093512000

DRAWING NAME 8-PROPERTY.DWG

8 of 8

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Appendix F

APPROVED ALP

SCANNED

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98057-3356

April 7, 2011

Mr. Brent Orton, Director
Engineering & Public Works Dept
621 Cleveland Blvd
Caldwell, ID 83605

Dear Mr. Orton:

The Caldwell Industrial Airport Layout Plan (ALP) dated November, 2010, submitted by Kimley-Horn & Associates, and bearing the Mayor's signature, is approved. A signed copy of the ALP is enclosed.

This approval considers only the safety, utility, and efficiency of the Caldwell Industrial Airport, and is conditioned on acknowledgment that any development on airport property requiring federal environmental approval must receive such written approval from the Federal Aviation Administration (FAA) prior to commencement of the subject development. This ALP approval is also conditioned on acceptance of the plan under local land use laws. We encourage appropriate agencies to adopt land use and height restrictive zoning based on the plan since action toward this end is a prerequisite of the Airport Improvement Program (AIP). Grant Assurance 21, Compatible Land Use, requires airport sponsors to take appropriate action, including the adoption of zoning laws to restrict the use of land adjacent to, or in the immediate vicinity of the airport, to activities and purposes compatible with normal airport operations including the arrival and departure of aircraft. The FAA recognizes residential development adjacent to the airport property as an incompatible land use. Allowing new residential use access to the Caldwell Airport would be in violation of grant assurance 5(g), which states that a sponsor will not permit or enter into any arrangement that results in permission for the owner or tenant of a property used as a residence, or zoned for residential use, to taxi an aircraft between that property and any location on the airport.

Approval of the plan does not indicate that the United States will participate in the cost of any development proposed. When airport construction, alteration, or deactivation is undertaken, such action requires notification and review in accordance with the provisions of Part 77 and Part 157 of the Federal Aviation Regulations.

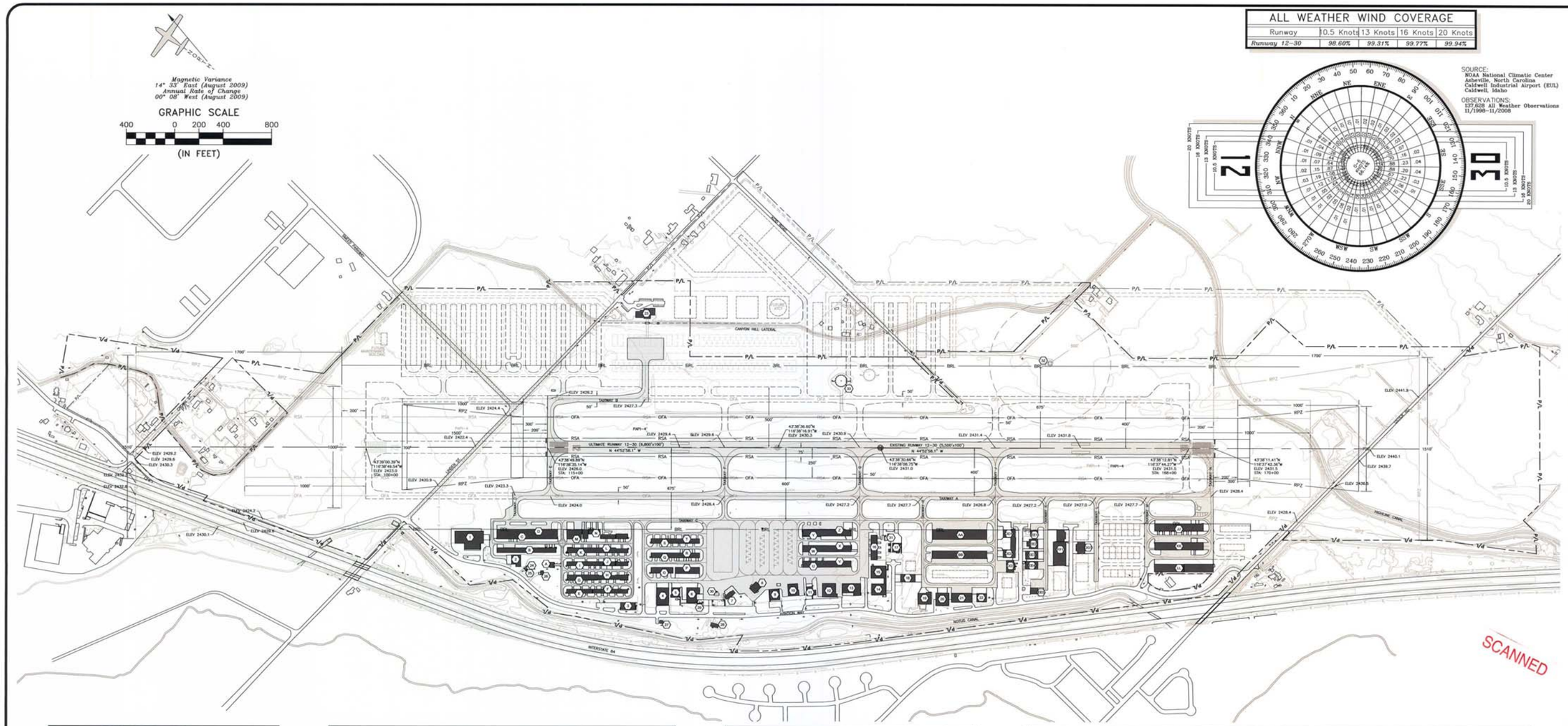
Please attach this letter to the Airport Layout Plan and retain it in the airport files for future use under the Airport Improvement Program.

Sincerely,

Carolyn Read
Acting Manager, Seattle Airports District Office

Encl: Caldwell ALP dtd Nov 2010

cc:
Mr. Bill Statham, Idaho Transportation Dept
Mr. Tom Lemenager, Kimley-Horn & Assoc., Inc.



SPONSOR APPROVAL

2.22.11

GARRET NANCOLAS MAYOR, CITY OF CALDWELL DATE

FAA APPROVAL

4/6/11

MANAGER, SEATTLE AIRPORTS DISTRICT OFFICE DATE

FAA DISCLAIMER

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

NOTES

1. ALL ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
2. ALL LATITUDE AND LONGITUDE COORDINATES ARE BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. STREET RIGHT–OF–WAY = 80' AND CANAL RIGHT–OF–WAY = 60' ACCORDING TO THE CITY OF CALDWELL STANDARDS.
4. NO MODIFACTIONS TO STANDARDS.
5. NO NON–STANDARD CONDITIONS.

RUNWAY DATA TABLE

DESCRIPTION	EXISTING		ULTIMATE	
	RUNWAY 12	RUNWAY 30	RUNWAY 12	RUNWAY 30
PERCENT EFFECTIVE GRADIENT	0.10%		0.13%	
RUNWAY ORIENTATION	N 44°52'58.1"W		SAME	
PERCENT WIND COVERAGE (10.5,13,16,20 KNOTS)	98.6%, 99.3%, 99.8%, 99.9%		SAME	
RUNWAY END ELEVATION	2426.0	2431.5	2423.0	2431.5
MAXIMUM RUNWAY ELEVATION	2431.8		2431.8	
RUNWAY LENGTH	5,500'		6,800'	
RUNWAY WIDTH	100'		SAME	
RUNWAY SURFACE TYPE	ASPHALT		SAME	
RUNWAY STRENGTH	72K LBS(SWL)/86K LBS(DWL)		SAME	
RUNWAY END COORDINATES	43°38'49.89"N 116°38'35.14"W	43°38'11.41"N 116°37'42.36"W	43°39'00.39"N 116°38'49.54"W	43°38'12.81"N 116°37'44.27"W
FAR PART 77 APPROACH CATEGORY	NPI ≥3/4MILE	NPI ≥3/4MILE	SAME	SAME
APPROACH TYPE	LPV ≥ 1 MILE	LPV ≥ 1 MILE	LPV ≥3/4MILE	LPV ≥3/4MILE
APPROACH SLOPE	34:1	34:1	SAME	SAME
RUNWAY LIGHTING	MIRL		MIRL	
RUNWAY MARKING	NPI	NPI	SAME	SAME
VISUAL AIDS	PAPI–4	PAPI–4	PAPI–4/REIL	PAPI–4/REIL
RUNWAY SAFETY AREA WIDTH	150'		500'	ODALS
RUNWAY SAFETY AREA LENGTH BEYOND END	300'		1,000'	
RUNWAY SAFETY AREA LENGTH PRIOR TO LANDING	300'		600'	
RUNWAY PROTECTION ZONE LENGTH	1,000'	1,000'	1,700'	1,700'
RUNWAY PROTECTION ZONE INNER WIDTH	500'	500'	1,000'	1,000'
RUNWAY PROTECTION ZONE OUTER WIDTH	700'	700'	1,510'	1,510'

AIRPORT DATA TABLE

DESCRIPTION	EXISTING	ULTIMATE
AIRPORT ELEVATION (MSL)	2431.0	2430.3
AIRPORT REFERENCE POINT DATA	43°38'30.66"N 116°38'08.75"W	43°38'36.60"N 116°38'16.91"W
MEAN MAXIMUM TEMPERATURE (F°)	93'	SAME
AIRPORT REFERENCE CODE (RUNWAY 12)	B–II	C–II
AIRPORT REFERENCE CODE (RUNWAY 30)	B–II	C–II
DESIGN AIRCRAFT (RUNWAY 12 & 30)	CESSNA CITATION V MODEL 560XL	CESSNA CITATION X MODEL 750

LEGEND

DESCRIPTION	EXISTING	ULTIMATE
AIRPORT PAVEMENT		
STREET & ACCESS ROAD		
AIRPORT BUILDING		
BUILDING RESTRICTION LINE (25' HIGH)	BRL	BRL
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY PROTECTION ZONE (RPZ)	RPZ	RPZ
AIRPORT REFERENCE POINT		
AIRPORT PROPERTY LINE	P/L	P/L
AIRPORT PAVEMENT TO BE REMOVED		
STREET & ACCESS ROAD TO BE REMOVED		
RUNWAY THRESHOLD LIGHTS		
TOPOGRAPHIC CONTOURS (2')		
AIRPORT LIGHTED ROTATING BEACON		
SEGMENTED CIRCLE & LIGHTED WINDCONE		
VISUAL AIDS	PAPI–4	PAPI–4
RUNWAY CENTERLINE ALIGNMENT		
IRRIGATION CANAL/LATERAL		
FENCE & GATE		
TREE & BRUSH/VEGETATION		

AIRPORT FACILITY & BUILDING LIST

#	DESCRIPTION	TOP ELEV.	#	DESCRIPTION	TOP ELEV.
A	BOX HANGAR (1 UNIT)	2441.9	KK	BOX HANGAR (16 UNITS)	2446.8
B	BOX HANGAR (10 UNITS)	2436.7	LL	CONVENTIONAL HANGAR (8 UNITS)	2448.4
C	BOX HANGAR (10 UNITS)	2441.8	1	VACANT MFG. BUILDING	2438.6
D	BOX HANGAR (11 UNITS)	2441.8	2	VACANT MFG. BUILDING	2444.9
E	T–HANGAR (8 UNITS)	2438.9	3	HIGHLAND APPRAISAL	2447.1
F	T–HANGAR (7 UNITS)	2438.9	4	WESTERN ROOFING	2456.2
G	T–HANGAR (8 UNITS)	2438.7	5	VACANT	2444.5
H	BOX HANGAR (6 UNITS)	2438.7	6	SILVERHAWK	2453.1
I	BOX HANGAR (8 UNITS)	2444.3	7	CAFE AND OFFICE SPACE	2440.5
J	BOX HANGAR (7 UNITS)	2444.3	8	AVIATION MAINTENANCE CENTER	2449.8
K	BOX HANGAR (8 UNITS)	2441.4	9	WARHAWK MUSEUM STORAGE	2444.7
L	BOX HANGAR (6 UNITS)	2441.4	10	BOB HANNAH	2450.6
M	BOX HANGAR (6 UNITS)	2444.1	11	VALLEY AIR PHOTO	2446.6
N	BOX HANGAR (6 UNITS)	2444.1	12	MICRON TECHNOLOGIES CEO	2450.7
O	BOX HANGAR (7 UNITS)	2447.0	13	RICK DRAKE/SECURITY GATES CO.	2454.5
P	BOX HANGAR (1 UNIT)	2449.1	14	THE SHIPPING CO.	2451.8
Q	BOX HANGAR (8 UNITS)	2444.6	15	SKY DOWN SKYDIVING	2451.8
R	BOX HANGAR (8 UNITS)	2444.6	16	SHORE & SHORE AVIATION (T–HANGARS)	2443.7
S	BOX HANGAR (6 UNITS)	2440.4	17	SHORE & SHORE AVIATION	2444.3
T	BOX HANGAR (7 UNITS)	2440.4	18	PERFORMANCE DRY WALL	2446.9
U–V	BOX HANGAR (7 UNITS)	2450.4	19	VACANT	2438.1
W–X	BOX HANGAR (8 UNITS)	2449.1	20	R&M STEEL	2448.5
Y–Z	BOX HANGAR (8 UNITS)	2450.0	21	BARKER/U.S. BLM	2447.2
AA	BOX HANGAR (20 UNITS)	2445.7	22	JACKSON AVIATION	2442.3
BB	BOX HANGAR (7 UNITS)	2445.9	23	NEW TERMINAL BUILDING	2462.7
DD1	BOX HANGAR (2 UNITS)	2448.7	24	AIRPORT LIGHTED ROTATING BEACON	2462.6
DD2	BOX HANGAR (2 UNITS)	2448.7	25	ELECTRICAL VAULT	2427.2
DD3	BOX HANGAR (2 UNITS)	2448.3	26	WELL WATER BUILDING	2429.6
EE1	BOX HANGAR (1 UNIT)	2445.1	27	MISC. OFFICE	2437.0
EE2	BOX HANGAR (2 UNITS)	2446.2	28	RESIDENTIAL	2436.4
EE3	BOX HANGAR (3 UNITS)	2448.9	29	ELECTRICAL VAULT	2435.6
EE4	BOX HANGAR (2 UNITS)	2447.3	30	SILVERHAWK FUEL PUMPS	2431.7
EE5	BOX HANGAR (1 UNIT)	2441.2	31	SHORE & SHORE FUEL PUMPS	2432.0
FF1	CONVENTIONAL HANGAR (6 UNITS)	2448.1	32	AWOS	2468.1
GG1	BOX HANGAR (2 UNITS)	2447.6	33	SEGMENTED CIRCLE & LIGHTED WINDCONE	2461.5
JJ	BOX HANGAR (8 UNITS)	2446.8			

NO.	REVISION	BY	DATE	APPR

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SCALE (H): 1"=400'
SCALE (V): N/A
DESIGNED BY: TJE
DRAWN BY: TJE
CHECKED BY: TWL
DATE: AUGUST 2010

CALDWELL INDUSTRIAL AIRPORT
CITY OF CALDWELL, IDAHO
AIRPORT LAYOUT PLAN

PROJECT NO. 093512000

DRAWING NAME 2–ALP.DWG

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