LEBANON
STATE AIRPORT

Lebanon, Oregon

Airport Master Plan

Final

AIRPORT MASTER PLAN

for

LEBANON STATE AIRPORT
Lebanon, Oregon

Prepared for

OREGON DEPARTMENT OF AVIATION

by

Coffman Associates, Inc.

August 2017

LEBANON
STATE AIRPORT

TABLE OF CONTENTS

TABLE OF CONTENTS

INTRODUCTION

Chapter One – INVENTORY

Chapter Two – FORECASTS

Chapter Three – FACILITY REQUIREMENTS

Chapter Four – ALTERNATIVES

Chapter Five – RECOMMENDED DEVELOPMENT PLAN

Chapter Six – CAPITAL IMPROVEMENT PROGRAM

EXHIBITS

INTRODUCTION

Chapter One – INVENTORY

Chapter Two – FORECASTS

Chapter Three – FACILITY REQUIREMENTS

Chapter Four – ALTERNATIVES

Chapter Five – RECOMMENDED DEVELOPMENT PLAN

Chapter Six – CAPITAL IMPROVEMENT PROGRAM

Appendix A
GLOSSARY OF TERMS

Appendix B
AIRPORT OVERLAY ZONE

Appendix C
GRANT ASSURANCES

Appendix D
FORECAST APPROVAL LETTER

Appendix E
AIRPORT LAYOUT PLAN

LEBANON
STATE AIRPORT

INTRODUCTION

INTRODUCTION

The Federal Aviation Administration (FAA) recommends that airports update their long term planning documents every seven to 10 years, or as necessary to address local changes at the airport. The last airport planning document completed was an Airport Layout Plan (ALP) and Narrative Report in 2006. The last full master plan was completed in 1990. The Oregon Department of Aviation (ODA) has received a grant from the FAA to develop a new Airport Master Plan. The FAA grant covers 90 percent of the fixed fee project cost with ODA providing a ten percent match.

Following federal guidelines for consultant selection based on qualifications, ODA selected Coffman Associates, a national aviation planning firm, to undertake the Master Plan project. After project scope negotiations and an independent review of study costs, a contract was approved by ODA in August 2015. A project notice to proceed was subsequently issued in October 2015.

The study is designed to provide guidance for future development and provide updated justification for projects for which the airport may request funding participation through federal and state airport improvement programs.

The Airport Master Plan will be prepared in accordance with FAA requirements, including Advisory Circular (AC) 150/5300-13A, *Airport Design* (as amended), and AC 150/5070-6C, *Airport Master Plans* (as amended). The scope of services, budget, and schedule was approved by ODA, following review by the FAA.

The Lebanon State Airport is a general aviation facility, as defined by the FAA, which is intended to serve the aviation needs of the community. The Airport is included in the FAA's *National Plan of Integrated Airport Systems* (NPIAS). As such, the Airport is eligible for federal development grants. ODA owns and operates the Airport, which is located approximately one mile west of the central business district of the City of Lebanon. The Airport is home to approximately 54 based aircraft. Services and facilities available include: hangar storage, tie-downs, fixed base operator (FBO) services, flight instruction, aircraft maintenance, and fueling. The Airport encompasses approximately 70 acres of land.

The Airport has a single runway oriented generally in a north to south manner. Runway 16-34 is 2,747 feet long and 60 feet wide. The runway is constructed of asphalt with a generalized weight bearing capacity of 12,500 pounds or less. The Airport is fully capable of accommodating activity by the single and multi-engine piston-powered aircraft fleet. Activity by pilots of turboprops or business jets is extremely rare.

MASTER PLAN OBJECTIVES

The overall objective of the Airport Master Plan is to provide the sponsor 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 planning effort related to the Airport is the 2006 *Airport Layout Plan and Narrative Report*. This Airport Master Plan will identify and provide justification, as available, for new priorities. This plan will be closely coordinated with other existing and on-going planning studies for the area, and with aviation plans developed by the FAA and the state. Specific objectives of the study include:

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

- Determine projected needs of airport users as it relates to the airside (runways, taxiways, etc.) and the landside facilities (hangar layout and mix).

- Recommend improvements that will enhance safety and the airport's ability to satisfy future aviation demand.

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

- Provide specific recommendations for aviation and non-aviation related land uses on airport property and review existing or proposed land use, economic development, and zoning documents to ensure future compatibility with off-airport development.

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

STUDY COORDINATION/PUBLIC INVOLVEMENT

The study process includes local participation through the formation of a planning advisory committee (PAC). The PAC consists of federal, state, and local agencies, airport tenants, and other airport stakeholders. The airport sponsor determines the final makeup of the committee. The PAC meets three times during the master plan process to review and discuss draft phase reports. All draft study materials are made available on a dedicated project website for the duration of the study.

One "open-house" public information workshop is scheduled to present the preliminary findings and to solicit public comment. **Exhibit IA** presents the key study elements, meeting intervals, project schedule, and documentation for the Airport Master Plan.

MASTER PLAN ELEMENTS AND PROCESS

To achieve the objectives described above, the Airport Master Plan is prepared in a systematic fashion pursuant to the scope of services that was coordinated with the airport sponsor and the FAA. The development of the Master Plan is an iterative process, meaning the information and results of one element are used in the analysis of subsequent elements.

The Master Plan process has been separated into three phases. Phase 1 will include the first three draft chapters, covering Inventory, Forecasts, and Facility Requirements. A draft report will be produced that will be distributed and presented to the PAC. Phase 2 will include the Development Alternatives. A draft report will be produced, distributed, and presented to the PAC. The first of two public information workshops will be held at this time as well. Phase 3 will include the Recommended Master Plan Concept, the Financial Program, and the Environmental Overview. This new material will be consolidated into a Draft Final document which will include any revisions to the previous chapters.

The Draft Final document will be used for the approval process. The approval process consists of sponsor review and approval of the overall plan. FAA approval consists of review and approval of the Forecast element and the Airport Layout Plan (ALP). The FAA may comment on the overall Master Plan but they do not specifically approve the Master Plan.

The study has 11 elements:

1.0 **Study Initiation and Organization** - Development of the scope of services, budget, and schedule. A kickoff visit to the Airport will be held and the project team will visit with various Airport stakeholders in order to gain a more comprehensive understanding of local issues.

2.0 **Inventory** - Inventory of facility and operational data, wind data, environmental data, population and economic data, airport financial data, and new aerial photography and mapping. All of the inventory data is organized as draft Chapter One.

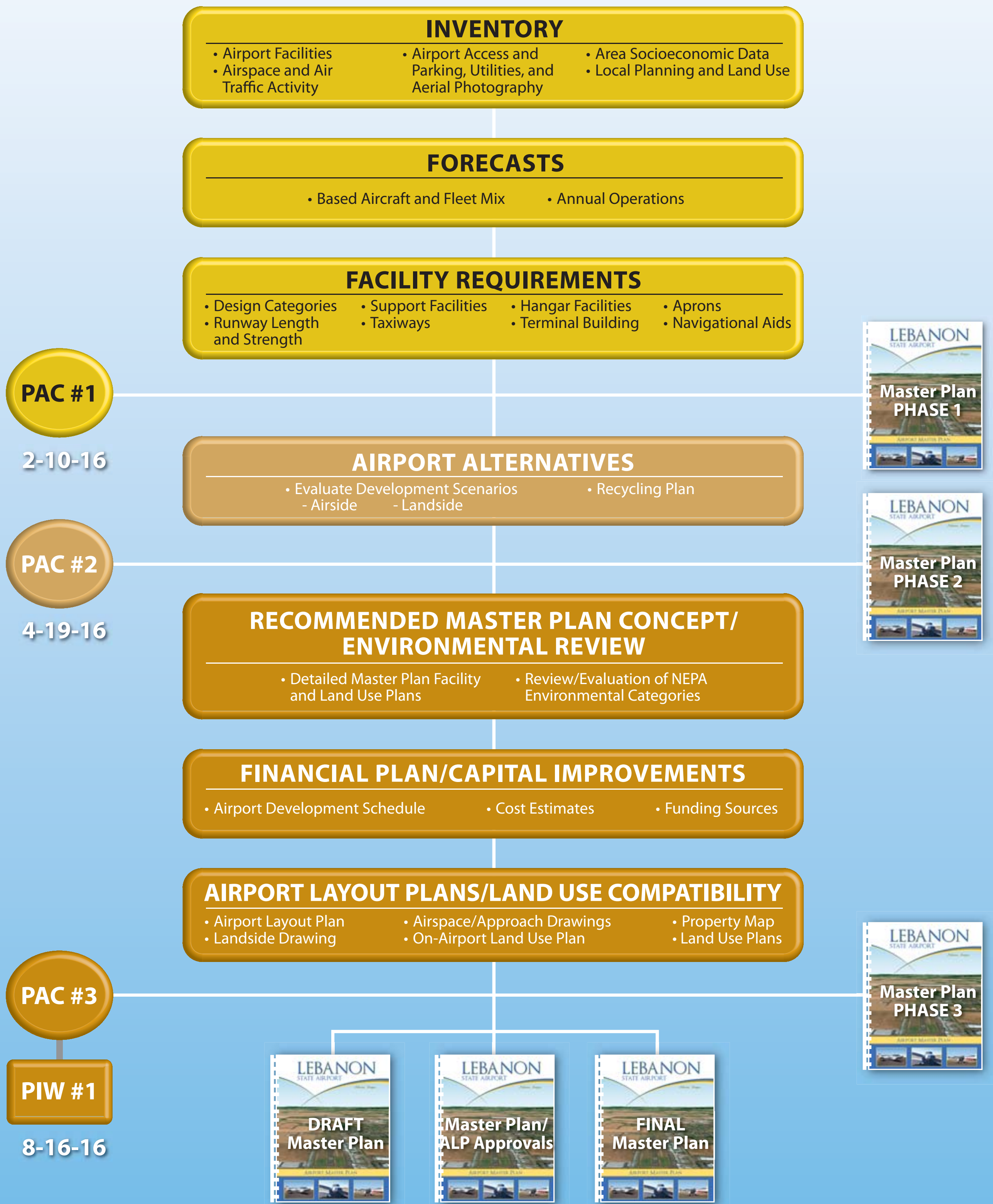


Exhibit IA
MASTER PLAN WORK FLOW

This element includes the collection data to comply with table 2-1 of Advisory Circular 150/5300-18B. The dataset is a high precision, digital model of the safety critical features of the Airport as defined in 18B, table 4-1. The process includes collection of high-resolution aerial photography, high precision surveys of safety critical airport data (runway ends, NAVAIDS, airport elevation, airspace, obstructions, and others), and compilation of collected data into a uniform GIS dataset. A GIS dataset that meets the airport's needs and is acceptable to the FAA is the deliverable.

3.0 **Forecasts** - Forecasts for based aircraft, operations, and peaking characteristics of the Airport over a 20-year period. The forecasts are organized into draft Chapter Two. The forecasts are delivered to the FAA for review and approval.

4.0 **Facility Requirements** - After establishing the critical design aircraft and physical planning criteria, airport needs will be developed for airside and landside facilities. The facility requirements are organized into draft Chapter Three.

5.0 **Phase I Report -** The first three chapters are consolidated into a draft report. It is distributed to the PAC and is posted to the project website. The project will assemble the PAC and make a presentation of the study findings to date.

6.0 **Airport Development Alternatives and Recycling Plan** - Potential airside and landside alternatives are developed for meeting long-term needs. Each of the alternatives is subjected to engineering and environmental analysis and summarized in draft Chapter Four. As part of the 2012 FAA *Modernization and Reform Act*, airports are required to examine the potential to implement recycling measures. This will be studied in this element as well.

7.0 **Phase II Report -** Draft Chapter Four is distributed and presented to the PAC.

8.0 **Master Plan Concept/Financial Program/Environmental Overview** – A recommended development concept is presented. A 20-year capital improvement program that is phased over time to various demand milestones is developed. Cost estimates for each project are developed in current (2016) dollars. The projects contained in the CIP are evaluated from an environmental perspective, utilizing guidelines provided in the *National Environmental Policy Act* (NEPA), in the Environmental Overview.

9.0 **Airport Layout Plans and Land Use Compatibility** - Airport layout plans (ALPs) (the technical drawings) are developed to depict existing and proposed facilities. The drawing set is developed to meet the requirements of FAA Standard Operating Procedures 2.0 for the ALP. Land use plans are developed to identify the recommended highest and best use of airport property.

10.0 **Draft Final Report –** The new material developed in elements 8.0 and 9.0 is combined with revisions to all previous elements to form a Draft Final document. The Draft Final will be presented to the PAC. A public information workshop is planned following the publication of the Draft Final.

11.0 **Final Documentation/Meetings/Public Workshop** – A Final Master Plan document is published following sponsor approval. The Final Master Plan will include updates based on PAC and public comments throughout the process. The ALP will be shepherded through the FAA for their approval. Four meeting are planned with the first being an initial inventory trip and the subsequent three being with the PAC throughout the process. A public information workshop is planned at the Draft Final stage of the process. An executive summary is developed as well.

Lebanon State Airport

Chapter One

INVENTORY

CHAPTER ONE

INVENTORY

The initial step in the preparation of the Airport Master Plan update for the Lebanon State Airport (Airport) is the collection of information that will provide a basis for the analysis to be completed in subsequent chapters. Information is gathered regarding both the Airport and the region it serves. This chapter will begin with an overview of the Airport history, administration, location, competing airports, and typical weather conditions. This will be followed by a discussion of demographic and socioeconomic factors relevant to the region. A comprehensive overview of the national aviation system for general aviation airports and the role of Lebanon State 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 and interviews with the Airport sponsor, management, tenants, and representatives of various government agencies. Information was also obtained from existing studies and various official internet websites. A general list of document sources is provided at the end of the chapter.

AIRPORT CHARACTERISTICS

It is important in any master plan to establish a baseline understanding of the Airport setting, including its location, geography, access to other transportation modes, the airport's role in the national aviation system, the local climate, and the administration of the airport. The following will describe these characteristics.

AIRPORT ADMINISTRATION

The Airport is a public use facility owned and operated by the State of Oregon Department of Aviation (ODA). The mission of ODA is to support and advocate for Oregon communities by preserving and enhancing aviation safety, infrastructure, and development through economic growth. ODA employs a State Airports Manager, two Airport Operations Specialists, and a State Airports Maintenance Coordinator to oversee operation of the 28 state-owned airports. The governor appoints members to serve four-year terms on the State Aviation Board. The State Aviation Board provides policy oversight for the activities of ODA.

Lebanon State Airport is owned and operated by the Oregon Department of Aviation (ODA)

LOCATION

The Airport is located in the City of Lebanon in Linn County, Oregon. It is approximately 75 miles south of Portland, Oregon, the largest population center in the state. The State Capital of Salem is approximately 30 miles to the north of Lebanon. Corvallis, home to Oregon State University, is approximately 20 miles west and Eugene, home of the University of Oregon, is approximately 35 miles to the south. The City of Lebanon is situated in the Willamette Valley between the Coast Range Mountains to the west and the Cascade Mountains to the east. The county seat of Albany is approximately eight miles to the northwest of Lebanon. A location map is presented on **Exhibit 1A**.

The Willamette Valley is a diverse agricultural area in the state of Oregon and also home to the majority of the population. The three largest cities, Portland, Salem, and Eugene, are located in the north, central, and south portions of the Valley, respectively. The urban areas are surrounded by varied and productive ranches, orchards, vineyards, and farms.

Lebanon is situated in the western foothills of the Cascade Mountains. Several prominent rocky outcrops are visible from the Airport, including Petersen's Butte which is approximately two miles to the southwest. This outcrop rises to an elevation of 1,431 feet, which is more than 1,000 feet above the Airport elevation of 346 feet.

ACCESS

State Highway 34 (Tangent Street) and U.S. Highway 20 (Santiam Highway) are the primary surface transportation routes to and from Lebanon. State Highway 34 is the primary east/west route that connects the City of Lebanon to Interstate 5 approximately eight miles to the west. U.S. Highway 20 traverses the state extending from Newport to the west and Ontario to the east. Interstate 5 is the major north/south highway extending from the Canadian border south to the Mexico border.

Airway Road is the main airport entrance road providing access to most of the hangars and the fixed base operator (FBO) on the east side of the Airport. Airway Road connects to Airport Road to the south and West Oak Street to the north. No roads, just agricultural lands and a self-storage facility, are located on the west side of the Airport.

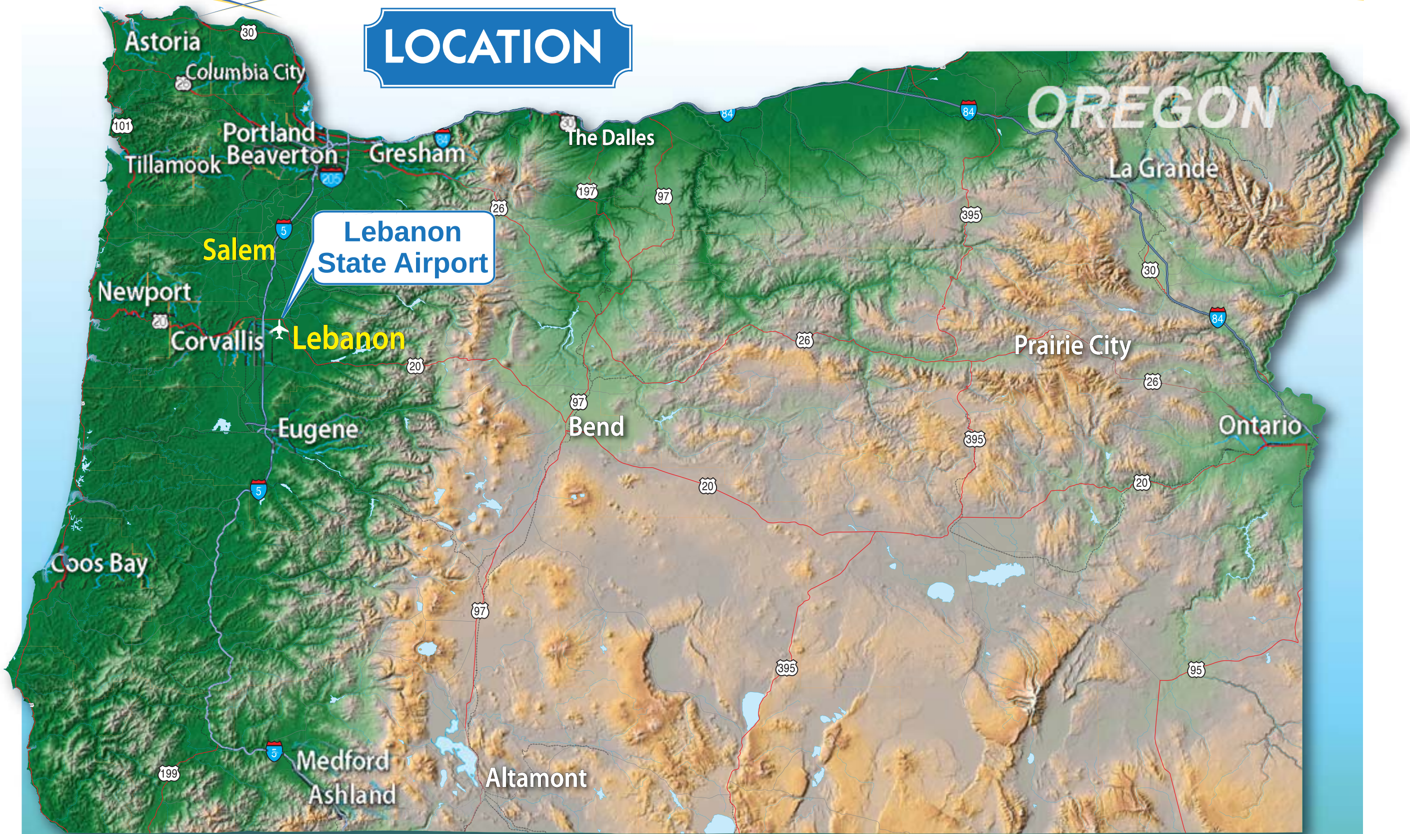


Exhibit 1A
LOCATION MAP

CLIMATE

The climate of the Valley is relatively mild throughout the year, characterized by cool, wet winters and warm, dry summers. Climate conditions are important to the planning and development of an airport. Temperature is an important factor in determining runway length requirements, while wind direction and speed are used to determine optimum runway orientation. The need for navigational aids and lighting is determined by the percentage of time that visibility is impaired due to cloud coverage or other conditions. The Federal Aviation Administration (FAA) has identified a single source for climate data that is to be utilized in airport studies. The source is the 30-year average "monthly normals," as produced by the National Oceanic and Atmospheric Agency (NOAA). The closest weather sensor that provides data to NOAA is located at Oregon State University. **Table 1A** summarizes relevant climate data from 1981 to 2010.

TABLE 1A
Climate Conditions

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Average High Temp[1]	47.1	50.9	56.1	60.8	67.2	73.2	81.7	82.6	77.0	64.7	52.6	45.8
Average Low Temp[1]	34.2	34.7	37.3	39.6	44.1	48.5	51.8	51.1	47.7	41.7	37.9	33.4
Average Rain Fall (i.)[1]	6.4	5.1	4.4	2.9	2.3	1.5	0.5	0.5	1.3	3.1	6.9	7.7
Wind Speed (mph)[2]	7.8	7.8	7.9	7.4	6.9	6.9	7.1	6.8	6.5	6.2	7.5	7.8
Sunshine Days[2]	27%	35%	48%	53%	56%	55%	70%	65%	63%	45%	26%	24%

Source: [1]*Climatography of the United States No. 81 (30-years of data from 1981-2010) as sourced from the weather sensor at Oregon State University*
[2]*www.city-data.com analysis of weather station data.*

The climate of the Linn County region is regulated by its latitude and location in the Willamette Valley between two mountain ranges. The mean maximum monthly high temperature ranges from a high of 82.6° Fahrenheit (F) in August to a low of 45.8° F in December. Average annual precipitation is approximately 42.71 inches, with most rainfall occurring during Oregon's wet season between November and April, while little or no precipitation falls during the summer months. Snow occasionally falls during the winter months with an average of approximately five inches.

AIRPORT HISTORY AND DEVELOPMENT

The community of Lebanon relies on the Airport to support its economic development objectives. Several business class aircraft currently use the airport to engage in local business activities. Lebanon State Airport plays a significant role in the community from an economic standpoint and also provides geographic coverage to the State's airport system.

In 1970, the Board of Aeronautics acquired the Airport from private owners in order to prevent the site from being redeveloped for non-aeronautical uses. Significant improvements were made in 1973-1974, including the construction of a partial parallel taxiway, an aircraft apron, as well as the acquisition of several avigation easements. In 1980, additional taxiway and apron construction was completed. The Airport was included in the FAA *National Plan of Integrated Airport Systems* (NPIAS) in 1990, signifying the Airport's importance to the National Aviation System and making the Airport eligible for various FAA development grants.

The 1990 Airport Master Plan and Airport Layout Plan (ALP) drawings were finalized in 1994, with major recommended changes in airport configuration, including runway reorientation/extension, realignment of Airport Road, and substantial areas of property acquisition along the west side of the airport.

In the mid-1990s, the *Linn County Regional Airport Feasibility and Site Investigation* study was undertaken to study the feasibility of developing a single regional airport that would replace both the Lebanon State Airport and the Albany Municipal Airport. The study evaluated the options associated with continued operation of the two airports, in addition to development of a new regional airport to replace the two existing airports. The study noted the development constraints associated with Lebanon State Airport that were identified in the previous master plan, but concluded that further efforts would be required to determine its development potential.

Since the completion of the *Linn County Regional Airport Feasibility and Site Investigation* in 1996, the long-term future of Albany Municipal Airport became more certain with the completion of a new airport master plan and substantial new investment in the airport. As a result, consideration of a combined regional airport has been discontinued.

In April 2003, the Lebanon State Airport ALP was revised by the ODA by eliminating the previously recommended runway reconfiguration/extension. Although the revised ALP was not submitted for formal FAA review and approval, the internal revision reflected a significant change in ODA's preferred development direction for the Airport.

Recent improvements at the Airport include installation of a new aboveground aviation fuel tank and card lock system; extension of the west parallel taxiway to the midfield exit; paving airport access entrance roads; fencing; and private hangar construction.

In 2006, with partial funding from an FAA grant, an updated Airport Layout Plan/Narrative Report was completed. The plan had the following primary recommendations:

- A regular schedule of pavement maintenance;
- Acquisition of 23 acres on the west to accommodate long term needs for additional hangars;
- Shifting the runway 258 feet to the north to provide adequate RSA on the Runway 34 end. (The Runway 34 end has since been shortened by 130 feet and a 260-foot displaced landing threshold installed; however, the extension to the north has not taken place. Total runway length currently is 2,747 feet.);
- Extension of west parallel taxiway to the Runway 16 threshold;
- Construction of an aircraft wash pad facility; and
- Expansion of the main aircraft apron.

Table 1B shows the capital grants and projects the Airport has received since 2007. Included are several projects to rehabilitate the runways and portions of the taxiways.

TABLE 1B Recent FAA Grant History Lebanon State Airport			
Year	**AIP Grant #**	**Description**	**Grant Amount**
2015	5	Master Plan Update (ALP)	$264,628
2009	4	Rehabilitate Runway 16-34 and Taxiway	$360,898
2009	3	Rehabilitate Runway 16-34 and Taxiway	$1,173,945
2008	2	Improve RSA, Install PAPI, Rehabilitate Runway and Taxiways	$1,041,510
2007	1	Improve RSA, Install PAPI, Rehabilitate Runway and Taxiways	$175,000
TOTAL AIRPORT IMPROVEMENT GRANTS			**$3,015,981**
Source: FAA Records accessed on 10.14.15 at http://www.faa.gov/airports/aip/grant_histories/#history			

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists on many levels: national, state, and local. Each level has a different emphasis and purpose. On the national level, the Airport is included in the *National Plan of Integrated Airport Systems* (NPIAS) and in the *General Aviation Airports: A National Asset*, an FAA report published in 2012. On the state level, the Airport is included in the *Oregon Aviation Plan* (2007), portions of which are currently being updated. The local planning document is the *Lebanon State Airport – Airport Layout Plan (ALP) Report*, which was last updated in 2006 (base year 2004). An airport master plan update typically includes an update to the ALP, as is the case with this study; however, the ALP can be updated independently, at the direction of the FAA, if necessary.

FEDERAL AIRPORT PLANNING

On the national level, the Lebanon State Airport is included in the NPIAS as a general aviation airport. The NPIAS identifies 3,331 existing airports which are considered significant to the national air transportation system. The NPIAS is published and used by the 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 2015-2019 NPIAS estimates that $33.5 billion worth of needed airport improvements are eligible for AIP funding 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 $965,000 in development needs at the Airport for the five-year planning horizon. This figure is not a guarantee of federal funding; instead, this figure represents development needs as presented to the FAA by the airport administration in the annual airport capital improvement program. Of the $33.5 billion in airport development needs identified by the NPIAS nationally, approximately 38 percent, or $12.7 billion, is proposed for the 2,939 non-primary general aviation airports.

Airports that apply for and accept AIP grants must adhere to various 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.

In an effort to distinguish the important and varied roles that general aviation airports serve, the FAA has completed two top-down reviews of the existing network of general aviation facilities included in the NPIAS. The results of these efforts are contained in the May 2012 report entitled, *General Aviation Airports: A National Asset,* and the March 2014 report entitled, *ASSET 2: In-Depth Review of 497 Unclassified Airports* (referred to collectively as the GA Asset Study). The purpose of the report is to further classify general aviation airports into four categories: national, regional, local, and basic airports. Of the 2,939 general aviation airports included in the study, 251 are currently unclassified due to types of activity and characteristics that did not provide for clear classification within one of the four groups. **Exhibit 1B** summarizes the composition of the National Airspace System, as well as the general aviation classifications and functions.

With this report, which has been integrated into the NPIAS, the FAA is recognizing the important contribution that general aviation airports provide to the national aviation system and economy. General aviation contributed $38.8 billion in economic output in 2009. When factoring in manufacturing and visitor expenditures, general aviation accounted for an economic contribution of $76.5 billion.

The new categories for general aviation airports are intended to help guide policymakers when making decisions regarding airports. The study recognized that categorizing all general aviation airports the same did not properly identify the important role of each airport within a community and the benefits of a large and diverse aviation system.

Lebanon State Airport is categorized as one of the 1,236 Local general aviation facilities. According to the GA Asset Study, Local general aviation airports are the backbone of the general aviation system with at least one in every state. Local airports account for 42 percent of the general aviation airports eligible for federal funding. They also account for 38 percent of total flying and 17 percent of flying with flight plans. Most of the flying from Local airports are by piston aircraft in support of business or recreational needs. These airports typically accommodate some level of flight training, emergency services, and charter passenger service. Flying from these airports tends to be within the state or immediate region.

STATE AIRPORT PLANNING

Lebanon State Airport is included in the *Oregon Aviation Plan 2007* (OAP). The OAP is a comprehensive evaluation of Oregon's aviation system and serves as a guide for future aviation development. The OAP defines the specific role of each airport in the state's aviation system and establishes funding and development needs. The OAP is periodically updated, with the current version having been completed in 2007. The Airport is one of 97 public use airports within the state's aviation system plan.

The State of Oregon categorizes public use airports by functional classification. They utilized the FAA's Airport Reference Code classification system (described in detail in Chapter Two - Forecasts), which is based on operational and physical criteria, and developed a unique set of performance measures to clearly demonstrate the types of facilities and services that should be provided at each airport category. The five airport classifications in the state are defined as follows:

Category I – Commercial Service Airports

These airports support some level of scheduled commercial airline service, in addition to a full range of general aviation aircraft. This includes both domestic and international destinations.

Category II – Urban General Aviation Airports

These airports support all general aviation aircraft and accommodate corporate aviation activity, including business jets, helicopters, and other general aviation activity. The primary users are business-related and service a large geographic region, or they experience high levels of general aviation activity.

Category III – Regional General Aviation Airports

These airports support most twin and single engine aircraft, occasional business jets, and support regional transportation needs.

Category IV – Local General Aviation Airports

These airports primarily support single engine, general aviation aircraft, but are capable of accommodating smaller twin-engine general aviation aircraft. They also support local air transportation needs and special use aviation activities.

In the Oregon Aviation Plan (2007), the Lebanon State Airport is classified as a Local General Aviation Airport

Category V – RAES (Remote Access/Emergency Service) Airports

These airports primarily support single engine, general aviation aircraft, special use aviation activities, and access to remote areas or provide emergency service access.

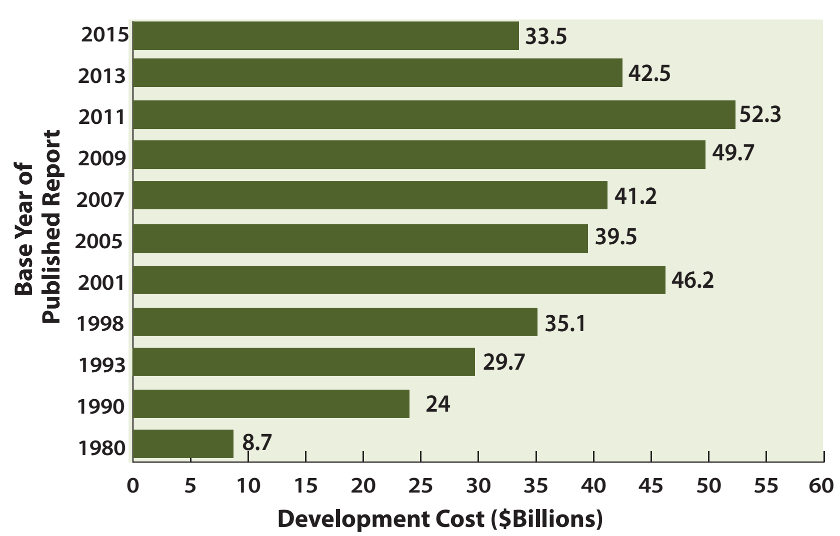
The Lebanon State Airport is classified as a Local General Aviation Airport in the *Oregon Aviation Plan (2007)*. The applicable design and performance criteria are listed in **Table 1C**.

The Lebanon State Airport meets all of the design criteria outlined in the *Oregon Aviation Plan 2007* except for runway length. At 2,877 feet in length, the current runway is 123 feet short of the desired length for a Local General Aviation airport. In Chapter Three – Facility Requirements, an evaluation of the recommended runway length will be presented.

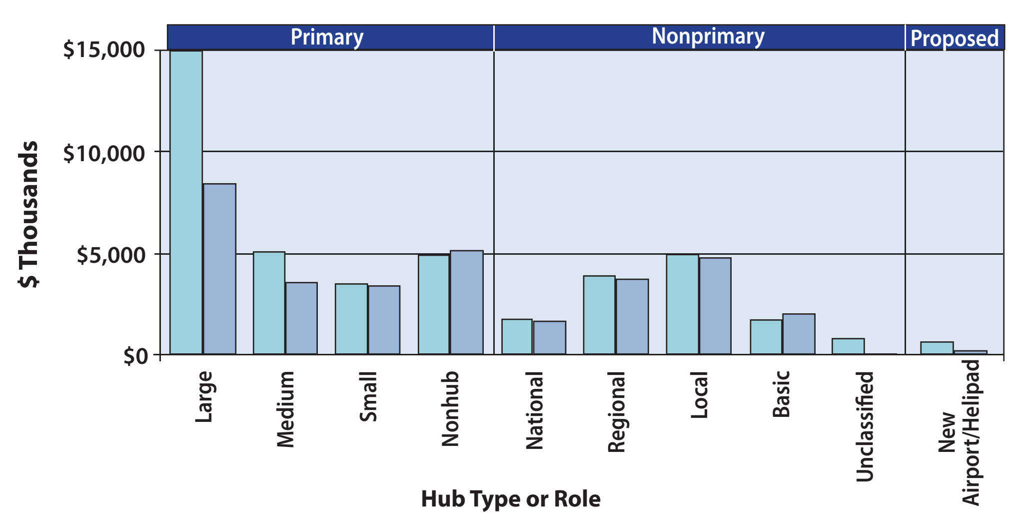
NATIONAL AVIATION SYSTEM

- **3,345 NPIAS Airports**
  - **3,331 Existing** (3,253 Public Owned; 78 Private Owned)
    - **2,942 Nonprimary** (2,553 GA; 264 Relievers; 125 Nonprimary CS)
      - 84 National
      - 459 Regional
      - 1,268 Local
      - 880 Basic
      - 251 Unclassified
    - **389 Primary**
      - 29 Large
      - 33 Medium
      - 76 Small
      - 251 Nonhubs
  - **14 Proposed**
    - **1 Primary**
    - **13 Nonprimary** (11 GA; 2 Nonprimary CS)

There are more than 19,360 aviation facilities in the United States, of which 5,148 are public use facilities. The National Plan of Integrated Airport Systems (NPIAS) includes 3,345 public use landing facilities, of which 3,331 are existing and 14 are proposed.



The FAA estimates that over the next five years, (2015-2019), there will be $33.5 billion of airport infrastructure projects eligible for Airport Improvement Program (AIP) funding.



The 389 primary airports account for 12% of the airports and 62% of the total development costs. The 2,939 non-primary airports account for 88% of the airports and 38% of total development costs.

Sources: National Plan of Integrated Airport Systems 2015-2019; General Aviation Airports: A National Asset (May 2012)

GENERAL AVIATION AIRPORTS

GROUP (number of airports)	DESCRIPTION
National (84)	**Serves national - global markets** Very high levels of activity with many jets and multiengine propeller aircraft Averaging about 200 total based aircraft, including 30 jets
Regional (459)	**Serves regional - national markets** High levels of activity with some jets and multiengine propeller aircraft Averaging about 90 total based aircraft, including 3 jets
Local (1,268)	**Serves local - regional markets** Moderate levels of activity with some multiengine propeller aircraft Averaging about 33 based propeller-driven aircraft and no jets
Basic (880)	**Often serving critical aeronautical functions within local and regional markets** Moderate - low levels of activity Averaging about 10 propeller-driven aircraft and no jets

FUNCTIONS (varies among individual airports)
- Emergency Preparedness and Response
- Critical Community Access
- Other Aviation Specific Functions
- Commercial, Industrial, and Economic Activities
- Destination and Special Functions

The FAA has further categorized non-primary airports to help guide policymakers when making decisions regarding airport development. An additional 251 airports are currently unclassified.

Emergency Preparedness and Response	Aeromedical Flights Law Enforcement/National Security/Border Security Emergency Response Aerial Fire Fighting Support Emergency Diversionary Airport Disaster Relief and Search and Rescue Critical Federal Functions
Critical Community Access	Remote Population/Island Access Air Taxi/Charter Services Essential Scheduled Air Service Cargo
Other Aviation Specific Functions	Self-Piloted Business Flights Corporate Flight Instruction Personal Flying Charter Passenger Services Aircraft/Avionics Manufacturing/Maintenance Aircraft Storage Aerospace Engineering/Research

Commercial, Industrial, and Economic Activities	Agricultural Support Aerial Surveying and Observation Low-Orbit Space Launch and Landing Oil and Mineral Exploration/Survey Utility/Pipeline Control and Inspection Business Executive Flight Service Manufacturing and Distribution Express Delivery Service Air Cargo
Destination and Special Events	Tourism and Access to Special Events Intermodal Connections (rail/ship) Special Aeronautical (skydiving/airshows)

General aviation airports provide important services for both local communities and the national aviation system.

Airports in the non-primary categories account for $12.7 billion of the $33.5 billion in identified development needs over the next five years.

2015-2019 NPIAS Costs by Airport and Development Category (2013 $ millions)

Category	National	Regional	Local	Basic	Unclassified	Total*
Safety	$76	$74	$86	$30	$0	$267
Security	$67	$63	$115	$76	$0	$321
Reconstruction	$572	$1,333	$1,578	$650	$1	$4,133
Standards	$769	$1,880	$2,740	$1,277	$2	$6,669
Environmental	$7	$11	$22	$11	$0	$52
Noise	$40	$23	$4	$0	$0	$67
Capacity	$150	$218	$180	$73	$0	$611
Terminal	$30	$44	$63	$19	$0	$155
Access	$36	$105	$88	$30	$0	$259
Other	$4	$29	$59	$37	$0	$130
New Airport	$0	$0	$0	$0	$0	$217
Total*	**$1,752**	**$3,781**	**$4,935**	**$2,204**	**$3**	**$12,675**
Percentage	**5.2%**	**11.3%**	**14.7%**	**6.6%**	**0.0%**	**38%**

*Totals may not equal due to rounding

This page intentionally left blank

TABLE 1C Oregon Aviation Plan 2007 Design Criteria for Local General Aviation Airports			
	Minimum Criteria	**Desired Criteria**	**Meets Minimum Criteria**
Airside Facilities			
FAA-ARC	B-I	B-II	Yes
Runway Length	3,000'	Varies	No
Runway Width	60'	Varies	Yes
Pavement Type	Concrete or Asphalt	Concrete or Asphalt	Yes
Taxiways	Exits needed	Partial or Turnarounds	Yes
Approach Type	Visual	Non-Precision	Yes
Visual Aids	NA	One runway end	Yes
Runway Lighting	LIRL	MIRL	Yes
Taxiway Lighting	LITL	MITL	Yes
General Facilities			
Rotating Beacon	Yes	Yes	Yes
Lighted Wind Indicator	Yes	Yes	Yes
Weather Reporting	NA	AWOS/ASOS	Yes
Hangared Aircraft Storage	75% of based aircraft	100% of based aircraft	Yes
Apron Parking/Storage	30% of daily transient	50% of daily transient	Yes
Terminal Building	NA	Small meeting area	Yes
Auto Parking	Minimal	Minimal	Yes
Fencing	NA	Terminal Area	Yes
Cargo	NA	NA	No
Services			
Fuel	100LL and Jet A	100LL, Jet A	Yes
FBO	NA	Limited	Yes
Ground Transportation	NA	Courtesy car/Offsite rental	Yes
Food Service	NA	Vending	Yes
Restrooms	Yes	Yes	Yes
Pilot Lounge	NA	Yes w/weather reporting	Yes
Snow Removal	Yes	Yes	Yes
Telephone	NA	Yes	Yes
Source: Oregon Aviation Plan 2007			

LOCAL AIRPORT PLANNING

The Airport Master Plan or Airport Layout Plan (ALP) Narrative Report is the primary local planning document. A Master Plan is intended to provide a 20-year vision for airport development based on aviation demand forecasts. An ALP Narrative Report is somewhat less rigorous in terms of analysis and scope, and is intended to focus on short term (typically five years) projects and to update the ALP, as necessary. The most recent airport planning document is the 2006 *ALP Narrative Report*, which had a forecast base year of 2004. Over time, the forecast element of an airport master plan typically becomes less reliable due to changes in aviation activity and/or the economy. As a result, the FAA recommends that general aviation airports update their master plans every 7 to 10 years, or as necessary to address any significant changes. Therefore, this is an appropriate time to update the airport planning documents and this 20-year Master Plan is being undertaken.

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 facilities necessary to provide a safe transition from surface-to-air transportation, including aprons, hangars, terminal buildings, and various other support facilities. Existing airside facilities are identified on **Exhibit 1C**. **Table 1D** summarizes airside facility information for the Airport.

TABLE 1D
Airside Facilities Data
Lebanon State Airport

	Runway 16-34	
Runway Length[1]	2,747'	
Runway Width	60'	
Landing Threshold Displacement	NA	260' (34)
Runway Construction	Asphalt	
Runway Condition	Excellent	
Runway Markings	Basic	
Runway Lighting	Medium Intensity	
Runway Weight Bearing Capacity (lbs): Single Wheel Type Landing Gear (S)	12,500 pounds[2]	
Taxiway Lighting	Medium Intensity/Reflectors	
Taxiway Type	Partial Parallel	
Taxiway Width[1]	25'-30'	
Taxiway Markings	Centerlines	
Taxiway Exits	5 Exits	
Approach Aids	PAPI-2L	
Instrument Approach Procedures	NA	
Weather or Navigational Aids	Lighted Wind Indicator (3) Rotating Beacon	

[1]Precision Approach Engineering As-Built CAD Drawings.
[2]Not published; Estimate provided from the 2006 ALP
PAPI-Precision Approach Path Indicator
Source: FAA Airport/Facility Directory, Northwest Mountain, Effective October 15, 2015

RUNWAYS

The Airport is served by a single runway oriented in a north-south manner. Runway 16-34 is 2,747 feet long and 60 feet wide. The Runway 16 end is at an elevation of 346 feet above mean sea level (MSL)


Fixed Base Operator (FBO)
Fuel
Northeast Hangar
East Hangars
South Hangars
Runway 34
12th St.
W Airway Rd.
Fuel
FBO
Beacon
Apron/Tie-down
East Hangars
A
A3
A2
A1
150'
210'
245'
PAPI
RUNWAY 16-34 (2,747' x 60')
260'
Displacement
B2
PAPI
Windsock
Windsock
B1
B
West Hangars
Windsock
B2 16-34
West Hangars
Oak St.
Airport Rd.
LEGEND
Airport Property Line
Avigation Easement
Runway Safety Area (RSA)
Object Free Area (OFA)
Runway Protection Zone (RPZ)
NORTH
0
400
800
SCALE IN FEET
Aerial Photo: Google Earth 7-14-15

This page intentionally left blank

and the Runway 34 end is slightly lower at 345 feet MSL. The strength rating of the runway is estimated at 12,500 pounds for aircraft with single wheel landing gear (S) configuration. The runway is considered to be in excellent condition having been completely rehabilitated in 2009.

Runway 16-34 is 2,747 feet long and 60 feet wide.

The Runway 34 end has what is termed a "lead-in-taxiway." A lead-in-taxiway is pavement aligned with the runway that is marked for use as a taxiway and not as a runway. Lead-in taxiways are now discouraged by the FAA as they can lead to pilot confusion and potential runway incursions. The lead-in-taxiway is 122 feet long. The Runway 34 end also has a landing threshold displacement of 260 feet from the end of the runway (where the lead-in-taxiway ends).

Runway 34 Lead-In-Taxiway

The runway is marked with basic marking that includes the runway designations, a dashed white centerline, and threshold bars. There are yellow chevrons on the south portion of the lead-in taxiway and white chevrons leading to the landing threshold. There is a white arrow on the pavement leading to the displaced threshold indicating the pavement is available for takeoff run when departing Runway 16.

NOTE: The FAA Airport Facility Directory, which is updated every three months, is the official source for published airport information. For Lebanon State Airport, a runway length of 2,877 feet is published with a 387-foot landing threshold displacement on the Runway 34 end. Following several projects between 2009 and 2010, the runway was shortened by 130 feet on the Runway 34 end to allow for a full 240-foot Runway Safety Area beyond the runway end. While the location of the landing threshold did not change, the displacement distance is now 260 feet and the official runway length is 2,747 feet.

PAVEMENT CONDITION

Every three years, the Oregon Department of Aviation performs inspections of the pavement conditions at the public use airports under its jurisdiction, including Lebanon State Airport. The pavement maintenance management program was developed as part of the Oregon Continuous Aviation System Plan sponsored in part by the Oregon Department of Aviation and the FAA. 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 was in September, 2015. 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 program for analysis. Maintaining a MicroPAVER database ensures that the airport complies with the "record keeping and information retrieval" requirements of the FAA grant assurances.

The MicroPAVER software program calculates a Pavement Condition Index (PCI) for each section of pavement on the airfield (runways, taxiways, and aprons). The program also generates forecasts of pavement condition five and 10 years into the future. The PCI values index ranges from 0 to 100, providing an indication of the overall condition of that section of pavement. For Category 4 airports such as Lebanon State Airport, pavement condition becomes critical when the PCI falls below 60 for runways, 55 for taxiways, and 50 for aprons. The MicroPAVER software also produces detailed reports indicating what on-going routine maintenance should be performed in order to maintain these minimum condition levels. The pavement condition index map for Lebanon State Airport is presented on **Exhibit 1D**.

As of September, 2015 all runway pavement had a PCI above 85 meaning it was in "good" condition which is the highest rating. The condition of taxiway pavements varied greatly. A section of Taxiway A, parallel to the terminal apron was listed as "poor" with a PCI below 55. The south end of Taxiway A was listed as "very poor" with a PCI below 40. The terminal apron was listed as "satisfactory" with a PCI above 70. In the future the runway remains in "good" condition through 2025 but the taxiways continue to deteriorate. Later in this Master Plan, several capital projects will be considered to maintain adequate pavement condition at the Airport.

The program provided by the Oregon Department of Aviation to monitor pavement condition is a significant asset to the state's system of airports. Continuous and on-going maintenance of the pavement at the Airport should provide a safe operating environment for aircraft for years to come.

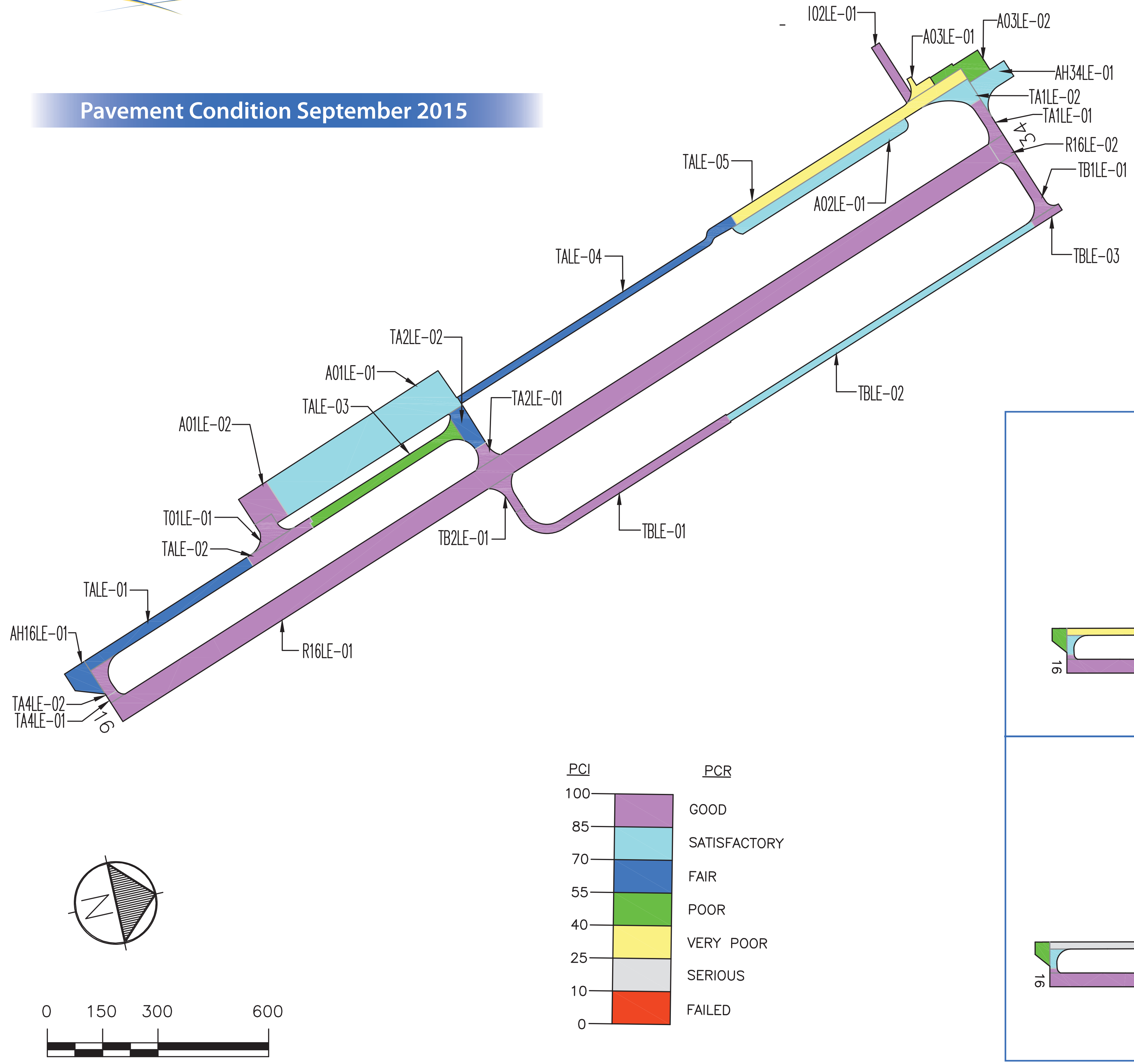
TAXIWAYS

Taxiways provide for ground movement of aircraft on airports. The following describes the taxiways at the Airport. All taxiways are lined on both edges with blue can reflectors and have a yellow centerline.

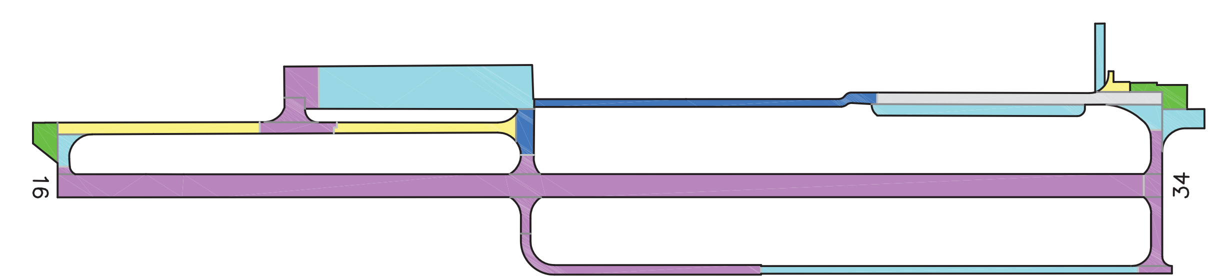
Taxiway A – East Parallel (North of Taxiway A2) is 30 feet wide and extends a distance of 1,200 feet to the intersection with Taxiway A3. It is 150 feet from the runway, centerline to centerline. It is in good condition but is showing some cracking and edge deterioration.

Taxiway A – East Parallel (South of Taxiway A2) is 1,600 feet long and 20 feet wide and extends to Taxiway A1 at the Runway 34 entrance point. From the intersection with Taxiway A2 and extending approximately 800 feet to the south, the taxiway is 210 feet from the runway. The taxiway then "jogs" slightly to the east and is then 245 feet from the runway centerline. At the south end, the taxiway begins to angle back to the west, toward the runway before intersecting with Taxiway A1. The south portion of Taxiway A is showing significant cracking and spalding and would be considered to be in fair condition.

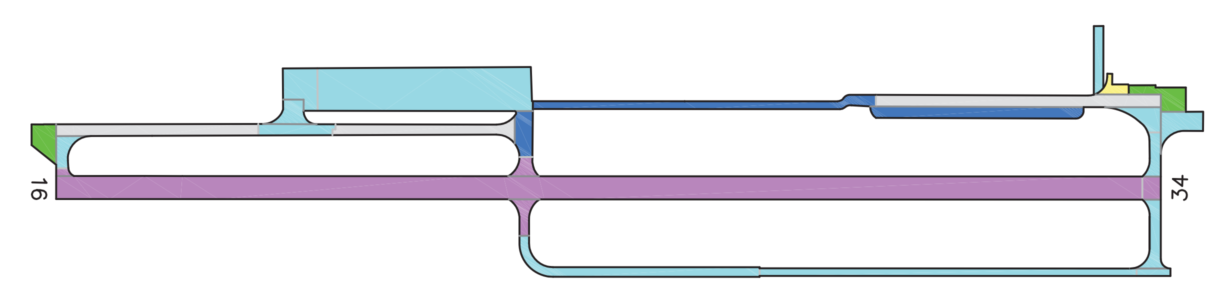
Pavement Condition September 2015



Predicted Condition in 2020



Predicted Condition in 2025



This page intentionally left blank

Taxiway A1 – South Threshold extends between the south end of Taxiway A and the entrance to the lead-in-taxiway to the runway. It is 25 feet wide and has a hold bar that is 125 feet from the extended centerline of the runway. The pavement is in excellent condition.

Taxiway A2 – Center Connector provides a runway exit and crossing point approximately in the middle of the runway. The taxiway is 30 feet wide at its narrowest point and has a hold bar that is 125 feet from the runway centerline. Portions of this taxiway are showing some deterioration with cracking and spalding.

Taxiway A3 – North Threshold extends between the north end of Taxiway A and the Runway 16 threshold. At its narrowest point, it is 30 feet wide with a hold bar situated 125 feet from the runway centerline. The hold apron in this area encompasses a portion of Taxiway A3. The pavement is showing some deterioration and spalding.

Taxiway B – West Partial Parallel is 1,600 feet long with a 1,050-foot south portion being 20 feet wide and a 550-foot north portion being 25 feet wide. It is separated from the runway by 235 feet. This taxiway provides access to the 18 individual hangars located on the west side of the Airport. The south portion of this taxiway has many cracks and is in poor condition. The north portion is in excellent condition.

Taxiway B2/Runway 16-34 Signage

Taxiway B1 – South Threshold extends between the south end of Taxiway B and the entrance to the lead-in-taxiway to the runway. It is 25 feet wide and has a hold bar that is 125 feet from the extended centerline of the runway. The pavement is in excellent condition.

Taxiway B2 – Center Connector provides a runway exit and crossing point approximately in the middle of the runway. The taxiway is 25 feet wide at its narrowest point and has a hold bar that is 125 feet from the runway centerline. This taxiway is in excellent condition.

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 below.

Identification Lighting: The location of the Airport at night is identified by a rotating beacon that projects two beams of light, one white and one green, 180 degrees apart. The beacon at the Airport is on the top of a steel lattice structure adjacent to the FBO building. The beacon operates sunset to sunrise.

Airport Beacon

Runway Lighting: Runway 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.

Runway 16-34 is equipped with medium intensity runway lighting (MIRL). These are lights set atop poles that are approximately one foot above the ground. The light poles are frangible, meaning if struck by an object, such as an aircraft wheel, they can easily break away, thereby limiting the potential damage to an aircraft. The edge lights are white in color and the threshold lights are green on the approach side and red on the departure side. The runway does not have caution zone lighting, which is yellow runway edge lights positioned in the last 2,000 feet of some jet-capable runways.

Taxiway reflective-can edge identification

Taxiway Reflectors: There is no taxiway lighting at the Airport. The lateral edges of the taxiways are defined by blue can reflectors.

Visual Approach Lighting: Common visual approach aids include the precision approach path indicator (PAPI) lights. PAPIs are a set of light boxes typically located to the left side of the approach to a runway end, approximately 1,000 feet from the runway threshold. When interpreted by pilots, PAPIs provide an indication of being above, below, or on the correct descent path to the runway. There is a two-box PAPI system on the left side of each end of the runway at the Airport. The PAPIs are owned by the Airport.

Airfield Signs: Airfield signs provide information to pilots regarding their current location on the airfield as well as what they are approaching (i.e., runway or taxiway). The Airport has lighted signs identifying the runway and taxiways.

Pilot-Controlled Lighting: While the runway edge lights are turned off at night, pilots can activate them using the pilot-controlled lighting system (PCL) from their aircraft through a series of clicks of their radio transmitter utilizing the Common Traffic Advisory Frequency (CTAF) (122.8 MHz). Typically, the airfield lights will remain on for approximately 15 minutes. The PAPI-2L visual approach slope lights operate continuously.

WEATHER AND COMMUNICATION AIDS

Current weather information at an airport is critical information for pilots. Some, but not all, general aviation airports will have sophisticated weather equipment, such as an Automated Weather Observation System (AWOS) or an Automated Surface Observation System (ASOS). These systems automatically record weather conditions, such as wind speed, wind gust, wind direction, temperature, dew point, barometric pressure, and density altitude and transmit the data regularly. There is no AWOS/ASOS at the Airport. The closest system is the AWOS located 16 nautical miles to the west at Corvallis Municipal Airport, which can be contacted via frequency (135.775 MHz).

Many airports will provide a segmented circle on the ground to provide information to pilots in the air. A segmented circle provides a visual indication of the appropriate traffic pattern pilots should use at an airport. There is not a segmented circle at the Airport.

The Airport has two windsocks that provide wind intensity and direction information to pilots. The primary windsock is located between Taxiway B and the runway, and a supplemental windsock is located to the west of the Runway 16 threshold. There is a smaller windsock atop the fuel farm.

CTAF (122.8 MHz) is available for pilots in the vicinity of the Airport to communicate with each other about approaches to or departures from the Airport. The CTAF frequency also serves as the UNICOM (Universal Communication) frequency, which provides communication with the Airport FBO.

Seattle Center is the Air Route Traffic Control Center (ARTCC) for the area, providing primarily en-route control services.

ELECTRONIC 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 the Airport include a very-high-frequency omni-directional range (VOR) facility and non-directional beacons.

The VOR provides azimuth readings to pilots of properly equipped aircraft. Frequently, distance measuring equipment (DME) is combined with a VOR facility (VOR/DME) to provide distance, as well as direction information to a pilot. Military tactical air navigation aids (TACANs) and civilian VORs are commonly combined to form a VORTAC. The Corvallis VOR/DME is located 15.7 nautical miles (nm) to the west and is on frequency 115.40 MHz. The Eugene VORTAC is located approximately 27.6 nm to the southwest and is available on frequency 112.9 MHz.

To the west of the Airport is the Lewisburg and the Turno NDB (non-directional beacon). The FAA has decommissioned NDBs in recent years as GPS and other technologies have been adopted.

GPS is an additional navigational aid for pilots. GPS was initially developed by the U.S. Department of Defense for military navigation around the world. GPS differs from a 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.

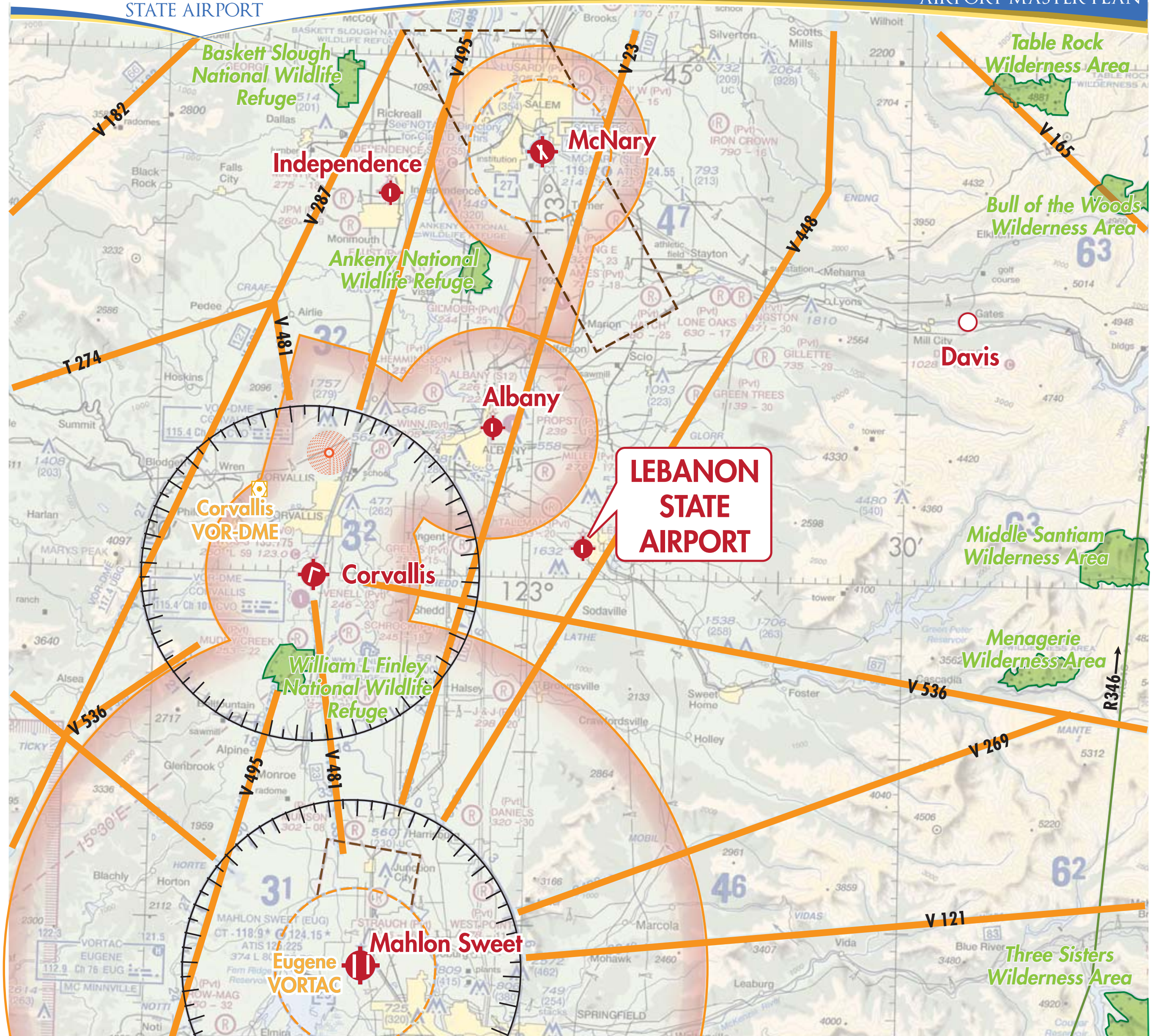
Each of these navigational aids are commonly integrated into instrument approach procedures to a specific runway end. There are no instrument approach procedures at the Airport; therefore, these navigational aids can only be utilized to navigate to the area and landings must then be conducted in visual conditions.

AREA AIRSPACE

The *Federal Aviation Administration Act of 1958* established the FAA as the responsible agency for the control and use of navigable airspace in 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 NAS. The U.S. airspace structure provides for categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, or G as described below. **Exhibit 1E** generally illustrates each airspace type in three-dimensional form.

- Class A airspace is controlled airspace and includes all airspace from 18,000 feet MSL to Flight Level 600 (approximately 60,000 feet MSL).
- Class B airspace is controlled airspace surrounding high-activity commercial service airports (e.g., Seattle International Airport).
- Class C airspace is controlled airspace surrounding lower-activity commercial service (e.g., Portland International Airport) and some military airports.
- Class D airspace is controlled airspace surrounding low-activity commercial service and general aviation airports with an airport traffic control tower (ATCT) (e.g., Salem McNary Field).



LEGEND

Airport with other than hard-surfaced runways	Wilderness Areas
Airport with hard-surfaced runways 1,500' to 8,069' in length	Military Training Routes
VOR-DME	Victor Airways
Non-Directional Radiobeacon (NDB)	Class D Airspace
Compass Rose	Class E (sfc) Airspace
	Class E Airspace with floor 700' above surface

NORTH

NOT TO SCALE

Source:
Seattle / Klamath Falls Sectional Charts, US Department of Commerce, National Oceanic and Atmospheric Administration, October 15, 2015

All aircraft operating within Classes A, B, C, or 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 (e.g., Albany Municipal Airport). 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.

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

Airspace within the vicinity of Lebanon State Airport is depicted on **Exhibit 1E**. The Airport operates in Class G airspace from the surface to 700 feet.

Victor Airways

Victor Airways are designated navigational routes extending between VOR facilities. Victor Airways are identified on sectional charges with a "V" followed by a number. Victor Airways have a floor of 1,200 feet aboveground level (AGL) and extend upward to an altitude of 18,000 feet MSL and are eight nautical miles wide. There are numerous Victor Airways in the vicinity of the Airport. The Victor Airways in the region include V-448, V-536, and V-23.

Military Operations Areas (MOAs)

A Military Operations Area (MOA) is airspace designated for military training use. This is not restricted airspace as civilian 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 a MOA is advertised by a *Notice to Airmen* (NOTAM) and noted on Sectional Charts. The closest MOA to the Airport is the Dolphin North MOA approximately 40 miles to the southwest.

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 low 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 the pilot must be able to see to complete the approach. Cloud ceilings define the lowest level that 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.

There are no instrument approach procedures established at Lebanon State Airport. Therefore, pilots can only complete an approach in visual conditions which is visibility of greater than three miles and cloud ceiling of not lower than 1,000 feet.

There are no instrument approach procedures established at Lebanon State Airport.

LOCAL PROCEDURES

Various pilot information services identify potential obstructions or other local conditions in the vicinity of the Airport of which pilots should be aware. Aircraft departing Runway 34 are asked to make a 20-degree left turn immediately after takeoff as soon as safety permits. This procedure is for the purpose of avoiding low overflights of adjacent residential housing. Pilots are also to be aware of trees in the vicinity of the Runway 16 end and the road in proximity to the Runway 34 end.

The Airport has implemented a standard left-hand traffic pattern. The traffic pattern altitude is 1,000 feet AGL (1,346 MSL).

LANDSIDE FACILITIES

Landside elements are the ground-based facilities that support the aircraft and pilot/passenger handling functions. These facilities typically include the 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 shown on **Exhibit 1C**.

AIRCRAFT HANGAR FACILITIES

It is important to identify the types, sizes, and availability of hangar space at the Airport in order to ultimately determine the long-term need for additional facilities. Hangars can be categorized as T-hangars, box hangars, or conventional hangars. T-hangar units are intended for storage of a single small aircraft. They are "T"-shaped, thus their name, and are typically nested together to maximize space and to lower the cost of construction.

South hangar complex with ODA owned hangar E-2 on the left

Box hangars can be rectangular or square and typically provide between 2,500 and 6,000 square feet of storage space. These hangars are often stand-alone structures, but they can be connected as well. Box hangars provide greater flexibility than T-hangars because they do not have interior support structures that limit aircraft positioning. Box hangars are typically equipped with utilities, such as electricity, water, and possibly sewer service.

Conventional hangars are large, clear-span hangars that typically house airport businesses or serve bulk aircraft storage needs. Operators of larger corporate aircraft may utilize these hangars as well.

Exhibit 1C includes the inventory of aircraft hangars. There are a total of 47 hangar buildings with a total of 77,500 square feet of aircraft storage space. The FBO hangar provides an additional 2,600 feet of hangar space typically dedicated to maintenance activities. It is estimated that these hangars provide for 54 individual aircraft storage units. All hangars are privately owned except for Hangar E-2, located at the southeast end of the airfield, which is leased from ODA.

TERMINAL FACILITIES

The Airport FBO building provides approximately 1,600 square feet that is used for operations and as the public lounge. There is a connected maintenance hangar encompassing approximately 2,600 square feet.

FBO pilot lounge

AIRCRAFT PARKING APRON

A main aircraft parking apron is typically provided to accommodate tie-down positions for both local and itinerant users. The FBO hangars face the south end of an 8,000-square-yard aircraft apron. There is a circulation taxilane through the middle of the apron with aircraft parking positions on both sides. There is approximately 3,600 square yards of apron space designated for aircraft parking with a total of 18 positions marked. For planning purposes, 13 of these positions are considered for local aircraft tie-down needs and five are considered for transient user needs, although this is flexible.

Terminal area apron looking south

FENCING, ACCESS, AND PARKING

Perimeter fencing provides important security and wildlife prevention functions. For general aviation airports, full perimeter fencing is not required; however, it is common for airports located in more urban areas. The Airport has full perimeter fencing with six-foot high chain-link topped with three-strand barbed-wire.

There are four primary vehicle access points, each of which is gated. There are also several pedestrian gates.

The public vehicle parking is located next to the FBO office/hangar building. The parking lot is approximately 8,500 square feet and is marked with 25 vehicle spaces, including one handicapped space. As with many general aviation airports, local aircraft owners will typically park their vehicles in their hangar while they are flying.

UTILITIES

The east side of the Airport has available water, electricity, sanitary sewer, and data communication lines that run along Airway Road. The east side Airport property line extends to Airway Road in two locations, in the FBO area and at the south end of the Airport. The west side of the airfield only has electricity available. Natural gas is not available at the Airport.

Republic Services provides solid waste removal and recycling services in the city of Lebanon and at the Airport.

EMERGENCY RESPONSE

As a general aviation facility that is not certified for scheduled commercial service, the Airport is not required to have on-airport firefighting capability. The closest fire station is located at 1050 West Oak Street, approximately ½-mile from the FBO gate entrance to the airfield. In the past, the fire department has indicated concern about the lack of water/fire hydrants on the west side of the Airport.

FUEL FACILITIES

Both 100 low-lead aviation fuel (AvGas) and unleaded motor gas (MoGas) are available at the Airport. There is an above-ground static fuel storage tank located at the south end of the main FBO apron. The tank is divided with 6,000-gallon AvGas and 4,000-gallon MoGas capacities. Fuel delivery is self-serve or via the Airport FBO.

There is movement among some general aviation pilot groups to promote the use of less expensive MoGas in airplane engines. The availability of MoGas for airplanes at Lebanon State Airport provides a unique offering at this Airport.

In June of 2016, LebanonAir, the Airport FBO was sold to a new operator. The new operator owns a small turboprop aircraft and intends to make Jet A fuel available at the airport.

Fuel farm

ADDITIONAL AIRPORT DOCUMENTATION

It is recommended that general aviation airports with significant activity maintain various procedural documents which provide guidance for airport management and tenants on airport issues. Typically, this includes a Minimum Standards document that is meant to encourage and ensure the provision of adequate services and facilities, economic health, and orderly development of aviation and related aeronautical activities at the airport. A rules and regulations document outlines the airport rules for administration and tenants. The Airport has a minimum standards document in place which applies to all state-owned airports. A separate rules and regulations document is not provided; however, many of the elements are contained in the minimum standards document

AREA LAND USE

Land uses in the vicinity of an airport can have an 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 the Lebanon State Airport. By understanding the land use issues surrounding the Airport, more appropriate recommendations can be made for the future of the Airport.

COMPATIBLE LAND USE

"Incompatible land uses and their impact on airport development are a continuing threat to airports nationwide. As the population of the State of Oregon continues to grow, so does the demand for space and, with it, the potential for incompatible land uses near airports. Consequently, it is important to properly manage land uses around the airport for the preservation of the state aviation system and, ultimately, the economic vitality of the state." (ODA Airport Land Use Compatibility Guidebook).

The Oregon Department of Aviation publishes and updates the *Airport Land Use Compatibility Guidebook*. This land use planning guidebook provides direction to any entity (typically cities and counties) that has an airport (or the airspace surrounding airports) within their jurisdiction. The document serves as a statewide planning tool providing the basis for future land use decisions regarding compatibility within airport planning areas.

Federal Legislation and Regulation

There are numerous federal laws and regulations related to airport land use compatibility. Airports that accept federal development grants are required to make every reasonable effort to comply with the laws and regulations. The following is a summary of the federal laws and regulations related to land use compatibility surrounding airports.

Airport and Airway Improvement Act of 1982 - United States Code (USC), Title 49: Upon acceptance of Federal funds, this Act obligates the airport owners to operate and maintain the airport and comply with specific assurances, including maintenance of compatible land uses around airports. The implementation of this Act is handled through stipulations outlined in the grant documents signed by airport owners when they accept Federal funds for a project.

Objects Affecting Navigable Airspace - Federal Code of Federal Regulations (CFR) Title 14, Part 77: This Federal regulation establishes standards for determining obstructions in navigable airspace. It sets forth requirements for construction and alteration of structures (i.e., buildings, towers, etc.). It also provides for studies of obstructions to determine their effect on the safe and efficient use of airspace, as well as providing for public hearings regarding these obstructions, along with provisions for the creation of antenna farm areas. It also establishes methods of identifying surfaces that must be free from penetration by obstructions, including buildings, cranes, cell towers, etc., in the vicinity of an airport. This regulation is predominately concerned with airspace-related issues. Implementation and enforcement of the elements contained in this regulation are a cooperative effort between the FAA and the individual state aviation agencies (in this instance, the Oregon Department of Aviation [ODA].

Airport Land Use Compatibility Planning -FAA Advisory Circular (AC) 150/5060-6: This document guides the development of a compatibility plan to ensure the environs surrounding an airport are not developed in a manner that could pose a risk to the airport's operations. This document specifically looks at land use and noise issues.

Airport Master Plans - FAA Advisory Circular (AC) 150/5070-6B: This document guides the development of airport master plans. The guiding principle of the airport planning process is to develop a safe and efficient airport through the use of acceptable standards. While there are many steps in the planning process, none of these steps should be treated in a piecemeal manner. The airside and landside issues must be equally evaluated to create a plan that provides for compatible airport and community development where possible.

A Model Zoning Ordinance to Limit Height of Objects Around Airports FAA Advisory Circular (AC) 150/5190-4A: This advisory circular concerns itself with developing zoning ordinances to control the height of objects. It is based upon the surfaces described in Subpart C of CFR Part 77, *Objects Affecting*

Navigable Airspace. This document provides sample language and model ordinances for use by local airports.

Airport Design - Advisory Circular (AC) 150/5300-13A: This document provides the basic standards and recommendations for airport design. Topics include various runway and taxiway safety areas, the runway protection zones, threshold siting surfaces, runway length, and facility separation standards.

Grant Assurances: Pursuant to the provisions of Title 49, U.S.C., subtitle VII, as amended, assurances are required to be submitted as part of a project application by sponsors requesting funds. Upon acceptance of the grant offer by the sponsor, these assurances are incorporated in, and become part of, the grant agreement. There are 39 grant assurances, several of which address airport planning. The following are the primary land use compatibility grant assurances:

- Grant Assurance 20 relates to an airport sponsor's obligation for hazard removal and mitigation to address potential obstructions to the airspace around the airport. Grant Assurance 20 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, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards."

- Grant Assurance 21 requires, in part, that the sponsor:

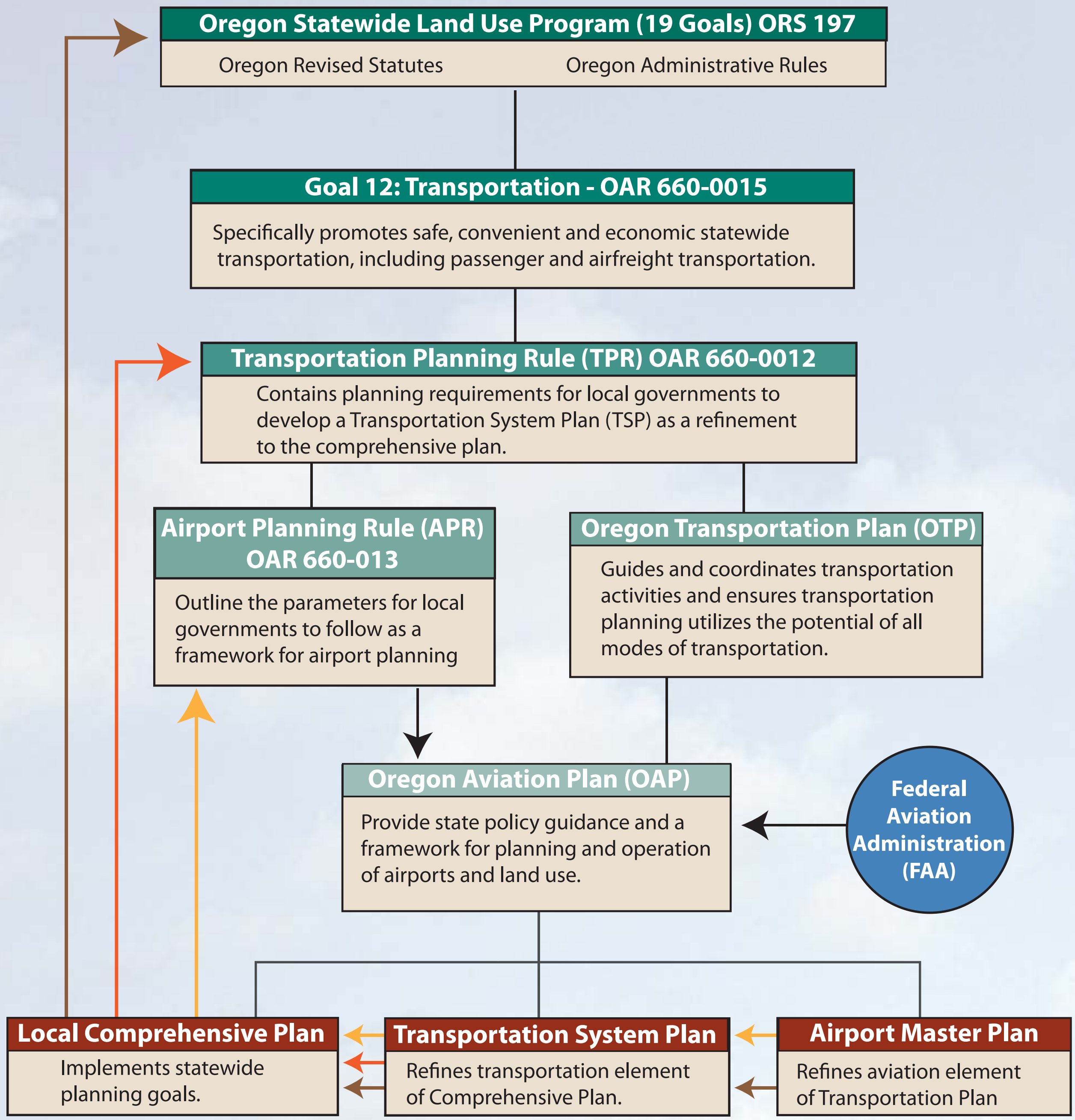
  "…take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft."

In addition to appropriate land use zoning, communities are responsible for protecting airports from obstruction to the airspace. Most communities develop height and hazard regulations surrounding airports.

State Statutes and Regulations

Since 1974, Oregon's *Land Use Planning Act*, embodied in Oregon Revised Statutes (ORS Chapter 197), has required all cities and counties to develop and adopt comprehensive plans. These plans must be updated through a process known as periodic review (ORS 197.682-650) to ensure that the plan continues to meet applicable statutes, administrative rules, and current laws and policies of the state of Oregon. **Exhibit 1F** graphically presents the relationship between the Statewide Land Use Program and Airports.

Relationship Between the Statewide Land Use Program and Airports



Source: Airport Land Use Compatibility Guidebook, January 2003

Oregon's land use planning program is predicated on conformance with the 19 statewide planning goals and administrative rules (OARs) that implement these goals. Requirements for meeting these goals are elaborated in applicable state statutes and administrative rules and must be embodied in local comprehensive plans adopted by each county and city. Each of these local plans must be acknowledged by the state Land Conservation and Development Commission (LCDC) as, in fact, conforming to the goals, statutes, and rules.

One of these goals (Goal 12, Transportation Planning) promotes the provision of a safe, convenient, and economic statewide transportation network, including passenger and freight air transportation. The goal is achieved by the creation of transportation system plans (TSPs). Oregon Revised Statutes (ORS 197.628 et seq.) also require local governments to periodically review comprehensive plans and to implement land use regulations to ensure that they adequately provide "needed housing, employment, transportation and public facilities and services." Through the periodic review process, local governments work with the state Department of Land Conservation and Development (DLCD), the agency arm implementing policies established through DLCD, to update certain comprehensive plan elements (e.g., transportation plans) and/or regulations (e.g., airport compatibility zoning).

The need for periodic review is based upon a determination that there has been:

- A change in circumstances such that the local plan or land use regulations do not comply with statewide planning goals,
- The existing plan or regulations are not achieving the goals, or
- There are agency plans or programs that affect land use which require modification to local plans or regulations to assure compliance with the goals.

The following is a summary of the major state aviation planning statutes and regulations:

Airport Planning Rule (APR): To aid in implementing Goal 12 and provisions for local government airport regulations outlined in ORS 836.600 et seq., the DLCD adopted the Airport Planning Rule (APR). Outlined in OAR Chapter 660, Division 13, the APR establishes a series of local government requirements pertaining to aviation facility planning. These include requirements to:

- Adopt comprehensive plan and land use regulations for airports to carry out the requirements established in the APR and applicable ORS;
- Map and provide supporting documentation to establish airport boundaries, identify existing and proposed facilities, site future expansion areas and/or airport uses, map airport safety and compatibility zones and imaginary surfaces, and delineate noise impact boundaries;
- Adopt an Airport Safety Overlay Zone prohibiting structures, trees, etc., from penetrating airport imaginary surfaces based upon FAA standards, and establish limited height exceptions and a means of approving variances when supported by the ODA and FAA;
- Develop compatibility standards to prohibit residential and public assembly uses within runway protection zones, limit certain uses within noise impact boundaries, limit outdoor lighting, prohibit new and expanded industrial uses that cause emissions hazardous to aviation, and require coordinated review with ODA of radio, TV, and cellular facilities proximate to airports;

- Regulate water impoundments (e.g., gravel pits) per ORS 836.623(2) through (6), and prohibit new landfills near airports per Oregon Department of Environmental Quality (DEQ) standards;
- Adopt land use regulations for non-towered airports authorizing various aviation and airport-related uses and activities, as well as forestry and agricultural uses;
- Allow certain industrial, manufacturing, and other uses within airport boundaries if they would result in no significant hazard or limitation on approved airport uses, and are consistent with local comprehensive plans, statewide planning goals, and other OARs; and
- Update local plans and land use regulations to conform to the APR during periodic review or a TSP update, and ensure that future amendments to local plans and regulations also comply with provisions of the APR.

The APR serves as the state regulatory basis for ensuring that local government airport planning conforms to the hierarchy of state plans and statutory requirements (i.e., Goal 12, ORS 836.600 et seq., Oregon Transportation Plan, Oregon Aviation Plan). These rules outline the clear, comprehensive parameters for local governments to follow as a framework for airport planning.

Transportation Planning Rule (TPR): The State Transportation Planning Rule (TPR, embodied in OAR Chapter 660, Division 12) contains planning requirements for local governments to develop TSPs as elements of comprehensive plans. These TSPs are required to contain elements intended to preserve local components of the state's public use aviation system, as identified in the 2007 *Oregon Aviation Plan*, as well as plan for multi-modal ground transportation system needs.

The TPR requires local jurisdictions to adopt land use regulations for land uses within airport noise corridors and CFR Part 77 imaginary surfaces and to restrict physical hazards to air navigation. Since publication of the 1994 *Oregon Airport Land Use Compatibility Guidebook*, several changes to the TPR were enacted that have bearing on airport planning. These changes include:

- OAR 660-012-0045(2), which requires local governments to adopt land use or subdivision ordinance regulations consistent with federal and state requirements that protect transportation facilities, corridors, and functions, including: controlling land uses within airport noise corridors and imaginary surfaces and limiting physical hazards to air navigation to protect public use airports; and
- Developing a process for coordinated review of future land use decisions affecting transportation corridors or facilities (including public use airports).

Therefore, these TPR standards obligate local governments through their TSP and comprehensive plan to protect public use airports from incompatible uses through planning and ongoing review of local land use decisions on development proposals that could impact airport facilities.

OAR 660-012-0065(3), which allows for expansions or alterations of public use airports without having to seek exceptions from certain statewide planning goals (Goals 3, 4, 11, and 14), when the expansion or alteration does not change the design class of aircraft planned for the subject airport. This standard significantly streamlines the approval process for certain types of airport expansions and modifications on rural lands surrounding airports.

Notice Requirements: ORS 197.183 requires local governments to provide notice to the Oregon Department of Aviation when applications are received for water impoundments (e.g., new gravel pits) larger than ¼-acre in size located within 10,000 feet of an airport identified in ORS 836.610(1). Standards in ORS 836.623 outline the local government responsibilities for approving or denying such impoundments.

Implementing state statutes (ORS 215.223, 215.416, and 227.175) and administrative rules (OAR 738-100-0010) also require local planning authorities to send notice of public hearings and decisions on land use permits or zone changes to owners of public use airports and to the Oregon Department of Aviation when the subject property is within 5,000 feet of the sides or ends of a runway on a visual airport, or 10,000 feet on an instrument airport. Notice need not be provided if the permit or zone change would allow a structure of less than 35 feet in height and the property is located outside the runway approach surface or on property owned by the airport.

Airport Land Use Compatibility Guidebook

The *Airport Land Use Compatibility Guidebook* is published by the Oregon Department of Aviation and enforced by state statute. The Guidebook is an essential tool for local governments to reference when undertaking airport compatibility issues. The Guidebook specifically outlines 11 activities that are permissible on airport property at non-towered airports. The following is quoted directly from Appendix A of the Guidebook:

Local government shall adopt land use regulations for areas within the airport boundary of non-towered airports identified in ORS 836.610(1) that authorize the following uses and activities:

(1) Customary and usual aviation-related activities, including but not limited to takeoffs, landings, aircraft hangars, tiedowns, construction and maintenance of airport facilities, fixed-base operator facilities, a residence for an airport caretaker or security officer, and other activities incidental to the normal operation of an airport. Residential, commercial, industrial, manufacturing, and other uses, except as provided in this rule, are not customary and usual aviation-related activities and may only be authorized pursuant to OAR 660-013-0110.

(2) Emergency Medical Flight Services, including activities, aircraft, accessory structures, and other facilities necessary to support emergency transportation for medical purposes. "Emergency Medical Flight Services" does not include hospitals, medical offices, medical labs, medical equipment sales, and similar uses.

(3) Law Enforcement and Firefighting Activities, including aircraft and ground-based activities, facilities and accessory structures necessary to support federal, state, or local law enforcement and land management agencies engaged in law enforcement or firefighting activities. These activities include transport of personnel, aerial observation, and transport of equipment, water, fire retardant, and supplies.

(4) Flight Instruction, including activities, facilities, and accessory structures located at airport sites that provide education and training directly related to aeronautical activities. "Flight Instruction" does not include schools for flight attendants, ticket agents, or similar personnel.

(5) Aircraft Service, Maintenance and Training, including activities, facilities, and accessory structures provided to teach aircraft service and maintenance skills, maintain, service and repair aircraft and aircraft components, but not including activities, structures, and facilities for the manufacturing of aircraft for sale to the public or the manufacturing of aircraft related products for sale to the public. "Aircraft Service, Maintenance and Training" includes the construction of aircraft and aircraft components for personal use. The assembly of aircraft and aircraft components is allowed as part of servicing, maintaining, or repairing aircraft and aircraft components.

(6) Aircraft Rental, including activities, facilities, and accessory structures that support the provision of aircraft for rent or lease to the public.

(7) Aircraft Sales and the sale of aeronautic equipment and supplies, including activities, facilities, and accessory structures for the storage, display, demonstration and sale of aircraft, and aeronautic equipment and supplies to the public.

(8) Aeronautic Recreational and Sporting Activities, including activities, facilities and accessory structures at airports that support recreational use of aircraft and sporting activities that require the use of aircraft or other devices used and intended for use in flight. Aeronautic Recreation and Sporting Activities on airport property shall be subject to approval of the airport sponsor. Aeronautic recreation and sporting activities include but are not limited to: fly-ins; glider flights; hot air ballooning; ultralight aircraft flights; displays of aircraft; aeronautic flight skills contests; gyrocopter flights; flights carrying parachutists; and parachute drops onto an airport. As used in this rule, parachuting and parachute drops include all forms of skydiving. Parachuting businesses may be allowed only where they have secured approval to use a drop zone that is at least 10 contiguous acres. A local government may establish a larger size for the required drop zone where evidence of missed landings and dropped equipment supports the need for the larger area. The configuration of a 10-acre minimum drop zone shall roughly approximate a square or circle and may contain structures, trees, or other obstacles if the remainder of the drop zone provides adequate areas for parachutists to safely land.

(9) Crop Dusting Activities, including activities, facilities, and accessory structures to crop dusting operations. These include, but are not limited to: aerial application of chemicals, seed, fertilizer, pesticide, defoliant, and other activities and chemicals used in a commercial, agricultural, forestry, or rangeland management setting.

(10) Agricultural and Forestry Activities, including activities, facilities and accessory structures that qualify as a "farm use" as defined in ORS 215.203 or "farming practice" as defined in ORS 30.930.

(11) Air passenger and air freight services and facilities at public use airports at levels consistent with the classification and needs identified in the state ASP.

CURRENT LAND USE PLANNING AND ZONING

Both the City of Lebanon and Linn County have made significant efforts to protect the future viability of the Airport through land use planning and zoning. There are some challenges to these efforts as the Airport is owned and operated by the Oregon Department of Aviation, is located within the city limits of Lebanon, and has airspace extending into Linn County. The following sections describe the land use planning and zoning efforts surrounding the Airport as they exist today (2016).

Exhibit 1G presents current land uses surrounding the Airport. To the east, along Airway Road are primarily light industrial type land uses. East of Airway Road is mixed-use development with some light industrial, some agricultural, and some single family housing. To the northeast is more single family residential housing. To the northwest and west is undeveloped or agricultural land. To the southwest is a self-storage facility and the Willamette Speedway, which is an oval dirt racing track. To the immediate south of the Airport is agricultural lands and to the southeast is more residential housing.

City of Lebanon

Exhibit 1H shows the Comprehensive Plan Map for the City of Lebanon, including its Urban Growth Boundary (UGB). The City is allowed to develop land use plans for the UGB, but it is not allowed to institute legally binding zoning regulations for the land. Therefore, those areas within the city limits reflect the current zoning, and those areas outside the city but within the UGB represent the desired future land uses.

The City of Lebanon has made a significant effort to protect the viability of the Airport by providing for compatible Industrial zoning around the Airport. The parcels immediately south of the Airport and west of the southwest half of the Airport are not in the city limits but are in the UGB and have Industrial planned land uses.

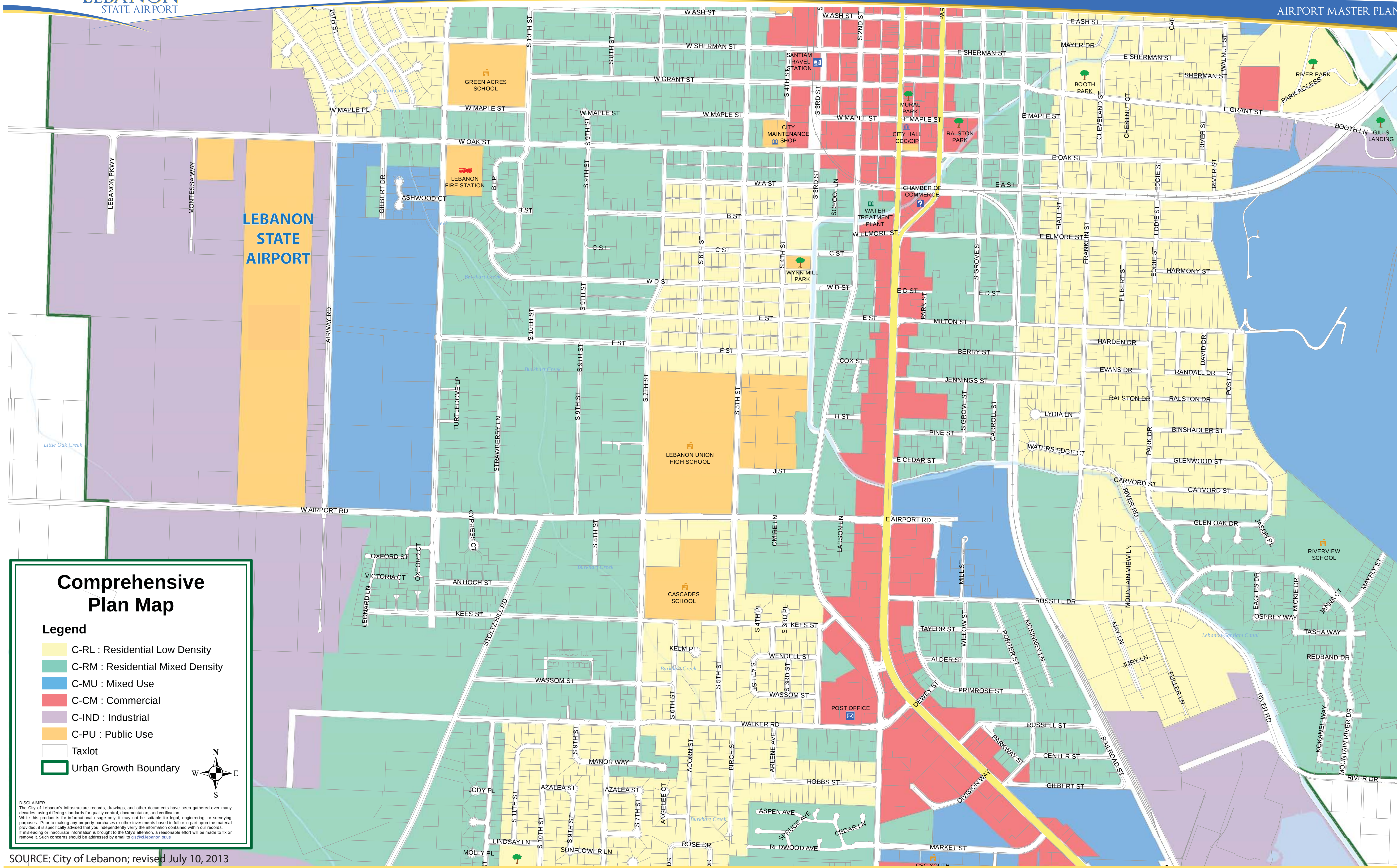
The Lebanon Development Code institutes an Airport Overlay Zone for the protection of the Airport. Properties are subject to the restrictions of both the base land use zoning and the Airport Overlay Zone. Chapter 16.11.020 defines the purpose and restrictions of two Airport Overlay Zones, described as follows:

Airport Control Zone

The Airport Control Zone is composed of the Airport Noise Impact Zone and the Airport Use Zone. The Airport Use Zone is defined as the Airport property line. The Airport Noise Impact Zone has a perimeter that extends 1,500 feet from the edge of the runway, or within the established 55 LDN noise contour as established by ODA.

Exhibit 1G
EXISTING LAND USES

This page intentionally left blank



SOURCE: City of Lebanon; revised July 10, 2013

This page intentionally left blank

Airport Safety Zone

The Airport Safety Zone is composed of the “imaginary” Direct Impact Area, and the Airport’s “imaginary” surfaces and zones, including Approach Surfaces, Transitional Surfaces, Horizontal Surfaces, Conical Surfaces, and Runway Protection Zones. These surfaces are closely aligned with FAA guidance provided in *Objects Affecting Navigable Airspace - Federal Code of Federal Regulations (CFR) Title 14, Part 77*. Each of these is defined as follows:

Direct Impact Area: The perimeter is within 5,000 feet of the edge of the Airport’s runway, excluding lands within the Runway Protection Zone and Approach Surface.

Primary Surface: A rectangular shape centered longitudinally on the runway with dimensions of 250 feet wide by 3,277 feet long. The primary surface extends 200 feet beyond each end of the runway’s hard surface.

Runway Protection Zone (RPZ): A trapezoidal-shaped area at each end of the primary surface with dimensions of 250 feet wide at the end of the runway by 1,000 feet long, with a width of 450 feet at the far end of the trapezoid, with an upward approach slope at a 20:1 ratio, one-foot vertical for each 20 feet horizontal.

Approach Surfaces: A trapezoidal-shaped visual approach surface at each end of the primary surface that is 5,000 feet long, with a width of 1,250 feet at the far end of the trapezoid, with an upward approach slope at a 20:1 ratio, one-foot vertical for each 20 feet horizontal.

Transitional Surface: A surface that extends upward and outward from each side of the primary surface at 90-degree angles to the runway centerline, and the runway centerline extended at a slope of seven (7) feet horizontally for each foot vertically from the sides of the primary and approach surfaces to the point of intersection with the horizontal and conical surfaces.

Horizontal Surface: A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is 5,000 feet for all runways designated as utility.

Conical Surface: A surface that extends outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet and a vertical height of 350 feet above the airport elevation.

The parameters and dimensions of the components of the Airport Overlay Zones are based on a runway that is 2,877 feet long and 50 feet wide. Since implementation of the Airport Overlay Zones, the dimensions of the runway have changed to 2,747 feet in length and 60 feet in width. Once this Master Plan is complete, the City of Lebanon should review the long term plan for the airfield and adjust the Airport Overlay Zones as appropriate.

The Airport Overlay Zones include height limitations indicating that no structure or tree, plant or other object of natural growth shall penetrate an airport's imaginary surface. The airport sponsor (ODA), or its agents, are permitted to enter onto private property to reduce the height of trees that exceed the established height limitations. In addition, the Airport Overlay Zone provides restrictions related to outdoor lighting, glare, industrial emissions, electrical interference, and housing densities. **Appendix B** presents the Lebanon Airport Overlay Zones from the Lebanon Development Code.

Linn County

Linn County has the zoning authority for land within the county. Currently, county lands immediately adjacent to the Airport are zoned as Urban Growth Management, which means they are lands falling within the UGB of the City of Lebanon. As noted previously, the Comprehensive Plan Map for the City of Lebanon identifies these adjacent county properties for Industrial uses in the future.

The Linn County Code includes an Airport Overlay development code. The stated purpose of the Airport Overlay is (A) to prevent the establishment of airspace obstructions near public use airports, and (B) to assure compatibility between the use of the airport and surrounding land uses. The Linn County Airport Overlay is consistent with the City of Lebanon Airport Overlay Zones.

HISTORICAL AIRPORT ACTIVITY

At general aviation airports, the number of based aircraft and 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 to project future aeronautical activity and to determine future facility needs.

BASED AIRCRAFT

As of 2015, there are 54 active aircraft based at the Lebanon State Airport.

Identifying the current number of based aircraft is important to master plan analysis, yet it can be challenging because of the transient nature of aircraft storage. The 2006 ALP Narrative Report indicated that there were 57 based aircraft in 2004. As of 2015, ODA indicates there are 54 active aircraft and an additional 8 aircraft considered to be in non-flyable condition. All active based aircraft are single engine piston-powered except for one that is multi-engine piston powered.

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 operations. Itinerant operations are arriving or departing aircraft which have an origin or destination away from the airport. One operation is counted when an aircraft arrives and one operation is counted when an aircraft departs.


Aircraft departure

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. Generally, fractional aircraft operations and air ambulance operations will fall in the air taxi category. General aviation operations include a wide range of aircraft from personal to business and corporate uses.

As the Airport does not have a control tower, actual operations are not counted; therefore, estimates of annual operations have been made. The FAA produces an annual estimate of operations for the Airport which is published in the *Terminal Area Forecast* (TAF). According to the FAA estimate, the Airport experiences approximately 10,000 operations in 2015. Of this total, approximately 58 percent is considered itinerant in nature, with the remaining 42 percent being local.

In the forecast chapter, more detailed analysis will be undertaken to establish the current baseline for annual operations at the Airport.

AIRPORT SERVICE AREA

The service area is loosely defined as a baseline geographical area from which future aviation demand (particularly based aircraft) is most likely to originate. The service area should relate to existing geographical areas, such as a county or city boundary, in order to facilitate a correlation with known socioeconomic data. This relationship facilitates development of aviation demand forecasts, which are presented in the next chapter.

The proximity of other airports is a primary factor in defining the limits of an Airport's service area. A review of the public use airport facilities within 30 nautical miles of the Airport was conducted to identify and distinguish the types of air service available in the region. Information pertaining to each airport was obtained from FAA Form 5010, *Airport Master Record*, and from current airport master plans and is summarized in **Table 1E**.

TABLE 1E
Public-Use Airports Near Lebanon, OR

Airport	Nautical Miles/ Direction	FAA Role	Longest Runway	Based Aircraft	Annual Operations	Services
Albany Muni	8.5/NW	GA-Local	3,004	51	23,500	Full GA
Corvallis Muni	15.5/W	GA-Regional	5,900	164	52,200	Full GA
Salem/McNary Field	22.9/N	GA-Regional	5,811	175	34,300	Full GA
Independence State	23.2/NNW	GA-Local	3,142	173	33,600	Partial GA
Source: [1]*Airnav.com*						

Albany Municipal Airport (S12) is located approximately eight miles to the northwest of Lebanon State Airport. Albany is a general aviation airport with a single 3,004-foot long runway. The airport has a full service FBO and the full array of general aviation services. Services include AvGas, aircraft apron parking, hangars, individual T-hangars, aircraft rental, flight training, aircraft maintenance, and modification. Albany is situated near Interstate 5 providing ready access. The Airport also has a circling instrument approach.

Corvallis Municipal Airport (CVO) is located 16 miles to the west. It is a regional general aviation facility as classified by the FAA. The primary runway is 5,900 feet long and a crosswind runway is 3,545 feet long. Several instrument approaches are available, including a CAT-I instrument landing system (ILS) to Runway 17. A full service FBO provides general aviation services at the airport. Both Jet A and AvGas are available. This Airport is capable of accommodating most aircraft, including business jets, in the national fleet.

Salem/McNary Field (SLE) is located 23 miles to the north and is a full service regional general aviation facility. There are approximately 175 based aircraft, including 5 business jets, 8 helicopters, and 19 military aircraft associated with the Oregon Army National Guard. The primary runway is 5,811 feet long and the crosswind runway is 5,145 feet long. The Airport has instrument approaches, including a CAT-I ILS to Runway 31. The Airport has a control tower. At times, the Airport has had commercial service; however, there is no commercial service at this time.

Independence State Airport (7S5) is located approximately 24 miles to the northwest of Lebanon State Airport. The single runway is 3,142 feet long. There are 173 based aircraft. The airport FBO provides basic general aviation services. There are no instrument approaches at the Airport.

These neighboring airports have the effect of limiting the service area for Lebanon State Airport. For purposes of this Master Plan, the service area is limited to Linn County. Because of the proximity of Albany Municipal Airport, the service area may be somewhat limited within the county. **Exhibit 1J** provides the Airport service area.

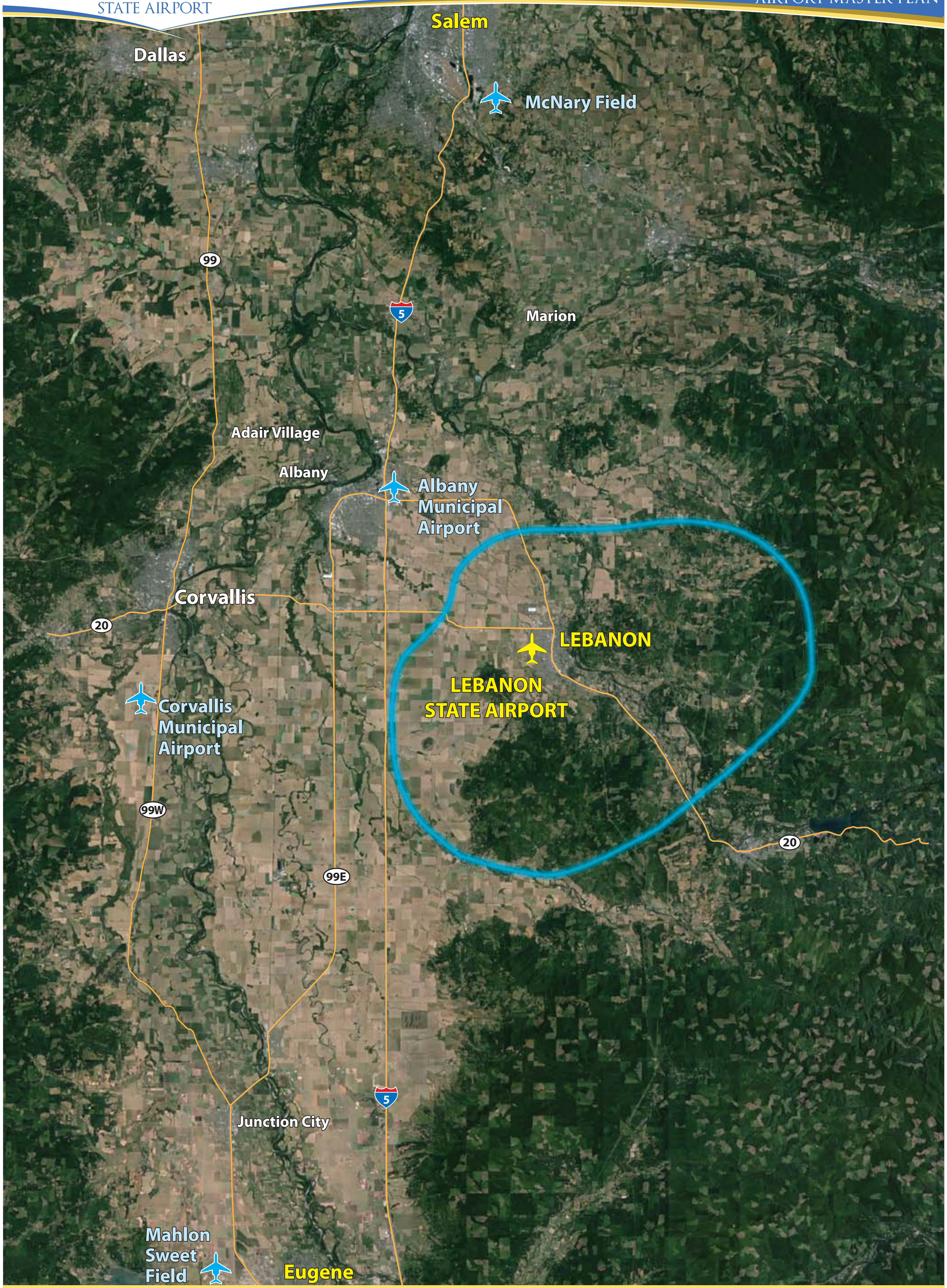


Exhibit 1J
SERVICE AREA

HISTORIC SOCIOECONOMIC DATA

Socioeconomic information related to the approximate airport service area is an important consideration in the master planning process. The historic trend in elements, such as population, employment, and income, provides insight into the long term socioeconomic condition of the region. **Table 1F** presents the historical population trends over the last 20 years for Linn County and for the State of Oregon.

TABLE 1F
Historic Socioeconomic Data

Year	Linn County	State of Oregon
POPULATION		
2015	121,040	4,008,154
2010	116,672	3,831,074
2005	108,132	3,613,202
2000	103,020	3,429,708
1995	98,853	3,184,369
AAGR 1995-2015	1.02%	1.16%
EMPLOYMENT		
2015	53,534	2,338,429
2010	51,532	2,172,447
2005	53,461	2,200,657
2000	52,607	2,089,965
1995	51,876	1,845,375
AAGR 1995-2015	0.16%	1.19%
INCOME (PCPI)		
2015	30,314	38,260
2010	28,667	35,314
2005	28,893	35,295
2000	28,174	34,724
1995	25,434	29,557
AAGR 1995-2015	0.88%	1.30%

AAGR: Average annual growth rate
PCPI: Per capita personal income in 2009 dollars
Source: Woods & Poole - Complete Economic and Demographic Data Source (2015)

Population in the county has steadily grown at an average annual rate of 1.02 percent, which is slightly below the State of Oregon's 1.16 percent over the same period. Employment in the county has been relatively flat, growing at an average annual rate of 0.16 percent. In fact, employment declined between 2005 and 2010 as a result of the economic recession that began in 2008. Income as measured in per capita personal income has consistently been lower than that for the state as a whole. Between 1995 and 2015, income in Linn County grew by 0.88 percent as compared to 1.3 percent for the state.

ENVIRONMENTAL INVENTORY

The purpose of the following environmental inventory is to identify potential environmental sensitivities that should be considered when planning future improvements at the Lebanon State Airport (Airport).

Research was done for each of the 14 environmental impact categories described within the FAA's Order 1050.1F, *Environmental Impacts: Policies and Procedures*. It was determined that the following resources are not present within the Airport environs or cannot be inventoried because they are evaluated during project implementation:

Not Present

- Coastal Resources (Coastal Barriers and Coastal Zones) – the Airport is inland and not subject to any coastal restrictions.
- Wild and Scenic Rivers – The closest Wild and Scenic River is Quartzville Creek, located 24 miles east of the Airport.

Not Inventoried

- Visual effects (including light emissions)
- Natural resources and energy supply
- Noise and compatible land use
- Visual effects (including light emissions)

Land use, which was discussed previously in this chapter, is also identified as an environmental impact category within FAA Order 1050.1F.

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

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_x), Particulate matter (PM_{10} and $PM_{2.5}$), and Lead (Pb).

Based on both federal and state 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. Lebanon State Airport is located in Linn County, Oregon, which is designated as an attainment area for all federal criteria pollutants.

Biological Resources

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 U.S. Fish and Wildlife Service (USFWS) is 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 USFWS reviews 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.

According to the U.S. Fish and Wildlife Service, there are eight threatened or endangered species, summarized in **Table 1G**, potentially present within the vicinity of the Airport. As part of the State of Oregon *Advance Aquatic Resource Plan and Request for Letter of Permission for Selected Industrial Sites in Linn and Benton Counties, Oregon* (Advance Aquatic Resource Plan), a wetland study was prepared for the Lebanon Airport Industrial Park, located immediately west of the Lebanon State Airport in 2012. As part of this project, field surveys were conducted to determine species present at the Airport. As indicated in **Table 1G**, seven of the federally listed species as of January 2016 were present during the field surveys. One species, the Water Howellia, a flowering plant, was not included in the survey. This is possibly due to changes in the species list since 2012.

TABLE 1G
Threatened and Endangered Species
Linn County, Oregon

Species	Status	Species Present
Birds		
Northern Spotted Owl	Threatened	No
Streaked Horned Lark	Threatened	No
Flowering Plants		
Bradshaw's Desert Parsley	Endangered	No
Kincaid's Lupine	Threatened	No
Nelson's Checker-mallow	Threatened	No
Water Howellia	Threatened	*Survey Not Conducted*
Willamette Daisy	Endangered	No
Insects		
Fender's Blue Butterfly	Endangered	No

Source: U.S. Fish and Wildlife Service, Information for Planning and Conservation, https://ecos.fws.gov/ipac, accessed January 2016 and Advance Aquatic Resource Plan and Request for Letter of Permission for Selected Industrial Sites in Linn and Benton Counties, Oregon, http://www.oregon.gov/dsl/Aquatic_Resource_Management/Documents/Advance%20Aquatic%20Resource%20Plan/Existing%20Conditions%20Report%20Volume%201%20FINAL.pdf

In addition to the ESA, the *Migratory Bird Treaty Act* (MBTA) is also applicable at the Sunport as much of the study area constitutes habitat for birds protected under the (MBTA). The IPaC report for the Airport lists 14 bird species that may be affected by projects at the Airport.

Birds protected under the MBTA may nest, winter, or migrate throughout the area, including those protected by the ESA. Under the requirements of the MBTA, all project proponents are responsible for complying with the appropriate regulations protecting birds when planning and developing a project. Migratory birds known to occur in the study area are listed in **Table 1H**.

TABLE 1H
Birds Protected Under the *Migratory Bird Treaty Act*
Linn County, Oregon

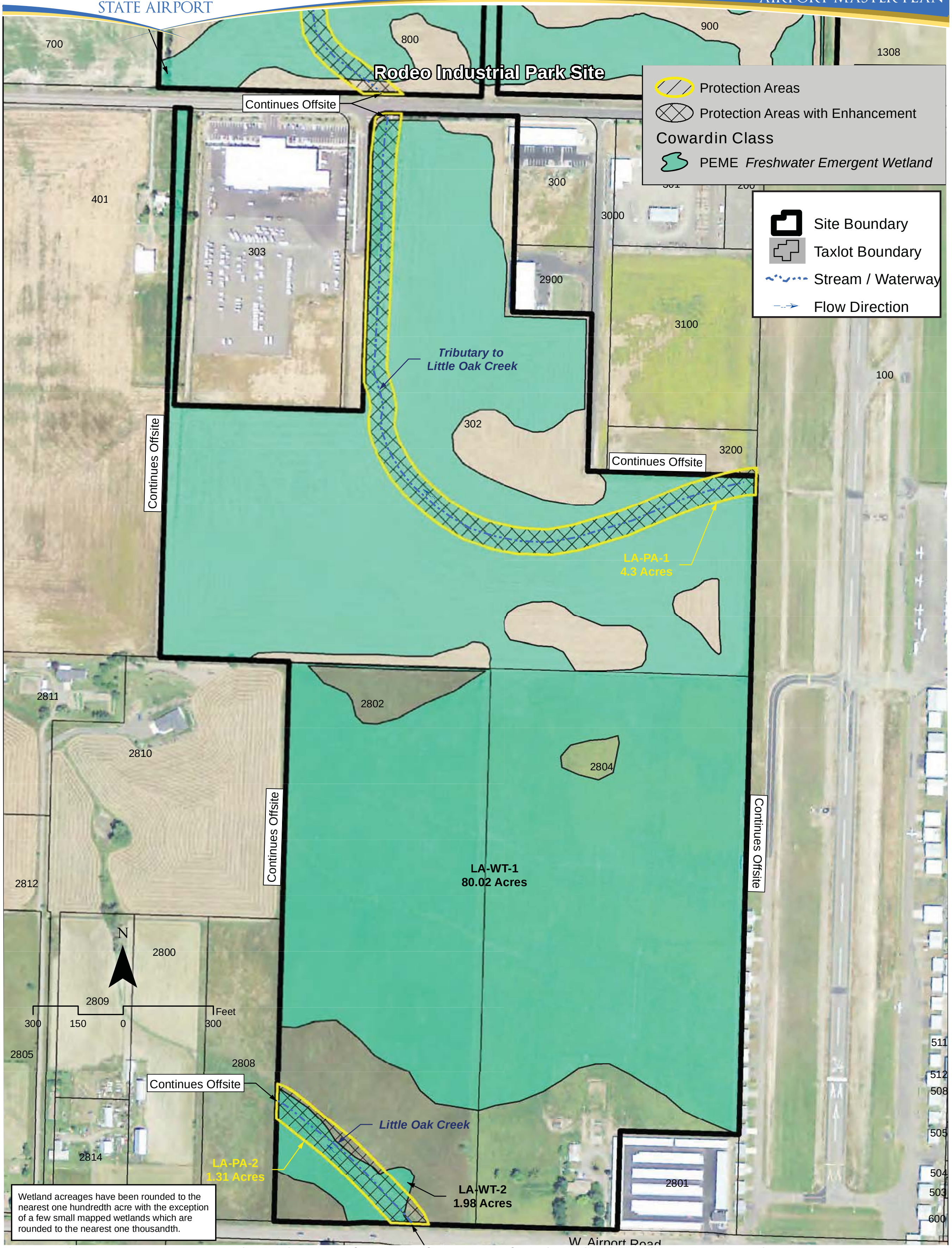
Bald Eagle	Peregrine Falcon
Burrowing Owl	Purple Finch
Calliope Hummingbird	Rufous Hummingbird
Fox Sparrow	Short-eared Owl
Lewis's Woodpecker	Vesper Sparrow
Loggerhead Shrike	Western Grebe
Olive-sided Flycatcher	Willow Flycatcher

A review of the National Hydrography Dataset, published by the United States Geological Survey, was conducted to determine the presence of perennial streams, rivers, sand and gravel pits, lakes and reservoirs within the study area. There are two streams located immediately west of the Airport. These include a tributary to Little Oak Creek and Little Oak Creek. The location of these features is indicated on **Exhibit 1K.**

Historical, Architectural, Archaeological, 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 *Archaeological 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.

Based on a review of the National Register of Historic Places, eight listed sites within five miles of the Airport: (Lebanon Pioneer Cemetery, Dr. J. C. Booth House, Louis A. Crandall House, Elkins Flour Mill, Rock Hill School, Hiram Baker House, Lebanon Southern Pacific Railroad Depot, and the John and Lottie Ralston Cottage). None of these sites are located on or adjacent to the Airport.



Source: Advance Aquatic Resource Plan and Request for Letter of Permission for Selected Industrial Sites in Linn and Benton Counties, Oregon, Exhibit 3

As part of the previously discussed Advance Aquatic Resource Plan, coordination was undertaken with the Oregon State Historic Preservation Office regarding available cultural resource information for each of the studied sites, including land immediately adjacent to the Airport. The response from the SHPO indicates that no previous cultural resources surveys have been conducted in the area. However, this is an area “perceived to have high probability for archeological sites and/or buried human remains.”[1]

Department of Transportation Act, Section 4(f)

Section 4(f) of the DOT Act, which was recodified and renumbered as Section 303(c) of 49 USC, provides that the Secretary of Transportation will not approve any program or project that requires the use of any publicly owned land from a historic site, public parks, recreation areas, or waterfowl and wildlife refuges of national, state, regional, or local importance unless there is no feasible and prudent alternative to the use of such land, and the project includes all possible planning to minimize harm resulting from the use.

The following list summarizes the nearest properties of each type that may be protected under Section 4(f) of the DOT Act:

- Wilderness Area – Menagerie Wilderness (29 miles east)
- Historic Site Listed on the National Register – As previously discussed, there are eight National Register of Historic Places properties within five miles of the Airport. None of these sites are located on or adjacent to the Airport.
- Locally Owned Public Park – The closest publically owned park is Christopher Columbus Park, located approximately ¾-mile to the southeast of the Airport.
- Wildlife Refuge – William T. Finley National Wildlife Refuge (19 miles west) and Ankeny National Wildlife Refuge (18 miles north).
- Recreation Area – None within 100 miles of the Airport.
- National Marine Sanctuary – None within 100 miles of the Airport.

Farmlands

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 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.

---

[1]*Advance Aquatic Resource Plan and Request for Letter of Permission for Selected Industrial Sites in Linn and Benton Counties, Oregon*

Information obtained from the Natural Resource Conservation Service's (NRCS) Web Soil Survey indicates that the soils at the Airport are composed of silty loams, with the most prevalent soil type being the Clackamas variant silt loam. According to the NRCS, all of the soils which underlie the Airport are classified Prime Farmland, Prime Farmland if drained, or Farmland of Statewide Importance.[2]

Hazardous Materials, Solid Waste, and Pollution Prevention

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. According to *EJSCREEN*, there are no Superfund or Brownfield sites within five miles of the Airport.

Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

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. The EPA's *EJSCREEN* online tool was consulted regarding the presence of environmental justice areas within the Airport environs. According to the tool, 11 percent of the population within the Census tract encompassing the Airport is below the poverty level. Additionally, the population of the Census tract which encompasses the Airport is two percent minority.

Water Resources

Wetlands. 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).

[2] NRCS Web Soil Survey, http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx, accessed January 2016

According to the U.S. Fish and Wildlife Service, which manages the National Wetlands Inventory[3] on behalf of all federal agencies, there are no wetlands present at the Airport.

In contrast, as outlined in the *Advance Aquatic Resource Plan*, much of the land west of the Airport is identified as wetland and the report indicates the wetland area "Continues Offsite" from the study area on to Lebanon State Airport property. Additionally, the report identifies the riparian corridor associated with the tributary to Little Oak Creek as a Protection Area. The features and notes from the *Advance Aquatic Resource Plan* are depicted on **Exhibit 1K**.

Based on a review of information from the NRCS Web Soil Survey indicates that the Clackamas variant silt loam, which comprises much of the soils at the Airport, has seven percent hydric components.[2] Other soil types, including Conser silty clay loam, Courtney gravelly silty clay loam, and Dayton silt loam, which occur in smaller percentages at the Airport, all have more than 90 percent hydric components. These soil types are located within the alignment of the tributary to Little Oak Creek.

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. Based on a review of Federal Emergency Management Agency (FEMA) maps dated September 29, 2010, no portion of a 100-year floodplain is located on Airport property.

Surface Waters. 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. Additionally, Congress has mandated (under the *Clean Water Act*) the National Pollutant Discharge Elimination System. This program addresses non-agricultural storm water discharges. Through the use of NPDES permits, certain procedures are required to prevent contamination of water bodies from storm water runoff.

Examples of direct impacts to surface waters include any in-water work resulting from expansion of an existing FAA facility adjacent to surface waters, or a withdrawal of water from a surface water for construction or operations.

According to *EJSCREEN*, the closest *Clean Water Act,* Section 303d impaired stream, Oak Creek, is one-half mile southwest of the Airport.

Groundwater. Groundwater is subsurface water that occupies the space between sand, clay, and rock formations. The term aquifer is used to describe the geologic layers that store or transmit groundwater, such as to wells, springs, and other water sources. Examples of direct impacts to groundwater could include withdrawal of groundwater for operational purposes, or reduction of infiltration or recharge area due to new impervious surfaces.

[3] http://www.fws.gov/wetlands/Data/Mapper.html, accessed January 2016

Based on information available from the Groundwater Atlas of the United States, the Airport is underlain by Willamette Lowland basin-fill aquifers.[4] This type of aquifer is "formed of volcanic and carbonate rocks and unconsolidated to consolidated basin-fill deposits. The basin-fill deposits form the most productive aquifers and are generally in individual alluvial basins that are drained internally and are separated by low mountains."

SUMMARY

The information discussed in this inventory chapter provides a foundation upon which the remaining elements of the planning process will be constructed. Information on current Airport facilities and utilization will serve as a basis, with additional analysis and data collection, for the development of forecasts of aviation activity and facility requirements determinations.

SELECT DOCUMENT SOURCES

As previously mentioned, a variety of different sources were utilized in the inventory process. The following listing reflects a partial compilation of these sources. This does not include data provided by the airport management as part of their records, nor does it include airport drawings and photographs which were referenced for information. On-site inventory and interviews with staff tenants also contributed to the inventory effort.

Airport Facility Directory, Northwest U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, Effective October 15, 2015.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration (2015-2019).

FAA Aerospace Forecasts – Fiscal Years 2015-2035, Department of Transportation, Federal Aviation Administration, Published March 2014.

Klamath Falls Sectional Chart, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Effective September 17, 2015.

Lebanon State Airport – Airport Layout Plan report (2006); Prepared by Century West Engineering.

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

Oregon Department of Aviation:
www.oregon.goc/aviation

[4] http://pubs.usgs.gov/ha/ha730/ch_b/B-text2.html, Ground Water Atlas of the United States, accessed January 2016.

AirNav:
www.airnav.com

City of Lebanon:
www.ci.lebanon.or.us

Portland State University – Population Research Center
www.pdx.edu/prc

FAA:
www.faa.gov

Linn County:
www.co.linn.or.us

U.S. Bureau of Labor Statistics:
www.bls.gov/

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

LEBANON
STATE AIRPORT

CHAPTER TWO

FORECASTS

CHAPTER TWO

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 Lebanon State Airport (S30), 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 *National Plan of Integrated Airport Systems* (NPIAS). FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, dated December 4, 2004, states that forecasts should be:

- Realistic;
- Based on the latest available data;
- Reflective of current conditions at the airport;
- Supported by information in the study; and
- 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 in complexity depending upon the issues to be addressed and the level of effort required. 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 seven standard steps involved in the forecast process, including:

1) **Identify Aviation Activity Measures**: Identify the level and type of aviation activities likely to impact facility needs. For general aviation airports, this typically includes based aircraft and operations.

2) **Review Previous Airport Forecasts**: The review of existing forecasts may include the FAA *Terminal Area Forecasts*, state or regional system plans, and previous master plans.

3) **Gather Data**: Determine what data are required to prepare the forecasts, identify data sources, and collect historical and forecast data.

4) **Select Forecast Methods**: Several appropriate methodologies and techniques are available, including regression analysis, trend analysis, market share or ratio analysis, exponential smoothing, econometric modeling, comparison with other airports, survey techniques, cohort analysis, choice and distribution models, range projections, and professional judgment.

5) **Apply Forecast Methods and Evaluate Results**: Prepare the actual forecasts and evaluate for reasonableness.

6) **Summarize and Document Results**: Provide supporting text and tables as necessary.

7) **Compare Forecast Results with FAA's TAF**: Follow guidance in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*. In part, the Order indicates that forecasts should not vary significantly (more than 10 percent) from the TAF. When there is a greater than 10 percent variance, supporting documentation should be supplied to the FAA (e.g., the Master Plan).

The aviation demand forecasts are then submitted to the FAA for their review and approval. Master plan forecasts of operations and based aircraft for general aviation airports are considered to be consistent with the TAF if they meet the following criteria:

- Where the 5- or 10-year forecasts exceed 100,000 total annual operations or 100 based aircraft:
  a) Forecasts differ by less than 10 percent in the 5-year forecast and 15 percent in the 10-year period, or
  b) Forecasts do not affect the timing or scale of an airport project, or
  c) Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.3C.

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 serve only as guidance, and planning must remain flexible to respond to unforeseen developments.

The forecasts are considered "unconstrained," meaning they reflect the level of demand that could be reasonably expected at the Airport over the next 20 years. The forecasts are Airport-specific and do not consider the constraints of the area airspace, hangar limitations, airport policies on growth, or other development scenarios that may or may not materialize. Essentially, the forecasts represent what might be reasonably expected were the airport to pursue policies to accommodate the forecast growth. For example, the forecasts may show growth in the number of based aircraft; however, if additional hangar space is not available, then the growth figures may not materialize.

The following forecast analysis for Lebanon State Airport was produced following these basic guidelines. Existing forecasts are examined and compared against current and historical 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 the Airport that will permit Airport management to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

SOCIOECONOMIC TRENDS

The socioeconomic conditions provide an important baseline for preparing aviation demand forecasts. Local socioeconomic variables, such as population, employment, and income, are indicators for understanding the dynamics of the community and can relate to local trends in aviation activity. Analysis of the demographics of the airport service area will give a more comprehensive understanding of the socioeconomic conditions affecting the region which supports Lebanon State Airport.

Table 2A presents forecasts of population, employment, and income for both Linn County and the State of Oregon. Linn County generally reflects the Airport's service area and the state data is an additional point of comparison. Several sources of socioeconomic data were consulted, including population data from the University of Portland – Population Research Center, the U.S. Census Bureau, and Woods & Poole Economics – The Complete Economic and Demographic Source (CEDDS 2015). All three presented similar growth trends. CEDDS is a source specifically approved by the FAA for use in airport planning studies and it provides annualized data through 2040 (this study is limited to the year 2035).

Over the next 20 years, the population of Linn County is projected to increase by approximately 25,200 people. This equates to an average annual growth rate of 0.95 percent. Employment is projected to grow at 1.02 percent annually. Income for Linn County is projected to grow at 1.16 percent annually. Each of these indicators is below those for the state.

TABLE 2A Socioeconomic Forecast Data		
Year	**Linn County**	**State of Oregon**
POPULATION		
2015	121,040	4,008,154
2020	127,308	4,225,490
2025	133,724	4,452,261
2035	146,198	4,909,806
AAGR 2015-2035	0.95%	1.02%
EMPLOYMENT		
2015	53,534	2,338,429
2020	56,932	2,515,784
2025	60,134	2,690,894
2035	65,578	3,020,026
AAGR 2015-2035	1.02%	1.29%
INCOME		
2015	30,314	38,260
2020	32,506	41,068
2025	34,829	44,039
2035	38,210	49,037
AAGR 2015-2035	1.16%	1.25%

AAGR: Average Annual Growth Rate
Source: Woods & Poole - Complete Economic and Demographic Data Source (2015)

FORECAST APPROACH

An important factor in facility planning involves a definition of demand that may reasonably be expected to occur during the useful life of the facility's key components. For Lebanon State Airport, this involves projecting potential aviation demand for a 20-year timeframe. In this report, forecasts of annual operations, peak operational activity, based aircraft, and based aircraft fleet mix will serve as the basis for facility planning.

The resulting forecast may be used for several purposes including facility needs assessments and environmental evaluations. The forecasts will be reviewed and approved by the FAA to ensure that they are reasonable projections of aviation activity. The intent is to permit the Airport to make the necessary planning adjustments to ensure that Airport facilities meet projected demands in an efficient and cost-effective manner.

Because aviation activity can be affected by many influences at the local, regional, and national levels, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to unforeseen facility needs.

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, is important in the final determination of the preferred forecast. The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered include trend line/time-series projections, correlation/regression analysis, and market share analysis.

The development of aviation forecasts proceeds through both analytical and judgmental processes.

Trend line/time-series projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical 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 direct relationship between two separate sets of historic data. Should there be a reasonable correlation between the data sets, further evaluation using regression analysis may be employed.

Regression analysis measures statistical relationships between dependent and independent variables, yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures association between the changes in the dependent variable and the independent variable(s). If the "r^2" value (coefficient determination) is greater than 0.95, it indicates good predictive reliability. A value less than 0.95 may be used, but with the understanding that the predictive reliability is lower.

Market share analysis involves a historical review of the 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.

It is important to note that one should not assume a high level of confidence in forecasts that extend beyond five years. Facility and financial planning usually require at least a 10-year purview since it often takes more than five 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.

NATIONAL AVIATION TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for the large air carriers, regional/commuter air carriers, general aviation, and FAA workload measures. The forecasts are prepared to meet budget 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 when this chapter was prepared was *FAA Aerospace Forecasts – Fiscal Years 2015-2035*, published in March 2015. The FAA primarily uses the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets. The following discussion is summarized from the FAA Aerospace Forecasts.

U.S. Economic Outlook

According to the FAA Aerospace Forecasts, as the economy recovers from the most serious economic downturn and the subsequent slow recovery since the Great Depression, aviation will continue to grow over the long run. Fundamentally, demand for aviation is driven by economic activity. As economic growth picks up, so will growth in aviation activity. The FAA forecast calls for passenger growth over the next 20 years to average 2.0 percent annually. The steep decline in the price of oil in 2014 and into 2015 is a catalyst for a short-lived uptick in passenger growth; however, growth is anticipated to be somewhat muted, primarily due to the uncertainty that surrounds the U.S. and global economies.

U.S. economic performance in 2014 continued to be mixed, with modest growth in real GDP and real incomes, a slowly falling unemployment rate, and oil prices and consumer inflation remaining in check. The economy grew at an average annual rate of 2.6 percent in fiscal year (FY) 2014 after expanding 1.8 percent in FY 2013. GDP growth was strong in the second half of 2014 after shrinking in the second quarter primarily due to adverse weather conditions spurred on by the polar vortex. There were favorable signs in 2014 as the housing market continued to improve, the stock market entered record territory, and the labor market saw steady improvement with almost 2.8 million new jobs created during the year, the best figure since 1999. The unemployment rate fell steadily throughout 2014 from 7.2 percent to 5.6 percent by December.

In the medium term, (the three-year period between 2016 and 2019), U.S. economic growth is projected to average 2.6 percent per year with rates ranging between 2.4 and 2.7 percent. Income growth picks up during the same period, averaging 3.2 percent per year. For the balance of the forecast period, annual average growth of U.S. real GDP and real income slow to around 2.4 and 2.5 percent, respectively. The long-term stability of U.S. economic growth depends on sustained growth in the workforce and capital stock, along with improved productivity and competitiveness.

FAA General Aviation Forecasts

The FAA forecasts the fleet mix and hours flown for single engine piston aircraft, multi-engine piston aircraft, turboprops, business jets, piston and turbine helicopters, light sport, experimental, and others (gliders and balloons). The FAA forecasts "active aircraft," not total aircraft. An active aircraft is one that is flown at least one hour during the year. From 2010 through 2013, the FAA undertook an effort to have all aircraft owners re-register their aircraft. This effort resulted in a 10.5 percent decrease in the number of active general aviation aircraft, mostly in the piston category.

After growing rapidly for most of the decade, the demand for business jet aircraft slowed over the past few years, as the industry was hard hit by the 2008-2009 economic recession. Nonetheless, the FAA forecast calls for growth through the long-term, driven by higher corporate profits and continued concerns about safety, security, and flight delays. Overall, business aviation is projected to outpace personal/recreational use.

In 2014, the FAA estimated there were 139,890 piston-powered aircraft in the national fleet. The total number of piston-powered aircraft in the fleet is forecast to decline by 0.5 percent from 2014-2035, resulting in 125,935 by 2035. This includes -0.6 percent annually for single engine pistons and -0.4 percent for multi-engine pistons.

Total turbine aircraft are forecast to return to growth in 2014 and have an annual growth rate of 2.4 percent through 2035. The FAA estimates there were 28,085 turbine-powered aircraft in the national fleet in 2014, and there will be 45,905 by 2035. This includes annual growth rates of 1.5 percent for turboprops, 2.8 percent for business jets, and 2.8 percent for turbine helicopters.

While comprising a much smaller portion of the general aviation fleet, experimental aircraft, typically identified as home-built aircraft, are projected to grow annually by 1.4 percent through 2035. The FAA estimates there were 24,480 experimental aircraft in 2014, and these are projected to grow to 33,040 by 2035. Sport aircraft are forecast to grow 4.3 percent annually through the long term, growing from 2,200 in 2014 to 5,360 by 2035. **Exhibit 2A** presents the historical and forecast U.S. active general aviation aircraft.

The FAA also forecasts total operations based upon activity at control towers across the U.S. Operations are categorized as air carrier, air taxi/commuter, general aviation, and military. General aviation operations, both local and itinerant, declined significantly as a result of the 2008-2009 recession and subsequent slow recovery. Through 2035, total general aviation operations are forecast to grow 0.4 percent annually. Air taxi/commuter operations are forecast to decline by 3.6 percent through 2024, and then increase slightly through the remainder of the forecast period. Overall, air taxi/commuter operations are forecast to decline by 1.2 percent annually from 2014 through 2035.

General Aviation Aircraft Shipments and Revenue

As previously discussed, the 2008-2009 economic recession has had a negative impact on general aviation aircraft production and activity, and the industry was slow to recover. Aircraft manufacturing declined for three straight years from 2008 through 2010. According to the General Aviation Manufacturers Association (GAMA), there is optimism that aircraft manufacturing will stabilize and return to growth, which has been evidenced since 2011. **Table 2B** presents historical data related to general aviation aircraft shipments.

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

Year	Total	Single Engine Piston	Multi-Engine Piston	Turboprop	Jet	Net Billings ($millions)
1994	1,132	544	77	233	278	3,749
1995	1,251	605	61	285	300	4,294
1996	1,437	731	70	320	316	4,936
1997	1,840	1043	80	279	438	7,170
1998	2,457	1508	98	336	515	8,604
1999	2,808	1689	112	340	667	11,560
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	2,963	1,999	52	321	591	11,918
2005	3,590	2,326	139	375	750	15,156
2006	4,053	2,513	242	412	886	18,815
2007	4,276	2,417	258	465	1,136	21,837
2008	3,970	1,943	176	538	1,313	24,772
2009	2,279	893	70	446	870	19,474
2010	2,020	781	108	368	763	19,715
2011	2,120	761	137	526	696	19,097
2012	2,133	790	91	580	672	18,873
2013	2,345	900	122	645	678	23,450
2014	2,445	986	143	603	722	24,499

Source: General Aviation Manufacturers Association 2013 Statbook; 2014 data from Year End Report.

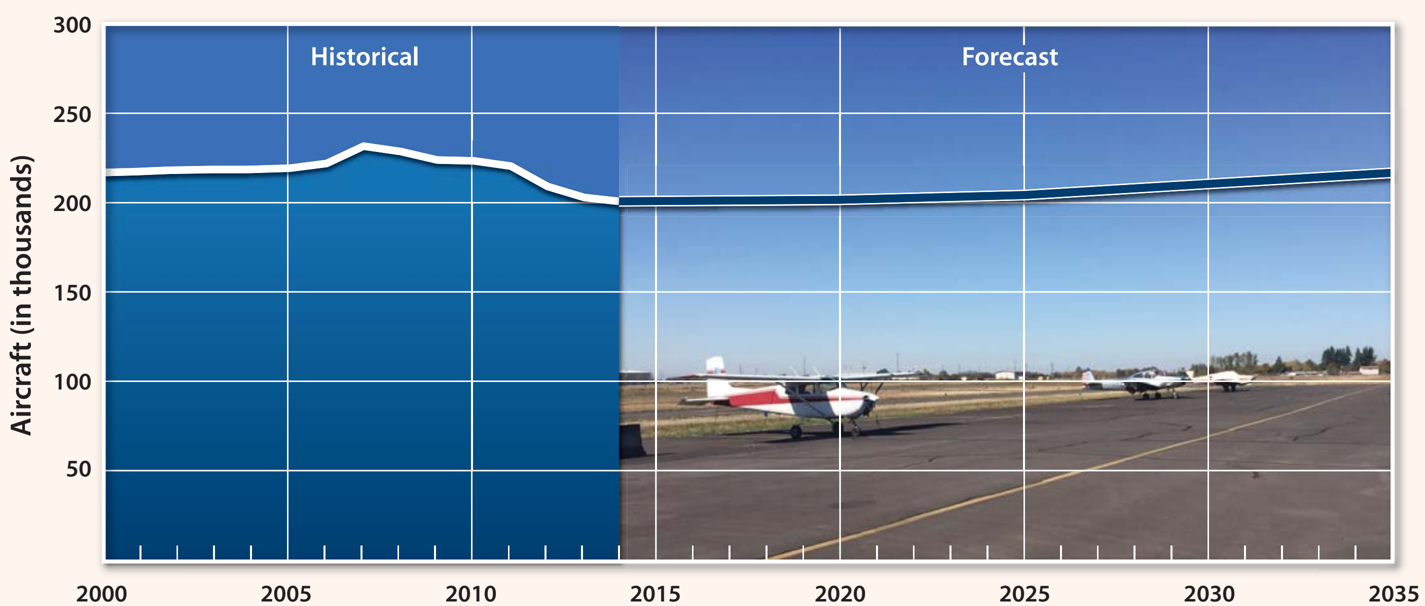
Worldwide shipments of general aviation airplanes increased for the fourth year in a row in 2014. A total of 2,445 units were delivered around the globe, as compared to 2,345 units in 2013. Worldwide general aviation billings were also higher than the previous year.

Business Jets: General aviation manufacturers delivered 722 business jets in 2014, as compared to 678 units in 2013. Similar to 2013, demand was stronger in 2014 for large-cabin business jets than it was for medium and light business jets.

Turboprops: In 2014, 603 turboprop airplanes were delivered to customers around the world, a slight decline from the 645 delivered in 2013. Overall, the turboprop market has experienced significant gains since 2010.

U.S. ACTIVE GENERAL AVIATION AIRCRAFT

	2014	2020	2025	2035	AAGR 2014-2035
Fixed Wing					
Piston					
Single Engine	123,440	117,770	113,905	108,810	-0.60%
Multi-Engine	13,215	12,920	12,545	12,135	-0.41%
Turbine					
Turboprop	9,485	9,315	9,855	12,970	1.50%
Turbojet	11,750	13,115	15,000	20,815	2.76%
Rotorcraft					
Piston	3,235	3,785	4,165	4,990	2.09%
Turbine	6,850	8,410	9,595	12,120	2.75%
Experimental					
	24,480	26,795	28,875	33,040	1.44%
Sport Aircraft					
	2,200	3,170	3,970	5,360	4.33%
Other					
	4,205	4,130	4,060	4,020	-0.21%
Total Pistons	**139,890**	**134,475**	**130,615**	**125,935**	**-0.50%**
Total Turbines	**28,085**	**30,840**	**34,450**	**45,905**	**2.37%**
Total Fleet	**198,860**	**199,410**	**201,970**	**214,260**	**0.36%**

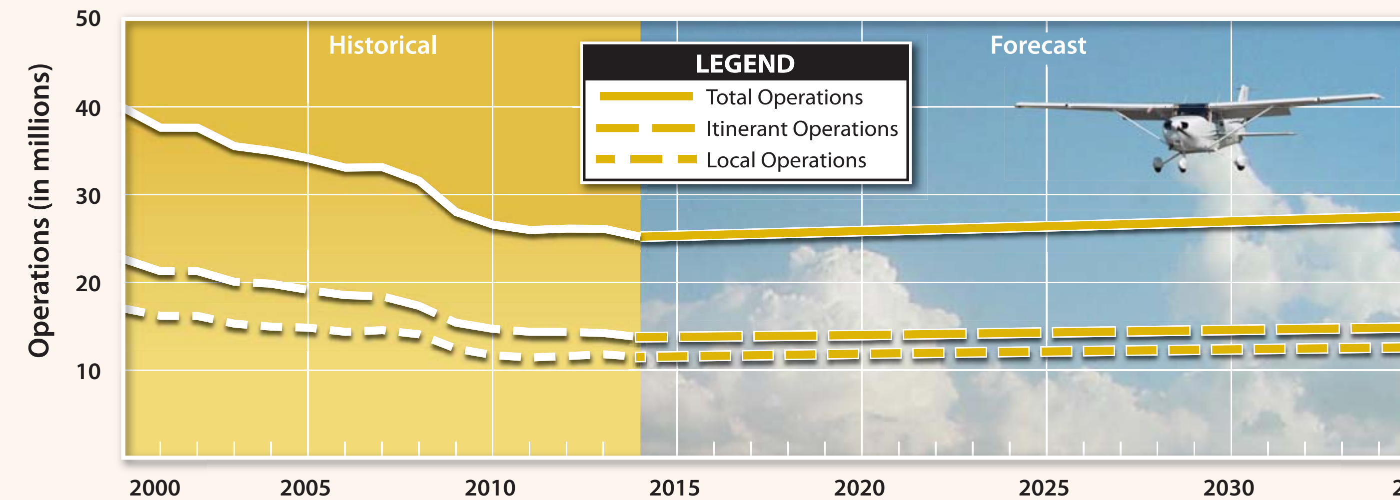


Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

Source: FAA Aerospace Forecast - Fiscal Years 2015-2035

U.S. GENERAL AVIATION OPERATIONS

	2014	2020	2025	2035	AAGR 2014-2035
Itinerant					
	13,977,500	14,209,500	14,499,400	15,118,400	0.37%
Local					
	11,674,100	12,048,000	12,298,900	12,834,800	0.45%
Total GA Operations	**25,651,600**	**26,257,500**	**26,798,300**	**27,953,200**	**0.41%**



U.S. GENERAL AVIATION AIR TAXI

	2014	2020	2025	2035	AAGR 2014-2035
Air Taxi/Commuter Operations					
Itinerant	8,439,300	7,075,700	5,918,500	6,580,200	-1.18%

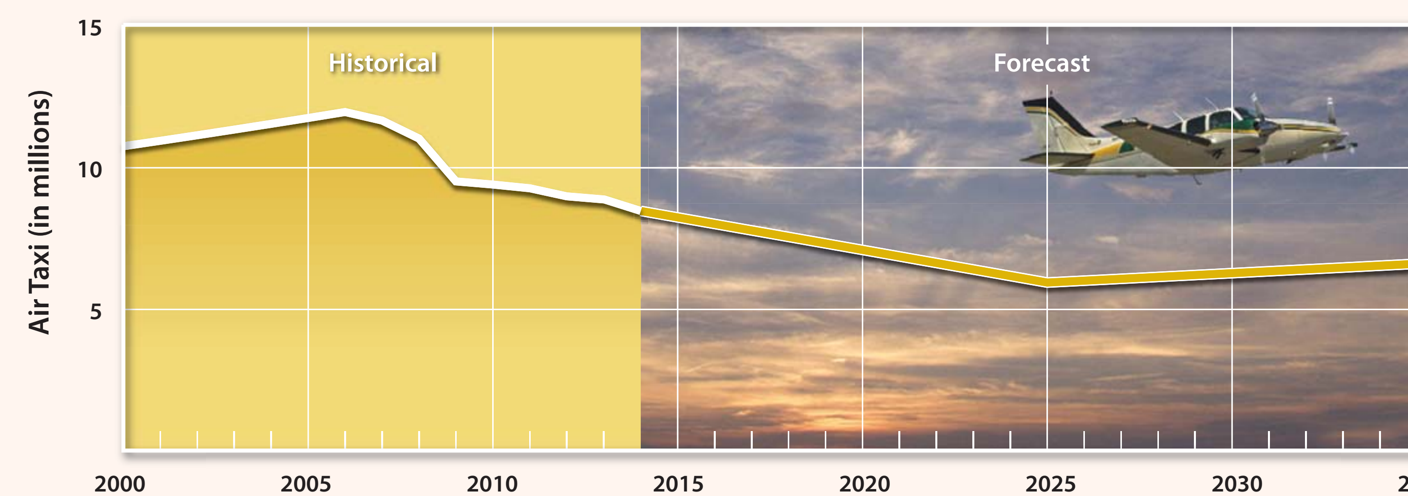


Exhibit 2A
FAA NATIONAL GENERAL AVIATION/AIR TAXI FORECASTS

This page intentionally left blank

Pistons: Piston deliveries increased from 1,022 units during 2013 to 1,129 in 2014. The piston segment continued to fare best for unit deliveries among the three segments by which GAMA tracks the airplane manufacturing industry. This is due in part by deliveries to flight schools in emerging markets.

Most industry observers believe that the general aviation market, particularly the business aviation market, is in a position for sustained growth. Industry net orders are back to positive and most leading indicators continue to improve. The large jet category of the market is expected to expand faster than the other categories.

FAA TERMINAL AREA FORECAST

On an annual basis, the FAA publishes the *Terminal Area Forecast* (TAF) for each airport included in the NPIAS. The TAF is a generalized forecast of airport activity used by FAA for internal planning purposes. It is available to airports and consultants to use as a point of comparison for development of local forecasts. **Table 2C** presents the *Terminal Area Forecast* for Lebanon State Airport.

TABLE 2C
FAA *Terminal Area Forecast* (2015)
Lebanon State Airport

	HISTORICAL			AAGR	FORECAST			AAGR
	2000	2010	2015	2000-2015	2020	2025	2035	2015-2035
OPERATIONS								
Itinerant								
Air Taxi	0	400	400	0.00%	400	400	400	0.00%
GA	10,682	5,305	5,381	-4.47%	5,574	5,774	6,204	0.71%
Total Itinerant	10,682	5,705	5,781	-4.01%	5,974	6,174	6,604	0.67%
Local								
GA	6,220	4,150	4,211	-2.57%	4,367	4,530	4,871	0.73%
Total Local	6,220	4,150	4,211	-2.57%	4,367	4,530	4,871	0.73%
TOTAL OPERATIONS	**16,902**	**9,855**	**9,992**	**-3.44%**	**10,341**	**10,704**	**11,475**	**0.69%**
BASED AIRCRAFT	**40**	**59**	**59**	**2.62%**	**60**	**63**	**73**	**1.07%**

AAGR: Average annual growth rate
Source: FAA Terminal Area Forecast (2015)

As can be seen in the table, the TAF forecasts an annual increase in total operations of 0.69 percent and 1.07 percent in based aircraft over the next 20 years. These growth figures are in line with national trends. The forecasts developed for this master planning effort will be compared to the TAF for reasonableness.

GENERAL AVIATION FORECASTS

To determine the types and sizes of facilities that should be planned to accommodate general aviation activity, certain elements of this activity must be forecast. Indicators of general aviation demand include:

- Based Aircraft
- Based Aircraft Fleet Mix
- General Aviation Operations
- Peak Period Operations

The remainder of this chapter will examine historical trends with regard to these areas of general aviation and project future demand for these segments of general aviation activity at the Airport. These forecasts, once approved by the FAA, will become the basis for planning future facilities, both airside and landside, at the Airport. The base year for the following analysis is 2015, with forecasts extending to 2035.

BASED AIRCRAFT

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft for the Airport, other general aviation activity and demand can be projected. The process of developing forecasts of based aircraft begins with an analysis of aircraft ownership in the primary general aviation service area through a review of historical aircraft registrations.

The number of based aircraft is the most basic indicator of general aviation demand.

Area Aircraft Ownership (Registered Aircraft)

Analysis presented earlier indicates that Linn County is the primary service area for general aviation demand. Aircraft ownership trends for the primary service area typically dictate the based aircraft trends for an airport. As such, an analysis of the Linn County aircraft registrations was made.

Table 2D presents the history of registered aircraft in Linn County from 1993 through 2015. These figures are derived from the FAA aircraft registration database that categorized registered aircraft by county based on the zip code of the registered aircraft. Although this information generally provides a correlation to based aircraft, it is not uncommon for some aircraft to be registered in the county, but based at an airport outside the county or vice versa.

TABLE 2D Historic Registered Aircraft Fleet Mix in Linn County, OR							
Year	**SEP**	**MEP**	**TP**	**J**	**H**	**O**	**Total**
1993	174	17	3	0	68	6	268
1994	171	16	4	0	68	6	265
1995	181	20	4	0	80	3	288
1996	193	19	4	0	82	3	301
1997	208	22	2	1	91	3	327
1998	217	21	2	1	81	2	324
1999	215	19	2	0	84	2	322
2000	226	19	1	1	80	1	328
2001	217	15	7	2	31	1	273
2002	218	15	7	2	32	1	275
2003	215	16	13	2	30	1	277
2004	221	16	12	3	29	0	281
2005	230	16	13	2	29	1	291
2006	233	16	2	2	29	1	283
2007	241	14	1	1	30	8	295
2008	237	16	2	1	30	8	294
2009	246	18	3	2	31	13	313
2010	247	16	2	3	30	15	313
2011	241	17	2	3	30	16	309
2012	223	16	2	4	17	14	276
2013	204	12	2	4	10	18	250
2014	205	12	2	4	9	13	245
2015	202	12	2	3	9	12	240
Average Annual Growth Rate from 1993 to 2015:							**-0.50%**

SEP: Single engine piston; MEP: Multi-engine Piston, TP: Turboprop, J: Jet, H: Helicopter, O: Other
Note: 'Other' includes gliders, balloons, blimps, ultralights, gyroplanes and powered parachutes.
Source: FAA Aircraft Registry Database; FAA Census of U.S. Civil Aircraft

In 2015, there were 240 aircraft registered in Linn County which marked the fifth consecutive annual decline. This is an indicator of how significantly the national recession of 2008-2009 negatively impacted general aviation activity in the region. In fact, the region has been slow to recover as the last three years reflect the lowest registered aircraft count since records began being kept in 1993. In addition, between 2010 and 2013, the FAA required all aircraft owners to re-register their aircraft. The re-registration process resulted in an overall decline of greater than 10 percent in the total number of registered aircraft nationally. With the number of registered aircraft identified, projections of future registered aircraft are considered.

Several regression and time-series analyses were first considered. Because of the declining trend in several variables, including registered aircraft and U.S. active aircraft, regression and time-series analyses did not result in reliable forecasts. As a result, these analytical methods were not considered further.

Exhibit 2B presents three different projections of registered aircraft for Linn County. The first is simply a trend line analysis applying the historic trend since 1993. This results in a continuing decline in registered aircraft over the next 20 years. If one were to carry the declining trend forward to its logical conclusion, eventually the forecast would result in zero based aircraft. There is reason to believe that declining aircraft ownership is beginning to reverse trends. First, the worst of the 2008-2009 national recession appears to be over and national economic growth has returned and, secondly, the FAA has completed its' re-registration of aircraft process. Therefore, from a forecasting perspective, an assumption is made that growth in aircraft ownership will return, however, that growth may be moderate and more in line with national trends. Therefore, two additional forecasts have been developed.

The second forecast considers the relationship between the area population and aircraft ownership. By maintaining a constant ratio of registered aircraft in Linn county to 1,000 persons in population, a forecast emerges. In the 2035 timeframe, aircraft ownership is forecast to reach approximately 290. This figure is lower than the high-water mark of 313 registered aircraft in 2010 and is reflective of the recent recession and FAA re-registration program.

A third forecast considers maintaining constant the county's market share of the national general aviation aircraft fleet. Since the national fleet is forecast to grow modestly over the next 20 years (AAGR 0.4%), registered aircraft in Linn County would also grow more modestly.

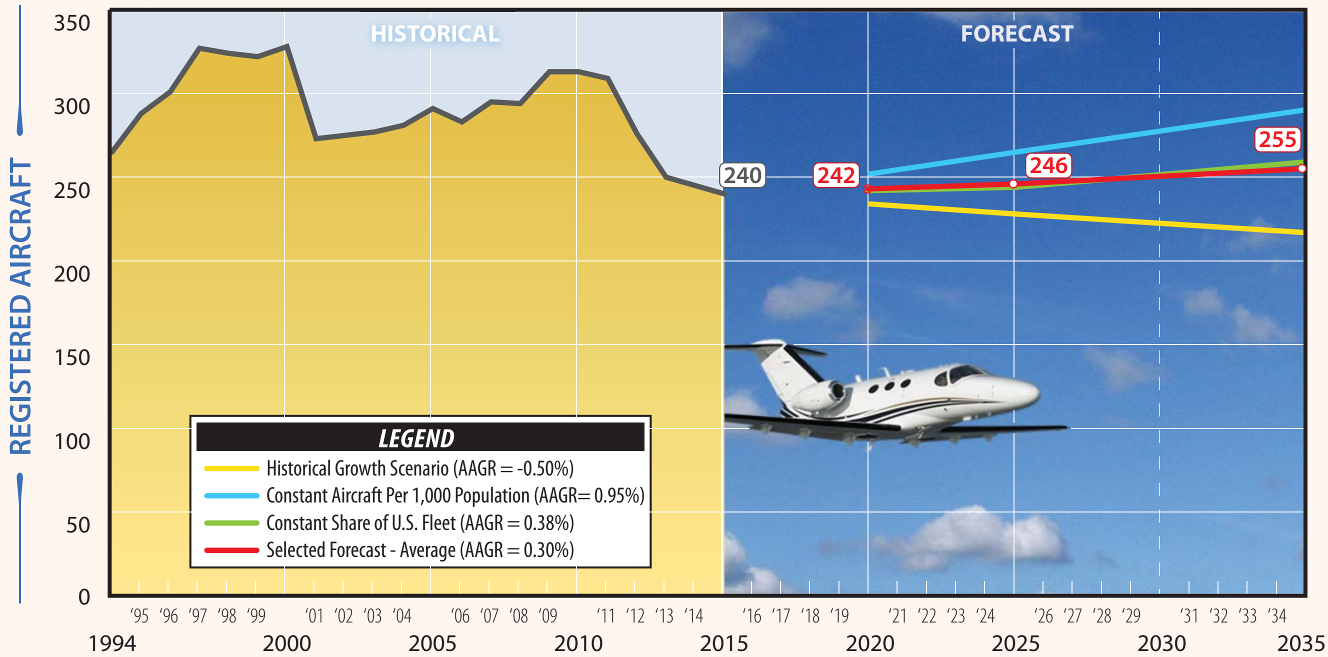
Both of the market share projections are considered reasonable. The recent declining trend in registered aircraft and U.S. active aircraft following the 2008-2009 recession is shown to slowly level off and ultimately return to growth over time. The selected forecast is an approximate average of the two market share projections. In 2020, registered aircraft are forecast to increase slightly to 245. By 2035, registered aircraft for the county are forecast to reach 275. Over the next 20 years, county-registered aircraft are forecast to grow slowly at 0.68 percent annually.

The registered aircraft projection is one data point to be used in the development of a based aircraft forecast. The following section will present several potential based aircraft forecasts, as well as the selected based aircraft forecast, to be utilized in this study.

Based Aircraft Forecast

Determining the number of based aircraft at an airport can be a challenging task. Aircraft storage can be somewhat transient in nature, meaning aircraft owners can and do move their aircraft. Some aircraft owners may store their aircraft at an airport for only part of the year. For many years, the FAA did not require based aircraft records; therefore, historical records are often incomplete or non-existent.

The Oregon Department of Aviation has indicated that there are 54 based aircraft at Lebanon State Airport as of 2015. Of this total, 52 are single engine piston aircraft and two are multi-engine piston aircraft.



YEAR	COUNTY REGISTRATIONS[1]	U.S. ACTIVE AIRCRAFT[2]	PERCENT OF U.S. ACTIVE AIRCRAFT	COUNTY POPULATION[3]	AIRCRAFT PER 1,000 POPULATION
2005	291	224,257	0.1298%	108,132	2.6912
2006	283	221,942	0.1275%	109,829	2.5767
2007	295	231,606	0.1274%	111,552	2.6445
2008	294	228,664	0.1286%	113,303	2.5948
2009	313	223,876	0.1398%	115,081	2.7198
2010	313	223,370	0.1401%	116,887	2.6778
2011	309	220,453	0.1402%	118,178	2.6147
2012	276	209,034	0.1320%	118,407	2.3309
2013	250	199,927	0.1250%	118,765	2.1050
2014	245	198,860	0.1232%	119,871	2.0439
2015	240	198,780	0.1207%	121,040	1.9828
HISTORIC GROWTH SCENARIO 1993-2015 (AAGR = -0.50%)					
2020	234	199,410	0.1173%	127,308	1.8381
2025	228	201,970	0.1129%	133,724	1.7050
2035	217	214,260	0.1013%	146,198	1.4843
CONSTANT AIRCRAFT PER 1,000 POPULATION (AAGR= 0.95%)					
2020	252	199,410	0.1266%	127,308	1.9828
2025	265	201,970	0.1313%	133,724	1.9828
2035	290	214,260	0.1353%	146,198	1.9828
CONSTANT SHARE OF U.S. FLEET (AAGR = 0.38%)					
2020	241	199,410	0.1207%	127,308	1.8912
2025	244	201,970	0.1207%	133,724	1.8235
2035	259	214,260	0.1207%	146,198	1.7694
SELECTED FORECAST - AVERAGE (AAGR = 0.30%)					
2020	***242***	199,410	0.1214%	127,308	1.9009
2025	***246***	201,970	0.1218%	133,724	1.8396
2035	***255***	214,260	0.1190%	146,198	1.7442

[1]FAA Aircraft Registration Database
[2]FAA Aerospace Forecasts Fiscal Years 2015-2035
[3]Woods & Poole Economics (CEDDS 2015).
Source: Coffman Associates analysis.

Exhibit 2B
REGISTERED AIRCRAFT FORECASTS

Exhibit 2C presents several forecasts of based aircraft, as well as the selected forecast for Lebanon State Airport. Each of the based aircraft forecasts also shows the percent (or market share) of forecast Linn County aircraft registrations, which serves as a check of the reasonableness of the based aircraft forecast.

The first forecast considers the Airport maintaining its 2015 share of Linn County registered aircraft (22.5%) through 2035. This results in a long term forecast of 62 based aircraft. The next forecast utilizes a method recommended by the FAA to apply the growth rate from the state-wide *Terminal Area Forecast* which is 1.01 percent. This results in 66 based aircraft by the long term. Three additional forecasts that apply forecast growth rates for population, employment, and income for Linn County, are also developed. These five forecasts form the planning envelope for based aircraft. The selected forecast is an approximate average of these five forecasts. The following forecast of based aircraft will be utilized in this Master Plan for determination of future facility needs at the Airport:

- 2020 – 57 Based Aircraft
- 2025 – 60 Based Aircraft
- 2035 – 65 Based Aircraft

Based Aircraft Fleet Mix

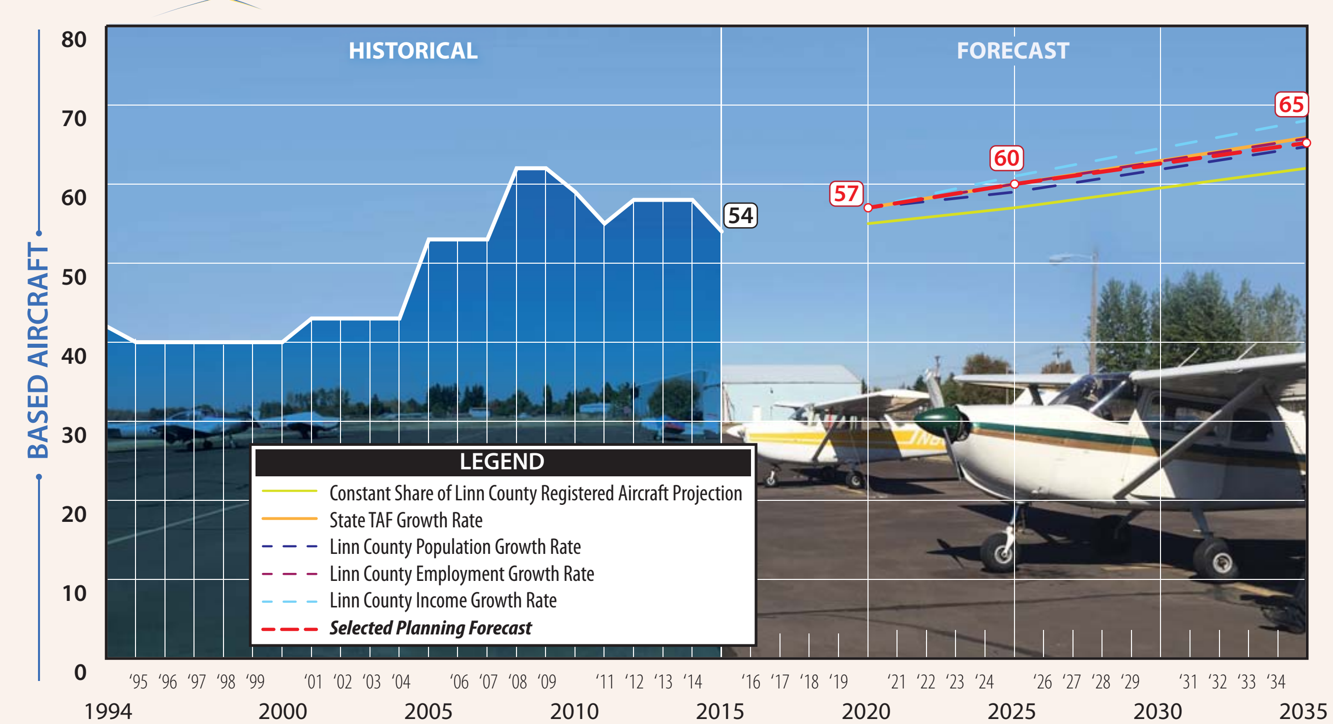
It is important to have an understanding of the current and projected based aircraft fleet mix at an airport. This will ensure the planning of proper facilities in the future. For example, the addition of one or several larger turboprop or business jet aircraft to the airfield can have a significant impact on the separation requirements and on runway length needs.

The current based aircraft fleet mix consists of 52 single engine piston aircraft and two multi-engine piston aircraft. The character and nature of the Lebanon State Airport is not expected to change significantly over time and it is expected to remain a local general aviation facility under both state and FAA classifications. Therefore, the future fleet mix is expected to continue to be dominated by single engine piston aircraft.

Table 2E presents the forecast fleet mix for based aircraft at Lebanon State Airport.

TABLE 2E
Based Aircraft Fleet Mix
Lebanon State Airport

Year	Single Engine Piston	Multi-Engine Piston	Total
2015	52	2	54
2020	55	2	57
2025	58	2	60
2035	63	2	65



YEAR	LINN COUNTY REGISTERED AIRCRAFT	BASED AIRCRAFT	MARKET SHARE
2004	291	57	19.59%
2015	240	54	22.50%
CONSTANT SHARE OF LINN COUNTY REGISTERED AIRCRAFT PROJECTION (AAGR = 0.68%)			
2020	245	55	22.50%
2025	255	57	22.50%
2035	275	62	22.50%
STATE TAF GROWTH RATE (AAGR = 1.01%)			
2020	245	57	23.27%
2025	255	60	23.53%
2035	275	66	24.00%
LINN COUNTY POPULATION GROWTH RATE (AAGR = 0.95%)			
2020	245	57	23.27%
2025	255	59	23.14%
2035	275	65	23.64%
LINN COUNTY EMPLOYMENTE GROWTH RATE (AAGR = 1.02%)			
2020	245	57	23.27%
2025	255	60	23.53%
2035	275	66	24.00%
LINN COUNTY INCOME GROWTH RATE (AAGR = 1.16%)			
2020	245	57	23.27%
2025	255	61	23.92%
2035	275	68	24.73%
SELECTED PLANNING FORECAST (AAGR = 1.01%)			
2020	245	***57***	23.27%
2025	255	***60***	23.53%
2035	275	***65***	23.64%

AAGR: Average Annual Growth Rate

BASED AIRCRAFT FORECASTS

TOTAL ANNUAL OPERATIONS

General aviation operations include a wide range of activity from recreational use to business and corporate uses. Military operations include those operations conducted by various branches of the U.S. military. Air taxi operations are those conducted by aircraft operating under FAR Part 135, otherwise known as "for-hire" activity. Air taxi operations typically include air cargo, air ambulance, and many fractional ownership operations.

Aircraft operations are further classified as local and itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of an airport, or which executes simulated approaches or touch-and-go operations at an airport. Generally, local operations are characterized by training activity. Itinerant operations are those performed by aircraft with a specific origin or destination away from an airport. Typically, itinerant operations increase with business and commercial use since business aircraft are used primarily to transport passengers from one location to another.

Lebanon State 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, as well as from historical documentation and studies.

Existing Operations Forecasts

Table 2F presents several existing forecasts of operations at Lebanon State Airport. The first is the operations forecast from the previous planning document, the 2006 ALP Narrative Report for the Airport. The ALP Report had a base year (2004) operations estimate of 14,250 total operations and a long term (2024) forecast of 17,940 operations for an annual growth rate of 1.16 percent. The operations forecast from the ALP Report has been interpolated and extrapolated to the plan years of this Master Plan and are shown in the table.

TABLE 2F
Existing Total Operations Forecasts
Lebanon State Airport

Year	2006 ALP[1]	2007 OAP[2]	2015 TAF[3]
2015	16,174	18,806	9,992
2020	17,132	19,652	10,341
2025	18,148	20,536	10,704
2035	20,362	22,425	11,475
AAGR 2015-2035	**1.16%**	**0.88%**	**0.69%**

[1]2006 ALP Report - Interpolated and Extrapolated to Plan Years
[2]2007 Oregon Aviation Plan - Interpolated and Extrapolated to Plan Years
[3]TAF - FAA Terminal Area Forecast
AAGR: Average Annual Growth Rate

The next existing forecast is from the 2007 *Oregon Aviation Plan* (OAP). The base year for this statewide system plan was 2005 where it was estimated there were 17,190 operations. By 2025, a total of 20,536 operations were forecast for an annual growth rate of 0.89 percent.

The third source considered for operations data is the FAA TAF. The TAF provides an estimate of 9,992 annual operations for 2015 and 11,475 for 2035 for an annual growth rate of 0.69 percent. The TAF is a top down forecast for all NPIAS airports nationally and does not take into consideration local variables. The primary purpose of the TAF is for national system planning of FAA workload measures.

The 2006 ALP Report and the 2007 OAP operations forecasts are both nearly 10 years old. The TAF is not designed to be specific to the Lebanon State Airport; instead, it is a placeholder for the FAA to plan various workload measures. Therefore, several new operations forecasts have been developed and are presented in the following section.

New Operations Forecasts

Several new operations forecasts have been developed and are presented in **Table 2G**. Each is described below.

TABLE 2G
New General Aviation Operations Forecasts
Lebanon State Airport

Year	FAA National Growth Rate[1]	Statewide TAF Growth Rate[2]	NPIAS Formula[3]	Non-Towered Equation[4]	Selected Forecast
2015	9,992	9,992	13,500	15,400	12,200
2020	10,193	10,585	14,250	16,400	12,900
2025	10,399	11,213	15,000	17,300	13,500
2035	10,822	12,584	16,250	18,900	14,600
AAGR 2015-2035	**0.40%**	**1.16%**	**0.93%**	**1.03%**	**0.90%**

[1]FAA National GA Forecast Growth Rate with FAA TAF Baseline
[2]State TAF Growth Rate with FAA TAF Baseline
[3]NPIAS Formula: 250 Operations Per Based Aircraft
[4]Model for Estimating General Aviation Operations at Non-Towered Airports (FAA 2001)
AAGR: Average Annual Growth Rate

NPIAS Formula Operations Forecast

Two separate methodologies of determining operations at non-towered airports were considered. The first methodology is presented in the *Field Formulation of the NPIAS.* In this FAA publication, it states that a satisfactory procedure for estimating operations at non-towered airports is to apply a general guideline of operations per based aircraft depending on the operational characteristics of the airport. For rural general aviation airports with little itinerant traffic, 250 annual operations per based aircraft are suggested. For busier general aviation airports with more itinerant traffic, 350 operations per based aircraft are suggested. For busy reliever general aviation airports, 450 operations per based aircraft are suggested.

Lebanon State Airport may be considered a rural general aviation airport with little itinerant traffic; therefore, 250 operations per based aircraft is utilized to develop an operations projection. This results in 13,500 operations for 2015 and 16,250 by 2035 for an average annual growth rate of 0.93 percent.

Non-Towered Airport Model Operations Forecast

The second methodology utilizes a statistical regression model approved by the FAA to estimate total operations at non-towered airports. The research paper entitled, *Model for Estimating General Aviation Operations at Non-Towered Airports Using Towered and Non-Towered Airports Data* (GRA, Inc. 2001), includes the methodology and formula for the model. Independent variables used in the model include airport characteristics, such as based aircraft; area demographics, such as population within 25 and 100 miles; the availability of certified flight schools (none at Lebanon); airport prominence (ratio of based aircraft to aircraft within 100 miles); and geographic location. The model was derived using a combined data set for small towered and non-towered general aviation airports and incorporates a dummy variable to distinguish the two airport types.

The results of the model estimate that the Airport had approximately 15,400 annual operations in 2015. By 2035, the model estimates 18,900 annual operations and an average annual growth rate of 1.03 percent.

FAA National Growth Rate Operations Forecast

Two additional new forecasts are presented, which are based on FAA-approved methodologies of utilizing annual growth rates from *FAA Forecasts for Fiscal Years 2015-2035* and the statewide *Terminal Area Forecast*. The 2015 base year TAF forecast of 9,992 for the Airport is utilized.

According to the *FAA Forecasts for Fiscal Years 2015-2035*, general aviation operations nationally are projected to increase 0.4 percent annually over the next 20 years. This growth rate is applied and results in 10,822 operations in 2035.

Statewide FAA TAF Growth Rate Operations Forecast

The *Field Formulation of the NPIAS* indicates that it is appropriate to apply the statewide TAF growth rate to a local non-towered airport to arrive at an operations forecast. The TAF growth rate for all NPIAS airports in the State of Oregon is 1.16 percent annually. This results in 12,584 annual operations by 2035 for the Airport.

Total Operations Forecast Summary

A total of three existing operations forecasts and four new operations forecasts were examined in this analysis. Each of the forecasts developed employs an FAA-approved methodology. The combination of these forecasts creates a reasonable planning envelope as depicted on **Exhibit 2D**. The selected forecast is an approximate average of the four new forecasts. The selected operations forecast to be used for planning purposes is as follows:

- 2020 – 12,900 total operations
- 2025 – 13,500 total operations
- 2035 – 14,600 total operations

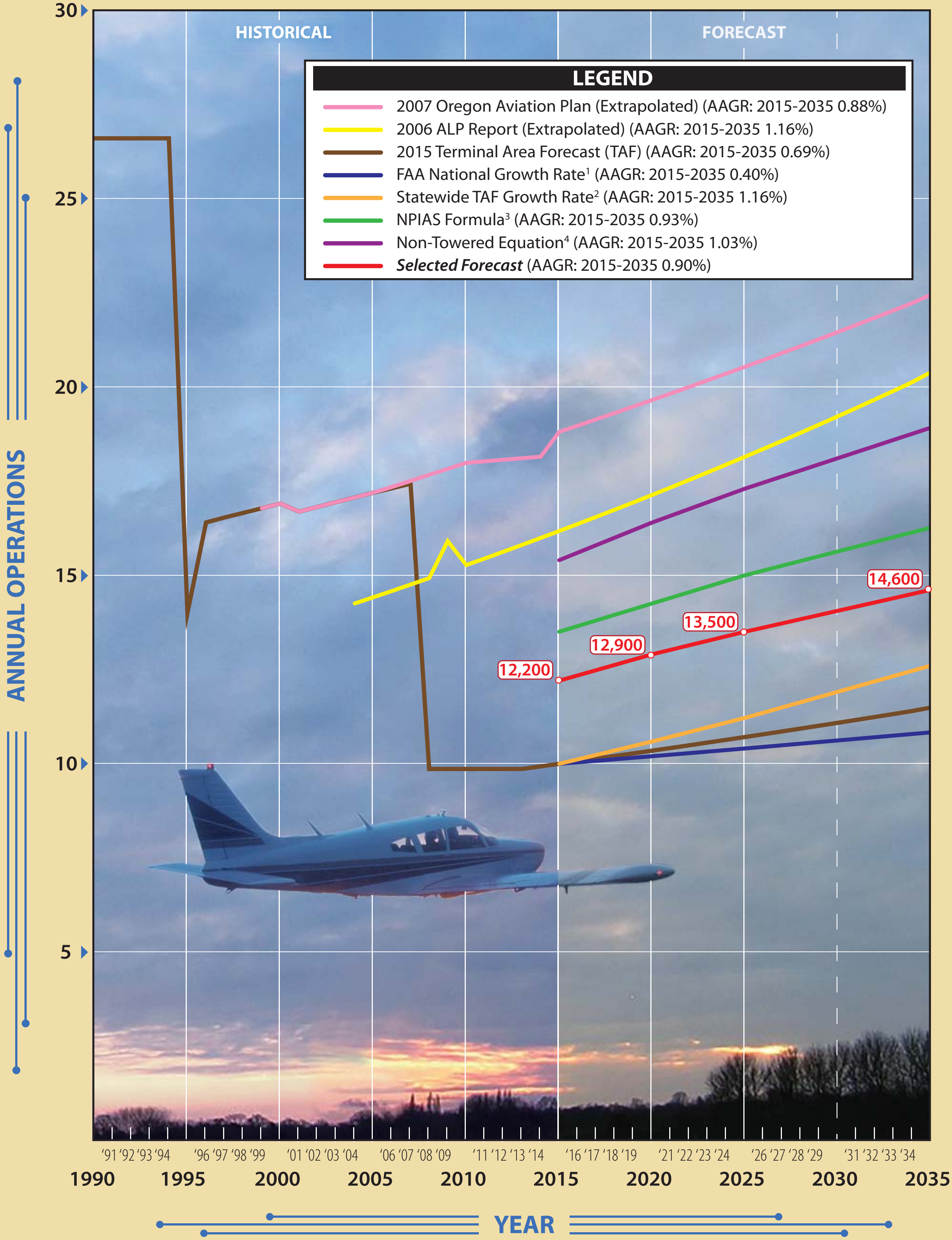
Table 2H presents the classification of the selected operations forecast. All operations at the Airport are general aviation in nature and do not include commercial or military activity. The airport may experience a limited number of air taxi operations which can be considered itinerant. The air taxi figure is an estimate from the *Terminal Area Forecast* which is carried over to this planning forecast. The TAF also estimates that local general aviation operations account for 42 percent of total operations with itinerant operations representing the remaining 58 percent. These percentages are applied to the planning forecast.

TABLE 2H
Total Operations Forecast
Lebanon State Airport

Year	Local GA Operations	Itinerant GA Operations	Air-Taxi	Total Operations
2015	5,000	6,800	400	12,200
2020	5,300	7,200	400	12,900
2025	5,500	7,600	400	13,500
2035	6,000	8,200	400	14,600
Average Annual Growth Rate: 0.90%				

For airport planning, the number of operations has a direct impact on overall airport capacity. Capacity is a measure of the capability of the existing runway and taxiway system to accommodate operations without unreasonable delay. As will be discussed in Chapter Three – Facility Requirements, the current capacity of the Airport is estimated at 209,000 annual operations. FAA guidance suggests that planning for capacity improvement projects should begin when operations reach 60 percent of capacity, which would be when the Airport reaches approximately 125,000 annual operations.

Rather than total operations, the character of those operations (i.e., the type of aircraft) may have a greater impact on airport planning and design for the Airport. For example, frequent activity by one large aircraft (i.e., a jet aircraft) has a more substantial impact on airport planning and design than even hundreds of smaller general aviation piston-powered aircraft. This concept will be described in greater detail in Chapter Three.



AAGR: Average Annual Growth Rate

[1]FAA National GA Forecast Growth Rate with FAA TAF Baseline
[2]State TAF Growth Rate with FAA TAF Baseline
[3]NPIAS Formula: 250 Operations Per Based Aircraft
[4]Model for Estimating General Aviation Operations at Non-Towered Airports (FAA 2001)

COMPARISON TO THE TAF

The FAA will review and compare the forecasts to the TAF. Where the 5- or 10-year forecasts exceed 100,000 total annual operations or 100 based aircraft, the FAA prefers that the forecasts differ by less than 10 percent in the 5-year period and 15 percent in the 10-year period. Where the forecasts do differ, the FAA will examine supporting documentation, such as this Master Plan. **Table 2J** presents a direct comparison of the 2015 TAF to the forecasts in this Master Plan.

TABLE 2J
Forecast Comparison to the *Terminal Area Forecast*
Lebanon State Airport

Year	Lebanon Operations	2015 FAA TAF	Percent Difference
TOTAL OPERATIONS			
2015	12,200	9,992	19.90%
2020	12,900	10,341	22.02%
2025	13,500	10,704	23.10%
2035	14,600	11,475	23.97%
AAGR 2015-2035	0.90%	0.69%	
BASED AIRCRAFT			
2015	54	59	8.85%
2020	57	60	5.13%
2025	60	63	4.88%
2035	65	73	11.59%
AAGR 2015-2035	0.93%	1.07%	

Source: Coffman Associates analysis

For total operations, the Master Plan forecasts are slightly higher than the TAF forecast. The Master Plan operations forecast takes into consideration local factors unlike the TAF. The based aircraft forecasts are slightly lower than the TAF but are based on a more reliable baseline figure.

PEAKING CHARACTERISTICS

Many aspects of facility planning relate to levels of peaking activity – times when an airport is busiest. For example, the appropriate size of terminal facilities 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.

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 control tower, peak periods must be estimated. The forecast of peak month operations assumes approximately 12 percent of annual operations. This is typical for a general aviation airport that may have some seasonal changes to activity levels, such as fluctuations between winter and summer activity.

The design day was then calculated by dividing the peak month operations by 31. 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 2K** summarizes the general aviation peak activity forecasts.

TABLE 2K
Peak Operations Forecast
Lebanon State Airport

	2015	2020	2025	2035
Annual Operations	12,200	12,900	13,500	14,600
Peak Month (12%)	1,464	1,548	1,620	1,752
Design Day	47	50	52	57
Busy Day	66	70	73	79
Design Hour (17.5%)	8	9	9	10

GENERAL AVIATION FORECAST SUMMARY

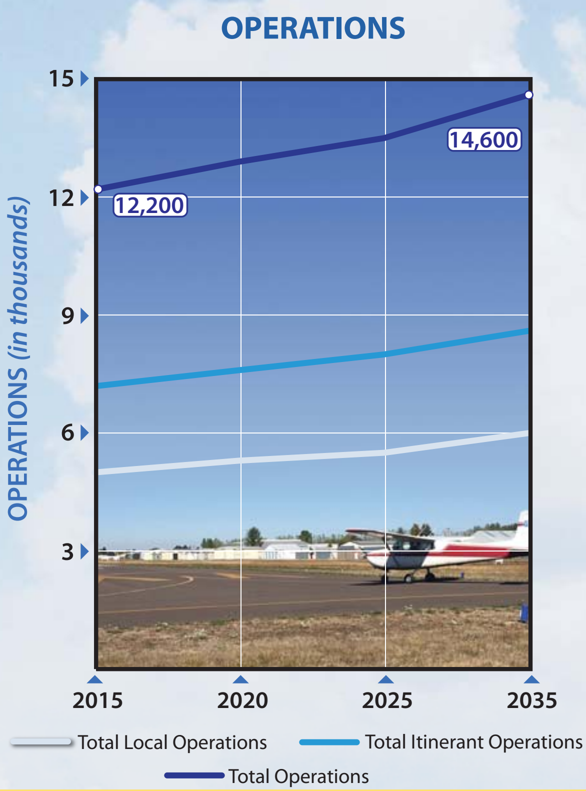
The previous sections outline the various activity levels that are reasonably anticipated over the next 20 years at the Lebanon State Airport. **Exhibit 2E** presents a summary of the aviation demand forecasts. The baseline year for forecast data is 2015. The forecasting effort extends 20 years to the year 2035.

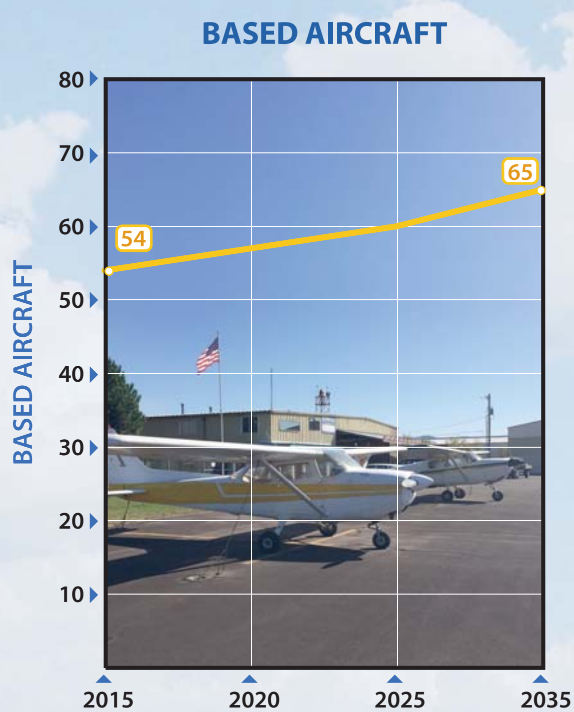
Lebanon State Airport is a general aviation facility as defined by the FAA. As described in Chapter One, Runway 16-34 is 2,747 feet long and 60 feet wide. The Airport is available in visual operating condition only and does not currently have any instrument approaches.

General aviation activity often trends with national and local economies. The country was in a recessionary period from December 2007 through the third-quarter of 2009, and was slow to recover. Activity at both commercial service and general aviation airports have been down. The Airport weathered the down-turn better than most maintaining a relatively steady number of based aircraft. Total operations were also relatively flat through this period.

Forecasts of aviation activity, including based aircraft and operations, is key to determining future facility requirements. The 54 aircraft currently based at the airport are forecast to grow to 65 aircraft by

	ACTUAL	FORECAST		
	2015	**2020**	**2025**	**2035**
ANNUAL OPERATIONS				
General Aviation				
Itinerant	6,800	7,200	7,600	8,200
Local	5,000	5,300	5,500	6,000
Air Taxi (Itinerant)	400	400	400	400
Total Itinerant	***7,200***	***7,600***	***8,000***	***8,600***
Total Local	***5,000***	***5,300***	***5,500***	***6,000***
TOTAL OPERATIONS	12,200	12,900	13,500	14,600
BASED AIRCRAFT				
Single Engine	52	55	58	63
Multi-engine	2	2	2	2
Turboprop	0	0	0	0
Business Jet	0	0	0	0
Helicopter	0	0	0	0
Total Based Aircraft	54	57	60	65
PEAKING CHARACTERISTICS				
Peak Month	1,464	1,548	1,620	1,752
Design Day	47	50	52	57
Busy Day	66	70	73	79
Design Hour	8	9	9	10





2035. Similarly, the estimated 12,900 operations in 2015 are forecast to grow to approximately 16,600 operations by 2035.

AIRCRAFT/AIRPORT/RUNWAY CLASSIFICATION

The FAA has established several aircraft classification systems that group aircraft types based on their performance (approach speed in landing configuration) and on-design characteristics (wingspan and landing gear configuration). These classification systems are used to determine the appropriate airport design standards for specific airport elements, such as runways, taxiways, taxilanes, and aprons.

AIRCRAFT CLASSIFICATION

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily on the characteristics of the aircraft which are currently using or are expected to use an airport. The critical design aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft type or, more commonly, is a composite aircraft representing a collection of aircraft classified by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). FAA AC 150/5300-13A, *Airport Design*, describes the following airplane classification systems, the parameters of which are presented on **Exhibit 2F**.

Aircraft Approach Category (AAC): A grouping of aircraft based on a reference landing speed (V_{REF}), if specified, or if V_{REF} is not specified, 1.3 times stall speed (V_{SO}) at the maximum certificated landing weight. V_{REF}, V_{SO}, and the maximum certificated landing weight are those values as established for the aircraft by the certification authority of the country of registry.

The AAC generally refers to the approach speed of an aircraft in landing configuration. The higher the approach speed, the more restrictive the applicable design standards. The AAC, depicted by a letter A through E, is the aircraft approach category. Aircraft in AAC A and B include pistons, turboprops, and small general aviation jets. Aircraft in AAC C, D, and E include medium-sized general aviation jets up to larger commercial jets. The AAC generally applies to runways and runway-related facilities, such as runway width, runway safety area (RSA), runway object free area (ROFA), runway protection zone (RPZ), and separation standards.

Airplane Design Group (ADG): The ADG, depicted by a Roman numeral I through VI, is a classification of aircraft which relates to aircraft wingspan or tail height (physical characteristic). When the aircraft wingspan and tail height fall in different groups, the higher group is used. The ADG influences design standards for taxiway safety area (TSA), taxiway object free (TOFA), taxi-lane object free area, apron wingtip clearance, and various separation distances.

Taxiway Design Group (TDG): A classification of airplanes that is based on outer-to-outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distances. The TDG relates to the undercarriage dimensions of the design aircraft and the TDG standards are based on the MGW and CMG distances. The

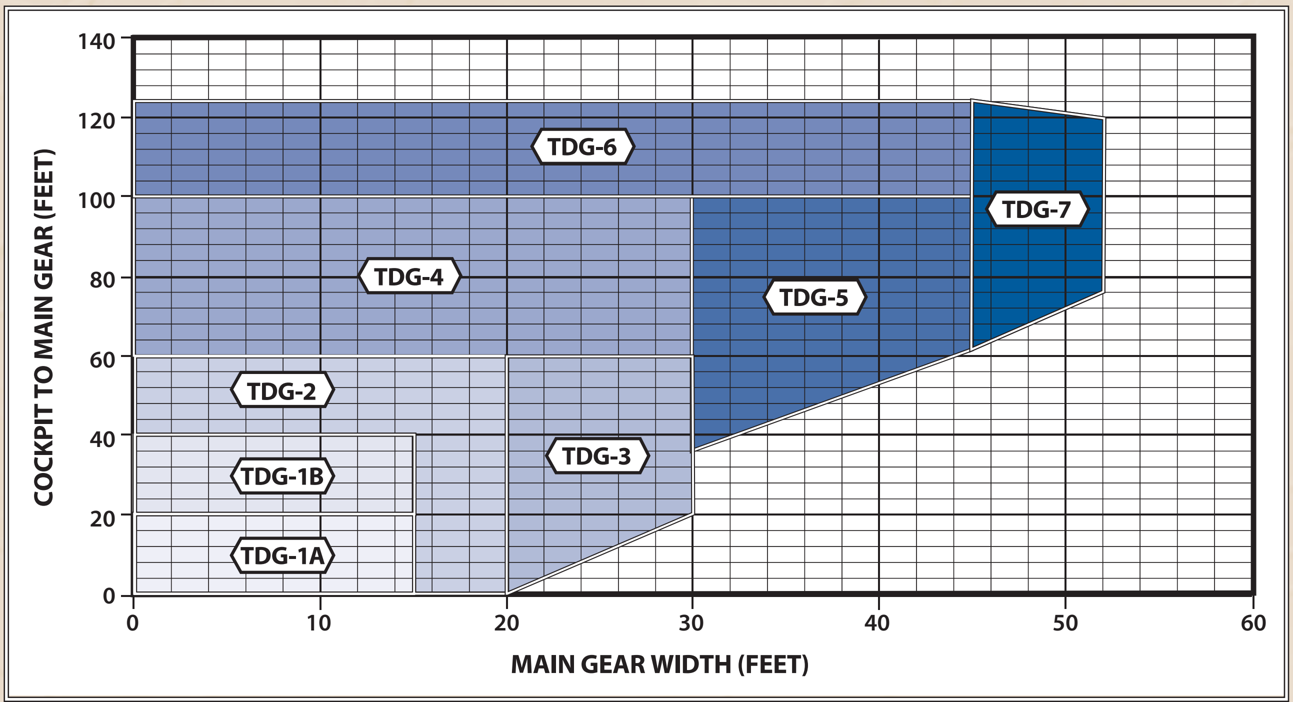
AIRCRAFT APPROACH CATEGORY (AAC)	
Category	**Approach Speed**
A	less than 91 knots
B	91 knots or more but less than 121 knots
C	121 knots or more but less than 141 knots
D	141 knots or more but less than 166 knots
E	166 knots or more

AIRPLANE DESIGN GROUP (ADG)		
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

VISIBILITY MINIMUMS	
RVR* (ft)	**Flight Visibility Category (statute miles)**
VIS	3-mile or greater visibility minimums
5,000	Not lower than 1-mile
4,000	Lower than 1-mile but not lower than ¾-mile
2,400	Lower than ¾-mile but not lower than ½-mile
1,600	Lower than ½-mile but not lower than ¼-mile
1,200	Lower than ¼-mile

***RVR**: Runway Visual Range

TAXIWAY DESIGN GROUP (TDG)



Source: FAA AC 150/5300-13A, *Airport Design* taxiway design elements determined by the application of the TDG include the taxiway width, taxiway edge safety margin, taxiway shoulder width, taxiway fillet dimensions, and, in some cases, the separation distance between parallel taxiways/taxilanes. Other taxiway elements, such as the TSA, TOFA, taxiway/taxilane separation to parallel taxiway/ taxi-lanes or fixed or movable objects, and taxiway/taxilane wingtip clearances are determined solely based on the wingspan of the design aircraft utilizing those surfaces. It is appropriate for taxiways to be planned and built to different TDG standards based on expected use.

Exhibit 2G summarizes the aircraft classification of the most common aircraft in operation today. Generally, recreational and business piston and turboprop aircraft will fall in approach categories A and B and airplane design groups I and II. Business jets typically fall in approach categories B and C, while commercial aircraft will fall in approach categories C and D.

AIRPORT AND RUNWAY CLASSIFICATION

These classifications, along with the aircraft classifications defined previously, are used to determine the appropriate FAA design standards to which the airfield facilities are to be designed and built.

Airport Reference Code (ARC)**:** The ARC is an airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport. The current ALP for the Airport, which will be updated as part of this master planning effort, identifies an ARC of B-I for the Airport, with a representative aircraft being a Beech Baron 58P. These designations will be reviewed and updated as necessary.

Runway Design Code (RDC): A code signifying the design standards to which the runway is to be built. The RDC is based upon planned development and has no operational component.

The AAC, ADG, and RVR are combined to form the RDC of a particular runway. The RDC provides the information needed to determine certain design standards that apply. The first component, depicted by a letter, is the AAC and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristics), whichever is most restrictive. The third component relates to the visibility minimums expressed by runway visual range (RVR) values in feet of 1,200 (⅛-mile), 1,600 (¼-mile), 2,400 (½-mile), 4,000 (¾-mile), and 5,000 (1-mile). The RVR values approximate standard visibility minimums for instrument approaches to the runways. The third component should read "VIS" for runways designed for visual approach use only.

Approach Reference Code (APRC): A code signifying the current operational capabilities of a runway and associated parallel taxiway with regard to landing operations. Like the RDC, the APRC is composed of the same three components: the AAC, ADG, and RVR. The APRC describes the current operational capabilities of a runway under particular meteorological conditions where no special operating procedures are necessary, as opposed to the RDC which is based upon planned development with no opera-

A-I

- Beech Baron 55
- **Beech Bonanza**
- Cessna 150
- Cessna 172
- Cessna Citation Mustang
- Eclipse 500/550
- Piper Archer
- Piper Seneca

C-II, D-II

- **Cessna Citation X (750)**
- Gulfstream 100, 200,300
- Challenger 300/600
- ERJ-135, 140, 145
- CRJ-200/700
- Embraer Regional Jet
- Lockheed JetStar
- Hawker 800

B-I

- Beech Baron 58
- Beech King Air A90/100
- Cessna 402
- **Cessna 421**
- Piper Navajo
- Piper Cheyenne
- Swearingen Metroliner
- Cessna Citation I (525)

C-III, D-III less than 100,000 lbs.

- ERJ-170
- CRJ 705, 900
- Falcon 7X
- **Gulfstream 500**, 550, 650
- Global Express, Global 5000
- Q-400

B-II

- Super King Air 200
- Cessna 441
- DHC Twin Otter
- Super King Air 350
- Beech 1900
- Citation Excel (560), Sovereign (680)
- Falcon 50, 900, 2000
- **Citation Bravo (550)**
- Embraer 120

C-III, D-III over 100,000 lbs.

- ERJ-90
- Boeing Business Jet
- B-727
- **B-737**-300, **700,** 800
- MD-80, DC-9
- A319, A320

A-III, B-III

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

C-IV, D-IV

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

C-I, D-I

- Beech 400
- **Lear** 31, **35,** 45, 60
- Israeli Westwind

D-V

- **B-747-400**
- B-777
- B-787
- A-330, A-340

Note: Aircraft pictured is identified in bold type.

Exhibit 2G
AIRCRAFT REFERENCE CODES

tional component. The APRC for a runway is established based upon the minimum runway-to-taxiway centerline separation.

Departure Reference Code (DPRC): A code signifying the current operational capabilities of a runway and associated parallel taxiway with regard to takeoff operations. The DPRC represents those aircraft that can takeoff from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions with no special operating conditions. The DPRC is similar to the APRC, but is composed of two components: ACC and ADG. A runway may have more than one DPRC depending on the parallel taxiway separation distance.

CRITICAL DESIGN AIRCRAFT

The selection of appropriate 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 an airport. The critical design aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft or a composite aircraft representing a collection of aircraft classified by the three parameters: AAC, ADG, and TDG. In the case of an airport with multiple runways, a design aircraft is selected for each runway.

The first consideration is the safe operation of aircraft likely to use an airport. Any operation of an aircraft that exceeds design criteria of an airport may result in either an unsafe operation or a lesser safety margin; however, it is not the usual practice to base the airport design on an aircraft that uses the airport infrequently.

The critical design aircraft is defined as the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport. Regular use is 500 annual operations, excluding touch-and-go operations. Planning for future aircraft use is of particular importance since the design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure that short term development does not preclude the reasonable long range potential needs of an airport.

According to FAA AC 150/5300-13A, *Airport Design*, “airport designs based only on existing aircraft can severely limit the ability to expand the airport to meet future requirements for larger, more demanding aircraft. Airport designs that are based on large aircraft never likely to be served by the airport are not economical.” Selection of the current and future critical design aircraft must be realistic in nature and supported by current data and realistic projections.

CURRENT DESIGN AIRCRAFT

At 2,747 feet in length, the runway currently presents limits to the type of aircraft that can safely operate at the Airport. Piston-powered aircraft and most turboprop aircraft will likely not be limited. Most medium and large business jets are not likely to utilize the Airport; however, some smaller jets, such as the Cessna Mustang (B-I), Embraer Phenom 100 (B-I), or Cessna Citation I (B-I), may operate at the airport currently. Nonetheless, business jet operations are extremely rare at the Airport. **The current critical design aircraft B-I-1A is best represented by the Beech Baron 58P which is a small twin-engine piston-powered aircraft.**

The critical design aircraft is less than 12,500 pounds, which is an important threshold for the application of certain safety design standards on airports. Therefore, the critical design aircraft designation includes the "small aircraft exclusively" categorization.

The current design aircraft for the Airport is described as B-I-1A (small aircraft exclusively) and is best represented by the Beech Baron 58P aircraft.

Current Runway Design Code

Runways are assigned an RDC. The RDC relates to specific FAA design standards that should be met in relation to each runway. Since the Airport has a single runway, the applicable RDC for the runway would have the same AAC and ADG as the airport design aircraft (B-I). The third component of the RDC is RVR as determined by the lowest instrument approach visibility minimums which is visual. **Therefore, the RDC for Runway 16-34 is B-I-VIS.**

FUTURE AIRPORT DESIGN AIRCRAFT

The Lebanon State Airport is expected to continue to serve a specific operator: owners of smaller piston-powered aircraft. **Therefore, the future design aircraft is anticipated to remain in ARC B-I and the RDC is planned to remain B-I-VIS.**

It should be noted that additional analysis to be conducted in this Master Plan (i.e., Facility Requirements and Alternatives) may require adjustment of the future design standards to be applied to the Airport. For example, with the implementation of GPS instrument approaches through the FAA program NextGen, certain design standards may change at the airport.

SUMMARY

This forecast chapter has presented forecasts of aviation demand indicators for Lebanon State Airport. Based aircraft are forecast to grow from 54 currently to 65 within 20 years. Total annual operations are forecast to grow from 12,200 currently to 14,600 over the course of the next 20 years.

The current and future critical design aircraft falls in design code B-I-1A (small aircraft exclusively). This classification is based on current activity at the Airport and what is reported on the current ALP.

The next step in the master planning process is to use the forecasts to determine development needs for the Airport through 2035. Chapter Three – Facility Requirements will address airside elements, such as safety areas, runways, taxiways, lighting, and navigational aids, as well as landside requirements, including hangars, aircraft aprons, and support services. The remaining portions of the Master Plan will lay out how that growth can be accommodated in an orderly, efficient, and cost-effective manner.

LEBANON
STATE AIRPORT

Chapter Three

FACILITY REQUIREMENTS

CHAPTER THREE

FACILITY REQUIREMENTS

To properly plan for the future of Lebanon State Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve the identified demand. This chapter uses the results of the forecasts presented in Chapter Two, as well as established planning criteria, to determine the airside (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 and outline what new facilities may be needed and when these may be needed to accommodate forecast demands. Having established these facility requirements, alternatives for providing them will be evaluated in Chapter Four - Alternatives to determine the most cost-effective and efficient means for implementation.

The facility requirements were evaluated using guidance contained in several Federal Aviation Administration (FAA) publications, including the following:

- Advisory Circular (AC) 150/5300-13A, *Airport Design*
- AC 150/5060-5, *Airport Capacity and Delay*
- AC 150/5325-4C, *Runway Length Requirements for Airport Design*
- Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*
- FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS).

PLANNING HORIZONS

An updated set of aviation demand forecasts for the 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 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 planning horizons are the Short Term (years 1-5), the Intermediate Term (years 6-10), and the Long Term (years 11-20).

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 by allowing airport management the flexibility 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.

AIRSIDE FACILITY 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
- Runway
- Taxiways
- Navigational Approach Aids
- Instrument Approaches
- 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), runway object free area (ROFA), runway obstacle free zone (OFZ), and runway protection zone (RPZ).

The entire RSA, ROFA, OFZ, and RPZ 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 by the FAA. 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.

Dimensional standards for the various safety areas associated with the runways are a function of the type of aircraft (ARC) expected to use the runways, as well as the instrument approach visibility minimums. Runway 16-34 is a visual runway which does not currently offer any instrument approaches. Currently, it should meet the design standards for ARC B-I-VIS. **Table 3A** presents the current design standards for each runway.

TABLE 3A
Runway Design Standards
Lebanon State Airport

	Runway 16-34
Runway Design Code (RDC)	A/B-I-VIS
Visibility Minimums (in miles)	Visual
Existing Runway Dimensions	2,747 x 60
RUNWAY DESIGN STANDARDS	
Runway Width	60
Runway Shoulder Width	10
Blast Pad Length/Width	80 x 60
RUNWAY PROTECTION STANDARDS	
Runway Safety Area (RSA)	
Width	120
Length Beyond Departure End	240
Length Prior to Threshold	240
Runway Object Free Area (ROFA)	
Width	250
Length Beyond Departure End	240
Length Prior to Threshold	240
Runway Obstacle Free Zone (ROFZ)	
Width	120
Length Beyond Runway End	200
Approach Runway Protection Zone	
Length	1,000
Inner Width	250
Outer Width	450
Departure Runway Protection Zone	
Length	1,000
Inner Width	250
Outer Width	450
RUNWAY SEPARATION STANDARDS	
Runway Centerline to:	
Holding Position	125
Parallel Taxiway	150
Aircraft Parking Area	125

Note: All dimensions in feet unless otherwise noted.
Source: FAA AC 150/5300-13A, Airport Design

Runway Safety Area (RSA)

The RSA is defined in FAA Advisory Circular (AC) 150/5300-13A, *Airport Design,* as a "surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft 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.

For a B-I runway with visual only or an instrument approach with visibility minimums of not less than 1-mile, such as Runway 16-34, the FAA calls for the RSA to be 120 feet wide, centered on the runway, and extend 240 feet beyond the runway ends. The RSA for Runway 16-34 meets standard.

The RSA for Runway 16-34 meets standard.

It should be noted that the runway rehabilitation project undertaken in the 2009/2010 timeframe provided a fix that brought the RSA into compliance. On the Runway 34 end, the pavement end is only 120 feet from the airport property line and perimeter fence. In order to provide the full 240-foot RSA beyond the runway end, the runway was shortened by 120 feet. The pavement was not physically removed; instead, it was converted to a lead-in taxiway and the runway end lights were relocated to the outer edges of the new runway end.

Runway Object Free Area (ROFA)

The ROFA 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 ROFA does not have to be graded and level like the RSA; instead, the primary requirement for the ROFA is that no object in the ROFA penetrate the lateral elevation of the RSA. The runway ROFA is centered on the runway, extending out in accordance to the critical aircraft design category utilizing the runway.

For a B-I runway with visual approaches or an instrument approach with visibility minimums of not less than 1-mile, such as Runway 16-34, the FAA calls for the ROFA to be 250 feet wide, centered on the runway, and extend 240 feet beyond the runway ends. The ROFA for Runway 16-34 meets standard.

The ROFA for Runway 16-34 meets standard.

Obstacle Free Zone (OFZ)

The OFZ is an imaginary surface 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.

The OFZ for Runway 16-34 meets standard.

The OFZ extends 200 feet beyond the runway ends and is 120 feet wide. The OFZ for the Runway 16-34 meets standard.

Runway Protection Zone (RPZ)

The RPZ is a trapezoidal area centered on the runway, typically beginning 200 feet beyond the runway end. When an RPZ begins at a location other than 200 feet beyond the end of a runway, two RPZs are required (i.e., a departure RPZ and an approach RPZ). 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 Area. The dimensions of the RPZ vary according to the visibility minimums serving the runway and the type of aircraft operating on the runway.

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 ROFA. Only objects necessary to aid air navigation, such as approach lights, are allowed in this portion of the RPZ. The remaining portions of the RPZ, the Controlled Activity Areas, have strict land use limitations. Wildlife attractants, fuel farms, places of public assembly, and residences are prohibited.

The approach and departure RPZ on the Runway 34 end extends beyond the airport perimeter fence, across Airport Road, and over property owned by the Airport. On the Runway 16 end, the RPZ extends beyond the airport property/fence line, across Oak Street, and onto privately owned property. The Airport is planning to purchase the private property within the RPZ in the next year.

The FAA has renewed its focus on improving land use compatibility in RPZs. On September 27, 2012, the FAA issued a memo entitled, *Interim Guidance on Land Use Within a Runway Protection Zone*. The Interim Guidance indicates that any **new or modified RPZs** that include incompatibilities must be reviewed and approved by the FAA headquarters prior to implementation. **Table 3B** summarizes the actions that typically trigger a change in the size and/or location of the RPZ and lists incompatible land uses.

The RPZs serving runways on both ends of Runway 16-34 have existing incompatibilities. On the Runway 34 end, Airport Road traverses the RPZ and on the Runway 16 end, Oak Street traverses the RPZ. Both of these incompatibilities are existing conditions and are not subject to the *Interim Guidance* regulations. If in the future the RPZs change in size or location, or a new incompatibility is proposed, then the change must be reviewed and approved by FAA headquarters. In essence, this means that any change in the RPZs at the Airport would require an extensive alternatives analysis which may result in requiring one or both roads to be relocated outside the RPZs.

Any future change in the RPZs may require the relocation of Airport Road and/or Oak Street outside of the RPZ.

TABLE 3B
New or Modified Land Uses in the RPZ

ACTIONS TYPICALLY TRIGGERING A CHANGE IN RPZ DIMENSIONS/LOCATION		
1	An airfield project (e.g., runway extension, runway shift)	
2	A change in the critical design aircraft that increases the RPZ dimensions	
3	A new or revised instrument approach procedure that increases the RPZ dimensions	
4	A local development proposal in the RPZ (either new or configured)	
LAND USES REQUIRING COORDINATION WITH FAA HEADQUARTERS		
	Land Use	**Examples and Notes**
1	Building and Structures	Including but not limited to: Residences, schools, churches, hospitals, other places of public assembly, etc.
2	Recreational Land Use	Including but not limited to: Golf courses, sports fields, amusement parks, other places of public assembly, etc.
3	Transportation Facilities	Including but not limited to: Rail facilities (light or heavy, passenger or freight), public roadways, and vehicular parking facilities.
4	Fuel Storage Facilities	Above and below ground
5	Hazardous Material Storage	Above and below ground
6	Wastewater Treatment Facilities	NA
6	Above-Ground Utility Infrastructure	Electrical substations, solar panels, etc.

Note: Airport sponsors must continue to work with FAA to remove/mitigate existing RPZ land use incompatibilities.
Source: FAA Memo: Interim Guidance on Land Uses Within a Runway Protection Zone (Sept, 27, 2012)

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-I which require a minimum separation of 150 feet. All taxiways are currently at least 150 feet, centerline-to-centerline from the runway; therefore, separation standards are met.

RUNWAY

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

Airfield Capacity

A demand/capacity analysis measures the capacity of the airfield facilities (i.e., runways and taxiways) in order to identify and plan for additional development needs. The Airport's single runway can provide up to 230,000 annual operations under ideal conditions. Due to times when the airport is closed (typically due to weather), a more reasonable capacity is estimated as approximately 209,000 annual operations. This calculation is based on 10 years of weather observations which indicates that visual conditions are in effect approximately 91 percent of the time.

FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS), indicates that improvements to capacity should be considered when operations reach 60 percent of the airfield's annual service volume (ASV). If the projected long range planning horizon level of 14,600 operations comes to fruition, the airfield's ASV will reach seven percent. As a result, there is not a need for additional runways or other capacity improvements.

Runway Orientation

Runway 16-34 is orientated in a north-to-south manner. 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.

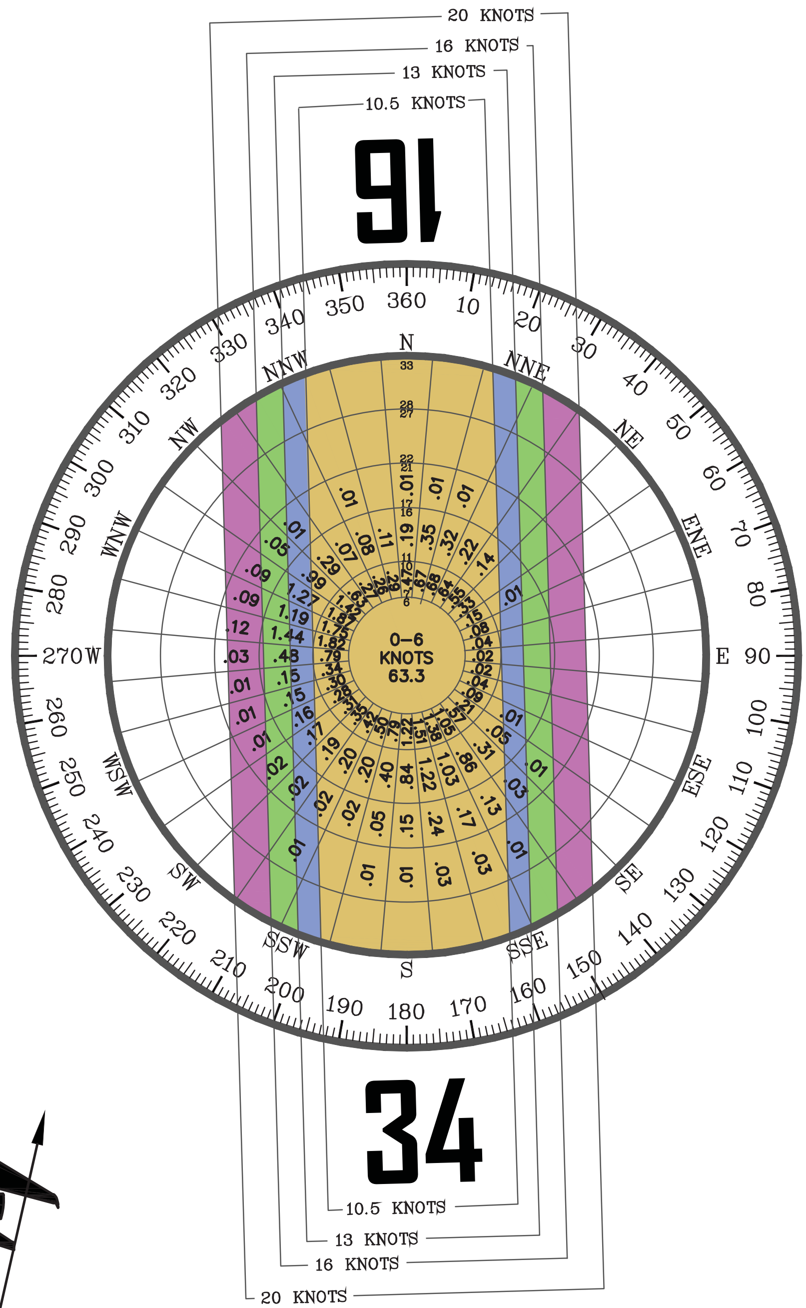
FAA Advisory Circular 150/5300-13A, *Airport Design,* recommends that a crosswind runway should be made available when the primary runway orientation provides for less than 95 percent wind coverage for specific crosswind components. The 95 percent wind coverage is computed on the basis of the crosswind 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.

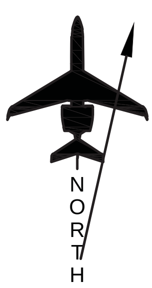
There is not an on-airport weather sensor; instead, weather data specific to the region was obtained from the weather reporting station at Corvallis Municipal Airport via the National Oceanic Atmospheric Administration (NOAA) National Climatic Data Center. This data was collected over a continuous period from 2005 through 2014. A total of 242,402 observations of wind direction and intensity, as well as other weather observations, were made. Of the total number of observations, 21,049 were made in Instrument Flight Rule (IFR) conditions. IFR conditions exist when visibility is below 3 miles or the cloud ceilings are below 1,000 feet.

Exhibit 3A presents the all-weather wind rose. A wind rose is a graphic tool that gives a succinct view of how wind speed and direction are historically distributed at a particular location. The table at the top of the wind roses indicates the percent of wind coverage for the runway at specific wind intensity.

Runway 16-34 provides 94.52 percent coverage for 10.5 knot crosswinds. This means the Airport would be eligible for a crosswind runway if needed. Wind coverage exceeds 95 percent for all other wind components.

ALL WEATHER WIND COVERAGE				
Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 16–34	***94.52%***	***97.31%***	***99.57%***	***99.95%***





Magnetic Declination
15° 22' East (Sept. 2015)
Annual Rate of Change
00° 7' West (Sept. 2015)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Corvallis Municipal Airport
Corvallis, Oregon

OBSERVATIONS:
242,402 All Weather Observations
2005–2014

Runway Length

The determination of runway length requirements for airports is based on five primary factors:

- Mean maximum temperature of the hottest month
- Airport elevation
- Runway gradient
- Critical design aircraft expected to use the runway (RDC)
- Stage length of the longest nonstop destination (specific to larger aircraft)

The mean maximum daily temperature of the hottest month at the Airport is 82.6 degrees Fahrenheit (F), which typically occurs in August. The Airport elevation is 346 feet above mean sea level (MSL). The runway elevation difference between the high and low point is 1-foot. The critical design aircraft falls in RDC B-I. The current runway length is 2,747 feet.

Advisory Circular 150/5325-4C, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length needs. Airplanes operate on a wide variety of available runway lengths. Many factors will govern the suitability of those runway lengths for aircraft, such as elevation, temperature, wind velocity, aircraft operating weight, wing flap settings, runway condition (wet or dry), runway gradient, vicinity airspace obstructions, and any special operating procedures. Airport operators can pursue policies that can maximize the suitability of the runway length. Policies, such as area zoning and height and hazard restrictions, can protect an airport's runway length. Airport ownership (fee simple or easement) of land leading to the runway's ends can reduce the possibility of natural growth or man-made obstructions. Planning of runways should include an evaluation of aircraft types expected to use the airport, or a particular runway now and in the future. Future plans should be realistic and supported by the FAA-approved forecasts and should be based on the critical design aircraft (or family of aircraft).

The first step in evaluating runway length is to determine general runway length requirements for the majority of aircraft operating at the Airport. The majority of operations are conducted using smaller single engine piston-powered aircraft weighing less than 12,500 pounds. Following guidance from AC 150/5325-4C, *Runway Length Recommendations for Airport Design*, the following minimum runway length requirements were identified:

- 3,100 feet to accommodate 95 percent of small aircraft with less than 10 passenger seats.
- 3,700 feet to accommodate 100 percent of these small aircraft.
- 4,100 feet to accommodate small aircraft with 10 or more passenger seats.

In addition, the Oregon Aviation Plan (OAP 2007) recommends a minimum runway length of 3,000 feet for Local general aviation airports, such as Lebanon State Airport. The Alternatives chapter of this Master Plan will examine the feasibility of extending the runway to at least 3,000 feet.

The Alternatives chapter of this Master Plan will examine the feasibility of extending the runway to at least 3,000 feet.

Runway Width

The runway width standard for a B-I airport, such as Lebanon State Airport, is 60 feet. The 2009/2010 runway rehabilitation project included widening the runway to 60 feet from 50 feet. The additional 10 feet was added to the west side of the runway in order to increase the runway/taxiway separation on the east side. The runway meets design standard for width.

Runway Strength

An important feature of airfield pavement is its ability to withstand repeated use by aircraft. Pavement strength is commonly measured in pounds based on the landing gear configuration of aircraft. The 2006 ALP for the Airport estimates a current pavement strength rating of 12,500 pounds for aircraft with single wheel landing gear. This is a common strength rating for airports such as Lebanon State Airport that are intended for use by small aircraft exclusively. This strength rating should be maintained for the Airport.

TAXIWAYS

The design standards associated with taxiways are determined by the taxiway design group (TDG) or the ADG of the critical design aircraft. As determined previously, the applicable ADG for Runway 16-34 is ADG I. The TDG is defined as 1A. **Table 3C** presents the various taxiway design standards related to taxiways at the Airport.

TABLE 3C
Taxiway Dimensions and Standards
Lebanon State Airport

STANDARDS BASED ON WINGSPAN	***ADG I***
Taxiway Protection	
Taxiway Safety Area (TSA) width	49’
Taxiway Object Free Area (TOFA) width	89’
Taxilane Object Free Area width	79’
Taxiway Separation	
Taxiway Centerline to:	
Fixed or Movable Object	44.5’
Parallel Taxiway/Taxilane	70’
Taxilane Centerline to:	
Fixed or Movable Object	39.5’
Parallel Taxilane	64’
Wingtip Clearance	
Taxiway Wingtip Clearance	20’
Taxilane Wingtip Clearance	15’
STANDARDS BASED ON TDG	***TDG 1A***
Taxiway Width Standard	25’
Taxiway Edge Safety Margin	5’
Taxiway Shoulder Width	10’

ADG: Airplane Design Group
TDG: Taxiway Design Group
Source: FAA AC 150/5300-13A, Airport Design

The table also shows those taxiway design standards related to TDG. The TDG standards are based on the Main Gear Width (MGW) and the Cockpit to Main Gear (CMG) distance of the critical design aircraft expected to use those taxiways. Different taxiway and taxilane pavements can and should be designed to the most appropriate TDG design standards based on usage.

Taxiways at the Airport should be designed to be at least 25 feet wide. **Table 3D** summarizes the recommendation for existing taxiways at the Airport.

TABLE 3D
Recommended Taxiway Improvement
Lebanon State Airport

Taxiway Designation	Location	Current Condition	Recommendation
A	North of Twy A2	25' wide	Maintain
A	South of Twy A2	20' wide	Expand to 25' wide
A1	Threshold to Rwy 34	25' wide	Maintain
A2	Center Twy Connector	30' wide	Narrow to 25' wide
A3	Threshold to Rwy 16	30' wide	Narrow to 25' wide
B	South Portion of West Parallel Twy	20' wide	Expand to 25' wide
B	North Portion of West Parallel Twy	25' wide	Maintain
B1	Threshold to Rwy 34	25' wide	Maintain
B2	Center Twy Connector	25' wide	Maintain

Taxiway B is currently a partial parallel taxiway on the southwest side of the airfield. Currently, any aircraft originating from the west side hangars that desires to depart Runway 16 must cross the active runway. In an effort to enhance the safety of the airfield, it is recommended that parallel Taxiway B be extended to the Runway 16 threshold in the future. As more hangars are constructed on the west side of the airfield, it will become increasingly important to extend Taxiway B to the Runway 16 threshold.

Taxiway Design Considerations

FAA AC 150/5300-13A, *Airport Design*, provides guidance on recommended taxiway and taxi-lane layouts to enhance safety by avoiding runway incursions. A runway incursion is defined as “any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.”

The taxiway system at the Airport generally provides for the efficient movement of aircraft; however, recently published AC 150/5300-13A, *Airport Design*, provides recommendations for taxiway design. The following is a list of the taxiway design guidelines and the basic rationale behind each recommendation:

1. **Taxi Method**: Taxiways are designed for “cockpit over centerline” taxiing with pavement being sufficiently wide to allow a certain amount of wander. On turns, sufficient pavement should be

provided to maintain the edge safety margin from the landing gear. When constructing new taxiways, upgrading existing intersections should be undertaken to eliminate "judgmental over-steering," which is where the pilot must intentionally steer the cockpit outside the marked centerline in order to assure the aircraft remains on the taxiway pavement.

2. **Steering Angle**: Taxiways should be designed such that the nose gear steering angle is no more than 50 degrees, the generally accepted value to prevent excessive tire scrubbing.
3. **Three-Node Concept**: To maintain pilot situational awareness, taxiway intersections should provide a pilot a maximum of three choices of travel. Ideally, these are right and left angle turns and a continuation straight ahead.
4. **Intersection Angles**: Design turns to be 90 degrees wherever possible. For non-right-angled intersections, standard angles of 30, 45, 60, 120, 135, and 150 degrees are preferred.
5. **Runway Incursions**: Design taxiways to reduce the probability of runway incursions.
    - *Increase Pilot Situational Awareness*: A pilot who knows where he/she is on the airport is less likely to enter a runway improperly. Complexity leads to confusion. Keep taxiway systems simple using the "three-node" concept.
    - *Avoid Wide Expanses of Pavement*: Wide pavements require placement of signs far from a pilot's eye. This is especially critical at runway entrance points. Where a wide expanse of pavement is necessary, avoid direct access to a runway.
    - *Limit Runway Crossings*: The taxiway layout can reduce the opportunity for human error. The benefits are twofold – through simple reduction in the number of occurrences, and through a reduction in air traffic controller workload.
    - *Avoid "High-Energy" Intersections*: These are intersections in the middle third of runways. By limiting runway crossings to the first and last thirds of the runway, the portion of the runway where a pilot can least maneuver to avoid a collision is kept clear.
    - *Increase Visibility*: Right angle intersections, both between taxiways and runways, provide the best visibility. Acute angle runway exits provide for greater efficiency in runway usage, but should not be used as runway entrance or crossing points. A right angle turn at the end of a parallel taxiway is a clear indication of approaching a runway.
    - *Avoid "Dual Purpose" Pavements*: Runways used as taxiways and taxiways used as runways can lead to confusion. A runway should always be clearly identified as a runway and only a runway.
    - *Indirect Access*: Do not design taxiways to lead directly from an apron to a runway. Such configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway.
    - *Hot Spots*: Confusing intersections near runways are more likely to contribute to runway incursions. These intersections must be redesigned when the associated runway is subject to reconstruction or rehabilitation. Other hot spots should be corrected as soon as practicable.
6. **Runway/Taxiway Intersections**:
    - *Right-Angle*: Right-angle intersections are the standard for all runway/taxiway intersections, except where there is a need for a high-speed exit. Right angle taxiways provide the best visual perspective to a pilot approaching an intersection with the runway to observe aircraft in both the left and right directions. They also provide optimal orientation of the runway holding position signs so they are visible to pilots.

- *Acute Angle*: Acute angles should not be larger than 45 degrees from the runway centerline. A 30-degree taxiway layout should be reserved for high-speed exits. The use of multiple intersecting taxiways with acute angles creates pilot confusion and improper positioning of taxiway signage.
- *Large Expanses of Pavement*: Taxiways must never coincide with the intersection of two runways. Taxiway configurations with multiple taxiway and runway intersections in a single area create large expanses of pavement, making it difficult to provide proper signage, marking, and lighting.

7. **Taxiway/Runway/Apron Incursion Prevention**: Apron locations that allow direct access into a runway should be avoided. Increase pilot situational awareness by designing taxiways in such a manner that forces pilots to consciously make turns. Taxiways originating from aprons and forming a straight line across runways at mid-span should be avoided.
8. **Wide Throat Taxiways**: Wide throat taxiway entrances should be avoided. Such large expanses of pavement may cause pilot confusion and makes lighting and marking more difficult.
9. **Direct Access from Apron to a Runway**: Avoid taxiway connectors that cross over a parallel taxiway and directly onto a runway. Consider a staggered taxiway layout that forces pilots to make a conscious decision to turn.
10. **Apron to Parallel Taxiway End**: Avoid direct connection from an apron to a parallel taxiway at the end of a runway.

FAA AC 150/5300-13A, *Airport Design*, states that, "existing taxiway geometry should be improved whenever feasible, with emphasis on designated "hot spots." To the extent practicable, the removal of existing pavement may be necessary to correct confusing layouts. While there are no designated "hot spots" at the Airport, **Exhibit 3B** identifies three airfield areas with taxiway layout concerns.

The first is the location of the centerfield taxiway crossing which is located in the "high-energy" portion of the runway (middle third). As noted above, FAA airfield geometry standards indicate that taxiways crossing a runway in the high-energy areas should be limited.

The second is the lead-in-taxiway leading to the Runway 16 threshold. When the runway rehabilitation project was undertaken in 2009/2010, it was necessary, and acceptable to the FAA, to shorten the runway to allow for adequate RSA beyond the runway end. The shortening was accomplished by re-marking the runway end approximately 130 feet from the pavement end, relocating the threshold lights, and marking the excess pavement as taxiway. New standards discourage this layout.

The last area of taxiway geometry concern is at the north end of Taxiway A and threshold Taxiway A3. This area is a "wide expanse of pavement" that can potentially be confusing to pilots. A contributing factor is the location of the aircraft hold apron which encroaches upon Taxiway A3, thus creating the wide expanse of pavement.

Another airfield geometry standard that does not conform to current FAA standard is the direct aircraft ramp to runway access. FAA's Runway Safety Action Team (RSAT) study indicates that runway incursion risks increase when a pilot can traverse directly from a ramp or non-movement area to an active runway without having to make a turn. The FAA recommends that all direct access linking a ramp with a runway be modified by relocating the taxiway or developing “no-taxi islands” on the ramp to prohibit direct access. Taxiway A2 currently has direct access from the terminal area (FBO) apron to the runway.

Analysis in the Alternatives chapter will outline options for reducing potential runway incursions through redesign of the taxiway system.

NAVIGATIONAL AND INSTRUMENT APPROACH AIDS

Both ends of the runway are outfitted with a two light precision approach path indicator lighting system located on the left side of the approach. These systems indicate to pilots if they are on the correct approach path to the landing threshold. These systems are owned by the Airport and should be maintained.

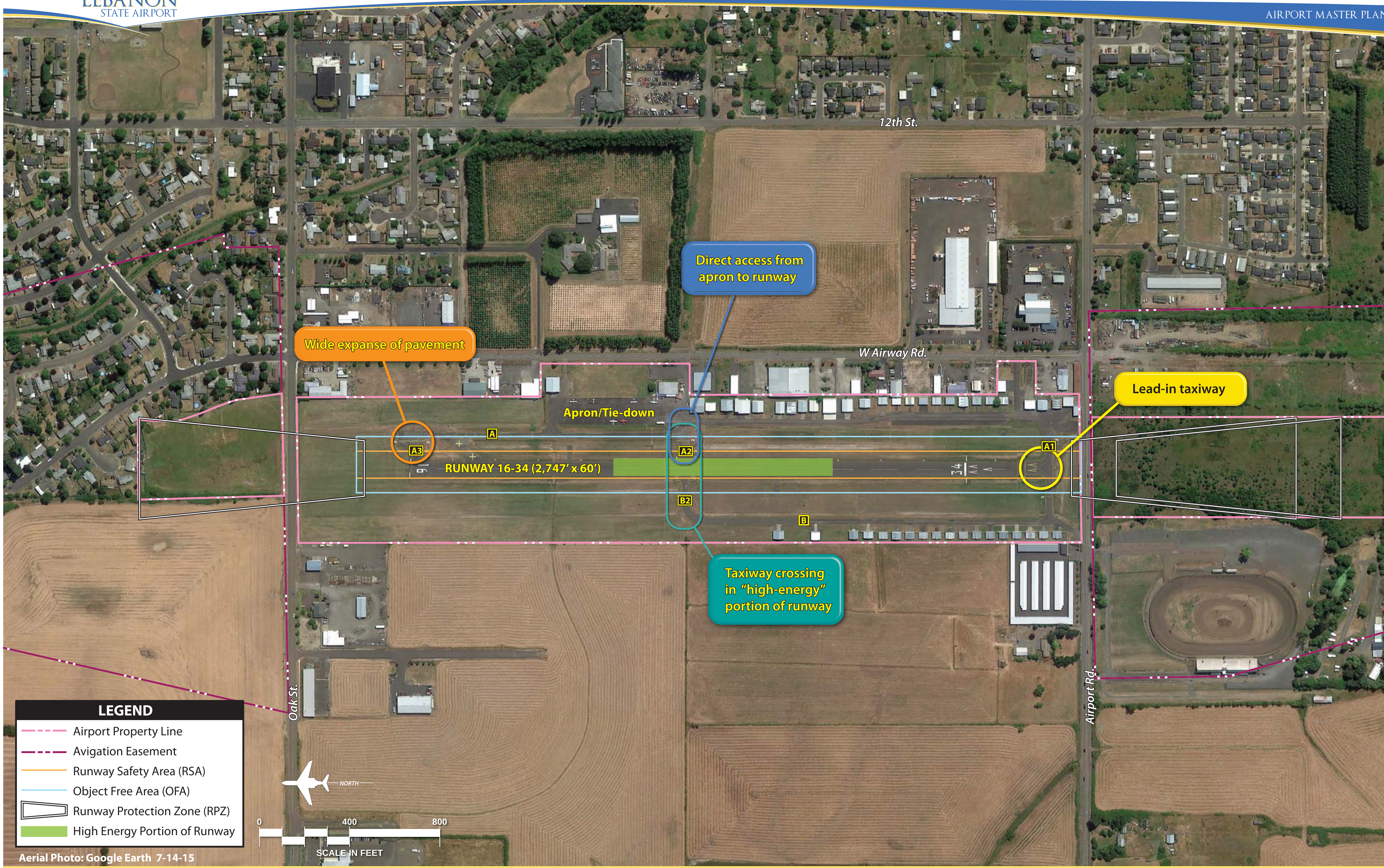
The airport does not have instrument approaches currently; therefore, operations are limited to visual conditions (3-miles visibility and 1,000-foot cloud ceiling heights). Most new instrument approaches being implemented by the FAA are GPS-based. GPS instrument approaches utilize the constellation of satellites to provide location accuracy. Most aircraft, including many smaller aircraft, are equipped to utilize GPS. GPS instrument approaches do not require any investment in ground-based equipment.

GPS approaches with 1-mile visibility minimums may be feasible at the Airport. This type of instrument approach would increase the utilization of the Airport to times with poor visibility conditions. Future planning will consider the introduction of GPS instrument approaches at the Airport with 1-mile visibility minimums. Visibility minimums are a factor in determining the size of the RPZs; however, 1-mile minimums would not change the size of the RPZ at the Airport. Visibility minimums lower than 1-mile would require FAA Headquarters to review the land use compatibility of the RPZs, including the presence of the public roads.

Many airports without a control tower will install a segmented circle. The segmented circle performs two functions: it aids pilots in locating obscure airports and it provides a centralized location for such indicators and signal devices as may be required on a particular airport. For example, it is common to locate the primary lighted windsock within a segmented circle so pilots can quickly determine the optimal runway end for landing. While not required, the Airport should consider the installation of a segmented circle.

AIRFIELD MARKING, LIGHTING AND SIGNAGE

Runway markings are designed according to the type of instrument approach available on the runway. Runway 16-34 has basic markings associated with visual approaches, which include the runway designation, runway centerline, and threshold bars. In addition, on the Runway 34 end, yellow chevrons identify the end of the runway and white chevrons identify the location of the displaced landing


12th St.
W Airway Rd.
Direct access from apron to runway
Wide expanse of pavement
Lead-in taxiway
Apron/Tie-down
A
A3
A2
A1
RUNWAY 16-34 (2,747' x 60')
B2
B
Taxiway crossing in "high-energy" portion of runway
Oak St.
Airport Rd.
LEGEND
Airport Property Line
Avigation Easement
Runway Safety Area (RSA)
Object Free Area (OFA)
Runway Protection Zone (RPZ)
High Energy Portion of Runway
NORTH
0
400
800
SCALE IN FEET
Aerial Photo: Google Earth 7-14-15

This page intentionally left blank

threshold. A white arrow leading to the white chevrons indicates usable pavement for runway takeoff calculations. These markings should be maintained.

The runway is equipped with standard white medium intensity runway (MIRL) edge lighting. This lighting should be maintained. The taxiways are equipped with blue can reflectors. Taxiway edge lighting is typically needed once an airport has more than 100 based aircraft. Since the Airport is not forecast to pass the based aircraft threshold, the blue can reflectors should be maintained.

The Airport has appropriate signage for both the taxiways and the runway. The airfield signage should be maintained.

A summary of the airside needs at Lebanon State Airport is presented on **Exhibit 3C**.

LANDSIDE FACILITY 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
- 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 development should be based upon 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 (due to the 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 Lebanon State Airport, it is estimated that 95 percent of the based aircraft are currently stored in hangars.

	AVAILABLE	POTENTIAL IMPROVEMENT/CHANGE
RUNWAY		
Runway Design Code	RDC B-I (small aircraft exclusively)	Maintain
Runway Dimensions	2,747' x 60'	Consider runway extension to 3,000'
Runway Strength	12,500 lbs.	Maintain
Standard RSA, OFA, OFZ	Meets standard	Maintain
Standard RPZ	Existing roads in RPZs. Partial ownership.	If feasible, remove roads from RPZs; acquire RPZ lands.
Edge Lighting	MIRL	Maintain
Runway Marking	Basic	Non-Precision when the airport gets an instrument approach
Approach Aids	PAPI-2L	Maintain
Airfield Signage	Runway/taxiway signage	Maintain
Instrument Approaches	None (Visual)	Consider GPS 1-mile visibility minimums
Segmented Circle	None	Consider segmented circle

TAXIWAYS		
Taxiway Design Group	TDG - 1A	Maintain
Taxiway Width	20'-30'	Uniform 25'
Taxiway Lighting	Blue can reflectors	Maintain
Taxiway Geometry		
Taxiway A2	Direct access from apron to runway	Consider alternate layout
Taxiway A2/B2	High-energy runway crossing	Consider alternate layout
Taxiway A3	Wide expanse of pavement	Consider alternate layout
Taxiway A1/B1	Lead-in taxiway to Rwy 34	Consider alternate layout
Taxiway B	Partial parallel	Consider full parallel

Red denotes calculated deficiency

As noted in the Inventory chapter, there are 47 hangars at the Airport with an estimated capacity of 54 airplanes. Total square footage available for aircraft storage is 77,500 square feet. The FBO hangar provides an additional 2,600 square feet which is utilized primarily for aircraft maintenance activity.

A planning standard of 1,500 square feet per aircraft is utilized to determine future hangar facility needs. As seen in **Table 3E**, current hangar space appears adequate. By the intermediate timeframe, approximately three additional hangar spaces may be needed and by the long term, a total of seven additional spaces will be needed. As calculated by hangar area, a total of 22,900 square feet of additional hangar space may be needed.

TABLE 3E
Hangar Requirements
Lebanon State Airport

	Existing	Short Term	Intermediate Term	Long Term
Based Aircraft	54	57	60	65
Aircraft to Tie-down	3	3	3	4
Aircraft to be Hangared				
Single Engine	49	52	55	59
Multi-Engine	2	2	2	2
Total Hangar Positions	54	54	57	61
Hangar Area				
Box Hangar Area (s.f)	77,500	81,000	86,000	92,000
Maintenance Area (s.f.)	2,600	10,000	11,000	11,000
Total Hangar Area (s.f)	80,100	91,000	97,000	103,000

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 (such as aircraft maintenance); 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. Typically, a main apron is centrally located near the airside entry point, such as a terminal or FBO building. Ideally, the main apron is large enough to accommodate transient airport users, as well as a portion of locally based aircraft. The apron layout at Lebanon State Airport follows this typical pattern.

There is one main apron at the Airport that encompasses approximately 8,000 square yards of pavement. The apron is located adjacent to the FBO hangar/office. There are 18 marked tie-down positions and a circulation taxilane. While not specifically designated, it is estimated that five of the 18 positions are reserved for itinerant users.

FAA Advisory Circular 150/5300-13A, *Airport Design*, suggests a methodology by which transient apron requirements can be determined from knowledge of busy-day operations. At Lebanon State 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 5 itinerant aircraft parking spaces. By the long term planning period, there is a need for 6 transient positions.

A planning criterion of 650 square yards per aircraft was applied to determine future transient apron area requirements for single and multi-engine aircraft. The current need for transient apron area is 3,300 square yards. By the long term planning period, approximately 3,900 square yards is necessary.

The apron area and positions necessary for local tie-down needs are determined by applying a planning standard of 650 square feet per position. An additional five spaces are added to accommodate various aircraft movement and temporary parking needs, such as movement of aircraft into and out of hangar facilities and temporary storage of aircraft on the ramp. There is a current need for 8 local tie-down positions and approximately 5,000 square yards of apron area. In the long term, 9 positions and 6,000 square yards are needed for local tie-down needs.

Total apron parking requirements are presented in **Table 3F**. Currently, the apron area appears adequate as it is easy to shift the use of the apron between local and transient users. By the long term, the apron area may become somewhat constrained. Future planning will consider the feasibility of expanding the apron area.

TABLE 3F
Apron Requirements
Lebanon State Airport

	Existing/ Current Need	Short Term	Intermediate Term	Long Term
ITINERANT APRON REQUIREMENTS				
Busy Day	66	70	73	79
Percentage of Itinerant Operations	58%	58%	58%	58%
Busy Day Itinerant Operations	38	41	42	46
Multiplier	13%	13%	13%	13%
Total Itinerant Aircraft Positions	5	5	6	6
Total Itinerant Apron Area	2,200	3,300	3,900	3,900
LOCAL APRON REQUIREMENTS				
Local Apron Positions	13	8	8	9
Local Apron Area (s.y.)	5,800	5,000	5,000	6,000
TOTAL APRON REQUIREMENTS				
Total Apron Position	18	13	14	15
Total Apron Area (s.y.)	8,000	8,300	8,900	9,900
Source: Coffman Associates analysis				

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 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 these facilities during the design hour. General aviation space requirements 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 estimated number of passengers on the aircraft (multiplier). An increasing passenger count (from 1.9 to 2.2) is used to account for the likely increase in the number of passengers utilizing general aviation services over time. **Table 3G** outlines the general aviation terminal facility space requirements for the Airport.

TABLE 3G
General Aviation Terminal Area Facilities
Lebanon State Airport

	Existing	Short Term	Intermediate Term	Long Term
Design Hour Operations	8	9	9	10
Design Hour Itinerant Operations	4	4	5	5
Multiplier	1.9	2	2.1	2.2
Total Design Hour Itinerant Passengers	8	9	10	12
General Aviation Building Space (s.f.)	1,600	1,100	1,200	1,400

Source: Coffman Associates analysis

The FBO building serves as the terminal building at the Airport. Restrooms, a sitting area, and a weather reporting station are available. It is estimated that approximately 1,600 square feet are available for terminal building services. Based on the calculations in **Table 3F**, this space appears adequate through the long term planning period.

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.

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 1.8 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.

At Lebanon State Airport, there are approximately 25 vehicle parking spaces available near the terminal building. A planning standard of 400 square feet is utilized to determine total vehicle parking space necessary. This includes area needed for circulation and handicap clearances.

Local vehicle parking spaces are more difficult to count as many based aircraft owners will simply park their car in their hangar when they are utilizing their aircraft. The existing parking available for local operators is calculated as one space for each hangar, or 47 in total. Future vehicle parking space is calculated as 400 square feet per local space needed (1/2 total based aircraft).

The total number of parking spaces appears to be adequate through the long term planning period. While the total number of spaces appears appropriate, the location of parking spaces should be considered. Parking should be made available in close proximity to the terminal building and airport businesses. In an effort to limit the level of vehicle traffic on the aircraft movement areas, many general aviation airports are providing separate parking in support of facilities with multiple aircraft parking positions, such as T-hangars. Parking requirements for the airport are summarized in **Table 3H**.

TABLE 3H
GA Vehicle Parking Requirements
Lebanon State Airport

	Existing	Short Term	Intermediate Term	Long Term
Design Hour Itinerant Passengers	8	9	10	12
GA Itinerant Spaces	25	16	18	21
GA Based Spaces	47	29	30	33
Itinerant Parking Area (s.f.)	8,500	6,000	7,000	8,000
GA Based Parking Area (s.f.)	18,800	11,000	12,000	13,000
Total GA Parking Area (s.f.)	27,300	17,000	19,000	21,000
Total Parking Spaces	72	45	48	53

Source: Coffman Associates analysis

FUEL STORAGE

The FBO owns a static fuel storage tank located on the main terminal apron. The tank has a 6,000-gallon capacity for AvGas and a 4,000-gallon capacity for MoGas. The Oregon Department of Aviation provides a land lease to the FBO operator for the fuel farm site and receives an $0.8 per gallon fuel flowage fee. Over the last five years, the Airport has averaged approximately 25,000 gallons of fuel sold annually, which calculates to approximately two (2) gallons of fuel per operation at the Airport.

Additional fuel storage capacity should be planned when the Airport is unable to maintain an adequate supply and 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 in order to receive a full fuel tanker truck delivery.

Table 3J presents a forecast of fuel demand through the planning period. The fuel storage need assumes two gallons sold for each operation, which is consistent with activity over the last five years. The existing fuel storage capacity should be adequate over the long term planning period.

TABLE 3J
Fuel Storage Requirements
Lebanon State Airport

	Current Capacity and Usage	Planning Horizon		
		Short Term	Intermediate Term	Long Term
AvGas Capacity	6,000			
Annual Usage (gal.)	25,000	25,800	27,000	29,200
Daily Usage (gal.)	68	71	74	80
14-Day Storage (gal.)	959	990	1,036	1,120
Assumptions: Two (2) gallons per operation				

LANDSIDE AND SUPPORT REQUIREMENTS SUMMARY

The intent of the landside requirements section has been to outline the facilities required to meet potential aviation demands projected for Lebanon State Airport for each planning horizon. A summary of landside needs is presented on **Exhibit 3D**.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demand projected for Lebanon State Airport for the next 20 years. In addition, all elements related to airfield layout design and FAA airport design standards have been identified. **Exhibits 3C and 3D** summarize both the airside and landside needs.

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 5-year time frame, the intermediate term is approximately 10 years, and the long term is 20 years. By utilizing planning horizons, airport management can focus on demand indicators for initiating projects and grant requests rather than on specific dates in the future.

	CURRENTLY AVAILABLE	SHORT TERM	INTERMEDIATE TERM	LONG TERM
Based Aircraft	54	57	60	65
Aircraft to Tie-Down	3	3	3	4

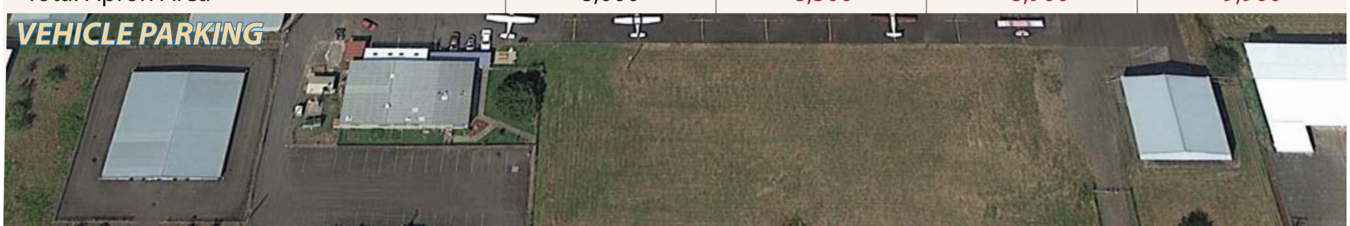
HANGARS

	CURRENTLY AVAILABLE	SHORT TERM	INTERMEDIATE TERM	LONG TERM
Aircraft to be Hangared	51	54	57	61
Individual Hangar Positions	54	54	57	61
Hangar Area Requirements	77,500	81,000	86,000	92,000
Maintenance Area (10%)	2,600	10,000	11,000	11,000
Total Hangar Area (s.f.)	80,100	91,000	97,000	103,000

APRON/RAMP

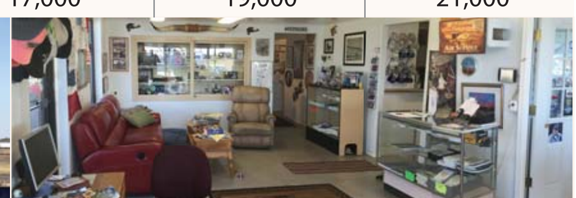
	CURRENTLY AVAILABLE	SHORT TERM	INTERMEDIATE TERM	LONG TERM
Local Apron Positions	13	8	8	9
Local Apron Area	5,800	5,000	5,000	6,000
Transient Apron Positions	5	5	6	6
Transient Apron Area	2,200	3,300	3,900	3,900
Total Apron Area	8,000	8,300	8,900	9,900

VEHICLE PARKING



	CURRENTLY AVAILABLE	SHORT TERM	INTERMEDIATE TERM	LONG TERM
Itinerant Parking Spaces	25	16	18	21
Itinerant Parking Area	8,500	6,000	7,000	8,000
Local Parking Spaces	47	29	30	33
Local Parking Area	18,800	11,000	12,000	13,000
Total Parking Spaces	72	45	48	54
Total Parking Area	27,300	17,000	19,000	21,000

SUPPORT REQUIREMENTS



	CURRENTLY AVAILABLE	SHORT TERM	INTERMEDIATE TERM	LONG TERM
Building Space	1,600	1,100	1,200	1,400
Fuel Storage - 14-Day Supply (gal.)	6,000	990	1,036	1,120

Red denotes calculated deficiency

Exhibit 3D
LANDSIDE REQUIREMENTS

Runway 16-34 currently falls within design category A/B-I (small aircraft). This category includes most piston and some smaller turboprop general aviation aircraft. This airport classification is anticipated to remain the same in the future for the Airport.

The analysis presented in this chapter indicates a minimum runway length requirement of 3,000 feet as indicated in the *Oregon Aviation Plan 2007*. Runway length calculations following FAA guidance indicate a runway length between 3,100 feet and 4,100 feet. On the landside, planning calculations indicate a long term need for additional aircraft hangar space.

The next chapter, Alternatives, will examine potential improvements to the airfield system and the landside. Most of the alternatives discussion will focus on those capital improvements that would be eligible for federal grant funds. On the landside, several facility layouts that meet the forecast demands over the next 20 years will be presented. Ultimately, an overall airport layout that presents a vision beyond the 20-year scope of this Master Plan may be included.

LEBANON
STATE AIRPORT

Chapter Four

ALTERNATIVES

CHAPTER FOUR

ALTERNATIVES

In the previous chapter, airside and landside facilities required to satisfy the projected demand at Lebanon State Airport through the long range planning period were identified. The next step in the planning process is to evaluate reasonable alternatives to provide these facilities. There are countless combinations of design alternatives, but the alternatives presented here have been limited to those that have the perceived greatest potential for implementation.

Any development proposed for a Master Plan is derived 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 Oregon Department of Aviation (ODA) and the City of Lebanon and its citizens, who have a vested interest in the development and operation of the Airport.

The development alternatives for the Lebanon State Airport can be categorized into two functional areas: **airside** (runways, navigational aids, taxiways, etc.) and **landside** (hangars, aprons, and terminal area). Within each of these areas, specific capabilities and facilities are required or desired.

Each functional area interrelates and affects the development potential of the other. Therefore, all relevant airside and landside areas are examined individually and then combined as a whole to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these functional areas on the

Airport must be evaluated to determine if investment in the Airport will meet the needs of the community, both during and beyond the 20-year planning period.

The alternatives presented in this chapter are also derived from a need to meet FAA design standards to the greatest extent practicable. As a result, certain elements considered are not to meet forecast demand but to bring certain elements up to current FAA design standards. The investment necessary for each alternative is not considered at this point in order to assure that the final plan first meets the needs of the Airport. Only where a project cost would be extraordinary is it considered as a limiting factor. Once a final plan is presented, cost estimates will be developed for each individual project considered for the next 20 years.

The Planning Advisory Committee (PAC) and ODA staff, will be asked to review these alternatives and to provide suggestions and comments. Following that review, a recommended concept will be developed. In most cases, the recommended concept will include the most appropriate elements from each applicable alternative.

AIRPORT DEVELOPMENT OBJECTIVES

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

The Lebanon State Airport plays a critical role in the economic development of the region and plays an important role in the national aviation network. There is significant public and private investment at the Airport. Pursuit of non-development alternatives would slowly devalue these investments, lead to infrastructure deterioration, and potentially result in 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 no-build or do-nothing alternative is not considered. At the very least, the existing facilities should be maintained up to industry standards.

In the mid-1990s, consideration was given to closing the Lebanon State Airport and consolidating services and based aircraft with those from Albany Municipal Airport at the new airport intended to serve both communities. A study was undertaken, the *Linn County Regional Airport Feasibility and Site Investigation*, to examine this potential. Ultimately community decision-makers opted to maintain both airports. At this point in time, there has not been any indication that community decision-makers wish to revisit the possibility of a single consolidated airport. In addition, the scope of this master planning effort does not include a relocation analysis. Therefore, transferring general aviation services to another airport or development of a new airport at a different location is not considered further.

It is the goal of this effort to produce an airside and landside configuration that best meets forecast aviation demands. However, before defining and evaluating alternatives, specific Airport development objectives will be considered. As owner and operator, ODA 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 facility that is responsive to the current and long term needs of general aviation users.
- To be reflective and supportive of the long-term planning efforts currently applicable to the region, including various transportation plans.
- 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 PLANS

The most recent planning documents for the Airport were developed in May 2006. The planned future of the Airport was reflected on the Airport Layout Plan depicted on **Exhibit 4A**. On this exhibit, the ALP has been enhanced with colors to identify new development and the outline of the residential parcels north of the Airport to show potential incompatibilities.

The most recent planning documents for the Airport were developed in May 2006.

On the airside, the 2006 ALP considered adding 258 feet of length to the runway on the north end and reducing the runway length by 120 feet on the south end. This would provide a total runway length of 3,015 feet.

Shortening the runway on the south end was considered in order to provide the requisite runway safety area (RSA) beyond the runway end. This project was undertaken during 2009-2010 with some slight modifications, including shortening the runway by 130 feet. A lead-in taxiway was created for aircraft to access the runway threshold.

The north end extension was intended to make up for the lost length on the south end and to provide the additional length needed to get to at least 3,000 feet. The landing threshold for Runway 16 was planned to remain in place so that the approach runway protection zone (RPZ) would remain clear of the homes to the north. However, the pavement was planned to be available for runway length calculations for takeoff and landing to Runway 34. Because of this, the departure RPZ beyond Runway 16 would have extended over all or a portion of nine residential properties. Current FAA guidance prohibits adding new RPZ incompatibilities to either the approach or departure RPZ; therefore, this planned layout will be revisited in this Alternatives chapter.

Taxiway B was planned to be extended from Taxiway B2 to the Runway 16 pavement end. It was planned at a separation distance of 150 feet from the runway, which meets the FAA design standard for separation.

Future hangar development was considered in two phases, all of which was planned on the west side of the Airport. The first phase included infill of smaller box hangars south of the lateral intersection with Taxiway B2. This essentially replicates the type of existing hangars on the west side. North of Taxiway B2 space was reserved for three 12-unit T-hangars within the existing fence line. The second phase considered the acquisition of approximately 23 acres of privately owned land west of the current fence line. Approximately half of this land was planned for seven 12-unit T-hangars and a central aircraft apron tie-down area. The remaining land was reserved for future aviation use.

The previous ALP identified the north end RPZ crossing over private property; however, a recommendation for acquisition of this property was not made at the time. Concurrent with the development of this Master Plan, ODA has received an FAA grant for acquisition of most of the RPZ.

The assumptions made and conclusions drawn from the previous planning efforts 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, changes in the long-term vision for the Airport, or financial considerations. The remainder of this chapter will present various alternatives to consider for both the airside and landside development of the Airport.

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 an airport. This includes consideration of the established design standard for an 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 previous chapters. This chapter will examine airside issues specific to the Airport which will then be applied to several development alternatives. **Exhibit 4B** presents a summary of the major airside and landside considerations.

Not all airside or landside elements will require a detailed alternatives analysis. The alternatives analysis is reserved for presenting viable solutions to specific problems or challenges. For those airside or landside elements where only one solution is reasonable or where no alternative is necessary, an explanatory narrative is provided.

LEGEND

	EXISTING	FUTURE
FACILITIES		
BUILDINGS		
RUNWAY		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS	530	530
AIRPORT REFERENCE POINT (ARP)		
PROPOSED AIRFIELD PAVEMENT	NONE	
VISUAL GUIDANCE INDICATORS	NONE	PAPI
WIND INDICATOR		
AVIGATION EASEMENT		
FENCE	X X	XX XX
PROPOSED ACCESS ROAD	NONE	
BEACON		SAME
THRESHOLD LIGHTS		
WIND INDICATOR		
REIL	NONE	
VASI (E) / PAPI (F)		

AIRPORT DATA

	EXISTING	FUTURE
AIRPORT ELEVATION (MSL)	344.0'	SAME
DATUM FOR ALL ITEMS	NAD 83/NAVD 88	SAME
AIRPORT REFERENCE POINT COORDINATES (ARP)	LAT. N 44° 31' 47.442" LONG. W 122° 55' 46.321"	LAT. N 44° 31' 49.31" LONG. W 122° 55' 46.321"
AIRPORT MAGNETIC VARIATION	16° 46(E) (2005)	SAME
MEAN MAXIMUM TEMPERATURE	81° F	SAME
NPIAS ROLE	GA	GA
AIRPORT REFERENCE CODE (ARC)	B-I (SMALL)	B-I (SMALL)
AIRPORT CODE	S30	SAME
LAND OWNED IN FEE (ACRES)	74.25	97.23

DECLARED DISTANCES

	RUNWAY 16		RUNWAY 34	
	EXISTING	FUTURE	EXISTING	FUTURE
TAKEOFF RUN AVAILABLE (TORA)	2757'	3015'	2877'	3015'
TAKEOFF DISTANCE AVAILABLE (TODA)	2757'	3015'	2877'	3015'
ACCELERATE-STOP DISTANCE (ASDA)	2757'	3015'	2877'	3015'
LANDING DISTANCE AVAILABLE (LDA)	2757'	2757'	2490'	2748'

RUNWAY DATA 16/34

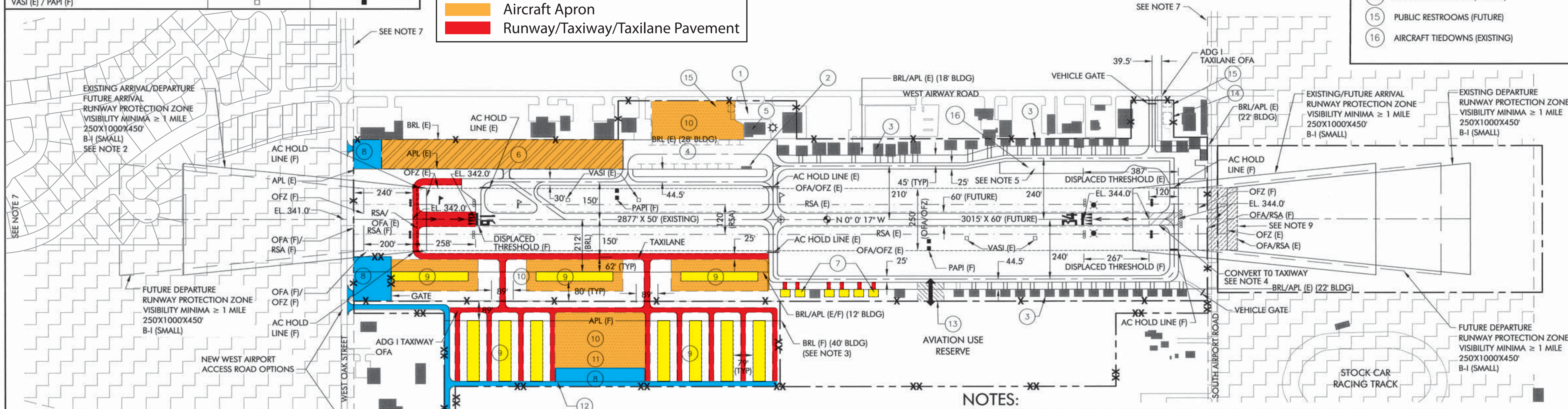
		EXISTING	FUTURE
LENGTH AND WIDTH		2877' X 50' (SEE NOTE 10)	3015' X 60'
PERCENT EFFECTIVE GRADIENT		0.07%	SAME
PERCENT WIND COVERAGE (12 MPH)		95% ALL WEATHER	SAME
PAVEMENT TYPE		ASPHALT CONCRETE	SAME
PAVEMENT STRENGTH		< 12,500# SW	12,500# SW
APPROACH SLOPE/TYPE		20:1/VISUAL	SAME
RUNWAY LIGHTING		MIRL	SAME
RUNWAY MARKING		BASIC	SAME
RUNWAY SAFETY AREA (SEE NOTE 9)		3357' X 120' (STD) 3237' X 120' (ACTUAL)	3495' X 120'
OBJECT FREE AREA (SEE NOTE 9)		3357' X 250' (STD) 3237' X 250' (ACTUAL)	3495' X 250'
OBSTACLE FREE ZONE (SEE NOTE 9)		3277' X 250' (STD) 3197' X 250' (ACTUAL)	3415' X 250'
CRITICAL AIRCRAFT		BE-58	SAME
NAVIGATIONAL AIDS		NONE	SAME
APPROACH AND LANDING AIDS	16	VASI	PAPI
	34	VASI	PAPI,REIL
RUNWAY END COORDINATES (SEE NOTE 8)	16	LAT.N 44° 32' 5.7" LONG.W 122° 55' 47.0"	LAT.N 44° 32' 8.29" LONG.W 122° 55' 47.0"
	34	LAT.N 44° 31' 37.38" LONG.W 122° 55' 47.1"	LAT.N 44° 31' 38.57" LONG.W 122° 55' 47.1"
TAXIWAY LIGHTING		REFLECTORS	SAME

FACILITY KEY

1. AUTO PARKING (EXISTING)
2. FUEL (EXISTING)
3. CONVENTIONAL HANGAR (EXISTING)
4. APRON (EXISTING)
5. FBO (EXISTING)
6. APRON RESERVE
7. CONVENTIONAL HANGAR (FUTURE)
8. AUTO PARKING (FUTURE)
9. T-HANGAR (FUTURE)
10. APRON (FUTURE)
11. FBO, FUEL STORAGE RESERVE
12. ACCESS ROAD (FUTURE)
13. TAXIWAY ACCESS RESERVE (FUTURE)
14. AIRCRAFT WASH PAD (FUTURE)
15. PUBLIC RESTROOMS (FUTURE)
16. AIRCRAFT TIEDOWNS (EXISTING)

LEGEND

- Hangars
- Roads and Vehicle Parking
- Aircraft Apron
- Runway/Taxiway/Taxilane Pavement



NOTES:

1. EXISTING RUNWAY 16 DECLARED DISTANCES LIMITED BY FENCE LOCATED APPROXIMATELY 120' BEYOND END OF RUNWAY 34.
2. THE EXISTING ARRIVAL/DEPARTURE RPZ FOR RUNWAY 16 WILL BE RETAINED AS THE FUTURE ARRIVAL RPZ WHEN RUNWAY IS EXTENDED.
3. THIS BRL/APL IS DEFINED BASED ON THE REQUIRED SEPARATION FOR THE WEST LANDSIDE DEVELOPMENT ACCESS TAXIWAY.
4. RUNWAY 34 END TO BE RELOCATED 120' NORTH TO MEET ADG I RSA, OFA, AND OFZ DIMENSIONAL STANDARDS (240').
5. EXISTING TIEDOWNS TO BE REMOVED.
6. ITEM # 15 IN FACILITY KEY SHOWN WITH TWO OPTIONAL LOCATIONS. FINAL SITTING DECISION TO BE MADE BY ODA DURING DESIGN.
7. EXISTING AVIGATION EASEMENTS EXTEND BEYOND ALP DRAWING COVERAGE, SEE EXHIBIT A PROPERTY PLAN FOR DETAIL.
8. EXISTING RUNWAY END COORDINATES PROVIDED BY FAA (HAND-HELD GPS). FUTURE RUNWAY END COORDINATES ESTIMATED BASED ON FAA DATA.
9. RSA, OFA, OFZ, AT SOUTH END OF RUNWAY LIMITED BY FENCE LOCATED APPROXIMATELY 120' FROM RUNWAY END; STANDARD (E) DIMENSIONS DEPICTED (SHADED AREA) FOR ILLUSTRATION ONLY.
10. RELOCATION OF SOUTH END OF RUNWAY MAY BE REQUIRED BEFORE NORTH RUNWAY EXTENSION IS CONSTRUCTED; INTERIM RUNWAY LENGTH WOULD BE APPROXIMATELY 2757 FEET.
11. BRL BUILDING HEIGHTS BASED ON ALLOWABLE HEIGHT ABOVE RUNWAY ELEVATION AT BRL.

"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 THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING.
0" 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FEDERAL AVIATION ADMINISTRATION APPROVAL
APPROVAL DATE: 6/9/06 (See Letter)
J. Wade Bryant
MANAGER, SEATTLE ADO

OREGON DEPT. OF AVIATION APPROVAL
APPROVAL DATE: 6/7/6
Gary G Weber
SIGNATURE

CENTURY WEST ENGINEERING CORPORATION
6650 S.W. Redwood Lane, Suite 300
Portland, Oregon 97224
503-419-2130 phone • 503-639-2710 fax
www.centurywest.com

DESIGNED BY: DM	DRAWN BY: SLK	CHECKED BY: DM	SCALE: AS SHOWN
DATE: MAY 2006		PROJECT NO: 40480004.01	

LEBANON STATE AIRPORT

AIRPORT LAYOUT PLAN

DRAWING NO. .
SHEET NO. 2 OF 4

AIRSIDE PLANNING ISSUES

Airport Reference Code: Maintain A/B-I (small aircraft)

Runway Extension: Consider feasibility of a minimum runway length of 3,000 feet in both directions.

Instrument Capability: Consider GPS with 1-mile visibility minimums.

Design Standards: Assure that planned future development is compliant with FAA's airport design standards.

Taxiway Geometry: Identify potential improvements to meet FAA's taxiway geometry standards.

Navigational Aids: Plan for new navigational aids as necessary.

LANDSIDE PLANNING ISSUES

Facility Layout: Maximize Airport property for aviation-related development.

Strategic Property Acquisition: Identify any potential land acquisition.

Consider feasibility of expanded aviation services hangars (FBO type hangars).

Aircraft Apron: Provide for additional aircraft apron parking.

Long Term Vision: Provide a long-term facility layout plan that preserves and enhances the economic viability of the Airport.

CRITICAL DESIGN AIRCRAFT

The critical design aircraft is the aircraft or grouping of general aviation aircraft that account for at least 500 annual operations at an airport, excluding touch-and-go activity. The critical design aircraft is 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 Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG).

Cessna 172 based at the Airport

As previously discussed in Chapter Two, the current critical design aircraft falls in design group B-I-1A which is best represented by small twin-engine piston-powered aircraft, such as the Beech Baron 58P.

It is known that a pilot of a King Air turboprop, which is slightly larger than the design aircraft identified, uses the Airport with some regularity. This pilot has indicated that they would base their aircraft at the Airport if the runway length were longer. Once this aircraft (or any other larger aircraft) accounts for 500 or more annual operations, an extension of the runway beyond what is minimally required currently (3,000 feet) may be justified.

LebanonAir, the Airport FBO was sold to a new operator in June 2016. The new operator has indicated a desire to offer Jet A fuel on the airfield. The availability of Jet A fuel may increase activity by turboprop fixed wing and helicopters over the long range.

For planning purposes, the consultant team has come to the conclusion that the future critical design aircraft should remain defined as B-I-1A for the following primary reasons:

- Analysis to follow will show the extreme challenges to extending the runway beyond 3,000 feet;
- Documentation of 500 annual operations by a larger aircraft does not exist;
- FAA will not consider an “if you build it, they will come” approach to extending runway length;
- Typical utilization rates for turboprop aircraft are around 250 annual operations.

RUNWAY LENGTH

At 2,747 feet in length, the runway at the Airport is shorter than is recommended by both the FAA and ODA. As noted previously in the Facility Requirements chapter, FAA recommends a minimum runway length of 3,100 feet and ODA recommends at least 3,000 feet.

RUNWAY DIMENSIONAL CONSIDERATIONS

There are several imaginary surfaces surrounding and associated with the runway that must be considered for safety reasons in conjunction with any runway improvements. These include the runway safety area (RSA), the runway object free area (ROFA), the runway obstacle free zone (ROFZ), and the runway protection zones (RPZs). Each of these elements must meet the appropriate design standard. (Note: Under certain local circumstances, the FAA may approve a Modification to Design Standard to deficiencies in the ROFA; however, this is very rare, especially when constructing runway improvements. For this alternatives analysis, it is assumed that all design standards shall be met.) Currently, there are no deficiencies to the RSA, ROFA, and OFZ. The RPZs extend over public roads, which are considered incompatible.

Runway Protection Zone

The RPZ design standards were presented previously in Chapter Three. To summarize, the RPZs associated with runway ends are to be clear of obstructions and incompatible land uses in order to enhance the protection of people and property on the ground. In 2012, the FAA published *Interim Guidance on Land Uses within a Runway Protection Zone*, which identified several potential land uses that must be evaluated and approved prior to implementation. Most pertinent to future development of the Airport is the future disposition of public roads and/or homes that may fall within or become introduced to an RPZ.

When one of the listed incompatible land uses (see Table 3B), such as a public road, is proposed or introduced into an RPZ, the Airport, in consultation with the local FAA Airport District Office (ADO), should identify and document the full range of alternatives which would remove or limit the RPZ incompatibility. The following are those alternatives to be considered:

1. Avoid introducing the land use issue within the RPZ;
2. Minimize the impact of the land use in the RPZ (i.e., routing a new roadway through the controlled activity area, move farther away from the runway end, etc.); and
3. Mitigate risk to people and property on the ground (i.e., tunneling, depressing and/or protecting a roadway through the RPZ, implement operational measures to mitigate any risks, etc.).

Documentation of the alternatives should include:

- A description of each alternative, including a narrative discussion and exhibits or figures depicting the alternative.
- Full cost estimates associated with each alternative regardless of potential funding sources.
- A practicability assessment based on the feasibility of the alternative in terms of cost, constructability, and other factors.
- Identification of the preferred alternative that would meet the project purpose and need while minimizing risk associated with the location within the RPZ.

- Identification of all Federal, State, and local transportation agencies involved or interested in the issue.
- Analysis of the specific portion(s) and percentages of the RPZ affected, drawing a clear distinction between the Central Portion of the RPZ versus the Controlled Activity Area, and clearly delineating the distance from the runway end and the runway landing threshold.
- Analysis of (and issues affecting) sponsor control of the land within the RPZ.
- Any other relevant factors for FAA Headquarters (HQ) consideration.

The RPZ analysis procedure applies to new or proposed RPZ incompatibilities only. Since the roads (Oak St. and Airport Rd.) traversed the RPZs prior to the 2012 publication of *Interim Guidance on Land Uses within a Runway Protection Zone,* they may be grandfathered so long as they do not change in size or location. Nonetheless, it is still incumbent upon the airport sponsor (ODA) to examine the potential to remove existing RPZ incompatibilities where feasible.

INSTRUMENT APPROACHES

The instrument approach capability at an airport is an important consideration that directly impacts the utility of the airport, with lower visibility minimums increasing the utility of an airport. The lowest visibility minimums typically available to general aviation airports is ½-mile, which is considered a Category I (CAT-I) precision instrument approach. The instrument approach capability is a significant consideration for pilots because lower visibility minimums reduce the potential for being unable to use an airport. From an economic development standpoint, it is important to achieve the lowest possible visibility minimums.

An instrument approach with 1-mile visibility minimums will be considered to both ends of the runway.

Currently, the Airport does not have any instrument approaches; however, the FAA has made significant progress in developing and implementing GPS instrument approach procedures across the country. It is feasible that Lebanon State Airport could obtain a GPS instrument approach. Therefore, for planning purposes, an instrument approach with 1-mile visibility minimums will be considered to both ends of the runway.

There are several reason to limit the visibility minimum to 1-mile, including:

- The RPZ would remain the same size as it is today, thus no new incompatibilities would be introduced;
- Lowering the visibility minimum below 1-mile would increase the size of the approach RPZ from approximately eight acres to 49 acres, thus introducing significantly more incompatibilities;
- 1-mile visibility minimums are common at smaller general aviation airport while lower minimums are not;
- Both ends of the runway are already served by a precision approach path indicator (PAPI) lighting system (though not required to have an instrument approach, they are beneficial).

AIRSIDE DEVELOPMENT ALTERNATIVES

The most prominent element considered for alternatives analysis is the potential to extend the runway to at least 3,000 feet in length. This analysis will begin with the 2006 ALP as the starting point and additional alternatives will be considered as necessary. The resolution of this element will provide guidance for other planned improvements at the Airport.

The most prominent element considered for alternatives analysis is the potential to extend the runway to at least 3,000 feet in length.

RUNWAY EXTENSION NORTH

The 2006 ALP for the Airport considered extending the runway to the north by 268 feet. This, in conjunction with adjustment to the south end of the runway, would provide a total length of 3,015 feet. The landing threshold was planned to remain in its current position, therefore displaced by 268 feet. Essentially, the planned north end extension would be available for takeoff and landing calculations to Runway 34, takeoff calculations for Runway 16, but not landing calculations to Runway 16.

This geometry necessarily requires two RPZs: an approach RPZ to the Runway 16 landing threshold and a departure RPZ. At the time (2006), FAA design standards for departure RPZs were not as well defined as those for approach RPZs, and it was common for departure RPZs to have incompatibilities. In this case, the departure RPZ would have all or part of nine residential properties in it as shown as **Option A on Exhibit 4C**.

With the publication of *Interim Guidance on Land Uses within a Runway Protection Zone* in 2012, the distinction between approach and departure RPZ is not allowed. Therefore, introducing homes north of Oak Street into the departure RPZ would require FAA headquarters approval. Approval is highly unlikely as homes are a significant red flag and allowing them introduces a safety risk. As a result, the plan to extend the runway to the north from the 2006 ALP is not considered feasible and is not considered further in the Master Plan.

Since the goal is to provide a runway length of at least 3,000 feet, a second option is considered for extending the runway to the north by 253 feet, which would bring the total runway length to 3,000 feet. **Option B on Exhibit 4C** presents a graphic of this option.

This option is somewhat more complex as pilot calculations of available runway length for takeoff and landing must be adjusted in order for the RPZ to remain in its current location. In this case, the full 3,000 feet of runway would only be available for takeoff on Runway 16. Landing to Runway 16 and takeoff and landing to Runway 34 would be limited to the existing length of 2,747 feet. This is necessary because the location of the departure RPZ is determined by the declared end of the runway. Essentially the new runway pavement would be a one-way pavement only available for takeoff from Runway 16.

FAA design standards address this potential circumstance under a concept called Declared Distances. With FAA approval, the runway length can be declared (published) to be shorter for certain operations in order to provide the necessary safety areas. FAA AC 150/5300-13A describes as follows: **"Declared distances represent the maximum length available and suitable for meeting takeoff, rejected takeoff, and landing distance performance requirements for turbine-powered aircraft."** The declared distances are defined by the FAA as:

- *Takeoff run available (TORA)* - The distance to accelerate from brake release to lift-off, plus safety factors.
- *Takeoff distance available (TODA)* - The distance from brake release past lift-off to start of takeoff climb, plus safety factors.
- *Accelerate-stop distance available (ASDA)* - The distance to accelerate from brake release to take-off decision speed (V_1), and then decelerate to a stop, plus safety factors.
- *Landing distance available (LDA)* - The distance from the threshold to complete the approach, touchdown, and decelerate to a stop, plus safety factors.

The TORA and TODA are equal to the actual runway length unless a clearway and/or stopway is provided at an airport (there is no clearway or stopway at Lebanon). The ASDA and the LDA are the primary considerations in determining the runway length available for use by aircraft, as these calculations must consider providing standard safety area beyond the runway ends in operational calculations. The ASDA and LDA can be figured as the usable portions of the runway length less the distance required to maintain adequate safety area (RSA) beyond the ends of the runway or prior to the landing threshold. By regulation, the full RSA must be available at the far end of a departure operation in the ASDA calculation and prior to the landing threshold in LDA calculations. Use of declared distances can impact the beginning and ending of the RSA, ROFA, and RPZ.

The beginning of the departure RPZ is established at 200 feet from the end of the TORA. Therefore, the TORA for Runway 34 would be 2,474 feet in Option B. The ASDA and LDA for Runway 34 would be the same. The TODA for Runway 34 would be 3,000 feet, which represents the full pavement length.

Takeoff operations on Runway 16 would have the full 3,000 feet available because all safety factors beyond the south end of the runway are met. For landing to Runway 16, the existing runway length of 2,747 feet would be available because the approach RPZ is set 200 feet from the landing threshold (and to move it back would introduce incompatible homes to the RPZ). **Table 4A** summarizes the potential declared distances for Option B on **Exhibit 4C**.

There is limited feasibility to obtaining FAA approval for implementing declared distances at Lebanon State Airport.

Implementation of declared distances is intended for airports with a significant level of activity by turbine aircraft. To meet that threshold, the critical design aircraft would have to be a turbine (turboprop or jet) aircraft. For Lebanon, the critical design aircraft was previously determined to be piston-powered aircraft. Therefore, there is limited feasibility to obtaining FAA approval for implementing declared distances at Lebanon State Airport.

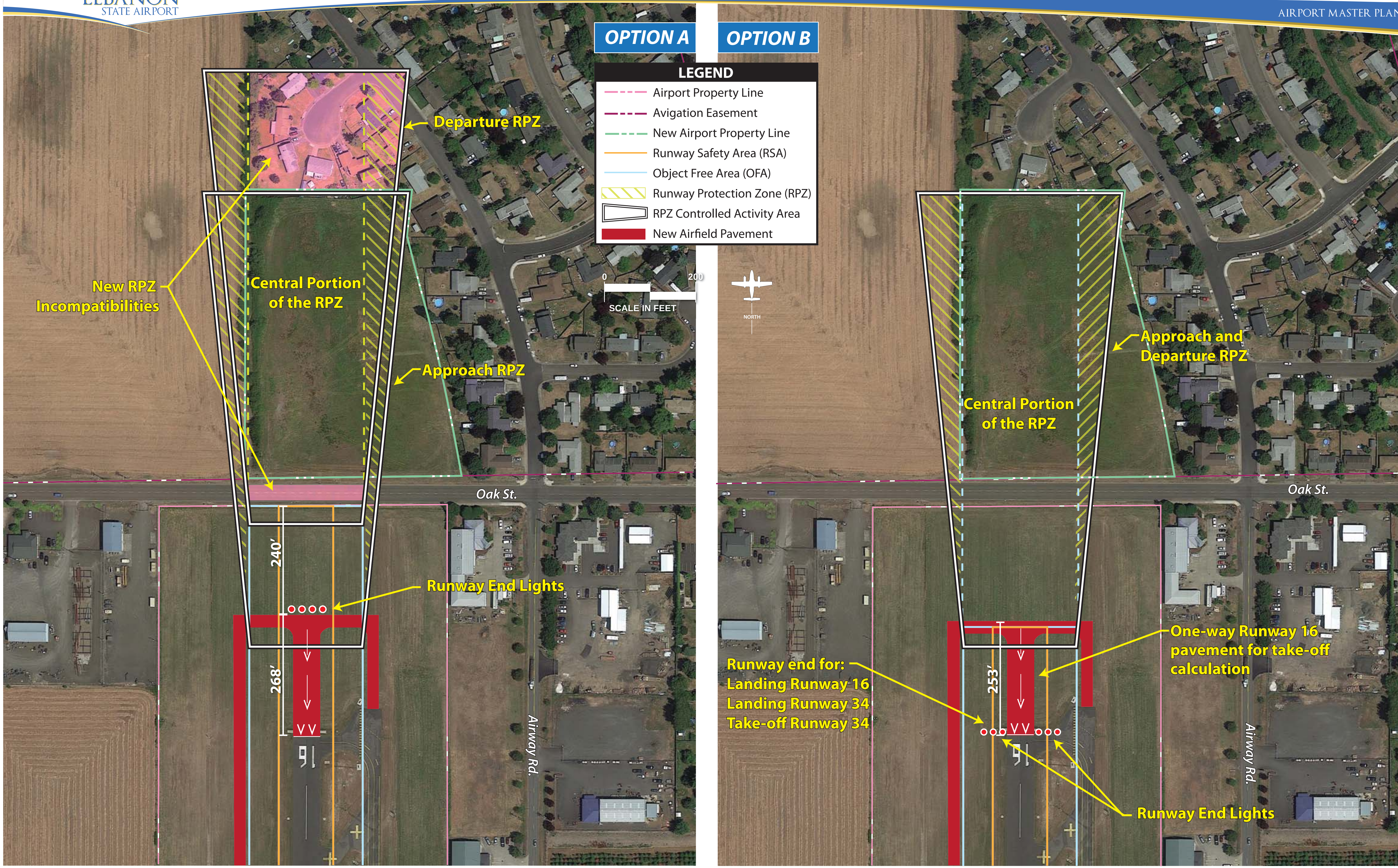


Exhibit 4C
NORTH END RUNWAY EXTENSION ALTERNATIVES

This page intentionally left blank

TABLE 4A Potential Declared Distances Runway 16-34 Lebanon State Airport		
	Runway 16	**Runway 34**
Takeoff Run Available (TORA)[1]	3,000’	2,747’
Takeoff Distance Available (TODA)[2]	3,000’	3,000’
Accelerate Stop Distance Available (ASDA)[3]	3,000’	2,747’
Landing Distance Available (LDA)[3]	2,747’	2,747’

[1] Departure RPZ begins 200 feet from the end of the TORA.
[2] TORA cannot be longer than TODA. Departure surface set on TODA. TODA can be shortened to mitigate departure surface penetrations, if so TORA is shortened too.
[3] Available runway length plus RSA.
Source: FAA AC 150/5300-13A, Airport Design

North Runway Extension Summary

The most significant factor when considering extending the runway to the north is the future disposition of the approach and departure RPZ. If a runway project leads directly to a change in the size or location of an RPZ, then FAA headquarters must approve that action. FAA has provided a clear indication in its publication, *Interim Guidance on Land Uses within a Runway Protection Zone* in 2012, that the bar is set very high for such approval. It would be particularly challenging at Lebanon State Airport because the only method where a northerly extension could be implemented without introducing new incompatibilities to the RPZ would require implementation of declared distances which are intended for airports with a turbine-powered critical design aircraft and Lebanon’s critical design aircraft is piston-powered.

There are significant challenges to pursuing any northerly extension of the runway.

While a final determination has not been made at this stage, the airport sponsor should understand that there are significant challenges to pursuing any northerly extension of the runway.

RUNWAY EXTENSION SOUTH

The possibility of extending the runway to the south in order to provide a 3,000-foot long runway was also examined. To achieve this, the runway pavement would only have to be extended 131 feet (the existing 122-foot long lead-in taxiway would be converted back to runway). While the runway end would not quite reach Airport Road, the 240-foot RSA beyond the pavement end would extend well across the road. As a result, some accommodation would have to be made for Airport Road.

Exhibit 4D shows two possible options. The first would be to tunnel Airport Road under the RSA. The second would be to close Airport Road at this location and provide an alternate route around the airport. The exhibit shows Airport Road being rerouted through currently undeveloped property and connecting back with Stoltz Hill Road. This is a distance of approximately 5,300 feet, or nearly a mile. In addition, a connection back to the airport would be necessary; therefore, Airway Road is shown extending south a distance of 1,600 feet to intersect with the rerouted Airport Road.

TAXIWAY CONSIDERATIONS

The FAA provides extensive guidance regarding the geometry of taxiways. The FAA guidelines were summarized in Chapter Three – Facility Requirements. The existing taxiway system at the Airport does not fully meet these standards in the following ways:

- Lead-in taxiway to Runway 34 threshold (no threshold taxiways);
- Direct access from the terminal apron to the runway via Taxiway A2;
- Runway crossing taxiway in the "high-energy" portion of the runway;
- A wide expanse of pavement at the convergence of Taxiway A and Taxiway A3;
- Taxiway A south of Taxiway A2 is 20 feet wide (25 feet is standard);
- Taxiway A2 is 30 feet wide (25 feet is standard); and
- Taxiway B (south half) is 20 feet wide (25 feet is standard).

Exhibit 4E presents potential alternatives for each of the taxiway geometry considerations.

The planned resolution to the lead-in taxiway is to construct two new threshold taxiways to the Runway 34 pavement end. The taxiway pavement remaining to the south (existing lead-in taxiway and Taxiways A1 and B1) would be removed.

The planned resolution to the lead-in taxiway is to construct two new threshold taxiways to the Runway 34 pavement end.

Taxiways A and B, south of the midfield intersection, would be planned to be widened at the time of the next reconstruction to a standard width of 25 feet. Taxiway B is planned to be extended to the Runway 16 threshold at a standard separation distance of 150 feet. A standard hold apron designed to accommodate aircraft in airplane design group I (ADG I) is planned. Taxiway A2 is planned to be relocated in order to both eliminate the wide expanse of pavement that exists and to eliminate the direct access from the apron area to the runway.

The hold apron at the north end of Taxiway A is located in such a manner as to create a wide expanse of pavement. Current design standards discourage having hold aprons extend beyond the lateral end of the runway. To remedy this issue, a replacement hold apron that meets the design standards for ADG I aircraft is planned to be constructed to the east of Taxiway A.

Taxiway A looking north


Oak St.
Airport Rd.
Close or tunnel
Airport Road
34
3000' Runway
W Airway Rd.
Close Airport Road here
Airport Rd.
Extend Airway Road
Re-route Airport Road
outside of RPZ
LEGEND
Airport Property Line
Avigation Easement
Runway Safety Area (RSA)
Object Free Area (OFA)
Runway
New Road
To Be Removed
New Airfield Pavement
Runway Protection Zone (RPZ)
NORTH
0
800
1600
SCALE IN FEET
Aerial Photo: Google Earth 7-14-15

This page intentionally left blank

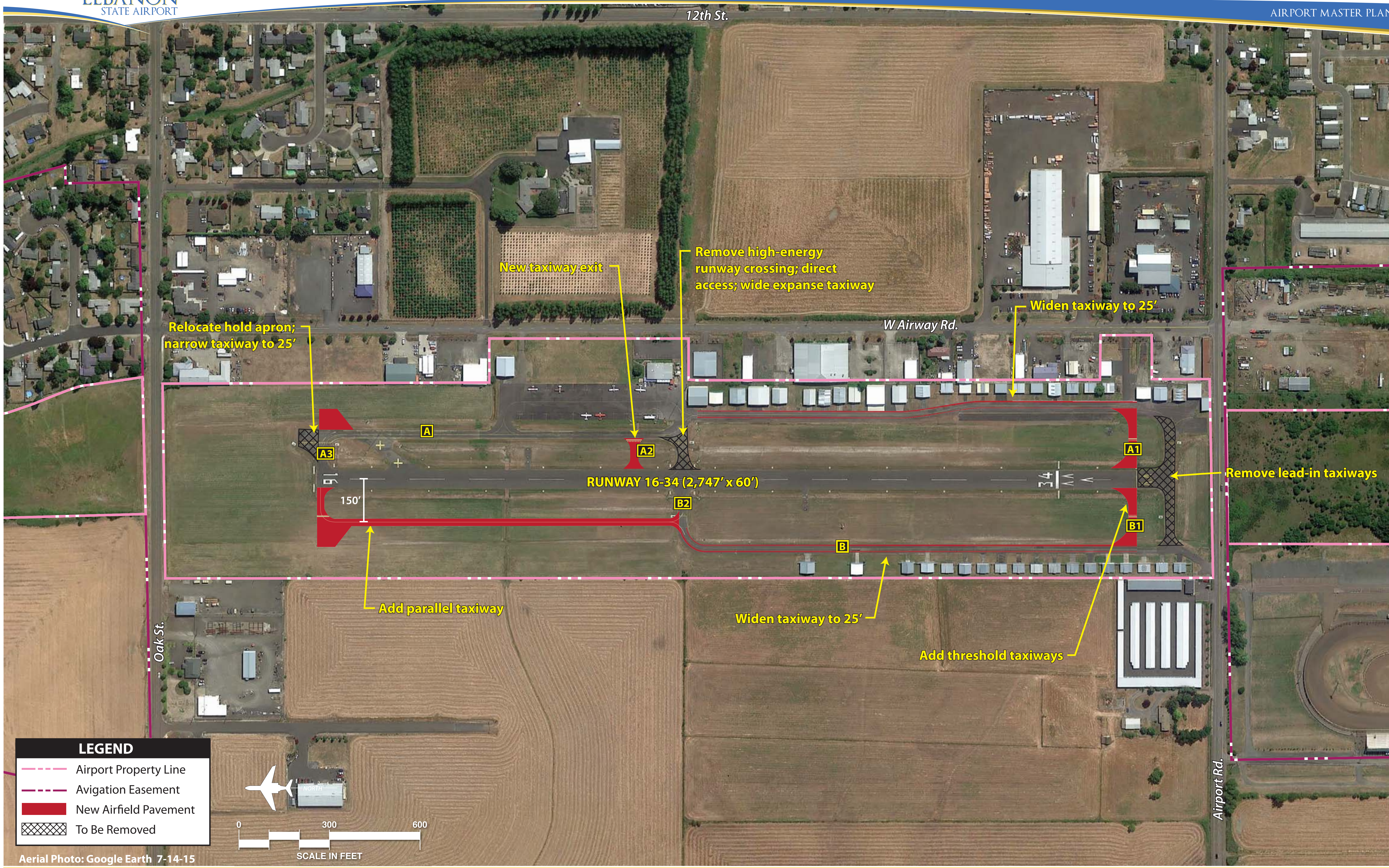


Exhibit 4E
TAXIWAY GEOMETRY IMPROVEMENTS

This page intentionally left blank

LANDSIDE ALTERNATIVES

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 utility access, are also considered in the landside functions.

Landside planning issues, previously summarized on **Exhibit 4B**, 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 an 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: high-, medium-, and low-activity. 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 multi-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; however, such a large hangar is not likely needed at Lebanon State Airport. 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 business aircraft operators that may desire their own executive or box hangar storage on the airport. A hangar in the medium-activity use area should be at least 50 feet by 50 feet, or approximately 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 Lebanon State Airport. Consideration to aesthetics should be given high priority in all public areas, as an airport often serves as the first impression a visitor may have of the community.

The existing landside facility development largely follows the separation of activity levels philosophy. The terminal area has an aircraft parking apron which is centrally located along the flight line. The FBO and fuel facilities are also located in this area. There are some limitations to the potential for development at the airport as the property boundary forms an approximate rectangle around the runway, which limits the depth of potential development.

A variety of potential hangar development alternatives will be presented. All of them will show far more hangar development than what is actually forecast to be needed. The purpose of this is to provide ODA with a long term vision for future development. With this vision in place, ODA staff are better positioned to manage potential development in a manner that would not limit other development. Each of the alternatives also maximizes airport property by identifying the minimum separation distances required to be maintained. Planning future development in this fashion is also a sustainable best management practice by maximizing airport property for aviation development.

2006 AIRPORT LAYOUT PLAN (ALP)

The development plan from the 2006 ALP is still, for the most part, a viable alternative. **Exhibit 4A**, presented previously, was highlighted and enhanced with color coding to distinguish planned development. On the east side of the runway, the area east of the existing aircraft apron was shown to be reserved for an expanded aircraft apron. The area east of Taxiway A and north of the aircraft apron was planned as additional aircraft apron reserve. A vehicle parking lot was planned at the far north end, accessible from Oak Street.

The west side of the Airport is where all future hangar development was planned on the 2006 ALP. On the west side south of Taxiway B2, additional box hangars were planned which continues the existing development pattern. North of Taxiway B2 was planned three stacked T-hangar facilities. Each of these was dimensioned to accommodate 12 aircraft hangar positions. Another vehicle parking lot was planned at the far northwest end.

The 2006 ALP then considered the acquisition of additional property on the west side. Two taxilanes extending between the T-hangars were planned to access seven additional T-hangar facilities and a secondary aircraft parking apron.

LANDSIDE ALTERNATIVE 1

The forecast demand for additional hangars can easily be satisfied within the current airport property line. Therefore, the main goal of this first landside alternative, as presented on **Exhibit 4F**, is to maximize the existing airport property for hangar development. On the east side, the current aircraft parking apron is planned to be expanded into the undeveloped property. Just north of the aircraft apron is

Exhibit 4F
LANDSIDE ALTERNATIVE 1

This page intentionally left blank

planned a 12-unit stacked T-hangar facility. These are relatively small hangars and would best accommodate smaller single engine aircraft. This size hangar was planned because of the proximity of the airport property line and the need for wing tip clearance when accessing the back side of the hangar.

On the west side of the airport, the existing development pattern of individual box hangars is replicated. Each of the hangars shown measures 50 feet by 50 feet and they are set back 75 feet from the planned new taxiway. While the minimum separation distance from the taxiway to the hangar front is 44.5 feet, the additional 30 feet is provided to accommodate the common practice of pulling an aircraft out of a hangar to work on it or in preparation for flight. While not shown on the exhibit, an access road could be extended from Oak Street to these hangars, as depicted on the 2006 ALP.

LANDSIDE ALTERNATIVE 2

The next landside development alternative, shown on **Exhibit 4G**, presents a very different concept for the east side of the Airport. The vacant land adjacent to the aircraft parking apron is considered for hangar development. Each of the hangars shown measures 60 feet by 60 feet. Because these hangars are located in the higher activity terminal apron area, these hangars might be reserved for future aviation businesses.

The location of these planned hangars would necessitate the removal of approximately half of the aircraft tie-down spaces; therefore, an expansion of the terminal apron to the north is considered. Further to the north of this apron is a row of additional box hangars.

On the west side of the airfield are three T-hangar facilities and a total of 28 individual units. This layout is similar to that presented on the 2006 ALP in that it also preserves a separation distance between the hangars that could facilitate a new taxilane onto the adjacent property should it be acquired. It should be noted that this layout would require extensive drainage infrastructure and improvement as current drainage flow traverses the west development area.

LANDSIDE ALTERNATIVE 3

The next landside alternative layout, shown on **Exhibit 4H**, considers the possibility of developing an additional FBO type facility on the west side of the airfield. Because of a lack of depth, the FBO hangar is positioned so that it faces north toward an aircraft apron. The FBO hangar is positioned as close to the center of the airfield as possible as this is where the high-activity areas should be concentrated. Farther north are two T-hangar facilities, each with a six-unit capacity. An access road is shown extending from Oak Street to the planned FBO hangar. Also shown is a fuel farm on the aircraft apron which should be considered if the north side is to provide aviation services.

On the east side of the airfield, the undeveloped property adjacent to the FBO is planned for apron expansion. To the north of the terminal apron are several individual hangars. These hangars are situated in such a location that would allow for a dedicated taxilane to the hangars.

LANDSIDE ALTERNATIVE 4

The final landside alternative is shown on **Exhibit 4J**. This layout considers an unconstrained growth pattern which includes property acquisition on both sides of the airfield. On the east side of the airfield, the aircraft apron is planned to be extended to the north. An undeveloped parcel approximately 1.8 acres in size is then planned to be acquired and developed with box hangars.

The west side of the airfield considers the acquisition of approximately 8.2 acres. Development is planned as if the property acquisition had already been completed; therefore, the existing property boundary is not a limit to development. With this entire area to work with, consideration was given to a more traditional layout for a new terminal area. A large aircraft apron is planned with several larger FBO type hangars fronting it. A fuel island would be located on the apron. Father to the north, four T-hangar facilities are proposed. An access road would extend from Oak Street.

LANDSIDE HANGAR SUMMARY

The 20-year forecast for based aircraft indicates that the trend is toward very moderate growth with the addition of 11 new aircraft to the Airport. Current hangar and tie-down availability may be able to accommodate this growth; therefore, there is not an immediate need for new hangar construction. However, each potential tenant may have different storage requirements or desires. Airport management will need to monitor hangar availability and user preference for aircraft storage type.

There is not an immediate need for new hangar construction.

The landside alternatives for hangar development far exceed that which is forecast to be necessary within the next 20 years. The benefit that these alternatives offer is to identify locations on the Airport that are best suited for each hangar type. For example, it is prudent to reserve prime high-activity apron frontage facing the runway for larger conventional or FBO type hangars which would typically house business aviation functions.

The selected landside alternative may be one of these layouts or it may be a combination of the elements of each. Another consideration should be the potential restrictions if any specific hangar types are shown. Some airport sponsors have had internal difficulty permitting development of a hangar type other than what is specifically shown on the airport layout plan or in the master plan. As a result, what may be shown is simply the identification of aviation reserve, with the actual type and size of the hangar to be determined at a later date.

PROPERTY ACQUISITION

There is not a need for additional property to accommodate forecast aviation demand at the Lebanon State Airport. The 2006 ALP and Landside Alternative 4 both consider the possibility of property acquisition. Property acquisition is only eligible for FAA grant funding when the property is needed for an

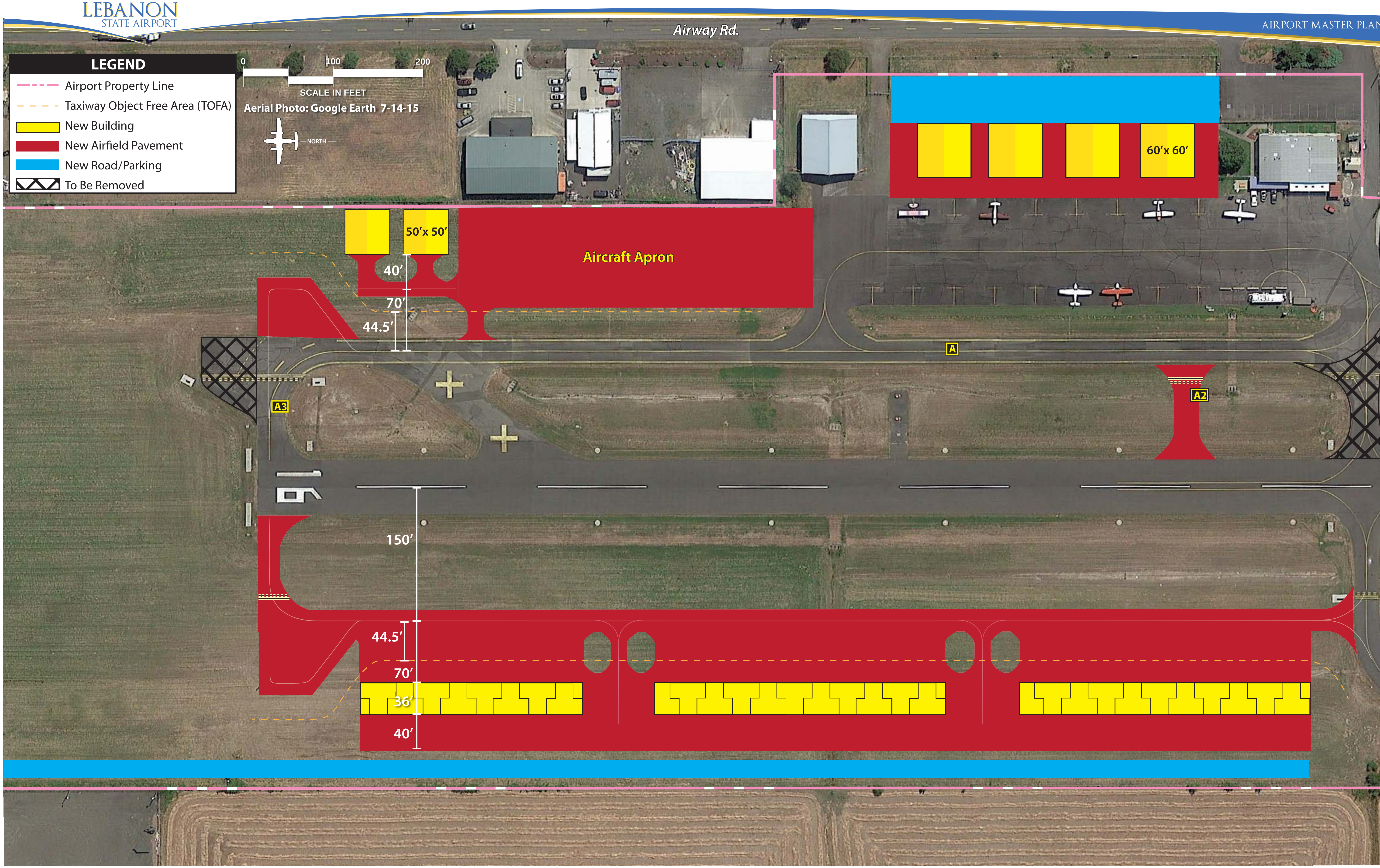
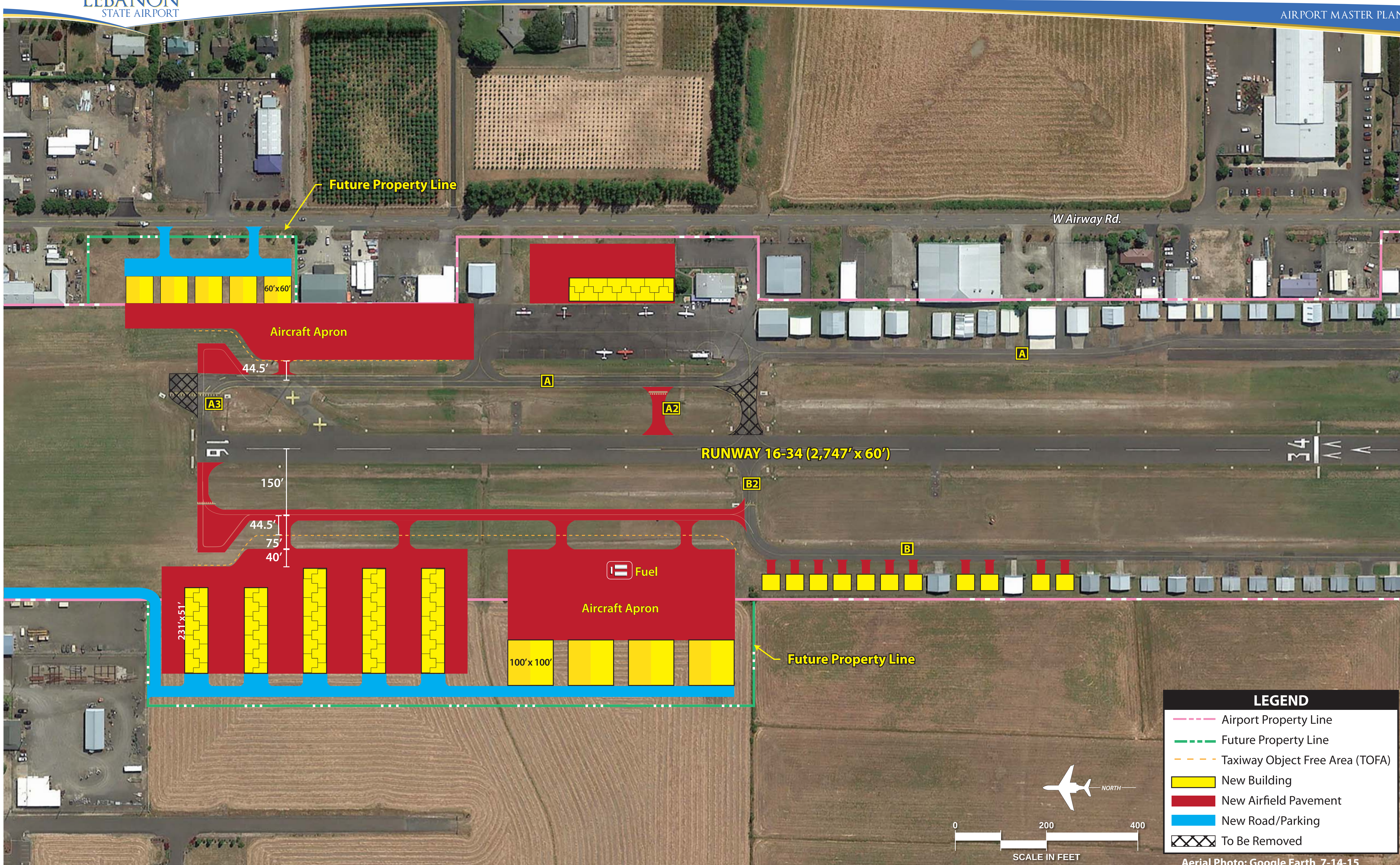

Airway Rd.
LEGEND
Airport Property Line
Taxiway Object Free Area (TOFA)
New Building
New Airfield Pavement
New Road/Parking
To Be Removed
0
100
200
SCALE IN FEET
Aerial Photo: Google Earth 7-14-15
NORTH
60'x 60'
50'x 50'
Aircraft Apron
40'
70'
44.5'
A
A2
A3
16
150'
44.5'
70'
36'
40'

Exhibit 4H
LANDSIDE ALTERNATIVE 3

This page intentionally left blank


Future Property Line
W Airway Rd.
60'x60'
Aircraft Apron
44.5'
A
A3
A2
RUNWAY 16-34 (2,747' x 60')
16
34
150'
B2
44.5'
75'
40'
Fuel
B
231'x51'
Aircraft Apron
100'x 100'
Future Property Line
LEGEND
Airport Property Line
Future Property Line
Taxiway Object Free Area (TOFA)
New Building
New Airfield Pavement
New Road/Parking
To Be Removed
NORTH
0
200
400
SCALE IN FEET
Aerial Photo: Google Earth 7-14-15

This page intentionally left blank

immediate aviation purpose. The FAA does not support "land-banking." Nonetheless, it is permissible to show future property acquisition on the updated ALP if that is the desire of the airport sponsor.

ODA is in the process of acquiring approximately 5.7 acres that are within the Runway 16 RPZ north of Oak Street.

Property needed in order to protect the airport from encroachment is eligible for FAA grant funding. Concurrent with the development of this Master Plan, ODA is in the process of acquiring approximately 5.7 acres that are within the Runway 16 RPZ north of Oak Street. This acquisition will be shown as existing airport property on the ALP to be updated as part of the Master Plan.

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, increasing 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 markings in place to control vehicle access. The best solution is to provide dedicated vehicle access roads to each landside facility (e.g., hangars) separated from nearby AOAs (e.g., taxiways) by security fencing where feasible.

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 Lebanon State Airport have been developed to reduce the need for vehicles to cross apron or taxiway areas. Dedicated vehicle parking areas, which are outside the airport fence line, are considered where appropriate. It should be noted, however, that at general aviation airports, fencing is not required, and federal funding for such projects is a low priority. In addition, it is common practice to allow tenants on general aviation airports to drive to their hangars; therefore, access roads and dedicated parking may not be necessary or feasible.

TERMINAL BUILDING

Many aviation operators consider available services when determining what airport to utilize. A central terminal building will typically provide restrooms, a weather reporting station, snacks or vending machines, and a pilot's lounge. Terminal buildings also act as another entrance to the community, often for visitors that may be considering investing in the community. Airport sponsors should be cognizant of the appearance and amenities available to the general aviation community.

If ODA or the City of Lebanon were to consider construction of a dedicated terminal building it should be located in the central portion of the Airport. A prime location would be the vacant airport property immediately east of the terminal aircraft apron. Such a facility could also include elements, such as a community meeting space. It should be noted that terminal building facilities at general aviation airports are not eligible for FAA grant funding.

UTILITY EXTENSION

The west side of the airfield has limited available utilities. Several of the development alternatives will require electricity, water, and potentially sewer lines. The availability and cost of utility extension should be considered prior to any development on the west side.

ALTERNATIVES SUMMARY

This chapter has presented analysis covering both the airside and landside development options for the Airport. On the Airside, options were considered for extending the runway to a length of at least 3,000 feet. It was shown that there are significant barriers to extending the runway in either direction. Additional discussion will need to be undertaken to determine if any extension of the runway is to be shown on the ALP.

There are significant barriers to extending the runway in either direction.

On the landside, five different development alternatives (including the 2006 ALP) were presented. All of them show a development plan that far exceeds the forecast need. Two of them show future property acquisition to accommodate additional hangar construction. The existing airport property boundary is capable of accommodating growth in based aircraft for perhaps the next 50 years or more.

This alternatives chapter will be reviewed by the Planning Advisory Committee (PAC) and the staff of ODA. Any comments and suggestions received will be considered and included in an updated version of this draft, as appropriate. The next chapter will present a consolidated recommended master plan concept and a 20-year capital improvement program with a list of prioritized projects triggered to aviation demand and/or necessity that will be presented. Finally, a financial analysis will be presented to identify potential funding sources and to show Airport management what local funds will be necessary to implement the plan.

SOLID WASTE RECYCLING PLAN

This section presents guidance on developing a Solid Waste Recycling Plan (Plan) for Lebanon State Airport which meets the requirements of Section 133 of the *FAA Modernization and Reform Act* of 2012. Consistent with Section 133, the Plan addresses the following issues:

- The feasibility of solid waste recycling at the airport;
- Minimizing the generation of solid waste at the airport;
- Operation and maintenance requirements;
- A review of waste management contracts; and
- The potential for cost savings or the generation of revenue.

INTRODUCTION

Lebanon State Airport is small general aviation facility that is one of 28 in a statewide system of general aviation airports owned by the State of Oregon. Like most of the state-owned airports, there is not on-site active management of day-to-day activities. Instead, these low-activity facilities typically have a locally based fixed base operator (FBO) that provides the necessary daily business functions, such as aircraft fueling and maintenance, and pilot services.

At Lebanon State Airport, all of the aircraft hangars except one are privately owned. Essentially, aircraft owners wishing to store an aircraft in a hangar at the Airport will contract with the state for a land lease and then construct their own hangar. These hangars then periodically change ownership through private property sales. The owners of the hangars are each responsible for contracting for solid waste (trash) and recycling services. Each tenant of a state-owned hangar (there is one state-owned hangar, Hangar E2, at Lebanon) is responsible for disposal of their own waste as outlined in their lease with ODA.

Republic Services of Albany and Lebanon is the primary waste hauler servicing the Airport.

Republic Services of Albany and Lebanon is the primary waste hauler servicing the Airport. Solid waste and recycling is collected on a regular schedule and delivered to the Lebanon Transfer Station, located at 33370 Brewster Road on the east side of the City of Lebanon. At this location, recycling is separated and then transported to processing facilities. Solid Waste is separately transported to area landfills.

Republic Services of Albany provides an extensive recycling program. Residential and individual businesses are provided a recycling bin, in which materials can be co-mingled. Most plastics, papers, cardboard, and metals can be co-mingled. Glass and used motor oils are also received curbside; however, these items must be in a separate container. E-waste and plastic film (grocery bags and other stretchy film) are accepted at the Recycling Depot in Albany, located at 1439 Industrial Way SE.

STATE OF OREGON RECYCLING LAWS

A perceived shortage of landfill space, in part, led to passage of Oregon's first *Opportunity to Recycle Act* in 1983. This Act also established solid waste management policies that recognized the environmental benefits of waste prevention, reuse, and recycling. It stated that, in order to conserve energy and natural resources, solid waste management should follow a hierarchy:

- **Reduce** the amount of waste generated
- **Reuse** materials for their original intended use
- **Recycle** what can't be reused
- **Compost** what can't be reused or recycled
- **Recover** energy from what cannot be reused, recycled or composted
- **Dispose** of residual materials safely

The Act also required wastesheds (usually counties, except for the City of Milton-Freewater and Metro) to have recycling depots. Linn County is considered its own wasteshed. It required cities with populations over 4,000 to provide monthly curbside recycling collection service to all garbage service customers.

In 1991, the state legislature passed the *Oregon Recycling Act* (Senate Bill 66) to strengthen and broaden recycling requirements. The 1991 Act had the following elements:

- Set a statewide recovery goal of 50 percent by 2000 and interim recovery goals for individual wastesheds by 1995;
- Expanded opportunity-to-recycle requirements to incorporate optional program elements;
- Established a state household hazardous waste program;
- Required recycled content in glass containers, directories, and newsprint and set requirements for recycling rigid plastic containers to promote market development;
- Established government procurement requirements for recycled products;
- Required the Department of Environmental Quality (DEQ) to calculate material recovery rates annually to measure progress toward the 50 percent goal;
- Required DEQ to conduct a waste composition study every other year to determine what materials are being disposed of, and inform local government of recycling program planning;
- Required DEQ to develop a solid waste management plan;
- Required and provided funding to develop a school curriculum on recycling and waste reduction; and
- Funded programs through tipping fees at landfills, including grants to local governments.

In 1997, a coalition of recycling and solid waste management experts developed a strategy to move Oregon's resource recovery efforts beyond recycling. One outcome of this effort was a program offering local governments a two percent recovery rate credit for establishing and maintaining programs in waste prevention, reuse, and backyard composting. DEQ established guidelines and evaluation criteria for wastesheds that allowed them to earn up to six percent total credits toward their recovery goals for qualifying programs.

By the year 2000, Oregon had not yet met its ambitious recovery goal of 50 percent. To increase waste recovery, the state legislature passed House Bill 3744 (2001) which reset the voluntary waste recovery goals for 2005 and 2009. Each wasteshed, including Linn County, were required to submit plans to DEQ.

HB 3744 also set two statewide waste generation goals and added waste prevention goal language to Oregon law (Oregon Revised Statute 459.015). The waste prevention goals are:

- By 2005, there would be no annual increase in per capita municipal solid waste generation;
- By 2009, there would be no annual increase in total municipal solid waste generation.

HB 3744 also added three new ways a wasteshed could qualify for a two percent credit toward its recovery rate for waste prevention programs. It allowed wastesheds to apply for more than two percent credit for residential composting programs if they can document that more than two percent of the waste generated is being diverted by the programs. Finally, HB 3744 gave wastesheds that burn mixed solid waste for energy recovery some additional credit toward their recovery rates under certain conditions.

Linn County has been an active participant in the state recycling programs. Linn County established prevention, reuse, and residential composting programs, and qualified for a total of six percent in recovery credits. In 2014, Linn County had a recovery rate of 48.2 percent which exceeded its goal of 40 percent (*2014 Oregon Material Recovery and Waste Generation Rates Report, DEQ, December 2015*).

The State Legislature passed Senate Bill 263 in 2015 with the goal of modernizing Oregon's recycling and waste prevention laws by updating the state recovery goals, wasteshed goals, and waste generation goals beginning in 2016. The new wasteshed goals range from 15 percent (Lake County) to 64 percent (Portland Metro and Marion County), but no longer include the option of two percent recovery credits each for one) waste prevention programs, 2) reuse programs, and 3) home composting programs. This change raised the waste recovery goal for Linn County by six percent. SB 263 also increases the waste recovery goal from 50 percent to 52 percent by 2020, and to 55 percent by 2025.

SB 263 imposes new requirements on local governments, including additional recycling program elements required for cities near Portland, and additional waste prevention and reuse program elements for cities with populations above 50,000, or for cities with populations between 10,000 and 50,000 that are within counties with populations above 100,000 (such as Linn County).

ESTABLISHING A RECYCLING PROGRAM FOR THE AIRPORT

The Environmental Protection Agency (EPA) has developed a multi-step program for establishing a successful airport recycling program:

- Obtain commitment from upper management;
- Organize a green team/recycling coordinator;
- Identify types and sources of waste;
- Assess current waste collection contracts;
- Develop a plan;
- Educate staff and customers;
- Monitor and refine the plan;
- Measure performance;
- Promote successes; and
- Expand the program.

The Environmental Protection Agency (EPA) has developed a multi-step program for establishing a successful airport recycling program.

Management support is crucial to developing and sustaining a recycling program since management must authorize team members' time commitment, responsibilities, and financial investment. Case studies from other airports have indicated that programs can be successful regardless of the size of the airport.

A "green team" should be assembled to help in the implementation of any recycling programs at the Airport. The "green team" should be knowledgeable of local haulers and material markets. The recycling coordinator will help organize, execute, and evaluate the recycling program.

A waste assessment provides qualitative and quantitative data and a baseline to measure progress in future years. Specifically, it will help answer the following questions:

- What areas on the airport generate waste?
- What recyclable material is generated?
- What type of waste is generated in each area?
- How much waste is generated? and
- What are the costs for trash and recycling containers, hauling, and disposal?

Three primary approaches to conducting a waste assessment include:

- Records examination;
- Facility walk-through; or
- Waste sort.

Each of the three approaches provides strengths and limitations. The records examination requires the least time and effort but lacks quantitative data for specific waste components. The facility walk-through allows first-hand examination of facility operations but limited identification of wastes generated. The waste sort provides quantitative data on total waste generated but requires more time and effort than other approaches.

For this study, both a records examination (via interviews) and facility walk-through were conducted. Due to the limited public use trash receptacles and recycling containers, a physical waste audit was not conducted. The research conducted indicates that each tenant disposes of the solid waste and recycling they produce, most by removing the material from the airport.

Since the ODA does not control waste disposal at the Airport, opportunities for direct impact on waste recovery by ODA is limited. ODA could take several cost-efficient steps to encourage airport users to recycle such as:

- Information Campaign: Post flyers, include recycling language in leases
- Set Goals: Develop a set of uniform recycling goals and procedures for all state airports
- Lead by example: Source recycled materials for business functions
- Construction: Encourage contractors to recycle material resulting from various capital projects

The following resources will aid the Airport in establishing a successful recycling program:

- *Recycling, Reuse and Waste Reduction at Airports: A Synthesis Document*. Prepared by the Office of Airports, Federal Aviation Administration, April 24, 2013. Accessible at: https://www.faa.gov/airports/resources/publications/reports/environmental/media/RecyclingSynthesis2013.pdf

- *Developing and Implementing an Airport Recycling Program*. Prepared by the Environmental Protection Agency (EPA 530-K-08-002). April, 2009. Accessible at: http://www.epa.gov/wastes/conserve/tools/rogo/documents/airport-recycling-guide.pdf

- FAA Memorandum: *Guidance on Airport Recycling, Reuse, and Waste Reductions Plans* (September 30, 2014). Accessible at: http://www.faa.gov/airports/environmental/media/airport-recycling-reuse-waste-reduction-plans-guidance.pdf

- Sustainable Aviation Guidance Alliance. Accessible at: http://www.airportsustainability.org

Chapter Five

RECOMMENDED DEVELOPMENT PLAN

CHAPTER FIVE

RECOMMENDED DEVELOPMENT PLAN

The airport master planning process for the Lebanon State Airport (S30) 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 two sets of draft phase reports which were presented to the Planning Advisory Committee (PAC) and discussed at several coordination meetings.

In the previous chapter, several alternatives were analyzed to explore options for the future growth and development of the Airport. The development alternatives have been refined into a single recommended development plan for the Master Plan. This chapter describes, in narrative and graphic form, the recommended direction for the future use and development of Lebanon State Airport.

AIRSIDE CONCEPT

The airside concept generally relates to planned improvements to the runway and taxiway system. **Exhibit 5A** presents the long term Master Plan development concept for the Lebanon State Airport.

AIRPORT REFERENCE CODE

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 an 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 an 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 the runway. The FAA has established the Airport Reference Code (ARC) to relate these critical aircraft factors to airfield design standards.

Analysis conducted in Chapter Two – Forecasts and Chapter Three - Facility Requirements concluded that the current critical design aircraft is classified as ARC B-I (small aircraft exclusively). The small aircraft exclusively means the critical aircraft weights less than 12,500 pounds. A representative aircraft is the Beech Baron 58P. The future critical design aircraft was determined to be the same ARC B-I (small aircraft exclusively) classification. While some airports may plan for a transition to a larger critical design aircraft, there was no evidence or justification for such a transition at Lebanon State Airport.

A variety of airport design standards relate to the applicable ARC including the runway safety area, runway object free area, the runway protection zone, and separation standards. The recommended development concept adheres to the applicable design standards.

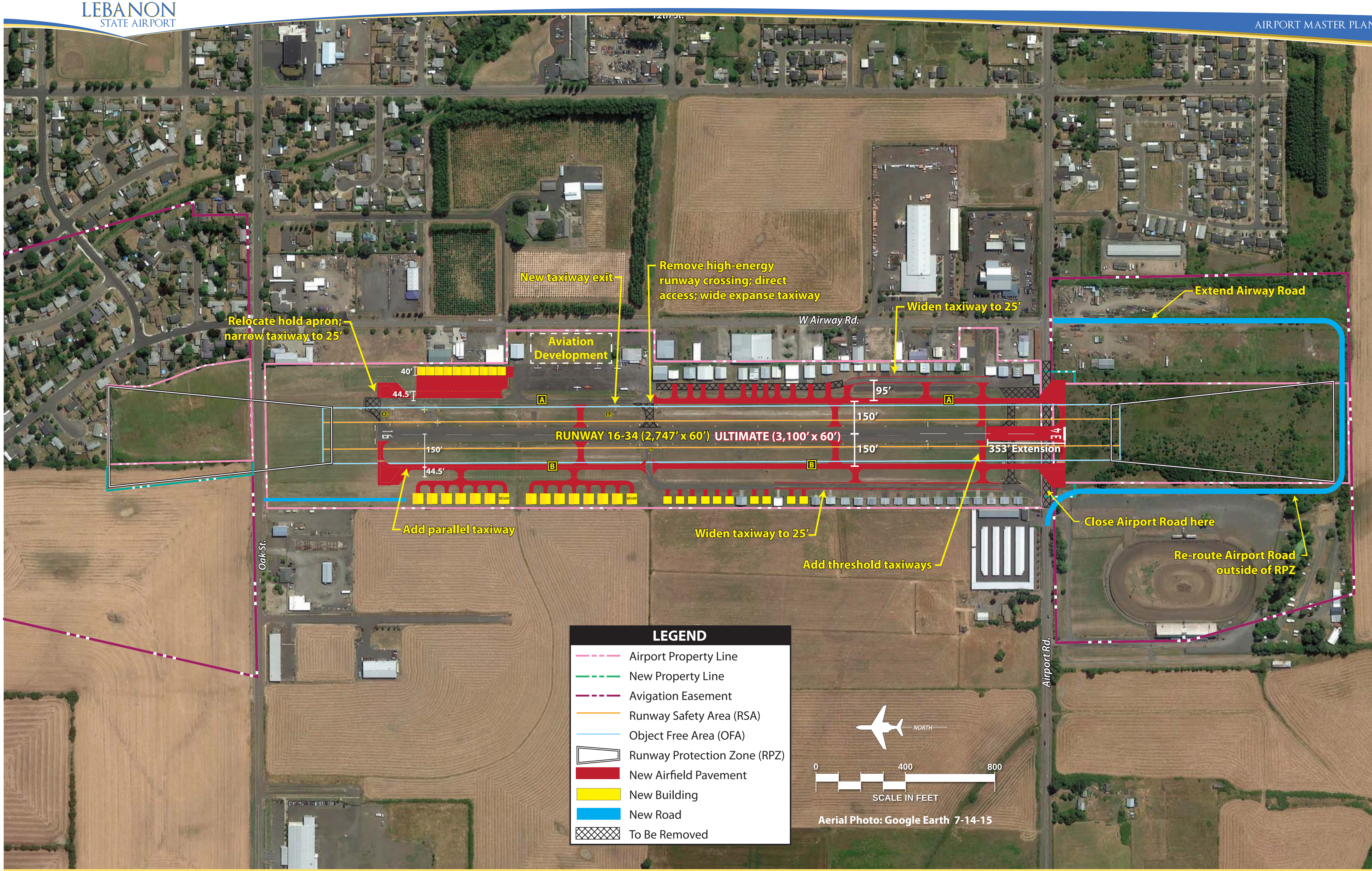
RUNWAY DESIGN CODE (RDC)

Runways are assigned an RDC. As discussed in Chapter Three – Facility Requirements, the RDC is comprised of the Approach Category, the Airplane Design Group, and the instrument visibility minimums. The current RDC for Runway 16-34 is described as B-I-VIS, meaning landings must take place in visual conditions. Analysis conducted in Chapter Four – Alternatives indicated that implementing an instrument approach with 1-mile visibility minimums would not change the size of the RPZ and would not introduce additional incompatible land uses into the RPZ. However, a non-precision instrument approach would require a Part 77 Primary Surface width of 500 feet, where the current Primary Surface width is 250 feet. At 500 feet in width (250 feet to either side of the runway centerline), the primary surface would encroach the fuel farm and half of the terminal apron tie downs. In addition, the Primary Surface would extend right up to the doors of numerous hangars. Because of these limitations, a non-precision instrument approach is not considered at this time. The applicable future RDC will remain B-I-VIS.

The recommended length for the runway is 3,100 feet.

RUNWAY 16-34

Runway 16-34 is 2,747 feet in length and 60 feet wide. As previously discussed, the recommended length for the runway according to FAA criteria is 3,100 feet, and by ODA criteria it is 3,000 feet. In Chapter Four – Alternatives, options for extending the runway to either the north or south were considered.


Relocate hold apron; narrow taxiway to 25'
New taxiway exit
Remove high-energy runway crossing; direct access; wide expanse taxiway
Widen taxiway to 25'
Extend Airway Road
W Airway Rd.
Aviation Development
40'
44.5'
95'
150'
RUNWAY 16-34 (2,747' x 60') ULTIMATE (3,100' x 60')
150'
150'
353' Extension
150'
44.5'
A
B
Add parallel taxiway
Widen taxiway to 25'
Add threshold taxiways
Close Airport Road here
Re-route Airport Road outside of RPZ
Oak St.
Airport Rd.
LEGEND
Airport Property Line
New Property Line
Avigation Easement
Runway Safety Area (RSA)
Object Free Area (OFA)
Runway Protection Zone (RPZ)
New Airfield Pavement
New Building
New Road
To Be Removed
NORTH
0
400
800
SCALE IN FEET
Aerial Photo: Google Earth 7-14-15

This page intentionally left blank

North Extension Alternative

Issue: As presented on Exhibit 4C, two alternatives were considered. The first would have extended the runway 268 feet north and utilized a displaced landing threshold in order to maintain the approach RPZ in its current location. This is the maximum northerly extension that also keeps the RSA on Airport property. The second would have added 253 feet, for a total length of 3,000 feet, and implemented declared distances in order to maintain the approach and departure RPZ in the current location and thereby avoid adding new incompatible land uses.

Alternatives Discussion: The first alternative for a northerly extension would have placed the departure RPZ over nine residential properties. This layout is highly unlikely to be considered by the FAA unless the Airport were to also acquire and raze the homes. This course of action is not supported by the PAC, including the ODA, and is not considered reasonable or feasible.

The second alternative considered extending the runway 253 feet to the north and implementing declared distances in order to maintain the current location of the approach and departure RPZ. Use of declared distances would have effectively made the new pavement available only for departure operations on Runway 16. All other landing and takeoff operations would have 2,747 feet available. According to FAA guidance, declared distances are intended for airports primarily utilized by turbine aircraft. Since Lebanon State Airport is rarely utilized by turbine aircraft, it is unlikely that the FAA would support this second alternative.

Recommendation: It is recommended that no northerly extension be considered. The primary reason is that any change in the location of the current RPZ will introduce new land use incompatibilities. The new incompatibilities are homes and/or more of Oak Street. By application of current RPZ design standards, introduction of new RPZ incompatibilities requires review and approval by FAA headquarters. Considering that this Airport is planned to be maintained primarily for piston powered aircraft, FAA headquarters approval of the change to the RPZ may be challenging.

It is recommended that no northerly extension be considered.

South Extension Alternative

Issue: Because of the inherent challenges to extending the runway to the north, an alternative for extending to the south was considered and presented on Exhibit 4D.

Alternative: One alternative considered was to examine the impact of extending the runway to the south by 253 feet for a total runway length of 3,000 feet. This extension would require either tunneling or closing Airport Road in order to accommodate the extension and RSA.

Recommendation: The option to tunnel Airport Road is not considered feasible primarily due to the anticipated cost.

Long term planning considers extending the runway to the south and relocating Airport Road.

The second option of rerouting Airport Road is considered feasible. The recommended alternative makes some adjustments to the original depiction on Exhibit 4D. The runway is planned to be extended to the FAA recommended 3,100 feet, and the rerouted road is planned to be brought in closer in order to reduce property acquisition and construction costs.

Rerouting public roads in order to accommodate an airport project, such as the planned runway extension, is eligible for FAA grant funding. However, only the minimum route would be eligible. As a result, the depiction of rerouted Airport Road is that which is most likely to be eligible for FAA funding. If the City desired to route the road in a different manner, then the extra cost would be a local responsibility.

TAXIWAYS

FAA taxiway design standards changed with the publication of AC 150/5300-13A in 2012. Exhibit 3B presented previously identified non-compliant taxiway geometries and Exhibit 4E presented alternatives for mitigating the non-standard conditions.

Table 5A is a list of the non-standard taxiways at the Airport and the recommended solution:

TABLE 5A
Taxiway Recommendations
Lebanon State Airport

Current Non-Standard Condition	Applicable Standard*	Recommendation
Lead-in taxiway to Runway 34.	No lead-in taxiways.	Remove current threshold taxiways and the lead-in taxiway. Replace with new threshold taxiways in the correct location.
Direct access from the terminal apron to the runway.	Non-standard as pilots should be forced to make a turn onto a parallel taxiway before turning to the runway.	Relocate Taxiway A2 slightly to the north.
Taxiway crossing the "high-energy" portion of the runway.	Non-standard as pilots have less reaction time in the middle-third of the runway.	Relocate Taxiway A2 slightly to the north.
Wide taxiway pavement at convergence of Taxiways A and A3.	Taxiways should be 25 feet wide for B-I runways to reduce potential pilot confusion.	Close the north hold apron to narrow threshold Taxiway A3 to 25 feet.
Taxiway A south of Taxiway A2 is 20 feet wide.	Taxiway width standard is 25 feet.	Widen to 25 feet.
Taxiway A2 is 30 feet wide.	Taxiway width standard is 25 feet.	Relocate and narrow to 25 feet.
Taxiway B (south portion) is 20 feet wide.	Taxiway width standard is 25 feet.	Widen to 25 feet.
*FAA AC 150/5300-13A, *Airport Design*.		

Lead-in Taxiway

Currently, pilots must utilize a 120-foot long lead-in taxiway to access the Runway 34 threshold. To remedy this situation, two new threshold taxiways are planned to provide access to the existing threshold. Taxiways A1 and B1 would then be closed.

Direct Apron to Runway Access

Currently, pilots are able to proceed directly from the terminal apron to the runway via Taxiway A2. The alternatives discussion considered relocating Taxiway A2 approximately 180 feet to the north, thus forcing pilots to make a turn onto parallel Taxiway A prior to turning toward the runway. This solution raised a concern that pilots on the west side of the airfield desiring to fuel up before departure would cross the runway at Taxiway B2 and traverse the runway for a distance of 180 feet before existing at the relocated Taxiway A2. While this geometry meets design standards, it is not optimal to promote a geometry that would encourage aircraft to taxi on the runway. As a result, four new alternatives were considered and are depicted on **Exhibit 5B**.

Alternative 1: This is the option considered previously where Taxiway A2 is relocated 180 feet to the north. This option would force west side aircraft desiring to cross the runway to taxi on the runway. To reduce or eliminate this situation, three additional alternatives were considered.

Alternative 2: This option considers closing Taxiway A at the connection with Taxiway A2. A new connecting taxiway would be installed to the north of the fuel farm that would provide access to Taxiway A. In essence, this alternative would extend Taxiway A through a portion of the terminal apron. This is not considered a viable option because fueling aircraft would block the taxiway and the utility of the terminal apron would be lost.

Alternative 3: This alternative would close the pavement connection between the terminal apron and Taxiway A2. A new connecting taxilane to the terminal apron would be installed north of the fuel farm. This alternative is not considered because it would create a congestion point in proximity to the fuel farm and several tie-down positions would be removed. Pilots would have to enter the terminal apron north of the fuel farm and then perform a full u-turn in order to exit the apron/fuel farm area. There is not enough space for two aircraft in this area, thus significant congestion is likely. For these reasons this alternative is not considered viable.

Alternative 4: The last alternative considers a longer term view of the situation. Since the goal is to eliminate runway crossings at the high-energy portion of the runway, this alternative considers closing both Taxiways A2 and B2 and replacing them with runway crossing taxiways that are not in the high-energy portion of the runway. On the exhibit, the high-energy portion of the runway is identified and two crossing taxiways are planned outside of this area. For planning purposes, the north crossing taxiway will be approximately 915 feet from the Runway 16 end and the south crossing taxiway will be approximately 809 feet from the current pavement end. By planning the crossing taxiways at these distances, they can be constructed separately if needed and will still meet standard when the extension is constructed.

These alternatives were discussed with the FAA during the spring of 2017. It was determined that Alternative 4 was the best option and would be depicted on the Airport Layout Plan.

Parallel Taxiways

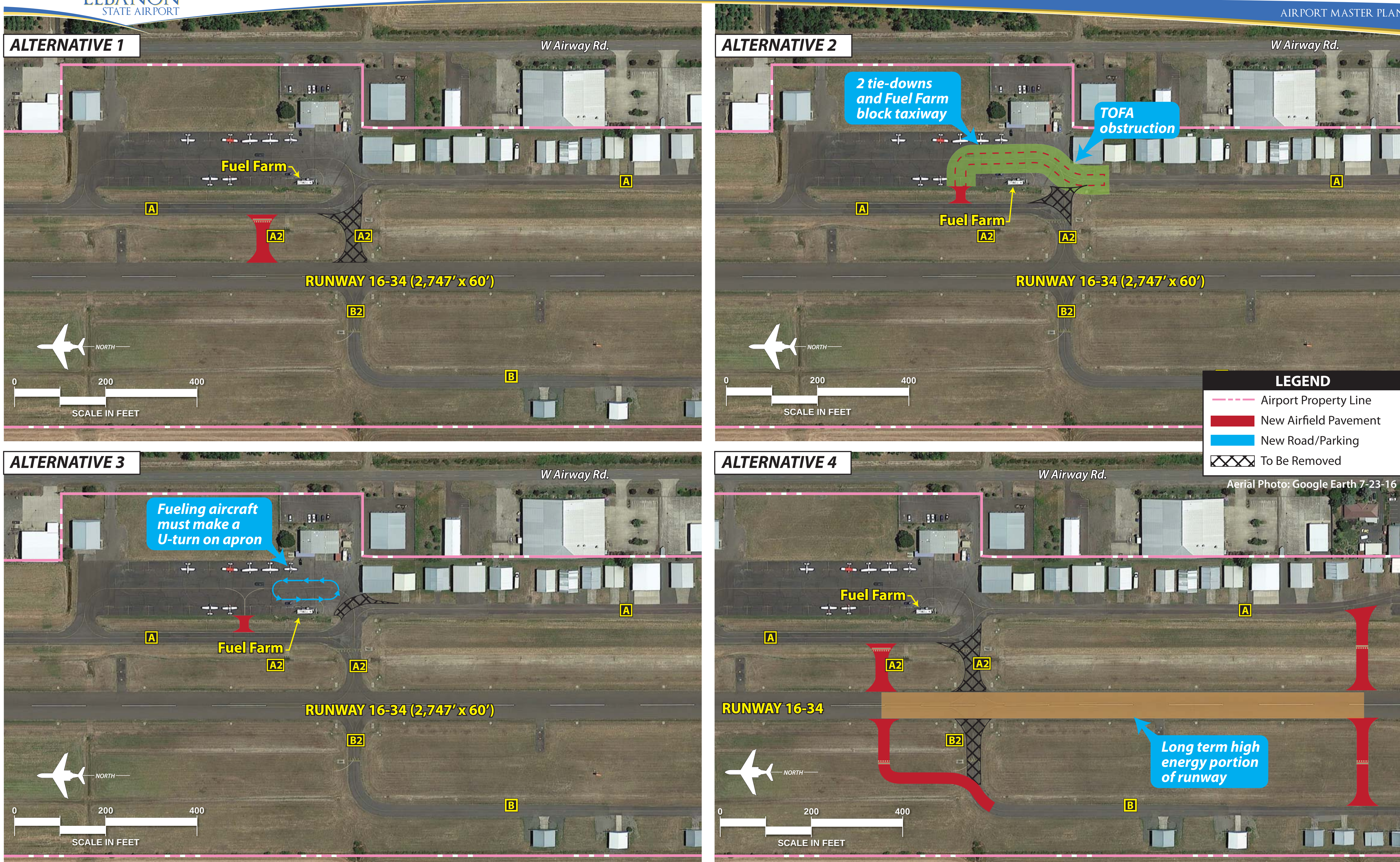
The standard runway to taxiway separation distance now and in the future for Lebanon State Airport is 150 feet. The northern portion of Taxiway A (north of Taxiway A2) meets this standard while the other parallel taxiway segments currently exceed the standard. At some point in the future, the taxiways will need to be reconstructed due to normal wear and tear. When that time comes, Taxiways A and B should be reconstructed 150 feet from the runway to meet standard. In addition, Taxiway B is planned to be extended from Taxiway B2 to the Runway 16 threshold which would eliminate the need for aircraft crossing the active runway to access the Runway 16 threshold.

When planning for parallel taxiway placement, it is important to consider the means to providing access to existing and future hangars. The south portion of Taxiway A currently has numerous stub taxilanes leading to hangars. Once a new parallel taxiway is constructed, the standard taxiway to taxiway/taxilane separation standard must be analyzed. This standard is 70 feet from centerline to centerline.

The south portion of existing Taxiway A would be 95 feet from the new parallel taxiway. Therefore, this section can remain and serve as the access taxilane to the hangars. This portion is planned to be widened to the 25-foot standard as well.

The remaining portion of Taxiway A (south of Taxiway A2), however, would be 65 feet from the new parallel taxiway. There are two options to consider:

1) Rather than removing that portion of Taxiway A and constructing 12 stub taxiways for hangar access (stubs that would be the responsibility of ODA to maintain), obtain a Modification to Standard for taxiway to taxilane separation distance. If approved by the FAA, then the stub taxilanes would not be necessary. The argument supporting the Modification to Standard would be that at 65 feet, the safety intent of the taxiway to taxiway/taxilane separation standard would still be met because the critical design aircraft (Beech Baron 58P), with a wingspan of 37 feet, can safety operate on both the future taxiway and the taxilane at the same time. In fact, even the largest wingspan in ADG I, which is 49 feet, would still meet the safety intent of the separation standard.
2) Remove that portion of Taxiway A that extends from Taxiway A2 to the south a distance of 930 feet. It would be replaced by the new construction of Taxiway A at the standard separation distance from the runway of 150 feet. A total of 11 stub taxilane would need to be constructed as part of the reconstruction of Taxiway A. there is also a drainage channel in this location which would require each stub taxilane to have a culvert.


ALTERNATIVE 1
W Airway Rd.
Fuel Farm
A
A2
A2
RUNWAY 16-34 (2,747' x 60')
B2
B
NORTH
0
200
400
SCALE IN FEET
ALTERNATIVE 2
W Airway Rd.
2 tie-downs and Fuel Farm block taxiway
TOFA obstruction
Fuel Farm
A
A2
A2
RUNWAY 16-34 (2,747' x 60')
B2
NORTH
0
200
400
SCALE IN FEET
LEGEND
Airport Property Line
New Airfield Pavement
New Road/Parking
To Be Removed
Aerial Photo: Google Earth 7-23-16
ALTERNATIVE 3
W Airway Rd.
Fueling aircraft must make a U-turn on apron
Fuel Farm
A
A2
A2
RUNWAY 16-34 (2,747' x 60')
B2
B
NORTH
0
200
400
SCALE IN FEET
ALTERNATIVE 4
W Airway Rd.
Fuel Farm
A
A2
A2
RUNWAY 16-34
Long term high energy portion of runway
B2
B
NORTH
0
200
400
SCALE IN FEET

This page intentionally left blank

Following detailed consultation with the FAA, it was determined that Option 2 is the best option. With Option 2, the taxiway geometry meets the applicable design standards. At the time that the south portion of Taxiway A (from Twy A2 to Twy A1) needs to be reconstructed it is planned to be relocated at the standard separation distance of 150 feet from the runway centerline. Approximately, 920 feet of the existing Taxiway A (from Twy A2 to the south) is currently 212 feet from the runway centerline. The minimum taxiway to taxilane separation distance is 70 feet. Because only 62 feet of separation would exist after the reconstruction of this portion of Taxiway A, the old portion of Taxiway A (approximately 920 feet) is planned to be removed and replaced with 12 connectors providing access to the existing hangars.

Taxiway B is currently 235 feet from the runway centerline and it would be 85 feet from the new parallel taxiway. Because this distance is greater than the 70-foot standard, the existing Taxiway B can remain in place to serve as the access taxilane to the existing hangars. That portion of Taxiway B that is only 20 feet wide is planned to be widened to the standard width of 25 feet.

Hold Aprons

The current design standard for hold aprons is that they be located in proximity to or at the end of parallel taxiways, but should not extend beyond the lateral end of the runway. **Exhibit 5A** shows aircraft hold aprons at the end of both parallel taxiways. These hold aprons are properly sized to accommodate the critical design aircraft in ARC B-I. FAA participation in funding for hold aprons requires specific justification which is a function of operations and peak hour operations. Forecast activity at the Airport is not anticipated to meet this threshold; therefore, hold aprons are unlikely to be eligible for FAA grant funding. Nonetheless, the space for future hold aprons should be preserved.

RUNWAY PROTECTION ZONES

The RPZ is a trapezoidal area beginning 200 feet beyond the runway end. The function of the RPZ is to protect people and property on the ground. Preferably, this is achieved through airport ownership of the RPZs, although proper land use control measures, such as easements, are acceptable by FAA to mitigate potential incompatible land uses and obstacle conflicts. Some land uses are permitted without further evaluation, such as farming that meets all airport design criteria (e.g., horizontal and vertical runway clearances) and irrigation channels that do not attract wildlife. Prohibited land uses include public roads, residences, and places of public assembly, such as churches, schools, hospitals, office buildings, and shopping centers.

It is not uncommon for RPZs to have existing incompatible land uses. In these cases, it is the responsibility of the airport sponsor to mitigate those incompatibilities when practicable. For example, an airport sponsor may have a plan to acquire and remove an RPZ incompatibility; however, implementation of the plan may be subject to financial feasibility. With the publication of the *Interim Guidance on Land Uses within a RPZ*, the FAA made clear that the introduction of new RPZ land use incompatibilities would require a detailed alternatives analysis that could avoid, minimize, and/or mitigate the risk to people and property on the ground and headquarters approval.

As discussed in detail in Chapter Three – Facility Requirements, the size and location of RPZs can change. Airport sponsors should be aware if any changes in the RPZ will introduce new incompatible land uses in order to protect the runways. The following are the primary reasons an RPZ may change in size or location:

- An airfield project (e.g. runway extension, runway shift);
- A change in the critical design aircraft that increases the RPZ dimensions;
- A new or revised instrument approach procedure that increases the size of the RPZ; and/or
- A local development proposal in the RPZ (either new or reconfigured).

Issue: The existing RPZs have public roads through them. Since the roads predate the 2012 *Interim Guidance on Land Uses within a RPZ*, the sponsor responsibility is to have a mitigation plan in place and to act upon that plan when financially feasible.

Alternatives: The alternatives considered for extending the runway to the north would have changed the location of the RPZ, thus triggering the need for a mitigation plan to removing Oak Street (and homes) from the RPZ. This was one of the primary reasons for recommending no runway extension to the north. An extension of the runway is planned to the south; therefore, the plan must include mitigation of the RPZ to ensure compatible land uses.

Recommendation: On the north end, the current size and location of the RPZ is planned to remain the same. Therefore, there is not an immediate need to remove Oak Street; however, the airport sponsor should seek opportunities in the future to remove the road from the RPZ. For example, if a bypass road that could redirect vehicular traffic around the RPZ were ever considered, it should be pursued.

On the south end, a runway extension is planned which would cross Airport Road. Therefore, the road is planned to be relocated completely outside of the RPZ.

INSTRUMENT APPROACHES

Lebanon State Airport has no instrument approach procedures. All takeoff and landing activity must be conducted in visual conditions (3-mile visibility and 1,000-foot cloud ceilings at a minimum). Instrument approach procedures extend the usefulness of the Airport to times of poor weather conditions.

Issue: The size of the RPZ may change as a function of the visibility minimums. Any visibility minimums below 1-mile increase the size of the RPZ. Larger RPZs at the Airport will introduce more of both Oak Street and Airport Road as incompatibilities which would require specific approval from FAA headquarters. A non-precision instrument approach with 1-mile visibility minimums will increase the Part 77 primary surface from 250 feet to 500 feet, as centered on the runway. This would introduce penetrations including the fuel farm and aircraft tie-down positions. It would also place the east edge of the Primary Surface at the door of approximately 12 hangars.

Recommendation: It is recommended that the Airport not pursue non-precision instrument approaches at this time. There is not enough property depth from the runway to fully accommodate the Primary Surface.

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 needed for airport development or protection. While the FAA supports and funds land acquisition, it does not support "land-banking" of property that may or may not be needed in the future.

The FAA recommends that airports own the entirety of the RPZs where feasible. Therefore, those RPZs that would extend beyond current airport property in the future are planned for fee simple acquisition. This includes approximately 1.0 acres of the Controlled Activity Area of the Runway 16 RPZ. This land is currently farmland and is on the edge of the RPZ. Acquisition of this land should remain on the plan; however, it is a lower priority.

The plan calls for the extension of the runway to the south. To accommodate this, Airport Road would have to be rerouted around the RPZ. Approximately 9 acres of privately owned land would have to be acquired. The rerouting of Airport Road shown on the plan is considered the minimum required and would therefore be eligible for FAA grant funding because its relocation is triggered by an airport project. If a different route for Airport Road were chosen, perhaps one located farther away, then the additional cost would be a local responsibility.

The previous plan for the Airport considered the acquisition of approximately 23 acres of land to the west to accommodate future hangar needs. Analysis in this Master Plan has shown that no more land is needed for hangar construction. As a result, this Master Plan will not include planned acquisition of property to the west.

AIRSIDE CONCLUSION

Airside needs are driven by several factors, including meeting forecast aviation demand and meeting FAA design standards. Demand factors indicate that the Airport will remain classified as a general aviation facility primarily suited to piston powered single and multi-engine aircraft. The applicable design standards now and in the future relate to ARC B-I (small aircraft exclusively).

The runway is planned to be extended by 353 feet to the south for a total length of 3,100 feet. This is the length recommended when following general FAA guidelines. The extension is will require Airport Road to be rerouted. No extension is considered to the north because of the proximity of incompatible land uses, specifically houses and roads.

For the FAA to participate in extension of the runway, specific operational justification will be required. Justification would be documentation of 500 annual operations by aircraft (or group of similar aircraft) that needs the additional 353 feet of length.

The runway is planned to be extended by 353 feet to the south for a total length of 3,100 feet.

Several improvements are planned to the taxiway system. Both Taxiways A and B are planned to be full parallel taxiways located at the standard separation distance from the runway centerline of 150 feet. Portions of the existing Taxiways A and B will be converted to taxilanes to provide access to hangars. Taxiway A2 is planned to be relocated in order eliminate direct access from the terminal apron area to the runway.

While not required, the FAA recommends Airport ownership of all RPZ lands. There is a 1.0-acre portion of the Runway 16 RPZ that is planned for future acquisition.

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. The development scheme presented segregates aircraft activity levels, while placing the airport in position to maximize revenue potential. The landside facility plan is also depicted on **Exhibit 5A**.

There are many potential facility layout concepts that could be considered. The plan shown is only one possible layout for future hangars, which may change based on developer needs. Nonetheless, the layout presented should be considered the starting point for future development needs.

In the Facility Requirements chapter, it was determined, based on forecast growth, that over the next 20 years, there was a need for approximately 22,900 square feet of additional hangar space. In the Alternatives chapter, four different hangar layout plans were presented. Each of those presented showed a full build-out scenario and far exceeded the hangar space needed during the term of the Master Plan.

The preferred alternative for future hangar development most closely resembles Landside Alternative 1 shown on Exhibit 4F. On the west side of the Airport, future hangar development is planned as a continuation of the existing pattern, that being individual box hangars. South of Taxiway B2, eleven 40’x40’ hangars are considered. North of Taxiway B2, 14-50’x50’ hangars are considered. These planned hangars would encompass 42,600 square feet of hangar space. An access road is planned to extend from Oak Street to the back side of the planned hangars north of Taxiway B2.

To the north of the terminal apron a 12-unit T-hangar facility is considered. This would be a new option for aircraft storage at Lebanon State Airport. T-hangars are typically constructed by the airport sponsor or by a private developer. The developer then leases individual T-hangar units. This structure encompasses 12,600 square feet.

On the east side of the Airport, an expansion of the paved terminal area apron is planned. The existing apron is approximately 8,000 square yards in size. The estimated need is for 9,900 square yards within the next 20 years. To satisfy this forecast need, the terminal apron is planned to be expanded to the east into the undeveloped grassy area adjacent to the FBO facility. This area encompasses approximately 6,200 square yards of new apron area.

AIRPORT LAND USE PLAN

The objective of airport land use planning is to coordinate future uses of the airport property in a manner that is both functional with the design of the airport and compatible with the airport environs. There are two primary considerations for on-airport land use planning. First is to secure those areas essential to the safe and efficient operation of the airport. Second is to determine compatible land uses for the balance of the property which would be most economically advantageous to the airport and the community.

ON-AIRPORT LAND USE OBLIGATIONS

The Airport has accepted grants for capital improvements from the FAA. As such, the Airport sponsor has agreed to certain grant assurances (See **Appendix C**). Grant assurances related to land use ensure that Airport property will be reserved for aeronautical purposes. If the Airport sponsor wishes 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. Additional discussion on this topic was presented in Chapter Three - Facility Requirements.

The FAA's Airport Compliance Program ensures airport sponsors comply with the Federal obligations they assume when they accept Federal grant funds or the transfer of Federal property for airport purposes. The program serves to protect the public interest in civil aviation and ensure compliance with applicable Federal laws, FAA rules, and policies.

Sources of Obligations

When airports receive Federal assistance, their owners or sponsors accept certain obligations and conditions, which may be incurred by contract or by restrictive covenants in property deeds. This generally involves the following:

- Grant agreements (Grant Assurances) issued under Federal grant programs;
- Instruments of approved property transfers (e.g., property acquisition);
- Deeds of conveyance

When Airport owners and operators accept Federal grants, they agree to preserve and operate their facilities in a safe and efficient manner and comply with certain conditions and assurances. These obligations can span different airport development grant programs, including the Federal Aid to Airports Program (FAAP), the Airport Development Aid Program (ADAP), and the current Airport Improvement Program (AIP). Airport owners should be aware that obligations incurred under each program or conveyance document vary.

Major Obligations

The following list includes some of the major obligations an airport owner can incur when accepting a Federal airport development grant.

- Prohibition of exclusive rights
- Proper use of airport revenue for Airport needs
- Proper maintenance and operation of airport facilities
- Protection of approaches
- Keeping good title of airport property
- Compatible land use
- Availability of fair and reasonable terms without unjust discrimination
- Adhering to the approved airport layout plan
- Financial self-sustainability
- Sale or disposal of Federally acquired property
- Preserving rights and powers
- Using acceptable accounting and record-keeping systems
- Compliance with civil rights requirements

The FAA encourages airport owners to review each agreement and conveyance document to ensure that they understand their obligations. Keeping good records will allow them to quickly reference incurred obligations. Further, annual reviews of all agreements will aid efforts in complying with incurred Federal obligations.

ON-AIRPORT LAND USE PLAN

The FAA requires that all federally obligated airports utilize property for aviation purposes first and foremost. If an airport has land that is unlikely to be utilized for aviation purposes because it exceeds that which is forecast to be needed or is inaccessible by aircraft, then these lands may be considered for compatible, non-aviation revenue support development. The revenue from these activities would provide supplemental funds to the airport with the goal of improving an airport's overall financial position.

By categorizing the entirety of airport property, Airport management can plan and direct any development proposals to appropriate locations. There are three major land use categories on an airport: airfield operations, aviation development, and non-aviation revenue support. The non-aviation revenue support category is only available to those airports with property that is unlikely to be needed for airfield operations or aviation development, or cannot be utilized for those purposes. A good rule of thumb is to reserve all flight line land to a depth appropriate for the airport for aviation purposes.

If airport expansion is needed, it should be directed to the appropriate use areas depicted on **Exhibit 5C**. The Oregon Department of Aviation's *Airport Land Use Compatibility Guidebook* (see detail in Chapter One – Inventory), which is supported by state statutes, should be used as a guideline to identify specific permissible on-airport activities at non-towered airports. Three airport land use categories are identified below which are consistent with FAA guidelines and grant assurances to preserve the safe and efficient operation of the airport now and into the future.

For purposes of airport land use classification, aviation-related means any activity or business that needs access to the runway and taxiway system. Non-aviation related uses or business are those that do not need runway or taxiway access. As an example, a manufacturer of aircraft parts, while an aviation-related business, may not have a need for runway and taxiway access, so they would be considered a non-aviation business.

Three classifications of Airport property have been identified: Airfield Operations, Aviation Development, and Revenue Support.

Airfield Operations (AO)

The Airfield Operations area is that portion of airport property that encompasses the major airside elements such as runways, taxiways, runway safety area, runway object free area, runway obstacle free zone, runway protection zone (on airport property), taxiway safety area, taxiway object free area, navigational aids and their critical areas, and the runway visibility zone (where applicable). The Airfield Operations area is intended to provide for safe and efficient aircraft taxiing, take-off, and landing. This land use classification includes the various object clearing areas, and only elements necessary for aircraft navigation can be located here.

Aviation Development (AD)

The Aviation Development land use category includes those areas that should be reserved for development that requires access to the airfield operations area. This might include aircraft hangars and transportation terminals. Any aviation business needing access to the runway and taxiway system could locate in these areas. A rule of thumb is that all land immediately adjacent to the runway and taxiway system must be reserved for aviation development.

Because of a lack of depth from the runway, all property on both sides of the runway are classified for Aviation Development. Also included is the entirety of the current property south of Airport Road that is not part of the Airfield Operations classification.

Revenue Support (RS)

This land use classification includes development that is compatible with aviation activities but is unlikely to require access to the runway and taxiway system. Typically, it is preferable that activities in these areas will complement airport activities to some degree, but that is not required. Examples of potential uses include research facilities, laboratories, manufacturing and processing facilities, warehouses, and other facilities compatible with an airport environment.

One parcel is identified as Revenue Support. This is a 1.5-acre parcel located immediately east and adjacent to the Runway 16 RPZ. This parcel is disconnected from the Airport by Oak Street.

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 discussion is to review the proposed capital improvement program at Lebanon State Airport (Airport) to determine whether the projects identified in the Master Plan could, individually or collectively, significantly affect existing environmental resources. The information contained in this section was obtained from previous studies, official 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 and those projects receiving federal funding. For projects not categorically excluded under FAA Order 1050.1F, *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 will provide a preliminary review of environmental issues that may need to be considered in more detail within the environmental review processes. This evaluation considers all environmental categories required as outlined within FAA Order 1050.1F and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementation Instructions for Airport Actions*.

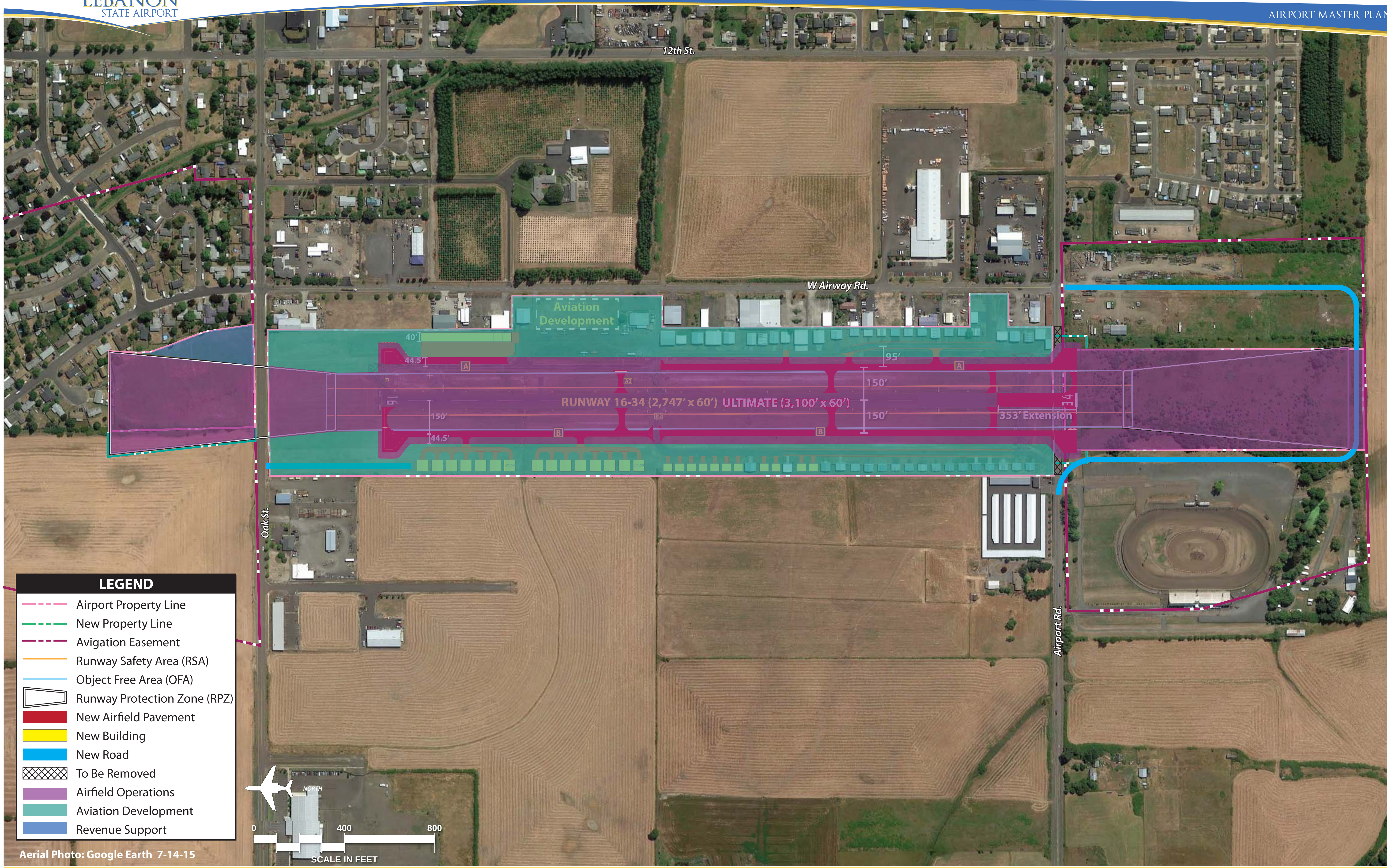


Exhibit 5C
ON-AIRPORT LAND USE PLAN

The following sections describe environmental resources which could be impacted by the proposed ultimate airport development depicted on **Exhibit 5A**. As discussed in the Environmental Inventory, it was determined that the following resources are not present with the airport environs or cannot be inventoried because they are evaluated during project implementation.

Not Present

- Coastal Resources (Coastal Barriers and Coastal Zones) – the Airport is inland and not subject to any coastal restrictions.
- Wild and Scenic Rivers – The closest Wild and Scenic River is Quartzville Creek, located 24 miles east of the airport.

Not Inventoried

- Visual Effects (including light emissions)
- Natural Resources and Energy Supply

Land use, which was discussed previously and therefore not included in this discussion, is also identified as an environmental impact category within FAA Order 1050.1F. The following sections provide a discussion of the remaining resource categories.

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 oxides (NO_x), particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb).

Based on both federal and state 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. Lebanon State Airport is located in Linn County, Oregon, which is designated as an attainment area for all federal criteria pollutants.

Planned projects at the Airport could result in temporary impacts to air quality during the planned construction projects. These include:

- Extension to the Runway 34 end;
- Removal of sections of Airport Road;
- Widening of the existing taxiway;
- Addition of a parallel taxiway;
- Addition of threshold taxiways;
- Removal of high-energy runway crossing;
- New taxiway exit;
- New Aircraft Apron Building; and
- Airway Road re-route.

Exhaust emissions from the operation of construction vehicles and fugitive dust from pavement removal are common air pollutants during construction. During evaluation of these specific projects, an emissions inventory, using on-road and off-road construction emissions models may be required.

BIOLOGICAL RESOURCES

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 and animals. Typically, development in areas such as previously disturbed airport property, populated places, or farmland would result in minimal impacts to biotic resources.

The U.S. Fish and Wildlife Service (FWS) is charged with overseeing compliance with Section 7 of the *Endangered Species Act* (ESA). This Act was put into place to protect animal or plant species whose populations are threatened by human activities. The FAA and FWS 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.

According to the U.S. Fish and Wildlife Service Information for Planning and Conservation (IPaC), there are 12 threatened or endangered species, summarized in **Table 5B**, potentially present within the vicinity of the airport. As part of the State of Oregon *Advance Aquatic Resource Plan* and Request for Letter of Permission for Selected Industrial Sites in Linn and Benton Counties, Oregon (Advance Aquatic Resource Plan), a wetland study was prepared for the Lebanon Airport Industrial Park, located immediately west of the Lebanon State Airport in 2012. As part of this project, field surveys were conducted to determine species' presence at the airport. As indicated in **Table 5B**, seven of the federally listed species as of January 2016 were not present during the field surveys. Some species, including the Marbled Murrelet, Yellow-billed Cuckoo, Bull Trout, Golden Paintbrush, and Water Howellia, were not included in the survey. This is possibly due to changes in the species list since 2012.

There are no critical habitats in this location[1].

Several of the planned projects at the Airport are on existing developed land and would not likely require field investigation prior to project implementation to determine the presence of protected species. Other projects, such as the re-route and extension of Airway Road, as well as the northern and southern end avigation easement acquisitions, may cause disturbance to areas that are currently undeveloped, natural areas. These projects may require field surveys to determine the potential presence of protected species. Coordination with the FWS and the State of Oregon Parks and Recreation Department may be necessary to determine the extent, if any, of field investigations prior to undertaking these planned improvements.

[1] U.S. Fish and Wildlife Service, January 2016.

TABLE 5B Threatened and Endangered Species Linn County, Oregon		
Species	**Status**	**Species Present at Airport**
Birds		
Northern Spotted Owl	Threatened	No
Marbled Murrelet	Threatened	Survey Not Conducted
Streaked Horned Lark	Threatened	No
Yellow-billed Cuckoo	Threatened	Survey Not Conducted
Fishes		
Bull Trout	Threatened	Survey Not Conducted
Flowering Plants		
Golden Paintbrush	Threatened	Survey Not Conducted
Bradshaw's Desert-parsley	Endangered	No
Kincaid's Lupine	Threatened	No
Water Howellia	Threatened	Survey Not Conducted
Nelson's Checker-mallow	Threatened	No
Willamette Daisy	Endangered	No
Insects		
Fender's Blue Butterfly	Endangered	No

Source:
U.S. Fish and Wildlife Service, Information for Planning and Conservation, https://ecos.fws.gov/ipac/, accessed May 2016
Advance Aquatic Resource Plan and Request for Letter of Permission for Selected Industrial Sites in Linn and Benton Counties, Oregon,
http://www.oregon.gov/dsl/Aquatic_Resource_Management/Documents/Advance%20Aquatic%20Resource%20Plan/Existing%20Conditions%20Report%20Volume%201%20FINAL.pdf

In addition to the *Endangered Species Act* (ESA), the *Migratory Bird Treaty Act* (MBTA) is also applicable at the Airport as much of the study area constitutes habitat for birds protected under the MBTA. The IPaC report for the airport lists 24 bird species that may be affected by projects at the Airport.

Birds protected under the MBTA may nest, winter, or migrate throughout the area, including those protected by the ESA. Under the requirements of the MBTA, all project proponents are responsible for complying with the appropriate regulations protecting birds when planning and developing a project. Protected migratory birds known to occur in the study area are listed in **Table 5C**.

TABLE 5C Birds Protected Under the *Migratory Bird Treaty Act* Linn County, Oregon		
Bald Eagle	Green-tailed Towee	Sage Thrasher
Black Swift	Lewis's Woodpecker	Short-eared Owl
Brewer's Sparrow	Loggerhead Shrike	Swainson's Hawk
Burrowing Owl	Long-billed Curlew	Vesper Sparrow
Calliope Hummingbird	Olive-sided Flycatcher	Western Grebe
Cassin's Finch	Peregrine Falcon	White Headed Woodpecker
Flammulated Owl	Purple Finch	Williamson's Sapsucker
Fox Sparrow	Rufous Hummingbird	Willow Flycatcher

Source: U.S. Fish and Wildlife Service, Information for Planning and Conservation, https://ecos.fws.gov/ipac/, accessed May 2016

CLIMATE

Research has shown that there is a direct link between fuel combustion and greenhouse gas (GHG) emissions. Therefore, sources that require fuel or power at an airport are the primary sources that would generate GHGs. GHGs are those that trap heat in the earth's atmosphere. They include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6). GHGs are both naturally occurring and anthropogenic (man-made). Aircraft jet engines, similar to other vehicle engines, produce CO_2, H_2O, nitrogen oxides (NO_x), carbon monoxide (CO), sulfur oxides (SO_x), volatile organic compounds (VOCs), particulates and other trace compounds. Due to its innate properties, CO_2 is the most important GHG to monitor. It remains in the atmosphere for up to 100 years, causing both short-and long-term impacts, locally and internationally. Climate change impacts include increased air temperatures, sea level rise, and more frequent and intense storms.

Similar to the air quality concerns, temporary construction activity would result in increased equipment emissions that could contribute to climate change.

DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(f)

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.

The following list summarizes the nearest properties of each type that may be protected under Section 4(f) of the DOT Act.

- Wilderness Area – Menagerie Wilderness (29 miles east).
- Historic Site Listed on the National Register – There are eight National Register of Historic Places (NRHP) properties within five miles of the Airport. None of these sites are located on or adjacent to the Airport.
- Locally Owned Public Park – Christopher Columbus Park (¾ miles southeast).
- Wildlife Refuge – William T. Finley National Wildlife Refuge (19 miles west) and Ankeny National Wildlife Refuge (18 miles north).
- Recreation Area – None within 100 miles of the Airport.
- National Marine Sanctuary – None within 100 miles of the Airport.

None of the proposed airport improvements will result in direct or indirect impacts to these properties.

FARMLANDS

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.

Information obtained from the Natural Resource Conservation Service's Web Soil Survey (NRCS-WSS) indicates that the soils at the Airport are composed of a silty loam, with the most prevalent soil type being the Clackamas variant silt loam. According to the NRCS, all of the soils which underlie the Airport property are classified as Prime Farmland or Farmland of Statewide Importance. A small section of land near the Runway 16 end, as well as areas north and east of Airport property, are soils classified as Prime Farmland if Drained.[2] These can be seen on **Exhibit 5D**.

Development of projects proposed on existing Airport property will likely be exempt from the requirements of FPPA as NRCS may consider them to be already committed to urban use. For the land affected by property acquisition, though, further coordination with NRCS may be required.

HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

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. According to *EJSCREEN*, there are no Superfund or Brownfield sites within five miles of the airport, causing no impact on proposed Airport development.

Several areas of pavement, concentrated primarily on the southern and eastern portions of the Airport, are slated for removal. Demolition of these areas will generate additional solid waste during the removal period only.

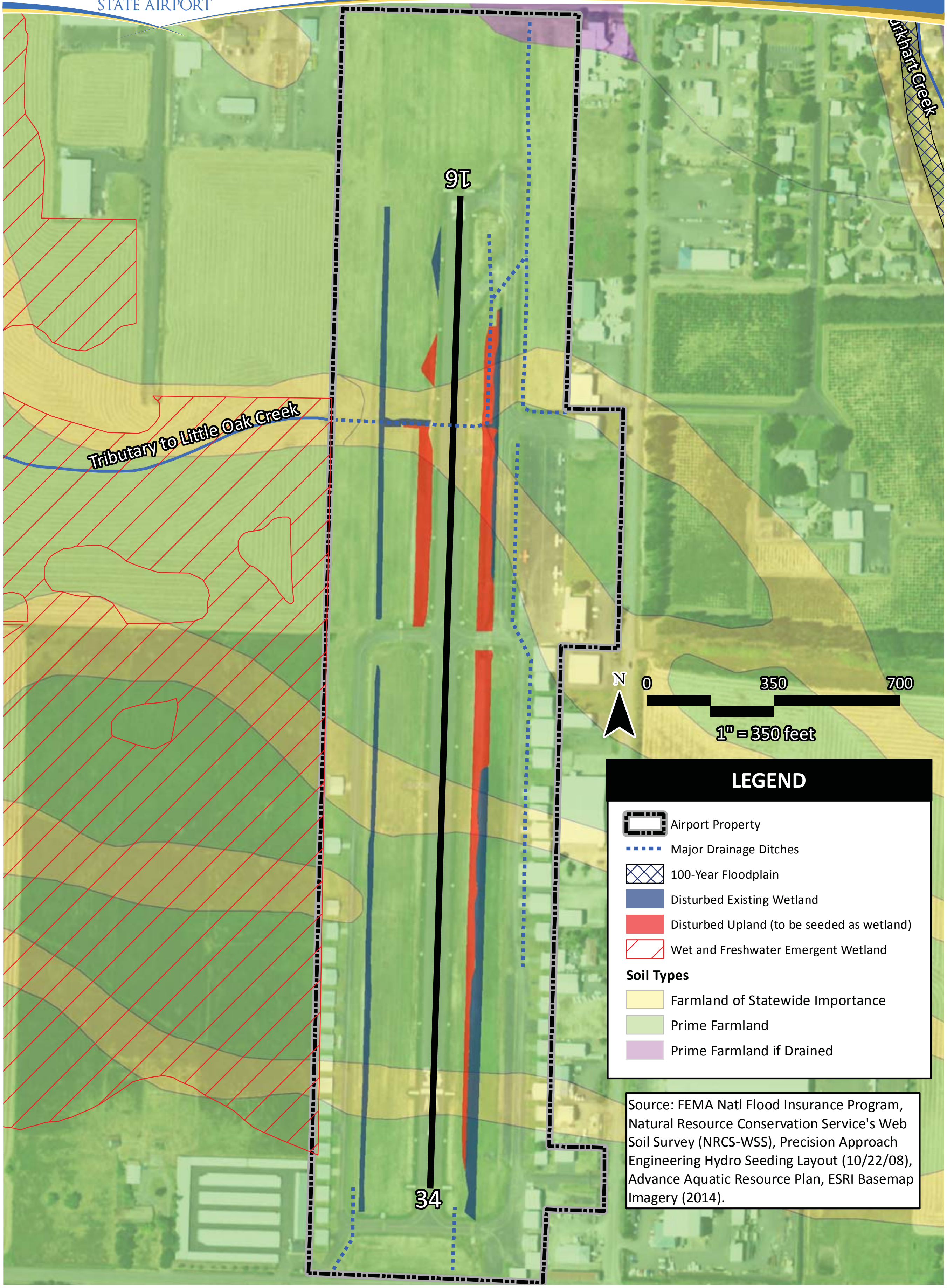
HISTORICAL, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

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 religious or cultural importance to Native American Tribes may also qualify. To satisfy the requirements of NHPA, further coordination with the Oregon State Historic Preservation Office (SHPO) may be necessary to determine the extent, if any, of field investigations prior to undertaking any of the planned improvements.

As mentioned previously, there are eight listed sites on the NRHP within five miles of the Airport including:

- Lebanon Pioneer Cemetery
- Dr. J. C. Booth House

[2] NRCS Web Soil Survey, http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx, accessed January 2016


16
Tributary to Little Oak Creek
34
N
0
350
700
1" = 350 feet
LEGEND
Airport Property
Major Drainage Ditches
100-Year Floodplain
Disturbed Existing Wetland
Disturbed Upland (to be seeded as wetland)
Wet and Freshwater Emergent Wetland
Soil Types
Farmland of Statewide Importance
Prime Farmland
Prime Farmland if Drained
Source: FEMA Natl Flood Insurance Program, Natural Resource Conservation Service's Web Soil Survey (NRCS-WSS), Precision Approach Engineering Hydro Seeding Layout (10/22/08), Advance Aquatic Resource Plan, ESRI Basemap Imagery (2014).

- Louis A. Crandall House
- Elkins Flour Mill
- Rock Hill School
- Hiram Baker House
- Lebanon Southern Pacific Railroad Depot; and
- the John and Lottie Ralston Cottage.

As part of the previously discussed Advance Aquatic Resource Plan, coordination was undertaken with the Oregon SHPO regarding available cultural resource information for each of the studied sites, including land immediately adjacent to the Airport. The response from the SHPO indicates that no previous cultural resources surveys have been conducted in the area. However, this is an area "perceived to have high probability for archeological sites and/or buried human remains."[3]

There are no proposed or planned airport improvements in the vicinity of the above eight listed properties; however, further investigation may be required to determine the likelihood of archeological sites or buried human remains that may be on the land immediately adjacent to the Airport.

NOISE AND 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, although attention is also given to wildlife attractants and community disruption.

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.

Noise exposure contours for the existing and future conditions were prepared for Lebanon State Airport based on the existing and forecast operating conditions discussed in Chapter Two using the FAA's Airport Environmental Design Tool (AEDT) software. The future noise exposure contours include the proposed runway extension to the south. As illustrated on **Exhibit 5E**, the existing and future 55, 60 and 65 DNL noise contours extend off airport property and encompass existing development. Land uses within the 55 DNL noise contours include industrial, residential and recreational land uses to the south; industrial and agricultural land uses to the east and west; and industrial, residential, and commercial land uses to the north.

As outlined in the State of Oregon Airport Land Use Compatibility Handbook, 2003, the State Department of Environmental Quality (DEQ) standards for noise control, abatement and mitigation are in-

[3] Advance Aquatic Resource Plan, June 2013

cluded in Oregon Administrative Rules Chapter 340, Division 35. The standards outline recommended mitigation methods (soundproofing, land acquisition, etc.) for noise-sensitive land uses exposed to 55 DNL and above; however, there is not currently funding available for these type of projects.

Land use compatibility also includes a consideration of wildlife attractants. Wildlife attractants include those land uses that bring wildlife into areas that can prove hazardous to aircraft operations. Wildlife attractants include landfills, wastewater treatment facilities, wetlands, agricultural crops, wildlife refuges, or any other land use that attracts wildlife. FAA AC 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports, states that wildlife attractants are hazardous if they are located within:

- 5,000 feet of an airport serving piston-powered aircraft;
- 10,000 feet of an airport serving turbine-powered aircraft; and/or
- For all airports, the FAA recommends a distance of five miles between the farthest end of the airport operating area and the hazardous wildlife attractant if the attractant can cause hazardous wildlife movement into or across the airport approach or departure airspace.

With regard to FAA AC 150/5200-33B, there are no solid waste landfills or wastewater treatment facilities within the immediate vicinity of the Airport site that would be considered wildlife attractants. The nearest solid waste landfill is the Albany-Lebanon Sanitation, Inc., located 15 miles northwest of the Airport. The area surrounding the Airport is primarily industrial, with low-density residential just north and mixed uses to the east.

SOCIOECONOMICS, 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 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 seen in **Exhibit 5A**, three tracts of land are proposed for acquisition to expand the Airport property line and enlarge the runway protection zone (RPZ), as well as accommodate the additions to Airway Road. Land to the north of the Airport, for which the state currently has an easement, would be acquired through a fee simple transaction and is not expected to result in displacement of any people or businesses. In January 2016, a market value assessment of this section of land was estimated to be $418,866. If the owner retains the right to transfer the property to wetland credits, the property would be approximately valued at $370,116.

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,

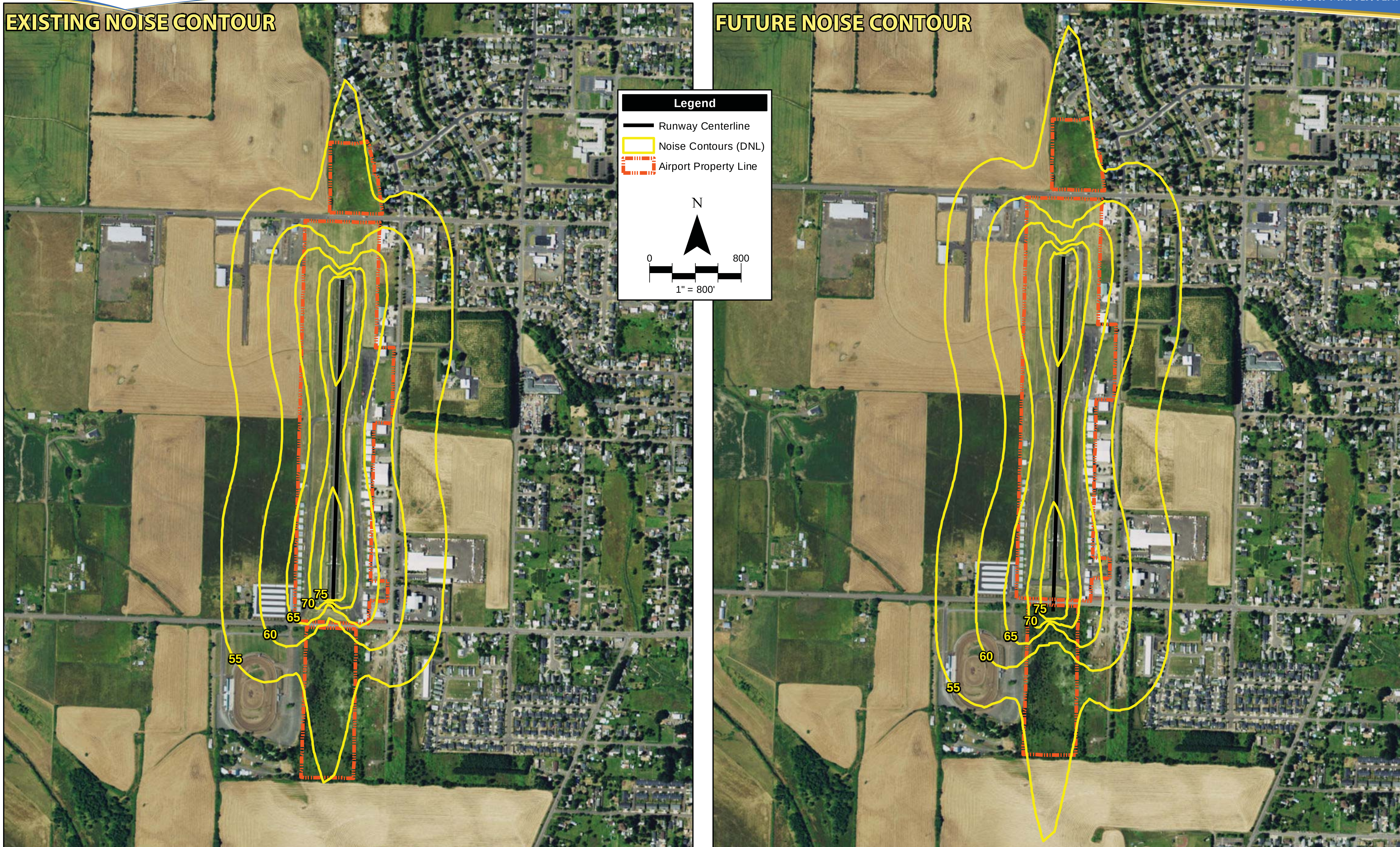


Exhibit 5E
EXISTING AND FUTURE NOISE CONTOURS

This page intentionally left blank

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. According to the EPA's *EJSCREEN*, 11 percent of the population within the Census tract encompassing the Airport is below the poverty level. Additionally, the population of the Census tract which encompasses the Airport is two percent minority. This indicates that the Airport environs does not contain high percentages (above 50 percent) of minority populations or high percentages of residents below the poverty level.

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 hazards to children.

WATER RESOURCES

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.

During construction of any of the planned improvements at the Airport it is suggested that mitigation measures from FAA Advisory Circular 150/5370-10A, *Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control*, be incorporated into project design specifications to further mitigate potential water quality impacts. These standards include temporary measures to control water pollution, soil erosion, and siltation through the use of berms, fiber mats, gravels, mulches, slope drains, and other erosion control methods.

Additionally, as development occurs at the Airport, the stormwater pollution prevention plan will need to be modified to reflect the additional impervious surfaces and any stormwater retention facilities. The addition and removal of impervious surfaces may require modifications to this plan should drainage patterns be modified.

Wetlands

According to the *Advance Aquatic Resource Plan* conducted by the State of Oregon in June of 2013, much of the land west of the Airport is identified as wetland and the report indicates the wetland area

"Continues Offsite" from the study area onto Airport property. Additionally, the report identifies the riparian corridor associated with the tributary to Little Oak Creek as a "Protection Area." The features and notes from the *Advance Aquatic Resource Plan* are depicted on Exhibit 1J. Parts of the freshwater emergent wetland would extend onto Airport property under the development proposal to extend the existing RPZ though property acquisition. However, this acquisition would cause little to no impact to the wetland as there is no ground-level construction. A portion of these wetlands can also be seen on **Exhibit 5D**.

There is also a wetland seeding plan that should be considered during the proposed improvements on Airport property, which can be seen on **Exhibit 5D**. A plan of this type shows where wetland plants will be re-seeded in an effort to propagate more species. The navy-blue shading indicates areas of disturbed existing wetland, and the red shading shows disturbed upland areas that are slated to be re-seeded. This plan will stay in place before, during, and after construction on the Airport.

Floodplains

Based on a review of Federal Emergency Management Agency (FEMA) maps dated September 29, 2010 (map numbers 41043C05665 and 41043C568G), areas designated as 100-year floodplains are located to the northeast and south of the Airport. These floodplains are associated with two small tributary creeks. None of the floodplains encroach upon the current or future Airport property. The floodplain to the northeast, along Burkhart Creek, is shown on **Exhibit 5D**; however, the one to the south cannot be seen at this map scale.

Surface Waters

According to *EJSCREEN* and the EPA MyWATERS Mapper, there are no impaired waterbodies or streams near the Airport. The closest streams are a tributary to Little Oak Creek and Little Oak Creek. Little Oak Creek runs along the southern edge of the Airport, and its tributary runs east to west, intersecting the runway. Precaution should be taken during the construction process to ensure construction by-products do not pollute the nearby water streams. Specifically, Little Oak Creek runs just south of Airport Road, where significant construction will be done creating a new road. Burkhart Creek flows northeast of the Airport. Some of these watersheds can be seen on **Exhibit 5D**.

There is a significant network of drainage ditches on Airport property that can be seen on **Exhibit 5D**. In addition, the use of standard Best Management Practices (BMPs), including those outlined within FAA Advisory Circular 150/5370-10G, *Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control,* should be implemented to avoid impacts to the drainage system at the airport.

Groundwater

Based on information available from the Groundwater Atlas of the United States, the Airport is underlain by Willamette Lowland basin-fill aquifers.[4] This type of aquifer is, "formed of volcanic and carbonate rocks and unconsolidated to consolidated basin-fill deposits. The basin-fill deposits form the most productive aquifers and are generally in individual alluvial basins that are drained internally and are separated by low mountains." Examples of direct impacts to groundwater could include withdrawal of groundwater for operational purposes or reduction of infiltration or recharge area due to new impervious surfaces. During construction, surface waters near the Airport can be subject to contamination due to runoff. Surface waters recharge groundwater supplies, potentially resulting in contamination of the Willamette Lowland aquifer. Proper on-site mitigation will need to take place during construction to reduce the amounts of contaminants that may enter the water sources nearby.

SUMMARY

A recommended development plan has been put forward that addresses future airside and landside needs. In addition, an on-airport land use has been developed.

In the future, the runway is planned to be extended by 353 feet to the south providing for a total runway length of 3,100 feet. This ultimate length is the minimum recommended length as determined utilizing FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*. Specific justification by aircraft needing the additional 353 feet in runway length will be required at the time this project is pursued. Justification is defined as 500 or more annual operations by that aircraft, or a combination of operations by several aircraft with similar characteristics. To accommodate the planned extension of the runway to the south, Airport Road will have to be relocated outside of the runway and runway protection zone environment.

Parallel Taxiways A and B are planned to be uniformly situated 150 feet from the runway centerline, which meets the separation design standard. Portions of the existing Taxiways A and B would then become access taxilanes to the existing hangar areas.

The plan includes the possibility of adding GPS instrument approaches to both ends of the runway. In order to insure RPZ compatibility, the visibility minimums are recommended at 1-mile. Instrument approaches will extend the capability of the Airport to times of poor weather conditions.

On the landside, the west side of the runway is planned to continue the existing development pattern with smaller individual box hangar development. On the east side, the terminal apron is planned to be expanded into the undeveloped grassy area adjacent to the FBO. To the northeast, a 12-unit T-hangar structure is planned. The T-hangar facility would be a new storage option for tenants and is a particularly popular one for recreational flyers.

[4] http://pubs.usgs.gov/ha/ha730/ch_h/H-text10.html, Ground Water Atlas of the United States, accessed July 2016.

The planned hangar development far exceeds the space that is forecast to be needed. Nonetheless, the layout provides a long term vision for the future direction of development at the airport.

The previous plan for the Airport considered the acquisition of approximately 23 acres to the west of the airport to accommodate additional hangar development. This Master Plan has concluded that additional property is not needed to accommodate even very long term hangar growth. Therefore, the previously planned acquisition of 23 acres to the west has not been carried over to this Master Plan.

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.

LEBANON
STATE AIRPORT

Chapter Six

CAPITAL IMPROVEMENT PROGRAM

CHAPTER SIX

CAPITAL IMPROVEMENT PROGRAM

The analyses completed in previous chapters evaluated development needs at the Lebanon State 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 three 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. Third is a section covering airport compliance.

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 associated costs for the plan. 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. Those short term projects that include multiple phases for environmental documentation, design, and construction have been separated into the yearly increments. **Table 6A** summarizes key activity milestones for the three planning horizons.

TABLE 6A
Planning Horizon Summary
Lebanon State Airport

	Base Year 2015	Short Term	Intermediate Term	Long Term
BASED AIRCRAFT	52	57	60	65
ANNUAL OPERATIONS				
General Aviation				
Itinerant	6,800	7,200	7,600	8,200
Local	5,000	5,300	5,500	6,000
Air Taxi				
Itinerant	400	400	400	400
TOTAL OPERATIONS	**12,200**	**12,900**	**13,500**	**14,600**
Source: Coffman Associates analysis				

A key aspect of this Master Plan is the use of demand-based planning milestones; however, future aviation demand is limited. Therefore, the majority of the projects identified are the result of meeting current FAA design standards for safety and performing anticipated maintenance and rehabilitation of the airfield pavements. The long term plan includes siting of new hangars. For purposes of this Master Plan, all future hangar construction is assumed to be undertaken by private developers. The airport sponsor's responsibility, related to new hangars, is to provide public access taxilanes, typically in conjunction with FAA development grants.

The airport sponsor can construct hangars and act as the lessor, as they do on the existing ODA owned hangar (E2). The economics of hangar construction and leasing over the last decade have made it difficult to amortize a 20-year loan on facilities while charging a reasonable monthly rent. Therefore, local airport sponsors across the country are increasingly relying on private developers to build facilities at airports. Nonetheless, some airport sponsors see a benefit to building hangar facilities in order to stimulate aviation activity and business development, even if the monthly rents have to be subsidized to some degree. Naturally, this will be a local decision, and nothing in this Master Plan and development schedule should be construed to indicate that only private developers can construct facilities at the Airport.

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.

At this juncture, it is difficult to know, precisely, what the cost of individual projects will be; however, preparing order-of-magnitude cost estimates is an effective way to get a feel for the current costs. Many federal agencies utilize a system of five classes of estimates, as presented in **Table 6B**. The Master Plan scope limits cost estimates to Class 5.

TABLE 6B Cost Estimate Classification			
Estimate Class	**Name**	**Purpose**	**Project Definition Level**
Class 5	Order-of-Magnitude	Screening or Feasibility	0% to 2%
Class 4	Intermediate	Concept Study or Feasibility	1% to 15%
Class 3	Preliminary	Budget, Authorization, or Control	10% to 40%
Class 2	Substantive	Control or Bid/Tender	30% to 70%
Class 1	Definitive	Check Estimate or Bid/Tender	50% to 100%
Source: U.S. Department of Energy			

Once the list of necessary projects was identified and refined, project-specific cost estimates were developed. The cost estimates include environmental documentation, 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 were developed based on recent airport construction costs in the region. Cost estimates for each of the development projects in the CIP are in current (2016) dollars. **Exhibit 6A** presents the proposed CIP for Lebanon State Airport. **Exhibit 6B** presents the CIP overlaid onto the airport aerial photograph and broken out into planning horizons.

The project cost estimates include engineering and design (12 percent), construction inspection and administration (13 percent), contingency (15 percent), and where not specifically called out, environmental documentation (e.g., Categorical Exclusion). Also included are other potential impacts of a project such as drainage improvement, lighting, signage, and pavement marking)

Most, but not all, of the projects identified are eligible for FAA grant funding because this Master Plan follows FAA guidelines and focuses on those projects that are eligible for FAA grant funding. There are a variety of capital expenses that the Airport will have that are not eligible for FAA funding and which are not presented in great detail in this CIP.

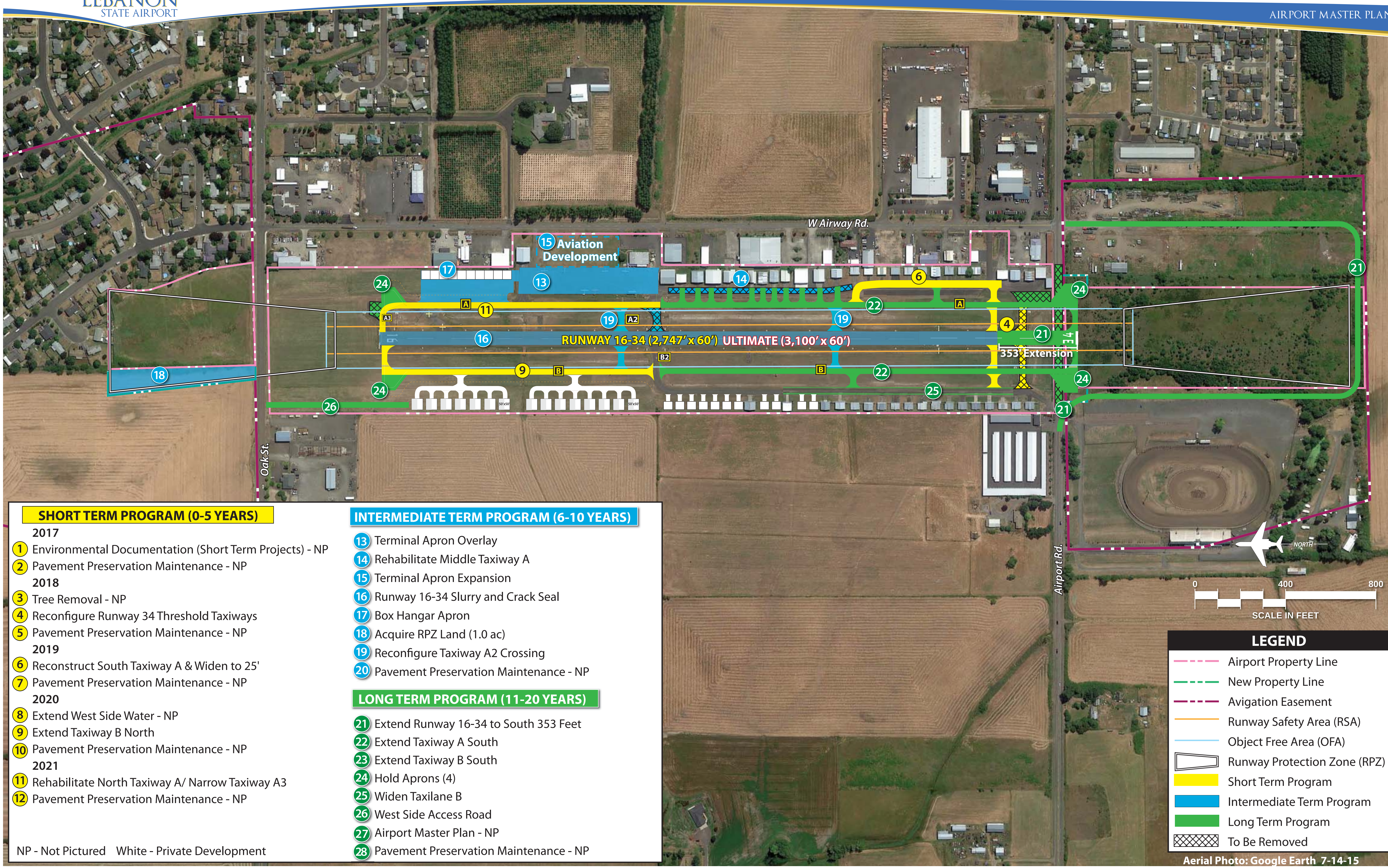
The FAA utilizes a national priority ranking system to help objectively evaluate potential airport projects. Projects are weighted toward safety, infrastructure preservation, standards, and capacity enhancement. The FAA will participate in the highest priority projects before considering lower priority projects, even if a lower priority project is considered a more urgent need by the local sponsor. Nonetheless, the project should remain a priority for the Airport and funding support should continue to be requested in subsequent years.

On an annual basis, the CIP is updated and reviewed with the FAA.

The most important feature of the CIP is that future projects for which the Airport may request FAA funding are included on the list. On an annual basis, the CIP is updated and reviewed with the FAA.

	PROJECT DESCRIPTION	PROJECT COST	FAA ELIGIBLE	LOCAL SHARE
SHORT TERM PROGRAM (0 - 5 YEARS)				
2017				
1	Environmental Documentation (Short Term Projects)	$200,000	$180,000	$20,000
2	Pavement Preservation Maintenance	$10,000	$0	$10,000
2017		***$210,000***	***$180,000***	***$30,000***
2018				
3	Tree Removal	$30,000	$27,000	$3,000
4	Reconfigure Runway 34 Threshold Taxiways	$600,000	$540,000	$60,000
5	Pavement Preservation Maintenance	$10,000	$0	$10,000
2018		***$640,000***	***$567,000***	***$73,000***
2019				
6	Reconstruct South Taxiway A & Widen to 25'	$380,000	$342,000	$38,000
7	Pavement Preservation Maintenance	$10,000	$0	$10,000
2019		***$390,000***	***$342,000***	***$48,000***
2020				
8	Extend West Side Water	$100,000	$0	$100,000
9	Extend Taxiway B North	$850,000	$765,000	$85,000
10	Pavement Preservation Maintenance	$10,000	$0	$10,000
2020		***$960,000***	***$765,000***	***$195,000***
2021				
11	Rehabilitate North Taxiway A/ Narrow Taxiway A3	$960,000	$864,000	$96,000
12	Pavement Preservation Maintenance	$10,000	$0	$10,000
2021		***$970,000***	***$864,000***	***$106,000***
TOTAL SHORT TERM PROGRAM		**$3,170,000**	**$2,718,000**	**$452,000**
INTERMEDIATE TERM PROGRAM (6-10 YEARS)				
13	Terminal Apron Overlay	$500,000	$450,000	$50,000
14	Rehabilitate Middle Taxiway A	$440,000	$396,000	$44,000
15	Terminal Apron Expansion	$770,000	$693,000	$77,000
16	Runway 16-34 Slurry and Crack Seal	$250,000	$225,000	$25,000
17	Box Hangar Apron	$710,000	$639,000	$71,000
18	Acquire RPZ Land (1.0 ac)	$40,000	$36,000	$4,000
19	Reconfigure Taxiway A2 Crossing	$440,000	$396,000	$440,000
20	Pavement Preservation Maintenance	$50,000	$0	$50,000
TOTAL INTERMEDIATE TERM PROGRAM		**$3,200,000**	**$2,835,000**	**$761,000**
LONG TERM PROGRAM (11-20 YEARS)				
21	Extend Runway 16-34 to South 353 Feet	$6,600,000	$5,940,000	$660,000
22	Extend Taxiway A South	$980,000	$882,000	$98,000
23	Extend Taxiway B South	$800,000	$720,000	$80,000
24	Hold Aprons (4)	$440,000	$396,000	$44,000
25	Widen Taxilane B	$250,000	$225,000	$25,000
26	West Side Access Road	$405,000	$364,500	$40,500
27	Airport Master Plan	$360,000	$324,000	$36,000
28	Pavement Preservation Maintenance	$100,000	$0	$100,000
TOTAL LONG TERM PROGRAM		**$9,935,000**	**$8,851,500**	**$1,083,500**
TOTAL PROGRAM COSTS (Rounded to nearest $1,000)		**$16,305,000**	**$14,405,000**	**$2,297,000**

Note: Totals may not equal due to rounding



SHORT TERM PROGRAM (0-5 YEARS)

2017
1. Environmental Documentation (Short Term Projects) - NP
2. Pavement Preservation Maintenance - NP

2018
3. Tree Removal - NP
4. Reconfigure Runway 34 Threshold Taxiways
5. Pavement Preservation Maintenance - NP

2019
6. Reconstruct South Taxiway A & Widen to 25'
7. Pavement Preservation Maintenance - NP

2020
8. Extend West Side Water - NP
9. Extend Taxiway B North
10. Pavement Preservation Maintenance - NP

2021
11. Rehabilitate North Taxiway A/ Narrow Taxiway A3
12. Pavement Preservation Maintenance - NP

NP - Not Pictured White - Private Development

INTERMEDIATE TERM PROGRAM (6-10 YEARS)

13. Terminal Apron Overlay
14. Rehabilitate Middle Taxiway A
15. Terminal Apron Expansion
16. Runway 16-34 Slurry and Crack Seal
17. Box Hangar Apron
18. Acquire RPZ Land (1.0 ac)
19. Reconfigure Taxiway A2 Crossing
20. Pavement Preservation Maintenance - NP

LONG TERM PROGRAM (11-20 YEARS)

21. Extend Runway 16-34 to South 353 Feet
22. Extend Taxiway A South
23. Extend Taxiway B South
24. Hold Aprons (4)
25. Widen Taxilane B
26. West Side Access Road
27. Airport Master Plan - NP
28. Pavement Preservation Maintenance - NP

LEGEND

- Airport Property Line
- New Property Line
- Avigation Easement
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Short Term Program
- Intermediate Term Program
- Long Term Program
- To Be Removed

Exhibit 6B
DEVELOPMENT STAGING

This page intentionally left blank

Projects on the CIP will be moved up and down depending on priority and funding availability. Periodically, new projects will arise that can then be added to the annual CIP presented to the FAA.

The following sections will describe in greater detail the projects identified for the Airport over the next 20 years. The short term (0-5 years) projects are presented in yearly increments. The intermediate (years 6-10) and long-term (years 10-20) are grouped by local priority.

SHORT TERM IMPROVEMENTS

The projects identified for the short term planning period have been prioritized based on airport need and potential to be funded. If any of these projects cannot be funded in the time frame indicated, ODA should consider the project for the following year.

2017 Projects

Any project at the Airport will require a certain level of environmental documentation prior to implementation. Generally, projects that are maintaining or updating existing infrastructure will require a Categorical Exclusion (CatEx). Projects that involve new construction on undeveloped property will typically require a more in-depth Environmental Assessment (EA). Ultimately, it is the FAA that will make the determination as to what level of environmental documentation is necessary; however, experience gives an indication as to what is most likely needed.

Several of the projects considered for the short term planning period would involve new construction on currently undisturbed property. It is assumed this will trigger the need for an EA, which is the first project considered. While it is possible to undertake environmental documentation for each individual project, in this case it is recommended that the EA include all relevant short term projects in order to be more cost-effective. An EA is typically considered valid for a duration of three years; however, it may simply be updated in certain cases to validate past assumptions to extend its application.

Ongoing maintenance of pavement surfaces is an important consideration for any airport. Airports included in the NPIAS, such as Lebanon State Airport, are required to maintain the useful life of the pavements as a condition of Federal Grant Assurances. To this end, a placeholder is included for each year of the CIP. While $10,000 is included for this purpose, in some years it could be more and in others it may be less. ODA can and does continually monitor pavement condition and prioritizes regular maintenance as necessary.

2018 Projects

A survey of airport property was undertaken in accordance with FAA AC 18B, *General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and GIS Standards*. This data was used to develop the Airport Layout Plan for the airport. Several trees were shown to penetrate the 20:1 Part 77 approach surfaces (see ALP set sheets 5 and). None of these trees penetrate the existing threshold siting surface. All of the trees are on land wither owned in fee by the airport or are within an existing avigation easement. A project is included to trim the trees.

The second project in this timeframe is the reconfiguration of the threshold entrance taxiways leading to Runway 34. This project is necessary to meet current geometry design standards which discourage lead-in taxiways, as exist today, and encourage the more typical 90-degree threshold taxiways. Threshold Taxiways A1 and B1 are planned to be removed and replaced with new threshold taxiways that connect to the actual runway end, approximately 120 feet to the north. The lead-in taxiway and the existing Taxiway A1 and B1 are planned to be removed.

The apron area providing access to the several hangars in the southeast corner of the airfield is planned to remain in place to additionally serve as a run-up area. This is necessary because there is not enough clearance to include a standard hold (run-up) apron adjacent to the new threshold taxiways. A standard hold apron would allow one aircraft to perform run-up activity while another may proceed directly to the runway without delay. Standard hold aprons are planned in the long term in conjunction with the runway extension.

2019 Projects

The south portion of existing Taxiway A is in poor condition and is only 20 feet wide, where the design standard is 25 feet in width. This project considers reconstruction of this portion of Taxiway A and widening to 25 feet.

2020 Projects

One of the goals of a Master Plan is to support requests for federal grants, however, some potential projects necessary to support future growth and development are not eligible for federal grant funding. One such project is the need to extend various utilities, most especially water lines, to the west side of the Airport.

Currently, water lines only extend to approximately half of the existing west side hangars. This project would extend the waterline the length of the west side of the Airport. This is necessary for fire protection purposes and to accommodate new hangars. As this project would serve revenue producing facilities (i.e., hangars), it is not eligible for federal grant participation.

The next project is the planned extension of Taxiway B to the north runway threshold. This project would have many benefits, including providing access to hangar development areas and eliminating the need for runway crossings. The taxiway would traverse the west side of the Airport, much of which is environmentally sensitive as a wetland. Some mitigation will likely be required but is not included in the cost estimate.

2021 Projects

The last project considered in the short term planning period is to rehabilitate the north portion of Taxiway A and to bring threshold Taxiway A3 up to current design standards. This project would involve a two-inch mill and overlay of the taxiway. The existing hold apron would be removed because its location beyond the runway end is non-standard. Taxiway A3 would be narrowed to 25 feet to meet standard. While not included in this project, a replacement hold apron to the side of Taxiway A could be considered as well. The reason the hold apron is not initially included is because the relatively low activity levels at the Airport likely do not justify federal financial participation.

Short Term Summary

The short term projects total approximately $3.17 million. It is estimated that $2.72 million would be eligible for FAA grant participation. The local matching share is $452,000.

INTERMEDIATE TERM IMPROVEMENTS

In order to provide maximum flexibility for management when programming capital improvement projects, the intermediate term projects have been grouped and generally include those projects that may be needed in years six through ten. Airport management should regularly assess the need and timing for these projects based on actual demand and growth at the Airport. The cost of environmental documentation is included in the cost of the intermediate term projects; however, the airport should be aware that environmental planning may need to occur at least a year prior to project implementation.

The first project in the intermediate term is an overlay of the terminal apron. As with other overlay projects, the condition of the pavement is the trigger.

The next project is to rehabilitate the middle portion of Taxiway A with an asphalt mill and overlay.

During the intermediate planning horizon, Runway 16-34 will be in need of a slurry seal. The last major rehabilitation for the runway was in 2010, so by the intermediate term the surface will be more than 15 years old.

The next project considered is the construction of an apron area to provide access to a planned box hangar facility to be located at the north end of the terminal apron. This project should only be pursued if there is an imminent need for this type of aircraft storage facility. Since ODA is not actively looking to construct hangars, this project would rise in priority when a private developer shows interest. As a general rule of thumb, small connected box hangars currently cost approximately $50,000 per unit. Thus, the nine-unit facility considered would be approximately $350,000.

There is a small 1.0-acre portion of the RPZ at the north end of the Airport that is not owned by the Airport. This land is privately owned and is currently used for crop production, which is a compatible land use. While not an urgent need, if the property were to become available, the ODA should consider acquisition.

The final project in the intermediate term is reconfiguration of the mid-field taxiway crossing (Taxiways A2 and B2). This crossing does not meet current design standards in two important respects:

1) Taxiway A2 allows for direct access from the terminal apron to the runway, and
2) Taxiway A2 and B2 constitute a runway crossing within the high-energy portion of the runway (middle third).

Taxiways A2 and B2 are planned to be removed. Two new runway crossings are then planned to replace them. The first runway crossing taxiway is approximately 300 feet to the north of the existing crossing. This taxiway would connect with the new parallel Taxiway B that was previously planned as a short term project. If the Taxiway B extension has not already been constructed, then a portion of parallel taxiway B will need to be constructed in conjunction with this project.

The second runway crossing is located approximately 850 feet to the south of the existing runway crossing. This distance would place the new crossing taxiway at a location that would be outside the high-energy portion of the runway after the extension of the runway. As currently planned, the south crossing taxiway would connect to the existing Taxiways A and B. Both of these are planned to be reconstructed at a separation distance from the runway of 150 feet in the future, therefore a portion of the planned runway crossing taxiway may have to be removed in the future. If the relocated parallel taxiways are already in place, then the south crossing taxiway would only have to connect to them. The cost estimate associated with this project includes drainage improvements, taxiway signage relocation, taxiway edge reflector installation, as well as engineering, design, engineering, construction, and contingencies.

Intermediate Term Summary

The intermediate planning horizon projects are grouped together with no specific implementation date other than sometime in years 6-10. This is to provide maximum flexibility to ODA when they consider annual adjustment to the CIP. If priorities change, any of these projects could be shifted to the short term or extended to the long term.

The intermediate term projects total approximately $3.20 million. Of this total, $2.84 million is eligible for FAA grant funding. The remaining $761,000 would be the responsibility of ODA.

LONG-TERM IMPROVEMENTS

Long-term projects are those planned for years 11-20. These projects are grouped as demand could shift over time. The need for these projects could be accelerated if exceptional growth occurs at the

Airport. All relevant cost elements including environmental documentation, design, and construction are included for each project.

The major project considered for the long term planning horizon is the 353-foot extension of the runway to the south. This will bring the total runway length to 3,100 feet, which is in line with FAA standards. Federal participation in the extension will require specific justification of need. Justification is defined as 500 or more annual operations by an aircraft or a family of aircraft with similar operating characteristics that needs the additional length currently.

As part of the project, Airport Road would need to be relocated around the RPZ, as shown on **Exhibit 6B**. Because the road relocation is required as part of the runway extension, it would be eligible for federal grant funding. The route shown is the maximum that would likely be eligible for funding; if a different route were desired, then the additional cost would be the responsibility of the local airport sponsor (ODA).

At some point in the long term, the south portion of Taxiways A and B will need to be reconstructed. The plan considers relocating both of these taxiway segments to the standard 150-foot separation distance from the runway. In association with these projects are several stub taxiways to provide access to existing hangar areas.

A placeholder has been included in the long term plan for the construction of up to four aircraft hold aprons to be located at the end of each parallel taxiway. Future activity levels forecast in this Master Plan do not provide justification for the hold aprons. ODA should continue to monitor operations to determine if the need for hold aprons develops over time.

A portion of the existing Taxiway B is only 20 feet wide, where the design standard is 25 feet. A project is included to widen the taxiway to meet the standard. This project is best suited for the time when this portion of Taxiway B needs to be reconstructed.

As hangar development extends along the west side of the extension of Taxiway B, a new access road is planned to extend from Oak Street.

Over time, the assumptions used to develop this Master Plan can change, and airport planning must be a continuous and ongoing process. To that end, a placeholder is included in the long term planning horizon for an update to the Airport Master Plan.

Long Term Summary

The long term projects include extension of the runway to a total length of 3,100 feet. This project should only be pursued when adequate justification, defined by the FAA as 500 current annual operations by aircraft that need the extra length, is provided. Other projects include reconstruction of the south portions of Taxiways A and B at a separation distance of 150 feet. Ultimately, a Master Plan update should be undertaken to address changes to the local or national aviation environment.

The long term projects total approximately $9.94 million. Of this total, approximately $8.85 million is eligible for federal grant funding. The remaining $1.09 million would be the matching share from the airport sponsor.

CAPITAL IMPROVEMENT SUMMARY

The CIP is intended as a road map of airport improvements to help guide the airport sponsor, FAA, and state aviation officials on needed projects. The plan as presented will meet the forecast demand over the next 20 years and, in many respects, beyond. The first five years of the CIP are separated into yearly installments, and the intermediate and long term projects are grouped together. It should be noted that the sequence of projects will likely change due to availability of funds or changing priorities in the years to come. Nonetheless, this is a comprehensive list of capital improvement projects the Airport should consider in the next 20 years.

The total 20-year CIP proposes approximately $16.31 million in airport development. Of this total, approximately $14.41 million would be eligible for FAA grant funding. The local funding requirement for the proposed 20-year CIP is $2.30 million.

CAPITAL IMPROVEMENT FUNDING SOURCES

There are generally four sources of funds used to finance airport development: airport cash flow, revenue and general obligation bonds, federal/state/local grants, and passenger facility charges (PFCs), which are reserved for commercial service airports. Access to these sources of financing varies widely among airports, with some large airports maintaining substantial cash reserves and most small commercial service and general aviation airports often requiring subsidies from local and state governments to fund operating expenses and to finance modest improvements.

Financing capital improvements at the Airport will not rely solely on the financial resources of the Airport or the taxpayers. Capital improvement funding is available through various grant-in-aid programs on both the state and federal levels. Historically, Lebanon State 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 Lebanon State 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, the *FAA Modernization and Reform Act of 2012*, was enacted on February 17, 2012

The law authorizes the FAA's Airport Improvement Program (AIP) at $3.35 billion for fiscal years 2012 through 2015. The AIP is funded through the collection of user fees such as those imposed on airline tickets, aircraft parts, and aviation fuel. Eligible airports, which include those in the *National Plan of Integrated Airport Systems* (NPIAS) such as Lebanon State Airport, can apply for airport improvement grants. **Table 6C** presents the approximate distribution of the AIP funds. Currently, Lebanon State Airport is eligible to apply for grants which may be funded through state apportionments, the small airport fund, and/or discretionary categories.

Funding for AIP-eligible projects is undertaken through a cost-sharing arrangement in which FAA provides up to 90 percent of the cost and the airport sponsor invests the remaining 10 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.

TABLE 6C
Federal AIP Funding Distribution

Funding Category	Percent of Total	Funds*
Apportionment/Entitlement		
Passenger Entitlements	29.19%	$977,865,000
Cargo Entitlements	3.00%	$100,500,000
Alaska Supplemental	0.65%	$21,775,000
State Apportionment for Nonprimary Entitlements	10.35%	$346,725,000
State Apportionment Based on Area and Population	9.65%	$323,275,000
Carryover	10.77%	$360,795,000
Small Airport Fund		
Small Hubs	1.67%	$55,945,000
Nonhubs	6.68%	$223,780,000
Nonprimary (GA and Reliever)	3.34%	$111,890,000
Discretionary		
Capacity/Safety/Security/Noise	11.36%	$380,560,000
Pure Discretionary	3.79%	$126,965,000
Set Asides		
Noise	8.40%	$281,400,000
Military Airports Program	0.99%	$33,165,000
Reliever	0.16%	$5,360,000
Totals	100.00%	$3,350,000,000

* FAA *Modernization and Reform Act of 2012*

AIP: Airport Improvement Program
Source: FAA Order 5100.38C, Airport Improvement Program Handbook

Apportionment (Entitlement) Funds

Federal AIP funds are distributed each year by the FAA from appropriations by Congress. A portion of the annual distribution is to primary commercial service airports based upon minimum enplanement levels of at least 10,000 passengers annually. If the airport exceeds the enplanement threshold, then it receives a minimum of $1 million. Other entitlement funds are distributed to cargo service airports, states and insular areas (state apportionment), and Alaska airports.

General aviation airports included in the NPIAS can receive up to $150,000 each year in Non-Primary Entitlement (NPE) funds. These funds can be carried over and combined for up to four years, thereby allowing for completion of a more expensive project. In the past, Lebanon State Airport has received NPE funding.

The states also receive an apportionment based on a federal formula that takes into account area and population. The FAA then distributes these funds for projects at various airports throughout the state.

Small Airport Fund

If a large or medium hub commercial service airport chooses to institute a passenger facility charge (PFC), which is a fee of up to $4.50 on each airline ticket, for funding of capital improvement projects, then their apportionment is reduced. Part of the reduced apportionment goes to the small airport fund. The small airport fund is reserved for small-hub primary commercial service airports, non-hub commercial service airports, and general aviation airports. Lebanon State Airport is eligible for funds from this source.

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; however, 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.

Set-Aside Funds

Portions of AIP funds are set-asides designed to achieve specific funding minimums for noise compatibility planning and implementation, select former military airfields (Military Airport Program), and select reliever airports. Lebanon State Airport is not eligible for these set-aside funds.

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 Airport Traffic Control Towers (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. The Airport owns the PAPI-2L visual approach aids.

STATE AID TO AIRPORTS

The State of Oregon recognizes the valuable contribution to the state's transportation economy that airports make. Therefore, the Oregon Department of Aviation administers several programs to help maintain airports in the state. As a state owned airport, the CIP for Lebanon State Airport is managed by the ODA. The CIP for Lebanon must be balanced with the needs of the other 29 state-owned airports. The combined CIPs for all state-owned airports far exceeds the available funds; therefore, some projects identified may be deferred. ODA also looks to local communities to participate financially, when feasible, for certain priority projects.

Pavement Maintenance Program (PMP)

The PMP program is a state-funded aid program intended to assist airports in undertaking preventative maintenance. A local match is required depending on the category of the airport as defined in the *Oregon Aviation Plan*. The most recent recommended match for Lebanon State Airport, was 10 percent. ODA (through a subcontractor) inspects approximately 66 Oregon airports on a rotating 3-year basis, including Lebanon State Airport, for pavement condition. This database of information helps airports meet FAA grant assurances for maintaining airport pavements. A portion of each airport's annual NPE funds from the FAA is typically applied to the PMP program.

Financial Assistance to Municipalities (FAM)

The Oregon Department of Aviation's *FAM Grant Program* is designed to fund planning, development, and capital improvements at airports across the state. Oregon municipalities meeting certain criteria are eligible to apply for these grants. These grants are capped at $25,000 and can be used for matching FAA grants or other projects not generally eligible for FAA funding. A local match is required which is 10 percent for Lebanon State Airport. Eligible projects are ranked and selected on a system-wide priority basis.

House Bill 2075 was passed by the Oregon Legislature in 2015. This bill raised the aircraft fuel tax by two cents per gallon for both Jet A and AvGas. Jet A is now set at $0.03 per gallon and AvGas is set at $0.11 cents per gallon. The law became effective on January 1, 2016 and is scheduled to sunset January 1, 2022. The additional funds are distributed by ODA as part of the FAM program. The following appropriation guidelines were provided in the bill:

- 5% for administration and of the remaining 95%;
- 50% for the Critical Oregon Airport Relief Program (COAR)
- 25% for the Rural Oregon Aviation relief Program (ROAR)
- 25% for State Owned Airport Reserve Program (SOAR)

COAR funds are to be distributed for the following purposes:

1) FAA grant match requirements;
2) Emergency preparedness and infrastructure projects in accordance with the Oregon Resilience Plan including seismic studies, emergency generators, etc.
3) To make grants for:
    - Services critical or essential to aviation including, but not limited to, fuel, sewer, water, and weather equipment.
    - Aviation-related business development including, but not limited to, hangars, parking for business aircraft, and related facilities.
    - Airport development for local economic benefit including, but not limited to, signs and marketing.

In 2016, ODA distributed approximately $1.7 million in COAR funds.

ROAR funds are targeted toward promotion and development of commercial air service to rural Oregon communities. Applicants for ROAD funds must submit a business plan to ODA for evaluation. The State Aviation Board will make a final determination for project funding. The State Aviation Board may also approve an emergent grant through ROAR if a communities' air service program has been jeopardized by unforeseen developments (i.e. potential loss of an air service provider, short-fused need for a grant for assisting with adding new service).

SOAR funds are directed toward improvement projects at state owned airports. In 2016, approximately $1.2 million was allocated for SOAR projects.

Statewide Capital Improvement Program (SCIP)

State aviation agencies in Oregon, Washington, and Idaho work with the FAA's Seattle Airports District Office (ADO) to streamline the application and distribution process for FAA participation on capital improvement projects. The consolidated SCIP is the primary tool used by FAA, state agencies, and local airport sponsors to prioritize funding. The benefits of the SCIP program have been numerous and include:

- Increased predictability, consistency, efficiency, and confidence levels among the FAA, state aviation agencies, and airport sponsors relative to the prioritization and distribution of airport capital improvement funds (both federal and state).
- Helps to identify where planning and resources may be needed to accurately reflect the needs of the individual state airport systems.
- Enhanced customer service for airport sponsors, including a primary point-of-contact within each state aviation department for CIP-related matters.
- A more sustainable airport system.
- Maximizes FAA grants for projects needed in each individual state.

The program is focused on prioritization and distribution of AIP funds from the FAA for the benefit of NPIAS airports in the state. By coordinating eligible capital projects at NPIAS airports across the state, ODA is able to actively retain federal aviation grant funds for airports in the state. In the past, if an airport did not have a capital project identified for a specific year, then those funds would be returned to FAA and potentially used outside of the state. The SCIP program allows for shifting of funds from one airport to another in the state, thus retaining those in the state.

OTHER CAPITAL FUNDING SOURCES

*Connect*Oregon

*Connect*Oregon is a lottery-backed bond initiative to invest in air, rail, marine, transit, and bicycle/pedestrian infrastructure to ensure Oregon's transportation system is strong, diverse, and efficient. In 2005, the Oregon Legislature created the Multimodal Transportation Fund to invest in air, marine, rail, and public transit infrastructure improvements. The legislature authorized issuance of $100 million in lottery-backed revenue bonds to fund the program in each of the 2005-07, 2007-09, and 2009-11 biennia. Additionally, funding of $40 million, $42 million, and $45 million was authorized in 2011, 2013, and 2015 respectively. The program has also leveraged more than $605 million of private investment as well as investments from other public resources.

*Connect*Oregon projects are eligible for up to 70 percent of project costs for grants. A minimum 30 percent cash match is required from the recipient for all grant-funded projects. Projects eligible for funding from state fuel tax revenues (Section 3a, Article IX of the Oregon Constitution, the Highway Trust Fund), are not eligible for *Connect*Oregon funding. If a highway or public road element is essential to the complete functioning of the proposed project, applicants are encouraged to work with their ODOT region, city, or county to identify the necessary funding sources.

The first installment of this program (*Connect*Oregon I) provided $100 million for 43 projects. The program was renewed at similar funding levels in both 2007 (*Connect*Oregon II) and 2009 (*Connect*Oregon III). The *Connect*Oregon program was renewed in 2011 with an allocation of $40 million. In 2013, ConnectOregon was allocated $43 million.

While *Connect*Oregon III included a commitment to set aside at least five percent of the total for rural airports in the state, *Connect*Oregon IV did not have this provision. Therefore, aviation projects are now competing with all other applicants for development funds. A local match of at least 20 percent is required if a grant application is approved.

Funding for the program is from lottery-based bonds, sold by the Oregon Department of Administrative Services, deposited into Oregon's Multimodal Transportation Fund, and administered by the Oregon Department of Transportation Local Government Section. Projects eligible for Oregon's Highway Fund are not eligible for *Connect*Oregon, which gives aviation projects less competition for funding (Oregon Department of Aviation).

Of the 43 projects funded under *Connect*Oregon I, 10 were aviation projects. Projects included runway relocation, runway extension, air cargo facilities, maintenance facilities, terminal improvements, and aircraft services and fueling. Funding also went to a multi-region project of installing Automatic Dependent Surveillance – Broadcast (ADS-B) transceivers at various airports in the state. *Connect*Oregon II received 70 applications, of which 30 were approved. Ten of the 30 were aviation-related projects. *Connect*Oregon III received 80 applications. Ten of the 41 approved projects were aviation-related.

A total of 65 applications were received for *Connect*Oregon IV development funds. The total funds requested are nearly $78 million.

*Connect*Oregon V was funded at $42 million by the Oregon Legislature. A total of 104 applications were received, 27 of which were for aviation-related projects. Fifteen aviation-related projects were accepted and received a total of $6.6 million.

*Connect*Oregon VI was appropriated $45 million. A total of 78 applications with a project value of $91.5 million were received. Of the 78 applications, 25 were aviation-related.

ODA has sought and received funding from *Connect*Oregon in the past, specifically for a new control tower at Aurora State Airport. ODA typically will have a Board member sit on the *Connect*Oregon evaluation committee, which adds complexity to the process. Therefore, ODA has only sought *Connect*Oregon funds on a limited basis.

GENERAL FUND TRANSFERS

The Oregon Legislature can appropriate funds for specific capital projects at state-owned airports. This has been rare and nonexistent in the years since the Great Recession of 2008.

BONDING

A variety of bonding options may be available to the state in order to finance airport capital improvements. To date, ODA has not issued bonds for specific airport projects.

LEASEHOLD FINANCING

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 airport sponsor 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.

FUNDING PLAN

The underlying strategy used to develop the funding plan of the CIP is to apply the maximum anticipated AIP entitlement funding to eligible project costs. To that, the local matching share is added and then the anticipated maximum NPE funds are applied. Once AIP entitlement funding sources have been applied to eligible project costs, the remaining balance is what is eligible for FAA discretionary funding. At a minimum, the Airport would have to provide a match of any discretionary funds. In addition, the Airport would be responsible for any non-eligible project costs (i.e., routine pavement maintenance, general aviation terminal building). The local Airport share of capital costs would include any sources other than FAA, including ODA.

Table 6D outlines the maximum potential funds from AIP entitlements and FAA discretionary sources that could be attained during each planning horizon, based upon the CIP. This analysis assumes that the short term horizon would be attained in five years, the intermediate horizon would be achieved in the next five years, and the long term horizon would be achieved in an additional 10 years. Each horizon includes the aggregate total costs and funds available for the given planning horizon. The last two rows of the table show the range of potential expenses for the Airport to complete all projects in the 20-year CIP.

TABLE 6D
CIP Financial Assumptions (2016$)
Lebanon State Airport

	Short Term	Intermediate Term	Long Term	Total
Total Project Costs	$3,170,000	$3,200,000	$9,935,000	$16,305,000
Non-Eligible Costs	$150,000	$50,000	$100,000	$300,000
Total Grant Eligible Project Costs	$3,020,000	$3,150,000	$9,835,000	$16,005,000
AIP Project Grant Match (10%)	$302,000	$315,000	$983,500	$1,600,500
Remaining Costs Less Matching Funds	$2,718,000	$2,835,000	$8,851,500	$14,404,500
AIP NPE Funds	$750,000	$750,000	$1,500,000	$3,000,000
Remaining Costs Eligible for FAA Discretionary Funding	$1,968,000	$2,085,000	$7,351,500	$11,404,500
Airport CIP Costs High End[1]	$2,420,000	$2,450,000	$8,435,000	$13,305,000
Airport CIP Costs Low End[2]	$452,000	$365,000	$1,083,500	$1,900,500

[1]Assumes no discretionary FAA funding.
[2]Assumes eligible costs receive full discretionary FAA funding.
AIP - Airport Improvement Program; NPE - Non-Primary Entitlements

In the short term planning horizon, all projects are considered eligible for FAA funding except a budget for routine pavement maintenance and extension of water lines to the west side of the Airport. If the Airport receives the maximum NPE funding, then approximately $2.0 million would be needed in discretionary funding from the FAA. The Airport would be responsible for $452,000 which is comprised of 10 percent matching funds and non-eligible project costs.

All projects identified for the intermediate timeframe are eligible for FAA grant funding except the routine pavement maintenance placeholder. Approximately $3.1 million in capital improvement project costs are eligible for FAA funding. If the FAA were to grant full FAA discretionary funding, the Airport would have a remaining balance of $365,000.

The long term timeframe includes extension of the runway from 2,474 feet to 3,100 feet. This extension will require specific justification through documentation of 500 annual operations by aircraft needing the additional length. All projects, other than routine pavement maintenance, are eligible for FAA grant funding. If full discretionary funding is available from the FAA, then the airport sponsor would be responsible for approximately $1.1 million. If no FAA discretionary funding is available, then approximately $8.4 million of the long-term program would be the responsibility of the local sponsor.

The funding plan makes no assumption about the potential for state grants or the methodology for financing improvements. Instead, a range is provided for the likely level of required local financial participation if the entire CIP were to be implemented. If the full level of FAA discretionary funding can be obtained, then the Airport would be responsible for approximately $478,000 in the short term, $321,000 in the intermediate term, and $1.1 million in the long term.

PLANNING FOR COMPLIANCE

The FAA's Airport Compliance Program ensures airport sponsors comply with the Federal obligations they assume when they accept Federal grant funds or the transfer of Federal property for airport purposes. The program serves to protect the public interest in civil aviation and ensure compliance with applicable Federal laws, FAA rules, and policies.

All airports included in the National Plan of Integrated Airport Systems (NPIAS) are eligible to receive FAA development grants for eligible capital projects. The FAA refers to the owners/operators of NPIAS airports as "sponsors" of the airport facility.

SOURCES OF OBLIGATIONS

When airports receive Federal assistance, the sponsor accepts certain obligations and conditions, which may be incurred by contract or by restrictive covenants in property deeds. This generally involves the following:

- Grant agreements (Grant Assurances) issued under Federal grant programs;
- Instruments of approved property transfers;
- Deeds of conveyance.

When Airport owners and operators accept Federal grants, they agree to preserve and operate their facilities in a safe and efficient manner and comply with certain conditions and assurances. These obligations can span different airport development grant programs, including the Federal Aid to Airports Program (FAAP), the Airport Development Aid Program (ADAP), and the Airport Improvement Program (AIP). Airport owners should be aware that obligations incurred under each program or conveyance document vary.

The FAA encourages airport owners to review each agreement and conveyance document to ensure that they understand their obligations. Keeping good records will allow them to quickly reference incurred obligations. Further, annual reviews of all agreements will aid efforts in complying with incurred Federal obligations.

GRANT ASSURANCES

There are 39 detailed Grant Assurances protecting the Federal government's investment in any airport. Airports must comply with all 39 Grant Assurances by law when accepting Federal grant funds (Title 49 USC). The Grant Assurances are designed to ensure the following:

- Airports are maintained and operated safely, efficiently, and fairly;
- Protect the Federal government's long-term aviation investment; and
- Ensure airport actions are in the best interest of the national air transportation system.

Generally, the airport sponsor is obligated to meet the Grant Assurances for the useful life of the project/investment, which is typically 20 years. For land conveyance or land acquisition, the obligation is in effect in perpetuity or until the facility no longer operates as an airport.

The Federal government will periodically update the Grant Assurances. A complete list and description of all 39 Grant Assurances is included in **Appendix C**. The following summarizes the major Grant Assurances that impact operation of all airports that accept Federal development grants.

Sponsor Fund Availability (Grant Assurance #3): When an airport sponsor accepts a grant offer from the Federal government, they must assure that it has sufficient funds available for their share of the project. Currently, general aviation airports such as Lebanon State Airport are eligible for 90 percent funding for eligible projects. The sponsor is then responsible for the remaining 10 percent of the project cost. Once a project is completed, the sponsor also assures that they will adequately maintain the investment.

Good Title (Grant Assurance #4): The airport sponsor must provide assurance that they have Good Title to all airport property. The sponsor agrees not to encumber or sell any airport property without prior review and consent of the Federal government.

Preserving Rights and Powers (Grant Assurance #5): The airport sponsor must not take any action that interferes with the operation of the airport without FAA approval. This requires that any major change to the airport be reviewed and approved by the FAA. For example, the sponsor will not sell, encumber, or otherwise transfer or dispose of any part of its title or other interests in the property shown on Exhibit A (a map contained in the Airport Layout Plan set that identifies airport property and other airport interests). In addition, Grant Assurance #5 prohibits the airport sponsor from granting an adjacent (or near) property used as a residence to taxi an aircraft onto any part of a commercial service airport (commonly referred to as through-the-fence access). Sponsors of general aviation airports may allow residential through-the-fence access in accordance with Sec. 136 of Public Law 112-95.

Pavement Maintenance (#11): With respect to a project approved after January 1, 1995, for the replacement or reconstruction of pavement at the airport, the sponsor assures that it has implemented an effective pavement maintenance/management program and the sponsor will use such program for the useful life of any pavement constructed.

Accounting System, Audit, Record Keeping Requirements (#13): The airport sponsor shall keep all project accounts and records which fully disclose the amount and disposition of the proceeds of each grant. Such records and accounts shall be made available for audit as requested.

Operations and Maintenance (#19): The airport and all facilities necessary to serve the aeronautical users of the airport shall be operated at all times in a safe and efficient manner. The sponsor will not cause or permit any activity or action which would interfere with its use for airport purposes.

Hazard Removal and Mitigation (#20): 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 will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing hazards and by preventing the establishment or creation of future airport hazards.

Compatible Land Use (#21): The airport sponsor will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations.

Economic Nondiscrimination (#22): The sponsor will make the airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds, and classes of aeronautical activities. All parties seeking to provide aeronautical services must be reasonably accommodated. Rates and fees need not be exactly equal among all tenants if the sponsor can show a sound accounting principle for differences such as prime versus secondary location or improved versus unimproved land.

Exclusive Rights (#23): The sponsor will permit no exclusive right for the use of the airport by any person providing, or intending to provide aeronautical services to the public. The sponsor further agrees that it will not either directly or indirectly grant or permit any person, firm, or corporation the exclusive right at the airport to conduct any aeronautical activities including but not limited to charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations, aircraft sales and services, dales of aviation petroleum products, repair and maintenance, sales of aircraft parts, or any other aeronautical activity.

Fee and Rental Structure (#24): The sponsor will maintain a fee and rental structure for facilities and services at the airport which will make the airport as self-sustaining as possible. No part of the Federal share of an airport development grant shall be included in the rate bases established for users of the airport. Rates and fees should include periodic adjustment for inflation and costs (FAA recommends five-year adjustment minimum). Ground leases should be of sufficient duration to amortize tenant's cost of the structure (FAA suggests leases of no longer than 30 years). A common practice is to include reversion clauses in tenant leases (property reverts to airport ownership after a predetermined period of time); however, reversion is not required.

Airport Revenues (#25): All revenue generated by the airport and any local taxes on aviation fuel, established after December 30, 1987, will be expended by it for the capital or operating costs of the airport.

Airport Layout Plan (ALP) (#29): The airport sponsor will keep up to date at all times an airport layout plan for the airport showing the property line and the location and nature of existing and planned facilities. The ALP for the Lebanon State Airport will be updated as part of this Master Planning process.

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, fleet mix, 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 striving toward economic self-sufficiency.

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 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.

Annually, the airport revises its five-year CIP for presentation to the FAA. While this Master Plan provides a starting point, it should be anticipated that the CIP will necessarily change over time. Issues such as funding priority and project justification will influence the annual CIP.

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

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.

AUTOMATIC 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.

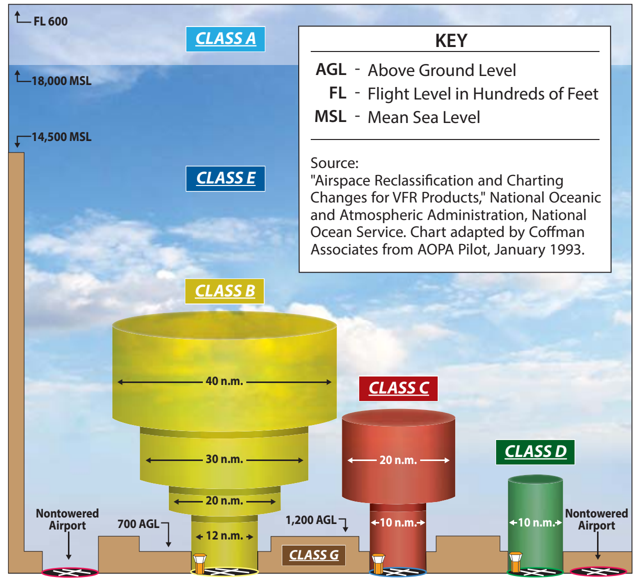
CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 200 feet above the horizontal plane containing the runway threshold.

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 100 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/ DECISION ALTITUDE: 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.

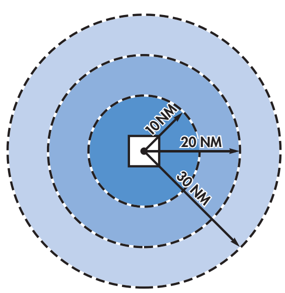
- **TAKEOFF DISTANCE AVAILABLE (TODA):** The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.
- **ACCELERATE-STOP DISTANCE AVAILABLE (ASDA):** The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a 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 measure of altitude used by aircraft flying above 18,000 feet. Flight levels are indicated by three digits representing the pressure altitude in hundreds of feet. An airplane flying at flight level 360 is flying at a pressure altitude of 36,000 feet. This is expressed as FL 360.

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 48 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 classification 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 DESIGN CODE: A code signifiying the design standards to which the runway is to be built.

RUNWAY END IDENTIFICATION LIGHTING (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 REFERENCE CODE: A code signifying the current operational capabilities of a runway and associated taxiway.

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 AIRCRAFT: An aircraft 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 DESIGN GROUP: A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance.

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.

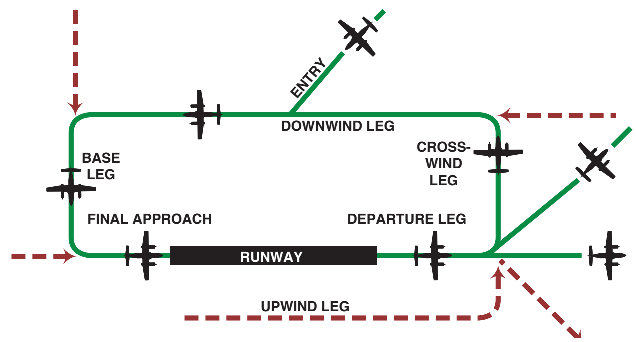
TOUCHDOWN AND LIFT-OFF AREA (TLOF): A load bearing, generally paved area, normally centered in the FATO, on which the helicopter lands or takes off.

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.

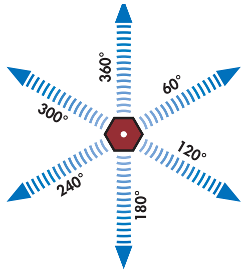
UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."

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.

Abbreviations

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 (100LL)

AWOS: automatic 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 middle marker

LOM: compass locator at outer marker

LORAN: long range navigation

MALS: medium 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

RRC: Runway Reference Code

RDC: Runway Design Code

REIL: runway end identification 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

TDG: Taxiway Design Group

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

AIRPORT OVERLAY ZONE

Appendix B
AIRPORT OVERLAY ZONE

The City of Lebanon Development Code includes certain zoning protections for the Airport. The following description of the Airport Overlay Zones is excepted from the Development Code. The Airport Overlay Zone Development Code should be updated if there is a change to the physical dimensions of the runway so that the parameters of the overlay zone apply to the existing conditions at the Airport.

CITY OF LEBANON
It's easier from here.

Lebanon Municipal Code Title 16: Development Code

Article Two: Land Use and Land Use Zones

Chapter 16.11: Overlay Land Use Zones

Adopted by City Council on
December 10, 2008
Amended by City Council on
July 14, 2010 and July 13, 2011

CITIZEN SERVICES & DEVELOPMENT CENTER

925 Main Street • Lebanon, Oregon 97355 • 541.258.4906 • 541.258.4955 Fax • www.ci.lebanon.or.us

Chapter 16.11: Overlay Land Use Zones

Table of Contents:

Chapter 16.11: Overlay Land Use Zones

16.11.010 OVERVIEW

A. Background and Purpose

1. An **Overlay zone** is an area where additional requirements are superimposed upon those of the base or underlying zone. An overlay zone addresses special land use circumstances or environmental safeguards unique to the property or properties. Properties within an overlay zone are subject to the requirements and regulations of both the base zone and the overlay zone. Where the standards of the overlay and base zone are different or in conflict, the more restrictive standards shall apply.
2. The Lebanon Development Code contains several overlay Zones, including the following: Airport; Riparian Protection; Special Transportation Area, Steep Slopes, Limited Use, and Flood Plains.

B. Introduction

1. **Overlay Zone Impact Classifications**
   - **a.** The Impact Classifications for the Overlay Zones are significantly different than those discussed in Chapter 16.03, and applied in Chapters 16.05 through 16.11.
   - **b.** The land uses are divided into Impact Classifications by the degree of impacts that the uses could reasonably be expected to exert on the Overlay Zones, or rather the attributes or values that the Overlay Zones are designed to protect.
   - **c.** **Class I Impacts:** The impacts or latent conflicts of the land use are so minimal that the land use can be conducted without special mitigation measures beyond those standards of the existing base zone.
   - **d.** **Class II Impacts:** The impacts or latent conflicts of the land use are significant enough to warrant special mitigation measures as prescribed by the standards of the Overlay Zone.
   - **e.** **Class III Impacts:** The impacts or latent conflicts of the land use are substantial and warrant significant mitigation as described by the standards of the Overlay Zone.
2. **Key to Procedures, Standards, and Conditions of Approval**
   - **a.** **Outright Permitted Uses with Site Review and Building Permit: "OP"** means the use is permitted outright and a **Building Permit** is issued after a **site review** determines that all setbacks and other lot and building site requirements are satisfied.
   - **b.** **Permitted Uses with Ministerial Review: "MR"** approval is gained through a ministerial review process.
   - **c.** **Permitted with Administrative Review**: **"AR"** means the use is permitted through an Administrative Review process that takes into account all applicable requirements.
   - **d.** **Permitted with Conditional Use Approval: "CU"** means the use is permitted with a Conditional Use approval (Chapter 16.21).
   - **e.** **Site Reviews:** The processing of a variety of land use applications may also include detailed site reviews (site plan reviews). These requirements are addressed in LDC Chapters 16.21 – 16.24 (Article Four).

f. Decision Criteria and/or Additional Conditions of Approval: The standards and review processes outlined in this Code in **Article Three: Community Development and Use Standards** and in **Article Four: Land Use And Development Review/Decision Requirements And Procedures**, as well as applicable Overlay Zones (Chapter 16.11) may set additional decision criteria and/or conditions of approval.

g. Not Permitted: The code provisions are also intended to make it more difficult to place incompatible uses near one another; an **"N"** designation means the use is not permitted.

(1) Existing Uses. The "Not Permitted" ("N") designation is not retroactive and does not impact existing uses.

(2) No New Uses. The "Not Permitted" ("N") designation indicates that no new uses of this type are allowed on a property to which this designation applies.

16.11.020 AIRPORT OVERLAY ZONES (AP-OZS)

A. Introduction to and Purpose of City's Airport Overlay Zones

The sponsor of the Lebanon airport is the Oregon Department of Aviation. For applicable Oregon Revised Statutes (ORS) and Oregon Administrative Rules (OARs), see the Oregon Department of Aviation.

As shown in **Table 16.11.020-1**, the City of Lebanon has two primary airport overlay zones: the Airport Control Zone (AC-OZ), and the Airport Safety Zone (AS-OZ). Each primary airport overlay zone is comprised of two or more subzones or areas.

1. Airport Control Zone (AC-OZ)

a. The AC Zone is composed of the Airport Noise Impact Zone (AN-OZ) and the Airport Use Zone (AU-OZ) (see **Table 16.11.020-1** and **Figure 16.11.020-1**).

b. The primary purpose of this zone is to promote safe and viable use of the airport by establishing criteria for compatibility of land uses.

2. Airport Safety Zone (AS-OZ)

a. The Airport Safety Zone (AS-OZ) is composed of the "imaginary" Direct Impact Area, and the airport's "imaginary" surfaces and zones, including Approach Surfaces, Transitional Surfaces, Horizontal Surfaces, Conical Surfaces, and Runway Protection Zones (see **Table 16.11.020-1** and **Figure 16.11.020-2**).

b. The primary purpose of this zone is to promote aviation safety by prohibiting structures, trees, and other objects of natural growth from penetrating airport imaginary surfaces as defined in applicable OARs.

Table 16.11.020-1: Overview of the Airport Overlay Zones

Airport Control Zone (AC-OZ)	Airport Safety Zone (AS-OZ)	
Airport Noise Impact Subzone (AN-OZ) Airport Use Subzone (AU-OZ) Also encompasses the Runway	Airport Direct Impact Area	"Imaginary" Surfaces and Zones
		Primary Surface; Runway Protection Zone; Approach Surfaces; Transitional Surface; Horizontal Surface; Conical Surface

3. **Overall Purpose**

The overall purpose of these two overlay zones is to encourage and support the continued safe operation and vitality of this public use airport in the Lebanon area. This is to be accomplished by establishing compatibility and safety standards to promote air navigational safety and to reduce potential safety hazards for persons living, working or recreating near such a public use airport. These standards will restrict incompatible land uses and airspace obstructions around the airport in an effort to maintain the airport's maximum benefit. Specific use limitations apply to the overlaying AC-OZ, the AS-OZ, and/or their subcomponents. Any uses permitted outright or by conditional use in the underlying zone are allowed except as provided for in 16.11.020.F. Incompatible uses may include the height of trees, buildings, structures or other items and uses that would be subject to frequent aircraft over-flight or might intrude into areas used by aircraft.

4. **Application of Provisions**

The provisions of this section shall only apply as stipulated to the areas located within the Lebanon City Limits and under the specified airport overlay zone: the Airport Control Overlay Zone (AC-OZ), and the Airport Safety Overlay Zone (AS-OZ), and/or their subcomponents. In any land use zone subject to the AC-OZ and/or AS-OZ, the requirements and standards of this section shall apply as stipulated in addition to those specified in the ordinance for the underlying land use zone. If a conflict in regulations or standards occurs, the more restrictive provisions shall govern.

5. **Aviation-Related Definitions**

See Aviation-Related Definitions Section in the Glossary, Chapter 16.32, of this Development Code**.**

B. Location and Description of the Lebanon Airport and Its Zones

1. **Location**

The State's Public Use Airport in the City of Lebanon is currently located 1 mile west of the downtown area at 44ºº31'47"N, 122ºº55'46"W. It has an Elevation - 344'. The single Runway is on a north-south axis; it is 2877' long and 50' wide, with an Asphalt Surface (see **Figure 16.11.020-1**).

2. **Airport Use Subzone (AU-OZ)**

The Use Zone of the Lebanon Airport is identical to the property line of the Airport (see **Figure 16.11.020-1**).

3. **Airport Noise Impact Subzone (AN-OZ)**

The perimeter of this boundary (see **Figure 16.11.020-1**) shall be 1,500 feet from the edge of the runway, or within established noise contour boundaries exceeding on a daily average 55 LDN noise contour as established by valid scientific studies by the Oregon Department of Aviation.

4. **Airport Direct Impact Area**

   The area located within 5,000 feet edge of the airport's runway(s), excluding lands within the runway protection zone and approach surface (see **Figure 16.11.020-2**).

5. **Description of Runway Protection Zone and Imaginary Surfaces: Primary, Approach, Transitional, Horizontal, and Conical Surfaces**

   The Lebanon Airport is currently classified as a utility airport and is designed to handle only visual approaches; it has the following "imaginary" surfaces:

   a. **Primary Surface:** a rectangular shape centered longitudinally on the runway with dimensions of 250' wide by 3,277' long. The primary surface extends 200 feet beyond each end of the runway's hard surface (see **Figure 16.11.020-2**).

   b. **Runway Protection Zone (RPZ):** a trapezoidal shaped area at each end of the primary surface with dimensions of 250' wide at the end of the runway by 1,000' long, with a width of 450' at the far end of the trapezoid, with an upward approach slope at a 20:1 ratio, one-foot vertical for each 20 feet horizontal (see **Figure 16.11.020-2**).

   c. **Approach Surfaces:** a trapezoidal shaped visual approach surface at each end of the primary surface by 5,000' long, with a width of 1,250' at the far end of the trapezoid, with an upward approach slope at a 20:1 ratio, one-foot vertical for each 20 feet horizontal (see **Figure 16.11.020-2**).

   d. **Transitional Surface:** a surface that extends upward and outward from each side of the primary surface at 90 degree angles to the runway centerline and the runway centerline extended at a slope of seven (7) feet horizontally for each foot vertically from the sides of the primary and approach surfaces to the point of intersection with the horizontal and conical surfaces (see **Figure 16.11.020-3**).

   e. **Horizontal Surface:** a horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is 5,000 feet for all runways designated as utility (see **Figure 16.11.020-3**).

   f. **Conical Surface:** a surface that extends outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet and a vertical height of 350 feet above the airport elevation (see **Figure 16.11.020-3**).

6. **Inclusion of Airport Overlay Zones on City's Official Zoning Map**

   The Lebanon Airport's elevation, the airport noise impact zone, and the location and dimensions of the runway, primary surface, runway protection zone, approach surface, horizontal surface, conical surface, transitional surface, and airport use zone shall be delineated and subject to the airport overlay zones as described herein, and shall be made part of the official Zoning Map (see **Figures 16.11.020-1** through **16.11.020-3**). All lands, waters and airspace, or portions thereof, that are located within these boundaries or surfaces are subject to the requirements of the airport overlay zones as applicable.

Figure 16.11.020-1: Lebanon Airport's Airport Control Overlay Zone (AC-OZ)
Showing the Runway, Airport Noise Impact Subzone, and Airport Use Subzone

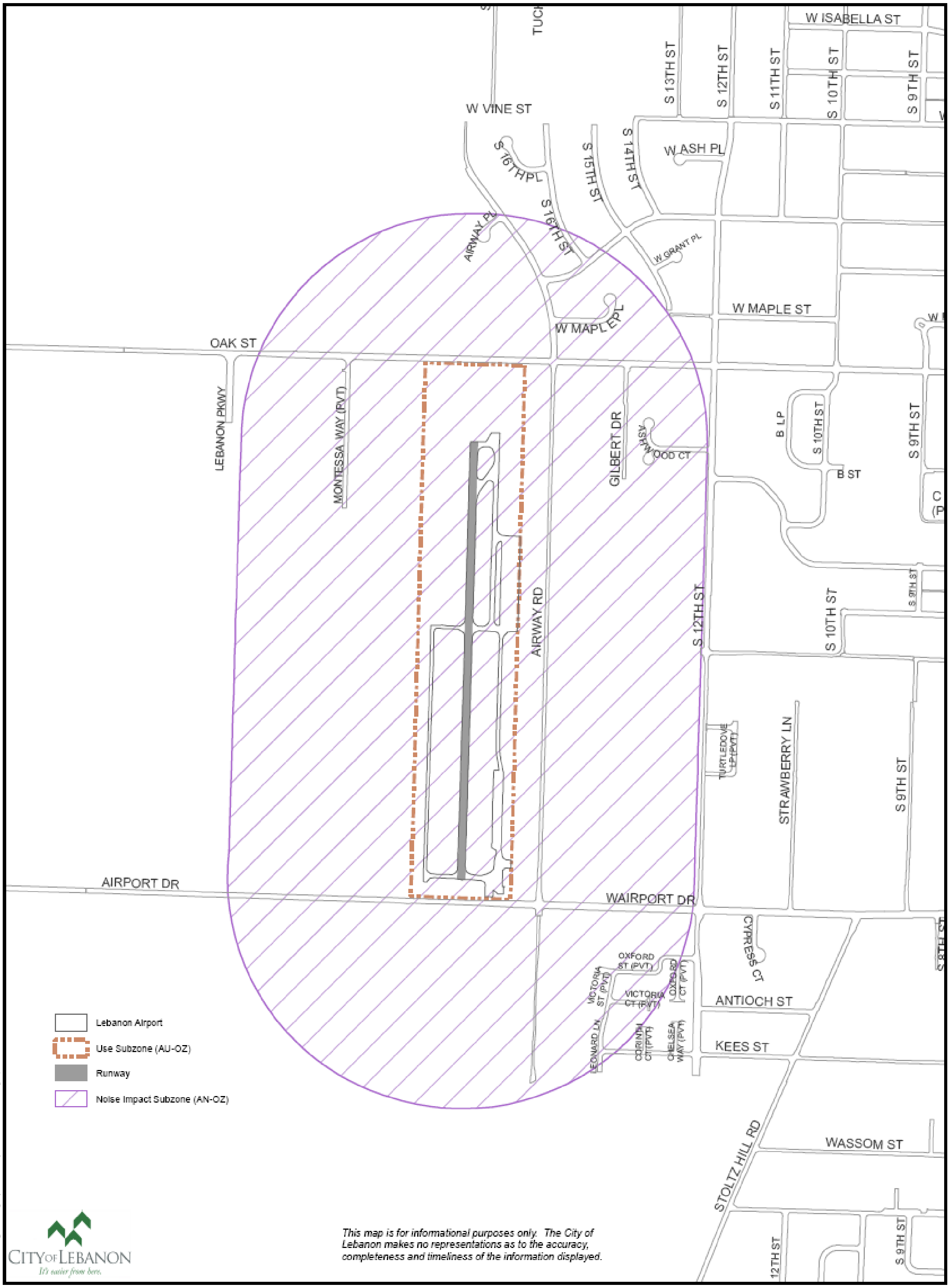


Figure 16.11.020-2: Lebanon Airport's Airport Safety Zone (AS-OZ)

Showing the Runway, Primary Surface, Airport Direct Impact Area, Runway Protection Zone, Approach Surfaces

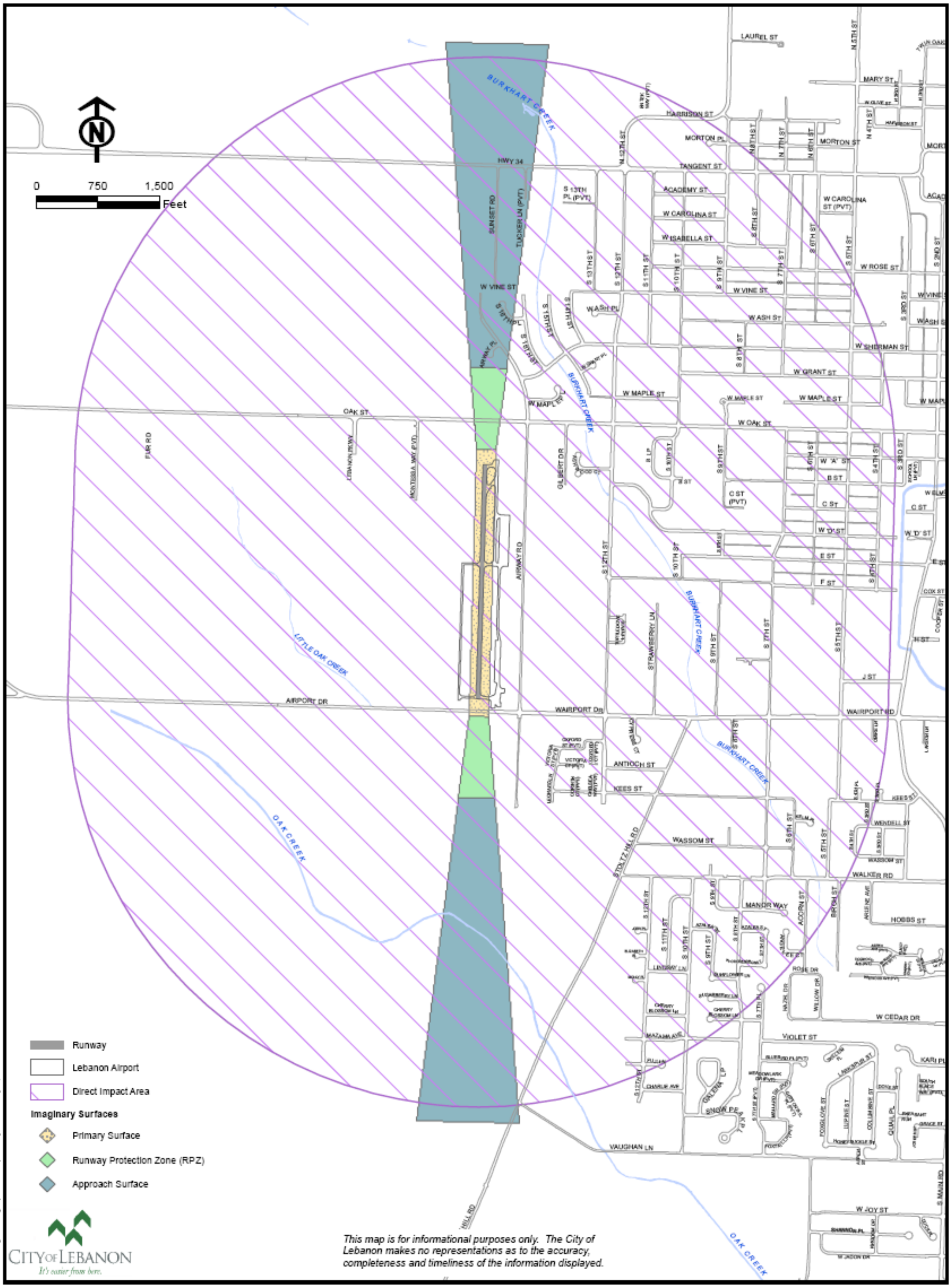
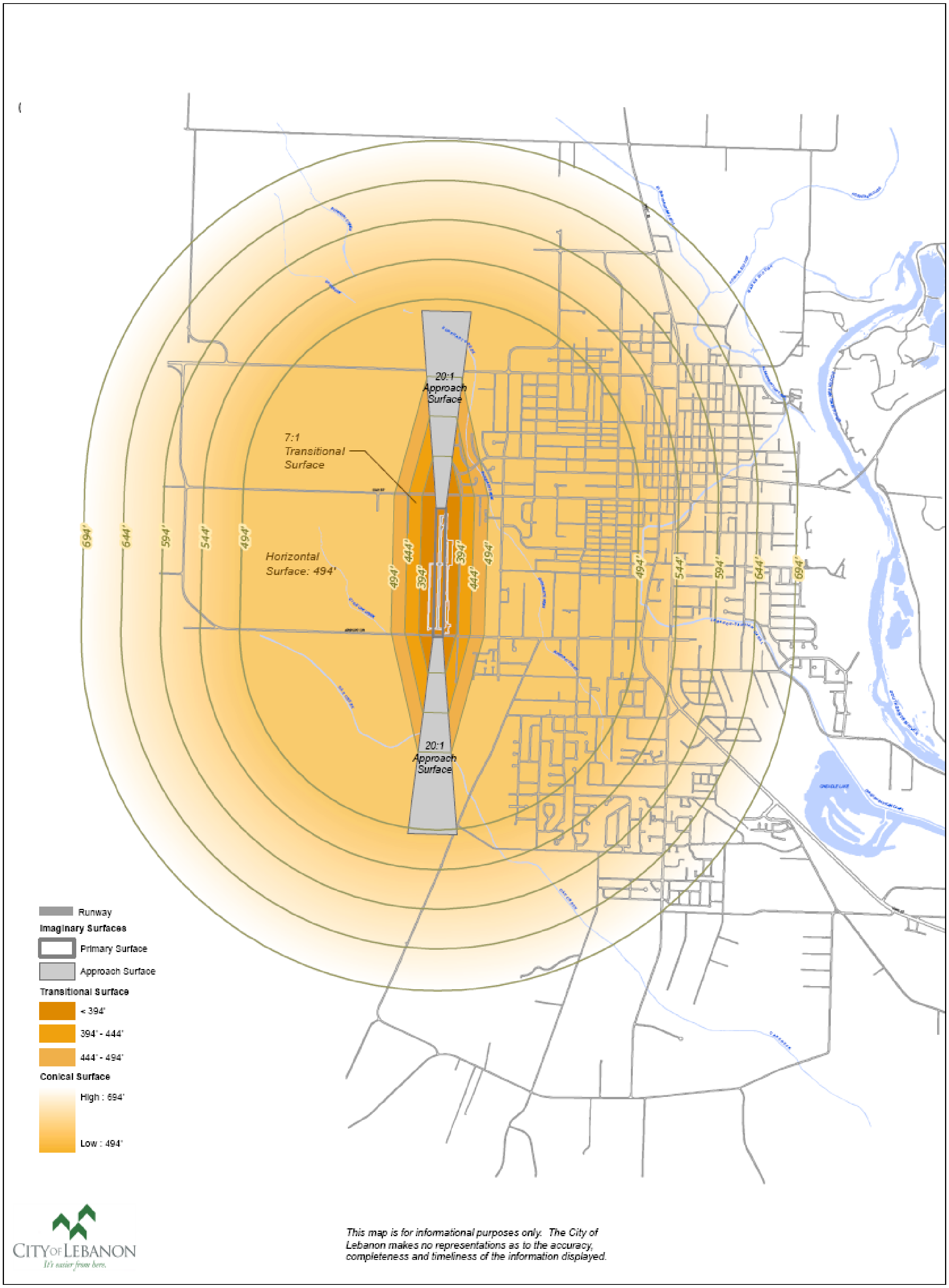


Figure 16.11.020-3: Lebanon Airport's Airport Safety Zone (AS-OZ)

Showing the Runway, Primary Surface,
Transitional Surfaces, Horizontal Surface, and Conical Surface



C. Notification of Land Use and Permit Applications

Within the described overlay zones and/or their subcomponents, except as otherwise provided herein, written notice of applications for land use or limited land use decisions, including comprehensive plan or zoning amendments, shall be provided to the airport sponsor in the same manner as notice is provided to property owners entitled by law to written notice of land use or limited land use applications. At the time of adoption of this Code, the airport sponsor is the Oregon Department of Aviation. Hereafter in this Code, the sponsor will be referenced as the Oregon Department of Aviation for administrative convenience, but the provisions of this Code apply as to any lawful successor-in-interest to the Oregon Department of Aviation. Notices are subject to the following provisions and exceptions.

1. Notice Requirements

Notice shall be provided to the airport sponsor (the Oregon Department of Aviation) when the property, or a portion thereof, that is subject to the land use or limited land use application is located within 1,500 from feet from both sides and ends of a runway (the AC Overlay Zone Area, or Noise Impact Boundary and Airport Use Zone) and/or 5,000 feet from both sides and ends of a runway (the AS overlay zone that includes the Airport Direct Impact Area as well as the Runway Protection Zone and Approach Surface).

a. Notice of land use and limited land use applications shall be provided within the following timelines:

(1) Notice of land use or limited land use applications involving public hearings shall be provided prior to the public hearing at the same time that written notice of such applications is provided to property owners entitled to such notice.

(2) Notice of land use or limited land use applications not involving public hearings shall be provided at least 20 days prior to entry of the initial decision on the land use or limited land use application.

b. Notice of the decision on a land use or limited land use application shall be provided to the airport sponsor (Oregon Department of Aviation) within the same timelines that such notice is provided to parties to a land use or limited land use proceeding.

2. Notice of Water Impoundment

A person submitting a land use application or limited land use application that will result in a water impoundment larger than ¼ acre within 10,000 feet of an airport shall provide notice of the application to the Oregon Department of Aviation.

3. Exceptions

Notices required under Paragraphs “a” and “b” directly above of this section need not be provided to the airport sponsor (Oregon Department of Aviation) where the land use or limited land use application meets **all** of the following criteria:

a. Allows structures of less than 35 feet in height;

b. Involves property located entirely outside the **Approach Surface and Transition Surface**;

c. Does not involve industrial, mining or similar uses that emit smoke, dust or steam; sanitary landfills or water impoundments; or radio, radiotelephone, television or similar transmission facilities or electrical transmission lines; and

d. Does not involve wetland mitigation, enhancement, restoration or creation.

D. Height Limitations on Allowed Uses in Underlying Zones, and Trimming of Trees

All uses permitted by the underlying zone shall comply with the height limitations in this Section. When height limitations of the underlying zone are more restrictive than those of the airport overlay zones, the underlying zone height limitations shall control.

1. Except as provided in subsections (b) and (c) immediately following, no structure or tree, plant or other object of natural growth shall penetrate an airport imaginary surface.
2. For areas within **Airport Imaginary Surfaces** but <u>outside</u> the **Approach** and **Transition Surfaces**, where the terrain is at higher elevations than the airport imaginary surfaces such that existing structures and permitted development penetrate or would penetrate the airport imaginary surfaces, the City may authorize structures up to 35 feet in height.
3. Other height exceptions or variances may be permitted when supported in writing by the airport sponsor (Oregon Department of Aviation) and the FAA. Applications for height variances shall follow the procedures for other variances and shall be subject to such conditions and terms as recommended by the Department of Aviation and the FAA.
4. **Trimming Trees:** The airport sponsor (Oregon Department of Aviation), or its agents, shall be permitted (at times and under stipulations mutually agreed to in writing by property owners and the airport sponsor or its agents) to enter onto private property to reduce the height of trees that exceed the height limitations herein established. The airport sponsor, and/or its agents shall be responsible for all such work and legally liable for any claims of damage caused by such work.

E. Application Procedures for Land Use Review

An applicant seeking a land use or limited land use approval in an area within the airport overlay zones shall provide the following information in addition to any other information required in the permit application:

1. **A map or drawing** showing the location of the property in relation to the **Airport Imaginary Surfaces**. The City's Community Development Division shall provide the applicant with appropriate base maps upon which to locate the property.
2. **Elevation profiles and a site plan**, both drawn to scale, including the location and height of all existing and proposed structures, measured in feet above mean sea level.
3. And, additionally, if a <u>**height variance**</u> is requested, **letters of support** from the airport sponsor (Oregon Department of Aviation) and the FAA as well. The letter(s) shall include specific references to the particular variance and proposed findings for approval.

F. Land Use Compatibility Requirements

1. Overview

Applications for land use or building permits for properties within the boundaries of the AC overlay zone and/or the airport imaginary surfaces stipulated below in this subsection shall comply with the requirements of this section as provided herein. When compatibility issues arise, the Planning Official or Hearings Body shall take reasonable steps to eliminate or minimize the incompatibility by choosing the most compatible location, design, or conditions for the boundary or use [see applicable ORS and OARs]. Decisions on compatibility shall further the State's Policy established by Applicable ORS: *In recognition of the importance of the network of airports to the economy of the state and the safety and recreation of its citizens, the policy of the State of Oregon is to encourage and support the continued operation and vitality of Oregon's airports.* To further these ends, the Planning Official or Hearings Body may impose reasonable conditions for new uses at the airport to ensure compatibility with existing and planned land uses surrounding the airport [Applicable ORS and OARs]. In addition, the Planning Official or Hearings Body may impose reasonable conditions to protect the public safety [see applicable ORS and OARs]. *"Compatible," as used in this section, is not intended as an absolute term meaning no interference or adverse impacts of any type with surrounding land uses* [see applicable ORS and OARs].

2. Noise

Within airport **Noise Impact Zone (AN-OZ)**, land uses shall be established consistent with the levels identified in applicable ORS and OARs.

a. Applicants for any subdivision or partition approval or other land use approval or building permit affecting land within airport noise impact boundaries, shall sign and file with the City of Lebanon and record in the Linn County Book of Records, a **Declaration of Anticipated Noise** declaring that the applicant and his successors will not now, or in the future complain about or otherwise contest or challenge the allowed airport activities at the adjacent airport. (The City may provide a **Model Declaration** based on a state template.)

b. In areas where the noise level is anticipated to be at or above 55 Average Day-Night Sound Level (Ldn), prior to issuance of a building permit for construction of a noise sensitive land use (real property normally used for sleeping or as a school, church, hospital, public library or similar use), the permit applicant shall be required to demonstrate that a noise abatement strategy will be incorporated into the building design that will achieve an indoor noise level equal to or less than 55 Ldn. *[NOTE: FAA Order 5100.38A, Chapter 7, provides that interior noise levels should not exceed 45 decibels in all habitable zones.]*

3. **Outdoor Lighting**

No new or expanded industrial, commercial or recreational use shall project lighting directly onto an existing **Runway** or **Taxiway** or into existing airport **Approach Surfaces** except where necessary for safe and convenient air travel. Lighting for these uses shall incorporate shielding in their designs to reflect light away from airport approach surfaces [see applicable ORS and OARs]. No use shall imitate airport lighting or impede the ability of pilots to distinguish between airport lighting and other lighting.

4. **Glare**

No glare producing material, including but not limited to unpainted metal or reflective glass, shall be used on the exterior of structures located within an **Approach Surface** and/or the **AC Zone** lands where glare could impede a pilot's vision.

5. **Industrial Emissions**

No new industrial, mining or similar use, or expansion of an existing industrial, mining or similar use, shall, as part of its regular operations, cause emissions of smoke, dust or steam that could obscure visibility within **Airport Approach Surfaces**, except upon demonstration, supported by substantial evidence, that mitigation measures imposed as approval conditions will reduce the potential for safety risk or incompatibility with airport operations to an insignificant level. The review authority shall impose such conditions as necessary to ensure that the use does not obscure visibility.

6. **Communications Facilities and Electrical Interference**

No use shall cause or create electrical interference with navigational signals or radio communications between an airport and aircraft. Proposals for the location of new or expanded radio, radiotelephone, and television transmission facilities and electrical transmission lines within the **AC Overlay Zone** shall be coordinated with the Department of Aviation and the FAA prior to approval. Review and approval of all radio, radiotelephone, and television transmission facilities and electrical transmission lines on property located under the **Airport's Imaginary Surfaces** shall be coordinated with the State's Department of Aviation [see applicable ORS and OARs].

7. **Use Prohibitions in the Runway Protection Zone (RPZ)**

Notwithstanding the underlying zone, the following uses are prohibited in the RPZ [see applicable ORS and OARs]:

a. New residential development.

b. New public assembly facilities.

8. **Restrictions on Housing Densities Beyond the Outer Edge of the Airport's RPZ**

   The areas located directly beyond Lebanon State Airport's RPZ are critical zones where aviation related accidents will most likely occur. To minimize the risks of damage or injury to persons and properties on the ground from potential aviation related accidents, the following densities on housing development are established in portions of the Approach Surface (see Section 16.11.020.B.5.a), the trapezoidal shaped area encompassed by "imaginary" extensions north and south of the Runway Protection Zones (See **Figure 16.11.020-4**):

   a. One dwelling unit per acre within 500 feet of the outer edge of the airport's RPZ.

   b. Two dwelling units per acre within 500 to 1,500 feet of the outer edge of the RPZ.

   c. Four units per acre within 1,500 to 3,000 feet of the outer edge of the RPZ.

9. **Sanitary Landfills**

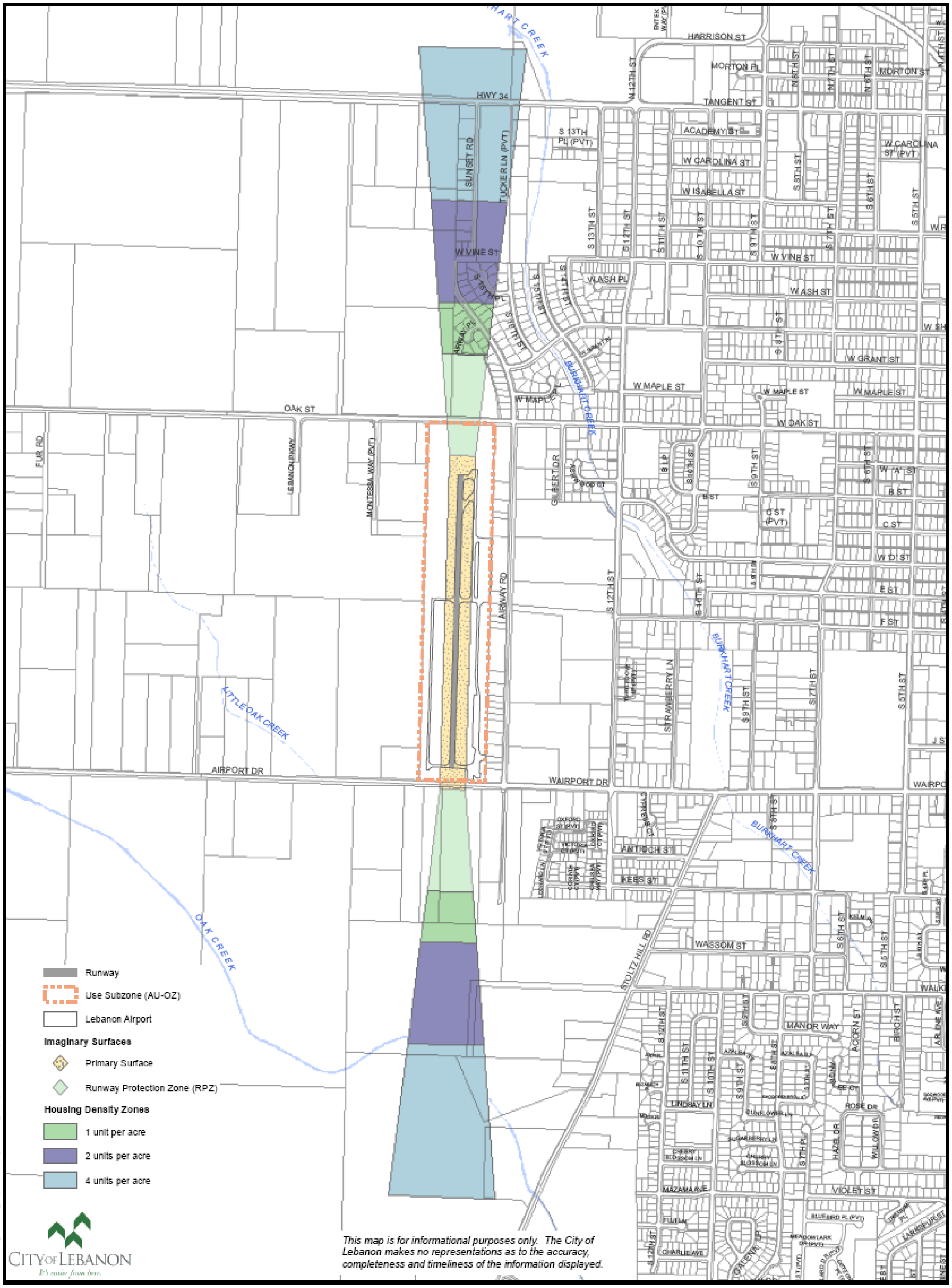
   No sanitary landfills shall be permitted within 5,000 feet of the airport runway if it is to be used by only piston-type aircraft, or within 10,000 feet of the airport runway if it will be used by turbojet aircraft.

10. **Dimensional Standards**

   a. Minimum lot size and setbacks shall be those indicated in the underlying zone with which the AC Zone or AS Zone is combined.

   b. Where an area is covered by more than one height limitation, the more restrictive shall prevail.

Figure 16.11.020-4: Lebanon Airport's Restrictions on Housing Densities Beyond the Outer Edge of the Airport's RPZ



G. Uses Permitted Outright in the Airport's Use Zone (AU-OZ)

The following uses and activities are permitted outright in the Airport's Use Zone [see applicable ORS and OARs]:

1. Customary and Usual Aviation-Related Activities

Includes but is not limited to takeoffs and landings; aircraft hangars and tie-downs; construction and maintenance of airport facilities; fixed based operator facilities; a residence for an airport caretaker or security officer; and other activities incidental to the normal operation of an airport. Except as provided in this ordinance, "customary and usual aviation-related activities" do not include: [1] residential, and [2] non-aviation related commercial, industrial, manufacturing and other uses.

2. Air Passenger and Air Freight Services and Facilities

Such services and facilities must be at levels consistent with the classification and needs identified in the Oregon Department of Aviation Airport System Plan, as determined by the airport sponsor.

3. Emergency Medical Flight Services

Includes activities, aircraft, accessory structures, and other facilities necessary to support emergency transportation for medical purposes. Emergency medical flight services do not allow the establishment of hospitals, medical offices, medical labs, medical equipment sales, and other similar uses in the AU-OZ.

4. Law Enforcement and Firefighting Activities

Includes aircraft and ground-based activities, facilities and accessory structures necessary to support federal, state or local law enforcement or land management agencies engaged in law enforcement or firefighting activities. Law enforcement and firefighting activities include transport of personnel, aerial observation, and transport of equipment, water, fire retardant and supplies.

5. Search and Rescue Operations

Includes aircraft and ground based activities that promote the orderly and efficient conduct of search or rescue related activities.

6. Flight Instruction Activities, Facilities, and Accessory Structures

Includes such facilities and services as are located at airport sites that provide education and training directly related to aeronautical activities. Flight instruction includes ground training and aeronautic skills training, but does not include schools for flight attendants, ticket agents or similar personnel.

7. Aircraft Service, Maintenance and Training

Includes activities, facilities and accessory structures provided to teach aircraft service and maintenance skills and to maintain, service, refuel or repair aircraft or aircraft components. "Aircraft service, maintenance and training" includes the construction and assembly of aircraft and aircraft components for personal use, but does not include activities, structures or facilities for the manufacturing of aircraft or aircraft-related products for sale to the public.

8. **Aircraft Rental**

   Includes activities, facilities and accessory structures that support the provision of aircraft for rent or lease to the public.

9. **Aircraft Sales and the Sale of Aeronautic Equipment and Supplies**

   Includes activities, facilities and accessory structures for the storage, display, demonstration and sales of aircraft and aeronautic equipment and supplies to the public but not including activities, facilities or structures for the manufacturing of aircraft or aircraft-related products for sale to the public.

10. **Crop Dusting Activities**

    Includes activities, facilities and structures accessory to crop dusting operations. Crop dusting activities include, but are not limited to, aerial application of chemicals, seed, fertilizer, defoliant and other chemicals or products used in a commercial agricultural, forestry or rangeland management setting.

11. **Agricultural and Forestry Activities**

    Includes activities, facilities and accessory structures that qualify as a "farm use" as defined in applicable ORS or "farming practice" as defined in applicable ORS.

H. Uses Permitted in the Use Zone (AU-OZ) of the Airport Subject to the Acceptance of the Airport Sponsor

In addition to the uses allowed in the underlying Zone, the following uses and activities and their associated facilities and accessory structures are permitted in the Use Zone of the Lebanon Airport upon demonstration of acceptance by the airport sponsor (Oregon Department of Aviation) [see applicable ORS and OARs].

1. **Aeronautic Recreational and Sporting Activities**

   Includes activities, facilities and accessory structures at airports that support recreational usage of aircraft and sporting activities that require the use of aircraft or other devices used and intended for use in flight. Aeronautic recreation and sporting activities authorized under this paragraph include, but are not limited to: fly-ins; glider flights; hot air ballooning; ultralight aircraft flights; displays of aircraft; aeronautic flight skills contests; and gyrocopter flights, but do not include flights carrying parachutists or parachute drops (including all forms of skydiving).

2. **Flights Carrying Parachutists, and Parachute Drops onto an Airport**

   Flights carrying parachutists, and parachute drops (including all forms of skydiving) onto an airport, may be permitted but only upon demonstration that the parachutist business has secured approval to use a drop zone that is at least 10 contiguous acres. The configuration of the drop zone shall roughly approximate a square or a circle and may contain structures, trees, or other obstacles only if the remainder of the drop zone provides adequate areas for parachutists to land safely.

I. Conditional Uses and Additional Requirements

1. Conditional Uses in Underlying Zone(s) and in the Airport's Use Zone (AU-OZ)

Within the Airport's Use Zone any uses permitted conditionally in the underlying zone(s) with which the AC Zone is combined shall be allowed conditionally except as provided in Section 16.11.020.F (Land Use Compatibility Requirements) or as outright permitted uses (section 16.11.020.G). Applications may be subject to review under the provisions of Chapter 16.21 of this Code, as well as the provisions directly below.

2. Additional Requirements Within the AC Zone (AC-OZ)

As a condition of approval of any conditional use proposed within the AC Zone (AC-OZ), the Planning Official or Hearings Body may require:

a. An increase in required setbacks.

b. Additional off-street parking and loading facilities and building standards.

c. Limitations on signs or lighting, hours of operation, points of ingress and egress and building heights.

d. Additional landscaping, screening and other improvements.

e. Use of glare-resistant materials in construction or other methods likely to reduce operating hazards.

f. Other conditions considered necessary to achieve compliance with this Code and applicable policies of the comprehensive plan and state law.

J. Non-Conforming Uses

1. These regulations shall not be construed to require the removal, lowering or alteration of any structure not conforming to these regulations. These regulations shall not require any change in the construction, alteration or intended use of any structure, the construction or alteration of which was begun prior to the effective date of this overlay zone.

2. No land use or limited land use approval or other permit shall be granted that would allow a nonconforming use or structure to become a greater hazard to air navigation than it was on the effective date of the airport overlay zones described this Section.

K. Variances

1. Any person desiring to erect or increase the height of any structure or use not in accordance with the provisions of this Code may apply for a variance (see Chapter 16.29 of this Code).

2. Application for Variance must be accompanied by a determination from the Oregon Department of Aviation and the Federal Aviation Administration (FAA) as to the effect of the proposal on the safe and efficient use of navigable airspace.

3. Any variance granted may be conditioned so as to require the owner of the structure to install, operate and maintain obstruction markers, at the owner's expense.

L. Permanent Water Impoundments within Approach Surfaces and the Airport's Direct Impact Zone

1. Any use or activity that would result in the establishment or expansion of a permanent water impoundment shall comply with the requirements of this section [see applicable ORS and OARs].

2. New or expanded permanent water impoundments of one-quarter acre in size or larger shall be prohibited:

a. Within an approach surface and within 5,000 feet from the end of a runway; or

b. On land owned by the airport sponsor (Oregon Department of Aviation) that is necessary for airport operations.

3. New or expanded permanent water impoundments of one-quarter acre in size or larger shall be prohibited within 5,000 feet from the end or edge of a runway, pending a valid and ODA approved Bird Strike Study.

M. Air Navigation Easement within Approach Surfaces and the AC Overlay Zone

1. State Department of Aviation Requirements

The State Department of Aviation, in response to notification by the City of Lebanon of land use actions within the AC Overlay Zone (AC-OZ) or the Approach Surfaces, **may** request in writing that the owners of properties that are the subjects of such applications submit an air navigation easement to the State Department of Aviation and the City of Lebanon as part of the review process**.**

2. Land Use Applications that could Require an Air Navigation Easement

Applications subject to this provision include land use or limited land use decisions for:

a. Building permits.

b. New residential, commercial, industrial, institutional or recreational buildings or structures intended for habitation or occupancy by humans or animals.

c. Expansions of such buildings or structures by the lesser of 50% or 1000 square feet.

3. Acceptable Air Navigation Easement Form and Filing Requirements

a. The air navigation easement shall be in a form acceptable to the airport sponsor (Oregon Department of Aviation).

b. This easement shall be signed and recorded in the deed records of Linn County with copies on file with the airport sponsor and the City of Lebanon.

Table 16.11.020-2: Summary of Special Uses and Regulations in the Airport Overlay Zones

Special Land Uses and Regulations	Airport Overlay Zones (OZs)		
	Airport Safety (AS-OZ)	Airport Control (AC-OZ)	
	"Imaginary" Areas & Surfaces	Airport Use (AU-OZ)	Airport Noise Impact (AN-OZ)
Notice shall be provided to the airport sponsor and the Department of Aviation when the property, or a portion thereof, that is subject to the land use or limited land use application is located within the OZ. ***[see 16.11.020.C]***	**YES** (See Exceptions)	**YES** (See Exceptions)	**YES** (See Exceptions)
Additional Height Limitations ***[see 16.11.020.D]***	**Varies**		
Prohibition on New residential development, and New public assembly facilities. ***[see 16.11.020F.7]***	**RPZ - YES**		
Density of new residential development ***[see 16.11.020.F.8]***	**Portions of the Approach Surface - YES**		
Special Factors or Features Subject to Regulation: Noise, Outdoor Lighting, Glare, Industrial Emissions, Communications Facilities and Electrical Interference, Sanitary Landfills, Permanent Water Impoundments ***[see 16.11.020.F and 16.11.020.L]***	**Varies**		
Customary and Usual Aviation-Related Activities, Air Passenger and Air Freight Services and Facilities, Emergency Medical Flight Services, Law Enforcement and Firefighting Activities, Search and Rescue Operations, Flight Instruction Activities, Facilities, and Accessory Structures, Aircraft Service, Maintenance and Training, Aircraft Rental, Aircraft Sales and the Sale of Aeronautic Equipment and Supplies, Crop Dusting Activities, Agricultural and Forestry Activities ***[see 16.11.020.G]***	**See Underlying Zone**	**OP**	**See Underlying Zone**
(1) Aeronautic recreational and sporting activities, including, but are not limited to: fly-ins, glider flights, hot air ballooning, ultralight aircraft flights, displays of aircraft, aeronautic flight skills contests, and gyrocopter flights. (2) Flights carrying parachutists, and parachute drops including sky-diving (with additional specific requirements). ***[see 16.11.020.H]***	**See Underlying Zone**	**OP** with Acceptance by the Airport Sponsor	**See Underlying Zone**
Additional **discretionary** conditions of approval ***[see 16.11.020.I]***	**Varies**	**YES**	**YES**
State Department of Aviation **discretionary** obstruction markers and tree trimming ***[see 16.11.020.D and 16.11.020.J]***	**YES**	**YES**	**YES**
State Department of Aviation **discretionary** request for submittal of an avigation easement ***[see 16.11.020.M]***	**YES**	**YES**	**YES**

Key: OP = Outright Permitted (Building Permit issued after a site review); MR = Ministerial Review; AR = Permitted with Administrative Review; CU = Conditional Use approval required (Chapter 16.21); N =Not permitted.

Appendix C

GRANT ASSURANCES

ASSURANCES

Airport Sponsors

A. General.

1. These assurances shall be complied with in the performance of grant agreements for airport development, airport planning, and noise compatibility program grants for airport sponsors.
2. These assurances are required to be submitted as part of the project application by sponsors requesting funds under the provisions of Title 49, U.S.C., subtitle VII, as amended. As used herein, the term "public agency sponsor" means a public agency with control of a public-use airport; the term "private sponsor" means a private owner of a public-use airport; and the term "sponsor" includes both public agency sponsors and private sponsors.
3. Upon acceptance of this grant offer by the sponsor, these assurances are incorporated in and become part of this grant agreement.

B. Duration and Applicability.

1. **Airport development or Noise Compatibility Program Projects Undertaken by a Public Agency Sponsor.**

   The terms, conditions and assurances of this grant agreement shall remain in full force and effect throughout the useful life of the facilities developed or equipment acquired for an airport development or noise compatibility program project, or throughout the useful life of the project items installed within a facility under a noise compatibility program project, but in any event not to exceed twenty (20) years from the date of acceptance of a grant offer of Federal funds for the project. However, there shall be no limit on the duration of the assurances regarding Exclusive Rights and Airport Revenue so long as the airport is used as an airport. There shall be no limit on the duration of the terms, conditions, and assurances with respect to real property acquired with federal funds. Furthermore, the duration of the Civil Rights assurance shall be specified in the assurances.

2. **Airport Development or Noise Compatibility Projects Undertaken by a Private Sponsor.**

   The preceding paragraph 1 also applies to a private sponsor except that the useful life of project items installed within a facility or the useful life of the facilities developed or equipment acquired under an airport development or noise compatibility program project shall be no less than ten (10) years from the date of acceptance of Federal aid for the project.

3. **Airport Planning Undertaken by a Sponsor.**

Unless otherwise specified in this grant agreement, only Assurances 1, 2, 3, 5, 6, 13, 18, 25, 30, 32, 33, and 34 in Section C apply to planning projects. The terms, conditions, and assurances of this grant agreement shall remain in full force and effect during the life of the project; there shall be no limit on the duration of the assurances regarding Airport Revenue so long as the airport is used as an airport.

C. Sponsor Certification.

The sponsor hereby assures and certifies, with respect to this grant that:

1. **General Federal Requirements.**

It will comply with all applicable Federal laws, regulations, executive orders, policies, guidelines, and requirements as they relate to the application, acceptance and use of Federal funds for this project including but not limited to the following:

Federal Legislation

a. Title 49, U.S.C., subtitle VII, as amended.
b. Davis-Bacon Act - 40 U.S.C. 276(a), et seq.[1]
c. Federal Fair Labor Standards Act - 29 U.S.C. 201, et seq.
d. Hatch Act – 5 U.S.C. 1501, et seq.[2]
e. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 Title 42 U.S.C. 4601, et seq.[1 2]
f. National Historic Preservation Act of 1966 - Section 106 - 16 U.S.C. 470(f).[1]
g. Archeological and Historic Preservation Act of 1974 - 16 U.S.C. 469 through 469c.[1]
h. Native Americans Grave Repatriation Act - 25 U.S.C. Section 3001, et seq.
i. Clean Air Act, P.L. 90-148, as amended.
j. Coastal Zone Management Act, P.L. 93-205, as amended.
k. Flood Disaster Protection Act of 1973 - Section 102(a) - 42 U.S.C. 4012a.[1]
l. Title 49, U.S.C., Section 303, (formerly known as Section 4(f))
m. Rehabilitation Act of 1973 - 29 U.S.C. 794.
n. Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
o. Americans with Disabilities Act of 1990, as amended, (42 U.S.C. § 12101 et seq.), prohibits discrimination on the basis of disability).
p. Age Discrimination Act of 1975 - 42 U.S.C. 6101, et seq.
q. American Indian Religious Freedom Act, P.L. 95-341, as amended.
r. Architectural Barriers Act of 1968 -42 U.S.C. 4151, et seq.[1]
s. Power plant and Industrial Fuel Use Act of 1978 - Section 403- 2 U.S.C. 8373.[1]
t. Contract Work Hours and Safety Standards Act - 40 U.S.C. 327, et seq.[1]
u. Copeland Anti-kickback Act - 18 U.S.C. 874.1
v. National Environmental Policy Act of 1969 - 42 U.S.C. 4321, et seq.[1]
w. Wild and Scenic Rivers Act, P.L. 90-542, as amended.
x. Single Audit Act of 1984 - 31 U.S.C. 7501, et seq.[2]
y. Drug-Free Workplace Act of 1988 - 41 U.S.C. 702 through 706.

z. The Federal Funding Accountability and Transparency Act of 2006, as amended (Pub. L. 109-282, as amended by section 6202 of Pub. L. 110-252).

Executive Orders

a. Executive Order 11246 - Equal Employment Opportunity[1]
b. Executive Order 11990 - Protection of Wetlands
c. Executive Order 11998 – Flood Plain Management
d. Executive Order 12372 - Intergovernmental Review of Federal Programs
e. Executive Order 12699 - Seismic Safety of Federal and Federally Assisted New Building Construction[1]
f. Executive Order 12898 - Environmental Justice

Federal Regulations

a. 2 CFR Part 180 - OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement).
b. 2 CFR Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards. [OMB Circular A-87 Cost Principles Applicable to Grants and Contracts with State and Local Governments, and OMB Circular A-133 - Audits of States, Local Governments, and Non-Profit Organizations].[4, 5, 6]
c. 2 CFR Part 1200 – Nonprocurement Suspension and Debarment
d. 14 CFR Part 13 - Investigative and Enforcement Procedures14 CFR Part 16 - Rules of Practice For Federally Assisted Airport Enforcement Proceedings.
e. 14 CFR Part 150 - Airport noise compatibility planning.
f. 28 CFR Part 35- Discrimination on the Basis of Disability in State and Local Government Services.
g. 28 CFR § 50.3 - U.S. Department of Justice Guidelines for Enforcement of Title VI of the Civil Rights Act of 1964.
h. 29 CFR Part 1 - Procedures for predetermination of wage rates.[1]
i. 29 CFR Part 3 - Contractors and subcontractors on public building or public work financed in whole or part by loans or grants from the United States.[1]
j. 29 CFR Part 5 - Labor standards provisions applicable to contracts covering federally financed and assisted construction (also labor standards provisions applicable to non-construction contracts subject to the Contract Work Hours and Safety Standards Act).[1]
k. 41 CFR Part 60 - Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor (Federal and federally assisted contracting requirements).[1]
l. 49 CFR Part 18 - Uniform administrative requirements for grants and cooperative agreements to state and local governments.[3]
m. 49 CFR Part 20 - New restrictions on lobbying.
n. 49 CFR Part 21 – Nondiscrimination in federally-assisted programs of the Department of Transportation - effectuation of Title VI of the Civil Rights Act of 1964.
o. 49 CFR Part 23 - Participation by Disadvantage Business Enterprise in Airport Concessions.

p. 49 CFR Part 24 – Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs.[1 2]
q. 49 CFR Part 26 – Participation by Disadvantaged Business Enterprises in Department of Transportation Programs.
r. 49 CFR Part 27 – Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance.[1]
s. 49 CFR Part 28 – Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities conducted by the Department of Transportation.
t. 49 CFR Part 30 - Denial of public works contracts to suppliers of goods and services of countries that deny procurement market access to U.S. contractors.
u. 49 CFR Part 32 – Governmentwide Requirements for Drug-Free Workplace (Financial Assistance)
v. 49 CFR Part 37 – Transportation Services for Individuals with Disabilities (ADA).
w. 49 CFR Part 41 - Seismic safety of Federal and federally assisted or regulated new building construction.

Specific Assurances

Specific assurances required to be included in grant agreements by any of the above laws, regulations or circulars are incorporated by reference in this grant agreement.

Footnotes to Assurance C.1.

[1] These laws do not apply to airport planning sponsors.

[2] These laws do not apply to private sponsors.

[3] 49 CFR Part 18 and 2 CFR Part 200 contain requirements for State and Local Governments receiving Federal assistance. Any requirement levied upon State and Local Governments by this regulation and circular shall also be applicable to private sponsors receiving Federal assistance under Title 49, United States Code.

[4] On December 26, 2013 at 78 FR 78590, the Office of Management and Budget (OMB) issued the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards in 2 CFR Part 200. 2 CFR Part 200 replaces and combines the former Uniform Administrative Requirements for Grants (OMB Circular A-102 and Circular A-110 or 2 CFR Part 215 or Circular) as well as the Cost Principles (Circulars A-21 or 2 CFR part 220; Circular A-87 or 2 CFR part 225; and A-122, 2 CFR part 230). Additionally it replaces Circular A-133 guidance on the Single Annual Audit. In accordance with 2 CFR section 200.110, the standards set forth in Part 200 which affect administration of Federal awards issued by Federal agencies become effective once implemented by Federal agencies or when any future amendment to this Part becomes final. Federal agencies, including the Department of Transportation, must implement the policies and procedures applicable to Federal awards by promulgating a regulation to be effective by December 26, 2014 unless different provisions are required by statute or approved by OMB.

[5] Cost principles established in 2 CFR part 200 subpart E must be used as guidelines for determining the eligibility of specific types of expenses.

[6] Audit requirements established in 2 CFR part 200 subpart F are the guidelines for audits.

2. **Responsibility and Authority of the Sponsor.**

   a. Public Agency Sponsor:

   It has legal authority to apply for this grant, and to finance and carry out the proposed project; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing body authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.

   b. Private Sponsor:

   It has legal authority to apply for this grant and to finance and carry out the proposed project and comply with all terms, conditions, and assurances of this grant agreement. It shall designate an official representative and shall in writing direct and authorize that person to file this application, including all understandings and assurances contained therein; to act in connection with this application; and to provide such additional information as may be required.

3. **Sponsor Fund Availability.**

   It has sufficient funds available for that portion of the project costs which are not to be paid by the United States. It has sufficient funds available to assure operation and maintenance of items funded under this grant agreement which it will own or control.

4. **Good Title.**

   a. It, a public agency or the Federal government, holds good title, satisfactory to the Secretary, to the landing area of the airport or site thereof, or will give assurance satisfactory to the Secretary that good title will be acquired.

   b. For noise compatibility program projects to be carried out on the property of the sponsor, it holds good title satisfactory to the Secretary to that portion of the property upon which Federal funds will be expended or will give assurance to the Secretary that good title will be obtained.

5. **Preserving Rights and Powers.**

   a. It will not take or permit any action which would operate to deprive it of any of the rights and powers necessary to perform any or all of the terms, conditions, and assurances in this grant agreement without the written approval of the Secretary, and will act promptly to acquire, extinguish or modify any outstanding rights or claims of right of others which would interfere with such performance by the sponsor. This shall be done in a manner acceptable to the Secretary.

b. It will not sell, lease, encumber, or otherwise transfer or dispose of any part of its title or other interests in the property shown on Exhibit A to this application or, for a noise compatibility program project, that portion of the property upon which Federal funds have been expended, for the duration of the terms, conditions, and assurances in this grant agreement without approval by the Secretary. If the transferee is found by the Secretary to be eligible under Title 49, United States Code, to assume the obligations of this grant agreement and to have the power, authority, and financial resources to carry out all such obligations, the sponsor shall insert in the contract or document transferring or disposing of the sponsor's interest, and make binding upon the transferee all of the terms, conditions, and assurances contained in this grant agreement.

c. For all noise compatibility program projects which are to be carried out by another unit of local government or are on property owned by a unit of local government other than the sponsor, it will enter into an agreement with that government. Except as otherwise specified by the Secretary, that agreement shall obligate that government to the same terms, conditions, and assurances that would be applicable to it if it applied directly to the FAA for a grant to undertake the noise compatibility program project. That agreement and changes thereto must be satisfactory to the Secretary. It will take steps to enforce this agreement against the local government if there is substantial non-compliance with the terms of the agreement.

d. For noise compatibility program projects to be carried out on privately owned property, it will enter into an agreement with the owner of that property which includes provisions specified by the Secretary. It will take steps to enforce this agreement against the property owner whenever there is substantial non-compliance with the terms of the agreement.

e. If the sponsor is a private sponsor, it will take steps satisfactory to the Secretary to ensure that the airport will continue to function as a public-use airport in accordance with these assurances for the duration of these assurances.

f. If an arrangement is made for management and operation of the airport by any agency or person other than the sponsor or an employee of the sponsor, the sponsor will reserve sufficient rights and authority to insure that the airport will be operated and maintained in accordance Title 49, United States Code, the regulations and the terms, conditions and assurances in this grant agreement and shall insure that such arrangement also requires compliance therewith.

g. Sponsors of commercial service airports 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 airport. Sponsors of general aviation airports entering into any arrangement that results in permission for the owner of residential real property adjacent to or near the airport must comply with the requirements of Sec. 136 of Public Law 112-95 and the sponsor assurances.

6. **Consistency with Local Plans.**

   The project is reasonably consistent with plans (existing at the time of submission of this application) of public agencies that are authorized by the State in which the project is located to plan for the development of the area surrounding the airport.

7. **Consideration of Local Interest.**

   It has given fair consideration to the interest of communities in or near where the project may be located.

8. **Consultation with Users.**

   In making a decision to undertake any airport development project under Title 49, United States Code, it has undertaken reasonable consultations with affected parties using the airport at which project is proposed.

9. **Public Hearings.**

   In projects involving the location of an airport, an airport runway, or a major runway extension, it has afforded the opportunity for public hearings for the purpose of considering the economic, social, and environmental effects of the airport or runway location and its consistency with goals and objectives of such planning as has been carried out by the community and it shall, when requested by the Secretary, submit a copy of the transcript of such hearings to the Secretary. Further, for such projects, it has on its management board either voting representation from the communities where the project is located or has advised the communities that they have the right to petition the Secretary concerning a proposed project.

10. **Metropolitan Planning Organization.**

    In projects involving the location of an airport, an airport runway, or a major runway extension at a medium or large hub airport, the sponsor has made available to and has provided upon request to the metropolitan planning organization in the area in which the airport is located, if any, a copy of the proposed amendment to the airport layout plan to depict the project and a copy of any airport master plan in which the project is described or depicted.

11. **Pavement Preventive Maintenance.**

    With respect to a project approved after January 1, 1995, for the replacement or reconstruction of pavement at the airport, it assures or certifies that it has implemented an effective airport pavement maintenance-management program and it assures that it will use such program for the useful life of any pavement constructed, reconstructed or repaired with Federal financial assistance at the airport. It will provide such reports on pavement condition and pavement management programs as the Secretary determines may be useful.

12. **Terminal Development Prerequisites.**

    For projects which include terminal development at a public use airport, as defined in Title 49, it has, on the date of submittal of the project grant application, all the safety equipment required for certification of such airport under section 44706 of Title 49, United States Code, and all the security equipment required by rule or regulation, and has provided for access to the passenger enplaning and deplaning area of such airport to passengers enplaning and deplaning from aircraft other than air carrier aircraft.

13. **Accounting System, Audit, and Record Keeping Requirements.**

    a. It shall keep all project accounts and records which fully disclose the amount and disposition by the recipient of the proceeds of this grant, the total cost of the project in connection with which this grant is given or used, and the amount or nature of that portion of the cost of the project supplied by other sources, and such other financial records pertinent to the project. The accounts and records shall be kept in accordance with an accounting system that will facilitate an effective audit in accordance with the Single Audit Act of 1984.

    b. It shall make available to the Secretary and the Comptroller General of the United States, or any of their duly authorized representatives, for the purpose of audit and examination, any books, documents, papers, and records of the recipient that are pertinent to this grant. The Secretary may require that an appropriate audit be conducted by a recipient. In any case in which an independent audit is made of the accounts of a sponsor relating to the disposition of the proceeds of a grant or relating to the project in connection with which this grant was given or used, it shall file a certified copy of such audit with the Comptroller General of the United States not later than six (6) months following the close of the fiscal year for which the audit was made.

14. **Minimum Wage Rates.**

    It shall include, in all contracts in excess of $2,000 for work on any projects funded under this grant agreement which involve labor, provisions establishing minimum rates of wages, to be predetermined by the Secretary of Labor, in accordance with the Davis-Bacon Act, as amended (40 U.S.C. 276a-276a-5), which contractors shall pay to skilled and unskilled labor, and such minimum rates shall be stated in the invitation for bids and shall be included in proposals or bids for the work.

15. **Veteran's Preference.**

    It shall include in all contracts for work on any project funded under this grant agreement which involve labor, such provisions as are necessary to insure that, in the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Vietnam era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns owned and controlled by disabled veterans as defined in Section 47112 of Title 49, United States Code. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

16. **Conformity to Plans and Specifications.**

    It will execute the project subject to plans, specifications, and schedules approved by the Secretary. Such plans, specifications, and schedules shall be submitted to the Secretary prior to commencement of site preparation, construction, or other performance under this grant agreement, and, upon approval of the Secretary, shall be incorporated into this grant agreement. Any modification to the approved plans, specifications, and schedules shall also be subject to approval of the Secretary, and incorporated into this grant agreement.

17. **Construction Inspection and Approval.**

It will provide and maintain competent technical supervision at the construction site throughout the project to assure that the work conforms to the plans, specifications, and schedules approved by the Secretary for the project. It shall subject the construction work on any project contained in an approved project application to inspection and approval by the Secretary and such work shall be in accordance with regulations and procedures prescribed by the Secretary. Such regulations and procedures shall require such cost and progress reporting by the sponsor or sponsors of such project as the Secretary shall deem necessary.

18. **Planning Projects.**

In carrying out planning projects:

a. It will execute the project in accordance with the approved program narrative contained in the project application or with the modifications similarly approved.

b. It will furnish the Secretary with such periodic reports as required pertaining to the planning project and planning work activities.

c. It will include in all published material prepared in connection with the planning project a notice that the material was prepared under a grant provided by the United States.

d. It will make such material available for examination by the public, and agrees that no material prepared with funds under this project shall be subject to copyright in the United States or any other country.

e. It will give the Secretary unrestricted authority to publish, disclose, distribute, and otherwise use any of the material prepared in connection with this grant.

f. It will grant the Secretary the right to disapprove the sponsor's employment of specific consultants and their subcontractors to do all or any part of this project as well as the right to disapprove the proposed scope and cost of professional services.

g. It will grant the Secretary the right to disapprove the use of the sponsor's employees to do all or any part of the project.

h. It understands and agrees that the Secretary's approval of this project grant or the Secretary's approval of any planning material developed as part of this grant does not constitute or imply any assurance or commitment on the part of the Secretary to approve any pending or future application for a Federal airport grant.

19. **Operation and Maintenance.**

a. The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies for maintenance and operation. It will not cause or permit any activity or action thereon which would interfere with its use for airport purposes. It will suitably operate and maintain the airport and all facilities thereon or connected therewith, with due regard to climatic and flood conditions. Any proposal to temporarily close the airport for non-aeronautical purposes must first be approved by the Secretary. In furtherance of this assurance, the sponsor will have in effect arrangements for-

1) Operating the airport's aeronautical facilities whenever required;
2) Promptly marking and lighting hazards resulting from airport conditions, including temporary conditions; and
3) Promptly notifying airmen of any condition affecting aeronautical use of the airport. Nothing contained herein shall be construed to require that the airport be operated for aeronautical use during temporary periods when snow, flood or other climatic conditions interfere with such operation and maintenance. Further, nothing herein shall be construed as requiring the maintenance, repair, restoration, or replacement of any structure or facility which is substantially damaged or destroyed due to an act of God or other condition or circumstance beyond the control of the sponsor.

b. It will suitably operate and maintain noise compatibility program items that it owns or controls upon which Federal funds have been expended.

20. **Hazard Removal and Mitigation.**

It 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, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.

21. **Compatible Land Use.**

It will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.

22. **Economic Nondiscrimination.**

a. It will make the airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical activities, including commercial aeronautical activities offering services to the public at the airport.

b. In any agreement, contract, lease, or other arrangement under which a right or privilege at the airport is granted to any person, firm, or corporation to conduct or to engage in any aeronautical activity for furnishing services to the public at the airport, the sponsor will insert and enforce provisions requiring the contractor to-

1) furnish said services on a reasonable, and not unjustly discriminatory, basis to all users thereof, and
2) charge reasonable, and not unjustly discriminatory, prices for each unit or service, provided that the contractor may be allowed to make reasonable and nondiscriminatory discounts, rebates, or other similar types of price reductions to volume purchasers.

c. Each fixed-based operator at the airport shall be subject to the same rates, fees, rentals, and other charges as are uniformly applicable to all other fixed-based operators making the same or similar uses of such airport and utilizing the same or similar facilities.

d. Each air carrier using such airport shall have the right to service itself or to use any fixed-based operator that is authorized or permitted by the airport to serve any air carrier at such airport.

e. Each air carrier using such airport (whether as a tenant, non-tenant, or subtenant of another air carrier tenant) shall be subject to such nondiscriminatory and substantially comparable rules, regulations, conditions, rates, fees, rentals, and other charges with respect to facilities directly and substantially related to providing air transportation as are applicable to all such air carriers which make similar use of such airport and utilize similar facilities, subject to reasonable classifications such as tenants or non-tenants and signatory carriers and non-signatory carriers. Classification or status as tenant or signatory shall not be unreasonably withheld by any airport provided an air carrier assumes obligations substantially similar to those already imposed on air carriers in such classification or status.

f. It will not exercise or grant any right or privilege which operates to prevent any person, firm, or corporation operating aircraft on the airport from performing any services on its own aircraft with its own employees [including, but not limited to maintenance, repair, and fueling] that it may choose to perform.

g. In the event the sponsor itself exercises any of the rights and privileges referred to in this assurance, the services involved will be provided on the same conditions as would apply to the furnishing of such services by commercial aeronautical service providers authorized by the sponsor under these provisions.

h. The sponsor may establish such reasonable, and not unjustly discriminatory, conditions to be met by all users of the airport as may be necessary for the safe and efficient operation of the airport.

i. The sponsor may prohibit or limit any given type, kind or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport or necessary to serve the civil aviation needs of the public.

23. **Exclusive Rights.**

It will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. For purposes of this paragraph, the providing of the services at an airport by a single fixed-based operator shall not be construed as an exclusive right if both of the following apply:

a. It would be unreasonably costly, burdensome, or impractical for more than one fixed-based operator to provide such services, and

b. If allowing more than one fixed-based operator to provide such services would require the reduction of space leased pursuant to an existing agreement between such single fixed-based operator and such airport. It further agrees that it will not, either directly or indirectly, grant or permit any person, firm, or corporation, the exclusive right at the airport to conduct any aeronautical activities, including, but not limited to charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations, aircraft sales and services, sale of aviation petroleum products whether or not conducted in conjunction with other aeronautical activity, repair and maintenance of aircraft, sale of aircraft parts, and any other activities which because of their direct relationship to the operation of aircraft can be regarded as an aeronautical activity, and that it will terminate any exclusive right to conduct an aeronautical activity now existing at such an airport before the grant of any assistance under Title 49, United States Code.

24. **Fee and Rental Structure.**

It will maintain a fee and rental structure for the facilities and services at the airport which will make the airport as self-sustaining as possible under the circumstances existing at the particular airport, taking into account such factors as the volume of traffic and economy of collection. No part of the Federal share of an airport development, airport planning or noise compatibility project for which a grant is made under Title 49, United States Code, the Airport and Airway Improvement Act of 1982, the Federal Airport Act or the Airport and Airway Development Act of 1970 shall be included in the rate basis in establishing fees, rates, and charges for users of that airport.

25. **Airport Revenues.**

a. All revenues generated by the airport and any local taxes on aviation fuel established after December 30, 1987, will be expended by it for the capital or operating costs of the airport; the local airport system; or other local facilities which are owned or operated by the owner or operator of the airport and which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes on or off the airport. The following exceptions apply to this paragraph:

1) If covenants or assurances in debt obligations issued before September 3, 1982, by the owner or operator of the airport, or provisions enacted before September 3, 1982, in governing statutes controlling the owner or operator's financing, provide for the use of the revenues from any of the airport owner or

operator's facilities, including the airport, to support not only the airport but also the airport owner or operator's general debt obligations or other facilities, then this limitation on the use of all revenues generated by the airport (and, in the case of a public airport, local taxes on aviation fuel) shall not apply.

2) If the Secretary approves the sale of a privately owned airport to a public sponsor and provides funding for any portion of the public sponsor's acquisition of land, this limitation on the use of all revenues generated by the sale shall not apply to certain proceeds from the sale. This is conditioned on repayment to the Secretary by the private owner of an amount equal to the remaining unamortized portion (amortized over a 20-year period) of any airport improvement grant made to the private owner for any purpose other than land acquisition on or after October 1, 1996, plus an amount equal to the federal share of the current fair market value of any land acquired with an airport improvement grant made to that airport on or after October 1, 1996.

3) Certain revenue derived from or generated by mineral extraction, production, lease, or other means at a general aviation airport (as defined at Section 47102 of title 49 United States Code), if the FAA determines the airport sponsor meets the requirements set forth in Sec. 813 of Public Law 112-95.

b. As part of the annual audit required under the Single Audit Act of 1984, the sponsor will direct that the audit will review, and the resulting audit report will provide an opinion concerning, the use of airport revenue and taxes in paragraph (a), and indicating whether funds paid or transferred to the owner or operator are paid or transferred in a manner consistent with Title 49, United States Code and any other applicable provision of law, including any regulation promulgated by the Secretary or Administrator.

c. Any civil penalties or other sanctions will be imposed for violation of this assurance in accordance with the provisions of Section 47107 of Title 49, United States Code.

26. **Reports and Inspections.**

It will:

a. submit to the Secretary such annual or special financial and operations reports as the Secretary may reasonably request and make such reports available to the public; make available to the public at reasonable times and places a report of the airport budget in a format prescribed by the Secretary;

b. for airport development projects, make the airport and all airport records and documents affecting the airport, including deeds, leases, operation and use agreements, regulations and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request;

c. for noise compatibility program projects, make records and documents relating to the project and continued compliance with the terms, conditions, and assurances of this grant agreement including deeds, leases, agreements, regulations, and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request; and

d. in a format and time prescribed by the Secretary, provide to the Secretary and make available to the public following each of its fiscal years, an annual report listing in detail:

   1) all amounts paid by the airport to any other unit of government and the purposes for which each such payment was made; and

   2) all services and property provided by the airport to other units of government and the amount of compensation received for provision of each such service and property.

27. **Use by Government Aircraft.**

It will make available all of the facilities of the airport developed with Federal financial assistance and all those usable for landing and takeoff of aircraft to the United States for use by Government aircraft in common with other aircraft at all times without charge, except, if the use by Government aircraft is substantial, charge may be made for a reasonable share, proportional to such use, for the cost of operating and maintaining the facilities used. Unless otherwise determined by the Secretary, or otherwise agreed to by the sponsor and the using agency, substantial use of an airport by Government aircraft will be considered to exist when operations of such aircraft are in excess of those which, in the opinion of the Secretary, would unduly interfere with use of the landing areas by other authorized aircraft, or during any calendar month that –

a. Five (5) or more Government aircraft are regularly based at the airport or on land adjacent thereto; or

b. The total number of movements (counting each landing as a movement) of Government aircraft is 300 or more, or the gross accumulative weight of Government aircraft using the airport (the total movement of Government aircraft multiplied by gross weights of such aircraft) is in excess of five million pounds.

28. **Land for Federal Facilities.**

It will furnish without cost to the Federal Government for use in connection with any air traffic control or air navigation activities, or weather-reporting and communication activities related to air traffic control, any areas of land or water, or estate therein, or rights in buildings of the sponsor as the Secretary considers necessary or desirable for construction, operation, and maintenance at Federal expense of space or facilities for such purposes. Such areas or any portion thereof will be made available as provided herein within four months after receipt of a written request from the Secretary.

29. **Airport Layout Plan.**

a. It will keep up to date at all times an airport layout plan of the airport showing

   1) boundaries of the airport and all proposed additions thereto, together with the boundaries of all offsite areas owned or controlled by the sponsor for airport purposes and proposed additions thereto;

   2) the location and nature of all existing and proposed airport facilities and structures (such as runways, taxiways, aprons, terminal buildings, hangars and

roads), including all proposed extensions and reductions of existing airport facilities;

3) the location of all existing and proposed nonaviation areas and of all existing improvements thereon; and

4) all proposed and existing access points used to taxi aircraft across the airport's property boundary. Such airport layout plans and each amendment, revision, or modification thereof, shall be subject to the approval of the Secretary which approval shall be evidenced by the signature of a duly authorized representative of the Secretary on the face of the airport layout plan. The sponsor will not make or permit any changes or alterations in the airport or any of its facilities which are not in conformity with the airport layout plan as approved by the Secretary and which might, in the opinion of the Secretary, adversely affect the safety, utility or efficiency of the airport.

b. If a change or alteration in the airport or the facilities is made which the Secretary determines adversely affects the safety, utility, or efficiency of any federally owned, leased, or funded property on or off the airport and which is not in conformity with the airport layout plan as approved by the Secretary, the owner or operator will, if requested, by the Secretary (1) eliminate such adverse effect in a manner approved by the Secretary; or (2) bear all costs of relocating such property (or replacement thereof) to a site acceptable to the Secretary and all costs of restoring such property (or replacement thereof) to the level of safety, utility, efficiency, and cost of operation existing before the unapproved change in the airport or its facilities except in the case of a relocation or replacement of an existing airport facility due to a change in the Secretary's design standards beyond the control of the airport sponsor.

30. **Civil Rights.**

It will promptly take any measures necessary to ensure that no person in the United States shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination in any activity conducted with, or benefiting from, funds received from this grant.

a. Using the definitions of activity, facility and program as found and defined in §§ 21.23 (b) and 21.23 (e) of 49 CFR § 21, the sponsor will facilitate all programs, operate all facilities, or conduct all programs in compliance with all non-discrimination requirements imposed by, or pursuant to these assurances.

b. Applicability

1) Programs and Activities. If the sponsor has received a grant (or other federal assistance) for any of the sponsor's program or activities, these requirements extend to all of the sponsor's programs and activities.

2) Facilities. Where it receives a grant or other federal financial assistance to construct, expand, renovate, remodel, alter or acquire a facility, or part of a facility, the assurance extends to the entire facility and facilities operated in connection therewith.

3) Real Property. Where the sponsor receives a grant or other Federal financial assistance in the form of, or for the acquisition of real property or an interest in real property, the assurance will extend to rights to space on, over, or under such property.

c. Duration.

The sponsor agrees that it is obligated to this assurance for the period during which Federal financial assistance is extended to the program, except where the Federal financial assistance is to provide, or is in the form of, personal property, or real property, or interest therein, or structures or improvements thereon, in which case the assurance obligates the sponsor, or any transferee for the longer of the following periods:

1) So long as the airport is used as an airport, or for another purpose involving the provision of similar services or benefits; or

2) So long as the sponsor retains ownership or possession of the property.

d. Required Solicitation Language. It will include the following notification in all solicitations for bids, Requests For Proposals for work, or material under this grant agreement and in all proposals for agreements, including airport concessions, regardless of funding source:

"The **(Name of Sponsor)**, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises and airport concession disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award."

e. Required Contract Provisions.

1) It will insert the non-discrimination contract clauses requiring compliance with the acts and regulations relative to non-discrimination in Federally-assisted programs of the DOT, and incorporating the acts and regulations into the contracts by reference in every contract or agreement subject to the non-discrimination in Federally-assisted programs of the DOT acts and regulations.

2) It will include a list of the pertinent non-discrimination authorities in every contract that is subject to the non-discrimination acts and regulations.

3) It will insert non-discrimination contract clauses as a covenant running with the land, in any deed from the United States effecting or recording a transfer of real property, structures, use, or improvements thereon or interest therein to a sponsor.

4) It will insert non-discrimination contract clauses prohibiting discrimination on the basis of race, color, national origin, creed, sex, age, or handicap as a

covenant running with the land, in any future deeds, leases, license, permits, or similar instruments entered into by the sponsor with other parties:

a) For the subsequent transfer of real property acquired or improved under the applicable activity, project, or program; and

b) For the construction or use of, or access to, space on, over, or under real property acquired or improved under the applicable activity, project, or program.

f. It will provide for such methods of administration for the program as are found by the Secretary to give reasonable guarantee that it, other recipients, sub-recipients, sub-grantees, contractors, subcontractors, consultants, transferees, successors in interest, and other participants of Federal financial assistance under such program will comply with all requirements imposed or pursuant to the acts, the regulations, and this assurance.

g. It agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the acts, the regulations, and this assurance.

31. **Disposal of Land.**

a. For land purchased under a grant for airport noise compatibility purposes, including land serving as a noise buffer, it will dispose of the land, when the land is no longer needed for such purposes, at fair market value, at the earliest practicable time. That portion of the proceeds of such disposition which is proportionate to the United States' share of acquisition of such land will be, at the discretion of the Secretary, (1) reinvested in another project at the airport, or (2) transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order, (1) reinvestment in an approved noise compatibility project, (2) reinvestment in an approved project that is eligible for grant funding under Section 47117(e) of title 49 United States Code, (3) reinvestment in an approved airport development project that is eligible for grant funding under Sections 47114, 47115, or 47117 of title 49 United States Code, (4) transferred to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport, and (5) paid to the Secretary for deposit in the Airport and Airway Trust Fund. If land acquired under a grant for noise compatibility purposes is leased at fair market value and consistent with noise buffering purposes, the lease will not be considered a disposal of the land. Revenues derived from such a lease may be used for an approved airport development project that would otherwise be eligible for grant funding or any permitted use of airport revenue.

b. For land purchased under a grant for airport development purposes (other than noise compatibility), it will, when the land is no longer needed for airport purposes, dispose of such land at fair market value or make available to the Secretary an amount equal to the United States' proportionate share of the fair market value of the land. That portion of the proceeds of such disposition which is proportionate to the United States' share of the cost of acquisition of such land will, (1) upon application to the Secretary, be reinvested or transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order: (1) reinvestment in an approved noise compatibility project, (2) reinvestment in an approved project that is eligible for grant funding under Section 47117(e) of title 49 United States Code, (3) reinvestment in an approved airport development project that is eligible for grant funding under Sections 47114, 47115, or 47117 of title 49 United States Code, (4) transferred to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport, and (5) paid to the Secretary for deposit in the Airport and Airway Trust Fund.

c. Land shall be considered to be needed for airport purposes under this assurance if (1) it may be needed for aeronautical purposes (including runway protection zones) or serve as noise buffer land, and (2) the revenue from interim uses of such land contributes to the financial self-sufficiency of the airport. Further, land purchased with a grant received by an airport operator or owner before December 31, 1987, will be considered to be needed for airport purposes if the Secretary or Federal agency making such grant before December 31, 1987, was notified by the operator or owner of the uses of such land, did not object to such use, and the land continues to be used for that purpose, such use having commenced no later than December 15, 1989.

d. Disposition of such land under (a) (b) or (c) will be subject to the retention or reservation of any interest or right therein necessary to ensure that such land will only be used for purposes which are compatible with noise levels associated with operation of the airport.

32. **Engineering and Design Services.**

It will award each contract, or sub-contract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering, surveying, mapping or related services with respect to the project in the same manner as a contract for architectural and engineering services is negotiated under Title IX of the Federal Property and Administrative Services Act of 1949 or an equivalent qualifications-based requirement prescribed for or by the sponsor of the airport.

33. **Foreign Market Restrictions.**

It will not allow funds provided under this grant to be used to fund any project which uses any product or service of a foreign country during the period in which such foreign country is listed by the United States Trade Representative as denying fair and equitable market opportunities for products and suppliers of the United States in procurement and construction.

34. **Policies, Standards, and Specifications.**

It will carry out the project in accordance with policies, standards, and specifications approved by the Secretary including but not limited to the advisory circulars listed in the Current FAA Advisory Circulars for AIP projects, dated ____________ (the latest approved version as of this grant offer) and included in this grant, and in accordance with applicable state policies, standards, and specifications approved by the Secretary.

35. **Relocation and Real Property Acquisition.**

    a. It will be guided in acquiring real property, to the greatest extent practicable under State law, by the land acquisition policies in Subpart B of 49 CFR Part 24 and will pay or reimburse property owners for necessary expenses as specified in Subpart B.
    b. It will provide a relocation assistance program offering the services described in Subpart C and fair and reasonable relocation payments and assistance to displaced persons as required in Subpart D and E of 49 CFR Part 24.
    c. It will make available within a reasonable period of time prior to displacement, comparable replacement dwellings to displaced persons in accordance with Subpart E of 49 CFR Part 24.

36. **Access By Intercity Buses.**

    The airport owner or operator will permit, to the maximum extent practicable, intercity buses or other modes of transportation to have access to the airport; however, it has no obligation to fund special facilities for intercity buses or for other modes of transportation.

37. **Disadvantaged Business Enterprises.**

    The sponsor shall not discriminate on the basis of race, color, national origin or sex in the award and performance of any DOT-assisted contract covered by 49 CFR Part 26, or in the award and performance of any concession activity contract covered by 49 CFR Part 23. In addition, the sponsor shall not discriminate on the basis of race, color, national origin or sex in the administration of its DBE and ACDBE programs or the requirements of 49 CFR Parts 23 and 26. The sponsor shall take all necessary and reasonable steps under 49 CFR Parts 23 and 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts, and/or concession contracts. The sponsor's DBE and ACDBE programs, as required by 49 CFR Parts 26 and 23, and as approved by DOT, are incorporated by reference in this agreement. Implementation of these programs is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the sponsor of its failure to carry out its approved program, the Department may impose sanctions as provided for under Parts 26 and 23 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1936 (31 U.S.C. 3801).

38. **Hangar Construction.**

    If the airport owner or operator and a person who owns an aircraft agree that a hangar is to be constructed at the airport for the aircraft at the aircraft owner's expense, the airport owner or operator will grant to the aircraft owner for the hangar a long term lease that is subject to such terms and conditions on the hangar as the airport owner or operator may impose.

39. **Competitive Access.**

a. If the airport owner or operator of a medium or large hub airport (as defined in section 47102 of title 49, U.S.C.) has been unable to accommodate one or more requests by an air carrier for access to gates or other facilities at that airport in order to allow the air carrier to provide service to the airport or to expand service at the airport, the airport owner or operator shall transmit a report to the Secretary that-

   1) Describes the requests;

   2) Provides an explanation as to why the requests could not be accommodated; and

   3) Provides a time frame within which, if any, the airport will be able to accommodate the requests.

b. Such report shall be due on either February 1 or August 1 of each year if the airport has been unable to accommodate the request(s) in the six month period prior to the applicable due date.

LEBANON
STATE AIRPORT

FORECAST APPROVAL LETTER

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

September 2, 2016

Ms. Heather Peck
Planning and Programs Manager
3040 25th St SE
Salem, OR 97302-1125

Dear Ms. Peck:

Forecast Approval
Lebanon State Airport, Lebanon, OR
AIP- 3-41-0033-005-2015

I have reviewed the aviation forecast of the Master Plan Update submitted by Coffman Associates for Lebanon State Airport (S30). The forecasts of based aircraft and aircraft operations, respectively, are hereby approved and accepted for Federal Aviation Administration (FAA) purposes.

Please update your based aircraft information for the National Based Aircraft Inventory Program at the basedaircraft.com website to correspond with your current data.

If you have any questions about this forecast approval, please call me at (425) 227-2655.

Sincerely,

Valerie R. Thorsen
Airport Planner, Oregon

cc: Patrick Taylor, Coffman Associates

LEBANON
STATE AIRPORT

Appendix E

AIRPORT LAYOUT PLAN

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. The technical drawings are collectively referred to as the Airport Layout Plan (ALP) set. 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 approval. The FAA will critique the drawings from a technical perspective to be sure all applicable federal regulations are met.

The five primary functions of the ALP that define its purpose are:

1) An approved plan is necessary for the airport to receive financial assistance under the terms of the *Airport and Airway Improvement Act of 1982* (AIP), as amended, and to be able to receive specific Passenger Facility Charge funding. An airport must keep its ALP current and follow that plan, since those are grant assurance requirements of the AIP and previous airport development programs, including the 1970 Airport Development Aid Program (ADAP) and Federal Aid Airports Program (FAAP) of 1946, as amended. While ALPs are not required for airports other than those developed with assistance under the aforementioned federal programs, the same guidance can be applied to all airports.

2) An ALP creates a blueprint for airport development by depicting proposed facility improvements. The ALP provides a guideline by which the airport sponsor can ensure that development maintains airport design standards and safety requirements, and is consistent with airport and community land use plans.

3) The ALP is a public document that serves as a record of aeronautical requirements, both present and future, and as a reference for community deliberations on land use proposals and budget resource planning.

4) The approved ALP enables the airport sponsor and the FAA to plan for facility improvements at the airport. It also allows the FAA to anticipate budgetary and procedural needs. The approved ALP will also allow the FAA to protect the airspace required for facility or approach procedure improvements.

5) The ALP can be a working tool for the airport sponsor, including its development and maintenance staff.

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 recognizes 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; however, a revision to the ALP drawing may be required.

AIRPORT LAYOUT PLAN SET

The ALP set includes several technical drawings which depict various aspects of the current and future layout of the Airport. The following is a description of the ALP drawings included with this master plan.

AIRPORT LAYOUT PLAN DRAWING

An official Airport Layout Plan (ALP) drawing has been developed for Lebanon State 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 includes 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. Also presented on the ALP are the runway safety areas, airport property boundary, and revenue support areas.

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 Lebanon State 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. The FAR Part 77 drawing is based on the future condition of the airfield. 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 associated point on the runway centerline. Due to weight limitations, the runway is classified as "utility." There are no instrument approach procedures at this time. The primary surface for Runway 16-34 is 250 feet wide as centered on the runway. It should be noted that implementing non-precision instrument approaches to the runway will increase the width of the primary surface to 500 feet. This may introduce incompatibilities to the primary surface, such as future taxiways, and could be a limiting factor when considering instrument approaches.

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.

The current approach surface based on visual approaches extends out to a distance of 5,000 feet and an outer width of 1,250 feet. If a non-precision instrument approach were implemented, then the inner width is 500 feet, the length is 10,000 feet, and the outer width is 2,000 feet. Under both scenarios the slope of the approach surface is 20:1.

Transitional Surface: The runway has a transitional surface that begins at the outside edge of the primary surface at the same elevation as the runway. The surface rises at a slope of 7:1, 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 5,000 feet from the end of the primary surface currently and 10,000 feet if non-precision instrument approaches are implemented.

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 20:1. 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.

The approach surface profile drawings include identified penetrations to the approach surface. Penetrations to the approach surface are considered obstructions. The FAA will determine if any obstructions are also hazards which require mitigation. The FAA utilizes other design criteria such as the threshold siting surface (TSS) and various surfaces defined in FAA Order 8260.3B, *Terminal Instrument Procedures* (TERPS), to determine if an obstruction is a hazard.

If an obstruction is a hazard, the FAA can take many steps to protect air navigation. The mitigation options range from removing the hazard to installing obstruction lighting to adjusting the instrument approach minimums.

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.

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 Lebanon State Airport, the airport property was segmented 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. However, implementation of any non-aeronautical uses will require further FAA approval, even if the land is designated for non-aeronautical uses on this drawing. There are three different land uses identified for Lebanon State Airport: Airfield Operations, Aviation Development, and Revenue Support.

The Airfield Operations category includes the immediate runway and taxiway environment and includes the Navaid critical areas, runway visibility zone, runway and taxiway safety areas, and the runway protection zones. The Airfield Operations area is reserved for facilities critical to the safe operations of aircraft on the runways and taxiways.

The Aviation Development category reserves critical space adjacent to the Airfield Operations area for aviation-specific activity. This activity includes all facilities necessary for aviation-related functions including hangars, terminal buildings, and fuel farms. Essentially any facilities to be developed in the Aviation Development area must be intended for a function that requires access to the runway and taxiway system. It should be noted that other uses that are compatible with airport operations can be located in the Aviation Development area on a temporary basis, usually considered five years or less.

The Revenue Support category can include aviation facilities and non-aviation facilities. There is a small parcel outside of the Runway 16 RPZ on the north side of Oak Street that is considered as Revenue Support.

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.

FAA ALP APPROVAL

FAA will review the ALP submitted. It will be routed through various departments. Comments provided by FAA will be addressed and the ALP will be updated for final FAA approval. FAA approval of any ALP is subject to the condition that the improvements identified may not be undertaken without prior written environmental approval by the FAA. Approval of the ALP does not imply any commitment for federal funding or approval of future structures requiring notice under FAR Part 77.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98055-4056

August 30, 2017

Mr. Matthew Maass
State Airports Manager
Oregon Department of Aviation
3040 25th Street SE
Salem, OR 97302

Dear Mr. Maass:

The Lebanon State Airport (S30) Airport Layout Plan (ALP), prepared by Coffman Associates, and bearing your signature, is approved and the master plan is accepted. A signed copy of the approved ALP is enclosed.

An aeronautical study (no. 2017-ANM-1299-NRA) was conducted on the proposed development. This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making this determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal.

The FAA has only limited means to prevent the construction of structures near an airport. The airport sponsor has the primary responsibility to protect the airport environs through such means as local zoning ordinances, property acquisition, avigation easements, letters of agreement or other means.

This ALP approval is conditioned on acknowledgement that any development on airport property requiring Federal environmental approval must receive such written approval from 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.

Approval of the plan does not indicate that the United States will participate in the cost of any development proposed. AIP funding requires evidence of eligibility and justification at the time a funding request is ripe for consideration. When construction of any proposed structure or development indicated on the plan is undertaken, such construction requires normal 45-day advance notification to FAA for review in accordance with applicable Federal Aviation Regulations (i.e., Parts 77, 157, 152, etc.). More notice is generally beneficial to ensure that all statutory, regulatory, technical and operational issues can be addressed in a timely manner.

Please attach this letter to the Airport Layout Plan and retain it in the airport. We wish you great success in your plans for the development of the airport.

Sincerely,

Joelle Briggs
Manager, FAA Seattle Airports District Office

Enclosure
cc: Mitch Swecker, Director, Airport Operations
Patrick Taylor, Coffman Associates

AIRPORT LAYOUT PLAN

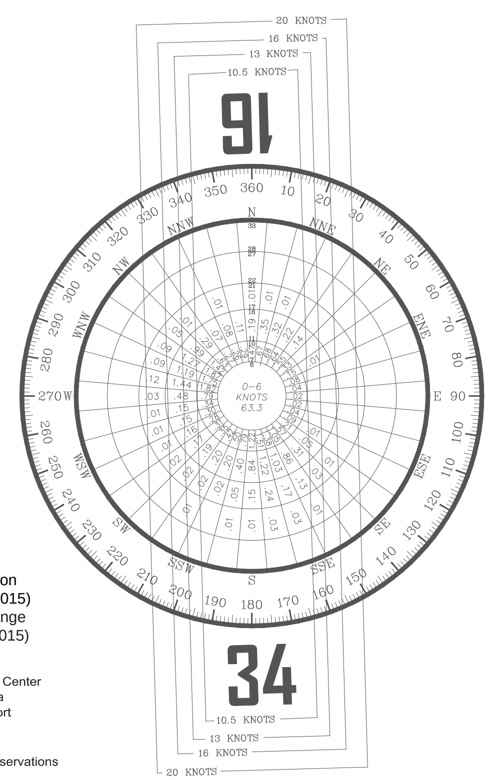
FOR

LEBANON STATE AIRPORT

Prepared for

Oregon Department of Aviation

INDEX OF DRAWINGS

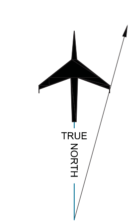


Magnetic Declination
15° 22' East (Sept. 2015)
Annual Rate of Change
00° 7' West (Sept. 2015)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Corvallis Municipal Airport
Corvallis, Oregon

OBSERVATIONS:
242,402 All Weather Observations
2005-2014

ALL WEATHER WIND COVERAGE				
Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 16-34	94.52%	97.31%	99.57%	99.95%



Magnetic Declination 15° 22' East (Sept. 2015)
Annual Rate of Change 00° 7' West (Sept. 2015)

0 100 200 300
SCALE IN FEET

FAA AIP: 3-41-0033-005

NO.	REVISIONS	DATE	BY	APP'D.
1	Airport Layout Plan Updated	8/1/2017	Coffman	—

LEBANON STATE AIRPORT (S30)

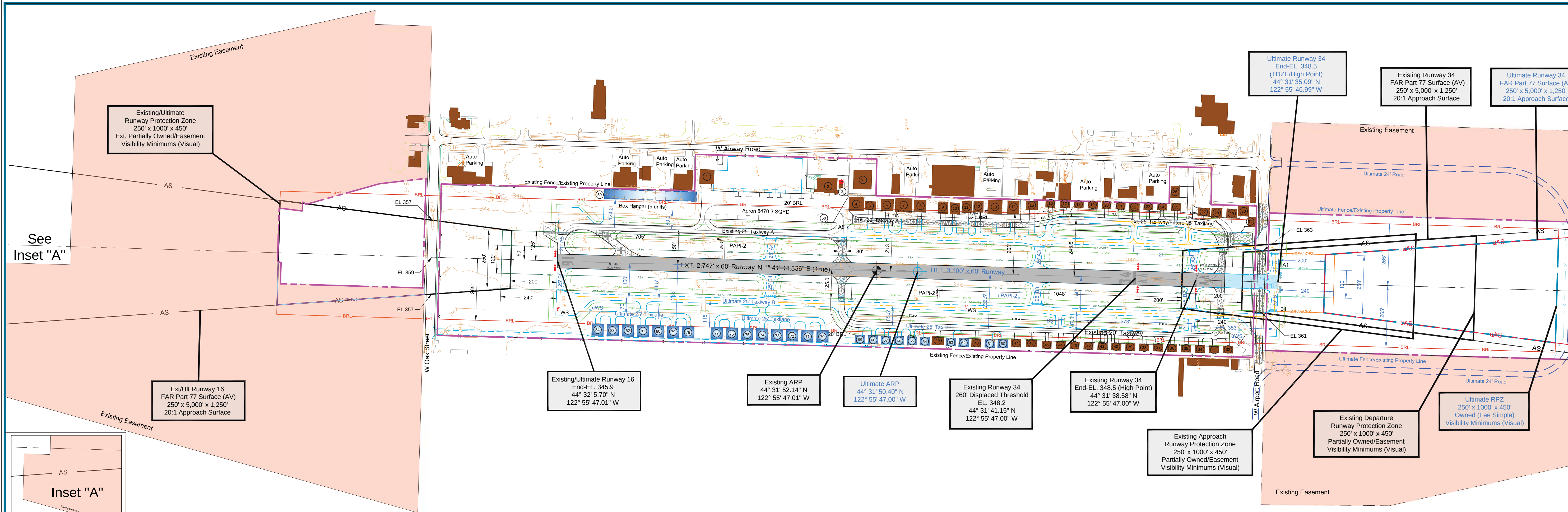
COVER SHEET

Lebanon, Oregon

PLANNED BY: Patrick C. Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

August 1, 2017 SHEET 1 OF 8

Coffman Associates
Airport Consultants
www.coffmanassociates.com



RUNWAY DATA	RUNWAY 16-34 EXISTING		RUNWAY 16-34 ULTIMATE	
RUNWAY IDENTIFICATION	Utility (Small Aircraft Exclusively)		Utility (Small Aircraft Exclusively)	
APPROACH REFERENCE CODE (APRC)	B/I (S)/VIS		B/I (S)/VIS	
DEPARTURE REFERENCE CODE (DPRC)	B/I (S)		B/I (S)	
RUNWAY DESIGN CODE (RDC)	B-I-VIS		B-I-VIS	
CRITICAL DESIGN AIRCRAFT TYPE	B-I-1A (Beech Baron 58P)		B-I-1A (Beech Baron 58P)	
AIRCRAFT APPROACH SPEED	101 knots		101 knots	
WINGSPAN OF DESIGN AIRCRAFT	37' 10"		37' 10"	
MAX. CERTIFIED TAKEOFF WEIGHT OF DESIGN A/C	6,200 lbs		6,200 lbs	
RUNWAY DIMENSIONS (L X W)	2,747' x 60'		3,100' x 60'	
RUNWAY TRUE BEARING (NGS SURVEY)	N 1° 42' 4.36" E		N 1° 42' 4.36" E	
RUNWAY WIND COVERAGE (10.5 KNOTS)	94.52%		94.52%	
RUNWAY SHOULDERS	N/A		None	
RUNWAY MAXIMUM ELEVATION/HIGH POINT OF RUNWAY	348.5' MSL		348.5' MSL	
RUNWAY LOW POINT ELEVATION (NAVD-88)	345.1' MSL		345.1' MSL	
RUNWAY LIGHTING	MIRL		MIRL	
RUNWAY EFFECTIVE GRADIENT/MAXIMUM GRADIENT	0.09%		0.08%	
RUNWAY SURFACE MATERIAL	Asphalt		Asphalt	
RUNWAY PAVEMENT SURFACE TREATMENT	None		None	
RUNWAY PAVEMENT STRENGTH (IN THOUSAND LBS. #1)	12.5 (S)		12.5 (S)	
RUNWAY CENTERLINE TO PARALLEL TAXIWAY CENTERLINE	Varies (150')		150'	
LINE OF SIGHT REQUIREMENT MET	Yes		Yes	
TAXIWAY LIGHTING	MITL, Reflectors		MITL, Reflectors	
TAXIWAY MARKING	Centerline		Centerline	
TAXIWAY SURFACE MATERIAL	Asphalt		Asphalt	
TAXIWAY CENTERLINE TO FIXED OR MOVABLE OBJECT	44.5'		44.5'	
TAXIWAY WINGTIP CLEARANCE	20'		20'	
TAXIWAY & TAXILANE WIDTH (TDG)	Varies' (25' TDG 1A, standard)		25' (TDG 1A)	
TAXIWAY SHOULDER WIDTH	None		None	
TAXIWAY & TAXILANE SAFETY AREA WIDTH	49'		49'	
TAXIWAY & TAXILANE OBJECT FREE AREA WIDTH	89' (TOFA), 79' (TL OFA)		89' (TOFA)	
TAXIWAY HOLDING POSITION MARKING/HOLDSIGN	125'		125'	
TAXIWAY EDGE SAFETY MARGIN (TESM)	TESM 5'		TESM 5'	
	RUNWAY 16	RUNWAY 34	RUNWAY 16	RUNWAY 34
FAR PART 77 CATEGORY	A (V)	A (V)	Same	A (V)
FAR PART 77 APPROACH SURFACE	Visual	Visual	Same	Visual
FAR PART 77 APPROACH SLOPE	20:1	20:1	Same	20:1
PRECISION OBSTACLE FREE ZONE (800' X 200')	N/A	N/A	Same	N/A
RUNWAY PROTECTION ZONES	250' x 1000' x 450'	250' x 1000' x 450'	Same	250' x 1000' x 450'
RUNWAY APPROACH VISIBILITY MINIMUMS (LOWEST)	Visual	Visual	Same	Visual
RUNWAY MARKING	Basic-Visual	Basic-Visual (Dspd)	Same	Visual
RUNWAY BLAST PAD	None	None	Same	None
RUNWAY DISPLACED THRESHOLD	N/A	260'	Same	N/A
RUNWAY DISPLACED THRESHOLD ELEVATION	N/A	EL. 348.2	Same	N/A
RUNWAY THRESHOLD SITING SURFACE (TSS)	20:1 (Rw Type II)	20:1 (Rw Type II)	Same	20:1 (Rw Type II)
RUNWAY END ELEVATION (NAVD88)	EL. 345.9	EL. 348.5	Same	EL. 348.5
RUNWAY TOUCHDOWN ZONE ELEVATION (TDZE / NAVD 88)	EL. 348.5	EL. 348.5	Same	EL. 348.5
RUNWAY SAFETY AREA (Standard and Actual RSA "L x W")	240' x 120'	240' x 120'	Same	240' x 120'
OBJECT FREE AREA (Standard and Actual OFA "L x W")	240' x 250'	240' x 250'	Same	240' x 250'
OBSTACLE FREE ZONE (Standard and Actual OFZ "L x W")	200' x 250'	200' x 250'	Same	200' x 250'
TYPE OF AERONAUTICAL SURVEY REQUIRED FOR APPROACH	NVG	NVG	Same	NVG
RUNWAY DEPARTURE SURFACE	N/A	N/A	Same	No
AIRPORT INSTRUMENT APPROACH PROCEDURES	None	None	Same	None
RUNWAY VISUAL AIDS (Approach Lights)	PAPI-2	PAPI-2	Same	PAPI-2

1 PAVEMENT STRENGTHS ARE EXPRESSED IN SINGLE (S).

AIRPORT DATA

OWNER: Oregon Department of Aviation | CITY: Lebanon,OR | COUNTY: Linn | NPIAS CODE: GA

LEBANON STATE AIRPORT - S30		EXISTING	ULTIMATE
AIRPORT REFERENCE CODE		B-I (Small Aircraft Exclusively)	B-I (Small Aircraft Exclusively)
DESIGN CRITICAL AIRCRAFT		Beech Baron 58P	Beech Baron 58P
AIRPORT ELEVATION (NAVD 88)		348.5' MSL	348.5' MSL
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		82.6° F (August 2010)	Same
STATE SERVICE ROLE		Local GA	Same
AIRPORT REFERENCE POINT (ARP)	Latitude	44° 31' 52.14" N	44° 31' 50.40 " N
COORDINATES (NAD 83)	Longitude	122° 55' 47.01" W	122° 55' 47.00" W
AIRPORT INSTRUMENT APPROACH PROCEDURES		None	None
AIRPORT and TERMINAL NAVIGATIONAL AIDS		PAPI	Same
MISCELLANEOUS FACILITIES		Airport Beacon Lighted Wind Cone	Airport Beacon Lighted Wind Cone

RUNWAY COORDINATES (NAD 83)

LEBANON STATE AIRPORT (S30)		EXISTING	ULTIMATE
Runway 16 End EL. 345.9 (NAVD 88)	Latitude	44° 32' 05.70" N	Same
	Longitude	122° 55' 47.01" W	
Runway 34 End EL. 348.5 (NAVD 88)	Latitude	44° 31' 38.58" N	44° 31' 35.09" N
	Longitude	122° 55' 47.00" W	122° 55' 46.99" W
Runway 34 Displaced Threshold 260' EL. 348.2 (NAVD 88)	Latitude	44° 31' 41.15" N	N/A
	Longitude	122° 55' 47.00" W	

SURVEY DATE: 10/12/2016

MODIFICATIONS TO FAA AIRPORT DESIGN STANDARDS

STANDARD MODIFIED	DESCRIPTION	AIRSPACE CASE NUMBER	APPROVAL DATE
None	-	-	-

DECLARED DISTANCE

DECLARED DISTANCE	Existing Rwy 16	Existing Rwy 34	Ultimate Rwy 16	Ultimate Rwy 34
TAKEOFF RUN AVAILABLE (TORA)	2747'	2747'	3100'	3100'
TAKEOFF DISTANCE AVAILABLE (TODA)	2747'	2747'	3100'	3100'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	2747'	2747'	3100'	3100'
LANDING DISTANCE AVAILABLE (LDA)	2747'	2487'	3100'	3100'

Airport Facilities (FAA Owned)

PAPI

GENERAL NOTES:

1. Depiction of features and objects, including related elevations and clearances, within the runway protection zones are depicted on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS.
2. Details concerning terminal improvements depicted on the TERMINAL AREA DRAWING.
3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE DRAWING.
4. NAVD 88 Datum was used for all vertical elevations and NAD 83 for all horizontal elevations.
5. There are no Existing Runway Shoulders or Taxiway Shoulders, tables show standard requirements.
6. Runway OFA and Runway OFZ is 250' wide, Line is label as xOFA/xOFZ or uOFA/uOFZ.
7. Threshold Siting Surface Depicted on the Inner Portion of Runway Approach Surface Drawings.

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
	Same	ABANDONED PAVEMENT (To Be Removed)
	PL(U)	AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
	Same	AIRPORT ROTATING BEACON
		BUILDING
		PAVEMENT
		FENCING (8')
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION (PAPI-2)
		RUNWAY THRESHOLD LIGHTS and REIL
340	Same	TOPOGRAPHY (NAVD 88)
		HOLDING POSITION MARKING
TSA	uTSA	TAXIWAY SAFETY AREA (49' Typical)
TOFA	uTOFA	TAXIWAY OBJECT FREE AREA (89' Typical)
xRSA	uRSA	RUNWAY SAFETY AREA (RSA)
xOFA/xOFZ	uOFA/uOFZ	OBJECT FREE AREA/OBSTACLE FREE ZONE
AS	uAS	PART 77 APPROACH SURFACE
		RUNWAY PROTECTION ZONE (RPZ)
BRL	Same	BUILDING RESTRICTION LINE (BRL)
	N/A	EASEMENT
		TIE-DOWNS
		WIND INDICATOR/WINDSOCK (WS)

BUILDINGS/FACILITIES

	DESCRIPTION	Elevation
1	Hangar	373.1'
2	FBO Hangar	365.6'
3	Airport Beacon	380.8'
4	Hangar	370.3'
5	Box Hangar	368.3'
6	Box Hangar	367.6'
7	Hangar	366.7'
8-31	Box Hangars	368.0'
32-49	Box Hangars	368.6'
50	FUEL PUMP	-
51	Hangar	360.6'

Ultimate Buildings/Facilities

	DESCRIPTION	Elevation
59	Box Hangars	22' AGL
60-69	Box Hangars	22' AGL
70-77	Box Hangars	22' AGL
78-84	Box Hangars	22' AGL

FAA APPROVAL STAMP

Paula Briggs 8/30/17
Manager, Seattle Airports District Office

FOR APPROVAL BY

Airport Manager — DATE: 11aug17

Magnetic Declination
15° 22' East (Sept. 2015)
Annual Rate of Change
00° 7' West (Sept. 2015)

TRUE NORTH

0 200 400 600
SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
1	Airport Layout Plan Updated	8/30/2017	Coffman	FAA

LEBANON STATE AIRPORT (S30)

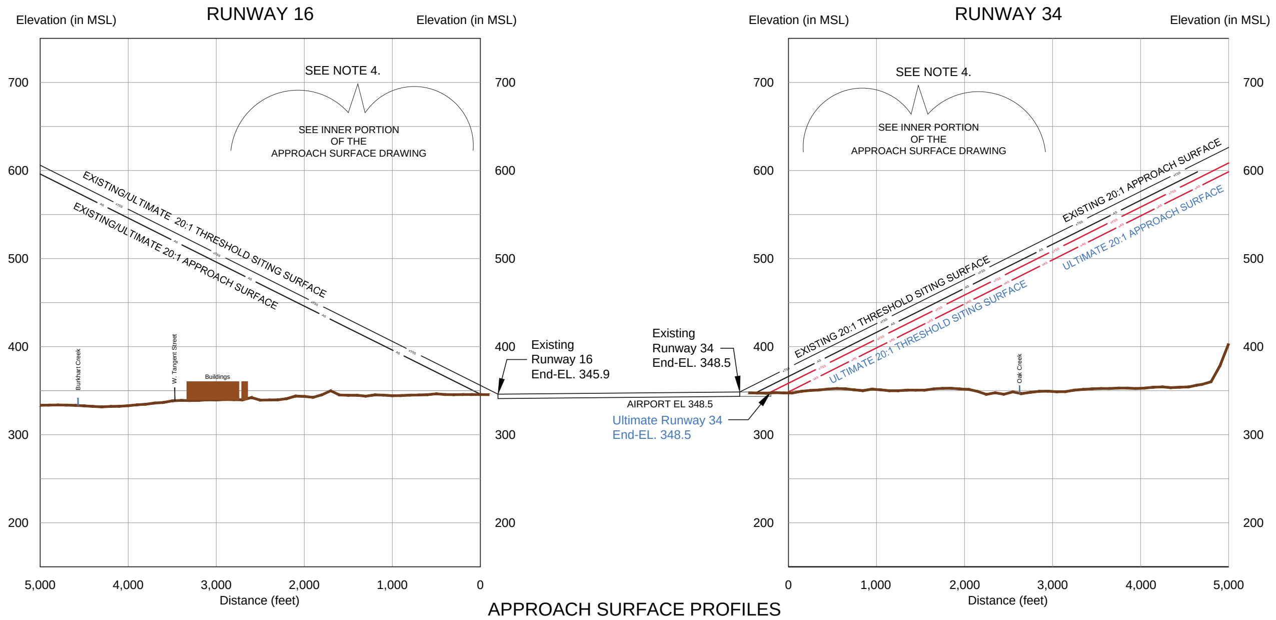
AIRPORT LAYOUT PLAN DRAWING

Lebanon, Oregon

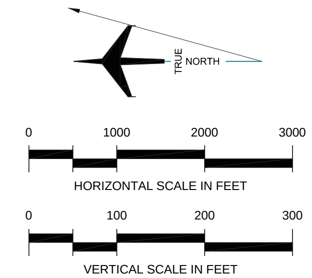
PLANNED BY: Patrick C. Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

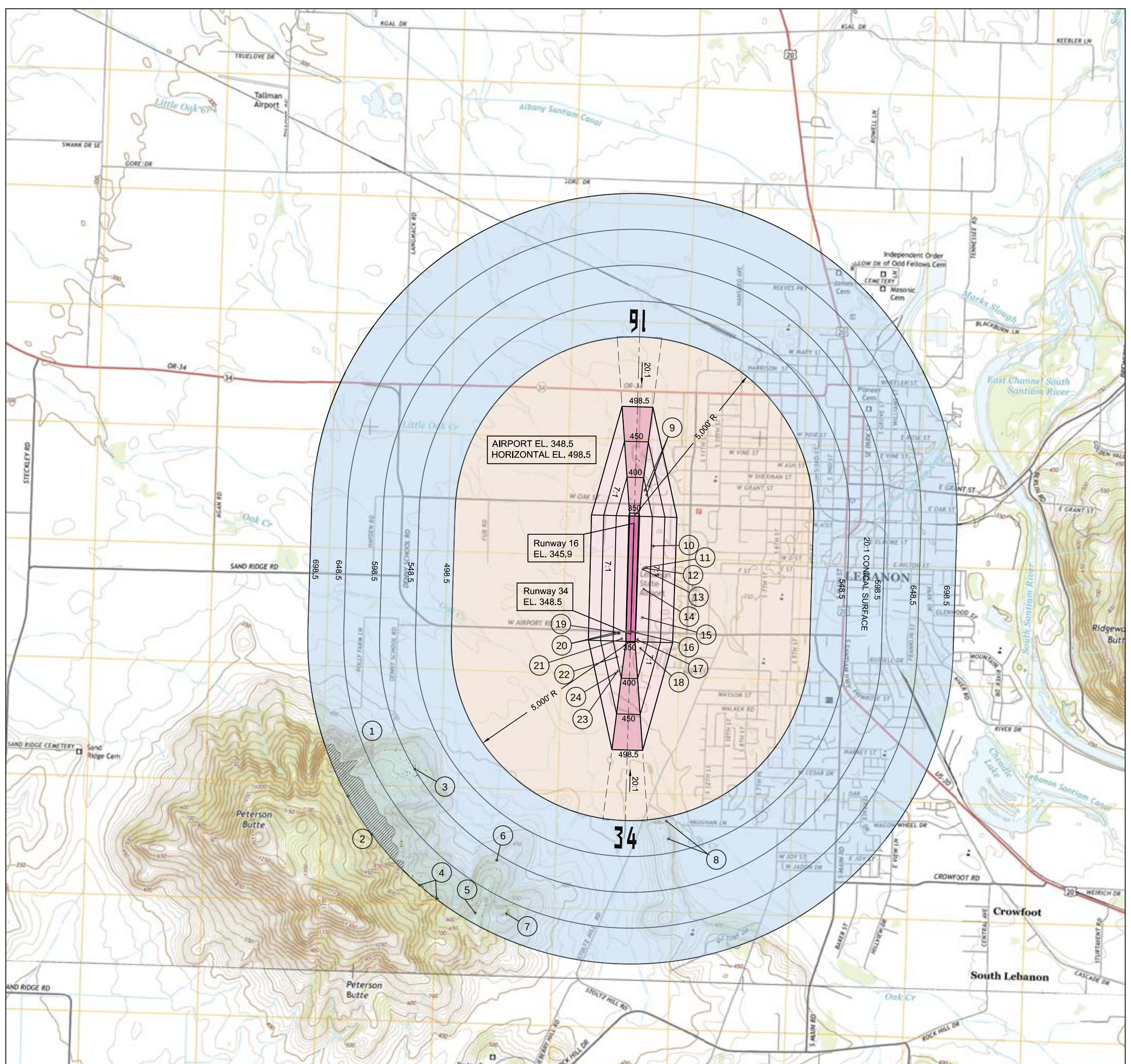
August 1, 2017 — SHEET 2 OF 8

Coffman Associates
Airport Consultants
www.coffmanassociates.com



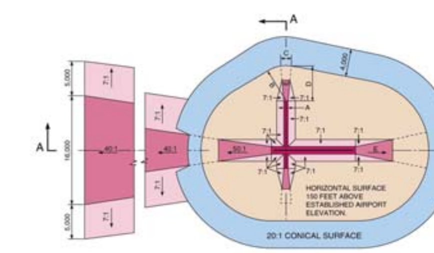
APPROACH SURFACE PROFILES





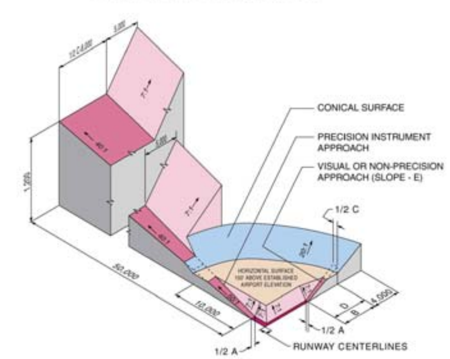
OBSTRUCTION TABLE

Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Object AGL	Proposed Object Disposition
1. Trees-EL. 1020.6 Ground-EL. 871	Conical Surface	up to 323' up to 171.5'	up to 170'	Request Aeronautical Study
2. Trees-EL. 1018.5	Conical Surface	up to 320'	up to 168'	No Action
3. Trees-EL. 620.7	Conical Surface	up to 22.8'	up to 95'	No Action
4. Trees-EL. 741.3	Conical Surface	up to 42.9'	up to 65'	No Action
5. Trees-EL. 772.7	Conical Surface	up to 87.8	up to 92'	No Action
6. Trees-EL. 610.4	Conical Surface	up to 4.3'	up to 112'	No Action
7. Trees-EL. 677.5	Conical Surface	up to 11.7'	up to 77'	No Action
8. Trees-EL. 541.8	Conical Surface	up to 12.7'	up to 122'	No Action
9. Trees-EL. 403.3	Transitional Surface	up to 11.7'	up to 60'	Trim Trees
10. Trees-EL. 417.3	Transitional Surface	up to 12.7'	up to 71'	Trim Trees
11. Airport Beacon-EL. 380.8	Transitional Surface	0'	up to 35'	No Action
12. Pole-EL. 378.0	Transitional Surface	3.7'	up to 32'	Request Aeronautical Study
13. Building-EL. 370.6	Transitional Surface	1.1'	up to 26'	Request Aeronautical Study
14. Trees-EL. 400.3	Transitional Surface	24.1'	up to 53'	Trim Trees
15. Trees-EL. 379.9	Transitional Surface	5.5'	up to 34'	Trim Trees
16. Road-EL. 362.1	Primary Surface	14'	15'	Relocate Road
17. Trees-EL. 362.1	Transitional Surface	5.1'	up to 15'	Trim Trees
18. Trees-EL. 382.3	Transitional Surface	5.7'	up to 40'	Trim Trees
19. Pole-EL. 382.3	Transitional Surface	4.3'	up to 35'	Request Aeronautical Study
20. Trees-EL. 384.7	Transitional Surface	8.1'	up to 41'	Trim Trees
21. Trees-EL. 367.1	Transitional Surface	2'	up to 23'	Trim Trees
22. Trees-EL. 412.6	Transitional Surface	14.6'	up to 65'	Trim Trees
23. Trees-EL. 420.4	Transitional Surface	13.1'	up to 73'	Trim Trees
24. Trees-EL. 427.2	Transitional Surface	7.9'	up to 80'	Trim Trees



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET



ISOMETRIC VIEW OF SECTION A-A

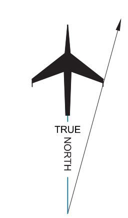
SOURCE: 14 CFR Part 77, Section 77.25, Civil Airport Imaginary Surfaces.

SURVEY DATE:
10/12/2016

OBSTRUCTION LEGEND

OBSTRUCTION

TOPOGRAPHIC OBSTRUCTION



Magnetic Declination
15° 22' East (Sept. 2015)
Annual Rate of Change
00° 7' West (Sept. 2015)

0 2000 4000 6000
SCALE IN FEET

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, horizontal, and conical surfaces, are illustrated on the AIRPORT AIRSPACE DRAWINGS.
3. Depiction of features and objects within the outer portion of the approach surfaces, are illustrated on the APPROACH SURFACE PROFILES.
4. Depiction of features and objects within the inner portion of the approach surfaces, are illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS.
5. Airport Mapping was completed October 12, 2016.

NO.	REVISIONS	DATE	BY	APP'D.
1	Airport Layout Plan Updated	8/1/2017	Coffman	—

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

LEBANON STATE AIRPORT (S30)

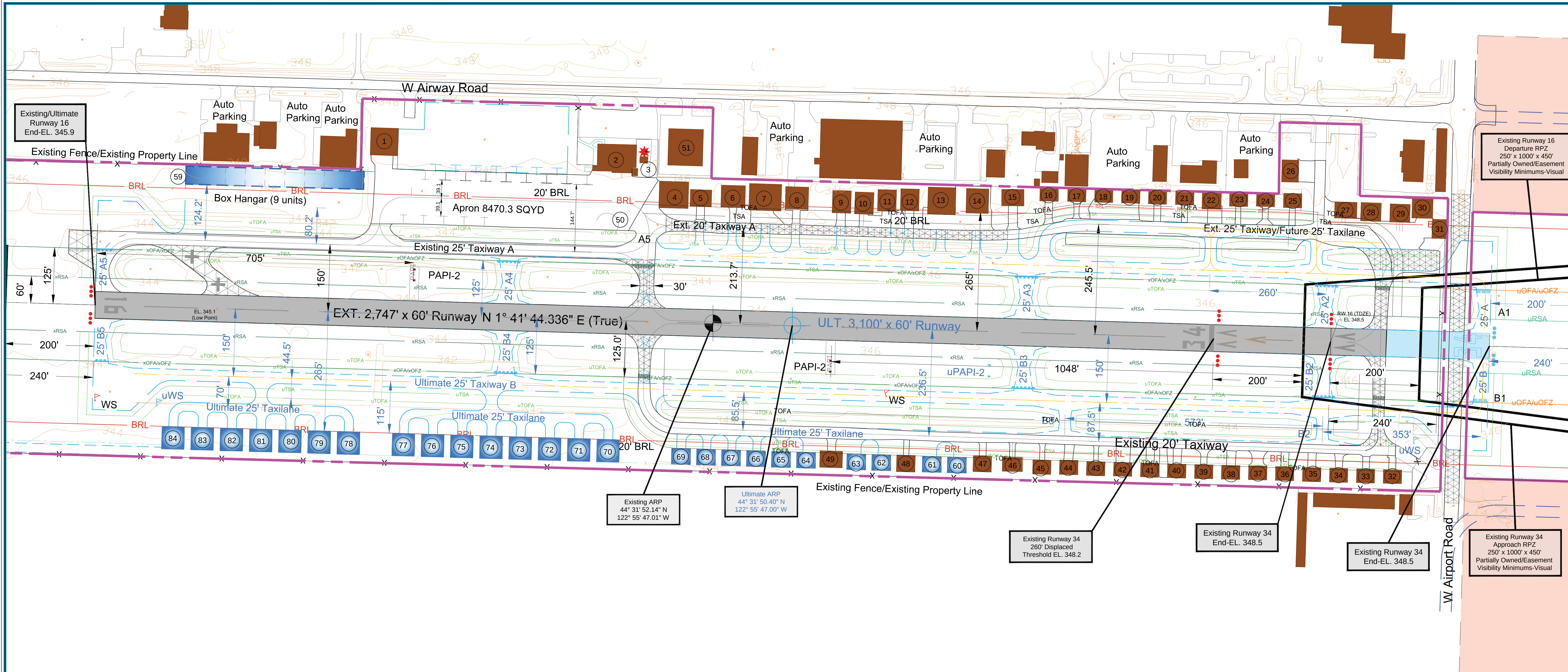
AIRPORT AIRSPACE DRAWING

Lebanon, Oregon

PLANNED BY: Patrick C. Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

August 1, 2017

Coffman Associates
Airport Consultants
www.coffmanassociates.com



SURVEY DATE:
10/12/2016

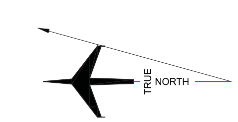
BUILDINGS/FACILITIES					
DESCRIPTION		Elevation (MSL)	DESCRIPTION		Elevation (MSL)
1	Hangar	373.1'	29	Box Hangar	368.6'
2	FBO Hangar	365.6'	30	Box Hangar	365.0'
3	Airport Beacon	380.8'	31	Box Hangar	363.8'
4	Hangar	370.3'	32	Box Hangar	358.2'
5	Box Hangar	368.3'	33	Box Hangar	357.7'
6	Box Hangar	367.6'	34	Box Hangar	356.9'
7	Hangar	366.7'	35	Box Hangar	357.1'
8	Box Hangar	367.1'	36	Box Hangar	357.5'
9	Box Hangar	364.1'	37	Box Hangar	357.4'
10	Box Hangar	363.6'	38	Box Hangar	357.5'
11	Box Hangar	364.8'	39	Box Hangar	357.2'
12	Box Hangar	364.9'	40	Box Hangar	357.2'
13	Box Hangar	366.4'	41	Box Hangar	357.0'
14	Box Hangar	363.5'	42	Box Hangar	356.5'
15	Box Hangar	366.9'	43	Box Hangar	356.8'
16	Box Hangar	356.6'	44	Box Hangar	366.8'
17	Box Hangar	358.7'	45	Box Hangar	356.6'
18	Box Hangar	359.2'	46	Box Hangar	362.8'
19	Box Hangar	358.6'	47	Box Hangar	362.7'
20	Box Hangar	357.8'	48	Box Hangar	363.8'
21	Box Hangar	359.1'	49	Box Hangar	364.3'
22	Box Hangar	367.7'	50	Fuel Tanks	-
23	Box Hangar	357.9'	51	Hangar	360.6'
24	Box Hangar	357.9'			
25	Box Hangar	359.2'			
26	Box Hangar	364.0'			
27	Box Hangar	367.0'			
28	Box Hangar	368.0'			

ULTIMATE BUILDINGS/FACILITIES					
DESCRIPTION		Elevation	DESCRIPTION		Elevation
59	Box Hangar (9 units)	22' AGL	75	Box Hangar	22' AGL
60	Box Hangar	22' AGL	75	Box Hangar	22' AGL
61	Box Hangar	22' AGL	77	Box Hangar	22' AGL
62	Box Hangar	22' AGL	78	Box Hangar	22' AGL
63	Box Hangar	22' AGL	79	Box Hangar	22' AGL
64	Box Hangar	22' AGL	80	Box Hangar	22' AGL
65	Box Hangar	22' AGL	81	Box Hangar	22' AGL
66	Box Hangar	22' AGL	82	Box Hangar	22' AGL
67	Box Hangar	22' AGL	83	Box Hangar	22' AGL
68	Box Hangar	22' AGL	84	Box Hangar	22' AGL
69	Box Hangar	22' AGL			
70	Box Hangar	22' AGL			
71	Box Hangar	25' AGL			
72	Box Hangar	25' AGL			
73	Box Hangar	22' AGL			
74	Box Hangar	22' AGL			

LEGEND		
EXISTING	ULTIMATE	DESCRIPTION
	Same	ABANDONED PAVEMENT (To Be Removed)
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
	Same	AIRPORT ROTATING BEACON
		BUILDING
		PAVEMENT
		FENCING (8')
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION (PAPI-2)
		RUNWAY THRESHOLD LIGHTS and REIL
340	Same	TOPOGRAPHY (NAVD 88)
		HOLDING POSITION MARKING
TSA	uTSA	TAXIWAY SAFETY AREA (49' Typical)
TOFA	uTOFA	TAXIWAY OBJECT FREE AREA (89' Typical)
xRSA	uRSA	RUNWAY SAFETY AREA (RSA)
xOFA/xOFZ	uOFA/uOFZ	OBJECT FREE AREA/OBSTACLE FREE ZONE
AS	uAS	PART 77 APPROACH SURFACE
		RUNWAY PROTECTION ZONE (RPZ)
BRL	N/A	BUILDING RESTRICTION LINE (BRL)
	None	EASEMENT
		TIE-DOWNS
		WIND INDICATOR/WINDSOCK (WS)

GENERAL NOTES:

1. Depiction of features and objects, including related elevations and clearances, within the runway protection zones are depicted on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS.
2. Details concerning terminal improvements depicted on the TERMINAL AREA DRAWING.
3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE DRAWING.
4. NAVD 88 Datum was used for all vertical elevations and NAD 83 for all horizontal elevations.
5. AMSL Above Mean Sea Level or top Elevations, also reference as MSL (from 0' to top of object).



Magnetic Declination
15° 22' East (Sept. 2015)
Annual Rate of Change
00° 7' West (Sept. 2015)

0 100 200 300
SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
1	Airport Layout Plan Updated	8/1/2017	Coffman	—

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

LEBANON STATE AIRPORT (S30)

TERMINAL FACILITIES DRAWING

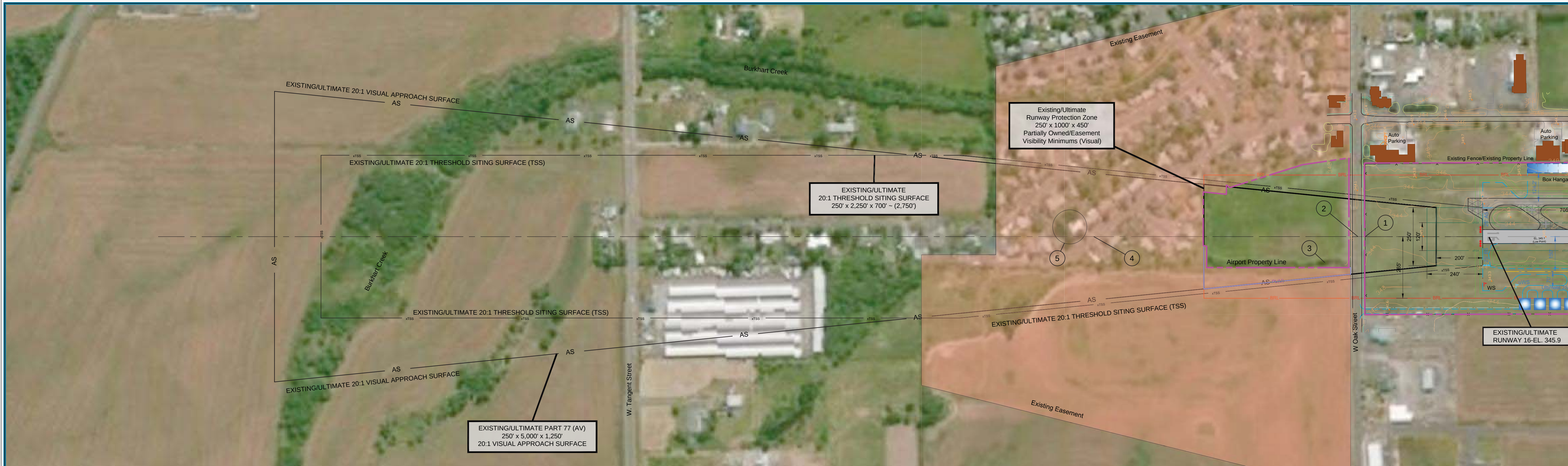
Lebanon, Oregon

PLANNED BY: Patrick C. Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

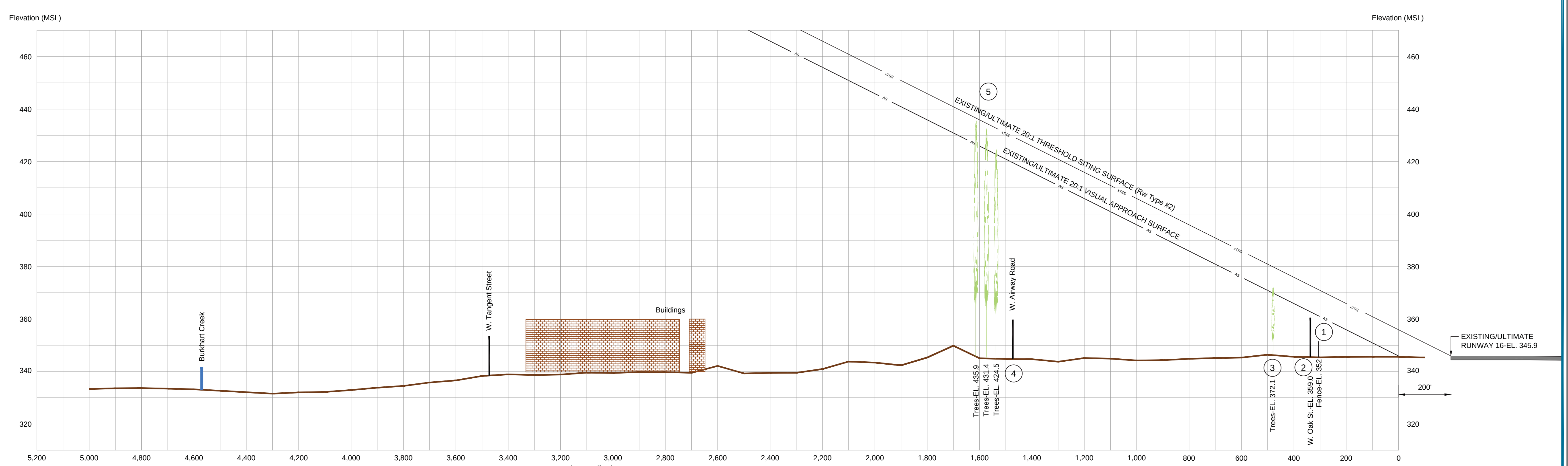
August 1, 2017

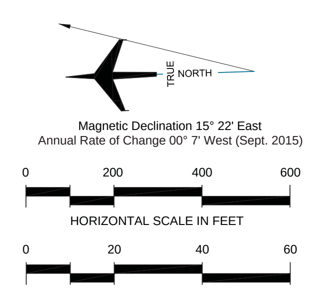
SHEET 4 OF 8

Coffman Associates
Airport Consultants
www.coffmanassociates.com



SURVEY DATE:
10/12/2016





OBSTRUCTION TABLE

Objects Description/Elevation	Part 77 Approach		Threshold Siting Surface		Disposition
	Existing 20:1	Ultimate 20:1	Existing 20:1	Ultimate 20:1	
3. Trees-EL. 372.1	2.2'	2.2'	0'	0'	Remove all Trees in RPZ
5. Trees-EL. 435.9	9.3'	9.3'	0'	0'	Remove or Trim all Trees to EL 350.0

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for noninterstate Roads, 17' for interstate Roads, and 23' for railroad.
2. Timeframe/expected date of obstruction removal (within the Short Term).

NO.	REVISIONS	DATE	BY	APP'D.
1	Airport Layout Plan Updated	8/1/2017	Coffman	—

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

LEBANON STATE AIRPORT (S30)

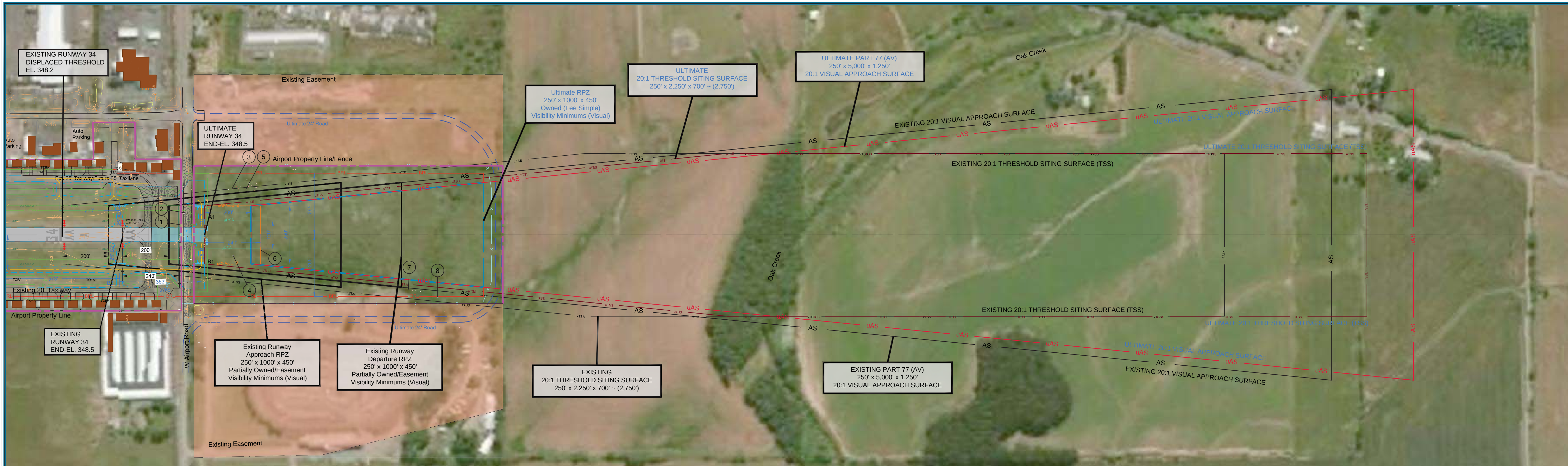
INNER PORTION OF RUNWAY 16 APPROACH SURFACE DRAWING

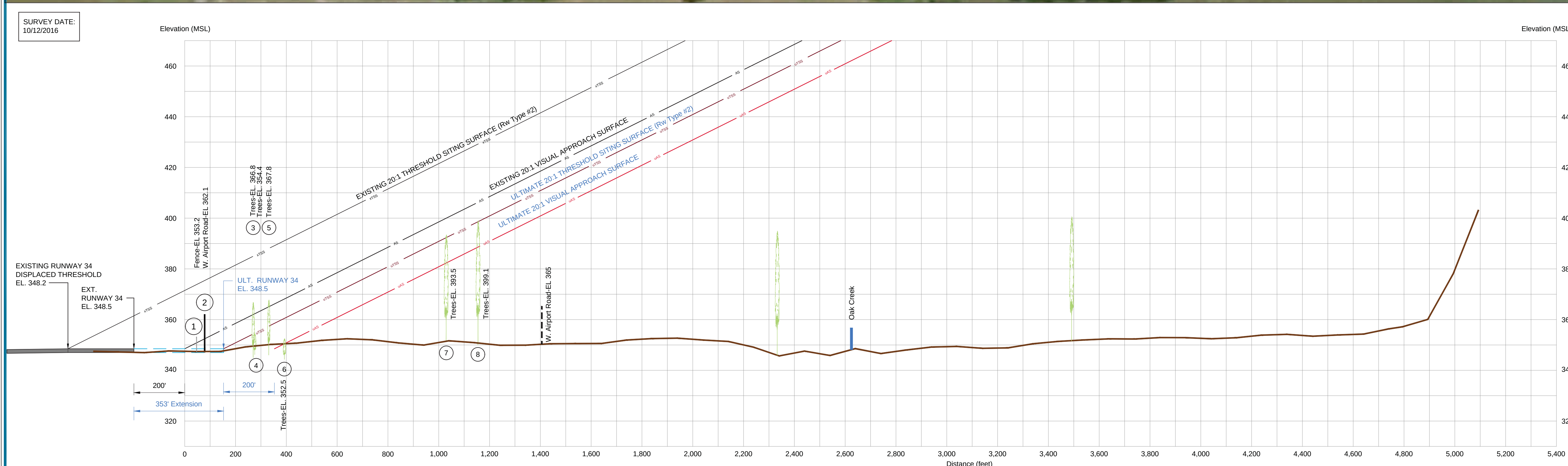
Lebanon, Oregon

PLANNED BY: Patrick C. Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

August 1, 2017 SHEET 5 OF 8

Coffman Associates
Airport Consultants
www.coffmanassociates.com





OBSTRUCTION TABLE

Objects Description/Elevation	Part 77 Approach Existing 20:1	Part 77 Approach Ultimate 20:1	Threshold Siting Surface Existing 20:1	Threshold Siting Surface Ultimate 20:1	Disposition
1. Fence-EL. 353.2	2.4'	N/A	0'	N/A	Relocate Fence
2. Road-EL. 362.1	10'	N/A	0'	N/A	Relocate Road
4. Trees-EL. 354.4	0'	0'	0'	6.4'	Remove all Trees in RPZ
6. Trees-EL. 352.5	-	-	-	2.5'	Remove all Trees in RPZ

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for noninterstate Roads, 17' for interstate Roads, and 23' for railroad.
2. Timeframe/expected date of obstruction removal (within the Short Term).

TRUE NORTH

Magnetic Declination 15° 22' East
Annual Rate of Change 00° 7' West (Sept. 2015)

0 200 400 600
HORIZONTAL SCALE IN FEET

0 20 40 60
VERTICAL SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
1	Airport Layout Plan Updated	8/1/2017	Coffman	—

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

LEBANON STATE AIRPORT (S30)

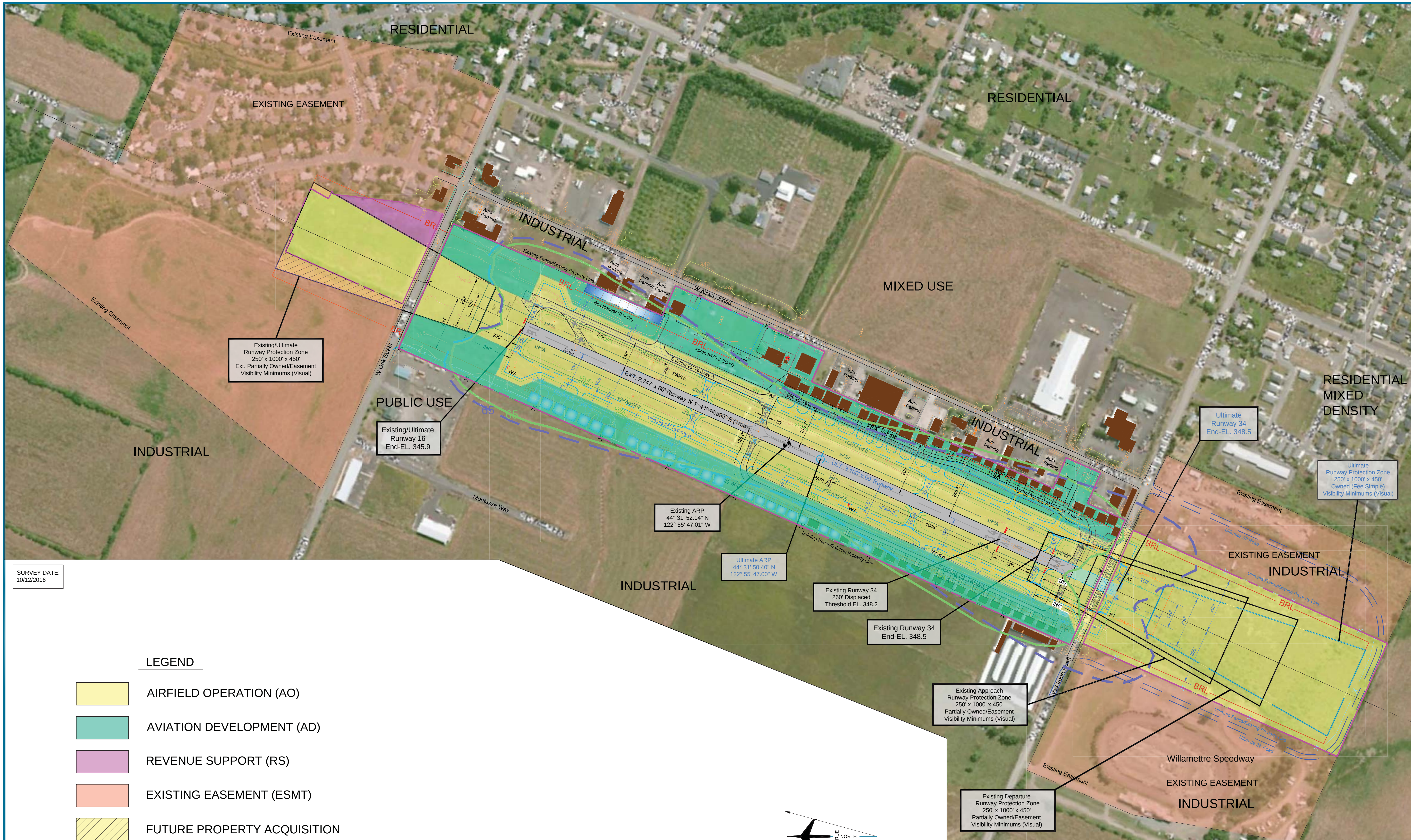
INNER PORTION OF RUNWAY 34 APPROACH SURFACE DRAWING

Lebanon, Oregon

PLANNED BY: Patrick C. Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

August 1, 2017 SHEET 6 OF 8

Coffman Associates
Airport Consultants
www.coffmanassociates.com



LEGEND

- AIRFIELD OPERATION (AO)
- AVIATION DEVELOPMENT (AD)
- REVENUE SUPPORT (RS)
- EXISTING EASEMENT (ESMT)
- FUTURE PROPERTY ACQUISITION
- 2015 Day-Night Noise Level (65 DNL)
- 2035 Day-Night Noise Level (65 DNL)

GENERAL NOTES:

1. Lebanon Municipal Code Title 16: Development Code; Article Two: Land Use and Land Use Zones; Chapter 16.11: Overlay Land Use Zones; Section 16.11.020: Airport Overlay Zones.

Magnetic Declination
15° 22' East (Sept. 2015)
Annual Rate of Change
00° 7' West (Sept. 2015)

0 200 400 600
SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
1	Airport Layout Plan Updated	8/1/2017	Coffman	—

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

LEBANON STATE AIRPORT (S30)

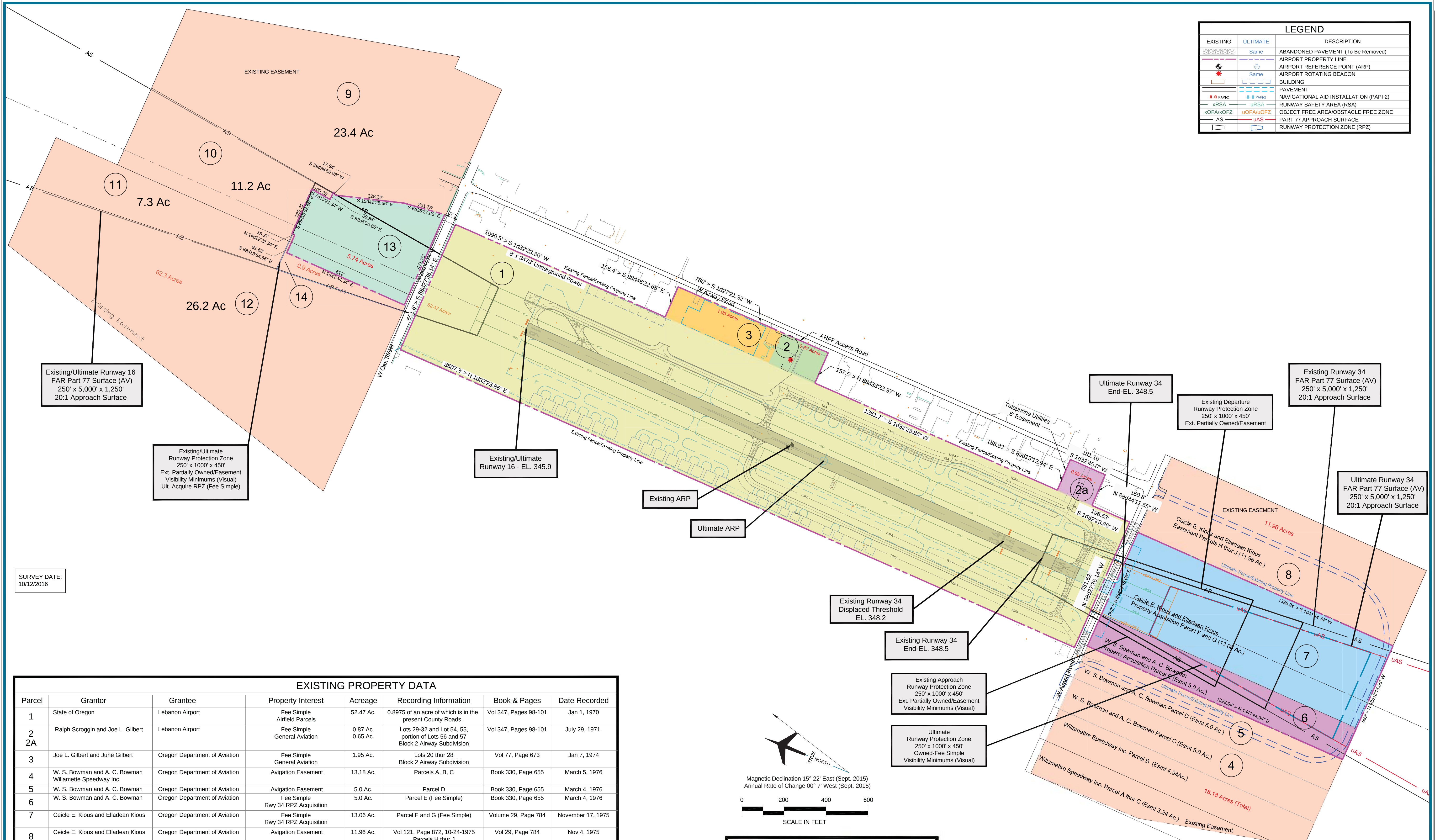
AIRPORT LAND USE DRAWING

Lebanon, Oregon

PLANNED BY: Patrick C. Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

August 1, 2017 SHEET 7 OF 8

Coffman Associates
Airport Consultants
www.coffmanassociates.com



LEGEND

EXISTING	ULTIMATE	DESCRIPTION
	Same	ABANDONED PAVEMENT (To Be Removed)
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
	Same	AIRPORT ROTATING BEACON
		BUILDING
		PAVEMENT
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION (PAPI-2)
xRSA	uRSA	RUNWAY SAFETY AREA (RSA)
xOFA/xOFZ	uOFA/uOFZ	OBJECT FREE AREA/OBSTACLE FREE ZONE
AS	uAS	PART 77 APPROACH SURFACE
		RUNWAY PROTECTION ZONE (RPZ)

EXISTING PROPERTY DATA

Parcel	Grantor	Grantee	Property Interest	Acreage	Recording Information	Book & Pages	Date Recorded
1	State of Oregon	Lebanon Airport	Fee Simple Airfield Parcels	52.47 Ac.	0.8975 of an acre of which is in the present County Roads.	Vol 347, Pages 98-101	Jan 1, 1970
2 2A	Ralph Scroggin and Joe L. Gilbert	Lebanon Airport	Fee Simple General Aviation	0.87 Ac. 0.65 Ac.	Lots 29-32 and Lot 54, 55, portion of Lots 56 and 57 Block 2 Airway Subdivision	Vol 347, Pages 98-101	July 29, 1971
3	Joe L. Gilbert and June Gilbert	Oregon Department of Aviation	Fee Simple General Aviation	1.95 Ac.	Lots 20 thur 28 Block 2 Airway Subdivision	Vol 77, Page 673	Jan 7, 1974
4	W. S. Bowman and A. C. Bowman Willamette Speedway Inc.	Oregon Department of Aviation	Avigation Easement	13.18 Ac.	Parcels A, B, C	Book 330, Page 655	March 5, 1976
5	W. S. Bowman and A. C. Bowman	Oregon Department of Aviation	Avigation Easement	5.0 Ac.	Parcel D	Book 330, Page 655	March 4, 1976
6	W. S. Bowman and A. C. Bowman	Oregon Department of Aviation	Fee Simple Rwy 34 RPZ Acquisition	5.0 Ac.	Parcel E (Fee Simple)	Book 330, Page 655	March 4, 1976
7	Ceicle E. Kious and Elladean Kious	Oregon Department of Aviation	Fee Simple Rwy 34 RPZ Acquisition	13.06 Ac.	Parcel F and G (Fee Simple)	Volume 29, Page 784	November 17, 1975
8	Ceicle E. Kious and Elladean Kious	Oregon Department of Aviation	Avigation Easement	11.96 Ac.	Vol 121, Page 872, 10-24-1975 Parcels H thur J	Vol 29, Page 784	Nov 4, 1975
9	E. L. Pletzer & Associates Inc.	Lebanon State Airport	Avigation Easement	23.4 Ac.	Part 77 Transitional Surface	Volume 36, Page 627	September 16, 1974
10	E. L. Pletzer & Associates Inc.	Lebanon State Airport	Avigation Easement	11.2 Ac.	Approach Surface	Volume 36, Page 627	September 16, 1974
11	M. M. & Jennie Orona	Lebanon State Airport	Permanent Avigation Easement	7.3 Ac.	Approach Surface	Book 313, Page 26	September 13, 1974
12	M. M. & Jennie Orona	Lebanon State Airport	Permanent Avigation Easement	26.2 Ac.	Part 77 Transitional Surface	September 13, 1974	September 13, 1974
13	Glorietta Bay LLC	Oregon Department of Aviation	Fee Simple Portion of Runway 16 RPZ Remaining Avigation Easement (after the sale of parcel 13)	5.74 Ac. 62.3 Ac.	Parcel 1 (LOT 9) Plat No. 2015-15	Doc. 2015-5261	May 23, 2016
14	M. M. & Jennie Orona	Oregon Department of Aviation	Portion of Rwy 16 RPZ Acquisition	0.9 Ac.	Future Property	-	-

1. CONSULTANT HAS MADE EVERY EFFORT TO RECONCILE PROPERTY DESCRIPTIONS AND INFORMATION.

APPROVAL BY

Oregon Department of Aviation (ODA)

DATE: 11 AUG 17

NO.	REVISIONS	DATE	BY	APP'D.
1	Airport Layout Plan Updated	8/30/2017	Coffman	FAA

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

LEBANON STATE AIRPORT (S30)

EXHIBIT "A" AIRPORT PROPERTY

Lebanon, Oregon

PLANNED BY: Patrick C. Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

August 1, 2017

SHEET 8 OF 8

Coffman Associates
Airport Consultants
www.coffmanassociates.com

www.coffmanassociates.com

KANSAS CITY
(816) 524-3500

237 N.W. Blue Parkway
Suite 100
Lee's Summit, MO 64063

PHOENIX
(602) 993-6999

4835 E. Cactus Road
Suite 235
Scottsdale, AZ 85254