PACKWOOD AIRPORT
AIRPORT MASTER PLAN

Packwood, WA
July 2024

ACKNOWLEDGMENTS

The following organizations and individuals contributed to this Master Plan. The study was funded by Lewis County with a grant from the Federal Aviation Administration.

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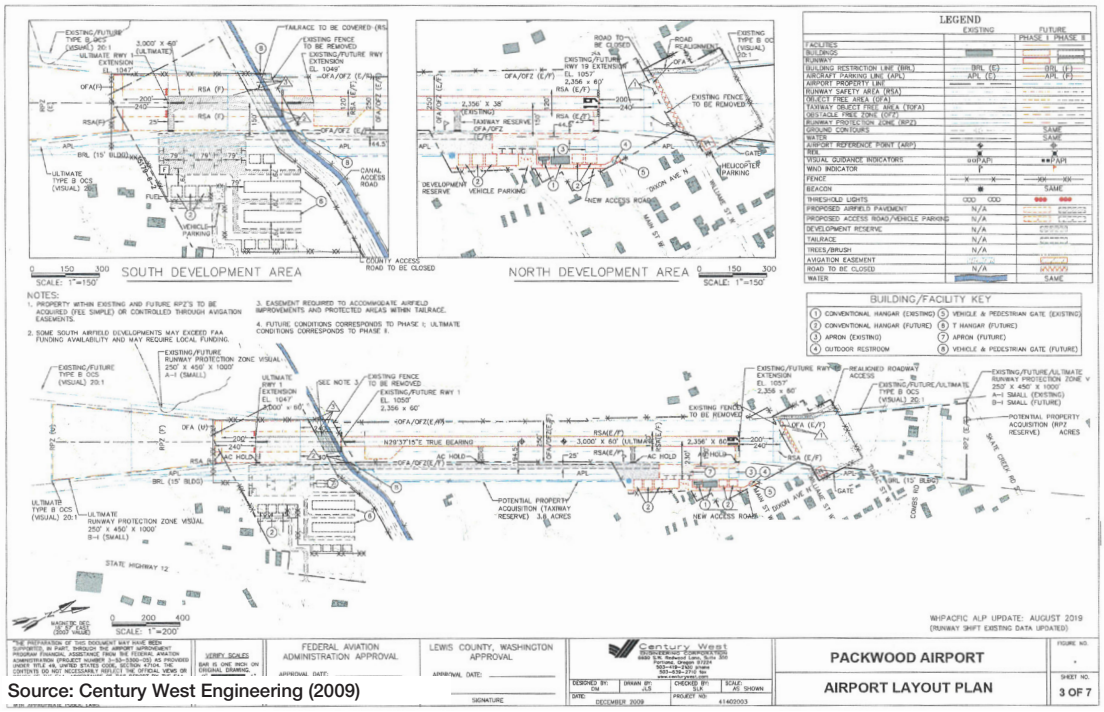
Chapter 1
Introduction

Lewis County is preparing an Airport Master Plan (AMP) for Packwood Airport in cooperation with the Federal Aviation Administration (FAA) to address the Airport's needs for the next 20 years (2022-2042). This AMP replaces the Airport Layout Plan (ALP) Report, completed in December 2009. The 2009 ALP drawing is depicted below. The AMP provides guidance in making the improvements necessary to maintain a safe and efficient airport that is economically, environmentally, and socially sustainable.

Study Purpose

The purpose of the AMP is to define the current, short-term, and long-term needs of the Airport through a comprehensive evaluation of facilities, conditions, and FAA airport planning and design standards. The study addresses elements of local planning (land use, transportation, environmental, economic development, etc.) that have the potential of affecting the planning, development, and operation of the Airport.



Source: Century West Engineering (2009)

Project Need

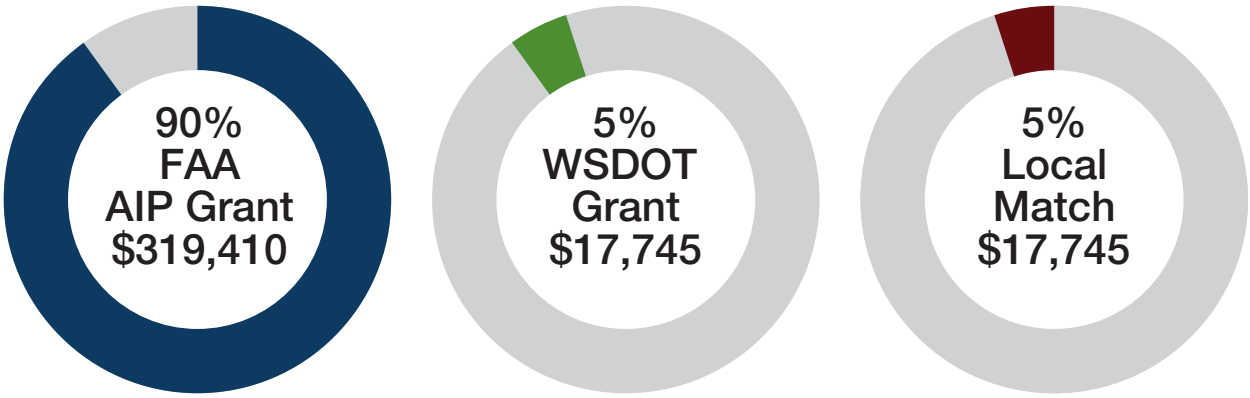
The FAA requires airport sponsors (in this case, Lewis County) to periodically update their ALP drawings as conditions change in order to maintain current planning. As noted earlier, this project replaces the 2009 ALP Report and drawing set. Several projects have been completed since the last ALP update:

- 2017 Runway Rehabilitation Project
  - » Runway Widened (60 feet);
  - » Runway shifted southwest to achieve standard runway safety area (RSA) for Runway 19; original runway length (2,356 feet) maintained;
  - » Covered Tailrace south of the runway; including the RSA;
  - » New Runway Edge Lighting; and
  - » County-owned industrial property added to the Airport (south end).

The 2017 runway reconstruction project design drawings provide details about current runway conditions. The 2009 ALP was not updated following reconstruction and will be referenced as the current FAA-approved ALP for the Airport. The 2009 ALP Report and these drawings will serve as primary sources for inventory data. More recent information provided by the County, published FAA data, and data obtained from on-site airfield inspections will also be reflected in the AMP.

Project Funding

Funding for the 2022-2042 Packwood Airport AMP is provided by the Federal Aviation Administration (FAA), the Washington Department of Transportation- Aviation Division (WSDOT) (5%), and Lewis County (5%). The total project cost of $354,900 includes County staff administration time to support the planning process. FAA funding is provided through the Airport Improvement Program (AIP), a dedicated fund administered by FAA with the specific purpose of maintaining and improving the nation's public use airports. The AIP is funded exclusively through fees paid by users of general and commercial aviation.



Goals of the Airport Master Plan

The primary goal of the AMP is to provide the framework and vision needed to guide future improvements at Packwood Airport. The FAA sets goals and objectives that each airport should meet through its master planning, in order to ensure future development will cost-effectively satisfy aviation demand and also consider potential environmental and socioeconomic impacts. These general goals are summarized below, with specific items added for Packwood Airport.

Goal 1: Define the vision for the Airport to effectively serve the community, airport users, and the region. Assess known issues including approach obstructions, runway conditions, ability to accommodate airside and landside development, auto parking, and land use to develop a realistic, practical, and sustainable plan to improve the Airport.

Goal 2: Document existing activity, condition of airfield facilities, and policies that impact airport operations and development opportunities.

Goal 3: Forecast future activity based on accepted methodology.

Goal 4: Evaluate facilities and conformance with applicable local, state, and FAA standards.

Goal 5: Identify facility improvements to address conformance issues and accommodate demand.

Goal 6: Identify potential environmental and land use requirements that may impact development.

Goal 7: Explore alternatives to address facility needs. Work collaboratively with all stakeholders to develop workable solutions to address needs.

Goal 8: Develop an Airport Layout Plan (ALP) to graphically depict proposed improvements consistent with FAA standards as a road map to future development. Prepare a supporting Capital Improvement Plan (CIP) to summarize costs and priorities.

Goal 9: Provide recommendations to improve land use, zoning, and County oversight of the Airport to protect the long-term viability of the Airport.

Goal 10: Summarize the collective vision and plan for the Airport in the Airport Master Plan report and ALP.

THE FAA ROLE IN THE AIRPORT MASTER PLAN

FAA *Advisory Circular (AC) 150/5070-6B Airport Master Plans* defines the specific requirements and evaluation methods established by FAA for the study. The guidance in this AC covers planning requirements for all airports, regardless of size, complexity, or role. However, each planning study must focus on the specific needs of the airport for which a plan is being prepared.

The recommendations contained in an AMP represent the views, policies and development plans of the airport sponsor and do not necessarily represent the views of the FAA. Acceptance of the plan by the FAA does not constitute a commitment on the part of the United States to participate in any development depicted in the plan, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public law. The FAA reviews all elements of the plan to ensure that sound planning techniques have been applied. However, the FAA only approves the Aviation Activity Forecasts and Airport Layout Plan (ALP) drawings.

Planning Process

The three phase planning process is designed to provide multiple feedback loops intended to maintain the flow of information and ideas among the community and project stakeholders and ultimately maximize public involvement.

DEVELOP UNDERSTANDING

A comprehensive understanding of the issues and opportunities, existing conditions, and an identified level of future aviation activity that would require facility improvements to satisfy future demand.

Analysis

- Develop Scope of Work
- Public Involvement Strategy
- AGIS Survey
- Existing Conditions Analysis
- Aviation Activity Forecasts

Project Meetings

- Bi-Weekly Planning Team Meetings
- Project Kick-off Meeting
- Planning Advisory Committee (PAC) Meetings

Work Product

- Introduction
- Existing Conditions
- Aviation Activity Forecasts

EXPLORE SOLUTIONS

A collaborative exploration of local airport needs, goals, and facility requirements in sequence with the development of locally-generated ideas, solutions, and development alternatives.

Analysis

- Define Updated Airfield Design Standards
- Perform Demand/Capacity Analysis
- Define Facility Goals and Requirements
- Identify & Prepare Development Alternatives
- Evaluate Development Alternatives

Project Meetings

- Bi-Weekly Planning Team Meetings
- Planning Advisory Committee (PAC) Meetings
- Public Open House

Work Product

- Facility Goals & Requirements
- Airport Development Alternatives

IMPLEMENTATION

An implementation program with recommended strategies and actions for future land use, transportation, and environmental requirements; a realistic and workable CIP; and current ALP drawings that graphically depict existing conditions at the Airport as well as proposed development projects.

Analysis

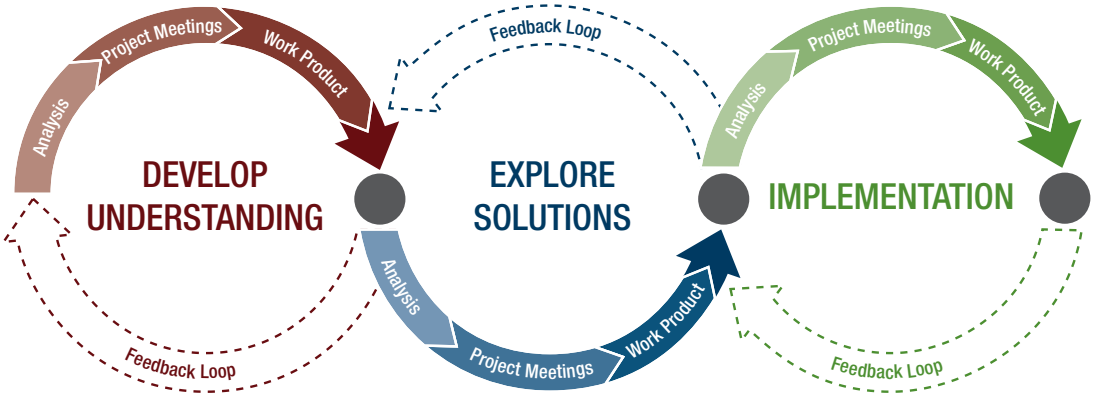
- Develop Strategies & Actions
- Develop CIP/Phasing/Financial Plan
- Develop ALP Drawing Set

Project Meetings

- Bi-Weekly Planning Team Meetings
- Planning Advisory Committee (PAC) Meetings

Work Product

- Strategies & Actions
- Financial Plan (CIP/Phasing)
- ALP Drawing Set
- Draft Report
- Final Report



Framework of the Airport Master Plan

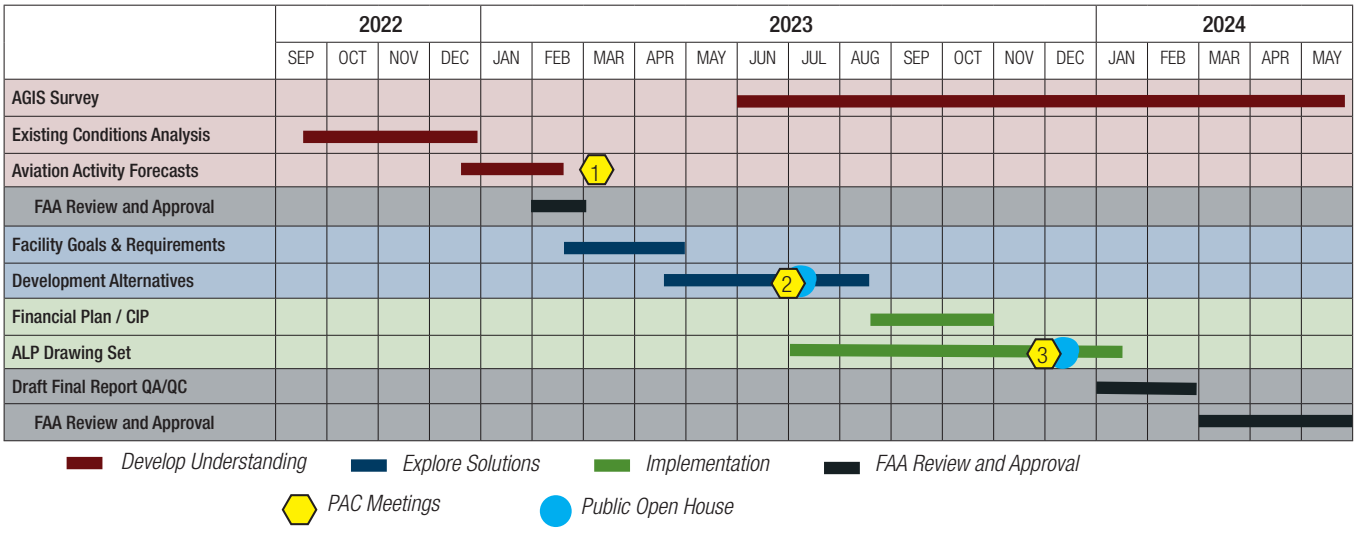
The framework of the AMP provides a clear structure to inform and steer future planning decisions and serve as a tool to guide a process that allows the plan to take shape through flexibility, iteration, and adaptation. The framework is intended to analyze the local and regional setting of the Airport, the landside and airside elements of the Airport, as well as the management and administration functions associated with the Airport. The framework provides guidance, while being flexible enough to adapt to changing conditions to maximize opportunities to develop understanding, explore solutions, and implement a preferred development alternative for the Airport that is compatible with its surroundings.

	Regional Setting	Airside Elements	Landside Elements	Airport Administration
Develop Understanding	Location & Vicinity Socio-Economic Data Airport Role Airport History Area Airports Context Airport Operations Relevant Studies Environmental Data Local Surface Transportation Land Use/Zoning	Area Airspace Instrument Flight Procedures Runway/Helipad Taxiways/Taxilanes Pavement Condition Airside Support Facilities	Terminal Building Aprons/Tiedowns Hangars Airport Fencing Airport Surface Roads Vehicle Parking Utilities	Airport Ownership & Management Airport Financials Airport Rates and Charges Local Rules & Regulations FAA Compliance Overview
Explore Solutions				
Implementation				

Project Schedule

The AMP schedule is expected to occur over the course of 18-24 months. **Phase 1 – Develop Understanding** will take approximately 6-7 months, excluding the AGIS survey. The AGIS survey implementation occurs during Phase 1 and extends though the project on a parallel track to obtain full FAA acceptance of survey data. **Phase 2 – Explore Solutions** will take approximately 8-9 months. **Phase 3 – Implementation** will take approximately 8-9 months, including 3 months for formal FAA review and approvals at the end of the project. The final FAA review step commonly extends beyond the standard 90-day schedule, which may extend project closeout by 3 to 6 months, depending on staff workload.

Note: The AGIS Survey was delayed until Spring 2023 due to local fire conditions affecting visibility at the scheduled time of survey control and aerial photography (late summer 2022).



Public Involvement Process

A comprehensive and engaging public involvement process is a key element to a successful AMP. Therefore, numerous opportunities for public input are built into the process. This will include up to three Planning Advisory Committee (PAC) meetings, one Public Open House, three FAA coordination meetings, a project website, and ongoing communication and coordination between County staff and the project planning team over the course of the project.

PLANNING ADVISORY COMMITTEE (PAC) MEETINGS

The PAC was assembled to provide input and allow for public dissemination of data. Airport users, local and regional economic development interests, neighbors of the Airport, and staff/representatives of the County were identified as members of the PAC. The FAA Seattle Airports District Office (ADO) project manager will interact with the project team throughout the project, and may attend one or more of the PAC meetings. The FAA has primary responsibility for technical review, comment, and project approval. A representative of the WSDOT – Aviation Division will also participate as an ex-officio member of the PAC.

The PAC meeting schedule included three in-person meetings, which are summarized below:

PAC Meeting #1 (3/7/23)

The Consultant summarized the goals and objectives of an AMP, and also presented the existing conditions of the Airport, community, and aviation industry. The preliminary aviation activity forecasts that were reviewed and ultimately approved by FAA were presented.

PAC Meeting #2 / Public Open House (7/11/23)

PAC Meeting #2 was an interactive discussion with the PAC that focused on the Airport's facility needs to meet FAA standards, future growth, as well as the goals of the County and its users. The Consultant presented a series of preliminary alternative concepts capable of satisfying future demand and any non-standard conditions and seek input from the PAC and public. A public open house was aligned with the PAC meeting to provide an opportunity to engage the community, seek input, and answer questions about the planning project.

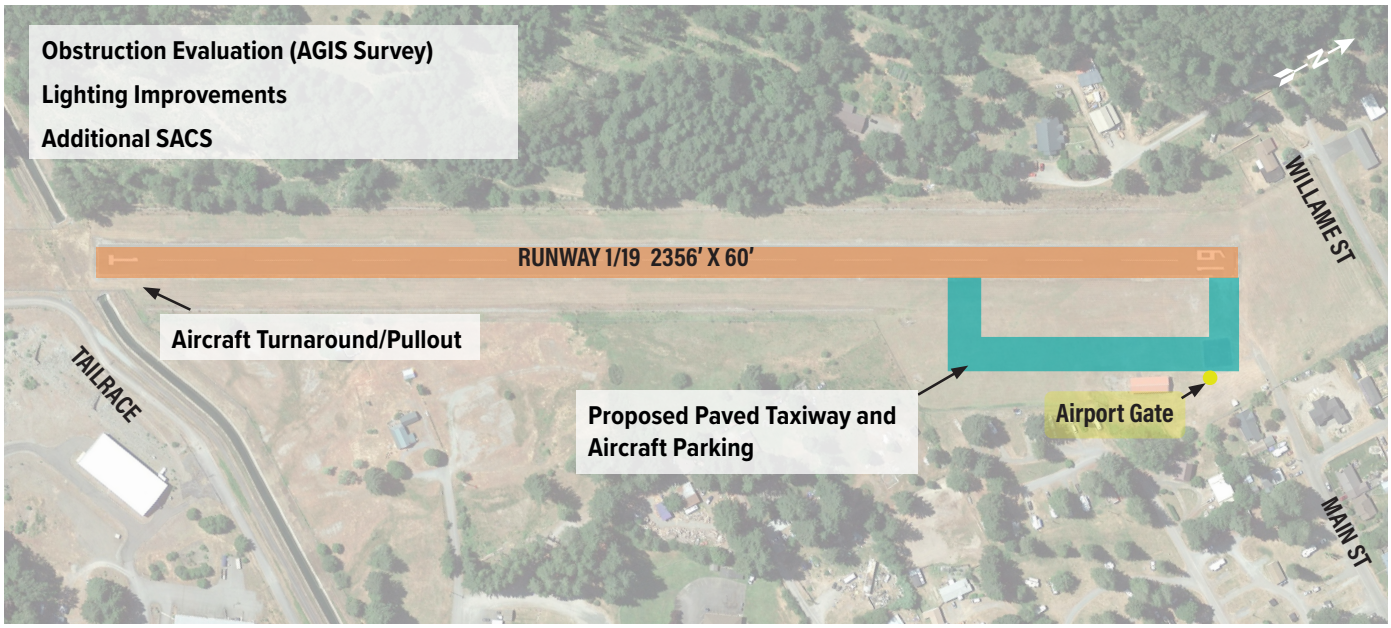
PAC Meeting #3 (12/5/23)

The input provided in PAC #2 and Public Open House were used to refine the concepts, and based on technical evaluations, public input and coordination with the County, a preferred alternative was presented to the PAC. The Consultant presented an implementation program with recommended strategies and actions for future land use, transportation, and environmental requirements; a realistic and workable CIP; and draft ALP drawings that graphically depict existing and future conditions at the Airport.

Known Issues & Opportunities

At the outset of the AMP several known issues and opportunities were identified by the FAA, County, and airport users/ tenants. These issues and opportunities, identified below, will serve as focus areas during the completion of the plan to ensure a comprehensive and thorough assessment that addresses and documents the proposed solutions and methods of implementation. **Figure 1-1** conceptually depicts some of the opportunities to be evaluated.

Figure 1-1: Known Issues & Opportunities



KNOWN ISSUE #1 – OBSTRUCTION EVALUATION (AGIS SURVEY)

An Airport Geographic Information Systems (AGIS) survey will be completed as part of the AMP Update. The AGIS survey will support current and future improvement projects, including obstruction mitigation adjacent to the runway, within runway approaches, and in Runway Protection Zones (RPZs). The AGIS survey will provide obstruction data and mapping that will be incorporated into the new ALP drawing set and support future obstruction mitigation.

OPPORTUNITY #1 – PAVED TAXIWAY AND AIRCRAFT PARKING

The addition of a paved taxiway and a paved aircraft parking area is a high priority and would improve the use of the Airport. The paved surfaces would reduce potential damage to aircraft propellers or landing gear caused by taxiing over rocky, sandy soils. The 2009 ALP depicts a future parallel taxiway and apron which has not yet been constructed. Adding a paved aircraft apron at the north end of Runway 01/19 with two taxiway connections will facilitate aircraft movement and reduce back-taxiing on the runway.

The ground condition of the potential apron and taxiway area has potential for sinkhole issues which will need to be addressed prior to construction. The 2015 runway reconstruction project required significant depth of subsurface excavation to remove pockets of unstable soils dating from the original (1950s) airfield clearing and construction. This condition is believed to occur throughout the cleared areas of the Airport.

OPPORTUNITY #2 – AIRCRAFT TURNAROUND/PULLOUT

The addition of an aircraft pullout/turnarounds on the runway may be considered to improve aircraft movement on the runway. A 180-degree turn on the 60-foot-wide runway may be challenging for some aircraft and may result in aircraft landing gear moving into the adjacent unpaved runway shoulders. The location and configuration of aircraft turnarounds will be included in airside facility evaluations.

The 2009 ALP depicts a south runway extension and full length parallel taxiway. Although the runway was shifted south during its reconstruction in 2015, the existing length was maintained without a new taxiway or aircraft turnarounds.

OPPORTUNITY #3 – LIGHTING IMPROVEMENTS

When the runway was reconstructed in 2015, new Medium Intensity Runway Lights (MIRL) runway edge lighting was installed. The 2009 ALP Report recommended Precision Approach Path Indicators (PAPI) on Runway 01 and Runway 19, which have not been installed. It is recommended that both runway ends be evaluated for feasibility (obstruction clearance) for PAPI installation using new AGIS survey data.

OPPORTUNITY #4 – RUNWAY IMPROVEMENTS

The most recent runway reconstruction project shifted the runway southward while maintaining the existing runway length. The runway shift increased FAA standard runway safety area (RSA) beyond both ends of the runway. The southern shift of the Runway 19 end improved obstacle clearance for the Runway 19 Part 77 approach surface. Additionally, the width of the runway was increased (to 60 feet) to meet FAA standards. The project shifted the south end of the RSA over the tailrace, which was consistent with the 2009 AMP goal of extending the runway's usable footprint to the south. The AGIS survey will also provide important approach obstruction clearance information to support future evaluations.

The 2009 ALP depicted the runway extending to a length of 3,000 feet (from the existing 2,356 feet). This extension has not yet been completed.

OPPORTUNITY #5 – ADDITIONAL SACS

In 2019, one Primary Airport Control Station (PACS) and one Secondary Airport Control Station (SACS) were installed at the Airport. It may be beneficial to convert the existing Cooperative Base Network (CBN) control monument to a second SACS at Packwood Airport to support future survey needs.

OTHER OPPORTUNITIES

The AMP will provide an opportunity to review forecast demand, planning assumptions, and development priorities defined in the 2009 ALP Report. Our practical understanding of the Airport, its use, and the general community ensures that a realistic approach to planning the Airport will be maintained to support the goals and priorities of the Lewis County Airport System.

Chapter 2
Existing Conditions

The Existing Conditions Analysis documents existing airfield facilities and conditions that affect the operation and development of the Packwood Airport (55S) within the context of the regional setting, landside, airside, and administrative functions. The existing conditions analysis utilized the 2009 Airport Layout Plan Report[1] and other subsequent work products in addition to numerous meetings with tenants, stakeholders, and County staff to support the effort. The findings documented in the Existing Conditions Analysis chapter will be used to support subsequent studies and recommendations throughout the development of the master plan.

Regional Setting

The Regional Setting section is comprised primarily of those features that provide a better understanding of the social, economic, and environmental impacts airports can have in a region and county. This section of the existing conditions analysis includes a discussion of the location & vicinity of Packwood Airport, as well as socio-economic conditions, airport history, airport role, area airports, historical airport operations, relevant studies, environmental data, local surface transportation systems, and land use on and around the Airport.

LOCATION & VICINITY

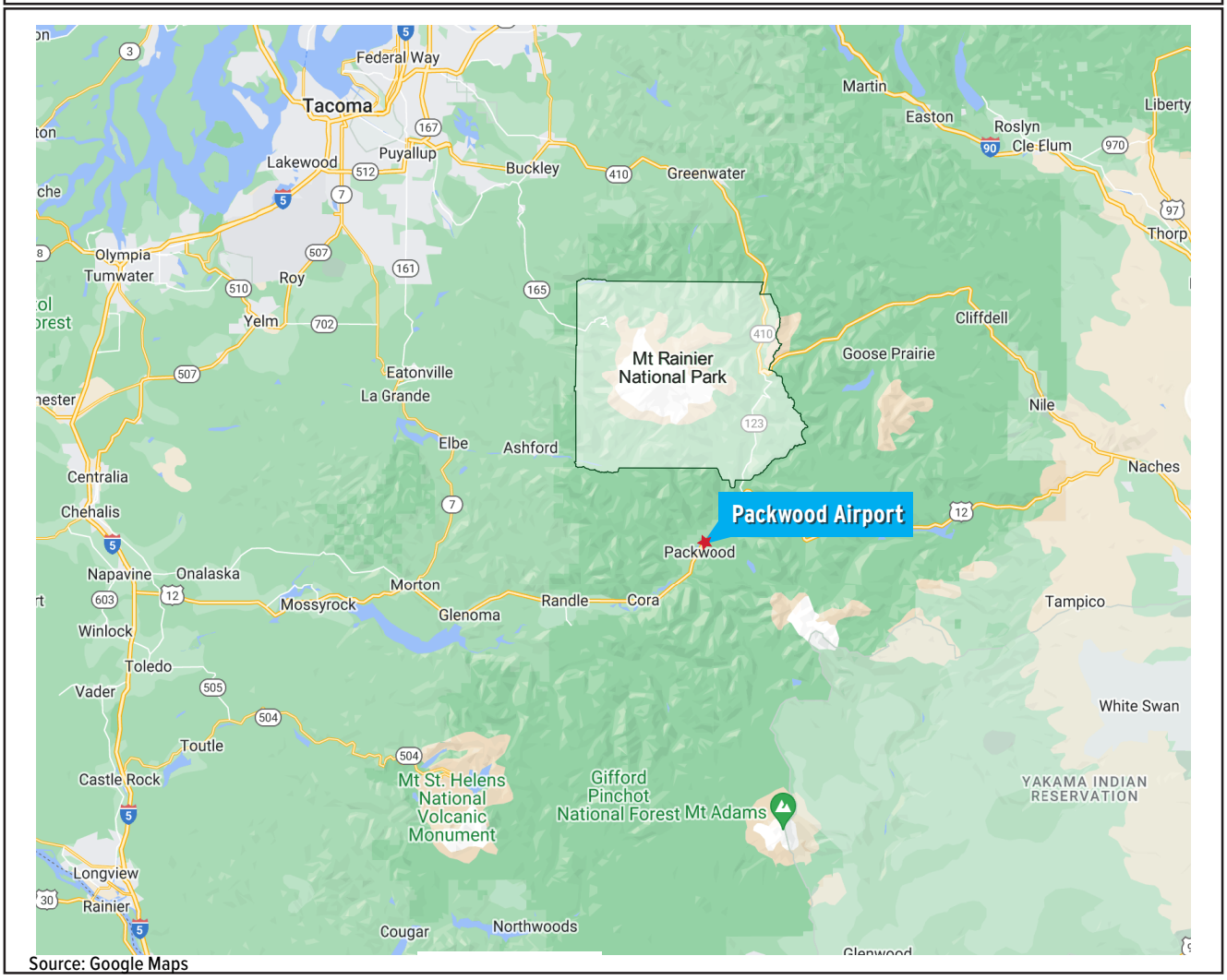
Packwood Airport is located about 1/2 mile southwest of the Packwood town center, in unincorporated Lewis County. Lewis County is located in the southwest region of Washington. It is bordered by Skamania, Cowlitz, and Wahkiakum (south); Pacific (west); Grays Harbor, Thurston and Pierce (north); and Yakima (east) counties. Packwood Airport is located south of Mount Rainier National Park (see **Figure 2-1**).

Packwood Airport is owned and operated by Lewis County. The Airport is located near the southwest edge of Packwood, between State Highway 12 and the Cowlitz River. Highway 12 extends east to U.S. Interstate 82 (I-82) at Yakima and west to U.S. Interstate 5 (I-5) near Napavine. Surface access to the Airport is provided from State Highway 12 and Main Street West.

The Airport sits in the upper reaches of the valley at an elevation of 1,057 feet above mean sea level (MSL). Mountainous terrain rises in all directions, with elevations above 3,000 feet located within 2 miles and several 5,000 to 6,000-foot peaks located within 5 to 8 miles.

1 Packwood Airport Layout Plan Report (Century West Engineering, December 2009)

Figure 2-1: Location & Vicinity Map



Source: Google Maps

Local and Regional Socio-Economic Data

The information presented in **Tables 2-1 through 2-3** is intended to provide a summary of the local and regional economic conditions that may affect activity at Packwood Airport.

Population

Packwood, Washington is an unincorporated community in Lewis County and therefore does not have an allocated city population.

However, Packwood is within U.S. Census zip code tabulation area (ZCTA) 98361, which recorded a total population of 1,158 in 2010. The *Packwood Subarea Plan*[2] documents the 2020 ZCTA population as 1,073, indicating a slight decline over the recent 10-year period. The subarea plan assumes that there are no full-time residents in the national public lands, making this 98361 ZCTA data a reasonable representation of the Packwood area population.

A notable comparison of population and housing units can be made using 98361 ZCTA data. The 2010 Census reports that there was a total population of 1,158 people, and 1,525 housing units. A greater number of housing units than population may be result of the recreation opportunities surrounding Packwood with second properties used as vacation homes or rentals in the Packwood area.

Data obtained from the State of Washington Office of Financial Management (OFM) (see **Table 2-1**) show that recent historical population in Lewis County has experienced moderate growth over the past decade but has lagged slightly behind the state average. The county's annual growth rates (AGR) during the period fluctuated from 0.78% to 0.90%, with a 10-year AGR of 0.82%. The net increase in county population during the period is 6,434 (+8.36%).

Annual population growth in unincorporated Lewis County for the 10-year period fluctuated between 0.71% to 1.06% AGR, with a 10-year AGR of 0.92%. With consistent year-over-year growth during the period, the population of unincorporated Lewis County increased by 4,255 (+9.26%).

It is noted that these population changes followed the protracted recovery from The Great Recession and the COVID-19 pandemic and its initial recovery period.

Table 2-1: Historical Population

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Washington	6,882,400	6,968,170	7,061,410	7,183,700	7,310,300	7,427,570	7,546,410	7,707,047	7,766,975	7,864,400
AGR	-	1.25%	1.29%	1.44%	1.52%	1.54%	1.55%	1.63%	1.52%	1.49%
										Average AGR 1.47%
Lewis County	76,966	77,563	78,006	78,556	79,477	80,250	81,151	82,149	82,700	83,400
AGR	-	0.78%	0.67%	0.68%	0.81%	0.84%	0.89%	0.94%	0.90%	0.90%
										Average AGR 0.82%
Unincorporated Lewis County	45,930	46,361	46,586	46,942	47,612	48,137	48,770	49,461	49,840	50,185
AGR	-	0.94%	0.71%	0.73%	0.90%	0.94%	1.00%	1.06%	1.03%	0.99%
										Average AGR 0.92%

Source: State of Washington Office of Financial Management Postcensal Estimates of Population (2012-2020);
April 1 Official Population Estimates - Revised August 2, 2022 (2020)
AGR: Annual Growth Rate

2 Lewis County – Packwood Subarea Plan (Adopted January 2, 2024; LCC Ord. #1350)

Economic Indicators

Gross Regional Product (GRP) and Personal Income per capita (PI) can serve as indicators of economic growth or decline of a particular area. According to data provided by Woods & Poole Economics, summarized in **Tables 2-2 and 2-3**, the GRP and PI for Lewis County showed net growth overall, through the recent 10-year historical period.

Table 2-2: Historical Gross Regional Product (2012 Dollars)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Lewis County (millions)	$2,761.4	$2,973.5	$2,932.1	$2,859.9	$3,019.2	$3,203.7	$3,430.6	$3,251.5	$3,499.6	$3,555.2
AGR	-	7.68%	3.04%	1.18%	2.26%	3.02%	3.68%	2.36%	3.01%	2.85%
									Average Annual Growth Rate	3.28%

Source: Woods & Poole Economics, Inc. Washington, D.C. Copyright 2021. Woods & Poole does not guarantee the accuracy of this data. The use of this data and the conclusion drawn from it are solely the responsibility of Century West Engineering.

Table 2-3: Historical Per Capita Income (2012 Dollars)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Lewis County	$34,825	$36,905	$38,489	$39,097	$40,483	$42,696	$44,569	$48,339	$47,260	$49,102
AGR	-	5.97%	5.13%	3.93%	3.84%	4.16%	4.20%	4.80%	3.89%	3.89%
									Annual Growth Rate	4.49%

Source: Woods & Poole Economics, Inc. Washington, D.C. Copyright 2021. Woods & Poole does not guarantee the accuracy of this data.
The use of this data and the conclusion drawn from it are solely the responsibility of Century West Engineering.

More detailed socio-economic data and analysis is presented in Chapter 3: Aviation Activity Forecasts to supplement the updated projections of future aviation activity.

AIRPORT ROLE (NATIONAL, STATE, AND LOCAL)

The role of an airport may vary slightly within the context of the national, state, or local perspective. Understanding the existing roles of Packwood Airport is key to establishing the long-term vision and development of the facility.

National Role

The FAA maintains an inventory of U.S. aviation facilities through the National Plan of Integrated Airport Systems (NPIAS). The NPIAS lists existing and proposed airports significant to the air transportation of the United States, and thus are eligible for federal funding though the Airport Improvement Program (AIP) which typically covers 90% of eligible costs of planning and development projects. According to the *2021 National Plan of Integrated Airport Systems (2021-2025)*, Report to Congress, Packwood Airport is classified as a **Basic General Aviation Airport** and as such, provide a means for general aviation flying and link the community to the national airport system. Basic airports support general aviation activities such as emergency response, air ambulance service, flight training, and personal flying.

State Role

The Washington State Department of Transportation (WSDOT) developed the current Washington Aviation System Plan (WASP) in 2017. The 2017 WASP updated previous WSDOT aviation system plans, including the 2009 Long-term Air Transportation Study (LATS), to provide a current look at the state aviation system, and to define common performance measures and metrics.

The WASP established a new classification system of five categories for Washington airports to better capture system performance and facility needs. The WASP designates Packwood Airport as a "**Local**" airport. Local airports support GA activities including personal transportation, recreational flying, pilot training, and agricultural activities. Local airports are generally located outside of metropolitan areas and regional centers, have paved primary runways, with 15 or fewer based aircraft.

AIRPORT HISTORY

As noted in the 2009 ALP Report, the Airport site was initially developed as an unpaved emergency airstrip around 1949-1950. There are references to ownership by the WSDOT Aviation Division of the Packwood State Airport in state aviation system plan documents from the mid-1970s. Ownership of the Airport was transferred to Lewis County in 1982.

In 2009, the first FAA-funded planning (ALP Report) defined future improvements for Packwood Airport. Major runway reconstruction occurred in 2015 (sinkhole repair).

A summary of the Packwood Airport's recent FAA grant history is presented in **Table 2-4**, totaling in over $2.5 million of improvements and upgrades since 2009. Additional FAA funds were awarded in 2022 for the Airport Master Plan update.

Table 2-4: FAA AIP Grant History

Fiscal Year	Project Description	AIP Federal Funds	Local Match	WSDOT State Match
2009	Airport Improvement – Obstruction Removal – Runway 01/19 Rehabilitation & Runway Safety Area Improvements	$320,400	$0	$8,432
2013	Runway Improvements – Phase I – Runway Safety Area Alternatives and Phase 2 – Design and Environmental	$153,481	$0	$8,527
2015	Runway 01/19 Improvements	$1,959,231	$0	$108,846
2022	Airport Master Plan Update	$319,410	$17,745	$17,745

Source: FAA AIP Grant Look Up Tool (Accessed 12/10/2021)

AREA AIRPORTS CONTEXTUAL ANALYSIS

The contextual analysis of the airport service area refers to the geographic area surrounding an airport that is directly affected by the activities at that airport. Normally a 30 or 60-minute surface travel time is used to approximate the boundaries of a service area. Airports located beyond a 60-minute travel time have less impact on local airport activity due largely to the redundancy provided by closer facilities. With numerous airports in the vicinity, service areas often overlap, creating competition between airports. Having several airports located within a relatively short distance affects user demand for items such as hangar space, fuel and aviation services. These items are sensitive to cost, convenience, and the quality of facilities or services.

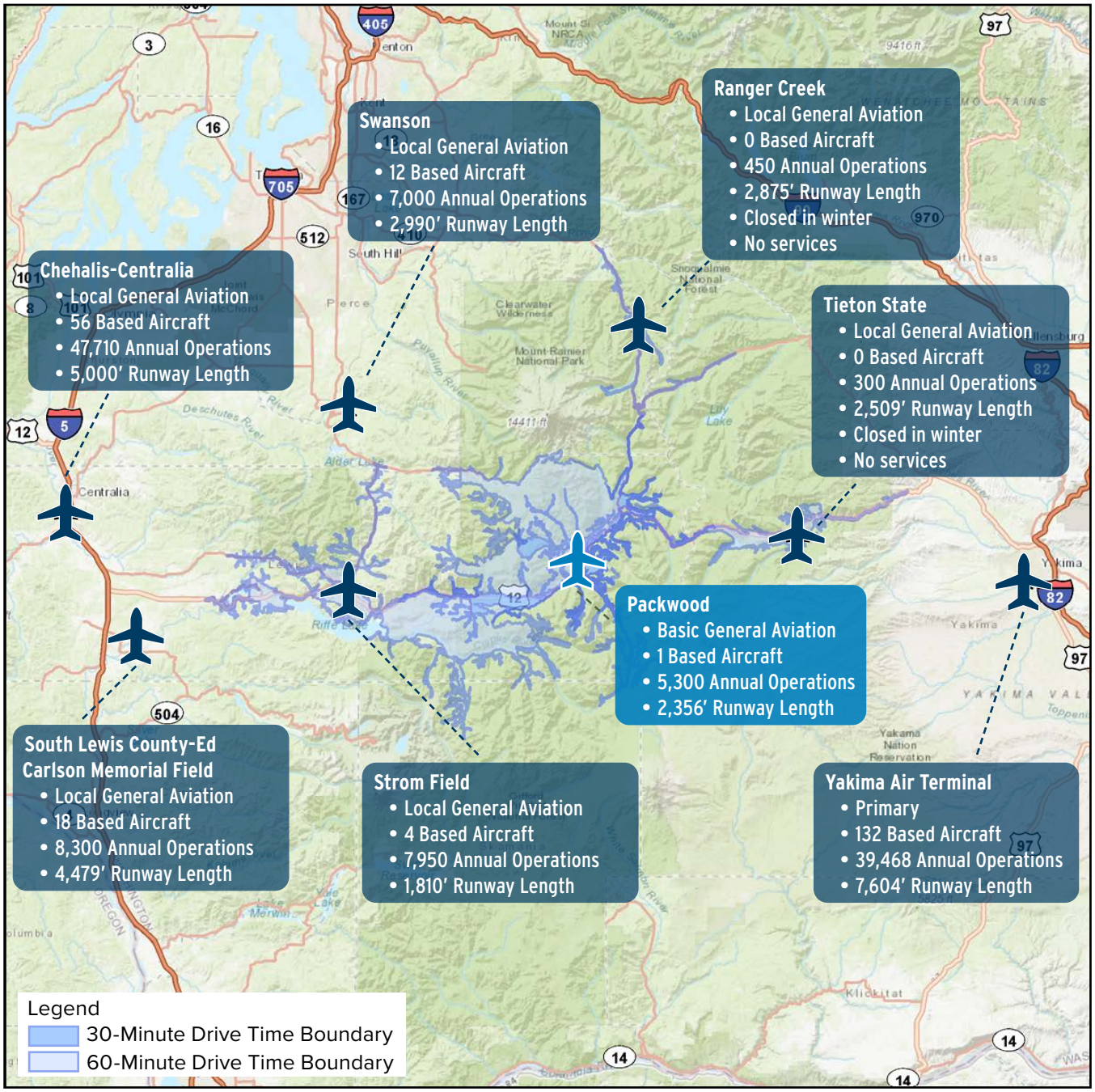
There are seven public use airports within a 60 nautical mile (NM) radius (air miles) of Packwood Airport. These airports are summarized in **Table 2-5** and depicted in **Figure 2-2**. It is noted that most of these airports are located outside the typical 30- or 60-minute drive times, and several of the airports are closed during winter months. When factors such as drive time, geographic features, and facility amenities (fuel, runway surface, etc.) are considered, it is reasonable to conclude that competition from these airports has a limited impact on activity at Packwood Airport. The nearest airports with services are Strom Field (Morton) and South Lewis County-Ed Carlson Memorial Field (Toledo). These airports are nearest to Packwood offering fuel (Toledo) and hangars (Strom, Toledo), although their impact on activity at Packwood Airport is not considered significant.

Table 2-5: Area Airports Comparison

Airport	Location (Air Miles)	Runway Dimension (feet)	Surface	Lighted Runway	Published Instrument Procedures	Fuel Available
Packwood Airport		2,356' x 60'	Asphalt	Yes	No	No
Strom Field (Morton)	24.5 NM W	1,810' x 40'	Asphalt	Yes	No	No
Ed Carlson Memorial Fld. (Toledo-Winlock)	47.2 NM W	4,479' x 150'	Asphalt	Yes	Yes	Avgas
Chehalis-Centralia	53.9 NM W	5,000' x 140'	Concrete	Yes	Yes	Avgas, Jet-A
Swanson (Eatonville)	28.7 NM NW	2,990' x 36'	Asphalt	Yes	No	No
Ranger Creek (Greenwater)*	25.2 NM N	2,875' x 30'	Asphalt	No	No	No
Tieton State (Rimrock)*	22.9 NM E	2,509' x 100'	Turf	No	No	No
Yakima Air Terminal	46.8 NM E	7,604' x 150' (Primary Rwy)	Asphalt	Yes	Yes	Avgas, Jet-A

Source: FAA 5010 Airport Master Record (Accessed 10/26/2022)
*Closed during winter

Figure 2-2: Area Airports



Source: AirportIQ 5010, Esri, USGS, NOAA

SUMMARY OF AIRPORT OPERATIONS DATA

Packwood Airport accommodates small single-engine aircraft and helicopters (including seasonal wildfire response, medevac, etc.). The 2009 ALP Report forecast base year (2007) listed 3 based aircraft and 1,000 (estimated) annual operations.

FAA 5010 Airport Master Record data for Packwood Airport and the other airports in the service area are summarized in **Table 2-6**. These data are unverified and are presented for reference only. It is noted that the 5010 annual aircraft operations (takeoffs and landings) for Packwood Airport (5,300) deviate significantly from the previous ALP twenty-year forecast (1,300 annual operations). An updated estimate of annual aircraft operations will be developed in Chapter 3, as the baseline for the master plan's updated twenty-year forecast.

It is important to note that aircraft takeoffs and landings (operations) at non-towered airports, including Packwood, are not routinely recorded. As such, flight activity is estimated through a variety of methods which will be discussed in Chapter 3.

Table 2-6: FAA 5010 Data

	Packwood Airport	Strom Field (Morton)	Ed Carlson Memorial Fld. (Toledo-Winlock)	Chehalis-Centralia	Swanson (Eatonville)	Ranger Creek (Greenwater)	Tieton State (Rimrock)	Yakima Air Terminal
Air Carrier	0	0	0	0	0	0	0	2,026
Air Taxi	0	0	0	4,500	0	0	0	4,034
GA Local	500	1,400	3,100	23,000	1,500	200	0	13,826
GA Itinerant	4,500	6,500	5,000	20,000	4,500	0	300	17,765
Military	300	50	200	210	1,000	250	0	1,817
TOTAL OPERATIONS	**5,300**	**7,950**	**8,300**	**47,710**	**7,000**	**450**	**300**	**39,468**
TOTAL BASED AIRCRAFT	**1**	**4**	**18**	**56**	**12**	**0**	**0**	**132**
Single Engine	1	4	17	49	12	0	0	15
Multi Engine	0	0	1	3	0	0	0	5
Jet	0	0	0	4	0	0	0	6
Helicopters	0	0	0	0	0	0	0	1
Glider*	0	0	0	0	0	0	0	0
Military*	0	2	0	0	0	0	0	0
Ultra-Light*	1	2	0	0	0	0	0	0

Source: AirportIQ 5010 Airport Master Records and Reports (AirportIQ5010.com, Accessed 10/26/2022)
*Glider, military, and ultra-light aircraft are not included in total based aircraft counts.

RELEVANT STUDIES

2009 Packwood Airport Layout Plan (ALP) Report

The 2009 ALP Report provided a detailed assessment of site-specific development needs and provided a range of facility improvement recommendations. The 2009 ALP drawing depicted the following improvements:

- **Runway:**
  - » Widen Runway to 60 feet
  - » Earthwork; grading and compaction
  - » Approach Obstruction Mitigation
    - » Fence removal and relocation
    - » Vacate a section of Willame Street (maintain, reroute surface access)
    - » Tree removal
  - » Slurry seal, crack repair, and repaint visual markings
  - » Runway Extension Reserve (south end)
- **Runway Lighting/Visual Aids:**
  - » Replace existing lighting system with MIRL
  - » Install PAPIs
- **Parallel Taxiway Reserve:** Construct partial-length east parallel taxiway (access to tiedown apron)
- **Property Acquisition:** County-owned property located north and south of the Airport was proposed for airport use
- **Surface Access Roads:**
  - » New and extended vehicle access roads to provide access to existing and future apron and hangar areas
  - » Vacate road (Willame Street) north of Runway 19 to accommodate FAA defined protected area
- **Terminal Area:**
  - » Aircraft apron (tiedowns and hangar access)
  - » Helicopter parking pad (Medevac)
  - » Hangar sites (north section)
  - » Hangar sites (south development reserve)

The runway at Packwood Airport was reconstructed in 2015 as an emergency repair project. The 2009 ALP Report and ALP drawing remain the most recent FAA-approved planning for the Airport that will be replaced with this Airport Master Plan. The elements of the runway reconstruction, summarized below, effectively captured several of the recommendations contained in the 2009 ALP Report.

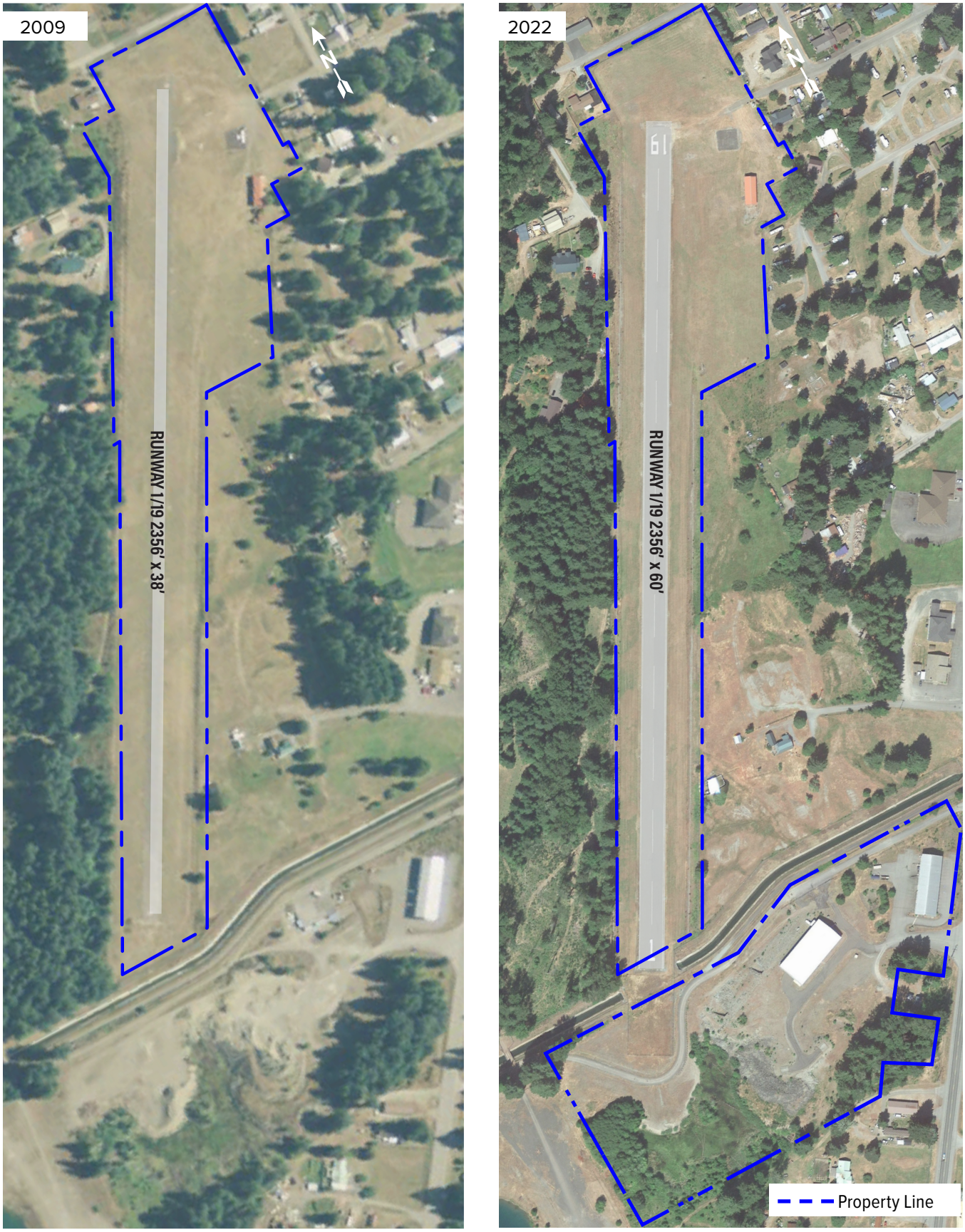
2015 Runway Reconstruction Project

Runway 1/19 was reconstructed in 2015 due to failures occurring in the runway base/subbase. According to available information, these sections contained pockets of unstable soils dating from the original site clearing and airfield development in the early 1950s. Uneven settling created irregular surface conditions along the runway that were corrected with significant excavation and replacement with new soil and aggregate. The runway surface is asphaltic concrete (AC) designed to accommodate small aircraft weighing 12,500 pounds and less.

The 2015 project included the following:

- **Reconstructed Runway (2,356 x 60 feet)**. The project maintained the original runway length and increased width from 38 feet to the FAA-standard width of 60 feet. The runway was shifted approximately 200 feet south of its original location to increase safety areas extending beyond both ends. The southerly shift was accomplished in conjunction with covering the tailrace (concrete-walled canal), as depicted on the 2009 ALP. New runway designation numbers and centerline stripe were painted. The reconstructed runway included 10-foot wide gravel shoulders and runway safety area (RSA) improvements. **Figure 2-3** features aerial imagery of the Airport prior to and following the runway reconstruction.

Figure 2-3: Packwood Airport – Facility Changes Since 2009 Airport Layout Plan Report



Source: Google Earth

- **New Medium Intensity Runway Edge Lights (MIRL) and threshold lights**. The new lighting systems are LED and are pilot-activated through the Airport's common traffic advisory frequency (CTAF).

Airport Property Expansion

A Lewis County-owned land parcel was added to the Airport in conjunction with the recent runway construction and extension of improvement south of the tailrace. This area was identified on the 2009 ALP for future Airport development. The parcel currently includes an industrial area with direct access to Highway 12.

WASHINGTON AVIATION SYSTEM PLAN (WASP)

As noted earlier, the 2017 WASP categorized Packwood as a "Local" airport.

The WASP identified minimum standards for Local airports that are consistent with overall facility use and functional role. A review of WASP minimum standards compliance will be included in the updated facility requirements assessment (Chapter 4).

WASHINGTON AVIATION ECONOMIC IMPACT STUDY

In 2020, Washington State Department of Transportation released the Washington Aviation Economic Impact Study (AEIS). The AEIS measured the annual economic impacts that the State's 134 public-use airports and the state-wide system had on local communities, geographic regions, and the State as a whole.

According to the study, Packwood Airport contributed $773,000 in value added, and over $1.34 million in business revenue annually to the local and regional economies. Total employment impact related to the Airport accounted for 6 jobs with an estimated labor income of $517,000.

Environmental Data

PHYSICAL GEOGRAPHY

Packwood Airport has a surveyed elevation of 1,057 feet above mean sea level (MSL). Packwood is located in eastern Lewis County, on the western slopes of the Cascade Mountains, approximately 20 miles west of White Pass on U.S. Highway 12. Notable features in the area include Mount Rainier National Park to the north, Mt. St. Helens National Park to the south, and the Goat Rocks Wilderness area. The community of Packwood and the Airport are located adjacent to the Gifford Pinchot National Forest.

Maximum elevation figures (MEF) depicted on the FAA Seattle Sectional Aeronautical Chart provides pilots with information on the highest known terrain elevation (above mean sea level - MSL) within defined areas. The MEFs immediately surrounding Packwood Airport are 8,300 feet to 14,800 feet MSL. As noted earlier, the Airport was originally constructed as an emergency landing strip located along a common east-west flight route through the Cascade Mountains.

LOCAL CLIMATE ANALYSIS

The Packwood area has snowy winters and warm, moderately dry summers. Historical climate data for Packwood indicates the maximum mean temperature is 79.1 F (August) and the coldest month is typically December with a maximum mean temperature of 42.3 F[3]. Summers are hot and short, spanning from mid-June to mid-September. Packwood receives precipitation throughout the year, with the rainiest seasons being winter, followed by fall and spring. Annual precipitation averages about 55 inches, with nearly one-third occurring in December and January. Precipitation in the summer season averages 1.29 inches (June to September). Annual snowfall averages about 27.9 inches.

3 Western Regional Climate Center (Packwood Station 456262) 1924-2016

*The following climate data charts (**Figure 2-4 and Figure 2-5**) were retrieved from weatherspark.com to illustrate the typical seasonal temperature and precipitation patterns in Morton, WA (the nearest city with available data, approximately 34 miles from the Packwood Airport). These are based on an analysis of historical weather reports and model reconstructions.*

Figure 2-4: Annual Temperatures

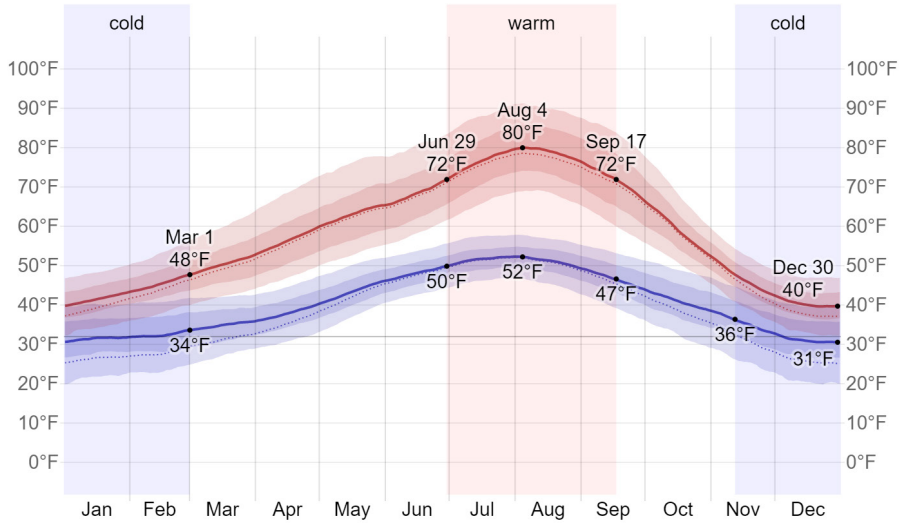
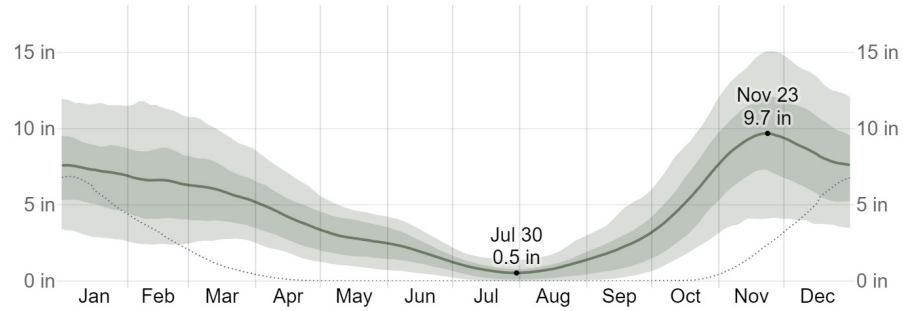


Figure 2-5: Annual Rainfall



Source: www.weatherspark.com

WIND ANALYSIS

Historical on-site wind data are not available for Packwood Airport. The FAA requires wind roses developed for use on ALP drawing sets to provide a minimum of ten years of data. In cases where on-site observation data is limited or unavailable, FAA recommends using a wind rose from a nearby airport to approximate wind coverage. The FAA recognizes that these data are approximate and may not account for unique terrain or localized weather patterns. Appropriate disclaimers and notations will be added to the ALP.

The nearest National Weather Service (NWS) tabulated wind data source acceptable to FAA is located at the Yakima Air Terminal (47 miles east). However, unique geography (mountain range) and distance make use of Yakima wind data less effective for evaluating wind conditions at Packwood Airport. Based on these factors, it was determined that wind data from Chehalis-Centralia Airport (CLS), located 53.9 miles from Packwood, would provide a more accurate assessment of local wind conditions. Applying CLS wind data to the Runway 01/19 alignment indicates that the current runway orientation meets the FAA minimum of 95% wind coverage for small aircraft. The alignment of the runway was determined during original construction based largely on the natural terrain within the valley, which provides generally favorable wind conditions.

Environmental Conditions

The Airport Master Plan scope of work includes an overview of environmental conditions, a preliminary assessment of NEPA environmental impact categories, and a cultural resource assessment for the site. These assessments are summarized below and the full technical memorandums are provided in the listed appendices. A review of recommended improvements will be provided in Chapter 5 – Alternatives Analysis

ENVIRONMENTAL REVIEW

A preliminary environmental screening of the Airport site and surrounding areas was completed as part of the Master Plan. The Project Area consists of the airport properties owned by Lewis County including Parcel 035179006002 located on the south side of the tailrace canal (see **Figure 2-6**). The screening study examined the following environmental categories on and in vicinity of the Airport:

- Air Quality
- Biological Resources (including fish, wildlife, and plants)
- Department of Transportation Act, Section 4(f)
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Natural Resources and Energy Supply
- Water Resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers

A brief summary of significant findings is provided below. The complete report is available in **Appendix A**.

Air Quality

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. The Airport is within an attainment area in Lewis County, Washington.

Biological Resources

Biological resources include sensitive plants, fish, wildlife, and their respective habitats. There are several recorded sightings of a Gray Wolf 1,000 feet north of the Airport on Combs Road, one recorded sighting in the Township of the Northern Spotted Owl, but no suitable habitat on the Airport for either of these species. There are a few more species which have the potential to be found in the area, including North American Wolverine, Marbled Murrelet, Yellow-Billed Cuckoo, Bull Trout, Chinook Salmon, Coho Salmon, and Steelhead.

It is unlikely that any federally or state protected fish species will occur on Airport property. However, Bull Trout, Chinook Salmon, Coho Salmon, and Steelhead are present in the Cowlitz River less than 1,000 feet west of the Airport. Stormwater discharge from the Airport eventually flows into the Cowlitz River through the irrigation canal at the southern end of the Airport.

Several migratory bird species covered by the *Migratory Bird Treaty Act* are known to occur in the vicinity of the Airport. Please consult the full report in **Appendix A** for the complete list and note that the species listed are representative of species found in the area surrounding the Airport, not necessarily on the property.

Suitable breeding habitat occurs in the vicinity of the Packwood Airport for five species of migratory birds listed as Birds of Conservation Concern, including the Black Swift, Cassin’s Finch, Evening Grosbeak, Olive-Sided Flycatcher, and Rufous Hummingbird.

The Bald Eagle and Golden Eagle are protected under the Bald and Golden Eagle Protection Act of 1940, which provides specific guidance for minimizing effects to these species. Golden eagle nesting habitat is not present on or near the Airport. Bald eagle nesting habitat is present in the Airport vicinity, but no records are present.

The nearest critical habitat for terrestrial species is marbled murrelet found approximately 2.5 miles northwest of the Airport in the Gifford Pinchot National Forest. The Cowlitz River is located approximately 1,000 feet west of the Airport and contains critical habitat for Chinook salmon, Coho salmon, and steelhead. The southern end of the Airport has an irrigation canal (tailrace) which connects to a seasonally flooded pond used for irrigation, and then enters the Cowlitz River downstream. Airport stormwater discharges into the Cowlitz River through the tailrace.

Hazardous Materials, Solid Waste, and Pollution Prevention

Federal, state, and local laws regulate the use, storage, transport, and disposal of hazardous materials. There are no sites, requiring cleanup of environmental contaminates prior to use, within 15 miles of the Airport. According to the EPA's Environmental Justice Screening and Mapping Tool (EJSCREEN), there are four EPA hazardous waste treatment, storage, and disposal facilities in the vicinity of Packwood with the nearest to the Airport at Packwood Bridge 12 approximately 0.5 miles to the east. According to the EPA's Toxic Release Inventory (TRI) Search Plus Tool, the nearest TRI site is the Hampton Mills Lumber facility located approximately 13 miles south east of the Airport in the City of Randle.

Water Resources

The 1987 Corps of Engineers Wetlands Delineation Manual and Regional Supplements organizes characteristics of a potential wetland into three categories: soils, vegetation and hydrology. The manual and supplements contain criteria for each category. With this approach, an area that meets all three criteria is considered a wetland (Clean Water Act Section 404). National Wetlands Inventory (NWI) mapping within the vicinity of the Airport is shown on **Figure 2-6**.

The southern end of the Airport contains a constructed tailrace used for transporting water from an upslope holding reservoir near Packwood to the Cowlitz River. A mapped seasonally flooded pond used for irrigation is located on the southern end of the Airport. The NWI maps a seasonal forested shrub wetland approximately 0.6 miles to the east of the Airport that seasonally accumulates water near the holding reservoir and nearby creeks that flow into it and is surrounded by an additional seasonal emergent wetland.

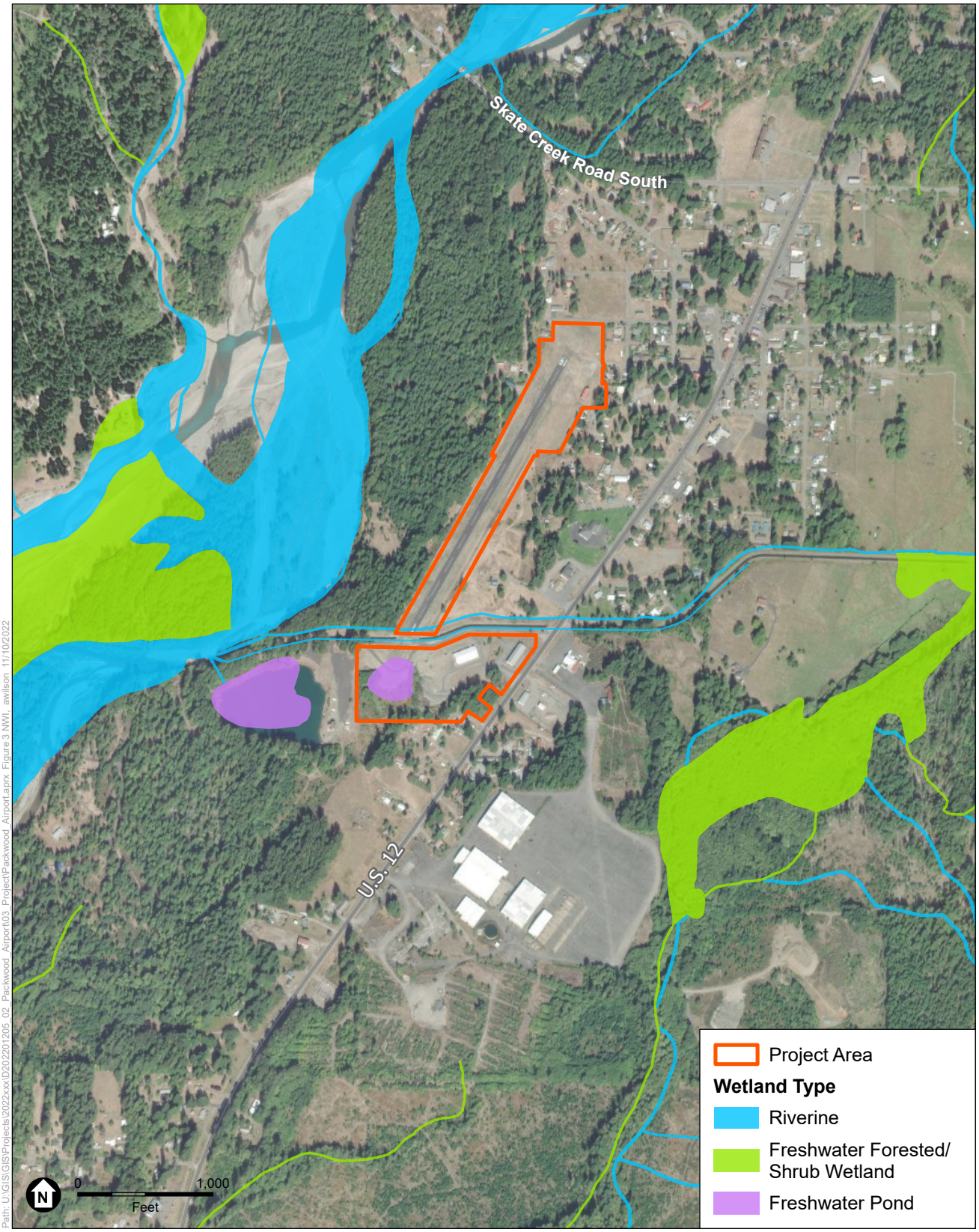
The Airport property is within the 100-year floodplain for the Cowlitz River. Lewis County records show the Airport Property mapped in a zone where 1-3 feet of year flooding can occur.

Many of the surface waters in the vicinity of the Airport property are contaminated including Skate Creek (west) and Clear Fork of the Cowlitz River (upstream). Both are sites known to be impaired, but with no probable source of contamination has been identified by the EPA. A Total Maximum Daily Load (TMDL) describes the maximum amount of a pollutant allowed in a water body and serves as the starting point or planning tool for restoring water quality. Several TMDLs actively apply to the waters listed above:

- Water Temperature (Skate Creek)
- Mercury (Clear Fork of the Cowlitz River)

The compromised waters in the vicinity of the Airport property include critical habitat for federally listed Coho salmon and steelhead populations.

Figure 2-6: National Wetland Inventory



SOURCE: Imagery: Maxar, 2021; National Wetlands Inventory: 2021; ESA, 2022

Packwood Airport Layout

CULTURAL RESOURCES REVIEW

The Airport Master Plan meets the requirements of Section 106 of the National Historic Preservation Act (NHPA) and consider impacts of future airfield improvements to any potential historic properties. The Section 106 review was conducted through online research. This research included the review of known archaeological resources within a 1.0-mile radius of the Airport property using publicly available archeological resource databases maintained by the State of Washington. This database includes recorded archaeological resources, historic property inventories (HPIs), National Register of Historic Properties (NRHP) and Washington Heritage Register (WHR) properties, identified cemeteries, and previously conducted cultural resource surveys found throughout the state. The full review is available in **Appendix B**.

NOISE CONTOURS

A noise analysis is not included in the scope of work for this master planning effort due to the relatively low levels of flight activity at the Airport, which falls below the FAA threshold for analysis.

AIRSPACE AND NAVIGATIONAL AIDS

Airspace Classifications

Airspace within the United States is classified by the FAA as “controlled” or “uncontrolled” with altitudes extending from the surface upward to 60,000 feet above MSL. Controlled airspace classifications include Class A, B, C, D, and E. Class G airspace is uncontrolled. **Figure 2-7** visually depicts these airspace classifications.

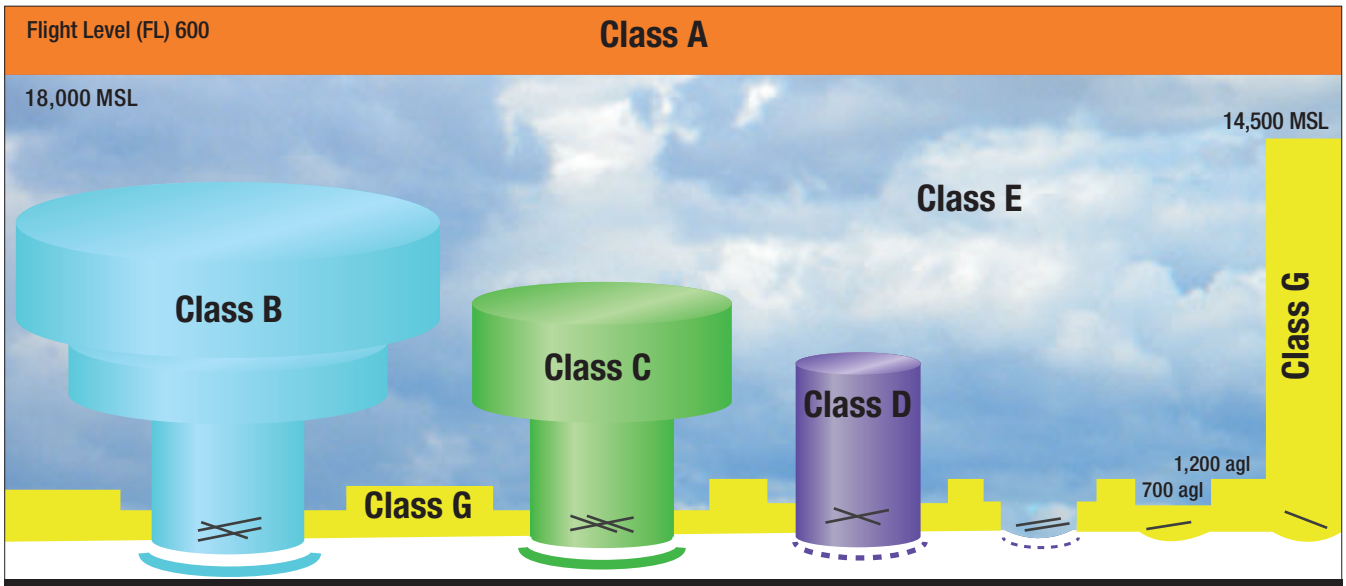
Aircraft operating within controlled airspace are subject to varying levels of positive air traffic control that are unique to each airspace classification. Requirements to operate within controlled airspace vary, with the most stringent requirements associated with very large commercial airports in high traffic areas. Uncontrolled airspace is typically found in remote areas or is limited to a 700 or 1,200-foot above ground level (AGL) layer above the surface and below controlled airspace

Local Area Airspace Structure

The Seattle Sectional Aeronautical Chart depicts nearby airports, notable obstructions, special airspace designations and instrument airways in the vicinity of Packwood Airport (see **Figure 2-8**).

Packwood Airport is located in an area of Class G airspace up to 1200 feet AGL, where it becomes Class E airspace. Radio communication is not required for visual flight rules (VFR) operations in Class G or E airspace, although pilots are encouraged to use the common traffic advisory frequency (CTAF) when operating at individual airports. Aircraft are required to obtain an air traffic control (ATC) clearance prior to operating in Class E airspace when operating under instrument flight rules (IFR).

Figure 2-7: Airspace Classifications



COMMUNICATION REQUIREMENTS AND WEATHER MINIMUMS

	Class A	Class B	Class C	Class D	Class E	Class G
Airspace Class Definition	Generally airspace above 18,000 feet MSL up to and including FL 600.	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports	Generally controlled airspace that is not Class A, Class B, Class C, or Class D	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E
Minimum Pilot Qualifications	Instrument Rating	Student*	Student*	Student*	Student*	Student*
Entry Requirements	IFR: ATC Clearance VFR: Operations Prohibited	ATC Clearance	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: None	None
VFR Visibility Below 10,000 MSL**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	3 Statute Miles	Day: 1 Statute Mile Night: 3 Statute Miles
VFR Cloud Clearance Below 10,000 MSL***	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal***
VFR Visibility 10,000 MSL and Above**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	5 Statute Miles	5 Statute Miles
VFR Cloud Clearance 10,000 MSL and Above	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal

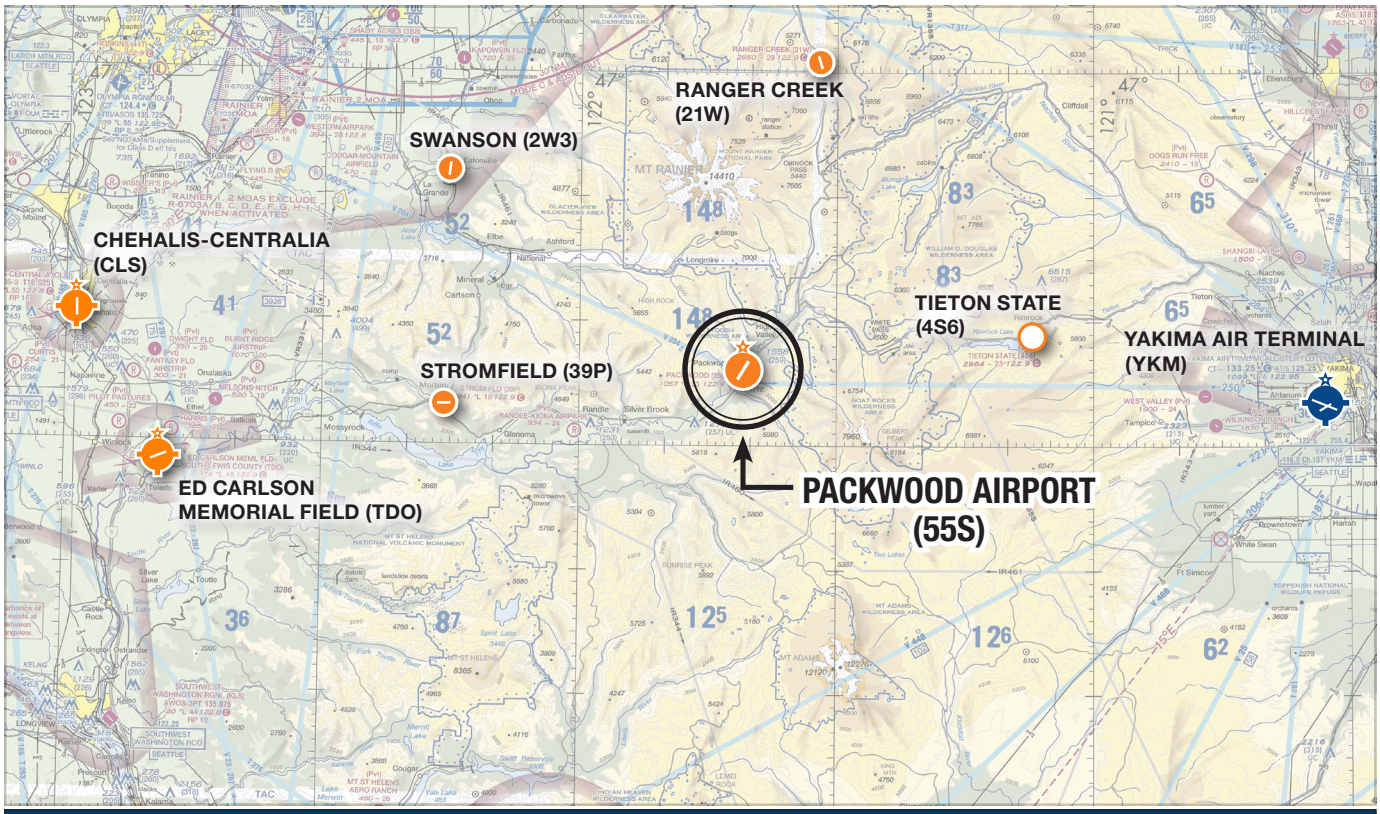
* Prior to operating within Class B, C, or D airspace (or Class E airspace with an operating control tower), student, sport, and recreational pilots must meet the applicable FAR Part 61 training and endorsement requirements. Solo student, sport, and recreational pilot operations are prohibited at those airports listed in FAR Part 91, appendix D, section 4.

** Student pilot operations require at least 3 statute miles visibility during the day and 5 statute miles visibility at night.

*** Class G VFR cloud clearance at 1,200 agl and below (day); clear of clouds.

Source: Federal Aviation Administration (FAA)

Figure 2-8: Area Airspace - Seattle Sectional Chart



LEGEND			
○	Airports with other than hard-surface runways	———	VOR or RNAV Airways
⊕	Airports with hard-surfaced runways 1,500 ft. to 8,069 ft.	- - - -	Class E Airspace (surface)
⬡	VOR/ VORTAC	▬▬	Class E Airspace with floor 700' above surface
⌒⌒⌒	Compass Rose (VOR/DME or VORTAC)	·····	National Wilderness Area

Special Use Airspace

There are several areas of special use airspace located in the vicinity of the Packwood Airport including Mount Rainer National Park (10 miles north) and two U.S. Forest Service Wilderness Areas (Goat Rocks Wilderness Area - 10 NM southeast; Tatoosh Wilderness Area - 7 NM northwest). Pilots are requested to maintain a minimum of 2,000 feet AGL of wildlife refuges, parks, and wilderness areas. The Rainier Military Operations Area (MOA) is located 55 NM northwest of the Airport. Two low altitude military training routes are located west (8 NM) and east (16 NM) of Packwood Airport.

Controlled & Uncontrolled Airspace

Packwood Airport is an uncontrolled field and pilots use the airport Unicom/common traffic advisory frequency (CTAF) for communications on the ground and in the vicinity of the Airport.

Navigational Aids and Airways

Packwood Airport operates exclusively under visual flight rules (VFR) and has no electronic navigational aids or published instrument procedures.

The nearest electronic navigational aids are the McChord VORTAC (TCM 109.60 MHz), located 48 NM northwest of Packwood Airport and the Yakima VORTAC (YKM 116.0 MHz), located 51 NM east. There is one low altitude instrument airway in the area: Victor 204 which connects to the YKM VORTAC, at Whyte intersection, less than 1 mile southeast of Packwood Airport. The minimum enroute altitude (MEA) for this section of V-204 is 10,000 MSL.

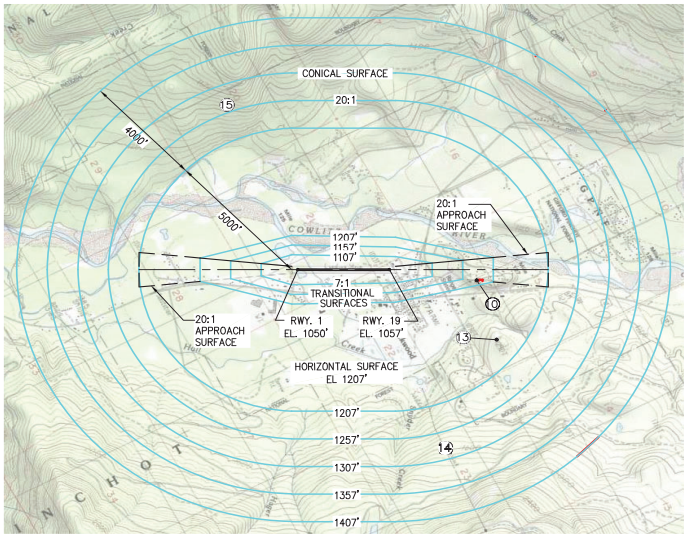
Airspace - Runway Threshold Siting Surfaces

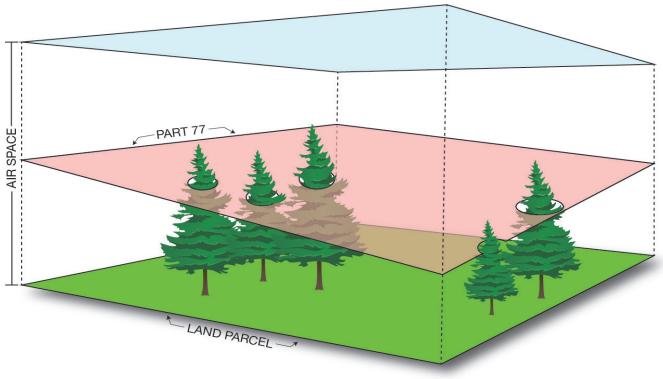
In addition to the airspace classifications and operating environment pilots are most familiar with (described in the previous section above) there are a variety of FAA rules, regulations, design standards, and policies associated with the protection of airspace, evaluation of proposed objects on and near airports, and their effects on navigable airspace. Several of these are summarized below and visually depicted in **Figure 2-9**. Additional information can be found in the *Airport Cooperative Research Program (ACRP) Report 38 - Understanding Airspace, Objects, and Their Effects on Airports.*

Airspace - Part 77

The Code of Federal Regulations (CFR) Part 77 is the central regulation governing airspace protection, with cross-references to many other criteria documents. It defines airport "imaginary surfaces" for civil and military airports and heliports. The surfaces are intended to be free of obstacles to the greatest extent feasible to provide for safe environment for aircraft operating in the vicinity of the landing area. For runways, Part 77 surfaces are established based on the approach type (visual, non-precision instrument, or precision instrument) and the size of aircraft. Part 77 also defines requirements for notification of FAA for proposed construction in vicinity of airports, defines obstruction criteria; and describes aeronautical studies required to assess hazard status. Existing visual Part 77 airspace surfaces for Runway 1/19 are depicted in **Figure 2-9**; generic surfaces are depicted in **Figure 2-10**.

Figure 2-9: Part 77 Visual Airspace Surfaces (Runway 1/19)





Generic relationship between ground, objects, and Part 77 airspace.

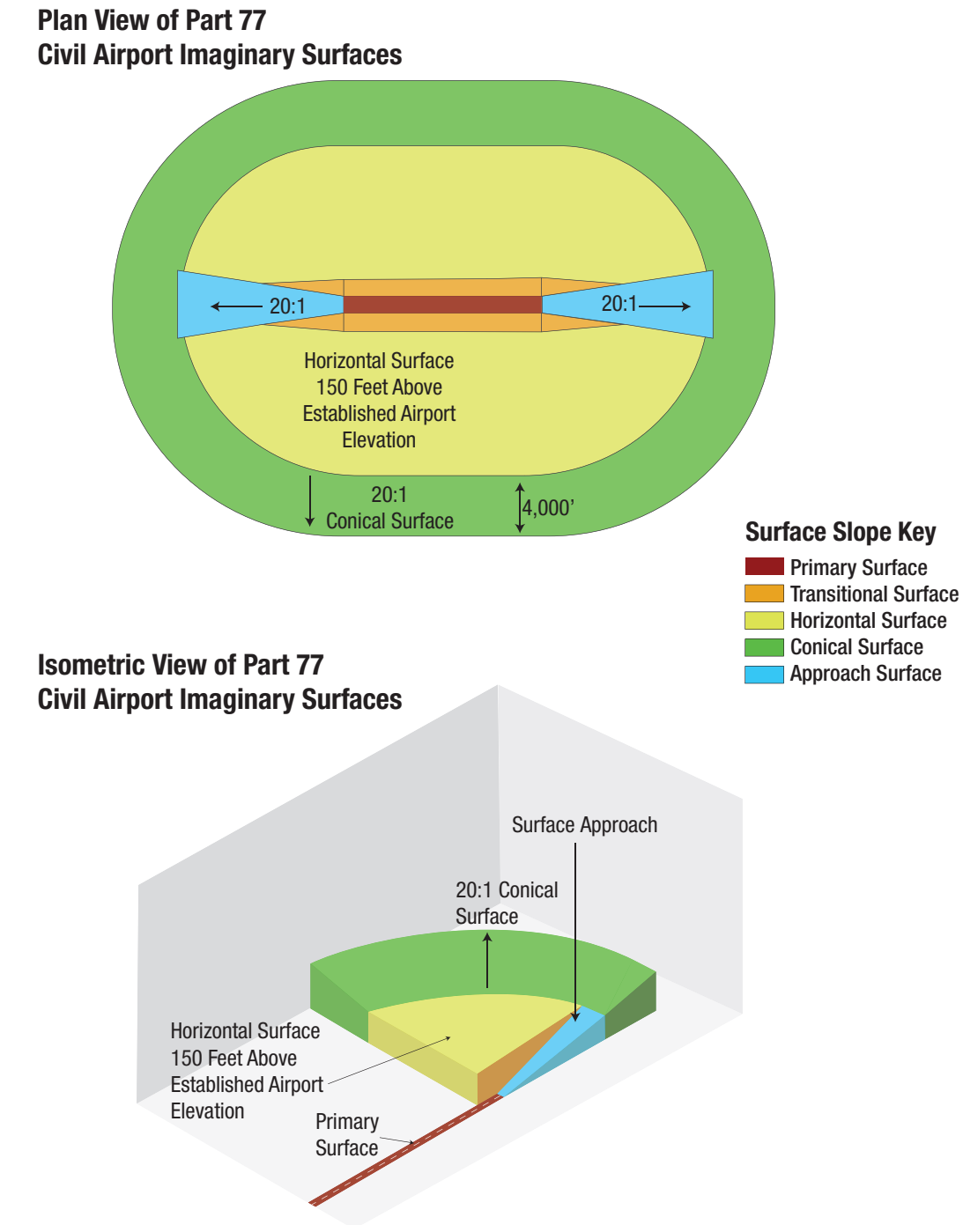
FAA AC 150/5300-13B—Airport Design

This Advisory Circular (AC) is the principal document utilized by the FAA, airport sponsors, and planning consultants when planning and designing new airports or modifications to airports. Airspace clearances for key runway end features are defined in the AC's discussion of Threshold Siting Surfaces. A comprehensive review of current FAA design standards will be provided in the facility requirements chapter of this study to identify any existing facilities that do not conform to current FAA standards.

Instrument Flight Procedures

Packwood Airport currently operates exclusively under visual flight rules (VFR) is not equipped with electronic navigational aids or instrument approach procedures. Previous planning for the Airport has been based on maintaining VFR airspace and capabilities, reflecting the surrounding terrain and runway length.

Figure 2-10: PART 77 Airspace



For Packwood Airport, the approach surfaces for the runway extend 5,000 feet beyond each end (beginning 200 beyond the runway end) at a 20:1 slope.

LAND USE & ZONING ANALYSIS

Packwood Airport and the community of Packwood are located in unincorporated Lewis County. All land use actions related to the Airport, and its immediate surroundings, are under the County's authority (Lewis County Code, Title 17).

2024 Packwood Subarea Plan

An amendment to the Lewis County Comprehensive Plan, incorporating the Packwood Subarea Plan was adopted by the Board of County Commissioners on January 2, 2024 (Ordinance 1350). Updated land use designations were proposed to better align with current and future development needs, while maintaining the rural character of the community. The subarea plan included a future land use map (Map 11) that defines the **Airport District (AX)** and recognized common land uses compatible with airport operations. The ordinance states that *"the proposed changes in zoning shown in Map 11, to be implemented by a separate ordinance following the adoption of the subarea plan..."* The definition of an implementing zone is anticipated that is consistent with the AX land use designation and clearly defines permitted uses and development conditions for Packwood Airport.

For the purposes of the airport master plan, the zoning defined in the adopted subarea plan is presented as "existing." Formal zoning code revisions are anticipated to occur in 2024 to ensure consistency with the county's adopted subarea plan. These changes in land use are depicted on the "Off Airport Land Use" sheet in the updated Airport Layout Plan (see Chapter 7). The Lewis County zoning ordinance articles associated with the Airport are summarized below and provided in **Appendix C**. **Figure 2-11** depicts zoning in the vicinity of Packwood Airport, consistent with the subarea plan.

The Packwood Subarea Plan changed several land use designations in the community and in the immediate vicinity of the Airport. Outside of the developed areas of Packwood, the current Rural Development Districts are unchanged.

Packwood Airport

The Airport's Part 77 airspace extends exclusively over areas of Lewis County authority. The County is responsible for protection of the Part 77 airspace surfaces for the Airport and within the Lewis County Code (LCC) for compliance with the State of Washington airport land use protections. LCC Chapter 17.80 Airport Obstruction Overlay, originally adopted in 1993, defines protections for each of the three public use airports in Lewis County, including Packwood. A review of the code language and overlay zone mapping for Packwood Airport is recommended at the completion of the airport master plan and approval of final ALP drawing set.

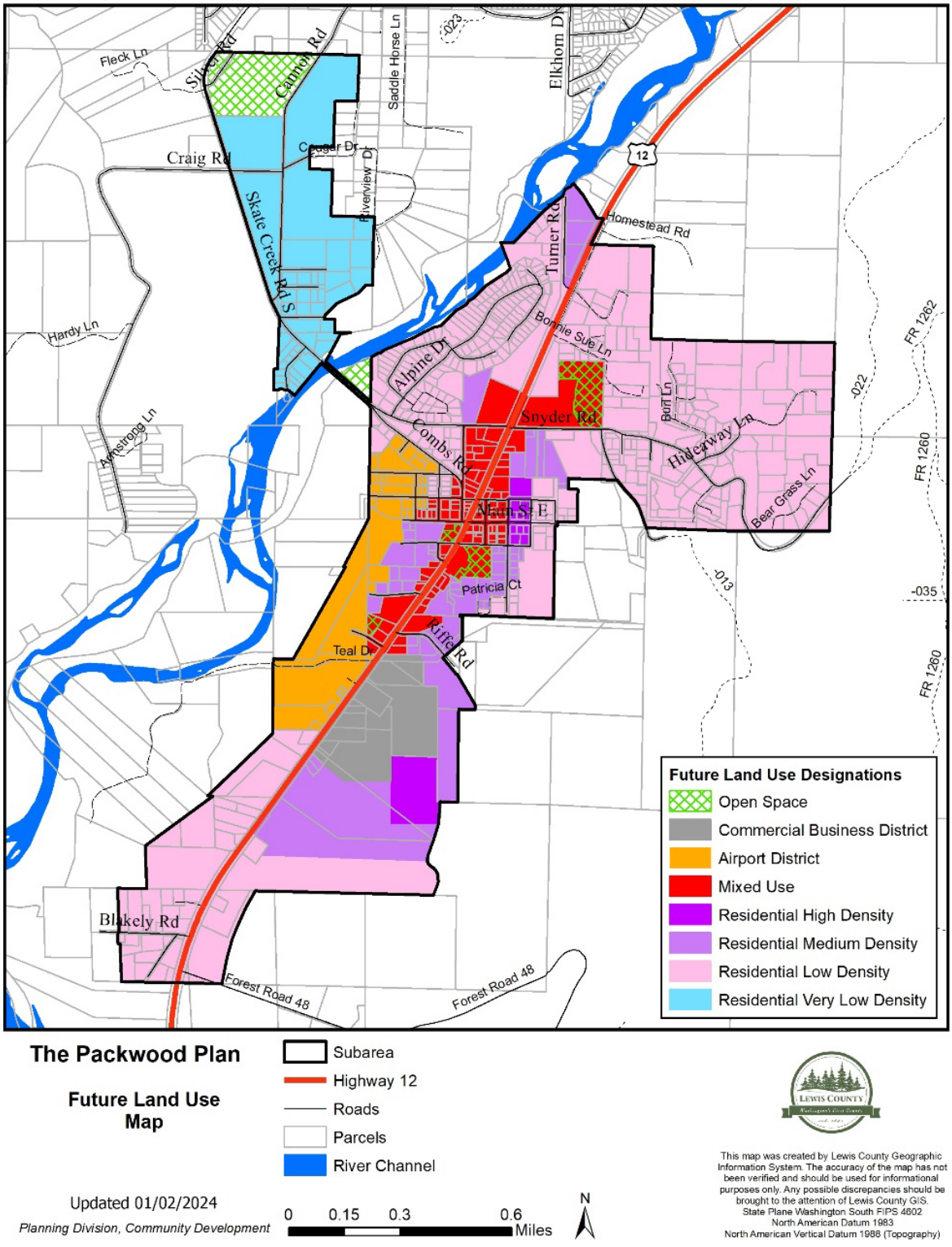
Packwood Airport is assigned the **Airport District (AX)** designation, which focuses on accommodating commercial and small-scale manufacturing activity that aligns with the operational needs of the Airport. As described in the subarea plan, The zone applies to the Airport and areas adjacent to the Airport ("supporting lands"), located west of Highway 12. Larger commercial buildings, 10,000 to 20,000 sq. ft., may be located here. Very low-density single family residential uses are allowed on larger lots. Duplexes, ADUs and multifamily residential are prohibited. Lot sizes are one (1) acre or larger. All common aviation and aeronautical uses, functions, and development typically associated with public use general aviation airports, are permitted.

Airport Vicinity Zoning

The areas in the immediate vicinity of Packwood Airport consist primarily of low density residential and commercial uses, along the Highway 12 corridor. Land Use/Zoning designations include Residential - Low, Medium, and Very Low Density; Mixed Use; and Commercial Business District. Small areas of Residential High Density are located east of Highway 12. The outlying areas surrounding Packwood have a variety of low-density **Rural Development District (RDD)** designations, including several "one dwelling unit" densities: per 5 acres (RDD-5), 10 acres (RDD-10), and 20 acres (RDD-20). Lewis County describes land zoned RDD as capable of providing *"a wide variety of rural residential densities and will preserve the rural character of the county while providing reasonable opportunity for any low-density development."*

A change to the traffic pattern for Runway 01/19 is proposed which would create “right traffic” for Runway 19. The proposed change (pending FAA approval) would establish the pattern on the west side of the runway, which reduces direct overflights over higher density residential areas. The west side traffic pattern is currently in use for operations on Runway 01 for left traffic (left turns). The same traffic pattern would be used for Runway 19 operations with right turns (right traffic). This change in the airport traffic pattern would effectively keep most aircraft west of Highway 12 and large areas of future residential land use.

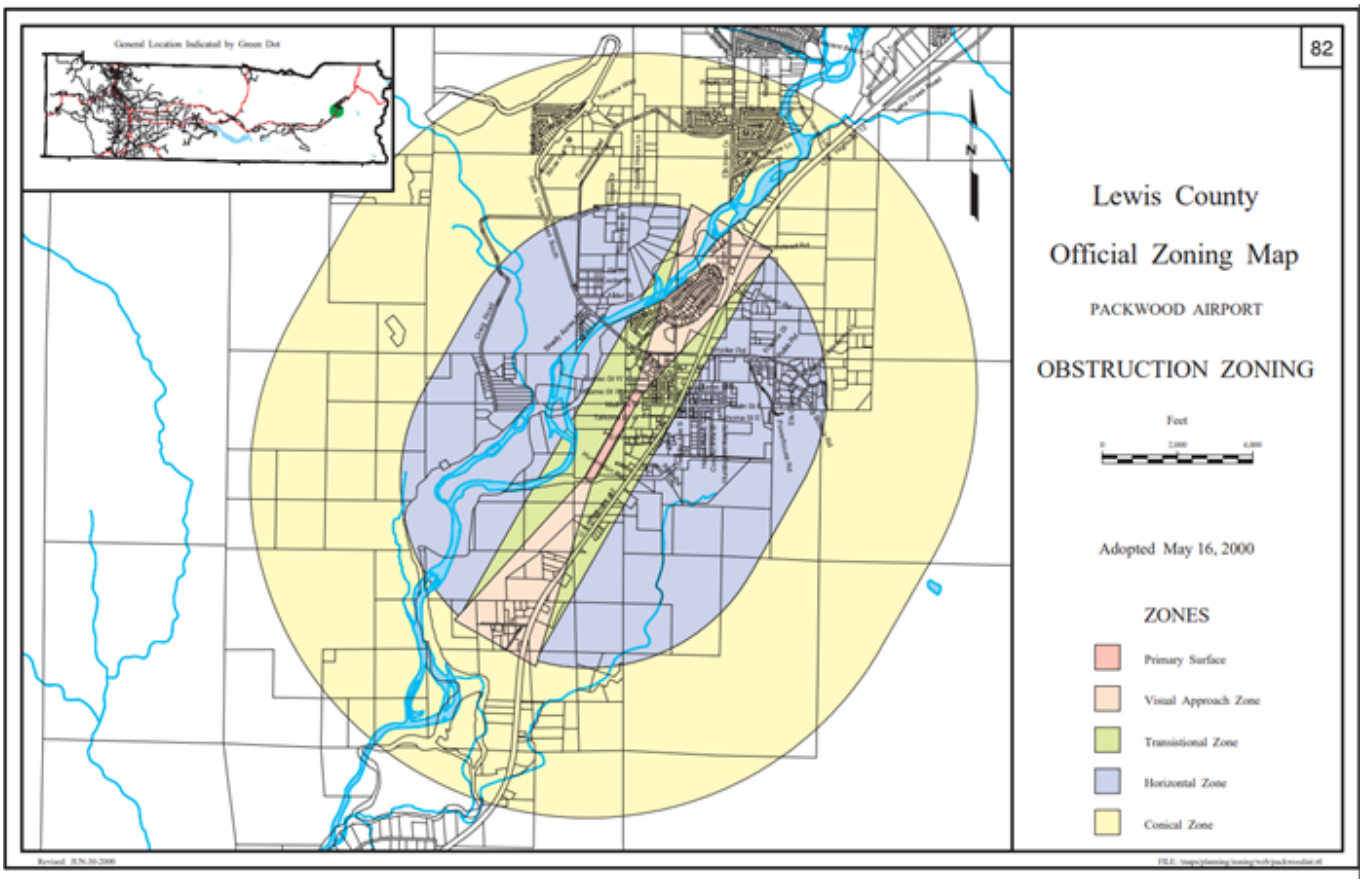
Figure 2-11: Airport Area Zoning Map



AIRPORT OVERLAY ZONING

Lewis County's Airport Obstruction Zoning (Chapter 17.80) is intended to protect public-use airports from airspace obstructions or hazards and incompatible land uses within defined airspace per 14, CFR, Part 77. In addition to regulations of the principal use district, the Airport Safety Overlay includes provisions for preserving land adjacent to the Airport for future commercial and industrial development; and assuring land uses located near the Airport are compatible with noise, height obstruction and other impacts from the Airport operation. The Packwood Airport approach, transitional, horizontal, and conical zones are defined in Chapter 17.80 of the Lewis County Code. The Official Zoning Map adopted by the County in 2000 (**Figure 2-12**) is not fully consistent with the code. As noted earlier, review of code language and mapping is recommended upon adoption of the master plan, and to ensure consistency with the new land use and zoning regulations emanating from the 2024 Packwood Subarea Plan.

Figure 2-12: Lewis County Official Zoning Map



Airside Elements

Airside facilities are comprised of infrastructure that facilitate the movement and operation of aircraft on the ground and in the air. This section of the existing conditions analysis includes a discussion of the Airport's runway- taxiway system, airfield lighting and signage, airfield pavements, and support facilities. Packwood Airport operates in day and night visual flight rules (VFR) conditions.

RUNWAY

Packwood Airport has one paved Runway (01/19) that is oriented in a north-south direction (010/190 magnetic). Runway 01/19 is 2,356 x 60 feet and is equipped with lighting systems that are consistent with visual approach requirements and runway use. The runway was reconstructed in 2015.

A summary of current runway conditions is provided below and in **Table 2-7**:

- **Runway Pavement:** Hot Mix Asphalt (HMA) 2-inch, with a 2-inch P-209 Crushed Aggregate Base Course (CABC), and an 18-inch aggregate subbase (quarry spalls).
- **Runway Markings:** Runway 01/19 has visual markings, consisting of runway end numbers and a centerline stripe. The runway markings were observed to be in very good condition during recent site visits. All runway markings are consistent with FAA standards for configuration, color (white paint), and approach type.
- **Runway Gradient:** Runway 19 has a high point elevation of 1,057 feet and a low point of 1,049 feet MSL. The runway gradient as 0.31%. The runway data was verified in the AGIS survey.
- **MIRL:** Runway 01/19 is equipped with LED Medium Intensity Runway Lighting (MIRL), which includes white edge lights and split lens (green/ red) threshold lights. The threshold lights consist of two sets of three fixtures near each corner of the runway, indicating the usable ends of the runway. The lighting was installed in 2015 as part of the runway reconstruction.
- **Visual Guidance Indicators (VGI):** The runway is not equipped with a VGI on either end.
- **Other Lighting/Marking:** Orange reflectors are mounted on the fence at the ends of the runway to identify potential approach obstructions.

Table 2-7: Runway Details

Runway 1/19	
Dimensions	2,356' x 60'
Bearing	N 29° 37' 15" E (True)
Effective Gradient	0.31%
Surface/Condition	Asphalt/Excellent
Weight Bearing Capacity	12,500 pounds - Single Wheel Load
Markings	Visual/Basic - Runway Designation Numbers, Centerline Stripe
Lighting	Medium Intensity Runway Edge Lighting (MIRL) and Threshold Lighting (pilot activated by radio)

Source: FAA 5010 Airport Master Record (Accessed 10/26/2022)

TAXIWAYS & TAXILINES

Packwood Airport is not equipped with any designated taxiways or taxilanes.

PAVEMENT CONDITION

The WSDOT Aviation Pavement Evaluation Program (innovations Deserving Exploratory Analysis - IDEA) systematically identifies maintenance, repair, and rehabilitation projects needed to sustain functional pavements at Washington airports. The program provides a thorough evaluation of current conditions and future projections of condition in terms of pavement condition indices (PCI) for all eligible pavements on all paved airports across the state. For NPIAS airports like Packwood Airport that receive federal money, this work assists airport sponsors in meeting their FAA grant assurances.

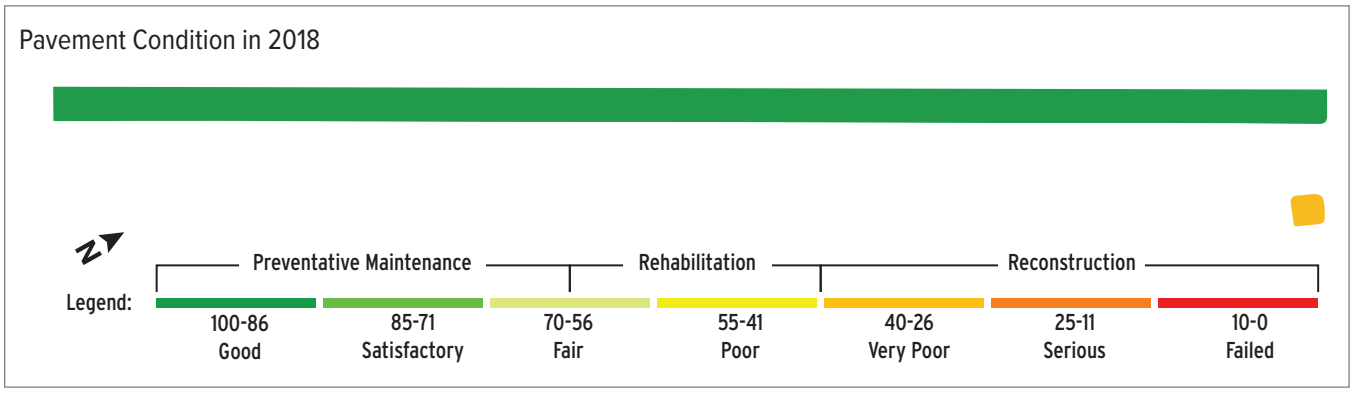
The most recent PCI data available for Packwood Airport is from a 2018 inspection. The survey was performed using the methodology developed by the U.S. Army Corps of Engineers, and outlined in the current edition of *ASTMD-5340, Standard Test Method for Airport Condition Index Surveys*.

The runway pavement at Packwood Airport was rated Good (100%) in the 2018 inspection survey. The current 141,360-square-foot runway was reconstructed in August of 2015. There is no recommended maintenance recorded in the IDEA database at this time. The forecasted PCI value for the runway in 2025 is 93.

A small apron located adjacent to the runway was rated Very Poor (26%). The 3,249-square-foot apron was constructed in 1985. The IDEA database indicates that a major rehabilitation of the apron was recommended for 2019. As of 2022 apron rehabilitation had not been completed. The forecasted PCI value for the apron in 2025 is 7.

Figure 2-13 shows the pavement condition report from the 2018 inspection published by WSDOT Aviation. The pavement ratings are consistent with pavement age and use. The recommended maintenance will be identified in the facility requirements chapter and included in the Capital Improvement Plan.

Figure 2-13: Pavement Conditions (2018 Inspection)



Source: WSDOT IDEA Datebase, Applied Pavement

AIRSIDE SUPPORT FACILITIES

Support facilities generally include airside support facilities such as airfield lighting, signage, weather reporting equipment and visual aids.

Airport Lighting

The Airport is equipped with a rotating beacon located on the east side of the runway.

One lighted wind cone is located on the east side of the runway (approximately 700 feet south of the end of Runway 19).

Airfield Signage

The airfield has no signage.

Weather Reporting

The Airport has no on-site weather reporting capabilities.

Airport Surveying/Airport Control Stations

There is one Primary Airport Control Station (PACS) and one Secondary Airport Control Station (SACS) installed at Packwood Airport. Both monuments were installed in 2019 to support ongoing survey requirements. Normally, one PACS and two SACS are installed on an airport. In Packwood's case, only one SACS was established at the time of installation. There is also a Cooperative Base Network (CBN) control monument located on the Airport in the area where a second SACS would normally be located. CBN monuments are a different control network and cannot be used as airport geodetic control, but if the monument is in suitable condition and meets stability requirements it can be established as a PACS/SACS through some very vigorous survey methods.

DESIGNATION	PID	Type
55S A	DR2452	PACS
55S B	DR2453	SACS
Packwood Air	SB1172	CBN

Runway 1 Looking North

Landside Elements

The landside elements section includes the facilities designed to support aircraft storage and airport operations. This section of the existing conditions analysis includes a discussion of aircraft aprons/ tiedown areas, hangars, utilities, fencing, surface roads, and vehicle parking. **Figure 2-14** shows the existing conditions of the Airport.

APRONS & TIEDOWN AREAS

Packwood Airport has one concrete apron (approximately 57 x 57 feet) that accommodates both fixed wing aircraft and helicopters. There are no permanent aircraft tiedowns, although aircraft parking is accommodated in the unpaved area between the runway and the hangar, adjacent to the paved apron. Airport management reports that the unpaved parking area is very rocky and the absence of paved taxiway access and aircraft parking discourages airport activity.

AIRPORT PERIMETER FENCING

Packwood Airport is fenced with 8-foot chain link fencing. A pedestrian and vehicle swing gate are located at the northeast corner of the Airport. Orange reflective markers are installed on the fence beyond the ends of the runway.

AIRPORT SURFACE ROAD ACCESS

Surface access to Packwood Airport is provided via U.S. Highway 12 and Main Street West, a local street. Public access is provided through the vehicle and pedestrian gates at the northeast corner of the Airport.

VEHICLE PARKING

There are no designated auto parking areas on the Airport, although the unimproved area adjacent to the gate and the aircraft hangar is used for parking.

AIRCRAFT FUEL

Aviation fuel is not currently available at Packwood Airport.

HANGARS AND BUILDINGS

The Airport currently has one hangar, a CXT vault toilet, and an electrical building. The hangar faces west with an open front and space to accommodate two small aircraft. The outdoor restroom building is next to the access gates. The toilet is mounted on a concrete base with a holding tank. A small electrical building is located near the northeast corner of the apron.

UTILITIES

The Airport has electrical power and water, but no sewer or septic service. The Airport's outdoor restroom consists of a CXT vault toilet with a waste storage tank that requires periodic pumping.

Electrical power in the area is generated by the Packwood Lake Hydroelectric facility owned by Energy Northwest. The facility is located east of Packwood at Packwood Lake. An underground pipeline carries water down the mountain to the powerhouse near Packwood. Water to the Airport is provided by the Town of Packwood water system.

PUBLIC SAFETY

The Packwood Airport is served by the Packwood Fire Department, located 1/4 mile from the Airport. Randle Fire and EMS is located approximately 15 miles west, via US Highway 12. Law enforcement is provided by the Lewis County Sheriff's Department and Washington State Patrol.

Figure 2-14: Existing Conditions

Airport Administration

The Airport Administration section provides a summary of Airport Ownership & Management, Airport Finance, Rates and Charges, Rules and Regulations, and overview of FAA Grant Assurances and Compliance.

AIRPORT OWNERSHIP & MANAGEMENT

Packwood Airport is owned and operated by Lewis County. The County is responsible for the day-to-day management of the Airport, in addition to any contractors who perform airfield maintenance and mowing as needed.

AIRPORT FINANCE

The Airport operates within a county Enterprise Fund, with all revenue generated through operations remaining in the Airport's budget. However, Airport revenues do not fully cover the annual operating expenses and the County provides additional funding from the General Fund. Airport revenues are required by FAA to be used for Airport operations and maintenance to prevent revenue diversion. The primary revenue generating sources for the Airport include rents from the County-owned hangar and seasonal use of the Airport by USDA-FS to support aerial wildfire response. The Airport has established a daily rate for use of the facility, which typically requires airport closure to non-fire fixed wing aircraft. The primary expenditures for the Airport include airport administration, maintenance, and facility improvements. Packwood Airport's capital improvement projects are typically funded through FAA grants with a local match.

Table 2-8: Airport Financials (FY2022 Budget)

AIRPORT EXPENSES	
Total Airport Revenue	$31,660
Total Airport Expenses	$30,685
Net Operating Income (loss)	**($975)**

Source: Lewis County, 2022 Budget

Fiscal year 2022 operating revenue and expense budgets for Packwood Airport are summarized in **Table 2-8.**

RULES AND REGULATIONS

Lewis County operates the Airport for the use and benefit of the public in order to make it available to all types, kinds, and classes of aeronautical activity on fair and reasonable terms and without unjust discrimination.

FAA Compliance Overview

A management program based on the FAA's "Planning for Compliance" guidance and the adoption of additional airport management "Best Practices" is recommended to address FAA compliance requirements and avoid noncompliance, which could have significant consequences.

Airport management "Best Practices" are developed to provide timely information and guidance related to good management practices and safe airport operations for airport managers and sponsors. The practices outlined herein are designed for use by the Lewis County for evaluating and improving their current and future operation and management program.

Airport sponsors must comply with various federal obligations through agreements and/or property conveyances, outlined in *FAA Order 5190.6B, Airport Compliance Manual*. The contractual federal obligations a sponsor accepts when receiving federal grant funds or transfer of federal property can be found in a variety of documents including:

- Grant agreements issued under the Federal Airport Act of 1946, the Airport and Airway Development Act of 1970, and Airport Improvement Act of 1982. Included in these agreements are the requirement for airport sponsors to comply with:
  - » Grant Assurances
  - » Advisory Circulars
  - » Application commitments

  - » FAR procedures and submittals
  - » Special conditions
- Surplus airport property should meet the requirements set forth in the Surplus Act of 1944
- Deeds of conveyance
- Commitments in environmental documents prepared in accordance with FAA requirements
- Separate written requirements between a sponsor and the FAA

Airport Compliance with Grant Assurances

As a recipient of both federal and state airport improvement grant funds, Lewis County is contractually bound to various obligations referred to as "Grant Assurances," developed by the FAA and WSDOT Aviation. These obligations, presented in detail in federal and state grants and state statute and administrative codes, document the commitments made by the airport sponsor to fulfill the intent of the grantor (FAA and State of Washington) required when accepting federal and/or state funding for airport improvements. Failure to comply with the grant assurances may result in a finding of noncompliance and/or forfeiture of future funding. Grant assurances and their associated requirements are intended to protect the significant investment made by the FAA, State, and County to preserve and maintain the nation's airports as a valuable national transportation asset, as mandated by Congress.

FAA Grant Assurances

The FAA's Airport Compliance Program defines the interpretation, administration, and oversight of federal sponsor obligations contained in grant assurances. The Airport Compliance Manual defines policies and procedures for the Airport Compliance Program. Although it is not regulatory or controlling with regard to Airport sponsor conduct, it establishes the policies and procedures for FAA personnel to follow in carrying out the FAA's responsibilities for ensuring compliance by the sponsor.

The Airport Compliance Manual states the FAA Airport Compliance Program is: *"...designed to monitor and enforce obligations agreed to by airport sponsors in exchange for valuable benefits and rights granted by the United States in return for substantial direct grants of funds and for conveyances of federal property for airport purposes. The Airport Compliance Program is designed to protect the public interest in civil aviation. Grants and property conveyances are made in exchange for binding commitments (federal obligations) designed to ensure that the public interest in civil aviation will be served. The FAA bears the important responsibility of seeing that these commitments are met. This order addresses the types of commitments, how they apply to airports, and what FAA personnel are required to do to enforce them."*

According to the FAA, cooperation between the FAA, state, and local agencies should result in an airport system with the following attributes:

- Airports should be safe and efficient, located at optimum sites, and be developed and maintained to appropriate standards
- Airports should be operated efficiently both for aeronautical users and the government, relying primarily on user fees and placing minimal burden on the general revenues of the local, state, and federal governments
- Airports should be flexible and expandable, able to meet increased demand and accommodates new aircraft types
- Airports should be permanent, with assurance that they will remain open for aeronautical use over the long- term
- Airports should be compatible with surrounding communities, maintaining a balance between the needs of aviation and the requirements of residents in neighboring areas
- Airports should be developed in convert with improvements to the air traffic control system
- The airport system should support national objectives for defense, emergency readiness, and postal delivery
- The airport system should be extensive, providing as many people as possible with convenient access to air transportation, typically not more than 20 miles of travel to the nearest NPIAS airport

- The airport system should help air transportation contribute to a productive national economy and international competitiveness

The airport sponsor should have a clear understanding of and comply with all assurances. The following sections describe the selected assurances in more detail.

Project Planning, Design, And Contracting

Sponsor Fund Availability (Assurance #3)

Once a grant is given to the airport sponsor, the sponsor commits to providing the funding to cover their portion of the total project cost. Currently this amount is 10% of the total eligible project cost, although it may be higher depending on the particular project components or makeup. Once the project has been completed, the receiving airport also commits to having adequate funds to maintain and operate the airport in the appropriate manner to protect the investment in accordance with the terms of the assurances attached to and made a part of the grant agreement.

Consistency with Local Plans (Assurance #6)

All projects must be consistent with city and county comprehensive plans, transportation plans, zoning ordinances, development codes, and hazard mitigation plans. The airport sponsor should familiarize themselves with local planning documents before a project is considered to ensure that all projects follow local plans and ordinances.

Accounting System Audit and Record Keeping (Assurance #13)

All project accounts and records must be made available at any time. Records should include documentation of cost, how monies were actually spent, funds paid by other sources, and any other financial records associated with the project at hand. Any books, records, documents, or papers that pertain to the project should be available at all times for an audit or examination.

General Airport Assurances

Good title (Assurance #4)

The airport sponsor must have a Good Title to affected property when considering projects associated with land, building, or equipment. Good Title means the sponsor can show complete ownership of the property without any legal questions, or show it will soon be acquired.

Preserving Rights and Powers (Assurance #5)

No actions are allowed, which might take away any rights or powers from the sponsor, which are necessary for the sponsor to perform or fulfill any condition set forth by the assurance included as part of the grant agreement.

Airport Layout Plan (ALP) (Assurance #29)

Packwood Airport should maintain an up-to-date ALP, which should include current and future property boundaries, existing facilities/structures, locations of non-aviation areas, and existing and proposed improvements. FAA requires proposed improvements to be depicted on the ALP in order to be eligible for FAA funding. If changes are made to the airport without authorization from the FAA, the FAA may require the airport to change the alternation back to the original condition or jeopardize future grant funding.

Disposal of Land (Assurance #31)

Land purchased with the financial participation of an FAA Grant cannot be sold or disposed of by the airport sponsor at their sole discretion. Disposal of such lands are subject to FAA approval and a definitive process established by the FAA. If airport land is no longer considered necessary for airport purposes, and the sale is authorized by the FAA, the land must be sold at fair market value. Proceeds from the sale of the land must either be repaid to the FAA, or reinvested in another eligible airport improvement project.

Airport Operations and Land Use

Pavement Preventative Maintenance (Assurance #11)

Since January 1995, the FAA has mandated that it will only give a grant for airport pavement replacement or reconstruction projects if an effective airport pavement maintenance-management program is in place. As noted

earlier, WSDOT Aviation prepares periodic pavement reports for Packwood Airport as part of its statewide airport pavement management program. These reports identify the maintenance of all pavements funded with federal financial assistance and provides a pavement condition index (PCI) rating (0 to 100) for various sections of aprons, runways, and taxiways; including, a score for overall airport pavements.

Operations and Maintenance (Assurance #19)

All federally funded airport facilities must operate at all times in a safe and serviceable manner and in accordance with the minimum standards as may be required or prescribed by applicable federal, state, and local agencies for maintenance and operations.

Compatible Land Use (Assurance #21)

Land uses around an airport should be planned and implemented in a manner that ensures surrounding development and activities are compatible with the airport. The Airport is both located in, and owned by Lewis County. To comply with this grant assurance Lewis County shall ensure that zoning and land use controls are in place to protect the Airport from incompatible land uses. Incompatible land uses around airports represents one of the greatest threats to their future viability.

Day-To-Day Airport Management

Economic Non-Discrimination (Assurance #22)

Any reasonable aeronautical activity offering service to the public should be permitted to operate at the airport as long as the activity complies with airport established standards for that activity. Any contractor agreement made with the airport will have provisions making certain the person, firm, or corporation will not be discriminatory when it comes to services rendered including rates or prices charged to customers.

Exclusive Rights (Assurance #23)

No exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. However, an exception may be made if the airport sponsor can prove that permitting a similar business would be unreasonably costly, impractical, or result in a safety concern, the sponsor may consider granting an exclusive right.

Leases and Finances

Fee and Rental Structure (Assurance #24)

An airport's fee and rental structure should be implemented with the goal of generating enough revenue from airport related fees and rents to become self-sufficient in funding the day-to-day operational needs. Airports should update their fees and rents on a regular basis to meet fair market value, often done through an appraisal or fee survey of nearby similar airports. Common fees charged by airports include fuel flowage fees, tie-down fees, landing fees, and hangar or ground lease rents.

Airport Revenue (Assurance #25)

Revenue generated by airport activities must be used to support the continued operation and maintenance of the airport. Use of airport revenue to support or subsidize non-aviation activities or to fund other sponsor non-airport departments who are not using the funds for airport specific purposes is not allowed and is considered revenue diversion. Revenue diversion at airports is a significant compliance issue for FAA.

For additional information on FAA Grant Assurances, please go to: https://www.faa.gov/airports/aip/grant_assurances/#current-assurances.

WSDOT Aviation Division Grant Assurances

In 2013, WSDOT Aviation adopted grant assurances (WAC Chapter 468-260) for airport sponsors that are intended to protect the public's investment in the Washington aviation system. The WSDOT grant assurances apply to both NPIAS and non-NPIAS airports that receive funding through the WSDOT Airport Aid Grant Program. The WSDOT grant assurance s are consistent and complimentary to FAA grant assurances with a significant emphasis placed on land use planning, public process, and environmental stewardship. A summary of the WSDOT grant assurances are included in **Appendix D**.

Chapter 3

Aviation Activity Forecasts

Introduction and Overview

This chapter provides updated aviation activity forecasts for Packwood Airport (55S) for the 20-year planning horizon (2022-2042). The most recent Federal Aviation Administration (FAA) approved aviation activity forecasts for the Airport were developed in the December 2009 Airport Layout Plan report.[1]

The forecasts presented in this chapter are consistent with the facility's current and historical role as a local general aviation airport serving the community and surrounding area. The forecasts are unconstrained and assume Lewis County will be able to make the facility improvements necessary to accommodate the anticipated demand unless specifically noted. The County will consider if any unconstrained demand will not or cannot be met through the evaluation of airport development alternatives later in the Airport Master Plan (AMP).

The Airport accommodates primarily single-engine aircraft and helicopters. Multi-engine aircraft use is occasional and is limited by available runway length (2,356 feet).

As noted in Chapter 2 - Existing Conditions, the 2017 Washington Aviation System Plan (WASP) defines Packwood Airport as a "Local" airport. Local airports support General Aviation (GA) activities including personal transportation, recreational flying, pilot training, and agricultural activities. Local airports are typically located outside of metropolitan areas and regional centers; have paved primary runways; and have 15 or fewer based aircraft. In addition to traditional general aviation (GA) activity, the Airport is strategically located to support aerial wildfire response. In late summer 2022 and 2023, the Airport was closed to non-emergency use for extended periods to support a sustained helicopter response to nearby fires.

In the federal airport system, Packwood Airport is classified as a "Basic" GA airport in the 2023 National Plan of Integrated Airport Systems (2023-2027) report to Congress. Basic airports provide a means for GA flying and link the community to the national airport system. Basic airports support GA activities such as emergency response, air ambulance service, flight training, and personal flying.

1 Packwood Airport – Airport Layout Plan Report (Century West Engineering, 2009)

FAA Forecasting Process

The FAA provides aviation activity forecasting guidance for airport master planning projects. *FAA Advisory Circular (AC) 150/5070-6B, Airport Master Plans*, outlines seven standard steps involved in the forecast process:

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

2. **Previous Airport Forecasts:** May include the FAA Terminal Area Forecast (TAF), 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:** There are several appropriate methodologies and techniques 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 5090.5, Field Formulation of the National Plan of Integrated Airport Systems and Airport Capital Improvement Program*. In part, the Order indicates that forecasts should not vary significantly (more than 10%) from the TAF. When there is a greater than 10% variance, supporting documentation should be supplied to the FAA. The aviation demand forecasts are then submitted to the FAA for their approval.

KEY ACTIVITY ELEMENTS

As noted above, general aviation airport activity forecasting focuses on two key activity segments: based aircraft and aircraft operations (takeoffs & landings). Detailed breakdowns of these activity segments include:

- Aircraft fleet mix
- Peak activity
- Distribution of local and itinerant operations
- Determination of the critical aircraft (also referred to as the design aircraft)

The critical aircraft represents the most demanding aircraft type or family of aircraft that uses an airport on a regular basis (a minimum of 500 annual takeoffs & landings). The critical aircraft is used to establish a variety of FAA design categories, which then establish design standards for airfield facilities. FAA airport design standard groupings reflect the physical requirements of specific aircraft types and sizes. Design items, such as runway length evaluations, are determined by the requirements of current/future critical aircraft. The activity forecasts also support the evaluation of several demand-based facility requirements including runway and taxiway capacity, aircraft parking, and hangar capacity.

Population and Economic Conditions

Historically, downturns in general aviation activity often occur during periods of weak economic conditions while growth typically coincides with favorable economic conditions. The historic depth of the 2008 Great Recession dramatically impacted regions and local communities and rippled throughout general aviation for several years after the recession. Following a slow economic recovery, a 10-year period of sustained economic growth leading into 2020 significantly improved conditions in general aviation. This upward trend included increased flight activity and growth in new aircraft deliveries, particularly in the business aviation, helicopter, light sport aircraft, and experimental (kit) aircraft segments.

The U.S. economy was abruptly impacted at the onset of the COVID-19 pandemic in early 2020. The effects of the pandemic and the related impacts affected the aviation industry in a variety of ways in 2020 and 2021. Signs of rebound within general aviation began to appear heading into 2021 as part of the national recovery. This upward trend has been sustained through a period of economic uncertainty that persisted into early 2023, easing somewhat in 2024.

The FAA's long-term Aerospace Forecast, Fiscal Years 2022-2042 reflects overall strength in both the U.S. and regional economies, and projects modest growth in aviation activity over the long-term. The forecast reflects areas of depressed general aviation activity in the near term and the assumption that general aviation will return to pre-COVID activity levels later in the forecast period, before resuming previously forecast growth.

POPULATION

The population within an airport's service area, in broad terms, affects the type and scale of aviation facilities and services that can be supported. Changes in population often reflect broader economic conditions that may also affect airport activity. The service area for Packwood Airport includes the local community and eastern Lewis County. For forecasting aviation activity, an evaluation of population for Lewis County and the Packwood area provides a reasonable indication of trends within the Airport's service area.

Historical Population (2010-2022)

The 2022 Washington Office of Financial Management (OFM) estimate for Lewis County's population was 83,400, up 10.5% (net gain of 7,945 residents) since 2010. Most of the net increase is concentrated in the western section of the county. The 2022 draft Packwood Subarea Plan notes that the Packwood area (zip code tabulation area 98361) had population of 1,073 in 2020, making up slightly less than 2% of Lewis County population (2020 Census). The population for zip code 98361 in the 2000 Census was 1,209.

OFM data indicate that annual population growth in Lewis County between 2010 and 2022 averaged 0.84%[2], which trailed statewide population growth (1.31% AAGR) during this period. Also worth noting, population growth in unincorporated Lewis County, which includes areas the Packwood area, averaged 0.93% AAGR over this 12-year period.

Recent historical population data and average annual growth rates for Lewis County (overall and unincorporated areas) and Washington are summarized in **Table 3-1**.

Table 3-1: Lewis County Population Summary (Historical)

	AAGR[1]	2010	2017	2018	2019	2020	2021	2022
Washington	1.31%	6,724,540	7,310,300	7,427,570	7,546,410	7,707,047	7,766,975	7,864,400
Lewis County (total)	0.84%	75,455	79,477	80,250	81,151	82,149	82,700	83,400
Unincorporated Lewis County	0.93%	44,892	47,612	48,137	48,770	49,461	49,840	50,185

Source: U.S. Census Bureau (2010, 2020); WA Office of Financial Management (OFM) Postcensal Estimates (2017-2022)
1 AAGR: 2010-2022

2 AAGR = Average Annual Growth Rate (compounded over time)

Forecast Population

In Washington state, OFM is responsible for developing long term population forecasts to support various local and state government programs. OFM also generates postcensal estimates of population on April 1 each year to supplement available census data. OFM periodically generates three 20-year population forecasts for Growth Management Act (GMA) counties for use in their comprehensive planning. The medium or "middle series" forecast scenarios are often selected by counties as the most realistic forecasts for long term planning. The 2017 Lewis County Comprehensive Plan presents an adopted 2040 population figure that fell between the 2017 medium and high OFM forecasts for the county. The most recent OFM Lewis County forecasts (updated in 2022) reflect slightly lower long-term population growth (post Covid) than previously forecast.

The Washington state long range forecast (2023-2050) issued by OFM in November 2022 matches OFM's statewide 2022 GMA middle series forecast. A summary of current county and statewide forecasts is presented in **Table 3-2**.

Table 3-2: Lewis County Population Forecast

	AAGR[1]	2020	2025	2030	2035	2040	2045
Lewis County (2022 GMA) medium	0.59%	82,149	87,957	87,746	90,188	92,313	94,187
Lewis County (2022 GMA) high	1.1%	82,149	91,754	95,616	99,103	102,248	105,122
Washington (2022 Forecast)	0.93%	7,706,310	8,100,384	8,502,764	8,884,512	9,248,473	9,598,597

Source: WA Office of Financial Management (OFM)
1 AAGR: 2010-2022

The long-term forecasts reflect the same differentials for county-versus-statewide growth as the 2010-2022 historical data indicate. In both cases, Lewis County's annual population growth rate tracks at about 2/3 the statewide growth rate.

Summary – Population

The long-term population growth projected for Packwood and eastern Lewis County is expected to have a modest, yet positive effect on activity at Packwood Airport. Incremental growth in year-round and part-time residents will increase opportunities to attract new airport tenants requiring aircraft storage (hangar, tiedown space), and may contribute to increased demand for services like critical patient transports (medevac) with helicopters.

ECONOMY

Lewis County's economy historically relies on the forest products industry, supplemented by trade, services and government employment. **Table 3-3** summarizes the county's leading employment sectors. Other significant employment sectors include construction, other services, farm employment, transportation and warehousing, administrative and waste services, and real estate & rental & leasing.

Table 3-3: Lewis County Employment (2021)

	Number of Jobs	Share of Employment
State and Local Government	5,310	13.9%
Health Care and Social Assistance	4,620	12.1%
Retail Trade	4,560	11.9%
Manufacturing	3,710	9.7%
Accommodation and Food Services	2,930	7.7%
All other industries	17,160	44.8%
Total	38,290	100%

Source: Woods & Poole Economics, 2021 State Profile (WA/OR/ID)

Among the unique economic segments in Packwood and eastern Lewis County is tourism and recreational visitor spending, which translates into hotel/motel, campground, and vacation rentals. One indicator of this activity may be found in the composition of private home use in the local area. The U.S. Census reports housing units—including the number of occupied versus vacant homes—in the 98361-zip code tabulation area (ZCTA), which includes

Packwood are the surrounding area. For census recording purposes, occupied dwellings have full time year-round occupants and vacant dwellings include part-time occupancy (seasonal, weekend, vacation, etc.) and short-term rental. **Table 3-4** summarizes the local housing trends from 2000 to 2020. The data identify two unique trends: both the overall growth in housing units and the percentage of unoccupied homes in 98361 ZCTA have increased, but at different rates. The increase in total housing units has averaged less than 1% annually (0.8%) since 2000, while the number of vacant units has increased at an average of 3.3% annually. The data suggest that the local housing market includes a significant and growing number of part-time, or second home residents and vacation rentals. Based on 2020 Census data, 76% of total housing units in ZCTA 98361 were reported as vacant.

Table 3-4: Local Area Housing Occupancy (ZCTA 98361)

	2000	2010	2020
Total Housing Units	1,369	1,525	1,600
Occupied	729	587	381
Vacant	640	938	1,219

Source: U.S. Census Bureau

Personal Income

Lewis County trails state and national per capita and household income levels. The county has a higher level of poverty than the state, but lower than the nation. The current Washington Employment Security Department (ESD) profile for Lewis County provides the following summaries related to personal income:

- Inflation-adjusted per capita income in Lewis County in 2020 was $47,752 compared to $67,126 (Washington) and $59,510 (U.S.)
- Median household income in 2019 was $58,911 in Lewis County, compared to $78,687 (Washington) and $65,712 (U.S.)
- 11.6% of Lewis County population was living below the poverty level in 2019—a higher rate than Washington (9.8%), but lower than the U.S. rate (12.3%)

These economic indicators (trends) are well established in Lewis County and as such, are not expected to change significantly during the current planning period.

Unemployment

Typically, peak unemployment levels in Lewis County[3] occur during the winter months, while the rest of the year remains fairly constant. A review of 2015 to 2022 data reveals relatively consistent seasonal unemployment levels, except for 2020 when COVID-19-induced unemployment spiked above 15% in April and May. Typically, the average high-low spread for monthly unemployment in Lewis County throughout the year is less than 3 percentage points. In 2020, the spread was 11.9 points. Unemployment levels began a steady improvement in late 2020 and have remained relatively stable since, fluctuating between 5% to 8%. The county's unemployment rates for the first three months of 2023 are generally comparable to the same period in 2019, nearly a year before the onset of the pandemic in the U.S.

Similar to income, historical unemployment levels in Lewis County reveal relatively predictable seasonal fluctuations. While overall levels may improve as ongoing economic expansion occurs both locally and throughout the county, changes in current trends would most likely be incremental and not significantly impact airport activity during the current planning period.

Economic Outlook

The Washington Employment Security Department (ESD) generates annual short and long-term employment forecasts by region. Lewis County is in the Pacific Mountain region, which also includes Pacific, Grays Harbor, Mason, and Thurston counties. The ESD projections show expected changes in employment by industry and occupation, current and projected employment counts, estimated growth rates and average annual openings. **Table 3-5** summarizes the region's near-term employment outlook, which ranges from 1% to 2% annual growth through 2030.

3 Centralia (Lewis County) data WA ESD, not seasonally adjusted.

Table 3-5: Pacific Mountain Region Employment Forecast By Industry (Updated July 2022)

Job Categories	Estimated employment 2020	Estimated employment 2025	Estimated employment 2030	Average annual growth rate 2020-2025	Average annual growth rate 2025-2030
TOTAL NONFARM	185,500	204,800	218,300	2.00%	1.28%
NATURAL RESOURCES and Mining	1,400	1,400	1,400	0.00%	0.00%
Logging	1,100	1,100	1,100	0.00%	0.00%
Mining	300	300	300	0.00%	0.00%
CONSTRUCTION	10,300	11,500	12,500	2.23%	1.68%
MANUFACTURING	10,400	10,900	11,200	0.94%	0.54%
Durable Goods	6,500	6,600	6,700	0.31%	0.30%
Wood Product Manufacturing	3,300	3,300	3,300	0.00%	0.00%
Nonmetallic Mineral Product Manufacturing	600	600	600	0.00%	0.00%
Primary Metal Manufacturing	600	700	700	3.13%	0.00%
Fabricated Metal Product Manufacturing	300	300	300	0.00%	0.00%
Machinery Manufacturing	100	100	100	0.00%	0.00%
Aerospace Product and Parts Manufacturing	0	0	0	0.00%	0.00%
Other Transportation Equipment	0	0	0	0.00%	0.00%
Other Durable Manufacturing	700	700	800	0.00%	2.71%
Non-Durable Goods	900	900	900	0.00%	0.00%
Food and Beverages Manufacturing	3,900	4,300	4,500	1.97%	0.91%
Paper Manufacturing	2,600	2,700	2,900	0.76%	1.44%
Printing and Related Support Activities	400	400	400	0.00%	0.00%
Other Non-Durable	200	200	200	0.00%	0.00%
WHOLESALE TRADE	5,800	6,200	6,400	1.34%	0.64%
RETAIL TRADE	21,200	22,900	24,200	1.55%	1.11%
Food and Beverage Stores	4,200	4,500	4,700	1.39%	0.87%
Motor Vehicle and Parts Dealers	2,600	2,700	2,800	0.76%	0.73%
Other Retail Trade	14,400	15,700	16,700	1.74%	1.24%
TRANSPORTATION, WAREHOUSING AND UTILITIES	5,500	5,400	5,900	-0.37%	1.79%
Utilities	500	500	500	0.00%	0.00%
Transportation and Warehousing	5,000	4,900	5,400	-0.40%	1.96%
INFORMATION	1,700	2,000	2,100	3.30%	0.98%
Software Publishers	200	300	300	8.45%	0.00%
Other Information	100	100	100	0.00%	0.00%
FINANCIAL ACTIVITES	1,400	1,600	1,700	2.71%	1.22%
Finance and Insurance	6,200	6,400	6,700	0.64%	0.92%
Real Estate, Rental and Leasing	4,200	4,300	4,500	0.47%	0.91%
PROFESSIONAL and BUSINESS SERVICES	2,000	2,100	2,200	0.98%	0.93%
Professional, Scientific and Technical Services	15,600	17,600	19,700	2.44%	2.28%
Management of Companies and Enterprises	6,600	7,700	8,600	3.13%	2.24%
Other Professional Services	1,100	1,200	1,300	1.76%	1.61%
Employment Services	5,000	5,200	5,700	0.79%	1.85%
EDUCATION and HEALTH SERVICES	27,500	30,600	34,200	2.16%	2.25%
Education Services	2,900	3,300	3,700	2.62%	2.31%
Health Services and Social Assistance	24,600	27,300	30,500	2.10%	2.24%
LEISURE and HOSPITALITY	15,900	21,700	23,400	6.42%	1.52%
Arts, Entertainment and Recreation	1,700	2,200	2,300	5.29%	0.89%
Accommodation and Food Services	14,200	19,500	21,100	6.55%	1.59%
OTHER SERVICES	6,800	7,600	7,900	2.25%	0.78%
GOVERNMENT	57,200	60,600	62,700	1.16%	0.68%
Federal Government	1,400	1,400	1,500	0.00%	1.39%
State and Local Government Other	41,300	43,400	44,700	1.00%	0.59%
Government Educational Services	14,500	15,800	16,500	1.73%	0.87%

Source: Washington Employment Security Department/LMEA, Pacific Mountain Region (July 2022 update)

Woods & Poole Forecasts

A review of Woods & Poole Economics, Inc., forecasts for the Pacific Northwest region reflect similar long-term growth expectations as other existing Washington State agency forecasts. Woods & Poole forecasts are recognized nationally for the demographic detail provided down to the county level, with additional breakouts provided for a variety of defined place designations.

The Woods & Poole 2021 State Profile Series[4] forecast contains regional data and projections for all Combined Statistical Areas (CSAs), Metropolitan Statistical Areas (MSAs), Micropolitan Statistical Areas (MICROs), Metropolitan Divisions (MDIVs), and counties in the region. The current forecasts extend to 2050 and provide a useful comparison to shorter term projections developed by state or local government. Although some differences in data organization may exist from the forecasts noted earlier, the overall growth rates within the forecasts provide relevant evaluations of long-term economic growth for comparison. **Table 3-6** summarizes key growth rates for Lewis County from the Woods & Poole 2050 forecasts. The economic data are presented in 2012 dollars, referred to as "constant" dollars, which are used to measure real change in earnings and income when inflation is considered.

Table 3-6: Lewis County – Forecast Annual Growth Rates (2021-2050)

Data Category	Average Annual Growth Rate
Total Population	0.49%
Total Employment (includes farm employment)	0.65%
Total Earnings (2012 $)	1.40%
Personal Income (2012 $)	1.74%
Income Per Capita (2012 $)	1.35%
Mean Household Income (2012 $)	1.37%
Gross Regional Product (2012 $)	1.41%

Source: Woods & Poole Economics, 2021 State Profile Series (Idaho, Washington, Oregon)
2012 referenced data represents "constant" dollars used to measure real change over time when inflation is considered.

Summary – Economic Outlook

Modest population growth is expected for Lewis County during the current 20-year planning horizon. Annual growth is projected to average about 0.59% (GMA medium) over this period, which is lower than the historical growth experienced over the last 10+ years. As with historical population trends, local growth is expected to be slower than statewide growth. It is noted that long term economic forecasts project more robust growth in terms of employment levels and measures of economic output (post-COVID-19 pandemic recovery).

The Draft Packwood Subarea Plan (December 2022), adopted by Lewis County in January 2024, projects robust near-term and long-term population growth in the local Packwood area (zip code tabulation area 98361). The projection for the 2045 full-time residential population is 1,250, up from 1,073 recorded in the 2020 Census. This projection reflects an average annual growth rate of 0.61%, which slightly exceeds the county-wide growth rate (medium series) currently forecast by Washington OFM.

Growth in local population and economic output is expected to be modest during the current planning period, and this in turn will contribute to future air traffic demand at Packwood Airport that is consistent with events in the community and its surroundings. Packwood Airport has not historically generated high levels of activity. However, the importance of the facility to the local community, Lewis County, and region is reflected in its unique ability to serve a remote and sparsely populated area.

The recreation and tourism segments of the local economy are especially capable of contributing to the Airport's future transient general aviation (GA) activity. Growth in transient activity would be expected to increase demand for facilities such as aircraft parking. Growth in seasonally based aircraft is also possible as part-time residents or extended stay visitors increase. The Airport's ability to accommodate critical patient transport (air ambulance

4 2021 State Profile – Idaho, Oregon, and Washington. Copyright 2021, Woods & Poole Economics, Inc.

flights) is well established, and demand for those services would be expected to increase as the resident population and visitor levels grow. This activity would benefit from basic facility improvements such as a lighted helicopter parking area that could support aircraft and ground support (EMS) needs. The frequency, size, and location of wildfires in Washington is random, but it is reasonable to assume that recent fire trends in the region may continue or worsen. The need for an effective aerial response supported by Packwood Airport will become increasingly important to protect human life, safety, and property as new development and a growing population requires additional resources. For planning purposes, fire-related airport activity comparable to 2022 and 2023 levels are assumed to randomly occur during the 20-year planning period.

Historical Aviation Activity

Historical activity data for Packwood Airport is limited to the FAA National Based Aircraft Inventory Program (validated counts), FAA Airport Record Forms (5010-1), the FAA TAF, and previous airport plans. Airport sponsors are required by FAA to periodically update 5010 forms and the validated based aircraft count based to accurately reflect local conditions. As noted earlier, the primary data used in general aviation airport planning includes based aircraft and annual aircraft operations. This chapter will document existing activity that will serve as the baseline for updated based aircraft and aircraft operations forecasts. The methods used to develop these data are described below.

The National Based Aircraft Inventory Program validated count for Packwood Airport is 0 aircraft (updated November 2022). The current validated count is not yet reflected in the February 2023 TAF update, but it is accepted as the baseline for developing new based aircraft forecasts. An updated aircraft operations estimate for 2022 is presented later in this chapter and will serve as the baseline for the 2022-2042 aircraft operations forecasts.

The current TAF and 5010 for Packwood Airport provide the most recent historical based aircraft and annual aircraft operations totals. The current 5010 reports 0 based aircraft (updated in late 2022) and 3,100 total operations for 12 months ending 12/31/2020. The current TAF reports one based aircraft and 3,100 annual aircraft operations for 2021. The 5010's based aircraft total is consistent with the Airport's validated based aircraft count updated by airport management in late 2022.

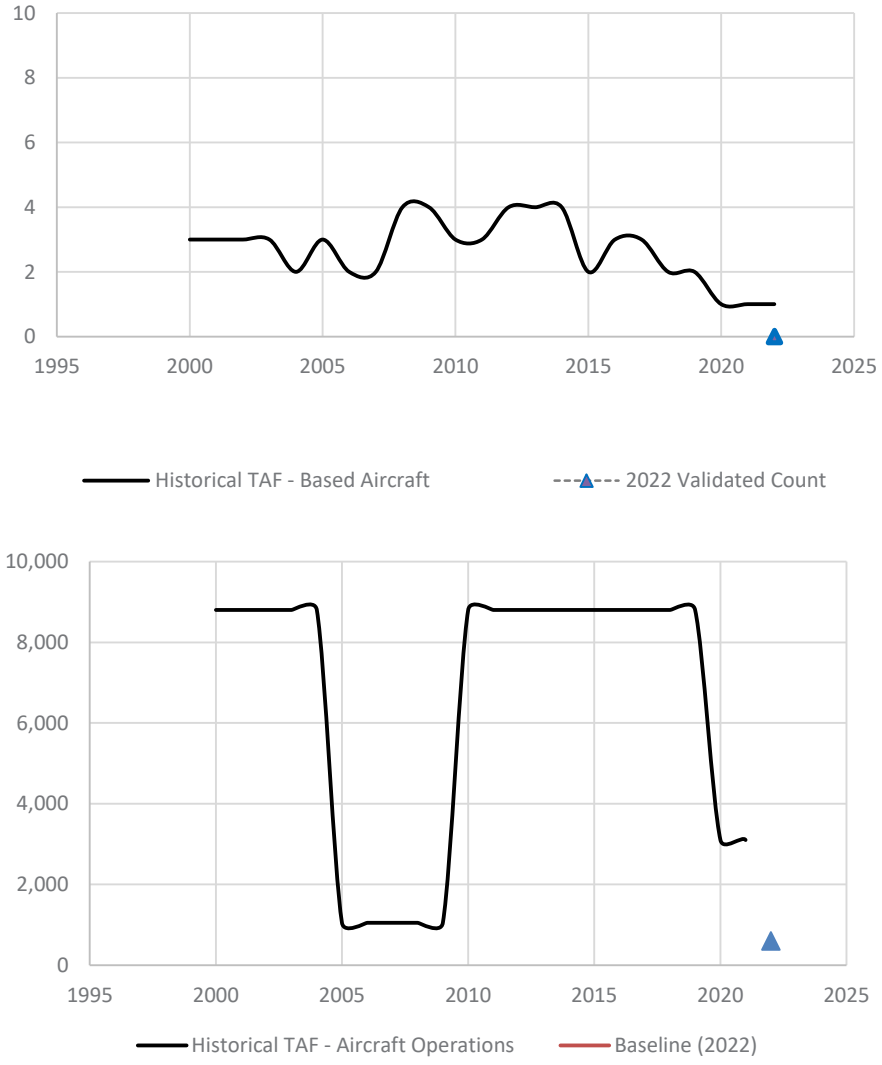
FAA TERMINAL AREA FORECAST

The February 2023 TAF provides a summary of historical activity (estimates) for the Airport that extends from 1990 to 2021. The range of data for based aircraft and annual aircraft operations is significant and there are several extended periods where numbers are unchanged year-over-year. As a result, the TAF does not appear to provide a consistently accurate record of actual historical activity at Packwood Airport.

Between 1990 and 2021 (32 years), the TAF provides only three different annual operations totals and these totals are repeated. The most common number (8,800 annual operations) appears in two extended runs that accounted for 26 of the 32 years of data. Annual operations for 2005-2009 were reset to 1,050, which matched the 2005 baseline from the FAA-approved 2009 ALP Report forecasts. In 2010 the annual operations were again reset to 8,800, where they were maintained until 2021 (3,100 operations). Similar deviations will need to be considered by FAA when the updated Airport Master Plan forecasts are compared to future year TAF data, as required by FAA.

A summary of current and historical TAF activity data for the Airport is presented in **Figure 3-1**.

Figure: 3-1: Based Aircraft & Annual Aircraft Operations - FAA TAF (Packwood – 55S)



Current Aviation Activity

As noted earlier, existing activity at the Airport is low. There are currently no year-round based aircraft. GA operations (takeoffs and landings) are generated by transient aircraft and part-time aircraft that are located at the Airport for extended periods. The Airport also accommodates seasonal helicopter firefighting and limited military helicopter activity.

Since no tabulated records of air traffic are available for the Airport, an updated estimate of current aircraft operations was developed to provide a baseline for the 2022-2042 forecasts. The baseline activity is summarized below and in **Table 3-7**.

It is recognized that activity levels will vary from year to year based on a variety of factors unrelated to the Airport. However, for planning purposes the 2022 baseline provides a reasonable indication of activity that may be experienced at the Airport in any given year during the current 20-year planning period. Annual fluctuations above or below this level should be expected and accounted for when defining facility needs such as aircraft parking apron.

General Aviation (GA)

Current GA activity typically includes a small number of aircraft that are located at the Airport for extended periods during the year and transient aircraft. Transient activity is generated by events such as the Airport Fly-In, local area visitors (recreational, vacation rentals, etc.), and by small aircraft flying through the area on the popular White Pass VFR route that connects western Washington with eastern Washington.

FAA Order 5090.5 Formulation of the NPIAS and ACIP, suggests a methodology for non-towered airports that relies on a general formula for estimating operations by utilizing an activity ratio that is applied to based aircraft. The Order identifies a typical range of 250 to 450 operations per based aircraft (OPBA) for distinct types of general aviation airports depending on the airport's role in the NPIAS. Consistent with FAA NPIAS guidance, the recommended multiplier (250 OPBA) for a Basic General Aviation airport was applied to an equivalent of 1 based aircraft at Packwood Airport. This was done to capture a basic measure of GA activity that would otherwise be unquantified with a calculation based on 0 based aircraft. Based on this estimate, the Airport accommodated 250 annual GA operations in 2022.

Aircraft takeoffs and landings are defined as operations by FAA, with a single takeoff or landing counted as one operation. A touch-and-go landing is counted as two operations since it involves both a takeoff and landing.

Wildfire Activity

In 2022, Lewis County closed the Airport to public use for about 6 weeks in August and September to support a major aerial wildfire response coordinated by USDA -Forest Service. During this period, the runway was closed by NOTAM with yellow "X" markers placed at each end. Several heavy-lift helicopters and a variety of smaller helicopters were dispatched to the Airport. Multiple large helicopters were parked on the closed runway; other aircraft were parked in areas adjacent to the runway. The daily volumes of flight activity varied during the extended response, which included active and stand-by modes. Based on airport management information, this activity was estimated to average 50 operations per week, or 300 operations over the 6-week period. Although this level of flight activity is not expected to occur consistently every year, it is common enough to assume it as a regular part of activity at the Airport going forward. It is also noted that higher flight volumes or multiple events may also occur. As such, the baseline level provides a reasonable indication of this activity.

Military

Military use of the Airport is limited but typically includes helicopters involved in local area search and rescue operations and related training operations. Occasional training operations generated by helicopters traveling between Joint Base Lewis-McChord and the Yakima Training Center, along the visual flight route through White Pass has also been noted in previous plans.

Table 3-7: Airport Activity Summary (2022)

Operator	A/C Type	ARC	Annual Operations
Local & Transient GA Activity[1]	Single-Engine Piston, Fixed Wing Experimental, LSA	A-I	250
Fire Related[2]	Bell 206 - Boeing CH47	Heli	300
Military[3]	Helicopter	Heli	50
TOTAL OPS - ALL			600
TOTAL OPS - A-I			250
TOTAL OPS - HELI			350
TOTAL OPS - ALL A/C			600
Based Aircraft[4]			0

1. Operations are estimated using 250 OPBA applied to the equivalent of 1 based aircraft to account for part-year based aircraft and transient aircraft use.
2. Operations estimated based on fire days (# days airport closed to regular traffic).
3. Nominal amount of airport activity associated with routine overflights between JBLM and Yakima Training Center, and local search and rescue or emergency response activity (training and live response).
4. Seasonal or part-time aircraft not included in based aircraft count.

Existing Aviation Activity Forecasts

Existing forecasts for Packwood Airport include the FAA TAF and the previous ALP Report completed in 2009. The 2017 Washington Aviation System Plan (WASP) does not provide forecasts for individual airports. The forecasts developed in the previous state aviation system plan, the 2007 Washington Long Term Air Transportation Study (LATS), are now considered obsolete. Each of the existing forecasts have relevancy issues that do not support valid comparisons with current activity or updated forecasts presented later in this chapter.

FAA TERMINAL AREA FORECAST

The TAF (Issued February 2023) for Packwood Airport lists 1 based aircraft and 3,100 annual operations for the most recent historical year (2021) and maintains these numbers unchanged through 2050. The TAF based aircraft number roughly corresponds (+1 aircraft) to the 2022 baseline activity defined for the master plan update, however, the TAF aircraft operations totals are significantly higher than the 2022 baseline. The variance of 1 based aircraft is not significant. The variance in aircraft operations is significant in percentage terms, although the annual operations totals are both consistent with "low activity" GA airports. The deviations will need to be considered by FAA when the recommended airport master plan forecasts are compared to the TAF, as required by FAA. In addition to the variance in current activity, the TAF's future year projections show no growth through 2050, which will deviate from any growth projection. **Table 3-8** summarizes the 2023 TAF and notes the 2022 baseline activity estimates.

Table 3-8: 2023 FAA TAF – Packwood Airport (55S)

Forecast	AAGR	2022	2027	2032	2037	2042
Based Aircraft	0.0%	1	1	1	1	1
Annual Aircraft Operations	0.0%	3,100	3,100	3,100	3,100	3,100
2022 Baseline (Based Aircraft)	-	0	-	-	-	-
2022 Baseline (Aircraft Operations)	-	600	-	-	-	-

Source: FAA Terminal Area Forecast (55S) – Issued February 2023. Century West Engineering (2022 Baseline)
AAGR: Average Annual Growth Rate

2009 ALP REPORT FORECASTS

The 2009 ALP Report provided forecasts for the 2005-2025 planning period. The forecast projected based aircraft to increase from 3 to 4 By 2025, which represented an average annual growth rate of 1.45%. As noted in the table, in 2022 Airport had 0 based aircraft. Annual aircraft operations were projected to increase from 1,050 to 1,300, which represented an average annual growth rate of 1.10%. The 2022 baseline operations estimate is 600.

The 2009 ALP forecasts did not anticipate the loss of the locally based aircraft fleet or the corresponding decline in aircraft operations. Although the forecast growth expectations were modest, the incremental changes in activity illustrate how any projection can become obsolete when working with small numbers. The updated baseline data noted above can be compared to the 2022 forecast to determine current relevance. **Table 3-9** summarizes the 2009 ALP Report forecasts and notes the 2022 baseline activity.

Table 3-9: 2009 ALP Report – Forecast Summary

Forecast	AAGR	2005	2010	2015	2020	2025
Based Aircraft	1.45%	3	3	4	4	4
Annual Aircraft Operations	1.10%	1,050	1,050	1,300	1,300	1,300
2022 Baseline (Based Aircraft)	-	-	-	-	0	-
2022 Baseline (Aircraft Operations)	-	-	-	-	600	-

Source: Century West Engineering; AAGR: Average Annual Growth Rate

WASHINGTON STATE AVIATION SYSTEM PLAN FORECAST

The 2017 WASP does not include individual airport activity forecasts. The most recent system plan forecasts prepared for individual airports were included in the 2007 LATS. The LATS was replaced with the 2017 WASP, although no new airport specific forecasts were included. The LATS forecasts are considered obsolete and are not currently used by WSDOT to support its system planning analyses.

Updated Aviation Activity Forecasts

Updated aviation activity forecasts developed for the ALP Report's 20-year planning period (2022-2042) are presented in this section. The updated activity forecasts use the common baseline activity data presented earlier in **Table 3-7** and provide projections in 5-year increments. A review of the preliminary based aircraft and annual aircraft operations models presented is provided at the end of this section, with recommended forecasts identified for each.

The recommended ALP Report forecasts will be compared to the TAF (APO TAF Detail Report 2020-2045, Issued March 2022) when presented to FAA for review and approval. Additional information about the TAF based aircraft and operations comparison is presented at the end of the chapter.

BASED AIRCRAFT

Four new based aircraft forecasts were developed for evaluation. All the forecasts use the 2022 validated based aircraft count of 0 described earlier as the baseline for the 20-year projections. The updated forecast models are summarized in **Table 3-10** and depicted in **Figure 3-3**. The current TAF projection is added to **Figure 3-3** for reference.

It should be noted that the absence of any existing based aircraft at the Airport and the actual loss of aircraft that occurred since the 2009 ALP report make any statistically based forward-looking projections unreliable. The ability to apply positive or negative growth rates to a base of "0" has limited value. As a result, applying broader FAA-defined forecast growth rates for general aviation or market share calculations will not produce a meaningful projection for the Airport. A more practical approach was used to develop the based aircraft forecast models described below. The models assume flat or modest incremental net growth in actual aircraft consistent with the Airport's historical activity and future growth expectations within the community. With this approach, however the resulting forecast growth rates are not relevant as the measure of relevancy to compare with the FAA TAF or other broad forecasts. For example, the addition of just 1 or 2 aircraft above current levels during the 20-year planning period would represent overall increases in the range of 100% to 200%. The resulting average annual growth rates would far exceed FAA long-term forecasts for the national GA fleet.

Based aircraft forecasts are primarily intended to identify future facility needs in forthcoming sections of the AMP, particularly aircraft storage – apron parking and hangar space. The use of development reserves is recommended for defining activity-dependent facility needs that may exceed forecasted growth. A basic long-term development reserve should have the capacity to accommodate 100% of the projected net of based aircraft over the planning period.

Model #1 – No Growth

This model assumes that no locally based aircraft will be located at the Airport during the 2022-2042 planning period. The projection essentially maintains the Airport's recent decline from 3 to 0 based aircraft since the last plan but does not drive future based aircraft totals lower than 0. The model projects an **average annual growth rate of 0%** and maintains the current 0 based aircraft total at Packwood Airport through 2042.

Model #2 – Low Growth

This model assumes partial replacement of the Airport's recent peak of 3 based aircraft over the current 2022-2042 planning period. The current availability of two small airplane hangar spaces and limited aircraft parking would fully support the increased activity. The projection increases based aircraft from **0 to 1 aircraft** at Packwood Airport by 2042. Due to the low starting point (2022: 0 based aircraft) in the forecast, the average annual growth rate is calculated from the first non-zero year (2027). The corresponding 15-year average annual growth rate (4.7%) is higher than would be generated with the same increase occurred over 20 years.

Model #3 – Intermediate Growth

This model assumes full replacement of the Airport's recent peak of 3 based aircraft over the current 2022-2042 planning period. The current availability of two small airplane hangar spaces and limited aircraft parking would support near-term increases in activity and additional hangar construction is assumed to support long-term demand. The projection increases based aircraft from **0 to 3 aircraft** at Packwood Airport by 2042. As with Model #2, the average annual growth rate is calculated from the first non-zero year (2027). The corresponding 15-year average annual growth rate (7.6%) is higher than would be generated with the same increase occurred over 20 years.

Model #4 –Moderate Growth

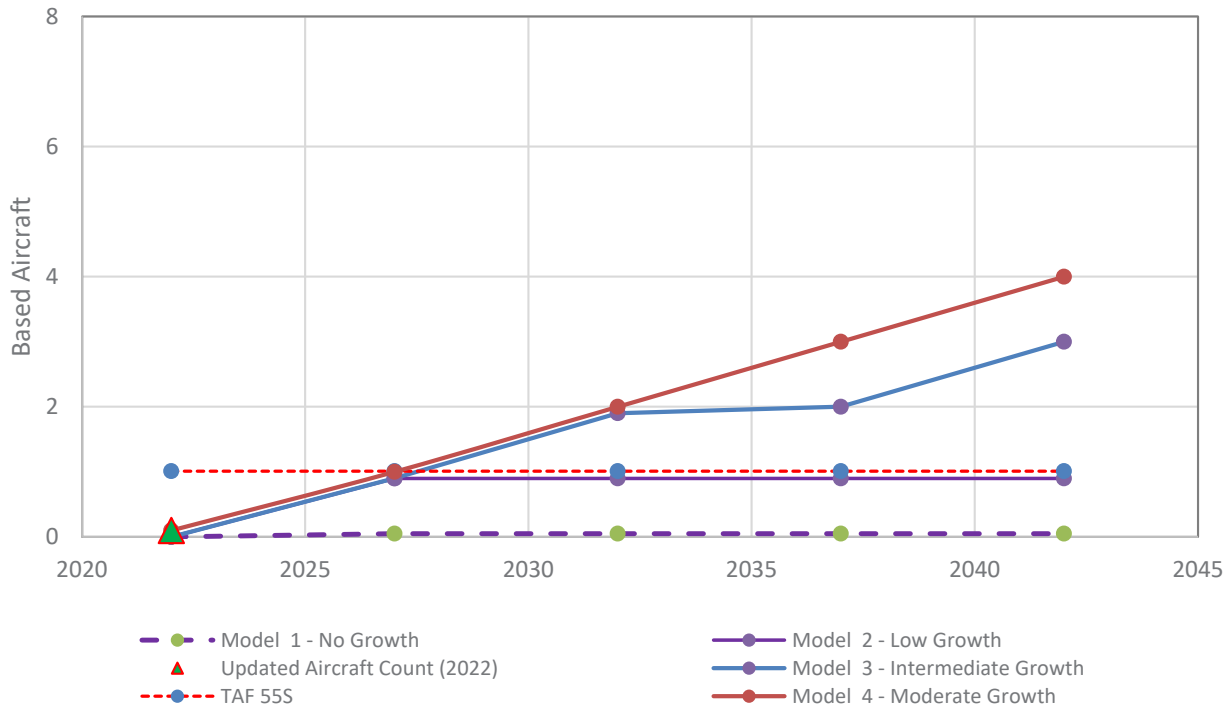
This model assumes nominal incremental growth beyond the Airport's recent peak of 3 based aircraft over the current 2022-2042 planning period. The current availability of two small airplane hangar spaces and limited aircraft parking would support near-term increases in activity and additional hangar construction is assumed to support long-term demand. The projection increases based aircraft from **0 to 4 aircraft** at Packwood Airport by 2042. As with Model #2 and #3, the average annual growth rate is calculated from the first non-zero year (2027). The corresponding 15-year average annual growth rate (9.7%) is higher than would be generated with the same increase occurred over 20 years.

Table 3-10: Based Aircraft Forecast Models (55S)

Forecast	AAGR	2022	2027	2032	2037	2042
Model 1 – No Growth	0.0%	0	0	0	0	0
Model 2 – Low Growth	4.7%	0	1	1	1	1
Model 3 – Intermediate Growth (Recommended)	**7.6%**	**0**	**1**	**2**	**2**	**3**
Model 4 – Moderate Growth	9.7%	0	1	2	3	4

Source: Century West Engineering.
AAGR: Average Annual Growth Rate calculated from first non-zero year (2027) 15 years.

Figure 3-2: Based Aircraft Forecast Models (55S)



RECOMMENDED AIRCRAFT OPERATIONS FORECAST

Model 3 – Intermediate Growth is the recommended based aircraft forecast for the 2022-2042 planning period for Packwood Airport. This model assumes that the anticipated economic and population growth in the local community will translate into airport activity that resembles the Airport's recent past activity.

The forecast model projects an increase from 0 to 3 based aircraft over the 20-year planning period. The projection results in 2 new based aircraft within the next 10 years and 1 additional aircraft added in the second half of the 20-year forecast period. When measured from 2027, the first year with an actual aircraft, the (15-year) average annual growth rate is 7.6%. For comparison, if projected the growth were to begin in 2022, the 20-year average annual growth rate would be 5.7%

This model assumes the Airport's future based aircraft fleet will be similar to its past fleet—consisting of traditional single-engine piston aircraft, with the possible addition of new-generation fixed-wing experimental (kit) aircraft, and light sport aircraft (LSA). The aircraft in these groups have similar operational requirements and currently generate transient operations at Packwood Airport.

BASED AIRCRAFT FLEET MIX

Conventional single-engine piston aircraft, LSA, and experimental home-built aircraft account for 100% of the forecast-based aircraft fleet at Packwood Airport. This fleet mix is consistent with national aircraft ownership trends and represents a segment of aircraft that can currently operate on the 2,356-foot runway. **Table 3-11** summarizes the current and forecast fleet mix for the planning period.

Table 3-11: Forecast Based Aircraft Fleet Mix (55S)

Aircraft Type	2022	2027	2032	2037	2042
Single Engine Piston	0	1	2	2	3
Multi Engine Piston	0	0	0	0	0
Turboprop	0	0	0	0	0
Jet	0	0	0	0	0
Helicopter	0	0	0	0	0
TOTAL	**0**	**1**	**2**	**2**	**3**

Source: Century West Engineering

AIRCRAFT OPERATIONS

Four new operations forecasts were developed from the air traffic mix in the 2022 baseline operations estimate and the based aircraft models described in the previous section. The aircraft operations forecast models are summarized in **Table 3-12** and depicted on **Figure 3-3**. The current TAF is added to **Figure 3-3** for reference.

As with the baseline estimate, future aircraft operations at Packwood Airport include general aviation (GA), fire-related, and military activity. Fire and military activity is fixed at 250 annual operations in each of the forecast models through the planning period. This level is believed to represent typical annual activity that would occur during the planning period. As noted earlier, fire activity is highly variable and will fluctuate from year to year. It is recognized that the projected level of this activity may be exceeded in some years and not exist in other years.

General aviation activity is projected using a ratio of 250 operations per based aircraft (OPBA) for the forecast-based aircraft totals. The equivalent of 1 based aircraft is used for the forecast baseline (2022) with 0 aircraft to capture a nominal amount of seasonally based and transient GA activity.

Model #1 – No Growth

This model effectively maintains current activity levels through the 2022-2042 planning period, consistent with Based Aircraft Forecast Model 1. A static projection of 250 annual operations for fire and military helicopter operations is assumed during the planning period. Transient GA activity is maintained at 250 annual operations. The model projects an **average annual growth rate of -0.9%** due to the adjustment for military and fire activity from 300 to 250 annual operations, resulting in a decrease from **600 to 500 operations** at Packwood Airport by 2042.

Model #2 – Low Growth

This model reflects incremental increases in annual operations in conjunction with the forecast increase in based aircraft in Based Aircraft Model 2. Fire and military helicopter operations are maintained at 250 per year, and GA operations are estimated based on the 250 OPBA ratio. The model projects an average **annual growth rate of 1.1%**, resulting in an increase from **600 to 750 operations** at Packwood Airport by 2042.

Model #3 –Intermediate Growth

This model reflects an increase in annual operations in conjunction with the forecast increase in based aircraft in Based Aircraft Model 3. Fire and military helicopter operations are maintained at 250 per year, and GA operations are estimated based on the 250 OPBA ratio. The model projects an **average annual growth rate of 2.6%**, resulting in an increase from **600 to 1,000 operations** at Packwood Airport by 2042.

Model #4 – Moderate Growth

This model reflects an increase in annual operations in conjunction with the forecast increase in based aircraft in Based Aircraft Model 4. Fire and military helicopter operations are maintained at 250 per year, and GA operations are estimated based on the 250 OPBA ratio. The model projects an **average annual growth rate of 3.7%**, resulting in an increase from **600 to 1,250 operations** at Packwood Airport by 2042.

TERMINAL AREA FORECAST (TAF) – PACKWOOD AIRPORT (55S)

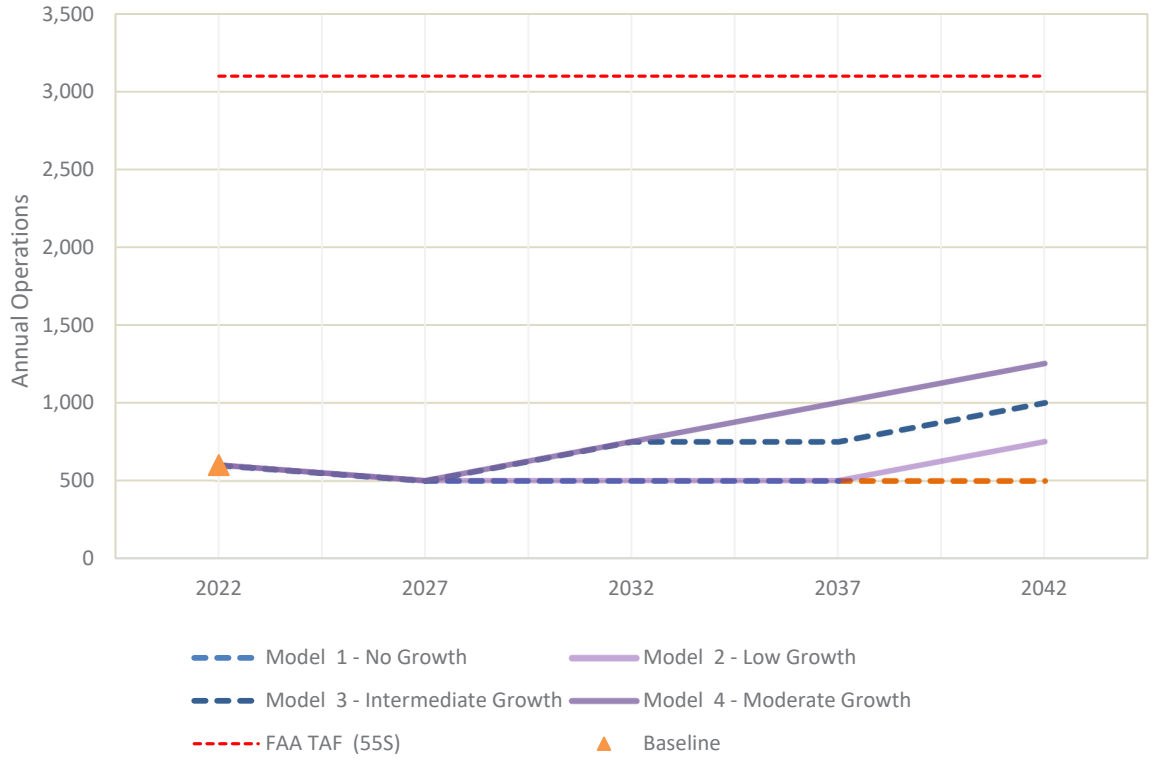
The current FAA TAF operations projection (issued February 2023) for Packwood Airport is provided for comparison. As noted earlier, the TAF projects a static 3,100 annual operations at Packwood Airport through 2050 (AAGR 0.00%). This projection is not consistent with the updated baseline operations estimate and the absence of future growth is not consistent with the Airport's potential.

Table 3-12: Aircraft Operations Forecast Models (55S)

Forecast	AAGR	2022	2027	2032	2037	2042
Model 1 – No Growth	-0.9%	600	500	500	500	500
Model 2 – Low Growth	1.1%	600	500	500	500	750
Model 3 – Intermediate Growth (Recommended)	**2.6%**	**600**	**500**	**750**	**750**	**1,000**
Model 4 – Moderate Growth	3.7%	600	500	750	1,000	1,250

Source: Century West Engineering.
AAGR: Average Annual Growth Rate

Figure 3-3: Aircraft Operations Forecast Models (55S)



RECOMMENDED AIRCRAFT OPERATIONS FORECAST

Model 3 – Intermediate Growth is the recommended aircraft operations forecast for the 2022-2042 planning period for Packwood Airport. This model is consistent with the recommended based aircraft forecast (Model 3 – Intermediate Growth), which reflects anticipated economic and population growth in the local community during the planning period. The forecast level of aircraft operations is comparable to previously estimated activity levels in 2005 (3 based aircraft, 1,050 annual operations). The forecast model projects an incremental increase from 600 to 1,000 annual aircraft operations at Packwood Airport over the 20-year planning period, which results in an **average annual growth rate of 2.6%**.

LOCAL AND ITINERANT OPERATIONS

Aircraft operations are classified by FAA as local or itinerant. Local operations are conducted in the vicinity of an airport and include flights that begin and end at the airport. These include aerial applicators or firefighting aircraft, flight training within the airport traffic pattern such as touch and go landings, and other flights that do not involve a landing at another airport. Itinerant operations include flights between airports such as on-demand air charter, air cargo/express, cross-country flight training, and personal or business travel.

The 2022 baseline estimates the local/itinerant operations split is approximately 50%/50%, when fire-related helicopter operations occur. In a non-fire year, the split would be expected to be 20% local and 80% itinerant. Since fire-related operations at the Airport typically require using the runway for helicopter parking and servicing, this activity does not drive non-emergency landside facilities such as aircraft parking apron. For regular use, a 20%/80% operational split is recommended for use in the forecast.

The local and itinerant distribution for each forecast year is summarized in **Table 3-13**.

Table 3-13: Itinerant/Local Aircraft Operations (55S)

Activity	2022	2027	2032	2037	2042
Itinerant Operations (80%*)	300	400	600	600	800
Local Operations (20%*)	300	100	150	150	200
Total Local & Itinerant Operations	**600**	**500**	**750**	**750**	**1,000**

Source: Century West Engineering
*50/50 spilt in 2022

AIRCRAFT OPERATIONS FLEET MIX

Single-engine piston aircraft account for nearly all fixed-wing aircraft operations at Packwood Airport. The runway can also accommodate limited use by single-engine turboprops and light twin-engine piston aircraft. The baseline operations estimate indicates that helicopters accounted for about 50% of air traffic at the Airport in 2022, an active fire year. Future projections do not assume fire activity at the Airport every year. The aircraft operations fleet mix forecast is summarized in **Table 3-14**.

Table 3-14: Aircraft Operations Fleet Mix (55S)

Aircraft Type	2022	2027	2032	2037	2042
Single Engine Piston	250	400	600	600	800
Helicopter	350	100	150	150	200
TOTAL	**600**	**500**	**750**	**750**	**1,000**

Source: Century West Engineering

Critical Aircraft

The selection of design standards for airfield facilities is based upon the characteristics of the most demanding aircraft that are expected to use an airport, which is designated as the "critical aircraft." This designation does not mean that other types of aircraft can't operate at the Airport, although it does typically define FAA funding eligibility for facilities based on the applicable dimensional standards.

The FAA provides the following definition for critical aircraft:

> *"The critical aircraft is 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, including both itinerant and local operations, but excluding touch- and-go operations. An operation is either a takeoff or landing."* (FAA AC 150/5000-17)

The characteristics of the critical aircraft (Aircraft Approach Category and Airplane Design Group) were previously used by FAA to define the Airport Reference Code (ARC), which represented the airport's highest Runway Design Code (RDC). Current FAA guidance eliminates use of the ARC, in favor of runway design codes and taxiway design groups. Since Packwood Airport has one runway, the previous ARC designation was also consistent with the RDC for Runway 01/19.

The aircraft component of the RDC is defined by the Aircraft Approach Category (AAC) and the Airplane Design Group (ADG) of the critical aircraft. The AAC is determined by the approach speed, or 1.3 times the stall speed of the aircraft in its landing configuration at its maximum landing weight. AAC categories A to E provide a wide range of approach speeds (<91 - ≥ 160 knots). ADG is determined by aircraft wingspan and tail height. Most small aircraft (12,500 pounds or less) are included in AAC A (<91 knots) or AAC B (<121 knots) and ADG I or II.

Historically, most fixed wing aircraft traffic at Packwood Airport has consisted of ADG I, and this trend is expected to continue in the 2022-2042 forecast. The 2009 ALP does not list a specific current and future critical aircraft, although A-I (small) designation is listed.

Figure 3-4 depicts the aircraft design criteria used to define RDC, and representative aircraft in each category. The applicable dimensional standards for Packwood Airport are shown in bold.

Figure 3-4: Critical Aircraft & Runway Design Code (RDC)

Aircraft Approach Category (AAC)	Aircraft Approach Speed knots	Airplane Design Group (ADG)	Aircraft Wingspan
A - Existing/Future	**less than or equal to 91**	**I - Existing/Future**	**less than or equal to 49'**
B	92 to 121	II	50' to 79'
C	122 to 141	III	80' to 118'
D	142 to 166	IV	119' to 171'

A-I
12,500 lbs. or less

Beech Baron 55
Beech Bonanza
Cessna 182
Piper Archer

B-I(small)
12,500 lbs. or less

Beech Baron 58
Beech King Air C90
Cessna 402
Cessna 421

A-II, B-II
12,500 lbs. or less

Super King Air 200
Pilatus PC-12
DCH Twin Otter
Cessna Caravan

ARC - B-II
Greater than 12,500 lbs.

Super King Air 300, 350
Beech 1900
Cessna Citation
Falcon 20, 50

A-III, B-III
Greater than 12,500 lbs.

DHC Dash 7, Dash 8
Q-200, Q-300
DC-3
Convair 580

C-I, D-I

Lear 25, 35, 55, 60
Israeli Westwind
HS 125-700

C-II, D-II

Gulfstream II, III, IV
Canadair 600
Canadair Regional Jet
Lockheed JetStar

C-III, D-III

Boeing Business Jet
Gulfstream 650
B 737-300 Series
MD-80, DC-9

C-IV, D-IV

B - 757
B - 767
DC - 8-70
DC - 10

Source: Century West Engineering

CURRENT & FUTURE CRITICAL AIRCRAFT

The current and future critical aircraft identified for Packwood Airport is a single-engine piston aircraft, represented by a 4-seat Cessna 172 (C-172), typical of small GA aircraft commonly used throughout the region. The C-172 is classified as a small airplane based on a maximum takeoff weight of less than 12,500 pounds, and it is included in Aircraft Approach Category A and Airplane Design Group I, which corresponds to RDC A-I (small). **Table 3-15** summarizes forecast operations for Packwood Airport by RDC (AAC + ADG).

Table 3-15: Aircraft Operations by RDC (55S)

Activity	2021	2026	2031	2036	2041
TOTAL OPS – A-I	250	250	500	500	750
TOTAL OPS – HELI (AAC A)	350	250	250	250	250
TOTAL OPS – ALL A/C	**600**	**500**	**750**	**750**	**1,000**

Source: Century West Engineering; AAGR Average Annual Growth Rate; "%" based on 2021 air traffic estimate.

Activity by Approach Category B aircraft may increase over the course of the planning period, although the available runway length and mountainous terrain are significant factors in aircraft use and this activity is not expected to be significant.

Operational Peaks

Activity peaking is evaluated to identify potential capacity related issues that may need to be addressed through facility improvements or operational changes. The Peak Month represents the month of the year with the greatest number of aircraft operations (takeoffs and landings). The peak month for most general aviation airports occurs during the summer when weather conditions and daylight are optimal.

The 2009 ALP forecast estimated peak month to be in the summer, accounting for approximately 15% of annual activity. For planning purposes, peak month activity will be increased to 20% in the 2022-2042 forecast to account for increased seasonal activity, including the annual airport fly-in.

Peak Day operations are defined by the average day in the peak month (Design Day) and the busy day in the typical week during peak month (Busy Day). The **Design Day** is calculated by dividing peak month operations by 30. For planning purposes, the **Busy Day** is estimated to be 50% higher than the average day in the peak month (Design Day x 1.5), based on common activities generating significant surges in flight activity.

The peak activity period in the Design Day is the **Design Hour**. For planning purposes, the Design Hour operations are estimated to account for 20% of Design Day operations (Design Day x 0.20).

The operational peaks for each forecast year are summarized in **Table 3-16**. This level of peaking is consistent with the mix of airport traffic and is expected to remain unchanged during the planning period. These measures of activity are considered when calculating runway/taxiway capacity and transient aircraft parking requirements. No significant runway or taxiway capacity issues have been identified at the Airport based on current or forecast activity levels.

Table 3-16: Peak Operations (55S)

Aircraft Type	2022	2027	2032	2037	2042
Annual Operations	600	500	750	750	1,000
Peak Month Operations (20%*)	250	100	150	150	200
Design Day Operations (average day in peak month)	8	3	5	5	7
Busy Day Operations (assumed 150% of design day)	13	5	8	8	10
Design Hour Operations (assumed 20% of design day)	2	1	1	1	1

Source: Century West Engineering. * 2022 Peak Month estimated to be approximately 42% (fire activity)

Military Activity

The current level of military use is estimated to be 50 annual operations (helicopters), consisting of emergency response, search and rescue, and training activities (Washington Army National Guard, etc.). The FAA Terminal Area Forecast (TAF) lists 100 military operations (current and projected static through 2050). Maintaining the baseline level of 50 annual military operations is recommended.

Air Taxi Activity

Air taxi activity at Packwood Airport is not reported by airport management and is not noted in the TAF.

Air taxi activity includes for-hire charter flights, medevac flights, and some scheduled commercial air carriers operating under FAR Part 135. It is noted that some aerial firefighting aircraft are operated under FAR Part 135 as contractors to the USDA Forest Service or Washington DNR. Small fixed-wing aircraft and helicopters used in Part 135 charter or air ambulance operators can use the Airport as needed, although a specific volume of activity is not projected.

Forecast Summary

A summary of the based aircraft and annual aircraft operations forecast is presented in **Table 3-17**. The forecast projects modest growth over the 20-year planning period that is consistent with the growth anticipated in the Packwood area over the next 20 years and beyond. As noted earlier, a portion of the forecast demand assumes the Airport's based aircraft fleet will be gradually reestablished during the planning period. The remaining activity will be driven by growth in the transient activity and periodic public safety requirements (wildfire response).

The forecast average annual growth rate for aircraft operations is 2.59% between 2022 and 2042.

Table 3-17: Forecast Summary (55S)

Activity	2022	2027	2032	2037	2042
Itinerant Operations					
General Aviation	200	200	400	400	600
Air Taxi	0	0	0	0	0
Military	50	50	50	50	50
Total Itinerant Operations	**250**	**250**	**450**	**450**	**650**
Local Operations	350	250	300	300	350
Total Local & Itinerant Operations	**600**	**500**	**750**	**750**	**1,000**
Based Aircraft	0	1	2	2	3
Operations per Based Aircraft	N/A	500	375	375	333

Source: Century West Engineering

TERMINAL AREA FORECAST COMPARISON

As discussed previously, the evaluation of the current TAF for Packwood Airport has identified issues related to data accuracy. Data from the most recent historical year (2021) is presented for all future years through 2045 for both based aircraft and annual aircraft operations in the TAF. FAA review will be required for both the based aircraft and the aircraft operations models for comparison to the current TAF, as presented in **Figure 3-5**.

Figure 3-5: FAA TAF and AMP Forecast Comparison (55S)

Forecast Summary

55S — Base Year: 2022

	Base Yr. Level	Base Yr.+1yr.	Base Yr.+5yrs.	Base Yr.+10yrs.	Base Yr.+15yrs.	Average Annual Compound Growth Rates: Base Yr. to +1	Base Yr. to +5	Base Yr. to +10	Base Yr. to +15
Passenger Enplanements									
Air Carrier	0	0	0	0	0	N/A	N/A	N/A	N/A
Commuter	0	0	0	0	0	N/A	N/A	N/A	N/A
TOTAL	0	0	0	0	0	N/A	N/A	N/A	N/A
Operations									
Itinerant									
Air carrier	0	0	0	0	0	N/A	N/A	N/A	N/A
Commuter/air taxi	0	0	0	0	0	N/A	N/A	N/A	N/A
Total Commercial Operations	0	0	0	0	0	N/A	N/A	N/A	N/A
General aviation	200	200	200	400	400	0.0%	0.0%	7.2%	4.7%
Military	50	50	50	50	50	0.0%	0.0%	0.0%	0.0%
Local									
General aviation	350	250	250	300	300	-28.6%	-6.5%	-1.5%	-1.0%
Military	0	0	0	0	0	N/A	N/A	N/A	N/A
TOTAL OPERATIONS	600	500	500	750	750	-16.7%	-3.6%	2.3%	1.5%
Instrument Operations	**0**	**0**	**0**	**0**	**0**	N/A	N/A	N/A	N/A
Peak Hour Operations	**1**	**1**	**1**	**1**	**1**	0.0%	0.0%	0.0%	0.0%
Cargo/mail (enplaned + deplaned tons)	**0**	**0**	**0**	**0**	**0**	N/A	N/A	N/A	N/A
Based Aircraft									
Single Engine (Nonjet)	0	0	1	2	2	n/a	n/a	n/a	n/a
Multi Engine (Nonjet)	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Jet Engine	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Helicopter	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Other	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
TOTAL	0	0	1	2	2	n/a	n/a	n/a	n/a
GA Operations Per Based Aircraft	**0**	**0**	**500**	**375**	**375**	n/a	n/a	n/a	n/a

Airport Planning and TAF Forecast Comparison

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2022	0	0	0.0%
Base yr. + 5yrs.	2027	0	0	0.0%
Base yr. + 10yrs.	2032	0	0	0.0%
Base yr. + 15yrs.	2037	0	0	0.0%
Commercial Operations				
Base yr.	2022	0	0	0.0%
Base yr. + 5yrs.	2027	0	0	0.0%
Base yr. + 10yrs.	2032	0	0	0.0%
Base yr. + 15yrs.	2037	0	0	0.0%
Total Operations				
Base yr.	2022	600	3,100	-80.6%
Base yr. + 5yrs.	2027	500	3,100	-83.9%
Base yr. + 10yrs.	2032	500	3,100	-83.9%
Base yr. + 15yrs.	2037	750	3,100	-75.8%

Legend:
"N/A" No Activity for this Category
"n/a" formula error generated for forecasts due to "0" base year data

Note: TAF data is on a U.S. government fiscal year basis (October through September).

FIFTY-YEAR FORECAST

Fifty-year demand projections were prepared as required in the FAA-approved airport master plan scope of work by extrapolating the average annual growth rates (AAGR) for the recommended 20-year aircraft operations forecasts. The fifty-year based aircraft projections approximate the incremental increases projected in the 20-year planning period. This method is recommended over extrapolating the high average annual growth rate generated by increases in a very small, based aircraft data set (0 to 3 aircraft). The purpose of the 50-year projection is to provide an estimate of demand to approximate long-term aviation use land requirements for the Airport. **Table 3-18** summarizes the 50-year forecast including the intermediate 30- and 40-year projections.

Table 3-18: 50-Year Forecast (55S)

	2022	2042	2052	2062	2072
Annual Operations (2.59 % AAGR)	600	1,000	1,292	1,669	2,154
Based Aircraft (4.06% AAGR*)	0	3	4	5	6

Source: Century West Engineering *45-year AAGR projected from first forecast year (2027-2072)

Chapter 4

Airport Facility Requirements

The evaluation of airport facility requirements is intended to determine the facility needs for Packwood Airport (55S) for the current 20-year planning period based on updated aviation activity forecasts and conformance to established Federal Aviation Administration (FAA) airport design criteria.

Introduction

The evaluation of airport facility requirements combines the results of the inventory and forecasts contained in Chapters 2 and 3, and established planning criteria to determine the future facility needs for the Airport during the current 20-year planning period. Airside facilities include the runways, taxiways, navigational aids, and lighting systems. Airside facilities are often protected by airspace or clear areas that are defined by applicable FAA standards.

Landside facilities include hangars, terminal/fixed base operator (FBO) facilities, aircraft parking apron(s), and surface access and automobile parking. Support facilities such as aircraft fueling, security/perimeter fencing, and utilities are also examined. All airfield items are evaluated based on established FAA standards and the functional role of the Airport.

The facility requirements evaluation identifies the adequacy or inadequacy of existing facilities and identifies what new facilities may be needed during the planning period based on forecast demand or conformance to FAA standards. The evaluation of demand-driven elements will quantify facility needs such as runway length requirements, hangar space, and aircraft parking positions based on forecast demand and the type of aircraft being accommodated. Items such as lighting, navigational aids, and approach capabilities are evaluated based on overall airport activity and facility classification. Options for accommodating current and future facility needs will be evaluated in the Airport Development Alternatives (Chapter 5).

Airport Facilities Analysis

DESIGN STANDARDS CONFORMANCE REVIEW

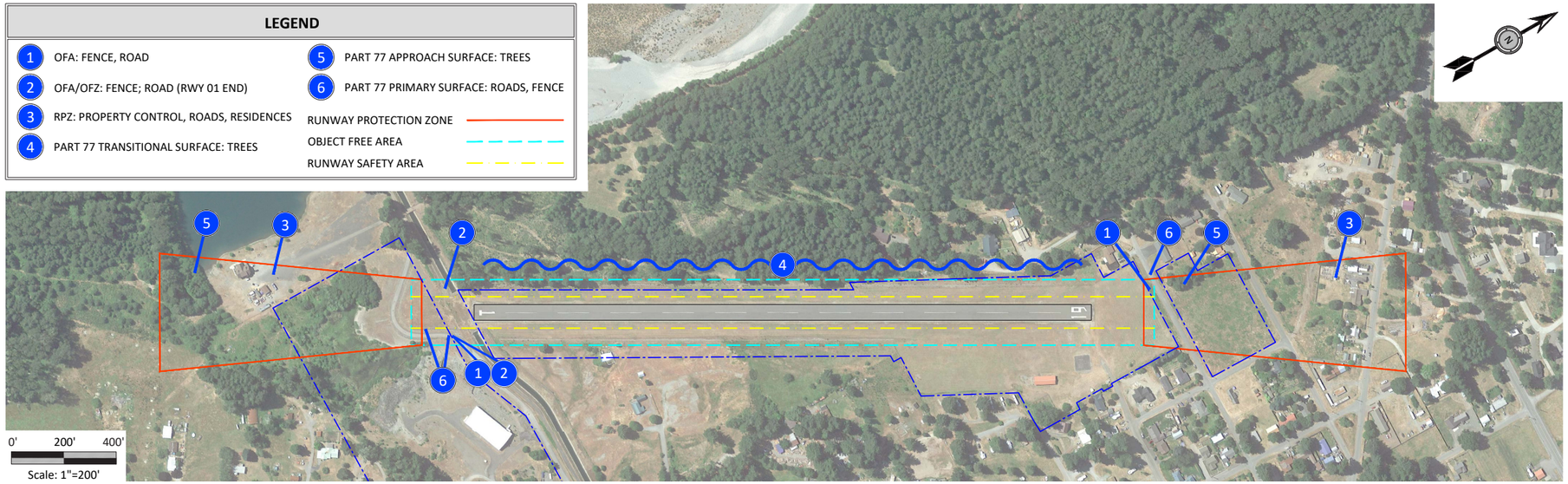
Existing airfield facilities were evaluated for their conformance with applicable FAA standards. As noted in Chapter 3, the current and future critical aircraft for the Airport is a small single-engine piston aircraft included in Aircraft Approach Category (AAC) A and Airplane Design Group (ADG) I. Packwood Airport currently operates exclusively under visual flight rules (VFR), with no instrument capabilities. Runway 01/19 is designated as a "visual" runway in the *41 Code of Federal Regulations (CFR), Part 77 – Safe, Efficient Use, and Preservation of the Navigable Airspace*. These designations were also identified in the previous (2009) ALP Report. The applicable design and visual airspace planning standards and individual facility assessments are summarized later in the chapter. The reader is also encouraged to consult the Glossary of Aviation Terms to clarify technical information.

Figure 4-1 depicts the existing non-conforming facilities at Packwood Airport based on the applicable A-I small aircraft design standards recommended for the updated planning evaluation. Detailed descriptions of existing conditions are provided in the chapter. Options for addressing non-conforming items will be evaluated through development alternatives review in Chapter 5. As noted in the existing conditions chapter, Runway 01/19 was reconstructed since the last ALP update based on FAA A/B-I standards. As a result, the runway meets FAA standards for width and Runway Safety Area (RSA). **Table 4-1** summarizes the non-conforming facilities.

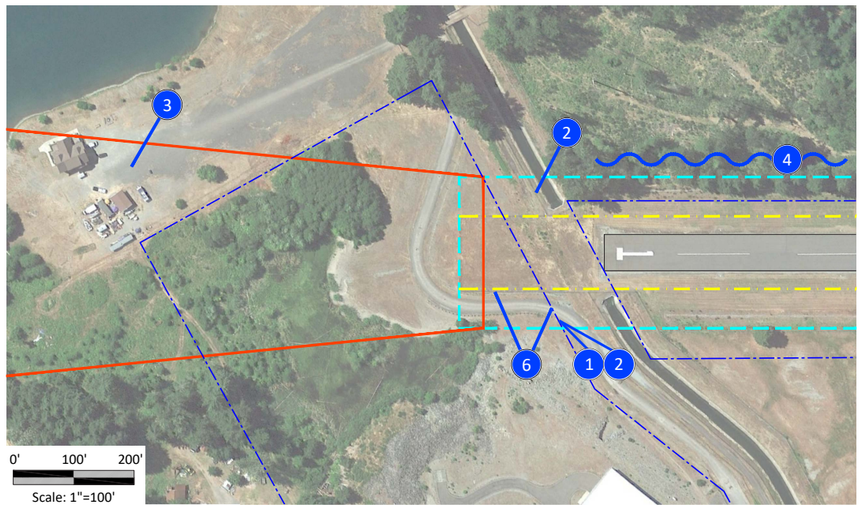
Table 4-1: Packwood Airport (55S) Airfield Conformance (Existing)

Non- Conforming Items	FAA Guidance / Proposed Approach
Runway Protection Zone (RPZ). Both RPZs extend beyond airport property and include incompatible land uses. The Runway 19 RPZ extends over several public roads, and publicly- and privately-owned land parcels (residential, public, etc.). A portion of the RPZ (north of Willame Street) includes an undeveloped parcel owned by Lewis County but is not officially identified as being part of the airport property. The Runway 01 RPZ extends over a local access road and a single residential dwelling.	The FAA guidelines on Incompatible Land Uses in RPZs discourages roads and other items within RPZs; airport control over uses within RPZs (fee simple or avigation easement) is also recommended. Existing County-owned property within the Runway 19 RPZ, north of Willame Street is recommended to be added to airport acreage.
Runway Object Free Area (OFA). The existing OFA is obstructed at its northwest corner (fence, Willame Road) and at its south end (fence sections running parallel to runway and access road near and beyond south end). The southern fences limit the OFA's width at its south end to approximately 125 feet wide (less than the ADG I standard - 250 feet).	Mitigate OFA obstructions where feasible.
Runway Obstacle Free Zone (OFZ). The existing OFZ is obstructed at its north and south end. The fence sections noted for the OFA (same width dimensional standard) and the road near the south end of the runway also obstruct the OFZ .	Mitigate OFZ obstructions where feasible.
Part 77 Airspace Obstacles. As depicted on the 2009 Airspace Plan drawing, mountainous and forested terrain surrounding Runway 01/19 results in numerous obstacles in Part 77 surfaces. The north and south ends of the primary surface was reconfigured in the 2015 runway reconstruction. Several obstacles are identified in these areas that will be documented in the AGIS survey.	Tree clearing/lowering recommended for inner approach surfaces for runway, consistent with Lewis County airport overlay zoning protections. Avigation easements are recommended for existing/future inner approach surfaces, coinciding with RPZs.

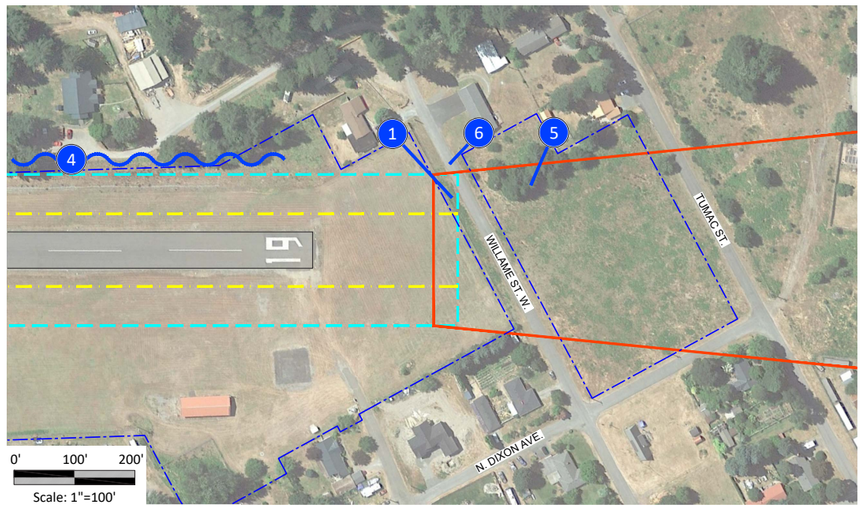
Figure 4-1: Non-Conforming Items (Airside Facilities)



AIRSIDE



RUNWAY 01 END



RUNWAY 19 END

Demand/Capacity Analysis

The evaluation of runway capacity is used to identify existing or future operational constraints that may require specific facility improvements such as taxiways, aircraft hold areas, etc. Runway 01/19 is not equipped with any taxiways or other facilities (turnarounds, etc.) to facilitate aircraft movement. As a result, aircraft use the runway for taxiing required for normal takeoff and landing sequences. Back-taxiing on the runway is required for operations at the south end of the runway. This operational configuration significantly reduces capacity due to the increased runway occupancy times required. However, aside from temporary periods of congestion, the traffic levels regularly experienced at the Airport are too low to create significant capacity or delay issues.

Annual service volume (ASV) is a broad measure of airport capacity and delay used for long-term planning as defined in *FAA Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay*. Although the generic ASV calculation assumes optimal conditions (air traffic control, radar, the ability to operate in both visual flight rules (VFR) and instrument flight rules (IFR) conditions, etc.) that do not exist at Packwood Airport, it provides a theoretical measure of existing and future capacity for planning purposes.

The evaluation of runway capacity is used to identify existing or future operational constraints that may require specific facility improvements such as taxiways, aircraft hold areas, etc. Based on the Airport's developable aeronautical land areas being concentrated at the north end of the runway, the addition of an aircraft turnaround at the south end of the runway may be considered to reduce runway occupancy times and congestion and improve safety.

The FAA estimates the annual capacity, referred to as Annual Service Volume (ASV), for a single runway with no air carrier traffic, full taxiway access, radar, and an air traffic control tower is approximately 230,000 annual operations. Hourly capacity is estimated to be 98 operations during visual flight rules (VFR) conditions and 59 operations during instrument flight rules (IFR) conditions (assuming the runway supports instrument operations). These numbers are provided for reference only and do not represent actual metrics for Packwood Airport.

The existing and future ASV-driven demand-capacity ratios for Runway 01/19 presented below are based on the aviation forecasts presented in Chapter 3.

- *Existing Demand-Capacity: 600 Annual Operations / 230,000 ASV = 0.26% (demand/capacity ratio)*
- *Future Demand-Capacity: 1,000 Annual Operations / 230,000 ASV = 0.43% (demand/capacity ratio)*

Based on these ratios, the annual capacity of Runway 01/19 exceeds demand through the 20-year planning period. Hourly capacity is also expected to be adequate to accommodate normal demand. The average delay per aircraft would be expected to remain below one minute throughout the planning period.

Critical Aircraft and Airport Design Standards Discussion

The existing and future critical aircraft is determined based on the activity described in Chapter 3, Aviation Activity Forecasts. The critical aircraft establishes existing and future airport planning & design standards organized in series of code categories. The groupings are applied to specific runways, taxiways and taxilanes to guide future planning, design, and development of the Airport. FAA design criteria are determined by the physical characteristics of the critical aircraft. Definitions for the FAA design standards are provided throughout the chapter. The primary airfield design groupings sharing common aircraft-specific components include:

- Airport Reference Code (ARC) - no longer in use
- Runway Design Code (RDC)
- Approach and Departure Reference Cost (APRC and DPRC)
- Taxiway Design Group (TDG)

The runway standards incorporate different combinations of aircraft elements including approach speed, wingspan/tail height, and weight with approach visibility criteria. Additional information is provided in the sections below. The taxiway design standard applies physical characteristics of the aircraft's landing gear configuration and overall dimensions.

FAA AC 150/5300-13B, Airport Design, serves as the primary reference in establishing the geometry of airfield facilities.

Note: Current FAA airport planning standards have eliminated use of the Airport Reference Code (ARC) as the primary designation for airfield categories, in favor of Runway Design Code (RDC). The Aircraft Approach Category (AAC) and Airplane Design Group (ADG) components of the current/future for the Runway 01/19 RDC are identical to the components used to define 'ARC' in the 2009 ALP Report. As such, ARC A-I (small) design standards are maintained.

CRITICAL AIRCRAFT

The critical aircraft is intended to represent the most demanding aircraft using the airport on a regular basis (defined by FAA as ≥ 500 annual operations). This designation does not mean that larger aircraft cannot operate on the runway, but it does define the design guidance to be used for FAA-funded improvements.

As noted in Chapter 3, the existing and future critical aircraft is a Cessna 172, a common 4-seat single-engine piston aircraft. Single-engine piston aircraft account for the majority of fixed-wing activity accommodated on the 2,356-foot runway.

For more information see *FAA AC 150/5000-17, Critical Aircraft and Regular Use Determination*, and applicable airport planning & design standards summarized in greater detail below.

RUNWAY DESIGN CODE (RDC)

The RDC defines specific runway dimensional standards based on a composite of aircraft-specific and runway-specific factors. The RDC inputs include critical aircraft characteristics: approach speed (AAC) and wingspan/tail height (ADG), and the approach visibility minimums of a specific runway end. The approach visibility refers to the minimum visibility required for aircraft operation, expressed by runway visual range (RVR) values in feet. Runways with only visual approaches use the 'VIS' designation in lieu of the prescribed RVR value. **The existing and future RDC for Runway 01/19 is A-I-VIS**.

APPROACH AND DEPARTURE REFERENCE CODE (APRC AND DPRC)

The APRC and DPRC represent the current operational capabilities of each specific runway end and adjacent taxiways. Since Runway 01/19 is not served by a parallel taxiway, the lowest APRC/DPRC groupings defined by FAA are used. The APRC uses the performance characteristics of the critical aircraft (approach speed and wingspan/ tail height) and the approach visibility minimums (expressed in RVR values) and runway-to-taxiway separation on the airfield to define specific standards. The DPRC uses only the physical characteristics of the design aircraft and runway-to-taxiway separation.

The existing and future APRC for Runway 01/19 is B-I (S) /4000. This is the nearest definition to ARC A-I small listed in AC 150/5300-13B, assuming the smallest referenced runway-parallel taxiway separation (150 feet).

The existing and future DPRC for Runway 01/19 is B/I (S). This is the closest DPRC designation listed in AC 150/5300-13B, which is equivalent to A/I (S).

TAXIWAY DESIGN GROUP (TDG)

The TDG is used to define taxiway dimensions based on physical aircraft characteristics. The TDG is based on aircraft dimensions, including landing gear distance from the cockpit to the main gear (CMG) and main gear width (MGW). These dimensions affect an aircraft's ability to safely maneuver on airport taxiways and dictate pavement fillet design.

The current and future critical aircraft (C-172) is listed in the FAA Aircraft Characteristics Database as TDG 1A. A review of ADG I aircraft types indicates that TDG 1A is also common for other single-engine piston aircraft (C-172, C-206, etc.) and is appropriate for Packwood Airport.

There are currently no taxiways at the Airport. Future taxiway improvements will be designed to accommodate ADG I aircraft, which is best represented by TDG 1A.

FAA DESIGN STANDARDS

FAA AC 150/5300-13B, Airport Design, serves as the primary reference in establishing the geometry of airfield facilities at Packwood Airport. Existing condition dimensions and applicable design standards (ADG I small) based on the updated critical aircraft determination are summarized in **Table 4-2**. It is noted that there is no change in the critical aircraft designation or most of the design standards for the Airport compared to the 2009 ALP. However, the FAA has updated the primary airport design advisory circular, which has led to additional, or modified design standards.

FAA DESIGN STANDARDS

Specific design standards and conditions applicable to Packwood Airport facilities are presented in the following sections of this chapter within the sidebar "FAA Design Standards" text box. For additional information reference appropriate sections within AC 150/5300-13B.

Table 4-2: Runway 01/19 Airport Design Standards Summary (Dimensions In Feet)

FAA STANDARD	RUNWAY 01/19 EXISTING CONDITIONS[1]	RUNWAY 01/19 RDC A-I - VIS EXISTING/FUTURE STANDARD
Runway Length	2,356	See Runway Length Discussion
Runway Width	60	60
Runway Shoulder Width	10	10
Runway Safety Area • Width • Beyond RWY End • Prior to Landing Threshold	 120 240 240	 120 240 240
Runway Obstacle Free Zone • Width • Beyond RWY End	 <250[3] <200[3]	 250 200
Object Free Area • Width • Beyond RWY End • Prior to Landing Threshold	 <250[4] 240[4] 240[4]	 250 240 240
Runway Protection Zone[5] Length	RWY 01: 1,000 RWY 19: 1,000	RWY 01: 1,000 RWY 19: 1,000
Runway Protection Zone[5] Inner Width	RWY 01: 250 RWY 19: 250	RWY 01: 250 RWY 19: 250
Runway Protection Zone[5] Outer Width	RWY 01: 450 RWY 19: 450	RWY 01: 450 RWY 19: 450
Runway Centerline to: Parallel Taxiway/Taxilane CL Aircraft Hold Position Aircraft Parking Area 18' Building Restriction Line (BRL) Nearest Airport Building	 N/A N/A 160[6] 251 240[7]	 150 125 125[2] 251 –

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

Table 4-2 Notes:

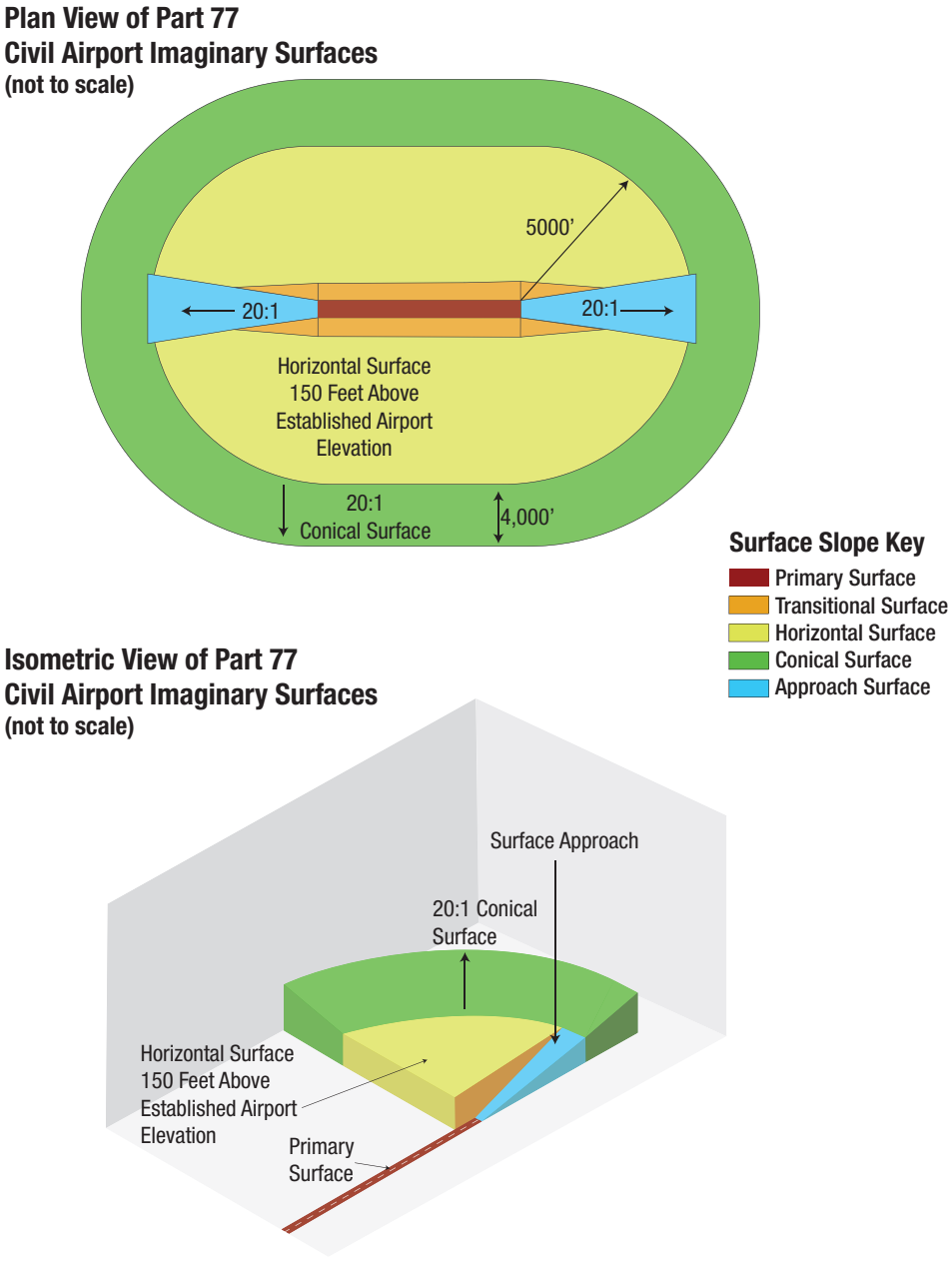
1. As depicted on most recent (2015) as-built ALP; visually documented in 2022.
2. This standard applies to runways or sides of runway without a parallel taxiway.
3. The south end of the OFZ is limited by two parallel sections of fence (125' spacing) and a public use access road located adjacent the tailrace canal.
4. Runway 01/19 has a clear 250-foot wide OFA with two exceptions: the OFA width is limited at its south end by two parallel sections of fence (125' spacing) and public use access road located adjacent the tailrace canal. The north end of the OFA (NW corner) is limited by a fence and road at the Runway 01 end.
5. Both RPZs extend beyond airport property and contain roads and structures.
6. Paved apron located adjacent to Runway 19 threshold.
7. 2-Unit Hangar, east side of runway.

Airside Facility Requirements

PART 77 AIRSPACE

U.S. airport airspace is defined by **Title 14, CFR Part 77 – Safe, Efficient Use, and Preservation of the Navigable Airspace**.[1] Part 77 defines airport imaginary surfaces that are established to protect the airspace immediately surrounding a runway. The airspace surfaces should be free of obstructions (i.e., terrain, structures, parked aircraft, trees, etc.) to the maximum extent possible to provide a safe aircraft operating environment. A generic Part 77 diagram illustrating each type of airspace surface is provided in **Figure 4-2**.

Figure 4-2: Part 77 Airspace (Generic)



Source: Century West Engineering, Airspace Plan; Part 77

1 Part 77 is contained in Code of Federal Regulations (CFR), Title 14 – Aeronautics and Space, Chapter 1, Subchapter E, Part 77.

RUNWAY 01/19 AIRSPACE PLANNING CRITERIA

The definition of Part 77 surfaces at an airport reflects a variety of factors functional elements. For runways, the primary defining factors include runway approach capability (visual, non-precision instrument, or precision instrument) and the size of aircraft that are accommodated on the runway – small aircraft < 12,500 pounds (Utility) or large aircraft ≥12,500 pounds (Larger Than Utility). Runway 01/19 is designated as a Utility Visual runway. It accommodates small aircraft and does not support existing or planned instrument procedures. A summary of Part 77 requirements for Runway 01/19 is provided in **Table 4-3**.

Table 4-3: Runway 01/19 - Part 77 Airspace Summary

	EXISTING/FUTURE STANDARD
PART 77 SURFACE DESIGN FEATURES	UTILITY VISUAL (VIS)
Width of Primary Surface	250 feet
Approach Surface Length	5,000 feet
Approach Surface Width (Outer End)	1,250 feet
Approach Surface Slope	20:1
Transitional Surface	7:1 Slope to 150 feet above runway
Horizontal Surface Elevation	150 feet above airport elevation
Horizontal Surface Radius	5,000 feet
Conical Surface	20:1 for 4,000 feet

Source: Code of Federal Regulations (CFR), Title 14, Part 77

RUNWAY 01/19 AIRSPACE SURFACES AND OBSTRUCTIONS

This section describes the Part 77 airspace surfaces for Runway 01/19 based on its existing visual approaches and small airplane (Utility) standards. Preliminary obstruction information (non-surveyed estimates) is limited to the information presented in the 2009 Airspace drawings (Sheets 4 and 5).[2] A total of 15 obstructions were listed (individual items or groups). As noted earlier, the runway was shifted approximately 140 feet south in 201 5 when it was reconstructed at the same length, which may affect previous obstruction estimates.

An updated obstruction survey (AGIS) for the Airport is being completed as part of the master plan project. The planned late summer 2022 aerial photography could not be flown due to an extended period of reduced visibility due to area wildfires. The flight was rescheduled for early summer 2023 (flown June 2023). The updated AGIS survey will verify previously identified obstructions and any additional items penetrating the Part 77 surfaces for the current runway configuration. FAA-approved 2023 AGIS data will be used to populate obstruction tables in the updated Part 77 Airspace Plan, and related drawings presented in chapter 7. The ALP drawing set will serve as the primary reference for future obstacle mitigation projects to be identified in the Capital Improvement Plan (CIP) (Chapter 8).

Approach Surfaces (20:1, 5,000 feet)

Approach Surfaces provide defined descent paths for landing aircraft on runways. The approach surface extends outward and upward from each runway end (at the end of the primary surface) along the extended runway centerline. The surface slope and dimensions are determined by the type of aircraft intended to use the runway, the most demanding approach planned for the runway, and the minimum visibility required for the approach.

2009 ALP Part 77 Drawing: Two obstructions (trees, terrain) are noted for the Runway 19 visual 20:1 approach surface, with estimated penetrations ranging from 9 to 64 feet. An FAA-defined 20:1 obstacle clearance surface (OCS) was used for both ends of the runway to evaluate close-in obstruction mitigation.

2023 Conditions: The southern runway shift reduced close-in obstructions at the Runway 19 end, although the north airport fence and vehicles traveling on Willame Street penetrate the 20:1 Part 77 approach surface. The Runway 01 approach surface appears to be penetrated by the south airport fence and vehicles traveling on the adjacent roadway.

Primary Surface

The Primary Surface is intended to provide a clear area surrounding the runway that accommodates aircraft overruns on takeoff or landing, undershoots on landing, and deviations to the sides of the runway during normal operations. The primary surface is a flat rectangular plane of airspace longitudinally centered on the runway, extending 200 feet beyond each runway end (for hard surfaced runways). The primary surface has the same elevation as the runway centerline at its nearest point. The outer ends of the primary surface connect to the inner portion of the runway approach surfaces.

2 Packwood Airport Airspace Plan, Century West Engineering (December 2009)

The width of the primary surface depends on runway category, approach type, and approach visibility minimums. Based on the utility designation and visual approaches for Runway 01/19 the primary surface is 250 feet wide.

The primary surface should be free of terrain or built item penetrations, except Items with locations fixed-by-function (e.g., approach lighting, runway or taxiway edge lights, visual guidance indicators, airfield signs, etc.). Those items are required to be mounted on break-away (frangible) mounts. Other common items such as wind cones require an obstruction light at the top of the mounting pole if it penetrates Part 77 airspace.

2009 ALP Part 77 Drawing: Eight obstructions (fence, roads, trees) are noted for the primary surface, with estimated penetrations ranging from 4 to 13 feet. Six of the obstructions were located at the south end; two items (airport fence, Willame Street) were located at the north end of the surface.

2023 Conditions: The south end of the primary surface is obstructed by chain-link airport fencing and a public use roadway. Both items enter the primary surface on its east side and continue beyond the runway end. The fencing enters the surface approximately 80 feet north of the Runway 01 end and extends south (two parallel sections with 125-foot spacing, centered on the runway) through the end of the primary surface. The unpaved roadway provides access to two residential parcels from U.S. Highway 12. The road travels along the north edge of the airport industrial park on the south side of the tailrace canal. A section of the road was realigned to clear the extended runway safety area (RSA) and fencing constructed as part of the 2015 runway shift. The southern runway shift reduced the primary surface obstructions at its northwest corner and changed the conditions at the south end. Sections of the western airport boundary fence appear to be just inside the primary surface, approximately 120 feet from runway centerline. The actual location and height of the fence will be verified in the AGIS survey.

Transitional Surface

The Transitional Surface is located along the lateral edges of the primary surface and is represented by a plane rising perpendicularly to the runway centerline at a slope of 7 to 1. The transitional surface airspace extends outward and upward to an elevation 150 feet above the airport elevation. The outer edges of the transitional surface connect with the horizontal surface. The transitional surface should be free of obstructions (e.g., parked aircraft, structures, trees, terrain, etc.), where feasible.

2009 ALP Part 77 Drawing: Two obstructions (groupings of trees) are noted in the transitional surface for Runway 01/19.

2023 Conditions: The full length of the Airport's western property line is bordered by mature evergreen trees (estimated heights >100 feet). The east side of the runway has limited trees with similar or lower heights, in the transitional surface.

Horizontal Surface

The Horizontal Surface is a flat plane of airspace located 150 feet above the airport elevation, with its boundaries defined by radii extended from each end of the runway primary surface. The outer edges of the radii for each runway end are connected with tangent lines, which taken together define the horizontal surface. Based on its utility and visual approach Part 77 designations, 5,000-foot radii are used on Runway 01/19.

2009 ALP Part 77 Drawing Obstructions: Due to the mountainous terrain surrounding the Airport, an area of terrain penetration is depicted within the horizontal surface, north and east of the runway. No specific elevations or penetration estimates are provided for the terrain, although one obstruction (tower) in this area is listed with an elevation of 1,297 feet, 97 feet above horizontal surface elevation (1,250 feet mean sea level (MSL)).

2023 Conditions: Where feasible, horizontal surface obstructions should be removed, lighted, or lowered to a height where they are no longer penetrating the surface. It is recognized that the ability to mitigate terrain and tree penetrations in remote mountainous terrain is limited. Built items, such as communication towers located on high terrain require obstruction lighting.

Conical Surface

The Conical Surface is an outer band of airspace that encircles the horizontal surface. The conical surface begins at the outer edge of the horizontal surface and extends outward 4,000 feet and upward at a slope of 20:1. The outer edge of the conical surface is 350 feet above airport elevation.

2009 ALP Part 77 Drawing Obstructions: Two large areas of terrain penetration are depicted within the conical surface, east and west of the runway. The terrain + tree elevations are estimated to range from 1,200 to 2,400 feet above MSL, compared to the estimated airport elevation of 1,057 feet.

2023 Conditions: Where feasible, conical surface obstructions should be removed, lighted, or lowered to a height where they are no longer penetrating the surface. The practical limitations for mitigating terrain and tree penetrations in mountainous areas noted for the horizontal surface also apply to the conical surface.

Airfield Pavement Strength and Condition

Airfield pavements are the single most important asset on an airport. Like roadways, airfield pavements have a common life expectancy and require ongoing maintenance to provide a safe operating surface and maximize useful life. Monitoring and planning for future improvements for airfield pavements is critical to maintaining air safety and satisfying aeronautical demand.

AIRFIELD PAVEMENT STRENGTH

The 2015 Runway 01/19 improvement project identified the pavement strength rating as 12,500 pounds for aircraft equipped with a single-wheel landing gear, which is sufficient to accommodate all A/B-I (small) aircraft. This pavement strength is recommended for all additional airfield pavements (taxiways, tiedown apron) constructed during the planning period.

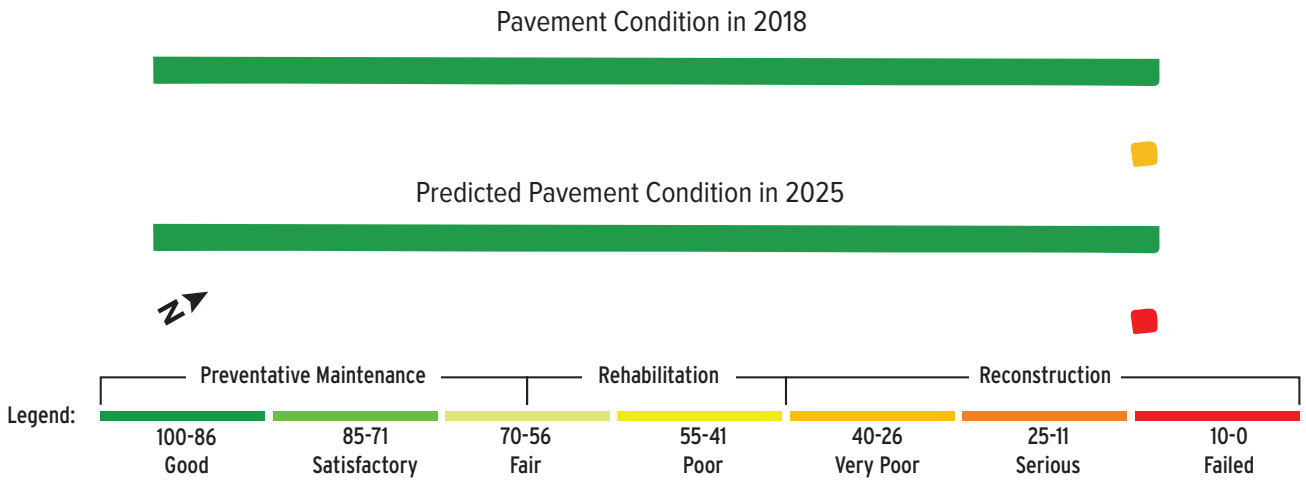
AIRFIELD PAVEMENT CONDITION

WSDOT Aviation conducted a statewide airport pavement inspection in 2018, which included the Packwood Airport. A graphical depiction of 2018 (existing) and 2025 (predicted) pavement conditions is shown in **Figure 4-3**.

The runway is in excellent condition due to its recent reconstruction. Ongoing preventative maintenance will be required during the current planning period to maximize pavement life. The runway may require an overlay near the end of the current planning period. The small aircraft apron located near the north end of the runway is in very poor condition and is projected to reach “Failed” condition without reconstruction. It is noted that this apron may be replaced in the new landside facilities configuration.

A prioritized list of pavement maintenance or rehabilitation projects will be provided in the updated capital improvement program (see Chapter 8). It is recommended that ongoing maintenance, including vegetation removal, crack filling, and seal coats be conducted on a regular basis to maximize the longevity of airfield pavements through the planning period.

Figure 4-3: Pavement Condition (2018 and 2025)



Source: Washington State Department of Transportation Aviation 2018 Pavement Management Program Update

FAA Design Standards

The airport design standards that correspond to the critical aircraft referenced in the April 2023 FAA Forecast approval letter are described in the following sections. Other than some updates to specific design standards defined by FAA, the underlying A-I (small) family of aircraft and the visual approaches dimensional standards depicted on the 2009 ALP are maintained.

RUNWAY 01/19

Runway 01/19 was analyzed relative to runway orientation, runway length and width, and FAA design standards.

Runway Orientation and Crosswind Coverage

The preferred orientation of runways is a function of wind velocity, combined with the ability of aircraft to operate under given conditions. FAA has defined the maximum allowable direct crosswind (90-degrees) for small aircraft as 10.5 knots and 13 knots for larger general aviation aircraft. The 10.5-knot crosswind component corresponds to the current and future critical aircraft and the applicable runway design standards (A-I small).

The FAA recommends that primary runways accommodate at least 95% of wind conditions. When this level of wind coverage is not provided, the FAA recommends consideration of a crosswind runway.

In cases like Packwood Airport, where the required onsite wind data are not available, the FAA requires use of wind data from the nearest available airport(s). The two nearest data points are the Chehalis-Centralia Airport (CLS), located approximately 54 nautical miles (NM) to the west of Packwood or the Yakima Air Terminal (YKM), located 47 NM to the East. Based on the north-south runway configuration and it being on the western slope of the Cascade Mountains, the weather data from CLS is a closer reflection of wind conditions for Packwood. Although use of CLS wind data meets the FAA ALP Checklist requirements, it is recognized that significant differences in terrain and localized wind conditions in Packwood and Chehalis prevent a reliable evaluation of wind conditions. However, the current runway alignment, established in the late 1940s, appears to reflect natural terrain and is aligned to with most common local wind conditions in the valley leading toward White Pass. The narrow airport site configuration between the Cowlitz River and Highway 12 does not provide a viable option for adjusting runway alignment. Based on these considerations, no changes in runway alignment or development of a crosswind runway is recommended to be considered in this master plan update.

FAA DESIGN STANDARDS

Runway Safety Area (RSA)
Standards: A/B-I (Small Aircraft) standard is 120 feet wide or 60 feet each side of runway centerline and 240 feet beyond runway ends. Additional gradient standards apply.

Condition: The RSA for Runway 01/19 appears to meet FAA dimensional, object clearing, and grading/surface compaction standards.

Runway Object Free Area (OFA)
Standards: A/B-I (Small Aircraft) standard is 250 feet wide or 125 feet each side of runway centerline and 240 feet beyond runway ends. Additional gradient standards apply.

Condition: The OFA for Runway 01/19 does not meet A-I small dimensional standards at its north and south ends (fences and roads). The remaining portions appear to meet FAA dimensional, object clearing, and grading standards.

Runway Obstacle Free Zone (OFZ)
Standards: A/B-I (Small Aircraft) standard is 250 feet wide or 125 feet each side of runway centerline and 200 feet beyond runway ends.

Condition: The OFZ for Runway 01/19 does not meet A-I small dimensional standards at its north and south ends (fences and roads). The remaining portions appear to meet FAA dimensional, object clearing, and grading standards.

Runway Length Requirements
Standards: 3,250 feet (FAA-defined length required to accommodate 95% of small airplane fleet based on local airport conditions)

Condition: 2,356 feet

Wind Data

An evaluation of Runway 01/19 wind coverage was performed based on the CLS wind data (All Weather, VFR, and IFR). The tabulated wind data from CLS is summarized in **Table 4-4** and the new wind rose will be added to the Airport Layout Plan (ALP).

A preliminary review of the CLS wind data applied to the Packwood Airport True runway alignment suggests that the Runway 01/19 orientation accommodates more than 95% of all weather wind conditions for small general aviation aircraft.

Table 4-4: Wind Analysis

Runway 01/19	
All Weather	
10.5 KNOTS	99.82%
VFR	
10.5 KNOTS	99.81%
IFR	
10.5 KNOTS	99.94%

Source: Chehalis-Centralia Airport (CLS)
USAF 720254 WBAN 00119 (Years 2013-2022)

Runway Length

Runway length requirements are based primarily on airport elevation, mean maximum temperature of the hottest month, runway gradient, and the critical aircraft type expected to use the runway.

For general aviation (GA) airports the FAA recommends using a "family of design aircraft" approach to defining runway length requirements. *FAA AC 150/5325-4B, Runway Length Requirements for Airport Design* includes runway length curves that match the category of critical aircraft defined for Packwood Airport: The current and future critical aircraft (Cessna 172) has a maximum takeoff weight (MTOW) of 2,300 pounds and meets the criteria for small airplanes (12,500 pounds or less) with 10 or fewer seats that make up 95% of the GA fleet.

The FAA provides the following information regarding percentage (95%) of fleet: *"This category applies to airports that are primarily intended to serve medium size population communities with a diversity of usage and a greater potential for increased aviation activities.* ***Also included in this category are those airports that are primarily intended to serve low-activity locations, small population centers, and remote recreational areas.***" The appropriate runway length curve is presented in Figure 2-1 of AC 150/5325-4B. This standard is appropriate for long-term planning at Packwood Airport.

Table 4-5: Take off – Ground Roll + Distance to Clear a 50-foot Obstacle

Aircraft	Temp (Fahrenheit)	2,300 lb (Fully loaded)	@ 2,100 lb	@ 1,900 lb
C172M	68	1,725 ft	1,405 ft	1,130 ft
	86	1,845 ft	1,500 ft	1,205 ft
	Temp (Fahrenheit)	2,950 (Fully loaded)	@ 2,500 lb	@ 2,000 lb
C182	59	1,350 ft	1,050 ft	720 ft
	84	1,485 ft	955 ft	655 ft

1. Distances based on zero wind; level dry runway; no flaps (172) / 20° flaps (182); 1,000-foot airfield elevation (172) / SL (182).
2. Calculations based on the pilot operating handbook.

Table 4-6: Landing Distance to Clear a 50-foot Obstacle

Aircraft	Temp (Fahrenheit)	2,300 lb (Fully loaded)
C172M	68	1,300 ft
	86	1,330 ft
	Temp (Fahrenheit)	2,950 (Fully loaded)
C182	59	1,350 ft
	84	1,485 ft

1. Distances based on zero wind; level dry runway; 40° flaps (172)/20° (182); 1,000-foot airfield elevation. C182: 10% increase in landing distance assumed based on +25°F temperature.
2. Calculations based on the pilot operating handbook.

For Packwood Airport, a length of 3,250 feet is needed to accommodate 95% of the small airplane fleet based on a mean high temperature (79 degrees) and airport elevation (1,056 feet). At a length of 2,356 feet, Runway 01/19 provides approximately 73% of the defined length based on FAA modeling. As a result, pilots are required to evaluate their aircraft operating requirements and assess actual weather conditions to determine if the available runway length is adequate, particularly during warm summer months.

A review of common single engine piston aircraft runway length requirements was performed to gauge the existing runway's ability to accommodate normal demand. **Table 4-5 and 4-6** summarize takeoff and landing distances for two common 4-passenger aircraft that would be expected to operate at the Airport. These aircraft are able to operate on runway 01/19 under a variety of warmer weather conditions. The take-off and landing distances required to clear a 50 ft obstacle were used to illustrate realistic length requirements for a runway with numerous close-in obstacles.

The existing length of Runway 01/19 (2,356 feet) reflects specific site limitations. It is recognized that the technical definition of justified runway lengths may or may not be feasible to pursue.

The 2009 Airport Layout Plan did not recommend increasing the existing runway length (2,356 feet) during the 20-year planning period, based largely on existing site conditions. A long-term reserve was identified to increase the (ultimate) runway length to 3,000 feet. As previously planned, the runway extension reserve would require acquisition of residential property beyond the south end of Runway 01/19 and also require mitigation of an adjacent small lake to meet FAA RSA and OFA requirements. Both impacts would be costly and could make any future extension unfeasible.

Runway Protection Zones (RPZ)

By FAA definition *"The RPZ is a protection zone that serves to enhance the protection of people and property on the ground."* The RPZ shape and location often corresponds to the inner portion of the runway approach surface, although RPZs do not have vertical (slope) component. RPZ dimensions vary by runway design code (RDC).

The most recent update of the FAA Airport Design advisory circular (AC 150/5300-13B, Appendix I) identifies several common conditions and facilities that are considered compatible with RPZs. An updated *Airport Land Use Compatibility Planning AC (150/5 190-4B)*, issued by FAA in 2022, provides this guidance for RPZs.

The FAA recommends airport control of RPZ through property ownership or acquisition of an avigation easement that limits specific conditions and defines vertical clearances for the corresponding approach surfaces. In general, proposed runway changes that reduce the presence of incompatible land uses in an RPZ are considered to provide incremental safety benefits.

No changes to the RPZ size based on the current and future RDC are anticipated during the current 20-year planning period. Any future changes in runway length or configuration may require changes in RPZ locations.

FAA DESIGN STANDARDS

Runway Protection Zone (RPZ)
Standards: A/B-I (small) standard for runway ends with visual or not lower than 1-mile visibility minimums is 250 x 450 x 1,000 feet (8.075 acres). RPZs should be owned by the Airport or under control by easement and incompatible land uses such as roads and buildings are discouraged. RPZs are located with a 200-foot offset from a runway end or threshold location.

FAA Advisory Circular 150/5300-13B, Appendix I (section I.3; I.3.1-I.3.3) defines permissible land uses within RPZs, which include farming activities that meet other design clearance requirements, compliant irrigation channels, and non-public airport service roads that are under airport control. Incompatible land uses are defined by FAA in a 2012 interim guidance memorandum.

Condition: Portions of the Runway 01 and 19 RPZs extend beyond Airport property and have roads and structures within their boundaries.

Runway Width/Shoulders

Runway 01/19 was fully reconstructed in 2015 and meets FAA A/B-I small standards for width and shoulders. The runway was previously 38 feet wide with no prepared shoulders.

FAA DESIGN STANDARDS

Runway Width/Shoulders
Standards: A-I (Small Aircraft) standard runway width for runways with visual or not lower than 1-mile visibility is 60 feet. The standard for shoulders is 10 feet.

Condition: Existing Runway 01/19 width is 60 feet with 10-foot gravel shoulders, both meet standards.

TAXIWAY/TAXILANE NETWORK

Packwood Airport has no defined or improved taxiways or taxilanes. Future taxiways/taxilanes should be designed based on FAA Taxiway Design Group 1A (TDG 1A), Airplane Design Group I (ADG I), and RDC A/B-I small standards based on the critical aircraft.

FAA DESIGN STANDARDS

Taxiway Width/Shoulders
Standards: TDG 1A standard width is 25 feet with 10-foot shoulders is recommended for all major taxiways and taxilanes at the Airport.

Condition: No existing improved taxiways or taxilanes.

Landside Facility Requirements

Landside facilities include aircraft parking aprons, hangars, terminal/pilot buildings, FBO facilities, aircraft fueling, surface access and automobile parking.

The existing landside facilities for Packwood Airport were reviewed for their conformance to current FAA design standards and current capacity. Future facility demand is estimated based on the FAA-approved aviation activity forecasts presented in Chapter 3.

FAA DESIGN STANDARDS

Aircraft Parking Area

Standards: A-I (Small Aircraft) runway centerline to aircraft parking area standard is 125 feet. This dimension may be increased to account for taxiway setbacks and Part 77 transitional surface clearances.

Condition: The unimproved and paved aircraft parking areas are located beyond the standard runway separation requirement.

AIRCRAFT PARKING APRON

The Airport has one paved apron (57' x57') with one parking position and an unpaved parking area located near the existing hangar on the east side of the runway (north end). Airport management reports that the loose rocky soils in this area, and the lack of hard surfaced taxiways and parking apron discourage aircraft use due to concerns about propellor damage.

The evaluation of apron requirements will address parking demand for locally based and transient fixed wing aircraft, and transient helicopters. Based on current and forecast use, ADG I standards are appropriate for small airplane tiedowns. Transient helicopter parking area requirements are based on accommodating small or medium helicopters commonly used for personal transport, air ambulance, and law enforcement. Emergency use heavy-lift helicopters will continue to operate and park on the runway in coordination with the airport management.

The aircraft parking facility requirements were analyzed relative to existing FAA apron and aircraft parking analysis provided in *FAA AC 150/5300-13B, Airport Design*. Facility needs are summarized in **Table 4-7**. It is noted that the projected demand is based on forecast air traffic and peaking levels. When existing parking is at capacity, it is assumed that demand is accommodated in unimproved areas in the existing landside area.

Based and Itinerant Aircraft Parking

To quantify the based and transient aircraft parking needs/requirements, the based aircraft forecasts and operations forecasts were used to determine the parking spaces needed to satisfy existing and future demand. A common planning standard of 300 square yards for each based aircraft and 360 square yards for transient aircraft was used to calculate apron space requirements for long-term planning purposes. Space requirements for transient helicopter parking were estimated based on typical aircraft use. The evaluation of apron configurations in the Airport Development Alternatives (Chapter 5) will reflect the aircraft using the facility, consistent with current FAA design guidance:

AC 150/5300-13B, Appendix E Section E.2.1. General Aviation Apron, General Design Considerations.

1. *Evaluate apron parking positions and tie-downs for aircraft entry and exit under self-power and by tow.*
2. *Segregate parking areas for small aircraft (e.g., ADG I) from larger aircraft (e.g., ADG II) to optimize utility and efficiency of apron space.*
3. *Design separate apron areas to accommodate the critical aircraft intended to use the segment of apron.*
4. *Account for the effects of jet blast and propeller wash on adjacent aircraft and facilities…"*

Transient Aircraft Parking

Transient aircraft parking demand was calculated using a method described in Airport Cooperative Research Program (ACRP) Report 113.[3] The ACRP method applies the following formula to the updated operations forecast to estimate future demand for transient aircraft parking:

(X/2 * T)/365 * P = Number of Transient Parking Positions

Where:
X = number of annual operations
T = percent of annual operations that are from transient aircraft (80% assumed)
P = percent of transient aircraft that are parked on the apron at the same time (50% assumed)

- *2022: (600/2 * .8)/365 * .5 = 0.33 Transient SEP Parking Positions (Round to 1)*
- *2042: (1,000/2 * .8)/365 * .5 = 0.55 Transient SEP/IMEP Parking Positions (Round to 1)*

Based on the low overall aircraft operations levels involved, the projected transient parking demand for small single engine aircraft using conventional methods is projected to remain <1 aircraft (rounded up to 1 aircraft) through the 20-year planning period. A similar demand projection exists for transient helicopters (rounded to 1 parking position). These projections reflect normal daily activity; but could be regularly exceeded during special events or unusual peak conditions. For basic facility planning purposes, a minimum of 3 small airplane tiedowns is assumed. Aircraft parking options will be included in the landside alternatives evaluation with the intent to meet forecast demand for fixed wing aircraft and helicopters. The evaluation of apron configurations will reflect the aircraft using the facility, consistent with current FAA design guidance:

> *A5-2. General aviation apron. a. General. Aprons and associated taxilanes should be designed for the critical design aircraft and/or the combination of aircraft to be using the facility. Itinerant or transient aprons should be designed for easy access by the aircraft under power.*

Table 4-7: Apron and Hangar Facility Requirements Summary

ITEM	BASE YEAR (2022)	2027	2032	2037	2042
Based Aircraft Forecast	0	1	2	2	3
Aircraft Parking Apron - Existing Aircraft Parking Type/Capacity					
Existing Tiedown Apron	361 sy				
Projected Needs (Gross Demand)					
Locally Based Tiedowns (@ 300 SY each)	N/A	1 space / 300 sy	1 space / 300 sy	1 space / 300 sy	1 space / 300 sy
Small Airplane Itinerant Tiedowns (@ 360 SY each)	1 space / 360 sy	2 spaces / 720 sy	2 spaces / 720 sy	3 spaces / 1,080 sy	4 spaces / 1,440 sy
Small Helicopter Parking Positions (@ 380 SY each)	N/A	1 space / 380 sy	1 space / 380 sy	1 space / 380 sy	1 space / 380 sy
Total Apron Needs	**N/A**	**4 spaces / 1,400 sy**	**4 spaces / 1,400 sy**	**5 spaces / 1,760 sy**	**6 spaces / 2,120 sy**
Aircraft Hangars (Existing Facilities)					
Existing Hangar Units/Aircraft Storage Capacity[1]	2 Units Open Hangar				
Projected Needs (Net Increase in Demand)[2]					
(New) Hangar Space Demand (@ 1,600 sq/ft (40x40) hangar per space)		0	1 Unit / 1,600 SF	0	0

Source: Century West Engineering
Table 4-7 Notes:
1. In 2022, Packwood Airport had a two-unit open hangar.
2. Assumes net increase above current capacity

3 ARCP Report 113, Appendix C.

HELICOPTER PARKING & FIRE OPERATIONS STAGING

Packwood Airport does not have designated helicopter parking areas. Transient helicopters, including medical evacuation (medevac) helicopters normally park in the turf area on the northeast side of the runway or on the small, paved apron. Seasonal fire emergency helicopters are typically operated and parked on the runway when conditions warrant closing the Airport to regular traffic.

The alternatives analysis will identify parking locations and potential improvements to support transient helicopter parking needs.

AIRCRAFT HANGARS

Packwood Airport currently has a one 2-unit hangar (open front). The county-owned hangar is currently used on a seasonal basis through short-term rental. In 2022, there were no year-round based aircraft; the updated forecast projects three based aircraft to be added at the Airport over the 20-year planning period. For planning purposes, it is assumed that 100% of the Airport's future based aircraft will be stored in hangars although providing 1 based aircraft tiedown is recommended if hangar space is unavailable.

The evaluation of future hangar requirements is presented as general square footage based on common sizes and configurations of different hangar types and aircraft sizes. Demand for new hangar space (aircraft storage only) is estimated to be 1 space totaling approximately 1,600 square feet (presumed 40'x40' hangar) over the 20-year planning period. This assumes that the existing two-unit open T-hangar would accommodate two of the future forecast based aircraft and one additional hangar would be constructed to support the third based aircraft. Based on the age and condition of the existing two-unit hangar, significant investment in maintenance or building replacement is anticipated during the planning period. The projected hangar storage requirements are included in **Table 4-7**.

It is recommended that space adequate to accommodate forecast demand for general aviation hangars, and a 100% hangar development reserve be defined during the landside development alternatives process.

AIRFIELD INSTRUMENTATION, SIGNAGE, LIGHTING, AND MARKINGS

Runway & Taxiway Lighting

Runway 01/19 is equipped with LED Medium Intensity Runway Lighting (MIRL). The MIRL was replaced as part of the 2015 runway reconstruction project and is in excellent condition. In 2015, the runway lighting regulator was also replaced.

The useful life for airfield lighting systems is assumed to be 20 years, although some systems remain reliable and functional for longer periods. Since all existing airfield lighting systems will exceed the assumed 20-year useful life during the current planning period, replacement systems will be included in the 20- year capital improvement program.

There are no taxiways at the Airport. New taxiways should be equipped with blue retroreflective edge markers. Heavy winter snow makes plowing around reflectors challenging and damage is common. Airports in heavy snow areas often remove the reflectors before winter and reinstall them in the spring. Some airports will install flexible wands to outline useable pavement to aid in plowing.

Visual Guidance Indicators

Runway 01/19 is not equipped with Visual Guidance Indicators (VGI). The Precision Approach Path Indicator (PAPI), with a standard 3-degree glide path is FAA's current standard for VGIs at GA Airports. An updated evaluation of obstacle clearance may be required for new PAPI installations to determine the ability to meet FAA glide slope siting standards.

Runway & Taxiway Markings

The runway markings at the Airport are consistent with FAA standards for color (white), configuration, and current approach type, and they are in good condition. There are no taxiways at this time. Any future taxiways shall have markings that are consistent with FAA standards for color (yellow) with reflective glass beads, while being maintained in good condition.

Airfield Signage

Runway 01/19 is not equipped with lighted or reflective signage. If taxiways are added in the future, mandatory runway signage should be installed, including aircraft hold position signs with runway numbers.

Airfield Lighting

The airfield lighting systems (airport beacon and wind cone) meet standards for location, type, and color. The airport beacon and wind cone were replaced as part of the 2015 runway improvement project and constructed on tip-down poles outside of the runway object free area.

SURFACE ACCESS AND VEHICLE PARKING

Vehicle access to Packwood Airport is provided from Main Street West, which connects to US-12. There is a vehicle and pedestrian access gate at the end of Main Street West. There is no designated vehicle parking area, although vehicles park in the grass areas adjacent to the hangar and apron. It is recommended that a future designated vehicle parking area (gravel) is established in the terminal area.

Support Facilities Requirements

Support facilities are limited at the Packwood Airport to include security/perimeter fencing, utilities, and outdoor restroom.

UTILITIES

The existing airport utilities are limited to electric and water, but appear to be adequate to support future development in the landside areas of the Airport. Depending on demand, the existing utilities may be extended to accommodate new development during the planning period. The County or individual tenants may install septic systems to support future hangars or facilities.

PERIMETER FENCING/GATES

The Airport's operating area is fenced (6-foot chain link) with primary vehicle and pedestrian gates located at the west end of Main Street, near the northeast corner of the Airport. The existing vehicle gate is a manual swing gate with a combination padlock. Upgrading the vehicle gate to an automated system (electric powered) with a secure access keypad system may be considered to improve access for tenants, transient pilots and emergency providers. The south end of the Airport (south of the tailrace) is not included in the airfield perimeter fencing.

Summary

Because of the significant investment in airfield facilities at Packwood Airport made by Lewis County and FAA in recent years, most facility needs for the current 20-year planning period are focused on aircraft parking aprons, access taxiways, hangar development, and internal airport access road improvements. With only minor expectations, the major airfield components meet FAA design standards for small aircraft included in ADG I.

The updated forecasts of aviation activity anticipate modest growth in activity resulting in similarly moderate airside and landside facility demands beyond existing capabilities. The existing airfield facilities can accommodate forecast activity, with targeted facility improvements. For the most part, the need for new or expanded facilities, such as aircraft hangars, will be based on actual demand. Most of the non-conforming items noted in this chapter are the result of a constrained site and the close-in airport surroundings.

Preliminary airport development alternatives will be presented in Chapter 5 to evaluate different options capable of meeting forecast demand, in addition to identifying any development constraints that exist. The process of Planning Advisory Committee (PAC) review of the preliminary alternatives will allow the County to define and refine the preferred alternative for the master plan and develop a viable implementation strategy.

Chapter 5
Alternatives Analysis

The evaluation of future development alternatives represents a critical step in the airport master planning process. The primary goal is to define a path for future development that provides an efficient use of resources, while accommodating forecast demand and the facility needs defined in the master plan. All project elements are consistent with the requirements of the Federal Aviation Administration (FAA).

Introduction

The current and long-term planning for Packwood (55S) is based on improving the Airport's ability to support its core general aviation and public safety functions. Among the most important ongoing aviation activities at Packwood Airport are critical wildfire operations, search and rescue missions, and military training operations from Joint Base Lewis McChord and the Yakima Training Center.

Packwood Airport is in a strategic location to support seasonal wildfire emergencies and search and rescue operations near Mount Rainer and the Cascade mountains. The overall intent of the airport master plan is to address non-emergency facility needs for the current planning period while preserving emergency response capabilities to the extent feasible.

The primary airfield components at the Packwood Airport consist of a single paved, lighted runway, a small, paved apron, an unpaved aircraft tiedown area, and a 2-unit hangar. The runway was reconstructed and widened to 60 feet in 2015 and remains in very good condition. The small paved apron has not undergone recent maintenance and is in poor condition.

Development Alternatives Analysis Process

The facility requirements analysis defined a variety aeronautical needs, including aircraft parking apron improvements, access taxiways, hangar development, and internal airport access road improvements.

The master plan's development priorities will focus on expanding basic airside and landside facilities based on current activity and projected future demand. The majority of runway-related operating and safety surfaces meet FAA design standards. The non-conforming items at the runway ends are the result of a constrained site. The forecasts of aviation activity anticipate modest growth in airside and landside facility needs beyond existing capabilities. The Airport will address demand-driven needs as they arise as current facilities are positioned to accommodate forecasted growth.

MASTER PLAN AREAS OF EMPHASIS

Table 5-1 summarizes the primary demand factors and corresponding facility needs that will be evaluated in the alternatives analysis. Individual facility development reserves are defined as 100% of the net forecast to account for uncertainty in predicting demand for new hangars and aircraft parking.

Table 5-1: Summary of Facility Development Needs

Items	Facility Planning
Runway 01/19	• Maintain existing length; Maintain existing width • Tree removal/lowering to improve runway approach obstacle clearances • Clear Runway Object Free Area (OFA) of existing obstacles to meet FAA standards • Replace wildlife perimeter fencing at end of useful life
Airfield Lighting	• Maintain existing airfield lighting; replace systems at the end of their useful life • Add edge reflectors to new taxiways
Major Taxiways	• Add paved taxiway access to aircraft parking and hangar areas » Centerline and edge stripes » Aircraft Hold Lines for all runway-taxiway connections » Reflective Edge Markers » Mandatory and Directional Signs (Reflective)
Terminal Area Facilities	• Define taxilane access required for planned aircraft use » Small airplane tiedowns » Helicopter parking • Add new second gate access from Tahoma Street W to terminal area
Hangar Development	• Define new hangar sites and taxilane access

Overview

Terminal Area/Landside Facilities. The main terminal area provides approximately 3 acres of developable space for a wide range of aeronautical facilities and related support uses, including aircraft parking, new hangar development, and other services. The primary facility needs include the addition of paved aprons for small aircraft tiedowns and transient helicopter parking. Development sites for future hangars will be identified within the existing terminal area.

Airside Facilities. Consistent with the facility requirements analysis, the preliminary airside alternatives will focus primarily on aircraft movement improvements including constructing a partial-length parallel taxiway and an aircraft turnaround point for the southern one-third of the runway. The current runway has significant service life remaining with dimensions that meet the applicable FAA design standards. Long term rehabilitation of runway pavement is anticipated during the current 20-year planning period based on typical design life. All existing airfield lighting will reach or exceed its useful life during the planning period, with replacement systems assumed. Airfield pavement markings will require repainting during the planning period, which typically coincide with periodic sealcoating projects.

- Runway Dimensions. Maintain existing length and width.
- Runway Markings. Maintain existing visual runway markings; repaint as needed to maintain adequate visibility.
- Airfield Lighting. Maintain existing lighting systems; replace as required with LED fixtures. Add visual glideslope indicators (VGSI) if feasible (obstruction clearance).
- Taxiways. Add hard surfaced taxiway access to serve adjacent landside facilities.
- Airfield Signage. Install Mandatory Instruction, Direction/Information, Taxiway Location, and Distance Remaining Signs. Reflective signs are recommended for Packwood Airport to provide an economical, durable system.

FAA PLANNING GUIDANCE

The evaluation process used in this study is based on guidance provided in *Advisory Circular (AC) 150/5070- 6B Airport Master Planning*. Evaluation criteria categories supporting the evaluation of development alternatives include:

Operational Capability – Includes criteria that evaluate how well the airport functions and the ability to satisfy future activity levels, meets functional objectives such as accommodating the design aircraft, and provides for the most efficient taxiway system or aircraft parking layout.

FAA Design Standards – Includes an analysis of existing FAA design standards and various requirements or areas of focus currently identified by Advisory Circular.

Airspace Compatibility – Includes the identification and analysis of the impacts that proposed changes to the airport environment would have on the local and regional airspace systems.

Land Use, Transportation, and Environmental Compatibility – The preliminary alternatives are reviewed to identify potential issues that may affect comparison and implementation of the development concepts. The environmental review memo and the site conditions described in the Existing Conditions chapter are referenced in the applicable sections. A more detailed review will be performed for the development concepts that move to the next level of evaluation. This 'best planning practices' evaluation will expand on the earlier inventory work and is intended to provide a cursory analysis/identification of potential environmental effects, as defined in *FAA Order 1050.1 Environmental Impacts Policies and Procedures* and *FAA Order 5050.4 FAA Airports Guidance for complying with the National Environmental Policy Act (NEPA)*.

By analyzing the development alternatives against the evaluation criteria presented above, and subsequently discussed with local stakeholders and interested airport users, an interactive process of identifying and selecting elements of a preferred alternative will emerge that can best accommodate all required facility improvements.

Throughout this process, Lewis County will seek public input and FAA consultation to shape the preferred alternative.

Once the preferred alternative is selected, a detailed capital improvement program will be created that identifies and prioritizes specific projects to be implemented. The elements of the preferred alternative will be integrated into the updated ALP drawings that will guide future improvements at the Airport.

Development Alternative Summaries

The development alternatives are intended to facilitate a discussion about the most effective way to meet the facility needs of the Airport. The facility needs identified in the previous chapter and depicted accordingly within each development alternative include a variety of airside and landside needs. Items such as lighting improvements, minor roadway extensions and pavement maintenance do not typically require an alternatives analysis and will be incorporated into the preferred development alternative and the ALP. The development alternatives have been organized accordingly:

- No-Build Alternative (no graphic)
- Airside Alternatives
  - » Airside Alternative 1 (Figure 5-1)
  - » Airside Alternative 2 (Figure 5-2)
- Landside Alternatives:
  - » Landside Alternative 1 (Figure 5-3)
  - » Landside Alternative 2 (Figure 5-4)
  - » Landside Alternative 3 (Figure 5-5)

The preliminary development alternatives described below and illustrated in **Figures 5-1 through 5-5** are intended to illustrate the key elements of each proposed concept. It is important to note that the eventual preferred alternative selected by Lewis County may come from one of the alternatives, a combination or hybrid of the alternatives, or a new concept that evolves through the evaluation and discussion of the alternatives. As noted earlier, the County has the option of limiting future facility improvements based on financial considerations or development limitations.

No Build Alternative

A No-Build Alternative is included to represent the maintenance of existing facilities and capabilities. Unlike the active development alternatives that are intended to respond to future demand for facility needs, the No-Build Alternative represents a “no-action” option. The existing airfield would remain unchanged from its present configuration and the Airport would be operated in a “maintenance-only” mode.

No improvement in public use facilities would be planned, although construction of private hangars or related facilities could be accommodated within currently developed areas.

The primary result of this alternative would be the inability of the Airport to accommodate aviation demand beyond current facility capabilities. Future aviation activity would be constrained by the capacity, safety, and operational limits of the existing airport facilities. In addition, the absence of new facility development limits the sponsor’s ability to increase revenues and operate the Airport on a financially sustainable basis over the long term.

The no-action alternative establishes a baseline from which the other alternatives can be developed and compared. The purpose and need for the alternatives are defined by the findings of the forecasts and facilities requirements analyses. The need to safely accommodate access and use of the public transportation facility provides the underlying rationale for making facility improvements. The timing of public investment in facilities is driven by safety, capacity, and the ability to operate an airport on a financially sustainable basis, whereas market factors generally determine the level and pace of private investment in hangars or other facilities at an airport.

Based on the factors noted above, the No-Build Alternative is inconsistent with the management and development policies established by Lewis County and its commitment to provide a safe and efficient air transportation facility to serve the surrounding areas that are socially, environmentally, and economically sustainable.

AIRSIDE DEVELOPMENT ALTERNATIVES

The primary focus of the airside alternatives is to improve conformance with FAA runway design standards and to improve aircraft movement at the Airport. Obstacles (fencing and roads) located at both ends of Runway 01/19 penetrate the runway object free area (OFA), and a small area in the runway obstacle free zone (OFZ) at the south end. Proposed improvements related to aircraft movement include a partial-length parallel taxiway and an aircraft turnaround for the section of runway not served by the proposed taxiway to facilitate aircraft back-taxiing on the

runway. All proposed facilities are based on RDC A-I (small) standards. The proposed parallel taxiway and aircraft turnaround configuration is the same for both alternatives.

Airside 1

The existing runway configuration in **Airside Alternative 1** (see **Figure 5-1**) is maintained. The proposed improvements focus on reducing obstacles (fences, roads. etc.) in the runway OFA.

Runway 01/19

Two road realignments are proposed to address existing obstacles in the runway OFA. At the Runway 01 end, a section of Willame Street crossing through the OFA is vacated, with a new north-south connection routed through county-owned property. Willame Street is the primary access route from U.S. Highway 12 to several residential land parcels located immediately west of the Airport. The new road is intended to preserve access to existing residential parcels by reconnecting the western section of Willame Street with Tumac Street. The existing north airport boundary fence that runs along the south side of Willame Street is removed and realigned on the county-owned parcel immediately north to clear the OFA and the inner approach surface for Runway 01. No changes to the existing Runway 01 threshold or lighting are required.

At the Runway 19 end, a small section of the existing gravel road used to access adjacent private land parcels south and west of the Airport is realigned outside the runway OFA and OFZ. The roadway runs through airport property, south of the adjacent tailrace canal. Relocation of existing airport fencing that borders the extended runway safety area (RSA) at the south end of the runway is recommended where feasible to clear the OFA and OFZ.

Tree removal/lowering within the Runway 01 and 19 approaches is also proposed to reduce obstacle penetrations.

Taxiways

A partial-length parallel taxiway is proposed to provide access to the north section of Runway 01/19 to facilitate aircraft movements entering and exiting the active runway. The proposed taxiway is depicted in the landside development options since it is located in the terminal area with direct access to aircraft storage facilities. A proposed reserve is depicted to extend the taxiway if needed. An aircraft turnaround point is proposed 544 feet from the Runway 01 end to facilitate aircraft movements associated with back-taxiing for takeoff and after landing.

Airside 2

Airside Alternative 2 (see **Figure 5-2**) proposes a minor shift of Runway 01/19 to the south to provide required clearance from an existing fence and public road located in the OFA (north end). The existing runway length is maintained and Willame Street is maintained in its current form.

Runway 01/19

Runway 01/19 is shifted slightly to eliminate existing non-standard OFA conditions at the north end of the runway. To accomplish this, the end of Runway 19 is relocated approximately 25 feet south and 25 feet of new runway pavement and additional RSA and OFA are added to the Runway 01 end. Existing runway threshold lighting installations and runway markings at both ends are relocated in the reconfiguration.

The existing fence and public roadway OFA obstacles at the north end of the runway are eliminated. The realignment of the south access road described in Airside Alternative 1 is modified slightly to clear the extended OFA and RSA.

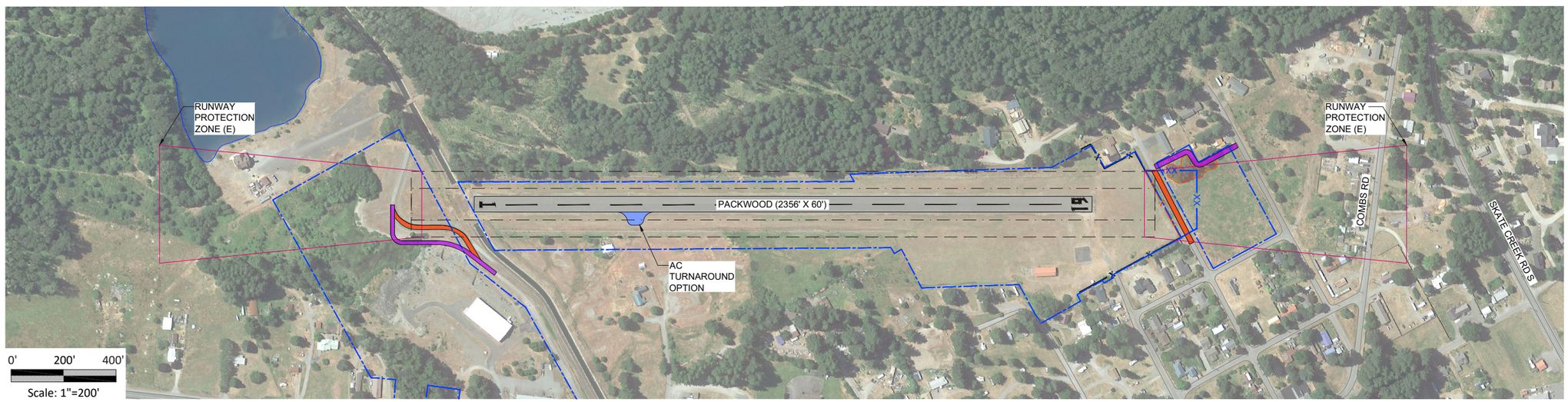
Taxiways

The taxiway improvements presented in Airside Alternative 1 are maintained.

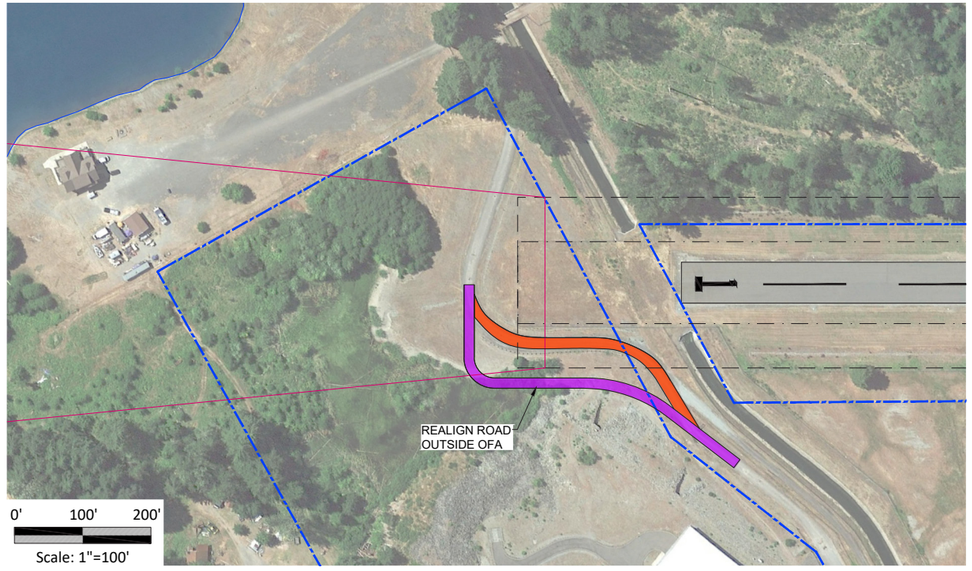
Summary

The proposed airside alternatives are both capable of improving operational function and safety for the existing runway-taxiway system. The options have different impacts for off-airport facilities at the north end of the runway, and the runway itself. The proposed taxiway improvements will increase the ability of aircraft to access the runway and adjacent landside facilities safely and efficiently.

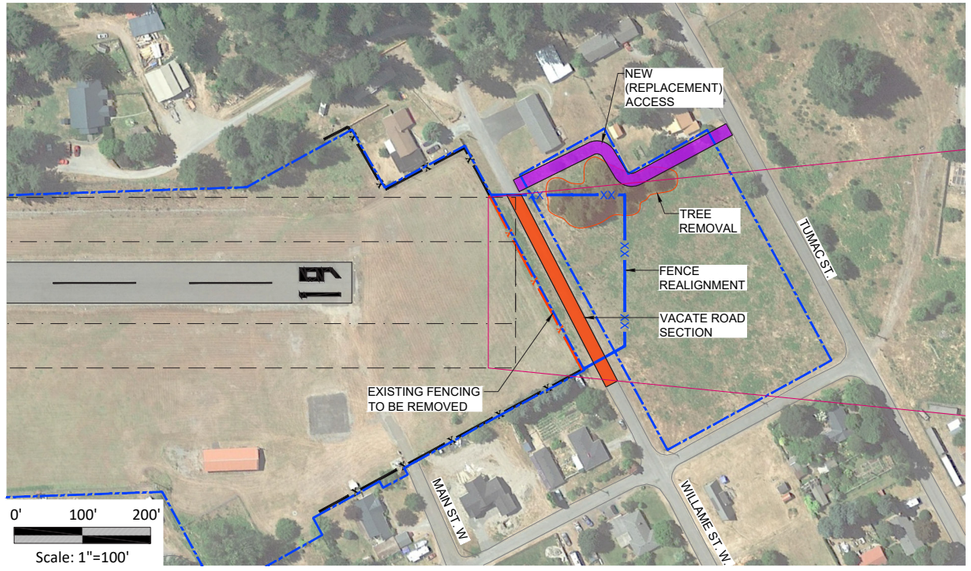
Figure 5-1: Airside Alternative 1



AIRSIDE

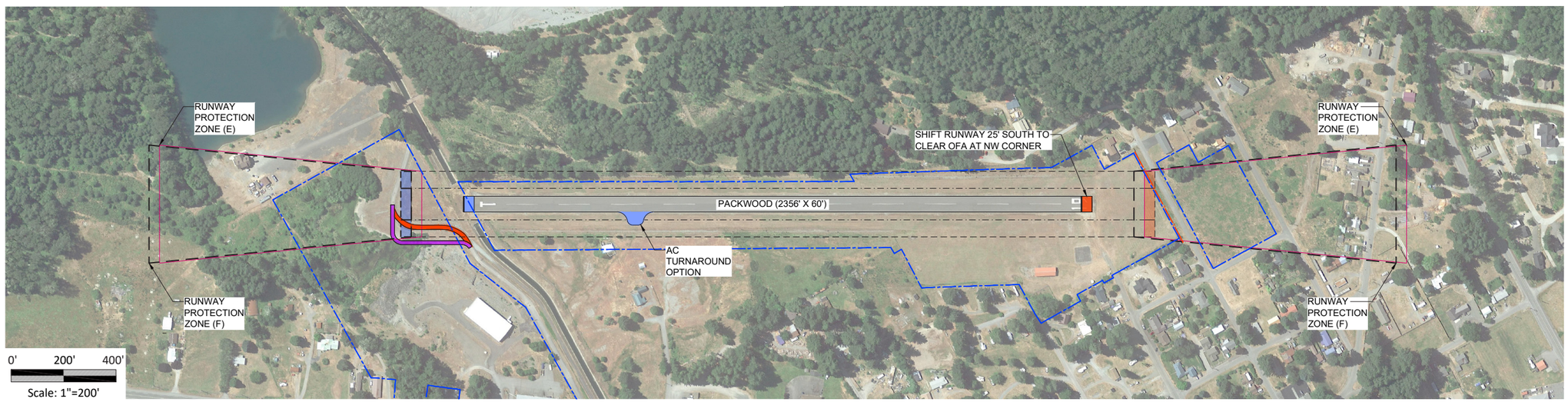


RUNWAY 01 END

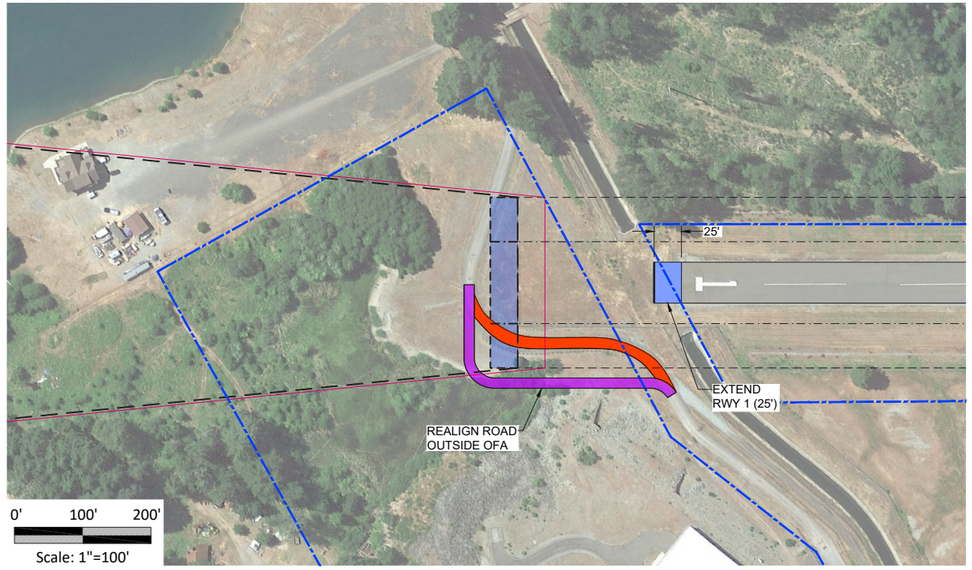


RUNWAY 19 END

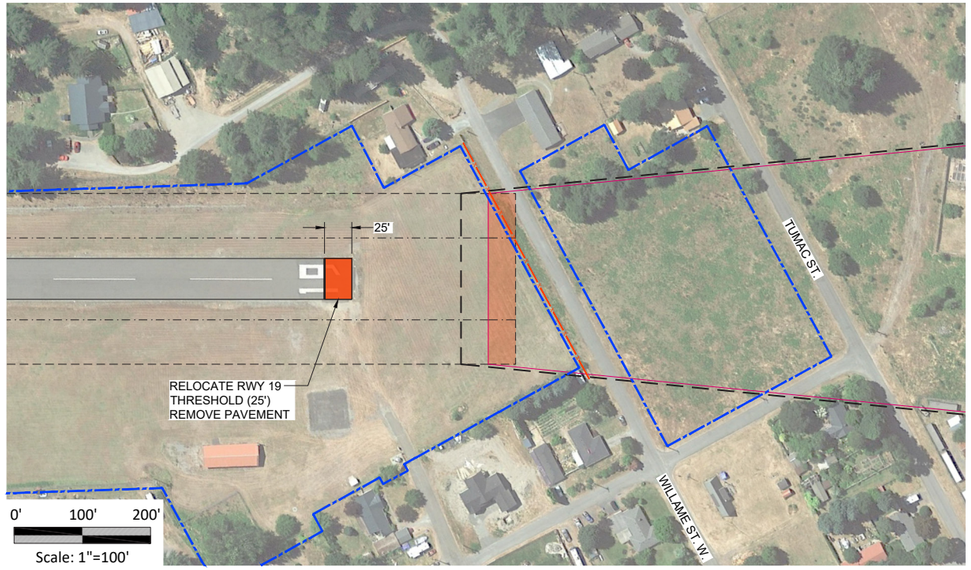
Figure 5-2: Airside Alternative 2



AIRSIDE



RUNWAY 01 END



RUNWAY 19 END

LANDSIDE DEVELOPMENT ALTERNATIVES

Overview

The landside planning evaluations are intended to identify options for meeting the next 20-year demand forecast for based aircraft and transient aircraft storage demand, plus development reserves equal to roughly 100% of the forecast demand. The primary landside improvements include new paved aprons for small airplane tiedowns and transient helicopter parking with taxilane connections to the future parallel taxiway. Future hangar sites are identified adjacent to the new apron/taxilane pavements. Proposed vehicle access improvements include upgrades to the existing road/gate on Main Street, and the addition of a second access road/gate through existing Lewis County right-of-way on Tahoma Street. The proposed landside improvements are summarized in **Table 5-2** and depicted in **Figures 5-3 to 5-5**.

Table 5-2: Landside Alternatives 1-3 Features

Development Features	Alternative 1	Alternative 2	Alternative 3
Transient Helicopter Parking	New paved apron (52x52 feet) to accommodate helicopter parking located north of tiedown apron	New paved apron (52x52 feet) to accommodate transient helicopter parking located north of existing hangar	Same as Alternative 2
Small Airplane Tiedown Apron	Four (4) tiedowns on the proposed tiedown apron with taxilane access to the tiedowns and helicopter parking area	Four (4) tiedowns in a row facing the proposed parallel taxiway with access being provided by a parallel taxilane to provide access to both the tiedowns and future hangar development	Four (4) tiedowns in a row facing the proposed parallel taxiway
New Conventional Hangar Sites	1	2	2
T-Hangar Sites	0	0	0
Road Access	Upgraded (paved) access the transient helicopter parking apron from the Main Street gate to improve EMS access. New access road connecting to Tahoma Street provides access to a proposed vehicle parking area and allows access to future development reserves.	New access road along the east side of existing and future apron and hangar sites, connecting to both Tahoma Street and Main Street gates.	Same as Alternative 2
Vehicle Parking; Gate Access	Upgraded (replacement) automated gate at Main Street entrance. New gate is installed providing controlled access from Tahoma Street. Vehicle parking proposed along the east side of the existing hangar and in the far east corner of the terminal area.	Same as Alternative 1	Same as Alternative 1

LANDSIDE ALTERNATIVES

Three preliminary landside alternatives were developed to explore possible variations on facility layouts. As noted earlier, the partial-length parallel taxiway described in the airside development alternatives is incorporated into all of the landside options. Each of the alternatives include several common elements:

- Small Airplane Tiedown Apron
- Helicopter Parking Apron
- Apron Taxilanes (connections to future parallel taxiway)

- Hangar Sites
- Access Road and Gate Improvements
- Long-Term Apron and Hangar Development Reserve

Landside 1

Landside Alternative 1 (see **Figure 5-3**) locates new small airplane tiedown and helicopter parking aprons near the north end of Runway 01/19. Aircraft access to the aprons is provided by the taxiway connector at the north end of the runway, and from the parallel taxiway. The partial-length parallel taxiway is depicted with development and reserve sections, although the taxiway could be completed as a single project if adequate funding was available.

The main concept with this apron layout is to consolidate the aircraft parking areas to reduce the size of the development footprint, and to minimize the taxi distance from the runway. The tiedown apron is configured with 4 small aircraft tiedowns served by a single ADG I stub taxilane that connects to the parallel taxiway. The helicopter parking apron and connecting taxilane is located at the north end of the landside area to provide both surface and hover-taxi access from the Runway 19 threshold for both wheel- and skid-equipped helicopters. The location of the helicopter apron is intended to provide direct access from the Main Street gate for ambulances and EMS vehicles to facilitate rapid transport of critical patients.

A future hangar site is located south of the existing 2-unit hangar. The existing and future hangar sites have direct access to the new parallel taxiway. The area between the existing hangar and the new parallel taxiway is proposed to be paved to improve aircraft access to/from the runway-taxiway system. The remainder of the terminal area bump out is identified as aircraft parking and hangar reserve. The proposed parallel taxiway will be capable of providing access for both the development area and the landside reserves.

A second airport access connection is proposed from Tahoma Street. The new access road would extend using existing (Lewis County) Tahoma Street right of way, with new vehicle and pedestrian gates located in the existing airport fence. The internal airport access road would provide access to the aircraft hangar and apron areas. Designated vehicle parking areas are identified adjacent to the apron and hangars.

Landside 2

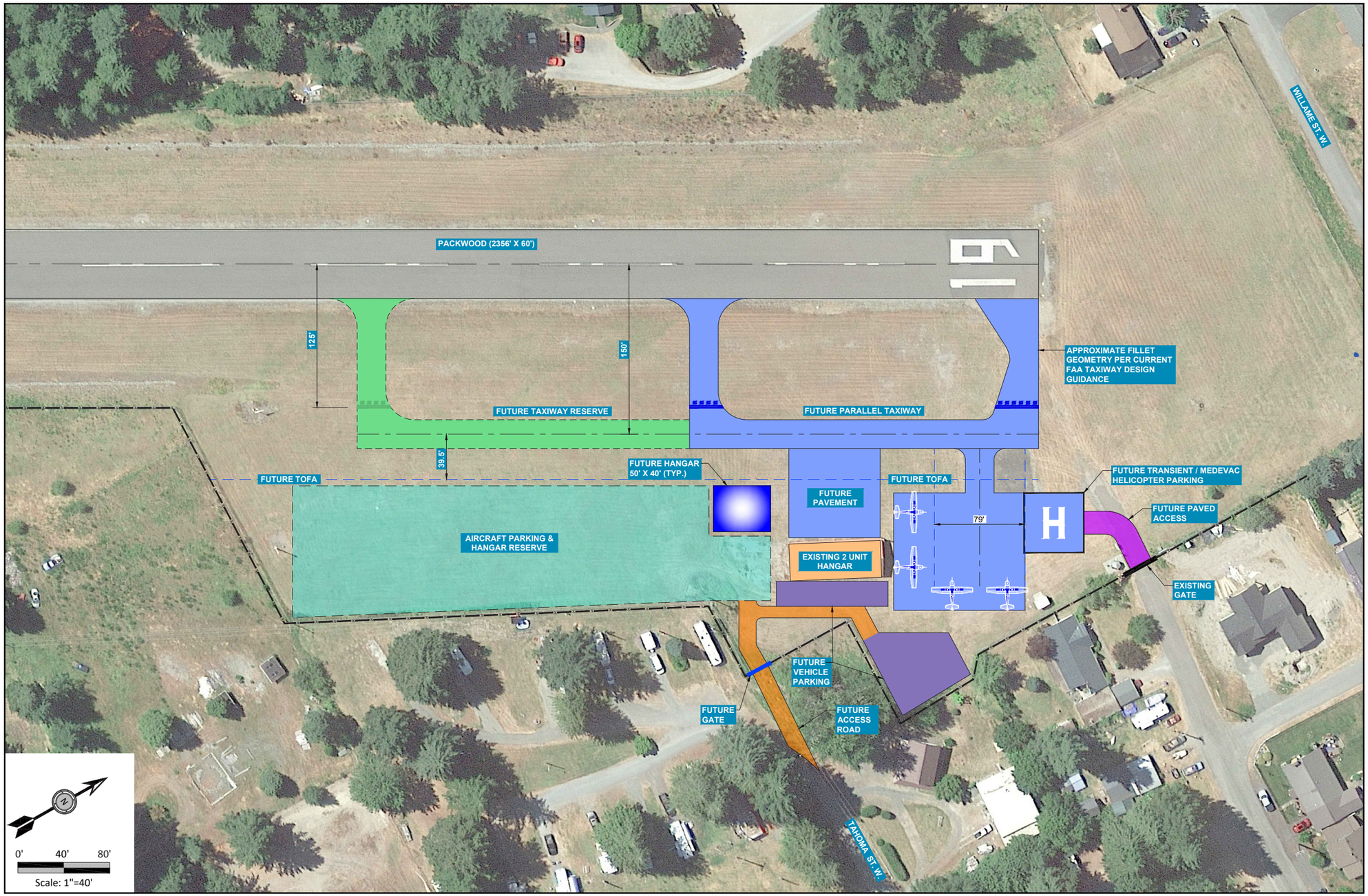
Landside Alternative 2 (see **Figure 5-4**) keeps the proposed helicopter parking apron near the north end of Runway 01/19 with prime emergency access provided from the Main Street gate. The new small airplane tiedown apron (4 aircraft) is located south of the existing hangar. Physically separating the fixed-wing and helicopter parking areas reduces potential rotor wash impacts on parked small aircraft. The tiedown apron is accessed from the parallel taxiway and a loop taxilane that connects to the taxiway. The taxilane also provides access to the hangar site located south of the existing hangar. A second hangar site is proposed on the north end of the existing hangar. The development reserve concepts described in the previous alternative also apply, although a longer section of parallel taxiway is required to access the proposed tiedown apron.

The new Tahoma Street access road connection proposed in the previous alternative is maintained, with an extended internal roadway connection running along the back of the hangar and apron areas. Vehicle parking areas are available adjacent to the internal access road.

Landside 3

Landside Alternative 3 (see **Figure 5-5**) provides the same group of landside facilities as Landside Alternative 2, with the exception of the small airplane tiedown apron taxiway/taxilane connection. This alternative eliminates the secondary loop taxilane used to access the aircraft tiedowns and south hangar site and positions the apron directly adjacent to the parallel taxiway. The tiedown location is determined by the ADG I taxiway object free area (TOFA) clearance for the future parallel taxiway. The future south hangar site would require a dedicated taxilane connection to the parallel taxiway. This configuration results in a significant reduction in the new pavement required to provide the same aircraft parking capacity provided in Landside Alternative 2. The smaller pavement footprint also reduces ongoing life-cycle maintenance and snow removal costs for the Airport.

Figure 5-3: Landside Alternative 1



CENTURY WEST ENGINEERING

Figure 5-4: Landside Alternative 2

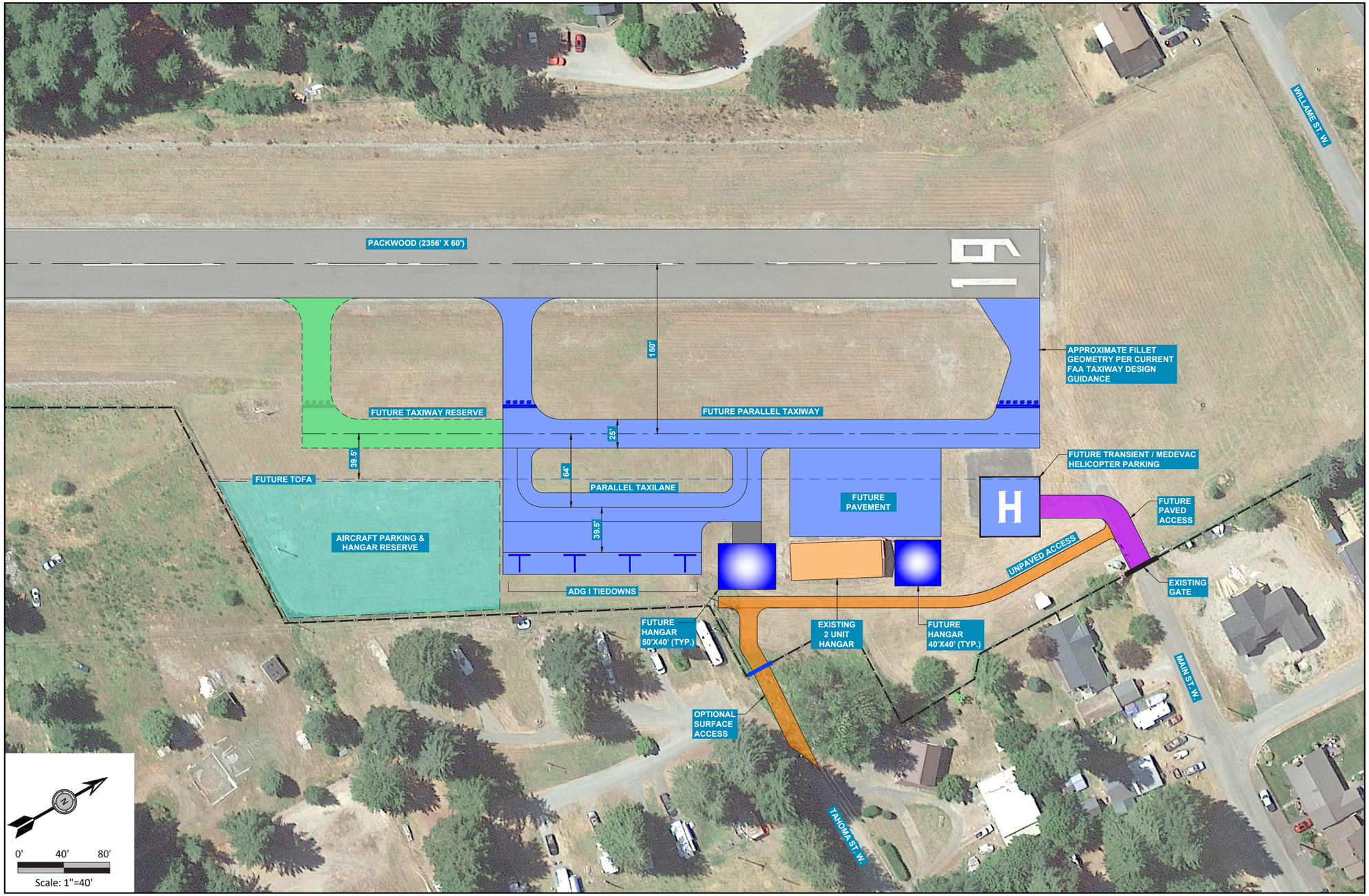
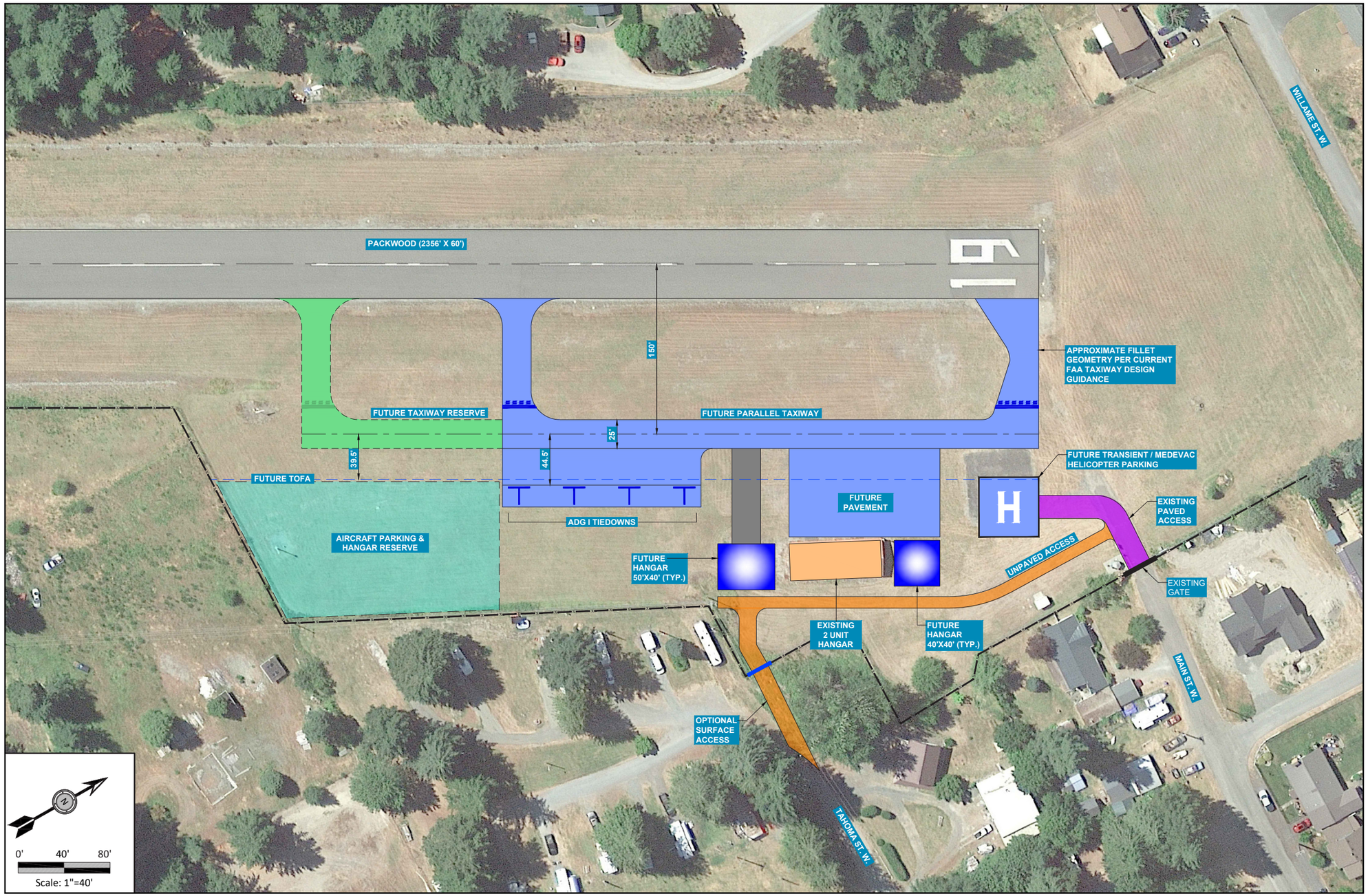


Figure 5-5: Landside Alternative 3



Preferred Alternative Summary

The preliminary development alternatives were presented for public review and comment at a July 11, 2023, master plan project PAC meeting. The project meeting was held both virtually and in person, with links provided to access the presentation materials and supporting documents. Project materials were subsequently posted on the Lewis County master plan project website. Project-related comments and questions have continued to be accepted until the airport master plan is finalized.

Lewis County reviewed the preliminary alternatives and selected a combination of **Airside Alternative 1** and **Landside Alternative 3** as the preferred alternative for further refinement and incorporation into the ALP drawing set and the master plan's 20-year Capital Improvement Program (CIP). **Figure 5-6** depicts the recommended improvements for the current 20-year planning period. Further refinement of the development concept is ongoing as the ALP is finalized. The recommended preferred alternative will be reviewed by the FAA Seattle Airport District Office (ADO). Minor refinements to the preferred alternative may be incorporated into the final ALP, as needed, to reflect ongoing airport activities and coordination with FAA.

The following improvements are included in the preferred alternative:

- Runway 01/19 – maintain existing length and width; realign roads within OFA to improve surface conditions.
- The new road connection between Tumac Street and Willame Street to be completed as part of vacating the section of Willame Street was modified by Lewis County staff to provide a more direct route. This route will require acquisition of the county road right-of-way (ROW) within an existing private land parcel.
- Taxiway – Construct a new partial-length east parallel taxiway at the Runway 19 end with two exit taxiway connections to facilitate aircraft movement between the runway, taxiway, and the adjacent landside facilities.
- Signage/Markings – Add FAA-recommended signage and markings to runway/taxiway system.
- Main Apron – Construct small airplane tiedown apron and taxilanes to accommodate small aircraft parking and hangars.
- Helicopter Parking – Construct a 52x52-foot concrete pad to accommodate transient helicopter parking (including MEDEVAC helicopters). Upgrade with paved access to existing gate and Main Street.
- Hangars – Development areas for additional hangar construction compatible with planned apron and taxiway/taxilane improvements.

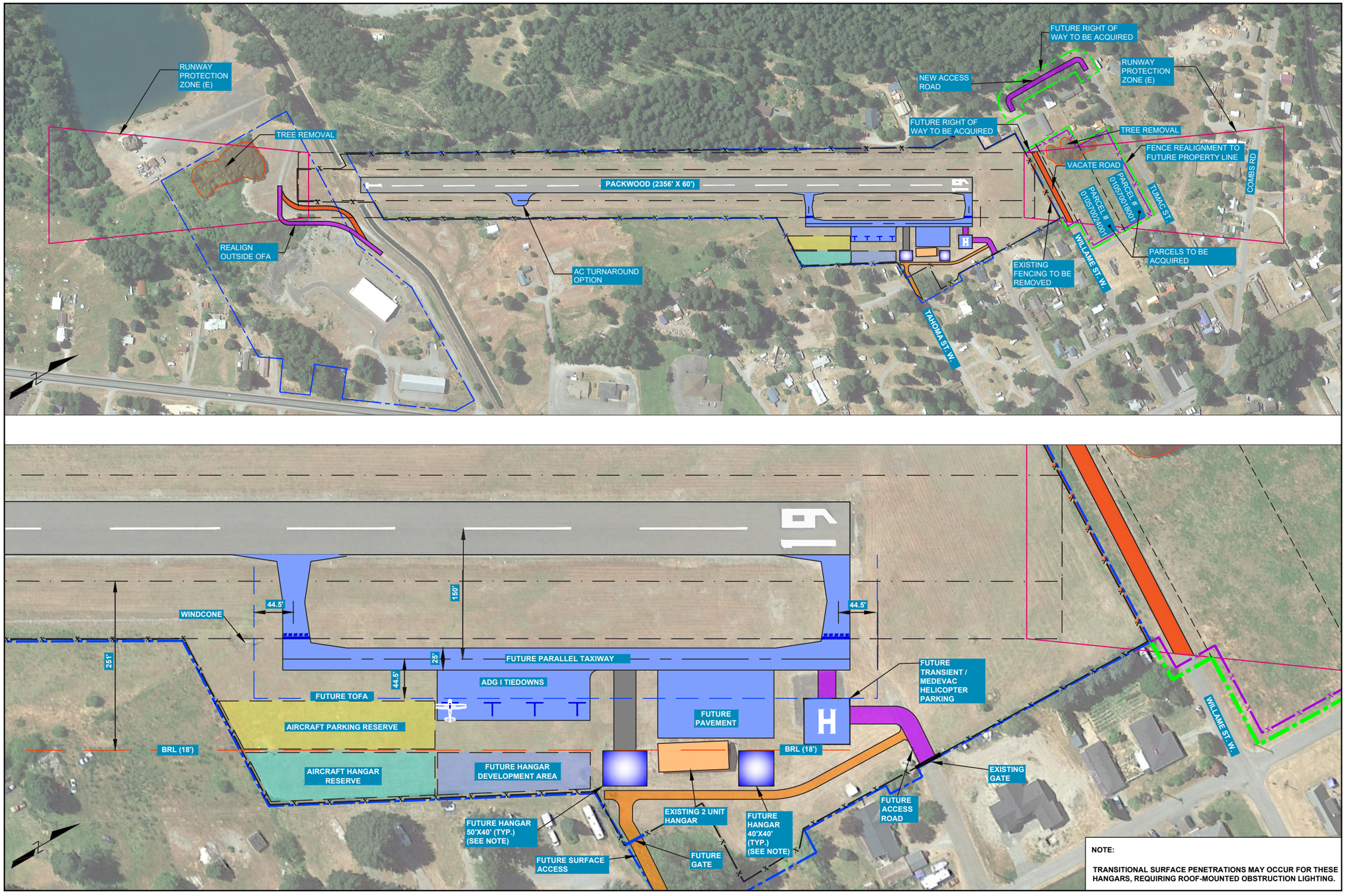
Next Steps

This draft Alternatives Analysis chapter presented the preliminary alternatives and a summary of the preferred development elements supported by Lewis County. This chapter has been submitted to the FAA for review and comment.

The following steps are required for project completion:

- Prepare project cost estimates and the 20-year CIP (see Chapter 6)
- Update ALP with recommended future improvements and AGIS survey data (see Chapter 7)
- Submit final draft of the Airport Master Plan Report and ALP to Lewis County and FAA for review
- FAA completes formal review and provides preliminary ALP approval
- Lewis County and FAA approve the Final ALP
- Documents revised as required; Final Airport Master Plan Report and ALP published

Figure 5-6: Preferred Alternative



Chapter 6
Implementation Plan

Introduction

The purpose of this chapter is to present the proposed implementation program for the 2022-2042 Packwood Airport Master Plan. The main feature of this information is the 20-year Airport Capital Improvement Program (ACIP) that was developed based on the analyses conducted in the Facility Requirements and Development Alternatives evaluations (Chapters 4 and 5).

The ACIP projects are summarized in **Table 6-1**, later in the chapter. The ACIP is organized into near term and long-term planning periods that reflect project prioritization and Lewis County's ability to support the proposed financial investments.

Several factors were considered in determining project prioritization, including safety, forecast demand, the need to maintain/ replace existing airfield facilities, and financial capabilities of both Lewis County and FAA to support the development program based on existing funding sources. Minor pavement maintenance items such as vegetation removal and crack filling are not included in the ACIP but will need to be undertaken by the County on an annual or semi-annual basis.

Airport Development Schedule and Cost Estimates

Cost estimates for each individual project were developed in 2023 dollars based on typical construction costs associated with the specific type of project. The project costs listed in the ACIP represent order-of-magnitude estimates that approximate design, engineering, environmental, other related costs, and contingencies. The estimates are intended only for preliminary planning and programming purposes. Specific project analysis and detailed engineering design will be required prior to project implementation to provide more refined and detailed estimates of the development costs.

These cost estimates can continue to assist management through adjustments to the 2023-dollar amounts to account for subsequent inflation as the plan is carried out in future years. This can be accomplished by converting the appropriate change in the United States Consumer Price Index (USCPI) to a multiplier using the following formula:

$$\frac{X}{I} = y$$

Where:
X = USCPI in any given future year
Y = Change Ratio
I = Current Index (USCPI)[1]

USCPI-U
301.744
(1982-1984 = 100)
March 2023

Multiplying the change ratio (Y) times any 2023-based cost estimate presented in this study will yield the adjusted dollar amounts appropriate in any future year evaluation. Several different CPI-based indices are available for use and any applicable index may be substituted by the airport sponsor in its financial management program.

The following sections outline the recommended development program and funding assumptions for the near-term and long-term projects. Overall project scheduling is defined based on the facility requirements needs identified in the master plan evaluation. The projected staging of development projects is based on a combination of needs, development priorities, and anticipated funding.

ACIP PROJECTS

The ACIP projects in **Table 6-1** are summarized below for short-term and long-term periods. The summaries provide a general time frame for implementation of individual projects. However, the actual timing for project implementation is subject to change, based on a variety of factors including availability of funding. Projects that are not completed during the current 20-year planning period will be reevaluated based on need, with determinations on future timing made by Lewis County.

Short-Term Projects (Years 1-5)

The main priority in the initial five years of the planning period is to construct hard surfaced taxiway and aircraft parking aprons. The collocated projects are located near the north end of the runway, and include a partial length parallel taxiway, small airplane tiedown apron, and helicopter parking apron. Completing an environmental assessment and the design phase for the project is the first project in the near-term period for the Airport, followed by construction. Selective tree removal/lowering within the Runway 01 approach is a high priority to maintain operational safety for the runway.

Long-Term Projects (Years 6-20)

The long-term development program includes several projects intended to improve airport access and security. These include adding new vehicle/pedestrian access gates on Tahoma Street and upgrading the existing manual swing gate on Main Street with an automated gate (card swipe or keypad). Constructing a paved internal roadway inside the Main Street gate is recommended to access the future helicopter parking apron.

As noted earlier, a portion of the existing gravel access road located beyond the south end of the runway is located within the runway object free area (OFA) and the runway primary surface. This road extends along the south side of the adjacent tailrace canal and provides access to on-airport industrial park users and several adjacent private parcels located west of the runway. Realigning a small section of the roadway is recommended to clear the OFA.

1 U.S. Consumer Price Index for All Urban Consumers (USCPI-U)

A 300-foot section of Willame Street, located immediately beyond the north end of Runway 01/19, is recommended to be vacated, with replacement access to the affected land parcels (west of the Airport) provided through a new connection at the west ends of Willame Street and Tumac Street. The vacated street right of way (ROW) would be incorporated into the Airport itself and cleared to meet FAA standards. Airport fencing would be extended to include adjacent Lewis County property north of Willame Street, which is recommended to be incorporated into the Airport. The future road connection would require ROW acquisition on adjacent private property.

Most of the remaining longer-term projects are related to maintenance of the runway, taxiway, and apron pavements and life cycle replacement of lighting systems. Other projects include selective tree clearing in the Runway 19 (north) approach. A small aircraft turnaround is proposed to be added to the southern 1/3 of the runway to facilitate aircraft movement (turnaround, back-taxiing) on the runway.

Table 6-1: 20-Year Capital Improvement Program - Probable Funding Sources

Project #	Short Term Projects (2023-2027)	FAA	Local	Total Project Costs
1	Environmental - Partial Length Parallel Taxiway, Tiedown Apron, and Helicopter Parking	$161,700	$17,966	$179,666
2	Design - Partial Length Parallel Taxiway, Tiedown Apron, and Helicopter Parking	$342,804	$38,089	$380,893
3a	Construction - Tiedown Apron	$651,543	$72,394	$723,937
3b	Construction - Partial Length Parallel Taxiway	$1,372,851	$152,539	$1,525,390
3c	Construction - Helicopter Parking Apron	$509,757	$56,639	$566,396
4	Tree Removal (South Approach)	$84,348	$9,372	$93,719
	SHORT-TERM TOTAL (1-5 Years)	**$3,123,002**	**$347,999**	**$3,470,001**
Project #	**Long Term Projects (2028-2043)****	**FAA**	**Local**	**Total Project Costs**
5	Main Entrance Vehicle Access Gate Replacement (Automated)	$123,503	$13,723	$137,226
6	Secondary Vehicle Access Gate (Automated)	$116,864	$12,985	$129,849
7	Terminal Area Internal Access Road Design and Construction	$82,834	$9,204	$92,038
8	South Road (Gravel) Realignment (Outside of OFA)	$110,230	$12,248	$122,478
9	Vacate Willame Street (300' @ North Runway End) /Construct New Connection between west end of Tumac and Willame Streets, west of runway	$1,103,833	$122,649	$1,226,482
10	Aircraft Turnaround (southern 1/3 of runway)	$631,427	$70,159	$701,586
11	Runway 1/19 Maintenance – Sealcoat, Crack fill, and Markings	$497,431	$55,270	$552,701
12	Paved Pad for Existing Hangar	$772,166	$85,796	$857,962
13	Runway 1/19 Overlay and Markings	$1,068,392	$118,711	$1,187,103
14	MIRL Replacement (LED)	$855,232	$95,026	$950,258
15	Taxiway and Apron Maintenance – Sealcoat, Crack fill, and Markings	$347,117	$38,569	$385,686
16	Beacon Replacement (LED)	$408,577	$45,398	$453,975
17	Supplemental Lighted Wind Cones	$201,191	$22,355	$223,546
18	Airport Wildlife Fencing Replacement	$1,107,387	$123,043	$1,230,430
19	Taxiway and Apron Maintenance – Sealcoat, Crack fill, and Markings	$347,117	$38,569	$385,686
20	Tree Removal (North Approach)	$54,000	$6,000	$60,000
	LONG-TERM TOTAL (6-10 Years)	**$7,827,304**	**$869,701**	**$8,697,006**
	20-YEAR CIP TOTALS	**$10,950,306**	**$1,216,701**	**$12,167,007**

*Typical FAA/local split for eligible projects is 90%/10%
**Long-term projects include design, construction, and environmental
*** All projects include sales tax

Capital Funding Sources & Programs

FAA grants provided through the federal Airport Improvement Program (AIP) are the primary source of funding for public use airports in the federal airport system. **Table 6-1** identifies the typical federal and local share of project costs based on current funding formulas. It is important to note that overall project eligibility for FAA funding does not guarantee availability of funding within the defined twenty-year time frame of the master plan.

FEDERAL GRANTS

The current AIP, reauthorized in 2024, is the latest evolution of a funding program originally authorized by Congress in 1946 as the Federal Aid to Airports Program (FAAP). Other appropriations of AIP funds go to states, general aviation airports, commercial service airports, and for noise compatibility planning. Any remaining AIP funds at the national level are designated as Discretionary funds and may be used by the FAA to fund eligible projects. Discretionary funds are typically used to enhance airport capacity, safety, and/or security and are often directed to specific national priorities such as the recent program to improve runway safety areas. AIP funds can only be used for eligible capital improvement projects and may not be used to support airport operation and maintenance costs. AIP funding for eligible projects is described in FAA Order 5100.38D (Change 1), *Airport Improvement Program Handbook*.

Funds for the AIP are derived from the Airport and Airway Trust Fund, which is supported by user fees, fuel taxes, and other similar revenue sources. Currently, AIP grants cover 90% of eligible project costs for general aviation airports like Packwood Airport.

The FAA Reauthorization Act of 2024 extends funding through fiscal year 2028, increasing AIP funding from $3.35 billion annually to $4 billion. AIP funding programs for general aviation (GA) airports include:

- **AIP General Aviation Non-Primary Entitlement (NPE) Grants:** The AIP provides Non-Primary Entitlement (NPE) funds for general aviation airports based on fixed amount of $150,000 per year. The NPE funds can be carried over for up to four years, or a maximum of $600,000. Unused NPEs may be “donated” to other GA airports within the state through the ADO, or the funds revert into a national pot for reallocation among all FAA regions.
- **AIP Discretionary Grants:** The AIP provides Discretionary funds to airports for projects that have a high federal priority or to enhance safety, security, or capacity. These grants are over and above NPE funding. Discretionary grant amounts can vary significantly compared to NPE and are awarded at the FAA’s sole discretion. Discretionary grant applications are evaluated based on:
  - » Need;
  - » The FAA’s project priority ranking system; and
  - » The FAA’s assessment of a project’s significance within the national airport and airway system.
- **FAA Facilities and Equipment Funds:** Additional funds are available under the FAA Facilities and Equipment (F&E) program to purchase navigational aids and air safety-related technical equipment, including Airport Traffic Control Towers (ATCTs) for use at commercial service airports in the National Airport System. Each F&E project is evaluated independently using a cost-benefit analysis to determine funding eligibility and priority ranking. Qualified projects are funded in total (i.e., 100 percent) by the FAA, while remaining projects would likely be eligible for funding through the AIP or PFC programs. In addition, an airport can apply for NAVAID maintenance funding through the F&E program for those facilities not funded through the F&E program.

FAA funding is limited to projects that have a clearly defined need and are identified through preparation of an FAA approved Airport Layout Plan (ALP). Periodic updates of the ALP are required when new or unanticipated project needs or opportunities exist that require use of FAA funds and to reflect the status of completed projects. The FAA will generally not participate in projects involving vehicle parking, utilities, building renovations, or projects associated with non-aviation development. Projects such as hangar construction or fuel systems are eligible for funding, although the FAA considers these types of projects as a much lower priority than other airfield needs.

As part of the economic recovery response to the COVID-19 pandemic, several supplemental funding programs were introduced that benefited airports. These included the American Rescue Plan (APRA) and the Bipartisan Infrastructure Law (BIL). These grant programs created temporary funding streams for airports beyond traditional AIP funding.

Airport sponsors accept obligations (grant assurances) when accepting FAA AIP grants. A summary of the applicable grant assurances is provided in **Appendix D.**

STATE FUNDING

The Washington State Department of Transportation - Aviation Division (WSDOT Aviation) provides an additional source of funding for airport projects in the form of grants through its Airport Aid Grants program. The Aviation Division has established grant criteria for airport sponsors requesting aid to define projects related to pavement, safety, maintenance, security, or planning.

Although Aviation Division funding is distributed widely to general aviation airports throughout the state, predicting any consistent level of funding for purposes of long-term financial planning is not possible. Competition for the limited grant funds is consistently high, with priority often given to airports with limited resources or to airports that are not eligible to receive FAA grants. Project funding is determined on a case-by-case basis and is affected by overall funding levels and competition among airports during any state budget cycle (biennium).

The current maximum grant award through the Aviation Division is $750,000. Due to the volume of grant applications received in any given cycle, large grant awards under this program remain relatively uncommon.

The WSDOT Aviation webpage provides the following information:

> *"On projects seeking state funds only, the airport sponsor must contribute a minimum 5 percent match of the entire project cost. If the sponsor is able, and would like to contribute a larger match amount, they certainly can and will receive additional points towards their total project application score during WSDOT Aviation's prioritization review of all grant applications.*
>
> *For projects receiving federal funds, it has been a long-standing practice of the Airport Aid Program to support airports in matching their Airport Improvement Program (AIP) grants. Currently, AIP grants require 10 percent of the project total to come from the airport sponsor. WSDOT supports grants to airports for up to half of their match requirement."*

For long-term planning purposes, the local share (10%) of FAA-eligible projects is assumed to be evenly split (5%/5%) between local and state levels in the updated CIP. However, since available funding levels in the state grant program may vary year to year, it is recommended that whenever possible, Lewis County manage its capital program where WSDOT grants are supportive, but not essential to fully fund the local match required for FAA grants.

When WSDOT Aviation Division grant requests are successful, the required Lewis County expenditure (local match) for FAA grants or funding non-FAA eligible projects will be reduced.

Community Aviation Revitalization Loan Program (description provided by WSDOT)

The new Community Aviation Revitalization Loan Program was established by EHB 1102 and funded initially with $5 million. The revolving loan program is for revenue-producing capital projects that help public-use general aviation airports become more self-sustainable. The program funds are distributed with the guidance of the Community Aviation Revitalization Board (CARB).

As currently authorized, the program provides loans up to $750,000 at 3% interest to airports with less than 75,000 annual commercial enplanements, as reported to the FAA. Loans can have a maximum 20-year loan period and recipients can opt to have up to a 3-year loan repayment grace period. Loan recipients must commit to providing public access to the airport for a period of time equivalent to one and one-half times the length of the loan. Eligible projects can include hangars, fueling facilities, business parks on airport property, paid parking facilities, passenger amenities, and other revenue-generating or cost-cutting developments that help make the airport more self-sustaining and less dependent on public funding.

State Capital Improvement Program (SCIP)

The FAA's Seattle Airports District Office (ADO) coordinates its capital improvement programming with state aviation agencies in Washington and Oregon. The coordinated program is known as the "state" capital improvement program, or "SCIP." The SCIP is the primary tool used by FAA, state aviation agencies, and local airport sponsors to prioritize current and near-term future funding decisions through evaluation formulas and ongoing coordination. Airport sponsors provide annual updates to the short-term project lists in order to maintain a current system of defined project needs. For Washington airports, the FAA and WSDOT Aviation schedule annual "joint planning conferences" (JPC) with airport sponsors to update the regularly SCIP.

LOCAL FUNDING

The locally funded portion of the CIP for the 20-year planning period is estimated to be approximately $1.22 million, as currently defined. Local matching funds are generated through airport operating revenues and may include other capital funds, interfund loans or the issuance of long-term debt (revenue or general obligation bonds). The WSDOT CARB loan program is a similar form of long-term debt available to support eligible projects at Washington GA airports.

CASH FLOW ANALYSIS

The current revenues generated through operations at Packwood Airport are limited to rental for the county-owned 2-unit aircraft storage hangar, and periodic day-use fees paid by the USDA Forest Service for use of the Airport to support helicopter wildfire response activities. In 2022 and 2023, non-emergency use of the Airport was suspended for several weeks in late summer/early fall and the runway was used to support emergency flight activity for several large firefighting helicopters. Fire activity cannot be predicted since many non-airport factors determine aeronautical demand in any given year. In a non-fire year, annual operating revenues at Packwood Airport currently total less than $2,000. The fire-related revenue for the Airport in 2022 and 2023 averaged about $3,500, which increased annual operating revenues above $5,000. Revenue generated in the Airport's south industrial area contributes to Lewis County's general financial support for the Airport.

Operating expenses for Packwood Airport total approximately $30,000 annually, not including one-time capital expenditures. Expenses consist primarily of staff and contract labor, repair and maintenance items, and internal transfers (services provided by other Lewis County departments/staff). The County balances its operating budget and provides additional matching funds for FAA/WSDOT grants, through general fund transfers.

Future revenue-generating opportunities at the Airport may include ground leases associated with any new (private) hangar construction and continued build-out of the south industrial area development. However, based on the limited scale and incremental pace of new development, future airport revenues are not expected to increase significantly during the current planning period.

Chapter 7

Airport Layout Plan

Introduction

This chapter presents the Airport Layout Plan (ALP) drawing set for Packwood Airport (55S). The ALP set includes individual drawings that provide specific information related to the existing conditions and recommended improvements for the Airport, developed through airport master plan evaluations.

The future airfield configuration presented in the ALP reflects the preferred alternative selected by Lewis County, with input provided by the Federal Aviation Administration (FAA), airport stakeholders, airport users, and members of the community. The analyses and findings of the previous chapters provided the technical and policy guidance required to support the ALP's development.

The following sheets make up the ALP set for Packwood Airport:

- Sheet 1 – Title Sheet
- Sheet 2 – Airport Data Sheet
- Sheet 3 – Airport Layout Plan
- Sheet 4 – Terminal Area Plan
- Sheet 5 – Airport Airspace Plan (Part 77)
- Sheet 6 – Runway 1/19 Approach Plan & Profile
- Sheet 7 – Runway 1/19 Inner Approach Surface Plan & Profile
- Sheet 8 – On-Airport Land Use Plan
- Sheet 9 – Off-Airport Land Use Plan
- Sheet 10 – Exhibit A - Airport Property Inventory Map
- Sheet 11 – Airspace Obstruction Data Tables (1 of 3)
- Sheet 12 – Airspace Obstruction Data Tables (2 of 3)
- Sheet 13 – Airspace Obstruction Data Tables (3 of 3)

A brief summary of the individual drawings is provided below:

Title Sheet (Sheet 1 of 13)

The Title Sheet serves as an introduction to the ALP drawing set. It includes airport location and vicinity maps, and an index of the drawings. The FAA ALP approval letter is embedded into the Title Sheet, in leu of signing the individual ALP sheets.

Airport Data Sheet (Sheet 2 of 13)

The Airport Data Sheet summarizes existing and future runway and taxiway dimensions, applicable FAA dimensional standards, and other data reflected in the ALP drawing set. An all-weather (VFR+IFR) wind rose is provided, based on best available data and the existing runway orientation.

Airport Layout Plan (Sheet 3 of 13)

The ALP drawing graphically depicts existing and future airfield facilities and their associated protected surfaces and development setbacks. Future facilities are color-coded to distinguish them from existing facilities. Future facilities depicted on the ALP are included in the airport master plan's 20-year capital improvement program (CIP), as individual projects or project groupings. All airfield facilities are configured to meet FAA airport design standards consistent with small single engine aircraft and visual operations (AAC/ADG A-I small).

No physical changes to Runway 1/19 or its existing lighting systems are recommended. Improvements to the existing runway object free area (OFA) are recommended and consist of clearing the OFA of obstacles (fences, roads (vehicles). Information about proposed changes to existing roads is provided later in this section.

A future partial length east parallel taxiway is planned at the north end of the runway, adjacent to existing and future landside facilities. The parallel taxiway will improve aircraft access and circulation on the runway and provide hard surfaced access to aircraft hangars and parking areas from the runway. The taxiway will be constructed in conjunction with a new airplane tiedown apron, a dedicated helicopter parking apron, and taxilane access to existing and future hangar sites. A small aircraft turnaround is recommended for the southern one-third of the runway to facilitate aircraft movements while taxiing/back taxiing on the runway to/from the taxiway.

Several landside improvements (hangar sites, aircraft parking, etc.) are planned in the terminal area. Additional details for these facilities are provided on the Terminal Area Plan drawing (Sheet 4).

Changes to existing roads are recommended to address non-standard conditions (obstructions) in the runway object free area at both ends of the runway. A future connection between Willame and Tumac Streets is proposed to maintain surface access to private land parcels when a section of Willame Street is vacated beyond the end of Runway 19. The construction of the new connection requires right of way acquisition and additional study to determine the final road alignment. A proposed realignment of a gravel road at the south end of the runway can be completed entirely within airport property. The addition of a second surface access point for the Airport is proposed from the Tahoma Street and Highway 12 connection. Improvements to internal surface roads in the terminal area are also proposed.

Terminal Area Plan (Sheet 4 of 13)

The Terminal Area Plan provides additional detail for existing and new landside facilities depicted on the ALP drawing, focusing on the main apron area and adjacent facilities (hangar, helicopter landing pad, and small aircraft tiedowns). The drawing depicts a future reconfiguration of aircraft parking and taxilane access to accommodate a variety of aircraft types (e.g., small aircraft, and helicopters). All future landside facilities are configured to be fully compatible with the planned parallel taxiway OFA clearances.

A minor reconfiguration of the terminal area is recommended to accommodate new facilities. The existing small hard surfaced apron will be removed to accommodate reconfigured taxilanes and apron development. The primary terminal area components include several new hard surface facilities:

- Small Aircraft Tiedown Apron (4 tail-in spaces)
- Helicopter Parking Apron (small/medium size helicopter)

- Parallel Taxiway (with two connections to runway)
- Additional hard surface areas for hangar access (some tenant developed)
- Upgraded vehicle gate and hard surfaced access to helicopter parking apron (Main Street entrance)

Development reserves are also recommended to protect the Airport's ability to accommodate long-term hangar and aircraft parking needs beyond the improvements described above.

Airport Airspace Plan (Part 77) (Sheet 5 of 13)

The Part 77 Airspace Plan depicts the five "imaginary surfaces" for Runway 1/19, as codified in Title 14 of the Code of Federal Regulations (CFR), Part 77 - Safe, Efficient Use and Preservation of the Navigable Airspace. The surfaces defined in Part 77.25 include the primary, transitional, approach, horizontal, and conical surfaces. These surfaces were previously described in the Facility Requirements chapter.

The Part 77 surfaces for Runway 1/19 are defined by future approach capabilities and the size of aircraft using the runway. Based on the activity documented in the master plan's FAA-approved aviation activity forecasts, Runway 1/19 is designated as a "Utility" runway, which is designed to accommodate predominantly small aircraft (≤12,500 pounds). Runway 1/19 is also designated a "visual" runway, based on its current and future approach capabilities. All Part 77 elevations correspond to the airfield elevation, which at Packwood Airport is the high point (north end) of Runway 1/19.

An Airports GIS survey, completed in 2023 as part of the master plan, provides detailed data for airfield facilities, built items, and natural items, such as trees and terrain. The drawing depicts large areas of terrain penetration, particularly east and west of the runway, where high elevations rise above the Cowlitz River drainage. The Airspace Plan is supplemented by obstruction tables (see Sheets 11, 12, 13) detailing surveyed obstacles with recommended (standard) dispositions.

The drawing includes a grid system for areas with significant (multiple) obstacles. The number in each grid matches the obstacle ID in the obstruction tables, which references the most penetrating obstacle in each grid cell. The grid also coincides with areas of mountainous terrain surrounding the runway found to penetrate one or more Part 77 airspace surfaces.

Due to the scale of the drawing, not all obstacles in the primary, approach, and transitional surfaces are identified on this sheet. The obstacles located in these surfaces are depicted in a larger scale on the runway plan and profile drawings (Sheets 6 and 7).

Part 77 surfaces should be free of built or terrain obstructions to the greatest extent possible. Objects that penetrate Part 77 surfaces may require action to mitigate (remove, obstruction light, etc.) depending on their severity, location, and the feasibility of the action. It is recognized that Runway 1/19 is located in an area of mountainous terrain that prevents providing obstruction-free Part 77 airspace surfaces. It is also noted that many of the trees identified as obstructions in the survey are located on penetrating terrain that cannot be substantially mitigated. The net benefit of lowering or removing individual trees within a larger area of penetrating terrain would need to be determined as part of any potential obstacle mitigation.

The following Part 77 surfaces are defined for Runway 1/19, based on its ultimate Utility-Visual airspace:

- **Approach Surfaces:** Runway approach surfaces are defined along the common approach path to a runway end. The approach surfaces for Runways 1 and 19 extend 5,000 feet from the ends of the primary surface at a slope of 20:1, which represents the horizontal distance required for each increment of vertical rise. For Utility runways, 20:1 approach slopes are standard for both visual and non-precision instrument approaches. A total of 82 surveyed items, including trees, fences, buildings, and roads (vehicles) are identified as obstacles within the approach surfaces, with penetrations ranging from less than 1 foot to 140 feet. Sheets 6 and 7 provide detailed plan and profile views of charted obstructions.
- **Primary Surface:** The primary surface is a flat plane of airspace centered on the runway, with the same elevation as the nearest point on the runway centerline. For Runway 1/19, the primary surface is 250 feet wide and extends 200 feet beyond each end of the runway. Seven (7) surveyed obstacles (fence, sign, trees) are identified within the primary surface, with penetrations ranging from 6 to 28 feet. Sheet 6 identifies surveyed obstructions in the plan view.

- **Transitional Surface:** The transitional surface extends outward and upward from each side (outer edges) of the primary surface at a slope of 7:1. The transitional surface extends upward to 150 feet above airfield elevation, where it connects to the horizontal surface. A total of 64 surveyed items (44 trees, the airport beacon and windsock, 11 power poles, the airport flagpole, and one off-airport building) are identified as obstacles or groupings of obstacles within the transitional surface, with penetrations ranging from 2 to 134 feet. The windsock location is "fixed by function" and would typically be fitted with a frangible (breakable) mount and a red obstruction light. Sheet 6 identifies surveyed obstructions in the plan view.
- **Horizontal Surface:** The horizontal surface is a flat plane of airspace that is established 150 feet above airport elevation. The horizontal surface for Runway 1/19 is drawn from 5,000-foot radii that extend from both ends of the primary surface, connected by tangential lines to form an oval. The outer ends of the horizontal surface are overlapped by the outer ends of the visual 20:1 approach surfaces, which rise 93 to 100 feet above the horizontal surface for Runway 1/19. A total of 53 surveyed items (50 trees, 2 buildings, 1 chimney on building) are identified as obstacles or groupings of obstacles within the horizontal surface, with penetrations ranging from less than 1 foot to 256 feet.
- **Conical Surface:** The conical surface is a band of upwardly sloping airspace that abuts the outer edge of the horizontal surface, extending outward for 4,000 feet at a slope of 20:1. 129 items are identified as obstacles or groupings of obstacles (124 trees, 4 buildings, 1 antennae) with penetrations ranging from less than 74 feet to 1,087 feet.

Runway 1/19 Approach Plan & Profile (Sheet 6 of 13)

The Approach Plan and Profile drawing depicts detailed plan and profile views of the existing/future approach surfaces and threshold siting surfaces for Runway 1/19. The drawing identifies penetrating obstacles and non-penetrating obstacles (provided for reference only) for the 20:1 approach and threshold siting surfaces. The obstruction tables for the runway approaches, with recommended dispositions, is provided on Sheet 11.

Runway 1/19 Inner Approach Surface Plan & Profile (Sheet 7 of 13)

The Inner Approach Surface Plan and Profile drawing depicts detailed plan and profile views of the inner portions (inner 2,000 feet) of the existing/future approach surfaces and threshold siting surfaces, and the full plan view of the runway protection zones (RPZs). The drawing identifies penetrating obstacles and non-penetrating obstacles (provided for reference only) for the surfaces. The obstruction tables for the runway approaches, with recommended dispositions, is provided on Sheet 11.

On-Airport Land Use Plan (Sheet 8 of 13)

The On-Airport Land Use Plan depicts land use categories common to general aviation airports, including:

- Airport Operations Area (runway, taxiway and protected areas)
- Runway Protection Zone (defined surfaces at runway ends)
- Aeronautical Development (aviation related development; hangars, aircraft parking, etc.)
- Aeronautical Compatible Non-Aviation Facilities (development that is compatible with the airfield's primary aeronautical functions)

The land use classifications are consistent with the ALP drawing and reflect both existing and future facilities. The airport operations areas and RPZs are intended to protect the function of the runway-taxiway system. All aircraft parking and hangar development is located in the aeronautical development area. Areas suitable for aeronautical compatible non-aviation development are identified primarily at the south end of the Airport.

Off-Airport Land Use Plan (Sheet 9 of 13)

The Off-Airport Land Use Plan depicts the land use/zoning for the Airport and surrounding areas, consistent with a 2024 comprehensive plan amendment. The current/future Part 77 airspace surfaces for Runway 1/19 are depicted. As noted earlier, Lewis County has land use jurisdiction for Packwood Airport and the surrounding area.

An amendment to the Lewis County Comprehensive Plan, incorporating the Packwood Subarea Plan was adopted by the Board of County Commissioners on January 2, 2024 (Ordinance 1350). Updated land use designations were proposed to better align with current and future development needs, while maintaining the rural character of the

community. The subarea plan included a future land use map (Map 11) that defines the Airport District (AX) and recognized common land uses compatible with airport operations. The ordinance states that "the proposed changes in zoning shown in Map 11, to be implemented by a separate ordinance following the adoption of the subarea plan…" The definition of an implementing zone is anticipated that is consistent with the AX land use designation and clearly defines permitted uses and development conditions for Packwood Airport.

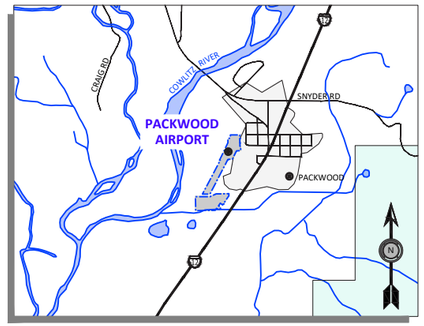
The areas surrounding the Airport have a variety of rural land use designations supporting low density commercial, residential, mixed-use and resource uses. A change to the traffic pattern for Runway 1/19 is depicted based on the proposed creation of "right traffic" for Runway 19 operations. The proposed change (pending FAA approval) would establish the pattern on the west side of the runway, which reduces direct overflights for residential areas. The west side traffic pattern is currently in use for operations on Runway 1 for left traffic (left turns). The same traffic pattern would be used for Runway 19 operations with right turns (right traffic). This change in the airport traffic pattern would effectively keep most aircraft west of Highway 12 and large areas of future residential land use.

Exhibit A - Airport Property Plan (Sheet 10 of 13)

The Exhibit A - Airport Property Plan depicts all property owned or controlled by Lewis County. The drawing notes the form of ownership or control (fee simple, easement, etc.), the date of acquisition per FAA guidelines, and the purpose for ownership. Total airport acreage is recorded as 39.64± acres, with transfer of ownership (from WSDOT to Lewis County) for the main section of the Airport listed as 1982.

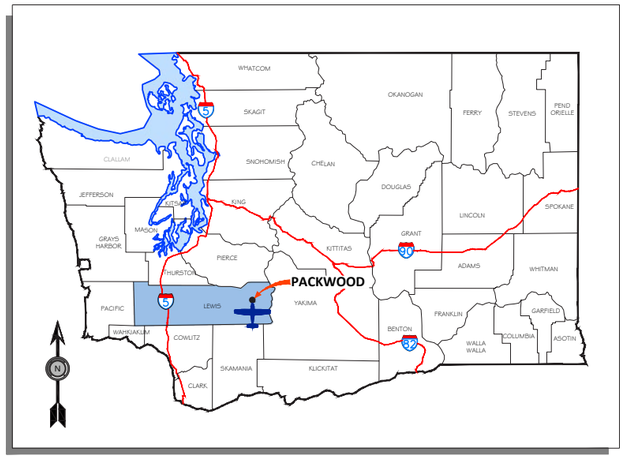
Airspace Obstruction Data Tables (Sheets 11-13 of 13)

The obstacles depicted on several airspace-related drawings in the ALP set are presented in tabular form on three separate drawings. The listed obstructions are organized by their respective Part 77 surface category. The location, elevation information, and proposed disposition for each obstruction is noted.



VICINITY MAP

AERIAL PHOTO



LOCATION MAP

PACKWOOD AIRPORT (55S)
AIRPORT LAYOUT PLAN

LEWIS COUNTY, WASHINGTON
AIP NO. 3-53-0156-012-2022
AIRPORT MASTER PLAN
JANUARY 2024

SHEET INDEX

FAA APPROVAL LETTER

ALP APPROVAL

Packwood Airport I Packwood, Washington

July 19th, 2024

Background

The updated Airport Layout Plan (ALP) for the Packwood Airport (55S) represents changes to the landside areas of the airport. These changes were developed based on the conclusions of an airport master plan completed over the course of 2022 and 2023. An aeronautical study (2024-ANM-1860-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.

ALP

Major changes in this 2024 ALP from the previous version (2009 ALP) include:

Sheet 3 - Airport Layout Plan

- No change to existing Runway 1/19;
- Partial length parallel taxiway (reduced from a full-length parallel taxiway depicted in 2009);
- New aircraft tiedown apron (4 spaces);
- New Helicopter parking apron;
- Hangar sites;
- Vehicle access roads and parking upgrades;
- Vacate section of Willame St W (at north end of the runway) replacement access;
- Realignment of road outside of ROFA (at south end of the runway); and
- 0.37 Acres of property acquisition (vacated road section of Willame St W).

Sheet 4 - Terminal Layout Plan

- Added a sheet for the Terminal Aera Plan.

Sheet 8 - On Airport Land Use Plan

- Added a sheet for the On Airport Land Use Plan.

Sheet 9 - Off Airport Land Use Plan

- Updated local zoning;
- Proposed change in airport traffic pattern (Right Traffic Runway 19).

Sheet 10 - Exhibit A Property Plan

- Added parcels transferred to airport ownership under Resolution No.19-103 (16.72 acres);
- Depicted proposed and existing easements.

Sheet 11, 12 & 13 - Obstruction Tables

- Added sheet 11, 12 & 13 cataloging obstructions (2023 AGIS Survey).

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.

Signature Blocks

The FAA signature below acknowledges approval of the ALP.

FAA: Agnes Fisher, Community Planner – SEA ADO

Agnes O. Fisher — Digitally signed by Agnes O. Fisher, Date: 2024.07.19 13:09:04 -07'00'

Airport Sponsor: Lewis County, Josh Metcalf, Public Works Director

07/18/24

Consultant: Century West Engineering, Samantha Peterson, Project Manager

Samantha Peterson — Digitally signed by Samantha Peterson, Date: 2024.07.19 12:45:19 -07'00'

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NO.	DATE	BY	APPR	REVISIONS

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LEWIS COUNTY APPROVAL

APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING

BEND OFFICE
1020 SW EMKAY DRIVE
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BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS/ES	WMR	AS SHOWN

DATE: JANUARY 2024

PROJECT NO: 3-53-0156-012-2022

PACKWOOD AIRPORT

TITLE SHEET

FIGURE NO. -

SHEET NO. 1 OF 13

AIRPORT DATA

	EXISTING (E)	FUTURE (F)
AIRPORT REFERENCE CODE	A-I SMALL	SAME
AIRPORT IDENTIFIER	55S	SAME
MEAN MAX TEMPURATURE	79.1°	SAME
AIRPORT ELEVATION (MSL)	1057	SAME
AIRPORT ACREAGE	40.01	40.51
NAVAIDS	NONE	SAME
AIRPORT REFERENCE POINT	46° 36' 14.984" N, 121° 40' 40.439" W	SAME
MISCELLANEOUS FACILITIES	MIRL	MIRL, TAXIWAY EDGE REFLECTORS
CRITICAL AIRCRAFT	CESSNA-172	SAME
MAGNETIC DECLINATION (SEE NOTE 1)	14° 54' E ± 0° 23'	0° 6' W ANNUALLY
NPIAS SERVICE LEVEL	BASIC GA	SAME
STATE SERVICE LEVEL	LOCAL	SAME

RUNWAY 1/19 DATA

	EXISTING (E)	FUTURE (F)
RUNWAY IDENTIFICATION	01/19	SAME
RUNWAY DESIGN CODE - RDC	A-I(S)-VIS	A-I(S)
APPROACH REFERENCE CODE - APRC	A-I(S)-VIS	A-I(S)
DEPARTURE REFERENCE CODE - DPRC	A-I(S)	A-I(S)
PAVEMENT TYPE	ASPHALT CONCRETE	SAME
PAVEMENT STRENGTH	UNKOWN	12.5 SW
RUNWAY PAVEMENT STRENGTH - PCN	N/A	N/A
RUNWAY SURFACE TREATMENT	NONE	SAME
RUNWAY GRADIENT	0.34%	SAME
PERCENT WIND COVERAGE	SEE WIND ROSE	
RUNWAY DIMENSIONS LENGTH AND WIDTH	2,356' x 60'	SAME
DISPLACED THRESHOLD	N/A	SAME
RUNWAY END COORDINATES		
RUNWAY 1	46° 36' 4.79" N 121° 40' 48.56" W ELEV: 1049'	SAME
RUNWAY 19	46° 36' 25.175" N 121° 40' 32.3179" W ELEV: 1057'	SAME
RUNWAY LIGHTING	MIRL	SAME
RUNWAY PROTECTION ZONE	SEE RUNWAY DESIGN SURFACES TABLE	
RUNWAY MARKING	VISUAL	SAME
14 CFR PART 77 RUNWAY CATEGORY	UTILITY / VISUAL	SAME
RUNWAY APPROACH SLOPE	20:1	SAME
RUNWAY VISIBILITY MINIMUMS	VISUAL	SAME
AERONAUTICAL SURVEY REQUIRED	AGIS (2023)	SAME
RUNWAY DEPARTURE SURFACE	N/A	SAME
RUNWAY SAFETY AREA - RSA	SEE RUNWAY DESIGN SURFACES TABLE	
RUNWAY OBJECT FREE AREA - OFA		
RUNWAY OBSTACLE FREE ZONE - OFZ		
THRESHOLD SITING SURFACE - TSS	TYPE 2	SAME
RUNWAY VISUAL AND INSTRUMENT NAVAIDS	NONE	NONE
TOUCHDOWN ZONE ELEVATION		
RUNWAY 1	1057'	SAME
RUNWAY 19	1057'	SAME
TAXIWAY AND TAXILANE SAFETY AREA - TSA	SEE TAXIWAY DATA TABLE	
TAXIWAY AND TAXILANE OBJECT FREE AREA - TOFA		
TAXIWAY AND TAXILANE SEPARATION		
TAXIWAY AND TAXILANE LIGHTING	NONE	REFLECTORS
VERTICAL DATUM	NAD88	SAME
HORIZONTAL DATUM	NAVD83	SAME

TAXIWAY DATA

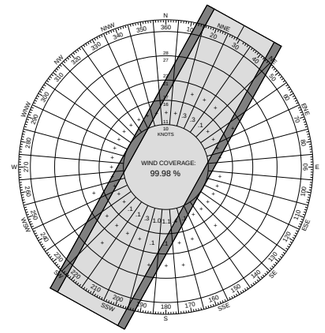
	DESIGN GROUP	LIGHTING	TAXIWAY WIDTH	OBJECT FREE AREA WIDTH	SAFETY AREA WIDTH	RUNWAY SEPERATION
TAXIWAY A (FUTURE)	ADG-I/TDG-1A	REFLECTORS	25'	89'	49'	150'
TAXILANE (FUTURE)	ADG-I/TDG-1A	REFLECTORS	25'	79'	49'	N/A
NOTE : EXISTING TAXIWAYS / TAXILANES						

RUNWAY 1/19 DESIGN SURFACES

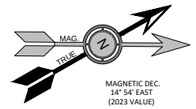
RUNWAY PROTECTION ZONE (RPZ)			
	INNER WIDTH	LENGTH	OUTER WIDTH
EXISTING RWY 1	250'	1,000'	450'
EXISTING RWY 19	250'	1,000'	450'
FUTURE RWY 1	SAME	SAME	SAME
FUTURE RWY 19	SAME	SAME	SAME
RUNWAY SAFETY AREA (RSA)			
	WIDTH	LENGTH BEYOND RUNWAY END & PRIOR TO THRESHOLD	
EXISTING RWY 1/19	120'	240'	
FUTURE RWY 1/19	SAME	SAME	
RUNWAY OBJECT FREE AREA (OFA)			
	WIDTH	LENGTH BEYOND RUNWAY END & PRIOR TO THRESHOLD	
EXISTING RWY 1/19	250'	240'	
FUTURE RWY 1/19	SAME	SAME	
RUNWAY OBSTACLE FREE ZONE (OFZ)			
	WIDTH	LENGTH BEYOND RUNWAY END & PRIOR TO THRESHOLD	
EXISTING RWY 1/19	250'	200'	
FUTURE RWY 1/19	SAME	SAME	
NOTE: NO CHANGE IN RUNWAY PLANNED			

DECLARED DISTANCES

	EXISTING (E)		FUTURE (F)	
	RWY 1	RWY 19	RWY 1	RWY 19
TORA	2,356'	2,356'	2,356'	2,356'
TODA	2,356'	2,356'	2,356'	2,356'
ASDA	2,356'	2,356'	2,356'	2,356'
LDA	2,356'	2,356'	2,356'	2,356'



ALL WEATHER WIND ROSE



SOURCE:
FAA AIRPORT DATA AND INFORMATION PORTAL
STATION 720254 CHEHALIS CENTRALIA AIRPORT
PERIOD OF OBSERVATIONS : 2013-2022
NUMBER OF OBSERVATIONS : 217,918
CALM OBSERVATIONS : 99,993

RUNWAY WIND COVERAGE

RUNWAY ALIGNMENT	CROSSWIND COMP. (KNOTS)	ALL-WEATHER WIND COVERAGE	VFR WIND COVERAGE	IFR WIND COVERAGE
RUNWAY 1	10.5	61.57%	59.27%	75.19%
	13	61.59%	59.29%	75.20%
RUNWAY 19	10.5	84.27%	83.87%	85.60%
	13	84.30%	83.89%	85.60%
COMBINED	**10.5**	**99.95%**	**99.94%**	**99.99%**
	13	99.98%	99.98%	100%

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NOTES:

1. NATIONAL GEODETIC SURVEY MAGNETIC DECLINATION CALCULATOR (HTTPS://WWW.NGDC.NOAA.GOV/GEOMAG/CALCULATORS/MAGCALC.SHTML) ACCESSED ON APRIL 5, 2023
2. AGIS SURVEY - JUNE 2023, PROVIDED RUNWAY END COORDINATES AND ELEVATIONS.
3. ONSITE WIND DATA NOT AVAILABLE. DATA FROM CENTRALIA - CHEHALIS AIRPORT (54 NMW) USED.

NO.	DATE	BY	APPR	REVISIONS

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BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS/ES	WMR	AS SHOWN

DATE: FEBRUARY 2024
PROJECT NO: 3-53-0156-012-2022

PACKWOOD AIRPORT

AIRPORT DATA SHEET

FIGURE NO.
-

SHEET NO.
2 OF 13

LEGEND

	EXISTING	FUTURE
BUILDINGS - ON AIRPORT		
BUILDINGS - OFF AIRPORT		N/A
RUNWAY/AIRFIELD PAVEMENT		
PAVEMENT TO BE REMOVED	N/A	
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
TAXIWAY SAFETY AREA (TSA)		SAME
TAXIWAY OBJECT FREE AREA (TOFA)		SAME
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS	1100'	N/A
AIRPORT REFERENCE POINT (ARP)		
REIL		
SEGMENTED CIRCLE WIND INDICATOR		
VISUAL GUIDANCE INDICATORS (PAPI)	N/A	SAME
FENCE	x x x	xx xx
BEACON		
THRESHOLD LIGHTS		
PAVED ROAD		
GRAVEL ROAD		
AIRCRAFT PARKING AREA / TIEDOWNS		
RUNWAY LIGHTS		
TAXIWAY MARKING		
RUNWAY MARKING		
TREE / PLANT / BUSH LINE		SAME
AREA OF TREE REMOVAL / LOWERING		SAME
AIRCRAFT PARKING RESERVE	N/A	
AIRCRAFT HANGAR RESERVE	N/A	
FUTURE HANGAR DEVELOPMENT AREA	N/A	
AVIGATION EASEMENT		
GROUND EASEMENT		SAME
WATER (SURFACE)		SAME

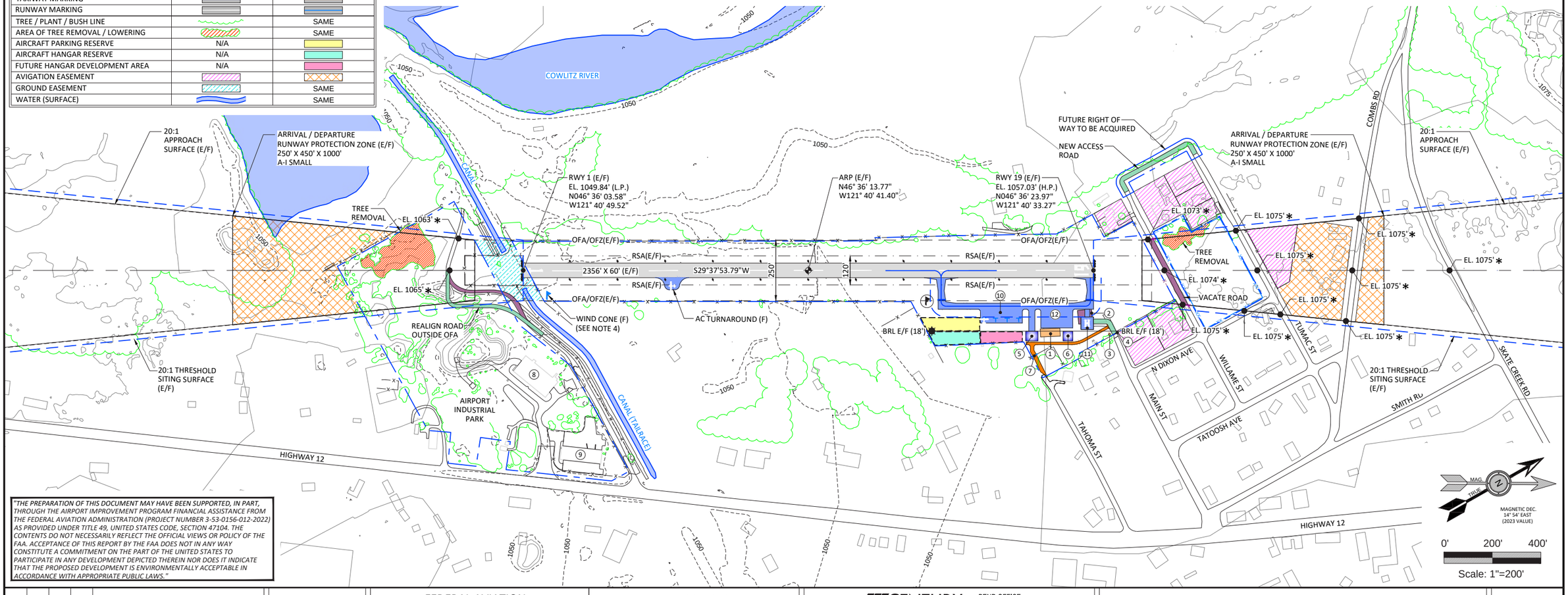
BUILDING / FACILITY KEY

NO.	DESCRIPTION	TOP ELEV.
1	CONVENTIONAL HANGAR (2-UNIT)	1067.9'
2	APRON (E)	1055.5'
3	OUTDOOR RESTROOM	1063.5'
4	VEHICLE & PEDESTRIAN GATE	1063.2'
5	FUTURE HANGAR 50'X40' (SEE NOTE 1)	N/A
6	FUTURE HANGAR 40'X40' (SEE NOTE 1)	N/A
7	FUTURE VEHICLE & PEDESTRIAN GATE	N/A
8	NON-AERONAUTICAL BUILDING (E)	1070.4'
9	NON-AERONAUTICAL BUILDING (E)	1073.4'
10	TIEDOWN APRON (F)	N/A
11	HELICOPTER PARKING APRON	N/A
12	FUTURE APRON	N/A

NOTES:

1. TRANSITIONAL SURFACE PENETRATIONS MAY OCCUR FOR THESE HANGARS, REQUIRING ROOF-MOUNTED OBSTRUCTION LIGHTING.
2. AGIS SURVEY - JUNE 2023, PROVIDED RUNWAY END COORDINATES AND ELEVATIONS.
3. BOUNDARY SURVEY RECOMMENDED TO VERIFY PRECISE AIRPORT PROPERTY LINE LOCATIONS.
4. SPACE CONSTRAINTS MAY NECESSITATE LOCATING A SUPPLEMENTAL WIND CONE L-806 WITHIN A ROFA. EVALUATE ON A CASE-BY-CASE BASIS THROUGH AN AERONAUTICAL STUDY (AC 150/5300-13B).

✱ ELEVATION INCLUDES GROUND ELEVATION PLUS 15' VEHICLE HEIGHT.



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DM	JLS/ES	WMR	AS SHOWN

DATE: FEBRUARY 2024

PROJECT NO: 3-53-0156-012-2022

PACKWOOD AIRPORT

AIRPORT LAYOUT PLAN

FIGURE NO.

SHEET NO. 3 OF 13

LEGEND

	EXISTING	FUTURE
BUILDINGS - ON AIRPORT		
BUILDINGS - OFF AIRPORT		N/A
RUNWAY/AIRFIELD PAVEMENT		
PAVEMENT TO BE REMOVED	N/A	
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
TAXIWAY SAFETY AREA (TSA)		SAME
TAXIWAY OBJECT FREE AREA (TOFA)		SAME
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS	1100'	N/A
AIRPORT REFERENCE POINT (ARP)		
SEGMENTED CIRCLE / WIND INDICATOR		
VISUAL GUIDANCE INDICATORS (PAPI)		
FENCE	x x x	xx xx
BEACON		
THRESHOLD LIGHTS		
PAVED ROAD		
GRAVEL ROAD		
AIRCRAFT PARKING AREA / TIEDOWNS		
RUNWAY LIGHTS		
TAXIWAY MARKING		
RUNWAY MARKING		
TREE / PLANT / BUSH LINE		SAME
AREA OF TREE REMOVAL / LOWERING		SAME
AIRCRAFT PARKING RESERVE	N/A	
AIRCRAFT HANGAR RESERVE	N/A	
FUTURE HANGAR DEVELOPMENT AREA	N/A	
AVIGATION EASEMENT		
WATER (SURFACE)		SAME

BUILDING / FACILITY KEY

NO.	DESCRIPTION	TOP ELEV.
1	CONVENTIONAL HANGAR (2-UNIT)	1067.9'
2	APRON (E)	1055.5'
3	OUTDOOR RESTROOM	1063.5'
4	VEHICLE & PEDESTRIAN GATE	1063.2'
5	FUTURE HANGAR 50'X40' (SEE NOTE 1)	N/A
6	FUTURE HANGAR 40'X40' (SEE NOTE 1)	N/A
7	FUTURE VEHICLE & PEDESTRIAN GATE	N/A
8	NON-AERONAUTICAL BUILDING (E)	1070.4'
9	NON-AERONAUTICAL BUILDING (E)	1073.4'
10	TIEDOWN APRON (F)	N/A
11	HELICOPTER PARKING APRON	N/A
12	FUTURE APRON	N/A

NOTE:

1. TRANSITIONAL SURFACE PENETRATIONS MAY OCCUR FOR THESE HANGARS, REQUIRING ROOF-MOUNTED OBSTRUCTION LIGHTING.

* ELEVATION INCLUDES GROUND ELEVATION PLUS 15' VEHICLE HEIGHT.

RUNWAY 01/19 - 2356' X 60' (E/F)

S29°37'53.79"W

RWY 19 (E/F)
EL. 1057.03' (H.P.)
N046° 36' 23.97"
W121° 40' 33.27"

RSA (E/F)

OFA/OFZ (E/F)

AC HOLD (E/F)

ADG (F) TIEDOWNS

AIRCRAFT PARKING RESERVE

AIRCRAFT HANGAR RESERVE

FUTURE HANGAR DEVELOPMENT AREA

BRL E/F (18')

TRANSIENT / MEDEVAC HELICOPTER PARKING (F)

FUTURE RIGHT OF WAY (ROW) TO BE ACQUIRED

NEW ACCESS ROAD

20:1 THRESHOLD SITING SURFACE (E/F)

EMERGENCY ACCESS (F)

TREE REMOVAL

STREET ROW TO BE VACATED BY LEWIS COUNTY

VACATE ROAD

TUMACT ST.

WILLAME ST.

MAIN ST.

N DIXON AVE.

ARRIVAL / DEPARTURE RUNWAY PROTECTION ZONE (E/F)
250' X 450' X 1000'
A-I SMALL

EL. 1073' *

EL. 1074' *

EL. 1075' *

MAGNETIC DEC. 14° 54' EAST (2023 VALUE)

0' 50' 100'

Scale: 1"=50'

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NO.	DATE	BY	APPR	REVISIONS

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APPROVAL DATE: _____

SIGNATURE

LEWIS COUNTY APPROVAL

APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS/ES	WMR	AS SHOWN
DATE: FEBRUARY 2024		PROJECT NO: 3-53-0156-012-2022	

PACKWOOD AIRPORT

TERMINAL AREA PLAN

FIGURE NO.

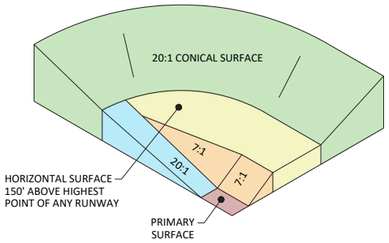
SHEET NO. 4 OF 13

RUNWAY 1/19

PART 77 DIMENSIONAL STANDARDS
UTILITY NON-PRECISION INSTRUMENT (EXISTING/FUTURE)
RUNWAY EXISTING/FUTURE LENGTH = 2,356' (RUNWAY TYPE = A-I / B-I SMALL)

RUNWAY 1
PRIMARY SURFACE WIDTH = 250'
APPROACH SURFACE INNER WIDTH = 250'
APPROACH SURFACE OUTER WIDTH = 1,250'
APPROACH SURFACE LENGTH = 5,000'
RADIUS OF HORIZONTAL SURFACE = 5,000'
APPROACH SLOPE = 20:1

RUNWAY 19
PRIMARY SURFACE WIDTH = 250'
APPROACH SURFACE INNER WIDTH = 250'
APPROACH SURFACE OUTER WIDTH = 1,250'
APPROACH SURFACE LENGTH = 5,000'
RADIUS OF HORIZONTAL SURFACE = 5,000'
APPROACH SLOPE = 20:1



TYPICAL ISOMETRIC VIEW OF PART 77 SURFACES
(CUT ON RUNWAY CENTERLINE)

LEGEND

▲ OBSTACLE

NOTES:

1. GRID NUMBERS REPRESENT THE HIGHEST PENETRATING OBJECT WITHIN EACH 1000' X 1000' GRID CELL.
2. SEE SHEETS 11, 12 AND 13 FOR OBSTRUCTION TABLES.
3. DATE OF AGIS OBSTRUCTION SURVEY: JUNE 2023.

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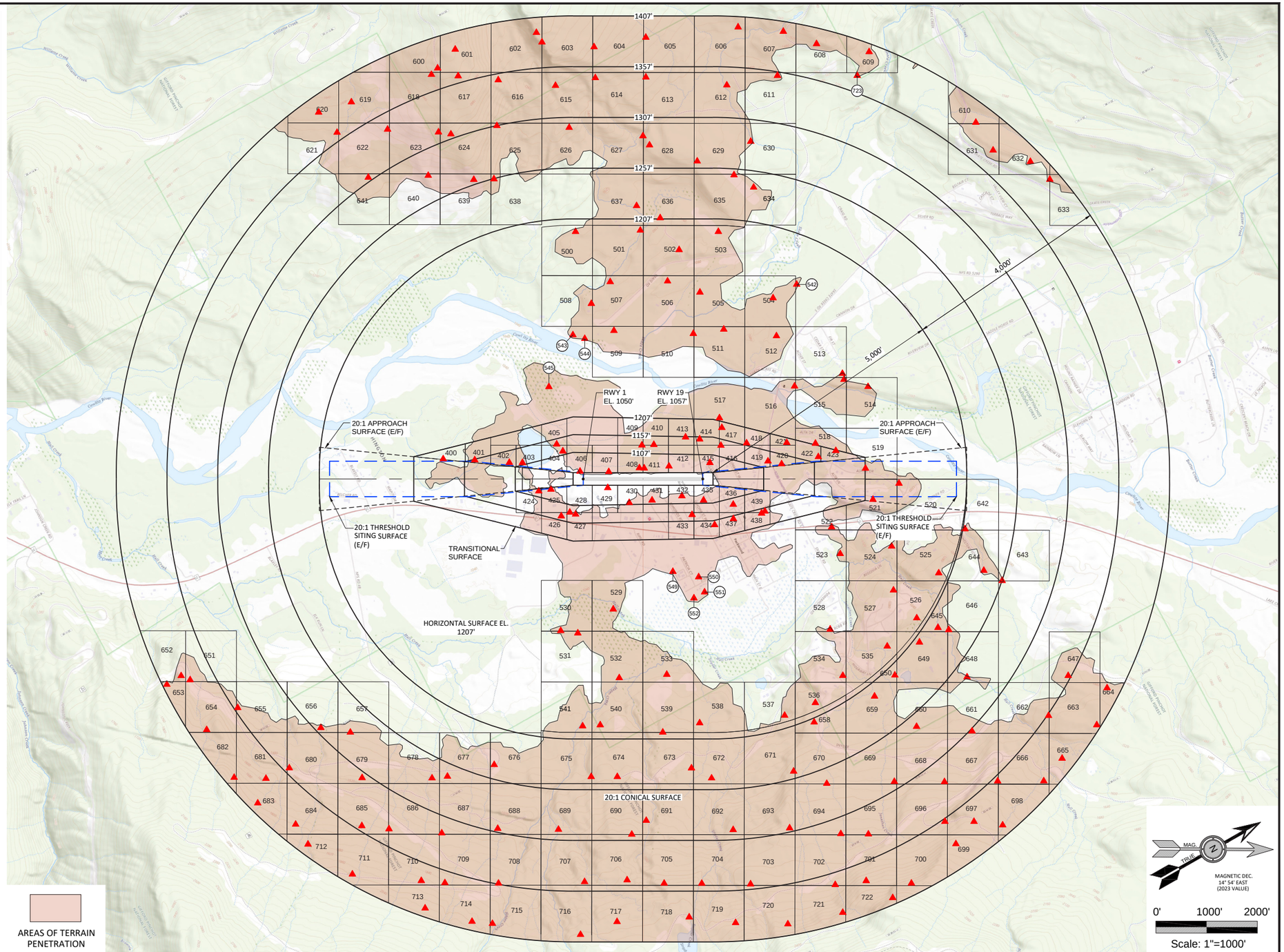

AREAS OF TERRAIN PENETRATION

NO.	DATE	BY	APPR	REVISIONS

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LEWIS COUNTY APPROVAL
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DM	JLS/ES	WMR	AS SHOWN

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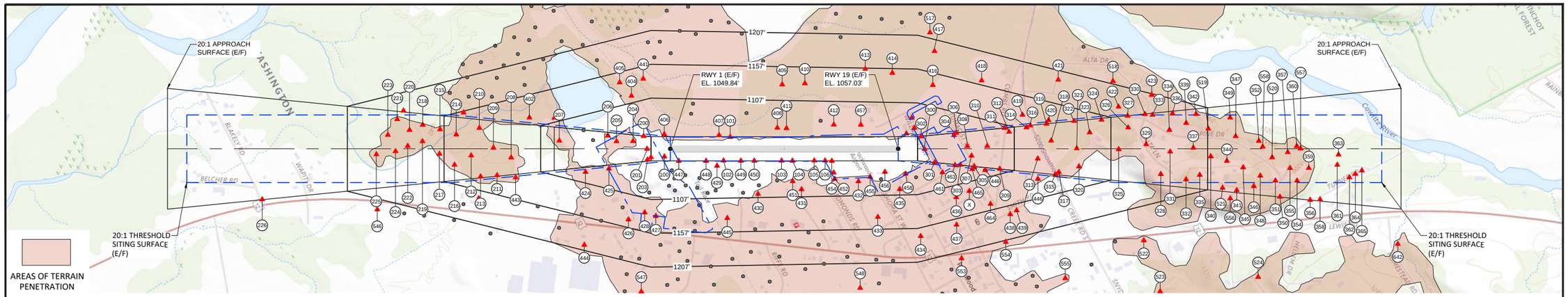
PROJECT NO: 3-53-0156-012-2022

PACKWOOD AIRPORT

AIRPORT AIRSPACE PLAN (PART 77)

FIGURE NO.

SHEET NO. 5 OF 13



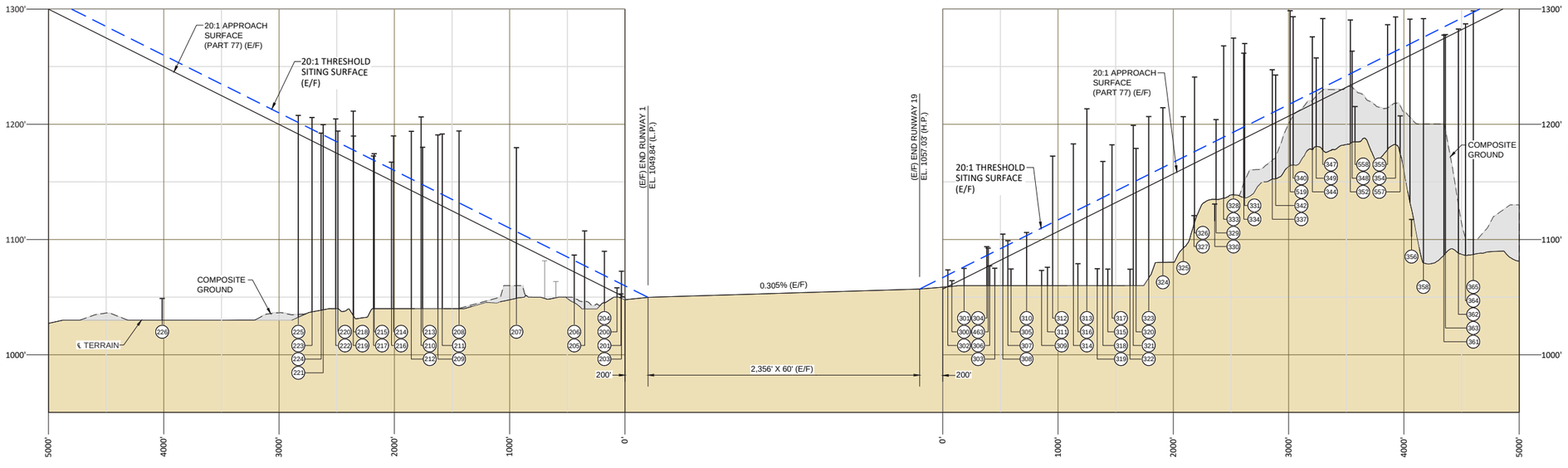
RUNWAY 1-19 PLAN VIEW

0' 500' 1000'

SCALE 1"=500'

LEGEND

- OBSTACLE
- NON-LISTED OBSTACLE



0' 50' 100'

SCALE OF FEET
VERTICAL SCALE 1"=50'

RUNWAY 1-19 PROFILE VIEW

0' 500' 1000'

SCALE OF FEET
HORIZONTAL SCALE 1"=500'

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NOTES:

1. DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE FUTURE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
2. SEE SHEETS 11, 12, AND 13 FOR OBSTRUCTION TABLES.
3. AGIS SURVEY - JUNE 2023, PROVIDED RUNWAY END COORDINATES AND ELEVATIONS.

MAG. TRUE

MAGNETIC DEC. 14° 54' EAST (2023 VALUE)

NO.	DATE	BY	APPR	REVISIONS

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LEWIS COUNTY APPROVAL

APPROVAL DATE: _____

SIGNATURE

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541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS/ES	WMR	AS SHOWN

DATE: FEBRUARY 2024

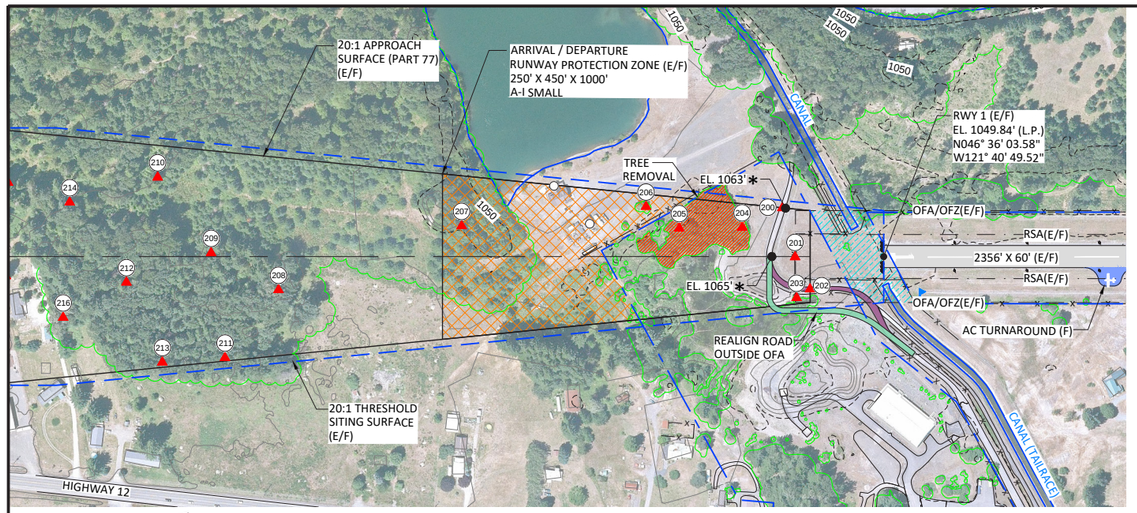
PROJECT NO: 3-53-0156-012-2022

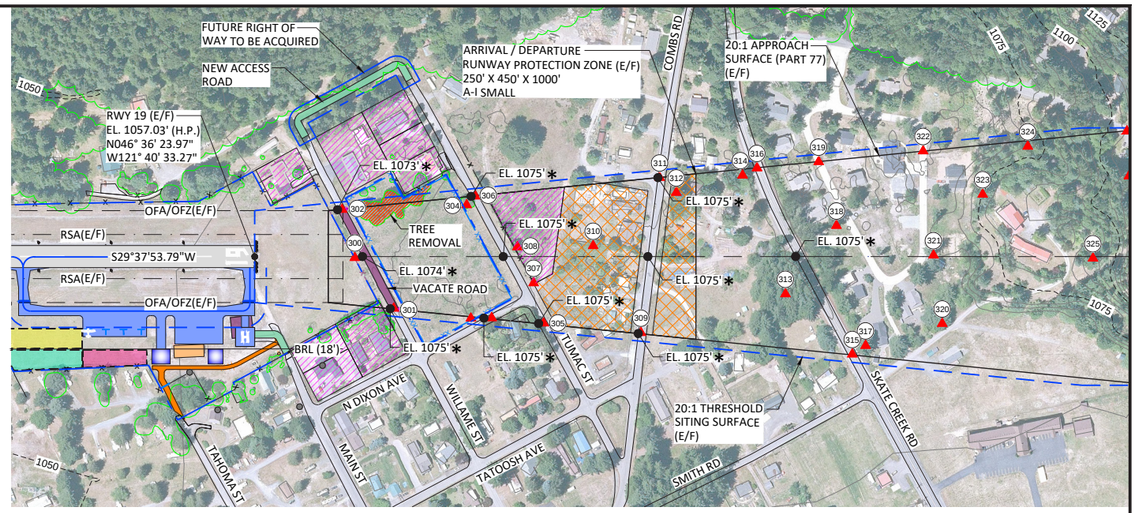
PACKWOOD AIRPORT

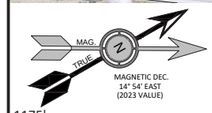
RUNWAY 1-19 PLAN & PROFILE

FIGURE NO.

SHEET NO. 6 OF 13







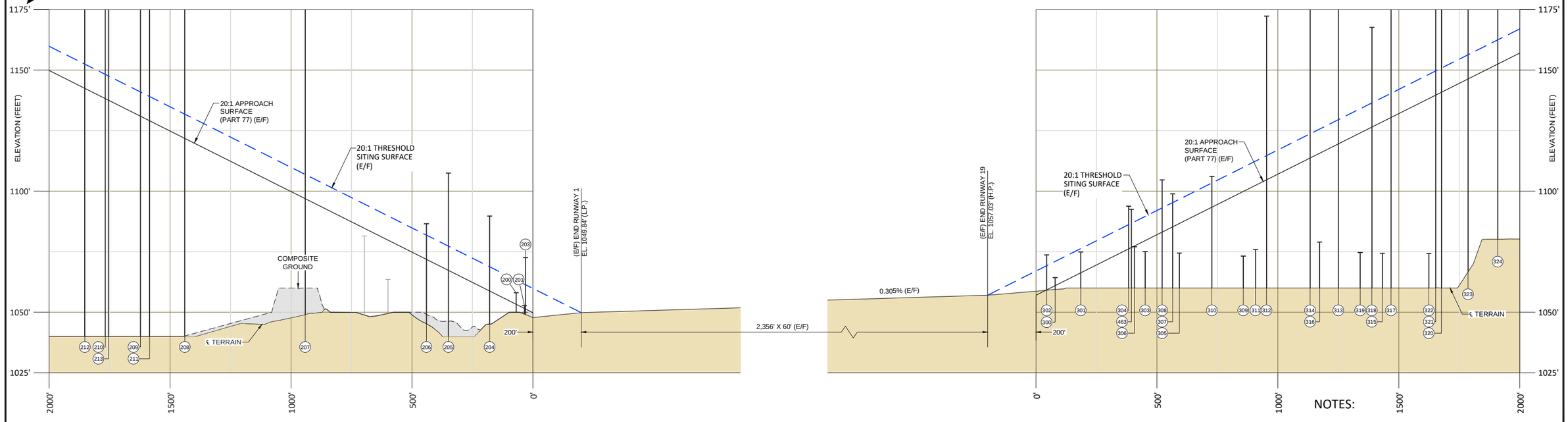
RUNWAY 1-19 PLAN VIEW

0' 200' 400'

Scale: 1"=200'

LEGEND

- ▲ OBSTACLE
- ○ NON-LISTED OBSTACLE



RUNWAY 1-19 PROFILE VIEW

0' 20' 40'

Vertical Scale: 1"=20'

0' 200' 400'

Horizontal Scale: 1"=200'

NOTES:

1. DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE FUTURE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
2. SEE SHEETS 11, 12 AND 13 FOR OBSTRUCTION TABLES.
3. AGIS SURVEY - JUNE 2023, PROVIDED RUNWAY END COORDINATES AND ELEVATIONS.

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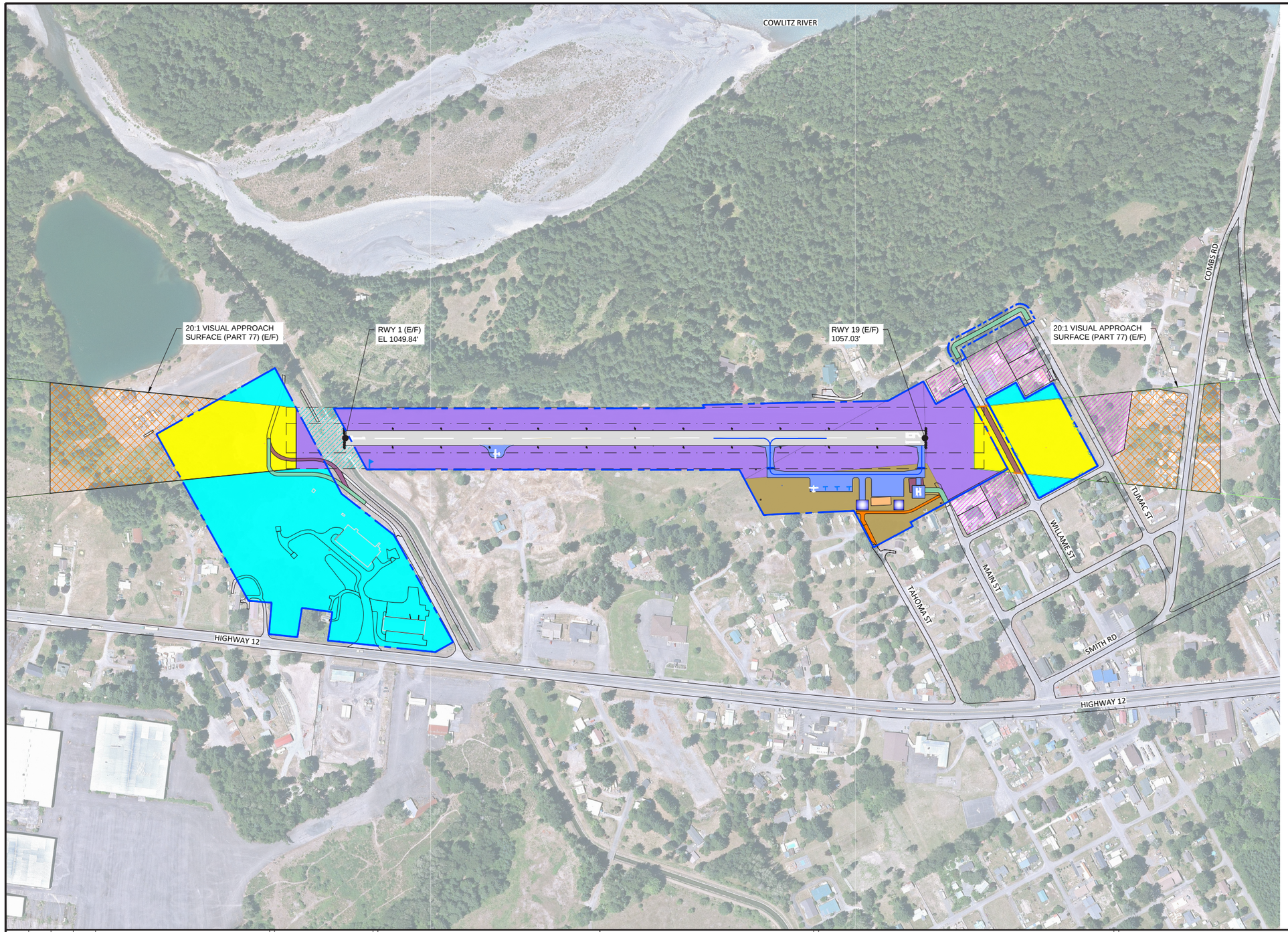
PACKWOOD AIRPORT

INNER PORTION RUNWAY 1-19 APPROACH SURFACES

FIGURE NO.

SHEET NO. 7 OF 13



ON AIRPORT LAND USE

- AERONAUTICAL DEVELOPMENT (APPROX. 3.52 ACRES)
- AERONAUTICAL COMPATIBLE NON-AVIATION FACILITIES (APPROX. 12.28 ACRES)
- AIRPORT OPERATIONS PROTECTED AREA (APPROX. 16.23 ACRES)
- RUNWAY PROTECTION ZONE (APPROX. 6.19 ACRES)
- FUTURE AVIGATION EASEMENT (APPROX. 7.77 ACRES)
- EXISTING AVIGATION EASEMENT (APPROX. 3.39 ACRES)
- EXISTING GROUND EASEMENT (APPROX. .08 ACRES)

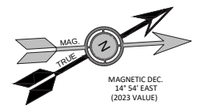
LEGEND

- AIRPORT PROPERTY LINE (EXISTING)
- AIRPORT PROPERTY LINE (FUTURE)

* SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR INFRASTRUCTURE AND SAFETY BOUNDARY LEGEND.

NOTES:

1. ZONING HEIGHT RESTRICTIONS: SEE LEWIS COUNTY - AIRPORT OBSTRUCTION ZONING CHAPTER 17.80.
2. ON AIRPORT LAND USE IS FOR PLANNING PURPOSES ONLY AND DOES NOT RELATE TO THE COUNTY DESIGNATED ZONING OF SMALL TOWN MIXED USE (STMU).



0' 200' 400'

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541.322.8962 OFFICE

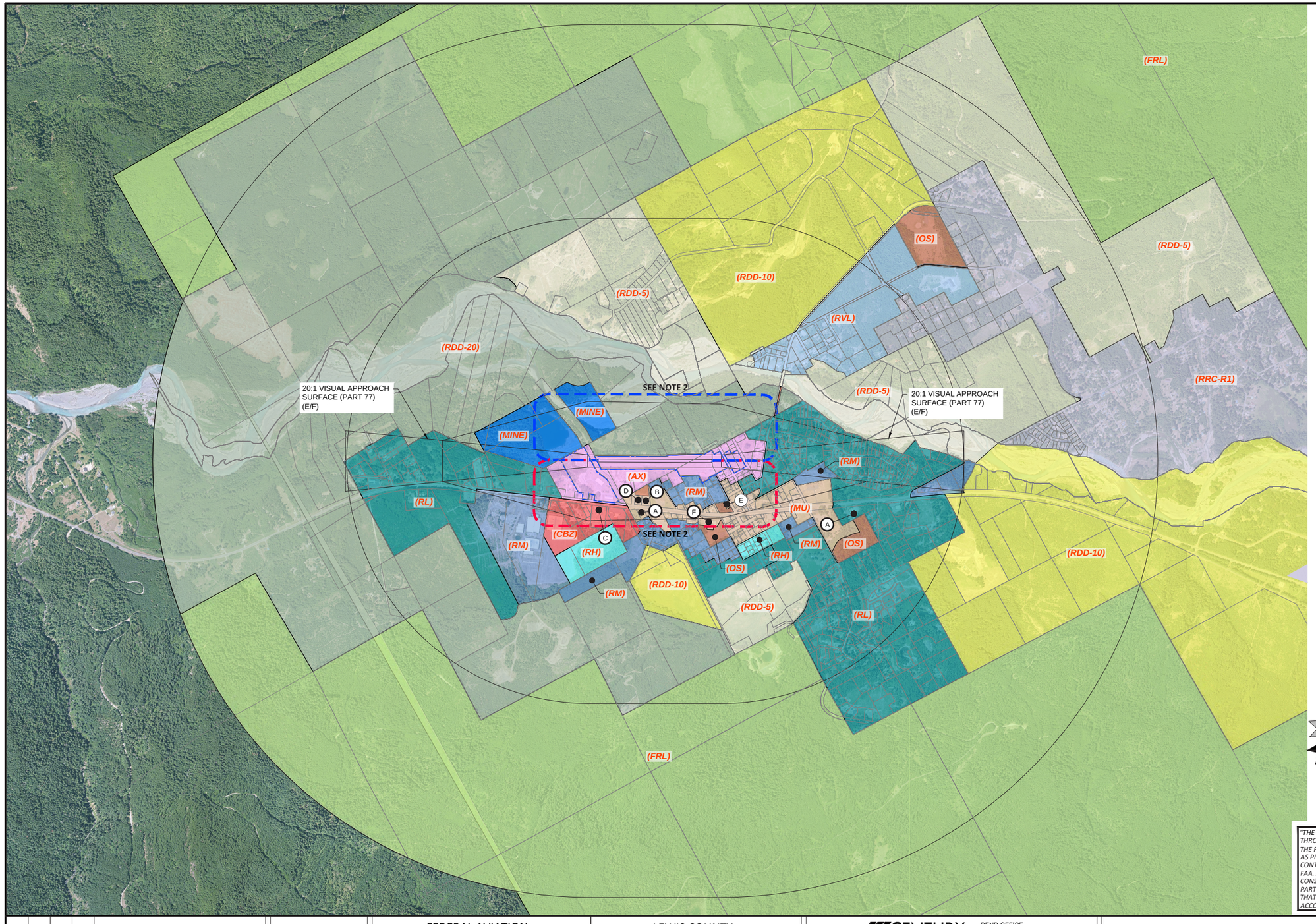
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS/ES	WMR	AS SHOWN
DATE: FEBRUARY 2024		PROJECT NO: 3-53-0156-012-2022	

PACKWOOD AIRPORT

ON AIRPORT LAND USE PLAN

FIGURE NO.

SHEET NO. 8 OF 13



LEWIS COUNTY ZONING

- MIXED USE (MU)
- MINE
- AIRPORT DISTRICT (AX)
- RURAL DEVELOPMENT DISTRICT (RDD-5)
- RURAL DEVELOPMENT DISTRICT (RDD-10)
- RURAL DEVELOPMENT DISTRICT (RDD-20)
- RURAL RESIDENTIAL CENTER 1 (RRC-R1)
- FOREST RESOURCE LAND (FRL)
- COMMERCIAL BUSINESS DISTRICT (CBZ)
- OPEN SPACE (OS)
- RESIDENTIAL VERY LOW DENSITY (RVL)
- RESIDENTIAL LOW DENSITY (RL)
- RESIDENTIAL MEDIUM DENSITY (RM)
- RESIDENTIAL HIGH DENSITY (RH)

LEGEND

- AIRPORT PROPERTY LINE (EXISTING/FUTURE)
- ZONING BOUNDARY
- EXISTING AIRPORT TRAFFIC PATTERN (TYP.) SEE NOTE 2
- FUTURE AIRPORT TRAFFIC PATTERN (TYP.) SEE NOTE 2

PUBLIC FACILITY KEY

A	CHURCH
B	PACKWOOD FIRE DEPARTMENT
C	WSDOT PACKWOOD MAINTENANCE SHED
D	PACKWOOD COMMUNITY HALL
E	PACKWOOD TIMBERLAND LIBRARY
F	WHITE PASS COUNTY HISTORICAL MUSEUM

NOTES:

1. ZONING HEIGHT RESTRICTIONS: SEE LEWIS COUNTY - AIRPORT OBSTRUCTION ZONING CHAPTER 17.80.
2. FUTURE CHANGE IN AIRPORT TRAFFIC PATTERN PLANNED (RIGHT TRAFFIC RWY 01) PENDING FAA REVIEW & APPROVAL OF FAA FORM 7480-1 NOTICE FOR CONSTRUCTION, ALTERATION OR DESTRUCTION OF AIRPORTS.
3. LEWIS COUNTY CODE TITLE 17 (PENDING).

MAG. TRUE — MAGNETIC DEC. 14° 54' EAST (2023 VALUE)

0' 1000' 2000'

Scale: 1"=1000'

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CENTURY WEST ENGINEERING

BEND OFFICE
1020 SW EMKAY DRIVE
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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS/ES	WMR	AS SHOWN

DATE: FEBRUARY 2024

PROJECT NO: 3-53-0156-012-2022

PACKWOOD AIRPORT

OFF AIRPORT LAND USE PLAN

FIGURE NO.

SHEET NO. 9 OF 13

LEGAL DESCRIPTIONS

PARCEL A - SECTION 21 TOWNSHIP 13N RANGE 09E PT NE4 SE4 W HWY. SITUATED IN THE COUNTY OF LEWIS, STATE OF WASHINGTON.

PARCEL B - THE PART OF THE NORTH HALF OF THE NORTHEAST QUARTER OF THE SOUTHEST QUARTER OF SECTION 21, TOWNSHIP 13 NORTH, RANGE 9 EAST, W.M. DESCRIBED AS FOLLOWS: BEGINNING AT THE NORTHEAST CORNER OF SAID NORTHEAST QUARTER OF SOUTHEAST QUARTER; THENCE SOUTH 0°58' WEST ALONG THE EAST LINE OF SAID NORTHEAST QUARTER OF THE SOUTHEAST QUARTER 560.05 FEET, THENCE SOUTH 88°44' EAST, 147.0 FEET TO A POINT ON THE NORTHWEST BOUNDARY OF SR 12 RIGHT OF WAY; THENCE SOUTH 36°14' WEST ALONG SAID RIGHT OF WAY 121.96 FEET; THENCE NORTH 88°44' WEST, 800.8 FEET TO THE TRUE POINT OF BEGINNING OF THIS DESCRIPTION; THENCE NORTH 61°30' WEST, 250 FEET; THENCE SOUTH 28°30' WEST TO A POINT NORTH 88°44' WEST OF THE TRUE POINT OF BEGINNING, THENCE SOUTH 88°44' EAST TO SAID TRUE POINT OF BEGINNING. SITUATED IN THE COUNTY OF LEWIS, STATE OF WASHINGTON.

PARCEL C - SECTION 21 TOWNSHIP 13N RANGE 09E AIRSTRIP PT SE4 NE4 & PT NE4 SE4. SITUATED IN THE COUNTY OF LEWIS, STATE OF WASHINGTON

PARCEL D - SECTION 22 TOWNSHIP 13N RANGE 09E LOT 97 PT NW4 SW4 NW4 DESC. SITUATED IN THE COUNTY OF LEWIS, STATE OF WASHINGTON.

PARCEL E - SECTION 22 TOWNSHIP 13N RANGE 09E LOTS 2-6 & LOTS 11-13 BLK 2 PACKWOOD HOMESITES 2. SITUATED IN THE COUNTY OF LEWIS, STATE OF WASHINGTON

PARCEL F - SECTION 22 TOWNSHIP 13N RANGE 09E LOTS 9 -14 BLK 1 PACKWOOD HOMESITES ADD 2. SITUATED IN THE COUNTY OF LEWIS, STATE OF WASHINGTON

PARCEL G - SECTION 22 TOWNSHIP 13N RANGE 09E LOTS 4 - 8 BLK 1 PACKWOOD HOMESITES ADD 2. SITUATED IN THE COUNTY OF LEWIS, STATE OF WASHINGTON

PARCEL H - N/A

PARCEL I - N/A

NOTES:

1. PROPERTY OWNERSHIP DATA OBTAINED FROM PREVIOUS EXHIBIT "A" DRAWINGS (CENTURY WEST ENGINEERING 12/05). NO UPDATED PROPERTY DATA PROVIDED BY LEWIS COUNTY.
2. SEE SHEET 3 FOR FULL LEGEND.
3. PACKWOOD AIRPORT WAS ESTABLISHED IN 1948 BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) AND WAS TRANSFERRED TO THE PACKWOOD AIRFIELD DISTRICT IN 1982 OWNERSHIP PRIOR TO ITS ESTABLISHMENT IS UNKNOWN.
4. BOUNDARY SURVEY IS RECOMMENDED.
5. PROPOSED ROW TO BE ACQUIRED BY LEWIS COUNTY TO REPLACE EXISTING SURFACE ACCESS PROVIDED BY A SECTION OF WILLAME STREET (TO BE VACATED).

OWNERSHIP DATA TABLE

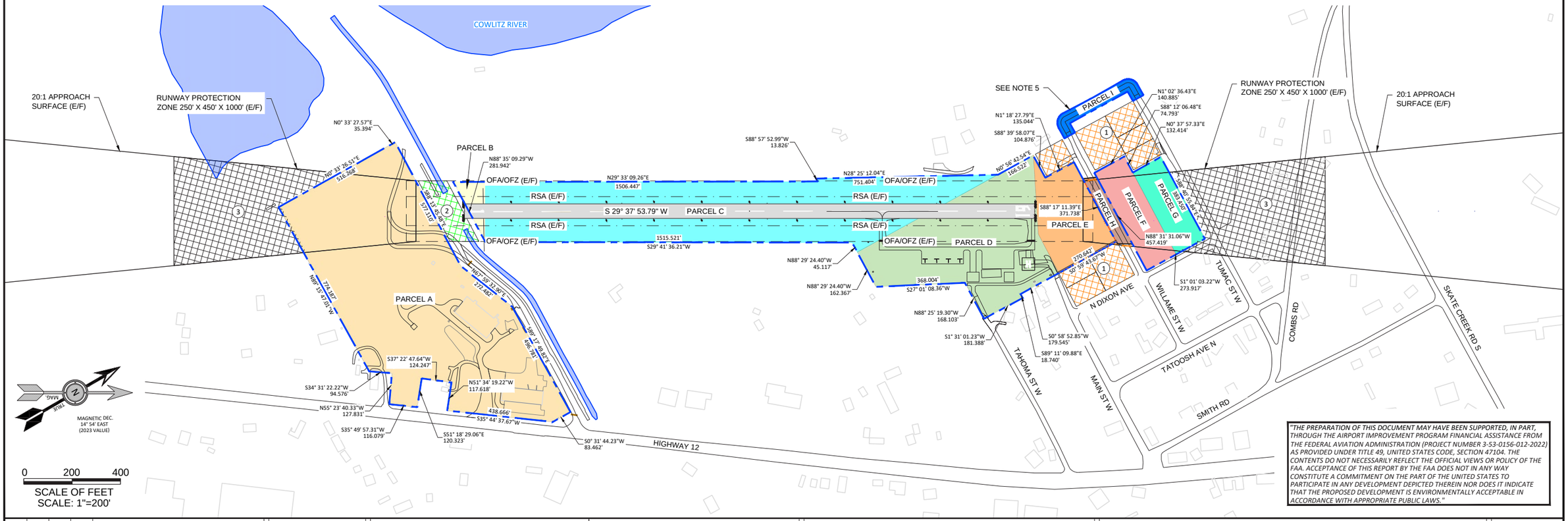
PARCEL	LAND OWNER	ACRES	RECORDING INFORMATION VOL., PAGE	INTEREST	PREVIOUS OWNER	ACQUISITION YEAR	PURPOSE
A	LEWIS COUNTY	16.72	N/A*	FEE SIMPLE	N/A	APR. 2019	AIRPORT PROPERTY
B	LEWIS COUNTY	0.4	548, 356	FEE SIMPLE	PUBLIC UTILITY DISTRICT NO. 1	JUN. 1983	AIRPORT PROPERTY
C	LEWIS COUNTY	10.89	248, 451	FEE SIMPLE	WSDOT	JUN. 1982	AIRPORT PROPERTY
D	LEWIS COUNTY	6.32	248, 451	FEE SIMPLE	WSDOT	JUN. 1982	AIRPORT PROPERTY
E	LEWIS COUNTY	2.85	248, 451	FEE SIMPLE	WSDOT	JUN. 1982	AIRPORT PROPERTY
F	LEWIS COUNTY	1.34	248, 451	FEE SIMPLE	WSDOT	JUN. 1982	AIRPORT PROPERTY
G	LEWIS COUNTY	1.12	248, 451	FEE SIMPLE	WSDOT	JUN. 1982	AIRPORT PROPERTY
H	LEWIS COUNTY	0.37	N/A	FEE SIMPLE	N/A	TO BE ACQUIRED	VACATE PUBLIC ROAD; OBSTRUCTION MITIGATION
I	LINDA LEWIS/OWENS WILLIAM, D	0.5	N/A	FEE SIMPLE	N/A	SEE NOTE 5	ACCESS ROAD

* INCLUDES TAX PARCEL 035179006002 AND 035179004001 TRANSFERRED TO THE AIRPORT IN RESOLUTION NO. 19-103

EASEMENT DATA TABLE

EASEMENT	GRANTOR	GRANTEE	INTEREST	AGREEMENT YEAR	PURPOSE
1	WSDOT*	LEWIS COUNTY	AVIGATION EASEMENT	JUN. 1982	OBSTRUCTION MITIGATION
2	WASHINGTON PUBLIC POWER SYSTEM	LEWIS COUNTY	SURFACE EASEMENT	TO BE ACQUIRED	RSA/OFA
3	VARIES**	LEWIS COUNTY	AVIGATION EASEMENT	TO BE ACQUIRED	RPZ CONTROL

*EXISTING EASEMENTS OVERLAP 9 PARCELS IN PRIVATE OWNERSHIP SEE DEEDS.
** PROPOSED EASEMENTS OVERLAP MULTIPLE PARCELS IN PRIVATE OWNERSHIP.



"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-53-0156-012-2022) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

NO.	DATE	BY	APPR	REVISIONS

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: _____
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LEWIS COUNTY APPROVAL
APPROVAL DATE: _____
SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS/ES	WMR	AS SHOWN
DATE: FEBRUARY 2024		PROJECT NO: 3-53-0156-012-2022	

PACKWOOD AIRPORT

EXHIBIT A - AIRPORT PROPERTY PLAN

FIGURE NO.

SHEET NO. 10 OF 13

PRIMARY

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION *
100	SIGN	6/29/2023	PRIMARY	1048.4	9.4	1057.8	1049.8	8.0	TO BE REMOVED
101	FENCE	6/29/2023	PRIMARY	1051.2	8.0	1059.2	1051.5	7.7	TO BE REMOVED
102	TREE	6/29/2023	PRIMARY	1050.5	29.0	1079.5	1051.3	28.2	TO BE REMOVED
103	FENCE	6/29/2023	PRIMARY	1049.5	8.8	1058.3	1052.8	5.4	TO BE REMOVED
104	TREE	6/29/2023	PRIMARY	1051.3	9.8	1061.0	1053.2	7.8	TO BE REMOVED
105	FENCE	6/29/2023	PRIMARY	1052.7	7.0	1059.7	1054.1	5.6	TO BE REMOVED
106	FENCE	6/29/2023	PRIMARY	1052.3	8.0	1060.4	1054.5	5.9	TO BE REMOVED

APPROACH RUNWAY 01

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION *
200	SECONDARY ROAD	6/29/2023	APPROACH 01	1048.1	10.0	1058.1	1053.7	4.4	TO BE LIGHTED
201	FENCE	6/29/2023	APPROACH 01	1046.4	6.4	1052.7	1052.0	0.8	TO BE REMOVED
202	SECONDARY ROAD	6/29/2023	APPROACH 01	1047.3	10.0	1057.3	1049.9	7.4	TO BE LIGHTED
203	TREE	6/29/2023	APPROACH 01	1046.3	26.2	1072.5	1051.7	20.8	TO BE REMOVED
204	TREE	6/29/2023	APPROACH 01	1044.4	45.3	1089.7	1059.1	30.6	TO BE REMOVED
205	TREE	6/29/2023	APPROACH 01	1045.7	61.8	1107.5	1067.7	39.8	TO BE REMOVED
206	TREE	6/29/2023	APPROACH 01	1048.7	37.8	1086.6	1072.2	14.4	TO BE REMOVED
207	TREE	6/29/2023	APPROACH 01	1051.7	128.0	1179.7	1097.3	82.4	TO BE REMOVED
208	TREE	6/29/2023	APPROACH 01	1041.4	152.7	1194.2	1122.2	72.0	TO BE REMOVED
209	TREE	6/29/2023	APPROACH 01	1039.8	151.0	1190.8	1131.4	59.4	TO BE REMOVED
210	TREE	6/29/2023	APPROACH 01	1040.6	165.7	1206.4	1138.6	67.8	TO BE REMOVED
211	TREE	6/29/2023	APPROACH 01	1039.3	152.2	1191.5	1129.5	62.0	TO BE REMOVED
212	TREE	6/29/2023	APPROACH 01	1039.1	154.7	1193.8	1142.8	51.0	TO BE REMOVED
213	TREE	6/29/2023	APPROACH 01	1038.7	141.3	1180.0	1138.0	42.0	TO BE REMOVED
214	TREE	6/29/2023	APPROACH 01	1041.6	148.2	1189.8	1150.6	39.3	TO BE REMOVED
215	TREE	6/29/2023	APPROACH 01	1037.7	136.7	1174.4	1158.9	15.5	TO BE REMOVED
216	TREE	6/29/2023	APPROACH 01	1036.1	131.1	1167.1	1151.4	15.7	TO BE REMOVED
217	TREE	6/29/2023	APPROACH 01	1039.1	133.4	1172.5	1159.2	13.3	TO BE REMOVED
218	TREE	6/29/2023	APPROACH 01	1039.6	150.2	1189.8	1167.9	21.8	TO BE REMOVED
219	TREE	6/29/2023	APPROACH 01	1040.6	170.8	1211.4	1168.0	43.4	TO BE REMOVED
220	TREE	6/29/2023	APPROACH 01	1039.1	155.0	1194.1	1174.7	19.3	TO BE REMOVED
221	TREE	6/29/2023	APPROACH 01	1036.4	163.2	1199.7	1181.0	18.6	TO BE REMOVED
222	TREE	6/29/2023	APPROACH 01	1039.8	164.8	1204.6	1175.7	28.9	TO BE REMOVED
223	TREE	6/29/2023	APPROACH 01	1035.4	170.4	1205.8	1185.9	19.9	TO BE REMOVED
224	TREE	6/29/2023	APPROACH 01	1038.5	153.9	1192.4	1182.0	10.4	TO BE REMOVED
225	TREE	6/29/2023	APPROACH 01	1039.1	168.6	1207.7	1191.9	15.8	TO BE REMOVED
226	PRIMARY ROAD	6/29/2023	APPROACH 01	1033.8	15.0	1048.8	1250.9	-202.1	TO BE REMOVED

APPROACH RUNWAY 19

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION *
300	FENCE	6/29/2023	APPROACH 19	1057.4	6.9	1064.3	1060.6	3.7	TO BE REMOVED
301	PRIMARY ROAD	6/29/2023	APPROACH 19	1059.9	15.0	1074.9	1065.9	9.0	TO BE LIGHTED
302	PRIMARY ROAD	6/29/2023	APPROACH 19	1058.7	15.0	1073.7	1058.9	14.8	TO BE LIGHTED
303	PRIMARY ROAD	6/29/2023	APPROACH 19	1060.1	15.0	1075.1	1079.2	-4.2	NO OBSTRUCTION
304	TREE	6/29/2023	APPROACH 19	1061.5	32.3	1093.8	1075.8	17.9	TO BE REMOVED
305	PRIMARY ROAD	6/29/2023	APPROACH 19	1059.4	15.0	1074.4	1086.3	-11.9	NO OBSTRUCTION
306	PRIMARY ROAD	6/29/2023	APPROACH 19	1062.1	15.0	1077.1	1077.0	0.1	TO BE LIGHTED
307	POWER POLE	6/29/2023	APPROACH 19	1059.4	39.5	1098.9	1084.9	14.0	TO BE LIGHTED
308	TREE	6/29/2023	APPROACH 19	1060.8	43.9	1104.7	1082.7	21.9	TO BE REMOVED
309	PRIMARY ROAD	6/29/2023	APPROACH 19	1058.2	15.0	1073.2	1099.5	-26.3	NO OBSTRUCTION
310	TREE	6/29/2023	APPROACH 19	1059.8	46.3	1106.1	1093.0	13.0	TO BE REMOVED
311	PRIMARY ROAD	6/29/2023	APPROACH 19	1060.9	15.0	1075.9	1102.1	-26.2	NO OBSTRUCTION
312	TREE	6/29/2023	APPROACH 19	1060.1	112.2	1172.3	1104.3	68.0	TO BE REMOVED
313	TREE	6/29/2023	APPROACH 19	1056.5	156.9	1213.4	1119.2	94.2	TO BE REMOVED
314	TREE	6/29/2023	APPROACH 19	1060.0	122.9	1183.0	1113.4	69.6	TO BE REMOVED
315	PRIMARY ROAD	6/29/2023	APPROACH 19	1059.3	15.0	1074.3	1128.3	-53.9	NO OBSTRUCTION
316	PRIMARY ROAD	6/29/2023	APPROACH 19	1064.0	15.0	1079.0	1115.3	-36.3	NO OBSTRUCTION

APPROACH RUNWAY 19

317	TREE	6/29/2023	APPROACH 19	1056.6	125.5	1182.1	1130.1	52.1	TO BE REMOVED
318	TREE	6/29/2023	APPROACH 19	1059.1	108.6	1167.7	1126.1	41.6	TO BE REMOVED
319	PRIMARY ROAD	6/29/2023	APPROACH 19	1059.7	15.0	1074.7	1123.7	-49.0	NO OBSTRUCTION
320	TREE	6/29/2023	APPROACH 19	1055.7	123.3	1179.0	1140.5	38.5	TO BE REMOVED
321	TREE	6/29/2023	APPROACH 19	1059.8	139.2	1199.0	1139.3	59.7	TO BE REMOVED
322	PRIMARY ROAD	6/29/2023	APPROACH 19	1059.3	15.0	1074.3	1137.9	-63.6	NO OBSTRUCTION
323	TREE	6/29/2023	APPROACH 19	1075.1	131.6	1206.7	1146.0	60.7	TO BE REMOVED
324	TREE	6/29/2023	APPROACH 19	1071.2	143.1	1214.3	1152.1	62.2	TO BE REMOVED
325	TREE	6/29/2023	APPROACH 19	1093.9	112.7	1206.6	1161.0	45.6	TO BE REMOVED
326	TREE	6/29/2023	APPROACH 19	1107.7	133.2	1241.0	1165.9	75.1	TO BE REMOVED
327	PRIMARY ROAD	6/29/2023	APPROACH 19	1105.8	15.0	1120.8	1165.6	-44.9	NO OBSTRUCTION
328	TREE	6/29/2023	APPROACH 19	1160.8	114.0	1274.8	1182.8	92.0	TO BE REMOVED
329	TREE	6/29/2023	APPROACH 19	1130.9	73.1	1204.0	1175.2	28.8	TO BE REMOVED
330	PRIMARY ROAD	6/29/2023	APPROACH 19	1115.8	15.0	1130.8	1174.6	-43.8	NO OBSTRUCTION
331	TREE	6/29/2023	APPROACH 19	1142.3	127.7	1270.0	1187.6	82.4	TO BE REMOVED
332	TREE	6/29/2023	APPROACH 19	1200.6	122.2	1322.8	1195.8	127.0	TO BE REMOVED
333	TREE	6/29/2023	APPROACH 19	1126.5	141.5	1268.0	1178.5	89.5	TO BE REMOVED
334	TREE	6/29/2023	APPROACH 19	1130.1	131.6	1261.7	1187.2	74.5	TO BE REMOVED
335	TREE	6/29/2023	APPROACH 19	1216.2	122.4	1338.6	1202.9	135.7	TO BE REMOVED
336	TREE	6/29/2023	APPROACH 19	1159.9	141.5	1301.4	1188.9	112.6	TO BE REMOVED
337	TREE	6/29/2023	APPROACH 19	1151.2	96.1	1247.2	1199.6	47.7	TO BE REMOVED
338	TREE	6/29/2023	APPROACH 19	1228.5	126.5	1355.0	1214.7	140.3	TO BE REMOVED
339	TREE	6/29/2023	APPROACH 19	1160.7	139.5	1300.2	1195.9	104.3	TO BE REMOVED
340	TREE	6/29/2023	APPROACH 19	1178.7	114.5	1293.2	1208.6	84.6	TO BE REMOVED
341	TREE	6/29/2023	APPROACH 19	1230.8	120.6	1351.5	1222.1	129.4	TO BE REMOVED
342	TREE	6/29/2023	APPROACH 19	1172.3	70.3	1242.7	1201.0	41.6	TO BE REMOVED
343	TREE	6/29/2023	APPROACH 19	1160.0	138.5	1298.5	1207.3	91.2	TO BE REMOVED
344	TREE	6/29/2023	APPROACH 19	1189.7	86.1	1275.8	1216.9	58.9	TO BE REMOVED
345	TREE	6/29/2023	APPROACH 19	1201.3	110.0	1311.3	1225.4	85.9	TO BE REMOVED
346	TREE	6/29/2023	APPROACH 19	1215.2	117.0	1332.2	1230.9	101.3	TO BE REMOVED
347	TREE	6/29/2023	APPROACH 19	1158.2	133.5	1291.7	1221.5	70.2	TO BE REMOVED
348	BUILDING	6/29/2023	APPROACH 19	1234.9	28.5	1263.4	1234.2	29.3	TO BE LIGHTED
349	TREE	6/29/2023	APPROACH 19	1119.3	138.2	1257.5	1218.6	38.9	TO BE REMOVED
350	TREE	6/29/2023	APPROACH 19	1201.8	126.2	1328.0	1244.4	83.6	TO BE REMOVED
351	TREE	6/29/2023	APPROACH 19	1221.4	108.8	1330.2	1242.0	88.2	TO BE REMOVED
352	TREE	6/29/2023	APPROACH 19	1168.7	121.7	1290.4	1233.4	57.0	TO BE REMOVED
354	TREE	6/29/2023	APPROACH 19	1200.8	123.5	1324.3	1253.3	71.1	TO BE REMOVED
355	TREE	6/29/2023	APPROACH 19	1196.1	90.2	1286.3	1249.6	36.7	TO BE REMOVED
356	PRIMARY ROAD	6/29/2023	APPROACH 19	1102.4	15.0	1117.4	1260.0	-142.5	NO OBSTRUCTION
357	TREE	6/29/2023	APPROACH 19	1179.7	130.7	1310.4	1248.4	62.1	TO BE REMOVED
358	TREE	6/29/2023	APPROACH 19	1108.0	183.6	1291.6	1265.1	26.5	TO BE REMOVED
359	TREE	6/29/2023	APPROACH 19	1180.8	110.4	1291.2	1259.3	31.9	TO BE REMOVED
360	TREE	6/29/2023	APPROACH 19	1181.5	111.5	1293.1	1253.0	40.0	TO BE REMOVED
361	TREE	6/29/2023	APPROACH 19	1101.3	176.0	1277.3	1274.0	3.3	TO BE REMOVED
362	TREE	6/29/2023	APPROACH 19	1111.0	171.5	1282.6	1280.3	2.3	TO BE REMOVED
363	TREE	6/29/2023	APPROACH 19	1100.7	177.0	1277.8	1274.7	3.1	TO BE REMOVED
364	TREE	6/29/2023	APPROACH 19	1113.6	173.5	1287.1	1283.4	3.7	TO BE REMOVED
365	TREE	6/29/2023	APPROACH 19	1113.1	185.2	1298.3	1286.8	11.6	TO BE REMOVED
520	TREE	6/29/2023	APPROACH 19	1200.5	132.2	1332.7	1240.4	92.3	TO BE REMOVED

* FAA RECOMMENDED DISPOSITION, WHERE FEASIBLE. SPECIFIC MITIGATION ACTIONS FOR OBSTACLES ARE EVALUATED ON A CASE-BY-CASE BASIS, AND MAY INCLUDE MEASURES SUCH AS LOWERING, LIGHTING, OR MARKING. MITIGATING CLOSE-IN OBSTACLES (E.G., INNER APPROACH SURFACES, ETC.) IS A HIGH PRIORITY FOR AIR SAFETY. NUMEROUS SURVEYED OBSTACLES (TREES, ETC.) ARE IDENTIFIED IN MOUNTAINOUS TERRAIN THAT ALSO PENETRATES PART 77 AIRSPACE. LEWIS COUNTY CODE -CHAPTER 17.80 - AIRPORT OBSTRUCTION ZONING (RA) DEFINES LOCAL REGULATIONS FOR AIRSPACE PROTECTION.

NO.	DATE	BY	APPR	REVISIONS

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: _____

SIGNATURE

LEWIS COUNTY APPROVAL

APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS/ES	WMR	AS SHOWN
DATE: FEBRUARY 2024		PROJECT NO: 3-53-0156-012-2022	

PACKWOOD AIRPORT

AIRSPACE OBSTRUCTION DATA TABLES

FIGURE NO.

SHEET NO. 11 OF 13

TRANSITIONAL

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION *
400	TREE	6/29/2023	TRANSITIONAL	1038.7	139.9	1178.7	1179.6	-0.9	NO OBSTRUCTION
401	TREE	6/29/2023	TRANSITIONAL	1038.2	134.8	1172.9	1154.6	18.4	TO BE REMOVED
402	TREE	6/29/2023	TRANSITIONAL	1043.2	154.8	1198.0	1123.0	75.0	TO BE REMOVED
403	TREE	6/29/2023	TRANSITIONAL	1050.1	131.1	1181.2	1113.2	68.0	TO BE REMOVED
404	TREE	6/29/2023	TRANSITIONAL	1047.0	139.2	1186.1	1117.3	68.8	TO BE REMOVED
405	TREE	6/29/2023	TRANSITIONAL	1048.7	130.5	1179.3	1141.3	38.0	TO BE REMOVED
406	TREE	6/29/2023	TRANSITIONAL	1051.1	125.7	1176.8	1053.4	123.4	TO BE REMOVED
407	TREE	6/29/2023	TRANSITIONAL	1050.6	135.7	1186.3	1053.5	132.8	TO BE REMOVED
408	TREE	6/29/2023	TRANSITIONAL	1051.8	147.9	1199.7	1065.6	134.1	TO BE REMOVED
409	TREE	6/29/2023	TRANSITIONAL	1053.7	145.3	1199.0	1129.8	69.2	TO BE REMOVED
410	TREE	6/29/2023	TRANSITIONAL	1052.7	136.2	1188.9	1132.4	56.5	TO BE REMOVED
411	TREE	6/29/2023	TRANSITIONAL	1052.7	146.5	1199.3	1065.4	133.9	TO BE REMOVED
412	TREE	6/29/2023	TRANSITIONAL	1054.3	120.5	1174.8	1072.6	102.2	TO BE REMOVED
413	TREE	6/29/2023	TRANSITIONAL	1054.5	142.6	1197.1	1155.4	41.7	TO BE REMOVED
414	TREE	6/29/2023	TRANSITIONAL	1054.9	153.0	1208.0	1151.0	57.0	TO BE REMOVED
415	TREE	6/29/2023	TRANSITIONAL	1057.8	151.7	1209.6	1084.6	125.0	TO BE REMOVED
416	TREE	6/29/2023	TRANSITIONAL	1060.6	161.4	1221.9	1138.8	83.1	TO BE REMOVED
417	TREE	6/29/2023	TRANSITIONAL	1059.2	162.6	1221.8	1189.7	32.1	TO BE REMOVED
418	TREE	6/29/2023	TRANSITIONAL	1062.6	144.7	1207.3	1163.7	43.6	TO BE REMOVED
419	TREE	6/29/2023	TRANSITIONAL	1062.3	140.2	1202.5	1127.7	74.8	TO BE REMOVED
420	TREE	6/29/2023	TRANSITIONAL	1061.4	133.6	1194.9	1129.5	65.4	TO BE REMOVED
421	TREE	6/29/2023	TRANSITIONAL	1063.8	123.9	1187.6	1193.0	-5.3	NO OBSTRUCTION
422	TREE	6/29/2023	TRANSITIONAL	1094.6	150.7	1245.2	1175.4	69.8	TO BE REMOVED
423	TREE	6/29/2023	TRANSITIONAL	1125.1	147.7	1272.8	1205.0	67.8	TO BE REMOVED
424	TREE	6/29/2023	TRANSITIONAL	1041.3	162.5	1203.7	1090.5	113.2	TO BE REMOVED
425	TREE	6/29/2023	TRANSITIONAL	1045.8	124.3	1170.1	1077.2	92.9	TO BE REMOVED
426	TREE	6/29/2023	TRANSITIONAL	1047.3	126.7	1174.0	1145.2	28.9	TO BE REMOVED
427	TREE	6/29/2023	TRANSITIONAL	1047.4	139.1	1186.4	1131.6	54.8	TO BE REMOVED
428	TREE	6/29/2023	TRANSITIONAL	1045.4	141.6	1187.1	1128.5	58.6	TO BE REMOVED
429	TREE	6/29/2023	TRANSITIONAL	1050.0	66.5	1116.5	1058.4	58.1	TO BE REMOVED
430	TREE	6/29/2023	TRANSITIONAL	1051.7	138.3	1190.0	1101.3	88.7	TO BE REMOVED
431	TREE	6/29/2023	TRANSITIONAL	1050.6	161.5	1212.1	1095.7	116.4	TO BE REMOVED
432	TREE	6/29/2023	TRANSITIONAL	1052.6	122.8	1175.4	1086.2	89.3	TO BE REMOVED
433	TREE	6/29/2023	TRANSITIONAL	1057.2	131.8	1188.9	1139.4	49.6	TO BE REMOVED
434	TREE	6/29/2023	TRANSITIONAL	1056.7	184.2	1241.0	1169.7	71.3	TO BE REMOVED
435	TREE	6/29/2023	TRANSITIONAL	1053.9	137.8	1191.7	1098.9	92.8	TO BE REMOVED
436	TREE	6/29/2023	TRANSITIONAL	1056.9	97.9	1154.8	1125.4	29.4	TO BE REMOVED
437	TREE	6/29/2023	TRANSITIONAL	1054.3	148.1	1202.4	1166.2	36.2	TO BE REMOVED
438	TREE	6/29/2023	TRANSITIONAL	1054.6	177.4	1232.0	1170.5	61.5	TO BE REMOVED
439	TREE	6/29/2023	TRANSITIONAL	1054.4	168.7	1223.2	1167.0	56.2	TO BE REMOVED
441	TREE	6/29/2023	TRANSITIONAL	1050.1	149.9	1200.1	1138.2	61.8	TO BE REMOVED
442	TREE	6/29/2023	TRANSITIONAL	1038.6	138.5	1177.1	1168.9	8.2	TO BE REMOVED
443	TREE	6/29/2023	TRANSITIONAL	1041.2	135.6	1176.7	1124.4	52.4	TO BE REMOVED
444	TREE	6/29/2023	TRANSITIONAL	1046.8	157.0	1203.8	1198.9	5.0	TO BE REMOVED
445	TREE	6/29/2023	TRANSITIONAL	1051.2	110.8	1162.1	1136.1	25.9	TO BE REMOVED
446	TREE	6/29/2023	TRANSITIONAL	1055.7	104.6	1160.3	1128.4	31.9	TO BE REMOVED
447	FENCE	6/29/2023	TRANSITIONAL	1049.3	7.4	1056.8	1050.3	6.4	TO BE REMOVED
448	FENCE	6/29/2023	TRANSITIONAL	1049.7	8.4	1058.1	1051.0	7.1	TO BE REMOVED
449	FENCE	6/29/2023	TRANSITIONAL	1051.1	7.8	1058.9	1051.8	7.2	TO BE REMOVED
450	FENCE	6/29/2023	TRANSITIONAL	1052.6	7.6	1060.2	1052.2	8.0	TO BE REMOVED
451	POWER POLE	6/29/2023	TRANSITIONAL	1050.0	39.8	1089.8	1083.6	6.2	TO BE LIGHTED
452	POWER POLE	6/29/2023	TRANSITIONAL	1052.5	35.6	1088.2	1082.0	6.2	TO BE LIGHTED
453	APBN	6/29/2023	TRANSITIONAL	1052.0	31.2	1083.2	1072.5	10.8	TO BE LIGHTED
454	WINDSOCK	6/29/2023	TRANSITIONAL	1052.4	21.6	1074.0	1055.3	18.7	TO BE LIGHTED
455	POWER POLE	6/29/2023	TRANSITIONAL	1053.9	42.8	1096.8	1080.0	16.8	TO BE LIGHTED
456	EQUIPMENT ON BUILDING	6/29/2023	TRANSITIONAL	1055.1	21.5	1076.6	1073.0	3.6	TO BE LIGHTED
457	BUILDING	6/29/2023	TRANSITIONAL	1056.4	26.2	1082.7	1073.2	9.5	TO BE LIGHTED
458	FLAGPOLE	6/29/2023	TRANSITIONAL	1055.9	21.6	1077.5	1076.2	1.3	TO BE LIGHTED
459	POWER POLE	6/29/2023	TRANSITIONAL	1056.9	26.1	1082.9	1061.3	21.6	TO BE LIGHTED
460	POWER POLE	6/29/2023	TRANSITIONAL	1057.5	26.3	1083.8	1070.0	13.8	TO BE LIGHTED
461	POWER POLE	6/29/2023	TRANSITIONAL	1058.2	33.7	1091.9	1083.1	8.9	TO BE LIGHTED
462	POWER POLE	6/29/2023	TRANSITIONAL	1057.2	76.8	1134.0	1120.8	13.2	TO BE LIGHTED
463	POWER POLE	6/29/2023	TRANSITIONAL	1059.0	33.5	1092.5	1077.1	15.4	TO BE LIGHTED
464	POWER POLE	6/29/2023	TRANSITIONAL	1055.4	124.6	1180.0	1147.8	32.2	TO BE LIGHTED
465	POWER POLE	6/29/2023	TRANSITIONAL	1058.8	70.6	1129.5	1089.4	40.1	TO BE LIGHTED
466	POWER POLE	6/29/2023	TRANSITIONAL	1057.8	49.1	1107.0	1095.6	11.4	TO BE LIGHTED

HORIZONTAL

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION *
348	BUILDING	6/29/2023	HORIZONTAL	1234.9	28.5	1263.4	1207.0	56.4	TO BE LIGHTED
360	TREE	6/29/2023	HORIZONTAL	1181.5	111.5	1293.1	1207.0	86.0	TO BE REMOVED
500	TREE	6/29/2023	HORIZONTAL	1163.6	140.1	1303.7	1207.0	96.6	TO BE REMOVED
501	TREE	6/29/2023	HORIZONTAL	1112.0	204.2	1316.3	1207.0	109.2	TO BE REMOVED
502	TREE	6/29/2023	HORIZONTAL	1137.9	209.8	1347.7	1207.0	140.6	TO BE REMOVED
503	TREE	6/29/2023	HORIZONTAL	1122.0	180.5	1302.5	1207.0	95.4	TO BE REMOVED
504	TREE	6/29/2023	HORIZONTAL	1090.4	218.6	1309.0	1207.0	101.9	TO BE REMOVED
505	TREE	6/29/2023	HORIZONTAL	1071.6	205.5	1277.0	1207.0	70.0	TO BE REMOVED
506	TREE	6/29/2023	HORIZONTAL	1103.4	195.2	1298.7	1207.0	91.6	TO BE REMOVED
507	TREE	6/29/2023	HORIZONTAL	1108.8	143.1	1251.8	1207.0	44.8	TO BE REMOVED
508	TREE	6/29/2023	HORIZONTAL	1103.7	123.6	1227.4	1207.0	20.3	TO BE REMOVED
509	TREE	6/29/2023	HORIZONTAL	1058.7	172.8	1231.5	1207.0	24.5	TO BE REMOVED
510	TREE	6/29/2023	HORIZONTAL	1062.0	192.1	1254.1	1207.0	47.1	TO BE REMOVED
511	TREE	6/29/2023	HORIZONTAL	1068.4	179.0	1247.4	1207.0	40.4	TO BE REMOVED
512	TREE	6/29/2023	HORIZONTAL	1081.4	202.7	1284.2	1207.0	77.1	TO BE REMOVED
513	TREE	6/29/2023	HORIZONTAL	1098.8	148.1	1246.8	1207.0	39.8	TO BE REMOVED
514	TREE	6/29/2023	HORIZONTAL	1121.2	154.2	1275.3	1207.0	68.3	TO BE REMOVED
515	TREE	6/29/2023	HORIZONTAL	1112.8	133.8	1246.5	1207.0	39.5	TO BE REMOVED
516	TREE	6/29/2023	HORIZONTAL	1070.7	178.9	1249.6	1207.0	42.5	TO BE REMOVED
517	TREE	6/29/2023	HORIZONTAL	1059.8	173.8	1233.6	1207.0	26.5	TO BE REMOVED
518	TREE	6/29/2023	HORIZONTAL	1122.0	138.0	1259.9	1207.0	52.9	TO BE REMOVED
519	TREE	6/29/2023	HORIZONTAL	1160.0	138.5	1298.5	1207.0	91.5	TO BE REMOVED
520	TREE	6/29/2023	HORIZONTAL	1200.5	132.2	1332.7	1207.0	125.6	TO BE REMOVED
521	TREE	6/29/2023	HORIZONTAL	1228.5	126.5	1355.0	1207.0	148.0	TO BE REMOVED
522	TREE	6/29/2023	HORIZONTAL	1051.3	160.8	1212.1	1207.0	5.0	TO BE REMOVED
523	TREE	6/29/2023	HORIZONTAL	1071.5	156.4	1228.0	1207.0	21.0	TO BE REMOVED
524	TREE	6/29/2023	HORIZONTAL	1139.0	142.1	1281.1	1207.0	74.0	TO BE REMOVED
525	TREE	6/29/2023	HORIZONTAL	1277.0	148.8	1425.8	1207.0	218.8	TO BE REMOVED
526	TREE	6/29/2023	HORIZONTAL	1250.3	129.6	1379.8	1207.0	172.8	TO BE REMOVED
527	TREE	6/29/2023	HORIZONTAL	1228.5	114.8	1343.3	1207.0	136.2	TO BE REMOVED
528	TREE	6/29/2023	HORIZONTAL	1172.8	123.8	1296.6	1207.0	89.6	TO BE REMOVED
529	TREE	6/29/2023	HORIZONTAL	1046.5	183.5	1230.0	1207.0	23.0	TO BE REMOVED
530	TREE	6/29/2023	HORIZONTAL	1044.2	187.2	1231.4	1207.0	24.4	TO BE REMOVED
531	TREE	6/29/2023	HORIZONTAL	1047.8	164.2	1212.0	1207.0	5.0	TO BE REMOVED
532	TREE	6/29/2023	HORIZONTAL	1102.5	144.1	1246.6	1207.0	39.6	TO BE REMOVED
533	TREE	6/29/2023	HORIZONTAL	1100.7	141.4	1242.0	1207.0	35.0	TO BE REMOVED
534	TREE	6/29/2023	HORIZONTAL	1234.0	137.0	1370.9	1207.0	163.9	TO BE REMOVED
535	TREE	6/29/2023	HORIZONTAL	1238.4	176.2	1414.6	1207.0	207.5	TO BE REMOVED
536	TREE	6/29/2023	HORIZONTAL	1240.5	183.0	1423.6	1207.0	216.5	TO BE REMOVED
537	TREE	6/29/2023	HORIZONTAL	1188.6	194.7	1383.3	1207.0	176.3	TO BE REMOVED
538	TREE	6/29/2023	HORIZONTAL	1166.8	220.3	1387.1	1207.0	180.1	TO BE REMOVED
539	TREE	6/29/2023	HORIZONTAL	1258.7	204.3	1463.0	1207.0	256.0	TO BE REMOVED
540	TREE	6/29/2023	HORIZONTAL	1187.0	166.1	1353.2	1207.0	146.2	TO BE REMOVED
541	TREE	6/29/2023	HORIZONTAL	1176.3	140.0	1316.3	1207.0	109.2	TO BE REMOVED
542	TREE	6/29/2023	HORIZONTAL	1098.2	211.3	1309.6	1207.0	102.5	TO BE REMOVED
543	TREE	6/29/2023	HORIZONTAL	1063.0	150.0	1213.0	1207.0	6.0	TO BE REMOVED
544	TREE	6/29/2023	HORIZONTAL	1052.2	153.1	1205.4	1207.0	-1.7	NO OBSTRUCTION
545	TREE	6/29/2023	HORIZONTAL	1046.0	155.6	1201.5	1207.0	-5.5	NO OBSTRUCTION
546	TREE	6/29/2023	HORIZONTAL	1036.6	165.1	1201.7	1207.0	-5.4	NO OBSTRUCTION
547	TREE	6/29/2023	HORIZONTAL	1047.6	161.2	1208.8	1207.0	1.7	TO BE REMOVED
548	TREE	6/29/2023	HORIZONTAL	1053.1	151.3	1204.4	1207.0	-2.6	NO OBSTRUCTION
549	TREE	6/29/2023	HORIZONTAL	1050.2	148.5	1198.7	1207.0	-8.3	NO OBSTRUCTION
550	TREE	6/29/2023	HORIZONTAL	1050.2	159.9	1210.1	1207.0	3.0	TO BE REMOVED
551	TREE	6/29/2023	HORIZONTAL	1049.7	156.5	1206.3	1207.0	-0.8	NO OBSTRUCTION
552	TREE	6/29/2023	HORIZONTAL	1046.8	153.4	1200.2	1207.0	-6.9	NO OBSTRUCTION
553	TREE	6/29/2023	HORIZONTAL	1054.3	157.9	1212.2	1207.0	5.2	TO BE REMOVED
554	TREE	6/29/2023	HORIZONTAL	1053.4	156.3	1209.7	1207.0	2.7	TO BE REMOVED
555	TREE	6/29/2023	HORIZONTAL	1049.6	154.3	1203.8	1207.0	-3.2	NO OBSTRUCTION
556	CHIMNEY ON BUILDING	6/29/2023	HORIZONTAL	1241.1	29.9	1271.0	1207.0	63.9	TO BE LIGHTED
557	BUILDING	6/29/2023	HORIZONTAL	1183.4	23.9	1207.2	1207.0	0.2	TO BE LIGHTED
558	BUILDING	6/29/2023	HORIZONTAL	1184.6	30.7	1215.3	1207.0	8.3	TO BE LIGHTED

* FAA RECOMMENDED DISPOSITION, WHERE FEASIBLE. SPECIFIC MITIGATION ACTIONS FOR OBSTACLES ARE EVALUATED ON A CASE-BY-CASE BASIS, AND MAY INCLUDE MEASURES SUCH AS LOWERING, LIGHTING, OR MARKING. MITIGATING CLOSE-IN OBSTACLES (E.G., INNER APPROACH SURFACES, ETC.) IS A HIGH PRIORITY FOR AIR SAFETY. NUMEROUS SURVEYED OBSTACLES (TREES, ETC.) ARE IDENTIFIED IN MOUNTAINOUS TERRAIN THAT ALSO PENETRATES PART 77 AIRSPACE. LEWIS COUNTY CODE -CHAPTER 17.80 - AIRPORT OBSTRUCTION ZONING (RA) DEFINES LOCAL REGULATIONS FOR AIRSPACE PROTECTION.

"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-53-0156-012-2022) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES

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

FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE: _____

SIGNATURE

LEWIS COUNTY APPROVAL

APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING

BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS/ES	WMR	AS SHOWN

DATE: FEBRUARY 2024

PROJECT NO: 3-53-0156-012-2022

PACKWOOD AIRPORT

AIRSPACE OBSTRUCTION DATA TABLES

FIGURE NO.

SHEET NO. 12 OF 13

CONICAL

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION *
600	TREE	6/29/2023	CONICAL	2052.0	136.2	2188.2	1383.3	804.9	TO BE REMOVED
601	TREE	6/29/2023	CONICAL	2072.0	196.1	2268.1	1396.1	872.0	TO BE REMOVED
602	TREE	6/29/2023	CONICAL	2023.8	124.3	2148.1	1398.4	749.7	TO BE REMOVED
603	TREE	6/29/2023	CONICAL	1983.5	111.0	2094.5	1388.7	705.8	TO BE REMOVED
604	TREE	6/29/2023	CONICAL	1791.0	141.2	1932.1	1382.7	549.4	TO BE REMOVED
605	TREE	6/29/2023	CONICAL	1597.7	143.4	1741.1	1392.3	348.8	TO BE REMOVED
606	TREE	6/29/2023	CONICAL	1462.3	161.3	1623.6	1403.1	220.6	TO BE REMOVED
607	TREE	6/29/2023	CONICAL	1524.2	136.3	1660.6	1403.5	257.1	TO BE REMOVED
608	TREE	6/29/2023	CONICAL	1514.3	117.7	1632.0	1397.9	234.1	TO BE REMOVED
609	TREE	6/29/2023	CONICAL	1412.8	172.8	1585.6	1405.2	180.5	TO BE REMOVED
610	TREE	6/29/2023	CONICAL	1440.0	171.1	1611.1	1393.6	217.5	TO BE REMOVED
611	TREE	6/29/2023	CONICAL	1415.2	84.6	1499.8	1359.6	140.2	TO BE REMOVED
612	TREE	6/29/2023	CONICAL	1372.3	137.0	1509.2	1345.7	163.6	TO BE REMOVED
613	TREE	6/29/2023	CONICAL	1475.3	86.5	1561.9	1353.1	208.8	TO BE REMOVED
614	TREE	6/29/2023	CONICAL	1557.2	86.3	1643.5	1352.2	291.3	TO BE REMOVED
615	TREE	6/29/2023	CONICAL	1587.0	146.3	1733.3	1345.1	388.2	TO BE REMOVED
616	TREE	6/29/2023	CONICAL	1706.1	206.3	1912.4	1357.2	555.2	TO BE REMOVED
617	TREE	6/29/2023	CONICAL	2020.6	168.5	2189.1	1370.1	819.0	TO BE REMOVED
618	TREE	6/29/2023	CONICAL	2000.5	134.2	2134.6	1379.3	755.4	TO BE REMOVED
619	TREE	6/29/2023	CONICAL	1590.4	166.9	1757.3	1388.0	369.3	TO BE REMOVED
620	TREE	6/29/2023	CONICAL	1586.8	65.3	1652.2	1396.9	255.3	TO BE REMOVED
621	TREE	6/29/2023	CONICAL	1517.2	106.0	1623.2	1370.2	253.0	TO BE REMOVED
622	TREE	6/29/2023	CONICAL	1630.7	49.4	1680.1	1347.1	333.0	TO BE REMOVED
623	TREE	6/29/2023	CONICAL	1770.9	200.2	1971.1	1323.6	647.5	TO BE REMOVED
624	TREE	6/29/2023	CONICAL	1792.3	148.1	1940.5	1317.6	622.9	TO BE REMOVED
625	TREE	6/29/2023	CONICAL	1527.9	102.3	1630.1	1313.0	317.2	TO BE REMOVED
626	TREE	6/29/2023	CONICAL	1433.9	91.8	1525.8	1303.4	222.4	TO BE REMOVED
627	TREE	6/29/2023	CONICAL	1313.9	129.8	1443.6	1295.2	148.4	TO BE REMOVED
628	TREE	6/29/2023	CONICAL	1348.9	155.3	1504.2	1286.1	218.1	TO BE REMOVED
629	TREE	6/29/2023	CONICAL	1340.5	165.9	1506.4	1270.4	236.0	TO BE REMOVED
630	TREE	6/29/2023	CONICAL	1246.2	173.0	1419.2	1291.6	127.6	TO BE REMOVED
631	TREE	6/29/2023	CONICAL	1467.0	178.2	1645.2	1382.6	262.5	TO BE REMOVED
632	TREE	6/29/2023	CONICAL	1488.5	139.9	1628.4	1399.4	229.1	TO BE REMOVED
633	TREE	6/29/2023	CONICAL	1422.6	182.4	1605.1	1401.3	203.8	TO BE REMOVED
634	TREE	6/29/2023	CONICAL	1206.9	215.9	1422.8	1247.3	175.5	TO BE REMOVED
635	TREE	6/29/2023	CONICAL	1268.2	193.4	1461.6	1257.3	204.3	TO BE REMOVED
636	TREE	6/29/2023	CONICAL	1139.1	200.5	1339.6	1214.5	125.1	TO BE REMOVED
637	TREE	6/29/2023	CONICAL	1133.7	221.6	1355.4	1226.2	129.2	TO BE REMOVED
638	TREE	6/29/2023	CONICAL	1369.0	131.0	1500.0	1262.7	237.3	TO BE REMOVED
639	TREE	6/29/2023	CONICAL	1479.2	49.3	1528.6	1267.8	260.8	TO BE REMOVED
640	TREE	6/29/2023	CONICAL	1475.1	41.8	1516.9	1288.4	228.6	TO BE REMOVED
641	TREE	6/29/2023	CONICAL	1453.2	92.9	1546.1	1316.4	229.7	TO BE REMOVED
642	TREE	6/29/2023	CONICAL	1161.1	161.8	1322.9	1210.3	112.5	TO BE REMOVED
643	TREE	6/29/2023	CONICAL	1217.0	169.2	1386.2	1259.2	127.0	TO BE REMOVED
644	TREE	6/29/2023	CONICAL	1207.0	175.7	1382.7	1238.8	143.9	TO BE REMOVED
645	TREE	6/29/2023	CONICAL	1229.5	175.0	1404.5	1222.8	181.7	TO BE REMOVED
646	TREE	6/29/2023	CONICAL	1235.4	168.2	1403.6	1232.9	170.7	TO BE REMOVED
647	TREE	6/29/2023	CONICAL	1440.8	124.1	1564.8	1357.4	207.5	TO BE REMOVED
648	TREE	6/29/2023	CONICAL	1286.9	164.3	1451.2	1274.6	176.6	TO BE REMOVED
649	TREE	6/29/2023	CONICAL	1252.4	172.7	1425.1	1216.6	208.5	TO BE REMOVED
650	TREE	6/29/2023	CONICAL	1253.9	168.2	1422.0	1220.8	201.2	TO BE REMOVED
651	TREE	6/29/2023	CONICAL	1405.2	193.8	1599.0	1383.3	215.7	TO BE REMOVED
652	TREE	6/29/2023	CONICAL	1453.3	157.7	1610.9	1389.4	221.5	TO BE REMOVED
653	TREE	6/29/2023	CONICAL	1439.2	169.2	1608.4	1405.9	202.6	TO BE REMOVED
654	TREE	6/29/2023	CONICAL	1615.7	162.1	1777.9	1394.8	383.0	TO BE REMOVED
655	TREE	6/29/2023	CONICAL	1393.5	221.0	1614.4	1357.3	257.2	TO BE REMOVED
656	TREE	6/29/2023	CONICAL	1373.3	196.5	1569.8	1306.2	263.6	TO BE REMOVED
657	TREE	6/29/2023	CONICAL	1361.2	159.2	1520.4	1289.7	230.7	TO BE REMOVED
658	TREE	6/29/2023	CONICAL	1313.8	184.7	1498.5	1216.7	281.8	TO BE REMOVED
659	TREE	6/29/2023	CONICAL	1283.0	168.8	1451.8	1224.1	227.7	TO BE REMOVED
660	TREE	6/29/2023	CONICAL	1322.5	160.5	1482.9	1273.0	209.9	TO BE REMOVED
661	TREE	6/29/2023	CONICAL	1363.4	162.5	1525.8	1313.4	212.5	TO BE REMOVED
662	TREE	6/29/2023	CONICAL	1493.6	117.1	1610.7	1362.0	248.8	TO BE REMOVED
663	TREE	6/29/2023	CONICAL	1548.3	160.8	1709.1	1406.3	302.7	TO BE REMOVED
664	TREE	6/29/2023	CONICAL	1431.5	171.8	1603.2	1396.9	206.4	TO BE REMOVED
665	TREE	6/29/2023	CONICAL	1527.4	140.2	1667.6	1397.9	269.8	TO BE REMOVED
666	TREE	6/29/2023	CONICAL	1614.9	163.9	1778.8	1398.6	380.3	TO BE REMOVED

CONICAL

667	TREE	6/29/2023	CONICAL	1731.1	130.2	1861.3	1366.3	495.0	TO BE REMOVED
668	TREE	6/29/2023	CONICAL	1604.2	132.0	1736.3	1333.0	403.3	TO BE REMOVED
669	TREE	6/29/2023	CONICAL	1532.6	149.6	1682.2	1304.9	377.3	TO BE REMOVED
670	TREE	6/29/2023	CONICAL	1540.5	217.5	1758.1	1277.6	480.4	TO BE REMOVED
671	TREE	6/29/2023	CONICAL	1466.9	153.7	1620.6	1256.0	364.6	TO BE REMOVED
672	TREE	6/29/2023	CONICAL	1368.6	230.1	1598.7	1252.0	346.7	TO BE REMOVED
673	TREE	6/29/2023	CONICAL	1351.9	211.5	1563.4	1242.1	321.3	TO BE REMOVED
674	TREE	6/29/2023	CONICAL	1374.2	170.7	1544.9	1250.8	294.1	TO BE REMOVED
675	TREE	6/29/2023	CONICAL	1333.6	155.1	1488.8	1250.8	238.0	TO BE REMOVED
676	TREE	6/29/2023	CONICAL	1274.7	208.4	1483.1	1249.3	233.9	TO BE REMOVED
677	TREE	6/29/2023	CONICAL	1376.8	218.8	1595.7	1275.5	320.2	TO BE REMOVED
678	TREE	6/29/2023	CONICAL	1401.7	196.0	1597.7	1283.1	314.6	TO BE REMOVED
679	TREE	6/29/2023	CONICAL	1520.5	233.6	1754.1	1317.6	436.5	TO BE REMOVED
680	TREE	6/29/2023	CONICAL	1564.2	195.2	1759.4	1356.3	403.1	TO BE REMOVED
681	TREE	6/29/2023	CONICAL	1624.6	82.4	1707.0	1380.0	327.0	TO BE REMOVED
682	TREE	6/29/2023	CONICAL	1824.9	164.6	1989.5	1402.3	587.2	TO BE REMOVED
683	TREE	6/29/2023	CONICAL	1802.0	166.9	1968.9	1402.8	566.1	TO BE REMOVED
684	TREE	6/29/2023	CONICAL	1809.4	188.0	1997.4	1393.7	603.7	TO BE REMOVED
685	TREE	6/29/2023	CONICAL	1755.3	192.4	1947.7	1357.5	590.2	TO BE REMOVED
686	TREE	6/29/2023	CONICAL	1714.3	194.4	1908.7	1346.9	561.8	TO BE REMOVED
687	TREE	6/29/2023	CONICAL	1645.7	134.0	1779.7	1329.4	450.4	TO BE REMOVED
688	TREE	6/29/2023	CONICAL	1583.1	186.0	1769.2	1309.6	459.6	TO BE REMOVED
689	TREE	6/29/2023	CONICAL	1471.9	223.5	1695.4	1302.9	392.5	TO BE REMOVED
690	TREE	6/29/2023	CONICAL	1700.8	166.4	1867.3	1307.6	559.7	TO BE REMOVED
691	TREE	6/29/2023	CONICAL	1568.2	188.5	1756.7	1293.9	462.9	TO BE REMOVED
692	TREE	6/29/2023	CONICAL	1555.8	209.9	1765.7	1303.5	462.3	TO BE REMOVED
693	TREE	6/29/2023	CONICAL	1725.4	128.0	1853.5	1309.3	544.1	TO BE REMOVED
694	TREE	6/29/2023	CONICAL	1735.9	158.9	1894.8	1328.9	565.9	TO BE REMOVED
695	TREE	6/29/2023	CONICAL	1753.6	143.3	1896.8	1339.2	557.6	TO BE REMOVED
696	TREE	6/29/2023	CONICAL	1809.4	126.4	1935.8	1364.8	570.9	TO BE REMOVED
697	TREE	6/29/2023	CONICAL	1928.5	123.2	2051.7	1381.7	670.1	TO BE REMOVED
698	TREE	6/29/2023	CONICAL	1884.4	190.8	2075.3	1401.9	673.3	TO BE REMOVED
699	TREE	6/29/2023	CONICAL	2054.3	108.3	2162.6	1389.2	773.4	TO BE REMOVED
700	TREE	6/29/2023	CONICAL	2268.3	147.8	2416.1	1401.2	1014.9	TO BE REMOVED
701	TREE	6/29/2023	CONICAL	2092.4	144.1	2236.6	1380.9	855.7	TO BE REMOVED
702	TREE	6/29/2023	CONICAL	1925.7	157.7	2083.4	1374.8	708.6	TO BE REMOVED
703	TREE	6/29/2023	CONICAL	1848.7	202.6	2051.3	1358.1	693.2	TO BE REMOVED
704	TREE	6/29/2023	CONICAL	1852.8	219.1	2071.9	1355.7	716.2	TO BE REMOVED
705	TREE	6/29/2023	CONICAL	1880.0	201.4	2081.4	1355.8	725.6	TO BE REMOVED
706	TREE	6/29/2023	CONICAL	1806.0	272.9	2078.9	1352.6	726.3	TO BE REMOVED
707	TREE	6/29/2023	CONICAL	1804.0	204.2	2008.2	1354.5	653.7	TO BE REMOVED
708	TREE	6/29/2023	CONICAL	1783.9	132.3	1916.2	1362.4	553.8	TO BE REMOVED
709	TREE	6/29/2023	CONICAL	1852.9	194.2	2047.1	1374.7	672.3	TO BE REMOVED
710	TREE	6/29/2023	CONICAL	1913.1	177.5	2090.6	1380.4	710.2	TO BE REMOVED
711	TREE	6/29/2023	CONICAL	2000.0	127.4	2127.4	1403.3	724.1	TO BE REMOVED
712	TREE	6/29/2023	CONICAL	1881.5	197.3	2078.8	1401.8	677.0	TO BE REMOVED
713	TREE	6/29/2023	CONICAL	2047.8	181.5	2229.3	1404.7	824.7	TO BE REMOVED
714	TREE	6/29/2023	CONICAL	2008.9	197.6	2206.4	1404.6	801.8	TO BE REMOVED
715	TREE	6/29/2023	CONICAL	1962.8	183.7	2146.5	1402.5	744.0	TO BE REMOVED
716	TREE	6/29/2023	CONICAL	2007.6	135.6	2143.2	1406.6	736.5	TO BE REMOVED
717	TREE	6/29/2023	CONICAL	1988.1	199.8	2188.0	1393.8	794.2	TO BE REMOVED
718	TREE	6/29/2023	CONICAL	2044.6	181.4	2226.0	1389.0	837.0	TO BE REMOVED
719	TREE	6/29/2023	CONICAL	2037.8	211.1	2248.9	1395.0	853.8	TO BE REMOVED
720	TREE	6/29/2023	CONICAL	2104.9	208.1	2313.0	1402.0	911.0	TO BE REMOVED
721	TREE	6/29/2023	CONICAL	2223.0	185.0	2408.1	1403.3	1004.7	TO BE REMOVED
722	TREE	6/29/2023	CONICAL	2418.7	75.6	2494.3	1406.4	1087.9	TO BE REMOVED
723	TREE	6/29/2023	CONICAL	1356.9	219.9	1576.8	1379.3	197.6	TO BE REMOVED
724	ANTENNA	6/29/2023	CONICAL	1301.5	266.0	1567.6	1226.9	340.6	TO BE LIGHTED
725	BUILDING	6/29/2023	CONICAL	1285.9	34.4	1320.3	1210.2	110.1	TO BE LIGHTED
726	BUILDING	6/29/2023	CONICAL	1319.0	10.6	1329.6	1249.5	80.1	TO BE LIGHTED
727	BUILDING	6/29/2023	CONICAL	1308.4	28.1	1336.5	1262.7	73.8	TO BE LIGHTED
728	BUILDING	6/29/2023	CONICAL	1489.7	12.8	1502.5	1390.9	111.6	TO BE LIGHTED

* FAA RECOMMENDED DISPOSITION, WHERE FEASIBLE. SPECIFIC MITIGATION ACTIONS FOR OBSTACLES ARE EVALUATED ON A CASE-BY-CASE BASIS, AND MAY INCLUDE MEASURES SUCH AS LOWERING, LIGHTING, OR MARKING. MITIGATING CLOSE-IN OBSTACLES (E.G., INNER APPROACH SURFACES, ETC.) IS A HIGH PRIORITY FOR AIR SAFETY. NUMEROUS SURVEYED OBSTACLES (TREES, ETC.) ARE IDENTIFIED IN MOUNTAINOUS TERRAIN THAT ALSO PENETRATES PART 77 AIRSPACE. LEWIS COUNTY CODE -CHAPTER 17.80 - AIRPORT OBSTRUCTION ZONING (RA) DEFINES LOCAL REGULATIONS FOR AIRSPACE PROTECTION.

"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-53-0156-012-2022) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

NO.	DATE	BY	APPR	REVISIONS

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: _____

SIGNATURE

LEWIS COUNTY APPROVAL

APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS/ES	WMR	AS SHOWN

DATE: FEBRUARY 2024

PROJECT NO: 3-53-0156-012-2022

PACKWOOD AIRPORT

AIRSPACE OBSTRUCTION DATA TABLES

FIGURE NO.

SHEET NO. 13 OF 13

Appendix A

Environmental Review Memo

Final

PACKWOOD AIRPORT

Airport Master Plan Environmental Overview

Prepared for
Century West Engineering Corporation

January 2023

ESA

Final

PACKWOOD AIRPORT

Airport Master Plan Environmental Overview

Prepared for
Century West Engineering Corporation

January 2023

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Acronyms and Abbreviations

Airport	Packwood Airport
CO	Carbon Monoxide
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
EJSCREEN	Environmental Justice Screening and Mapping Tool
EPA	U.S. Environmental Protection Agency
ESA	Environmental Science Associates
ESU	Evolutionarily Significant Unit
F	degrees Fahrenheit
FAA	Federal Aviation Administration
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOx	Nitrogen Oxide
NWI	National Wetlands Inventory
O3	Ozone
Pb	Lead
PM10 and PM2.5	Particulate matter
SO2	Sulfur Dioxide
TMDL	Total Maximum Daily Load
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington Department of Transportation

AIRPORT MASTER PLAN

Environmental Overview

Building off of previous environmental work completed for the Packwood Airport (Airport), Environmental Science Associates (ESA) has prepared this Environmental Overview for the Airport's Master Plan. The purpose of this Environmental Overview is to describe the environmental conditions of the Airport and identify any known or potential environmental conditions or issues that could be affected by proposed development at the Airport.

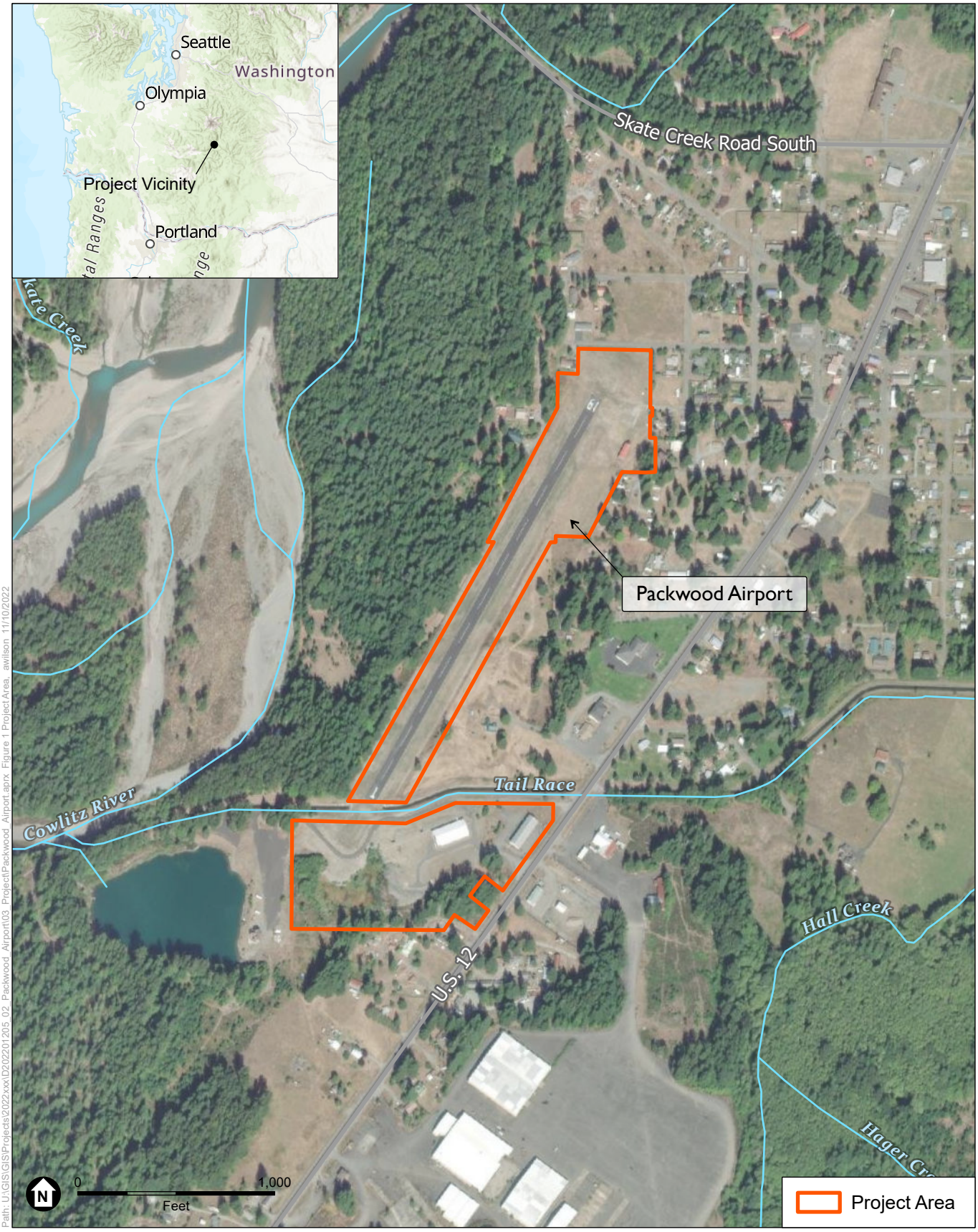
Utilizing available data and information, the contents and organization of this Environmental Overview are based on the National Environmental Policy Act (NEPA) Environmental Impact Categories outlined in Federal Aviation Administration (FAA) Order 1050.1F Environmental Impacts: Policies and Procedures as well as the NEPA implementation instructions for Airport Actions outlined in FAA Order 5050.4B (FAA 2006). ESA performed a desktop analysis for the following environmental impact categories described in the FAA Order 1050.1F:

- Air Quality
- Biological Resources (including fish, wildlife, and plants)
- Department of Transportation Act, Section 4(f)
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Natural Resources and Energy Supply
- Water Resources (including wetlands, floodplains, surface waters, water quality, stormwater, groundwater, and wild and scenic rivers)

LOCATION

The Packwood Airport is located in the city limits of Packwood in Lewis County, Washington. The Airport is located at an elevation of 1,057 feet mean sea level (msl) and is bordered by the city to the east, the Cowlitz River to the west, the Gifford Pinchot National Forest to the north, and rural development to the south. The Project Area consists of the properties owned by the Airport as well as Parcel 035179006002 to the south west of the Airport (**Figure 1**).

Depending on the environmental category, the study area may include a large area in order to give context to potential protected resources.



SOURCE: Imagery: Maxar, 2020; Hydrography: WADNR 2021; ESA, 2022

Packwood Airport Layout

Figure 1
Project Location

ESA

AIR QUALITY

Local air quality is generally described by the concentration of various pollutants in the atmosphere. The significance of a pollution concentration is determined by comparing it to 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: Ozone (O3), Carbon Monoxide (CO), Sulfur Dioxide (SO2), Nitrogen Oxide (NOx), Particulate matter (PM10 and PM2.5), 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. The Airport is within an attainment area in Lewis County, Washington (Ecology 2022).

The EPA's Environmental Justice Screening and Mapping Tool (EJSCREEN) was created to highlight locations that may be candidates for further environmental review. The Packwood Airport property falls within a census block where all air quality-related environmental hazard indexes are between the 8th and 50th percentile and all environmental justice indexes are between the 2nd and 42nd percentile nationwide (EPA 2022a). This means that indexes within the Project Area are equal to or higher than the listed percentile of the greater US population.

Meteorological Information

The climate in Lewis County averages approximately 138 days of sunny weather and a combined 152 days of wet weather including rain and snow. National Oceanic and Atmospheric Administration (NOAA) data from 2011 to 2021 indicates that the annual average temperatures at the Airport have a high of 79 degrees Fahrenheit (F) and a low of 42 degrees F. The lowest temperatures are in December when the average daily low is 30 degrees F and the average daily high is 42 degrees F (NOAA 2022). The highest temperatures are in August when the average daily high is 79 degrees F and the average daily low is 51 degrees F (NOAA 2022). The average annual precipitation is 62 inches, with the wettest month typically being December with an average of 9 inches and the driest month being July with an average of 0.8 inch (NOAA 2022).

BIOLOGICAL RESOURCES

Biological resources are valued for their intrinsic aesthetic, economic, and recreational qualities and include fish, wildlife, plants, and their respective habitats. Categories of biological resources evaluated in this document include:

- General land cover and habitat types;
- Species and Critical Habitat protected under the Endangered Species Act;
- State-listed species and protected habitat;

- Migratory birds;
- Bald and golden eagles; and
- Essential Fish Habitat.

General Land Cover and Habitat Types

Bird species in the area include crows and jays, smaller passerine species, and some waterfowl (eBird 2022). Mammal species in the vicinity include elk and deer (PHS 2022). The Airport is inside of the city limits and habitat on the Airport is limited for wildlife and consists of mowed herbaceous areas. While the Airport is actively mowing and managing to discourage wildlife usage and prevent wildlife hazards, Elk are known to use the cleared runway to forage and a warning to pilots is present on the Airport information site (WSDOT 2022).

Species and Habitat Covered under the Endangered Species Act

U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) are charged with overseeing the requirements of the *Endangered Species Act*, specifically Section 7, which sets forth requirements for consultation to determine if a proposed action "may affect" a federally endangered or threatened species. If an agency determines that an action "may affect" a federally protected species, then Section 7(a)(2) requires the agency to consult with the agencies to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species, or result in the destruction or adverse modification of critical habitat. The agency coordination would occur during completion of the NEPA determination for the proposed project.

Table 1 lists species protected under the Endangered Species Act that potentially occur in the vicinity of the Airport. **Appendix A** includes the official federal species list from the USFWS, provided by the Information for Planning and Consultation system.

The nearest critical habitat for any terrestrial species is marbled murrelet, found approximately 2.5 miles north west of the Airport in the Gifford Pinchot National Forest (USFWS 2022c).

The Cowlitz River is located approximately 1,000 feet west of the Airport and contains critical habitat for Chinook salmon Lower Columbia River Evolutionary Significant Unit (ESU), Coho salmon Lower Columbia River ESU, and Lower Columbia River Distinct Population Segment (DPS) steelhead (NOAA 2022a). The south western portion of the runway crosses an irrigation canal which connects to a seasonally flooded pond used for irrigation, and then enters the Cowlitz River downstream. Listed fish species do not occur in the canal (PHS 2022), but stormwater from the Airport does ultimately discharge into the Cowlitz River through this canal. All stormwater drains off of paved surfaces and flows into either the tailrace to the south or Hall Creek based on surface water maps (USGS 2022a) and is not treated before eventually flowing into the Cowlitz River.

TABLE 1
FEDERAL OR STATE PROTECTED FISH AND WILDLIFE SPECIES THAT MAY OCCUR IN THE VICINITY OF THE AIRPORT

Species	Status[1]	Habitat Requirements	Occurrence in Vicinity of Airport
Mammals			
Gray wolf (Canis Lupus)	FE, SE	Lives in a variety of habitats but most common in relatively flat forested areas, rolling hills, or open spaces such as river valleys.	There have been several wolf sightings 1,000 feet north of the Airport on Combs Road.
North American wolverine (Gulu gulu)	FC, SC	Remote and inhospitable places at high elevations away from human populations.	There are no recorded sightings within a mile radius of the Airport and there is no suitable habitat on the Airport.
Birds			
Marbled Murrelet (Brachyramphus marmoratus)	FT, SE	Nest in old growth forests within 50 miles of Pacific Coast shoreline.	There are no recorded sightings within a mile radius of the Airport and there is no suitable habitat on the Airport.
Northern spotted owl *(Strix occidentalis caurina)*	FE, SE	Multi-storied, mixed species forest, large overstory trees, moderate-to-high forest canopy closure.	There are no recorded sightings within a mile radius of the Airport and there is no suitable habitat on the Airport.
Yellow-billed cuckoo *(Coccyzus americanus)*	FT, SE	Large blocks of riparian habitats (particularly woodlands containing cottonwoods and willows) with patch sizes of at least 200 acres.	There are no recorded sightings within a mile radius of the Airport and there is no suitable habitat on the Airport..
Fish			
Bull trout (Salvelinus confluentus)	FT, SC	Clean, cold undisturbed watersheds.	Does not occur in waterbodies on the Airport or in the surrounding area.
Chinook salmon (Oncorhynchus tshawytscha) Lower Columbia River ESU	FT	Spawning habitat typically consists of riffles and the tailouts of pools with clean substrates dominated by cobbles.	Occurs in the Cowlitz River less than 1,000 feet west of the Airport.
Coho salmon (Oncorhynchus kisutch) Lower Columbia River ESU	FT	Spawning habitat typically consists of riffles and the tailouts of pools with clean substrates dominated by cobbles .	Occurs in the Cowlitz River less than 1,000 feet west of the Airport..
Steelhead (Oncorhynchus mykiss) Lower Columbia River DPS	FT, SC	Spawning habitat typically consists of riffles and the tailouts of pools with clean substrates dominated by cobbles.	Occurs in the Cowlitz River less than 1,000 feet west of the Airport.
Insects			
Monarch Butterfly (Danaus plexippus)	FC	Dependent on their hostplant, milkweed. Occur along riparian habitats in Columbia River Basin.	There are no recorded sightings within a mile radius of the Airport and there is no suitable habitat on the Airport

[1] Endangered Species Act listing status: FC = Federal Candidate; FT = Federally Threatened; FE= Federally Endangered; SC= State Candidate; SE= State Endangered; ST= State Threatened.
SOURCE: USFWS 2022a

State-listed Species and Protected Habitat

Table 1 lists State-listed that could potentially occur in the vicinity of the Airport. The only recorded sighting of a state-listed species is the gray wolf. Several sightings of a wolf have been recorded about 1,000 feet north of the Airport on Combs Road.

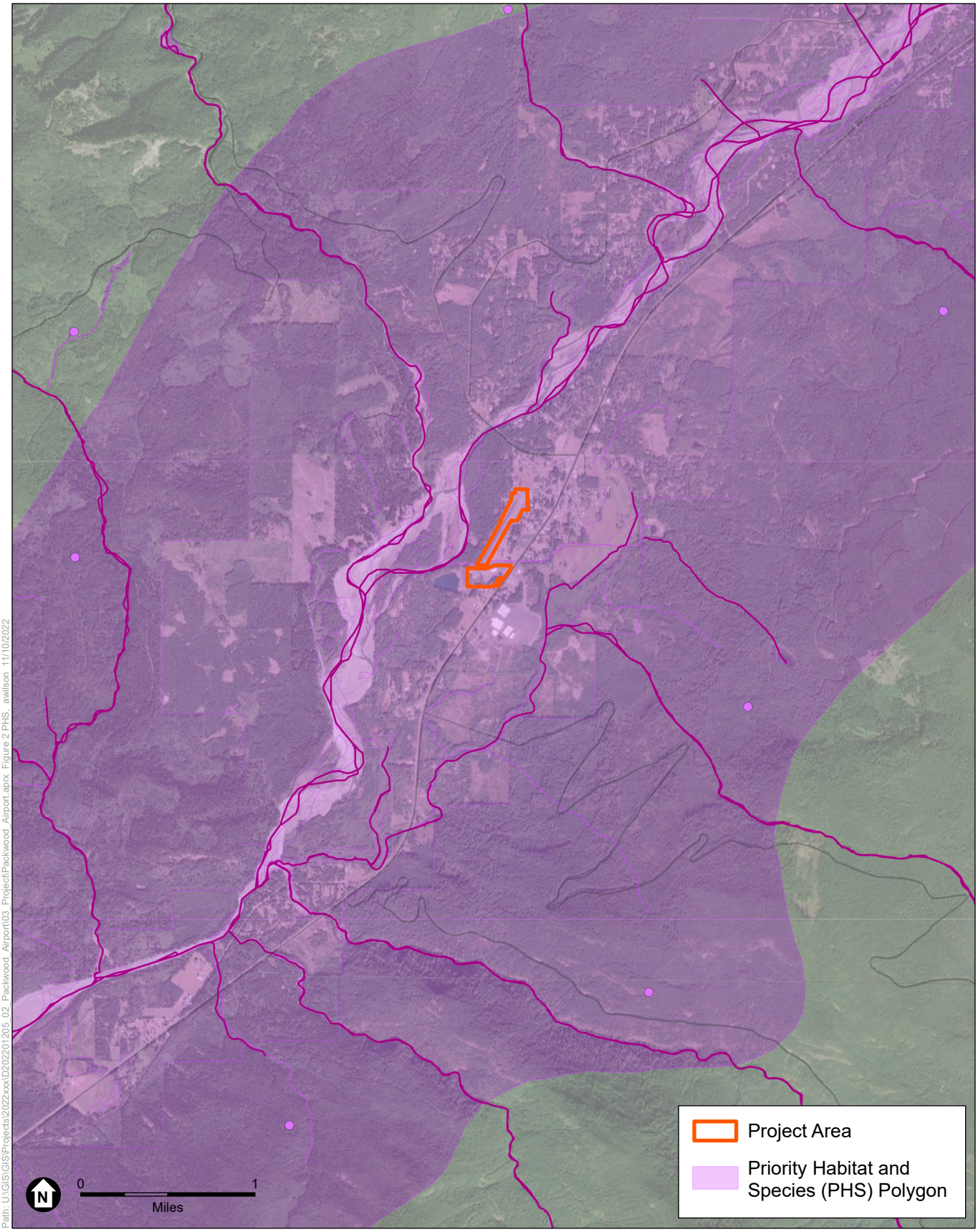
The Washington Department of Fish and Wildlife's Priority Habitats and Species (PHS) Program is the agency's primary means of transferring fish and wildlife information from our resource experts to local governments, landowners, and others who use it to protect habitat. PHS information is used primarily by cities and counties to implement and update land use plans and development regulations under the Growth Management Act and Shoreline Management Act. Landowners also use PHS as they consider ways to develop and conserve their property.

The PHS maps sensitive habitat for both blacktail and mule deer, and rocky mountain elk in the vicinity of the Airport (**Figure 2**). Additionally, a historical record for northern spotted owl is present at the township level, but this species has not been detected near the Airport (PHS 2022).

Migratory Birds

The Migratory Bird Treaty Act (MBTA) prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS (USFWS 2022b). Protected MBTA resources generally include native birds and their active nests and young. 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. Suitable breeding habitat occurs in the project area for five of the species of migratory birds listed as Birds of Conservation Concern.

The nesting season for migratory birds occurs between March 1 and September 15. The U.S. Department of Interior's legal opinion on the MBTA states, *"the take [killing] of birds resulting from an activity is not prohibited by the Migratory Bird Treaty Act when the underlying purpose of that activity is not to take birds"* (December 2017). There is no suitable breeding habitat for any of the species of migratory birds listed as Birds of Conservation Concern on the Airport.



SOURCE: Imagery: Maxar, 2021; PHS: WDFW, 2021; ESA, 2022

Packwood Airport Layout

Figure 2
Project Area and Priority Habitat and Species

ESA

TABLE 2

MIGRATORY BIRD HABITAT IN THE PROJECT AREA

Species	Breeding Season	Nesting Habitat Requirements	Probability of Presence in the Project Area
Black swift	Jun 7 – Sept 15	Nest site is on ledge sheltered by overhang or in protected crevice on cliffs. Nest sites are often behind waterfalls, in spots where nest is continuously damp from spray.	May 14 -- Sept 15
Cassin's finch	May 7 – July 28	Breeds mostly in mountain forests of conifers, especially spruce and fir, also in pine and Douglas-fir in some areas and sometimes in pinyon-juniper woods. Often at very high elevations, near treeline in mountains	Year round
Evening grosbeak	May 15 – Aug 10	Mixed conifer forests, but will used broadleaved trees for nesting and foraging.	May 22 – Jul 31
Olive-sided flycatcher	May 20 – Aug 31	Breeds in coniferous forests.	May -- Aug
Rufous hummingbird	April 15 – Jul 15	Mixed pine/oak and oak forests. Nests are built in shrubs or conifers.	Apr – Aug

SOURCE: USFWS 2022b

Bald and Golden Eagle Protection Act

Bald eagles and golden eagles are protected under the Bald and Golden Eagle Protection Act of 1940. The act's primary purpose is the protection of nesting sites. Bald eagles generally construct nests in large trees near large waterbodies, and golden eagles nest in cliff habitats adjacent to large flat expanses for foraging.

There are no recorded sightings of either golden or bald eagles within a mile-radius of the Airport. There is no suitable golden eagle nesting habitat on or near the Airport. There is suitable bald eagle nesting habitat west of the Airport in the forested area along the Cowlitz River.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat (EFH). The objective of this EFH assessment is to determine whether or not the proposed action(s) "may adversely affect" designated EFH for relevant commercially, federally managed fisheries species within the proposed action area. The Cowlitz River contains EFH for Chinook salmon and Coho salmon as part of the Pacific Salmon EFH (NOAA 2022b).

DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(f)

Section 4(f) of the Department of Transportation Act 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 park, recreation area, or waterfowl and wildlife refuge 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 properties within a 1-mile radius of the Airport that may be protected under Section 4(f):

- Packwood Cowlitz River Public Access Point is approximately 0.3 miles north east of the Airport
- The White Pass Country Historical Museum is located approximately 0.3 miles east of the Airport

HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

Federal, state, and local laws regulate the use, storage, transport, and disposal of hazardous materials. According to the EPA's EJSCREEN, there are no Superfund[1] or brownfield[2] sites within 20 miles of the Airport. There are no sites, sites requiring cleanup of environmental contaminates prior to use, within 15 miles of the Airport. EJSCREEN reports four EPA hazardous waste treatment, storage, and disposal facilities within the city limits of Packwood with the nearest to the Airport at Packwood Bridge 12 approximately 0.5 miles to the east (EPA 2022a).

According to the EPA's Toxic Release Inventory[3] (TRI) Search Plus Tool, the nearest TRI site is the Hampton Mills Lumber facility located approximately 13 miles south east of the Airport in the City of Randle (EPA 2022b)..

There are no fueling services at the Airport.

NATURAL RESOURCES AND ENERGY SUPPLY

Utilities at the Airport include water, sewer, and electric and are all provided by Lewis County. Water services on the Airport property and surrounded business areas are provided by Lewis County Water District No. 3. Sewer is addressed through Lewis County. Electricity is provided by Lewis County Public Utilities District.

[1] Superfund sites are designated by the EPA as being contaminated by hazardous waste, allowing for governmental management and cleanup of the area.

[2] Brownfield sites require cleanup of environmental contaminates prior to use,

[3] TRI sites are places where chemicals are released by industrial facilities into the air, water, or land with potential health impacts

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."*

The 1987 Corps of Engineers Wetlands Delineation Manual and Regional Supplements organizes characteristics of a potential wetland into three categories: soils, vegetation and hydrology. The manual and supplements contain criteria for each category. With this approach, an area that meets all three criteria is considered a wetland (Clean Water Act Section 404).

National Wetlands Inventory (NWI) mapping within the vicinity of the Airport is shown on **Figure 3**. The NWI shows a riverine at the southwest end of the Airport property. This is a constructed tail race used for transporting irrigated water from an upslope holding reservoir near Packwood. Water flows from the reservoir downstream, eventually discharge into the Cowlitz River.

Floodplains

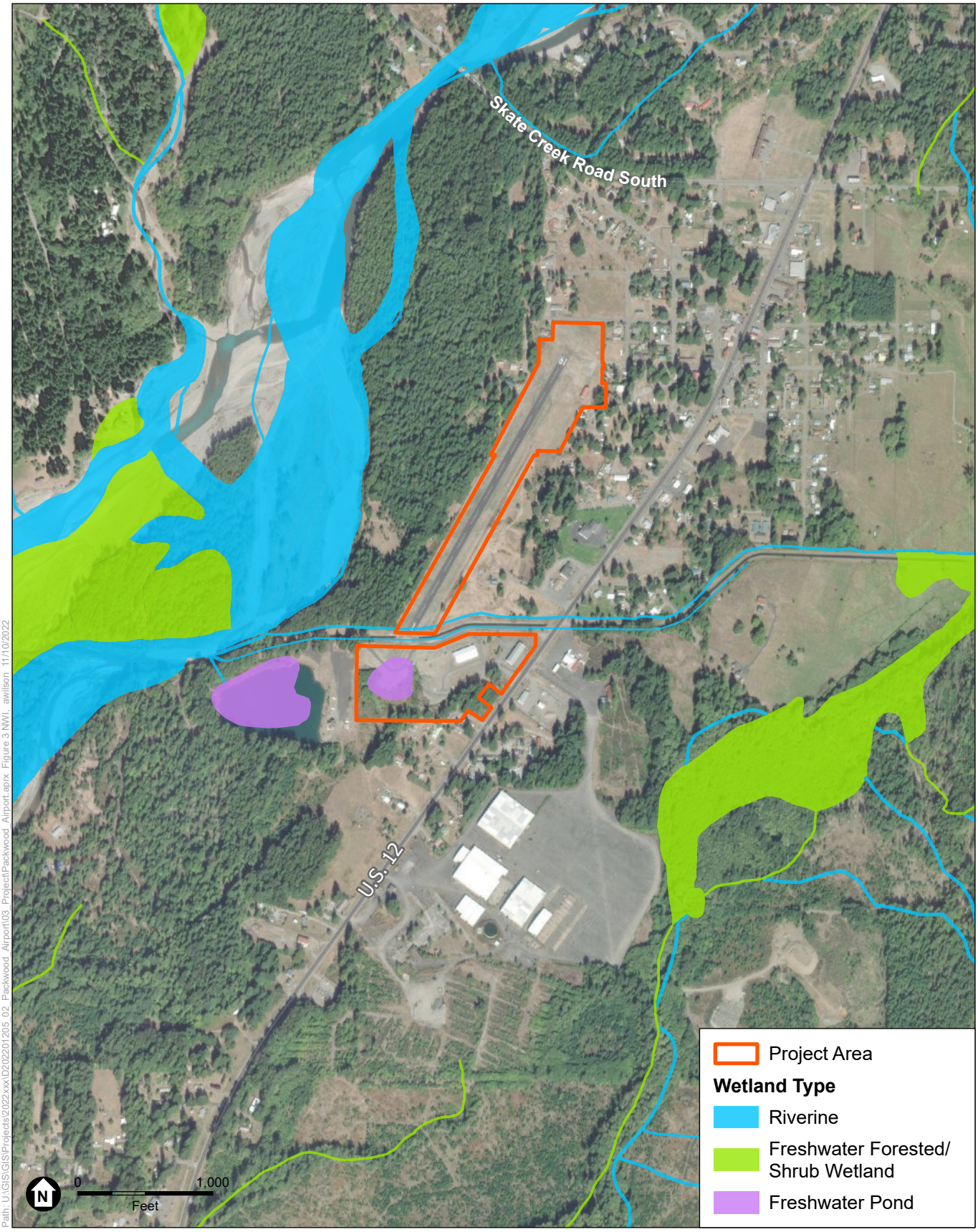
Executive Order 11988, Floodplain Management, directs federal agencies to take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by the floodplains.

Based on a review of Federal Emergency Management Agency maps, the Airport property is within the 100-year floodplain for the Cowlitz River seen in **Figure 4**. Lewis County records show the Airport Property mapped in a zone where 1-3 feet of year flooding can occur (Lewis County 2022a).

Surface Waters

The Airport property is in the Cowlitz drainage basin defined by the 6-digit Hydrologic Unit Code 170800.

Surface waters to the east of the Airport flow downslope into Hall Creek and the tailrace and both of these creeks eventually flow into the Cowlitz River (USGS 2022a).



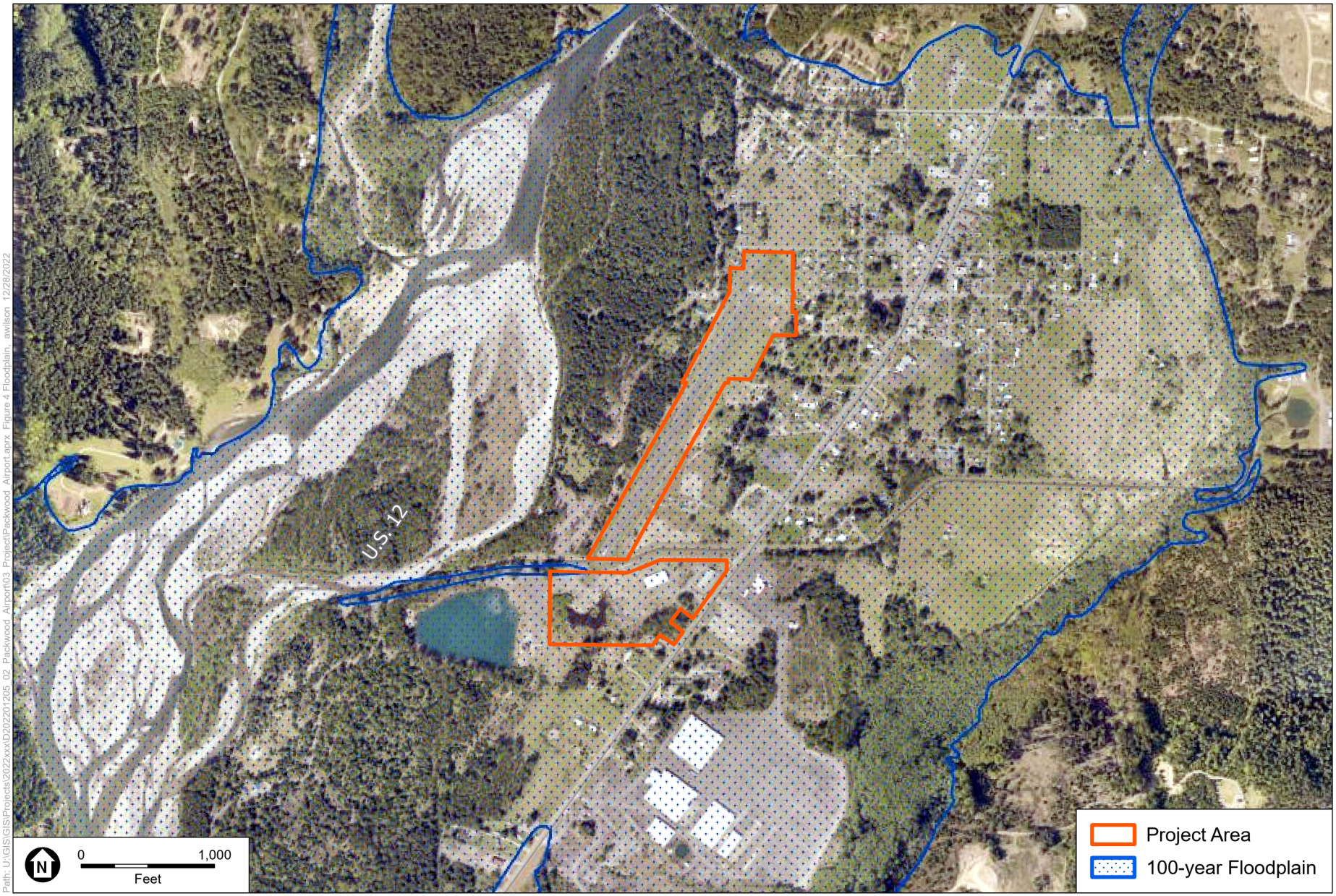
Path: U:\GIS\GIS\Projects\2022xxx\D20220120S_02_Packwood_Airport\03_Project\Packwood_Airport.aprx Figure 3 NWI. awilson 11/10/2022

SOURCE: Imagery: Maxar, 2021; National Wetlands Inventory: 2021; ESA, 2022

Packwood Airport Layout

Figure 3
Project Area and National Wetlands Inventory

ESA



Path: U:\GIS\GIS\Projects\2022xxx\D2022001205_02_Packwood_Airport\03_Project\Packwood_Airport.aprx Figure 4 Floodplain_ awilson 12/28/2022

SOURCE: Imagery: Maxar, 2021; Floodplain: FEMA, 2023; ESA, 2023

Packwood Airport Layout

Figure 4
Floodplain

ESA

Water Quality

Many of the surface waters in the vicinity of the Airport property are contaminated and listed on the 303(d) list (EPA 2022c). Contaminated surface waters in the vicinity of the Airport include:

- Skate Creek (west)
- Clear Fork of the Cowlitz River (upstream)

Both are sites known to be impaired, but with no probable source of contamination has been identified by the EPA (2022c).

A Total Maximum Daily Load (TMDL) describes the maximum amount of a pollutant allowed in a water body and serves as the starting point or planning tool for restoring water quality. Several TMDLs actively apply to the 303(d) impaired waters listed above:

- Water Temperature (Skate Creek)
- Mercury (Clear Fork of the Cowlitz River)

The compromised waters in the vicinity of the Airport property include critical habitat for federally listed Coho salmon Lower Columbia River ESU, and steelhead Lower Columbia River DPS populations.

Stormwater

The Airport currently does not hold an National Pollutant Discharge Elimination System permit that regulates the stormwater discharge from the Airport property. Packwood is unincorporated and jurisdiction for stormwater regulation falls under Lewis County and the property owner (Lewis County 2022b)

All stormwater drains off of paved surfaces and flows into either the tailrace to the south or Hall Creek based on surface water maps (USGS 2022a) and is not treated before eventually flowing into the Cowlitz River.

Groundwater

There are no unconsolidated aquifers in the vicinity of the Airport (USGS 2022b). The Airport Property is part critical aquafer recharge area designated by Lewis County and is located in both severe and moderate recharge areas (Lewis County 2022a).

National Wild and Scenic Rivers

The nearest designated segment of a Wild and Scenic River is the White Salmon River, a tributary of the Columbia River located over 20 miles to the southeast (USFWS 2022d).

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Appendix A
USFWS Official Species List

ESA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington Fish And Wildlife Office
510 Desmond Drive Se, Suite 102
Lacey, WA 98503-1263
Phone: (360) 753-9440 Fax: (360) 753-9405

In Reply Refer To:
Project Code: 2023-0015860
Project Name: Packwood Airport Master Plan Update

November 15, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Washington Fish And Wildlife Office
510 Desmond Drive Se, Suite 102
Lacey, WA 98503-1263
(360) 753-9440

Project Summary

Project Code: 2023-0015860
Project Name: Packwood Airport Master Plan Update
Project Type: Airport - Maintenance/Modification
Project Description: Environmental update for the Packwood Airport Master Plan
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@46.60437325,-121.6793964569553,14z

Counties: Lewis County, Washington

Endangered Species Act Species

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Gray Wolf *Canis lupus* Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA, MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, and WV; and portions of AZ, NM, OR, UT, and WA. Mexico. There is **final** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/4488	Endangered
North American Wolverine *Gulo gulo luscus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5123	Proposed Threatened

Birds

NAME	STATUS
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Bull Trout *Salvelinus confluentus*	Threatened

Population: U.S.A., conterminous, lower 48 states

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/8212

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.

Species profile: https://ecos.fws.gov/ecp/species/9743

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency:	Federal Aviation Administration
Name:	Chris Beck
Address:	5309 Shilshole Avenue NW
Address Line 2:	Suite 200
City:	Seattle
State:	WA
Zip:	98107
Email	cbeck@esassoc.com
Phone:	5303914585

Lead Agency Contact Information

Lead Agency: Federal Aviation Administration

Packwood Airport
Environmental Overview Response to Comments

Section & Page #	FAA Comment	ESA Response or Resolution
TOC Page i	I would recommend all potential extraordinary circumstances as stated in 5050.4b at least be discussed, even if they are not present at the airport. This includes Coastal zone, community. farmland, historical or cultural property, noise, etc. The analysis can be completed for an APE of your choosing, but for example, it could be something like the airport property plus a 2 mile radius. You can reference any past completed surveys and/ or determinations made in prior EAs to better inform us going forward with proposed actions developed in the MPU.	Our scope of work only included those listed in the table of contents.
Overview Page 1	Again, I recommend at least touching base on all potential extraordinary circumstances even if to say it is not applicable for the Airport. Please also reference FAA order 5050.4B. Feel free to reach out if you have any questions on how to evaluate each potential extraordinary circumstance.	Our scope of work only included those listed in the table of contents.
Location Page 1	The figure is called the "Project Area" but please defined what the project area is in this section or a following section, as the term is used throughout the analysis without being defined.	The description of the project area has been added.

Location Page 1	I would recommend pulling additional census information for the area from EJ Screen and then state it will be further discussed in the community/ social justice section to be added.	Socioeconomics, Environmental Justice, and Children's Health & Safety are outside the scope of services.
Air Quality Page 1	I would add a section here for the meteorological information for the airport that is currently included in the "Air Quality" section.	The scope of services includes climate/meteorological in the air quality section as Climate is outside the scope of services.
Air Quality Page 3	Therefore this airport is in an attainment area? Please use language consistent with the EPA defined classification for ease of understanding.	The sentence has been revised to state the Airport is within an attainment area.
Air Quality Page 3	What does this mean and is there more definition as to which pollutants are the primary concern?	This paragraph has been revised to have a more clear understanding.
Air Quality Page 3	Consistent with my comment above, after location I would have a separate section for climate/ meteorological condition of the airport.	A subheading has been added.
Air Quality Page 3	At the end of each section, please add a summary of what the findings will mean for the airport when proceeding with environmental review. Will agency consultation be expected, who with, etc.	Each section is a summary of potential regulated resources that may occur at the Airport and should be taken into consideration during the master planning process. At this point in the master planning process, it is unknown if a resource would be impacted, if an impact assessment is needed or if agency consultation would be required.
Biological Resources Page 3	add (Endangered Species Act) to the end of this category.	Added.
Biological Resources Page 3	(Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act)	Added.
Biological Resources Page 3	I recommend keeping these subsections/ headings consistent with the above	Revised as recommended.

	categories. Is this the non-listed section? Please address each in the same order as above.	
Biological Resources Page 4	I recommend stating that the agency coordination would occur during completion of the NEPA determination for the proposed project.	This has been added.
Biological Resources Page 4	This is a great example on how to address the extraordinary circumstances that may not be present at the airport, but should at least be acknowledged in the environmental review.	Noted.
Biological Resources Page 7	I would recommend stating that the Airport will continue active visual monitoring for the added presence of habitat and or migratory bird species.	This is a commitment that the Airport needs to make, and is not part of the environmental overview.
Biological Resources Page 8	Are there currently any stormwater treatment systems? This does not need to be fully discussed here and you can rather reference the stormwater section for more information, but it should be touched on.	All stormwater drains off of paved surfaces and flows into either the tailrace to the south or Hall Creek based on surface water maps (USGS 2022a) and is not treated before eventually flowing into the Cowlitz River.
Biological Resources Page 8	Please move the figure to be after it is introduced on the following page. The Section 4(f) section can follow on the page after Figure 2.	This change has been made.
Biological Resources Page 8	Similar to my comment above, please add a summary section. A lot of information has been discussed in the biological resources section and it is great to have a summary as to what are the main items and mitigation measures to focus on when taking a project to the NEPA determination level.	Each section is a summary of potential regulated resources that may occur at the Airport and should be taken into consideration during the master planning process.

DOT Act, Section 4(f) Page 8	Please link this back to the defined "Project Area". Is this the airport property plus a 2 mile radius boundary? How was the "nearest properties of each type" defined and what if there are properties adjacent that will be impacted but were not necessarily the "nearest". Additionally, please revise to "the following list summarizes the properties of each type either within the Airport property boundary or within the x radius" or the defined "nearest property"	Study area radius has been added.
DOT Act, Section 4(f) Page 8	Are there any on the Airport property? Or are there any properties that are 45-50 years or older that have not been evaluated for eligibility.	An inventory and evaluation of eligibility of buildings 45-50 years or older on the airport was not included in this scope of service. The overview only included those structures listed on the NRHP
Hazardous Materials, Solid Waste, and Pollution Prevention Page 9	Similar comments to above, please add a summary for what the findings mean.	Each section is a summary of potential regulated resources that may occur at the Airport and should be taken into consideration during the master planning process.
Hazardous Materials, Solid Waste, and Pollution Prevention Page 9	Please define a superfund site for the reader. So far, the analysis has been excellent in providing a summary of the topic prior to jumping into the analysis. Similarly, please define brownfield sites prior to jumping into discussing those in the proximity of the Airport And same for the TRI site. TRI should be defined if it is an acronym.	Definitions for superfund site, brownfield site, and TRI was added.

Hazardous Materials, Solid Waste, and Pollution Prevention Page 9	facilities	
Water Resources Page 9	Please add the following: The 1987 Corps of Engineers Wetlands Delineation Manual and Regional Supplements organizes characteristics of a potential wetland into three categories: soils, vegetation and hydrology. The manual and supplements contain criteria for each category. With this approach, an area that meets all three criteria is considered a wetland. This was pulled from the EPA CWA 404 Wetlands definition site but I think it is helpful to discuss the criteria required to be considered a wetland.	Added
Water Resources Page 11	If there is a figure of the floodplain map, please add.	Floodplain map added
Water Resources Page 11	Are there any defined causes of contamination?	Contaminations for Skate Creek and Clear Fork of the Cowlitz River have been added.
Water Resources Page 12	Please add a water resources summary section.	Each section is a summary of potential regulated resources that may occur at the Airport and should be taken into consideration during the master planning process.

Appendix B

Cultural Resources Survey

Archaeological Investigations Northwest, Inc.

3510 N.E. 122nd Ave. • Portland, Oregon 97230
Phone (503) 761-6605 • Fax (503) 761-6620

Vancouver Phone (360) 696-7473
E-mail: ainw@ainw.com
Web: www.ainw.com

MEMO

Date: January 6, 2023

To: Samantha Peterson, Aviation Planner/ Project Manager, Century West Engineering

From: Khrystyne Tschinkel, Ph.D., R.P.A., Supervising Archaeologist
Tara Seaver, M.S., Architectural Historian
Jason A. Cowan, M.A., R.P.A., Senior Archaeologist

Re: Packwood Airport
Packwood, Lewis County, Washington
Cultural Resources Review
AINW Report No. 4929

INTRODUCTION

Lewis County intends to complete an Airport Master Plan for the Packwood Airport, which will be used to address development needs at the airport for a 20-year planning period. Century West has been retained by Lewis County to accomplish this work. Packwood Airport is located west of US Highway 12 in the unincorporated community of Packwood, Lewis County, Washington. It is in Sections 21 and 22, Township 13 North, Range 9, East, Willamette Meridian (Figures 1). Century West has requested Archaeological Investigations Northwest, Inc. (AINW), conduct a cultural resource background review of the 39.6-acre airport (study area) to provide information and recommendations that can be incorporated into the Airport Master Plan.

Records examined during this background review indicate that the airport became operational in 1948, and that there is one structure within the study area that was built more than 50 years ago. Three previous cultural resource surveys with subsurface testing have occurred within the study area; no archaeological resources were encountered during these surveys.

If individual projects are proposed in association with the Airport Master Plan, compliance-level cultural resource investigations are recommended. This includes conducting archaeological surveys where ground disturbance is proposed outside of previously investigated areas, documenting historic resources (i.e., buildings or structures more than 50 years old) on one or more Washington State historic property inventory forms prior to changes to these built resources, and determining cultural resource eligibility for listing in the National Register of Historic Places (NRHP) in consultation with the Federal Aviation Administration and the Washington State Department of Archaeological and Historic Preservation (DAHP).

BACKGROUND REVIEW

AINW reviewed records available at DAHP as well as materials in the AINW library to create a profile of the previously conducted cultural resource surveys at and near the Packwood Airport and to determine the specific locations, types, and significance of previously identified cultural. Historical maps of the area, General Land Office (GLO) maps from the Bureau of Land Management (BLM), local Lewis County historic resource inventories, aerial photography, and primary historical sources were also examined. The Washington Information System for Architectural and Archaeological Records Data (WISAARD) predictive model depicts the study area as having a very high probability of archaeological resources.

Historic-Period Maps and Documents

The unincorporated community of Packwood is part of the Upper Cowlitz River Valley, known locally as "Big Bottom." Led by three Nisqually guides, the first Euroamericans to visit the area were William Packwood and James Longmire (Jermann and Mason 1976; Thompkins 1933). They arrived in Big Bottom in 1854 looking for a pass, now known as Cowlitz Pass, to connect the Puget Sound with the Oregon Trail (Jermann and Mason 1976; Tompkins 1933). The settlers followed a trail in alignment with modern-day Washington Highway 12, first depicted on a cadastral survey from 1904; the map shows little to no other development in the area (GLO 1904). Packwood and Longmire named the area of modern-day Packwood "Sulphur Springs" (Prats 2016).

The Rainer Forest Reserve was created in 1897 and it included the Upper Cowlitz Valley. The creation of the reserve prevented the allocation of new homesteads between 1897 and 1906. Between 1906 and 1914, population and development in Big Bottom increased, coinciding with the planned expansion of the North Coast Railroad Company and the Valley Development Company (Jermann and Mason 1976). In 1931 Clark A. Huntington was granted 161.85 acres in Section 21 of Township 13 North, Range 9 East, which includes the entire project area, under the authority of the 1862 Homestead Act (BLM 1913).

Within a short time, the North Coast Railroad abandoned its development plans, citing the project as not feasible. The town of Sulphur Springs (Packwood) was established in 1910 when the Valley Development Company began construction work on its project (Jermann and Mason 1976). In 1911, Sulphur Springs was renamed Lewis, after the Valley Development Company's president. In 1912 the Valley Development Company also decided their project was not feasible, and all construction work ceased. The initial Valley Development Company buildings that were constructed at Lake Packwood were later used by the Forest Service and the state fish hatcher (Jermann and Mason 1976).

In 1914 the boundary of the Rainer Forest Reserve was changed to exclude the Cowlitz Valley, leading to a land rush for parcels in the area (Jermann and Mason 1976:36). In the 1930s, to avoid confusion with Fort Lewis, particularly regarding mail services, the area was renamed again to Packwood (Prats 2016; White Pass Museum and Garoutte n.d). In 1933, as part of Roosevelt's "New Deal," the Civilian Conservation Corps (CCC) camp was built at Packwood (Jermann and Mason 1976; Prats 2016). CCC employees planted trees, fought forest fires, and built roads and structures at the La Wis Wis

Campground, Lewis and Clark State Park, and Rainbow Falls State Park (Prats 2016). The CCC was dismantled in 1942, but many who were enrolled remained in Packwood.

Two brothers once part of the CCC, Henry and Wes Kerr, established a sawmill in the 1940s (Prats 2016). Additional development in Packwood occurred during World War II to meet the increased need for wood. Almost all the modern-day recreational trails in Packwood were created by the Kerr Brothers' sawmill timber harvesting activities during World War II (White Pass Museum and Garoutte n.d). The sawmill, which became Packwood Lumber Company, sustained the community for 60 years, before it closed in 1999 as a result of forest conservation efforts (White Pass Museum and Garoutte n.d).

The Packwood airport first became active in 1948. Known then as Anderson Airfield, it was named after the land donors Howard and Irene Anderson (Packwood Visitors Center 2022). From 1948 to today, Packwood airport has remained a single-runway airport (U.S. Geological Survey 1958, 1962, 1978, 1989, 1994, 2014). The runway was first paved in 1984 (Packwood Visitors Center 2022).

Previous Cultural Resource Studies

A review of records available in WISAARD shows that 11 cultural resource surveys have been conducted within 1.6 kilometers (km) (1 mile [mi]) of the study area. These surveys identified six archaeological sites and no archaeological isolates. The sites and projects most germane to the current project are discussed below.

Cultural Surveys

Six cultural resource surveys have been done within 0.5 km (0.3 mi) of the study area (Baldwin 2012; Brownell 2015; Dampf and Thompson 2006; Neil et al. 2008; Tingwall et al. 2009). Two of the surveys were conducted outside the project area; no archaeological resources were encountered by these two surveys (Baldwin 2012; Neil et al. 2008). The additional three previously conducted archaeological surveys overlap with the study area (Figure 2) (Brownell 2015; Dampf and Thompson 2006; Tingwall et al. 2009). No archaeological resources were identified in the study area by these surveys.

- A cultural survey of 4.3 acres was conducted along the entire length of the landing strip and its southeastern border (Figure 2). The survey consisted of a pedestrian walkover, two subsurface shovel tests, and monitoring of 10 geotechnical test pits (Brownell 2015). Shovel tests were dug 10 centimeters (cm) (4 inches [in]) into sterile subsoil. The geotechnical test pits were excavated to depths between 1.8 and 3.3 meters (m) (6 and 11 feet [ft]) below the ground surface. No archaeological resources were encountered (Brownell 2015).

- A cultural survey of 84.4 acres was conducted along the water conveyance system extending from Packwood Lake to the town of Packwood (Dampf and Thompson 2006). A small portion of this survey partially overlapped the study area at the southwestern end of the landing strip and along the canals that run east to west in the southern portion of the airport (Figure 2). No archaeological resources were encountered within the current project boundaries (Dampf and Thompson 2006).

- A cultural survey of 1.5 acres conducted at the southwestern end of the landing strip consisted of a pedestrian survey (Figure 2), three subsurface shovel tests, and monitoring of six geotechnical pits (Tingwall et al. 2009). Shovel tests were excavated to depths between 80 and 100 cm (32 and 39 in) below the ground surface. The geotechnical test pits were excavated to depths between 1.7 and 2.4 m (5.5 and 7.7 ft) below the ground surface. No archaeological resources were encountered (Tingwall et al. 2009).

Archaeological Resources

Six archaeological sites have been recorded within 1.6 km (1 mi) of the study area. None of these resources are affected by current airport operations.

- **Site 45LE999** is approximately 0.6 km (0.4 mi) north of the study area. The site is a scatter of pre-contact lithic artifacts identified between 50 and 177 cm (20 and 70 in) below the ground surface. The site was determined to be eligible for listing in the NRHP (Sarjeant 2019).

- **Site 45LE415** is approximately 0.8 km (0.5 mi) northeast of the study area. The site is a pre-contact camp and lithic scatter. The site was determined to be eligible for listing in the NRHP in 1992 (McClure 1992). Data recovery investigations focused on answering questions about the site's chronology and its changing uses as a long- and short-term hunting camp (Mack et al. 2010; McClure 2008b). Dating to as early as 9,200 years before present, the site is one of the earliest in the Western Cascade Mountains (Mack et al. 2010).

- **Site 45LE271** is approximately 1.0 km (0.6 mi) southeast of the study area. The site is a partially disturbed pre-contact site, originally discovered in 1962. A large number of flaked tools and lithic debitage as well as a small amount of calcined bone was reported to have originated at this site. The material is rumored to have been sold in the 1960s (McClure 1986).

- **Site 45LE0998** is approximately 1 km (0.6 mi) northeast of the study area. The site is a scatter of pre-contact lithic artifacts identified between 10 and 80 cm (4 and 32 in) below the ground surface. The site has been determined to be potentially eligible for listing in the NRHP (Williams-Larson 2019).

- **Site 45LE606** is approximately 1.3 km (0.8) northeast of the study area. The site is a single pre-contact culturally modified cedar tree located in a swampy area near Beech Creek. The site has been determined to be eligible for listing in the NRHP (McClure 2008a, 2008b).

- **Site 45LE201** is approximately 1.6 (1 mi) northeast of the study area. The site is an unevaluated historic-period refuse scatter with residential structures (Lewis 1965).

Built Environment

Historical maps and aerial images show one structure (the airport runway) within the study area that is more than 50 years of age. Construction of the runway began in 1946 and it became operational in 1948. The runway was paved in 1984. Three other buildings are present in the study area. They were built between circa 1977 and 2010. The runway has not been previously recorded in WISAARD.

There are five previously recorded historic resources within 304 m (1,000 ft) of the study area. The three closest previously documented historic resources are a circa 1964 Canal Access Road Bridge, a 1963 tailrace, and a 1963 transmission line. The 1964 Canal Access Road Bridge is located off an unnamed road that crosses through the lower south portion of the study area. The bridge is situated immediately west of the southwest study area boundary. The 1963 tailrace is located to the north of the modern buildings. The 24-km (15-mi) long 1963 transmission line is located on the west side of Highway 12 adjacent to the southeastern boundary of the study area.

In 2020, these resources were recommended to be eligible as contributing resources to the proposed Packwood Lake Hydroelectric Project Historic District. DAHP has yet to concur with the recommendations; the NRHP eligibility of the three resources is currently listed as undetermined in WISAARD.

The other two resources include the site of the circa 1903 Huntington home located left of Highway 12 and west of the airport, approximately 135 m (443 ft) from the study area, and a 1945 building at 12880 Highway 12 approximately 83 m (275 ft) from the study area. The NRHP eligibility of the circa 1903 Huntington Home and the 1945 building is undetermined in WISAARD.

The closest NRHP eligible resource to the study area is the Packwood Elementary School. The school, which was built in 1936, is located at 12990 Highway 12, approximately 0.3 km (0.2 mi) north of the Packwood Airport.

SUMMARY AND RECOMMENDATIONS

AINW has completed a cultural resource background records search for the Packwood Airport project. The search found that three previous cultural surveys have been done inside the study area. Six archaeological sites are within 1.6 km (1 mile) of the study area and five historic resources are within 304 m (1,000 ft) of the study area. There are no previously documented archaeological or historic resources within the study area. The airport was established in 1948 as part of a land donation by the Anderson family. There is one structure (the airport runway) within the study area that was constructed over 50 years ago.

AINW recommends compliance-level cultural resource investigations occur when individual projects are proposed in association with the Airport Master Plan. This includes conducting archaeological surveys with subsurface testing in areas where ground disturbance is proposed outside the previously

investigated areas, documenting buildings and structures more than 50 years old in the study area in WISAARD, and determining eligibility for listing in the NRHP in consultation with the Federal Aviation Administration and DAHP for cultural resources found during these investigations. AINW also recommends that in the case of a federal nexus, the Packwood Airport be investigated for its potential to meet the minimum eligibility requirements for listing in the NRHP as a historic resource to assist in compliance with Section 106 of the National Historic Preservation Act and to meet current reporting standards of DAHP.

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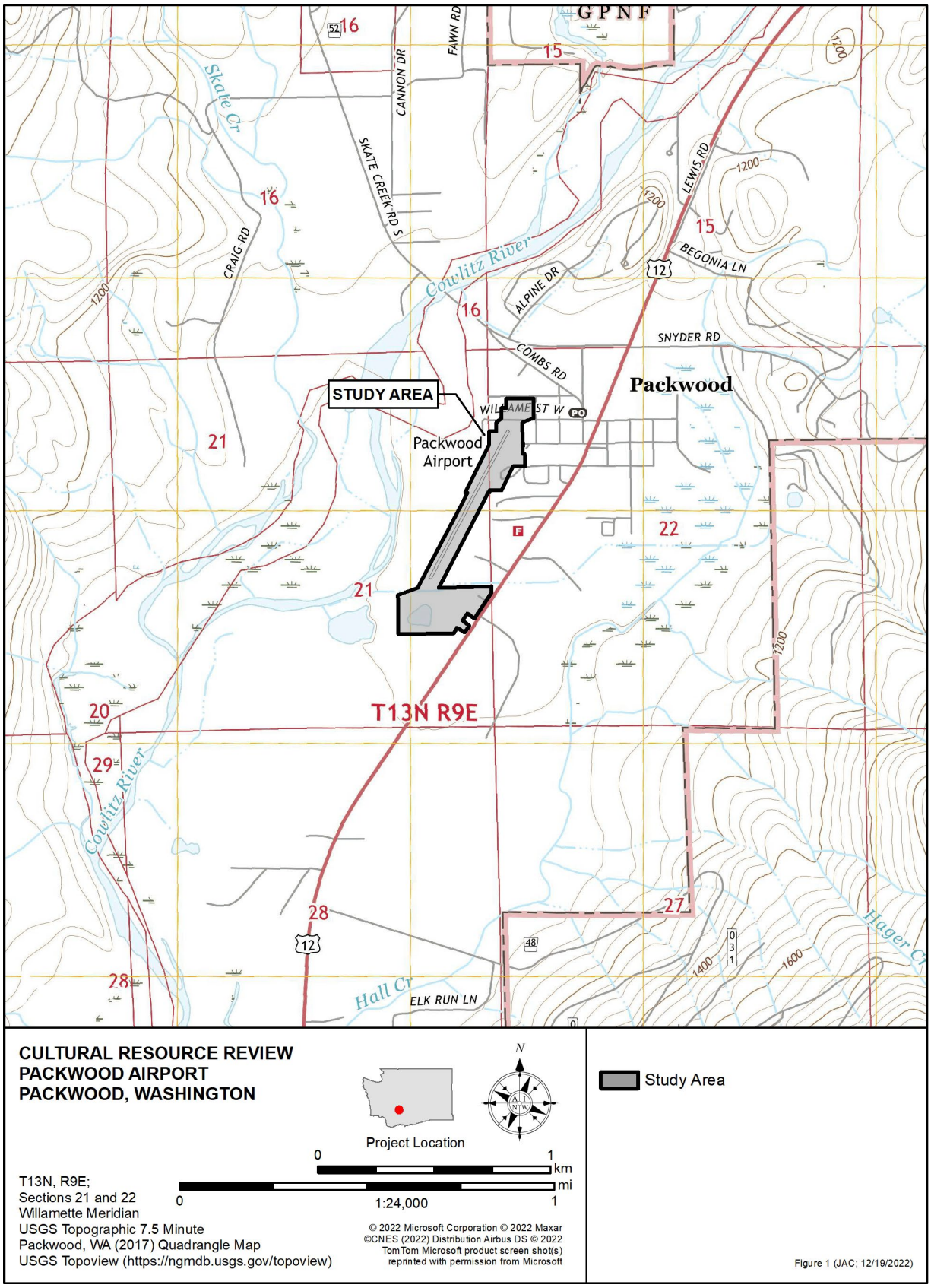


Figure 1. Location of the Packwood Airport study area in Packwood, Washington.

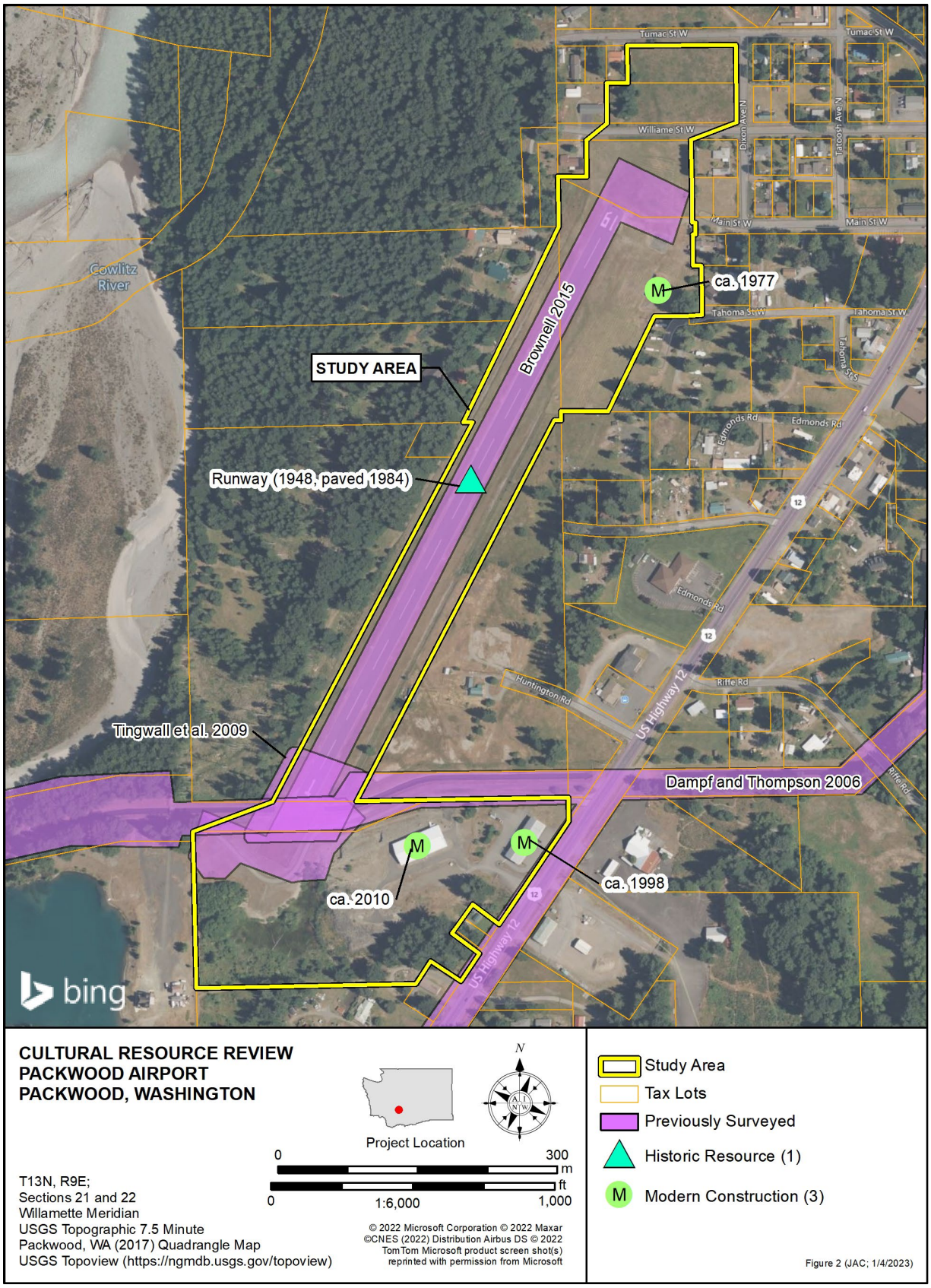


Figure 2. Aerial overview of the Packwood Airport study area.

Appendix C

Zoning Ordinances

Land Use

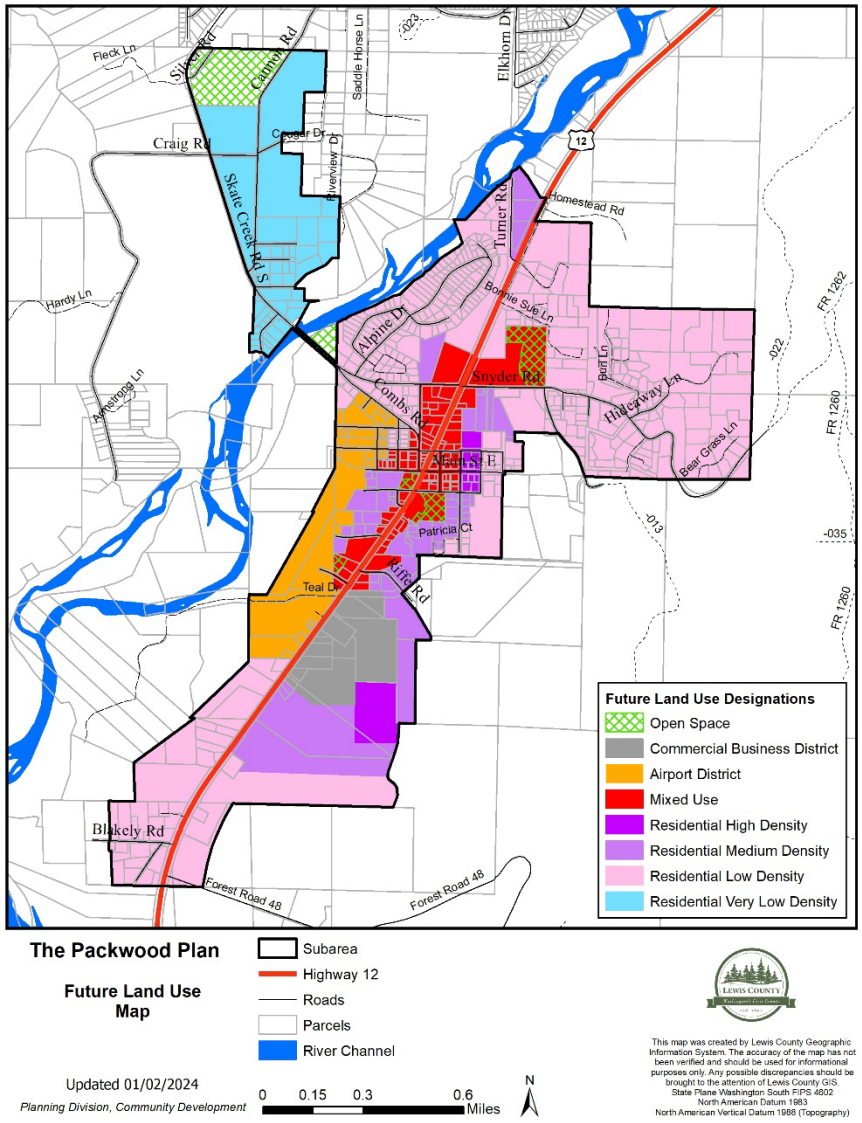
Land Use Goal 1 – Preserve the small town uniqueness and charm of Packwood.
Packwood is a small town with history rooted in the timber industry. Historic buildings like the Historic Hotel Packwood, White Pass Museum (formerly an elementary school) and Packwood Station (formerly Packwood Ranger Station), exemplify the town's history. The relatively small size of existing buildings and space between each building aides in a "small town" feel. There are many locally owned small businesses that provide unique and charming products and services.

Policies
LU1.1: Support locally owned small-scale businesses not found anywhere else in Washington.
LU1.2: Preserve and enhance historic buildings and sites.
LU1.3: Create design guidelines for new buildings that face Highway 12, Main Street or Willame Street in Downtown Packwood to ensure a cohesive look and size (see Design Guidelines subsection).
LU1.4: Establish side setbacks to maintain space between buildings in Downtown Packwood.

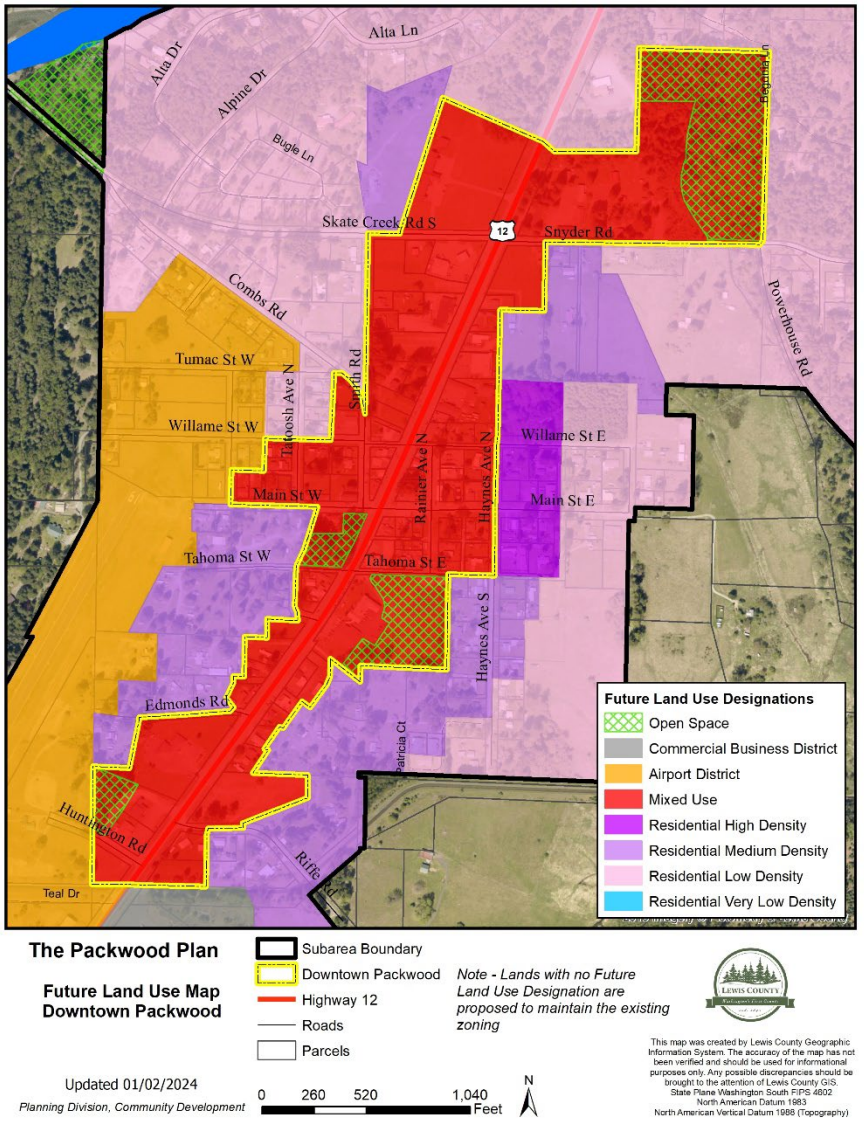
Land Use Goal 2 – Contain higher density development near Downtown Packwood and prevent sprawl.
Packwood is located in the Upper Cowlitz River Valley and is surrounded by national forests, wildlife areas and parks. This in-and-of-itself helps to contain future development. However, there are also large lots (greater than 5 acres) and small agricultural operations located between the forests and the town that create the rural setting for Packwood. These rural areas are important to the residents, business owners and tourists and should be protected from future higher density development.

Policies
LU2.1: Encourage mixed use commercial and multifamily residential development in Downtown Packwood.
LU2.2: Encourage higher density residential development near Downtown Packwood.
LU2.3: Support redevelopment of the historic mill site with commercial and residential uses.
LU2.4: Reduce incompatible land uses surrounding the Packwood Airport.
LU2.5: Develop new residential uses west of the Franklin Bridge (aka Skate Creek Bridge) that has a similar housing density as the residential developments of High Valley.
LU2.6: Maintain rural density of development surrounding the subarea plan boundary.

Table 2: Future Land Use Designations		
Designation	**Code**	**Description**
Open Space	OS	The focus of these areas is recreation for the general public. Areas should be programmed for community gathering and outdoor play. Play structures, sports fields and courts, picnic tables, benches, gazebos and walking trails are encouraged. Streams, wetlands, trees and native vegetation should be protected and enhanced.
Commercial Business District	CBZ	The focus of these areas is commercial, office space and small scale manufacturing uses. Larger commercial buildings, 10,000 to 20,000 sq. ft., may be located here. Highest density residential uses, 18-30 units per acre, should be allowed if buffered from manufacturing uses. Connectivity and pedestrian access should be prioritized. New residential single family development should be discouraged.
Airport District	AX	This area includes the Packwood Airport and supporting lands. The focus is commercial and small scale manufacturing. Larger commercial buildings, 10,000 to 20,000 sq. ft., may be located here. Very low density single family residential uses should be allowed on larger lots. Duplexes, ADUs and multifamily residential should be prohibited. Lots sizes should be one (1) acre or larger in size.
Mixed Use	MU	The focus of these areas is small scale (<10,000 sq. ft.) commercial and highest density residential uses, 18-30 units per acre. Lots facing Highway 12 should include ground floor commercial or office space and second story apartments or condos, with entrances facing Highway 12 and surface parking placed behind buildings to increase pedestrian access. Connectivity and pedestrian safety should be prioritized. Space between buildings is encouraged and building heights capped to preserve small town feel and views of Mount Rainier, Tatoosh Wilderness and Goat Rocks Wilderness. New residential single family development should be discouraged.
Residential High Density	RH	High density residential uses, 10-16 units per acre, should be located near Downtown Packwood and the Commercial Business District. Apartments and condos should be in a courtyard style around a common open space. Row houses, fourplexes, triplexes and duplexes should be encouraged. Dormitories or hostels should also be encouraged. Commercial uses should be allowed. Building heights should be capped to preserve views of Mount Rainier, Tatoosh Wilderness and Goat Rocks Wilderness.
Residential Medium Density	RM	Medium density residential uses, 6-10 units per acre, should be located in these areas. Rowhouses, fourplexes, triplexes, duplexes and ADUs, as well as tiny home villages should be allowed. Single family residential uses should also be allowed. Institutional uses (e.g., churches, libraries, schools) and home-based commercial uses should be allowed. Lot sizes should range from 5,000 to 7,500 sq. ft.
Residential Low Density	RL	The focus of these areas is traditional single family residential uses at 4-6 units per acre. Duplexes and ADUs should be encouraged to increase affordable housing options. Clustered tiny home villages should also be allowed. Institutional uses (e.g., churches, libraries, schools) and home-based commercial uses should be allowed. Lot sizes should range from 7,500 to 12,500 sq. ft.
Residential Very Low Density	RVL	The focus of these areas is traditional single family residential uses at a scale consistent with historic development patterns on the west side of the Cowlitz River, which is approximately 4 units per acre. ADUs should be encouraged to increase affordable housing options. Lots sizes should average 12,500 sq. ft.



Map 11: Future Land Use Map

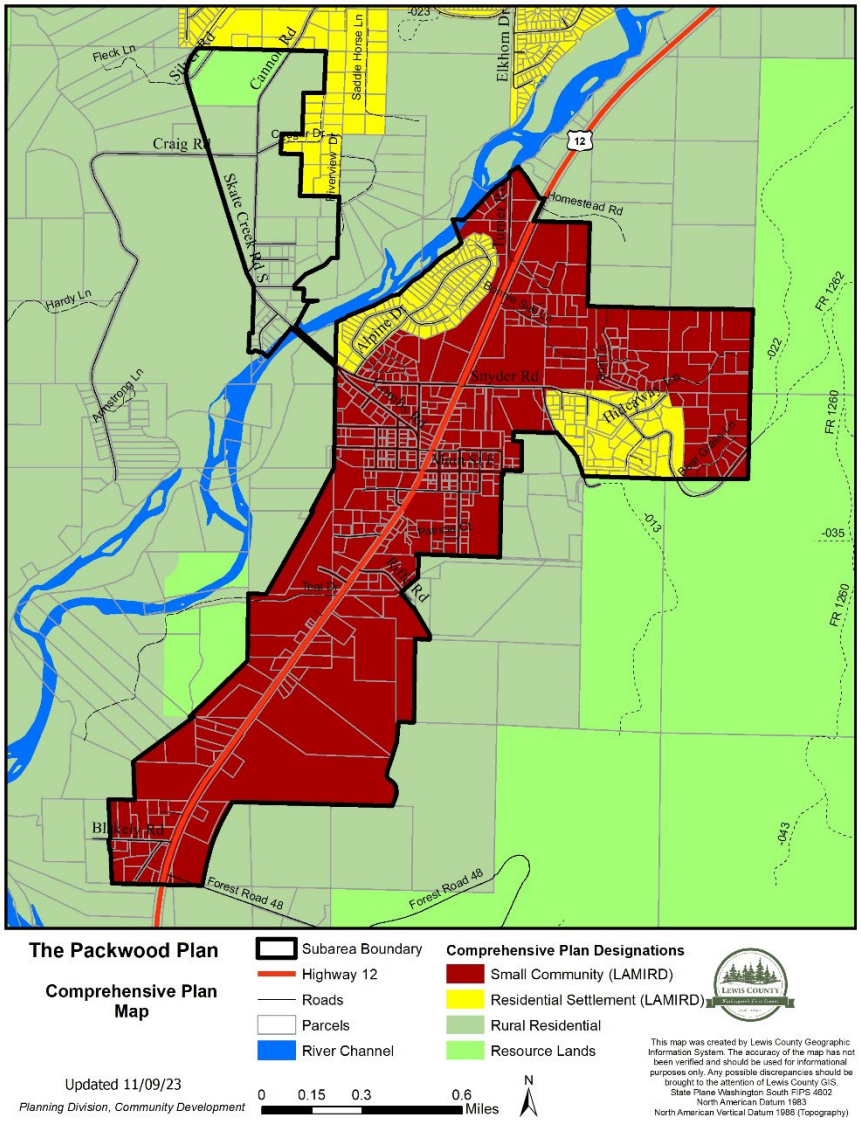


Map 12: Future Land Use Map - Downtown Packwood

Lands with no future land use designation on the maps are proposed to maintain the existing zoning as shown on Map 5, as well as the existing development regulations. Only those areas with future land use designations are proposed for new zoning designations and development regulations in Phase 2.

Map 13 shows the **existing** Lewis County Comprehensive Plan map designations. The designations for most of the subarea are Small Community and Residential Settlement. Small Community is described as "detached residential, commercial or industrial structures in an existing settlement. Some attached buildings are also present. Predominantly small scale, though some larger commercial, institutional or industrial buildings may be present." The level of urbanization is considered "moderate." Residential Settlement is described as "detached residential structures in a residential settlement." The level of urbanization is considered "low to low/moderate." Both designations are a LAMIRD Type I under the Growth Management Act.

The Future Land Use Maps (Map 11and Map 12 on the previous page) are intended to show how zoning should change over the 20-year planning horizon to achieve the Land Use goals and policies stated in this section. The maps depict the future development types and densities described in Table 2. The goal is to concentrate development in and near Downtown Packwood. The 100-year floodplain and wetlands are taken into consideration with the intent of not increasing residential development beyond what is currently allowed in these critical areas. New zoning rules, created during Phase 2, would impact **new** development or redevelopment. **Existing legal nonconforming development and uses may stay, be maintained and be replaced in the current footprint.**



Map 13: Existing Comprehensive Plan Designations

The future land uses described in Table 2 are consistent with the description of Small Community and Residential Settlement. Therefore, for those areas the Future Land Use Map is consistent with the existing Lewis County Comprehensive Plan and Countywide Planning Policies. The other lands within the subarea are currently designated Other Rural Residential with detached residential uses on standard rural lots typically 5-20 acres in size. The designation for those lands will need to be amended in the Lewis County Comprehensive Plan during Phase 2 to implement the Future Land Use Map.

Chapter 17.45
SMALL TOWNS - MIXED USE/COMMERCIAL (STMU)

Sections:

17.45.010 Purpose.

Small towns have been the historic, cultural, and commercial hubs for rural Lewis County. As such, public infrastructure including schools, fire, and often water systems are in place. The purpose of the Mixed Use/Commercial District is to provide land areas within the small towns for the siting of commercial uses which serve the surrounding community with a broad range of retail goods and services. Property within this district may also serve to meet the residential needs of the community in accordance with the capability of local facilities. The Mixed Use/Commercial Districts are designed to assure infilling consistent with surrounding uses and the existing public facilities and character of the area. [Ord. 1292 §9, 2018; Ord. 1170B, 2000]

17.45.020 Permitted uses.

Allowed uses, shown in Chapter 17.42 LCC, shall be permitted within this district. [Ord. 1292 §9, 2018; Ord. 1179, 2002; Ord. 1170B, 2000]

17.45.030 Accessory uses.

As defined at LCC 17.10.010, accessory uses are considered part of the permitted uses. [Ord. 1292 §9, 2018; Ord. 1179, 2002; Ord. 1170B, 2000]

17.45.060 Development standards.

All development shall be required to conform to the supplementary requirements of Chapter 17.145 LCC. [Ord. 1292 §9, 2018; Ord. 1283 §10, 2017; Ord. 1179, 2002; Ord. 1170B, 2000]

Chapter 17.80
AIRPORT OBSTRUCTION ZONING (RA)

Sections:

17.80.010 Short title.

This chapter shall be known and may be cited as the airport obstruction zoning chapter. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §1, 1993]

17.80.030 Airport overlay maps.

In order to carry out the provisions of this chapter, there are hereby created and established certain zones which include all of the land lying beneath the approach surfaces, transitional surfaces, horizontal surfaces, and conical surfaces as they apply to the Packwood, Ed Carlson Memorial Field, and Chehalis-Centralia Airports.

(1) For the Packwood and Ed Carlson Memorial Field Airports, such zones are shown on the airport approach and clear zone map, which is adopted by reference as part of this chapter.

(2) For the Chehalis-Centralia Airport, such zones are shown on the Chehalis-Centralia Airport Imaginary Surfaces Drawing, prepared in conjunction with the Airport Master Plan (2000), Map 85 at LCC 17.200.030 which is adopted by reference as part of this chapter.

An area located in more than one of the zones is considered to be only in the zone with the more restrictive height limitation. [Ord. 1269 §30, 2016]

17.80.035 Airport zones.

The various zones are hereby established and defined as follows:

(1) Approach Zone.

(a) Packwood Approach Zone. For the Packwood Airport, the inner edge of this approach zone coincides with the width of the primary surface and is 250 feet wide for Runway 1/19. The approach zone expands outward uniformly to a width of 1,250 feet at a horizontal distance of 5,000 feet from the primary surface. Its centerline is the continuation of the centerline of the runway.

(b) Ed Carlson Approach Zone. For the Ed Carlson Memorial Field Airport, the inner edge of this approach zone coincides with the width of the primary surface and is 500 feet wide for Runway 6/24. The approach zone expands outward uniformly to a width of 1,500 feet at a horizontal distance of 5,000 feet from the primary surface. Its centerline is the continuation of the centerline of the runway.

(c) Chehalis-Centralia Larger than Utility Approach Zone. For the Chehalis-Centralia Airport, the inner edge of this approach zone coincides with the width of the primary surface and is 500 feet wide. The approach zone expands outward uniformly to a width of 3,500 feet at a horizontal distance of 10,000 feet from the primary surface. Its centerline is the continuation of the centerline of the runway.

(2) Transitional Zones. The transitional zones are the areas beneath the transitional surfaces.

(3) Horizontal Zone.

(a) For the Packwood and Ed Carlson Memorial Field Airports, the horizontal zone is established by swinging arcs of 5,000 feet radii from the center of each end of the primary surface of each runway and connecting the adjacent arcs by drawing lines tangent to those arcs. The horizontal zone does not include the approach and transitional zones.

(b) For the Chehalis-Centralia Airport, the horizontal zone is established by swinging arcs of 10,000 feet radii from the center of each end of the primary surface of each runway and connecting the adjacent arcs by drawing lines tangent to those arcs. The horizontal zone does not include the approach and transitional zones.

(4) Conical Zone. The conical zone is established as the area that commences at the periphery of the horizontal zone and extends outward and upward at 20:1 therefrom for a horizontal distance of 4,000 feet. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §3, 1993. Formerly 17.80.030]

17.80.040 Airport zone height limitations.

(1) General. Except as otherwise provided in this chapter, no structure shall be erected, altered, or maintained, and no tree shall be allowed to grow in any zone created by this chapter to a height in excess of the applicable height limit herein established for such zone. Such applicable height limitations are hereby established for each of the zones in question as follows:

(a) Approach Zone.

(i) For the Packwood Airport, slopes 20 feet outward for each foot upward (20:1) beginning at the end of and at the same elevation as the primary surface and extending to a horizontal distance of 5,000 feet along the extended runway centerline.

(ii) For the Ed Carlson Memorial Airport, slopes 34 feet outward for each foot upward (34:1) beginning at the end of and at the same elevation as the primary surface and extending to a horizontal distance of 5,000 feet along the extended runway centerline.

(iii) For the Ed Carlson Memorial Airport and Chehalis-Centralia Airport, slopes 34 feet outward for each foot upward (34:1) beginning at the end of and at the same elevation as the primary surface and extending to a horizontal distance of 10,000 feet along the extended runway centerline.

(b) Transitional Zones. Slopes seven feet outward for each foot upward (7:1) beginning at the sides of and at the same elevation as the primary surface and the approach surface, and extending to a height of 150 feet above the airport elevation.

(c) Horizontal Zone. Established at 150 feet above the airport elevation.

(i) For the Packwood Airport, at a height of 1,203 feet above mean sea level.

(ii) For the Ed Carlson Memorial Field Airport, at a height of 525 feet above mean sea level.

(iii) For the Chehalis-Centralia Airport, at a height of 324 feet above mean sea level.

(d) Conical Zone. Slopes 20 feet outward for each foot upward (20:1) for 4,000 feet beginning at the periphery of the horizontal zone and at 150 feet above the airport elevation and extending to a height of 350 feet above the airport elevation.

(2) All structures shall be limited in height consistent with Federal Aviation Regulations (FAR) Part 77 for airport operations or the height limitations of the district, whichever is less. Nothing in this chapter shall restrict the height of a structure to 15.5 feet or less. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §4, 1993]

17.80.050 Use restrictions.

(1) Notwithstanding any other provisions of this chapter, no use may be made of land or water within any zone established by this chapter in such a manner as to create electrical interference with navigational signals or radio communication between the airport and aircraft, make it difficult for pilots to distinguish between airport lights and others, result in glare in the eyes of pilots using the airport, impair visibility in the vicinity of the airport, create bird strike hazards, or otherwise in any way endanger or interfere with the landing, takeoff, or maneuvering of aircraft intending to use the airport.

(2) Uses within the mapped areas shall be consistent with RCW 36.70A.547 to discourage the siting of incompatible uses adjacent to public aviation airports.

(a) The mapped area is the minimum area necessary to protect general airport activities.

(b) Incompatible uses shall include residential uses, places of public assembly, and medical facilities involving the care of people or animals. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §5, 1993]

17.80.060 Nonconforming uses.

(1) Regulations Not Retroactive. The regulations prescribed by this chapter shall not be construed to require the removal, lowering, or other change or alteration of any structure or tree not conforming to the regulations as of the effective date of the ordinance codified in this chapter, or otherwise interfere with the continuance of nonconforming use. Nothing contained herein shall 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 the ordinance codified in this chapter, and is diligently prosecuted. However, before any nonconforming structure or tree may be replaced, substantially altered or repaired, rebuilt, allowed to grow higher, or replanted, a permit must be secured from the administrator under the procedures specified in LCC 17.80.070 through 17.80.120. No permit shall be granted that would permit a nonconforming tree to become higher or a nonconforming structure to be made or become a greater hazard to air navigation than it was when the applicable regulation was adopted or than it is when application for a permit is made.

(2) Marking and Lighting. Notwithstanding the preceding provision of this section, the owner of any existing nonconforming structure or tree is hereby required to permit the installation, operation, and maintenance thereon of such markers and lights as shall be deemed necessary by the airport owner to indicate to the operators of aircraft in the vicinity of the airport the presence of such airport obstruction. Such markers and lights shall be installed, operated, and maintained at the expense of the airport owner. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §6, 1993]

17.80.070 Permits - future uses.

(1) Except as specifically provided in subsections (2) and (3) of this section, no material change shall be made in the use of land, no structure shall be erected or otherwise established, and no tree shall be planted in any

zone hereby created unless a permit therefor shall have been applied for and granted. Each application for a permit shall indicate the purpose for which the permit is desired, with sufficient particularity to permit it to be determined whether the resulting use, structure, or tree would conform to the regulations herein prescribed. If such determination is in the affirmative, the permit shall be granted. No permit for a use inconsistent with the provisions of this chapter shall be granted unless a variance has been approved in accordance with LCC 17.80.100.

(2) In the area lying within the limits of the horizontal zone and conical zone, no permit shall be required for any tree or structure less than 75 feet of vertical height above the ground, except when, because of terrain, land contour, or topographic features, such tree or structure would extend above the height limits prescribed for such zones.

(3) In areas lying within the limits of the approach zones, but at a horizontal distance of not less than 4,200 feet from each end of the runway, no permit shall be required for any tree or structure less than 75 feet of vertical height above the ground, except when such tree or structure would extend above the height limits prescribed for such approach zones.

(4) Nothing contained in any of the foregoing exceptions shall be construed as permitting or intending to permit any construction, or alteration of any structure, or growth of any tree in excess of any height limits established by this chapter. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §8, 1993]

17.80.080 Permits - Existing uses.

No permit shall be granted that would allow the establishment or creation of an obstruction or permit a nonconforming use, structure, or tree to become a greater hazard to air navigation than it was on the effective date of the ordinance codified in this chapter or any amendments thereto or than it is when the application for a permit is made. Except as indicated, all applications for such a permit shall be granted. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §8, 1993]

17.80.090 Permits –Nonconforming uses abandoned or destroyed.

Whenever the administrator determines that a nonconforming tree or structure has been abandoned or more than 80 percent torn down, physically deteriorated, or decayed, no permit shall be granted that would allow such structure or tree to exceed the applicable height limit or otherwise deviate from the zoning regulations. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §8, 1993]

17.80.100 Variances.

Variances from the standards of this chapter shall be processed in accordance with LCC 17.162.010. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §8, 1993]

17.80.110 Obstruction marking and lighting.

Any permit or variance granted may, if such action is deemed advisable to effectuate the purpose of this chapter

and be reasonable in the circumstance, be so conditioned as to require the owner of the structure or tree in question to install, operate, and maintain, at the owner's expense, such markings and lights as may be necessary. If deemed proper by the planning commission, this condition may be modified to require the owner to permit the airport owner, at its own expense, to install, operate, and maintain the necessary markings and lights. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §8, 1993]

17.80.120 Special use permit.

Any proposed use located in an approach zone shall be treated as a Type III special use application per Chapter 17.05 LCC. [Ord. 1269 §30, 2016; Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1129 §8, 1993]

Chapter 17.95
RURAL RESIDENTIAL CENTERS (RRC)

Sections:

17.95.010 Purpose.

Rural residential centers are areas in rural Lewis County which historically had development and facilities at densities and intensities greater than rural development, but outside of urban growth areas and authorized in accordance with RCW 36.70A.070(5)(d)(i). The zones are necessarily limited to areas of existing development or development impact and defined by logical boundaries and service areas. This chapter provides guidelines for residential development in rural residential centers and shoreline-related development in designated shoreline areas to assure infilling consistent with surrounding uses and the existing public facilities and character of the area. [Ord. 1292 §20, 2018; Ord. 1179, 2002; Ord. 1170B, 2000]

17.95.020 Permitted uses.

Allowed uses, shown in Chapter 17.42 LCC, shall be permitted within this district. [Ord. 1292 §20, 2018; Ord. 1283 §12, 2017; Ord. 1170B, 2000]

17.95.030 Accessory uses.

As defined at LCC 17.10.010, accessory uses are considered part of the permitted uses. [Ord. 1292 §20, 2018; Ord. 1283 §13, 2017; Ord. 1170B, 2000]

17.95.050 Maximum density and minimum lot size.

Designation criteria. The maximum density and minimum lot size shall be set to reflect the historic development pattern to assure infilling is accomplished at the same or similar density.

(1) For areas designated one unit per 10,000 square feet, the maximum density shall be 4.356 units per gross acre. Such areas shall be designated “RRC-R10000” on the official zoning map.

(2) For areas designated one unit per one-half acre, the maximum density shall be two units per gross acre. Such areas shall be designated “RRC-R.5” on the official zoning map.

(3) For areas designated one unit per acre, the maximum density shall be one unit per gross acre. Such areas

shall be designated “RRC-R1” on the official zoning map.

(4) For areas designated one unit per two acres, the maximum density shall be one unit for each two gross acres. Such areas shall be designated “RRC-R2” on the official zoning map. [Ord. 1292 §20, 2018; Ord. 1170B, 2000]

17.95.060 Development standards.

All development shall be required to conform to the supplementary requirements of Chapter 17.145 LCC. [Ord. 1292 §20, 2018; Ord. 1170B, 2000]

Chapter 17.100
RURAL DEVELOPMENT DISTRICT (RDD)

Sections:

17.100.010 Purpose.

The Rural Development District is the portion of land in Lewis County not otherwise designated. While the Rural Development District has an overall density designation of one unit per five acres, one unit per 10 acres, one unit per 20 acres, the combinations of steep slopes, tight soils, flood plains, and unbuildable critical areas will provide a wide variety of rural residential densities, and will preserve the rural character of the county while providing reasonable opportunity for any low density development. The purpose of this chapter is to achieve a variety of lot sizes, protect rural character, and protect small rural business which have historically served the citizens of Lewis County. [Ord. 1292 §21, 2018; Ord. 1179, 2002; Ord. 1170B, 2000]

17.100.015 General guidelines.

(1) The Zoning Districts. The Rural Development District is divided into three density districts:

(a) Rural Development District at one dwelling unit per five acres (RDD-5);

(b) Rural Development District at one dwelling unit per 10 acres (RDD-10); and

(c) Rural Development District at one dwelling unit per 20 acres (RDD-20).

In the RDD-10 District, all contiguous property 15 acres or larger, but less than 20 acres, may be divided into two lots. In the RDD-20 District, all contiguous property 30 acres or larger, but less than 40 acres, may be divided into two lots. This provision is only applicable to legal lots of record in existence prior to the adoption date of May 12, 2002, and shall not apply to any lot created after that date. This provision is limited to a one-time division of property; no future multiple divisions are permitted.

(2) For purposes of subdivision, lot area shall be consistent with the methodology contained in RCW 58.17.040(2). [Ord. 1292 §21, 2018; Ord. 1179B, §2, 2003; Ord. 1179, 2002]

17.100.020 Permitted uses.

Allowed uses, shown in Chapter 17.42 LCC, shall be permitted within this district. [Ord. 1292 §21, 2018; Ord. 1179, 2002; Ord. 1175 §2, 2000; Ord. 1170B, 2000]

17.100.030 Accessory uses.

As defined at LCC 17.10.010, accessory uses are considered part of the permitted uses. [Ord. 1292 §21, 2018; Ord. 1179, 2002; Ord. 1170B, 2000]

17.100.060 Design standards.

The creation of new building lots, pursuant to this section, shall be governed by the following recommended design standards:

(1) The base residential density shall be one unit per five, one unit per 10, or one unit per 20 acres. See zoning maps for specific density allowances.

(2) Clustering shall be encouraged in rural lands per Chapter 16.18 LCC. [Ord. 1292 §21, 2018; Ord. 1283 §14, 2017; Ord. 1179, 2002; Ord. 1170B, 2000]

17.100.080 Development standards.

All development shall be required to conform to the supplementary requirements of Chapter 17.145 LCC. [Ord. 1292 §21, 2018; Ord. 1170B, 2000]

Appendix D

Grant Assurances

FAA
Airports

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, 23, 25, 30, 32, 33, 34, and 37 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 Exclusive Rights and 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 Grant including but not limited to the following:

FEDERAL LEGISLATION

a. 49 U.S.C. subtitle VII, as amended.
b. Davis-Bacon Act, as amended — 40 U.S.C. §§ 3141-3144, 3146, and 3147, 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, 42 U.S.C. § 4601, et seq.[1, 2]
f. National Historic Preservation Act of 1966 – Section 106 – 54 U.S.C. § 306108.[1]
g. Archeological and Historic Preservation Act of 1974 – 54 U.S.C. § 312501, et seq.[1]
h. Native Americans Grave Repatriation Act – 25 U.S.C. § 3001, et seq.
i. Clean Air Act, P.L. 90-148, as amended – 42 U.S.C. § 7401, et seq.
j. Coastal Zone Management Act, P.L. 92-583, as amended – 16 U.S.C. § 1451, et seq.
k. Flood Disaster Protection Act of 1973 – Section 102(a) - 42 U.S.C. § 4012a.[1]
l. 49 U.S.C. § 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, as amended – 42 U.S.C. § 4151, et seq.[1]
s. Powerplant and Industrial Fuel Use Act of 1978 – Section 403 – 42 U.S.C. § 8373.[1]
t. Contract Work Hours and Safety Standards Act – 40 U.S.C. § 3701, 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 – 16 U.S.C. § 1271, et seq.

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. §§ 8101 through 8105.

z. The Federal Funding Accountability and Transparency Act of 2006, as amended (P.L. 109-282, as amended by section 6202 of P.L. 110-252).

aa. Civil Rights Restoration Act of 1987, P.L. 100-259.

bb. Build America, Buy America Act, P.L. 117-58, Title IX.

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

g. Executive Order 13166 – Improving Access to Services for Persons with Limited English Proficiency

h. Executive Order 13985 – Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government

i. Executive Order 13988 – Preventing and Combating Discrimination on the Basis of Gender Identity or Sexual Orientation

j. Executive Order 14005 – Ensuring the Future is Made in all of America by All of America's Workers

k. Executive Order 14008 – Tackling the Climate Crisis at Home and Abroad

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. [4, 5]

c. 2 CFR Part 1200 – Nonprocurement Suspension and Debarment.

d. 14 CFR Part 13 – Investigative and Enforcement Procedures.

e. 14 CFR Part 16 – Rules of Practice for Federally-Assisted Airport Enforcement Proceedings.

f. 14 CFR Part 150 – Airport Noise Compatibility Planning.

g. 28 CFR Part 35 – Nondiscrimination on the Basis of Disability in State and Local Government Services.

h. 28 CFR § 50.3 – U.S. Department of Justice Guidelines for the Enforcement of Title VI of the Civil Rights Act of 1964.

i. 29 CFR Part 1 – Procedures for Predetermination of Wage Rates.[1]

j. 29 CFR Part 3 – Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States.[1]

k. 29 CFR Part 5 – Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction (Also Labor Standards Provisions Applicable to Nonconstruction Contracts Subject to the Contract Work Hours and Safety Standards Act).[1]

l. 41 CFR Part 60 – Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor (Federal and Federally-assisted contracting requirements).[1]

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 Financial Assistance Programs.

r. 49 CFR Part 27 – Nondiscrimination on the Basis of Disability in Programs or Activities Receiving 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 38 – Americans with Disabilities Act (ADA) Accessibility Specifications for Transportation Vehicles.

x. 49 CFR Part 41 – Seismic Safety.

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] 2 CFR Part 200 contains requirements for State and Local Governments receiving Federal assistance. Any requirement levied upon State and Local Governments by this regulation shall

apply where applicable to private sponsors receiving Federal assistance under Title 49, United States Code.

[4] Cost principles established in 2 CFR part 200 subpart E must be used as guidelines for determining the eligibility of specific types of expenses.

[5] Audit requirements established in 2 CFR part 200 subpart F are the guidelines for audits.

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.

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. Subject to the FAA Act of 2018, Public Law 115-254, Section 163, 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 ensure that the airport will be operated and maintained in accordance with Title 49, United States Code, the regulations and the terms, conditions and assurances in this Grant Agreement and shall ensure 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-Management.

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 49 U.S.C. § 44706, 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 under 40 U.S.C. §§ 3141-3144, 3146, and 3147, Public Building, Property, and Works), 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 49 U.S.C. § 47112. 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 pilots 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 49 U.S.C. § 47102), if the FAA determines the airport sponsor meets the requirements set forth in Section 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 49 U.S.C. § 47107.

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 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. Subject to the FAA Reauthorization Act of 2018, Public Law 115-254, Section 163, 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 non-aviation 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. Subject to the FAA Reauthorization Act of 2018, Public Law 115-254, Section 163, 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, color, and national origin (including limited English proficiency) 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); creed and sex (including sexual orientation and gender identity) per 49 U.S.C. § 47123 and related requirements; age per the Age Discrimination Act of 1975 and related requirements; or disability per the Americans with Disabilities Act of 1990 and related requirements, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination in any program and 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 49 CFR §§ 21.23(b) and 21.23(e), 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 (**[Selection Criteria: Sponsor Name]**), 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 or offerors that it will affirmatively ensure that for any contract entered into pursuant to this advertisement, [select businesses, or disadvantaged business enterprises or airport concession disadvantaged business enterprises] will be afforded full and fair opportunity to submit bids in response to this invitation and no businesses will be discriminated against on the grounds of race, color, national origin (including limited English proficiency), creed, sex (including sexual orientation and gender identity), age, or disability 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 Department of Transportation (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 (including limited English proficiency), creed, sex (including sexual orientation and gender identity), age, or disability 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 49 U.S.C. § 47117(e);

    3. Reinvestment in an approved airport development project that is eligible for grant funding under 49 U.S.C. §§ 47114, 47115, or 47117;

    4. Transfer to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport; or

    5. Payment 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, 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 49 U.S.C. § 47117(e);
    3. Reinvestment in an approved airport development project that is eligible for grant funding under 49 U.S.C. §§ 47114, 47115, or 47117;
    4. Transfer to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport; or
    5. Payment 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.

If any phase of such project has received Federal funds under Chapter 471 subchapter 1 of Title 49 U.S.C., 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 in the same manner as a contract for architectural and engineering services is negotiated under Chapter 11 of Title 40 U S.C., 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 any project funded under an Airport Improvement Program Grant in accordance with policies, standards, and specifications approved by the Secretary including, but not limited to, current FAA Advisory Circulars (https://www.faa.gov/airports/aip/media/aip-pfc-checklist.pdf) for AIP projects as of [Selection Criteria: Project Application Date].

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 of 49 CFR Part 24 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 Disadvantaged Business Enterprise (DBE) and Airport Concessions Disadvantaged Business Enterprise (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 1986 (31 U.S.C. §§ 3801-3809, 3812).

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 49 U.S.C. § 47102) 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.

Appendix E

FAA Approval Letter

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Colorado · Idaho · Montana · Oregon · Utah
Washington · Wyoming

Seattle Airports District Office
2200 S 216th Street, Rm 1W-422
Des Moines, WA 98198

April 28, 2023

Mr. Mark Burch
Packwood Airport
2025 NE Kresky Avenue
Chehalis, WA 98532

Packwood Airport (55S), Washington
Approval of Forecast

Dear Mr. Burch:

The Federal Aviation Administration (FAA), Seattle Airports District Office has reviewed the aviation forecast for Packwood Airport (55S) master plan update with airport layout plan. The FAA approves the forecast for airport planning purposes based on the information summarized below:

Planning Interval	Year	2022 Airport Master Plan Operations	FAA TAF Operations	AF/TAF (%Change)
Base Year	2022	600	3,100	80.65%
Base Year +5 (Short Term)	2027	500	3,100	86.67%
Base Year +10 (Intermediate)	2032	750	3,100	75.81%
Base Year +15 (Long Term)	2037	750	3,100	75.81%

Planning Interval	Year	2022 Airport Master Plan Based Aircraft	FAA TAF Based Aircraft	AF/TAF (% Change)
Base Year	2022	0	1	N/A
Base Year +5 (Short Term)	2027	1	1	0.00%
Base Year +10 (Intermediate)	2032	2	1	50.00%
Base Year +15 (Long Term)	2037	2	1	50.00%

Source: Century West Engineering Packwood (55S) Master Plan Update – Aviation Forecast; April 24, 2023

1. The difference between the FAA Terminal Area Forecast (TAF) and Packwood Airport forecast for total operations to-date is higher than the 10 percent allowance for the 5-year planning horizon, and higher than 15 percent allowance for the 10-year planning horizon.
2. The difference between the TAF and Packwood airport's forecast for based aircraft to-date is also higher than the 10 percent allowance for 5-year plans, and higher than the 15 percent allowance for the 10-year planning horizon.

The forecast is based on reasonable planning assumptions, current general aviation airport data (*which changed while TAF held constant*) and acceptable methodologies. Consideration is given to the significant impacts of COVID-19 on current aviation activity and the historical changes at the airport which resulted in lower than normal confidence in future growth projections.

The FAA approves the A-I (small) family of single-engine piston aircraft typified by the Cessna 172 (C-172), for existing and future critical aircraft.

The forecast approval does not provide justification for future airport development. Justification for future projects will be based on activity levels at the time the future project is requested for development, rather than this forecast approval. Further documentation of actual activity levels reaching the required planning levels will be needed prior to FAA participation in funding for eligible future projects.

If you have questions, please call me at 206 231-3498

Sincerely,

AGNES O. FISHER

Digitally signed by AGNES O. FISHER
Date: 2023.05.02 15:16:58 -07'00'

Community Planner, SEA - 637
Seattle Airports District Office

Appendix F

FAA NRA Notification

Federal Aviation Administration

June 17, 2024

TO:
Packwood Airport
Attn: John Roe - Airport Manager
Lewis County Public Works
Tahoma Street W
Packwood, WA 98361
John.roe@lewiscountywa.gov

CC:
Century West Engineering
Attn: Samantha Peterson
22232 17th Avenue SE
Suite #206
Bothwell, WA 98021
SPeterson@CenturyWest.com

RE: *(See attached Table 1 for referenced case(s))*
ALP 7460 No Objection Letter
FINAL DETERMINATION

Table 1 - Letter Referenced Case(s)

ASN	Prior ASN	Location	Latitude (NAD83)	Longitude (NAD83)	AGL (Feet)	AMSL (Feet)
2024-ANM-1860-NRA		PACKWOOD,WA	46-36-14.98N	121-40-40.44W	1	1058

Description: Packwood Master Plan Updates: - Runway Improvements - Taxiway Construction - AGIS for Capital Improvements •No change to existing Runway 1/19; •Partial length parallel taxiway (reduced from a full-length parallel taxiway depicted in 2009); •New aircraft tiedown apron (4 spaces); •New Helicopter parking apron; •Hangar sites; •Vehicle access roads and parking upgrades; •Vacate section of Willame St W (at north end of the runway) replacement access; •Realignment of road outside of ROFA (at south end of the runway); and •0.37 Acres of property acquisition (vacated road section of Willame St W). •Updated local zoning; •Proposed change in airport traffic pattern (Right Traffic Runway 19). Sheet 10 – Exhibit A Property Plan •Added parcels transferred to airport ownership under Resolution No.19-103 (16.72 acres); •Depicted proposed and existing easements. Sheet 11, 12 & 13 – Obstruction Tables •Added sheet 11, 12 & 13 cataloging obstructions (2023 AGIS Survey).

The proposed change to your currently approved Airport Layout Plan (ALP) submitted, 2024-03-21 15:24:26.0 has been reviewed under the authority of Part 77 and under the requirements of the Terms and Conditions of Accepting Airport Improvement Program Grants dated September 1, 1999. This review has considered the safety and utility of aircraft operations and planned navigational aids as related to this proposal.

The proposal does not exceed any federal obstruction standard and has no effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, we have no objection to this proposal.

It should be noted that this study did not consider the height of construction equipment. This information needs to be coordinated with this office via an "Airspace Study Checklist" before construction begins.

This study did not evaluate the plans for operational safety during construction. Those plans should be submitted to this office for coordination and review prior to construction.

This determination does not include any environmental analysis or environmental approval for this proposal. All local and state requirements and/or permits must be obtained to prior to construction of this proposal.

This determination does not include approval of any lease, does not release any surplus or grant agreement acquired airport property, nor does it relieve the airport owner or the proponent of compliance with Part 155, or any other law, ordinance, or regulation of federal, state, or local government body or organization. Furthermore, the design and location of any stormwater retention/detention facilities on or near the airport must comply with FAA Advisory Circular 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports", and must be approved on the ALP prior to construction.

We look forward to working with you in the continued development of your airport. If you have any questions, please contact me at (206) 231-3984, agnes.fisher@faa.gov.

Agnes Fisher
ADO
Signature Control No: 616237756-624725593

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