



OREGON AVIATION PLAN AIRPORT SUMMARY

MULINO STATE AIRPORT

In 2018, the Oregon Department of Aviation (ODA) updated the Oregon Aviation Plan (OAP v6.0) for the state airport system which includes 95 airports, one heliport and one seaplane base. The study area was statewide and considered both commercial service and general aviation airports. Airports outside of Oregon in proximity to the state were considered as well. The study includes Mulino State Airport (4S9 or the Airport). This section focuses on the system plan's individual findings and recommendations for this facility as well as documenting the various benefits the Airport provides in Oregon.

Aviation system plans are top down studies that must be implemented from the bottom up by individual airports. The ultimate success of the plan depends on each airport implementing recommendations from the study and following through on any identified improvement actions. Individual airport improvements will result in the enhancement of overall system performance.

Within the statewide system, the Mulino State Airport has been designated as a Category IV – Local General Aviation Airport in the 2007 OAP. Within the OAP, a Category IV airport support primarily single-engine general aviation aircraft but are capable of accommodating smaller twin-engine general aviation aircraft. These airports support local air transportation needs and special-use aviation activities.

Some, but not all of the study airports also have federal role definitions from the FAA. Within FAA's ASSET Study and National Plan of Integrated Airport Systems (NPIAS), the Mulino State Airport is designated as a Local General Aviation Airport; this designation signifies the Airport's importance to the federal system of public-use airports. From the economic impacts it provides and the volume of business activity it serves, Mulino State Airport has all the attributes of a Local General Aviation Airport. Its airfield facilities are in line Local General Aviation Airport; hence the OAP v6.0 recommends that this airport maintain this role within the NPIAS.

From a facilities standpoint, the Mulino State Airport meets most of the objectives for an OAP Category IV Airport. It is worth noting, however, that the Airport's own capital improvement plan and/or master plan may recommend additional projects that it will be needed over the coming 10 years. The OAP also does not identify all maintenance, rehabilitation, and replacement costs that could be incurred by the Airport during this period.

EXISTING OREGON AIRPORT SYSTEM 2018



More information on the OAP can be obtained from the ODA Aviation website at <https://www.oregon.gov/aviation/pages/index.aspx>. In addition to the complete Technical Report, a statewide Executive Summary was produced to support the OAP. More information on all OAP-related products can be obtained from ODA.



OREGON AIRPORT ROLES/CATEGORIES

ODA’s Oregon Aviation Plan was last published in 2007. This update to the OAP re-sets the bar for future system performance by evaluating each airport’s facilities and services. Since 2007, a number of Oregon airports have made progress toward meeting various performance measures. As part of this study, airport infrastructure data, aviation activity projections and population growth in each airport’s environs were used to determine whether the airport should be elevated to a higher OAP Category to improve overall system accessibility and performance. The OAP v6.0 also addressed the need for airports to support resiliency efforts related to a potential Cascadia Earthquake and Tsunami Event.

Recommended categories for airports in the Oregon Aviation Plan are shown below.

OAP AIRPORT CATEGORIES RECOMMENDED OREGON AIRPORT ROLES

Category I	Commercial Service Airport: These airports support some level of scheduled commercial airline service in addition to supporting a full range of general aviation aircraft activities. Commercial service includes both domestic and international destinations. Objectives call for a minimum runway length of 6,000 feet.
Category II	Urban General Aviation Airport: These airports support all general aviation aircraft and accommodate corporate aviation activity, including piston and turbine engine aircraft, business jets, helicopters, gliders, and other general aviation activity. The most demanding user requirements are business-related. These airports service a large/multi-state geographic region or experience high levels of general aviation activity. The minimum runway length objective for Category II airports is 5,000 feet.
Category III	Regional General Aviation: These airports support most twin and single-engine aircraft and may accommodate occasional business jets. These airports support regional transportation needs with a large and often sparsely populated service area. The minimum runway length objective for Category III airports is 4,000 feet.
Category IV	Local General Aviation Airport: These airports support primarily single-engine general aviation aircraft but are capable of accommodating smaller twin-engine general aviation aircraft. These airports support local air transportation needs and special-use aviation activities. The minimum runway length objective for Category IV airports is 3,000 feet.
Category V	Remote Access/Emergency Services (RAES): These airports support primarily single-engine general aviation aircraft, special-use aviation activities, access to remote areas, or provide emergency service access. These airports should have at least 2,500 feet of runway.

Source: Jviation

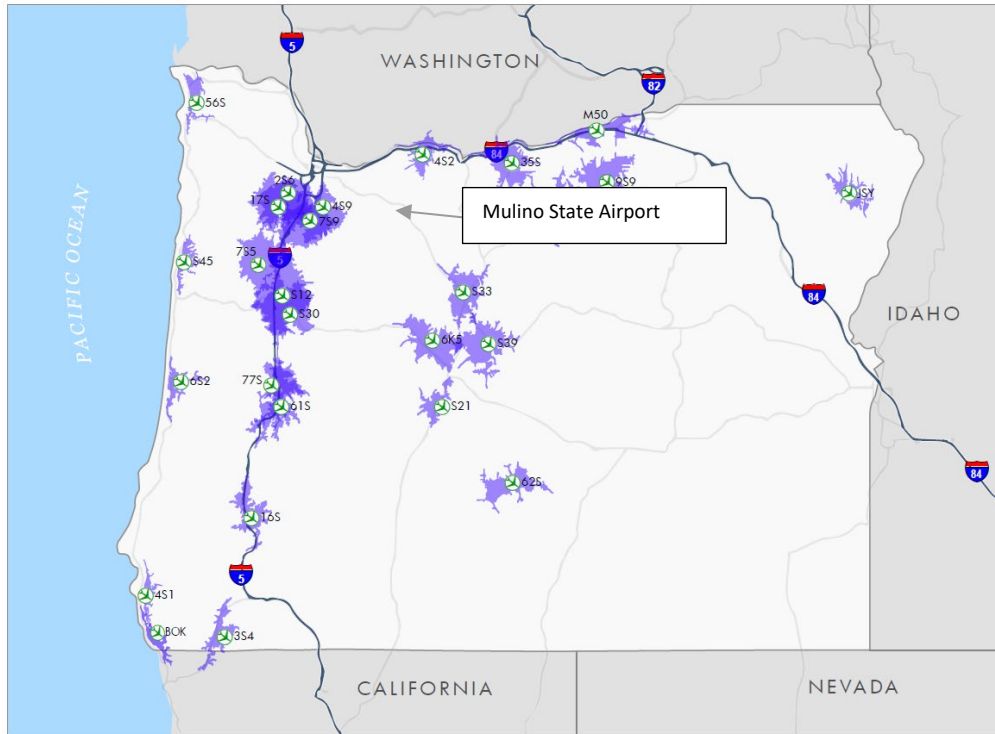
MULINO STATE AIRPORT OVERVIEW

The Hamlet of Mulino is located 23 miles south of Portland in Clackamas County. The Airport is owned and operated by the Oregon Department of Aviation. Major employers in the area include Brentwood Industries and RSG Forest Products. There are logging, road construction, quarrying, and trucking companies to support the timber land managers in the area.



The Airport's runway, Runway 14/32, is 3,425 feet long and 100 feet wide. This visual runway is equipped with MIRL and a full length parallel taxiway. The Airport handles approximately 21,300 annual general aviation operations and is home to 63 based aircraft. It is estimated that 39 percent of the Airport's annual operations are conducted by itinerant aircraft.

30-MINUTE DRIVE TIME SERVICE AREA AND POPULATION OAP CATEGORY IV AIRPORTS



Source: Jviation

Airport roles consider the characteristics of the area the airport serves. Analysis for the OAP was conducted using a geographic information system (GIS) and a 30-minute drive time for each airport. There are approximately 198,580 residents within a 30-minute drive of 4S9 and a labor force of approximately 60,520.

Mulino State Airport	
Population	
2016 30-minute drive	198,580
2016 Associated city	9,111
Labor force	
2016 30-minute drive	60,520

Source: US Census Bureau, Jviation Analysis, Oregon Zoomprospector.com, Oregon Population Center – Portland State University



RECOMMENDED ROLE FOR MULINO STATE AIRPORT

Each airport’s level generally reflects the type of aircraft and customers the airport serves as well as the characteristics of the airport’s service area. Mulino State Airport will remain a Category IV – Local General Aviation Airport within the OAP.

As a Category IV airport, the OAP has identified certain facilities and services that should ideally be in place. These objectives are considered the “minimums” to which the Airport should be developed. Based on local needs and other justifications, it is quite possible that the Airport could exceed its minimum development objectives established in the OAP. Mulino State Airport’s specific objectives, as they pertain to the Airport’s Category IV role in the state airport system, are listed below.

OBJECTIVES FOR CATEGORY IV – LOCAL GENERAL AVIATION MINIMUM STANDARD GENERAL AVIATION AIRPORT

Airside Facilities

- » **Airport ARC:** B-I
- » **NPIAS:** Not an Objective
- » **Based Aircraft:** ≥10 (NPIAS Only); Not an Objective (Non-NPIAS)
- » **Runway orientation:** 95% wind coverage (combined primary/secondary rwy)
- » **Runway Pavement Type:** Bituminous, Concrete, Turf
- » **PCI:** 60
- » **Runway Pavement Strength:** ≥12,500 lbs. (Hard Surface Only)
- » **Runway length:** Minimum 3,000 feet Paved; 2,500 feet Turf
- » **Runway width:** 60 feet Paved; 120 feet Turf
- » **Taxiway:** Exit Taxiway(s)
- » **Lighting systems:** MIRL and MITL
- » **Approach:** Visual
- » **Visual Approach Aids:** One Runway End
- » **Instrument Approach Aids:** Not an Objective
- » **Runway Lighting:** LIRL
- » **Taxiway Lighting:** LITL/Reflectors
- » **Fencing:** Not an Objective

General Aviation Facilities

- » **Rotating Beacon:** Yes
- » **Weather reporting:** Not an Objective
- » **Lighted Wind Indicator:** Yes
- » **Hangared aircraft storage:** 75% of based aircraft fleet
- » **Apron parking/storage:** 30% of Daily Transient
- » **Terminal/Building:** Not an Objective
- » **Auto parking:** Minimal (tenant/public)
- » **Fencing:** Not an Objective
- » **Cargo:** Not an Objective
- » **Deicing Facility:** Not an Objective

Services

- » **Fuel:** 100 LL
- » **FBO:** Not an Objective
- » **Transportation:** Not an Objective
- » **Food Service:** Not an Objective
- » **Restrooms:** Yes
- » **Pilot Lounge:** Not an Objective
- » **Snow Removal:** Yes (coastal airports exempt)
- » **Telephone:** Not an Objective



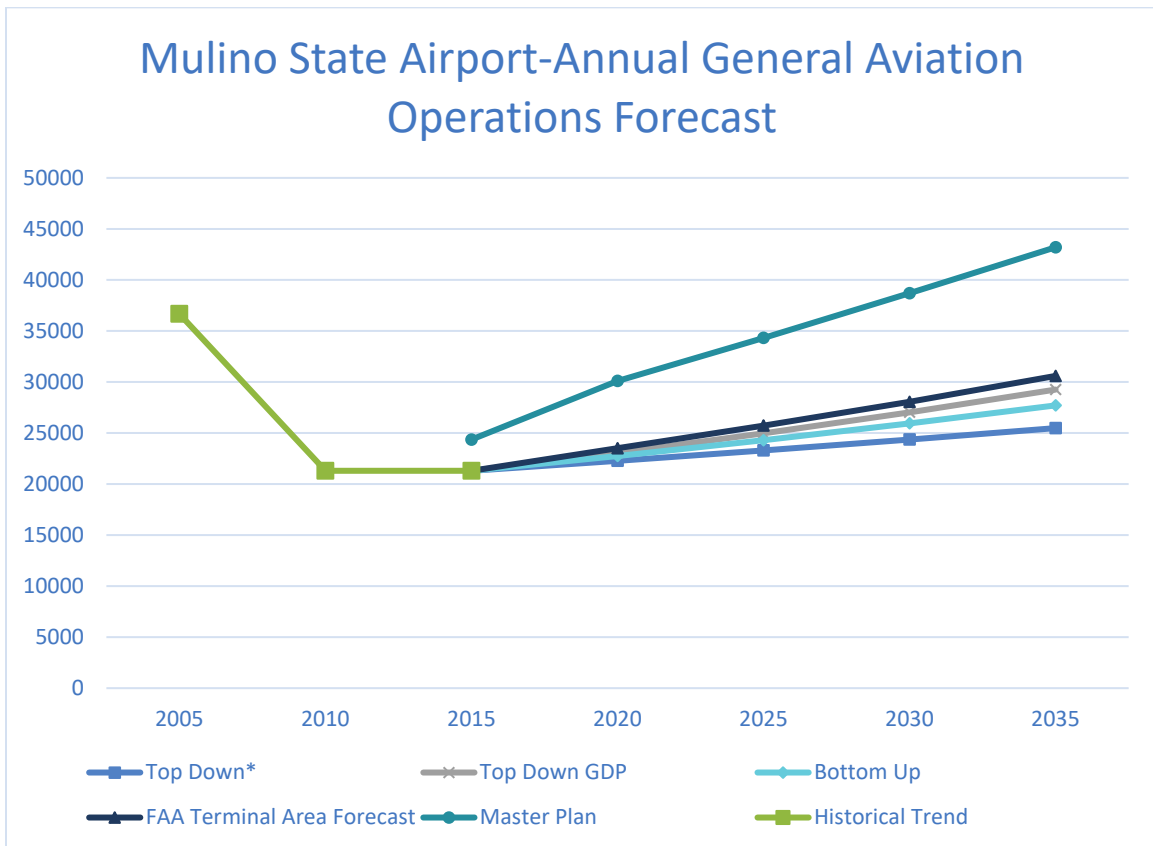
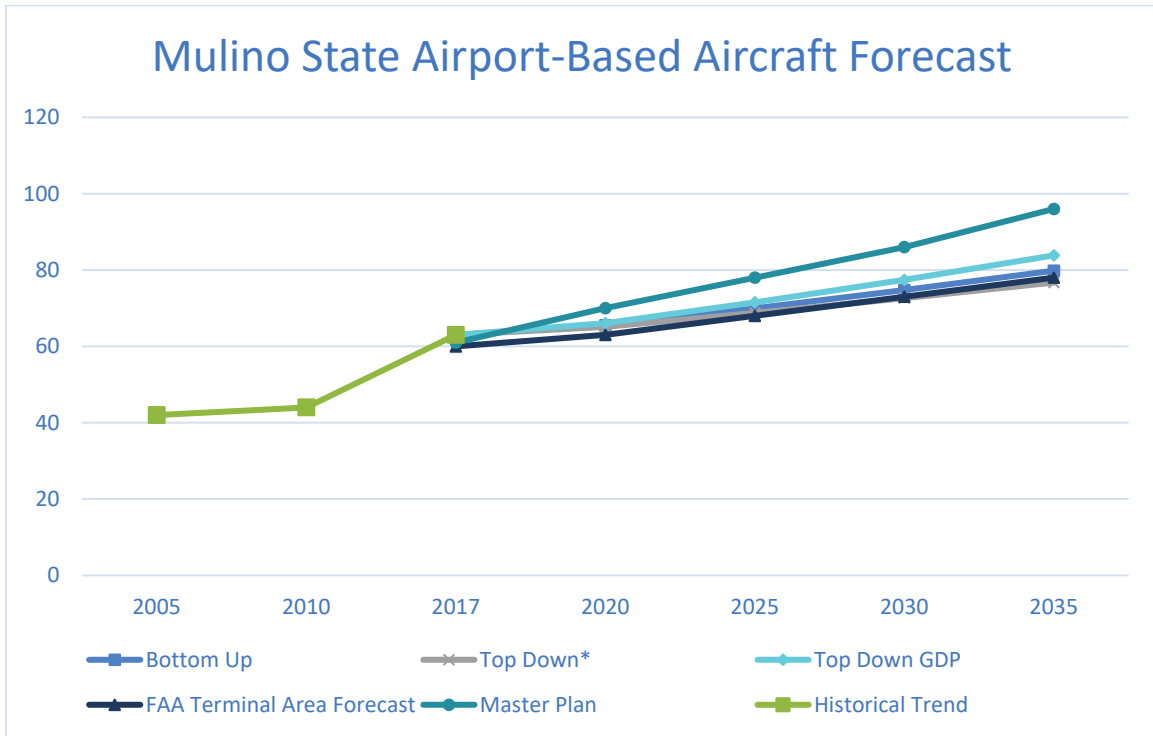
MULINO STATE AIRPORT PROJECTIONS OF AVIATION DEMAND

Over the past 10 years, general aviation has experienced a general decline on a nationwide basis and in Oregon. The high cost of acquiring and maintaining a general aviation aircraft, the cost to secure a private pilot's license, competing opportunities for allocation of disposable income, the economic recession, along with significant increases in the cost of aviation fuel, have all contributed to a contraction in general aviation demand.

Recent economic recovery and increased use of general aviation as a tool to improve business efficiency have helped to stabilize the general aviation industry. For most airports in Oregon, however, including Mulino State Airport, anticipated growth in general aviation demand will be modest at best. The two graphs below show projections of based aircraft and annual general aviation operations for Mulino State Airport as they were developed in the OAP v6.0.

Three based aircraft projection methodologies were developed in this forecast. The bottom-up methodology produced an average annual growth rate of 0.8 percent and the top-down methodology based on historical Per Capita Real GDP produced the highest average annual growth rate, of the three projections, at 1.6 percent. The alternative top-down methodology utilizing FAA Terminal Area Forecast (TAF) projections for NPIAS airports in Oregon produced more moderate growth rate. Comparing the results of the forecasts indicated that the historical Per Capita Real GDP projection had the strongest growth, but was considered to be overly optimistic, since sustaining a 1.6 percent GDP growth rate over the planning period is unlikely. Therefore, the more conservative bottom-up growth rate of 1.1 percent, which is based on FAA TAF growth rates for based aircraft, was chosen as the preferred forecast. Based aircraft at Mulino State Airport are projected to increase from 63 in 2017 to 77 by 2035.

The results from the three general aviation operations projection methodologies developed in this forecast are compared in the graphs below. The bottom-up methodology produced an average annual growth rate of 1.1 percent while the top-down methodology based on FAA Hours Flown projections produced an average annual growth rate of 0.9 percent. The alternative top-down methodology based on historical GDP growth produced an average annual growth rate of 1.6 percent. The top-down growth rate of 0.9 percent was chosen as the preferred growth rate since it is based on FAA national average growth forecasted for hours flown. Annual general aviation aircraft operations at Mulino State Airport are projected to increase from 21,300 to 25,480 by 2035.



Source: FAA TAF, Aviation analysis, 459 airport master plan
 Note: * indicates preferred growth rate

MULINO STATE AIRPORT ECONOMIC IMPACT UPDATE

Annual economic impacts for 97 study airports were estimated as part of ODA’s economic impact research. Total annual economic impacts for the Airport are attributed to one or more of the following four economic activity centers: airport management, airport tenants, average annual capital investment, and spending by visitors who arrive on general aviation aircraft.

This study uses three primary measures to express both statewide and airport-specific annual economic impacts:

- » Employment
- » Annual Payroll
- » Sales/Output (or total annual economic activity)

Direct Impacts – Mulino State Airport is owned and operated by the Oregon Department of Aviation. General aviation operations at the Airport accounted for approximately 2,739 visitors who arrived in the area via aircraft. The direct employment, payroll, and sales/output impacts relate to the Airport’s tenants were derived from survey data. Visitor impacts were calculated using airport-specific expenditure estimates. The total combined direct output stemming from all on-airport aviation-related tenants and visitor-related expenditures was estimated at \$570,299. On-airport tenants and visitors accounted for nearly 3 direct jobs with an estimated direct payroll of \$171,130. Construction impacts related to Capital Improvement Projects (CIP) are included in aggregate with other general aviation airports.

MULINO STATE AIRPORT

	Direct	Indirect/Induced	Total
Employment			
Tenant	2.0	2.9	4.9
GA Visitor	0.8	0.3	1.1
CIP			
Employment Total	2.8	3.2	6.0
Payroll			
Tenant	\$145,000	\$107,154	\$252,154
GA Visitor	\$26,130	\$20,520	\$46,650
CIP			
Payroll Total	\$171,130	\$127,674	\$298,804
Sales/Output			
Tenant	\$532,000	\$428,056	\$960,056
GA Visitor	\$38,299	\$26,675	\$64,974
CIP			
Sales/Output Total	\$570,299	\$454,731	\$1,025,030

Source: Mead and Hunt, EDR Group, Aviation, IMPLAN econometric package

Multiplier Impacts - Direct on-airport tenant and general aviation visitor impacts also create multiplier impacts throughout Oregon. These benefits are made up of indirect and induced impacts calculated with IMPLAN multipliers. Induced impacts result from employees on the airports and in the hospitality sector off-airport spending their earnings in Oregon while indirect impacts result from on-airport businesses and hospitality sector businesses spending for goods and services in Oregon. The table above presents the Airport's direct, indirect/induced, and total economic impacts for sales/output, payroll, and employment as they relate to all on-airport tenants and all general aviation visitors.

Total Impacts - The total output (including direct and multiplier impacts) stemming from all on-airport tenants and all general aviation visitors to Mulino State Airport was approximately \$1 million. Total full-time employment related to all tenants and general aviation visitors, including all multiplier impacts is 6. A total annual payroll associated with these jobs is estimated at \$298,804.



MUNICIPALITIES NEAR MULINO STATE AIRPORT WITH LAND USE CONTROLS

Having land uses adjacent to airports that are compatible with aircraft operations is imperative from a safety standpoint. Airports that accept state and/or federal grants are obligated to take steps to promote compatible land use and activities in the environs of their airport. For the OAP analysis, airports and their immediate or adjacent municipalities in the environs of the airport were identified. Analysis of each airport’s airspace were compared to local jurisdiction boundaries on Google Earth. If a jurisdiction was entirely or partly under the airport’s airspace local zoning ordinances were reviewed. County land use ordinances related to airports and height restrictions were also analyzed.

Research was undertaken for municipalities identified during the OAP to determine if the municipalities are taking steps to promote compatible land use and protect the operating environments for airports. Municipalities near Oregon airports were investigated to determine the following key land uses controls:

- » **Has the municipality adopted land use zoning controls?**
- » **Does the municipality have an airport-specific overlay zone or district?**
- » **Does the municipality have a land use map that shows the location of the airport?**
- » **Has the municipality adopted some type of height zoning?**

The following table shows municipalities near Mulino State Airport and summarizes the status of land use controls for each. Municipalities and airports throughout Oregon should work together to help ensure airports are protected from incompatible land uses and from the encroachment of obstacles that pose a height hazard to safe airport operations.

LAND USE CONTROL SUMMARY FOR MULINO STATE AIRPORT

Type of Control	Jurisdictions Impacting Airport	
	City of Mulino*	Clackamas County
Airport Zone	-	Yes
Adopted Height Zoning Restrictions	-	No
RPZ Protection	-	No
Airport Safety Overlay Zone	-	Yes

Source: Angelo Planning Group, Aviation

Note: *Information was not gathered for cities where 100% of the airport’s horizontal surface is located outside the municipal boundary

AIRPORT REPORT CARD AND RECOMMENDATIONS

This section provides information on ODA facility/service objectives associated with a Category IV airport in the OAP. The “report card” on the following pages shows Mulino State Airport’s ability to meet its objectives. If the Airport does not meet an objective, an estimated cost to enable the Airport to meet the objective was developed. The report card for Mulino State Airport, developed as part of the OAP, is shown below. Several projects are identified as necessary for improving the Airport to meet all the facility objectives.

Category IV Performance Criteria		459	Mulino State Airport	Mulino
Facilities	Basic Criteria	Actual	Action Needed to Meet Criteria	Estimated Cost
Airside Facilities				
FAA – ARC	B-I	B-II		
NPIAS	Not an Objective	Yes		
Based Aircraft	≥10 (NPIAS Only); Not an Objective	63		
Runway Orientation	95% wind coverage	Yes		
Runway Length	3,000 feet Paved; 2,500 feet Turf	3,425		\$ -
Runway Width	60 feet Paved; 120 feet Turf	100		\$ -
Runway Pavement Type	Bituminous, Concrete, Turf	Bituminous		
Runway Pavement Strength	≥12,500 lbs. (Hard Surface Only)	12,500		\$ -
Runway Pavement PCI	60	83		
Taxiways	Exit Taxiway(s)	Full Parallel		
Approach Type	Visual	Visual		
Visual Approach Aids	One Runway End	None	Install visual approach aids	
Instrument Approach	Not an Objective	None		
Runway Lighting	LIRL	MIRL		
Taxiway Lighting	LITL/Reflectors	LITL		\$ -
General Facilities				
Rotating Beacon	Yes	Yes		\$ -
Lighted Wind Indicator	Yes	Wind Cone, Lighted		\$ -
Weather Reporting	Not an Objective	None		
Hangared Aircraft	75% of Based Aircraft	85%		
Apron Parking/Storage	30% of Daily Transient	25%	Provide additional apron parking spaces	\$ 33,472
Terminal Building	Not an Objective	No		
Auto Parking Spaces	Minimal (tenant/public)	6		\$ -
Fencing	Not an Objective	Partial fencing only near terminal area		
Cargo	Not an Objective	Any available space on apron		
Deicing Facility	Not an Objective	None		
Services				
Fuel	100 LL	Yes		\$ -
FBO	Not an Objective	No		
Ground Transportation	Not an Objective	Uber/taxi		
Food Service	Not an Objective	No		
Restrooms	Yes	Yes		
Pilot Lounge	Not an Objective	Pilot lounge only		
Snow Removal	Yes	No	Provide snow removal	Exempt
Telephone	Not an Objective	Yes		
Total				\$ 33,472

Source: Aviation, Century West, Marr Arnold Planning

OTHER IDENTIFIED FACILITY IMPROVEMENT COSTS

Projects identified in the deficiencies analysis from the OAP represent a portion of the total development and maintenance costs that Oregon airports could require in the near term. In order to have a better picture of total investment needs for Oregon’s airport system, it is important to also consider projects identified in each airport’s current Statewide Capital Improvement Program (SCIP) and in Oregon’s most recent Statewide Pavement Maintenance Program (PMP).

SCIP - Current SCIPs were reviewed to provide ODA with a general understanding of what projects are already being considered on the local level that would address deficiencies noted in the OAP. A review was performed to ensure project costs were not duplicated between the OAP and current SCIP projects for each airport. Analysis of 2018 SCIP data indicates that over \$3.8 million in improvements for Mulino State Airport are identified in the SCIP over the next five to ten years. This estimate does not include transfers or PMP funds.

ODA SCIP Improvements (4S9)	Costs
EA for Obstruction Removal and Fence	\$207,764
Obstruction Removal	\$88,888
Design for Fence	\$166,667
Construction for Fence	\$403,348
Environmental and Design for Taxiway Rehabilitation	\$144,445
Rehab Taxiway / Taxilane - Construction	\$2,833,333
Total	\$3,844,445

Source: ODA SCIP 2018, Aviation analysis

PMP - ODA’s Pavement Maintenance Program (PMP) identifies maintenance, repair, and rehabilitation projects needed to sustain functional pavements at Oregon airports. The PMP program provides some level of pavement maintenance for all paved airports across the state. For NPIAS airports receiving federal monies, this work assists the airports in meeting their grant assurances. Projects in the PMP for Mulino State Airport are estimated at nearly \$246,000 between 2018 and 2023.

Cost Summary - The OAP v6.0 summarized the Airport’s development needs over the next five to ten years. Costs to improve and maintain the Airport over that time frame consider not only projects identified by the OAP, but also projects from ODA’s Pavement Maintenance Program and the Airport’s own locally generated capital improvement plan reported to ODA (SCIP). These three sources indicate an estimated \$4.1 million will be needed to maintain and improve the Airport over the next ten years.

As ODA’s Statewide Economic Impact Study has shown, on an annual basis the Mulino State Airport supports an estimated \$1.0 million in economic benefit. The Airport’s annual economic impact helps to offset the Airport’s need for investment identified in the state system plan to maintain and improve the Airport.



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