MULINO AIRPORT
Mulino, Oregon

2008 AIRPORT MASTER PLAN & AIRPORT LAYOUT PLAN UPDATE

Prepared for:

PORT OF PORTLAND

Prepared by:

WHPacific

Adopted by the Port of Portland Commission
<<insert date>>

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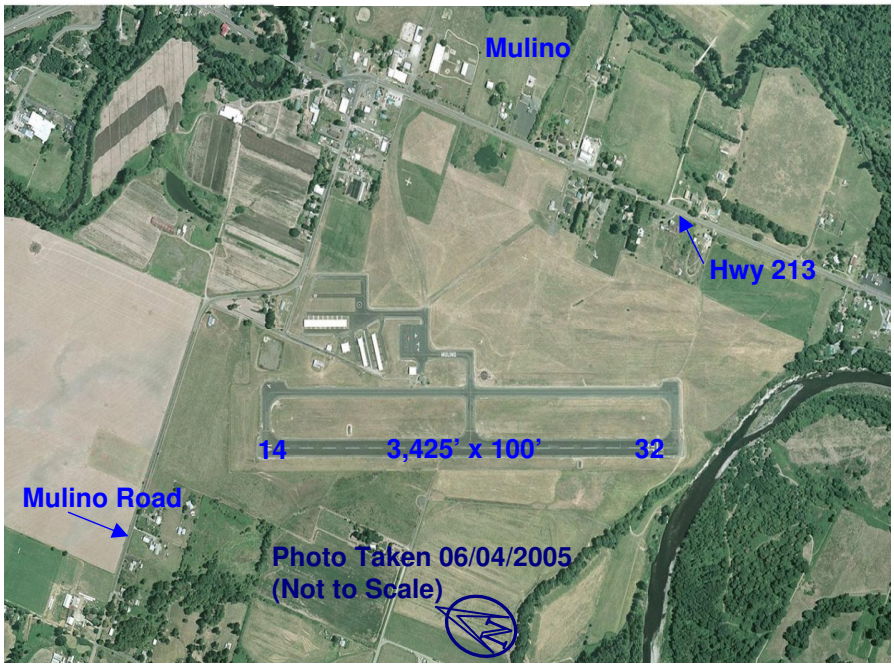
INTRODUCTION

Mulino Airport



The Port of Portland (Port) and the Federal Aviation Administration (FAA) initiated this project to update the 1993 Mulino Airport Layout Plan (ALP). An airport master plan is a long-term development concept. It serves as a 20-year guide that outlines how the physical development of an airport can satisfy aviation demand in a safe, efficient, and fiscally responsible way. Airport master plans typically need updating at five to ten year intervals because conditions affecting airport operations and development can change in unpredictable ways. Guidance for the master planning process is highlighted in the FAA's Advisory Circular 150/5070-6B.

MASTER PLAN ELEMENTS

Following guidance from the FAA and industry-accepted practices, the Master Plan contains seven key elements, or chapters, that provide the foundation for identifying future Airport needs and demands while citing reasons for implementing those improvements. These elements are discussed in detail below.

Chapter One, *Strategic Analysis*, provides an analysis of the appropriate future role for the Airport within the Portland metro area system of airports. The recommended role was used to guide the development of aeronautical activity forecasts and facility requirements.

Chapter Two, *Inventory*, offers a detailed overview of the existing airport facilities through a physical inspection of the Airport and discussions with Airport users, Port staff, nearby residents, and an archival review of Airport documents. The information gathered supplies the foundation for various analyses completed throughout the Master Plan, especially the aeronautical activity forecasts and facility requirements.

Chapter Three, *Aeronautical Activity Forecast*, is used to help determine the size and timing of needed airport improvements. Forecasts of based aircraft and aircraft operations have been established by utilizing data from Chapter One, as well as national, regional, and socioeconomic trends and forecasts.

Chapter Four, *Airport Facility Requirements*, evaluates existing airport facilities to identify their functionality, condition, compliance with design standards, and capacity to accommodate the demand projected in Chapter Three. This analysis of facility needs to meet anticipated demand is the basis for the Airport development alternatives in Chapter Five.

Chapter Five, *Airport Development Alternatives*, builds upon the previous chapters and presents several possible development alternatives that focus on meeting the Airport's facility needs for the long-term future. Three development alternatives and one no-build alternative are presented with cost estimates. A preferred alternative, or Master Plan Concept, is also presented that was derived from the alternatives.

Chapter Six, *Airport Layout Plan*, presents drawings that are a pictorial representation and summarization of the efforts made throughout the planning process. These drawings are used by the FAA for determining grant eligibility and funding.

Chapter Seven, *Capital Improvement Plan*, provides the basis for planning the funding of the improvements identified within the planning process and depicted on the Airport Layout Plan. The Capital Improvement Plan proposes scheduling, cost estimates, and funding sources for the projects.

The following appendices are included for reference:

Appendix A – *Glossary of Terms: Definitions and Acronyms*
Appendix B – *Project Advisory Committee Meeting Summaries*
Appendix C – *User Survey*

Appendix D – *Survey Response*
Appendix E – *Existing Utilities and Storm Drainage*
Appendix F – *Clackamas County Zoning and Development Ordinance*
Appendix G – *Federal Aviation Administration Correspondence*

PUBLIC PARTICIPATION

The Port is committed to involving the public, airport users, tenants, and interested persons throughout the planning process. Public participation has historically been vital to the successful planning and implementation of airport master plans. A proactive public involvement program was devised to inform the citizens about the nature of the update, identify concerns, cultivate support for the project, and set the stage for the public meeting process. Additionally, a Project Advisory Committee (PAC) consisting of various stakeholders was formed to give advice to the Port about the master plan.

Project Advisory Committee

Name	Title	Organization
J.D. Clarizio	Owner	Arrowhead Golf Club
Dan Clem	Director	Oregon Department of Aviation
Kenneth Itel	Senior Planner	Clackamas County
Dianne Johnson	Vice Chair	Oregon Pilot's Association, Mulino Chapter
Warren Jones	Chair	Mulino Community Planning Organization
Gary Sparks	Vice President	Experimental Aircraft Association, Mt. Hood Chpt. 902

A mailing list of PAC members, agencies, organizations, aviation interests and individuals with an interest in the airport was developed. Throughout the planning process, multiple mailings were sent to maintain positive communications. Information was also included on the Port's website to keep the public informed of the latest developments.

Six PAC meetings were held, in conjunction with the completion of each Master Plan Element, to solicit ideas and suggestions from PAC members and interested citizens. Additionally, two open houses gave members of the public an opportunity to learn about the project and provide comments. A summary of all PAC meetings is in **Appendix B**.

Chapter One
STRATEGIC ANALYSIS

The objective of this chapter is to determine, through a strategic analysis, the appropriate future role for the Mulino Airport (Airport) within the Portland metro area system of airports. This chapter documents the tasks undertaken for the strategic analysis. The first section defines the current role of the Mulino Airport within the national, state, and Portland metro area systems of airports. In the second section, the roles, activity levels, facilities, services, and development potential of other airports in the Portland metro area are analyzed. The third section summarizes the results of a survey of airport users and aviation service providers in the area regarding the use of the Mulino Airport and its future needs. The chapter ends with analysis conclusions, an evaluation of alternative airport roles, and a recommended future role of the Airport. This recommended role will guide the development of aviation activity forecasts and facility requirements.

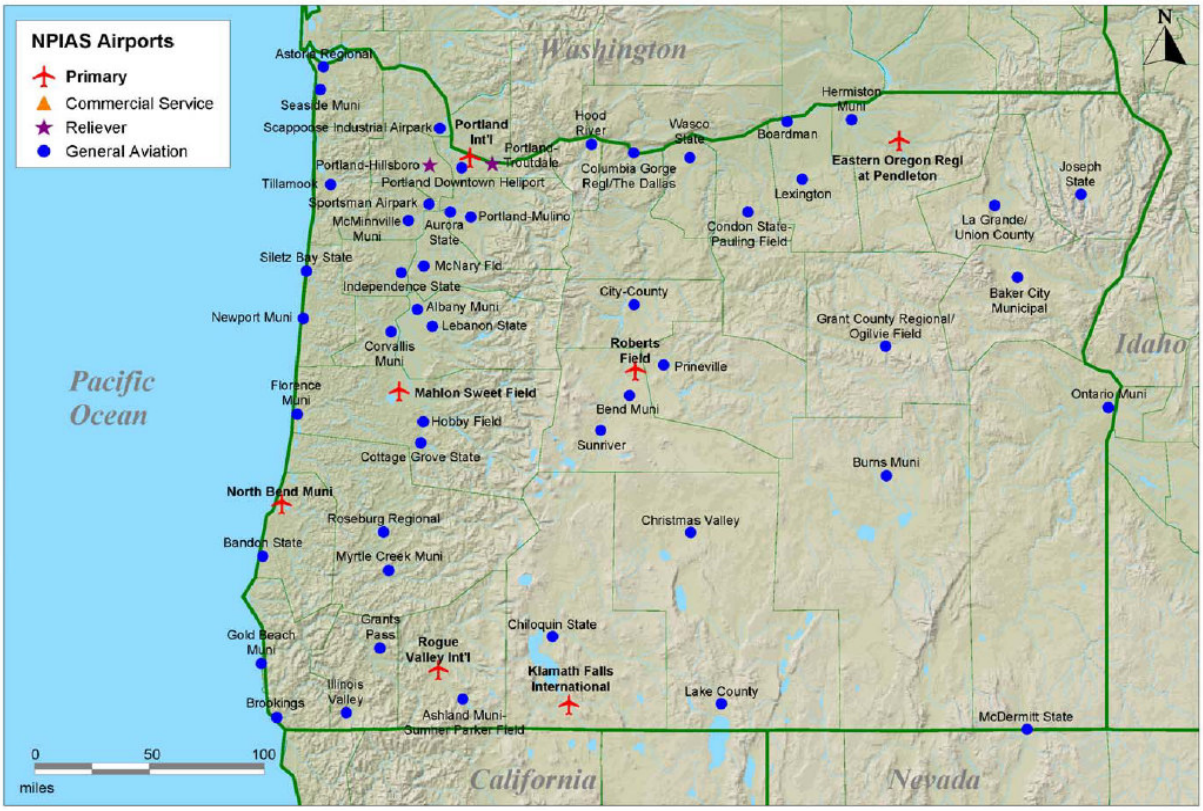
MULINO AIRPORT'S CURRENT ROLE

Mulino Airport's Role within the National System

The Mulino Airport is identified by the Federal Aviation Administration (FAA) as one of 2,558 General Aviation (GA) facilities nationwide and is included within the National Plan of Integrated Airport Systems (NPIAS). GA airports do not have scheduled passenger service. There are several criteria allowing an airport to be included in the NPIAS; however, the general criteria are that the airport has at least 10 based aircraft and is located at least 20 miles (30 minutes drive time) from another NPIAS airport. The Mulino Airport meets the based aircraft criteria; however, the Airport is within 13 miles (approximately 19 minutes drive time) of

another NPIAS airport (Aurora State). This is not unusual; other urban areas with hundreds of based aircraft have NPIAS airports located within 20 miles of each of because the additional airport capacity is needed.

The NPIAS is updated biannually and reported to Congress with a 5-year estimation of Airport Improvement Program (AIP) eligible development. **Exhibit 1A** displays the NPIAS airports within the State of Oregon.



FAA 2005-2009 NPIAS report: Appendix B. (2004, September 30). Retrieved August 16, 2006, from http://www.faa.gov/airports_airtraffic/airports/planning_capacity/npias/ reports/

MULINO AIRPORT	OREGON NPIAS AIRPORTS (2005)	EXHIBIT 1A

Since it is in the NPIAS, the Airport is eligible to receive Federal grants under the AIP. Under the current AIP program, federal grants cover up to 95% of GA airport eligible costs. Eligible costs include planning, development or noise compatibility projects. As part of receiving AIP grants, the Port of Portland (Port) must accept all conditions and obligations under the FAA grant assurances. In general, such assurances require the Port to operate and maintain the Mulino Airport in a safe and serviceable condition, not grant exclusive rights, mitigate hazards to airspace, and use airport revenue properly.[1] In September of 2007, the AIP program will enter

[1] *FAA Airport Improvement Program*. (n.d.). Retrieved August 16, 2006, from http://www.faa.gov/airports_airtraffic/airports/aip/

re-authorization, which may have significant effects on the funding of GA airports such as Mulino Airport.

Mulino Airport's Role within the State of Oregon's System

According to the 2000 State of Oregon Aviation Plan, the Mulino Airport is classified as a Category 4 airport. Category 4 airports serve general aviation and local business, typically have 2,500 or more annual operations, and have at least 10 based aircraft. The Airport is also designated as a Core airport by the State of Oregon, which indicates its significance in the State's network of airports. Core airports are eligible for the State-sponsored Financial Aid to Municipalities (FAM) discretionary grant and Pavement Maintenance Program (PMP). Currently, FAM Grants are awarded annually for an amount not-to-exceed $25,000 for projects including planning, development and capital improvement. The PMP consists of annual funds of up to $1,000,000 dedicated to preserving and maintaining pavements at eligible Oregon airports.

The State of Oregon is currently updating its System Plan and will be providing recommendations on the role the Mulino Airport will fulfill within the State's system. It is not expected for the status of the Mulino Airport to change from its current classification; however, the State may possibly modify the designation requirements for each category.

Mulino Airport's Role within the Portland System

The Port is responsible for providing, among other services, aviation facilities in the Portland metro area, which consists of Clackamas, Washington and Multnomah counties. The Port owns and operates Portland-International (PDX), Hillsboro, Troutdale, and Mulino airports, which are located in these three counties.

PDX serves the greater Portland metro area with extensive international and domestic commercial service. The intent of the Port is to utilize the remaining three airports as reliever airports. Components of this goal are to focus non-scheduled and GA traffic away from the congested airspace near PDX and to provide improved GA access to the overall community. The Mulino Airport was acquired in 1988 by the Port as a GA reliever for PDX, though unlike the Hillsboro and Troutdale Airports, it is not designated by the FAA as a Reliever Airport.

The Clackamas County Reliever Airport Study (1981, August) projected the Mulino Airport would develop in 20 years into a busy airport with hundreds of based aircraft, facilities and services for business jets, more than one fixed base operator (FBO), and an air traffic control tower. The type and amount of growth projected has not occurred. The Airport's FBO ceased operation in 1994 because it was no longer financially viable. Growth in based aircraft has been much slower than forecast in 1981 and the character of aviation at the Airport has not changed from small piston airplanes. Clearly, the Airport has not developed to fulfill the role originally envisioned in 1981.

Management of Mulino Airport by the State of Oregon. Since the Port began operating the Mulino Airport, revenue from the Airport has never covered expenses. That gap has widened in recent years. For this and other reasons, the Port has turned over management of the overall

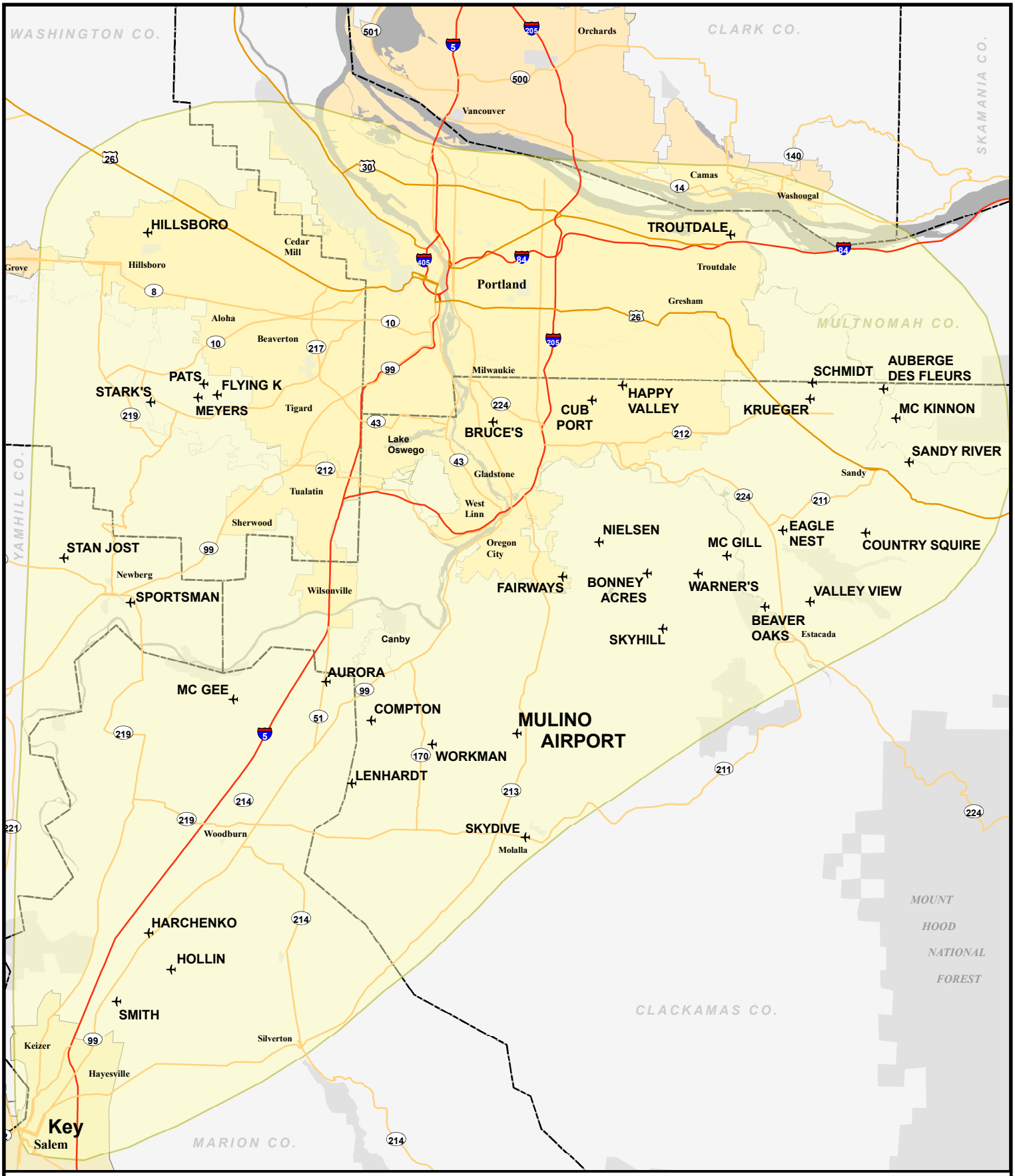
daily airport operations to the Oregon Department of Aviation (ODA). ODA owns and manages the Aurora State Airport, which is approximately 13 miles driving miles west of the Mulino Airport, ODA may be able to administer and maintain the Airport more cost effectively, since maintenance equipment and personnel would be located closer to the Airport. Additionally, ODA's airports, in general, are smaller GA airports similar to the Mulino Airport.

On January 10, 2007, the Port Commission approved a management transfer agreement with the ODA, which became effective on February 1. The Commission approval also included the potential transfer of airport ownership to ODA, if certain financial targets are met. As part of the proposed management agreement, the Port will contribute $80,000 annually to ODA for administrative expenses. The Port has also agreed to fund construction of a new retail card-lock fueling system and two more rows of T-hangars. The Port also committed to completing the Airport's master plan update, which began in July 2006, and a planned drainage project on airport property.

ANALYSIS OF PORTLAND AREA AIRPORTS

To understand the airport market niche that the Mulino Airport serves requires analysis of the other airports in its service area—including a review of the activity levels, facilities, and services available, along with the development potential at those airports. Based on NPIAS criteria, the service area for a GA airport is a 30-minute driving time, or approximately 20 road miles. While the Mulino Airport is situated so that it can serve populations outside the three-county Portland metro area (*e.g.* Marion and Yamhill Counties), the Port's primary interest is how the Airport serves the Portland metro area population as a reliever airport for PDX. It is important to analyze Troutdale and Hillsboro Airports, both located beyond the 30-minute driving time criteria from Mulino, because these airports are included within the Port's system of reliever airports and serve as appropriate benchmarks for evaluating the Mulino Airport and the role it plays in the Port's airport system. As a result, a strategic analysis study area was defined that does not exactly match the service area, but extends approximately 15 minutes drive time to the southeast and up to an hour drive time to the north (see **Exhibit 1B**).

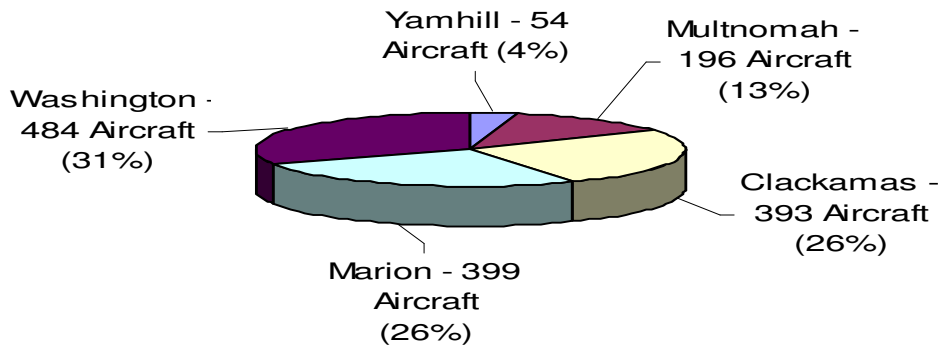
The study area covers portions of Clackamas, Marion, Multnomah, Washington, and Yamhill Counties. **Exhibit 1C** highlights each county's share of based aircraft within the strategic analysis study area. A majority of the airports located within the study area are privately owned for private-use.



Airports
Study Area
UGB
Iinterstae
US Hwy
State Hwy
Counties
Parks/Forest
Water
N
0 5 10 Miles

MULINO AIRPORT	STRATEGIC ANALYSIS STUDY AREA	EXIBIT 1B

Joseph W. Hayes 7/27/2007. Data Source:ESRI, RLIS, & Port of Portland.



MULINO AIRPORT	STRATEGIC ANALYSIS AREA BASED AIRCRAFT BY COUNTY	EXHIBIT 1C

Including Mulino, 40 airports were analyzed and information on each was gathered from available FAA data (Form 5010, Airport Master Records[2]), and the ODA's website[3]. **Table 1A** presents the study area airports in order of vehicular drive time from the Mulino Airport and provides information such as drive time and distance from the Mulino Airport, ownership and use, FAA and State status, based aircraft, runway data, approach data and fuel services. **Table 1B** provides a detailed breakdown of based aircraft and annual aircraft operations at the study airport.

Table 1A reveals 1,526 aircraft are based at the 40 study area airports. Nearly 67% percent of the aircraft are based at public-use, publicly-owned airports and 88% are based at public-use airports, including both public and privately owned. Of the airports studied, only 14 have at least ten based aircraft, four of which are privately owned, private-use. Runway lengths vary between 1,115 to 6,600 feet, while runway widths vary from 20 feet to 150 feet. Over 67% of the runways are not paved. Only seven of the airports have aircraft fueling capabilities.

Ten of the 40 airports are assigned Oregon Airport Categories within the plan. The Mulino Airport and six other airports are Category 4, meaning they:

- Serve general aviation and local business
- Typically have 2,500 or more annual operations, and
- Have at least 10 based aircraft.

Three airports, Aurora State, Hillsboro, and Troutdale, are Category 2. Category 2 airports are business or high activity general aviation airports that accommodate corporate aviation (including business jets and helicopters) in addition to other general aviation activities. They also have 30,000 or more annual operations, of which at least 500 are business related aircraft.

Table 1A lists the Airport Reference Code (ARC) for the four airports that have ARCs designated in their master plans. The ARC is a system designed by the FAA to define airport facility standards appropriate for the aircraft using a particular airport. The ARC identifies the highest performance aircraft the airport was designed for based on its approach speed and

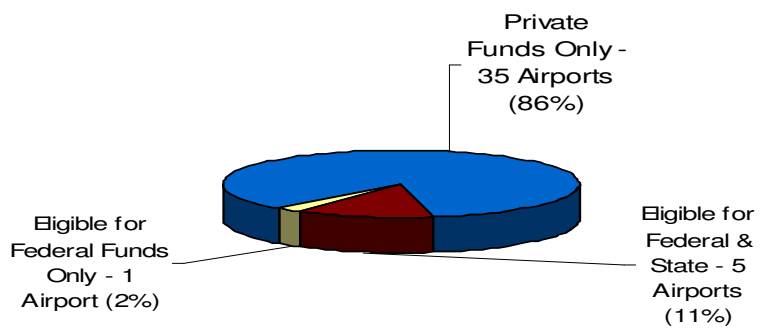
[2] Found at: http://www.gcr1.com/5010Web/
[3] Found at: http://www.oregon.gov/Aviation/index.shtml

wingspan. ARC has two components: Aircraft Approach Category and Airplane Design Group. The ARC for the Mulino Airport is B-II (Aircraft Approach Category B – Airplane Design Group II), which means (it is designed for) aircraft with approach speeds up to 121 knots[4] and wingspans up to 79 feet. The Beech King Air is an example of an ARC B-II aircraft.

Aurora State and Troutdale are also ARC B-II airports. Hillsboro's ARC is C-III, which means it is designed for aircraft with approach speeds up to 141 knots and wingspans up to 118 feet (Gulfstream and other large business jets). The ARCs for the other 36 study airports are not designated, but a review of the based aircraft fleet mix and runway dimensions indicates they would likely not accommodate or meet FAA standards for aircraft larger or faster than the B-I category (approach speed up to 121 knots and wingspan up to 49 feet). Most single and twin-engine piston Beech, Cessna and Piper aircraft are slower and smaller than ARC B-I standards.

Only three of the airports within the study area have instrument approaches – Aurora State, Troutdale, and Hillsboro. At the other airports the runways are visual only, which means that aircraft can only land when the weather is clear. GPS-aided instrument approach procedures have been available for about ten years. Since GPS approaches do not require costly ground-based equipment, such as required by traditional instrument approaches, the number of GA airports changing from visual to GPS aided instrument runways has been growing nationwide. GPS navigation is becoming standard in GA aircraft, although the majority of the GA pilots still fly by Visual Flight Rules (VFR) in visual weather.

Study area airport funding sources are shown in **Exhibit 1D** below. Of the study area airports only five, or 12.5%, are eligible for federal funding, due to their inclusion in the NPIAS. For of those airports (or 10.0%) are eligible for the State's FAM Grant and PMP, since they are designated as core airports. The remaining 35 airports, or 87.5%, must rely solely on private funding. While there are many airports within the study area, few have stable funding for planning and capital development. Facilities like the Mulino Airport play an important function within the study area because they have viable, renewable sources of funding.



MULINO AIRPORT	STRATEGIC ANALYSIS AREA POSSIBLE AIRPORT FUNDING	EXHIBIT 1D

[4] 1 knot = 1.15 miles per hour

Table 1A. Study Area Airport Data

AIRPORT NAME	ID	Drive Time (min.)	Distance & Direction (straight line)	Ownership /Use	NPIAS?	Core?	Oregon Cat. [5]	Based Aircraft	ARC[6]	Rwy Type[7]	Rwy Length/ Width	Rwy Alignment.	Approach.	Fuel
Mulino	4S9	0	0	Port/Pub	Y	Y	4	42	B-II	A	3600 x 100	14 32	Visual	N
Skydive Oregon	OL05	8	4.8 nm S	Pvt/Pvt	N	N	N/A	20	-	A	2900 x 32	18 36	Visual	N
Dietz Airpark	OR40	12	3.6 nm NW	Pvt/Pvt	N	N	N/A	32	-	T	2800 x 60	N / S	Visual	N
Workman Airpark	OR41	12	3.8 nm W	Pvt/Pvt	N	N	N/A	27	-	T	2240 x 100	07 25	Visual	N
Compton	44OR	12	6.2 nm W	Pvt/Pvt	N	N	N/A	3	-	T	2000 x 60	09 27	Visual	N
Aeroacres	OG30	18	5.8 nm N	Pvt/Pvt	N	N	N/A	6	-	T	1800 x 250	04 22	Visual	N
Fairways	OG20	18	6.1 nm NNE	Pvt/Pvt	N	N	N/A	31	-	T/T	2900 x 160[8]	16 34	Visual	N
Skyhill	1OR7	18	6.6 nm NE	Pvt/Pvt	N	N	N/A	1	-	T	2500 x 66	07 25	Visual	N
Bonney Acres	7OR9	18	7.7 nm NE	Pvt/Pvt	N	N	N/A	1	-	T	1300 x 50	06 24	Visual	N
Nielson	2OR0	18	7.8 nm NNE	Pvt/Pvt	N	N	N/A	3	-	T	1150 x 50	09 27	Visual	N
Clackamas Heights	1OR6	18	9.1 nm N	Pvt/Pvt	N	N	N/A	1	-	A/T	2100 x 125	16 34	Visual	Y
Aurora State	UAO	19	8.1 nm W	State/Pub	Y	Y	2	387	B-II	A	5004 x 100	17 35	Non & Prec[9]	Y
Warner's	20OR	22	9.1 nm NE	Pvt/Pvt	N	N	N/A	3	-	T	2640 x 150	17 35	Visual	N
Lenhardt Airpark	7S9	25	7.3 nm WSW	Pvt/Pub	N	N	4	109	-	A	2956 x 45	02 20	Visual	Y
Bruce's	07OR	26	12.1 nm N	Pvt/Pvt	N	N	N/A	1	-	T	1200 x 100	17 35	Visual	N
Mc Gee	67OR	27	11.7 nm W	Pvt/Pvt	N	N	N/A	2	-	T	1960 x 90	16 34	Visual	N
Cub Port	26OR	27	13.2 nm N	Pvt/Pvt	N	N	N/A	2	-	T	900 x 60	16 34	Visual	N
Happy Valley	OL03	27	14.0 nm NNE	Pvt/Pvt	N	N	N/A	3	-	A	2264 x 25	16 34	Visual	N
Mc Gill	OR67	28	10.4 nm NE	Pvt/Pvt	N	N	N/A	1	-	G	1400 x 50	16 34	Visual	N
Beaver Oaks	OR66	28	10.5 nm ENE	Pvt/Pvt	N	N	N/A	9	-	T	1700 x 50	15 33	Visual	N
Valley View	5S9	28	12.2 nm ENE	Pvt/Pub	N	N	4	33	-	A	3780 x 32	16 34	Visual	N
Eagle Nest Ranch	OR65	28	12.7 nm NE	Pvt/Pvt	N	N	N/A	2	-	T	2500 x 80	12 30	Visual	N
Meyer Riverside Airpark	OG34	33	15.0 nm NW	Pvt/Pvt	N	N	N/A	4	-	T	1585 x 100	16 34	Visual	N
Krueger	OR72	33	17.1 nm NE	Pvt/Pvt	N	N	N/A	1	-	T	1300 x 150	16 34	Visual	N
Flying K Bar J Ranch	OR35	33	17.2 nm NE	Pvt/Pvt	N	N	N/A	1	-	T	1450 x 100	17 35	Visual	N
Schmidt	6OR7	33	17.7 nm NE	Pvt/Pvt	N	N	N/A	3	-	T	2300 x 55	07 25	Visual	N
Hollin	7OR7	36	17.1 nm SW	Pvt/Pvt	N	N	N/A	1	-	T	1750 x 80	16 34	Visual	N
Harchenko Industrial	OR38	36	17.1 nm WSW	Pvt/Pvt	N	N	N/A	8	-	A/G	2290 x 75	07 25	Visual	N
Smith Private	29OR	36	19.6 nm SW	Pvt/Pvt	N	N	N/A	1	-	T	2500 x 70	16 34	Visual	N
Flying K Ranch	OR00	38	18.0 nm NW	Pvt/Pvt	N	N	N/A	4	-	T/G	1700 x 20	07 25	Visual	N
Pats Pasture	OR28	38	18.6 nm NW	Pvt/Pvt	N	N	N/A	1	-	T	2100 x 100	E / W	Visual	N
Country Squire Airpark	S48	40	15.4 nm ENE	Pvt/Pub	N	N	4	27	-	A	3095 x 32	07 25	Visual	N
Sportsman Airpark	2S6	40	16.4 nm WNW	Pvt/Pub	Y	N	4	53	-	A	2745 x 50	17 35	Visual	Y
Sandy River	03S	40	18.4 nm NE	Pvt/Pub	N	N	4	24	-	T	2115 x 100	08 26	Visual	N
McKinnon Airpark	OG29	40	19.0 nm NE	Pvt/Pvt	N	N	N/A	4	-	T	3000 x 50	07 25	Visual	N
Auberge Des Fleurs	4OR6	40	19.4 nm NE	Pvt/Pvt	N	N	N/A	3	-	T	1850 x 50	09 27	Visual	N
Stan Jost	74OR	40	19.5 nm WNW	Pvt/Pvt	N	N	N/A	1	-	T	1300 x 80	15 33	Visual	N
Troutdale	TTD	41	19.7 nm NW	Port/Pub	Y	Y	2	196	B-II	A	5399 x 150	07 25	Nonprec	Y
Hillsboro	HIO	52	21.5 nm N	Port/Pub	Y	Y	2	362	C-III	A/A	6600 x 150[8]	12 30	Non & Prec	Y
Stark's Twin Oaks Airpark	7S3	56	24.7 nm NW	Pvt/Pub	N	N	4	113	-	A	2465 x 48	02 20	Vis	Y

[5] www.aviation.state.or.us Oregon Aviation Plan, Executive Summary (2000). See text for explanation.
[6] Airport Reference Code, obtained from individual airport's most recent master plan. See text for explanation.
[7] A= Asphalt, T= Turf, G= Gravel
[8] For airports with multiple runways, largest runway data shown.
[9] Non precision instrument approach (Non) and precision instrument approach (Prec).

Table 1B. Study Area Based Aircraft and Annual Operations

AIRPORT NAME	Single Engine	Multi Engine	Jet	Heli.	Glider	Military	Ultra-Light	Total Based Aircraft	Air Carrier	Air Taxi	GA Local	GA Itinerant	Military	Total Annual Operations
Mulino	40	0	0	0	2	0	0	42	0	0	13,000	8,300	0	21,300
Skydive Oregon	15	1	0	0	0	0	4	20	0	0	0	0	0	NR[10]
Dietz Airpark	30	1	0	0	0	0	1	32	0	0	0	0	0	NR
Workman Airpark	26	1	0	0	0	0	0	27	0	0	0	0	0	NR
Compton	3	0	0	0	0	0	0	3	0	0	0	0	0	NR
Aeroacres	6	0	0	0	0	0	0	6	0	0	0	0	0	NR
Fairways	31	0	0	0	0	0	0	31	0	0	0	0	0	NR
Skyhill	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Bonney Acres	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Nielson	3	0	0	0	0	0	0	3	0	0	0	0	0	NR
Clackamas Heights	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Aurora State	319	27	7	34	0	0	0	387	0	6,190	27,980	39,475	250	73,895
Warner's	2	0	0	0	0	0	1	3	0	0	0	0	0	NR
Lenhardt Airpark	108	1	0	0	0	0	0	109	0	0	1,250	4,750	0	6,000
Bruce's	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Mc Gee	2	0	0	0	0	0	0	2	0	0	0	0	0	NR
Cub Port	2	0	0	0	0	0	0	2	0	0	0	0	0	NR
Happy Valley	2	0	0	1	0	0	0	3	0	0	0	0	0	NR
Mc Gill	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Beaver Oaks	9	0	0	0	0	0	0	9	0	0	0	0	0	NR
Valley View	28	4	0	1	0	0	0	33	0	0	1,135	1,830	0	2,965
Eagle Nest Ranch	2	0	0	0	0	0	0	2	0	0	0	0	0	NR
Meyer Riverside Airpark	4	0	0	0	0	0	0	4	0	0	0	0	0	NR
Krueger	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Flying K Bar J Ranch	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Schmidt	3	0	0	0	0	0	0	3	0	0	0	0	0	NR
Hollin	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Harchenko Industrial	6	0	0	2	0	0	0	8	0	0	0	0	0	NR
Smith Private	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Flying K Ranch	4	0	0	0	0	0	0	4	0	0	0	0	0	NR
Pats Pasture	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Country Squire Airpark	26	1	0	0	0	0	0	27	0	0	800	1,200	0	2,000
Sportsman Airpark	45	1	0	7	0	0	0	53	0	100	3,875	7,675	0	11,650
Sandy River	14	2	0	2	0	0	6	24	0	0	10,000	1,500	0	11,500
McKinnon Airpark	3	1	0	0	0	0	0	4	0	0	0	0	0	NR
Auberge Des Fleurs	2	1	0	0	0	0	0	3	0	0	0	0	0	NR
Stan Jost	1	0	0	0	0	0	0	1	0	0	0	0	0	NR
Troutdale	177	14	3	2	0	0	0	196	0	4,000	70,000	29,520	1,500	105,020
Hillsboro	244	48	41	29	0	0	0	362	0	8,287	111,250	72,446	870	192,853
Stark's Twin Oaks Airpark	107	1	0	4	0	0	1	113	0	0	5,750	16,445	0	22,195
ALL STUDY AREA AIRPORTS	**1,274**	**104**	**51**	**82**	**2**	**0**	**13**	**1,526**	**0**	**18,577**	**245,040**	**183,141**	**2,620**	**449,378**

Source: FAA Form 5010 (Airport Master Records

[10] Not recorded (NR).

Supplemental information was gathered about the 26 largest airports, which are those reported by the FAA to have at least three based aircraft. Below is a description of these airports. Each description provides, where possible the following:

- The county in which the airport is located
- Total acres
- Accessibility by automobile
- Fuel services
- Instrument approaches
- Expansion potential
- Future development plans
- Hangar availability, rates, and fees
- Any other requirements

Accessibility was judged to be "good" if the airport is a short distance from an interstate of major highway. This information was acquired from available data on the ODA website, FAA Form 5010 and airport owner/manager interviews. At least three attempts were made to contact airport owners or managers. Not all could not be reached.

Mulino. Mulino Airport is located in Clackamas County near Highway 213. Access to the Portland metro area is good; however, direct access to Interstate 5 is poor. The Airport is approximately 275 acres. Other than a pilot's lounge, the Airport does not offer any services. It also does not have an instrument approach. Monthly fees for the Port owned hangars are $125 per month. Privately owned T-hangars rent for $225 per month. Land is available for more hangars. More information on existing facilities will follow in Chapter 2, *Inventory*.

Skydive Oregon Airport. Skydive Oregon is located in Clackamas County, with good access to the Portland metro area. The airport sits on approximately 42 acres. Available records show there are no services offered for the 20 based aircraft. Future plans for the airport are unknown. Aerial photography indicates there may be room for additional hangars.

Dietz Airpark Airport. Dietz is a residential airpark located in Clackamas County, with good access to the Portland metro area. There are 32 aircraft based at the airport. Total airport acreage was not reported on the FAA Form 5010. It was reported there is no room to expand and no more hangar/homes will be developed. There are no services available to the public.

Workman Airpark Airport. Workman is another residential airpark located in Clackamas County. No services are available to the public, but there are a significant number of based aircraft. There are no plans to expand the airport or the number of hangar/homes located there. Acreage was not reported on the FAA Form 5010.

Compton Airport. Located within Clackamas County, Compton Airport is situated on approximately 43 acres. There are three aircraft based on the airfield; however, there are no services available or plans to expand the airport. Access to the Portland Metro is good.

Aeroacres Airport. Also located within Clackamas County, Aeroacres supports six based aircraft. Acreage was not reported on the FAA 5010 Form. There are no services available.

Numerous housing developments are being built close to the airport and airport expansion will not be possible. Portland metro area access is good.

Fairways Airport. Situated on approximately 40 acres within Clackamas County, Fairways supports a significant amount of based aircraft. Aerial photography indicates there is possible land available to develop hangars; however, it is not known if such expansion is planned.

Nielson Airport. With three based aircraft, Nielson Airport is located within Clackamas County. Total acreage was not listed in the FAA Form 5010. Aerial photos suggest that some expansion may be possible.

Aurora State Airport. Aurora State is the closest airport to the Mulino Airport that offers a variety of services. Aurora State is located in Marion County and sits on 144 acres. It is very easily accessible from Interstate 5, which runs north-south through the Willamette Valley. Aircraft maintenance, fuel services (Avgas and Jet Fuel) and flight training are among the many services offered at the airport's three FBOs. Weather information is available from an Automated Weather Observation System (AWOS) and the airport has a Global Positioning System (GPS), instrument landing system localizer (ILS-LOC), and very high frequency omnidirectional range (VOR) approaches. The runway was recently overlaid; however, there are no plans to extend the runway at this time. The ARC is identified as B-II in the most recent Master Plan, indicating the most demanding aircraft with at least 500 itinerant annual operations is a Cessna Citation II or similar aircraft. The largest aircraft using the airport today are Challenger and Embraer 145 jets.

There are 186 hangars at Aurora. The State has land leases ranging from $.04 - $.22 per square foot per month (in comparison, Mulino Airport leases range from $0.8 - $.10 per square foot per month). Private entities build the hangars and charge $400-$800 for monthly hangar rent for small piston aircraft. Tenants are required to have $100,000 of insurance and name the State as an additional insurer. There is a waiting list for hangars but its length is not known. The State does have a small amount of property that will be leased soon for construction of 15 more hangars. South End Airpark is on private property next to the airport and infrastructure construction is occurring now to accommodate five new hangars (50,000 – 100,000 square feet each) for multiple corporate jets.

Warner's Airport. Warner's Airport is located in Clackamas County on approximately 98 acres. Three aircraft are based at the airport. Based on the airport acreage and a review of aerial photos of the airport, it appears growth could occur at the airport.

Lenhardt Airpark Airport. Lenhardt Airpark is situated on approximately 43 acres within Clackamas County. The airport offers Avgas to its many based aircraft and transient users. There are no plans to extend the runway; however, there is room to build 30 more hangars if needed. Aircraft hangar rents are $300 per month for a T-hangar and $350 per month for a traditional box hangar. Hanger lessees must secure additional premises liability insurance for the hangar.

Happy Valley Airport. Situated on approximately 10 acres, Happy Valley Airport is located in Clackamas County. No services are available at the airport. According to the State's 2000 Oregon Aviation Plan, there is no expansion capability at the airport and incompatible land uses exist adjacent to the airport.

Beaver Oaks Airport. Also located within Clackamas County, Beaver Oaks is situated on approximately 27 acres. Access to the Portland metro area is good. There are no services available. There are plans to build an undetermined number of aircraft hangars in the future. Rates for the hangars have not been determined at this time, but will be commensurate with the locale. Additional requirements, such as insurance have not been determined at this time.

Valley View Airport. Valley View Airport sits on approximately 134 acres within Clackamas County. There is good access to the Portland metro area. There are no plans to extend the runway, but there is potential for the runway to be lengthened to 4,000 feet. Currently, there are no hangars available, but there is room to build approximately 40 to 50 hangars and an FBO with fueling capabilities. Hangars currently rent for $155 per month and lessees are only required to sign a liability release and contract. An additional eight to ten homes could be built on-site in the future.

Meyer Riverside Airpark Airport. Meyer Riverside Airpark is located in Washington County and sits on approximately 32 acres. Aerial photos indicate a possibility to add three to five hangar/homes. A hangar/home is a combination of a home that is attached to an aircraft hangar.

Schmidt Airport. Located within Clackamas County, the Schmidt Airport is situated on approximately 3 acres. There are no plans to expand the airport, but expansion is possible. There are no hangars for rent or lease. Access to the Portland metro area is poor.

Harchenko Industrial Airport. Harchenko Industrial is located in Marion County on approximately 28 acres. The airport is used only for agricultural spray application purposes. There is no expansion capability or plans to expand the airport.

Flying K Ranch Airport. Flying K Ranch Airport is located in Washington County on approximately 200 acres. The airport has no expansion capability or plans for development. Hangars are not available for lease or rent. There are no services available to the public.

Country Squire Airpark Airport. Also located in Clackamas County, Country Squire Airpark is situated on approximately 120 acres. The manager reported access to the Portland metro area good. There are no hangars available for rent, but many tie-downs are available. The airport does have expansion capabilities and will build more hangars as demand dictates. Currently, two people are on a waiting list for hangars. The present rate for renting a hangar is $200 per month and the lessee must carry content insurance on the hangar. The southern portion of the airport is neighbored by 400 acres of Bureau of Land Management property and, if needed, the airport could expand the runway to the south to accommodate a 5,000-foot runway.

Sportsman Airpark Airport. Sportsman Airpark is located in Yamhill County on approximately 60 acres, with good access to the Portland metro area. Both Avgas and Jet Fuel

are available. There are no hangars available, but development is in progress for hangars and aviation-related businesses located on the Eastern portion of the airport. Depending on hangar size, rental rates vary from $200 - $250 per month and the airport carries its own hangar insurance coverage.

Sandy River Airport. Sandy River Airport is located on approximately 35 acres in Clackamas County. There are no services available to the public. However, as of September 2006 there is one hangar available for lease. There is demand to add hangars and services, but a plan for expansion has not yet been determined. Hangars at this time rent for $230 - $250 per month depending on size. There are no additional insurance requirements needed for hangar rental. Access to the Portland metro area is good.

McKinnon Airpark Airport. McKinnon Airpark is located in Clackamas County on approximately 80 acres. There are no services available at the airport. Expansion capabilities and development plans are not known.

Auberge Des Fleurs Airport. 60 acre Auberge Des Fleurs is in Clackamas County. There are currently no services available and there does not appear to be any availability for aircraft storage.

Troutdale Airport. 284 acre Troutdale Airport is owned and operated by the Port of Portland as part of its reliever airport system. A variety of services are offered for pilots, including fuel (Avgas and Jet Fuel), maintenance, aircraft rental, and flight instruction. The airport has an air traffic control tower and GPS and non-directional radio beacon (NDB) instrument approaches are available to pilots. The airport's Master Plan Update (2004, October) reports the airport's ARC is B-II. The airport is located 10 miles east of PDX and has excellent access to Interstate 84. As part of the Port's reliever system, the airport attracts GA and recreational traffic.

Hillsboro Airport. The 900 acre Hillsboro Airport is owned and operated by the Port. The airport provides many services, such as fuel (Avgas and Jet Fuel), aircraft maintenance, flight instruction, and aircraft rental. As part of the Port's system of reliever airports, Hillsboro caters to a large and growing volume of corporate air traffic in the area. The Airport Master Plan (2005, June) shows the Hillsboro Airport has a C-III ARC, meaning the most demanding aircraft using the airport would be a Gulfstream or similar. Both precision and nonprecision approaches (ILS, LOC, VOR/distance measuring equipment (DME), and NDB) are available to pilots, as well as a control tower. Access to the Portland metro area is very good.

Stark's Twin Oaks Airpark Airport. Stark's Twin Oaks Airpark is situated on approximately 65 acres in Washington County. There is good access to the Portland metro area. Avgas is available to aircraft flying into the airport. Currently, there are no hangars available. Rent rates vary from $225 - $245 per month depending on hangar size. Those occupying hangars must show hangar keeper insurance as an addition to their aircraft insurance. Plans to build more hangars and expand the aircraft maintenance shop and services are underway.

SURVEY OF AIRPORT USERS

Airport users and other airport stakeholders were surveyed in the summer of 2006. The survey was intended to help determine the role of Mulino Airport, the type and amount of activity that occurs at the Airport and airport improvement needs. A copy of the survey is included in **Appendix C**.

Surveys were distributed at the Annual Mulino Blueberry Pancake Fly-In, the Airport pilot's lounge, and the FBOs at Aurora, Troutdale, and Hillsboro Airports. Additional surveys were sent to all Project Advisory Group (PAC) members, public meeting attendees, Mulino Airport tenants, and Mulino Community Planning Organization (CPO) members. Over 500 surveys were distributed. A response rate of approximately 7% yielded 35 responses. All survey responses are included in **Appendix D**.

Completed surveys were received from pilots in the Tri-County area and two counties in the State of Washington. Seven were from people who are not pilots or who chose not to report aircraft operations information. The majority of respondents own or rent single engine aircraft. Two respondents fly twin engine aircraft and one respondent flies helicopters.

Survey respondents reported nearly 3,000 annual operations (including touch and go) at the Mulino Airport. Of the 18 respondents who own aircraft, only ten base their aircraft at the Airport. Those ten based aircraft represent nearly 600 annual operations. Operations by transient aircraft totaled over 2,300.

Most aircraft not based at the Mulino Airport were located at Troutdale. Aurora State, Hillsboro, and private airports were also airports where survey respondents based their aircraft. Survey respondents who do not base their aircraft at the Mulino Airport were asked why. The most common reason cited was lack of fuel sales, followed by the lack of an FBO, lack of suitable hangars, inconvenient location, and no aircraft maintenance. Other reasons were current airport management, inadequate road structure, lack of flight instruction, and insufficient runway length. Few people cited the cost of hangar rent or the lack of an instrument approach as reasons for not basing at the Mulino Airport.

Survey respondents were also given the opportunity to recommend improvements at the Mulino Airport. Many of the comments reiterated the need for fuel, FBO services, and hangars. Other comments suggested changes in airport management and operation. Interest was also expressed in improving the access to the Airport Café located adjacent to the Mulino Airport. The restaurant is considered by many airport users to be an asset that many airports lack. Comments also included adding an instrument approach, improving the road system, and securing compatible land uses surrounding the Airport. Several comments also suggested incorporating a residential airpark on or near the Airport.

CONCLUSIONS

The Mulino Airport has not grown as projected in previous planning studies, in part, due to the large number of other airports, particularly private airports that are available in the area. Another

reason for not meeting projected growth forecasts has been the airports lack of aviation services. When the Mulino Airport FBO closed, fuel sales ended and planned hangar development did not occur – factors that have discouraged both based and transient aircraft activity.

The ability of private airports to serve the area's aviation demand will decrease in the future. Many of the airports within the study area are not planning to expand their services or facilities. Only six of the airports indicate they will expand in the near future and only one airport has a hangar available. Urban development is starting to encroach on some of these airports. As the value of land for residential and other uses increases, private airport closures tend to become more likely. An example is the recent (July 2006) closure of Evergreen Field in Vancouver, Washington. Evergreen Field had 165 based aircraft.

Private airports generally lack funding sources to purchase land to protect their airports from approach surface obstructions and encroachment from non-compatible land uses. They also lack the advantage of a publicly owned airport, which is entitled to certain land use and airspace protections from both state and federal law.

The same urban growth that threatens private airports also fuels aviation demand. Because the Airport is publicly-owned, is eligible for federal funds, and has land available for hangar development, it seems inevitable demand will increase at the Mulino Airport. The timing for such demand and resultant development is dependent on many factors. One factor affecting private airport closures and population growth in the area is the residential and commercial real estate market, which in turn, is affected by interest rates, economic cycles, and many other factors. GA activity is also subject to changing market conditions. GA activity rises and falls with economic cycles and is affected by changes in legislation, regulation, and tax structures. Most recently, soaring fuel costs have discouraged recreational flying. While knowing exactly when demand will materialize is difficult, Mulino Airport may be well situated to accommodate increase aviation demand, especially as local private airports close and and population growth increases.

Federal grant assurances will not allow the Mulino Airport to discriminate against any type of aviation (aircraft type or aviation purpose) except for reasons associated with safety (*e.g.*, bearing strength of the runway, wingspan limitations imposed by airfield geometry). However, it is possible for a public airport owner to focus facility and service development towards serving desired types of aviation. A well-defined airport role will help guide deliberate and financially responsible development.

ALTERNATIVE ROLES

The Mulino Airport could expand to accommodate business aviation in higher performance turboprop and turbojet, business-class aircraft. However, current air service market conditions appear to make demand for this unlikely. Nearby Aurora State Airport, which has better road access to population centers and existing facilities and services for business aviation is more likely to serve this market in the short term.

The Mulino Airport could downsize to focus on serving smaller, lighter, less costly aircraft used mostly for recreation (*e.g.*, light-sport aircraft and ultra-lights). It could also be converted into a residential airpark. However, it is not advisable to reduce the assets of the Airport, including its capability to handle aircraft with wingspans up to 79 feet, because few airports within the study area can accommodate aircraft that large.

Instead of full conversion to a residential airpark, land on or near the Airport could be developed into an airpark, as some survey respondents suggested. An airpark would generate airport revenue, including revenue from off-airport aircraft owners who would pay a through-the-fence charge for taxiway access to the Airport. However, a residential airpark may not be the most appropriate use of airport property. Residential airparks typically include detached single-family homes, so that airpark land does not have very a high volume of aircraft storage capacity. Considering the possibility that the number of aircraft in the area will grow as the area population and the potential of aircraft relocating to base at the Airport from private airports grows, it may be more beneficial to build a higher density of hangars on the Airport than is possible at a residential airpark. In addition, the FAA discourages through-the-fence operations at NPIAS airports and federal grant assurances regarding the use of land and facilities may hinder residential airpark development.

RECOMMENDATIONS

The Port intends to serve the public in the best way possible by accommodating aviation demand in the strategic analysis area. The Port and the FAA also want the Airport to be financially self-sufficient.

It is recommended the Mulino Airport continue to serve the type of aircraft it has historically served—small (maximum gross takeoff weight of 12,500 pounds), mostly single engine piston aircraft. The current Mulino ARC for Mulino Airport is B-II, exemplified by the Beech King Air. As shown from the survey and the types of based aircraft at the study area airports, the majority of aircraft located in the area can be served by the Mulino Airport. Larger, faster, and heavier aircraft are better served elsewhere, such as at the Aurora State Airport.

Another important recommendation of this strategic analysis regards an instrument approach. Area pilots are not demanding an instrument approach at the Mulino Airport. It is assumed the apparent lack of interest is caused by a few factors, these include:

1. When compared to the other needs at the Airport, an instrument approach is a lower priority.
2. A non-precision approach is located at nearby Aurora State Airport, and
3. Few general aviation pilots are instrument-rated.

However, despite the current low interest, the Port should be familiar with the broader trend in developing instrument approaches. Having a network of all-weather public airports is a safety benefit and goal for the national and state aviation systems. It is recommended that the Port consider establishing an instrument approach to at least one runway at the Mulino Airport. The Port has undergone the initial steps to receive a GPS approach, including a request to FAA, and

surveying and obstruction removal. Through an ODA System Planning Grant, an obstruction survey was completed for the Mulino Airport in 1994. The FAA is currently using this information for GPS approach calculation. Additionally, the Port has undertaken an aggressive obstruction removal program to survey and remove obstructions in the approach to Runway 32, both on property owned by the Port and land not owned by the Port, but where avigation easements have been obtained.

For the Airport to realize improved utilization, more landside services are needed and will be addressed in this master plan. Fueling, aircraft maintenance, and additional hangar capacity are the major needs. Developing a residential airpark at the Airport will be investigated to substantiate demand and feasibility. In addition, the Port should coordinate with Clackamas County and the Oregon Department of Transportation to improve future access to the airport.

The Mulino Airport should continue to serve the GA community as a reliever for PDX. Aviation forecasts, facility requirements, and airport development alternatives prepared later in the master planning process will further evaluate the appropriate ARC for the Mulino Airport.

Chapter Two
INVENTORY

An initial step in the preparation of an airport master plan is to collect data pertaining to an airport and the area it serves. An inventory of the Mulino Airport was accomplished through a physical inspection of all existing facilities, interviews with Airport users, Port of Portland (Port) staff, residents that live near the Airport, and a review of previous Airport studies and records.

This chapter provides a summary of the Airport's background (*i.e.*, location, history), existing airfield and landside facilities, airspace, land use and zoning, environmental issues, and historical aviation activity and financial data. The information gathered as part of this initial step is the foundation for various analyses completed in the subsequent chapters of this plan. An accurate inventory helps produces aviation demand forecasts that are reasonable and aids in identifying future facility development needs.

BACKGROUND DATA

Airport Location & Access

The Mulino Airport is located in the hamlet of Mulino, within the Portland metropolitan area in northern Clackamas County, Oregon. The majority of the County is rural and has abundant recreational opportunities. Mulino is located 10 miles south of Oregon City and five miles north of Molalla on State Highway 213. Interstates 5 and 205 are approximately 20 miles from Mulino. The Airport is located approximately one-half mile west of Highway 213, off Mulino Road. **Exhibit 2A** shows a map of the region and Airport vicinity.

The South Clackamas Transportation District operates bus service between Molalla – a small town SE of Mulino and Canby - a small town NW of Mulino, which includes a stop in Mulino at the intersection of Mulino Road and Highway 213. Taxi service is available in Oregon City (10 miles north of the Airport) and Amtrak train and Greyhound bus services are located in Portland (20 miles north of the Airport).

Area Topography

The area is surrounded by the rolling terrain of the Cascade Range foothills and is abundant in both farmland and forested area. The majority of Clackamas County is rural, and includes Mount Hood, the Mount Hood National Forest and the Bull Run Watershed, as well as numerous other rivers and watersheds.

The Airport is situated in a small valley on the west side of Mulino. It is at 260 feet above Mean Sea Level (MSL). The Molalla River is adjacent to the Airport, located south and west of the runway.

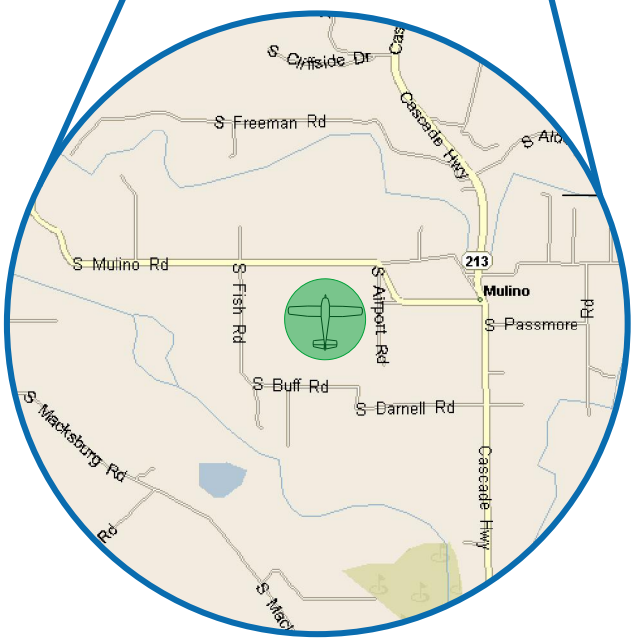
Climate

The Mulino area has mild, wet winters, and warm, dry summers. Winter temperatures generally range from 45 to 55 degrees Fahrenheit, and summer temperatures generally range from 70 to 80 degrees Fahrenheit. Annual rainfall averages 47 inches, with the majority of it occurring from November through January. Annual snowfall averages seven inches per year. The mean maximum temperature in the hottest month (August) is 80 degrees.

Community and Airport History

The Mulino community was named after a flourmill built in 1851. "Mulino" is derived from the Spanish word *molino*, which means mill and was chosen when postal authorities objected that "Molino" was easily confused with nearby Molalla. The Mulino area has a strong agricultural background and in the 1850s, the local mill was one of the largest flour producing mills in the Willamette Valley. A post office was established in Mulino in 1888, and railroad arrived in the area in 1915. Today, the unincorporated community still has a strong rural and agricultural presence.

A private individual established the Airport in 1949. At the time, the facility consisted of two intersecting grass runways each 2,100 feet in length. The Port purchased the Airport in 1988 as a result of the Clackamas County Reliever Airport Study, a Port sponsored project completed in 1981.



SOURCE: MICROSOFT STREETS AND TRIPS, 2003

MULINO AIRPORT	LOCATION & VICINITY MAP	EXHIBIT 2A

The Port spent the next several years acquiring additional property and undergoing land use approval processes to construct a new airport. In 1990, a new runway on an orientation of 14-32 was constructed and is in place today.

EXISTING FACILITIES

Existing facilities at the Mulino Airport are divided into three categories: airfield, landside, and support facilities. Airfield facilities include areas such as runways, taxiways, and aprons. Landside facilities include areas such as hangars, airport buildings, and auto parking. Support facilities include emergency services, utilities, and miscellaneous facilities that do not logically fall into either airfield or landside facilities. **Exhibit 2B** shows the existing facilities at the Mulino Airport.

Airfield Facilities

Airfield facilities include pavements used for the movement of aircraft (*i.e.*, runways, taxiways, taxilanes, aprons). In October of 2004, the Mulino Airport's Pavement Condition Index (PCI) was updated. The condition of the Airport pavements were rated on a scale of 0-100 with 0 being an unusable paved surface and 100 reflecting a just-constructed paved surface. Generally, ratings with a PCI above 70 require only preventative maintenance in the short term, while ratings between 40 and 70 require major rehabilitation and ratings less than 40 typically require reconstruction. **Exhibit 2C** depicts the pavement condition map for the Mulino Airport. At the time the PCI was updated, pavement sections were documented. Pavement sections describe how individual sections of pavement were constructed. In general, most pavements at the Mulino Airport consist of a seal coat, on top of two inches of asphalt, on top of eight inches of a crushed aggregate base. **Exhibit 2D** provides a detailed graphic of the existing pavement sections at the Airport.

Runway. The Mulino Airport has one paved runway, 14-32. The total pavement length is 3,600 feet, however, in order to meet FAA safety standards the Runway 32 threshold was relocated 175 feet to the north in 2003, making the runway's usable length 3,425 feet. The runway is 100 feet wide. The runway pavement surface is asphalt and in October 2004 was given a PCI rating of 96, which is considered excellent. The pavement strength of the runway is rated for 12,500-pound Single Wheel Gear (SWG)[1] aircraft.

Taxiways and Taxilanes. Taxiways are constructed primarily to facilitate aircraft movements to and from the runway environment. Some taxiways are necessary simply to provide access between the aprons and the runways, whereas other taxiways become necessary to provide safe and efficient use of the airfield as airport activity increases.

Several taxiways support operations at the Mulino Airport. Runway 14-32 has a full-length parallel taxiway (Taxiway A) and three connector taxiways, Taxiway A1 on the north side, A2 at

[1] Single Wheel Gear is the term used to describe aircraft with one wheel per strut. An aircraft's landing gear configuration and gross weight are critical components in airfield pavement design and are often used to characterize pavement strength.

midfield, and A3 on the south side. These connectors link the runway and parallel taxiway together. At midfield, there is an undesignated taxiway, which leads to the apron/tiedown area.

From the apron, there is a second undesignated taxiway, which leads to the hangar area. There are also several taxilanes located between hangar buildings. All paved taxiways at the Airport are 40 feet wide, with the exception of the Taxiways A1 and A3, which are 50 feet wide. All taxilanes are 20 feet wide. Taxiways and taxilanes are constructed of asphalt and have PCI ratings between 89 and 100, which is representative of pavements in excellent condition.

There are also two grass taxiways at the Airport. These taxiways are located just east of the aircraft apron – one taxiway leads to the Airport Café located along State Highway 213, while the other leads to the Experimental Aircraft Association (EAA) building. Both grass taxiways are 50 feet wide.

Aprons and Aircraft Parking. There is one asphalt aircraft apron located on the east side of the runway. It is 200 feet by 240 feet and has 16 tiedown positions. There are also four tiedown positions in the grassy area north of the apron; however, only two of the tiedowns are usable due to missing components that would allow an aircraft to be secure.

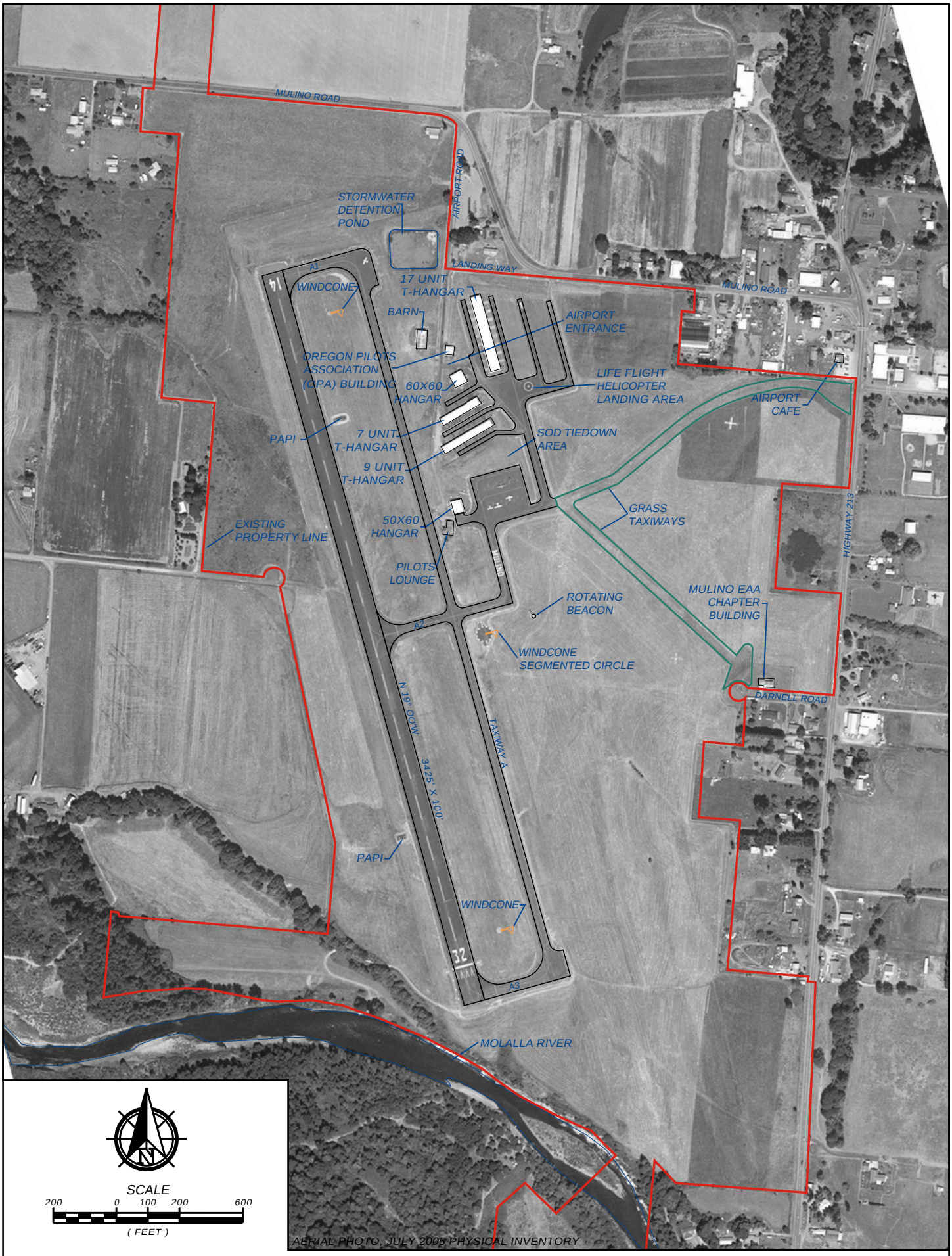
Airfield Lighting. Airfield edge lighting systems are categorized as low, medium, or high intensity. The color of the lights is also important as it indicates to pilots where they are in the airport environment. For example, runway edge lights are white and taxiway edge lights are blue.

At the Mulino Airport, the lighting system is a medium intensity system, which can be pilot controlled. In other words, a pilot can turn the lights on or off or change their intensity by keying the microphone inside of the aircraft. Edge lighting is located on the runway and taxiways, while the apron and hangar taxilanes are lined with reflectors.

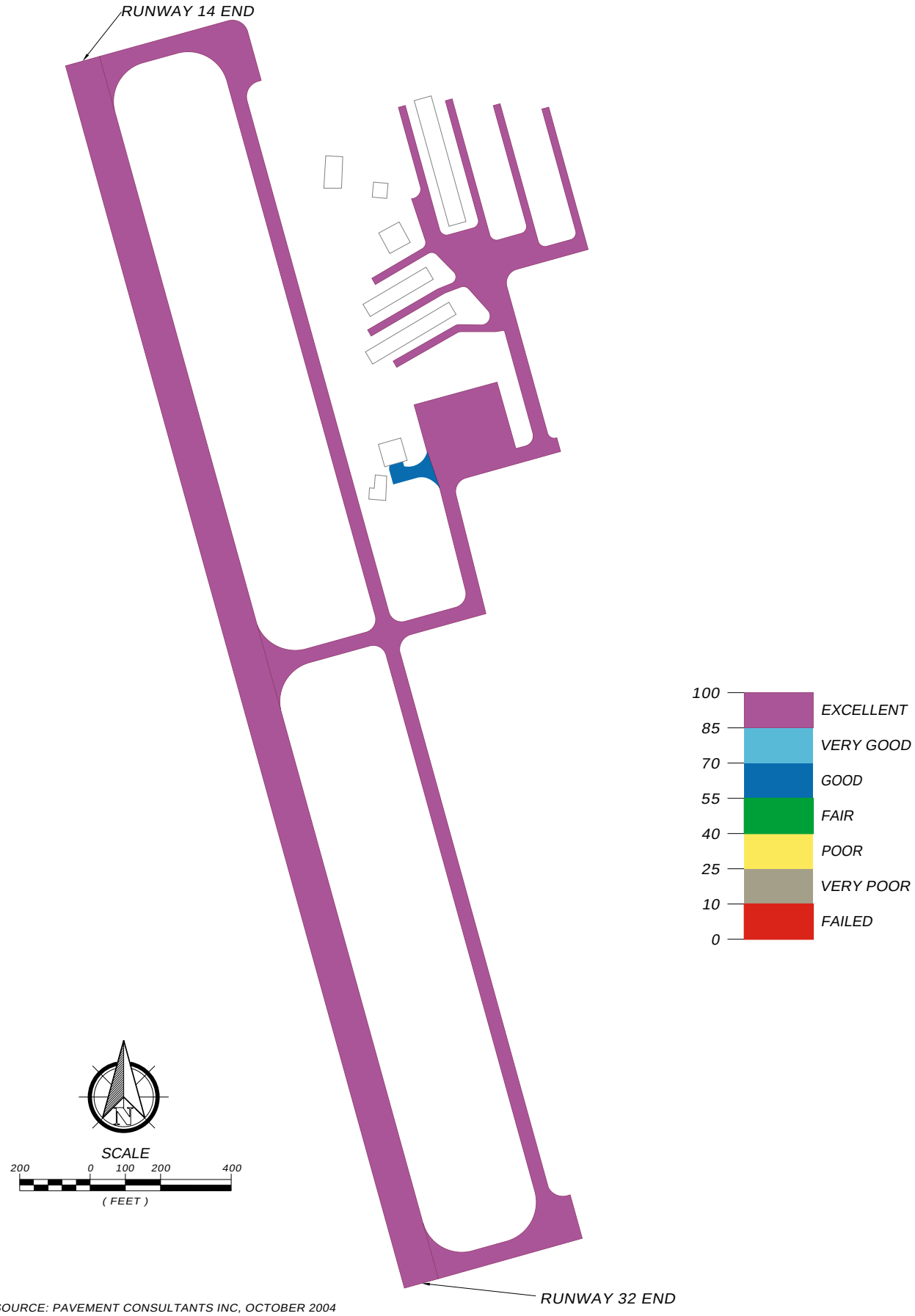
Airport Navigational Aids. Airport Navigational Aids, or NAVAIDS, provide navigational assistance to aircraft for approaches to an airport. NAVAIDS either are classified as visual approach aids or instrument approach aids and the former providing a visual navigational tool, and the latter being an instrument-based navigational tool. The types of approaches available at an airport are based on the NAVAIDS provided. The subsequent sections describe existing NAVAIDS at the Mulino Airport.

Visual Approach Aids. Each runway end has a two-box Precision Approach Path Indicator (PAPI). A PAPI gives glide slope information to a pilot on final approach by displaying sequences of different colored lights. The glide slope provides a pilot with vertical guidance while approaching the runway. Based on the lights displayed, a pilot can then make the necessary altitude adjustments to ensure the correct glide slope is being followed for a safe landing.

Instrument Approach Aids. Neither Runway 14 nor Runway 32 has an instrument approach, which can be used when the visibility and cloud ceiling are below minimums for Visual Flight Rules (VFR) conditions.



MULINO AIRPORT	EXISTING AIRPORT FACILITIES	EXHIBIT 2B



SOURCE: PAVEMENT CONSULTANTS INC, OCTOBER 2004

MULINO AIRPORT	PAVEMENT CONDITION MAP	EXHIBIT 2C

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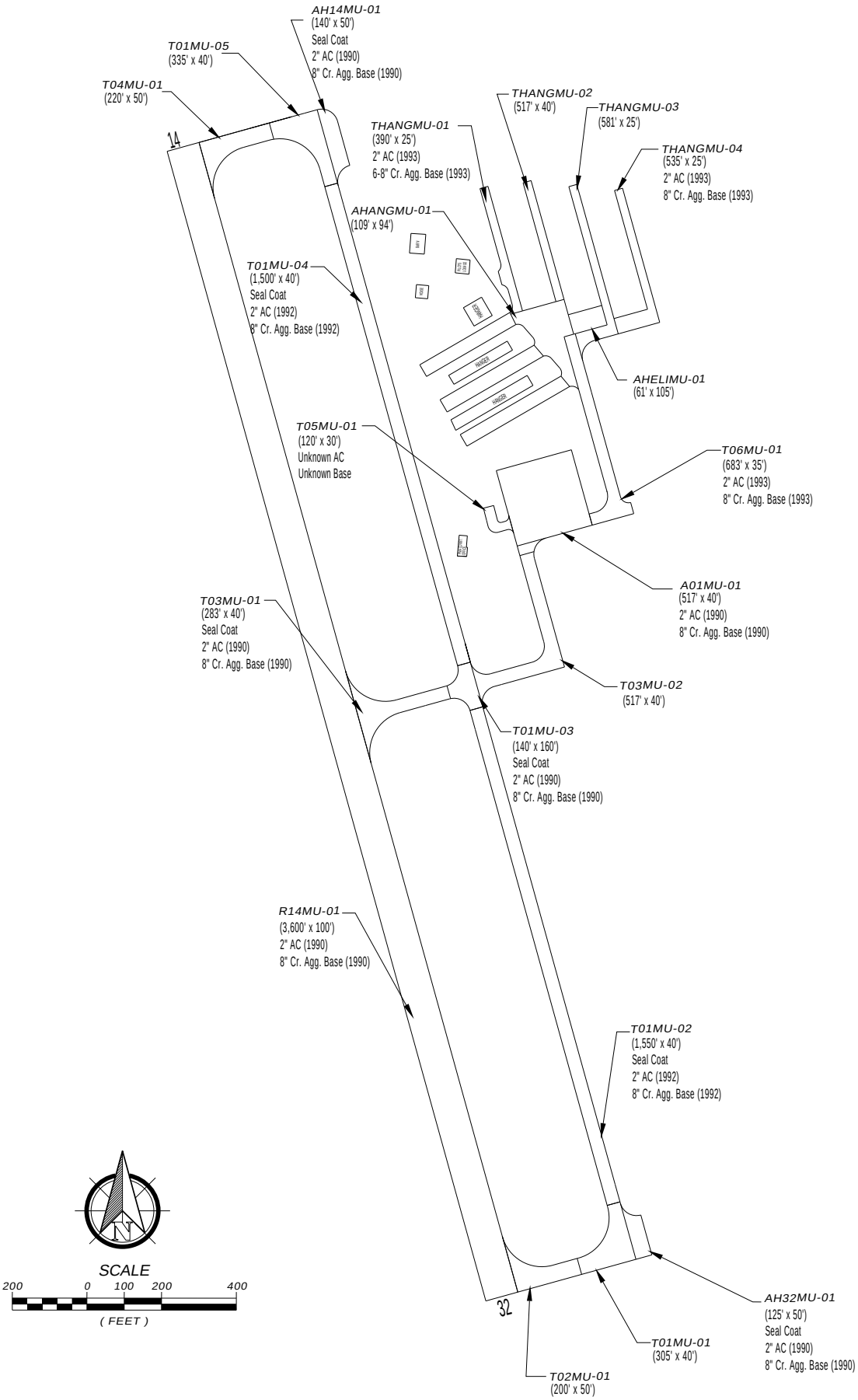


SOURCE: PAVEMENT CONSULTANTS INC, OCTOBER 2004

MULINO AIRPORT	PAVEMENT SECTION MAP	EXHIBIT 2D

Office: SPOKANE | System: WHP-SPK-5VTCP31 | User: JSTRATTON | Time: 09/14/2006 08:00:17

Other NAVAIDS. There is a lighted wind cone and segmented circle located on the east side of Taxiway A at approximately the midfield point. Unlighted wind cones are also near each runway end. A rotating beacon is located east of the segmented circle. The closest source of real-time weather reporting for pilots is the Automated Surface Observing System (ASOS) at the Aurora State Airport, located approximately eight nautical miles to the west.

Landside Facilities

Hangars. There are five hangar buildings at the Mulino Airport – three T-hangars and two box hangars. Cougar Development, a private hangar developer, built a 17-unit T-hangar building on a ground lease from the Port. The Port owns and manages the other hangars, including a 7-unit T-hangar, a 9-unit T-hangar, a 60-foot-by-60-foot semi-enclosed box hangar, and a 50-foot by 60-foot enclosed box hangar. The semi-enclosed hangar contains four individual units within the building's footprint. This hangar building does not have doors; however, each unit is secured with chain link fencing. Three of the four units house an aircraft, while the fourth is storage for the Port's mower and pickup truck. The other box hangar stores one aircraft. The two Port-owned T-hangars, constructed of wood, are approximately 40 to 50 years old and are nearing the end of their useful life.

Other Buildings. Along the entrance road, just outside of the gated secured area is the Mulino Chapter of the Oregon Pilot's Association (OPA) building. Due west, and across the road from the OPA building is a barn, which predates Port ownership of the Airport, used to store some of the Port's maintenance equipment. There is also a pilot's lounge building located adjacent to the aircraft apron. This building has a small classroom, an area for flight planning, a kitchen, and restrooms. Outside of this building is a portable latrine. The Mulino Chapter of the Experimental Aircraft Association (EAA) is also located at the Airport. Their building is located along Highway 213, is accessible via aircraft from the grass taxiway at the aircraft apron or by vehicle from Highway 213.

Aviation Services. A fixed based operator is an individual or a business that offers aviation-related services such as flight instruction, aircraft rental, aircraft maintenance, hangar/tiedown storage, and aircraft fueling to Airport users. There are currently no fixed based operators or other aviation services available at the Airport. The building that serves as a pilot lounge/flight planning area operated as an FBO in the past.

Airport Access and Vehicle Parking. Access to the Airport is via State Highway 213 to Mulino Road and then to Landing Way if accessing the Airport from the east or Airport Road if accessing the Airport from the west. Airport Road provides direct access to the entrance gate.

Near the pilots lounge are six marked automobile parking spaces. Hangar tenants typically park their vehicles in their hangars while flying. In addition, approximately 15 parking spaces are located north of the OPA building, outside of the Airport security fencing.

Airport Support Facilities

Emergency Services. There are no Aircraft Rescue and Firefighting (ARFF) facilities available at the Airport. Emergency services are provided by the City of Molalla Volunteer Fire Department and the Clackamas County Sherriff Department. The Port provides aircraft emergency training to the volunteer firefighters once per year.

Airport Maintenance. Airport maintenance is provided by the Port. Mowers, trucks, and other maintenance equipment are stored on-site in the barn near the front entrance or in one of the hangar units within the semi-enclosed box hangar. The Port does not provide snow removal services. In the event of snow, a Notice to Airmen (NOTAM) is issued stating that the Airport is closed. Once the snow has melted, the NOTAM is cancelled.

Airport Fencing. Three-foot tall, primitive wildlife fencing surrounds the perimeter of the Airport. There is one automated six-foot, chain link vehicle gate controlled by a punch type combination, and one open pedestrian access point located near the OPA building on Airport Road.

Utilities. Utilities available at the Airport include electricity provided by Portland General Electric, water provided by the Mulino Water District, and telephone provided by local franchise companies. A storm water detention pond is located on the north side of the airport property. There is no sanitary treatment facility in the community of Mulino. A map of the existing utilities and storm drainage is provided in **Appendix E**.

Airport Signage. Guidance signs to the Airport are located on Highway 213 and are maintained by the Oregon Department of Transportation (ODOT).

Other Support Facilities. The Airport Café is accessible via grass taxiway from the apron area, but is not located on airport property. A gas station and lodging facility are also within walking distance of the Airport.

AIRSPACE

The FAA is responsible for the control and use of navigable airspace within the United States. Aircraft in flight, whether approaching or departing an airport, are subject to varying degrees of FAA control depending on location and meteorological conditions. These levels of control are called airspace classes. Classes are distinguished by the alphabet characters A through G. Each class has its own unique shape and rules that govern such things as visibility minimums and cloud clearances.

The Mulino Airport is located in Class G airspace. Class G airspace is considered uncontrolled airspace in that pilots are not required to communicate with air traffic controllers; however regulations regarding visibility minimums and cloud clearances still apply. The Mulino Airport is depicted on the Seattle sectional chart (see **Exhibit 2E**). The Airport is located south of Portland International Airport (PDX) and northeast of Salem McNary Field. Several private airports are also in the surrounding area. The Mulino Airport's location is such that it lies

NOTE: AIRPORTS HAVING CONTROL TOWERS ARE SHOWN IN BLUE, ALL OTHERS MAGENTA.

SOURCE: SEATTLE SECTIONAL CHART,JUNE 2006

MULINO AIRPORT	AIRSPACE	EXHIBIT 2E

underneath a Victor Airway, or a "highway in the sky." A Victor Airway is a corridor of protected airspace defined by radio navigational aids. In the case of the Mulino Airport, the Victor Airway above the Airport (labeled as V 448 and depicted with a semi-transparent blue line on Exhibit 2E) leads to PDX, making over flying traffic a common occurrence.

LAND USE PLANNING AND ZONING

The following land use and zoning discussion focuses on four areas:

- On-airport zoning and land use.
- Surrounding area land uses.
- Protection of airport airspace to prevent hazards and land uses that may interfere with the safety of aircraft operations.
- Ownership/control of airport runway protection zones to enhance the safety of people and property on the ground.

Federal, State, Regional, County, and City land use regulations need consideration when reviewing existing land uses for airport compatibility and when planning for future development at and around an airport.

Federal regulations are also concerned with airspace protection (14 CFR Part 77) and noise levels, particularly for areas that fall within the 65-decibel (dBA) noise contour line. 14 CFR Part 77, *Objects Affecting Navigable Airspace,* establishes obstruction standards used to identify potential adverse effects to air navigation and notice standards for proposed construction. Imaginary surfaces are the basis for protecting the airspace around runways. There are five imaginary surfaces: primary, approach, transitional, horizontal, and conical. Definitions of each imaginary surface will be discussed in Chapter Six, *Airport Layout Plan*. These surfaces should be kept clear of all obstructions.

FAA guidelines state that before FAA grants can be received the airport sponsor must provide assurances that appropriate actions have been (or will be) taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to those that are compatible with normal airport operations.

Existing On-Airport Zoning and Land Use

The Mulino Airport is a public use airport and is designated as a special use Public Use Airport Zoning District through the Clackamas County Zoning and Development Ordinance Division 713 (see **Appendix F**). Clackamas County is the planning and building permit authority for the Airport. The Airport's existing zoning classification complies with Oregon Revised Statutes 836.600 through 836.630, Local Government Airport Regulation, and includes airport overlay imaginary surface protection, which mirror Part 77 imaginary surfaces.

Uses permitted outright in the Public Use Airport zone include (Section 713.04 of Clackamas County Zoning and Development Ordinance):

- Airport operations and operational facilities (*i.e.* aircraft hangar, FBO, flight instruction, aircraft rental and sales, maintenance, etc.)
  - One single-family dwelling for use by airport manager, caretaker or similar.
  - Does not include residential, commercial, industrial, manufacturing, and other uses.
- Air passenger and air freight services, if consistent with Oregon Department of Aviation System Plan.
- Emergency services and facilities for medical flight services.
- Law enforcement, military and firefighting facilities to support activities of federal, state, or local law enforcement or firefighting.
- Search and rescue operations and related activities.
- Agricultural and forestry spray application activities and facilities.
- Aeronautical sporting and recreational activities and facilities (including skydiving with some restrictions).

Section 713.05 of the Ordinance gives allowances for a Hearings Officer, who is responsible for overseeing administrative hearings (*i.e.*, land use), to review applications for uses not permitted outright. In general, applicants must exhibit compliance with the following in order for their use to be permitted:

- The use must be supported by applicable statewide land use planning goals and development standards must comply with County ordinances.
- The use does not interfere with existing land use areas adjacent to airport boundary (additional restrictions are placed on underlying exclusive farm use zones).

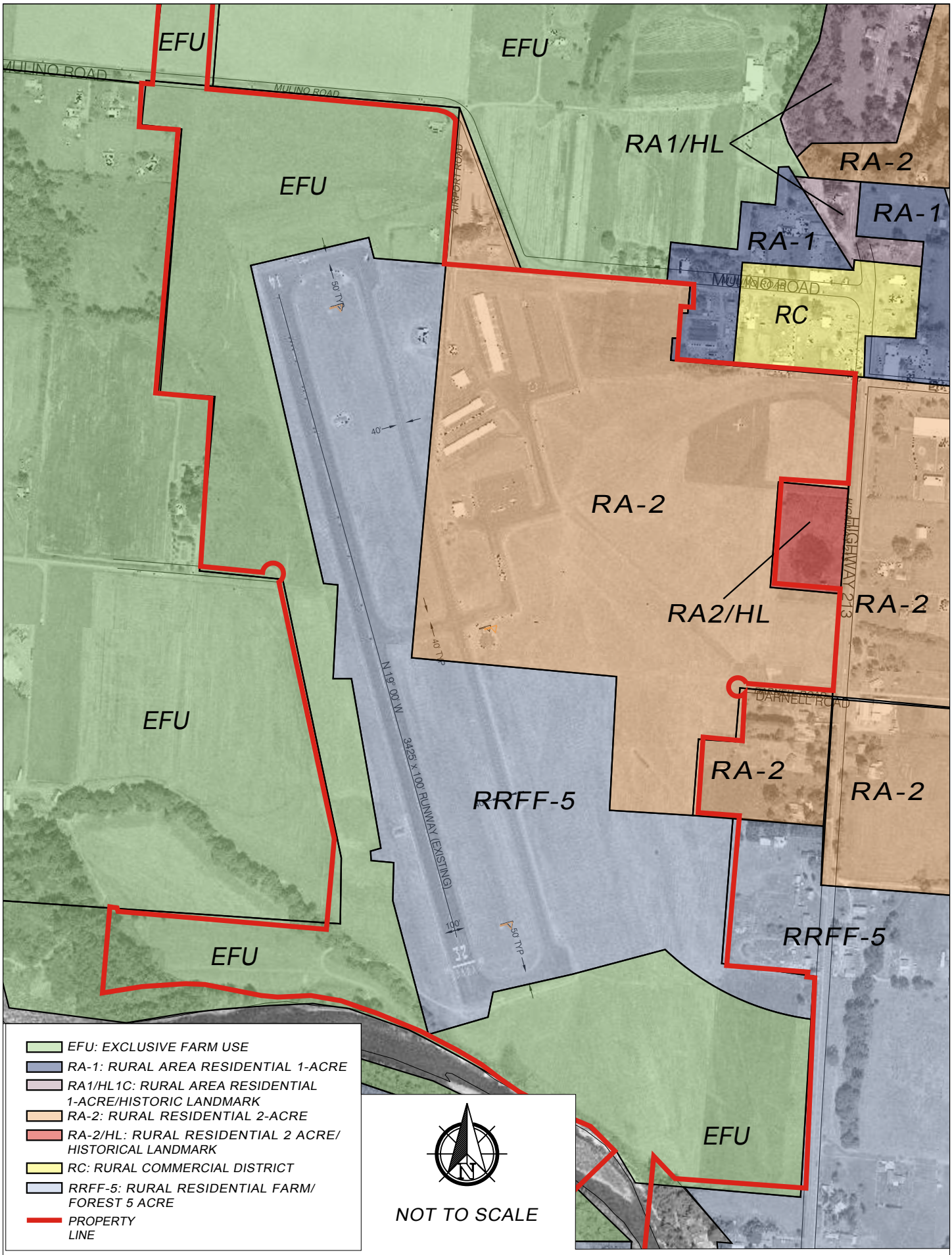
The community of Mulino and the airport property are outside of the urban growth boundary for the Portland Metro Region. Zoning at the airport consists of exclusive farm use (EFU), rural residential farm/forest - 5 acres (RRFF-5) and residential/agricultural - 2 acres (RA-2). These zones are depicted on **Exhibit 2F.**

- EFU zoning designates land for the preservation of agricultural uses, in an effort to uphold agricultural economic values, and to maintain open space.
- RRFF-5 land allows for a mixed use of a single-family dwelling in coordination with farm or forestry uses on a (minimum?) five-acre plot of land.
- RA-2 zoning allows for one single-family dwelling with agricultural uses on a (minimum?) two-acre parcel of land.

Surrounding Area Land Use

The Mulino Airport is surrounded primarily by agricultural and rural residential land uses. The areas directly to the north and west of the Airport are zoned EFU. Rural residential properties border the northwest corner of the airport. On the south side of the Airport is the Molalla River, and across the River to the south is the Arrowhead Golf Course. Land east of the Airport is a combination of uses including residential, commercial, institutional and public facilities

Surrounding the Airport, the land is zoned: EFU, rural commercial (RC), RRFF-5, RA-2, residential/agricultural – 1 acre (RA-1) and rural industrial (RI).



MULINO AIRPORT	ZONING MAP	EXHIBIT 2F

EFU, RRFF-5, and RA-2 zoning designations were discussed in the previous section. RC, RA-1, and RI zoning are defined as follows:

- The purpose of RC zoning is to allow commercial operations within a rural area. Commercial operations include such uses as apparel shops, markets, banks, etc.
- Similar to RA-2, RA-1 allows for one single-family dwelling with agricultural uses on a one-acre (minimum) parcel of land.
- RI zoning allow for light industrial use within a rural area. Uses can range from processing, retail, wholesale, and storage among other light industrial uses.

Also related to land use and zoning around the Airport are Measure 37 claims. Ballot Measure 37 (2004) requires governments to pay landowners or forgo enforcement when certain land use regulations reduce their property values. As a result, airport sponsors should be aware of claims near airport boundaries[2]. Potentially, land that is currently compatible with Airport operations may be developed in the future for uses that are non-compatible. There have been several claims near the Mulino Airport, but none appear to pose incompatibility problems for the Airport at this time. However, it is advisable for the airport sponsor to monitor future Measure 37 claims near the Airport.

Protection of Airport Airspace

Clackamas County has established an Airport Overlay Zone/District to protect the Airport and its airspace from hazards to air navigation, such as tall structures and other non-compatible land uses. An overlay zone/district may restrict the height of buildings and other structures or trees. Airport overlay zones also may restrict any land use that would create such hazards as electrical interference with airport radio communications, cause glare or impair visibility near the airport or would attract wildlife.

Ownership/Control of Runway Protection Zones

Runway Protection Zones (RPZs) are designated areas off runway approaches that enhance the protection of people and property on the ground and are trapezoidal in shape. RPZ dimensions are determined by the aircraft approach speed and runway approach visibility minimums. The FAA strongly encourages airport sponsors to either own or exercise land use control within the RPZs. If an airport does not own the RPZs in fee, control of obstructions to airspace can be achieved through avigation easements. As depicted in **Exhibit 2G,** the Port owns or controls, through existing avigation easements, all property within the airports two RPZs.

ENVIRONMENTAL INVENTORY

The purpose of this section is to summarize the environmental setting of the airport, and identify any potential environmental constraints. This discussion provides a baseline for future comparison of alternatives in terms of their potential environmental impact. The FAA's

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[2] Information concerning Measure 37 Claims can be found at either the Oregon Department of State Lands website (http://www.oregon.gov/LCD/MEASURE37/index.shtml) or the Clackamas County website (http://www.co.clackamas.or.us/dtd/zoning/37/index.html)

environmental checklist will be used as a guide within this inventory. The checklist incorporates the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act, as well as US Department of Transportation environmental regulations and many other federal statutes and regulations. The checklist will be used to review alternatives at a qualitative level, once they are developed.

Environmental constraints for airports typically fall into two general categories: human and natural environment. Human factors that can constrain airports include existing settlements and incompatible land use, noise, social or socioeconomic conditions, and light and glare, and the general controversial nature of airports. Natural environmental elements include air quality, water resources, fish, wildlife, hazardous materials, energy, and other resource issues. **Exhibit 2H** depicts the existing environmental designations at the Airport.

Human Factors

Noise. The Airport currently supports over 30,000 annual operations according to the FAA's Terminal Area Forecast, conducted primarily by single engine aircraft. Noise for airports is typically measured using a weighted average, where nighttime noise is given more weight. This measurement is referred to as Day/Night Level, or DNL. The typical threshold of concern is when the 65-decibel DNL contour extends over noise sensitive land uses such as housing, schools, or churches. Another threshold of significance is 90,000 annual adjusted propeller operations. The current usage of the Airport is well below this.

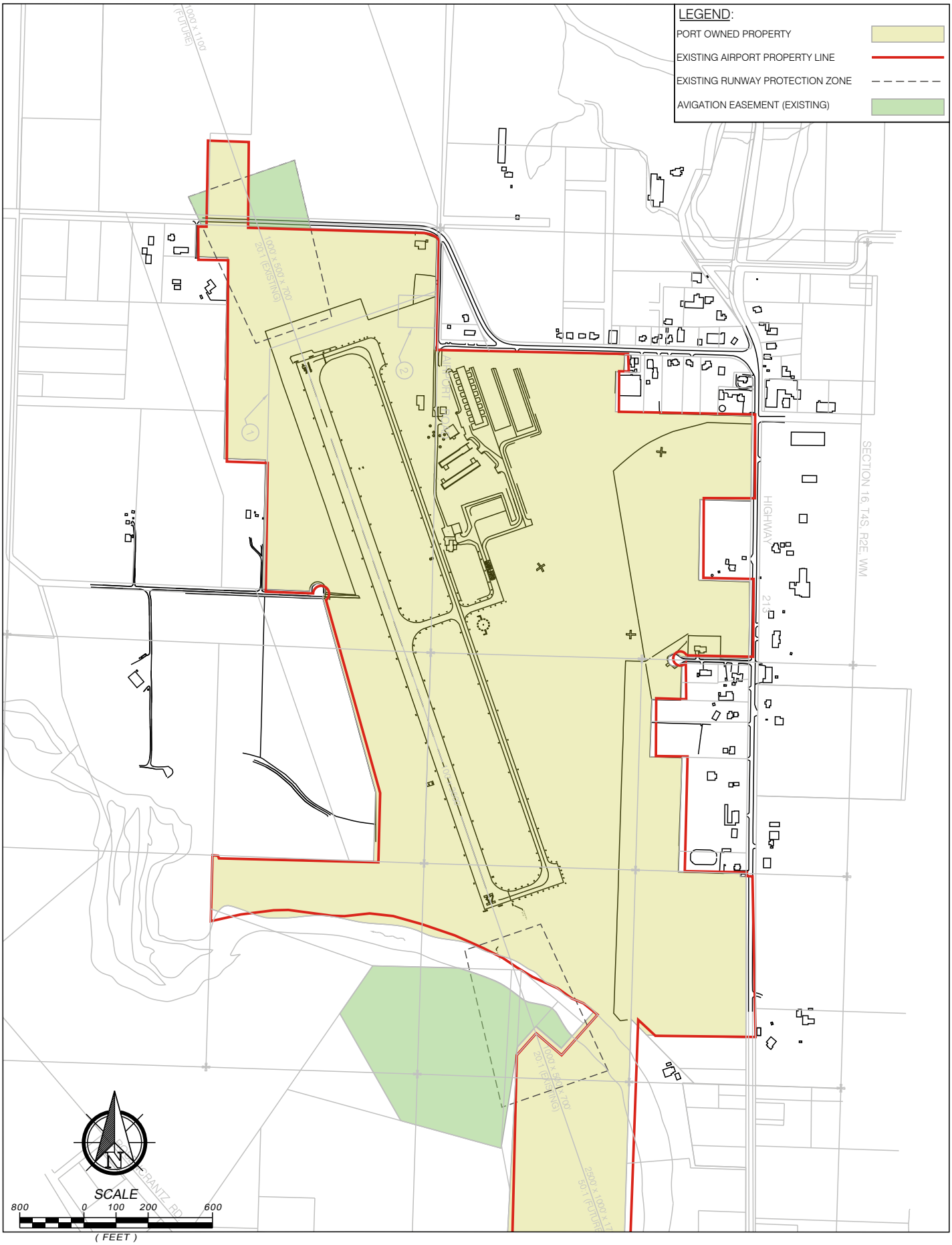
Land Use. Land use issues associated with airports typically relate to the compatibility of surrounding uses. This issue is discussed in detail above in the Land Use section.

Social Impact and Induced Socioeconomic Issues. Social impacts are typically related to relocation of businesses or residences or the alteration of established patterns of life (*e.g.*, roadway changes, new facilities that divide a community, etc.). The Airport includes a significant amount of land, creating separation between the Airport, non-airport businesses, and local residences. As such, the impact of the Airport on community activities is lower than if the Airport were closer to developed land uses.

The County's 20-year Transportation Improvement Plan (TIP) shows Mulino Road to be widened to include turning lane refuges at various locations. Any road improvements should be coordinated between the Oregon Department of Aviation and the appropriate state or local agency.

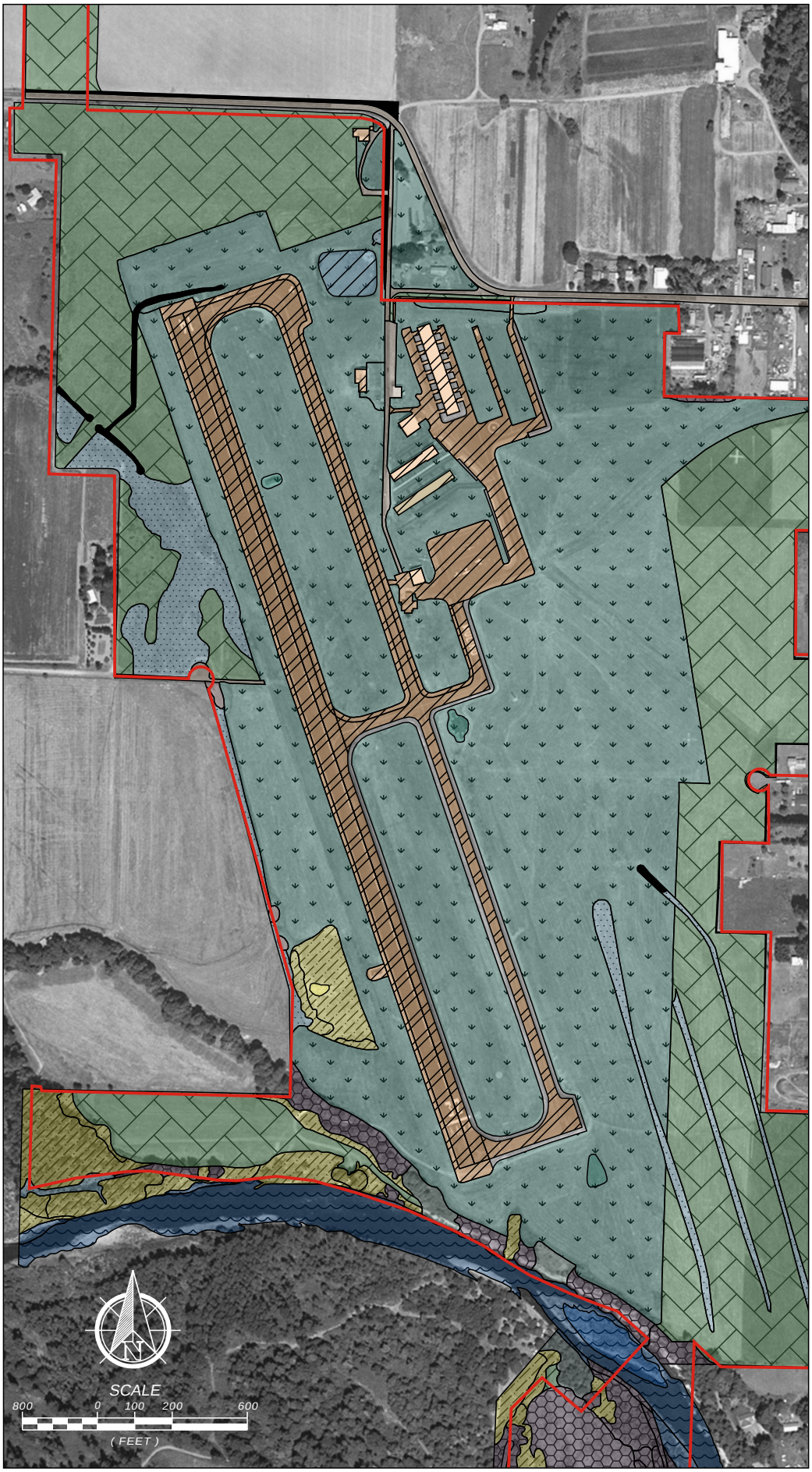
Socioeconomic issues include the potential for the Airport to provide an economic attraction to the community, including on-airport jobs, off-airport jobs that are the direct result of airport activities, or some attraction that provides incentive to use the Airport. The Airport provides some positive economic benefit to the community today, such as when people fly in for meals at the Airport Café.

The Airport also has existing and proposed hangar space that could provide rental income to the Port. Land to the east of the existing hangar area could be developed into a range of aviation



SOURCE: PORT OF PORTLAND, AUGUST 2004

MULINO AIRPORT	EXISTING EXHIBIT A AIRPORT PROPERTY MAP	EXHIBIT 2G



FOREST LAND

FARMLAND

AIRPORT ACTIVITY AREA

DETENTION POND

DITCH

GRASS MOWED

POND/WETLAND

RIVER ENVIRONMENT

ROAD

UPLAND/SHRUB

PROPERTY LINE

MULINO AIRPORT	ENVIRONMENTAL DESIGNATIONS	EXHIBIT 2H

related industrial, commercial or manufacturing uses. The Oregon Department of Aviation is currently preparing an analysis of the economic benefit of each airport in the State, which will provide more complete information about the benefits of the Mulino Airport.

Local population growth, as identified in the Clackamas County Comprehensive Plan, may cause demand for services at the Airport to increase. Typically, increased population brings an increase in the number of registered pilots and aircraft. This is discussed more thoroughly in Chapter Three, *Aeronautical Activity Forecasts*.

Environmental Justice. Environmental justice is a specific category of socioeconomic impact that analyzes the disproportionate burden a facility may place on a population that is subject to perceived discrimination or other burden. This may include areas where noise or vibration is perceived as an impact, such as residential concentrations off the ends of runways or in approach patterns. A review of local Census information, as well as a visit to the community suggests that there appear to be no populations meeting the definition within the immediate airport vicinity. There do not appear to be residential concentrations within the areas that would be considered "impacted."

Historic Properties, Cultural Resources (Section 106 Resources). The Mulino Airport site has been in use as an airport since 1949. No cultural resource studies of this site have been identified.

There is a relic of a former railroad crossing of the Molalla River at the southern end of the runway. This resource may be considered historic if the railroad played a significant role in the settlement or history of the Mulino area of Clackamas County. More information may be needed on this element if any proposed airport activity is proposed near the relic crossing.

Recreational Lands (Section 4(f)) Resources. The Molalla River is considered by the Oregon State Marine Board and other state agencies as a recreational river for water sports (rafting, kayaking) and fishing. A review of local and state parks' mapping and narrative information shows that there do not appear to be any designated parks, refuges or other land resources protected under Section 4(f) near the Airport. Airport activity may currently have some level of noise impact on river users.

Farmland Preservation. The Airport is located in an agricultural area, where much of the land is in cultivation. Federal and state laws require the review of any airport action that would remove farmland, as defined by soil classification or actual use, from active or potential agricultural use. Any property acquisition that would result in a loss of farmland would need evaluation using the procedures outlined by the Natural Resource Conservation Service (the federal agency charged with farmland preservation). Such action would also need to be reviewed under Clackamas County's land use ordinances for zoning and farmland protection.

Light and Glare. On-airport lighting is focused for visibility by aviators, without creating a disturbance or distraction. Any additional facilities will need to consider the impact of light and/or glare, including the use of windows or roofing material, on aviation. Similarly, residences and other uses that may be affected by on-airport light are located some distance from the

Airport. Any additional lighting or structures will need to be focused such that light or glare is not projected into residential areas.

Natural Factors

Air Quality. Air quality can be a concern in a regional context or in a local, or "hot spot" context. Regional air quality typically relates to six criteria pollutants, including ozone, particulates, carbon monoxide, sulfur dioxide, lead, and nitrogen oxide. Regions are considered "maintenance" if the area is marginal in meeting established criteria for each pollutant. Hot spots are typically locations where traffic congestion or an industrial source creates a concentration of criteria pollutants. According to the Oregon Department of Environmental Quality map (website http://www.deq.state.or.us/aq/aqplanning/aqmamap.htm), the Airport is outside of the Portland Area Air Quality Maintenance Area. The area inside the boundary is in Maintenance for Ozone and Carbon Monoxide. Any aviation capacity increases proposed by the Master Plan may need to undergo review for air quality impact. Any construction impacts will need to consider the impact of particulate material on the local environment, including water quality and other resources. There are no "air quality hot spots" for surface transportation facilities in the Airport vicinity.

It should be noted that the fields to the north of the runway were observed to produce significant amounts of airborne material while being plowed during the dry summer months. The dust clouds created by this activity could present visibility or mechanical impacts to aircraft operating in this area.

Water Quality. The Port currently has a 1200Z permit for stormwater discharge. The permit expires in 2007. The Airport has a system for the collection, treatment, and discharge of stormwater that meets the requirements of the permit. Any additions to impervious surfaces or changes in drainage plans for the Airport must be evaluated in the context of the permit conditions.

Plants and Animals, Including Endangered and Threatened Species and Essential Fish Habitat (MSA resources). The Molalla River is a popular local recreational fishing river. The Oregon Department of Fish and Wildlife's (ODFW) Fish Finder website shows winter steelhead, spring Chinook, cutthroat and rainbow trout, and smallmouth bass present in the river.

Any airport actions with need to consider impacts to listed endangered and threatened species protected under federal or state legislation. In addition, the Magnuson-Stevens Act protects critical habitat for commercial fish species. Chinook is a federally listed threatened species. Any activity on the airport will need to consider impacts to the Chinook under the Endangered Species Act as well as habitat impacts under the Magnuson-Stevens Act.

Much of the airport area is mowed grass. This continued disturbance limits the likelihood of any endangered plants being on the Airport. Areas around the Airport are overgrown with blackberry and teasel, which are invasive species that typically out-compete native species for survival.

There is an open detention pond near the northeast end of the runway. This pond is surrounded by wetland vegetation and has been observed to provide bird habitat. When the pond contains water, waterfowl have been observed in the pond. Songbirds and corvids (crows and jays) were observed in the vegetation during summer months. This habitat should be monitored to ensure that the bird population does not present a safety threat to aviation.

Wetlands and Floodplains. The Army Corps of Engineers and the Oregon Department of State Lands are the agencies charged with regulating wetlands. The detention pond at the northeast corner of the Airport may include areas considered jurisdictional wetlands. At the time of any development action affecting the pond, a formal delineation will need to be prepared. There are also three linear wetland areas to the east of the taxiway that are potentially jurisdictional (see Exhibit 2H), outside of the current area of airport activity (runways, taxiways, or structures that are in use). Any proposed activity in these areas will require formal delineation and review by the Department of State Lands and the U.S. Corps of Engineers.

The Airport is outside of the Molalla River 100-year floodplain. The Airport is located on a bench above the river, on the outside of a small bend. The river has exceeded flood stage in several recent years and there appears to be some undercutting of the riverbank below the Airport. The undercutting is not visible in Exhibit 2H; however, this is a constraint that will be further discussed in Chapter Five, *Airport Development Alternatives*.

Energy Supply and Natural Resources. This category focuses on the impact of airport actions on energy and natural resources not already discussed. Typically, the resources include those used in construction materials. In general, construction materials are not in short supply. Fuel for construction equipment is available nearby. At one time, the Airport had a fueling station and an area has been prepared for future installation of one. The site has adequate electrical supply to provide power to navigation aids and security lighting on the Airport. In general, the airport does not directly have an impact on energy supply and natural resources.

Solid Waste. General Aviation airports typically do not generate significant amounts of solid waste. Often the waste that is generated includes food and beverage containers, or packaging for aircraft maintenance products. Food containers may create a bird and rodent attractant.

Other solid waste materials may be generated during construction. These include pavement materials being removed. The current trend in construction is to recycle the old material into the new pavement, reducing the need for disposal.

Plans for future activity at the Airport should consider the manner in which waste is collected and removed so that food or other waste materials do not attract scavenging wildlife to the Airport.

Hazardous Materials. The former fueling base was decommissioned in the 1990s. As part of the process, monitoring wells were established and sampled. In 1998, after four quarters of no detectable contamination in the samples, the Port requested a conditional notice of no further action from DEQ. The conditions include leaving the eight monitoring wells in place, disclosing

the site conditions and history to potential buyers, and in the event of demolishing the adjacent airplane hangar, excavating remaining petroleum-affected soil.

There is potential for additional contamination anywhere maintenance or fueling takes place, because of accidental spills. No exploration of this has occurred on the Airport. The old hangar that is currently used for storing mowing equipment appears to have potential for some soil contamination, based on a site visit where small patches of darkened soil with petroleum odor were observed.

Any areas where construction is proposed would need to undergo some level of research, such as a "Phase One Environmental Site Assessment (ESA)" to identify any history of possible contamination. A Phase One ESA is a prescribed process to review a site through a review of records and physical inspection, to identify the potential for contamination.

Construction Impacts. Construction impacts typically include temporary noise, dust or traffic, as well as the potential for erosion and water quality impacts from material spills associated with construction. Once construction activities are identified, construction timing, phasing, and mitigation measures need to be considered to reduce impacts such as erosion and dust, maintain water quality, comply with rules regarding in-water work for fish habitat, and reduce noise impacts on neighbors.

Controversy. Off-airport impacts can be controversial. During the history of the Airport, noise has been the only substantive off-airport issue. This prompted the Airport to develop and maintain a Noise Growth Management Plan (NGMP). The NGMP established a noise impact boundary, which is approximately the 55 DNL noise contour. The plan also includes a series of operations procedures and management policies to reduce noise impacts from the Airport, including a series of recommended actions for land use compatibility planning. Public outreach during the master plan provided an opportunity for controversial issues to be identified. See Appendix B for documentation of the master plan public outreach efforts.

Environmental Conclusion

In general, the Airport presents few environmental constraints. The environmental impact of the airport development alternatives, which will be developed in Chapter Five, will be further evaluated in that chapter.

AVIATION ACTIVITY DATA

There are two primary measures of aviation activity at a general aviation airport: based aircraft and aircraft operations. Each activity type is discussed below.

Based Aircraft

Based aircraft are the number of aircraft that are stored at an airport, either in a hangar or tied down on either a paved apron surface or a grassy area designated for such a use. The Port's tenant records indicate that there are currently 40 aircraft based at the Mulino Airport. Of the 40

existing based aircraft, 37 are stored in hangars, while the remaining three are stored in tiedown positions on the apron.

Aircraft Operations

Annual operations are the total number of aircraft takeoffs and landings occurring at the Airport in a year. A touch-and-go, which occurs during pilot training, counts as two operations. Touch-and-go operations are categorized as local, along with other operations that remain within 20 miles of an Airport. Operations not categorized as local are categorized as itinerant. Conflicting data exist for the estimated number of aircraft operations in 2004, the most recent year with published data:

	FAA Airport Master Record (Form 5010)	FAA Terminal Area Forecast
Air Taxi	-	100
General Aviation Local	13,000	14,385
General Aviation Itinerant	8,300	21,577
Total	21,300	36,062

Chapter Three discusses this conflict in operations data in more detail.

AIRPORT FINANCIAL DATA

The following subsections provide a brief summary of historical financial information for the Mulino Airport.

Airport Operating Revenues & Expenses

Table 2A shows the Mulino Airport's revenues and expenses for the past five years. Operating costs have consistently exceeded revenues. Discussions with the Port have indicated that the Mulino Airport has never been financially self-sufficient.

Federal grants from the Airport Improvement Program (AIP) are the major source of funding for airport capital expenditures. Table 2B depicts the AIP funding the Mulino Airport has received for airport improvement projects between the years 2000 and 2005.

Table 2A. Airport Revenues and Expenses

	Actual 2000	Actual 2001	Actual 2002	Actual 2003	Actual 2004	Actual 2005	Actual 2006
Operating Revenues							
Land Lease	12,438	12,438	12,438	12,438	12,438	11,838	12,663
Rent Revenue	6,492	7,575	3,247	3,050	5,458	6,700	6,563
Concession Revenue	27,002	31,855	25,955	26,520	24,962	25,020	23,487
Operating Grant Revenue	0	0	0	0	0	10,841	171,659
Miscellaneous	890	736	680	0	0	0	0
Total Operating Revenues	46,821	52,604	42,320	42,008	42,858	54,399	214,372
Operating Expenses *							
Personal Services	5,150	7,791	1,952	2,797	13,428	3,850	3,500
Materials & Supplies	5,163	1,774	6,053	5,576	3,949	971	2,005
Equipment Rents, Repair, and Fuel	8	4	682	1,581	1,816	22,811	3,010
Utilities	11,580	10,370	14,400	11,176	13,278	13,781	16,171
Outside Services	30,545	25,198	32,443	51,668	40,956	52,124	218,450
Fixed Charges (insurance)	4,736	5,159	11,610	8,999	12,717	12,103	12,787
Allocated & Other Expenses	0	66	0	30	53	14	4
Management & Travel	483	113	73	84	252	372	134
Direct Transfers (maintenance)	18,244	10,733	29,219	23,545	22,550	26,059	36,613
Allocated Support Service	4,929	8,064	3,217	9,200	35,742	10,815	0
Total Operating Expenses before Depreciation	80,840	69,272	99,650	114,656	144,741	142,901	292,674
Operating Income before Depreciation	(34,018)	(16,668)	(57,330)	(72,647)	(101,883)	(88,502)	(78,302)

Source: Port of Portland, 2008, April.

Table 2B. Recent Federal Grant Projects

Year	Project	AIP Funding Received
2002	Installed rotating beacon, improved Runway 32 Safety Area, constructed hangar taxilanes, updated Exhibit "A" property map.	$374,815
2003	Removed Runway 32 Obstructions	$172,600

Source: FAA, 2006, August.

Rates & Charges

The Port charges hangar tenants a fee of $125 per month. Tiedown rental rates are $25 per month. Cougar Development currently pays $0.19 per square foot for a ground lease with the Port, a recent increase from $0.175 per square foot. Cougar Development charges its T-hangar tenants $225 per month. The local EAA chapter also pays a $176.25 monthly fee to the Port for the building they occupy.

Chapter Three
AERONAUTICAL ACTIVITY FORECAST

Aviation demand forecasts help to determine the size and timing of needed airport improvements. This chapter indicates the types and levels of aviation activity expected at the Mulino Airport during a 20-year forecast period. Projections of aviation activity for the Airport were prepared for the near-term (2012), mid-term (2017), and long-term (2027) timeframes. These projections are generally unconstrained and assume the Port of Portland (Port) or its potential successor, the Oregon Department of Aviation (ODA), will be able to develop the various facilities necessary to accommodate based aircraft and future operations. The methodology followed is from *Forecasting Aviation Activity by Airport* (GRA, Incorporated, 2001, July), which is the Federal Aviation Administration's (FAA) recommended guidance for airport forecasting.

The primary objective of a forecasting effort is to define the magnitude of change in aviation activity that can be expected over time. Because of the cyclical nature of the economy, it is virtually impossible to predict with certainty year-to-year fluctuations in activity, especially when looking 20 years into the future. However, trends can be identified and used to study long-term growth potential. While a single line is often used to express the anticipated growth, it is important to remember that actual growth may fluctuate above and below this line. Forecasts serve only as guidelines and planning must remain flexible to respond to unforeseen aviation facility needs and the economic/external conditions giving rise to those needs.

The aviation demand forecasts were developed within the framework of the strategic analysis documented in Chapter One. The Mulino Airport will likely continue to serve the type of

aircraft it has historically served—small (maximum gross takeoff weight of 12,500 pounds), mostly single engine piston aircraft. The current Airport Reference Code for the Mulino Airport is B-II, exemplified by the Beech King Air aircraft. The majority of aircraft located in the study area can be served by the Mulino Airport. Larger, faster, and heavier aircraft originating in or destined for the southeastern part of the Portland metro are better served by nearby Aurora State Airport.

Forecasts for the following aviation activity parameters are presented in this chapter:

- Based Aircraft, including fleet mix. The number and type of based aircraft help determine the future aircraft hangar, tiedown apron, and auto parking facility requirements.
- Aircraft Operations, including annual, peak, local vs. itinerant, and fleet mix. This information helps in analyzing runway capacity and determining runway, taxiway, and navigation aid requirements. The critical aircraft is derived from the fleet mix. The critical aircraft and its airport reference code determine many airfield design requirements, such as runway length, pavement strength, runway and taxiway width, and safety clearances needed for the runway and taxiways. The aircraft operations forecast provides some of the input for the computer modeling that estimates future aircraft noise exposure.

Prior to projecting future activity at the Mulino Airport, national and regional aviation trends and forecasts were reviewed. Socioeconomic trends in the Portland metro area were also analyzed to identify how they might affect aviation demand at the Airport.

NATIONAL AVIATION TRENDS AND FORECASTS

Ten years ago general aviation (GA) in the United States of America was growing, due not only to an expanding economy, but also to the General Aviation Revitalization Act (GARA) of 1994. GARA set an 18-year limit on the liability of GA aircraft and component manufacturers, spurring production of single engine piston aircraft. It is this aircraft type that has accounted for the majority of the nation's GA activity.

Five years ago, the terrorist attacks of 9/11 dampened GA activity with their affect on the national economy and the imposition of new aviation security restrictions. While the piston aircraft component of GA suffered in the aftermath of 9/11, the business, or corporate, segment of GA has grown. This growth is partly due to security measures implemented at commercial service airports and the increased personal travel times that have resulted. Business aircraft usage provides: employee time savings, increased enroute productivity, minimized time away from home, enhanced industrial security, enhanced personal safety, and management control over scheduling.

Many of the nation's employers who use GA are members of the National Business Aircraft Association (NBAA). The NBAA's *Business Aviation Fact Book 2004* indicates that approximately 75 percent of all Fortune 500 businesses operate GA aircraft and 92 of the Fortune 100 companies operate GA aircraft. Business use of GA aircraft ranges from small, single-engine aircraft rentals to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. General aviation aircraft use allows employers to transport personnel and

air cargo more efficiently than commercial passenger flights. Businesses often use GA aircraft to link multiple office locations or to reach existing and potential customers. Business aircraft use by smaller companies has escalated as various chartering, leasing, time-sharing, fractional ownership, interchange agreements, partnerships, and management contracts have emerged. Fractional ownership arrangements have experienced rapid growth. NBAA estimated that 2,591 companies used fractional ownership arrangements in 1999; by 2004 that number had grown to 6,217 companies, more than doubling over the five year period. The fixed base operators at the Aurora State Airport report that NetJets, Flight Options, Citation Shares, and Flex Jets fractional ownership companies use that airport.

FAA Aerospace Forecasts Fiscal Years 2006-2017 describes aviation trends and forecasts growth in GA aircraft, hours flown, and pilots. Comparing 2005 with 2004, GA aircraft manufacturers reported a 10% increase in shipments, the active GA fleet grew 1.0%, and flight hours increased nearly 3.8%. Single engine piston aircraft grew 0.5% from 2004 to 2005, while turbojet aircraft grew 4.2%. The number of student pilots decreased slightly (0.8%), ending two consecutive years of growth. The total number of pilot certificates declined 1.5% from 2004 to 2005. In 2005, the total number of active pilot certificates was 609,603, GA aircraft hours flown totaled 28.3 million, and the active GA fleet totaled 214,591 aircraft. Two-thirds of the active GA fleet was single engine piston aircraft similar to the type of aircraft based at the Mulino Airport.

The FAA projects 0.9% annual growth in pilots through 2017 and the active GA fleet is projected to grow at an average annual rate of 1.4%.

The business/corporate side of GA is expected to continue growing faster than personal/sport use, benefiting from a growing market for the new, relatively inexpensive (between $1 and $2 million) microjets. The FAA's forecast assumes that 100 microjets, which are also called Very Light Jets (VLJ), will enter the market in 2006, growing to 4,950 aircraft by 2017 (still only 2.3% of all GA aircraft, however). Some believe that the VLJ will revolutionize the aviation industry by supporting true "air taxi" service. In fact, DayJet,[1] a new air taxi operator formed in 2002 in Florida, plans to launch a "per-seat, on-demand" jet service throughout the southeastern U.S. near the end of 2006 using a fleet of Eclipse 500 VLJ[2] aircraft. Other VLJs under development or undergoing certification are the Adam A-700, Safire S-26, and Cessna Mustang.

The FAA also projects high growth for the new category of Sport Aircraft. In 2004 the Sport Pilot Rule was issued, requiring a driver's license rather than a medical certificate, a factor that may draw older pilots back into aviation.

Rotorcraft (helicopters) and fixed-wing turbine aircraft are projected to increase at higher rates than fixed-wing piston aircraft. Increased utilization of aircraft is projected for the future, resulting in higher growth rates for hours flown than for the number of aircraft. **Table 3A** presents the FAA's forecast growth rates for GA aircraft and hours flown.

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[1] www.DayJet.com

[2] Designed for Airport Reference Code B-II (small) aircraft, Mulino Airport's airfield is adequate for the Eclipse 500, which is an Airport Reference Code A-I aircraft.

Table 3A. FAA General Aviation Forecasts, Average Annual Growth Rates through 2017

Aircraft Category		Aircraft	Hours Flown
Total GA		1.4%	3.2%
Total Piston Fixed Wing		0.3%	1.2%
	Single Engine	0.3%	1.2%
	Multi-engine	0.1%	1.1%
Total Turbine Fixed Wing		4.3%	7.5%
	Turboprop	2.2%	1.2%
	Turbojet	6.0%	10.2%
Total Rotorcraft		4.4%	3.9%
	Piston	6.7%	6.8%
	Turbine	2.7%	2.8%
Experimental		1.2%	1.7%
Sport Aircraft		19.5%	21.9%

Note: Average annual growth rates are for the period 2005 through 2017 except for Sport Aircraft. Since Sport Aircraft is a new category of aircraft for the FAA, lacking historical records, the average annual growth rate shown is for the years from 2007 to 2017.
Source: FAA Aerospace Forecasts Fiscal Years 2006-2017, Tables 27 and 28.

REGIONAL AVIATION TRENDS AND FORECASTS

While broad industry trends influence aviation activity at individual airports, regional and local factors may have a greater influence.

The Oregon Aviation Plan[3] describes the following trends that would fuel aviation demand:

- Continued migration into the state – new residents will depend on air transportation to maintain ties with family and friends.
- Population growth in the Portland metro area and the Willamette Valley
- Growth in high-tech industries (export-oriented and high-value products)
- Growth in just-in-time delivery
- Growth in tourism
- Increase in air travel by the general public as it has become increasingly affordable
- An aging population with a large amount of discretionary income.

GA operations in the state have been projected to grow more slowly than commercial operations, 37% from 1999 to 2018, which equates to an average annual growth rate of 1.4%.

Owned and operated by the State of Oregon, the Aurora State Airport is the closest publicly owned airport to Mulino, located eight nautical miles away in Marion County. **The Aurora State Airport Master Plan Update[4] included an unconstrained forecast of 1.3% annual growth in based aircraft, from 256 in 1997 to 345 in 2017.** Aircraft operations were forecast

[3] Oregon Department of Transportation, Aeronautics Division. (2000, February).
[4] W&H Pacific. (2000, October).

using a ratio of 339 operations per based aircraft. The forecast reflected the relative attractiveness of the airport within the region due to:

- excellent ground access via Interstate 5
- facilities that accommodate most GA aircraft and allow instrument approaches
- a wide range of services
- the benefit of facility ownership because hangar development is on private property
- competitive prices for leases, fuel, and other charges.

Troutdale Airport is owned and operated by the Port of Portland and located in Multnomah County, near the Columbia River. The 2004 Troutdale Airport Master Plan Update[5] considered factors such as the potential closure of Evergreen Field in Vancouver and the possible forced reduction of based aircraft at Pearson Airpark. Both of these airports are located nearby in Clark County, Washington. Weather was noted as a factor affecting activity levels at the Troutdale Airport. Columbia River gorge winds provide more visual weather than other Portland area airports, an attractive feature to visual flight rule (VFR) pilots. On the other hand, ice storms can be particularly bad at Troutdale, which discourages pilots. The Troutdale Airport Master Plan Update states that the number of based aircraft at airports within the greater Portland area has increased at an annual rate of 1.9% per year since the late 1980s. It reports that the movement of aircraft between airports is relatively common, based on airport closures, changes in the availability or price of fuel, FBO or maintenance services, flight training, and hangar space. The average number of aircraft operations per based aircraft at Troutdale was 520 between 1998 and 2001. In 2002 Troutdale Airport had 193 based aircraft (92% single engine). According to the FAA's 2006 Terminal Area Forecast, based aircraft at Troutdale grew to 197 in 2003 and then dropped to 177 in 2004, possibly illustrating the movement of aircraft between airports. **The Troutdale Airport Master Plan Update projects that based aircraft will grow at an annual rate of 1.8% through 2022. The aircraft operations forecast is based upon a ratio of 357 operations per based aircraft.**

Hillsboro Airport, located in Washington County, is also owned and operated by the Port. According to the Hillsboro Airport Master Plan Update,[6] the airport had 363 based aircraft (67% single engine) in 2003. Analysis found that the Hillsboro Airport's market share was declining. While aircraft registrations were increasing in Washington County at the highest rate in the metro area, Hillsboro Airport was not capturing all the potential growth in based aircraft. **The forecast for based aircraft growth, 1.4% annually through 2010 and then 1.0% annually from 2011 through 2025**, assumed that Hillsboro Airport would recapture a greater share of the based aircraft in Washington County. A pilot survey conducted for the Master Plan Update found that aircraft owners prefer to base their aircraft close to home or work. The Master Plan Update also notes that privately-owned airports such as Skyport Airport and Stark's Twin Oaks Airport might not be able to stay open long-term.

Airport closures are an issue nationwide. According to the Aircraft Owners and Pilots Association (AOPA), "Public-use airports in the United States are closing at the rate of about one

[5] Aron Faegre & Associates and Century West Engineering. (2004, October).
[6] Coffman and Associates. (2005, June).

every two weeks."[7] Private-use airports are also closing, possibly at an even faster pace, since they typically do not gain revenue from the public through fuel sales, aircraft repair services, hangar rent, or similar sources. There are several factors fueling the trend to close GA airports, particularly those that are privately owned. Liability concerns and insurance costs contribute to airport closures. Urban growth causes the value of the airport land to rise, resulting often in sale of the land for residential and other development. The heirs of airport owners sometimes choose to sell the airport rather than continue its operation. Some retiring airport owners sell to a buyer who plans to redevelop the land rather than accept a lower price from a buyer who wants to continue operating the airport. Encroaching urban growth often erects obstacles in runway approaches or eliminates the feasibility of airport expansion, decreasing the airport's viability. New neighborhoods around airports increase pressure to control or close them because of aircraft noise.

According to ODA records, 17 airports have closed in Oregon in the last ten years. Nearly half the airports that closed, as shown in **Table 3B**, were located in the northwest part of the state. Not listed in Table 3B is Evergreen Field in Vancouver, Washington, just across the Columbia River from Portland, which closed in July 2006. Evergreen Field was home to approximately 165 based aircraft before its closure was announced.

Table 3B. Airport Closures in Northwest Oregon

Year Closed	Airport	County
1997	Cubport	Multnomah
2001	Cubehole	Linn
2001	Hayden Mtn.	Washington
2003	Green River	Linn
2003	Basl Hill Farms Airstrip	Marion
2005	Myers	Washington
2005	S & H Aircraft Painting	Linn
2006	Waynes	Linn

Source: Public and private airport closures provided by ODA, 2006, October.

Fairways Airport, located a mere 6 nautical miles from Mulino Airport, is reportedly going to close soon. Fairways Airport is a privately owned, private-use airport with 31 based aircraft, according to Table 1A in Chapter One. The waiting list for a hangar at the Mulino Airport has grown in the last year; reportedly, one of the reasons for this growth is the potential closure of Fairways Airport. The Port has a list of 37 individuals waiting for a hangar at the Mulino Airport. Three names have been on the list since 1999. The list includes four names from 2004, four from 2005, and 13 added in the first nine months of 2006.

REGIONAL SOCIOECONOMIC TRENDS AND FORECASTS

Aviation activity at an airport is usually tied closely to the local and regional economy. As population around the airport grows, airport activity grows. Aviation activity has also traditionally been linked to employment and income factors because of the discretionary nature of personal and business travel as well as the recreational nature of some GA activity.

[7] *AOPA Pilot*. (2006, October). AOPA Airport Support Network Section.

Mulino Airport is located in Clackamas County, but has a 30-minute service area that extends into four other counties (Washington, Multnomah, Marion, and Yamhill). **Table 3C** presents historical and projected populations for the five-county area. This table also presents average annual growth rates for population.

Table 3C. Historical and Projected Populations

Year	Clackamas County	Marion County	Multnomah County	Washington County	Yamhill County	Total
			Historical			
1970	166,088	151,309	556,667	157,920	40,213	1,072,197
1980	241,919	204,692	562,640	245,808	55,332	1,310,391
1990	278,850	228,483	583,887	311,554	65,551	1,468,325
2000	338,391	284,834	660,486	445,342	85,500	1,814,553
			Projected			
2010	391,536	323,128	711,909	542,678	98,932	2,068,183
2020	460,323	367,018	756,390	660,367	119,011	2,363,109
2030	536,123	410,022	800,565	788,162	141,505	2,676,377
			Average Annual Growth Rates			
			Historical			
1970 - 1980	3.8%	3.1%	0.1%	4.5%	3.2%	2.0%
1980 - 1990	1.4%	1.1%	0.4%	2.4%	1.7%	1.1%
1990 - 2000	2.0%	2.2%	1.2%	3.6%	2.7%	2.1%
			Projected			
2000 - 2010	1.5%	1.3%	0.8%	2.0%	1.5%	1.3%
2010 - 2020	1.6%	1.3%	0.6%	2.0%	1.9%	1.3%
2020 - 2030	1.5%	1.1%	0.6%	1.8%	1.7%	1.3%

Source: Historical Population Data - US Census Bureau, Projected Population Data – Office of Economic Analysis, Department of Administrative Services, State of Oregon, April 2004

Clackamas County has been growing and is projected to grow faster than the five-county area as a whole, although at a slightly slower pace than Washington and Yamhill Counties.

Table 3C depicts how the population in the five-county area has shifted and will shift in the future. In 1970, 52% of the residents in the five-county area lived in Multnomah County; by 2030, it is projected that only 29% will live in Multnomah County. Washington County's share of residents is projected to grow the most, but Clackamas County's will also grow significantly. Clackamas County accounted for 15% of the five-county population in 1970, but its share is projected to grow to 20% by 2030.

Higher income usually correlates with GA activity. In the five-county region, Clackamas County has the highest per capita personal income, as shown in **Table 3D**.

Table 3D. Per Capita Personal Income History, Five Counties, OR, and the U.S.

County	1980	1990	2000	Annual Growth 1980-2000
Clackamas County	$11,395	$20,865	$36,556	6.0%
Multnomah County	$11,381	$20,770	$32,329	5.4%
Washington County	$11,983	$20,969	$33,178	5.2%
Marion County	$9,602	$16,832	$24,439	4.8%
Yamhill County	$9,437	$16,049	$24,364	4.9%
State of Oregon	$10,113	$18,010	$28,097	5.2%
U.S.	$10,114	$19,477	$29,845	5.6%

Source: US Bureau of Economic Analysis, 2006

From 1970 to 2000, the total number of people employed within Clackamas County grew twice as fast as the population growth in the County, from 48,979 to 190,727. This strong employment growth in the county could mean increased business aviation activity at airports located there. An indication of the growth and diversification of employment within the County is the current construction of an 87-acre heavy-industrial park in Molalla; anticipated tenants include an industrial plastic recycling plant and a manufacturer of medical devices.[8]

Table 3E shows that Clackamas County residents have a slightly higher than average propensity to own aircraft, compared to the five-county area as a whole. Proportionately, significantly more Clackamas County residents own aircraft than Washington, Multnomah, or Marion County residents. Low density development, residential airparks, higher-than-average income, and the proximity of outdoor recreation opportunities may all contribute to the popularity of general aviation in Clackamas County.

Table 3E. Comparison of Population and Aircraft Registration

Area	Population	Registered Aircraft	Registered Aircraft per 1,000 Population
Clackamas County	361,300	872	2.4
Washington County	489,785	798	1.6
Multnomah County	692,825	1,147	1.7
Marion County	302,135	542	1.8
Yamhill County	90,310	413	4.6
Five-County Totals	1,936,355	3,772	1.9
State of Oregon Totals	3,631,440	9,385	2.6

Source: Population as of 2005, estimated by Portland State University's Population Research Center. Registered aircraft data from FAA Civil Aviation Registry, October 14, 2006.

In recent years, unemployment in Oregon has been higher than the U.S. as a whole. In July 2006, the unemployment rate was 5.3%, compared to 4.8% for the U.S. The unemployment rate in the Portland-Vancouver-Beaverton metropolitan statistical area (MSA) was also 5.3%. In contrast, unemployment in Clackamas County was 4.9%, indicating the relative strength of its economy within the metro area. For the last 20 years or so, Oregon has been moving from a resource-based economy to a more mixed manufacturing and marketing economy, with an

[8] Oregon Employment Department, (2005, September).

emphasis on high technology. The high-tech sector has grown in the Portland metro area, while more rural parts of the state have been less successful at changing to a new economy.[9] Molalla, the closest incorporated town to the Mulino Airport, is typical of many small communities whose economic base has been shifting from the timber industry.

In spite of the fact that Portland is the state's largest urban area, agriculture is a significant part of the Portland metro area economy, accounting for 25% of the state's total agricultural sales in 2005. Specialty products are the driving force for agriculture's success. Clackamas County leads the metro area in agricultural sales revenue ($361.9 million). The County has a strong nursery industry and is the state's top producer of Christmas trees (with 1,670 acres devoted to growing this particular crop). The county is also Oregon's second largest producer of chicken eggs, and is a significant producer of fruits and berries. Clackamas County has 46,000 acres planted in crops. The most predominant crops are hay and forage.[10]

As of July 2006, total non-farm employment (seasonally adjusted) in the Portland-Vancouver-Beaverton MSA was 1,006,900, representing 95% of total employment. Of these non-farm jobs, 87% were in private industry and 13% were in federal, state, or local government. The leaders in private industry jobs were trade, transportation, and utilities (201,200 jobs), professional and business services (135,100 jobs), manufacturing (128,200 jobs), and educational and health services (118,800 jobs).

BASED AIRCRAFT FORECAST

The based aircraft forecast begins by presenting historical numbers of based aircraft. Then, various forecast models prepared for the Airport are analyzed and the preferred forecast for based aircraft and fleet mix through 2027 is presented.

Historical Based Aircraft Data

Table 3F indicates historical numbers of based aircraft from 1984 through 2006, as reported in the FAA's 2006 Terminal Area Forecast and updated by the Port.

All of the aircraft based at the Airport are single engine piston. Records show that up to two multi-engine aircraft have been based at the Airport at one time. Until recently the Civil Air Patrol based two gliders at the Airport, but they were destroyed in 2005.[11]

[9] Oregon Bluebook. Retrieved 10/16/06 at http: Bluebook.state.or.us/facts/economy.
[10] Oregon Employment Department. (2006, September). *Workforce Analysis, Portland Trends*.
[11] The Civil Air Patrol hopes to obtain a glider and tow plane soon, so they can reinstate cadet orientation rides at Mulino Airport (an estimated 960 annual aircraft operations).

Table 3F. Historical Based Aircraft at Mulino Airport

Year	Based Aircraft	Year	Based Aircraft
1984	39	1996	57
1985	39	1997	57
1986	39	1998	57
1987	39	1999	53
1988	39	2000	53
1989	39	2001	53
1990	39	2002	53
1991	30	2003	53
1992	30	2004	42
1993	30	2005	40
1994	30	2006*	40
1995	45		

**Partial calendar year figure with no significant changes anticipated through year-end.*
Source: 1984-2004, FAA Terminal Area Forecasts, 2006. 2005 – 2006, Port of Portland

Based Aircraft Forecast Through 2027

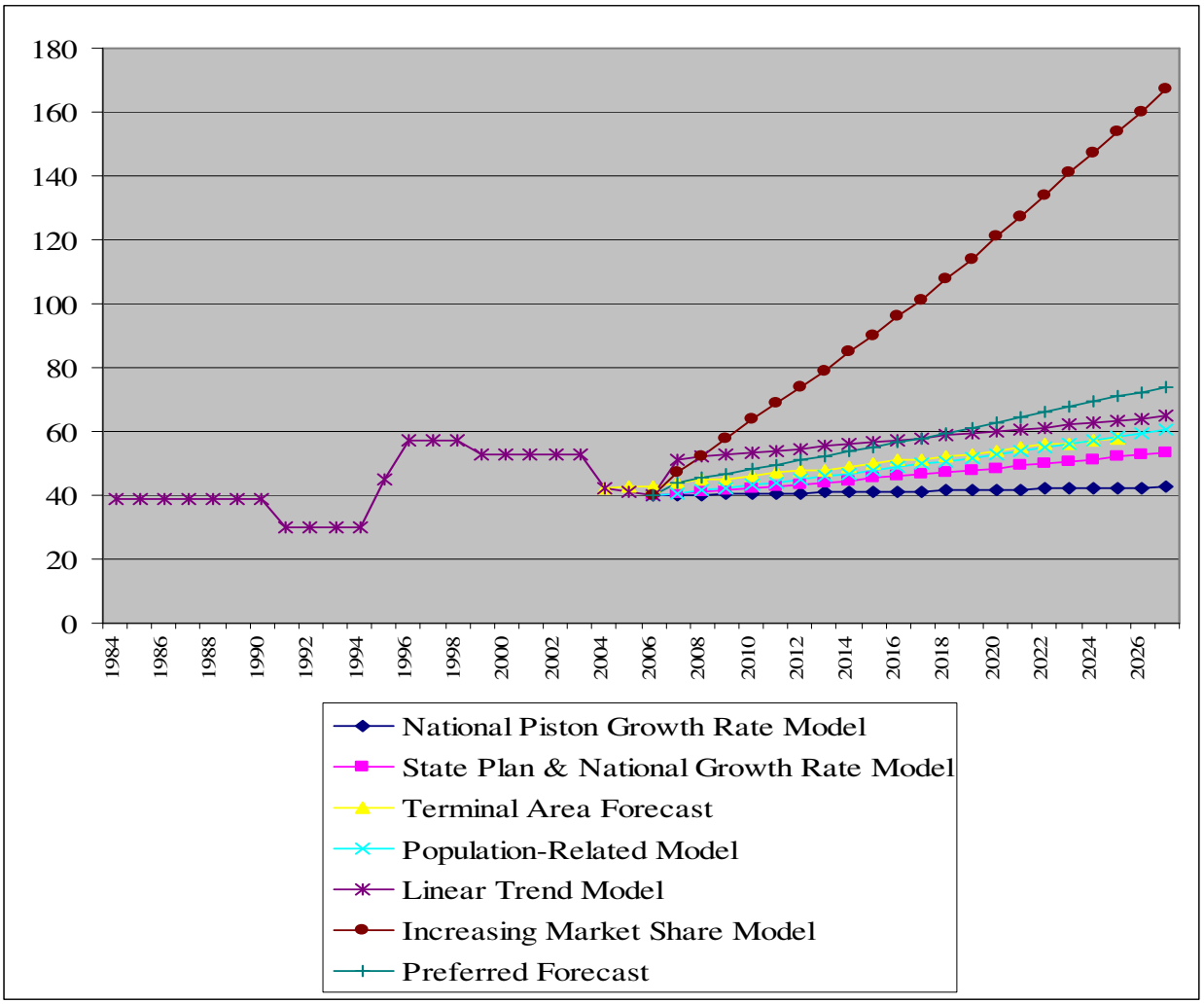
Six different forecasts or forecasting models were developed to provide a range of the possible numbers of based aircraft. The average annual growth rates for these six models ranged from 0.3% to 7.0%, as shown in **Table 3G**. Each forecast is described in the paragraphs to follow. **The preferred forecast was derived by a simple averaging of the six possible forecasts, which resulted in an average annual growth rate of 3.0%.** All six and the preferred forecast are described and evaluated below, and the reason for selecting the preferred forecast is explained. **Exhibit 3A** graphically compares these forecasts. While the exhibit presents the forecasts as increasing year-by-year according to average growth rates, actual growth will occur in steps, as hangars are constructed and made available for based aircraft.

Table 3G. Comparison of Based Aircraft Forecasts

Year	National Piston Growth Rate Model	State Plan & National Growth Rate Model	Terminal Area Forecast	Population-Related Model	Linear Trend Model	Increasing Market Share Model	Preferred Forecast
2006	40	40	43	40	40	40	40
2012	41	43	48	45	55	74	51
2017	41	47	51	50	58	101	58
2027	43	54		61	65	167	74
Annual Growth	0.3%	1.4%	1.5%	2.0%	2.3%	7.0%	3.0%

Source: W&H Pacific, 2006.

Exhibit 3A. Graphic Comparison of Based Aircraft Forecasts



Source: W&H Pacific, 2006.

National Piston Growth Rate Model (0.3% Average Annual Growth)

All the airplanes based at the Mulino Airport now and in the past have been piston-powered. It is reasonable to assume that the based aircraft at the Mulino Airport may grow at the rate forecast for piston airplanes nationwide, shown in Table 3A. However, this model does not take into consideration that the population in Clackamas County is projected to grow faster than the U.S. population (1.5% annually compared to 1.0%). Also, it does not take into consideration the possibility of airplanes moving from nearby airports that are either closing or at capacity.

State Plan & National Growth Rate Model (1.4% Average Annual Growth)

The average annual growth rate for GA in the Oregon Aviation Plan is the same as the FAA's projected growth rate for the national GA fleet shown in Table 3A. One potential problem with this model is that local influences on the number of based aircraft at the Mulino Airport are not considered.

Terminal Area Forecast (1.5% Average Annual Growth)

The FAA's Terminal Area Forecast for the Mulino Airport, prepared in 2006, shows 1.5% annual growth from 2004 (its base year) to 2025. (Coincidentally, 1.5% annual growth is the rate projected for Clackamas County population in Table 3C.) Mulino's Terminal Area Forecast is based upon the forecasts prepared in the 1993 Master Plan Update. The reasoning behind the forecast is nearly 15 years old and may need updating.

Population-Related Model (2.0% Average Annual Growth)

The population of Clackamas County is projected to grow at a rate that is 50% higher than that for the nation (average annual growth of 1.5% compared to 1.0%). Because of this, it is reasonable to expect that GA aircraft would increase at a faster pace in the Mulino Airport vicinity than in the nation as a whole (1.4% per year). Based aircraft at the Mulino Airport might reasonably be expected to grow 2.0% per year because of the faster regional population growth.

Linear Trend Model (2.3% Average Annual Growth)

The linear trend model projects a straight-line continuation of the historical trend into the future. Future growth consistent with the historical trends is likely limited without additional hangar development. With the planned hangar expansion; however, growth may not be limited by lack of hangar storage.

Increasing Market Share Model (7.0% Average Annual Growth)

This forecast model assumes that the closure and constraints on privately owned airports in the Mulino service area will result in some shifting of based aircraft from privately owned airports to the Mulino Airport. Within approximately a half-hour drive of the Mulino Airport are 21 airports. Mulino and these 21 airports have a combined 669 based aircraft. The full list of airports and their based aircraft are in Tables 1A and 1B of Chapter One. Other than Mulino, the major airports are Aurora State (387 aircraft), Lenhardt Airpark (59 aircraft), Valley View (33 aircraft), Dietz Airpark (32 aircraft), Fairways Airport (31 aircraft), and Workman Airpark (27 aircraft). The Increasing Market Share Model assumes the number of aircraft in the Mulino Airport service area will grow at an average annual rate of 1.3%. This growth rate matches the growth rate forecast for Aurora State Airport. It is slightly lower than population growth projected in Clackamas County (1.5%) and slightly lower than national growth projected for the GA fleet (1.4%). Using a lower rate is reasonable because of the preponderance of single engine piston aircraft, which are projected to grow much more slowly than other types of GA aircraft. Of the total 669 aircraft based at the 22 airports, 87% are single engine piston aircraft.

The Increasing Market Share Model adopts the 1.3% annual growth rate from the Terminal Area Forecast for Aurora State Airport, which was based on its Master Plan Update. The forecast model applies this growth rate to the total number of based aircraft in the service area, and also assumes that every year two aircraft (on average) are relocated to the Mulino Airport from another airport in the service area. Relocations would be due primarily to closure and constraints at privately owned airports within the service area. **Table 3H** presents the resulting forecast for the service area. According to this forecasting model, the Aurora State Airport would retain 60% of the based aircraft in the service area through 2027, while the Mulino Airport's share would grow from 6% to 19%. The resultant growth of the Mulino Airport to 167 aircraft in 2027 represents a high average annual growth rate of 7.0%. However, this forecast model might not

overstate the growth potential, considering the fact that there is currently a waiting list of 37 people for a hangar at the Mulino Airport and considering the potential impact of building new hangars and making fuel available.

Table 3H. Potential Service Area Forecast

Year	Aurora State Airport	Mulino Airport	20 Other Service Area Airports	Total
2006	398	40	231	669
2012	430	74	219	723
2017	461	101	209	771
2027	521	167	189	877
Annual Growth	1.3%	7.0%	-0.9%	1.3%

Preferred Forecast (3.0% Average Annual Growth)

The average of the previous forecasts represents a 3.0% average annual growth rate from 40 based aircraft to 74 aircraft in 2027—a reasonable scenario for planning airport development. The Increasing Market Share Model's annual growth rate of 7% seems unreasonably high. On the other hand, the other forecast rates of 0.3% to 2.3% annual growth are based on no change in the Mulino Airport's market share. The preferred forecast addresses the likelihood that one or more privately owned airports in the service area will be closed or capacity constrained in the future. One airport user projected approximately 10 aircraft would relocate from Fairways Airport to Mulino Airport in 2007 if the hangars were available. If this occurs, and then 2.0% annual growth (same rate as projected population growth) occurs after 2007, the number of based aircraft in 2027 would be 74, the same number that results from a 3.0% annual growth rate applied to the 2006 number of based aircraft.

Consistent with the strategic analysis presented in Chapter One, the fleet mix of aircraft will not change appreciably. **Table 3I** presents the based aircraft fleet mix forecast. The forecast includes a small number of multi-engine aircraft in the future. Multi-engine aircraft have been based at the Airport in the past. The Airport's ability to accommodate aircraft with wingspans up to 79 feet should be attractive to the owners of multi-engine aircraft, which tend to be larger than single engine aircraft.

Table 3I. Preferred Based Aircraft Fleet Mix Forecast

Year	Single Engine	Multi-engine	Total
2006	40	0	40
2012	50	1	51
2017	56	2	58
2027	71	3	74

Source: W&H Pacific, 2006.

AIRCRAFT OPERATIONS FORECAST

This section begins with a review of historical trends in aircraft operations. Previous aircraft operations forecasts are reviewed and the preferred aircraft operations forecast is explained and presented. Other forecast information presented in this section includes operations fleet mix, critical aircraft and Airport Reference Code, local vs. itinerant operations, and peak activity.

Historical Aircraft Operations Data

Table 3J presents the history of annual aircraft operations according to the FAA's Terminal Area Forecast. Operations are divided into two basic categories: itinerant and local. Local operations are defined as touch-and-go, or training operations, as well as any other operations that stay within 20 miles of the Airport. All other operations are categorized as itinerant. Another distinction for aircraft operations at the Mulino Airport is that they occur in either GA or air taxi aircraft. Air taxi aircraft operations are chartered, for-hire, passenger-carrying commercial flights.

Table 3J. Historical Aircraft Operations

	Itinerant Operations			Local Operations			
Year	Air Taxi	GA	Total	GA	Military	Total	Total Operations
1980	0	7,000	7,000	20,000	0	20,000	27,000
1981	75	7,000	7,075	20,000	0	20,000	27,075
1982	75	11,000	11,075	11,000	0	11,000	22,075
1983	0	4,200	4,200	12,000	0	12,000	16,200
1984	100	4,200	4,300	12,000	0	12,000	16,300
1985	100	4,200	4,300	12,000	0	12,000	16,300
1986	100	4,200	4,300	12,000	0	12,000	16,300
1987	100	4,200	4,300	12,000	0	12,000	16,300
1988	0	4,681	4,681	13,460	0	13,460	18,141
1989	100	4,200	4,300	10,000	0	10,000	14,300
1990	100	4,200	4,300	12,000	0	12,000	16,300
1991	100	6,000	6,100	9,000	0	9,000	15,100
1992	100	4,200	4,300	12,000	0	12,000	16,300
1993	100	4,200	4,300	12,000	0	12,000	16,300
1994	100	4,200	4,300	12,000	0	12,000	16,300
1995	100	4,200	4,300	12,000	0	12,000	16,300
1996	100	19,200	19,300	12,800	0	12,800	32,100
1997	100	19,517	19,617	13,012	0	13,012	32,629
1998	100	19,850	19,950	13,234	0	13,234	33,184
1999	100	20,199	20,299	13,467	0	13,467	33,766
2000	100	20,548	20,648	13,700	0	13,700	34,348
2001	100	20,490	20,590	13,661	0	13,661	34,251
2002	100	20,853	20,953	13,903	0	13,903	34,856
2003	100	21,217	21,317	14,145	0	14,145	35,462
2004*	100	21,577	21,677	14,385	0	14,385	36,062
2005**	100	21,941	22,041	14,627	0	14,627	36,668
2006**	100	22,304	22,404	14,870	0	14,870	37,274

**Does not match annual operations from FAA's Airport Master Record (5010 Form) for 2004, which is 21,300.*
***Forecast numbers from Terminal Area Forecasts, FAA, 2006*
Source: Terminal Area Forecasts, FAA, 2006.

The 2006 estimate of 37,274 annual aircraft operations in Table 3J may be inaccurate. The FAA's Airport Master Record (5010 Form with 9/10/04 inspection date) reported 21,300 operations for the 12 months preceding August 31, 2004. The Airport Master Record number is considerably lower than the number for 2004 in the Terminal Area Forecast (36,062 operations). Besides being inconsistent with each other, the operations numbers from the Airport Master Record and the Terminal Area Forecast have been criticized as being overstated. Annual operations of 21,300 or 37,274 seem high for a GA airport with only 40 based aircraft and no flight school. However, there is no way to determine a more correct number, short of documenting actual activity over the course of a full year.

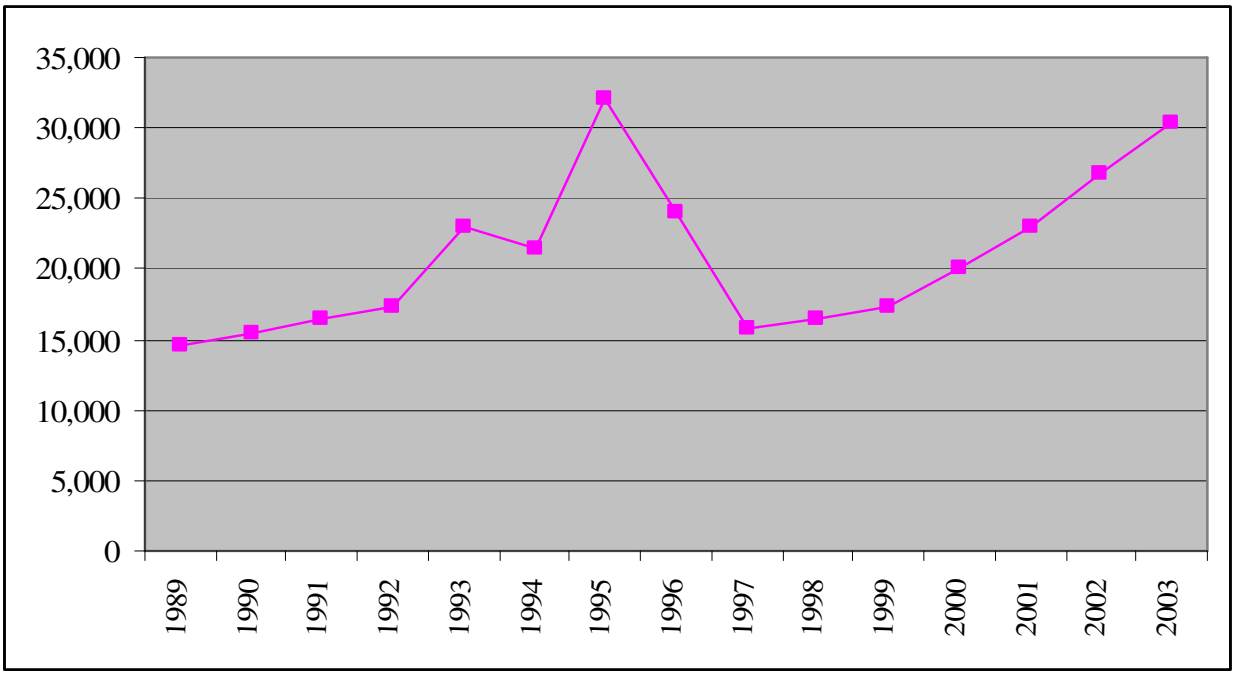
It is difficult to measure aircraft operations at airports lacking air traffic control towers and even harder at unattended airports (no fixed base operator). For such airports, the numbers of annual aircraft reported in the FAA's Terminal Area Forecast are usually based on numbers reported in FAA Airport Master Records (5010 Forms), although this does not appear to be the case in 2004. Airport Master Records are not updated every year and the numbers reported on Airport Master Records are often estimates by airport management. The source of the operations numbers for the Mulino Airport may have been derived from the ODA's RENS Aircraft Activity Counter Program, as detailed below.

The ODA periodically places an acoustical counter, which records the sound of aircraft takeoffs, at non-towered airports around the state. Annual aircraft operations are then estimated based on the sampling. Occasionally the counter records sounds other than aircraft or fails to record an aircraft operation. In addition, the sample period may not reflect average activity, leading to a faulty estimation of annual operations. Nevertheless, the acoustical counter records help understand the level and trends of aircraft operations. Counter records for the Mulino Airport, shown in **Exhibit 3B**, indicate that operations grew from around 15,000 in 1989 to more than 30,000 in 1995. They dropped down to approximately 15,000 in 1997. Since 1997, operations have risen fairly steadily to over 30,000 in 2003. The dramatic increase in operations between 1994 and 1995 (from 21,470 to 32,138) may be due to the fact that 1995 was the first year that the counts included rotary aircraft.

The acoustical counter records in Exhibit 3B do not match the Terminal Area Forecast operations in Table 3J. For example, Exhibit 3B shows operations derived from the acoustical counter increased 50% between 1994 and 1995, a period of no operations growth according to Table 3J. However, Table 3J shows a doubling of operations between 1995 and 1996. Possibly the acoustical counter data's increase in operations in 1995 was attributed to helicopter activity that had not been acoustically counted in previous years, and an increase was reported a year later in the Terminal Area Forecast.

In spite of their differences, both the Terminal Area Forecast and acoustical counter records show operations growing since 1997, a period in which the number of based aircraft declined. This is most likely due to an increasing amount of traffic by transient aircraft rather than more operations by based aircraft. Since the number of based aircraft declined while the number of operations grew, the number of operations by based aircraft would have to grow to an unreasonably high number if there were no increase in transient aircraft operations.

Exhibit 3B. Historical Aircraft Operations - Acoustical Counter Records



Note: 1990, 1991, 1996, 1998, 2000, and 2002 operations were interpolated between years when acoustical counting occurred.
Source: ODA RENS Aircraft Activity Counter Program.

Other measures of activity were sought to identify trends in traffic levels at the Airport. The amount of fuel sold over a period of time is often used, but it is not applicable to Mulino because no fuel is sold at the Airport. The number of breakfasts sold at the annual pancake breakfast fly-in that the Oregon Pilots Association sponsors every June measures activity at the fly-in, which is Mulino Airport's busiest time. The Oregon Pilots Association, Mulino Chapter, reports a steady increase in the number of breakfasts sold from 1,150 in 2002 to 1,375 in 2006, although it is possibly due to an increase in drive-in participation instead of fly-in participation:

Aircraft Operations Forecast Through 2027

The national FAA forecasts presented in Table 3A indicate that GA aircraft usage will increase. While the fleet is projected to grow 1.4% per year, hours flown are projected to grow 3.2% per year. For the piston fleet, the hours flown are projected to grow 1.2% annually, while the number of piston aircraft is projected to grow only 0.3% annually. Based upon these differences in growth rates, it would be logical to assume that aircraft operations will grow at a higher rate than based aircraft nationally.

On the other hand, dividing 2006 operations by the number of based aircraft results in an average of 932 operations per based aircraft. This is a very high ratio of operations to based aircraft. The FAA has recommended using 450 operations per based aircraft to estimate operations at very busy reliever airports. Rural/remote airports with little itinerant traffic should have about 250 operations per based aircraft. Comparing the historical aircraft operations and based aircraft records in Tables 3J and 3F, respectively, the Mulino Airport's operations per based aircraft ratio

has been as low as 367 (in 1989) and has averaged 568 since 1984. Looking at the nine years of RENS operations counts available between 1989 and 2003, the ratio of operations per based aircraft has been as high as 765, as low as 276, and has averaged 529.

Table 3K presents three forecasts for aircraft operations. The FAA's Terminal Area Forecast was based upon the 1993 Mulino Airport Master Plan Update. It projects an average annual growth of 1.5% through 2025. The Linear Trend Forecast projects a straight-line continuation of the historical trend for each component of aircraft operations, resulting in the following growth rates:

Air taxi	+2.2% average annual growth
GA itinerant	+2.7% average annual growth
GA local	-0.6% average annual growth
Total operations	+1.6% average annual growth

The preferred forecast does not depend upon the accuracy of the 2006 operations number reported in the Terminal Area Forecast, as the Linear Trend Forecast does. **Instead, the preferred aircraft operations forecast uses the historical 23-year average of 568 operations per based aircraft. By using the historical average of 568 operations per based aircraft, there is some continuity with historical records of operations.** While a ratio of 350 operations might be more consistent with general FAA guidance (between the 250 operations per based aircraft expected at a rural/remote airport with little itinerant traffic and the 450 operations per based aircraft expected at a busy reliever airport), it would probably understate operations. Understating numbers of operations would be a serious concern when they are used to determine noise exposure. In addition, the RENS acoustical count estimates that are available for nine years average 529 operations per based aircraft, which is close to the historical Terminal Area Forecast average of 568.

To project annual operations in the future, the based aircraft forecast numbers from Table 3I were multiplied by 568. **Because the 568 operations per based aircraft ratio is much lower than the single-year 2006 ratio of 932 operations per based aircraft, the preferred aircraft operations forecast shows a decline in operations from 2006 to 2012, and only 0.6% average annual growth from 2006 to 2027.** The reduced operations between 2006 and 2012 result in smaller noise contours for the Airport, as is indicated in the drawing in Chapter 7.

Table 3K. Comparison of Aircraft Operations Forecasts

Year	Terminal Area Forecast	Linear Trend	Preferred Forecast
2006	37,274*	37,274*	37,274*
2012	40,697	40,199	28,968
2017	43,789	44,275	32,944
2027	-	52,426	42,032
Average Annual Growth	1.5%	1.6%	0.6% from 2006 – 2027 2.5% from 2012 – 2027

**The accuracy of the base year (2006) operations figure is questionable; a more accurate number may be 21,300, the number reported for 2004 in the FAA's Airport Master Record (5010 Form).*
Source: W&H Pacific, 2006, except 2006 figures and figures in Terminal Area Forecast column are from Terminal Area Forecast, FAA, 2006.

Very likely, the 2006 operations number reported in the Terminal Area Forecast and shown in Table 3K is much higher than reality. If 2006 operations are actually closer to the 21,300 operations reported for 2004 in the Airport Master Record, the preferred forecast for operations would show growth rather than decline between 2006 and 2012. For the years after 2006, the preferred forecast for operations shows growth comparable to the preferred forecast for based aircraft, since it is derived from the based aircraft forecast.

Table 3L presents the breakdown of the preferred forecast for aircraft operations. Following the table is an explanation of how the breakdown was determined.

Table 3L. Preferred Aircraft Operations Forecast

Year	Air Taxi	GA Itinerant	GA Local	Total
2006	100	22,304	14,870	37,274
2012	121	17,308	11,539	28,968
2017	141	19,682	13,121	32,944
2027	194	25,103	16,735	42,032

Source: W&H Pacific, 2006.

Air taxi operations have been listed as 100 per year since 1989. One of the national trends that is expected to affect the Mulino Airport is a significant increase in air taxi aircraft operations. Air taxi operations are projected to increase at 3.2% annually, which is the FAA's forecast increase for air taxi aircraft hours flown (the same as GA aircraft hours flown in Table 3A). Despite this growth, air taxi aircraft operations will represent less than 0.5% of total operations in 2027.

The reported split between itinerant and local operations has been 60% itinerant and 40% local for the last ten years. The preferred forecast assumes future GA operations will be similarly divided between itinerant and local.

The Airport has no air carrier or military aircraft operations now, and it is assumed this will be the case over the planning period. The Airport's ARC B-II airfield is not adequate for use by air carrier aircraft, which seat over 60 passengers and are typically ARC C-III and larger. Military aircraft use other airports in the metro.

Operations Fleet Mix

Many transient aircraft use the Mulino Airport today and this situation is not anticipated to change in the future. Because of transient aircraft traffic, the fleet mix for aircraft operations is not the same as the fleet mix for based aircraft. For example, while there are no helicopters based at the Airport, there are many helicopter operations occurring there. Helicopter training from flight schools in Hillsboro and Aurora occurs often at the Mulino Airport. Less frequently, helicopter operations for medevac and firefighting occur at the Airport.

None of the air taxi aircraft operating at the Airport are based there. Some of the estimated air taxi operations are by air ambulances and others are chartered for business or recreation purposes. Generally, air taxi aircraft are larger and faster than the single engine piston aircraft based at the Airport.

Table 3M presents the estimated current (2006) and projected future operations fleet mix. The current fleet mix was estimated from surveys and interviews with Airport users. Table 3M indicates that current operations include single and multi-engine piston aircraft, turboprops, and helicopters. In the future, it is projected that air taxi and GA aircraft using the Airport will include more turboprops, such as the King Air models, and eventually even some turbojet aircraft, such as the new VLJs, which will be comparably priced. The first certificated VLJ, the Eclipse 500, is categorized Airport Reference Code A-I and is well below 12,500 pounds takeoff weight. The Mulino Airport airfield can easily accommodate the Eclipse 500, and it is likely that a few VLJ operators will use the Mulino Airport to access destinations in the local area. However, throughout the forecast period, the Aurora State Airport's location, facilities, and services will continue to be more attractive to turbojet operators and their passengers than the location, facilities, and services at the Mulino Airport.

Table 3M. Preferred Operations Fleet Mix Forecast

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Helicopter
2006	86.6%	1.1%	0.3%	0.0%	12.0%
2012	86.0%	1.5%	0.5%	0.0%	12.0%
2017	86.0%	1.0%	1.0%	0.0%	12.0%
2027	85.5%	1.0%	1.0%	0.5%	12.0%

Source: W&H Pacific, 2006.

Critical Aircraft and Airport Reference Code

Based upon the estimated operations fleet mix in Table 3M for 2006, there are slightly over 500 annual operations in multi-engine piston (410) and turboprop aircraft (119) now. By 2027, the annual number of operations by multi engine piston, turboprop and turbojet aircraft is projected to reach 1,050 (2.5% of 42,032). For existing and future conditions, the Beech King Air represents the critical design aircraft--Airport Reference Code B-II and 12,500 pounds maximum takeoff weight.

Peak Demand Forecast

As airport activity often fluctuates from month to month, day to day, and hour to hour, airfield and landside facilities are traditionally designed to accommodate reasonable peak levels of use. Interviews with Mulino Airport users have resulted in some consensus about the peaks and valleys of airport use. The Airport is busier in the summer than in the winter, and it is busier on the weekends than during the week.

In preparing the peak demand forecast, it was useful to compare Mulino with other airports in the area. Peak activity characteristics are available for Troutdale and Aurora State Airports in their most recent Master Plan Updates. Troutdale's peak activity characteristics are especially useful because they were determined by air traffic control data. Their based aircraft fleet mix and the type of activities that occur there are also somewhat similar to Mulino.

- An estimated 12% of annual operations are projected to occur during the peak summer month. This is about the same proportion as occurs at Troutdale Airport (11.7%). It is higher than Aurora State Airport (10%), but this is to be expected, since Aurora State has more business traffic, which is less seasonal than recreational traffic.
- The design day operations are the peak month operations divided by 31 days.
- The peak hour is estimated to be 20% of the design day. At Aurora, it is 11% of the design day. Unlike Mulino, Aurora State Airport's operations occur at night as well as during the daytime. Troutdale's Master Plan Update reports 19.71% of peak day operations occurring in the peak hour.

Table 3N presents the operations forecasts resulting from peak demand factors described above.

Table 3N. Preferred Peak Operations Forecast

	2012	2017	2027
Annual Operations	28,968	32,944	42,032
Peak Month	3,476	3,953	5,044
Design Day	112	128	163
Peak Hour	22	26	33

Source: W&H Pacific, 2006.

SUMMARY OF FORECASTS

The long term growth of the Airport will be influenced by national and regional trends outlined within this chapter. The elements of the aeronautical activity forecast for the Mulino Airport are summarized in **Table 3O**. The FAA, as documented in **Appendix G**, has approved the aeronautical activity forecast.

With this forecast data, the next step in the master planning process is to calculate the ability of existing facilities to meet the forecasted demand. Additionally, the next chapter will identify needed enhancements of airside and/or landside facilities to accommodate forecasted demand.

Table 3O. Summary of Preferred Mulino Airport Aeronautical Activity Forecasts

Forecast Element	2006	2012	2017	2027
BASED AIRCRAFT				
Single Engine Piston	40	50	56	71
Multi-engine Piston	0	1	2	3
Total	40	51	58	74
AIRCRAFT OPERATIONS				
Air Taxi	100	121	141	194
GA Itinerant	22,304	17,308	19,682	25,103
GA Local	14,870	11,539	13,121	16,735
Total	37,274	28,968	32,944	42,032
OPERATIONS FLEET MIX				
Single Engine Piston	32,274	24,912	28,332	35,937
Multi-engine Piston*	400	435	329	420
Turboprop	100	145	329	420
Turbojet	0	0	0	210
Helicopters	4,500	3,476	3,953	5,044
Total	37,274	28,968	32,944	42,032
PEAK DEMAND (OPERATIONS)				
Peak Month	4,473	3,476	3,953	5,044
Average Day/Peak Month	144	112	128	163
Peak Hour	29	22	26	33

**Multi-engine Piston operations decline from 2012 to 2017 because their share of the operations mix declines from 1.5% to 1.0%, as shown in Table 3M. Their share of the operations mix stays at 1.0% between 2017 and 2027 and so the number of multi-engine operations grows from 2017 to 2027 because total operations are projected to grow.*
Source: W&H Pacific, 2006.

Chapter Four
AIRPORT FACILITY REQUIREMENTS

In this chapter, existing airport facilities are evaluated to identify their functionality, condition, compliance with design standards, and capacity to accommodate demand projected in Chapter Three.

The objective of this effort is to identify, in general terms, what facilities are needed and the adequacy of the existing airport facilities in meeting those needs. Where differences between existing and needed facilities are noted, this chapter will identify when those additional facilities may be needed. Once the facility requirements have been established, alternatives for providing these facilities will be created.

BACKGROUND

Airport Planning and Development Criteria

Airport planning and development criteria are often defined by both federal and state agencies. The FAA provides specific guidance concerning dimensional standards whereas many state agencies provide generalized guidance based on facilities offered and aircraft activity levels. Both sets of planning criteria are discussed below.

The Oregon Department of Aviation (ODA) has created general guidelines for airport planning and development based on the roles, or categories, of airports within the statewide system. Five unique categories were created, each with its own set of performance criteria. However, new

categories will be added soon. This may necessitate an "earlier than later" reexamination of this master plan update. The categories are based on several factors including the Airport's function, the type and level of activity at the Airport, and the facilities and services available. The categories are:

- Category 1 – Commercial Service Airports
- Category 2 – Business or High Activity General Aviation Airports
- Category 3 – Regional General Aviation Airports
- Category 4 – Community General Aviation Airports
- Category 5 – Low Activity General Aviation Airports

As mentioned in Chapter One, *Strategic Analysis*, the Mulino Airport is classified as Category 4 - Community General Aviation Airport. The function of this category is to accommodate general aviation users and local business activities. This category includes all airports that have at least 2,500 annual operations or more than 10 based aircraft. Category 4 airports are designed to accommodate light single and multi-engine aircraft weighing 12,500 pounds and less. ODA recommends that this type of airport also should include services such as aviation fuel and aircraft maintenance, and should have airfield lighting and basic navigational aids.

The FAA specifies design standards by Airport Reference Code (ARC) and instrument approach visibility minimums. In the previous chapter, it was determined that the critical aircraft at Mulino for purposes of airport design is the Beech King Air, which has an ARC of B-II (small).

The Airport does not currently have an instrument approach and the runway is classified as visual. For determining airport design criteria, instrument approach visibility minimums are divided into three categories:

- Visual and not lower than one-mile
- Not lower than ¾-mile
- Lower than ¾-mile

The Port and several Airport users have indicated that an instrument approach procedure at the Mulino Airport would be desirable. New technology allows instrument approaches using the Global Positioning System (GPS) to be implemented at a minimal cost, in terms of navigational aids and cockpit equipment. For many small general aviation airports, however, the cost of upgrading facilities (*e.g.*, larger safety area, installing lights) to the minimum requirements for the different approach visibility categories is a significant constraint to establishing an instrument approach. This chapter presents the requirements of all the different instrument approach visibility minimums, to aid in assessing the feasibility of an instrument approach, considering existing constraints.

AIRFIELD REQUIREMENTS

As discussed in Chapter Two, airfield facilities are those that are related to the arrival, departure, and ground movement of aircraft. Airfield facility requirements are addressed for the following areas:

- Airfield Capacity
- Airfield Design Standards
- Runway Orientation, Length, Width, and Pavement Strength
- Taxiways
- Airport Visual Aids
- Airport Lighting
- Radio Navigational Aids & Instrument Approach Procedures
- Helicopter Facilities
- Other Airfield Recommendations

Airfield Capacity

A demand/capacity analysis measures the capacity of the airfield configuration by determining its Annual Service Volume (ASV). This measure is an estimate of an Airport's maximum annual capacity based on factors such as aircraft mix and weather conditions, among others. FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*, provides guidance on determining an airport's ASV. The annual capacity of a single runway configuration with a parallel taxiway is approximately 230,000 operations (takeoffs, landings, and training operations). The forecast projects annual operations of 42,032 by 2027 - well below the maximum capacity of the existing airfield system.

In addition to ASV, *Airport Capacity and Delay* also provides guidance on determining peak hour capacity. For the Mulino Airport, the peak hourly capacity during VFR conditions is 98 operations. The forecast projects peak hour operations of 33 by 2027 (only 34% of the VFR hourly capacity). Therefore, the Airport is expected to have sufficient hourly capacity throughout the 20 year planning period.

Airfield Design Standards

FAA AC 150/5300-13, *Airport Design,* sets forth the FAA's recommended standards for airport design. A few of the more critical design standards are those for runways and the areas surrounding runways, including:

- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Obstacle Free Zone (OFZ)
- Runway Protection Zone (RPZ)

The RSA is a defined surface surrounding the runway that is prepared or suitable for reducing the risk of damage to airplanes in the event of an airplane undershoot, overshoot, or an excursion from the runway.

The OFA is an area on the ground centered on the runway or taxiway centerline that is provided to enhance the safety of aircraft operations. No above ground objects are allowed except for those that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

The OFZ is a volume of airspace that is required to be clear of objects, except for frangible items required for navigation of aircraft. It is centered along the runway and extended runway centerline.

The RPZ is defined as an area off each runway end whose purpose is to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The dimensions of an RPZ are a function of the runway ARC and approach visibility minimums. The FAA recommends that RPZs be clear of all residences and places of public assembly (churches, schools, hospitals, etc) and that airports own the land within the RPZs.

In addition to these design standards, the FAA provides recommended dimensions for runway width, taxiway width, taxiway safety areas and others. It is important to note that while these are FAA recommendations, ODA generally follows the same criteria. **Table 4A** compares the Airport's existing dimensions to the recommended design standards for Airplane Design Group (ADG) II (small) based on two different approach categories, which are the two most likely upgrades at the Airport. One category reflects dimensions based on visual approaches and approach visibility minimums not lower than ¾ statute mile, while the other category depicts approach visibility minimums lower than ¾ statute mile.

As shown in Table 4A, the existing OFA is non-standard. The width of the OFA is 365 feet and should be 500 feet. There are several objects that are penetrating its surface. On the west side of the runway there is a berm located approximately 150 feet from the runway centerline. The berm extends the length of the runway and reaches its highest elevations near the runway ends, thereby penetrating the OFA. On the east side of the runway, both windsocks are located 214 feet from the runway centerline. However, since these windsocks are supplemental and are on frangible mountings, their location is sufficient. The OFA lengths beyond both runway ends are adequate. In order to bring the OFA into compliance, the berm would need to be removed.

Table 4A. Airfield Design Standards

	Existing Dimensions	ADG II (small) Visual and Not lower than ¾ statute mile	ADG II (small) Lower than 3/4 statute mile
Runway Width	100’	75’	100’
Runway Centerline to Parallel Taxiway Centerline Separation	400’	240’	300’
RSA			
Width	150’	150’	300’
Length beyond runway end (14/32)	300’/300’	300’	600’
OFA			
Width	365’	500’	800’
Length beyond runway end (14/32)	300’/300’	300’	600’
OFZ			
Width	250’/250’	250’	300’
Length beyond runway end (14/32)	200’	200’	200’
Precision OFZ [1/]			
Width	N/A	N/A	800’
Length	N/A	N/A	200’
RPZ			
Inner Width x Outer Width x Length	250’ x 450’x 1,000’	250’ x 450’x 1,000’ [2/]	1,000’ x 1,750’ x 2,500’
Runway Blast Pads			
Length	0’	150’	150’
Width	0’	95’	120’
Runway Shoulder Width	20-25’	10’	10’
Taxiway Width	40’-50’	35’	35’
Taxiway Safety Area Width	79’	79’	79’
Taxiway Object Free Area Width	131’	131’	131’

Source: FAA Advisory Circular 150/5300-13

Notes: [1/] A Precision OFZ (POFZ) is a volume of airspace above an area beginning at the runway threshold, at the threshold elevation and is in effect only when the following three conditions are met: Vertically guided approach, reported ceiling below 250’ and/or visibility less than ¾ mile, an aircraft on final approach within two miles of runway threshold.

[2/] If an instrument approach with visibility minimums between ¾ mile and 1 mile is implemented, the recommended RPZ size is 1,000’ x 1,510’ x 1,700.

Runway Orientation

For the operational safety and efficiency of an airport, it is desirable for the primary runway to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of crosswind components during landing or takeoff.

The FAA recommends providing a crosswind runway when the primary runway configuration provides less than 95 percent wind coverage at specific crosswind components. The 95 percent wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for aircraft in

ADG I or 13 knots for aircraft in ADG II.

The Mulino Airport has a single runway oriented northwest-southeast (Runway 14-32). Wind coverage data is unavailable for Mulino; however, wind coverage at nearby airports was analyzed. The National Climatic Data Center (NCDC) has recorded prevailing wind information for several locations in Oregon, including Portland and Salem, two urban areas near Mulino. The data is a summary of the period between 1930 and 1996. The data for Portland indicates that winds are consistently out of the east-southeast and average speeds between seven and ten miles per hour. The data for Salem indicates that winds are out of the north during the summer months (June through September) and out of the south during the fall, winter, and spring months with average wind speeds between six and eight miles per hour. Portland International Airport's primary runway is oriented on a heading of 10-28 (east-west) consistent with the prevailing wind direction reported by the NCDC. Salem's primary runway is oriented on a heading of 13-31 (northwest-southeast), consistent with the prevailing wind direction.

Mulino Airport users have reported that the prevailing winds at the Airport are out of the south-southwest, and therefore are frequently at a 45 degree angle to the runway, especially during the fall and spring months. Based on this information, it is possible that the existing runway orientation may not meet the FAA's recommended 95% wind coverage. The Port could conduct a wind survey to obtain information on wind direction/strength to help determine the appropriate runway orientation. In the past, the FAA recommended increasing the width of the runway to the next highest ADG for runways that do not meet the recommended wind coverage, when the provision of a crosswind runway is infeasible. Mulino's runway width currently meets the recommended width of the next highest ADG.

Runway Length

Runway length requirements for an airport are based on several factors such as airport elevation, mean maximum temperature of the hottest month, runway gradient, airplane operating weights, runway surface conditions (*i.e.*, wet or dry), and others. FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*, as well as the FAA's Airport Design Computer Program was consulted for guidance on recommended runway length at the Mulino Airport.

Both the Advisory Circular and the computer program classify aircraft based on weight. For "small" airplanes (those weighing no more than 12,500 pounds), the classifications are further divided into two additional categories - small airplanes with fewer than 10 passenger seats and small airplanes with 10 or more passenger seats. The computer program, using site-specific data, reflects runway length recommendations by grouping general aviation aircraft into several categories, reflecting the percentage of the fleet within each category. **Table 4B** summarizes the FAA's generalized recommended runway lengths for the Mulino Airport.

Table 4B. Runway Length Requirements

Airport and Runway Data	
Airport elevation	260 feet
Mean daily maximum temperature of the hottest month	80° F
Maximum difference in runway centerline elevation	12 feet
Wet and slippery runways	
Runway Lengths Recommended for Airport Design	
Small airplanes with less than 10 passenger seats	
To accommodate 75 percent of these small airplanes	2,480 feet
To accommodate 95 percent of these small airplanes	3,030 feet
To accommodate 100 percent of these small airplanes	3,600 feet
Small airplanes with 10 or more passenger seats	4,140 feet

Source: FAA's Airport Design Computer Program, Version 4.2D, AC 150/5325-4B, Runway Length Requirements for Airport Design.

The current runway length of 3,425 feet accommodates nearly 100% of the small aircraft fleet with fewer than 10 passenger seats. The runway length required for takeoff by the critical aircraft (King Air 200) at the Mulino Airport is 3,034 feet. A 1,600 feet runway extension was recommended in the 1993 Master Plan. The Port of Portland reserves the right to extend the runway in the future. The runway length is forecast to be adequate for the remainder of the planning period.

Runway Width

The current runway width of 100 feet exceeds the FAA's recommended standard of 75 feet for ADG II (small) aircraft and runways with visual approaches. It is recommended that the 100-foot width be maintained. If the existing runway orientation does not meet the 95% wind coverage recommendation (discussed on previous page) or if an instrument approach with visibility minimums of lower than ¾ mile were implemented, the runway would need to be 100 feet wide.

Runway Pavement Strength

The most important feature of airfield pavement is its ability to withstand repeated use by the most weight-demanding aircraft that operates at an airport. The pavement strength rating of Runway 14-32 is 12,500 pounds single-wheel gear (SWG). This strength rating will be adequate through the planning period, although occasional maintenance will be needed to preserve this strength. A crack seal and slurry seal coat was applied to the runway in 2005. The next round of preventative maintenance is slated for 2008.

Taxiways

The runway currently has a full-length parallel taxiway. A full length parallel taxiway provides a safe, efficient traffic flow and eliminates the need for aircraft to back taxi before take-off or after landing. The FAA recommends a parallel taxiway for nonprecision instrument approaches with visibility minimums of one mile or more and requires a parallel taxiway for instrument

approaches with visibility minimums lower than one mile.

Similar to runway width, taxiway width is also determined by the ADG of the most demanding aircraft to use the taxiway. The existing taxiways at the Airport range between 40 and 50 feet wide. Both widths exceed the ADG II recommendation of 35 feet. Those taxiways that are 50 feet wide meet the ADG III standard.

Runway centerline to parallel taxiway centerline separation distance is another important criterion to examine. The recommended distance is based on satisfying the requirement that no part of an aircraft on a taxiway or taxilane centerline is within the runway safety area or penetrates the runway obstacle free zone (OFZ). The current distance between the runway centerline and the full length parallel taxiway centerline is 400 feet, which exceeds the 240-foot standard for ADG II visual runways and the 300-foot standard for ADG II runways with lower than ¾ mile visibility minimums.

The taxiway system at the Airport either meets or exceeds all FAA recommended standards and should be maintained through preventative pavement maintenance. The Oregon Department of Aviation's pavement maintenance program recommends that both fog and crack seals be completed in 2011.

There is only one access taxiway from the parallel taxiway. As the Airport gets busier, congestion at this single point will increase. A second taxiway to the hangar area is recommended.

Future airport development should maintain the turf/grass taxiway, which currently provides direct access to the Airport Café and Experimental Aircraft Association building.

Airport Visual Aids

Airports commonly include a variety of visual aids, such as pavement markings and signage to assist pilots using the airport.

Pavement Markings. Runway markings are designed according to the type of instrument approach available on the runway. FAA Advisory Circular 150/5340-1J, *Standards for Airport Markings*, provides the guidance for airport markings. Basic (visual) markings are currently in place on Runway 14-32. If a nonprecision approach were to be implemented, the runway markings would need to be upgraded to nonprecision markings.

There are hold markings on all taxiways adjoining the runway. The purpose of hold markings is to ensure that aircraft waiting for arriving or departing aircraft to clear the runway are not in the RSA. In addition to hold markings, all taxiways are clearly marked with centerlines. Existing hold and taxiway markings at the Mulino Airport are adequate.

Airfield Signage. The Airport currently has lighted hold signs on taxiways adjoining the runway. There is also a "Fly Neighborly" sign located near the Runway 14 end and a sign near midfield designating Runway 14 as the calm wind runway. The existing signage is adequate and

should be maintained.

Airport Lighting

Beacon. The Airport's rotating beacon, installed in 2003, should be maintained.

Visual Glide Slope Indicators. As discussed in Chapter One, the Airport has two-box PAPIs on both runway ends. It is recommended that the Port maintain the existing PAPI system.

Runway and Taxiway Lighting. Airport lighting systems provide critical guidance to pilots at night and during low visibility conditions. Runway 14-32 is equipped with medium intensity runway lighting (MIRL). It is recommended that this system be maintained throughout the planning period.

Runway identification lighting provides the pilot with a rapid and positive identification of the runway end. The most basic system involves runway end identifier lights (REILs). Currently, there are no REILs installed at the Mulino Airport. If a nighttime instrument approach procedure were implemented, REILs would aid pilots in locating the runway ends quickly. It is recommended that REILs be installed at both runway ends.

If an instrument approach with visibility minimums lower than 1 mile is implemented, an instrument approach lighting system would be required.

Effective ground movement of aircraft at night is enhanced by the availability of taxiway lighting. All taxiways at the Airport are lit; taxilanes and the apron area are lined with edge reflectors. The current conditions are adequate. However, future improvements to the hangar area could include the installation of taxilane edge lights, which would aid pilots at night and during low visibility.

The Mulino Airport is equipped with pilot-controlled lighting (PCL). PCL allows pilots to turn runway lighting on and control its intensity using the radio transmitter in their aircraft. The PCL system should be maintained.

Radio Navigational Aids & Instrument Approach Procedures

Radio Navigational Aids. There are no radio navigational aids at the Mulino Airport; however, Newberg and Portland Airports both have VOR/DME (Very High Frequency Omni-Directional Range/Distance Measuring Equipment), which can be used to guide a pilot to the Airport.

Instrument Approach Procedures. There are currently no instrument approach aids available at the Airport. Visual approaches are used on both runway ends.

Global Positioning System (GPS) technology provides the Airport with the capability of establishing new instrument approaches at minimal cost since there is no requirement for the installation and maintenance of costly ground-based transmission equipment. The FAA is

proceeding with a program to transition from existing ground-based navigational aids to a satellite-based navigation system utilizing GPS technology. The FAA commissioned the Wide Area Augmentation System (WAAS) in July 2003. WAAS refines GPS guidance for enroute navigation and approaches. General aviation, corporate, air taxi, and regional airline operators are expected to benefit from this augmentation to GPS signals. The FAA is certifying new approaches at the current rate of about 300 per year, nationally.

Lower than ¾ mile visibility minimums are now possible with GPS. To be eligible for an instrument approach, the airport landing surface must meet specific standards as outlined in FAA AC 150/5300-13, *Airport Design*. *Airport Design* states that airports having runways as short as 2,400 feet could support an instrument approach if the lowest Height Above Touchdown (HAT) is based on clearing a 200-foot obstacle within the final approach segment. However, runways less than 3,200 feet are protected by 14 CFR 77 to a lesser extent.

The Port has been proactively identifying and removing obstructions as necessary to provide clear airspace and make way for a straight-in nonprecision GPS approach to the Airport. The existing runway length meets the minimum 3,200-foot length requirement for this type of approach and therefore would not require an adjustment to the lowest Height Above Touchdown elevation as described above. A straight-in nonprecision approach requires a cleared threshold siting surface slope of 34:1 (versus the 20:1 slope required for a visual approach). Initial examination indicates that the threshold siting surface dimensions required by this type of approach would be clear of penetrations with the exception of a few trees near the Molalla River. Final determination of feasibility of implementing an instrument approach procedure would need to be conducted by the FAA Flight Procedures Office.

Helicopter Facilities

A helipad is located east of the hangar area. This helipad is marked with an "LF" and is designated for LifeFlight emergency medical transport helicopters. If additional rows of hangars are constructed as currently proposed, the helipad will interfere with aircraft taxiing to the hangar area. It is recommended that an alternate helipad location be found.

Other Airfield Recommendations

Traffic Pattern. The current traffic pattern requires left hand traffic for Runway 32 and right hand traffic for Runway 14. This pattern is in place as a noise abatement procedure to reduce over flight of the community. The existing traffic pattern procedure is adequate.

Wind Indicators/Segmented Circle. The existing windcone and segmented circle are located on the east side of the parallel taxiway at about midfield. These facilities are adequate and should be maintained throughout the planning period. There are also two supplemental windcones, one near each runway end.

Weather Reporting. There is currently no weather reporting facility at the Mulino Airport. The closest weather reporting station to the Airport is located at Aurora State Airport, eight nautical miles west. If an instrument approach is implemented, an approved altimeter reporting

source will also be needed. An Automated Weather Observation System (AWOS) consists of a sensor located on top of a tower that provides automatic recordings of cloud heights, visibility, wind speed, wind direction, temperature, dew point, and altimeter setting. An AWOS requires a 500-foot critical radius in which buildings taller than a specified height can not be located. A SuperUnicom (also known as a SuperAWOS) will provide both wind and altimeter information.

LANDSIDE REQUIREMENTS

Landside facilities are those facilities necessary for handling aircraft on the ground, and those facilities which provide an interface between the air and ground transportation modes. Landside requirements are addressed for the following facilities:

- Hangars
- Aprons and Aircraft Parking
- Airport Access & Vehicle Parking
- Aviation Services

Hangars

The utilization of hangars varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft is toward higher performance, higher value aircraft. Therefore, many aircraft owners prefer enclosed hangar space to outside tie-downs. In planning for hangar development, the number and type of aircraft to be based at the Airport is analyzed. Hangar development should be based upon actual demand trends and financial investment conditions, not solely on forecasts. At the Mulino Airport 37 of the 40 based aircraft (92%) are currently stored in hangars; the remaining three aircraft are stored in tie-downs. In the future, it is expected that this ratio will increase slightly to 95%, creating a need for 36 additional hangar spaces by 2027. This increase accounts for the trend that aircraft owners are purchasing higher valued aircraft and that the based aircraft forecast includes the addition of multi-engine aircraft to the fleet mix.

Hangar facilities at an airport typically consist of some combination of T-hangars and conventional hangars. T-hangars typically store one aircraft in one unit, while conventional hangars can store more than one aircraft in one large enclosed structure. In order to determine the number of T-hangars versus conventional hangars, the following assumptions were made:

- All multi-engine aircraft will be stored in conventional hangars
- 5% of all single engine aircraft stored in hangars will be stored in conventional hangars, while the remaining single engine aircraft will be stored in T-hangars.

Applying these assumptions, 31 additional T-hangars will be needed and 5 additional conventional hangars will be needed by 2027. For space planning purposes, a ratio of 1,200 square feet per aircraft is used for T-hangar development, resulting in a total of 76,800 square feet of building area. Conventional hangar sizes generally range between 1,400 to 3,600 square feet per aircraft. For planning purposes at the Mulino Airport, a ratio of 2,500 square feet will be

used, resulting in a need for 15,000 square feet of conventional hangar building area. **Table 4C** summarizes the hangar development needs for each milestone year.

Aprons and Aircraft Parking

Currently, there are 18 tiedown positions at the Airport, 16 on the apron, and two usable tiedowns in the grassy area adjacent to the apron. Three based aircraft (8%) are presently stored in tiedowns. As noted earlier, due to the desire for aircraft owners to store their aircraft in hangars, it has been assumed that the number of aircraft stored in tiedowns will decrease over the planning period to 5%. Using this ratio, four based aircraft will be stored in tiedowns by 2027.

The FAA has developed an approach for determining the number of tiedowns needed for itinerant aircraft operating at an airport. The following general methodology was taken from *Airport Design*, Appendix 5, Change 10 and is based on peak operations calculations:

1. Total annual operations (from Chapter Two)
2. Multiplied by 50 percent (50 percent of annual operations are departures)
3. Divided by 12 (Number of departures per month in a one year period)
4. Divided by 30 (Number of departures per day, based on a typical 30-day month)
5. Reduced by 80 percent to account for aircraft that do not remain at the Airport.

Using this methodology, the Airport will need to have transient tiedown space for 11 aircraft by 2027. Combining based and transient tiedown needs, a total of 15 tiedown positions will be needed throughout the planning period. The FAA recommends using a ratio of 300 square yards per based aircraft tiedown, and 360 square yards per small transient aircraft tiedown. To account for a portion of the aircraft being ADG II, an estimate of 500 square yards per aircraft is used for transient aircraft. By 2027, the total area needed for both based aircraft and transient aircraft tiedowns is 6,700 square yards. The current apron is approximately 5,300 square yards and will be adequate for about ten years. The forecasted transient operations have a larger turboprop fleet than the based aircraft fleet and many turboprops are ADG II aircraft. In addition, the critical aircraft (Beech King Air) is also an ADG II aircraft.

Table 4C. Landside Facility Needs

	2006	2012	2017	2027
Based Aircraft	40	51	58	74
Total Hangar Units	34	48	55	70
Total T-Hangars	33	45	50	64
Total Square Feet	39,900	54,000	60,000	76,800
Total Conventional Hangars	1	3	5	6
Total Square Feet	2,500	7,500	12,500	15,000
Semi-Enclosed Hangars	3	0	0	0
Total Square Feet	2,700	0	0	0
Tiedown Positions	18	11	12	15
Based Aircraft Tiedowns	3	3	3	4
Total Square Yards	5,300	900	900	1,200
Transient Aircraft Tiedowns	N/A	8	9	11
Total Square Yards	N/A	4,000	4,500	5,500

Source: W&H Pacific, 2006
Note: Square footages for hangars do not include areas needed for taxilanes between hangars.

In addition to the hangars and paved tiedowns in Table 4C, the airport development plan should also preserve the grass tiedown area needed during the summer fly-in.

Airport Access

The current single access road for the Airport has several problems. The two short roads that lead to the Airport entrance intersect with Mulino Road at points where Mulino Road curves. Sight lines are poor in this area for vehicles turning to/from Mulino Road. The entrance to the Airport lacks good visibility for the public. Also, the existing entrance road is not well located to provide access to future hangars without requiring vehicles to cross taxilanes. It would be preferable for the Airport to have two access locations, to improve emergency vehicle response time, to improve emergency vehicle response time, provide another means of access in case of road closure, and for the convenience of Airport users. Consequently, it is recommended that in the short term the existing entrance road be relocated and, in the long term, a new entrance road from Highway 213 be added. New on-airport access roads should be located to provide good access to developable parcels and to keep vehicles and taxiing aircraft separated.

Aviation Services

As discussed in Chapter Two, there are no FBOs currently operating at the Airport. However, a pilot's lounge/FBO building is available. This building houses restrooms, telephones, a lounge area, flight planning area, and other amenities. It is recommended that this building be maintained.

As aviation activity grows, an FBO business may be attracted to the Airport. The FBO may lease existing building(s) or prefer to lease land and construct a new facility. In the planning of the Airport's landside area, it is recommended that at least one acre be designated for a FBO facility. The FBO site should be located with easy access and visibility from the airfield and should have adjacent land available for future expansion.

SUPPORT FACILITY REQUIREMENTS

Facilities that are not classified as airfield or landside are known as Support Facilities. The following support facilities were evaluated:

- Emergency Services
- Airport Maintenance
- Airport Fencing
- Utilities
- Storm Drainage
- Aviation Fueling Facilities

Emergency Services

There are no Aircraft Rescue and Firefighting (ARFF) facilities available at the Airport, nor does FAA require them. Emergency services are provided by the City of Molalla Volunteer Fire Department and the Clackamas County Sheriff's Department. The Port provides aircraft emergency training to the volunteer firefighters once per year.

Airport Maintenance

Airport maintenance is currently provided by the Port. The existing maintenance building is deteriorating and should be replaced.

Airport Fencing

Three-foot tall, primitive wildlife fencing surrounds the perimeter of the Airport. There is one automated six-foot, chain link vehicle gate, which is controlled by a punch-type combination. There is also one open pedestrian access point located near the OPA building on Airport Road. While fencing is not required, the Port may want to upgrade the existing wildlife fencing. Typically, either six or eight-foot secure chain link fencing topped with three-strand barbed wire is used.

Utilities

Utilities available at the Airport include electricity, water, and telephone. A stormwater detention pond is located on the north side of the Airport's property boundary. There is no sanitary treatment facility in the community of Mulino.

Storm Drainage

The need for additional hangar and taxilanes facilities has been identified. The construction of these types of facilities will increase the Airport's existing impervious surfaces. These additional surfaces must be evaluated to ensure that the requirements of the 1200-Z[1] stormwater discharge permit are met. Because a specific layout for future development has not been defined yet, the exact amount of increased impervious surface is to be determined. The alternatives analysis will provide additional details regarding stormwater impacts of each alternative. The analysis will also include Department of Environmental Quality (DEQ) requirements, and water treatment and detention.

Aviation Fueling Facilities

Fuel was not available for sale at the time of the inventory. However, the Port has recently installed the infrastructure required for a self-service fuel-dispensing facility. Aurora State Airport is the closest airport where aviation gasoline and jet fuel are sold. Airport users have indicated that one of the most important improvements that could be made to the Mulino Airport is the installation of a fueling facility.

For some GA airport sponsors, the major source of revenue at an airport is profit from selling fuel. The first entry into fuel sales for a small general aviation airport is usually a self-service facility, wherein revenues gained from fuel sales can be used toward facility operation and improvement. In the event that an FBO begins operating at the Airport, fee restructuring will likely be needed as management of the fuel facility would shift from Port-owned self service to FBO-owned fueling. It is important to note that even when airport sponsors are not the fuel vendor, airport sponsors still derive revenue from fuel flowage fees imposed on vendors.

AIRPARK

Interest in a residential airpark at the Airport was expressed by several Airport users throughout the master planning process. If developed, a residential airpark would exist either on-Airport property or off-Airport property.

If the airpark were to be developed off-Airport, a private developer would acquire land and finance all development. Once developed, the residential airpark homeowner's association would enter negotiations with the airport sponsor to gain ingress and egress to and from the Airport. The agreement would require the homeowner's association to pay a fee, which would then be direct revenue to the Airport.

Development of an on-Airport residential airpark has inherent obstacles for both the Airport

[1] The federal Clean Water Act mandates jurisdictional control of the quality of stormwater runoff. This mandated program is found in the Code of Federal Regulation part 122.26. The Airport may fall under the scope of these regulations and may need to apply for a National Pollution Discharge Elimination Permit (NPDES) for the discharge of rain water to the surface water system. In Oregon this is typically referred to as a 1200-Z General Permit.

Sponsor and the developer to overcome. Financing the infrastructure and development is a major obstacle. The FAA will not fund airport development that is not open to the general public. Without having a deed to the land, potential homeowners would have difficulty securing a loan or mortgage. Land currently owned by the airport sponsor that is ideal for a residential airpark would need to be identified as surplus before it could be sold to a private developer. FAA approval and possible grant repayment would also be required. Once purchased, the land could be developed in the same manner as the off-Airport scenario.

Taxiway access would be provided via secured taxiway(s). The taxiway(s) would be financed by the private developer/homeowner's association. Additionally, it would be necessary to apply for zoning changes to allow for residential development, if the land is not already appropriately zoned.

FAA policy as outlined in Carey v. Afton-Lincoln County Municipal Airport (FAA Docket No. 16-06-06), prohibits federally obligated airports to enter into new ingress-egress (through-the-fence) agreements with residential airparks. The Airport Layout Plan and the Capital Improvement Plan that have been completed as part of this master plan, do not identify a residential airpark as part of the preferred alternative for future development. However, consideration of a residential airpark was discussed by the Master Plan Planning Advisory Committee and was an integral part of the master planning process. This planning element has been included in the master plan document to reflect that discussion.

LAND USE PLANNING & ZONING RECOMMENDATIONS

In general, the Airport meets all State and County land use requirements. Even so, there are several items the Port should work towards with regard to land use and zoning around the Airport. Recommendations are provided below.

Zoning Code:

- Consider rezoning the underlying designations within the Airport property as "Airport" to ensure that only compatible uses occur within the Airport property boundary. The rezoning would be based on Oregon Administrative Rules Division 13, *Airport Planning*, which provides guidelines for local government land use compatibility to encourage and support the continued operation and vitality of Oregon's airports.

Comprehensive Plan:

- Adopt the final Airport Layout Plan, by reference, into Clackamas County's Comprehensive Plan.
- Adopt a title notice or similar requirement to inform purchasers of property within one mile of the Airport that their property is located adjacent to or in close proximity to the Mulino Airport and their property may be impacted by a variety of aviation activities. Note that such activities may include but are not limited to noise, vibration, chemical odors, hours of operations, low overhead flights, and other associated activities.

Chapter Five
AIRPORT DEVELOPMENT ALTERNATIVES

The preceding chapter identified deficiencies of the Mulino Airport with respect to existing and anticipated aeronautical demand, which are consistent with current Federal Aviation Administration (FAA) design standards and State of Oregon development guidelines. This chapter presents several development alternatives that focus on meeting the Airport's facility needs for the long-term future (2027 and beyond).

The Port of Portland (Port), Oregon Department of Aviation (ODA), Project Advisory Committee (PAC), FAA, and members of the public reviewed each development alternative presented in this chapter. The alternatives were assessed on several factors including functionality, ease of implementation, development cost, and potential environmental concerns. After review by all interested parties, the Port (in cooperation with ODA) selected a preferred alternative for future development of the Airport. The preferred alternative is a composite of features from more than one alternative. The preferred alternative is developed in more detail in the Airport Layout Plan and the Capital Improvement Plan (Chapters Six and Seven).

While the development alternatives focus on meeting aeronautical demand projected for 2027, it is prudent to consider the ultimate potential of Airport property. By doing so, the planning documents remain flexible and functional, considering the possibility that unforeseen events or increases in user demand occur. Consequently, the alternatives highlight possible airfield and landside uses that could meet facility needs projected to occur after 2027.

SUMMARY OF FACILITY REQUIREMENTS

The preceding chapter, *Facility Requirements*, identified development needs to accommodate forecasted aeronautical activity. These are summarized below.

Airfield Requirements

- The current Runway Protection Zone (RPZ) dimensions meet FAA design standards. However, if an instrument approach with visibility minimums between ¾ mile and 1 mile is implemented, the recommended RPZ size is 1,000 feet by 1,510 feet by 1,700 feet. An instrument approach with visibility minimums lower than ¾ mile requires a larger RPZ. The larger the RPZ, the more land that will need to be acquired by fee simple or easement to ensure land use compatibility.

- The existing runway length is adequate for the planning period. A 1,600-foot extension was recommended in the 1993 Master Plan and the Port, and/or any future Airport owner, has reserved the right to extend the runway. Accordingly, one of the development alternatives shows this runway extension on the Runway 14 end.

- The berm of land located within the runway object free area should be removed and the area graded to meet object free area standards.

- The Airport's paved taxiway system meets or exceeds FAA design standards. It is recommended that access to the Airport Café, via grass taxiway, be maintained.

- Runway End Identifier Lights (REILs) should be installed at both runway ends.

- If an instrument approach is implemented, an instrument approach lighting system is recommended or required by the FAA, depending upon the type of approach.

- Installation of taxilane edge lights is recommended to enhance ground movement of aircraft.

- The Port has been planning for a GPS-assisted instrument approach to Runway 32 for several years. To assess the impact of different approach visibility minimums on facilities and land, the alternatives reflect a range of instrument approach visibility minimums.

- The location of the current helicopter landing area may interfere with aircraft ground maneuvering and should be relocated.

- If an instrument approach were implemented, it would become necessary to install an Automated Weather Observation System (AWOS).

Landside Requirements

- To meet 2027 demand, 31 additional T-hangars will be needed. This equates to approximately 76,800 square feet of building area, including taxilane construction around the T-hangar area.

- Five conventional hangars will also be needed to meet 2027 demand, which is an addition of 18,000 square feet of building area.

- It is recommended the tiedown apron be expanded and reconfigured to include three to four tiedowns sized for larger transient aircraft (Airplane Design Group II with wingspans up to 79 feet). Currently, there are 16 tiedowns on the apron and two usable grass tiedowns.

- Additional vehicular parking areas should be added to accommodate use.

- At least one acre should be reserved for locating a Fixed-Based Operator (FBO) facility.

- Current security and wildlife fencing should be upgraded to six or eight-foot secure chain link fencing with three-strand barbed wire.

- Install a self-service card-lock fueling system.

- Access road improvements are needed.

DEVELOPMENT ALTERNATIVES

Four alternatives for the long-term future development of the Mulino Airport are presented in this chapter:

- No-Build Alternative, which assumes maintenance of existing facilities and no expansion of airfield or landside facilities (except for facilities the Port has committed to building in 2007 as part of the management agreement with ODA).

- Alternative 1, which reflects many of the improvements in the current Airport Layout Plan and the 1993 Master Plan (including a runway extension).

- Alternative 2, which fulfills the minimum facilities projected to be needed by 2027.

- Alternative 3, plans for roads, taxiways, and hangars beyond those needed to accommodate growth forecasted for 2027. This alternative also shows the potential location of an off airport residential airpark. As stated earlier in this document, interest in a residential airpark at the Airport was expressed by several Airport users throughout the master planning process. The Airport Layout Plan and the Capital Improvement Plan that have been completed as part of this master plan, do not identify a residential airpark as part of the preferred alternative for future development. However, consideration of a residential airpark was discussed by the Master Plan Planning Advisory Committee and was an integral part of the master planning process. This planning element has been included in the master plan document to reflect that discussion.

All four alternatives show the two rows of T-hangars and fueling facility that the Port will build as part of the agreement with ODA. All four alternatives also show a residential area southeast of the Airport where the Port is pursuing an avigation easement.

The three development alternatives depict additional hangar expansion, a new place for helicopter parking, an instrument approach to Runway 32, an AWOS, and the acquisition of land within the building restriction lines and RPZs. Each alternative also depicts land reserved for a future FBO, but no FBO-specific apron has been designated. All the alternatives have excess apron area available that could accommodate FBO apron needs.

No-Build Alternative

One alternative to be considered is the No-Build alternative. By showing the consequences of not developing the Airport, the Airport Sponsor has a method for assessing advantages and disadvantages of development alternatives.

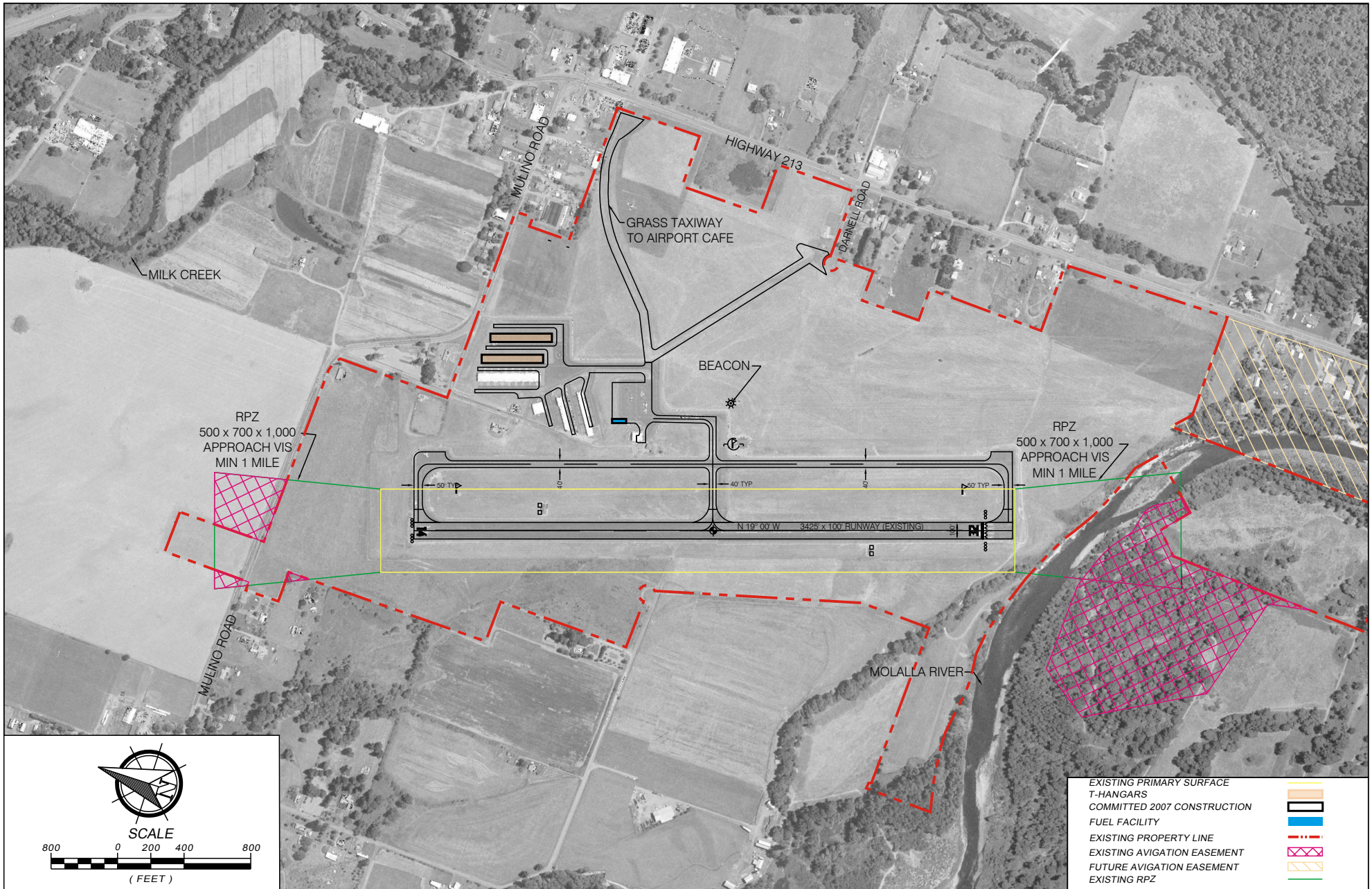
As shown in Chapter 3, Aeronautical Activity Forecast, the Mulino Airport is expected to experience increased demand. If no development were to occur, the Airport would not be able to support forecasted aeronautical uses and demands. The No-Build alternative would not optimize the Airport's potential. A safety deficiency would remain, namely the object free area that does not comply with FAA design standards. The helicopter landing location would continue to place fixed and rotor wing aircraft close to each other, increasing the risk of rotorwash damage to fixed wing aircraft. **Exhibit 5A** illustrates the No-Build alternative.

While the No-Build alternative is essentially a do-nothing option, it does not mean that there would be no financial impact to the Airport. Most prominently, there would still be a cost associated with maintaining the current pavements and facilities. Without additional sources of revenue, the Mulino Airport would continue to need financial subsidy, since income from leases and other sources falls short of covering operating expenses. In accordance with the Port and ODA management agreement, the Port will fund the construction of a retail card-lock fueling system, two rows of T-hangars (32 units total), and make drainage improvements on airport property. Since these improvements are part of the management contract and separate from the Airport Master Plan, they are included as a component of the No-Build alternative. **Table 5A** illustrates the total cost associated with this alternative over the 20-year planning period.

Table 5A. No-Build Alternative Cost Summary

Project Description	Time Period		Total Cost[1]
Fuel Facility Upgrade		$	86,000
Avigation Easements		$	103,000
T-Hangars		$	2,400,000
Pavement Maintenance	1 - 5 Years	$	143,000
	5 - 10 Years	$	230,000
	10 - 15 Years	$	1,924,000
	15 - 20 Years	$	265,000
Total No-Build Alternative		**$**	**5,151,000**

[1] All cost sources from Port of Portland and statewide construction bid tabs. Costs in 2006 dollars.



MULINO AIRPORT	NO-BUILD ALTERNATIVE	EXHIBIT 5A

Development Alternative 1

Development Alternative 1 (Alternative 1) maintains similar characteristics as the 1993 Mulino Airport Layout Plan (ALP). **Exhibit 5B** illustrates this alternative. Alternative 1 encompasses the facility requirements previously outlined. Many of the features are remnants of the 1993 plan, which reflected a more aggressive aeronautical activity forecast. Consequently, Alternative 1 incorporates development well beyond the projected 20-year need.

Airfield. Airfield developments for Alternative 1 are outlined below.

- Runway and parallel taxiway extension of 1,600 feet to the north-northwest, which requires the relocation of Mulino Road.
- Installation of a precision approach to Runway 32 with minimums lower than ¾ mile, which requires land acquisition and some residential relocation, due to the larger imaginary surfaces needing clearance and the larger RPZ required. New RPZ dimensions 1,000 feet by 1,750 feet by 2,500 feet.
- Realigned taxiway access to the Airport Café.
- Land cleared and available for a partial second parallel taxiway / taxilane on the east side of the runway.
- Installation of REILs, instrument approach lighting system, and taxilane edge lights.
- Relocation of helicopter landing facility.
- Installation of AWOS.

The runway extension was recommended in the 1993 Airport Master Plan and has been shown on the ALP since then. In order to accomplish the extension, land would need to be acquired, as well as the relocation of Mulino Road. As Chapter Four indicated, to accommodate 100% of all airplanes with 12,500 pound maximum takeoff weights, a runway extension of 715 feet would be needed. Consequently, an extension of 1,600 feet would allow for a much larger diversity of aircraft types that could use the runway, including aircraft with gross takeoff weights greater than 12,500 pounds, when the pavement strength is increased accordingly.

A significant feature of Alternative 1 is the precision approach to Runway 32. In order to meet specific standards outlined in FAA Advisory Circular 150/5300-13, *Airport Design*, many changes would occur. First, the RPZ area would need to be increased to 1,000' x 1,750' x 2,500', which would require additional property acquisition or avigation easements on the Runway 32 approach. Second, Part 77 Imaginary Surfaces would be affected considerably. A detailed discussion of Part 77 surfaces will be presented in Chapter Six, *Airport Layout Plan*. The primary surface, which is a horizontal surface centered on the runway centerline that should be kept free of obstructions, would need to be widened from 500 feet to 1,000 feet[2]. Additionally, restrictions from the transitional surface would place the building restriction line[3] 750 feet from the runway centerline. Consequent to these changes, property acquisition and

[2] Proposed Part 77 changes would make 1,000-foot wide primary surfaces applicable for all runways with nonprecision and precision instrument approaches, regardless of approach minima. Alternative 1 shows compliance with a 1,000-foot primary surface.

[3] Building restriction line shown would prevent structures 35 feet higher than the runway's established elevation from penetrating the Part 77 transitional surface.

residential relocation would be necessary to ensure safety. Other facility upgrades needed with the instrument approach are an approach lighting system and AWOS.

Landside. The landside development features proposed in Alternative 1 include:

- In addition to the two rows of T-hangars that will be built in 2007, nine additional T-hangar buildings, with the potential to accommodate approximately 100 individual T-hangar units.
- Two large conventional hangars, with a combined area large enough to accommodate 14 aircraft.
- A terminal building.
- An air traffic control tower.
- Apron expansion of 12,500 square yards to accommodate larger transient aircraft tiedowns.
- Additional vehicle parking spaces.
- An FBO reserve of 2.7 acres.
- Upgraded security and wildlife fencing.
- A new entrance road connecting to the Airport Access Road and Mulino Road.

Based on the 1993 ALP and the building restriction line, consistent with a 1,000-foot wide primary surface, several existing buildings would penetrate the primary or transitional surfaces. These buildings could remain under an anticipated "grandfather" clause associated with the proposed Part 77 changes. They could also be removed and replaced when they reach their useful lives. These buildings are shown on Exhibit 5B. Once the buildings are removed, direct access from the parallel taxiway to the apron and taxilanes would be achieved by a new taxiway. The buildings would then be replaced with facilities, located according to Alternative 1. The demolition of these existing hangars will result in the loss of 20 T-hangar units. Consequently, the construction of 100 T-hangar units will yield a net increase of 80 T-hangar units.

A reserve of 2.7 acres is set aside for the development of a FBO facility. In addition, the two large conventional hangars flanking the terminal building would be large enough for competing FBOs to lease.

Alternative 1 shows much more aircraft storage and parking than the projected need in 2027. A future air traffic control tower is also shown, which would not be justified by the number of aircraft operations forecast for 2027, but may be needed in the future, when justified by annual operations.

Development cost estimates for Alternative 1 appear in **Table 5B**.

Table 5B. Development Alternative 1 Cost Summary

Project Description		Total Cost
Airfield		
Obstruction Removal (including 8 residential relocations)	$	3,435,000
Runway Extension and Strengthening (30,000 SWG)	$	10,496,000
Helicopter Landing Facility	$	169,000
T-Hangar Aprons/Taxilanes	$	10,969,000
Approach Lighting	$	1,454,000
Taxilane Edge Lighting	$	364,000
Automated Weather Observation Station	$	171,000
Airside Subtotal	**$**	**27,058,000**
Landside		
Structural Obstruction Clearance	$	3,060,000
Property Acquisition	$	17,131,000
Terminal Building	$	965,000
Air Traffic Control Tower	$	2,143,000
Conventional Hangars (14)	$	1,418,000
T-Hangars (100)	$	6,750,000
Terminal Parking/Aprons	$	7,086,000
Maintenance Building	$	375,000
Mulino Road Relocation	$	1,790,000
Access Road	$	2,476,000
Security Fencing	$	1,000,000
Landside Subtotal	**$**	**44,194,000**
Total Alternative 1	**$**	**71,252,000**

Development Alternative 2

Development Alternative 2 (Alternative 2) is the most conservative development alternative of the three plans. It focuses primarily on meeting the development demands presented in Chapter Four, *Facility Requirements* (see **Exhibit 5C**).

Airfield. Airfield development elements in Alternative 2 include:

- An instrument approach with 1-mile visibility minimums.
- Taxilane extensions for new hangars.
- Continued access to Airport Café via the grass taxiway.
- Installation of approach lighting system, REILs and taxilane edge lights.
- Relocation of helicopter landing facility.

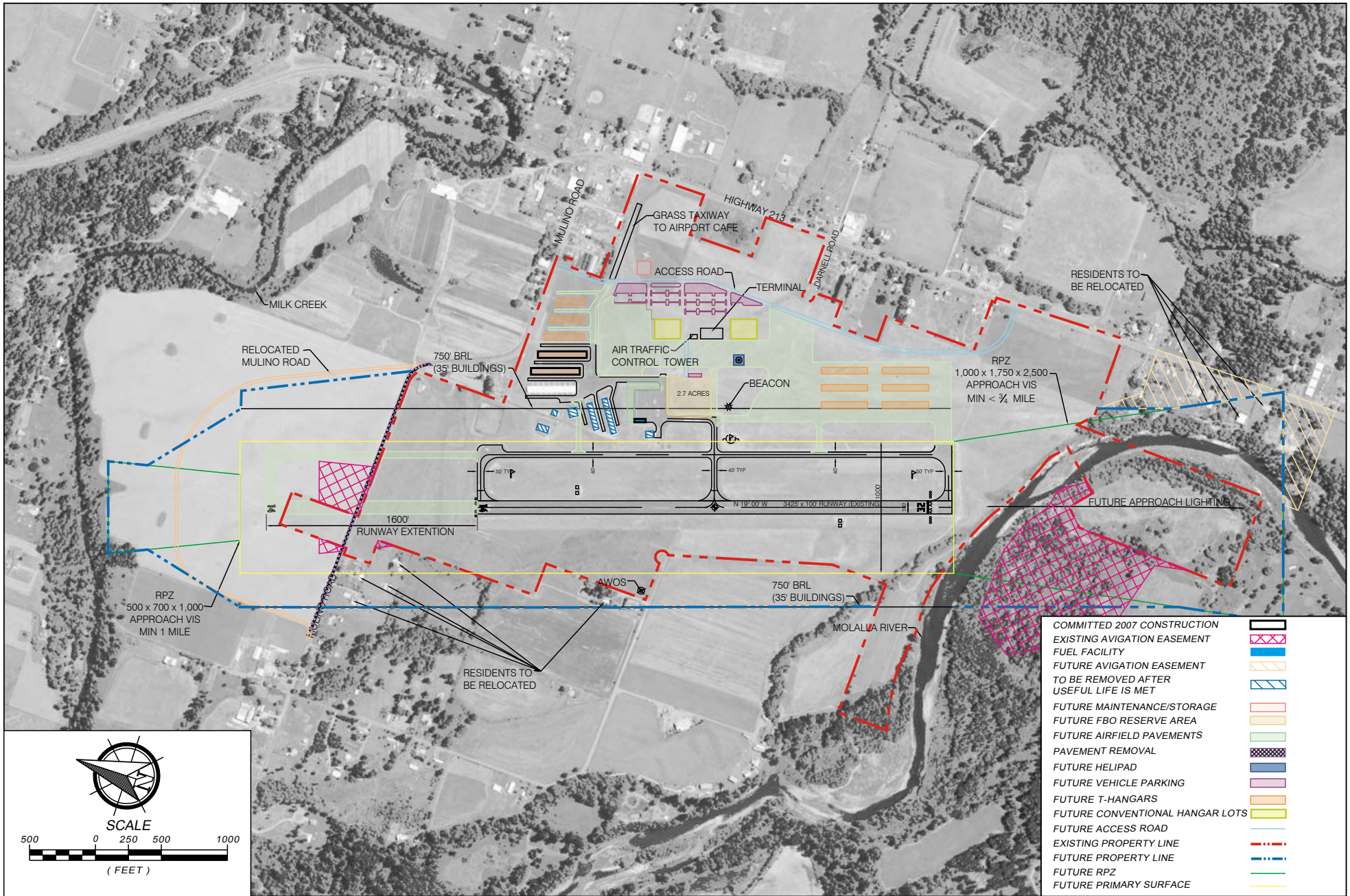
The proposed instrument approach associated with Alternative 2 would require minimal changes to airfield design standards. The alternative shows the acquisition of some agricultural and undeveloped land so the Airport Sponsor can control all areas within the building restriction lines and RPZs.

Landside. Alternative 2 consists of the following landside developments:

- The two rows of T-hangars that the Port is committed to build in 2007, providing a total of 32 new T-hangar units.
- Development area of 64,000 square feet to accommodate the construction of 18 conventional hangars.
- Apron expansion of 12,500 square yards to accommodate larger transient aircraft tiedowns and taxilanes for better circulation.
- A new access point from Mulino Road.
- New interior airport roads to facilitate the separation of vehicles, taxiing aircraft, and to provide access to new development areas.
- Additional vehicle parking area.
- Aviation reserve of approximately 27 acres, which can be used for hangar development, tiedowns, etc.
- A reserve for an FBO facility consisting of approximately 1.5 acres.
- Upgraded security and wildlife fencing.

Alternative 2 meets the facility requirements outlined in Chapter Four. This alternative has land available for development in the event demand exceeds the aeronautical activity forecast. The aviation reserve area could be developed for aircraft parking and storage and/or for aviation related businesses as demand occurs.

Development cost estimates for Alternative B are shown in **Table 5C**.



MULINO AIRPORT	ALTERNATIVE 1	EXHIBIT 5B

Table 5C. Development Alternative 2 Cost Summary

Project Description		Total Cost
Airfield		
Obstruction Removal	$	150,000
Helicopter Landing Facility	$	169,000
Hangar Taxiways/Aprons	$	716,000
Taxilane Edge Lighting	$	364,000
Approach Lighting	$	570,000
Airside Subtotal	**$**	**1,969,000**
Landside		
Property Acquisition	$	2,480,000
Conventional Hangars (18)	$	1,823,000
Access Road	$	732,000
Security Fencing	$	887,000
Landside Subtotal	**$**	**5,922,000**
Total Alternative 2	**$**	**7,891,000**

Development Alternative 3

Compared to Alternatives 1 and 2, Development Alternative 3 (Alternative 3) is a moderate development option that addresses the 2027 facility requirements, but also outlines development concepts beyond the planning period. Alternative 3 is illustrated by **Exhibit 5D**.

Airfield. Alternative 3 has the following airfield features:

- Installation of a non-precision approach to Runway 32 with minimums not lower than ¾ mile. New RPZ dimensions would be 1,000' x 1,510' x 1,700'.
- Taxilane extensions to serve new hangars and hangar development areas.
- Maintenance of taxiway access to the Airport Café.
- Installation of REILs, instrument approach lighting system, and taxilane edge lights.
- Relocation of helicopter landing facility.
- Installation of AWOS.

Alternative 3 incorporates the installation of a nonprecision approach to Runway 32. The approach minima for the approach would be not lower than ¾ mile. Due to the approach minima, the RPZ dimensions would need to increase to 1,000 feet by 1,510 feet by 1,700 feet. However, the primary surface and building restriction lines would be the same as in Alternative 2. Some land acquisition is recommended so that land within the building restriction lines and RPZs are controlled by the Port. As a component of the nonprecision instrument approach, an approach lighting system and AWOS will be needed.

Landside. Significant landside developments within Alternative 3 are:

- In addition to the two rows of hangars the Port will build in 2007, three additional T-hangar buildings are shown with the potential for 24 additional T-hangar units.
- Twelve acres for the development of attached or detached conventional hangars. This land is estimated to accommodate up to 145 conventional hangars, depending on hangar size and spacing.
- Apron expansion of 12,500 square yards to accommodate larger transient aircraft tiedowns and taxilanes for better circulation.
- Aviation reserve of approximately 37 acres, which can be used for hangar development, tiedowns, etc.
- A new access road connecting on airport development with Mulino Road and Highway 213.
- Additional vehicle parking area.
- FBO reserve of approximately 2.1 acres.
- Recommended fencing upgrade.
- Off-airport residential airpark.

Like the other development alternatives, Alternative 3 incorporates all of the recommendations from the Facility Requirements chapter. In addition, it allows more hangar development options (*i.e.*, T-hangars, conventional hangars, or large hangar lots). The variety of accommodations, with road/taxiway access and close proximity to services like fueling, could make the Airport more appealing to people looking to base their aircraft. Alternative 3 has an aviation reserve on the southeast side of the Airport that encompasses approximately 37 acres. Such an area could be used for the development of hangars, aprons, and aviation businesses once the northeast area has been built out.

An off-airport residential airpark site is shown in Alternative 3. Interest in a residential airpark at the Airport was expressed by several Airport users throughout the master planning process. The Airport Layout Plan and the Capital Improvement Plan that have been completed as part of this master plan, do not identify a residential airpark as part of the preferred alternative for future development. However, consideration of a residential airpark was discussed by the Master Plan Planning Advisory Committee and was an integral part of the master planning process. This planning element has been included in the master plan document to reflect that discussion.

Currently, the area is zoned as Exclusive Farm Use (EFU)[4]; consequently, a zoning change would be necessary to a land use compatible with residential housing[5]. Development density would depend on many factors, including sewage / septic treatment. In Clackamas County, allowed density also depends on the type of soils, depth to groundwater, depth to hardpan and other elements that require onsite testing. These are unknown at the present time. An assumed density of three dwelling units per acre[6] yields approximately 72 airpark housing units, within the 24-acre reserve.

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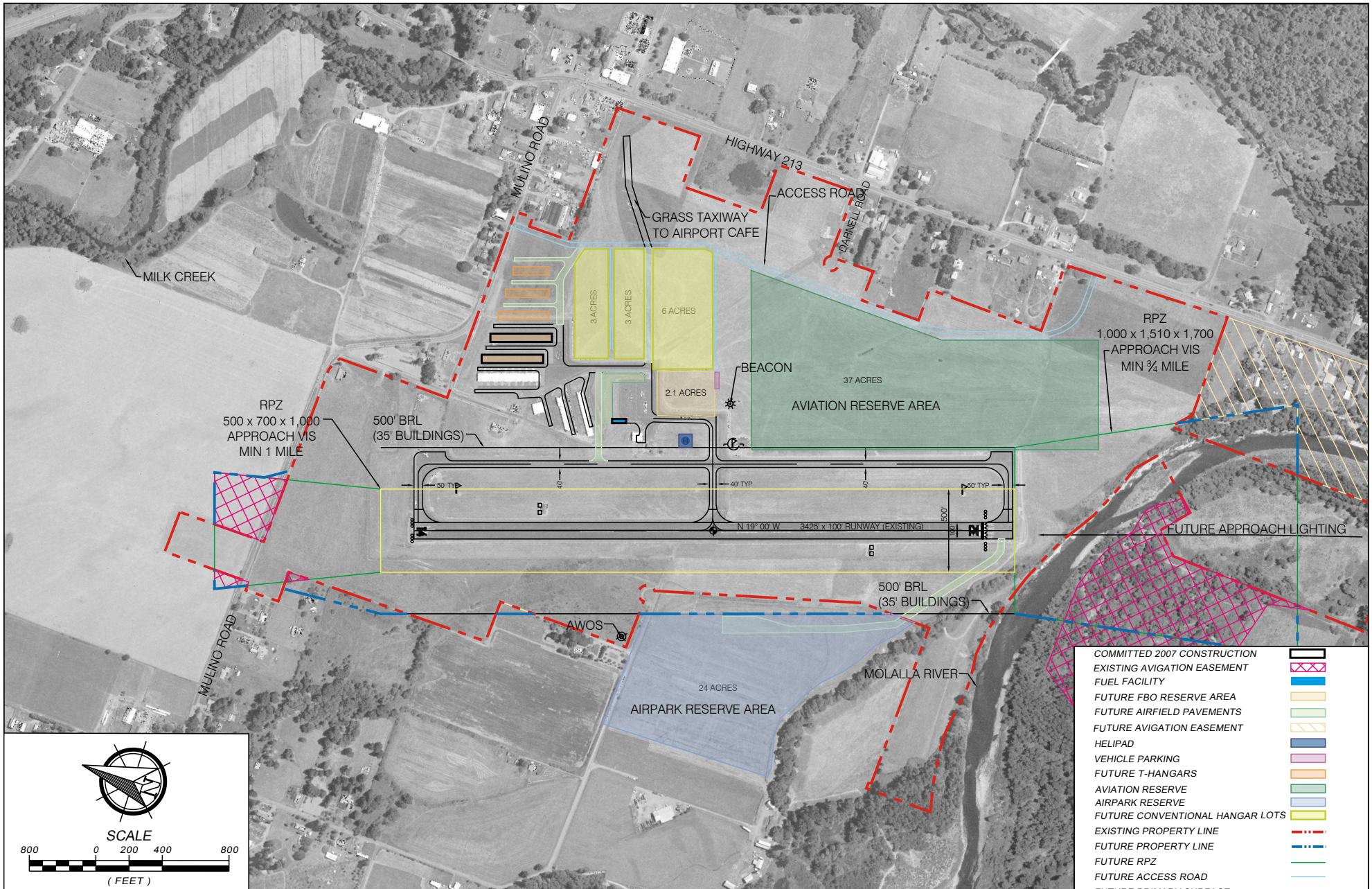
[4] Refer to Chapter Two, *Inventory*, for details of these Clackamas County Zoning designations.
[5] Clackamas County does not have a land use zoning designation that would permit a residential airpark outright. Most likely, a new zoning designation would have to be developed under the Special Use category.
[6] Housing density maximum of three dwelling units per acre is taken from the City of Independence, Oregon Development Code Subchapter 48, *Residential Single Family Airpark Overlay Zone*, section 48.035.



MULINO AIRPORT	ALTERNATIVE 3	EXHIBIT 5D

Table 5D presents the development cost estimates for Alternative 3.

Table 5D. Development Alternative 3 Cost Summary

Project Description		Total Cost
Airfield		
Obstruction Removal	$	300,000
Hangar Taxiways/Aprons	$	1,315,000
Taxilane Edge Lighting	$	364,000
Helicopter Landing Facility	$	169,000
Approach Lighting	$	570,000
Automated Weather Observation Station	$	171,000
Airside Subtotal	**$**	**2,889,000**
Landside		
Property Acquisition	$	4,377,000
T-Hangars (24)	$	1,620,000
Conventional Hangars (145)	$	14,682,000
Access Road	$	2,365,000
Security Fencing	$	879,000
Landside Subtotal	**$**	**23,923,000**
Total Alternative 3*	**$**	**26,812,000**

** Costs do not reflect the development of a possible residential airpark.*

COMPARATIVE SUMMARY OF ALTERNATIVES

Table 5E presents the key elements of the four airport development alternatives. The preferred alternative may be a composite of features from more than one alternative, as long as those features are not mutually exclusive. For example, whatever instrument approach is selected, the design standards, clearances, and lighting requirements for that approach must be included.

Table 5E. Comparative Summary of Alternatives and Facility Requirements

		No-Build	Alternative 1	Alternative 2	Alternative 3
Airfield Requirements	*Instrument Approach – Runway 32*	No	Yes, lower than ¾ mile	Yes, 1 mile	Yes, not lower than ¾ mile
	RPZ Size	Both ends – 500' x 700' x 1,000'	Runway 14-500' x 700' x 1,000'. Runway 32-1,000' x 1,750' x 2,500'	Both ends – 500' x 700' x 1,000'	Runway 14-500' x 700' x 1,000'. Runway 32-1,000' x 1,510' x 1,700'
	Runway Length	No change	1,600' Extension	No change	No change
	Runway Strength	No change	Strengthen	No change	No change
	Maintain Airport Café Access	Yes	Yes	Yes	Yes
	Install REILs	No	Yes	Yes	Yes
	Instrument Approach Lighting	No	Yes	Yes	Yes
	Taxilane Edge Lights	No	Yes	Yes	Yes
	Helicopter Landing Facility	No change	Relocated	Relocated	Relocated
	Install AWOS	No	Yes	Yes	Yes
Landside Requirements	*T-Hangars*[7] *(31 more required by 2027)*	32	112	32	56
	Conventional Hangars[8] *(5 more required by 2027)*	0	14	18	145
	Reconfigured Tiedowns	No Change	Expansion capable of 30 tiedown units	Expansion capable of 30 tiedown units	Expansion capable of 30 tiedown units
	Vehicular Parking	No	Yes	Yes	Yes
	FBO Reserve	No	Yes	Yes	Yes

[7] Based on assumptions of 1,750 square feet needed for one T-hangar unit. Hangar units for Alternatives 1, 2, and 3 include the hangar development associated with the No-Build Alternative.
[8] Based on assumptions of 3,600 square feet per conventional hangar unit.

Table 5E. Comparative Summary of Alternatives and Facility Requirements, Cont.

		No-Build	Alternative 1	Alternative 2	Alternative 3
Landside Requirements	*Upgrade Fencing*	No	Yes	Yes	Yes
	Fuel Facility	Yes	Yes	Yes	Yes
	Residential Airpark	No	No	No	Off-airport
Development Costs[9]	--	$ 5,151,000	$ 76,403,000	$ 13,042,000	$ 31,963,000
Land Acquisition	--	0 acres	151.6 acres	19.0 acres	33.6 acres
Easement Acquisition	--	24.5 acres	9.4 acres	24.5 acres	20.7 acres

ENVIRONMENTAL SCREENING OF ALTERNATIVES

Each alternative was analyzed to assess its relative environmental impact, as well as identify any environmental constraints that may prohibit development. The results of this analysis is presented in **Table 5F**.

[9] No-Build development costs have been added to the development costs for Alternatives 1, 2, and 3 to reflect the maintenance needs throughout the planning period.

Table 5F. Development Alternatives - Environmental Constraints and Impacts[10]

Impact Categories[11]	No-Build Alternative	Alternative 1	Alternative 2	Alternative 3
Noise	Noise increases with growth in operations. *1*	Noise increases with growth in operations; runway extension may attract larger aircraft; instrument approach may bring landing aircraft in at a lower slope thus, closer to the ground. *3*	Noise increases with growth in operations, with development of hangars. *2*	Noise increases with growth in operations. Instrument approach may bring landing aircraft in at a lower slope *2*
Land Use Compatibility	No apparent issues. *1*	Runway extension/road relocation not consistent with EFU. Potential noise impacts. *4*	No apparent issues. *1*	Residential airpark not consistent with current zoning of EFU. *4*
Social Impact	No apparent issues. *1*	No apparent issues. *1*	No apparent issues. *1*	Airpark location in area of low density/agricultural residences. *3*
Induced Socio-Economic Impacts	Fuel could generate revenue for local business. *4*	Longer runway could attract industrial tenants, more tenants, and more revenue. *3*	Aviation Reserve could attract tenants. *2*	Aviation Reserve could attract tenants. Development of Airpark would have infrastructure costs. *1*
Environmental Justice	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Historic Properties & Cultural Resources	No apparent issues. *1*	RW extension may require a cultural resource study under FAA guidelines. *2*	If FAA funds are used for development of Aviation Reserve, cultural resource study may be needed. *2*	If FAA funds are used for development of Aviation Reserve, cultural resource study may be needed. *2*
Recreational Lands	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Farmland Preservation	No apparent issues. *1*	Relocation of Mulino Road and RW/TW extension conflict with EFU regulations. *4*	Reserve development in EFU and Rural Residential, Farm Forest-5 acre (RRFF-5) area. *2*	Reserve development in EFU area. *4*
Light and Glare	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Air Quality	No apparent issues. *2*	No apparent issues. Construction dust is covered under Construction Impacts. *2*	No apparent issues. Construction dust is covered under Construction Impacts. *2*	No apparent issues. Construction dust is covered under Construction Impacts. *2*

[10] The small italic number in each cell represents the qualitative rank of each alternative for the specific category. Where all alternatives are approximately equal, a value of 2 was given. A value of 1 represents the least impacting alternative; a value of 4 represents the greatest impact. A summing of these values appears at the bottom of this table, which in turn provides a subjective ranking of the four alternatives.

[11] The analysis is divided into 18 impact categories and is examined per FAA Order 1050.1E and guidance from the Council on Environmental Quality.

Table 5F. Development Alternatives - Environmental Constraints and Impacts, Continued

Impact Categories	No-Build Alternative	Alternative 1	Alternative 2	Alternative 3
Water Quality	Fuel facility will need protection to keep potential spills out of the Airport's runoff. Increased impervious surface from T-hangars and fuel area will need to be collected, treated, and conveyed. *1*	Fuel facility will need protection to keep potential spills out of the Airport's runoff. Increased impervious surface from T-hangars and fuel area will need to be collected, treated, and conveyed. This alt. also has largest increase in impervious surface due to RW/TW extension. *2*	Fuel facility will need protection to keep potential spills out of the Airport's runoff. Increased impervious surface from T-hangars and fuel area will need to be collected, treated, and conveyed. Drainage from Aviation reserve would need to be addressed as they are developed. *3*	Fuel facility will need protection to keep potential spills out of the Airport's runoff. Increased impervious surface from T-hangars and fuel area will need to be collected, treated, and conveyed. Drainage from Airpark and Aviation reserves would need to be addressed as they are developed. *4*
Plants & Animals	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Wetlands & Floodplains	No apparent issues. *1*	May affect three linear wetlands to the east of the RW south end. *3*	May affect three linear wetlands to the east of the RW south end. *3*	May affect three linear wetlands to the east of the RW south end. *3*
Energy Supply & Natural Resources	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Solid Waste	No apparent issues. *2*	No apparent issues. *2*	Aviation Reserve developed uses could generate solid waste. *3*	Airpark and Aviation Reserve developed uses could generate solid waste. *4*
Hazardous Materials	Fuel site will need containment. May require review of previous fuel site that has been remediated. *2*	Fuel site will need containment. May require review of previous fuel site that has been remediated. *2*	Fuel site will need containment. May require review of previous fuel site that has been remediated. *2*	Fuel site will need containment. May require review of previous fuel site that has been remediated. *2*
Construction Impacts	Construction activities will require dust suppression and erosion protection. Possible short-term noise impacts. *1*	Construction activities will require dust suppression and erosion protection. Runway construction and road relocation would have transportation impacts and more significant earthwork than other alternatives. *2*	Construction activities will require dust suppression and erosion protection. Development of reserve areas could have significant earthwork, although they would likely be built in stages over time. *3*	Construction activities will require dust suppression and erosion protection. Development of reserve areas could have significant earthwork, although they would likely be built in stages over time. *4*
Controversy	No apparent issues. *1*	RW/TW extension could be controversial. *3*	Development of reserve could be controversial.*2*	Development of reserves could be controversial. *3*
Total ranking	29	43	38	48

Each alternative presents an array of environmental opportunities and constraints. The following discussion summarizes the potential environmental concerns associated with each alternative.

No-Build Alternative

The No-Build Alternative includes three actions: a fuel facility, two rows of T-hangars, and improvements to on-airport drainage. The alternative proposal does not present land use compatibility concerns, noise concerns, or direct threats to plant and animal communities. The fuel facility will need to include spill containment features and ways to keep any spilled fuel out of the airport drainage system. New T-hangars will increase impervious surface and will need to include stormwater treatment and drainage. In terms of overall impact, **this alternative has the least impact to the existing natural and built environments.**

Development Alternative 1

This alternative extends the runway and taxiway approximately 1,600 feet to the north-northwest. It includes nine rows of new T-hangars, a fuel facility, helipad, FBO site, terminal buildings, conventional hangars, and an air traffic control tower. This alternative changes the location of one runway end and has the potential of attracting larger and potentially noisier aircraft, thereby increasing, and reconfiguring the Airport's noise footprint. Alternative 1 would add a large amount of new impervious surface, primarily from the runway and taxiway extension. Extension into previously undisturbed areas would likely require a cultural resources review and consultation with the State Historic Preservation Office and local tribes. The proposed runway extension crosses a zoning boundary into land zoned as EFU. The relocation of Mulino Road and the runway/taxiway extension is not consistent with the allowed uses in EFU zones. A land use process, likely involving County Commission approval, will be required to allow the extension. The extension may also generate public controversy based on potential noise, farmland intrusion, and other land use issues.

In general, noteworthy impacts associated with this alternative include increased pavement and runoff, and extension of the noise footprint. It appears that the noise increases would occur over farmland and not sensitive noise receptors, such as residential areas. The extension would require a land use review process where the purpose and need is weighed against farmland preservation goals. **This alternative lies between Alternative 2 and Alternative 3 in potential environmental impact.**

Development Alternative 2

This alternative includes two rows of conventional hangars, an FBO site, a fuel facility, and a helipad. It also includes 25.8 acres in aviation reserve. Impervious surface increase would be minimal in the aircraft operation area. Development of the aviation reserve land could increase impervious surface significantly, and therefore increase stormwater runoff and risk for water quality issues. Development of these areas could require cultural resource reviews. Development in these reserves may impact three linear wetlands shown east of the southern end of the runway. The Reserve areas cross into zoning districts of EFU and RRFF-5. These uses are not consistent with the zoning and may require a zone change, and possible goal exception to

statewide planning goals. The principal focus of analysis for goal exceptions of transportation facilities is on the identified transportation need and on the reasons why that need cannot reasonably be accommodated through alternative methods or locations not requiring goal exceptions. Potential development density of the reserve areas may generate public controversy based on density, urbanization, and traffic issues. **This alternative has the second least overall impact of the alternatives.**

Development Alternative 3

This alternative includes three rows of T-hangars, two rows of conventional hangars, space for large hangars, an FBO site, a fuel facility, and a helipad. It also includes 35.6 acres in aviation reserve and approximately 20 acres in airpark reserve. Impervious surface increase would be moderate in the aircraft operation area with the addition of the largest area of hangar space. Development of the aviation reserve and airpark reserve land could increase impervious surface significantly, and therefore increase stormwater runoff and risk for water quality issues. The off-airport airpark would likely require additional drainage system development, as it may be too distant to take advantage of existing airport facilities. Development of these areas could require cultural resource reviews. Development in the aviation reserve may impact three linear wetlands shown east of the southern end of the runway. The reserve areas cross into EFU and RRFF-5 zoning districts. These uses are not consistent with the zoning and may require a zone change. The off-airport airpark may have increased traffic impacts on the roads west of the Airport. The reserve areas are larger and have the potential for a greater amount of development than Alternative 2. Potential development density of the reserve areas may generate public controversy based on density, urbanization, and traffic issues.

An important issue with this alternative is the inclusion of the airpark in areas that are zoned for EFU. The Airport is outside of the Urban Growth Boundary and it may be difficult for the County to support the necessary land use changes. In addition, development of the residential airpark would have secondary impacts to infrastructure, including drinking water, sanitary sewer/septic, stormwater resources, and off-airport surface transportation. **This alternative has the most impact.**

Stormwater Analysis

An analysis was performed to calculate each alternative's impact on stormwater runoff. The current stormwater system consists of piping that drains to two detention ponds located in the northwest and northeast quadrants of the Airport. This system was designed to retain runoff from existing impervious surfaces, as well as the areas to be developed as part of the ODA management agreement, for a 25-year flood. Calculations of each alternative's increase of impervious surface[12] and the resulting required maximum storage are included in **Table 5G**.

[12] The aviation reserves for Alternatives 2 and 3 and the airpark reserve in Alternative 3 are not included in the calculations. Since development in the aviation reserve is beyond the 2027 planning period, it is too speculative to determine what the amount of impervious surface would be. If development in the reserves occurs, future stormwater analyses would be needed.

Table 5G. Development Alternative Impacts on Stormwater

	Impervious Surface (Acres)	Required Maximum Storage (ft^3) 25-yr flood
Existing and Planned Impervious Surface (No-Build)	21.72	131,809
Alternative 1	80.37	175,262
Alternative 2	25.05	132,870
Alternative 3	34.72	135,355

The analysis shows that there is little impact on the required maximum storage needed for Alternatives 2 and 3 compared to the No-Build alternative. Piping the areas of new development into the existing detention ponds would be sufficient to maintain stormwater runoff.

However, development associated with Alternative 1 would require capacity enhancement of the detention system. Approximately 43,500 cubic feet of additional storage capacity would need to be provided, as well as conveyance piping from areas of new development.

MASTER PLAN CONCEPT

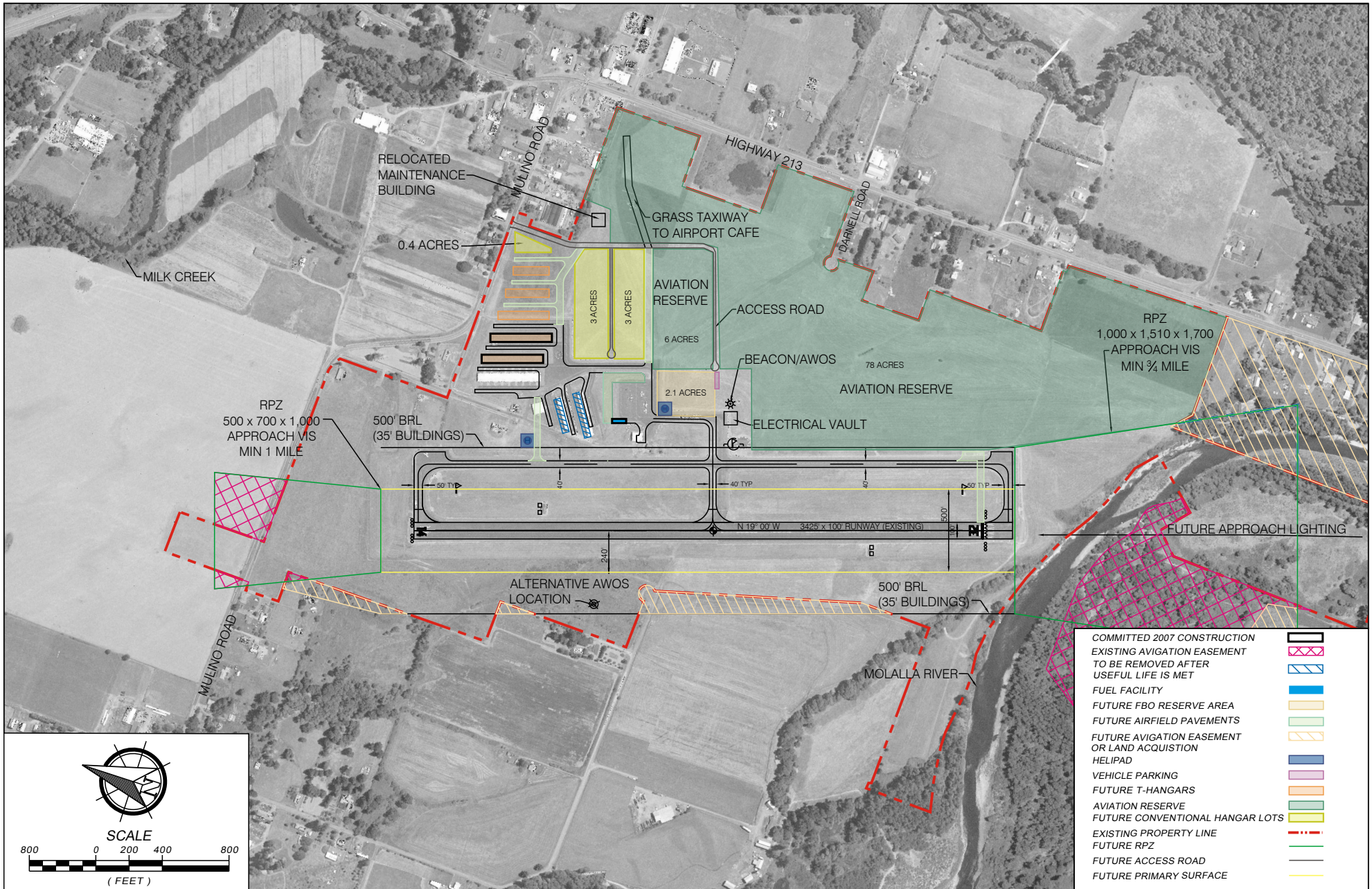
The three development alternatives and No-Build were presented to the Port, ODA, PAC, and members of the public on February 13, 2007. Based on comments made at that meeting and during a six-week review period, the Port selected a preferred alternative (see **Exhibit 5E**). The preferred alternative, or Master Plan Concept, is based on various components of each of the alternatives presented in this chapter, as well as a few additional components not previously depicted. The Master Plan Concept is the basis for the Airport Layout Plan in Chapter Six. The proposed Master Plan Concept is summarized below:

Airfield.

- Installation of a nonprecision approach to Runway 32 with minimums not lower than ¾ mile. New RPZ dimensions would be 1,000 feet by 1,510 feet by 1,700 feet.
- Taxilane extensions to serve new hangars and hangar development areas.
- Additional taxilane access from the parallel taxiway to the aircraft storage area.
- Maintenance of taxiway access to the Airport Café, unless demand for non-aviation development occurs.
- Relocate access taxiway to Runway 32 threshold.
- Installation of REILs, instrument approach lighting system, and taxilane edge lights.
- Relocation of helicopter landing facility.
- Installation of AWOS.

Landside.

- In addition to the two rows of hangars the Port will build in 2007/08, three additional T-hangar buildings, with potential of 24 T-hangar units.
- Approximately six acres for the development of attached or detached conventional hangars. This land is estimated to accommodate up to 72 conventional hangars, depending on hangar size and spacing.



MULINO AIRPORT	MASTER PLAN CONCEPT	EXHIBIT 5E

- Apron expansion of 12,500 square yards to accommodate larger transient aircraft tiedowns and taxilanes for better circulation.
- Aviation reserve area, which can be used for hangar development, tiedowns, etc., if demand necessitates.
- New access road connecting areas of development with both Mulino Road and Highway 213.
- Additional vehicle parking area.
- FBO reserve of approximately 2.1 acres.
- Recommended fencing upgrade.
- New maintenance building.
- Electrical vault.
- Installation of fueling facility.

Changes to the airfield improvements previously depicted are the location of a new access taxilane, relocation of the taxiway accessing Runway 32, the helicopter landing facility location, and the AWOS location:

- Stakeholders supported the need for two access points to the aircraft ramp, parking, and storage area, noting the one existing access point can become congested during summer operations. However, the location proposed in Alternative 3 was thought to be too close to the existing access taxilane. The proposed location of the new taxilane will require the aging hangar/maintenance building to be removed.
- The relocated threshold for Runway 32 requires the access taxiway to be relocated to the new threshold, in order to meet FAA design standards.
- The helicopter landing facility is shown in two locations. The initial location is on the FBO reserve. When the FBO reserve is developed and the ramp area is built out, the ultimate location will be farther north, near the future taxilane. To minimize the potential of vehicle and aircraft conflicts, a new Airport entrance road should be built before the new helicopter landing facility and access taxilane, since these facilities will put operating aircraft next to what is now the main gate to the Airport.
- Two AWOS locations are depicted on the exhibit. The preferred location is a collocation on the beacon tower. If FAA siting criteria are not met at this location, the alternative location is on the west side of the runway.

A nonprecision approach to Runway 32, with minimums not lower than ¾ mile, was selected as the preferred instrument approach. It was not felt that an approach with lower minimums was needed at the Airport, based on user comments and survey input. An approach with minimums not lower than ¾ mile should be achievable, although additional evaluation will need to be completed at a later date to confirm this.

New landside features not previously depicted are: enlarged aviation reserve area, and location for an electrical vault:

- The aviation reserve area was enlarged to maximize the land dedicated for aviation-related functions.
- The electrical vault will be necessary to accommodate the installation of approach lighting, taxilane edge lighting, and REILs.

An extension of Runway 14-32 is not a component of the master plan concept, since the projected demand throughout the planning period does not justify additional length. If the type of aircraft using the Airport changes substantially in the future from what is currently forecasted, it may be necessary to conduct another master plan update to determine the need for a runway extension.

The master plan concept allows considerable airport growth. However, ultimately it is demand for the facilities that will drive development. If demand grows at a moderate rate for the next 20 years, as forecasted in this planning process, it is likely not all of the development shown in the Master Plan Concept will occur. It is possible that growth may occur at a higher rate than expected and at that time it may be necessary to re-evaluate the Master Plan Concept.

Chapter Six
AIRPORT LAYOUT PLAN

The Airport Layout Plan (ALP) drawings are a pictorial representation and summarization of the efforts made in this planning process. The previous chapters supply the basis for the Airport's future airport layout as shown in the drawing set. In order for improvement projects to be eligible for Federal Airport Improvement Program Grants, the projects must appear on a Federal Aviation Administration (FAA) approved ALP.

AIRPORT LAYOUT PLAN DRAWING SET

The paragraphs to follow describe the specific elements found on each sheet within the ALP drawing set.

Cover Sheet

The cover sheet shows a sheet index to the airport layout plan drawing set, and provides pertinent information such as the airport sponsor, airport name, grant number the project is funded through, and date the plan was completed.

Airport Layout Plan Drawing (Sheet C-1)

The airport layout plan depicts the current airport layout and proposed improvements to the Airport for the 20-year planning period and beyond. This drawing also includes location and vicinity maps, which show the Mulino Airport in relation to its surrounding geography. Descriptions of the improvements and costs over the next 20 years are included in Chapter

Seven, *Capital Improvement Plan*. The master plan concept, as selected by the Port of Portland (Port) in consultation with the Project Advisory Committee (PAC) and Oregon Department of Aviation (ODA), was the basis for determining the proposed improvements at the Airport. The ALP is a development guide that can be modified as dictated by demand.

Runway approach visibility minimums, runway protection zones, runway object free area, runway safety area and other standard airport dimensions are shown in the plan and in the runway data tables. Other tables include an airport data table, buildings/facilities table, modifications to standards, and a non-standard conditions and disposition table. The wind rose depicts wind coverage for the runway alignment.

Airspace Plan Drawing (Sheet C-2)

This drawing shows the Part 77 Imaginary Surfaces for the future layout of the Airport with a USGS topographic map as the background. Part 77 defines five distinct surfaces, each with a different size and shape. The dimensions of these surfaces are based on the type of runway and the type of approach ultimately planned for the Airport. Each imaginary surface and its dimension as it applies to the Mulino Airport are defined below.

Primary Surface. A rectangular surface with a width (centered on the runway centerline) that varies for each runway and a length that extends 200 feet beyond each end of the runway. The elevation of the primary surface corresponds to the elevation of the nearest point of the runway centerline. The width of the primary surface of Runway 14-32 is 500 feet.

Approach Surface. A surface centered on the extended runway centerline, starting at each end of the primary surface (200 feet beyond each end of the runway), at a width equal to that of the primary surface and an elevation equal to that of the end of the runway. The ultimately planned approach surfaces at the Airport reflect a visual approach to Runway 14 and a nonprecision approach to Runway 32. The Runway 14 approach surface extends for a horizontal distance of 5,000 feet at a slope of 20:1 to a width of 1,250 feet. The nonprecision instrument approach surface, with minimums not lower than 3/4 mile, to Runway 32 has an inner width of 500 feet extending outward 10,000 feet to an outer width of 4,000 feet at a slope of 34:1.

Transitional Surface. A sloping 7:1 surface that extends outward and upward at right angles to the runway centerline from the sides of the primary surface and the approach surfaces.

Horizontal Surface. An elliptical surface at an elevation 150 feet above the established airport elevation created by swinging arcs of a 10,000-foot radius from the center of each end of the primary surface.

Conical Surface. A surface extending outward and upward from the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

The Part 77 surfaces are the basis for protecting airspace around an airport; therefore, it is ideal to keep these surfaces clear of obstructions whenever possible. The obstruction data tables on

Sheets C-2 and C-3 identify each obstruction and their location, along with the disposition to address the described obstruction.

Obstructions to the Part 77 surfaces were determined based on an obstruction survey performed by W&H Pacific in 2004. Since that time an obstruction removal project has been completed, which eliminated many prior obstructions. As the obstruction removal process is still ongoing, removal for the remaining obstructions has been incorporated into the capital improvement plan (CIP). The CIP prioritizes obstruction removal in the following manner: on-Airport obstructions, off-Airport obstructions within the approach surface, and off-Airport obstructions within the transitional surface. The negotiation and purchase of avigation easements will be necessary prior to the removal of any off-Airport obstructions.

Inner Portion of the Runway 14/32 Approach Surface Drawing (Sheet C-3)

This drawing provides a plan and profile view of the runway, the Runway Protection Zones and approach surfaces. Obstructions within the approach and transitional surfaces are indicated in the profile view.

Airport Land Use Plan and Noise Contour Drawing (Sheet C-4)

A land use plan has been developed for the Airport and the surrounding area. This plan includes the land uses on and around the Airport per the Clackamas County Zoning and Development Ordinance.

Land uses around airports should be compatible with airport operations. Aircraft noise is also a major concern. Land uses and their associated activities that are of greatest concern to airports include:

- Nearby Lighting
- Glare, Smoke and Dust Emissions
- Bird Attractions and Landfills
- Airspace Obstructions
- Electrical Interference
- Concentrations of People

Any of these activities can create safety concerns for airport users and people on the ground. They may also be impacted by airport operations. The airport sponsor should work with the local land use agency(s) to ensure that land uses around the airport are compatible with airport operations.

This sheet shows existing and future 55 – 75 Day-Night Equivalent Sound Level (DNL) contours for Mulino Airport. DNL is a 24-hour average sound level, in A-weighed decibels, obtained after the addition of ten decibels to sound levels occurring between 10 pm and 7 am as averaged over a span of one year. DNL is the FAA's standard metric for determining the cumulative exposure of individuals to noise. Contours for DNL above 65db do not extend beyond the Airport's current property line.

The local zoning designations and noise contours are overlaid on an aerial photograph. The location of the Mulino Elementary School is also depicted, since schools are noise sensitive land uses.

Port of Portland

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SHEET NO. DESCRIPTION

1 (C-1) AIRPORT LAYOUT PLAN
2 (C-2) AIRSPACE PLAN
3 (C-3) RUNWAY 14/32 APPROACH SURFACE PLAN AND PROFILE
4 (C-4) AIRPORT LAND USE PLAN & NOISE CONTOURS

PORTLAND - MULINO AIRPORT

AIRPORT LAYOUT PLAN

AIP#3-41-0072-010

APRIL 2008

DESIGN NO. 2007ZGEN PROJECT MANAGER JASON GATELY

PROJECT NO. 500098 DRAWING NO. 4S9 2007-500

4S9 - AIRPORT LAYOUT PLAN

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AIRPORT DATA

	EXISTING	ULTIMATE
CRITICAL AIRCRAFT (TAIL HEIGHT)	BEECHCRAFT BARON (BE-58)(9.1')	BEECHCRAFT KING AIR 200 (BE-20)(15')
DATUM FOR ALL ITEMS	NAD 83/NAVD 88	SAME
AIRPORT REFERENCE POINT	LAT. 45° 12' 58.7865"N	SAME
COORDINATES (ARP)	LONG. 122° 35' 24.3025"W	SAME
AIRPORT MAGNETIC VARIATION	16° 45' E	SAME
MEAN MAXIMUM TEMPERATURE	80°F (JULY)	SAME
NPIAS ROLE	GA	SAME
AIRPORT REFERENCE CODE (ARC)	B-II	SAME
AIRPORT CODE	4S9	SAME
LAND OWNED IN FEE (ACRES)	275	SAME

DECLARED DISTANCES

	RUNWAY 14		RUNWAY 32	
	EXISTING	ULTIMATE	EXISTING	ULTIMATE
TAKEOFF RUN AVAILABLE (TORA)	3425'	SAME	3425'	SAME
TAKEOFF DISTANCE AVAILABLE (TODA)	3425'	SAME	3425'	SAME
ACCELERATE-STOP DISTANCE AVAILABLE(ASDA)	3425'	SAME	3425'	SAME
LANDING DISTANCE AVAILABLE (LDA)	3425'	SAME	3425'	SAME

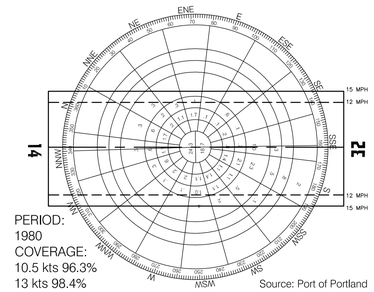
RUNWAY DATA 14/32

		EXISTING	ULTIMATE
LENGTH AND WIDTH		3425' x 100'	SAME
PERCENT EFFECTIVE GRADIENT		0.34%	SAME
PERCENT WIND COVERAGE (10.5 KTS)		96.3%	SAME
PAVEMENT TYPE		ASPHALT	SAME
PAVEMENT STRENGTH		12,000 S.W.	SAME
APPROACH TYPE		VISUAL	NON-PRECISION (R32)
FAR PART 77 DESIGNATION		UTILITY	UTILITY
APPROACH SLOPE REQ'D/CLEAR	14	20:1/20:1	SAME
	32	20:1/20:1	34:1/34:1
RUNWAY PROTECTION ZONE (RPZ)	14	500' X 700' X 1,000'	SAME
	32	500' X 700' X 1,000'	1,000' X 1,510' X 1,700'
RUNWAY LIGHTING		MIRL	SAME
RUNWAY MARKING		BASIC	NON-PRECISION
RUNWAY SAFETY AREA		4025' X 150'	SAME
OBJECT FREE AREA		4025' X 500'	SAME
OBSTACLE FREE ZONE		3825' X 400'	SAME
AIRPORT ELEVATION (MSL)		259.6'	SAME
NAVIGATIONAL AIDS		NONE	GPS
APPROACH AND LANDING AIDS	14	PAPI	PAPI,REIL
	32	PAPI	PAPI, REIL, ODAL, GPS
RUNWAY END COORDINATES	LATITUDE 14	45° 13' 15.4177" N (SURVEYED)	SAME
	LONGITUDE 14	122° 35' 33.1070" W (SURVEYED)	SAME
	LATITUDE 32	45° 12' 43.743" N (EST)	SAME
	LONGITUDE 32	122° 35' 16.359" W (EST)	SAME
TAXIWAY LIGHTING		MITL	SAME
TAXIWAY SAFETY AREA (WIDTH)		118'	SAME

LEGEND

	EXISTING	ULTIMATE
FACILITIES		
BUILDINGS		
BUILDING CONSTRUCTION PHASE 1		
BUILDING CONSTRUCTION PHASE 2		
BUILDING CONSTRUCTION PHASE 3		
PAVEMENT		
PAVEMENT REMOVAL		
PAVEMENT CONSTRUCTION PHASE 1		
PAVEMENT CONSTRUCTION PHASE 2		
PAVEMENT CONSTRUCTION PHASE 3		
BUILDING RESTRICTION LINE (BRL)	BRL	SAME
AIRPORT PROPERTY LINE		SAME
RUNWAY SAFETY AREA (RSA)	RSA	SAME
OBJECT FREE AREA (OFA)	OFA	SAME
OBSTACLE FREE ZONE (OFZ)	OFZ	SAME
GROUND CONTOURS	640	640
AIRPORT REFERENCE POINT (ARP)		SAME
VISUAL GUIDANCE INDICATORS		
WIND INDICATOR		
AVIGATION EASEMENT		
RUNWAY PROTECTION ZONE (RPZ)		
BEACON		SAME
THRESHOLD LIGHTS		SAME
ODAL LIGHTS	NONE	
AWOS	NONE	★
PAVEMENT MARKINGS (NON-PRECISION)		
TAXIWAY SAFETY AREA (TSA)	TSA	SAME
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	SAME
FENCE		SAME
AIRFIELD DRAINAGE		SAME

ALL WEATHER WIND ROSE



PERIOD:
1980
COVERAGE:
10.5 kts 96.3%
13 kts 98.4%

Source: Port of Portland

NOTES:

1. THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (FAA) (PROJECT #3-41-0072-010) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47.104. 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.
2. EXISTING RUNWAY WIDTH EXCEEDS THE DESIGN STANDARDS FOR THE CRITICAL AIRCRAFT AND THE NEED FOR THE WIDER RUNWAY WILL BE ADDRESSED AT THE TIME OF THE NEXT RUNWAY REHABILITATION.
3. THE MULINO RIVER HAS ERODED PORTIONS OF THE RUNWAY 32 RUNWAY SAFETY AREA, WHICH REQUIRED A 175' THRESHOLD RELOCATION. IF MORE EROSION OF THE SAFETY AREA OCCURS, IT MAY BE NECESSARY TO EXTEND RUNWAY 14 COMMENSURATE TO THE LOSS OF RUNWAY LENGTH.
4. BUILDING RESTRICTION LINES (BRL) ARE BASED UPON A 35-FOOT TALL BUILDING LOCATED 500 FEET FROM THE RUNWAY CENTERLINE NOT PENETRATING THE AIRPORT'S FAR PART 77 SURFACES.
5. THERE ARE NO OBSTACLE FREE ZONE (OFZ) OBJECT PENETRATIONS OR THRESHOLD SITING SURFACE (TSS) OBJECT PENETRATIONS FOR RUNWAY 32.

NON STANDARD CONDITIONS & DISPOSITION:

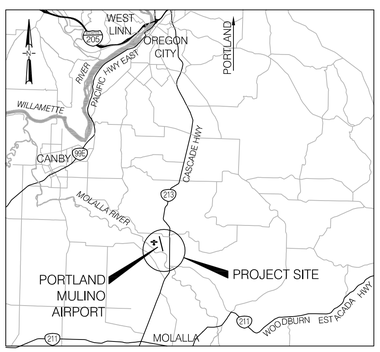
1. THE EXISTING OFA IS PENETRATED BY A BERM LOCATED ON THE WEST SIDE OF RUNWAY 14/32. THE BERM WILL NEED TO BE REMOVED.

MODIFICATIONS TO STANDARDS:

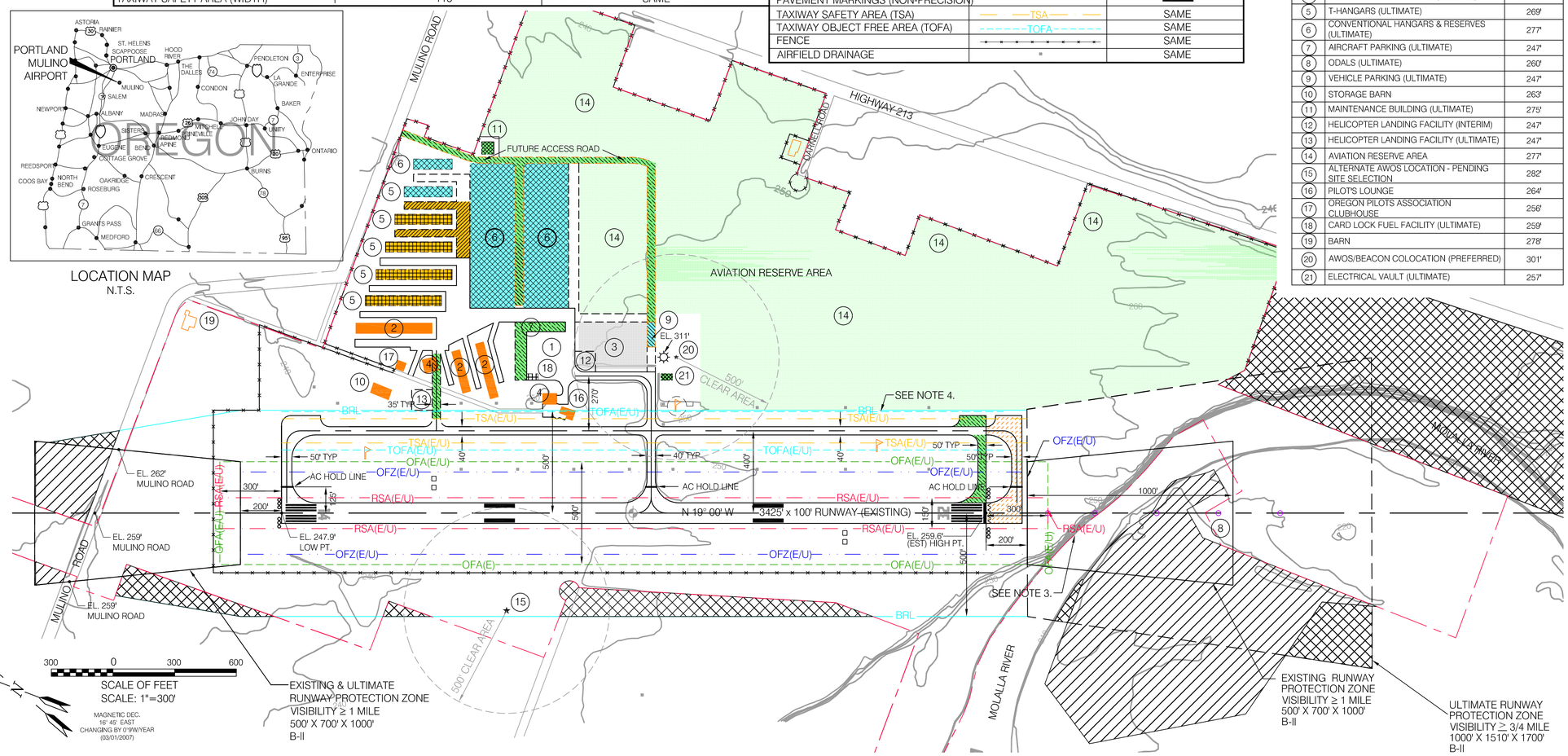
1. THERE ARE NO EXISTING MODIFICATIONS TO STANDARDS.

	BUILDINGS AND FACILITIES	EST. TOP EL.
1	AIRCRAFT APRON (200' X 240')	247'
2	T-HANGARS (EXISTING)	261'-268'
3	FBO RESERVE	277'
4	CONVENTIONAL HANGARS (EXISTING)	262'-264'
5	T-HANGARS (ULTIMATE)	269'
6	CONVENTIONAL HANGARS & RESERVES (ULTIMATE)	277'
7	AIRCRAFT PARKING (ULTIMATE)	247'
8	ODALS (ULTIMATE)	260'
9	VEHICLE PARKING (ULTIMATE)	247'
10	STORAGE BARN	263'
11	MAINTENANCE BUILDING (ULTIMATE)	275'
12	HELICOPTER LANDING FACILITY (INTERIM)	247'
13	HELICOPTER LANDING FACILITY (ULTIMATE)	247'
14	AVIATION RESERVE AREA	277'
15	ALTERNATE AWOS LOCATION - PENDING SITE SELECTION	282'
16	PILOT'S LOUNGE	264'
17	OREGON PILOTS ASSOCIATION CLUBHOUSE	256'
18	CARD LOCK FUEL FACILITY (ULTIMATE)	259'
19	BARN	278'
20	AWOS/BEACON COLOCATION (PREFERRED)	301'
21	ELECTRICAL VAULT (ULTIMATE)	257'

LOCATION MAP
N.T.S.



VICINITY MAP
N.T.S.



NO.	DATE	BY	REVISIONS	CK'D	APPV'D

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AIRPORT SPONSOR:
SIGNATURE
TITLE DATE:
FEDERAL AVIATION ADMINISTRATION
SIGNATURE
TITLE DATE:
APPROVAL LETTER DATED:

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PORTLAND, OREGON

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2007ZGEN	500098
DESIGN NUMBER	PROJECT NUMBER

DESIGNED BY	SML
DRAWN BY	RAI
CHECKED BY	REA
DATE	APRIL 2008
SCALE	1"= 300'

PORTLAND - MULINO AIRPORT

AIRPORT LAYOUT PLAN

SUBMITTED BY
AIRPORT MANAGER

TYPE	DRAWING NO.		
CD	4S9 2007-500	1/4	(C-1)

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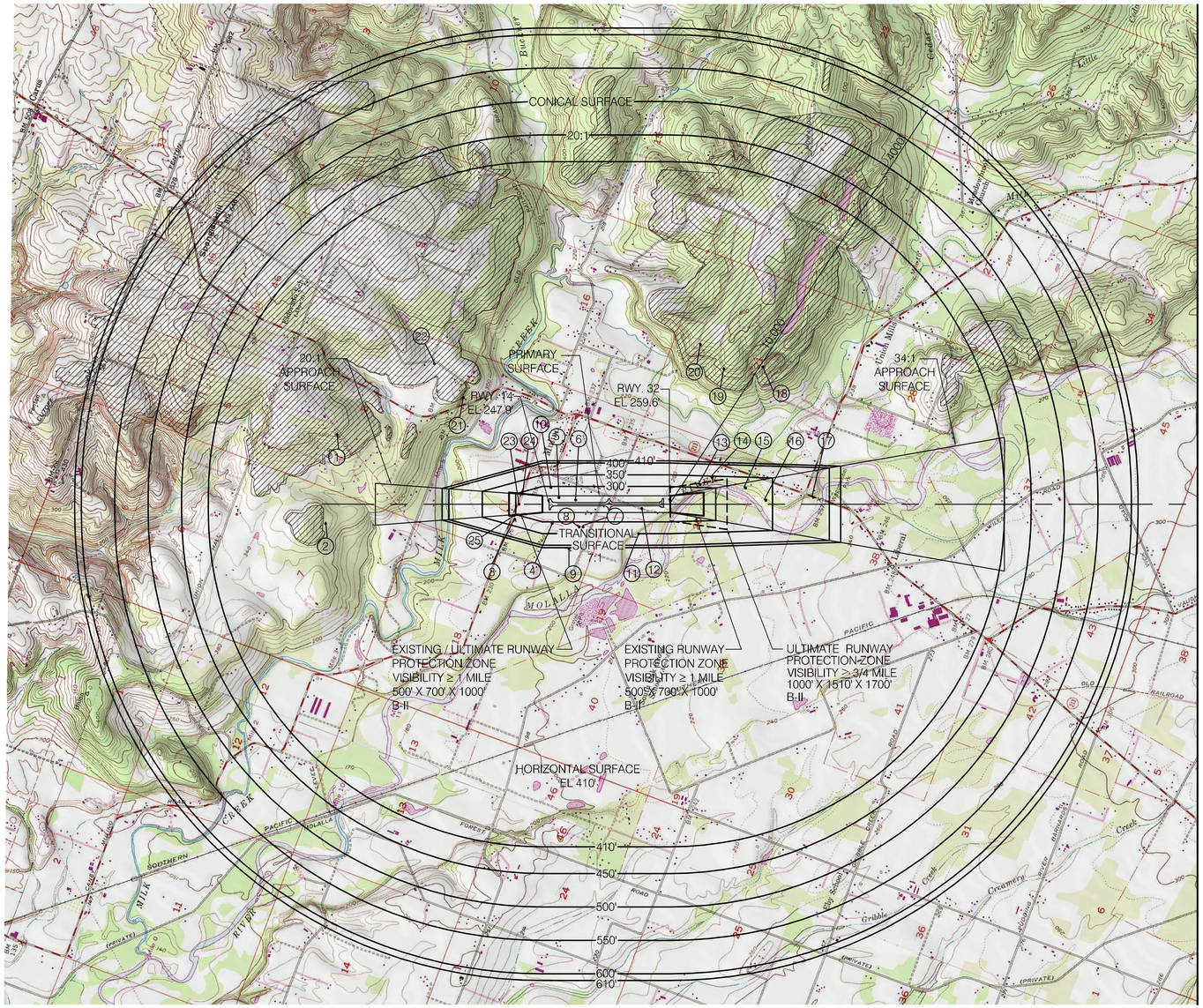
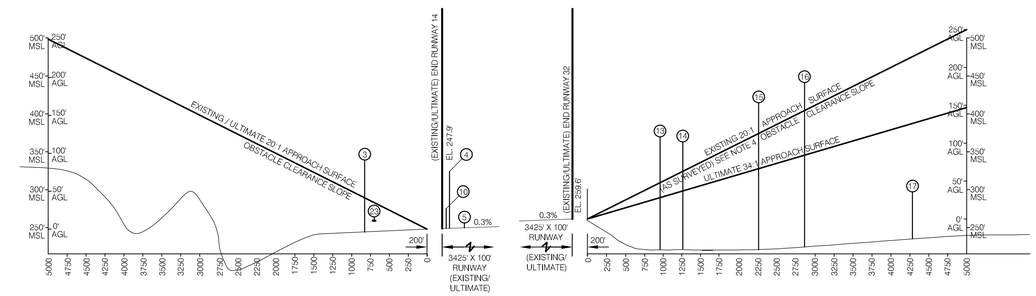


NO.	ITEM	PART 77 SURFACE (SEE NOTE 1)	MEAN SEA LEVEL (MSL) ELEV	DISTANCE FROM RWY CL (SEE NOTE 2)	DISTANCE FROM RWY 14 END (SEE NOTE 2)	DISTANCE FROM RWY 32 END (SEE NOTE 2)	AMOUNT OF PENETRATION (ESTIMATED) (SEE NOTE 3)	ON AIRPORT PROPERTY?	DISPOSITION	EXPECTED DATE FOR REMOVAL
1	TREE GROUP	HORIZONTAL	635'	2,080'	6,340'	-9,765'	225'	NO	NONE	-
2	TREE GROUP	HORIZONTAL	550'	580'	6,680'	-10,105'	140'	NO	NONE	-
3	TREE	TRANSITIONAL	310'	470'	1,020'	-4,445'	19'	NO	TOP/REMOVE	1-5 YEARS
4	TREES	TRANSITIONAL	324'	580'	-100'	-3,325'	17'	NO	TOP/REMOVE	1-5 YEARS
5	WINDSOCK	PRIMARY	256'	200'	-300'	-3,125'	8'	YES	LIGHT	1-5 YEARS
6	PAPI	PRIMARY	N/A	125'	-800'	-2,625'	--	YES	NO OBSTRUCTION, REFERENCE ONLY	-
7	TREE	TRANSITIONAL	380'	680'	-1,020'	-2,405'	59'	NO	TOP/REMOVE	1-5 YEARS
8	TREE	TRANSITIONAL	373'	680'	-910'	-2,515'	52'	NO	TOP/REMOVE	1-5 YEARS
9	TREE	TRANSITIONAL	337'	1,330'	-600'	-2,825'	(-73')	NO	NO OBSTRUCTION, REFERENCE ONLY	-
10	OBS LIGHT ON WINDSOCK	TRANSITIONAL	275'	510'	-60'	-3,365'	(-16')	YES	NO OBSTRUCTION, REFERENCE ONLY	-
11	TREES	TRANSITIONAL	344'	890'	-2,660'	-745'	(-6')	NO	NO OBSTRUCTION, REFERENCE ONLY	-
12	PAPI	PRIMARY	N/A	125'	-2,770'	-655'	--	YES	NO OBSTRUCTION, REFERENCE ONLY	-
13	TREE GROUP	TRANSITIONAL	357'	590'	-4,520'	1,095'	43'	YES	TOP/REMOVE	1-5 YEARS
14	TREE GROUP	TRANSITIONAL	365'	800'	-4,880'	1,455'	15'	NO	TOP/REMOVE	1-5 YEARS
15	TREE GROUP	APPROACH RWY 32 (NON-PREC)	402'	490'	-6,055'	2,630'	71'	NO	TOP/REMOVE	1-5 YEARS
16	TREE GROUP	APPROACH RWY 32 (NON-PREC)	432'	120'	-6,665'	3,240'	83'	NO	TOP/REMOVE	1-5 YEARS
17	HIGHWAY 213	APPROACH RWY 32 (NON-PREC)	267'	210'	-8,085'	4,660'	(-124')	NO	NO OBSTRUCTION, REFERENCE ONLY	-
18	TREE GROUP	HORIZONTAL	670'	4,110'	-6,400	2,975'	260'	NO	NONE	-
19	TREE GROUP	HORIZONTAL	650'	4,050'	-5,230	1,805'	240'	NO	NONE	-
20	TREE GROUP	HORIZONTAL	620'	4,780'	-4,530	1,105'	210'	NO	NONE	-
21	TREE GROUP	HORIZONTAL	540'	3,180'	2,560'	-5,985	130'	NO	NONE	-
22	TREE GROUP	HORIZONTAL	620'	4,210'	3,430'	-6,855'	210'	NO	NONE	-
23	MULINO ROAD	APPROACH RWY 14 (VISUAL)	259'	0'	900'	-4,325'	--	NO	NO OBSTRUCTION, REFERENCE ONLY	-
24	MULINO ROAD	TRANSITIONAL	262'	310'	800'	-4,225'	--	NO	NO OBSTRUCTION, REFERENCE ONLY	-
25	MULINO ROAD	TRANSITIONAL	259'	335'	1050'	-4,475'	--	NO	NO OBSTRUCTION, REFERENCE ONLY	-



PROFILE VIEW RUNWAY 14/32

1000 0 1000 2000
SCALE OF FEET
HORIZONTAL SCALE: 1"=1000'

100 0 100 200
SCALE OF FEET
VERTICAL SCALE: 1"=100'

NOTES:

1. PART 77 SURFACES BASED ON ULTIMATE AIRSPACE SURFACES
2. DIMENSIONS TO RUNWAY SURFACE BASED ON EXISTING/ULTIMATE RUNWAY CONFIGURATION ADAPTED FROM W&H PACIFIC (2004) SURVEY
3. OBSTRUCTION PENETRATION BASED ON ULTIMATE AIRPSACE SURFACES (RWY 32 NON-PRECISION, RWY 14 VISUAL APPROACHES) ADAPTED FROM W&H PACIFIC (2004) SURVEY

MAGNETIC DEC.
16° 45' EAST
CHANGING BY 0°0'W/YEAR
(03/01/2007)

2000 0 2000 4000
SCALE OF FEET
SCALE: 1"=2000'

NO.	DATE	BY	REVISIONS	CK'D	APPV'D

APPROVAL BLOCK
AIRPORT SPONSOR:
SIGNATURE
TITLE DATE:
FEDERAL AVIATION ADMINISTRATION
SIGNATURE
TITLE DATE:
APPROVAL LETTER DATED:

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20007ZGEN — DESIGN NUMBER
500098 — PROJECT NUMBER

DESIGNED BY SL
DRAWN BY RAI
CHECKED BY REA
DATE APRIL 2008
SCALE AS SHOWN

PORTLAND - MULINO AIRPORT

AIRSPACE PLAN

SUBMITTED BY
AIRPORT MANAGER

TYPE CD
DRAWING NO. 4S9 2007-500 2/4 (C-2)

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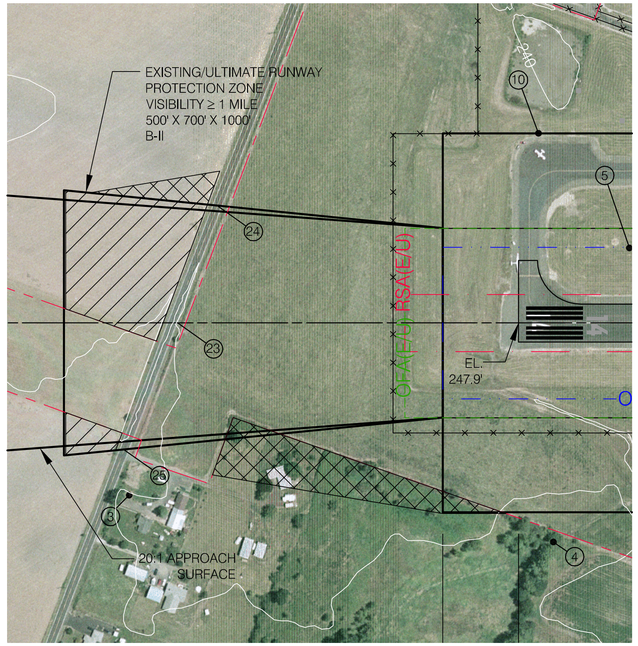

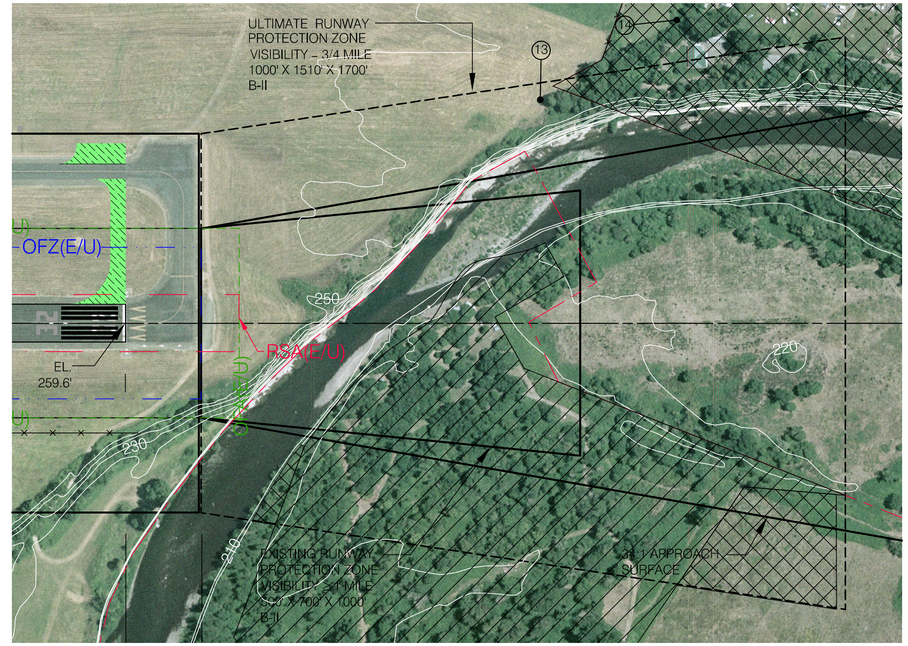

NO.	ITEM	PART 77 SURFACE (SEE NOTE 1)	MEAN SEA LEVEL (MSL) ELEV	DISTANCE FROM RWY CL (SEE NOTE 2)	DISTANCE FROM RWY 14 END (SEE NOTE 2)	DISTANCE FROM RWY 32 END (SEE NOTE 2)	AMOUNT OF PENETRATION (ESTIMATED) (SEE NOTE 3)	ON AIRPORT PROPERTY?	DISPOSITION	EXPECTED DATE FOR REMOVAL
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10	OBS LIGHT ON WINDSOCK	TRANSITIONAL	275'	510'	-60'	-3,365'	(-16')	YES	NO OBSTRUCTION. REFERENCE ONLY	-
11	TREES	TRANSITIONAL	344'	890'	-2,680'	-745'	(45')	NO	NO OBSTRUCTION. REFERENCE ONLY	-
12	PAPI	PRIMARY	N/A	125'	-2,775'	-655'	--	YES	NO OBSTRUCTION. REFERENCE ONLY	-
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18	TREE GROUP	HORIZONTAL	670'	4,110'	-6,400'	2,975'	260'	NO	NONE	-
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21	TREE GROUP	HORIZONTAL	540'	3,180'	2,560'	-5,985'	130'	NO	NONE	-
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23	MULINO ROAD	APPROACH RWY 14 (VISUAL)	259'	0'	900'	-4,325'	--	NO	NO OBSTRUCTION. REFERENCE ONLY	-
24	MULINO ROAD	TRANSITIONAL	262'	310'	800'	-4,225'	--	NO	NO OBSTRUCTION. REFERENCE ONLY	-
25	MULINO ROAD	TRANSITIONAL	259'	330'	1,050'	-4,475'	--	NO	NO OBSTRUCTION. REFERENCE ONLY	-

LEGEND

	EXISTING	ULTIMATE
AIRPORT PROPERTY LINE		SAME
RUNWAY SAFETY AREA (RSA)	RSA	SAME
OBJECT FREE AREA (OFA)	OFA	SAME
OBSTACLE FREE ZONE (OFZ)	OFZ	SAME
AVIGATION EASEMENT		
FENCE		SAME
PAVEMENT CONSTRUCTION PHASE 2		

PLAN VIEW - RUNWAY 14

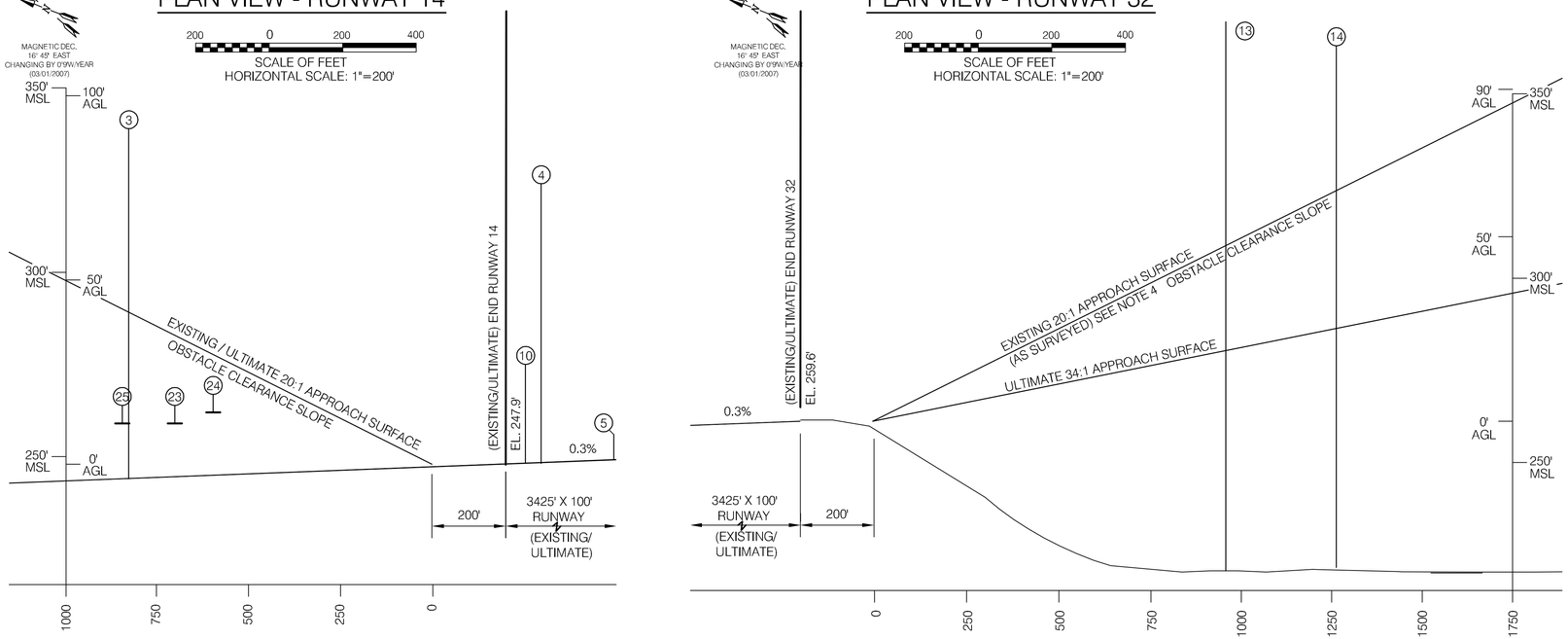
MAGNETIC DEC.
16° 45' EAST
CHANGING BY 0°9W/YEAR
(03/01/2007)

200 0 200 400
SCALE OF FEET
HORIZONTAL SCALE: 1"=200'

PLAN VIEW - RUNWAY 32

MAGNETIC DEC.
16° 45' EAST
CHANGING BY 0°9W/YEAR
(03/01/2007)

200 0 200 400
SCALE OF FEET
HORIZONTAL SCALE: 1"=200'



200 0 200 400
SCALE OF FEET
HORIZONTAL SCALE: 1"=200'

20 0 20 40
SCALE OF FEET
VERTICAL SCALE: 1"=20'

PROFILE VIEW RUNWAY 14/32

NOTES:

1. PART 77 SURFACES BASED ON ULTIMATE AIRSPACE SURFACES
2. DIMENSIONS TO RUNWAY SURFACE BASED ON EXISTING/ULTIMATE RUNWAY CONFIGURATION ADAPTED FROM W&H PACIFIC (2004) SURVEY
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4. 20:1 APPROACH SURFACE FOR REFERENCE ONLY.
5. AGL = ELEVATION ABOVE GROUND LEVEL MEASURED FROM RUNWAY END

NO.	DATE	BY	REVISIONS	CKD	APPVD

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AIRPORT SPONSOR:
SIGNATURE
TITLE DATE:
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TITLE DATE:
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2007ZGEN — DESIGN NUMBER
500098 — PROJECT NUMBER

DESIGNED BY SL
DRAWN BY RAI
CHECKED BY REA
DATE APRIL 2008
SCALE AS SHOWN

PORTLAND - MULINO AIRPORT

INNER PORTION OF THE RUNWAY 14/32 APPROACH SURFACE

SUBMITTED BY
AIRPORT MANAGER

TYPE CD
DRAWING NO. 4S9 2007-500 3/4 (C-3)

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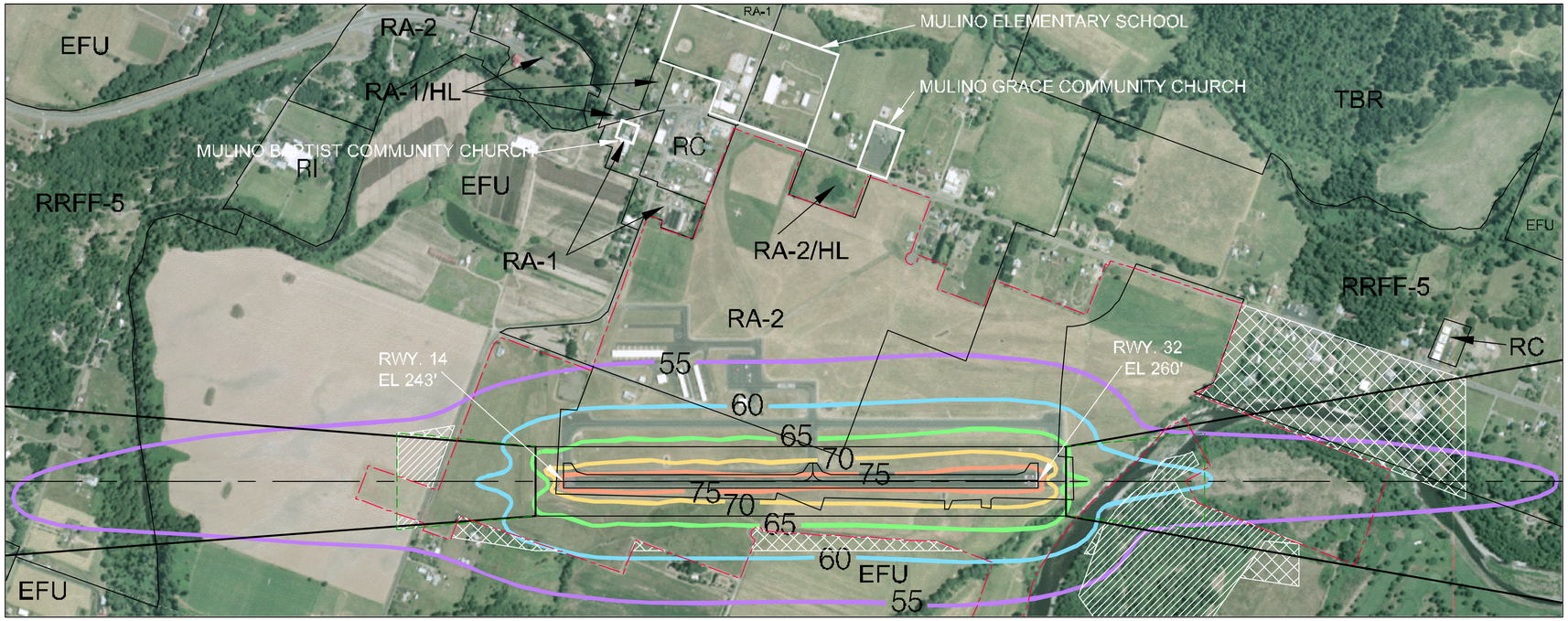


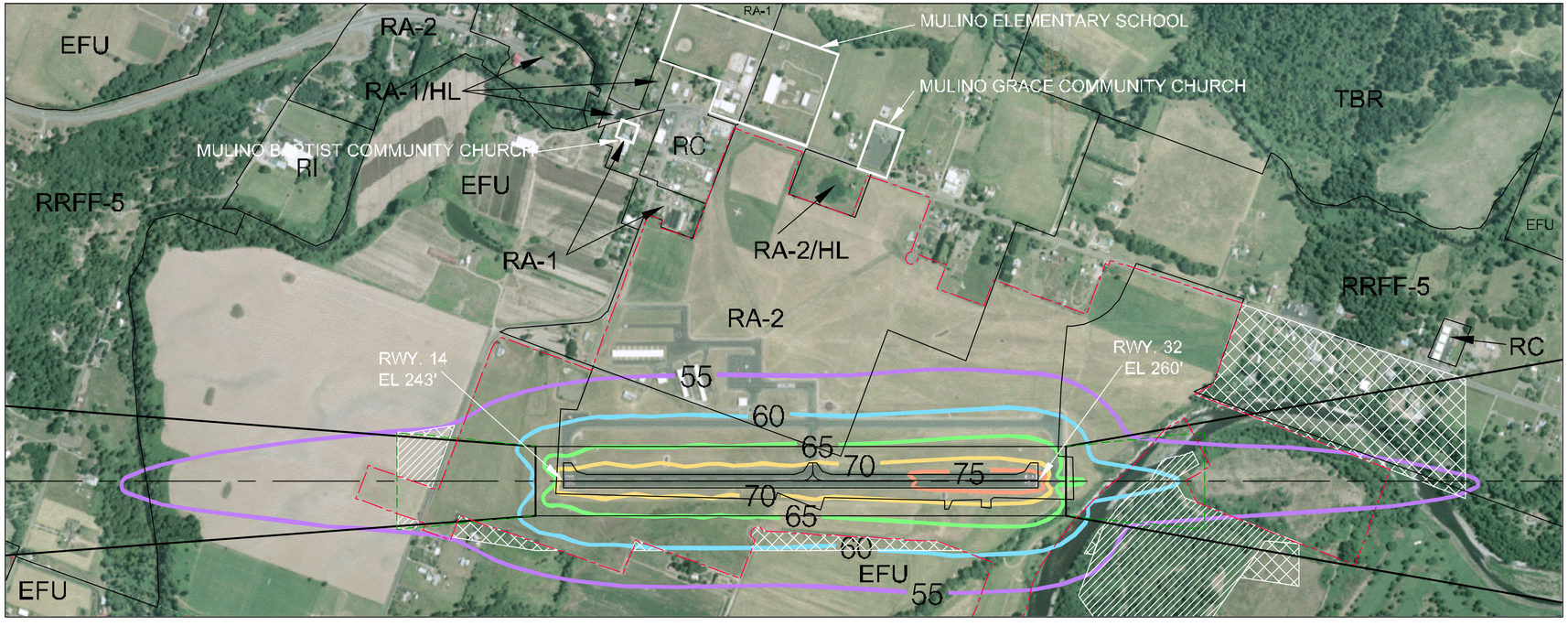
EXISTING NOISE CONTOURS 2006

SCALE OF FEET
SCALE: 1"=500'

LEGEND	
AIRPORT PROPERTY LINE	
ZONING BOUNDARY	
RUNWAY PROTECTION ZONE (RPZ)	
NOISE CONTOURS (75 DNL)	75
NOISE CONTOURS (70 DNL)	70
NOISE CONTOURS (65 DNL)	65
NOISE CONTOURS (60 DNL)	60
NOISE CONTOURS (55 DNL)	55
AVIGATION ESMT. (EXISTING)	
AVIGATION ESMT. (ULTIMATE)	

NOTE:

1. EXISTING CITY/COUNTY AIRPORT OVERLAY ZONING TO BE REVISED TO REFLECT THE AIRSPACE SURFACES DEPICTED IN THIS DRAWING.
2. THE AIRSPACE SURFACES DEPICTED ON LAND USE PLAN REFLECT ULTIMATE CONFIGURATION OF RUNWAY AND PLANNED NON-PRECISION INSTRUMENT APPROACH CAPABILITIES CONSISTENT WITH SHEET NO. 3 (FROM THE AIRPORT MASTER PLAN).
3. SOURCE FOR AERIAL PHOTOS: GOOGLE EARTH PRO, 2006



ULTIMATE NOISE CONTOURS 2012

SCALE OF FEET
SCALE: 1"=500'

CLACKAMAS COUNTY ZONING DISTRICTS	
AG/F	AGRICULTURE / FOREST
EFU	EXCLUSIVE FARM USE
FF-10	FARM / FOREST 10 ACRE
RA-1	RURAL AREA RESIDENTIAL, 1-ACRE
RA-1/HL	RURAL AREA RESIDENTIAL 1-ACRE / HISTORIC LANDMARK
RA-2	RURAL AREA RESIDENTIAL, 2-ACRE
RA-2/HL	RURAL AREA RESIDENTIAL 2-ACRE / HISTORIC LANDMARK
RC	RURAL COMMERCIAL
RI	RURAL INDUSTRIAL
RRFF-5	RURAL RESIDENTIAL FARM / FOREST 5 ACRE
TBR	TIMBER

NO.	DATE	BY	REVISIONS	CHKD	APPVD

APPROVAL BLOCK
AIRPORT SPONSOR
SIGNATURE
TITLE DATE
FEDERAL AVIATION ADMINISTRATION
SIGNATURE
TITLE DATE
APPROVAL LETTER DATED

PORT OF PORTLAND
PORTLAND, OREGON
WHPacific
2007-63-A
DESIGN NUMBER
500008
PROJECT NUMBER

DESIGNED BY BVL
DRAWN BY HAI
CHECKED BY HEA
DATE APRIL 2008
SCALE 1" = 500'

PORTLAND - MULINO AIRPORT

AIRPORT LAND USE PLAN & NOISE CONTOURS

SUBMITTED BY
APPROVAL DATE

TYPE CD | DRAWING NO. 4S9 2007-500 | 4/4 | (C-4)

Chapter Seven
CAPITAL IMPROVEMENT PLAN

Through the evaluation of the facility requirements, identification of the Master Plan Concept, and the development of the Airport Layout Plan, the improvements needed at the Mulino Airport over the next 20-year period have been determined. The Capital Improvement Plan (CIP) provides the basis for planning the funding of these improvements. The planned phases of development are in the 5-, 10- and 20-year time frames.

CAPITAL IMPROVEMENT PROJECTS

The CIP develops both the timeline for airport improvements and estimated costs for those improvements. The plan is divided into three phases: Phase I: present-2012; Phase II: 2013-2017; and Phase III: 2018-2027. The development phases for buildings and pavements are also shown on the Airport Layout Plan (ALP).

Below is the anticipated plan for the Airport to meet projected demand. Funding for these projects has not yet been committed and the actual costs may vary depending upon final construction costs. The date of implementation may also vary due to funding availability.

Phase I (2007-2012)

Phase I is the first five years of the planning period, through 2012. Phase I development projects are further broken down into specific years. Projects in this phase include:

2007

- Begin projects detailed in the Port and ODA management agreement, which include: the fuel facility upgrade, two rows of T-hangars, and drainage improvements. These projects will be completed within Phase I.

2008

- Pavement maintenance (crack and fog seal).
- Remove obstructions on Port property.

2009

- Relocate helicopter landing facility to interim location.
- T-hangar development of one row, with potential of 12 T-hangar units.
- Taxilane extensions to serve new hangars and hangar development areas (approximately 50' x 275' extension with two taxilanes, approximately 30' x 300' and 30' x 250').

2010

- Acquisition of avigation easements and removal of obstructions within approach.

2011

- Installation of Automatic Weather Observation System (AWOS).
- Pavement maintenance (crack and fog seal).

2012

- T-hangar development of one row, with potential of 12 T-hangar units.
- Taxilane extensions to serve new hangars and hangar development areas (approximately 50' x 140' extension with one taxilane, approximately 30' x 200').
- Acquisition of avigation easements and removal of obstructions within transitional surfaces.

Phase II (2013-2017)

Phase II is the second five years of the planning period, 2013-2017. Projects during this phase include:

- Install non precision approach to Runway 32 with minimums not lower than ¾ mile, which does not have a cost since there is no installation of ground-based equipment is necessary.
- Installation of Runway End Identifier Lights (REILs) and instrument approach lighting system.
- New maintenance building.
- Additional taxilane access from the parallel taxiway to the aircraft storage area (approximately 35' x 400').
- Relocate access taxiway to Runway 32 threshold (approximately 50' x 400').
- Apron expansion of 12,500 square yards to accommodate larger transient aircraft tiedowns.
- Fencing upgrade.
- New access road connecting areas of development to Mulino Road, approximately 2,700 feet.
- Install taxilane edge lights and electrical vault.
- Master Plan update.

- Pavement maintenance (2014 and 2017), including crack and fog seal.

Phase III (2018-2027)

Phase III is the last ten years of the planning period, 2018 – 2027. Projects falling within this timeframe include:

- Additional vehicle parking area, approximately 15 parking spaces.
- Pavement Maintenance (2020, 2023, and 2026), including crack seal, fog seal, slurry seal, and overlay.
- Development of attached or detached conventional hangars for up to 72 conventional hangars, depending on hangar size and spacing.

PROJECT COSTS

A list of improvements and costs over the next 20 years are included in **Table 7A**. All costs are estimated in 2006 dollars. Total project costs include construction, temporary flagging and signing, construction staking, testing, engineering, administration, and contingency, as applicable. Power utilities are included in all new hangar projects. No water service cost was added for the hangar developments.

FUNDING SOURCES

The Mulino Airport is part of the National Plan of Integrated Airport Systems (NPIAS), and is eligible to receive federal Airport Improvement Program (AIP) funding. Currently, small general aviation airports, like Mulino, receive $150,000 in annual entitlements from the AIP and are eligible for discretionary AIP funding grants. Therefore, the majority of funding for airport improvement projects is likely to come from the Federal Aviation Administration (FAA). For projects eligible for FAA AIP funding, the FAA may fund up to 95% of the total project cost. The airport owner must contribute the remaining amount. The legislation currently authorizing the AIP and the taxes that fund the program expire September 30, 2007. The annual entitlement amount, the percentage of matching funds required, and project eligibility criteria may soon change. AIP funding is available for most capital projects, but at this time it is difficult to receive funding for revenue-producing items such as hangars.

The Mulino Airport is designated as a Core airport by the State of Oregon. As such, the Airport is eligible for the State-sponsored Financial Aid to Municipalities (FAM) discretionary grant and Pavement Maintenance Program (PMP). Currently, FAM Grants are awarded annually for an amount not-to-exceed $25,000 for projects including planning, development and capital improvement. The PMP consists of annual funds of up to $1,000,000 dedicated to preserving and maintaining pavements at eligible Oregon airports.

Other funding may come directly from the airport owner.

Table 7A. Mulino Airport Proposed Capital Improvement Projects (present – 2027)

	Project Description	Total Cost	Funding Source: Airport Owner (5%)	FAA* (95%)	ODA** (95%)	Private
Phase I (2007-2012)						
2007						
1	Fuel Facility Upgrade	$ 86,000	$ 86,000	$ -	$ -	$ -
2	T-hangar Development	$ 1,200,000	$ 1,200,000	$ -	$ -	$ -
3	Drainage Improvements	$ 61,000	$ 61,000	$ -	$ -	$ -
2008						
1	Pavement Maintenance (crack and fog seal)	$ 72,000	$ 3,600	$ -	$ 68,400	$ -
2	Obstruction Removal (on Port property)	$ 60,000	$ 3,000	$ 57,000	$ -	$ -
2009						
1	Helicopter Landing Facility Relocation	$ 169,000	$ 8,450	$ 160,550	$ -	$ -
2	T-hangar Development (one row)	$ 900,000	$ 45,000	$ 855,000	$ -	$ -
3	Taxilane Extensions to Service New T-hangars (50' x 275', 30' x 300', 30' x 250')	$ 483,000	$ 24,150	$ 458,850	$ -	$ -
2010						
1	Easement Acquisition and Obstruction Removal (Part 77 Approach Surfaces)	$ 447,000	$ 22,350	$ 424,650	$ -	$ -
2011						
1	AWOS Installation	$ 223,000	$ 11,150	$ 211,850	$ -	$ -
2	Pavement Maintenance (crack and fog seal)	$ 72,000	$ 3,600	$ -	$ 68,400	$ -
2012						
1	T-hangar Development (one row)	$ 900,000	$ 45,000	$ 855,000	$ -	$ -
2	Taxilane Extensions to Service New T-hangars (50' x 140', 30' x 200')	$ 208,000	$ 10,400	$ 197,600	$ -	$ -
3	Easement Acquisition and Obstruction Removal (Part 77 Transitional Surfaces)	$ 63,000	$ 3,150	$ 59,850	$ -	$ -
	Subtotal Phase I	**$ 4,944,000**	**$ 1,526,850**	**$ 3,280,350**	**$ 136,800**	**$ -**
Phase II (2013-2017)						
1	Install REILs and Instrument Approach Lights	$ 627,000	$ 31,350	$ 595,650	$ -	$ -
2	New Maintenance Building	$ 275,000	$ 13,750	$ 261,250	$ -	$ -
3	Taxilane Access from Parallel Taxiway to Aircraft Storage Area (35' x 400')	$ 198,000	$ 9,900	$ 188,100	$ -	$ -
4	Relocate Access Taxiway at Runway 32 Threshold (50' x 400')	$ 692,000	$ 34,600	$ 657,400	$ -	$ -
5	Apron Expansion (12,500 SY)	$ 318,000	$ 15,900	$ 302,100	$ -	$ -
6	Fencing Upgrade	$ 879,000	$ 43,950	$ 835,050	$ -	$ -
7	Access Road - (2,700')	$ 1,206,000	$ 60,300	$ 1,145,700	$ -	$ -
8	Taxilane Edge Lights and Electrical Vault	$ 421,000	$ 21,050	$ 399,950	$ -	$ -
9	Master Plan Update	$ 150,000	$ 7,500	$ 142,500	$ -	$ -
10	Pavement Maintenance - crack and fog seal (2014 and 2017)	$ 230,000	$ 11,500	$ -	$ 218,500	$ -
	Subtotal Phase II	**$ 4,996,000**	**$ 249,800**	**$ 4,527,700**	**$ 218,500**	**$ -**
Phase III (2018-2027)						
1	Vehicle Parking (40' x 120' approximately 15 spaces)	$ 60,000	$ 3,000	$ 57,000	$ -	$ -
2	Pavement Maintenance - crack, fog, slurry seal, and overlay (2020, 2023, and 2026)	$ 2,189,000	$ 109,450	$ -	$ 2,079,550	$ -
3	Conventional Hangar Development	$ 7,290,000	$ -	$ -	$ -	$ 7,290,000
	Subtotal Phase III	**$ 9,539,000**	**$ 112,450**	**$ 57,000**	**$ 2,079,550**	**$ 7,290,000**
	Cumulative Total =	**$ 19,479,000**	**$ 1,889,100**	**$ 7,865,050**	**$ 2,434,850**	**$ 7,290,000**

** Eligibility for FAA funding does not insure that funds will be available or granted for the project.*
*** Oregon Department of Aviation (ODA) Pavement Maintenance Program (PMP). Eligibility for PMP funding does not insure that funds will be available or granted for the project.*
- All cost estimates are in 2006 dollars. Costs for avigation easements and obstruction removal based from Mulino Obstruction Removal Report (2005) and adjusted to 2006 dollars using the Bureau of Labor Statistic's Consumer Price Index Calculator.
- Total costs include construction, temporary flagging and signing, construction staking, testing, engineering, administration, and contingency, as applicable.

To better understand the purpose of these projects, it is useful to further break down the CIP by project type. The capital needs at the Airport can be categorized as follows: capacity, demand, environmental, maintenance, and safety.

Capacity. Projects that increase the capacity of the Airport in an effort to reduce congestion or delay are included within this category.

Demand. Many of the capital projects identified within the Master Plan are demand driven. While these projects are indicated within specific phases of development, the actual implementation of the projects will be justified by future activity levels.

Environmental. The Port has an environmental policy of achieving its mission through responsible environmental stewardship. Projects within this category integrate this policy into the Port's decision-making process.

Maintenance. It is imperative to maintain and preserve existing infrastructure and previous capital investments. Maintenance for the Airport's pavement areas is on a 3-year rotation, consistent with ODA's PMP schedule.

Safety. Safety is of utmost importance at the Airport. All projects are designed in accordance with FAA design standards. Projects within this grouping are considered necessary for the safety and protection of people and aircraft both on and off airport property.

Table 7B shows how project costs are allocated by project type.

Table 7B. Capital Improvement Projects by Type

Project Description	Project Type	Total Cost
Phase I (2007-2012)		
T-hangar Development	Capacity	$ 1,200,000
Capacity Subtotal		***$ 1,200,000***
Fuel Facility Upgrade	Demand	$ 86,000
T-hangar Development (one row)	Demand	$ 900,000
Taxilane Extensions to Service New T-hangars (50' x 275', 30' x 300', 30' x 250')	Demand	$ 483,000
T-hangar Development (one row)	Demand	$ 900,000
Taxilane Extensions to Service New T-hangars (50' x 140', 30' x 200')	Demand	$ 208,000
Demand Subtotal		***$ 2,577,000***
Drainage Improvements	Environmental	$ 61,000
Environmental Subtotal		***$ 61,000***
Pavement Maintenance (crack and fog seal)	Maintenance	$ 72,000
Pavement Maintenance (crack and fog seal)	Maintenance	$ 72,000
Maintenance Subtotal		***$ 144,000***
Obstruction Removal (on Port property)	Safety	$ 60,000
Helicopter Landing Facility Relocation	Safety	$ 169,000
Easement Acquisition and Obstruction Removal (Part 77 Approach Surfaces)	Safety	$ 447,000
AWOS Installation	Safety	$ 223,000
Easement Acquisition and Obstruction Removal (Part 77 Transitional Surfaces)	Safety	$ 63,000
Safety Subtotal		***$ 962,000***
Phase I Total		**$ 4,944,000**
Phase II (2013-2017)		
Taxilane Access from Parallel Taxiway to Aircraft Storage Area (35' x 400')	Capacity	$ 198,000
Apron Expansion (12,500 SY)	Capacity	$ 318,000
Capacity Subtotal		***$ 516,000***
New Maintenance Building	Demand	$ 275,000
Access Road - (2,700')	Demand	$ 1,206,000
Master Plan Update	Demand	$ 150,000
Demand Subtotal		***$ 1,631,000***
Fencing Upgrade	Maintenance	$ 879,000
Pavement Maintenance - crack and fog seal (2014 and 2017)	Maintenance	$ 230,000
Maintenance Subtotal		***$ 1,109,000***
Install REILs and Instrument Approach Lights	Safety	$ 627,000
Relocate Access Taxiway at Runway 32 Threshold (50' x 400')	Safety	$ 692,000
Taxilane Edge Lights and Electrical Vault	Safety	$ 421,000
Safety Subtotal		***$ 1,740,000***
Phase II Total		**$ 4,996,000**
Phase III (2018-2027)		
Vehicle Parking (40' x 120' approximately 15 spaces)	Demand	$ 60,000
Conventional Hangar Development	Demand	$ 7,290,000
Demand Subtotal		***$ 7,350,000***
Pavement Maintenance - crack, fog, slurry seal, and overlay (2020, 2023, 2026)	Maintenance	$ 2,189,000
Maintenance Subtotal		***$ 2,189,000***
Phase III Total		**$ 9,539,000**

Project Totals		***Project Costs***	***Percent of Total Cost***
Capacity Total		$ 1,716,000	8.8%
Demand Total		$ 11,558,000	59.4%
Environmental Subtotal		$ 61,000	0.3%
Maintenance Total		$ 3,442,000	17.6%
Safety Subtotal		$ 2,702,000	13.9%
Cumulative Total		$ 19,479,000	100.0%

As Table 7B highlights, the majority (59.4%) of the CIP projects are demand driven. Maintenance (17.6%) and safety (13.9%) projects represent the second and third highest percent of total cost estimates, respectively.

DEFINITIONS

ACCELERATE – STOP DISTANCE AVAILABLE (ASDA). See declared distances.

AIR CARRIER. An operator, which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specifies the times, days of the week, and places between which such flights are performed; or (2) transport mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC). A facility established to provide air traffic control service to an aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

AIR TAXI. An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft for hire for specific trips.

AIRCRAFT. An aircraft is a device that is used or intended to be used for flight in the air.

AIRCRAFT APPROACH CATEGORY. A grouping of aircraft based on 1.3 times the stall speed in their maximum certificated landing weight. The categories are as follows:

- Category A: Speed less than 91 knots.
- Category B: Speed 91 knots or more, but less than 121 knots.
- Category C: Speed 121 knots or more, but less than 141 knots.
- Category D: Speed 141 knots or more, but less that 166 knots.
- Category E: Speed greater than 166 knots.

AIRPLANE. Means an engine-driven fixed-wing aircraft heavier than air that is supported in flight by the dynamic reaction of the air against its wings.

AIRPLANE DESIGN GROUP (ADG). A grouping of aircraft based upon relative wingspan or tail height (whichever is most demanding). The groups are as follows:

Group	Tail Height (ft)	Wingspan (ft)
1	<20	<49
II	20 - <30	49 - <79
III	30 - <45	79 - <118
IV	45 - <60	118 - <171
V	60 - <66	171 - <214
VI	66 - <80	214 - <262

AIRPORT. An airport is an area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any.

AIRPORT ELEVATION. The highest point on an airport's usable runway expressed in feet above mean sea level (MSL).

AIRPORT LAYOUT DRAWING (ALD). The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRPORT REFERENCE CODE (ARC). A coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP). The latitude and longitude of the approximate center of the airport.

AIRPORT TRAFFIC CONTROL TOWER (ATCT). A central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of terminal air traffic.

ALERT AREA. See special-use airspace.

ANNUAL INSTRUMENT APPROACH (AIA). An approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS). An airport lighting facility, which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his/her final approach and landing.

APPROACH MINIMUMS. The altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

AUTOMATIC DIRECTION FINDER (ADF). An aircraft radio navigation system, which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AUTOMATED WEATHER OBSERVATION STATION (AWOS). Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dew-point, etc.).

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS). The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction and active runway.

AZIMUTH. Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

BASE LEG. A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See Traffic Pattern.

BEARING. The horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE. A barrier used to divert or dissipate jet blast or propeller wash.

BUILDING RESTRICTION LINE (BRL). A line that identifies suitable building area locations on the airport.

CIRCLING APPROACH. A maneuver initiated by the pilot to align the aircraft with the runway for landing when flying a predetermined circling instrument approach under IFR.

CLASS A AIRSPACE. See Controlled Airspace.

CLASS B AIRSPACE. See Controlled Airspace.

CLASS C AIRSPACE. See Controlled Airspace.

CLASS D AIRSPACE. See Controlled Airspace.

CLASS E AIRSPACE. See Controlled Airspace.

CLASS G AIRSPACE. See Controlled Airspace.

COMPASS LOCATOR (LOM). A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two or the marker sites.

CONSULTANT. W&H Pacific, Inc.

CONTROLLED AIRSPACE. Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows.

CLASS A. The airspace from 18,000 feet mean sea level (MSL) up to but not including 60,000 MSL (flight level FL600).

CLASS B. Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of airspace and is

designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.

CLASS C. Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical miles (nm) radius and an outer area with a 10 nm radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

CLASS D. Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedures. Unless otherwise authorized, all persons must establish two-way radio communications.

CLASS E. Generally, controlled airspace not classified as Class A, B, C or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communications with air traffic control.

CLASS G. Generally, that airspace not classified as Class A, B, C, D or E. Class G airspace extends from the surface to the overlying Class E airspace

CONTROLLED FIRING AREA. See special-use airspace.

CROSSWIND. Wind flow that is not parallel to the runway of the flight of an aircraft.

CROSSWIND LEG. A flight path at right angles to the landing runway off its upwind end. See Traffic Pattern.

DECLARED DISTANCES. The distances declared available for the airplane's takeoff run, takeoff distance, accelerate-stop distance and landing distance requirements. The distances are:

TAKEOFF RUN AVAILABLE (TORA). The runway length declared available and suitable for the ground run of an airplane taking off.

TAKEOFF DISTANCE AVAILABLE (TODA). The TORA plus the length of any remaining runway and/or clearway beyond the far end of the TORA.

ACCELERATE – STOP DISTANCE AVAILABLE (ASDA). The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.

LANDING DISTANCE AVAILABLE (LDA). The runway length declared available and suitable for landing.

DISPLACED THRESHOLD. A threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME). Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

DNL. The 24-hour average sound level, in A-weighed decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 pm and 7 am as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG. A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see Traffic Pattern.

EASEMENT. The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on or below property; certain air rights above property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ENPLANED PASSENGERS. The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and non-scheduled services.

FINAL APPROACH. A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See Traffic Pattern

FIXED BASE OPERATOR (FBO). According to the Port of Portland's Minimum Standards, a FBO at Mulino Airport is a business with airport caretaking responsibilities, plus any or none of the following: aircraft charter operation, aircraft rental, aircraft storage, flight training, aircraft sales/leasing, aircraft component maintenance, aircraft parts sales, and aircraft maintenance.

FRANGIBLE NAVAID. A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

GENERAL AVIATION. That portion of civil aviation that encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GLIDE SLOPE (GS). Provides vertical guidance for aircraft during approach and landing. The glide slope consists of 1) electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or 2) visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM (GPS). A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude and altitude.

HELIPAD. A designated area for the takeoff, landing and parking of helicopters.

HIGH-SPEED EXIT TAXIWAY. A long radius taxiway designed to expedite aircraft turning off the runway after land (at speeds up to 60 knots), thus reducing runway occupancy time.

INSTRUMENT APPROACH. A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR). Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

INSTRUMENT LANDING SYSTEM (ILS). A precision instrument approach system, which normally consists of the following electronic components and visual aids: 1) localizer, 2) glide slope, 3) outer marker, 4) middle marker and 5) approach lights.

LANDING DISTANCE AVAILABLE (LDA). See declared distances.

LOCAL TRAFFIC. Aircraft operating in the traffic pattern or within site of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch-and-go training operations.

LOCALIZER. The component of an ILS, which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA). A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LORAN. Long range navigation, an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for enroute navigation.

MICROWAVE LANDING SYSTEM (MLS). An instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS AREA (MOA). See special-use airspace.

MISSED APPROACH COURSE (MAC). The flight route to be followed if, after an instrument approach, a landing is not effected, and occurring normally when the aircraft has descended to the decision height and has not established visual contact or when directed by air traffic control to pull up or to go around again.

MOVEMENT AREA. The runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

NAVAID. A term used to describe any electrical or visual air navigational aid, light, sign, and associated supporting equipment.

NOISE CONTOUR. A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NONDIRECTIONAL BEACON (NDB). A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a compass locator.

NONPRECISION APPROACH PROCEDURE. A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB or LOC.

OBJECT FREE AREA (OFA). An area on the ground centered on a runway, taxiway or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ). The airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

OPERATION. A takeoff or landing.

OUTER MARKER (OM). An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline indicating to the pilot that he/she is passing over the facility and can begin final approach.

PORT. Port of Portland

PRECISION APPROACH. A standard instrument approach procedure, which provides runway alignment and glide slope (descent) information. It is categorized as follows:

CATEGORY I. A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than ½ mile or Runway Visual Range (RVR) 2400 with operative touchdown zone and runway centerline lights.

CATEGORY II. A precision approach, which provides for approaches with a decision height of not less than 100 feet and visibility not less that 1200 feet RVR.

CATEGORY III. A precision approach, which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI). A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a Visual Approach Slope Indicator (VASI) but provides a sharper transition between the colored indicator lights.

PRECISION OBJECT FREE ZONE (POFZ). An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFZ is a clearing standard, which requires the POFZ to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for NAVAIDs). The POFZ applies to all new authorized instrument approach procedures with less than ¾ mile visibility.

PROHIBITED AREA. See special-use airspace.

REMOTE TRANSMITTER / RECEIVER (RTR). See remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT. An airport to serve general aviation aircraft, which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA. See special-use airspace.

RNAV. Area Navigation – airborne equipment, which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used enroute and for approaches to an airport.

RUNWAY. A defined rectangular area on an airport prepared for an aircraft landing and taking off. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. The runway heading on the opposite end of the runway is 180 degrees from

that runway end. Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY BLAST PAD. A surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

RUNWAY END IDENTIFIER LIGHTS (REIL). Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT. The average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ). An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type/minima.

RUNWAY SAFETY AREA (RSA). A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway.

RUNWAY VISUAL RANGE (RVR). An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

RUNWAY VISIBILITY ZONE (RVZ). An area on the airport to be kept clear of permanent objects so that there is an unobstructed line-of-site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

SEGMENTED CIRCLE. A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER. An area adjacent to the edge of paved runways, taxiways or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE. The straight line distance between an aircraft and a point on the ground.

SPECIAL USE AIRSPACE. Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a port of those activities. Special-use airspace classifications include:

ALERT AREA. Airspace that may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

CONTROLLED FIRING AREA. Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

MILITARY OPERATIONS AREA (MOA). Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

PRHIBITED AREA. Designated airspace within which the flight of aircraft is prohibited.

RESTRICTED AREA. Airspace designated under FAR 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

WARNING AREA. Airspace, which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID). A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD TERMINAL ARRIVAL (STAR). A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO. A procedure wherein an aircraft will land, make a complete stop of the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operations for the landing and one operations for the takeoff.

STOPWAY. An area beyond the takeoff runway, no less wide than the runway and centered on the extended centerline of the runway, able to support an airplane during an aborted takeoff, without causing structural damage to the airplane, and designated for use in decelerating the airplane during an aborted takeoff.

STRAIGHT-IN LANDING / APPROACH. A landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

TACTICAL AIR NAVIGATION (TACAN). An ultra-high frequency electronic air navigation system, which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF DISTANCE AVAILABLE (TODA). See declared distances.

TAKEOFF RUN AVAILABLE (TORA). See declared distances.

TAXILANE. The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY. A defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY SAFETY AREA (TSA). A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TETRAHEDRON. A device used as a landing indicator. The small end of the tetrahedron points in the direction of landing.

THRESHOLD. The beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

TOUCH-AND-GO. An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

TOUCHDOWN ZONE (TDZ). The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE). The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING. Two rows of transverse light bars located symmetrically about the runway centerline normally at 100-foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN. The traffic flow that is prescribed for an aircraft landing or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, and final approach.

UNICOM. A nongovernmental communication facility, which may provide airport information at certain airports. Locations and frequencies of UNICOMs are shown on aeronautical charts and publications.

UPWIND LEG. A flight path parallel to the landing runway in the direction of landing. See traffic pattern.

VECTOR. A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY / OMNIDIRECTIONAL RANGE STATION (VOR). A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national

airspace system. The VOR periodically identifies itself by Morse code and may have an additional voice identification feature.

VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION / TACTICAL AIR NAVIGATION (VORTAC). A navigation aid providing VOR azimuth, TACAN azimuth and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY. A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH. An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control on an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI). An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high-intensity red and white focused light beams, which indicate to the pilot whether or he or she is on path. Some airports serving large aircraft have three-bar VASIs that provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR). Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirement. In addition, it is used by pilots and controllers to indicate type of flight plan.

Wide Area Augmentation System (WAAS). The Wide Area Augmentation System (WAAS) uses a system of ground stations to provide necessary augmentations to the GPS Standard Positioning Service (SPS) navigation signal. A network of precisely surveyed ground reference stations is strategically positioned across the country to collect GPS satellite data. Using this information, a message is developed to correct any signal errors.

WARNING AREA. See special-use airspace.

ACRONYMS / ABBREVIATIONS

AC. Advisory circular

ADF. Automatic direction finder

ADG. Airplane design group

AFSS. Automated flight service station

AGL. Above ground level

AIA. Annual instrument approach

AIP. Airport improvement program

ALS. Approach lighting system

ALSF-1. Standard 2,400-foot high-intensity approach lighting system with sequenced flashers (Cat I configuration)

ALSF-2. Standard 2,400-foot high-intensity approach lighting system with sequenced flashers (Cat II configuration)

APV. Instrument approach procedure with vertical guidance

ARC. Airport reference code

ARFF. Aircraft rescue and firefighting

ARP. Airport reference point

ARTCC. Air route traffic control center

ASDA. Accelerate-stop distance available

ASR. Airport surveillance radar

ASOS. Automated surface observation station

ATCT. Air traffic control tower

ATIS. Automated terminal information service

AVGAS. Aviation gasoline (typically 100 low lead (LL))

AWOS. Automated weather observation station

BRL. Building restriction line

CFR. Code of Federal Regulations

CIP. Capital improvement program

CPO. Community Planning Organization

DME. Distance measuring equipment

DNL. Day-night noise level

DWL. Runway weight bearing capacity for aircraft with dual wheels per strut

DTWL. Runway weight bearing capacity for aircraft with dual-tandem type landing gear

EAA. Experimental Aircraft Association

FAA. Federal Aviation Administration

FAM. Financial Aid to Municipalities

FAR. Federal Aviation Regulation

FBO. Fixed base operator

FY. Fiscal year

GA. General Aviation

GPS. Global positioning system

GS. Glide slope

HIRL. High-intensity runway edge lighting

IFR. Instrument flight rules

ILS. Instrument landing system

IM. Inner marker

LDA. Landing distance available

LIRL. Low-intensity runway edge lighting

LMM. Compass locator at middle marker

LOC. ILS localizer

LOM. Compass locator at ILS outer marker

LORAN. Long range navigation

MALS. Medium-intensity approach lighting system

MALSR. Medium-intensity approach lighting system with runway alignment indicator lights

MIRL. Medium-intensity runway edge lighting

MITL. Medium-intensity taxiway edge lighting

MLS. Microwave landing system

MM. Middle marker

MOA. Military operations area

MSL. Mean sea level

NAVAID. Navigational aid

NDB. Nondirectional radio beacon

NM. Nautical mile (6,076.1 feet)

NOTAM. Notice to airmen

NPIAS. National plan of integrated airport systems

NPRM. Notice of proposed rulemaking

ODA. Oregon Department of Aviation

ODALS. Omnidirectional approach lighting system

OFA. Object free area

OFZ. Object free zone

OM. Outer marker

OPA. Oregon Pilots Association

PAC. Project Advisory Committee

PAPI. Precision approach path indicator

PFC. Passenger facility charge

PCL. Pilot-controlled lighting

PLASI. Pulsating visual approach slope indicator

PMP. Pavement Maintenance Program

POFA. Precision object free area

PVASI. Pulsating/steady visual approach slope indicator

RCO. Remote communications outlet

REIL. Runway end identifier lights

RNAV. Area navigation

RPZ. Runway protection zone

RTR. Remote transmitter/receiver

RVR. Runway visibility range

RVZ. Runway visibility zone

SALS. Short approach lighting system

SASP. State Aviation System Plan

SEL. Sound exposure level

SID. Standard instrument departure

SM. Statute mile (5,280 feet)

SRE. Snow removal equipment

SSALF. Simplified short approach lighting system with sequenced flashers

SSALR. Simplified short approach lighting system with runway alignment indicator lights

STAR. Standard terminal arrival route

SWL. Runway weight bearing capacity for aircraft with single-wheel type landing gear

STWL. Runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN. Tactical air navigation

TDZ. Touchdown zone

TDZE. Touchdown zone elevation

TAF. Terminal Area Forecast

TODA. Takeoff distance available

TORA. Takeoff run available

TRACON. Terminal radar approach control

VASI. Visual approach slope indicator

VFR. Visual flight rules

VHF. Very high frequency

VOR. Very high frequency omnidirectional range

VORTAC. VOR and TACAN collocated

WAAS. Wide Area Augmentation System

Mulino Airport Master Plan Update

Meeting: Planning Advisory Committee (PAC) Meeting #1
Date: June 27, 2006
Location: Mollala City Hall

Purpose: To kickoff the project

Participants: See attached sign-in sheets for Port of Portland, consultant, committee and public attendees.

The meeting began at 5:40 p.m. and ended at 7:30 p.m. The agenda (attached), schedule and scope of work were distributed to participants.

Meeting Summary:
Comments regarding the master plan scope, schedule, advisory committee role, and meetings follow:

Comment: Some meetings/open houses should be held at Mulino Airport. The Oregon Pilots Association building at the airport can hold approx. 25 people and may be a good meeting location. The Mollala Library is another possible meeting location. Tentatively, the next meeting will be Sept. 26 at 5:30 – 7:30 at the Mulino OPA Clubhouse at the airport.

Response: The Port will look into other locations for meetings. The meeting rooms need to be large enough to accommodate the PAC, staff and the public, easy to find, have restrooms available, and be accessible for those that are disabled.

- The PAC does not include enough representation of airport users.

  The Port sought balanced representation of all stakeholders in forming the PAC. The PAC member representing the Experimental Aircraft Association was not able to attend the first meeting.

- Be sure to contact all tenants of the airport about meetings, as well as others who attended the PAC Meeting #1.

  The Port agreed to this. There are six PAC meetings and four public open houses planned. PAC meetings are open to the public, although it may be necessary at future meetings to save public comment for a specific time on the agenda, if a large number of non-committee attendees want to speak. The July 15 &16 Fly-In would be a good time to contact pilots.

- The PAC may not have much opportunity to review/revise work products if their review happens after the Port and after the FAA. It would help to make the FAA and PAC reviews simultaneous.

  The Port agreed to simultaneous FAA and PAC reviews.

The possibility of Mulino Airport being managed or owned/managed by the Oregon Department of Aviation (ODA) has been a subject of discussions between the Port of Portland and the ODA. One reason is that the ODA owns nearby Aurora Airport and might be able to manage Mulino Airport more cost effectively. While the Port did not envision the possible change in management/ownership having an effect on the master plan process or results, one meeting attendee felt that under management by ODA, it would be easier for tenants to develop hangars and airport activity might grow more.

Other comments:

- Several people at the meeting felt that FAA records of annual operations were much overstated. The airport is much busier in the summer than in the winter.
- The two gliders reported in FAA records are gone; one was a Civil Air Patrol trainer and the other a motorized glider. Blimps use the airport about once a year.
- More restrooms are needed but septic systems are problematic because of the high water table.
- Lack of an FBO, fuel, and hangars are reasons Mulino aviation activity has not grown as much as previously projected.
- How much of the airport is in the floodplain? (Probably only the portion beyond the river.)
- A different use for the property, other than an airport, would generate more revenue.
- One neighbor attending the meeting enjoyed watching the airplanes, but thought the initiation of night flying might be a concern.
- Another neighbor who lives on a hill above the airport expressed concern with planes trying to get below the fog and nearly landing on his house. He expressed concern about security and noise.
- The only complaints have been about helicopter training operations from Hillsboro airport.
- A four-unit subdivision will be built on the east side of Highway 213.
- There is a major road project starting around the airport.
- All participants from the public need to give their mailing address on the sign in sheet so we can get them info as needed.
- The Port is working to get project info on its website.
- W&H staff suggested perhaps having two CIP alternatives – one with ODA ownership and one with Port ownership.
- Future PAC meetings need to start no earlier than 5pm – we need to confirm future meeting and open house times (time of day) at the 2nd PAC meeting.

- “Let’s think outside the box” was a comment expressed by JD Clarizio. He also asked if there was even a need for the Mulino airport. “It needs to pencil out” “What is happening at other airports, how does Mulino fit in?” he asked.
- The community of Mulino looks at the airport as an asset.
- Mulino (the community) will continue to grow.
- The airport is not intrusive right now – it’s agreeable.
- If the airport grew to be 10 times larger, I would not like it.
- The night flights are not a problem right now, but thanks for asking.
- The County staff person on the Pac, Ken Itel, said the County is interested in what the people of Mulino think about the airport.
- PAC members requested the finalized scope of work for the project (Port to provide).

Master Plan/ALP Update
For
Mulino Airport

Mulino Airport Advisory Committee
Meeting #1
June 27th 2006
5:30-7:30 pm

Agenda

Introductions
Steve Nagy, Port of Portland 5 Min.

- Mulino Master Plan Project Advisory Committee (PAC)
- Port of Portland
- Federal Aviation Administration
- W&H Pacific

Master Plan Process/Scope of Work.
Rainse Anderson & Sara Funk, W&H Pacific 30 Min.

Project Schedule
Rainse & Sara 10 Min.

Role of the PAC
Steve 10 Min.

Airport Ownership
Daren Griffin, Port of Portland 10 Min.

General Airport Issues
All 30 Min.

Questions & Answers
All 20 Min.

Next Meeting

Mulino Airport Master Plan Update

Meeting: **Project Advisory Committee (PAC) Meeting #2**
Date: **September 26, 2006**
Location: **Oregon Pilots Association Clubhouse, Mulino Chapter**

Purpose: To present Tasks 1 and 2 of scope – Draft Chapters of the Strategic Analysis and Inventory.

Participants: Port of Portland (Port), Consultant, PAC members and public attendees (sign-in sheet attached).

PAC Members in attendance:

Kenneth Itel, Clackamas County

Dianne Johnson, Oregon Pilot's Association (OPA), Mulino Chapter

Warren Jones, Mulino Community Planning Organization (CPO)

Gary Sparks, Experimental Aircraft Association (EAA), Chapter 902

Jennifer Kellar and Larry Weber for Bob Hidley, Oregon Department of Aviation

PAC Members not in attendance:

JD Clarizio, Arrowhead Golf Club

Meeting Summary:

The meeting began at 5:40 p.m. and ended at 8:00 p.m. The agenda (attached), meeting minutes from the first meeting, and handouts of the slideshow presentation were distributed to participants.

The following are comments from the Port and the PAC on the Draft Chapters:

- Steve Nagy of the Port gave an update on the status of discussion with the Oregon Department of Aviation (ODA) regarding Airport ownership/management. It was reported that a contract is still being negotiated for the ODA to manage the Airport for an undetermined period of time. At a later time there may negotiations to transfer full ownership of the Airport to ODA.
- Dianne Johnson, OPA-Mulino Chapter representative and PAC member, noted that Life Flight helicopter facility needs to be added to the Inventory Chapter and identified on the existing facilities drawing (Exhibit 2B).
    - Consultant will add this information.
- Warren Jones, Mulino CPO representative and PAC member advised that the City of Molalla does not operate the fire department referenced in the Inventory Chapter. The volunteer department is part of a Rural Fire District. In addition, there is a separate Ambulance District, which controls a larger area than the fire district.
    - Consultant will update the Inventory Chapter text.

- The Port inquired if there was interest by survey respondents to re-open the grass runway.
    - Consultant reported only one respondent commented on the grass runway.
    - Gary Sparks, EAA chapter representative and PAC member, reported grass runways in the region are used often by members, although several are too short for flight training.
- The Port commented that there is currently a Single Aviation Service Organization (SASO) at the Airport, who provides limited aircraft maintenance services.
- Warren Jones commented that there is an existing drainage easement and tile located in the northeast corner of the airport, which is active in the winter months and drains into Milk Creek. The easement dates back to the 1950s and records may be difficult to obtain.
- Port highlighted that Clackamas County has Airport Zoning. No other county in Oregon has airport zoning.
- One of the slides under the environmental subtitle listed dust from nearby farmer's fields as a potential air quality issue. One PAC member commented that seasonal smoke from field burning is more of an issue than dust.
- Gary Sparks suggested that the terminologies used in Table 2A in the Inventory Chapter, Airport Revenues and Expenses should be defined (i.e. – concession revenue versus rent revenue).
- Consultant inquired about prevailing wind direction. Local pilots responded that the wind is primarily out of the south-southwest, especially in fall and spring, at a 45 degree angle to the runway.
- Dianne Johnson noted that the reason for the right hand traffic pattern on Runway 14 is to avoid over flight of the Mulino School located on Highway 213.

The following are questions and comments from the public:

- What is the timeline for shutting down the airport if it continues to operate in the red?
    - Steve Nagy responded that the Federal Aviation Administration (FAA) mandates that airports move towards being financially self-sufficient, but acknowledges that not all airports will ever be able to operate in the black. As an entire system, the Port-owned airports do operate in the black. Part of the Port's strategy to make Mulino Airport operate more efficiently is to negotiate a contract with the ODA to manage the Airport. There is no timeline established.
- Regarding possible ODA management, questions were brought forth regarding revenue (i.e. fuel flowage fee).
    - Steve Nagy responded that the contract was still under negotiations and the accounting involved with income and expenses was not determined at this time. Both the Port and ODA assured that any money made at Mulino Airport would be cycled back into the Airport's operating funds, per FAA requirements.

- Through-the-Fence (TTF) operations were discussed. A public attendee pointed out that while the FAA discourages TTF, it does not prohibit them from occurring. Also, TTF fees add to airport revenue.
    - Steve Nagy acknowledged this statement and reinforced that any TTF operations should be carefully implemented and be able ensure no Federal Grant Assurances are violated. Currently, the Port does not foster TTF operations.
- Erosion on the Molalla River bank is a concern to the local residents. A land-owner to the south of the Airport reported losing 20 feet per year to erosion. Warren Jones reported CH2M Hill did a hydrology study on the river and will provide the Port a copy of the report. Historical aerial photos give further evidence to the River's erosion.
- Residential Airparks were reported to be in demand. Few airparks exist in the region and are all full. A residential airpark at Mulino Airport should be seriously considered during this study. An airpark would add a market for a fixed base operator.

Next Steps:

- The next meeting will also include an Open House. The PAC meeting will run from 5-6:30pm with the Open House following.
- The next meeting is scheduled for the week of November 20th; however, the PAC would prefer that the next meeting be after Thanksgiving - Tuesdays work well.
- The location is to be determined.
- Notice will be advertised in the paper and the Port and County's websites.

Mulino Airport Master Plan / ALP Update

Mulino Airport Master Plan Advisory Group, Meeting #2

Sept 26th, 2006 – 5:30-7:30 pm
Mulino Oregon Pilot's Association Clubhouse

AGENDA

Welcome & Introductions
Steve Nagy, Port of Portland 5 min.

Project Update
Rainse Anderson & Sara Funk, W&H Pacific 20 min.

- Creation of Advisory Group information binders
- Field reconnaissance & data gathering
- Survey distribution and compilation of returns
- Production of Draft Chapters

Draft Chapters
Rainse Anderson & Sara Funk 60 min.

- Introduction
- Strategic Analysis
- Inventory

Questions & Answers
All 25 min.

Next Meeting
Location, Date & Time 5 min.

Mulino Airport Master Plan Update

Meeting: **Project Advisory Committee (PAC) Meeting #3**
Date: **December 5, 2006**
Location: **Oregon Pilots Association Clubhouse, Mulino Chapter**

Purpose: To present Tasks 3 and 4 of scope – Draft Chapters of the Aeronautical Activity Forecasts and Facility Requirements.

Participants: Port of Portland (Port), W&H Pacific (Consultant), PAC members and public attendees (sign-in sheet attached).

PAC Members in attendance:

- Kenneth Itel, Clackamas County
- Scott Crockard for Dianne Johnson, Oregon Pilot's Association (OPA), Mulino Chapter
- Warren Jones, Mulino Community Planning Organization (CPO)
- Gary Sparks, Experimental Aircraft Association (EAA), Chapter 902
- Bob Hidley, Bob Altemus, Jennifer Kellar and Chris Cummings, Oregon Department of Aviation

PAC Members not in attendance:

- JD Clarizio, Arrowhead Golf Club

Meeting Summary:

The meeting began at 5:00 p.m. and ended at 6:30 p.m. The agenda (attached) and handouts of the slideshow presentation were distributed to participants.

The following are comments from the Port and the PAC on the Draft Chapters:

- Steve Nagy of the Port gave an update on the status of discussion with the Oregon Department of Aviation (ODA) regarding Airport ownership/management. He reports the negotiations are going well. As the agreement stands, if ODA did take over management of the Airport, tenants would contact ODA for all issues.
- Ken Itel, Clackamas County, asked for a table in the forecast chapter to better explain the difference between the Master Record Form 5010 and Terminal Area Forecast data.
    - Consultant will add this information.
- Gary Sparks, EAA, expressed concern that without appropriate facilities the larger aircraft shown in the forecasts may not use the Airport.
    - Steve Nagy recognized that concern and stated facilities are built based on demand.

- Gary Sparks, EAA, inquired into how Experimental Aircraft are accounted for in the forecast.
    - The Consultant responded that the Federal Aviation Administration (FAA) publishes forecasted annual growth rates for Experimental Aircraft, which was reflected upon in the forecast for the Airport.
    - A member of the public, who is employed at Vans Aircraft, reports that his company averages 1.3 phone calls per day from people who have completed a homebuilt aircraft.
- Concern with the Airport Safety Overlay Zone was discussed.
    - Steve Nagy and Ken Itel report that progress is being made to fully implement the Overlay Zone.
    - If a residential airpark were developed, it would most likely be permitted through a conditional-use permit, reported Ken Itel.

The following are questions and comments from the public:

- A comment was made that if hangars were built now there is a large enough demand that aircraft would base at the Airport.
- An inquiry from the public was expressed regarding construction at the north end of the Airport.
    - Steve Nagy explained that a Seismic Sensor was being placed at the Airport, which would monitor earth movement activities.
- It was asked whether or not the forecasts addressed the effects of fuel prices.
    - The Consultant responded that it did not. The information needed for an analysis of this nature is not available. It was noted that while the aviation industry is cyclical, the forecasts are based on an average over the next 20 years. Using average growth rates minimizes effect from industry fluctuations.
- A question was raised if blast pads, which were shown to be deficient with FAA design standards, were really needed at the Airport.
    - Both the Consultant and Port responded that it is not necessary, considering there is little, if any, jet use projected at the Airport.
- A member of the public asked if the ODA would be bound to the findings of the Master Plan and Airport Layout Plan.
    - Steve Nagy responded that the Plans are only guides to be used by any Airport Sponsor to respond to demand and growth at the Airport.
- It was expressed that constraints from Port management is the cause for slow growth at the Airport and that requirements are too constrictive on potential developers.

An Open House immediately followed at the Mulino Pilot's Lounge from 6:30p.m. to 8:00 p.m. At the Open House a selection of Exhibits were displayed for the attendees to review. Representatives from the Port, ODA and Consultants were available to address questions one-on-one with members of the public. Comment forms were also distributed for those who preferred to mail their comments/suggestions to the Port.

Next Steps:

- The next meeting will address Layout Alternatives, based on the Forecasts and Facility Requirements. The next meeting will also include an Open House.
- The next meeting will be on February 13, 2007 at the Mulino Elementary School. The meeting will begin at 5:00 p.m. and end at 6:30 p.m. An Open House will immediately follow and will last until 8:00 p.m. Notifications to PAC members and interested parties will be sent at a later date.
- Notice will be advertised in the paper and the Port and County's websites.

Mulino Airport Master Plan / ALP Update

Mulino Airport Project Advisory Committee (PAC), Meeting #3

December 5, 2006 – 5:00-6:30 pm
Mulino Oregon Pilot's Association Clubhouse

AGENDA

Welcome & Introductions
Steve Nagy, Port of Portland — 5 min.

Project Update / Draft Chapters
Rainse Anderson, Sara Funk & Sarah Lucas, W&H Pacific — 60 min.

- Aeronautical Activity Forecast
- Facility Requirements

Questions & Answers
All — 20 min.

Next Meeting
Location, Date & Time — 5 min.

Mulino Airport Master Plan Update

Meeting: **Project Advisory Committee (PAC) Meeting #4 & Public Open House**
Date: **February 13, 2007**
Location: **Mulino Elementary School Cafeteria**

Purpose: To present Task 5 – Draft Chapter of the Airport Development Alternatives.

Participants: Port of Portland (Port), W&H Pacific (Consultant), PAC members and public attendees (sign-in sheet attached).

PAC Members in attendance:

- JD Clarizio, Arrowhead Golf Club
- Bob Hidley, Oregon Department of Aviation (ODA)
- Kenneth Itel, Clackamas County
- Dianne Johnson, Oregon Pilot's Association (OPA), Mulino Chapter
- Warren Jones, Mulino Community Planning Organization (CPO)
- Gary Sparks, Experimental Aircraft Association (EAA), Chapter 902

Meeting Summary:

The meeting began at 5:00 p.m. and ended at 6:30 p.m. The agenda (attached), comment form, project overview packet, and handouts of the slideshow presentation were distributed to participants.

The following are comments from the Port and the PAC on the Alternatives:

- Steve Nagy of the Port opened the meeting by thanking everyone for attending the meeting. An overview of the Master Planning efforts to date was presented, as well as clarification of what the purpose of the alternatives is. The alternatives provide options, either in whole or specific components, from which a preferred development alternative can be selected.
- The Consultants gave a presentation that reviewed the facility requirements presented at the PAC Meeting #3 and discussed the no-build and three development alternatives. The floor was then opened to the PAC members, wherein they could provide comments on which alternative components they liked and those they disliked.
- Ken Itel, Clackamas County, said he preferred alternative #2, but didn't feel he was qualified to discuss which instrument approach was most beneficial to the Airport and Airport users. He disliked the runway extension shown in Alternative #1. Regarding the Airpark, he said he wasn't sure of the demand for such a facility and highlighted there are feasibility issues. He mentioned the development of the residential airpark would require a land use review process and said developing residential areas on EFU designated land is not a compatible use
- Bob Hidley, ODA, asked his staff members to comment on the alternatives.

- Chris Cummings, planning analyst with ODA, said hangar development should be maximized to increase revenue. He liked how all alternatives maintained the grass taxiway access to the Café and noted that it is a unique feature at the Airport.
- Larry Weber, State Airport Manager with ODA, said he favored alternative #2 and echoed Mr. Cummings' comments.
- Bob Hidley then expressed concerns with the Airpark because people would need to taxiway across the runway to get fuel and other services. He explained how the Airpark at the Independence State Airport operated and suggested that a full parallel taxiway on the west side of the runway be added to the alternative.

- Dianne Johnson, Mulino OPA, expressed concern that Alternative #1 was too over-the-top and unnecessary. She preferred Alternative #2, combined with the Airpark concept. While she thought there may be demand for the Airpark, she raised concerns over zoning issues associated with its development. She agreed a full parallel taxiway for the Airpark may be beneficial.
- J.D. Clarizio, Arrowhead Golf Club, favored Alternative #2 because it meets the Airport's needs and had the least impact off-airport. He thought the Airpark was a good idea, but also questioned the zoning feasibility.
- Warren Jones, Mulino CPO, said his organization would be presenting the Port and Consultant with an alternative that combines the No-Build with only the recommended safety improvements. He does not believe there is a need for the runway extension and asked that it be removed from the alternatives completely.
- Gary Sparks, EAA, said that Alternative #2 encompassed logical and practical projections for the Airport. While the Airpark could have an economic advantage, he expressed concern for the location because tenants would have to cross the runway to get fuel. He thought that once fuel becomes available at the Airport, there may be a need for more larger, conventional hangars than was projected, and the alternatives should be flexible to accommodate this potential demand. Last, he suggested an additional taxiway to access the hangars would be beneficial to reduce congestion at the sole taxiway access point.
    - The Consultant highlighted where an additional taxiway was proposed in the alternatives.
- Steve Nagy of the Port then spoke about the Port's position on the alternatives. He agreed with Mr. Sparks that an additional taxiway access point is needed. Regarding the Airpark, he commented that the Port recognizes the potential constraints, but that a private developer would be the one pursuing development. It was reaffirmed that Alternative #1 is a representation of the Master Plan that has been in place since 1993 and not necessarily what the Port believes is in demand at the current time. The preferred alternative will most likely be a combination of Alternatives #2 and 3 and will not show a runway extension or pavement strengthening.

The following were questions and comments from the public:

- Is there an underlying reason for improving the Airport, such as off-loading General Aviation operations from congested airspace at Portland International Airport?
- Is the purpose of Alternative #1 to attract an anchor tenant?
- What are the Airport's immediate needs? The Alternatives should be looking at what the demand is now, not what it may be in 20 years.
- In regards to the Airpark, has the property owner been consulted? Is it believed he would be a willing seller?
- The Airpark location is undesirable because aircraft would be crossing the taxiway too much. Why weren't on-Airport locations shown in the alternatives?
- The apron reconfiguration to add tiedowns for larger aircraft won't work. There isn't enough room.
- A question was posed to clarify the environmental impact evaluation process.
- Concern for quality of life was expressed, which mostly was concerned with noise and light issues. The Airport beacon and flight patterns were discussed.
- A teacher at the elementary school asked what deliberation was given to reduce noise and traffic over the school. Studies have shown aircraft noise reduces children's reading scores. There was concern for safety, as well.
- Will there be a breakdown of construction phasing?
- Will there be a breakdown of cost?
- Are the development cost estimates based on current dollars?
- Where's the money coming from for the development projects?
- Can we assume that only Alternative #1 would make it feasible for jet operations?
- A vote, by raise of hands, was cast by public attendees to which alternative they preferred. The results were:
    - Alternative #1 – No votes
    - Alternative #2 – Approximately 5 or 6 votes
    - Alternative #3 – Only one or two votes
    - No-Build – The majority of votes

An Open House immediately followed from 6:30p.m. to 8:00 p.m. At the Open House a selection of Exhibits were displayed for the attendees to review. Representatives from the Port, ODA and Consultants were available to address questions one-on-one with members of the public. Comment forms were also distributed for those who preferred to mail their comments/suggestions to the Port.

Next Steps:

- The next public meeting will address the Airport Layout and Capital Improvement Plans.

- The next public meeting will also include an Open House immediately afterwards.
- The date and location for the next meeting has not been specified at this time. Notifications to PAC members and interested parties will be sent as soon as more details are finalized.
- Notice will be advertised in the local newspaper(s) and on the Port and Clackamas County websites.

Mulino Airport Master Plan / ALP Update

Mulino Airport Project Advisory Committee (PAC), Meeting #4

February 13th, 2007 – 5:00-6:30 pm
Mulino Elementary School

AGENDA

Welcome & Introductions
Steve Nagy, Port of Portland — 5 min.

Project Update / Draft Development Alternatives
Rainse Anderson, Sara Funk & Sarah Lucas, W&H Pacific — 60 min.

- No-Build Alternative
- Alternative #1
- Alternative #2
- Alternative #3

Questions & Answers
All — 20 min.

Next Meeting
Location, Date & Time — 5 min.

Mulino Airport Master Plan Update

Meeting: **Project Advisory Committee (PAC) Meeting #5**
Date: **June 5, 2007**
Location: **Mulino Elementary School Cafeteria**

Purpose: To present Tasks 6 and 7 – Draft Chapter of the Airport Layout Plan and Capital Improvement Plan.

Participants: Port of Portland (Port), W&H Pacific (Consultant), PAC members and public attendees (sign-in sheet attached).

PAC Members in attendance:

- Dan Clem, Oregon Department of Aviation (ODA)
- Kenneth Itel, Clackamas County
- Warren Jones, Mulino Community Planning Organization (CPO)
- Scott Crockard for Dianne Johnson, Oregon Pilot's Association (OPA), Mulino Chapter
- Gary Sparks, Experimental Aircraft Association (EAA), Chapter 902

PAC Members not in attendance:

- JD Clarizio, Arrowhead Golf Club

Meeting Summary:

The meeting began at 5:30 p.m. and ended at 7:00 p.m. An agenda (attached) and comment form were distributed to participants.

Steve Nagy of the Port began the meeting with an overview of the Master Plan's purpose and the work already completed to date. The Consultant then presented the Airport Layout Plan (ALP) drawings and Capital Improvement Plan (CIP). PAC members were allowed an opportunity to comment and ask questions, prior to opening up the discussion forum to all public attendees.

The following are comments from the PAC regarding the ALP and CIP:

- Gary Sparks, EAA, asked why the existing pavement prior to the relocated Runway 32 threshold is marked for removal. He understood the need to relocate the taxiway access point, but felt leaving the pavement as a blast pad or as a safety overrun was beneficial.
    - The Consultant responded by stating the pavement removal is in accordance with Federal Aviation Administration (FAA) guidelines.
    - Dan Clem, ODA, noted the Department does not believe the pavement removal to be a high priority and as such did not include the expense in the CIP.
- Warren Jones, Mulino CPO, noted there were a few minor discrepancies on the land use drawing. He also inquired if the CIP project phasing was changeable.

- The Consultant will further consult with Clackamas County to ensure all land uses are depicted correctly.
- In regards to CIP staging, it was explained that many of the developments are demand based and dependant upon funding availability and programming, while others do need to occur sequentially (i.e. new access road prior to new taxilane access) but may not necessarily occur in the time period planned.

- Dan Clem, ODA, asked the representatives from Clackamas County if they could discuss Oregon Department of Transportation (ODOT) plans for the intersection of Highway 213 and Mulino Road.
  - Warren Jones, Mulino CPO, reported that ODOT does not have any plans for a traffic signal at this time. The intersection site distance needs to be improved and at this time traffic counts are just below the threshold needed for improvements. He also mentioned that traffic has increased on Mulino Road since the completion of the Milk Creek bridge project. As a result, it may be necessary to place a turning lane near the entrance of the Airport's proposed access road.
  - Dan Clem stated his Department is coordinating a meeting with ODOT to begin dialog regarding these projects.
- Gary Sparks, EAA, reemphasized the importance of a second taxilane to access aircraft parking and hangars and asked if it could be given a higher priority in the CIP. He also stated the need for a grass runway and continued grass taxiway access to both the EAA building and the Airport Café. He suggested designating an area for helicopter practice and a glider staging area.
  - The Port and Consultant clarified the second taxilane construction cannot occur until the new access road is developed. Currently, vehicle access would interfere with aircraft operations, thereby creating a safety hazard.
  - The Consultant will further explore the potential for a grass runway.
  - Future development of the access road and aviation reserves may impact the grass taxiway access to the EAA building and Airport Café. The Port and Consultant; however, showed those particular developments aren't slated until the later of the 20-year planning period and beyond. They, too, are concerned about cutting off access and are aware of its importance.
  - Regarding the helicopter practice area and glider staging area, the Consultant and Port indicated there is ample area for these operations, and it would not be necessary to set aside designated areas.

The following were questions and comments from the public:

- A member of the public presented an alternative placement of the access road and taxilane.
  - The Port and Consultant responded by giving their reasoning for choosing the preferred routing, which achieves an optimal aircraft/vehicular flow, reduces congestion, and capitalizes on federal project funding eligibility.

After the meeting, representatives from the Port, ODA and Consultants were available to address questions one-on-one with members of the public.

Next Steps:

- The next public meeting will present the final Master Plan Report.
- The date and location for the next meeting has not been specified at this time. Notifications to PAC members and interested parties will be sent as soon as more details are finalized.
- Notice will be advertised in the local newspaper(s) and on the Port and Clackamas County websites.

Mulino Airport Master Plan / ALP Update

Mulino Airport Project Advisory Committee (PAC), Meeting #5

June 5th, 2007 – 5:30-7:00 pm
Mulino Elementary School Cafeteria

AGENDA

Welcome & Introductions
Steve Nagy, Port of Portland 10 min.

Project Update / Draft Airport Layout and Capital Improvement Plans
Rainse Anderson & Sarah Lucas, W&H Pacific 50 min.

- Master Plan Concept
- Purpose of Airport Layout Plan
  - *Sheet 1 – Airport Layout Plan*
  - *Sheet 2 – Airspace Plan*
  - *Sheet 3 – Runway 14/32 Approach Surface Plan and Profile*
  - *Sheet 4 – Airport Land Use Plan and Noise Contours*

- Capital Improvement Plan

Questions & Answers
All 25 min.

Next Meeting
Location, Date & Time 5 min.

Appendix C
USER SURVEY

Airport Master Plan Update

Mulino Airport

Help Us Make Mulino Airport Better!

The Port of Portland is beginning to update the master plan for Mulino Airport. Please help us understand airport use better and how the airport could be improved. Your input will be documented and included in the master plan update. Circle your answer or fill in the blank.

What is your zip code?

What type aircraft do you own or use? (List Model/Type)

Estimate your number of annual landings. (Include Touch & Go)

% of your annual landings at Mulino Airport? %

Is your aircraft based at the Mulino Airport? YES NO

If not at Mulino, where is it based? (List Airport ID)

Why don't you base at Mulino? (Check or circle all that apply.)

Inconvenient Location	No Instrument Approach
Lack of Suitable Hangar	No FBO
Cost of Hangar	No Aircraft Maintenance
No Fuel Sales	Other:

What should be done to improve Mulino Airport?

OPTIONAL: If you provide your name, address, phone number, and email address, we will notify you of public meetings about the master plan and may contact you for more information related to the master plan update.

Name:

Address:

Phone #:

Email Address:

You may return the completed survey by either faxing or e-mailing to Rainse Anderson, Project Manager, at W&H Pacific, OR via postal service (postage paid). If sending by mail, please fold the survey and tape closed, with the return address visible. We would appreciate receiving your comments by August 7, 2006.

503-372-3521(office) 503-526-0775(fax) randerson@whpacific.com

Thank you!

Help Us Make Mulino Airport Better!

The Port of Portland is beginning to update the master plan for Mulino Airport. Please help us understand airport use better and how the airport could be improved. Your input will be documented and included in the master plan update. Circle your answer or fill in the blank.

What is your zip code? 97042

What type aircraft do you own or use? (None at present; rent) (List Model/Type)

Estimate your number of annual landings. 4 (Include Touch & Go)

% of your annual landings at Mulino Airport? 25 %

Is your aircraft based at the Mulino Airport? YES NO

If not at Mulino, where is it based? (List Airport ID)

Why don't you base at Mulino? (Check or circle all that apply.)

Inconvenient Location	No Instrument Approach
Lack of Suitable Hangar X	No FBO X
Cost of Hangar	No Aircraft Maintenance X
No Fuel Sales X	Other:

What should be done to improve Mulino Airport?

Make it Economically self-sustaining	Need fuel sales, an FBO, More Tee hangars,
Build and they will come.	Develop an airpark to the West of the runway.
Add facilities (toilets, septic system)	Small business park like Aurora.

OPTIONAL: If you provide your name, address, phone number, and email address, we will notify you of public meetings about the master plan and may contact you for more information related to the master plan update.

Name:

Address:

Phone #:

Email Address:

Please return the completed survey by mail, fax, or email by August 7, 2006, to:
Rainse Anderson, Project Manager, W&H Pacific
9755 SW Barnes Road, Suite 300, Portland, OR 97225

503-372-3521(v) 503-526-0775(f) randerson@whpacific.com

Thank you!

Help Us Make Mulino Airport Better!

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What is your zip code? 97042

What type aircraft do you own or use? (None at present; rent) (List Model/Type)

Estimate your number of annual landings. 4 (Include Touch & Go)

% of your annual landings at Mulino Airport? 25 %

Is your aircraft based at the Mulino Airport? YES NO

If not at Mulino, where is it based? (List Airport ID)

Why don't you base at Mulino? (Check or circle all that apply.)

Inconvenient Location	No Instrument Approach
Lack of Suitable Hangar X	No FBO X
Cost of Hangar	No Aircraft Maintenance X
No Fuel Sales X	Other:

What should be done to improve Mulino Airport?

Make it Economically self-sustaining	Need fuel sales, an FBO, More Tee hangars,
Build and they will come.	Develop an airpark to the West of the runway.
Add facilities (toilets, septic system)	Small business park like Aurora.

OPTIONAL: If you provide your name, address, phone number, and email address, we will notify you of public meetings about the master plan and may contact you for more information related to the master plan update.

Name:

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What type aircraft do you own or use? (None at present; rent) (List Model/Type)

Estimate your number of annual landings. 4 (Include Touch & Go)

% of your annual landings at Mulino Airport? 25 %

Is your aircraft based at the Mulino Airport? YES NO

If not at Mulino, where is it based? (List Airport ID)

Why don't you base at Mulino? (Check or circle all that apply.)

Inconvenient Location	No Instrument Approach
Lack of Suitable Hangar X	No FBO X
Cost of Hangar	No Aircraft Maintenance X
No Fuel Sales X	Other:

What should be done to improve Mulino Airport?

Make it Economically self-sustaining	Need fuel sales, an FBO, More Tee hangars,
Build and they will come.	Develop an airpark to the West of the runway.
Add facilities (toilets, septic system)	Small business park like Aurora.

OPTIONAL: If you provide your name, address, phone number, and email address, we will notify you of public meetings about the master plan and may contact you for more information related to the master plan update.

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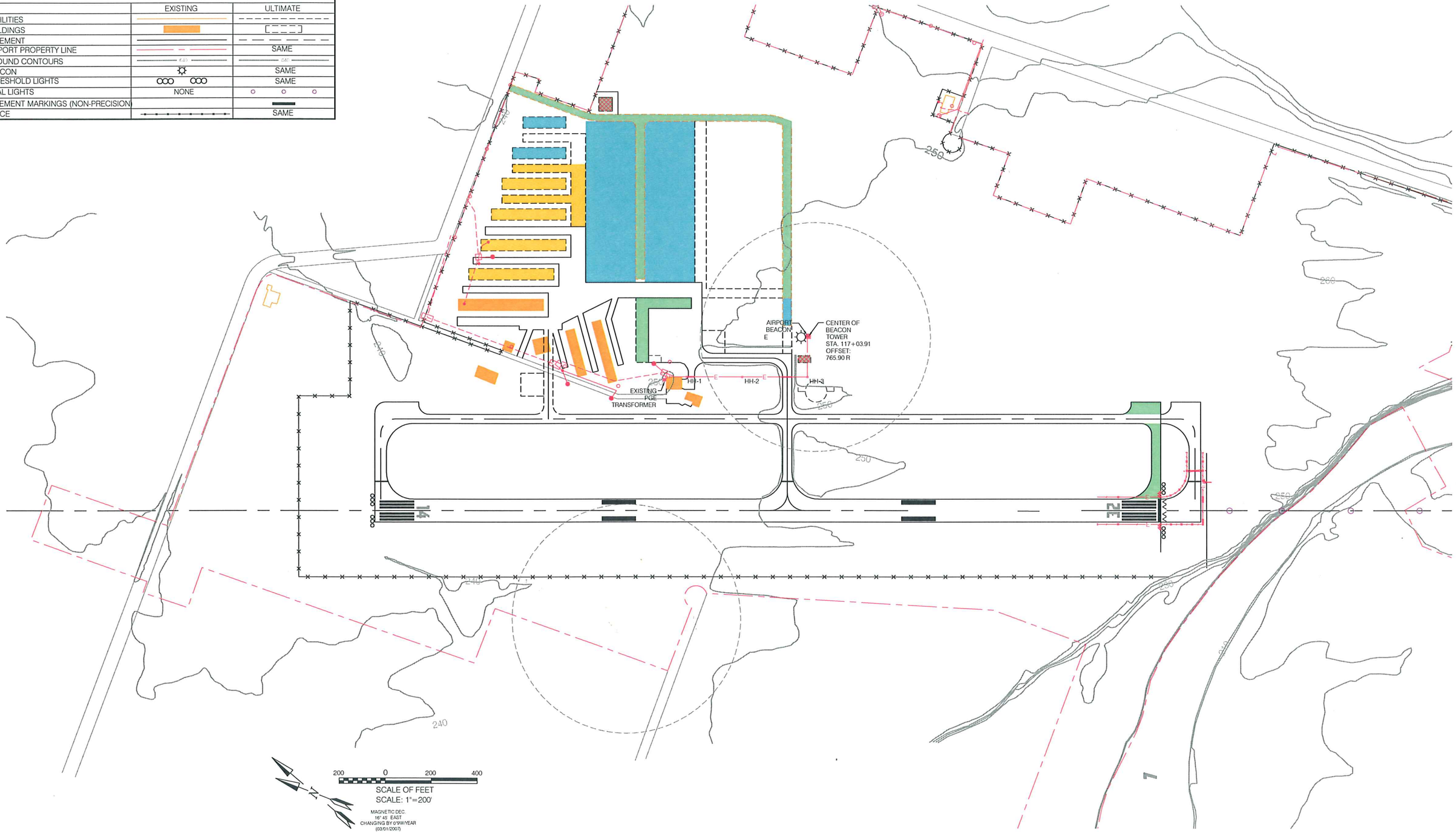
Please return the completed survey by mail, fax, or email by August 7, 2006, to:
Rainse Anderson, Project Manager, W&H Pacific
9755 SW Barnes Road, Suite 300, Portland, OR 97225

503-372-3521(v) 503-526-0775(f) randerson@whpacific.com

Thank you!

LEGEND	EXISTING	ULTIMATE
FACILITIES		
BUILDINGS		
PAVEMENT		
AIRPORT PROPERTY LINE		SAME
GROUND CONTOURS		
BEACON		SAME
THRESHOLD LIGHTS		SAME
ODAL LIGHTS	NONE	
PAVEMENT MARKINGS (NON-PRECISION)		
FENCE		SAME



NO.	DATE	BY	REVISIONS	CKD	APPVD

APPROVAL BLOCK

AIRPORT SPONSOR:

SIGNATURE

TITLE | DATE:

FEDERAL AVIATION ADMINISTRATION

SIGNATURE

TITLE | DATE:

APPROVAL LETTER DATED:

PORT OF PORTLAND
PORTLAND, OREGON

W&H PACIFIC
9755 SW Barnes Road
Suite 300
Portland, Oregon 97225
(503)626-0455
(503)626-0775 Fax
whpacific.com
Planners • Engineers • Surveyors • Landscape Architects

2007ZGEN	500098
DESIGN NUMBER	PROJECT NUMBER

DESIGNED BY	SML
DRAWN BY	RAI
CHECKED BY	REA
DATE	MAY 2007
SCALE	1"= 200'

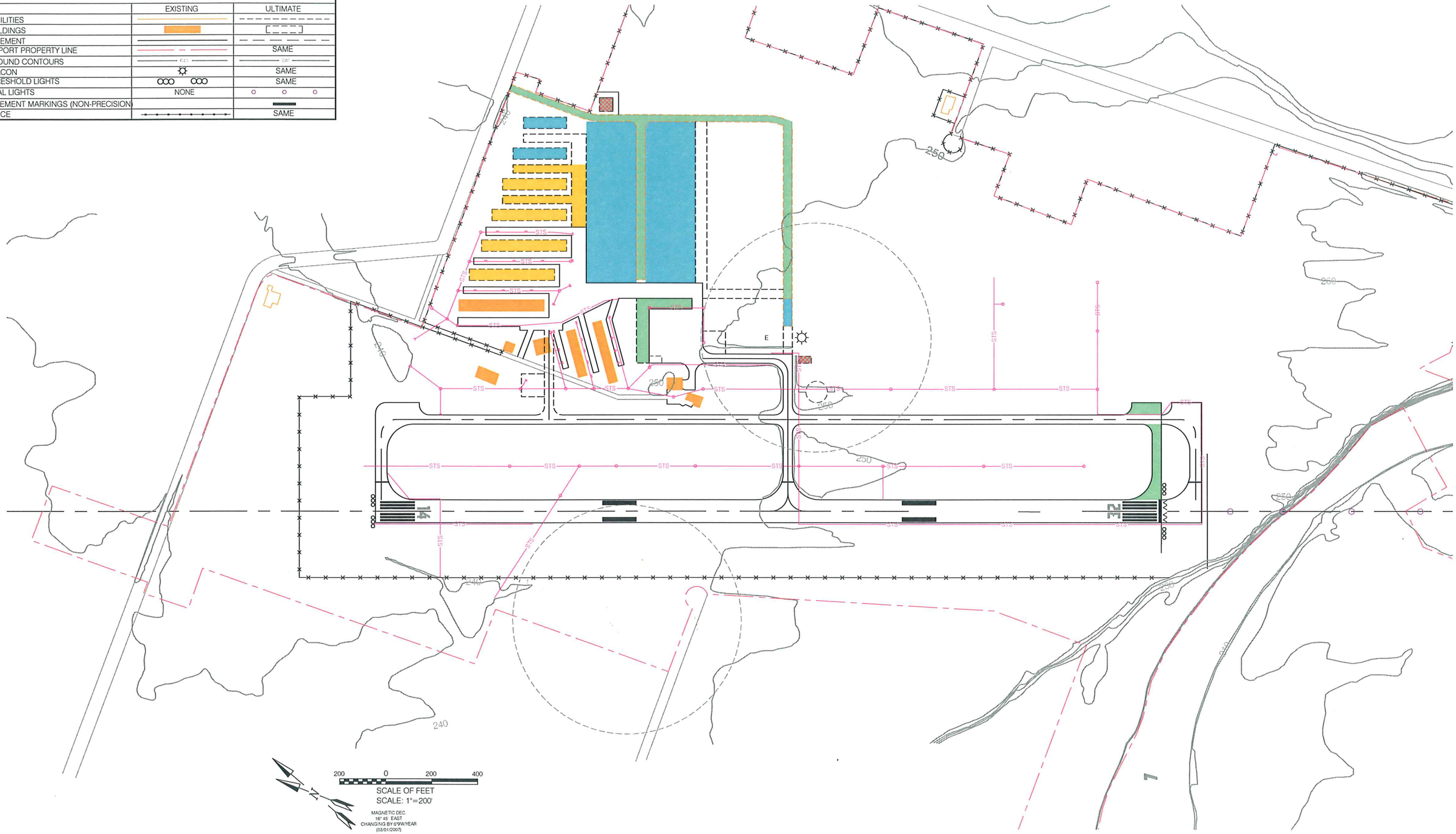
MULINO AIRPORT

ELECTRICAL UTILITIES

SUBMITTED BY
AIRPORT MANAGER

TYPE	DRAWING NO.
CD	4S9 2007-500

LEGEND	EXISTING	ULTIMATE
FACILITIES		
BUILDINGS		
PAVEMENT		
AIRPORT PROPERTY LINE		SAME
GROUND CONTOURS	240	240
BEACON		SAME
THRESHOLD LIGHTS		SAME
ODAL LIGHTS	NONE	
PAVEMENT MARKINGS (NON-PRECISION)		
FENCE		SAME



NO.	DATE	BY	REVISIONS	CKD	APPVD

APPROVAL BLOCK

AIRPORT SPONSOR:

SIGNATURE

TITLE DATE:

FEDERAL AVIATION ADMINISTRATION

SIGNATURE

TITLE DATE:

APPROVAL LETTER DATED:

PORT OF PORTLAND
PORTLAND, OREGON

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Suite 300
Portland, Oregon 97225
(503)293-2488
(503)293-2778 Fax
whpacific.com
Planners • Engineers • Surveyors • Landscape Architects

DESIGN NUMBER	PROJECT NUMBER
2007ZGEN	500098

DESIGNED BY	SML
DRAWN BY	RAI
CHECKED BY	REA
DATE	MAY 2007
SCALE	1"= 200'

MULINO AIRPORT

STORM UTILITIES

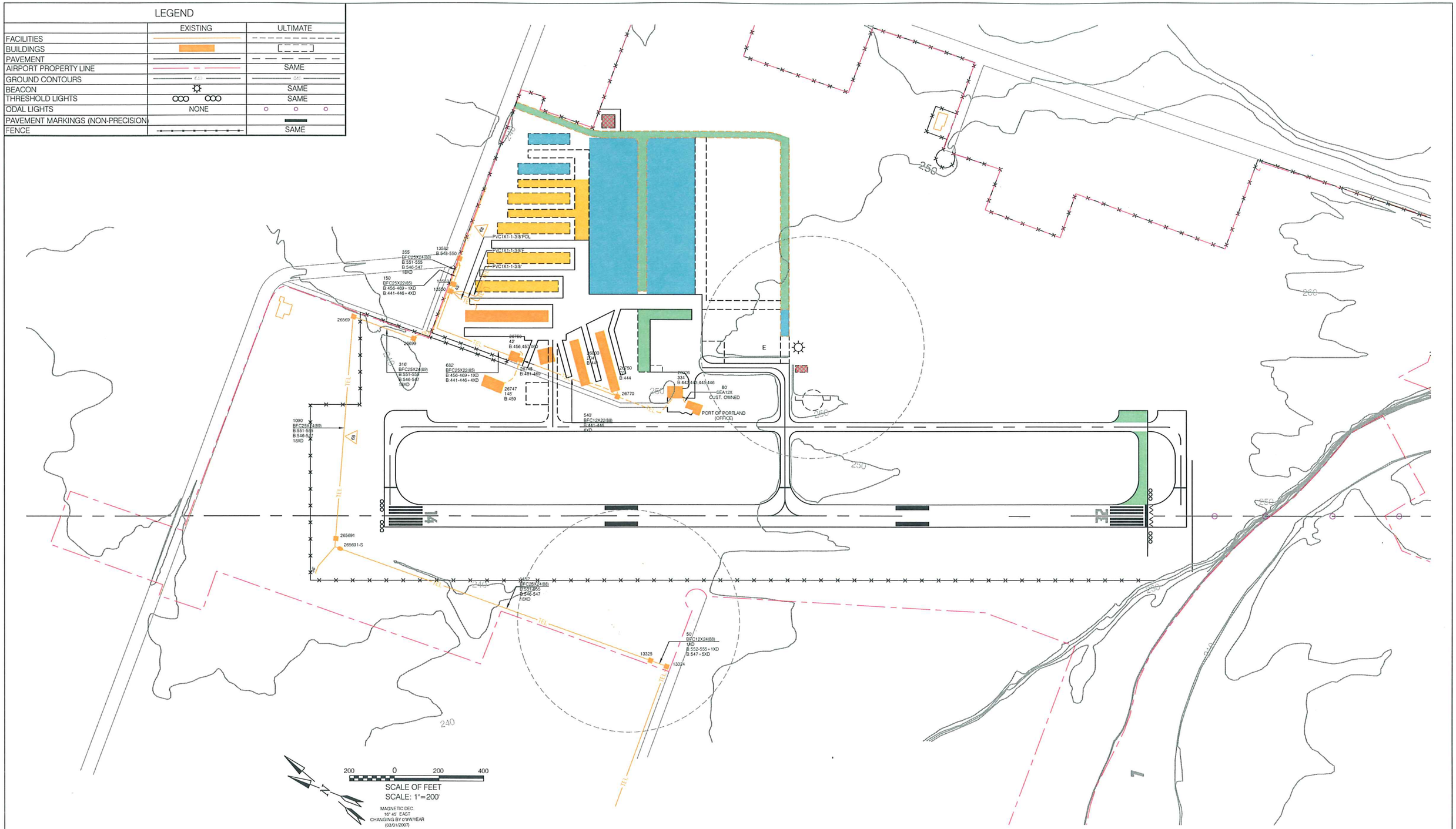
SUBMITTED BY

AIRPORT MANAGER

TYPE	DRAWING NO.
CD	4S9 2007-500

LEGEND

	EXISTING	ULTIMATE
FACILITIES		
BUILDINGS		
PAVEMENT		
AIRPORT PROPERTY LINE		SAME
GROUND CONTOURS		
BEACON		SAME
THRESHOLD LIGHTS		SAME
ODAL LIGHTS	NONE	
PAVEMENT MARKINGS (NON-PRECISION)		
FENCE		SAME



NO.	DATE	BY	REVISIONS	CKD	APPVD

APPROVAL BLOCK

AIRPORT SPONSOR:

SIGNATURE

TITLE | DATE:

FEDERAL AVIATION ADMINISTRATION

SIGNATURE

TITLE | DATE:

APPROVAL LETTER DATED:

PORT OF PORTLAND

PORTLAND, OREGON

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Portland, Oregon 97225
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(503)626-0775 Fax
whpacific.com
Planners • Engineers • Surveyors • Landscape Architects

2007ZGEN	500098
DESIGN NUMBER	PROJECT NUMBER

DESIGNED BY	SML
DRAWN BY	RAI
CHECKED BY	REA
DATE	MAY 2007
SCALE	1"= 200'

MULINO AIRPORT

TELEPHONE UTILITIES

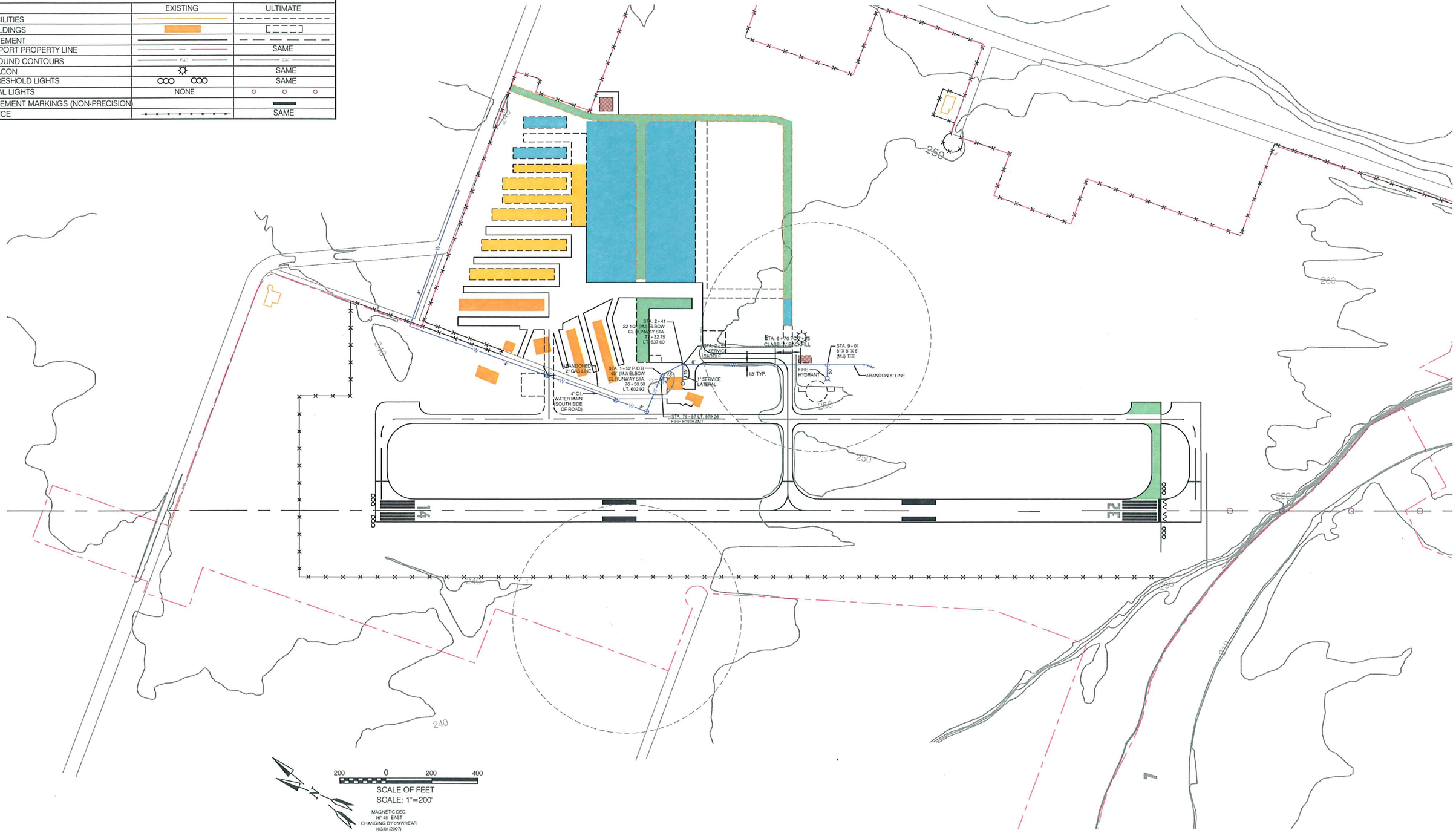
SUBMITTED BY

AIRPORT MANAGER

TYPE	DRAWING NO.
CD	4S9 2007-500

LEGEND

	EXISTING	ULTIMATE
FACILITIES		
BUILDINGS		
PAVEMENT		
AIRPORT PROPERTY LINE		SAME
GROUND CONTOURS	640	640
BEACON		SAME
THRESHOLD LIGHTS		SAME
ODAL LIGHTS	NONE	
PAVEMENT MARKINGS (NON-PRECISION)		
FENCE		SAME



NO.	DATE	BY	REVISIONS	CKD	APPVD

APPROVAL BLOCK

AIRPORT SPONSOR:

SIGNATURE

TITLE | DATE:

FEDERAL AVIATION ADMINISTRATION

SIGNATURE

TITLE | DATE:

APPROVAL LETTER DATED:

PORT OF PORTLAND
PORTLAND, OREGON

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(503)293-0455
(503)293-0775 Fax
whpacific.com
Planners • Engineers • Surveyors • Landscape Architects

2007ZGEN	500098
DESIGN NUMBER	PROJECT NUMBER

DESIGNED BY	SML
DRAWN BY	RAI
CHECKED BY	REA
DATE	MAY 2007
SCALE	1"= 200'

MULINO AIRPORT

WATER UTILITIES

SUBMITTED BY

AIRPORT MANAGER

TYPE	DRAWING NO.
CD	4S9 2007-500

SECTION 700 - SPECIAL DISTRICTS

713 PUBLIC USE AIRPORT & SAFETY OVERLAY ZONES (3/24/05)

713.01 PURPOSE

This section is adopted to implement ORS 836.600 through 836.630 and policies of the Comprehensive Plan as they relate to public use airports. When applied, it provides for their continued operation and vitality consistent with state law by allowing certain compatible airport related commercial and recreational uses. It also provides for safety standards to promote air navigational safety at such public use airports and to reduce the potential for safety hazards for property and for persons living, working or recreating on lands near such airports.

713.02 APPLICATION

This special use zoning district may be applied to publicly owned airports in Clackamas County, that are shown in the records of the Oregon Department of Aviation on December 31, 1994. It also may be applied to those privately owned, public use airports in Clackamas County identified pursuant to ORS 836.610(3) by the Oregon Department of Aviation as providing important links in air traffic in Oregon, providing essential safety or emergency services, or are of economic importance to the county where the airport is located.

The boundaries of this special use district are coterminous with airport boundaries as described in OAR 660-013-0040. The boundaries of safety overlay zones radiate from points at the ends of the airport's primary surface as described in Oregon Administrative Rules 660-013-0070(1)(a) and Exhibits 1 and 4 that accompany that Rule. The definitions in subsection 713.03 are consistent with ORS Chapter 836, OAR 660-013 and Exhibits 1 and 4 of that rule.

If an airport that had this special use zoning district applied is removed from the State's list of airports in a manner described in ORS 836.610, the application of this special use zoning district is automatically terminated.

713.03 DEFINITIONS

A. Aircraft. Means airplanes and helicopters, but not hot air balloons or ultralights.
B. Airport. The strip of land used for taking off and landing aircraft, together with all adjacent land used in connection with the aircraft landing or taking off from the strip of land, including but not limited to land used for existing airport uses.
C. Airport Elevation. The highest point of an airport's usable runway, measured in feet above mean sea level.
D. Airport Imaginary Surfaces. Imaginary areas in space and on the ground that are established in relation to the airport and its runways. Imaginary surfaces are defined by the primary surface, runway protection zone, approach surface, horizontal surface, conical surface and transitional surface.
E. Airport Noise Impact Boundary. Areas located within 1,500 feet of an airport runway or within established noise contour boundaries exceeding 55 Ldn.

F. Airport Sponsor. The owner, manager, or other person or entity designated to represent the interests of an airport.

G. Approach Surface. A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface.

1. The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of:
    a. 1,250 feet for a utility runway having only visual approaches;
    b. 1,500 feet for a runway other than a utility runway with only visual approaches;
    c. 2,000 feet for a runway with a non-precision instrument approach;
    d. 3,500 feet for a non-precision instrument runway other than utility, having visibility minimums greater than three-fourths statute mile;
    e. 4,000 feet for a non-precision instrument runway, other than utility, having a non-precision approach with visibility minimums as low as three-fourths statute mile; and
    f. 16,000 feet for precision instrument runways.
2. The approach surface extends for a horizontal distance of:
    a. 5,000 feet at a slope of twenty (20) feet outward for each foot upward for all utility and visual runways;
    b. 10,000 feet at a slope of thirty-four (34) feet outward for each foot upward for all non-precision instrument runways, other than utility; and
    c. 10,000 feet at a slope of fifty (50) feet outward for each one foot upward, with an additional 40,000 feet at a slope of forty (40) feet outward for each one foot upward, for precision instrument runways.
3. The outer width of an approach surface will be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

H. Conical Surface. A surface extending outward and upward from the periphery of the horizontal surface at a slope of twenty (20) to one (1) for a horizontal distance of 4,000 feet.

I. Department of Aviation. The Oregon Department of Aviation, formerly the Aeronautics Division of the Oregon Department of Transportation.

J. FAA. The Federal Aviation Administration.

K. Height. The highest point of a structure or tree, plant or other object of natural growth, measured from mean sea level.

L. Heliports. A heliport is an area of land, water, or structure designated for the landing and take-off of helicopters or other rotorcraft. The heliport overlay zone applies the following imaginary surfaces. The Heliport Approach Surfaces begin at each end of the heliport primary surface and have the same width as the primary surface. They extend outward and upward for a horizontal distance of 4,000 feet where their width is 500 feet. The slope of the approach surfaces is 8 to 1 for civilian heliports and 10 to 1 for military heliports. The Heliport Primary surface coincides in size and shape with the designated takeoff and landing area of a heliport. The heliport primary surface is a horizontal plane at the established heliport elevation. The heliport transitional surfaces extend outward and upward from the lateral boundaries of the heliport primary surface and from the approach surfaces at a slope of 2 to 1 for a distance of 250 feet measured horizontally from the centerline of the primary and approach surfaces.

M. Hazard. All hazards within and around airports shall be as determined by the Oregon Department of Aviation or Federal Aviation Administration.
N. Horizontal Surface. A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is:
    1. 5,000 feet for all runways designated as utility or visual.
    2. 10,000 feet for all other runways.
    3. The radius of the arc specified for each end of a runway will have the same arithmetical value. That value will be the highest determined for either end of the runway. When a 5,000 foot arc is encompassed by tangents connecting two adjacent 10,000 foot arcs, the 5,000 foot arc shall be disregarded on the construction of the perimeter of the horizontal surface.
O. Non-precision Instrument Runway. A runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance, or area type navigation equipment, for which a straight-in non-precision instrument approach has been approved, or planned, and for which no precision approach facilities are planned or indicated on an FAA-approved airport layout plan or other FAA planning document.
P. Obstruction. Any structure or tree, plant or other object of natural growth that penetrates an imaginary surface.
Q. Other than Utility Runway. A runway that is constructed for and intended to be used by turbine-driven aircraft or by propeller-driven aircraft exceeding 12,500 pounds gross weight.
R. Precision Instrument Runway. A runway having an existing instrument approach procedure utilizing air navigation facilities that provide both horizontal and vertical guidance, such as an Instrument Landing System (ILS) or Precision Approach Radar (PAR). It also means a runway for which a precision approach system is planned and is so indicated by an FAA-approved airport layout plan or other FAA planning document.
S. Primary Surface. A surface longitudinally centered on a runway. When a runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway. When a runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of the primary surface is:
    1. 250 feet for utility runways having only visual approaches;
    2. 500 feet for utility runways having non-precision instrument approaches;
    3. For other than utility runways the width is:
        a. 500 feet for visual runways having only visual approaches;
        b. 500 feet for non-precision instrument runways having visibility minimums greater than three-fourths statute mile;
        c. 1,000 feet for a non-precision instrument runway having a non-precision instrument approach with a visibility minimum as low as three-fourths statute mile, and for precision instrument runways.
T. Public Assembly Facility. A permanent or temporary structure or facility, place or activity where concentrations of people gather in reasonably close quarters for purposes such as deliberation, education, worship, shopping, employment, entertainment,

recreation, sporting events, or similar activities. Public assembly facilities include, but are not limited to, schools, churches, conference or convention facilities, employment and shopping centers, arenas, athletic fields, stadiums, clubhouses, museums, and similar facilities and places, but do not include parks, golf courses or similar facilities unless used in a manner where people are concentrated in reasonably close quarters. Public assembly facilities also do not include air shows, structures or uses approved by the FAA in an adopted airport master plan, or places where people congregate for short periods of time such as parking lots or bus stops.

U. Runway. A defined area on an airport prepared for landing and takeoff of aircraft along its length.

V. Runway Protection Zone (RPZ). An area off the runway end used to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The inner width of the RPZ is the same as the width of the primary surface. The outer width of the RPZ is a function of the type of aircraft and specified approach visibility minimum associated with the runway end. The RPZ extends from each end of the primary surface for a horizontal distance of:
    1. 1,000 feet for utility runways.
    2. 1,700 feet for other than utility runways having non-precision instrument approaches.
    3. 2,500 feet for precision instrument runways.

W. Structure. Any constructed or erected object which requires location on the ground or is attached to something located on the ground. Structures include but are not limited to buildings, decks, fences, signs, towers, cranes, flagpoles, antennas, smokestacks, earthen formations and overhead transmission lines. Structures do not include paved areas.

X. Transitional Surface. Those surfaces that extend upward and outward at 90 degree angles to the runway centerline and the runway centerline extended at a slope of seven (7) feet horizontally for each foot vertically from the sides of the primary and approach surfaces to the point of intersection with the horizontal and conical surfaces. Transitional surfaces for those portions of the precision approach surfaces which project through and beyond the limits of the conical surface, extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at a 90 degree angle to the extended runway centerline.

Y. Utility Runway. A runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight or less.

Z. Visual Runway. A runway intended solely for the operation of aircraft using visual approach procedures, where no straight-in instrument approach procedures or instrument designations have been approved or planned, or are indicated on an FAA-approved airport layout plan or any other FAA planning document.

AA. Water Impoundment. Includes wastewater treatment settling ponds, surface mining ponds, detention and retention ponds, artificial lakes and ponds, and similar water features. A new water impoundment includes an expansion of an existing water impoundment except where such expansion was previously authorized by land use action approved prior to the effective date of this ordinance.

713.04 USES PERMITTED OUTRIGHT

The following uses and activities are permitted outright in the Public Use Airport special use zoning district:

A. Customary and usual aviation-related activities, including but not limited to takeoffs and landings; aircraft hangars and tie-downs; construction and maintenance of airport facilities; fixed-base operator facilities; 1 single-family dwelling in conjunction with an airport (if there is not one there already) for an airport manager, caretaker, or security officer; and other activities incidental to the normal operation of an airport. Except as provided in this ordinance, "customary and usual aviation-related activities" do not include residential, commercial, industrial, manufacturing, and other uses. (3/24/05)
B. Air passenger and air freight services and facilities, at levels consistent with the classification and needs identified in the Oregon Department of Aviation Airport System Plan.
C. Emergency medical flight services, including activities, aircraft, accessory structures, and other facilities necessary to support emergency transportation for medical purposes. Emergency medical flight services do not include hospitals, medical offices, medical labs, medical equipment sales, and other similar uses.
D. Law enforcement, military, and firefighting activities, including aircraft and ground-based activities, facilities and accessory structures necessary to support federal, state or local law enforcement or land management agencies engaged in law enforcement or firefighting activities. Law enforcement and firefighting activities include transport of personnel, aerial observation, and transport of equipment, water, fire retardant and supplies.
E. Search and rescue operations, including aircraft and ground based activities that support the orderly and efficient conduct of search or rescue related activities.
F. Flight instruction, including activities, facilities, and accessory structures located at airport sites that provide education and training directly related to aeronautical activities. Flight instruction includes ground training and aeronautic skills training, but does not include schools for flight attendants, ticket agents or similar personnel.
G. Aircraft service, maintenance and training, including activities, facilities and accessory structures provided to teach aircraft service and maintenance skills and to maintain, service, refuel or repair aircraft and aircraft components. "Aircraft service, maintenance and training" includes the construction and assembly of aircraft and aircraft components for personal use, but does not include activities, structures or facilities for the manufacturing of aircraft, aircraft components or other aircraft-related products for sale to the public.
H. Aircraft rental, including activities, facilities and accessory structures that support the provision of aircraft for rent or lease to the public.
I. Aircraft sales and the sale of aeronautic equipment and supplies, including activities, facilities and accessory structures for the storage, display, demonstration and sales of aircraft and aeronautic equipment and supplies to the public but not including activities, facilities or structures for the manufacturing of aircraft, aircraft components or other aircraft-related products for sale to the public.
J. Crop dusting activities, including activities, facilities and structures accessory to crop dusting operations. Crop dusting activities include, but are not limited to, aerial application of chemicals, seed, fertilizer, defoliant and other chemicals or products used in a commercial agricultural, forestry or rangeland management setting.

K. Agricultural and Forestry Activities, including activities, facilities and accessory structures that qualify as a "farm use" as defined in ORS 215.203 or "farming practice" as defined in ORS 30.930.
L. Aeronautic recreational and sporting activities, including activities, facilities and accessory structures at airports that support recreational usage of aircraft and sporting activities that require the use of aircraft or other devices used and intended for use in flight. Aeronautic recreation and sporting activities authorized under this paragraph include, but are not limited to, fly-ins; glider flights; hot air ballooning; ultralight aircraft flights; displays of aircraft; aeronautic flight skills contests; and gyrocopter flights, but do not include flights carrying parachutists or parachute drops (including all forms of skydiving).
M. Flights carrying parachutists, and parachute drops (including all forms of skydiving) onto an airport, but only upon demonstration that the parachutist business has secured approval to use a drop zone that is at least ten (10) contiguous acres in size. The configuration of the drop zone shall roughly approximate a square or a circle and may contain structures, trees, or other obstacles only if the remainder of the drop zone provides adequate areas for parachutists to land safely.
N. Uses not identified in Section 713.04 of this special use zoning district, but allowed in the base zone, may be allowed if they do not conflict with allowed uses in Section 713.04, safety, or the continued operation and vitality of the airport.
O. --Reserved for future use--

713.05 USES PERMITTED SUBJECT TO HEARINGS OFFICER REVIEW

Uses not identified in section 713.04 and contained in an Airport Expansion Plan approved by the County as part of the Comprehensive Plan shall be permitted following a public hearing before the Clackamas County Land Use Hearings Officer as an administrative action pursuant to the procedures specified in Section 1300 of this Ordinance and upon demonstration of compliance with the following standards.

A. The use is, or will be, supported by adequate types and levels of public facilities, services and transportation systems authorized by applicable statewide land use planning goals;
B. The use does not seriously interfere with existing land uses in areas surrounding the airport; and
C. For airports where the underlying zone is exclusive farm use, the use shall comply with the standards described in ORS 215.296.
D. The development standards in Section 1000 of this ordinance shall be applied appropriate to the type of use permitted.
E. An applicant may demonstrate that these standards will be satisfied through the imposition of clear and objective conditions.

713.06 IMAGINARY SURFACE AND NOISE IMPACT BOUNDARY DELINEATION

The airport elevation, the airport noise impact boundary, and the location and dimensions of the runway, primary surface, runway protection zone, approach surface, horizontal surface, conical surface and transitional surface, direct and secondary impact boundaries shall be delineated for each public use airport where this district is applied and shall be made part of the Official Zoning Map. All lands, waters and airspace, or portions thereof, that are located within these boundaries or surfaces shall be subject to the requirements of this zone.

713.07 NOTICE OF LAND USE AND PERMIT APPLICATIONS WITHIN SAFETY OVERLAY ZONES

Except as otherwise provided herein, written notice of applications for land use or limited land use decisions, including comprehensive plan or zoning amendments, in an area within the largest of these safety zones, shall be provided to the airport sponsor and the Department of Aviation in the same manner as notice is provided to property owners entitled by law to written notice of land use or limited land use applications.

A. Notice shall be provided to the airport sponsor and the Department of Aviation when the property, or a portion thereof, that is subject to the land use or limited land use application is located within 5,000 feet of the sides or ends of a visual runway and within 10,000 feet of the sides or ends of a runway with an instrument approach.
B. Notice of land use and limited land use applications shall be provided within the following timelines.
    1. Notice of land use or limited land use applications involving public hearings shall be provided prior to the public hearing at the same time that written notice of such applications is provided to property owners entitled to such notice.
    2. Notice of land use or limited land use applications not involving public hearings shall be provided at least twenty (20) days prior to the initial decision on the land use or limited land use application.
C. Notice of the decision on the land use or limited land use application shall be provided to the airport sponsor within the same timelines that notice is provided to parties to the proceeding.
D. Notices required under Paragraphs A-C of this Section need not be provided to the airport sponsor or the Department of Aviation where the land use or limited land use application meets all of the following criteria:
    1. Would allow only structures of less than thirty-five (35) feet in height;
    2. Involves property located entirely outside the approach surface;
    3. Does not involve industrial uses, mining or similar uses that emit smoke, dust or steam; sanitary landfills or water impoundments; or radio, radiotelephone, television or similar transmission facilities or electrical transmission lines; and
    4. Does not involve wetland mitigation, creation, enhancement or restoration.

713.08 HEIGHT LIMITATIONS ON ALLOWED USES WITHIN SAFETY OVERLAY ZONES

A. --Reserved for future use--
B. --Reserved for future use--
C. Mediation is available from the County for airport sponsors and owners of obstructions not conforming with height limitations addressed in this Section to resolve disputes about those obstructions.
D. The traveling of any lawful vehicle or livestock kept on private or public land, road, waterway, or railway shall not be considered an obstruction. Fences to a height necessary for agricultural use, shall not be considered obstructions.
E. --Reserved for future use--
F. Other height exceptions or variances may be permitted when supported in writing by the airport sponsor, the Department of Aviation and the FAA. Applications for height

variances shall be subject to the procedures and standards in Section 1205 and 1305 of this Ordinance and shall be subject to such conditions and terms as recommended by the Department of Aviation and the FAA.

713.09 PROCEDURES

An applicant seeking a land use or limited land use approval or a building permit in an area within safety overlay zones enacted by this ordinance shall provide the following information in addition to any other information required in the permit application:

A. --Reserved for future use--
B. --Reserved for future use--
C. If a height variance is requested, letters of support from the airport sponsor, the Department of Aviation and the FAA shall be submitted with the application.

713.10 LAND USE COMPATIBILITY REQUIREMENTS

Applications for land use or building permits for properties within the boundaries of these safety overlay zones shall comply with the requirements of this Section as provided herein.

A. --Reserved for future use--
B. --Reserved for future use--
C. --Reserved for future use--
D. --Reserved for future use--
E. --Reserved for future use--
F. --Reserved for future use--
G. --Reserved for future use--

713.11 WATER IMPOUNDMENTS WITHIN SAFETY OVERLAY ZONES

Any use or activity that would result in the establishment or expansion of a water impoundment shall comply with the requirements of this section.

A. --Reserved for future use--

713.12 NONCONFORMING USES

A. These regulations shall not be construed to require the removal, lowering or alteration of any existing structure or vegetation not conforming to these regulations. These regulations shall not require any change in the construction, or alteration of the intended use of any structure, the construction or alteration of which was begun or completed prior to the effective date of this safety overlay zone.
B. --Reserved for future use--
C. --Reserved for future use--

(LAST TEXT REVISION 3/24/05)

U.S. Department
of Transportation
Federal Aviation
Administration

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98057-3356

February 25, 2007

Mr. Jason Gately
Port of Portland
P. O. Box 3529
Portland, OR 97208

Dear Mr. Gately:

Airport Layout Plan (ALP) Review Comments
Portland - Mulino Airport; Portland, OR
AIP Project Number 3-41-0072-010

The coordination for review within the Federal Aviation Administration (FAA) has been completed on the draft Airport Layout Plan set of drawings for the proposed improvements at Portland - Mulino Airport. Our review comments, previously sent to you on January 25, 2007, are again provided herein.

Also, an aeronautical study (No. 2007-ANM-786-NRA) was conducted on the proposed development to determine its effect on the safe and efficient utilization of the navigable airspace by aircraft. There were no objections based on that evaluation.

The Master Plan report will be accepted upon receipt of two copies of the final document. The FAA will approve the ALP and drawings related to Federal Aviation Regulation (FAR) Part 77 once our comments are reflected on the final drawings, with proposed development subject to environmental approval, where applicable. Please send us 3 sets of prints, signed and dated by you, the sponsor, plus 1 set of mylars (unsigned), along with the ALP CADD files on disk when they are finalized. We will return 1 approved set to you, the sponsor. Please call me at (425) 227-2654 if I can be of further assistance.

Sincerely,

Stanley C. Allison
OR/ID State Planner

1 Enclosure

cc:
Dan Clem, Oregon Department of Aviation
Sarah Lucas, W&H Pacific

FAA REVIEW COMMENTS
DRAFT AIRPORT LAYOUT PLAN (ALP) SET
PORTLAND - MULINO AIRPORT

Previously Submitted Comments on 1/25/07

Sheet 1 – Airport Layout Plan

1. The FAA's ALP Checklist specifies that the elevations of roadways "where they intersect the RPZ edges and extended runway centerline be depicted. Extended runway centerline elevation is shown, however, the edge elevations are not. Please show the additional elevations.
2. The FAA's ALP Checklist specifies that the elevations of structures on the airport be shown. "If a terminal area plan is not included, show structure top elevations on this sheet." Please add. Also, Building 16 is shown within the BRL. What is the top elevation of this structure? Does it penetrate the Part 77 Transitional Surface?
3. The dimension between the full length parallel taxiway and the partial parallel taxiway is shown as 270 feet, however, the arrowhead of the dimension line is drawn to the edge of the full-length parallel taxiway, not the centerline. Please correct.
4. The FAA's ALP Checklist specifies that the Design Aircraft be shown in the Airport Data Table for each runway or airfield component. Please add.
5. The FAA's ALP Checklist specifies that the Maximum elevation of the runway above MSL be shown in the Runway Data Table. Please add.
6. The FAA's ALP Checklist specifies that the Name and Location of the airport be shown in the Title and Revision Blocks. Airport name is shown as "Mulino Airport". Name of record for the airport is "Portland-Mulino Airport" and is located in Portland, OR. Please correct.

Sheet 2 - Airspace Plan

7. The FAA's ALP Checklist specifies that the Airspace Plan include small scale profile views of existing and ultimate approaches. Sheet 3 shows Inner Portion of Approach profiles within the RPZ, but not much beyond. Scope of Work states that the entire approach profiles shall be shown. Please modify the drawing set to include. Refer to ALP Checklist for specifications on what must be shown on these profiles (i.e., Items 2.h.(1), (2), and (3)).
8. ALP on file with the FAA (dated 8/8/06) indicates two additional structures have been airspaced since that ALP was approved. Airspace case numbers were: 2006-ANM-661-OE and 2006-ANM-4864-OE. Please verify if these two structures have been constructed, or not, or whether they are obstructions, or not.

Sheet 3 – Inner Portion of the Approach Surface

9. Suggest renaming the sheet from RWY 14/32 Approach Surface Plan and Profile to Inner Portion of the Approach Surface to coincide with the FAA's ALP Checklist.
10. The FAA's ALP Checklist specifies that the horizontal scale of the drawing be 1" = 200' and the vertical scale be 1" = 20'. All scales are correct except the graphic scale for the Horizontal portion of the Profile view is shown as 1" = 1,000'. Please correct.

11. The FAA's ALP Checklist specifies that all traverse ways be identified, by numbers, with elevations and computed vertical clearance in the approach. Please add intersection points with edges of the RPZ.
12. The FAA's ALP Checklist specifies that the existing and ultimate physical end of the runways be depicted. "Note runway end number and elevation." Please add elevations.
13. ALP on file with the FAA (dated 8/8/06) indicates many more obstructions than are shown on this sheet. Please verify whether or not these obtructions have been removed. If not, make sure they are added to the current plans and profiles. This may be a scale issue and the fact that the entire length of the approaches are not shown.

Sheet 5 – Land Use Plan

14. The FAA's ALP Checklist specifies that the land use drawing include all land uses, on and off the airport, to at least the 65 DNL contour. The Checklist also specifies that the scale of the drawing be the same as the Airport Layout drawing. Scale shown is 1" = 1,600 feet.
15. The FAA's ALP Checklist specifies that the drawing "identify public facilities (such as schools, parks, and others)." Please verify if this is applicable.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98057-3356

January 25, 2007

Mr. Jason Gately
Port of Portland
P. O. Box 3529
Portland, OR 97208

Dear Mr. Gately:

Draft Airport Layout Plan (ALP) Review Comments
Portland - Mulino Airport; Portland, OR
Airport Improvement Program (AIP) Project Number 3-41-0072-010

We have reviewed the draft ALP set of drawings for Portland-Mulino Airport. Our preliminary review comments are enclosed and will be forwarded to other Federal Aviation Administration (FAA) divisions reviewing the ALP and conducting an aeronautical study on the proposed improvements. These comments are being provided at this time as a convenience to the consultant and to expedite revisions to the drawings.

The plans should not be finalized for submittal until the aeronautical study has been completed, as additional revisions may be necessary. We will forward final comments upon completion of the aeronautical study. Please call me at (425) 227-2654 if I can be of further assistance.

Sincerely,

ORIGINAL SIGNED BY

Stanley C. Allison
OR/ID State Planner

1 Enclosure

cc:
Dan Clem, Oregon Department of Aviation
Sarah Lucas, W&H Pacific

RECEIVED

JAN 30 2008

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FAA REVIEW COMMENTS
DRAFT AIRPORT LAYOUT PLAN (ALP) SET
PORTLAND - MULINO AIRPORT

Airport District Office Comments

Sheet 1 – Airport Layout Plan

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15. The FAA's ALP Checklist specifies that the drawing "identify public facilities (such as schools, parks, and others)." Please verify if this is applicable.

W&H PACIFIC

9755 SW Barnes Road, Suite 300
Portland, Oregon 97225
503.626.0455
Fax 503.526.0775

TRANSMITTAL

To:	**Mr. Stan Allison, SEA-644**	Date:	
Company:	Federal Aviation Administration Seattle Airports District Office	Project Number:	33211
Address:	1601 Lind Ave. SW	Project Name:	Mulino Airport Master Plan Update
City/State:	Renton, WA 98055	**Re:**	Final ALP Set (revised)
Phone:	425-227-2654		
Fax:	425-227-1650		

From: Sarah Lucas

Phone: (503) 372-3533

Fax: (503) 526-0775

We are sending:		These Are Transmitted:		Copied To:
☒	Attached	☐	For Your Info/File	Jason Gately, Port (*1 copy via USPS*)
☐	Facsimile	☐	As Requested	Larry Weber, ODA (*1 copy via USPS*)
		☒	For Review & Comment	Project File

Copies	Description
5	ALP Drawing Set (full size) *via UPS 2nd Day Air*

Stan,

All comments provided in Dave Roberts' letter dated October 11, 2007 have been addressed in the attached revised ALP drawing set – with the exception of comment #6 as the wind rose period provided is the only data available. An electronic copy of the Master Plan text will be posted to our FTP site for your review. I will e-mail you once this data is available, with the link to the FTP site. All changes made as a result of Dave's letter will be highlighted in track changes.

Please contact me if you have any questions or concerns.

whpacific.com *planners* *surveyors* *engineers* *landscape architects*

U.S. Department
of Transportation

**Federal Aviation
Administration**

Seattle Airports District Office
1601 Lind Avenue, S. W., Ste 250
Renton, Washington 98055-4056

October 11, 2007

Mr. Jason Gately
Port of Portland
P. O. Box 3529
Portland, OR 97208

Dear Mr.Gately:

Draft Airport Layout Plan (ALP) Review Comments
Mulino Airport
AIP Project No. 3-41-0072-010

I have reviewed the draft ALP set of drawings for Mulino Airport and the final draft of the Master Plan. My preliminary review comments are enclosed. Please revise the ALP to address these comments and send five corrected copies so that we may coordinate with other Federal Aviation Administration (FAA) division. These comments are provided at this time as a convenience to the consultants and to expedite revisions to the drawings.

The plans should not be finalized for submittal until the aeronautical study has been completed, as additional revisions may be necessary. I will forward final comments upon completion of the aeronautical study. Please call me at (425) 227-2629 if I can be of further assistance.

Sincerely,

Dave Roberts
Civil Engineer

Enclosure: FAA Review Comments Draft Airport Layout Plan (AIP) Set
FAA Associate Administrator's letter of August 29, 2005
Portion of Director's Determination 16-06-06

Cc Sarah Lucas W&H Pacific

www.faa.gov/airports_airtraffic/airports/regional_guidance/northwest_mountain/

FAA REVIEW COMMENTS
DRAFT AIRPORT LAYOUT PLAN (ALP) SET
MULINO AIRPORT

Sheet 1 – AIRPORT LAYOUT PLAN

1. Under "Buildings and Facilities " table number 15, a non-aviation Reserve (Aviation compatible) has been established. The land in this area was purchased with Federal Funds 1988 for aviation development purposes. Federal law does not permit use of land acquired for aviation development purposes be used for non-aviation purposes. Please remove the designation and shaded area.

2. Under Note 2 and item 16 of the "Buildings and Facilities " table, residential airparks are considered to be a non-compatible land use on or adjacent to publicly owned airports. See attached Associate Administrators letter dated August 29, 2005 and portion of Director's Determination for Afton-Lincoln County Docket No. 16-06-06. Please remove the note and reference to item 16. Also, on the first sheet , we do not label areas off the airport "potential aviation compatible" unless the area is also designated for future acquisition and inclusion into the airport. If an area is aviation compatible, it should be shown on the land-use sheet.

3. Need to add note that existing runway width exceeds the design standards for the critical aircraft and that the need for the wider runway will be addressed at the time of the next runway rehabilitation.

4. The future access road shown on the ALP will cut off aviation access to a portion of the airport. Please revise access road so the aviation access is not cut off to that section of the airport.

5. At each proposed AWOS location show 500 foot radius clear area.

6. The wind rose period just says 1980, usually there is a range of dates for when the coverage was measured.

On the Runway Data table:

a. For Runway 32 use 45-12-43.743 latitude and 122-35-16.359 longitude (est.) These coordinates provide a runway that is 3425 feet long. These are also what is shown in the NAS.

ALL OTHER DRAWINGS

Revisions must be made where appropriate for consistency with the above comments. Please make needed corrections and/or provide information from available sources to the extent specified in the approved scope of work.

MASTER PLAN REPORT REVIEW COMMENTS

The following comments were provided in our January 10, 2007 letter to the airport, "runway Pavement Length, page 4-7: is there a need for this footnote? We do not usually include guidance from other regions in our documents." and "Airpark, page 4-15: Remove section. .." These comments were not addressed in the final revised master plan.

On page 3-17 after paragraph on the decrease in operations between 2006 and 2012, indicate that this reduced operations results in smaller noise contours.

On page 5-20 first paragraph change to indicate proposed non-aviation reserve area is contrary to use of development land purchased with FAA federal funds.

On page 5-20 second paragraph. It is against FAA policy as outlined in Carey v. Afton-Lincoln County Municipal Airport, FAA Docket No. 16-06-06, Directors Determination dated January 19, 2007, to permit federally obligated airports to enter into in new ingress-egress (through-the-fence) agreements with residential airparks. This paragraph should be modified to remove reference to airpark. Also since the area should not be noted on the ALP per earlier comment. The paragraph should simple refer to the area west of the airport as having future potential for aviation development.

On page 7-4, Capital Improvement Program, T-hangers are considered eligible for AIP funding and could be included under FAA funding source.

Vasconcelos

U.S. Department of Transportation
Federal Aviation Administration

Office of Associate Administrator for Airports

800 Independence Ave., SW.
Washington, DC 20591

AUG 29 2005

Mr. Hal Shevers
Chairman
Clermont County-Sporty's Airport
Batavia, OH 45103

Dear Mr. Shevers:

Thank you for your letter of July 18. In your letter, you suggested the Federal Aviation Administration promote developing residential airparks as a means to improve airport security and reduce the closure rate of general aviation airports. Residential airparks developed next to an airport usually rely on "through-the-fence" agreements to gain access to the airfield.

First, I would like to make clear that the FAA does not oppose residential airparks at private use airports. Private use airports are operated for the benefit of the private owners, and the owners are free to make any use of airport land they like. A public airport receiving Federal financial support is different, however, because it is operated for the benefit of the general public. Also, it is obligated to meet certain requirements under FAA grant agreements and Federal law. Allowing residential development on or next to the airport conflicts with several of those requirements.

An airpark is a residential use and is therefore an incompatible use of land on or immediately adjacent to a public airport. The fact there is aircraft parking collocated with the house does not change the fact that this is a residential use. Since 1982, the FAA has emphasized the importance of avoiding the encroachment of residential development on public airports, and the Agency has spent more than $300 million in Airport Improvement Program (AIP) funds to address land use incompatibility issues. A substantial part of that amount was used to buy land and houses and to relocate the residents. Encouraging residential airparks on or near a federally obligated airport, as you suggest, would be inconsistent with this effort and commitment of resources.

Allowing an incompatible land use such as residential development on or next to a federally obligated airport is inconsistent with 49 USC §47104(a) (10) and associated FAA Grant Assurance 21, *Compatible Land Use*. This is because a federally obligated airport must ensure, to the best of its ability, compatible land use both off and on an airport. We would ask how an airport could be successful in preventing incompatible residential development before local zoning authorities if the airport operator promotes residential airparks on or next to the airport.

Additionally, residential airparks, if not located on airport property itself, require through-the-fence access. While not prohibited, the FAA discourages through-the-fence operations because

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they make it more difficult for an airport operator to maintain control of airport operations and allocate airport costs to all users.

A through-the-fence access to the airfield from private property also may be inconsistent with security guidance issued by the Transportation Security Administration (TSA). TSA created guidelines for general aviation airports: Information Publication (IP) A-001, *Security Guidelines for General Aviation Airports*. The TSA guidelines, drafted in cooperation with several user organizations including the Aircraft Owners and Pilots Associations (AOPA), recommend better control of the airport perimeter with fencing and tighter access controls. Accordingly, we do not agree with your view that a residential airpark and the associated through-the-fence access points can be said to improve airport security. In fact, multiple through-the-fence access points to the airfield could hinder rather than help an airport operator maintain perimeter security.

Finally, we find your statement that general aviation airports have been closing at an alarming rate to be misleading, because it is simply untrue with respect to *federally* obligated airports. In fact, the FAA has consistently denied airport closure requests. Of approximately 3,300 airports in the United States with Federal obligations, the number of closures approved by the FAA in the last 20 years has been minimal. The closures that have occurred generally relate to replacement by a new airport or the expiration of Federal obligations. AOPA has recognized our efforts. In its latest correspondence to the FAA on the *Revised Flight Plan 2006-2010*, AOPA stated, "the FAA is doing an excellent job of protecting airports across the country by holding communities accountable for keeping the airport open and available to all users."

For the above reasons, we are not able to support your proposal to promote the development of residential airparks at federally obligated airports.

I trust that this information is helpful.

Sincerely,

Original signed by:
Woodie Woodward

Woodie Woodward
Associate Administrator
for Airports

Cntl: 20051267-0/FAA-050816-006
AAS-400:MVasconcelos:78730:08/26/05:seb
G: AAS-400\Vasconcelos\Final Airport Issues\20051267-0 Shevers.doc
AAS-400\1\ARP\AGL-600\Vasconcelos
Page: 1
[0] Statistics 20051267-0 Shevers2.doc, 705 words
Original, 26 Aug 2005 07:18
Style Index 11, Excellent for a Letter
Average Sentence 22, Fair
Passive Index 16, Good

Carey v. Davenport v. Afton-Lincoln County Municipal Airport Joint Powers Bd.
Docket No. 16-06-06, 1/19/07 Directors Determination.

on airport property.[23] Neither does the Town of Afton permit residential dwellings on airport property.[24] [FAA DD Exhibit 1, Item 3, exhibit page 33.] Even though zoning may be the responsibility of the Town of Afton, the Respondent is expected to meet its grant assurance obligations. The Respondent is responsible for ensuring hangars are not used for residential facilities and that no residential facilities are developed on the airport in conflict with the Airport Layout Plan and the other grant assurances.

The administrative record in this matter is persuasive. Complainants allege at least one tenant is permitted to use his hangar as a residence. The Respondent does not deny the claim. Rather, the Respondent attempts to deflect attention by stating (a) it is not the responsibility of the Respondent to enforce zoning violations, and (b) the Complainants have or had also used hangars for personal activities. [FAA DD Exhibit 1, Item 5, pages 7-8.] It does appear the Respondent is not enforcing the ban on residential hangars on airport property. We expect the Respondent to confirm that hangars are not being used for residential facilities and to exert whatever effort is necessary to ensure this activity is not permitted on airport property. At this time, the Director finds the Respondent is in violation of grant assurance 21, *Compatible Land Use*, by failing to enforce a prohibition on residential use of hangars on the airport.

(2) *Issue 7(b): Residential Hangars Adjacent to Airport Property*

Whether Respondent is in violation of grant assurance 21, *Compatible Land Use*, by encouraging the development of a residential airpark adjacent to the airport.

The administrative record shows a residential airpark was developed adjacent to airport property with Airport Board support.

- On August 18, 2004, the Airport Board discussed a proposal to combine privately owned acreage adjacent to the airport for use as an airpark that would include hangars, residences, and a camping area. The Airport Board discussed turning the old runway into a road to provide access to the park area. [FAA DD Exhibit 1, Item 3, exhibit page 93.]

- On November 17, 2004, the Airport Board again discussed plans for the proposed airpark. [FAA DD Exhibit 1, Item 3, exhibit page 109.]

- On January 27, 2005, the Airport Board discussed the water source for the airpark, the resolution of the old taxiway, and the general aviation camping area.

[23] See *Land Use Compatibility and Airports: A Guide for Effective Land Use Planning* at http://www.faa.gov/airports_airtraffic/airports/environmental/land_use/. Page 2 of 141 lists examples of incompatible land uses, including residential, schools, and churches. Grant assurance 21, *Compatible Land Use*, obligates the airport to implement whatever steps are necessary to prevent incompatible land use.

[24] In a September 19, 2005, letter to Complainant M. Daniel Carey from James K. Sanderson, Counsel for the Town of Afton, Mr. Sanderson stated, "under no circumstances were there to be living quarters contained within the hangers at the airport. The airport is not currently zoned for any residential dwellings." [FAA DD Exhibit 1, Item 3, exhibit page 217.]

W&H PACIFIC

9755 SW Barnes Road, Suite 300
Portland, Oregon 97225
503.626.0455
Fax 503.526.0775

TRANSMITTAL

To:	**Dave Roberts, SEA-643**	Date:	
Company:	Federal Aviation Administration	Project Number:	33211
Address:	1601 Lind Ave. SW	Project Name:	Mulino Airport Master Plan Update
City/State:	Renton, WA 98055	**Re:**	Draft Final Report
Phone:	425-227-2654		
Fax:			

From: Sarah M. Lucas

Phone: (503) 626-0455

Fax: (503) 526-0775

We are sending:		**These Are Transmitted:**		**Copied To:**
☒	Attached	☐	For Your Info/File	Jason Gately, Port
☐	Facsimile	☐	As Requested	Project File
	# Of Pages Including Cover	☒	For Review & Comment	_____

Copies	Description
1	Draft Final Master Plan Report
1	ALP Drawing Set (full size)

Dave,

Please contact me if you have any questions.

Regards,

Sarah

whpacific.com *planners* *surveyors* *engineers* *landscape architects*

9755 SW Barnes Road, Suite 300
Portland, Oregon 97225
503.626.0455
Fax 503.526.0775

TRANSMITTAL

To:	**Suzanne Lee-Pang**	Date:	
Company:	FAA	Project Number:	33211
Address:	1601 Lind Ave. SW	Project Name:	Mulino Airport Master Plan Update
City/State:	Renton, WA 98057	**Re:**	Draft Tasks 6 and 7 (Airport Layout and Capital Improvement Plans)
Phone:	425-227-2654		
Fax:			

From: Sarah Lucas

Phone: (503) 626-0455

Fax: (503) 526-0775

Confidentiality Notice: This facsimile is intended only for the use of the individual and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that the unauthorized dissemination, distribution or copying of this communication, or the taking of any action in reliance on the contents of this information is strictly prohibited. If you have received this facsimile in error, please notify us immediately by telephone (collect). Thank you.

We are sending:		**These Are Transmitted:**		**Copied To:**
☒	Attached	☐	For Your Info/File	_____
☐	Facsimile	☐	As Requested	_____
	# Of Pages Including Cover	☒	For Review & Comment	_____

Copies	Description
2	Draft Task 6 – Airport Layout Plan
2	Draft Task 7 – Capital Improvement Plan
1	ALP Drawing Set (full size)
1	ALP Drawing Set (1/2 size)
2	ALP Checklist

Suzanne,

The advisory committee meeting to discuss the above items will be held at the Mulino Elementary School on June 5th from 5:30 – 6:00 pm. I look forward to receiving your comments and please let me know if you have any questions.

whpacific.com *planners* *surveyors* *engineers* *landscape architects*

Article I. APPENDIX F - AIRPORT LAYOUT PLAN DRAWING SET

The following list provides general guidelines in preparing the Airport Layout Plan drawing set. The individual sheets that comprise the Airport Layout Plan drawing set will vary with each planning effort. During the project scoping activities, planners must determine which sheets will be necessary. Checklists from FAA Regional and District Offices and many state aviation offices may supplement the guidance provided in this Appendix. Since these checklists are comprehensive, not all items will be applicable to a specific project.

1. Airport Layout Drawing					
	Sponsor/Consultant				
	Yes	No	N/A		FAA
a. Sheet size – Minimum 24" x 36"		X			
b. Scale – Within a range of 1" = 200' to 1" = 600'	X				
c. North Arrow	X				
1) True and Magnetic North	X				
2) Year of the magnetic declination	X				
3) Orient drawing so that north is to the top or left of the sheet	X				
d. Wind rose	X				
1) Data source and the time period covered	X				
2) Include individual and combined coverage for:	X				
a) Runways with 10.5 knots crosswind	X				
b) Runways with 13 knots crosswind	X				
c) Runways with 16 knots crosswind			X		
d) Runways with 20 knots crosswind			X		
e. Airport Reference Point (ARP) – Existing and ultimate, with latitude and longitude to the nearest second based on NAD 83	X				
f. Ground contours at intervals of 2' to 10', lightly drawn	X				
g. Elevations (Existing and Ultimate to 1/10 of a foot)	X				
1) Runway	X				
2) Displaced thresholds	X				
3) Touchdown zones	X				
4) Intersections			X		
5) Runway high and low points	X				
6) Roadways where they intersect the RPZ edges and extended runway centerlines	X				
7) Structures on Airport – If a terminal area plan is not included, show structure top elevations on this sheet		X			
h. Building limit lines – show on both sides of the runways and extend to the airport property line of	X				

RPZ					
i. Runway Details (Existing and Ultimate)	X				
1) Dimensions – length and width within the outline of the runway	X				
2) Orientation – Runway end numbers and true bearing to nearest 0.01 degree	X				
3) Markings	X				
4) Lighting – Threshold lights only	X				
5) Runway Safety Areas – Dimensions may be included in the Runway Data Table	X				
6) End Coordinates – Note near end (existing and ultimate) of each runway end, to nearest second		X			
7) Displaced threshold coordinates, to the nearest second			X		
8) Declared Distances – For each runway direction if applicable. Identify any clearway/stopway portions in the declared distances		X			
j. Taxiway details (Existing and Ultimate)	X				
1) Taxiway widths and separations from the runway cetnerlines, parallel taxiway, aircraft parking, and objects	X				
k. RPZ Details (Existing and Ultimate)	X				
1) Dimensions	X				
2) Type of property acquisition (fee or easement)	X				
l. Approach slope ratio (20:1; 34:1; 50:1)	X				
m. Airport Data Table (Existing and Ultimate)	X				
1) Airport elevation (MSL)	X				
2) Airport Reference Point data	X				
3) Mean maximum temperature	X				
4) Airport Reference Code for each runway	X				
5) Design Aircraft for each runway or airfield component	X				
n. Runway Data Table (Existing and Ultimate)	X				
1) Percent effective gradient	X				
2) Percent wind coverage	X				
3) Maximum elevation above MSL	X				
4) Runway length and width	X				
5) Runway surface type	X				
6) Runway strength	X				
7) FAR Part 77 approach category	X				
8) Approach type	X				
9) Approach slope	X				
10) Runway lighting (HIRL, MIRL, LIRL)	X				
11) Runway marking	X				
12) Navigational and visual aids	X				

13) RSA dimensions	X				
o. Title and Revision Blocks	X				
1) Name and location of the airport	X				
2) Name of preparer	X				
3) Date of drawing	X				
4) Drawing title	X				
5) Revision block	X				
6) FAA disclaimer	X				
7) Approval block	X				
p. Other					
1) Standard legend	X				
2) Existing and Ultimate airport facility and building list	X				
3) Location map	X				
4) Vicinity Map	X				
Remarks					
Explanation for fields answered "No." • Sheet size = 22" x 34" so sheet can be printed on 11" x 17" • g.7. Structure top elevations currently unavailable. Information forthcoming will be surveyed June 5, 2007. • i.6. End coordinate data located in Runway Data Table. • i.8. Declared distances presented in Declared Distances Table.					
2. Airport Airspace Drawing					
a. Plan view of all FAR Part 77 surfaces, based on ultimate runway lengths	X				
b. Small scale profile views of existing and ultimate approaches	X				
c. Obstruction data tables, as appropriate	X				
d. Sheet size – same as airport layout drawing	X				
e. Scale – 1" = 2,000' for the plan view; 1" = 1,000' for approach profiles; and 1" = 100' (vertical) for approach profile	X	X			
f. Title and revision blocks – same as the airport layout drawing	X				
g. Approach Plan View Details	X				
1) USGS for base map	X				
2) Show runway end numbers	X				
3) Include 50' elevation contours on all slopes	X				
4) Show the most demanding surfaces with solid lines and other with dashed lines		X			
5) Identify top elevations of objects that penetrate any of the surfaces. For objects in the inner approach, add note "See inner portion of the approach plan view for close-in obstructions."	X				

6) For precision instrument runways, show balance of 40,000' approach on a separate sheet.			X		
h. Approach Profile Details					
1) Depict the ground profile along the extended runway centerline representing the composite profile, based on the highest terrain across the width and along the length of the approach surface.	X				
2) Identify all significant objects (roads, rivers, and so forth) and tope elevations within the approach surfaces, regardless of whether or not they are obstructions	X				
3) Show existing and ultimate runway ends and FAR Part 77 approach slopes.	X				
Remarks					
Explanation for fields answered "No." • e. See Sheet C-3 for profile views. • g.4. All lines shown as solid. • H.1. thru h.3, see Sheet C-3 for profile views.					
3. Inner Portion of the Approach Surface Drawing					
a. Large scale plan views of inner portions of approaches for each runway, usually limited to the RPZ areas	X				
b. Large scale projected profile views of inner portions of approaches for each runway, usually limited to the RPZ areas	X				
c. Interim stage RPZs when plans for interim runways extensions are firm and construction is expected in the near future			X		
d. Sheet size – same as Airport Layout drawing	X				
e. Scale – 1" = 200'; vertical 1" = 20'		X			
f. Title and revision blocks – Same as for Airport Layout drawing	X				
g. Plan View Details	X				
1) Aerial photos for base maps	X				
2) Numbering system to identify obstructions	X				
3) Depict property line	X				
4) Identify, by numbers, all traverse ways with elevations and computed vertical clearance in the approach	X				
5) Depict the existing and ultimate physical end of the runways. Note runway end number and elevation	X				
6) Show ground contours, lightly drawn	X				
h. Profile View Details	X				
1) Depict terrain and significant items (fences, roadways, and so forth)	X				

2) Identify obstruction with numbers on the plan view	X				
3) Show roads and railroads with dashed lines at edge of the approach	X				
i. Obstruction Table Details	X				
1) Depict terrain and significant items (fences, roadways, and so forth)	X				
2) Identify obstructions with numbers on the plan view	X				
3) Show roads and railroads with dashed lines at edge of the approach.	X				
4) Prepare a separate table for each RPZ		X			
5) Include obstruction identification number and description, the amount of the approach surface penetration, and the proposed disposition of the obstructions.	X				
Remarks					
Explanation for fields answered "No." • e. Vertical Scale – 1" = 200' • i.4. All obstructions are within one table, and identified clearly.					
4. Terminal Area Drawing					
The need for this drawing will be decided on a case-by-case basis. For small airports, where the Airport Layout drawing is prepared to a fairly large scale, a separate drawing for the terminal area may not be needed.					
a. Large scale plan view of the area or areas where aprons, building, hangars, and parking lots are locate	N/A				
b. Sheet size – Same as Airport Layout drawing	N/A				
c. Scale – 1" = 50' to 1" = 100'	N/A				
d. Title and revision blocks – Same are for Airport Layout drawing	N/A				
e. Building Data Table – To list structures and show pertinent information about them. Include space and columns for:	N/A				
1) A numbering system to identify structures	N/A				
2) Top elevation of structures	N/A				
3) Existing and planned obstruction markings	N/A				
Remarks					
A Terminal Area Drawing is not being updated as part of this AIP project.					
5. Land Use Drawing					
a. Include all land uses (industrial, residential, and so forth) on and off the airport, to at least the 65 DNL contour	X to 55 DNL				

b. Sheet size – Same as Airport Layout drawing	X				
c. Scale – Same as Airport Layout drawing	X				
d. Title and revision blocks – Same as for Airport Layout drawing	X				
e. Aerial base map	X				
f. Legend (symbols and land use descriptions)	X				
g. Identify public facilities (such as schools, parks, and others)	X				
h. Drawing details – Normally limited to existing and future airport features (i.e. runways, taxiways, aprons, RPZs, terminal buldings, and navigational aids)	X				
Remarks					
Oregon Department of Environmental Quality requests noise contours be depicted to the 55 DNL line.					
6. Runway Departure Surfaces Drawing					
a. Large scale plan views of departure surfaces for each runway end that is designated primarily for instrument departures. The one-engine inoperative (OEI) obstacle identification surface (OIS) should be shown for any departure runway end supporting air carrier operations.	N/A				
b. Large scale projected profile views of departure surfaces for each runway that is designated primarily for instrument departures.	N/A				
c. Sheet size – Same as Airport Layout drawing	N/A				
d. Scale – Horizontal 1” = 1000’; vertical 1” = 100’ (runway departure surfaces); and Scale – Horizontal 1” = 2000’; vertical 1” = 100’ (OEI obstacle identification surfaces)	N/A				
e. Title and revision blocks – Same as for Airport Layout drawing	N/A				
j. Plan View Details	N/A				
1) Aerial photos for base map	N/A				
2) Numbering system to identify obstructions	N/A				
3) Depict property line, including easements	N/A				
4) Identify, by numbers, all traverse ways with elevations and computed vertical clearance in the departure surface	N/A				
5) Depict the existing and ultimate physical end of the runways. Note runway end number and elevation	N/A				
6) Show ground contours, lightly drawn	N/A				
k. Profile View Details	N/A				
1) Depict terrain and significant objects, including	N/A				

fences, roadways, rivers, structures, and buildings					
2) Identify obstructions with numbers of the plan view	N/A				
3) Show roads and railroads with dashed lines at edge of the departure surface	N/A				
l. Obstruction Table Details	N/A				
1) Depict terrain and significant objects, including fences, roadways, rivers, structures, and buildings	N/A				
2) Identify obstructions with numbers of the plan view	N/A				
3) Show roads and railroads with dashed lines at edge of the departure surface	N/A				
4) Prepare a separate table for each departure surface	N/A				
5) Include obstruction identification number and description, the amount of the departure surface penetration, and the proposed disposition of the obstructions	N/A				
Remarks					
The Runway Departure Surfaces Drawing is not being updated as part of this AIP project.					
7. Airport Property Map					
a. Sheet size – Same as Airport Layout drawing	N/A				
b. Scale – Same as the Airport Layout drawing	N/A				
c. Title and revision blocks – Same as for Airport Layout drawing	N/A				
d. Legend	N/A				
e. Data Table	N/A				
1) A numbering or lettering system to identify tracts of land	N/A				
2) The date property was acquired	N/A				
3) The Federal aid project number under which it was acquired	N/A				
4) Type of ownership (fee, easement, federal surplus, and others)	N/A				
f. Show existing and future airport features (i.e. runways, RPZs, navigational aids and so forth) that would indicate a future aeronautical need for airport property.	N/A				
Remarks					
The Airport Property Map is not being updated as part of this AIP project.					

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98057-3356

January 10, 2007

RECEIVED
JAN 12 2007
W&H PACIFIC

Mr. Jason Gately
Port of Portland
P. O. Box 3529
Portland, OR 97208

Dear Mr. Gately:

Airport Master Plan Update
Portland-Mulino Airport
Airport Improvement Program Project Number 3-41-0072-10
Review Chapter 4 Airport Facility Requirements

I have reviewed the Airport Facility Requirements working paper received in December 2006 from the consultants for the Airport Layout Plan Update project for Portland-Mulino Airport (4S9). My review comments at this time are as follows:

a. Table 3A: Blast pads are not required unless blast erosion control is required for takeoff operations. The way it is presented in the table may present the perception that the airport needs blast pads. If this is not the case, either remove the line item or place a footnote that blast pads are not needed at the airport.

Provide better distinction between the width, and length of the RSA, OFA and OFZ, etc in the table. The data in the table appears to run together.

b. Runway Pavement Length, page 4-7: Is there a need for this footnote? We do not usually include guidance from other regions in our documents.

c. Airpark, page 4-15: Remove section. We do not support **any** residential development near an airport including airparks. It is not a compatible use. If this is allowed, it would probably lead to a through the fence agreement. The airport does not have through the fence operations now nor does the FAA recommend these types of agreements. Some of these agreements have been found to be detrimental to the economic viability of the airport. Further discussion can be conducted with our office if there are more questions.

As to identifying airport land as "surplus" and then eventually selling it, this is **not** an option. The land shown on Exhibit A as airport property was acquired for airport/aviation use from 1984 onwards with AIP funding. This was fairly recent and we see no benefit to civil aviation in releasing the land, especially not for the reasons stated.

This whole section presents unfeasible ideas that may be better off not presented and the section removed. Or if presented, state that it is unfeasible because… and leave it at that. Discussion on the surplus option should be totally removed.

Please call me at (425) 227-2654 if you have any questions.

Sincerely,

Original signed by Suzanne Lee-Pang

Suzanne Lee-Pang
Oregon/Idaho State Airport Planner/Engineer

cc:
Sarah Lucas, W&H Pacific

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98057-3356

March 26, 2007

Mr. Jason Gately
Port of Portland
P. O. Box 3529
Portland, OR 97208

RECEIVED
MAR 28 2007
W&H PACIFIC

Dear Mr. Gately:

Airport Master Plan Update
Portland-Mulino Airport
Approval of Chapter 3, Aeronautical Activity Forecast

I have reviewed the revised Chapter 3, Aeronautical Activity Forecast submitted by the consultants for the Master Plan Update project for Portland-Mulino (4S9). The revisions, including the forecasts, are hereby approved by the Federal Aviation Administration (FAA). If I can be of further assistance, please call me at (425) 227-2654.

Sincerely,

ORIGINAL SIGNED BY

Suzanne Lee-Pang
Oregon/Idaho State Planner-Engineer

cc:
Sarah Lucas, W&H Pacific

W&H PACIFIC
AN AECOM COMPANY

9755 SW Barnes Road, Suite 300
Portland, Oregon 97225
503.626.0455
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Suzanne Lee-Pang
Oregon-Idaho State Planner/Engineer
Federal Aviation Administration
1601 Lind Avenue SW, Suite 250
Renton, WA 98057-3356

Re: Mulino Airport Master Plan Aeronautical Activity Forecast

AIP Project Number 3-41-0072-10

Dear Suzanne,

Thank you for reviewing and commenting on the Mulino Airport Aeronautical Activity Forecast. We have incorporated information and clarification, as requested. Your comments were addressed as follows:

1. ***Table 3G – Indicate how the preferred forecast was calculated for year 2027.***
   a. Item accomplished by providing further explanation of forecast calculation within the preceding paragraph.

2. ***Page 3-13 – Elaborate in more detail the rationale in selecting the "preferred forecast."***
   a. More detail within the paragraph has been included for selection rationale.

3. ***Page 3-14 – last sentence on page, which "numbers" are being referred to?***
   a. The reference is to aircraft operations. Clarification has been made.

4. ***Page 3-15 – 3rd paragraph, when was the 21,300 reported by the Airport? On what basis was the count provided?***
   a. Date of the Airport Master Record Form 5010 was added. The count was based on Oregon Department of Aviation RENS counts.

   In last paragraph, elaborate more on why the increase in operations more likely indicates more transient traffic.
   b. Additional clarification was included.

5. ***Page 3-16 – first paragraph. Add sentence to why fuel sales can't be used as a measure of activity, i.e. no fuel facility at the time.***
   a. Statement has been refined to exemplify this.

6. ***Page 3-17 – first paragraph – elaborate more on why 568 ops are reasonable to use. Present the justification behind this.***
   a. More justification has been added within the paragraph.

   Third paragraph, last sentence, "… from 2006 to 2012." Add words"… based on "TAF forecasts. However…"
   a. Sentence has been restructured.

   Table 3K – what do the ** indicate?
   a. The following was added to the table: * *The accuracy of the base year (2006) operations figure is questionable; a more accurate number may be 21,300, the number reported for 2004 in the FAA's Airport Master Record (5015 Form).*

7. ***Table 3O – under operations fleet mix, expound on why the multi-engine ops drops then increase again.***
   a. The following statement was added: * *Multi-engine Piston operations decline from 2012 to 2017 because their share of the operations mix declines from 1.5% to 1.0%, as shown in Table 3M. Their share of the operations mix stays at 1.0% between 2017 and 2027 and so the number of multi-engine operations grows from 2017 to 2027 because total operations are projected to grow.*

8. ***We concur that the Airport reference code (ARC) BII is appropriate to establish current design standards for the airfield.***
   a. ARC BII has been retained for planning purposes at the Airport.

Enclosed is an updated version of the Aeronautical Activity Forecast chapter. We anticipate your approval of the revised document. Please contact me at your earliest convenience if you have any questions.

Best regards,

W&H PACIFIC, INC.

Rainse E. Anderson, P.E.
Project Manager

cc: Jason Gately, Port of Portland

enc: Mulino Airport Master Plan – Aeronautical Activity Forecast

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98057-3356

RECEIVED
JAN 08 2007
W&H PACIFIC

November 20, 2006

Mr. Jason Gately
Port of Portland
P. O. Box 3529
Portland, OR 97208

Dear Mr. Gately:

Airport Master Plan Update
Portland-Mulino Airport
Airport Improvement Program Project Number 3-41-0072-10
Review Chapter 3 Aeronautical Activity Forecast

I have reviewed the draft Forecasts of Aviation Activity working paper submitted by the consultants for the Airport Master Plan Update project for Portland-Mulino Airport (4S9). The working paper contains much useful information and reflects considerable effort. My comments are as follows:

1. Table 3G – Indicate how the preferred forecast was calculated for year 2027.

2. Page 3-13 – Elaborate in more detail the rationale in selecting the " preferred forecast.`` .

3. Page 3-14 – last sentence on page, which "numbers" are being referred to?

4. Page 3-15 – 3rd paragraph, when was the 21,300 reported by the airport? On what basis was the count provided?

   In last paragraph, elaborate more on why the increase in operations more likely indicates more transient traffic.

5. Page 3-16 – first paragraph. Add sentence to why fuel sales can't be used as a measure of activity, i.e. no fuel facility at the time.

6. Page 3-17 – first paragraph – elaborate more on why 568 ops are reasonable to use. Present the justification behind this.

   third paragraph, last sentence, "...from 2006 to 2012." Add words "...based on "TAF forecasts. However..."

   Table 3K – what do the ** indicate?

7. Table 3O – under operations fleet mix, expound on why the multi-engine ops drops then increase again.

8. We concur that the airport reference code (ARC) BII is appropriate to establish current design standards for the airfield.

Sincerely,

Original signed by Suzanne Lee-Pang

Suzanne Lee-Pang
Oregon-Idaho State Planner/Engineer

cc:
Sarah Lucas - W&H Pacific

U.S. Department
of Transportation

**Federal Aviation
Administration**

Seattle Airports District Office
1601 Lind Avenue, S. W., Ste 250
Renton, Washington 98055-4056

May 4, 2006

Mr. Jason A. Gately
Aviation Planner
7000 NE Airport Way, 3rd Floor
Portland, OR 97218

Dear ~~Mr. Gately:~~ Jason

Airport Master Plan Update
Portland-Mulino Airport, Mulino, Oregon
FAA Review Comments on Draft Workscope
AIP Project No. 3-41-0072-10

I have reviewed the draft workscope submitted by the consultants for the Airport Master Plan Update for Portland-Mulino Airport (4S9). My comments on the workscope are enclosed. This letter constitutes conditional approval of the workscope, subject to the enclosed comments. If you have any questions or concerns about the review comments, please let me know so we can discuss. Otherwise, the draft workscope should be revised to include the enclosed comments, as appropriate. The revised workscope, ***less proposed hours and costs***, should then be sent to the independent estimator. Upon completion of the independent estimate, please contact me for resolution of any outstanding issues. The final workscope, including approved costs, should then be submitted as Part IV of the final grant application.

Before a notice to proceed can be issued to the consultant, I have to approve the proposed consultant contract. Afterwards, I will need a copy of the executed final agreement. Also, as a condition of project approval, I would like to receive monthly status/progress reports in support of billings submitted by the consultant. If I can be of further assistance, please call me at (425) 227-2652. Be advised, however, that I will be out of the office, on training, May 22-30.

Sincerely,

Don M. Larson

Don M. Larson
Airport Planner

Enclosure

cc:
Rainse Anderson, W&H Pacific

FAA Review Comments on Draft Workscope
Airport Master Plan Update
Portland-Mulino Airport

1. Page 2, para. 1 – The airport layout plan (ALP) was also updated in 2004, and an unofficial "obstruction chart" prepared, in conjunction with an Oregon Aviation System Plan project to conduct field surveying for potential instrument approach procedures. That ALP has not yet been submitted by the Port of Portland to FAA for approval.

2. Page 2, Task 0.3 – With the final application workscope, please submit a budget table with hours/costs distribution by element, and a project timeline schedule by element.

3. Page 7, Task 3.3 – The FAA spreadsheet noted may be found in the FAA guidelines contained in "Forecasting Aviation Activity by Airport": http://www.faa.gov/data_statistics/aviation_data_statistics/forecasting/media/AF1.doc. That guidance also contains two Excel templates in Appendix B and C. Please provide the preliminary forecasts to me in those Excel spreadsheets (via e-mail) before finalizing the draft working paper. This should not create extra work, but should actually facilitate preparation of approvable forecasts as well as FAA review of them. The reason for this is that FAA Headquarters is getting very strict on forecast approvals relative to the FAA Terminal Area Forecasts (TAF), as can be seen in the current guidance: http://www.faa.gov/arp/planning/Forecast04.pdf.

4. Page 10, Task 6.2 – The ALP "checklist" is now in Appendix F of AC 150/5070-6B. I will provide via email an electronic version of it (verbatim from the AC) in true checklist format, but our FAA Region has not yet modified it.

5. Page 12, para. 6 – It is suggested that noise contours beyond five years not be prepared. Aviation demand forecasts for 20 years out, as well as the state of aircraft technology and noise characteristics at that time, are so speculative as to be essentially meaningless for planning purposes. That is why existing- and 5th-year noise contours are used in Noise Exposure Maps (NEM's) under Federal Aviation Regulation (FAR) Part 150 noise compatibility planning.

6. Page 14, Task 8.1 – Upon project commencement, please provide an organizational chart depicting Sponsor and other involved agencies, and a listing of the Master Plan Advisory Group members and their affiliations. Working papers/draft reports should be received by FAA and the MPAG members ***at least one week prior to meetings***.