

Technical Advisory Committee Meeting #2

NIRGEN

Aviation Planning Group

July 15, 2021

Airport Master Plan Update

Leah Whitfield Project Manager

Introductions

OLYMPIA REGIONAL

PORT OF OLYMPIA

ORT

Justin Heid Assistant Project Manager/Lead Planner

Darren Murata, P.E. Engineer

Haseeb Mirza Aviation Planner

Zach Duvall Aviation Planner



Participation

We will mute all participants during the presentation.

If you have a comment or question you can:

- Use the "Raise Hand" button under "Participants"
- Or under "Reactions"
- Type a comment in the chat box

~	Participants (3)					
H	Justin H	leid, APG (Me)	Ŷ	D 1		
L	Leah W	hitfield (Host)	Q	□1		
H	Haseeb	Mirza	÷	D 1		
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~		Chat				

DRT Airport Master Plan Update



OLYMPIA REGIONAL

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- **1.** What is an Airport Master Plan
- 2. Your Role as the Technical Advisory
- Committee (TAC)
- **3.** Master Plan Schedule
- **4.** Forecast Review
- **5.** Facility Requirements
- 6. Alternatives Discussion
- 7. Next Steps

Airport Master Plan Update

What is an Airport Master Plan?

> A master plan's purpose is not to solve the airport's management, operations, or maintenance issues.

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According to the Federal Aviation Administration (FAA), an airport master plan is...

A comprehensive study of an airport that usually describes the short-, medium-, and long-term development plans to meet future aviation demand.

Follows FAA Advisory Circular 150/5070-6B

- What's Included
 - Inventory
 - Forecast
 - Facility Requirements
 - Alternatives
 - Airport Layout Plan
 - Capital Improvement Plan

Airport Master Plan Update

Your Role on the Technical Advisory Committee (TAC)

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- Responsible and representative input is very important to the success of the Master Plan Update
- Limited time commitment: 4 meetings
- Review Draft Report and provide feedback with an eye towards your respective constituents
- Provide suggestions AT ANY TIME





Airport Master Plan Update SCHEDULE (Draft)



Technical Advisory Committee Meeting



Public Open House

Feasibility Study Meeting

Forecast Review



Aviation Demand Forecasts

Forecasts help determine an airport's facility needs—the type, size and timing of development to meet changing demand. The forecasts should be realistic and based on the best available information to enhance the accuracy and integrity of the planning process. Further, the FAA is required to review and approve the forecasts.

FAA's Stance:

"Any project that comes out (even ones considered being necessary within 1-3 years after the master plan) of the master plan will require justification.

Focus Areas:

- Planning activity levels
- Triggering events.

Forecasting Process

- Determine current aviation activity for:
 - Based Aircraft an aircraft is based at an airport if it spends the majority of its time there
 - Operations an operation is a takeoff or a landing, so total operations typically comprise 50% takeoffs and 50% landings
- Review and consider:
 - National, state and local aviation trends and projections
 - Area socioeconomic characteristics
- Prepare aviation activity projections using relevant forecast models
- Select preferred forecast, compare to FAA projections and submit for FAA review and approval



Current Aviation Activity

Based Aircraft:

- 95 Single-engine
- 8 Multi-engine
- 3 Jet
- <u>18 Helicopter</u>
- 124 TOTAL

Annual Operations

- 70,466 Operations per year
 - 39,196 GA Local Operations
 - 31,270 GA Itinerant Operations
 - 193 Operations per day

"Local" operations include aircraft activity that remains in the vicinity (e.g. traffic pattern) of an airport.

"Itinerant" operations include activity that is arriving from or destined for other locations.

Aviation Trends and Projections

National

- FAA Aerospace Forecasts 2020-2040
- General Aviation Manufacturers Association (GAMA)
- FAA Terminal Area Forecasts (2019 TAF)

Region

FAA TAF Northwest Mountain Region

State

- Washington Aviation System Plan (WASASP)
- FAA TAF (Washington)

Local

- FAA TAF (Olympia)
- User survey responses
- FBO data (fuel, landing fees)
- ATC logs
- IFR Operations

Forecast: Based Aircraft Indicators

Level of Indicator	Specific Indicator	Source	Average Annual Rates
Local	FAA OLM Based Aircraft Stats (1990-2020)	FAA 5010 / TAF	-0.29%
Local	FAA OLM Based Aircraft Stats (2010-2020)	FAA 5010 / TAF	-1.22%
Local	2013 Master Plan Based Aircraft Forecast	OLM MP 2013	1.20%
Local	FAA OLM Based Aircraft Forecasts (2020-2040)	FAA TAF	0.82%
Regional	FAA NWMR Forecasts (2020-2040)	FAA TAF	0.91%
Regional	FAA Washington State Forecasts (2020-2040)	FAA TAF	1.10%
Regional	2016 WASASP Forecasts (all classes)	WASASP	1.10%
Regional	2016 WASASP Forecasts (Regional class)	WASASP	0.80%
National	FAA National Forecasts (2020-2040)	FAA TAF	0.80%

Source: FAA Airport Master Record 5010 2021, FAA TAF 2019, OLM Master Plan 2013, and WASASP 2017.

OLM Based Aircraft Forecast

Forecast and Year	Master Plan Preferred Forecast
Based Aircraft	
Base Year: 2020	124
Short-Term Forecast: 2025	128
Intermediate-Term Forecast: 2030	132
Long-Term Forecast: 2040	139

Source: The Aviation Planning Group 2021



Tower Operations & After Hours Ops (8pm-8am)

Manah					Year	r				
Month	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total	47,787	61,434	65,573	62,134	56,525	43,071	41,052	54,108	63,194	64,816

Source: OLM ATC 2021.

Organization	Hours
Glacier Aviation Flight School	2,500
Safety in Motion Flight School	780
Department of Natural Resources	225
Northwest Aeromed	250
Washington State Patrol Aviation	800
All Other GA Users	1,095
Total	5.650

Source: Stakeholder interviews 2021.

Aircraft Design Classifications

AIRCRAFT DESIGN CLASSIFICATIONS

Aircraft Approach Category

Α	Approach speed less than 91 knots.
в	Approach speed 91 knots but less than 121 knots.
с	Approach speed 121 knots but less than 141 knots
D	Approach speed 141 knots but less than 166 knots
Е	Approach speed 166 knots or more.

Airplane Design Group

• •					
#	Tail Height [ft.(m)]	Wingspan [ft.(m)]			
1	<20' (<6m)	<49' (<15m)			
н	20' - <30' (6m - <9m)	49' - <79' (15m - <24m)			
ш	30' - <45' (9m - <13.5m)	79' - <118' (24m - <36m)			
IV	45' - <60' (13.5m - <18.5m)	118' - <171' (36m - <52m)			
v	60' - <66' (18.5m - <20m)	171' - <214' (52m - <65m)			
VI	66' - <80' (20m - <24.5m)	214' - <262' (65m - <80m)			



FBO LANDING FEE DATA FOR LARGE AIRCRAFT



Source: FBO Landing Fee Data 2021.

Forecast: Aircraft Operation Indicators

Level of	Specific Indicator		Average	Growth Rate	
Indicator			Annual Rates	Applied To	
Local	FAA OLM GA Local Operations Stats (1990-2020)	FAA 5010/TAF	3.13%	Local	
Local	FAA OLM GA Itinerant Operations Stats (1990-2020)	FAA 5010/TAF	0.24%	ltinerant	
Local	2013 Master Plan GA Operations Forecast	OLM MP 2013	1.30%	Both	
Local	FAA OLM Local GA Operations Forecasts (2020-2045)	FAA TAF	0.01%	Local	
Local	FAA OLM Itinerant GA Operations Forecasts (2020-2045)	FAA TAF	0.33%	Itinerant	
Local	Population growth estimate 2020-2045	2017 GMA Projections	1.02%	Both	
Regional	FAA NWMR Local Forecasts (2020-2040)	FAA TAF	0.77%	Local	
Regional	FAA NWMR Itinerant Forecasts (2020-2040 all operations)	FAA TAF	1.16%	Itinerant	
Regional	FAA Washington State Local Forecasts (2020-2040)	FAA TAF	0.83%	Local	
Regional	FAA Washington State Itinerant Forecasts (2020-2040)	FAA TAF	1.30%	Itinerant	
Regional	WASASP Forecasts (all classes)	WASASP	0.70%	Both	
Regional	WASASP Forecasts (Regional class)	WASASP	1.10%	Both	
National	FAA National Forecasts (near term local GA operations)	FAA TAF	0.36%	Local	
National	FAA National Forecasts (near term itinerant operations)	FAA TAF	0.63%	ltinerant	
National	FAA National Forecasts (long term local GA operations)	FAA TAF	0.40%	Local	
NationalFAAFAADNational&Orecasts (long 2001), itine rant 0009, toma)GMA 2017, BAAMAGSter Plan 2013, ch94%ASAStineerant					

OLM Operations Forecast

	Base Vear	Short-Term	Intermediate-	Long-Term		
Type of Operation	Dase rear	Forecast	Term Forecast	Forecast		
	2020	2025	2030	2040		
Itinerant Operations						
(+0.87% annually)						
Air Taxi / Commuter	980	1,024	1,069	1,166		
GA	29,541	30,853	32,223	35,148		
Military	749	782	817	891		
Itinerant Operations Total	31,270	32,659	34,109	37,205		
Local Operations (+0.92%						
annually)						
GA	38,381	40,261	42,234	46,473		
Military	815	855	897	987		
Local Operations Total	39,196	41,116	43,131	47,460		
Total Aincraft Qperations Forecast 021, FAA Air 70,466 aster Record 503,077521, FAA TAF 2019,239 GMA 2017,84,665						
Master Plan 2013, and WASASP 2017.	Master Plan 2013, and WASASP 2017.					

OLM Operations Forecast

Type of Operation	Base Year	Short-Term Forecast	Intermediate- Term Forecast	Long- Term Forecast	
	2020	2025	2030	2040	
Total Based Aircraft	124	126	129	139	
Total Operations	70,466	73,775	77,239	84,665	
Critical Aircraft					
Current (2020) Critical Aircraft	Cessna Cit	Cessna Citation 560			
Ultimate (2040) Critical Aircraft Bombardier Ch		nallenger 700	C-II		

Source: The Aviation Planning Group 2021, FAA Airport Master Record 5010 2021, FAA TAF 2019, OFM GMA 2017, OLM Master Plan 2013, and WASASP 2017.

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VI	66' - <80' (20m - <24.5m)	214' - <262' (65m - <80m)			



Facility Requirements



Item	Runway 17	Runway 35	Runway 8	Runway 26			
Design Group: Aircraft	Category C	Category C					
Approach Category	Approach speed 121 knots but less than 2	Approach speed 91 knots but less than 121 knots.					
Airplane Design Group	Group II	Group II					
	Tail Height 20'- <30 , wingspan 49'-	<79'	Tail Height 20'- <30 , wingspan 49'-<79'				
Orientation	S	Ν	E	W			
Length	5,500'		4,15	7'			
Width	150'		150	'			
Surface Type	Asphalt/Grooved	Asphalt/Grooved Asphalt					
	Single Wheel 75,000 Lbs.	Single Wheel: 30,000 Lbs.					
Weight Capacity	Double Wheel 94,000 Lbs.						
	Double Tandem Wheel 142,000 Lbs.						
Lighting	High Intensity Runway Lighting (HIRL) None						
Pavement Markings	Precision	Non-Precision	Basic Visual	Basic Visual			
Traffic Pattern	Left	Right	Right	Left			
Approach Lighting	MALSR (Medium Intensity Approach Lighting System With Runway Alignment Indicator Lights)	No	No	No			
Runway End Identifier Lights (REIL)	Yes	Yes	No	No			
Precision Approach Path Indicators (PAPI)	Yes	Yes	No	No			

Wind Analysis

Runway	10.5 Knots	13 Knots	16 Knots	
17/35	98.62%	99.37%	99.93%	
08/26	94.71%	96.94%	99.25%	
Combined	99.84%	99.99%	99.99%	

- Compasses point to "magnetic north"
- The difference from "true north" is called "variation" or "declination"
- Approximately a 1 degree shift every ten years.

It is recommended that the runways be re-numbered to their corrected magnetic headings due to the changes that have occurred over time from natural magnetic shift.

16-Knot

OLM ALL WEATHER WIND ROSE



Airfield Facility Requirements

Runway Requirements

Aircraft Category	Length	(feet)
Existing Conditions		
17/35	5,5	01
08/26	4,157	
Small Aircraft (12,500 lbs or less MTOW)		
Approach Speeds < 30 knots	30)6
Approach Speeds > 30 knots but < 50 knots	816	
Approach Speeds > 50 knots and < 10 Passengers		
95% of the fleet	2,980	
100% of the fleet	3,540	
Approach Speeds > 50 knots and > 10 Passengers	4,0	80
Large Aircraft (more than 12,500 MTOW)	Dry	Wet
< 60,000 lbs 75% of the fleet at 60% useful load	4,690	5,270
< 60,000 lbs 100% of the fleet at 60% useful load	5,970	6,740
< 60,000 lbs 75% of the fleet at 90% useful load	5,090	5,500
< 60,000 lbs 100% of the fleet at 90% useful load	7,370	7,370
> 60,000 lbs or Regional Jets	5,090	5,090

Both runways have adequate length to accommodate the aircraft that regularly utilize the Airport.

Runway Width Existing vs.	Runway 17/35	Runway 8/26
Required	Width (feet)	Width (feet)
Existing	150'	100'
Required	100'	75′

Runway 17/35 exceeds the operational width requirements associated with ARC C-II and Runway 8/26 exceeds the operational width requirements of ARC B-II. Continue to maintain Runway 8/26 only to 75' width.

Airfield Facility Requirements

Taxiway/Taxilane and Apron Requirements

Taxiway	Intersection Angle				
Runway 17/35 Non-Standard Exit					
Та	Taxiways				
Taxiway C	36°				
Taxiway D	39°				
Taxiway G	79°				
West Taxiway L	76°				
East Taxiway L	82°				
Runway 08/26 Non-Standard Exit					
Taxiways					
Taxiway W	77°				
South Taxiway F	88°				
North Taxiway F	56°				
North Taxiway C	52°				
Taxiway E	38°				
Taxiway G	77°				

Taxiway geometry throughout the airport needs to be revised to meet FAA standards of right-angle intersections.

Taxiway W is recommended to be revised to serve as a full-length parallel taxiway along with the analysis of a new full-length parallel taxiway to serve Runway 08/26.

It is also recommended to add optimally located exit taxiways to both runways to increase airfield efficiency.

Airfield Lighting System Wiring

- In-conduit wiring supplied from the electrical vault for the airfield.
- Edge Lighting/ Reflectors/ Signage
 - Recommend lighting Taxiway E for GA traffic to RWY 17.



- Runway:
 - 17/35 150' wide lighted
 - 8/26: 150' wide –
- Taxiway:
 - A: 50' wide lighted
 - B: 50' wide lighted
 - C: 35' wide reflectors
 - D: 40' wide reflectors
 - E: 50'(NW) wide reflectors
 - E: 35'(SW) wide reflectors
 - F: 35' wide reflectors
 - G: 50' wide reflectors
 - L: 50' wide lighted
 - W: 50' wide lighted

Wind Cones

- A primary wind cone is located within the segmented circle west of the north end of Taxiway E.
- Secondary lighted wind cones are located at the south end of Runway 17/35 near Taxiway W and the runup area and on the west end of runway 8/26 near the south end of Taxiway E.



Navigational Aids

- An ASOS (Automated Surface Observing System) is located west of runway 17/35 and north of runway 8/26 to provide audible real time weather conditions and wind speed/direction on radio frequency 135.725 or by calling (360) 754-0781.
- The airfield is equipped with a VORTAC (Very High Frequency Omnidirectional Range/Tactical Air Navigation) which has the ability to measure the distance an aircraft is from the VOR and reporting it to the pilot in nautical miles when capable of receiving that information.



Navigational Aids

- OLM has a rotating beacon that shines a green light and a white light 180 degrees apart from one another is located on the water tower northwest of the airport. The beacon assists pilots in finding the airport and is operational at night and during Instrument Flight Rules (IFR) conditions.
- A compass rose is located on Taxiway C and is available to operationally check and align the aircraft compass when needed.



Roadways and Parking Lots

- Road Access to Airport
 - I-5 to Capitol Blvd SE
- Public Parking
 - 13 public use spaces near the Airport Administration Building
 - Each Business has private parking available





Support Facilities

Aircraft Maintenance

- Avionics shop: Olympia Avionics
- Airframe/Powerplant: Needed
- Aircraft Fuel Storage
 - Existing Fuel Storage Capacity: 8 Tanks/96,000 Gallons
 - Current Usage: 6 Tanks/68,000 Gallons (3 Jet A tanks = 34, 000 Gallons & 3 100LL Tanks = 34,000 Gallons)
 - Capacity has been leased and 2 tanks/28,000 gallons to be placed

soon



Support Facilities

- Deicing None Designated
- Airport Wash Pads None Designated
- Airport Maintenance and Equipment Storage
 - Storage utilizes planeports that are unusable for aircraft due to taxilane safety areas and distances to other hangars.



Utilities

- Power is provided by Puget Sound Energy
- Major trunk lines run on the east and west side of the Airport.

General Aviation

• FBO

- Two FBO's Glacier Aviation & Safety In Motion (Fuel/Over Night Hangars/ Flight Instruction)
- Tie-down spaces
 - 5 small aircraft and 6 large aircraft tiedowns available on the north end of Taxiway E.
 - 26 small aircraft tiedowns and 2 large aircraft tiedown parking spaces along the hangar rows on the south end of Taxiway E.



General Aviation

Hangars

- 2 Planeport Structures (12 spaces @ 15k sq ft)
- 10 T-Hangars (90 spaces @ 169K sq ft)
- 16 Traditional Hangar structures in total (175 sq ft)
- Future Allocations for Growth
 - After addressing current environmental concerns, it is strongly recommended that the Airport expand aircraft parking, prioritizing hangar space.



Biofuels

- The International Energy Agency forecasts biofuels reaching 20% of aviation fuel demand by 2040.
- Made from waste oils and animal fats.
- It is more expensive than jet fuel (2-3 times more) but that gap is expected to close as biofuel technology continues to develop and more biofuel refineries are established.
- Manufacturers are developing aircraft that are able to use biofuel blended with conventional fuel.
- Blending biofuel and jet fuel requires quality control. The National Renewable Energy Laboratory's U.S. Airport Infrastructure and Sustainable Aviation Fuel report recommends storing jet fuel and biofuel in separate tanks and then combining the two in a third tank at the airport.



United Airlines buys approximately 10M gallons per year at LAX.

Electric Aviation

- Washington State Department of Transportation's *Washington Electric Aircraft Feasibility Study* (November 2020)
 - Recommended OLM as an initial beta test site for electric aircraft
 - Runway length
 - Need for aviation service
 - Connectivity to airports within 500 nm
 - Presence of FBOs
 - Availability of jet fuel for hybrid electric aircraft
- In order to integrate electric aircraft into the existing transportation network, the Airport will need to incorporate electric aircraft into long-term transportation specific strategic planning.
 - Electrical infrastructure needs
 - Level of expected demand
- Electric aircraft operations will increase demand on the Airport's electrical grid and will require an upgraded power distribution system.
 - On-site generation (wind turbines, solar panels, etc.)
 - Team with local energy providers
 - Power usage management (cap on charging)

Electric Aviation

There are two methods being considered for providing energy to electric aircraft:

• Battery swapping

- Replaces a spent battery out of an aircraft with fully charged battery.
- Less peak demand on the electrical grid as opposed to direct aircraft charging.
- Potential to reduce turn-around times for aircraft as well.
- Testing: magniX's eCaravan currently flying out of Moses Lake, WA
- On-site, direct aircraft charging
 - Similar to current electric vehicle charging
 - An industry standard has not yet been established and any charging station infrastructure would require adaptors to accommodate the variety of standards.







SUMMARY TABLE: Runways

Airfield & Airspace Requirements	Existing Condition	Required or Recommend	Action Needed	Remarks	
ARC to Meet Fleet Mix Demand	D-III	C-II	Yes	Projects should be constructed in the future for the proposed usage design at or above a C-II design standard	
Runway 17/35 (C-II)					
Orientation/ Wind	RWY = 99.93%	05%	NLa		
Coverage	Combined= 99.99%	95%	NO		
Length	5,501'	5,501'	No	< 60,000 lbs 75% of the fleet at 90% useful load	
Width	150'	100'	Yes	Existing Pavement exceeds the required width based on the existing critical aircraft	
Magnetic Heading	17/35	18/36	Yes	Runway numbers must be corrected due to magnetic shift over time	
Runway Pavement Condition	Avg. PCI = 88	Avg. PCI = >70	Yes	The southern section is reported as a 69, and requires near-term maintenance	
Pavement Design Strengths	75,000 lbs.	>12,500 lbs.	No	Single wheel weights shown as existing	
Runway 8/26 (B-II)					
Orientation/ Wind	RWY = 96.94%	05%	NLa		
Coverage	Combined= 99.99%	95%	NO		
Length	4,157' (2/20)	4,157'	No		
Width	150'	75'	Yes	Existing Pavement exceeds the required width based on the existing critical aircraft	
Magnetic Heading	8/26	9/27	Yes	Runway numbers must be corrected due to magnetic shift over time	
Runway Pavement	$\Delta v \sigma P C I = 58$	$\Delta v\sigma PCI = >70$	Yes	Currently, not AIP eligible. Runway 8/26 should be rehabilitated to rejuvenate the existing	
Condition	Avg. 1 Ci - 30	Avg. 1 CI - 270	103	105	pavement
Pavement Design Strengths	30,000 lbs.	>12,500 lbs.	No	Single wheel weights shown as existing	

SUMMARY TABLE: Taxiways

Airfield & Airspace Requirements	Existing Condition	Required or Recommend	Action Needed	Remarks
Taxiway				
Full or partial parallel	Yes	Yes	Yes	Parallel Taxiway does not Parallel the Runway
Width	35'-50'	35′	Yes	Justification is needed for the extended width beyond the needs of the critical aircraft
Runway Connector Angles	36-88 Degrees	90 Degrees	Yes	FAA standards require turns connections to a runway to be at 90 degree angles
Taxiway Pavement Condition (2018 Forecast for 2021 PCI Values)				Regular maintenance should occur to maintain the useful life of the pavement
TWY A	PCI = 80	Avg. PCI = >70	No	Future maintenance will be required
TWY B	PCI = 78	Avg. PCI = >70	No	Future maintenance will be required
TWY C	PCI = 91	Avg. PCI = >70	No	Future maintenance will be required
TWY D	PCI = 41	Avg. PCI = >70	Yes	Near-term maintenance is required
TWY E	PCI = 89	Avg. PCI = >70	No	Future maintenance will be required
TWY F	PCI = 73	Avg. PCI = >70	Yes	Future maintenance will be required
TWY G	PCI = 62	Avg. PCI = >70	Yes	Near-term maintenance is required
Lighting	Lighting/Reflectors	Lighting/Reflectors	Yes	Lighting for the east side of the Airport would increase safety on the general aviation taxiways for access to Runway 17/35

SUMMARY TABLE: Support Facilities

Facilities & Support Requirements	Existing Condition	Required or Recommend	Action Needed	Remarks
General Aviation Related Dev	velopment			
Apron / Transient Parking	39 tiedowns	No specific minimums	No	
Apron Pavement Condition	Avg. PCI = 75	Avg. PCI = >70	Yes	Some near-term and future maintenance will be required
Terminal / Pilot Lounge	FBO's	Updated facility	Yes	Potential for a standalone facility with a restaurant/offices and other amenities
Support Facilities				
Equipment and Storage	Covered storage - Planeport	Equipment protection	Yes	A standard maintenance building would be recommended for maintenance and storage of equipment
Fuel Storage	68,000-gal available	No specific minimum	No	Biofuels and Electric charging should be considered for the future
Public Access and Parking	13 public + private parking	No specific minimum	No	Future growth will require parking additions respectively
Fencing	Fenced	100% protection	No	
Utilities	Existing	No specific minimums	No	Electric capacities may be increased with the introduction of future electric aircraft

Alternatives Discussion







Alternatives Discussion



Discussion Items

- <u>Top desires by based users</u>
 - Self-serve fuel: most for 100LL
 - Additional hangars to rent/own
 - Pavement Condition
 - Airfield Lighting
 - Improved instrument approaches

- Restaurant
- Enhance or Additional Security
- Commercial/Cargo Service
- More ramp/apron space for helicopters



Airport Master Plan Update

Next Steps





Airport Master Plan Update

THANK YOU!

Any Comments or Questions?

Contact:Leah WhitfieldJustin HeidLeah@theaviationplanninggroup.com

OLM MPU Email address: <u>AMPUpdate@PortOlympia.com</u>