TRI-CITIES
AIRPORT • PSC

MASTER PLAN 2020

Mead&Hunt

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Mead & Hunt

PORTLAND
9600 NE Cascades Parkway
Suite 100
Portland, OR 97220
Ph. 503-548-1494

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INTRODUCTION

INTRODUCTION

CHAPTER OVERVIEW

The Tri-Cities Airport (PSC) and the Port of Pasco (Port) initiated an update to the Airport Master Plan (Plan) to evaluate the long-range needs of PSC. The evaluation includes the airfield, airspace, terminal area, landside facilities and compatibility with surrounding land uses. The Plan will document the orderly development of future airport facilities essential to meeting the existing and expected needs, essentially becoming a roadmap for bringing projects and funding together in a coordinated manner.

The Plan is conducted in accordance with Federal Aviation Administration (FAA) guidance, standards, and policies, as prescribed by grant assurances and regulatory standards. Conformance with FAA standards enables the Port to receive federal and state funds to support to the maintenance, expansion, and upgrade of airport facilities as demand warrants and funding is available. However, the Plan is also a reflection of local goals and interests, thus it is a comprehensive and complimentary presentation of the Port’s strategy for meeting the 20-year development needs of both PSC and the community.

INTRODUCTION

An Airport Master Plan is a comprehensive study with a primary focus on the physical facilities. The overarching purpose evaluates the short-, medium-, and long-term improvement needs as identified by up-to-date user information, trends, facility conditions, and design standards. It documents and describes the orderly development of airport facilities, services, and equipment needs, providing the basis for justifying improvement projects identified by airport users, the Port, and community stakeholders. While the Plan is responsive to local issues, above all, it follows FAA and Washington Department of Transportation (WSDOT) policies in providing for an airport that is:

- Safe and efficient, in accordance with FAA design standards
- Economically viable and supported in a financially sustainable manner
- Aligned with broad local, regional, state, and national planning goals.

Background

This Plan is a comprehensive evaluation of airport facility needs with respect to updated user demands, site development considerations, anticipated costs, and funding priorities. As best practices for planning suggest, Airport Master Plans are typically updated about every 10 years. However, FAA design standards have been updated, aviation activity trends have changed, and PSC has completed most of the capital improvement projects since the previous Master Plan was completed in 2012. Therefore, the Port is prepared to investigate and update the next stages of required airport development.

Plan Focus

The Plan is principally used to quantify future airport facility needs and resolve key planning issues. The following items, as coordinated between PSC and the FAA, are the major issues addressed in the Plan:

- Update aviation activity forecasts
- Evaluate runway extension justification and documentation for required runway length
- Address land use compatibility within the extended Runway Protection Zone (RPZ) and aircraft approach and departure paths
- Resolve the FAA-designated hotspot to runway and taxiway geometry
- Determine the vehicle parking needs during peak periods
- Evaluate the financial feasibility of a vehicle parking structure and determine its best location
- Identify opportunities for increased airport revenue generation
- Evaluate vehicle access improvements to and from PSC
- Determine the highest and best uses for development of airport property
- Determine if aviation facilities are adequate to meet the needs of the growing community
- Update PSC's noise contours
- Update the Airport Layout Plan (ALP)
- Prepare 20-year project development plan
- Update 5-year FAA Capital Improvement Program (CIP).

Plan Documentation

The Plan is composed of the following core components.

Written Report

The written portion of the Plan describes the decision-making process that led to the recommendations depicted on the ALP and carried forward as part of the 20-year capital development plan. The written report, which is organized to follow FAA master planning guidance contained in FAA Advisory Circular 150/5060-6B, is arranged by the following chapters.

- Chapter I — Introduction
- Chapter 1 — Airport Inventory and Environmental Overview
- Chapter 2 — Demand Forecast
- Chapter 3 — Facility Requirements
- Chapter 4 — Improvement Alternatives
- Chapter 5 — Land Use Compatibility
- Chapter 6 — Financial Feasibility and Implementation

The written report will include technical appendices that provide more detail on Plan focus areas, including runway length analysis, recycling plan, coordination and outreach summary, a capital improvement plan, and others as needed.

Airport Layout Plan

The technical portion of the Plan is the production of the ALP drawings that graphically depict existing airport facilities, recommended improvements determined by the Plan process, FAA design standards, changes to airport property, designated land uses, and data tables among others. The ALP is the public document serving as PSC's official 'record of planning' and is developed in accordance with the FAA checklist standards and procedural requirements.

Plan Coordination and Participation

The participation process is designed to coordinate planning objectives with the needs and concerns of the local community by providing an opportunity for information sharing and collaboration among interested participants, key stakeholders, and regulatory agencies. The participation process involves technical project meetings, public open houses, and Port Commission presentations to inform and solicit feedback at key decision points from PSC and Port staff, airport users, tenants, and the public.

Agency Coordination

FAA is the lead agency for the Plan, and primarily involved with documentation review and formal approval of the aviation activity forecasts and the ALP drawings. The Seattle Airports District Office and Northwest Mountain Region oversee FAA policy that relates to PSC.

Local Stakeholders

The Plan involves coordination and input from multiple local governmental interests, organizations, and constituencies. The following are key stakeholders that are engaged as part of the Plan:

- Port of Pasco
- City of Pasco
- City of Richland
- City of Kennewick
- Franklin County
- Port of Benton
- Passenger and Cargo Air Carriers
- Tri Cities Development Council
- Benton-Franklin Council of Governments
- Fixed Base Operators (FBOs)
- Airport Traffic Control Tower
- Aircraft Rescue and Fire Fighting
- Transportation Security Administration.

Planning Advisory Committee

Knowing that plans involving diverse participation are more successful and widely accepted than those without, PSC staff assembled a Planning Advisory Committee (PAC) specifically for this Plan. The PAC serves in a an 'advisory' capacity and consists of aviation and non-aviation constituents selected to provide well-rounded perspectives. The PAC provides continuous participation, is formally engaged at key decision-points, and is focused on guiding Plan recommendations to reflect airport user needs, align with community interests, and be consistent with the Port's plan and vision.

The PAC is charged with reviewing interim materials, attending project meetings, providing comments on project findings, and encouraging awareness and adoption of the Plan recommendations. PAC feedback is incorporated, as appropriate, into the final Plan documentation.

Public Outreach and Participation

Public outreach is an important element of the Plan process, as it is used to inform, educate, and solicit feedback from the public. It serves as the opportunity for the public to learn about the Plan progress, interact with stakeholders, and communicate concerns. It also provides PSC and the Port an opportunity to gauge and understand community sentiment towards the Plan. Public meetings, conducted in an 'open house' format using static displays organized as stations in a room, are strategically held at key project milestones. Public insights and suggestions are integrated, as appropriate, into the final Plan documentation.

Strategic Evaluation

As a strategic planning process, the Plan is structured to be responsive to the Port's overall mission while being inclusive of broader community needs. PSC has been identified as one of the Port's most important economic assets, with scheduled commercial air service of paramount importance. PSC's Industrial Park and Business Center are also valuable properties providing highly marketable locations and facilities. The Port, as a public agency, has the mission to maximize the value of its assets, make short-term decisions that are consistent with and reinforce their long-term plans, advance economic stability within the district, and weigh financial risk against return on investment job creation and retention and distribution of resources.

As part of the strategic planning process, a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis will be conducted with the PAC to determine the appropriate strategic visions for PSC, and specific goals and objectives to be addressed throughout the Plan. SWOT is a process for synchronizing strategic decision-making factors, and helps categorize PSC's internal and external characteristics, qualities, and merits. When compiled, the SWOT factors help formulate Plan goals, provide the basis to pragmatically assess recommendations, and guide the Plan's overall development policy.

Strengths:

1. Neutral relationship with the community
2. Reliably good flying weather
3. Airport accessibility
4. Convenient General Aviation Facilities
5. Hotel development
6. Age of infrastructure
7. Terminal Art

Weakness:

1. Lack of 24-hour public transportation serving the passenger terminal
2. Relationship with Community aviation aircraft and pilots, capital costs, lease costs, suitable building
3. ASOS weather observation system
4. Restaurant in secure area of passenger terminal
5. Pickup/Drop-off zone
6. Industrial park aging infrastructure
7. FAA development process

SWOT TABLE

		Helpful	Harmful
		To Achieving the Objective	To Achieving the Objective
Internal Origin	Attributes Within Airport Influence	Strengths	Weaknesses
External Origin	Attributes Outside of Airport Influence	Opportunities	Threats

Strengths:	characteristics that provide an advantage over others.
Weaknesses:	characteristics that create a disadvantage compared to others.
Opportunities	outside potential that the Airport could capitalize on.
Threats:	outside risks that could be detrimental to the Airport.

Opportunities:

1. Niche market
2. Clean technology
3. Use the Airport as a recruiting for labor force and economic development
4. Aviation research and development
5. Drones/UAVs for agricultural use
6. Parking lot coverings for shelter to the passenger terminal
7. Multimodal freight
8. Digitize the airport with apps for ordering food/flight information
9. Promoting culture
10. Marketing/Advertising
11. Community engagement

Threats:

1. Drones/UAVs conflicting airspace uses
2. Spokane proximity – leaking passenger ticket sales
3. Encroachment and constraint of future airport development

   Rental car desk distance to parking

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TRI-CITIES
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CHAPTER 1
INVENTORY

CHAPTER 1 - AIRPORT INVENTORY

CHAPTER OVERVIEW

The Inventory Chapter provides an overview of Tri-Cities Airport's infrastructure, assets, services, and activity levels. The Inventory Chapter is the basis for analysis and recommendations made throughout the Tri-Cities Airport Master Plan. Tri-Cities Airport will be referred to by its Federal Aviation Administration (FAA) identifier PSC throughout this document.

Information for the Inventory comes from PSC's records, published information by federal and state agencies, and firsthand accounts from airport management, tenants, and users. The Inventory Chapter is arranged in the following sections:

- Airport Overview
- Airside Facilities
- Terminal Areas
- Landside Facilities
- Financial Conditions
- Weather Profile
- Airport Environmental Review

AIRPORT OVERVIEW

This section provides an understanding of PSC's location, function, and history.

Airport Location

PSC is two miles northwest of downtown Pasco, Washington. Along with Kennewick to the south and Richland to the west, Pasco is part of the metropolitan area known as the Tri-Cities. Pasco is on the northern bank of the Columbia and Snake Rivers in southern Franklin County; Kennewick and Richland are on the southern bank of the Columbia River in eastern Benton County. Franklin and Benton Counties are in southeastern part of State of Washington, near the Oregon border. A location map is shown in **Figure 1-1**.

The Tri-Cities are at the junction of three major highways: Interstate 82, U.S. Highway 395, and U.S. Highway 12. PSC connects to Interstate 182 via 20th Avenue; Interstate 182 connects to Interstate 82, U.S. Highway 395, and U.S. Highway 12.

Airport History

The original Pasco Airport was located southeast of the existing airfield and was the site of the first airmail flight in the Northwest in 1926. PSC has existed in its current location since 1929. During World War II, the U.S. Navy used the airfield as an air training station. The Navy made significant changes, building four runways, a taxiway system, and over 100 buildings. Passenger air service began in the late 1940s. Airport ownership transferred from the Navy to the city of Pasco in 1953. The Port of Pasco obtained ownership of the airport in 1963 and is the current owner. The Port built a new passenger terminal in 1966, closed the fourth runway in 1975, implemented a facility expansion program in 1986, and remodeled the passenger terminal in 2003. This remodel added 3,000 square feet to the ticket lobby and boarding area.

In 2014, PSC began a $42.1 million-dollar project to expand the terminal building. This project expanded the boarding concourse and restaurant, increased space for security screenings, and modernized the ticketing and baggage areas. The size of the was terminal doubled to 110,000 square feet, and the whole project was completed in January 2017.

Airport Role and Classification

The FAA's National Plan of Integrated Airport Systems (NPIAS) is a registry of over 3,400 airports in the country that are significant to national air transportation and eligible to receive federal Airport Improvement Program (AIP) grants. The 2018 NPIAS identifies PSC as a Non-Hub Commercial Service Primary Airport. The Non-Hub Commercial Service designation indicates that PSC accounts for less than 0.05 percent of nationwide commercial service enplanements. The Primary Airport designation indicates that PSC has over 10,000 annual enplaned passengers. **Table 1-1** is a summary of PSC's existing attributes.

Figure 1-1: Tri-Cities Airport Location

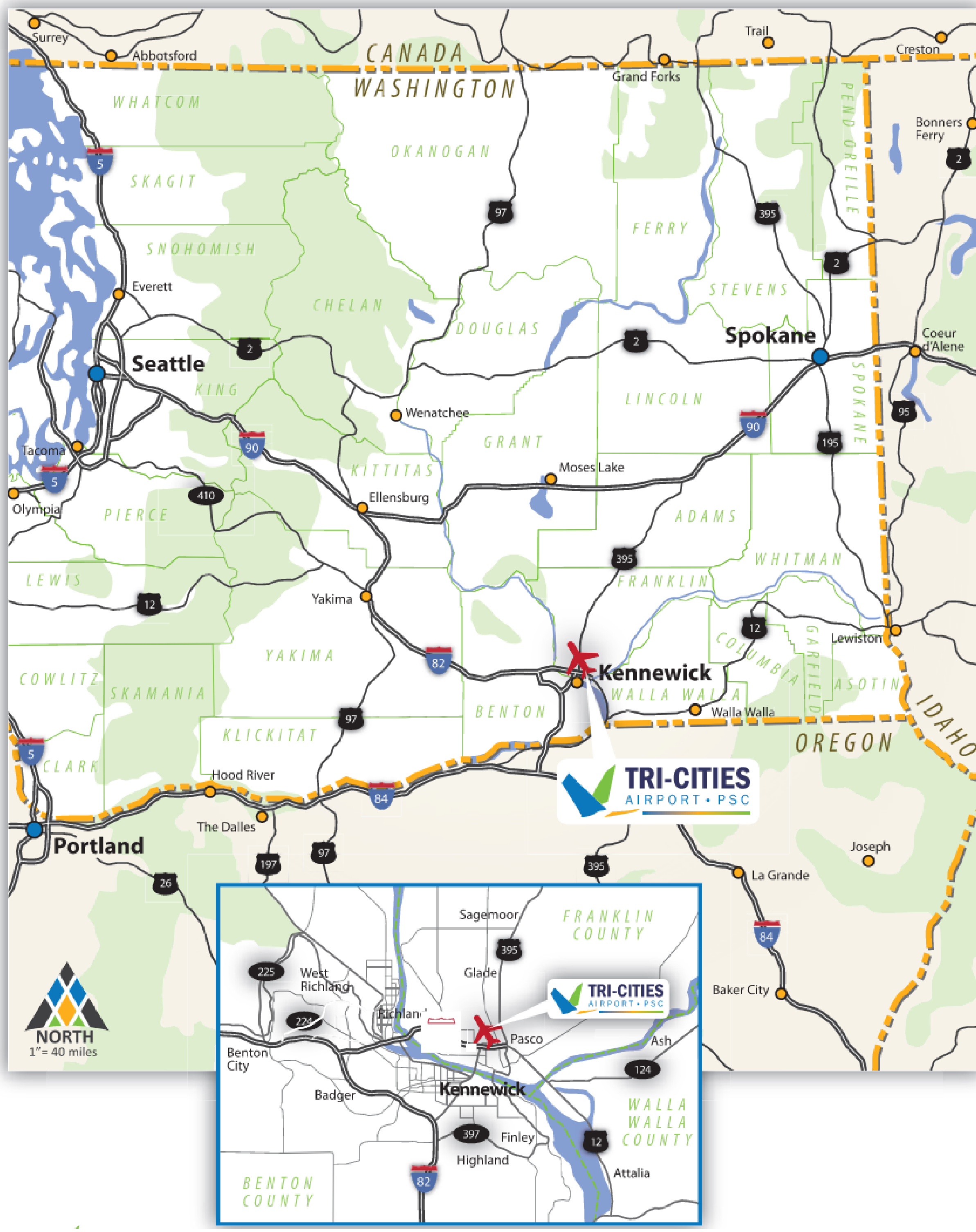


Table 1-1: Tri-Cities Airport Existing Attributes

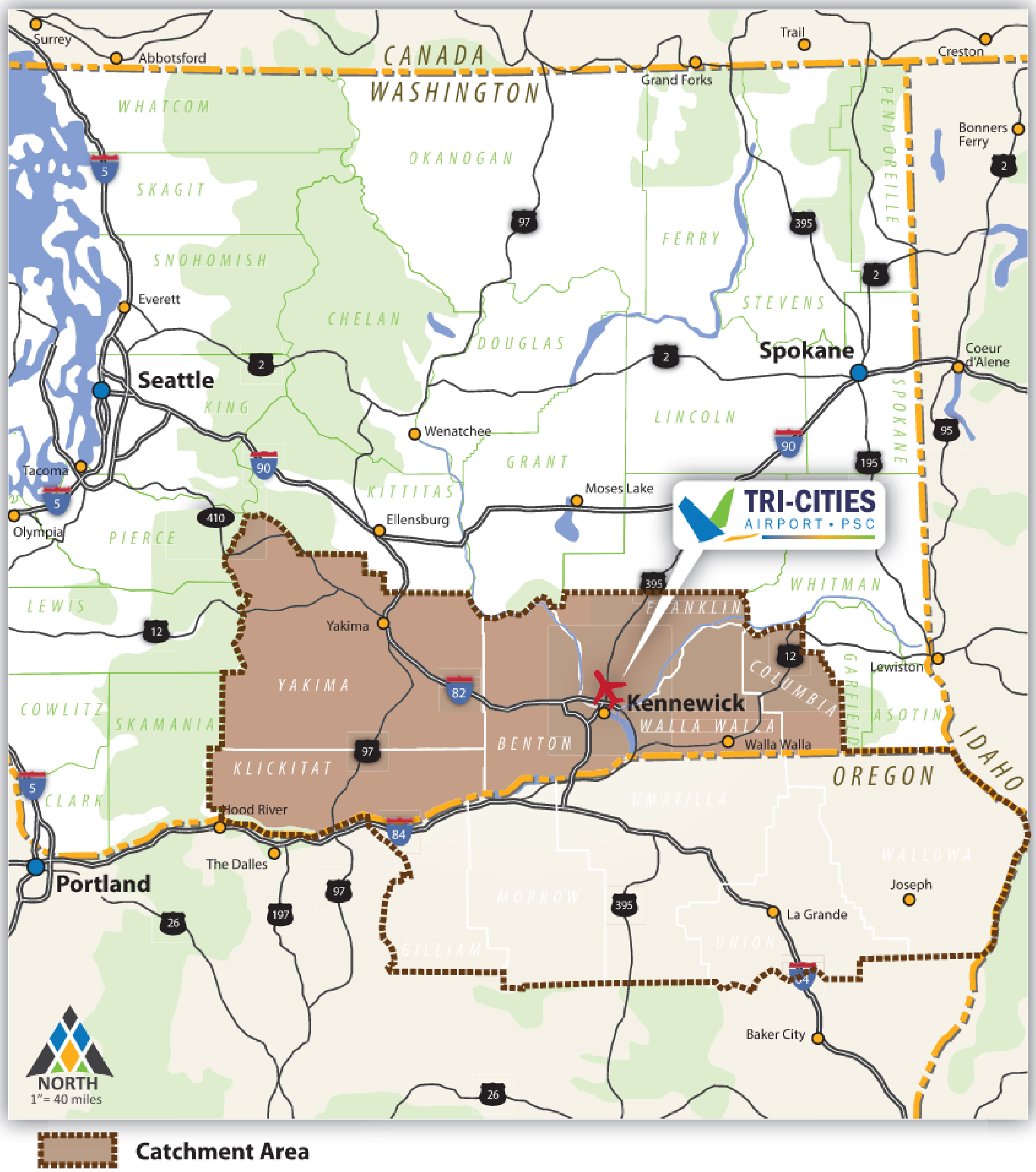
Airport Attributes	Description
Airport Owner	Port of Pasco
FAA NPIAS Airport Classification	Non-Hub Commercial Service Primary Airport
Site #	26345.A
FAA Part 139 Certification	Class I
FAA Part 139 ARFF Index	Category B
WSDOT Airport Category	Commercial Service
Airport Traffic Control Tower	Yes
Airport Property	2,235 Acres (Total Fee)
Automated Weather Station	Automated Surface Observation Service (ASOS)
Communications	Approach/Departure Control (Chinook Appr/Dep),TWR, Unicom, CTAF
Note: See Appendix for list of acronyms. Sources: FAA Publications and Airport Records Obtained August 2017.	

PSC is certified by the FAA as a commercial airport under Title 14 of the Code of Federal Regulations (CFR) Part 139. Because of Part 139 Certification, PSC can accept operations of scheduled and unscheduled large air carrier aircraft. As a Class I airport under Part 139 PSC can serve scheduled operations of air carrier aircraft designed for at least 31 passenger seats (large air carrier aircraft) and any others. This certification also means PSC has to meet standards for Aircraft Rescue and Fire Fighting (ARFF) equipment, staff training and certifications, airfield lighting equipment, fueling facilities, runways, taxiways, and administrative records.

The commercial air services provided by air carriers operating at PSC draws passengers from Benton, Columbia, Franklin, Klickitat, Walla Walla, and Yakima counties in Washington, and Gilliam, Morrow, Umatilla, Union, and Wallowa counties in Oregon. The Airport's 2017 traffic retention and leakage report identifies these counties as PSC's catchment area, which is the area an airport can reasonably expect to attract passengers. **Figure 1-2** shows the extent of service to the region. In Washington State, the Airport serves the businesses and residents of Pasco, Kennewick and Richland as well as neighboring counties and northeastern Oregon. The community around the Airport drives the demand for commercial air service, general aviation, and air cargo.

PSC has scheduled air cargo service provided by two air carriers. Empire Airlines operating on behalf of Federal Express (FedEx) flies daily to Spokane. Ameriflight flies to Portland. Alaska Airlines transports cargo in the belly compartments of its commercial aircraft. General aviation (GA) users, ranging from training aircraft to corporate jets, operate from PSC and the Airport has facilities to service and store GA aircraft.

Figure 1-2: Tri-Cities Airport Catchment Area



Airports in the Tri-City Region

This section describes the aeronautical setting surrounding the Airport, including details about neighboring airports and their facilities. PSC and other airports in the region present users with a healthy aviation market that offers choice, competition, and specialty services. By knowing the local aviation market, the Airport can focus development to build a sustainable future that meets the needs of airport tenants and visitors. Airport based aircraft and average daily operations are taken from the Airport's FAA form 5010 Master Record.

Commercial Service Airports

Walla Walla Regional Airport (ALW)

ALW is 36 miles east of PSC. Alaska Airlines operating at ALW offers domestic commercial service flights. There are 101 based aircraft at ALW, and averages 74 aircraft operations per day.

Eastern Oregon Regional Airport (PDT)

PDT is 36 miles south of PSC. Boutique Air offers three round-trip flights a day, seven days a week, to Portland International Airport (PDX). There are 40 based aircraft at PDT and averages 37 operations per day.

Yakima Air Terminal/McAllister Field (YKM)

YKM is 71 miles west/northwest of PSC. Alaska Airlines provides four daily flights to and from Seattle-Tacoma International Airport (SEA). Allegiant Airlines provides charter operations to Laughlin, Nevada, and Swift Airlines provides charter operations to Wendover, Nevada. AirPac serves connections from Yakima to Boeing Field in Seattle. FedEx serves connections to Moses Lake and Spokane. United Parcel Services (UPS) served by Ameriflight provides air cargo connection to Portland and Boeing Field in Seattle. Other aircraft services include emergency medical flights, aircraft manufacturing and testing, corporate aviation, and GA. YKM has 125 based aircraft and averages 100 aircraft operations per day.

Regional General Aviation Airports

Richland Airport (RLD)

RLD is 9 miles west of PSC. There are 182 based aircraft and an average of 70 aircraft operations per day.

Hermiston Municipal Airport (HRI)

HRI is 27 miles south of PSC. There are 44 based aircraft and an average of 68 aircraft operations per day.

Prosser Airport (S40)

S40 is located about 32 miles west of PSC. There are a total of 52 based aircraft and an average of 36 operations per day.

Table 1-2 summarizes the runway lengths, instrument approach capabilities and the primary market served.

Table 1-2: Regional GA Airports

Airport	Characteristics			Primary Markets			
	Primary Runway Length	IAP	Jet A	Large Jets	Small Jets	Turbo-Props	Piston
Tri-Cities Airport (PSC)	7,711’ (3L/21R)	Precision	Yes	Yes	Yes	Yes	Yes
Walla Walla Regional (ALW)	6,527’ (2/20)	Precision	Yes	Yes	Yes	Yes	Yes
Eastern Oregon Regional (PDT)	6,301’ (7/25)	Non-Precision	Yes	No	Yes	Yes	Yes
Hermiston (HRI)	4,500’ (5/23)	No	Yes	No	No	Yes	Yes
Prosser (S40)	3,451’ (8/26)	No	No	No	No	Yes	Yes
Richland (RLD)	4,009’ (1/19)	Non-Precision	Yes	No	No	Yes	Yes
Yakima (YKM)	7,604’ (9/27)	Non-Precision	Yes	Yes	Yes	Yes	Yes
Source: FAA Airport Facilities Directory. Market determination based on instrumentation, runway length, and fuel availability.							

Airport Ownership and Management

The Port of Pasco owns and operates PSC. The Port is a self-governing municipal corporation managed by three elected Port Commissioners. The Airport Director reports to the Port of Pasco Executive Director, who reports to the Port Commissioners. Airport management, operations, maintenance, and security have a total of 21 full-time personnel.

Airport Layout

PSC occupies 2,335 acres. Airport property used for aviation purposes is classified as either airside or landside. Airside functions facilitate aircraft movement and storage and include runways, taxiways, aprons, tie-downs, and hangars. Landside areas include the passenger terminal building, the Airport Traffic Control Tower (ATCT), ARFF, and automobile access and parking facilities. Additionally, airport property includes an Airport Business Center, an East Side Industrial Park, and property leased for agricultural purposes. The layout of PSC facilities is shown in **Figure 1-3.**

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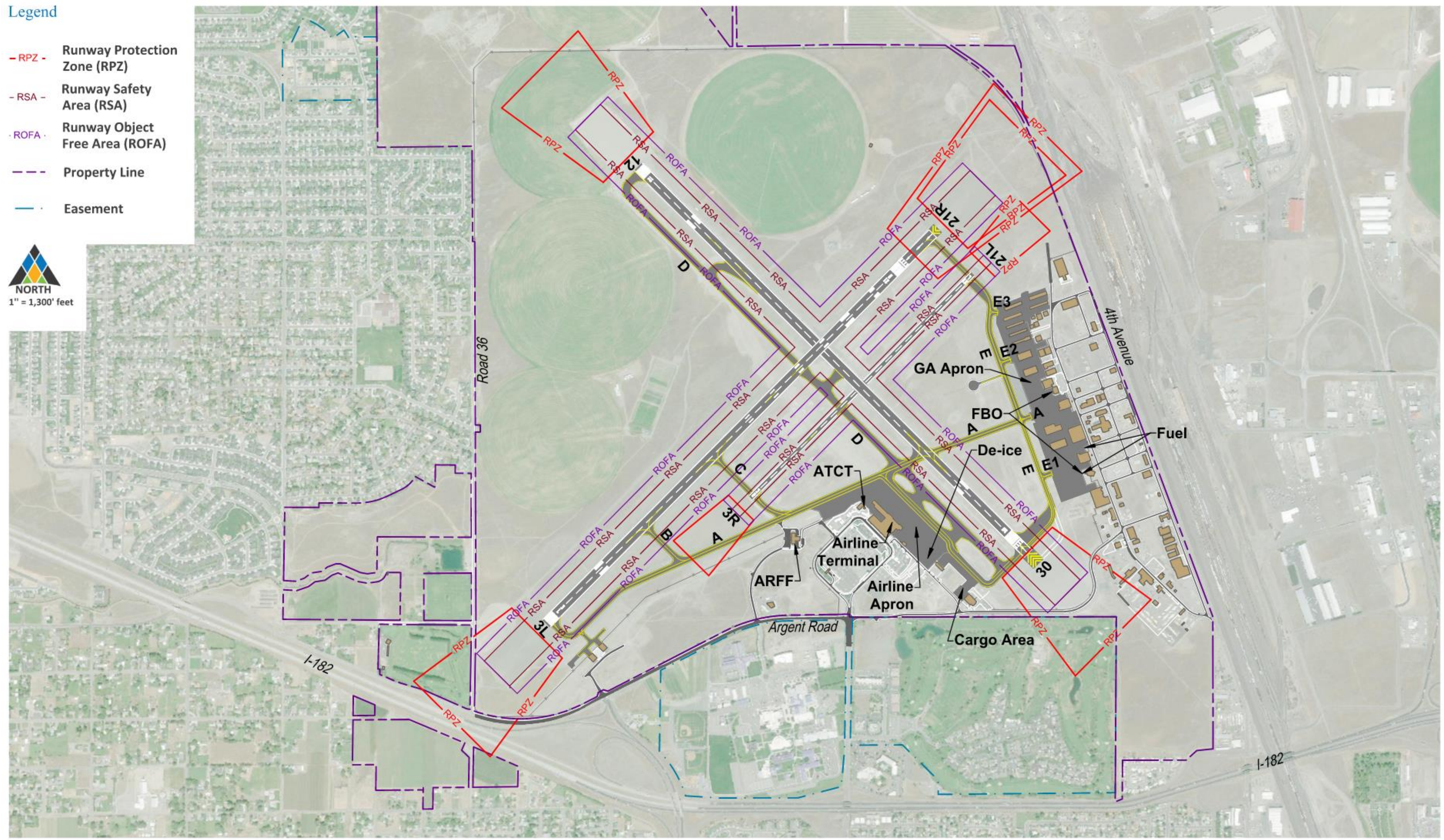
Figure 1-3: Airport Layout



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AIRSIDE FACILITIES

Runway System

PSC has three runways**.** Runways 3L/21R and 12/30 are primarily used by commercial service, cargo, military, and GA aircraft because of their instrument approach procedures and length. Runway 3R/21L is used by smaller GA aircraft. **Table 1-3** lists visual aids and other characteristics for each runway.

Runway Length and Width

- Runway 3L/21R is 7,711 feet long and 150 feet wide. The Runway 21R landing threshold is displaced by 600 feet, making the runway length available for landing is 7,111 feet.
- Runway 12/30 is 7,703 feet long and 150 feet wide. The Runway 30 landing threshold is displaced by 200 feet limiting the runway length available for landing to 7,503 feet.
- Runway 3R/21L is 4,423 feet long and 75 feet wide.

Pavement Condition

Figure 1-4 Pavement Condition Index depicts the airfield pavement conditions and rated values based on the latest Pavement Condition Index (PCI) inspection. Pavement maintenance represents one of the largest airport capital investments and is monitored using the PCI, which is the standard system for visual analysis of airport surface distresses. The PCI assigns the usable runway, taxiway, and apron pavement numbered ratings, ranging from 100 (excellent) to 0 (failed), and codes them by color to correspond with the types of pavement repairs anticipated.

Pavement Strength

The weight-bearing capacity of a runway does not limit the size of aircraft that can use the runway but does indicate the size of aircraft for which the runway is designed. Continuous use by aircraft heavier than the weight-bearing capacity can result in increased runway maintenance, and lead to premature pavement failure requiring replacement. Current pavement strengths at PSC are listed below in **Table 1-3**.

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Figure 1-4: **Pavement Condition Index**

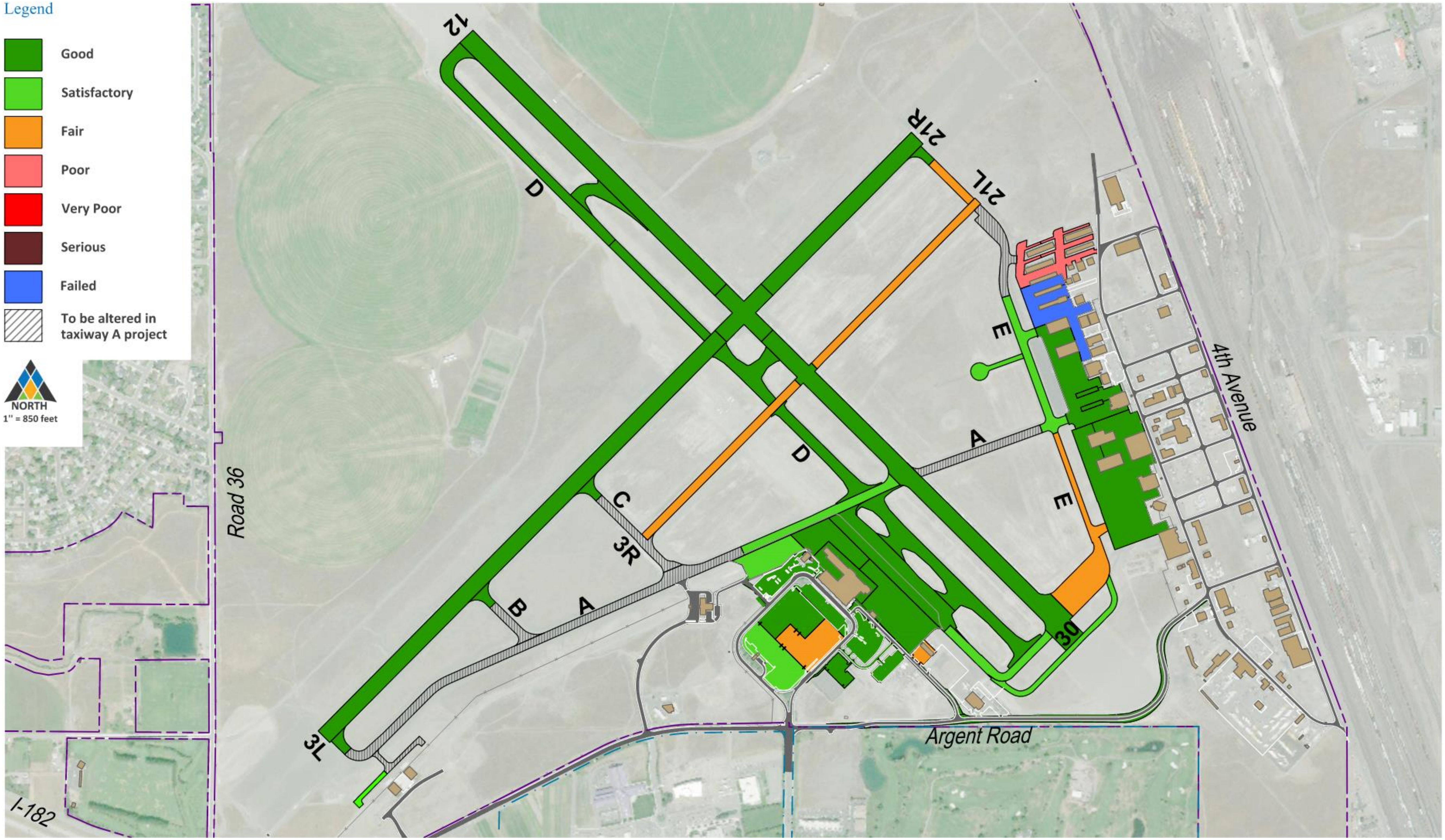

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Table 1-3: Runway Characteristics

RUNWAY SYSTEM						
Facility Component	Runway 3L/21R		Runway 3R/21L		Runway 12/30	
	Runway 3L	Runway 21R	Runway 3R	Runway 21L	Runway 12	Runway 30
Runway Length x Width	7,711' x 150'		4,423' x 75'		7,703' x 150'	
Runway Type	Primary		Parallel (GA)		Crosswind	
Runway Shoulder Width	25' (STD)		25'		25'	
Runway Blast Pad	None	150'x90'	None		None	190' x 200'
Runway Displaced Threshold	None	600'	None		None	200'
Pavement Surface Course	Asphalt (Grooved)		Asphalt		Asphalt (Grooved)	
Pavement Markings	Non-Precision	Precision	Basic		Non-Precision	Non-Precision
Distance Remaining Signs	Yes	Yes	None		Yes	Yes
Pavement Strength (lbs) (Gear Type)	150,000 (S) 200,000 (DWL) 400,000 (DTWL)		52,000 (S)* 85,000 (DWL) 150,000 (DTWL)		150,000 (S) 200,000 (DWL) 400,000 (DTWL)	
Runway Edge Lights	HIRLS		None		MIRLS	

* Runway pavement condition will not accept large aircraft greater than 12,500 pounds.
Source: ALP Drawings; Pavement strength obtained from FAA Form 5010-1, Airport Pavement Design.
STD = Standard; (S) = Single Wheel Mains; (DWL) = Dual Wheel Mains.; DTWL = Dual Tandem Wheel Mains
HIRL = High Intensity Runway Lights; MIRL = Medium Intensity Runway Lights

Runway Protection Zones

Runway Protection Zones (RPZs) are a trapezoidal area off the end of the runway designed to enhance safety for aircraft operations and for people and objects on the ground. **Table 1-4** summarizes the Arrival and Departure RPZ information.

Table 1-4: RPZ Dimensions

Runway Protection Zones (RPZ)	Runway 3L-21R (C-III)		Runway 12-30 (C-III)		Runway 3R-21L (B-II)	
	3L	21R	12	30	3R	21L
Approach RPZ	Non-Precision	ILS	Non-Precision		Visual	
Length	1,700'	2,500'	1,700'		1,000'	
Inner Width	1,000'	1,000'	1,000'		500'	
Outer Width	1,510'	1,750'	1,510'		700'	
Acres	48.978	78.914	48.987		13.77	
Departure RPZ						
Length	1,700'		1,700'		1,000'	
Inner Width	500'		500'		500'	
Outer Width	1,510'		1,010'		700'	
Acres	29.465		29.465		13.77	

Instrument Approach Procedures

PSC has nine non-precision and two precision Instrument Approach Procedures (IAPs) providing for the orderly transfer of aircraft from the beginning of the initial approach to a landing on two of its runways. Runway 3L/21R is equipped with two precision and four non-precision IAPs. Runway 12/30 is equipped with five non-precision IAPs. Runway 3R/2L is a visual approach only runway. IAPs are categorized by aircraft approach speeds and by the visibility and altitude to which an aircraft can follow the approach until the pilot can execute the landing. **Table 1-5** lists PSC's IAPs. PSC has two instrument departure procedures to guide aircraft leaving PSC's airspace.

Table 1-5: Instrument Approaches and Lowest Minimums

Runway End	Procedure	Procedure Type	Aircraft Categories	Minimum Descent Altitude (Feet AGL)	Visibility Minimums (Statute Mile)
21R	ILS	Precision	A, B, C, D	200	1/2
	RNAV (GPS) Y	Precision	A, B, C, D	200	1/2
	VOR/DME	Non-Precision	A, B	500	1/2
			C, D	500	1
	RNAV (RNP) Z	Non-Precision	A, B, C, D	400	5/8
3L	RNAV (GPS) Y	Non-Precision	A, B, C, D	200	3/4
	RNAV (RNP) Z	Non-Precision	A, B, C, D	400	1
12	RNAV (GPS) Y	Non-Precision	A, B, C, D	200	3/4
	RNAV (RNP) Z	Non-Precision	A, B, C, D	400	1 1/4
30	RNAV (GPS) Y	Non-Precision	A, B, C, D	300	3/4
	RNAV (RNP) Z	Non-Precision	A, B, C, D	400	1 1/8
	VOR/DME	Non-Precision	A, B	500	3/4
			C, D	500	1

Source: FAA Published Instrument Approach procedures for PSC

Taxiway System

The taxiway system at PSC gives aircraft access between the apron and hangar areas and the runways. Taxiways A, E, and D provide access between the terminal areas and runway ends. Taxiways B, C, and F are mid-runway exit taxiways. Taxiways are 75 feet wide, except for a 50-foot-wide portion of Taxiway E between Runway 12/30 and Taxiway A that serves the GA apron and hangars. The Taxiway pavement dimensions and design criteria are summarized in **Table 1-6**.

Table 1-6: Taxiway System

TAXIWAY SYSTEM				
Taxiway Segment	TWY A	TWY B	TWY C	TWY D
Type	Primary Parallel	Exit/Connector	Exit/Connector	Exit/Connector
Dimension (Length x Width)	7,200’ x 75’	800' x 75’	1,000’ x 75’	7,200’ x 75’
Taxiway Design Group (TDG)	5	5	5	5
Paved Shoulder Width	30'	30'	30'	25'
Pavement Surface Course	Asphalt	Asphalt	Asphalt	Asphalt
Edge Lighting	MITL*	MITL	MITL	MITL
Pavement Strength (lbs) (Gear Type)	57,000 (S) 95,000 (DWL)	57,000 (S) 95,000 (DWL)	57,000 (S) 95,000 (DWL)	57,000 (S) 95,000 (DWL)
Runway-Taxiway CL Separation	400’	--	--	400'
Hold Short Separation	250’	300’	300'	250'
Taxiway Signs	Yes	Yes	Yes	Yes
Taxiway Segment	TWY E (A to 21R)	TWY E (A to 30)	TWY F	TWY G
Type	Connector	Exit/Connector	High Speed Exit	Connector
Dimension (Length x Width)	1,600’ x 40’	1,650' x 50'	400’ x 75’’	250’ x 85’
Taxiway Design Group (TDG)	5	3	5	5
Paved Shoulder Width	30'	20'	25'	30'
Pavement Surface Course	Asphalt	Asphalt	Asphalt	Asphalt
Edge Lighting	MITL	MITL	MITL	MITL
Pavement Strength (lbs) (Gear Type)	57,000 (S) 95,000 (DWL)	57,000 (S) 95,000 (DWL)	57,000 (S) 95,000 (DWL)	57,000 (S) 95,000 (DWL)
Runway-Taxiway CL Separation	--	700'+	--	--
Hold Short Separation	250' (465' at 12R)	250'	250'	250’
Taxiway Signs	Yes	Yes	Yes	Yes
Source: 2012 PSC ALP; MITL = Medium Intensity Taxiway Light				

Pavement Marking, Lighting, Signage

Airfield Marking

Runway markings are white and indicate the IAP category for each runway threshold. Runway 21R has markings for a precision approach associated with the ILS. Runways 3L, 12, and 30 are marked for non-precision approaches. Runway 3R/21L has visual markings.

Airfield Lighting

Runway lighting systems enable aircraft to use the runways during periods of low visibility and assist in identifying the runway environment during instrument landings. Runway lights are white. Runways 3L/21R and 12/30 have Medium Intensity Runway Lights (MIRL). Runway 3R/21L doesn't have any lights.

Approach lighting systems allow the pilot to visually identify the runway environment and align the aircraft with the runway upon arriving at a prescribed point on an IAP. Runway End 3L and Runway End 12 have Runway End Identifier Lights (REIL). REILs are flashing strobe lights that help to identify runway ends during night and low visibility approaches. Runway 30 has Omni-Directional Approach Lights (ODALS). Runway 21R has a Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR).

Visual Glide Slope Indicators (VGSI) are ground-based visual aid that use lights to help pilots monitor their angle of descent during landing. Runways 3L, 21R, and 30 have a four-box Precision Approach Path Indicator (PAPI). Runway 12 has a four-box Visual Approach Slope Indicator (VASI).

Airfield Signage

FAA Advisory Circular 150/5340-18G, *Standards for Airport Signs Systems* (AC 5340-18G) states that airports with frequent turbojet aircraft operations shall include distance remaining signs. PSC meets this criteria, and Runway 3L/21R and Runway 12/30 have distance remaining signs. Runway 3R/21L is rarely used by turbojets and does not have distance remaining signs.

The runway and taxiway signage facilities at PSC support the existing airfield operations, support IAPs, and comply with the airfield signage plan. The April 2018 Part 139 commercial airport certification inspection found no deficiencies with markings, lighting and signage at PSC. **Table 1-7** summarizes the airfield markings types, lighting equipment, and airside signage at PSC.

Table 1-7: Markings, Lighting, and Signage Summary

Markings, Lighting and Signage	Runway 3L/21R		Runway 12/30		Runway 3R/21L	
	3L	21R	12	30	3R	21L
Runway Markings	Non-Precision	Precision	Non-Precision	Non-Precision	Visual	Visual
Aim Points	Yes		Yes		None	
Centerline	Yes		Yes		Yes	
Threshold Bars	Yes		Yes		None	
Runway Number and Edge Lines	Yes		Yes		Yes	
TDZE Distance Markers	None	Yes	None		None	
Runway Lighting	HIRL		HIRL		MIRL	
MALSR	None	Yes	None	ODALS	None	
Visual Approach Path Guidance	PAPI	PAPI	VASI	PAPI	None	
REIL	Yes	None	Yes	None	None	
Runway and Taxiway Signage						
Distance Remaining Signs	Yes		Yes		No	
Runway Entry Hold Signs	Yes		Yes		Yes	
Taxiway Location Signs	Yes		Yes		Yes	
Taxiway Directional Signs	Yes		Yes		Yes	

Source: FAA Form 5010 Airport Master Record

Airspace

The control and use of navigable airspace determine the capacity and operational utility of PSC. Three main components of the airspace system pertain to PSC: en route, transitional, and terminal. Each component serves a different phase of flight and is supported by a network of navigational aids (NAVAIDs) and the ATCT.

The airspace to the northwest of PSC is restricted based on national security concerns over the Hanford Nuclear Reservation. Aircraft are restricted in overflight altitude to higher than 1,800 feet mean sea level (MSL).

En Route Airspace

En route airspace is for aircraft traveling between airports. These aircraft generally follow FAA-defined low altitude “Victor” routes (below 18,000 feet MSL) and high altitude “jet” routes (above 18,000 feet MSL) that navigate between ground-based Very High Frequency (VHF) Omni-Directional Radio Ranges (VOR) and positional fixes. PSC is home to the FAA’s Terminal Radar Approach Control (TRACON) that controls air traffic for airports in Yakima, Pendleton, Moses Lake, Richland, and Spokane.

Transitional Airspace

The FAA identifies transitional airspace as Class E airspace that begins 700 feet above the ground and extends to 18,000 feet above MSL. The Class E airspace surrounds the PSC Class D airspace and is above the Class G uncontrolled airspace. This airspace allows aircraft to transition between en route and terminal airspace.

Terminal Airspace

Terminal airspace is the airspace around an airport where airport traffic control and approach control services are provided. These facilities include visual and electronic equipment, NAVAIDs, and ATCT personnel to assist pilots in finding the airport and landing. The area immediately surrounding PSC is designated as Class D, due to the presence of the ATCT. Aircraft operating within Class D airspace are required to establish communications with ATCT. There are extensions of the Class D airspace to accommodate instrument approaches into the Airport. The ATCT is closed nightly between 10 p.m. and 6 a.m. When the ATCT is closed the Class D airspace is reclassified as uncontrolled Class G. Aircraft can continue to operate at the Airport when the ATCT is closed and the airspace is uncontrolled, but pilots are expected to announce their positions and intentions to other aircraft on the ATCT radio frequency known as the Common Traffic Advisory Frequency (CTAF).

Airspace Surfaces

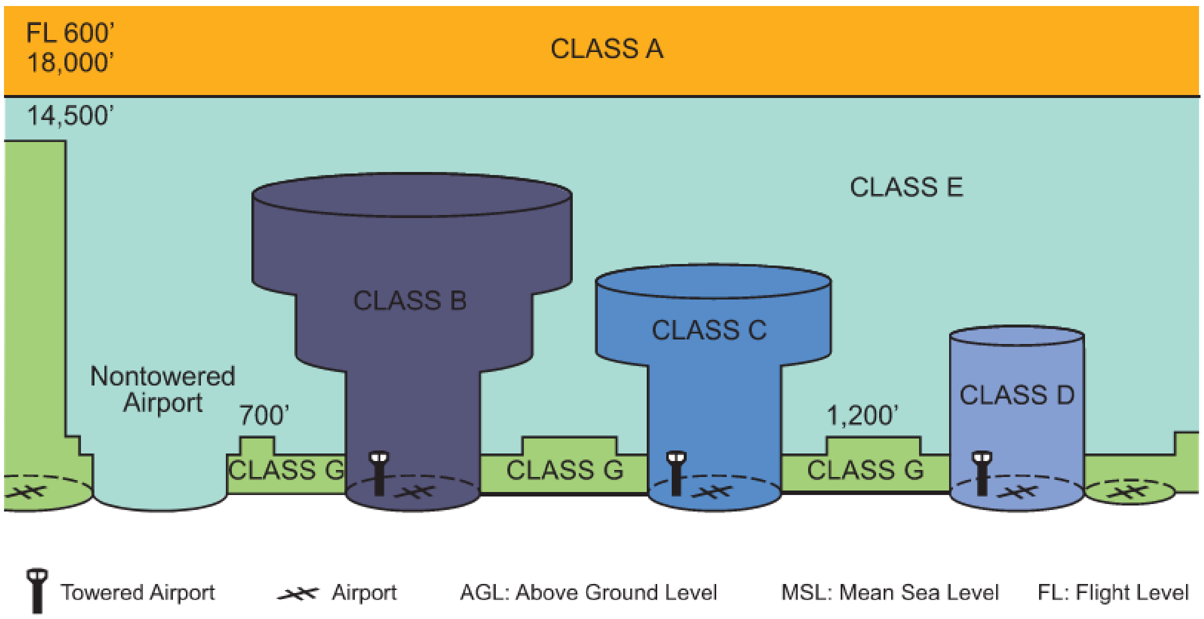
Federal Aviation Regulation (FAR) Part 77 establishes imaginary surfaces that identify objects affecting navigable airspace. Part 77 includes imaginary surfaces for approach, primary, transitional, conical, and horizontal surfaces. Airport imaginary surfaces are established relative to the airport and each runway. The size and slope of each imaginary surface is based on the classification of each runway according to the type of aircraft expected to use the runway as well as the instrument approach available or planned for that runway. The land use zoning codes in place for the City of Pasco and Franklin County specify height restrictions and require development notification to protect these surfaces.

Figure 1-5 shows the airspace and low en route airways around PSC.

Figure 1-6 shows FAA airspace classes.

Figure 1-5: Surrounding Airspace and Low En Route Airways

Figure 1-6: Airspace Classes



Airspace Class	Communication with Air Traffic Control (ATC)	Entry Requirements	Seperation Services	Special VFR in Service Area
A	Required for All Operations	ATC Clearance	All	N/A (No Surface Area)
B	Required for All Operations	ATC Clearance	All	Yes
C	Required for All Operations	Two-way Communications Required Prior to Entry	VFR/IFR	Yes
D	Required for All Operations	Two-way Communications Required Prior to Entry	Runway Operations	Yes
E	Required for All Operations	Required for IFR Operations	Required for IFR Opeartions Only	Yes
G	Not Required	None	None	N/A (No Surface Area)

The airspace map from the 2012 Airport Layout Plan (ALP) in **Figure 1-7** illustrates the extents of the existing Part 77 airspace imaginary surfaces around PSC.

Figure 1-8 Part 77 provides an illustration of the Part 77 airspace imaginary surfaces in cross section.

Figure 1-7: Part 77 Surfaces – Plan View

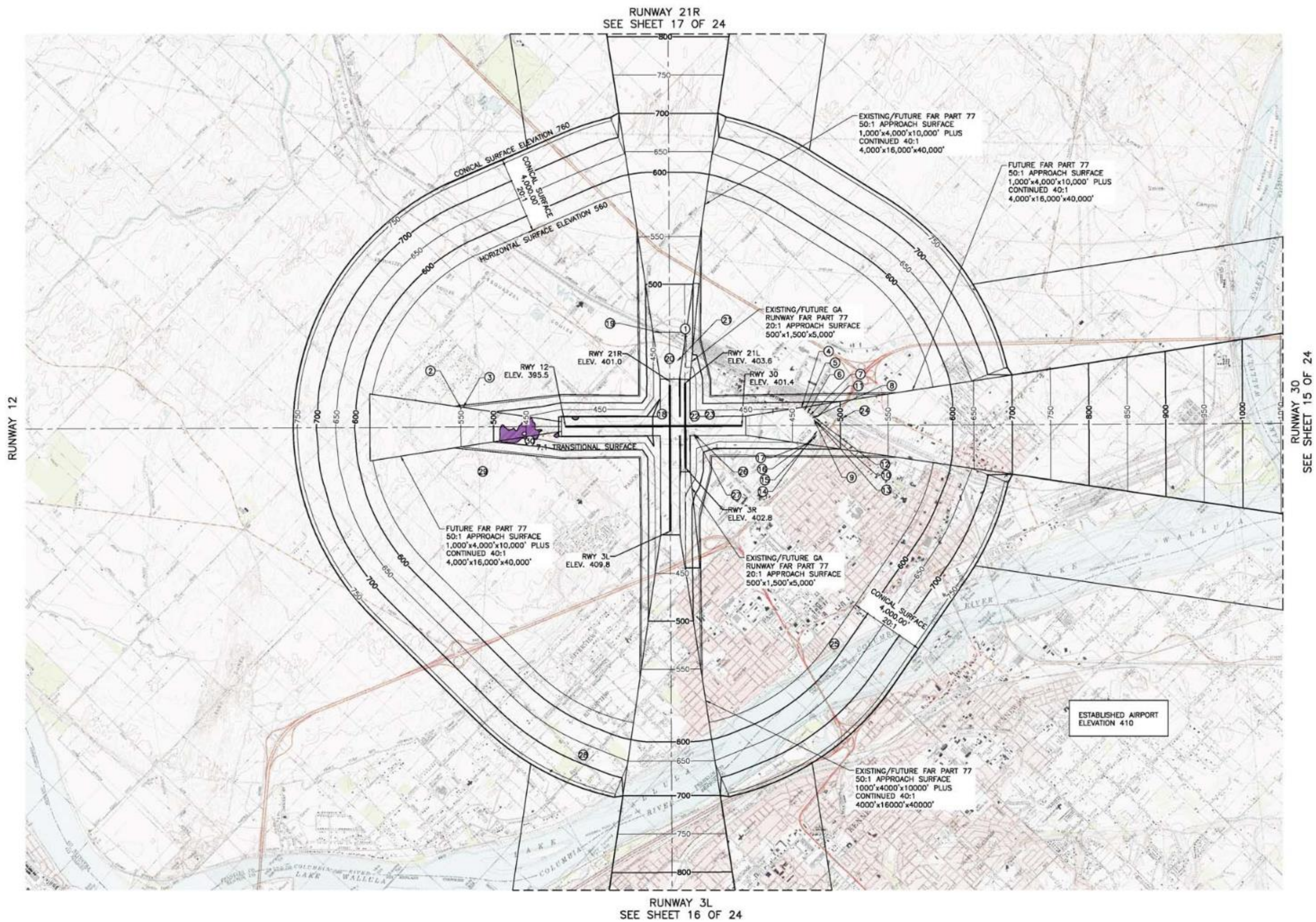


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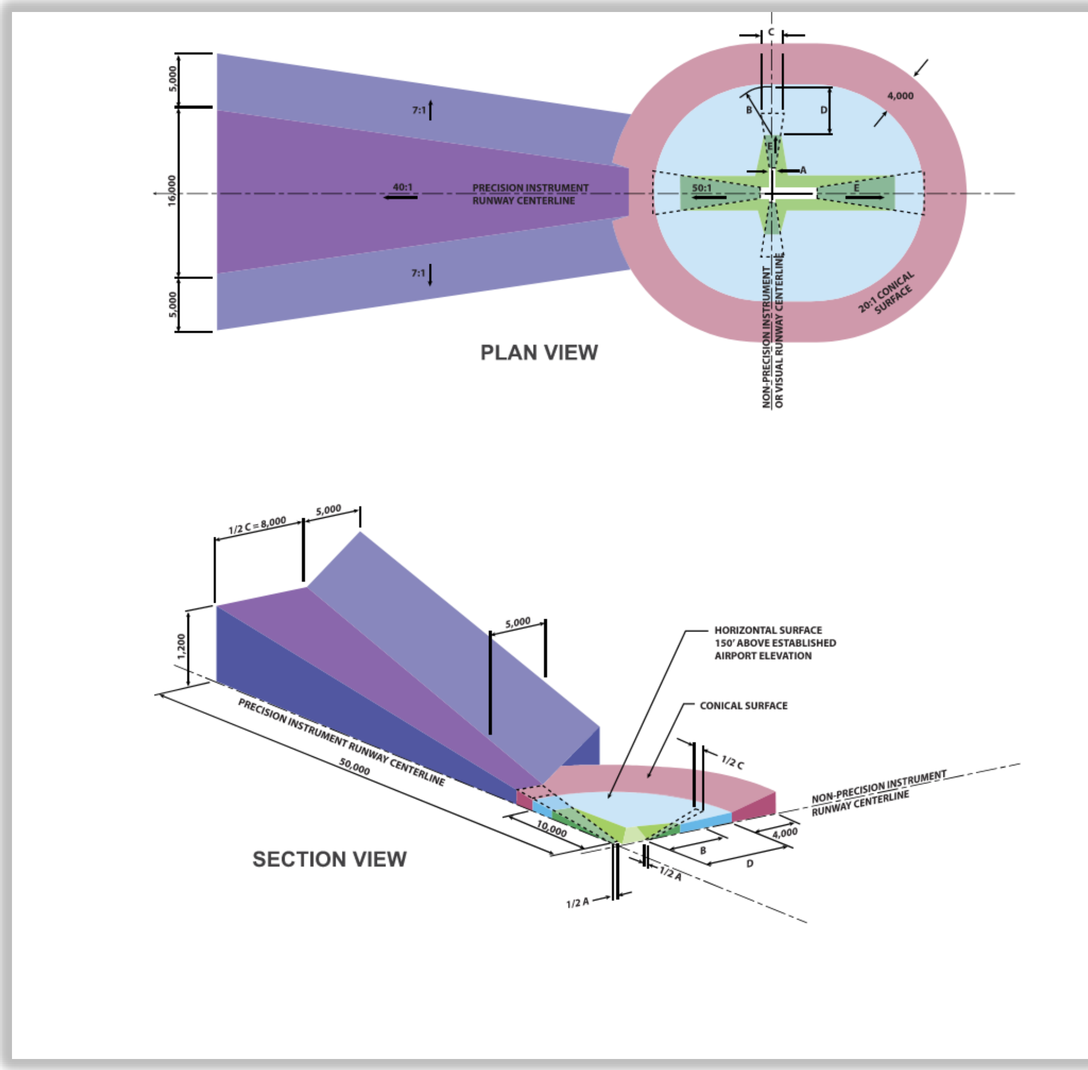
Figure 1-8: **Part 77 Surfaces – 3D Isometric View**



Navigational Aids (NAVAIDs)

NAVAIDs provide guidance and positional information to aircraft. NAVAIDs include lighting systems, radio beacons, signage, global positioning satellites, and pavement markings. NAVAIDs can transmit weather and airport operational information to en route aircraft and allow pilots to operate during periods of poor visibility.

PSC has a VOR co-located with an Ultra High Frequency (UHF) Tactical Air Navigation (TACAN) station that military aircraft use for navigation. These NAVAIDs, when collocated, are called a VOR-TAC. The FAA owns the VOR-TAC, which guides the non-precision IAPs to Runways 21R and 30 and also serves as a navigational aid identifying airway intersections for aircraft en route along low altitude airways.

Runway 21R has an ILS that comprises two components working together to guide precision instrument approaches. The ILS localizer antenna (LOC) is installed beyond Runway 3L and provides final course guidance. The glideslope is approximately 990 feet from the Runway 21R threshold and provides vertical guidance on the descent path.

In addition to runway-specific NAVAIDs (see **Table 1-3**), PSC has an Automatic Terminal Information Service that transmits information such as weather conditions, active runways, and notices via a radio signal. PSC also has an Automated Surface Observation System (ASOS), a rotating beacon, and wind indicators. The rotating beacon is on a tower just south of the passenger terminal building. To support the automated tools, PSC has four wind indicators. The primary wind indicator is a lighted tetrahedron located between the GA Apron and Runway 12/30 to the north of Taxiway A. Supplemental wind socks are located to the left of the touchdown zone of Runways 3L and 30 and between the touchdown zones of Runways 12L and 12R.

Airfield Grading and Drainage and Storm Water Management

The terrain that PSC is located on is relatively flat areas (slopes of 0-5 percent) with overall drainage from northwest to southeast.

PSC has a self-contained drainage system of swales and drywells. There are trench drains on pavement edges that collect rainfall on-site. Rainfall is not discharged off-site. Runoff from the commercial portion of the terminal apron is collected in trench drains and discharged to oil-water separators. The separators discharge into percolation trenches on the northeast side of Taxiway D. Runoff from the transient portion of the terminal apron collects in a storm sewer and discharges to an infiltration basin located southwest of the apron, between the ATCT and the ARFF facility.

Runoff from the terminal building and automobile parking area collects in a storm sewer that discharges to an infiltration basin between the short-term and long-term parking lots. Aircraft washing occurs on the GA apron where runoff discharges to an infiltration basin. Runoff from apron pavement surfaces drains to infiltration devices where runoff enters the ground and percolates to groundwater. Catch basins collect the water and allow the sediments to settle before water drains into a dry well. Dry wells contain the water until it percolates into the soil.

Perimeter Fencing and Gates

A 6-foot tall chain link fence topped by three strands of barbed wire surrounding PSC secures the aviation areas. Airfield access is controlled by key pads for electric gates and locked manual gates. The existing fence meets Airport standards under Part 139 to prevent inadvertent entry onto airport movement areas by unauthorized persons or vehicles and reasonable protection of persons and property from aircraft blast. Additionally, fences control wildlife access and serve to mitigate aircraft strikes caused by larger animals such as deer and coyotes.

TERMINAL AREAS

The terminal areas at PSC provide services and facilities for passengers, air cargo, aircraft, and aviation support facilities. This section describes the existing facilities for air cargo, Fixed Base Operators (FBOs), aircraft storage and parking, ARFF, ATCT, and the passenger terminal building.

Air Cargo/Freight Facilities

FedEx

FedEx has a dedicated 49,100-square-foot sorting facility at PSC. The air cargo apron was recently repaved to better accommodate multiple aircraft ATR-72s and Cessna 208 Caravans simultaneously.

Charter Cargo Carriers

Charter cargo carrier Ameriflight uses the GA ramp to transfer cargo. Alaska Airlines uses the terminal apron to transfer cargo from the belly compartments of its commercial service aircraft.

FBOs

An FBO is a business that provides aircraft services, such as fuel sales, aircraft maintenance, flight training, and aircraft storage. Bergstrom Aircraft Inc, and SullinAir Jet Center are the two FBOs at PSC in the GA area on the east side.

SullinAir Jet Center provides Jet A fuel sales, as well as a pilot lounge, public office, rental cars, flight catering, and local transportation.

Bergstrom Aircraft provides both 100LL and Jet A fuel sales. The FBO office facilities include a passenger waiting area and lounge, pilot lounge, and rest area. Services provided include sales of pilot supplies, aircraft maintenance, aircraft parts, flight training, aerial tours, rental cars and oxygen/nitrogen services. Bergstrom Aircraft contracts with the air carriers for fuel service to air carrier aircraft at the terminal apron.

Hangars and Storage Areas

Aircraft parking and storage consists of T-hangars, box hangars, and aircraft tie-downs. These facilities are located near the GA apron on the east side of the property, and in the Airport Business Center on the west side of the property. Box hangars may contain multiple aircraft while T-hangars generally hold one.

Aircraft tie-downs are used by both based and transient aircraft. There are 22 aircraft tie-down positions on the GA apron. Bergstrom Aviation reports that 14 aircraft tie-down spots were removed during the recent apron rehabilitation project when concrete apron sections containing tie-down spaces were replaced with asphalt taxilane surfaces.

Bergstrom Aircraft leases a 30,000-square-foot hangar from PSC that is capable of accommodating large corporate aircraft up to a Gulfstream G-V. The primary transient and aircraft storage is hangar #142, built in 1943 for the U.S. Navy.

Bergstrom Aircraft provides maintenance and repair services in Hangar 2-01. SullinAir jet Center provides repair services from Hangar 1-69. Bergstrom Aircraft and SullinAir are located on the east side GA apron.

Aircraft Taxiway/Taxilane Access

Taxiway E runs parallel to the GA hangar and apron areas on the east side of the Airport and provides access through four entrance connectors. Taxiway E connects Runway 30 with Runway 21L. Corporate aircraft stored in the box hangars often bypass apron connector E-2 in favor of using connector at Taxiway A due to proximity of hangar 1-07 to the entrance. Pilots report concerns with wing tip clearances when executing the turn onto the apron using Taxiway E-2. The apron and taxilane along the southwest edge of the east side GA apron were shifted to provide clearance for the Taxiway E Object Free Area.

Aircraft Aprons

Aircraft aprons are where aircraft park when not in use. PSC has four aircraft aprons on the airfield: the terminal, transient, cargo, and general aviation aprons.

Terminal Apron

The terminal apron is approximately 489,260 square feet and has nine parking spaces surrounding the terminal building and three additional remote aircraft parking spaces. The apron can serve nine aircraft at a time.

Transient Apron

The transient apron with approximately 100,000 square feet of parking is primarily used by GA aircraft, often as overflow for the GA apron. The transient apron is also used as storage for air carrier aircraft that are not in use.

General Aviation Apron

The GA apron, approximately 609,670 square feet, is primarily used by the FBOs, transient aircraft, and based aircraft to access hangars, tie-downs, and services. Hangars developed near the west end of Taxiway A in the Airport Business Center also have adjacent apron space.

Fuel Storage Facilities

The fuel storage tanks for Bergstrom Aviation are located within their Bergstrom lease area, inside the perimeter fence, between Hangars 71 and 142. The SullinAir Jet Center fuel tanks are on the SullinAir Jet Center apron next to the FBO building (Building 70). Fuel delivery trucks operate on the airfield to service aircraft and have to contact the tower to cross between the GA apron and Commercial apron at Runway End 30. **Table 1-8** summarizes the storage and truck delivery systems capacity.

Table 1-8: Fuel Storage Facilities

Storage Type	Lessee / Owner	Facilities
Storage and Dispensing		
Fuel Storage Tanks	Bergstrom Aircraft, Inc	Storage Tanks: (2)-30,000-gallon tanks (Jet-A) 3 Fuel Trucks: (2)-3,000 gallon; (1)-5,000 gallon
		Storage Tank: (1)-15,000 gallon tank (100LL) Fuel Trucks: (1)-750 gallon; (1)-1,280 gallon
	SullinAir jet Center	Storage Tanks: (1)- 20,000-gallon tank (Jet A); (1) 12,300 gallon (AvGas Not in use) Fuel Trucks: (1) 3,000 gallon (Jet A)
Annual Fuel Volume Sales (5-Year Average Range)		
Jet-A	350,000 to 400,000 Gallons (Peak Month: June to September)	
100LL	50,000 to 60,000 Gallons (Peak Month: July to September)	

Aircraft Deicing

PSC constructed two deicing pads in 2007 between the terminal apron and the FedEx facility. Each pad has the capacity for one Boeing 737-sized aircraft, or two Bombardier Q400-sized aircraft. The de-ice fluid and melted snow and ice are collected in a 15,000-gallon capacity holding tank for settling. An uplift pump then moves the fluids to the City of Pasco sewer system for transport to the City's water treatment facility.

The GA apron does not have a designated de-ice pad location. De-ice fluid use is limited to small aircraft and run off assists with snow and ice melt on the apron. Bergstrom Aviation reports it is typical to use less than 100 gallons of de-ice fluid over the course a winter.

ARFF Facility

PSC is classified as an ARFF Index B airport, meaning that the largest aircraft to regularly use the airport is longer than 90 feet but shorter than 126 feet. Commercial passenger aircraft operating at PSC fit into this category. Some longer models of the 737, 757, and MD-83 are ARFF Index C, meaning their length is at least 126 feet, but less than 159 feet. FAR Part 139 states that if there are fewer than five average daily departures for the largest aircraft using an airport the airport is to remain at Index B levels of equipment and materials.

The ARFF facility is southwest of the passenger terminal building. The dual-use facility allows firefighters to serve PSC and the surrounding community. This is accomplished with three garage bays opening onto the airfield, and three bays opening onto the street. Five City of Pasco firefighters and emergency response personnel staff the ARFF facility 24 hours a day. The facility has two ARFF dedicated trucks, each providing the necessary 500 pounds of dry-chem and 1,500 gallons of water required for an Index B response. Truck 81 is a 1986 Oshkosh T1500 and due to its age serves as the backup vehicle. Truck 82 is a 2009 Oshkosh Stryker vehicle and serves as the primary response vehicle.

Airport Maintenance Personnel and Equipment

Airport maintenance is tasked with the upkeep, protection, and preservation of airport facilities, and the removal of snow and ice from airfield pavements. PSC is currently using the 5,500-square-foot old FAA building for temporary operations and maintenance storage.

PSC employs eight full-time maintenance and three full-time operations personnel, supplemented by two part-time personnel during the summer to assist in landscaping duties. Airport maintenance equipment is housed in a 14,000-square-foot building east of the GA area within the East Side Industrial Park. PSC has eight vehicles used for snow removal, including two front end loaders, two plows, a high-speed broom, a de-ice chemical dispersal truck, and a snow removal and sand truck. The maintenance and snow removal vehicles are summarized in **Table 1-9**.

Table 1-9: Maintenance Vehicles and Equipment

Maintenance Vehicles List		Maintenance Equipment/Attachment List
Year	1991	Light Tower
1982	2006	SNOGO WAUSAU (snowblower for CAT)
1986	2007	HYSTER 60 FORKLIFT
1998	2008	Graco Line Driver
1999	2008	Graco Line Lazer
2001	2014	Magnum Generator
2001	2014	Magnum Generator
2003	Chevy Pickup	
2003	Elgin Whirlwind Street Sweeper	
2006	Cat Front End Loader	
2007	Chevy C-10 Pickup	
2008	Chevy Tahoe	
2009	Oshkosh ARFF	
2010	Utility Dump Trailer	
2011	Chevy Tahoe	
2012	Ford F150 Pickup	
2013	Chevy Silverado	
2013	Chevy Silverado K3500	
2013	Wausau Runway Broom	
2013	Chevy Silverado 2500	
2015	Chevy Pickup	
2016	Ford F150 Pickup	
2017	Chevy 1-ton 3500 4WD	
2017	Chevy 1-ton 3500 4WD	

ATCT

The ATCT is located northwest of the passenger terminal building. The ATCT operates from 6:00 a.m. to 10:00 p.m. and is accessed by 20th Avenue. The ATCT uses an Airport Surveillance Radar (ASR-9) system, located immediately north of airport property, to track aircraft.

The FAA has been implementing a new air traffic control and management system called NextGen to decrease delay and increase capacity. First announced in 2004, Nextgen is a series of modernization initiatives and is expected to continue until 2030. NextGen will use global positioning system (GPS) satellites rather than ground-based radio-navigational aids. PSC's ATCT radar services are NextGen compatible and will ease the transition to NextGen. The ATCT has the Automatic Dependent Surveillance Broadcast system to assist with air traffic identification and advisory services to aircraft.

Passenger Terminal Facilities

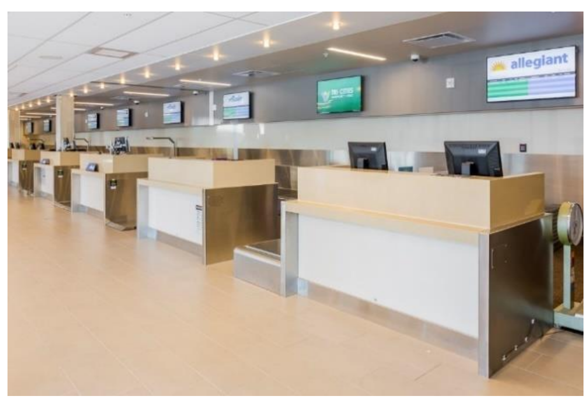
The passenger terminal building offers passenger services from arrival to departure ranging from airline ticketing and rental cars to a restaurant and gift shops. Automobile parking and ground transportation are available near the terminal building. **Figure 1-9** depicts the PSC passenger terminal building layout.

Pre-Secure Area

Law Enforcement Officers Area

The Law Enforcement Officers have a main office on the first floor between ticketing and the queuing area for the Transportation Security Administration (TSA) screening facilities. An elevated open station overlooks the TSA screening area and the exit from the secure side of the terminal. The administrative office for law enforcement is in a second-floor suite.

Ticketing



Ticketing comprises nine ticket counters with a bag conveyor leading to the secure baggage inspection. Eight Airline Ticketing Offices provide support space for airline personnel. Self-service kiosks are opposite the ticket counters.

Meeter/Greeter Lounge

Local cultural behavior brings large groups of family and friends to meet and greet arriving passengers. As a result, PSC management made it a priority to create a comfortable place for greeters to gather during the recent terminal remodel and expansion. The meeter/greeter area at the end of the exiting lane has a small retail space and concession area. The area offers lounge seating as well as flight information displays.

Baggage Claim

The baggage claim area is served by two baggage carousels and an oversize baggage chute adjacent to the rental car counters. The exterior exit opens directly to the curb for pick-up by autos, shuttles, and taxi service.

Rental Cars

Four rental car counters are adjacent to the baggage claim area. An office behind each counter is available for the rental agency personnel. Because rental car parking is at the opposite end of the passenger terminal area, passengers must travel through ticketing to access the rental car lot.

Administrative Space

The Administration space is on the second floor of the pre-secure area of the terminal. There are six offices, two conference rooms, one training room, four small storage rooms and a server room. Men's and women's restroom are also on the second floor. The administrative suite opens to a central atrium revealing the first-floor main entry below.

Secure Inspection Area

Security Check Point

The TSA passenger screening separates the pre-secure and post-secure areas of the terminal. Queuing for the check point begins in the atrium. The secure check point currently operates with two lanes and has the room to expand to four lanes when needed. A private screening room and a composure area are available prior to entering the airside (post-secure) terminal.

TSA Suites

TSA has a suite of offices adjacent to the passenger screening checkpoints. The suite contains workrooms, offices, a training room, breakroom, and server room.

Secure Baggage Area

A bag conveying system moves the checked bags from ticketing to the Checked Baggage Inspection System area. This is an in-line baggage handling system with two Explosive Detection System machines.

Inspectors in the On-Screen Resolution Room determine if baggage requires manual inspection. If a bag is diverted for inspection, it travels to the Checked Baggage Resolution Area, which contains six Baggage Inspection Tables. An Oversize Bag Inspection Station is dedicated for baggage too large to move through the in-line system. When baggage clears screening, it is directed to the outbound baggage room.

Post-Secure Area

Retail and Concessions

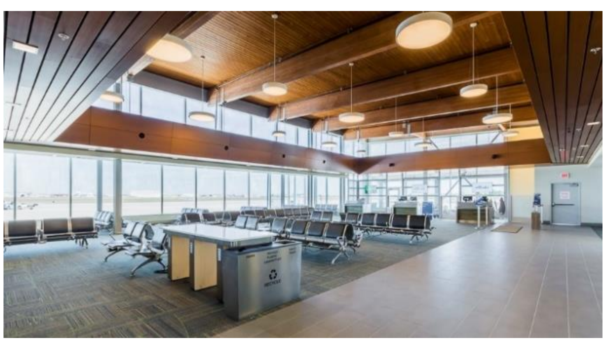
The Gallery, located at the intersection of the two concourses and security screening contains a full-service restaurant, a bar, a coffee shop and retail space. The seating for this area is a combination of chairs and tables for dining, as well as casual lounge chair seating.

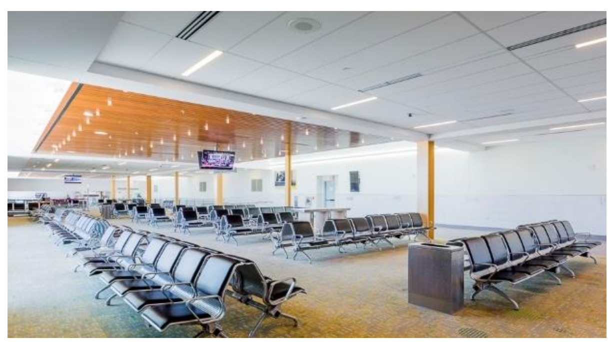
Children's Play Area

Across from the retail space in the gallery is an enclosed room for child entertainment. The space contains a soft floor surface and multiple play stations.

Holdrooms

Two concourses branch off the main gallery space. The eastern concourse contains ground boarding Gates 1 and 2. Gate 1 has three agent counters to conduct boardings for multiple flights leaving the gate. The western concourse contains Gates 3, 4, and 5. Gate 3 is a ground boarding gate. Gates 4 and 5 are elevated above the terminal floor to support Passenger Boarding Bridges (PBB). Gate 4 is currently the only gate that has a PBB where Gate 5 accesses ground boarding use by stairs and a ramp. All holdrooms contain beam seating with power adapters, standup computer counters, and monitors for cable TV presentation.

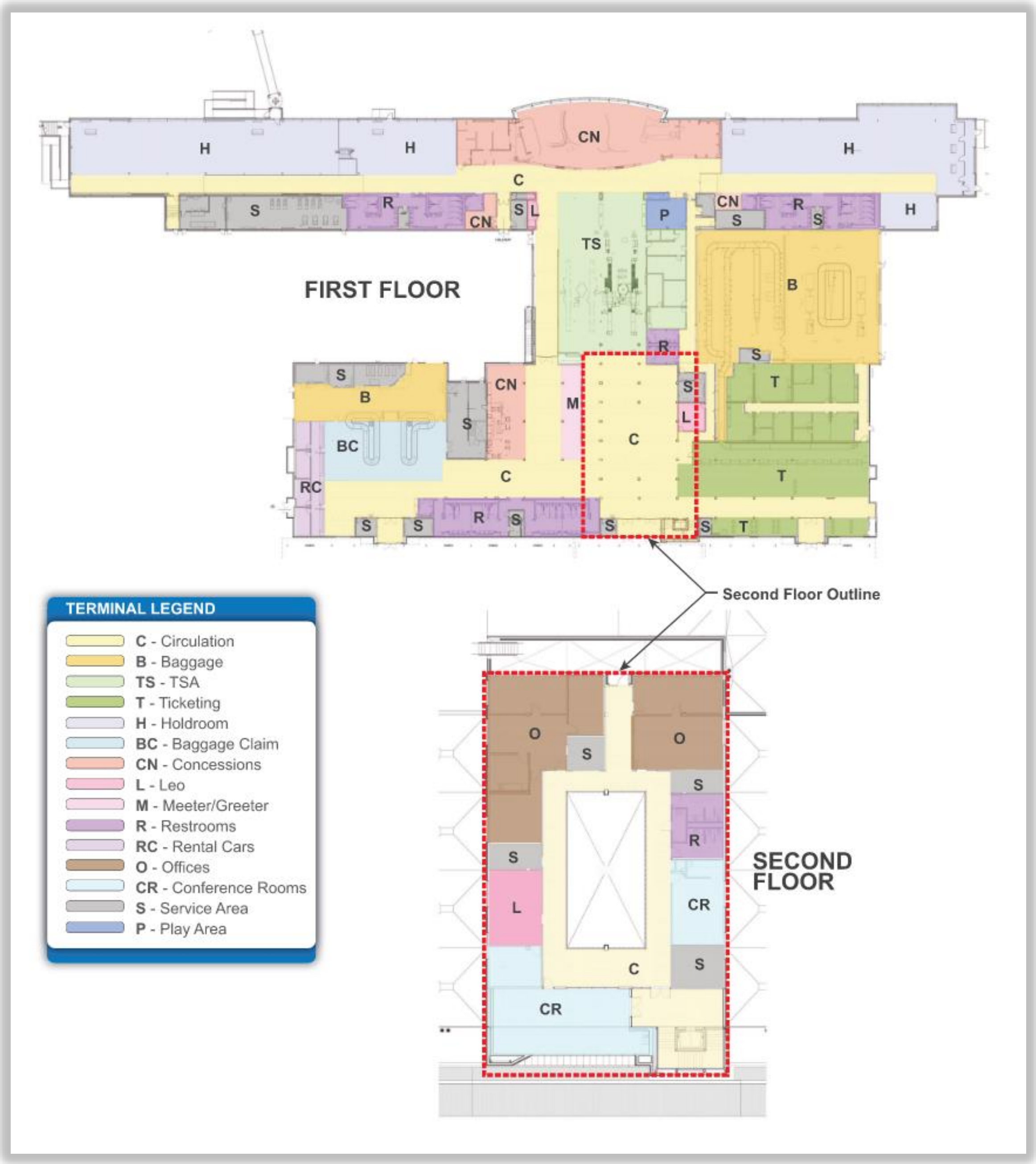




Outbound Baggage

The outbound baggage room is the loading area for baggage after it has been screened by TSA. Manually placed on carts, baggage tugs deliver luggage to departing aircraft. The tugs must travel around one carousel to load luggage to the aircraft.

Figure 1-9: Passenger Terminal Building Floor Plan



Parking and Ground Transportation

Republic Parking is the current operator of PSC's parking system that comprises eight different surface parking lots (including two different employee lots) for a total of 2,184 spaces. **Table 1-10** lists the parking space counts in each lot by type, such as regular space, Americans with Disabilities Act (ADA) space, and unpaved/unmarked space. In the table, the space count for two employee parking lots are combined and the overflow lot is shown as an addition to the credit card lot.

Table 1-10: Parking Inventory

Type	Short-Term	Long-Term	Credit Card	Employee	FAA	Rental Car	Total
Regular Spaces	183	1,190	110	171	33	355	2,042
ADA Spaces	8	34	-	6	2	-	50
Overflow (Unpaved)	-	-	92	-	-	-	92
Total	191	1,224	202	177	35	355	2,184

Source: Walker Consultants, 2018.

The short-term lot is located closest to the passenger terminal building and as such, it is the most convenient customer parking. South of the short-term lot is the long-term lot. West of the passenger terminal building is the FAA lot and one employee lot. East of the passenger terminal building is the other, smaller employee lot and the rental car lot. To the southeast are the credit card lot and overflow lot.

All parking lots enter and exit from 20th Avenue through a one-way access that travels in a counter-clockwise circulation pattern to reduce or avoid accidents. This traffic pattern also funnels exiting traffic from the short- and long-term lots successfully through the toll plaza. **Figure 1-10** provides the location of each parking lot.

Figure 1-10: Parking Map

Table 1-11 summarizes the vehicle flow and access control in place at PSC.

Table 1-11: Parking Access and Revenue Controls

Lot and Parking Function	Entry Lanes from 20th Avenue	Exit Lanes	Ticket Splitters	Booths	Gates
Short-Term	2	2	2	2	6
Long-Term	2	2	2	2	4
Credit Card Lot	1	1	1	2	2

Currently hospitality shuttles and taxi service drop-off and pick-up passengers. Uber and Lyft also offer Tri-Cities connection to and from PSC. The drop-off and pick-up curb in front of the passenger terminal building is approximately 425 feet long.

LANDSIDE FACILITIES

PSC's landside facilities comprise the Airport Business Park, East Side Industrial Park, and agricultural areas.

East Side Industrial Park

The majority of PSC's tenants are in the 70-acre East Side Industrial Park. Located between the GA area and 4th Avenue, the park has over 500,000 square feet of building space. Tenants include commercial, industrial, agricultural, and public agency support facilities. The age of the buildings in the park range from WW II era to new construction. Airport staff report that facilities are fully occupied and vacancies are filled promptly.

Airport Business Park

The Airport Business Park is in the southwest corner of airport property, between Taxiway A and Argent Road. The Port of Pasco owns and operates the 86-acre business park. The park has ample opportunities for land development, with many lots that provide controlled airfield access. Available utilities include electricity, water, communications, and natural gas. A hotel is planned for construction at the northwest corner of the 20th Avenue and Argent Road intersection.

Airport Agricultural Areas

There are two main agricultural areas at PSC, one located northwest of Runway 3L/21R and the other located southwest of Runway 3L, south of U.S. Highway 12. The area northwest of Runway 3L/21R includes five circular areas supported by a central pivot irrigation system and one rectangular shaped area. The circular agricultural areas are leased to Lamb Weston Inc. through December 2027. The total lease area is approximately 627 acres. Allowable crops are: garlic, alfalfa, sugar beets, sweet corn, lima beans, cereal grain, dry beans, potatoes, and peas. Tracts A, B, and C are outside the airport operations area, located south of U.S. Highway 12, are leased to Zeb's Vineyards until July 2022. These tracts total approximately 32 acres. A smaller agricultural area is located west of Road 36. This approximately 17-acre tract is leased by Columbia Basin College and is used for educational purposes.

Airport Entrance Roadway, Access Point, and Vehicle Circulation

Access to the passenger terminal building is provided by 20th Avenue just north of the intersection with Argent Road. The one-way, three-lane circulation road encircles the terminal parking area. Both 20th Avenue and Argent Road intersect with Interstate 182 south of PSC. Argent Road and 4th Avenue provide access to the East Side Industrial Park and the GA area. The Airport Business Park is accessed via Argent Road. Local roadways provide interior circulation within the business and industrial parks.

Airport Service and Perimeter Roadways

PSC has a service and perimeter roadway network comprised of paved and unpaved surfaces. Parts of airport property do not have a dedicated, paved service road, so communication with ATCT is necessary when using taxiways and runways for ground vehicles. Service roads that may interfere with aircraft operations also require communication with ATCT.

Utilities

Fire Flow and Location of Hydrants

Fire hydrants are near the passenger terminal building, the ATCT, the ARFF, and the Airport Business Park in the East Side Industrial Park. The City of Pasco Public Works Department operates and maintains the water system surrounding PSC on three sides: 24- and 36-inch water mains are adjacent to Road 36 west of PSC, an 18-inch water main is adjacent to Argent Road south of PSC, and a 12-inch water main is adjacent to Stearman Avenue east of PSC. A 12-inch water main extends into the passenger terminal area along 20th Avenue. Water pressure and fire flow rates within the area, as reported by the City Fire Marshall, are summarized in **Table 1-12**.

Table 1-12: Fire Flow

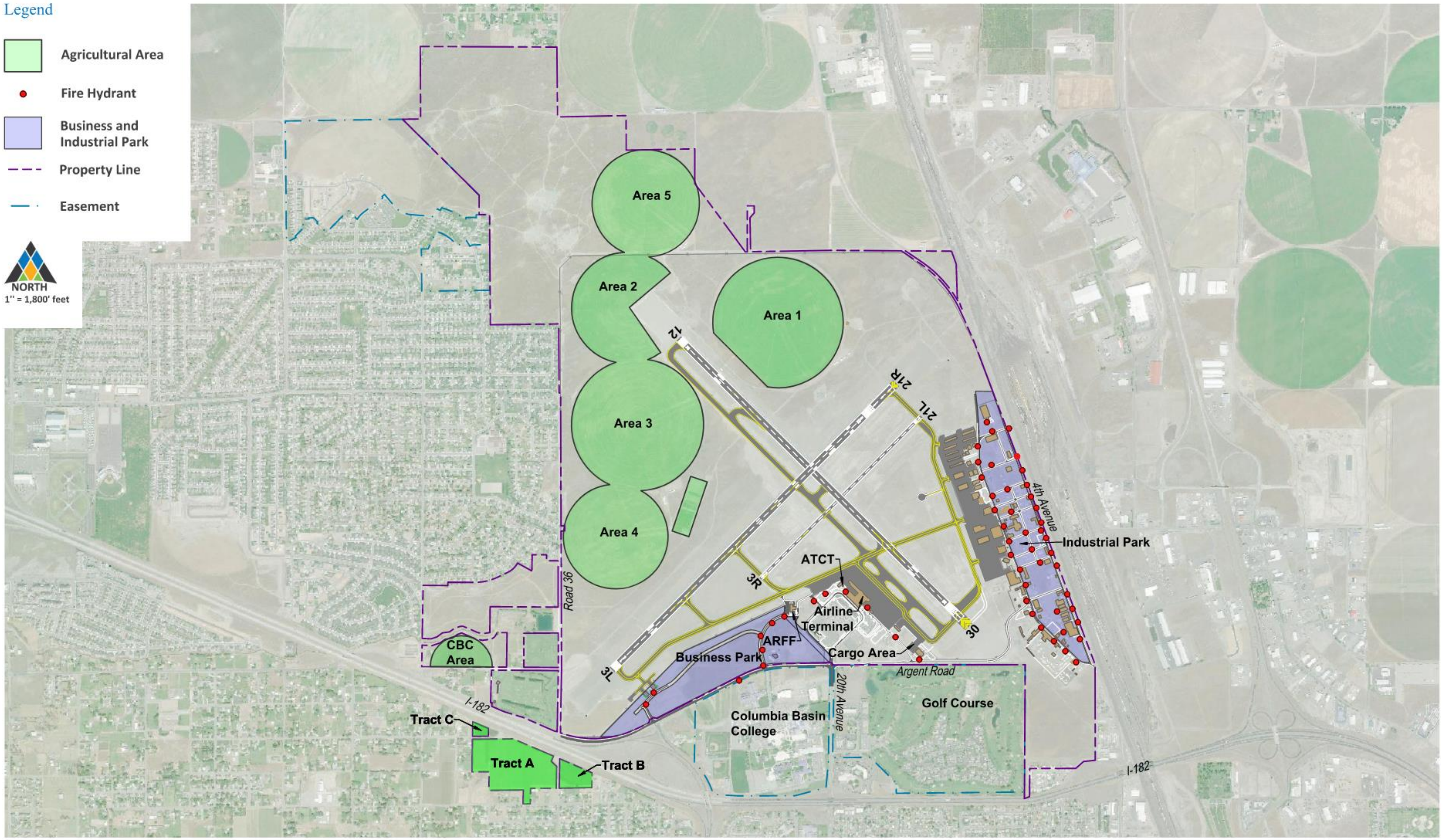
Location	Static Pressure (PSI)	Residual Pressure (PSI)	Flow (GPM)	Flow @ 20 PSI (GPM)
3125 Rickenbacker Dr.	92	80	1,300	3,420
East End of Rickenbacker Dr.	93	72	1,200	2,352
NW Corner of Varney & Argent Rd.	86	72	1,275	2,945
3406 Stearman Ave.	80	67	1,190	2,718
North end of Swallow Ave.	84	62	1,160	2,065
4218 Stearman Ave.	84	68	1,130	2,389
Terminal Dr. northwest of FedEx	94	82	1,250	3,339

Source: City of Pasco Fire Chief

Note: PSI (Pounds per Square Inch) GPM (Gallon Per Minute)

Landside facilities and locations are depicted in **Figure 1-11.**

Figure 1-11: Landside Facilities



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Sanitary Sewer

The City of Pasco Public Works Department operates and maintains the sanitary sewer system surrounding PSC. A 12-inch sewer line is located at Argent Road and Road 36, and an 18-inch sewer line is located along Stearman Avenue. An 8-inch line provides sewer service from the passenger terminal building to the City's lift station on Argent Road. PSC discharges deicing fluid disposal to the City system via the lift station, continuously monitoring the flow and waste characteristics, and provides an annual report to the City of Pasco. The City of Pasco has an Operation and Maintenance Plan in place for the Deicing Collection facility. A comprehensive sewer plan is in place for the Airport Business Park development. A master grading plan is in place to complement the sewer plan.

Stormwater Collection

The City of Pasco has jurisdiction over the review of stormwater collection. Collection must be maintained on site with no offsite discharge. Typically, this is done with a series of catch basins, piping, and drywells to discharge the water into the subsurface. Sediment and oil control are accommodated and managed. PSC annually inspects and cleans catch basins and drywells in keeping with the stormwater operation and maintenance plan in place. Two detention ponds located near the ARFF building detain parking lot and apron runoff.

Sediment and Oil control is accomplished with two methods:

1) When stormwater discharge is to a Drywell, a catch basin with a 2-foot settling bottom is included ahead of the drywell.
2) For larger drainage systems, a separate Oil/Water Separator is applied prior to discharge into ponds or percolation trenches. As part of the Stormwater Operation and Maintenance Plan, these facilities are monitored monthly and then cleaned out annually with a Vactor Truck.

Power

Power and street light service is provided to PSC by Franklin Public Utility District (PUD). The PUD has electrical service on three sides of PSC, along 36th Road, Argent Road, and Stearman Avenue. PUD installed a new major trunk power line along Terminal Loop Road as part of the recent passenger terminal building expansion project.

Natural Gas

Cascade Natural Gas provides service to PSC. An existing gas mainline is located on Argent Road and Stearman Avenue in the Airport Industrial Area. With a connection at 20th Avenue, an additional gas mainline follows Terminal Loop Road to serve the passenger terminal building.

Telephone/Communications

Charter Communications and CenturyLink provide telephone and broadband service to PSC with trunk lines along Argent Road, 36th Road, and Stearman Avenue.

Fiber Optic Communication

A major fiber optic system is in place within the passenger terminal area provided by Franklin PUD. The PUD's broadband network provides a high-speed network for communication for electronic gates, video surveillance, and parking lot operations. The PUD does not provide service directly but does provide the bandwidth to local providers who in turn deliver finished broadband services to end users. The main fiber optic line surrounds the terminal building parking lot, terminating at the passenger terminal building.

FINANCIAL CONDITIONS

This section describes the general financial condition of the Airport to understand the financial structure, constraints, requirements, and opportunities for airport activities as related to the development of the Airport's Capital Improvement Program (CIP). The CIP will be used to formulate a reasonable and financially sound CIP with which to fund projects identified in the master planning process.

Background

PSC is both a public service and business and must be operated as both. Financial assistance to public airports is often provided by Sponsor, state, federal, and private sources where available. In return, airports provide jobs, promote development, and supply economic benefits to the areas they serve, as well as provide a major element of the public transportation system. This is the public sector component of an airport. From a business standpoint, airports can generate certain revenues and, therefore have the obligation to do so. The most successful and satisfactory method of accomplishing this is through a combination of fair and equitable fees and charges associated with the use of airport facilities.

Financial Inventory

PSC's financial statements have been gathered and summarized in **Table 1-13**. The primary responsibility for developing the financial program rests with the Port of Pasco. Major sources of operating revenue at the Airport are parking fees, airline income, car rentals, landing fees, and land leases. Major expenses include salaries, Port administration expenses, ARFF services, insurance, and janitorial services. The financial statements indicate that the Airport has been operationally self-supporting recently, excluding depreciation and interest. Additionally, the Airport receives non-operating revenue through the collection of $4.50 Passenger Facility Charge (PFC) on every enplaned passenger at the airport as well as a $3.00 Customer Facility Charge on every rental car. FAA and TSA federal grants, state grants, and state loans, among others, are also sources of non-operating revenue.

Airport improvement projects are principally financed by FAA AIP grants and PFC funds. Recently, PSC used AIP and PFC funds to expand the passenger terminal building, rehabilitate an apron, construct a taxiway, and improve signage and markings.

Table 1-13: Revenue and Expenses Summary, 2014-2017

Year	Operating Revenue	Expenses	Net Operating Income (Before Depreciation and Interest)
2014	$5,858,685	$5,125,396	$733,289
2015	$5,560,574	$5,973,575	$413,001
2016	$5,860,808	$6,517,300	$656,492
2017	$7,813,209	$6,293,850	$1,519,359

Source: Tri-Cities Airport financial records.

WEATHER PROFILE

Weather conditions impact aircraft performance and influence airport design. The design process must account for temperature, precipitation, winds, visibility, and cloud ceiling heights. Wind patterns impact runway utilization and must be assessed to determine runway design requirements.

Wind

The historical pattern of prevailing winds influences desirable runway orientation and runway use. The FAA has determined that crosswinds pose a hazard to the safe operation of aircraft, particularly to small and light aircraft. Therefore, an airport's primary runway should align with the prevailing winds.

Wind coverage is defined as the average percentage of time that a runway or grouping of runways is not subjected to crosswinds of magnitude greater than the allowable crosswind component for each runway. FAA defines the desirable minimum wind coverage of an airport's runway configuration as 95 percent of wind velocity and direction observations over the most recent 10-year period. The allowable crosswind component used to compute the wind coverage for a given runway is based on the Airport Reference Code (ARC) of the most demanding aircraft expected to use the runway. Approach category and design group definitions are listed in **Table 1-14.**

Table 1-14: Crosswind Component RDC Categories

FAA Runway Design Code (RDC)	Aircraft Types	FAA Crosswind Component	Runway 12/30 Applicable Crosswind Component	Runways 3R/21L and 3L/21R Applicable Crosswind Component
A-I and B-I: Includes A-I and B-I Small (Small Aircraft are 12,500 pounds or less)	Piston	10.5-Knot	Yes	Yes
A-II and B-II	Small Jets & Turboprops	13-Knot	Yes	Yes
A-III, B-II | C-I to C-III | D-I to DIII	Large Jets & Turboprops	16-Knot	Yes	Yes
A-IV and B-IV | C-IV to C-VI | D-IV to D-VI	Large Jet Transports	20-Knot	No	No

Wind data is reported to and available from the National Oceanic and Atmospheric Administration (NOAA) by an ASOS located at PSC. Wind data from 2007 to 2017 is grouped in three categories presented in **Table 1-15.**

Table 1-15: Ceiling and Visibility Categories

Wind Coverage	Definition	Occurrence
All-Weather	All wind observations.	N/A
Instrument Flight Rules (IFR)	Cloud ceiling less than 1,000 feet and/or visibility less than 3 miles, but cloud ceiling greater or equal to 200 feet and visibility greater than or equal to 0.5 miles.	These conditions occurred approximately 3 percent of the time from 2007 to 2017.
Visual Flight Rules (VFR)	Cloud ceiling greater than or equal to 1,000 feet and visibility greater than or equal to 3 miles.	These conditions occurred approximately 96 percent of the time from 2007 to 2017.

The FAA's Airport Design Tools program was used to determine the wind coverage for PSC's runway orientations, both individually and combined (see **Table 1-16**).

Runways 3L/21R and Runway 3R/21L align more with the prevailing winds than Runway 12/30. Runway 12/30 provides adequate wind coverage for the 16- and 20-knot crosswind components but does not provide adequate All-Weather and Visual Flight Rules (VFR) wind coverage for the 10.5-knot and 13-knot crosswind components. The wind coverage for Runway 12/30 being less than 95% for light aircraft indicates the need for a two-runway system.

Climate

The Tri-Cities lie in the "rain shadow" of the Cascade Mountains, which creates a dry and hot desert climate. NOAA data shows that average annual precipitation at PSC is approximately 9 inches, with most precipitation falling in the cooler months. **Table 1-17** shows monthly rain, and temperatures for PSC.

Table 1-16: Wind Coverage

Runway	10.5-Knot Component	13-Knot Component	16-Knot Component	20-Knot Component
	Piston	Small Jets & Turboprops	Large Jets & Turboprops	Large Jet Transports
ALL-WEATHER WIND DATA OBSERVATIONS (PERCENT COVERAGE)				
Runway 12/30	89.32%	92.62%	96.48%	98.78%
Runway 3L/21R & Runway 3R/21L	96.78%	98.20%	99.52%	99.90%
Runway 12/30, Runway 3L/21R & Runway 3R/21L Combined	99.47%	99.84%	99.96%	99.99%
INSTRUMENT WIND DATA OBSERVATIONS (PERCENT COVERAGE)				
Runway 12/30	98.93%	99.22%	99.48%	99.71%
Runway 3L/21R & Runway 3R/21L	96.68%	97.97%	99.47%	99.88%
Runway 12/30, Runway 3L/21R & Runway 3R/21L Combined	99.62%	99.84%	99.95%	100.00%
VISUAL WIND DATA OBSERVATIONS (PERCENT COVERAGE)				
Runway 12/30	88.38%	91.98%	96.19%	98.69%
Runway 3L/21R & Runway 3R/21L	96.80%	98.23%	99.53%	99.90%
Runway 12/30, Runway 3L/21R & Runway 3R/21L Combined	99.45%	99.84%	99.97%	99.99%
Notes: Crosswind component computed using runway true bearings (135.44° and 45.43°). Crosswind component computed using FAA’s Airport Design Tools program. All weather conditions: period of record: 2007 to 2017 with 93,219 observations. IFR weather conditions: period of record: 2007 to 2017 with 8,419 observations. VFR weather conditions: period of record: 2007 to 2017 with 84,800 observations				

As shown in **Table 1-17**, the hottest month of the year is July, with a mean daily maximum temperature of 91.3° F. The coldest month of the year is December, with a mean daily maximum temperature of 39.9° F.

Table 1-17: Climate Data

Month	Total Precipitation (inches)	Mean Maximum Temperature (°F)	Mean Minimum Temperature (°F)	Mean Average Temperature (°F)
January	1.22	41.8	27.9	34.9
February	0.86	49.0	28.7	38.9
March	0.79	59.1	33.6	46.3
April	0.65	67.4	38.5	52.9
May	0.73	75.6	45.8	60.7
June	0.68	82.9	52.2	67.5
July	0.28	91.3	55.7	73.5
August	0.27	90.0	55.5	72.8
September	0.40	80.3	46.6	63.4
October	0.65	65.8	38.0	51.9
November	1.09	50.2	32.4	41.3
December	1.21	39.9	26.4	33.1

Source: NOAA National Weather Service Forecast, Monthly Climate Normals for Tri-Cities Area, WA, September 2018

AIRPORT ENVIRONMENTAL REVIEW

This environmental review section is not intended to satisfy environmental clearance requirements outlined in FAA Order 1050.1F, *Environmental Impacts and Procedures*, nor is it intended to fulfill requirements of the National Environmental Policy Act (NEPA). NEPA requires an action involving federal funding or permit approval to undergo an environmental analysis that evaluates and documents the action's proposed impacts to the environment.

Environmental Overview

The Environmental Overview provides an initial review of environmental resources that are known to occur on or near an airport. The intent of the preliminary review is to assist in the avoidance and minimization of environmental effects throughout the airport master planning process. Environmental overview conditions were assessed primarily through research of existing studies and documents, agency database searches, local inquiry, and with limited field investigation and agency coordination. The following review is not intended to satisfy the requirements of NEPA, and the need for a formal NEPA review will be determined on a project-by-project basis by environmental specialists at the Seattle Airports District Office.

The overview analysis includes these environmental categories:

- Air Quality
- Biological Resources
- Climate
- Coastal Resources
- Construction Impacts
- Department of Transportation Act, Section 4(f)
- Farmlands and Soils
- Hazardous Materials, Pollution Prevention, and Solid Waste
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise-Compatible Land Use
- Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks
- Light Emissions and Visual Impacts
- Water Resources

Table 1-18 describes data sources, including links, used in this Airport Environmental Review.

Table 1-18: Description of Data Sources

Source	Description
Federal	
Environmental Protection Agency (EPA): National Ambient Air Quality Standards (NAAQS)	The Clean Air Act requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment.
Environmental Protection Agency: SIP Status Report: Status of Washington Designated Areas	State Designated Area Reports describe the status of a state's submissions and EPA actions on those submissions.
US Department of Agriculture: Natural Resources Conversion Service: Web Soil Survey	Web Soils Survey provides soil data and information produced by the National Cooperative Soil Survey.
National Wild and Scenic Rivers System	The National Wild and Scenic Rivers systems preserves certain rivers with outstanding natural, cultural, and recreational values in free-flowing condition.
US Census Bureau: Small Area Income and Poverty Estimates (SAIPE)	The SAIPE Program produces estimates of median household incomes for states and counties, and poverty for states, counties, and school districts.
US Census Bureau: Population Estimates Program	Population Estimates Program uses current data on births, deaths, and migration to calculate population change.
US Fish and Wildlife Service (USFWS): Information Planning and Consultation (IPaC)	IPaC offers the ability to obtain an informal list of endangered species, critical habitat, migratory birds, wildlife refuges, and wetlands under the USFWS jurisdiction that are known or expected to be on or near the project area.
US Geological Survey: National Water Information System National Wetlands Inventory (NWI)	NWI produces and provides information on the characteristics, extent, and status of the Nation's wetlands and deep-water habitats and other wildlife habitats.
State	
Washington Department of Fish & Wildlife: Priority Habitats and Species (PHS)	Provides basic information about the known location of PHS in Washington State.
Washington Information System of Architectural & Archeological Records Data (WISAARD)	WISAARD is the state's digital repository for architectural and archaeological resources and reports.
Washington Department of Ecology: WA Coastal Zone Management	WA Coastal Zone Management Program meets the national interests of protecting, restoring, and responsibly developing the state's marine shorelines.
Washington Department of Ecology: Coastal Atlas, Flood Hazards Areas	Provides access to flood hazard maps to determine the flood risk to homes or businesses.
Washington Department of Ecology: Facility/Site Database	Facility/Site Database and map search tool includes information on State cleanup sites; Federal Superfund cleanup sites, Hazardous waste generators.

Air Quality

An air quality analysis generally applies to projects that, due to their size, scope, or location, have the potential to change or diminish air quality standards. These standards, governed by the Clean Air Act of 1970 (CAA) and the Environmental Protection Agency (EPA), are known as National Ambient Air Quality Standards (NAAQS).

EPA standards address six pollutants known as *criteria air pollutants:* carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), and two types of particulate matter (PM_{10} and $PM_{2.5}$). Federal regulations require states to define areas for NAAQS as *attainment, non-attainment,* or *maintenance* areas. Areas defined as attainment meet NAAQS; non-attainment and maintenance areas have concentrations of pollutants that exceed NAAQS. States develop an EPA-approved State Implementation Plan (SIP) to address air quality and identify a plan to bring non-attainment and maintenance areas into compliance. Compliance with NAAQS means that ambient outdoor levels of defined air pollutants are safe for human health and the environment.

The EPA *Green Book of Nonattainment Areas for Criteria Pollutants* and the Washington State Department of Ecology *Status of Washington Designated Areas* indicate that PSC is considered to be in attainment for all criteria air pollutants, which is in compliance with NAAQS.

Biological Resources (Threatened and Endangered Species)

Section 7(a)(2) of the Federal Endangered Species Act (ESA) requires the FAA ensure that a proposed action does not jeopardize the continued existence of any endangered or threatened species or adversely affect its habitat. Project sponsors who seek federal agency approvals or funding must coordinate with the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) concerning listed or candidate species.

USFWS identifies federally listed threatened, endangered, or candidate species or their critical habitats. Based on data obtained from USFWS Environmental Conservation Online System (ECOS), the following species have the potential to occur on or near PSC: yellow-billed cuckoo (*Coccyzus americanus*); bull trout (*Salvelinus confluentus*); white bluffs bladderpod (*Physaria douglasii* ssp. *tuplashensis*); gray wolf (*Canis lupis*); and, Columbia basin pygmy rabbit (*Brachylagus idahoensis*).

A search of the USFWS Information for Planning and Consultation (IPaC) database indicates that the gray wolf, yellow-billed cuckoo, and bull trout may be found in Franklin County. However, there are no critical habitats located on airport property.

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) report identifies PSC property as part of a regular concentration area for black-tailed jackrabbit (*Lepus californicus*) and burrowing owl (*Athene cunicularia*). PSC is listed as a breeding area for the burrowing owl and greater sage-grouse (*Centrocercus urophasianus*).

Climate

The Council on Environmental Quality (CEQ) has indicated that global climate change should be considered in a NEPA analysis. However, CEQ states that, "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand." Scientific research is ongoing to better understand climate change, but any increased concentrations of greenhouse gases (GHGs) in the atmosphere can affect global climate change. GHGs are defined as including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Air analyses performed to support NEPA compliance will identify the extent to which GHGs could be produced during construction and operation of proposed master plan projects. The air quality analyses will occur as part of formal environmental analysis undertaken to comply with NEPA.

Coastal Resources

The Coastal Zone Management Act established the Federal Coastal Zone Management Program to encourage and assist states in preparing and implementing management programs to “preserve, protect, develop, and where possible, to restore or enhance the resources of the nation’s coastal zones.” PSC is not located in a coastal zone management area.

Construction Impacts

FAA Advisory Circular (AC) 150/5370-10, *Standards for Specifying Construction of Airports*, contains provisions to minimize impacts to air quality, water quality, and soil erosion associated with projects. The AC directs that construction and demolition debris be disposed of according to applicable state and federal criteria.

The construction of proposed master plan projects can cause temporary impacts associated with construction noise, air quality, traffic impacts on local roads, and the use and storage of fuel to operate construction vehicles and equipment. Best management practices are available to avoid or reduce temporary construction impacts. Potential construction impacts will be considered in forthcoming environmental analyses performed in accordance with NEPA.

Department of Transportation Section 4(f) Properties

Section 4(f) provides that the Secretary of Transportation “may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance, only if there is no feasible and prudent alternative to using that land and the program or project includes all possible planning to minimize harm resulting from the use.” The U.S. Department of Transportation Act – Section 4(f) protects certain properties from use for DOT projects unless the FAA determines there is no feasible and prudent alternative.

No Section 4(f) properties are known to be present on or near PSC. The nearest Section 4(f) property to PSC is the Sun Willows Golf Course located south of PSC.

Farmlands and soils

The Farmland Protection Policy Act (FPPA) was enacted to minimize the extent to which federal actions and programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. The FPPA classified farmland as prime farmland, unique farmland, or farmland of statewide or local importance. Prime farmland has the best combination of physical and chemical characteristics for producing food, forage, fiber, and oilseed crops. Unique farmland is land other than prime farmland used to produce specific high-value food and fiber crops such as citrus, tree nuts, olives, cranberries, fruits, and vegetables. Farmland of statewide or local importance includes soils that do not meet prime farmland criteria, but economically produce high yields of crops when treated and managed. A federal action that may result in conversion of farmland to non-agricultural use requires coordination with the U.S. Department of Agriculture Natural Resource Conservation Services (NRCS).

The NRCS online web soil survey system was used to identify soil types on the airport and adjacent property. Mapping and table details regarding the mapped soils within PSC are contained within the USDA/NRCS Soil Report. Airport soils are listed below in **Table 1-19**.

Table 1-19: Airport Soils

Soil Type	Percentage of Area of Interest (AOI)	Farmland Classification
Quincy loamy fine sand, 0 to 15 percent slopes	70.1%	Farmland of statewide importance
Urban land-Torripsamments complex, gently rolling	13.2%	Not prime farmland
Winchester loamy coarse sand, 2 to 5 percent slopes	8.1%	Not prime farmland
Royal loamy fine sand, 0 to 10 percent slopes	4.3%	Farmland of statewide importance
Novark silt loam, 2 to 5 percent slopes	1.5%	Prime farmland if irrigated
Quincy loamy fine sand, 15 to 30 percent slopes	1.0%	Not prime farmland
Quincy loamy fine sand, loamy substratum, 0 to 10 percent slopes	0.9%	Farmland of statewide importance
Burbank loamy fine sand, 0 to 5 percent slopes	0.7%	Not prime farmland
Royal fine sandy loam, 0 to 2 percent slopes	0.1%	Prime farmland if irrigated
Hezel loamy fine sand, 0 to 15 percent slopes	0.0%	Farmland of statewide importance

Source: USDA, NRCS, Soil Resource Report for Franklin County, WA, August 2018.

According to the NRCS, the Quincy loamy fine sand with 0 to 15 percent slope is the dominant soil type accounting for approximately 70.1 percent of the airport area. This soil type is considered farmland of statewide importance. The soil types and locations are shown on **Figure 1-12**.

The sandy soils are non-hydric soils (meaning non-wetland soils) and have a drainage class that falls within the excessively drained category. Vegetation consists of upland grasses, cheat-grass, and crested wheatgrass.

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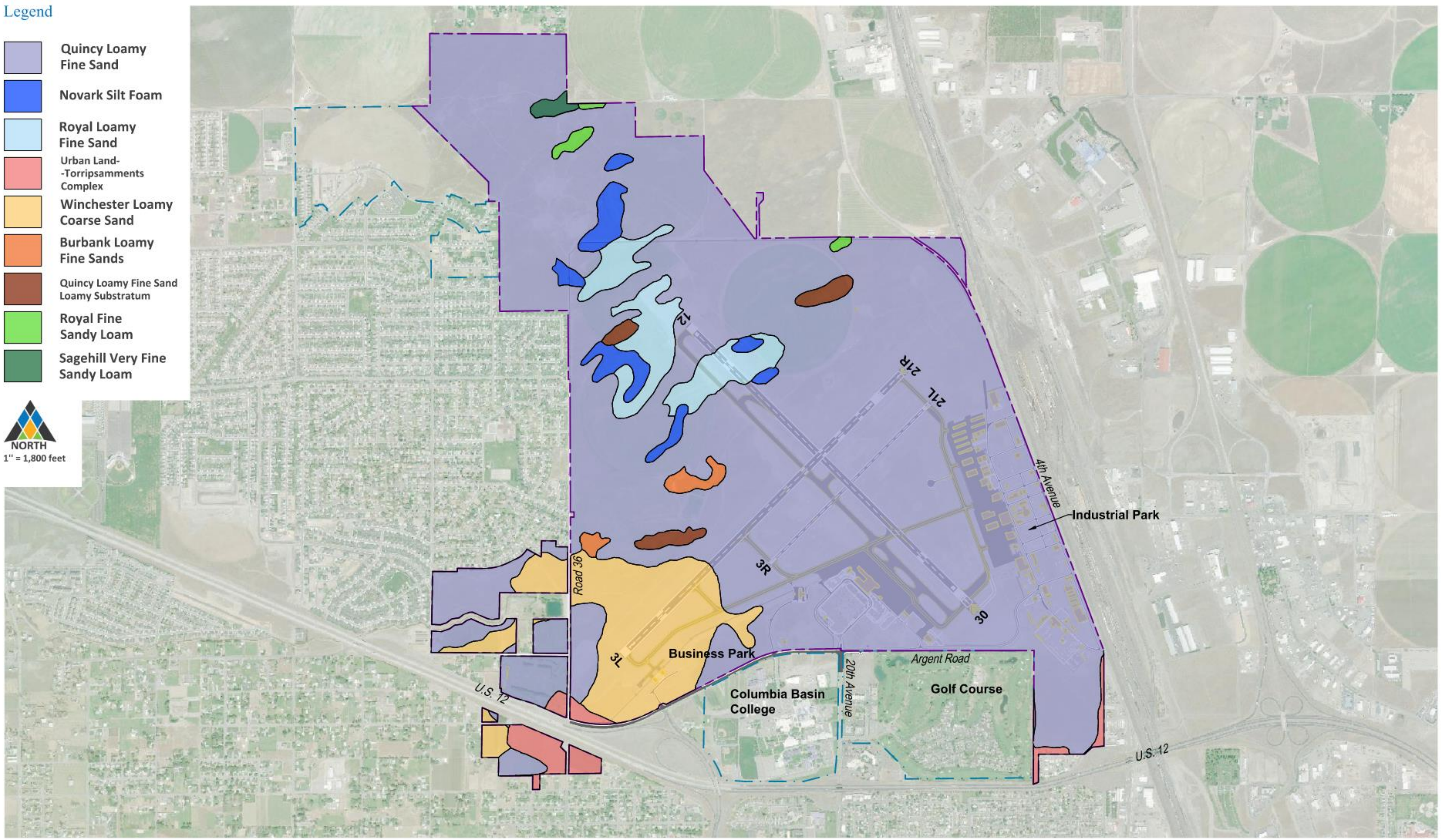
Figure 1-12: Soil Data



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Hazardous Materials, Pollution Prevention, and Solid Waste

Hazardous materials are defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) 42 United States Code (USC) 6901-6992. Hazardous materials include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or the environment.

The two statutes of concern to the FAA are the RCRA, as amended by the Federal Facilities Compliance Act, and the CERCLA, as amended by the Superfund Amendments Reauthorization Act (SARA) and by the Community Environmental Response Facilitation Act. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of release of a hazardous substance, excluding petroleum, into the environment.

Sites of interest are defined as state cleanup sites, federal superfund cleanup sites, hazardous waste generators, solid waste facilities, underground storage tanks, dairies, and enforcement actions. The State of Washington DOE Facility website noted several sites of interest on the airport property listed in **Table 1-20**.

Executive Order 12088, *Federal Compliance with Pollution Control Standards,* directs federal agencies to comply with applicable pollution control standards, in the prevention, control, and abatement of environmental pollution. The order also directs federal agencies to consult with the EPA, state, interstate, and local agencies concerning the techniques and methods available for the prevention, control, and abatement of environmental pollution.

Solid waste produced on site from construction operations is to be disposed of in accordance with the Washington Department of Environmental Quality (DEQ).

Table 1-20: Sites of Interest on PSC

Facility/Site Name	Facility/Site ID No.	Location	Status: Open/Closed
Astleys Tran	91627192	4302 Swallow Ave	Closed
US DOE BPA Pasco Maintenance HQ	67343615	3404 Swallow Ave Bldg 102	Open
J&D Aircraft Sales LLC	62999486	4218 Stearman Ave	Open
Rd 54 Boat Launch Improvement	8330893	N/A	Open
Road 54 Boat Launch	6861768	4316 N Stearman Ave	Open
HD Supply Waterworks	2094718	645 Lockheed St	Open
Tri City Fuel Association	72629964	Stearman Ave	Closed
Connell Oil	38665323	Pasco Airport Industrial Park	Closed
Pasco Rifle and Pistol Club	22813	602 Dynamics St	Open
Battelle Pacific NW Div Hangar 71	17176	3804 Stearman Ave	Open
Connell Oil Swallow Ave	1329543	3802 Swallow Ave	Open
Truax Harris Energy	3161252	3802 Swallow Ave	Open
Pasco School Dist 1	38161865	3412 Stearman Bldg 210	Open
Pasco Port Dicks U Drive	16491467	Argent Rd & Ave C	Closed
FedEx Express PSC	6593543	1705 W Argent	Closed
WA AGR Franklin 2	34759515	3416 Stearman Ave	Open
Pacific Fruit & Produce	51453993	Bldg 58 N 4th A	Closed
Franklin Co. Pub Works	87115	3414 Stearman Ave	Open
BPA PSC Maintenance Garbage	4776808	3618 Stearman Bldg 69	Open
Bergstrom Aircraft Inc	26669153	Bldg 72 Tri City Airport	Open
Franklin County Highway UST 4391	43564182	Bldg 202 Pasco Airport	Open
Tri Cities Airport	2125987	3601 N 20th Ave	Open
FAA PSC ATCT	25253	3601 N 20th Ave	Open
PSC TRACON	32877413	LAT 46 15 38 N	Open
US DHS TSA Tri Cities	4737143	3601 N 20th Ave	Open
Horizon Air Pasco	65829775	3601 N 20th Ave	Open
AVIS Rent A Car System	61147819	3601 N 20th Ave	Open
Power City Electric Inc	59789184	Bldg 35 Pasco Airport	Open
Delta Air Lines Inc	16766475	Tri Cities Airport	Open
US DOT FAA Pasco	36133324	Pasco Airport Bldg 1 87	Closed
Tri City Water Follies Assoc.	19466487	Bldg 72 Tri Cities Airport	Closed
Sun Mart 34	20730	2305 W Argent Rd	Open

Source: Department of Ecology, State of Washington, Facility/Site Search, September 12, 2018

Historical, Architectural, Archaeological, and Cultural resources

Historical, architectural, archaeological, and cultural resources encompass a range of sites, properties, and physical resources associated with human activities, society, and cultural institutions. Federal law requires project sponsors who require federal funds or approvals to consider how their proposed projects would affect historic properties. In accordance with NEPA and Section 106 of the National Historic

Preservation Act (NHPA), the FAA is the federal lead agency for identifying the potential impacts of a proposed project on these resources and consulting with the federally recognized tribes, the State Historic Preservation Office (SHPO), and other agencies as necessary.

Section 106 of the NHPA recommends measures to coordinate federal historic preservation activities and to comment on federal actions affecting historic properties included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). The Archaeological and Historic Preservation Act "provides the survey, recovery, and preservation of significant scientific, prehistorical, historical, archeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally licensed, or federally funded project."

A cultural resources survey and report was conducted for the Tri-Cities Airport East Development Area (12 acres) in August 2017. The goal of the survey was to locate all discoverable sites within, and adjacent to, the Area of Potential Effect (APE) that could have been impacted by proposed development projects. The survey team discovered no prehistoric cultural resources within or adjacent to the 12-acre site. The survey team did not identify any historic sites within the survey area. No pre-contact, historic sites, or isolated finds were identified within the 12-acre site. The survey concluded that the proposed 12-acre East Development project would have "no effect" on any NRHP eligible sites since there were no NRHP sites located in the APE.

Sixteen archaeological and cultural resource surveys were conducted previously within an approximate 1-mile radius of PSC. The survey conducted nearest to the airport property was conducted by Transect Archaeology in 2012 (NADB# 1689507). The 16 surveys did not identify prehistoric or historic sites on the Airport. However, a 2012 cultural and archeological survey completed by Transect Archaeology prior to a 12-acre apron construction project noted the presence of a WWII era bunker outside of the survey's boundary on airport property, confirming the potential for the presence of WWII era historic cultural resources in the vicinity of PSC. This site should be reviewed under a NEPA analysis on a project to project basis.

The Pasco Naval Air Station is located on airport property and identified in the Washington Information System for Architectural and Archaeological Records Database (WISAARD). The station includes: hangars; a link trainer building; an assembly and repair building; supply warehouses; inflammable stores; public works shops; a service station; free gunnery training; a central heating plant; a parachute loft; the firehouse; and the brig. The station is not listed on the NRHP. This environmental overview did not include research or evaluations to determine whether inventoried buildings qualify as eligible for listing in the NRHP. The eligibility of these sites may need to be evaluated with future development.

Land Use

Compatible land use protects the health, safety, and welfare of those living and working near PSC, while protecting airspace for safe and efficient aircraft operations. Airports that receive federal funds must prevent the development of incompatible uses on land and ensure that proposed airport actions, including the adoption of zoning laws, have 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 activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. Compatible land use will be addressed in the Land Use Chapter.

Natural Resources and Energy Supply

Energy or natural resources impacts result from implementation of projects that have a measurable effect or result in significant changes in the use or demand placed on local supplies. Energy requirements associated with an airport usually fall into two categories: demands for stationary facilities and demands for the movement of air and ground vehicles.

FAA guidance states that airport improvement projects not increase the consumption of energy or natural resources to the point of significant impacts, unless it is found that implementation of a project would cause demand to exceed supply. Airport improvement projects may cause increased energy consumption during construction, but increases are expected to be temporary and not significant.

Noise and Noise-Compatible Land Use

According to the FAA Order 1050.1F, Desk Reference, Chapter 11, Noise and Noise-Compatible Land Use, “noise” is defined as unwanted sound that may interrupt activities such as sleep, conversation, or student learning. Aviation noise typically comes from the operation of aircraft during departures, arrivals, overflights, taxiing, and engine run-ups.

The Control and Abatement of Aircraft Noise and Sonic Boom Act of 1986 authorizes the FAA to prescribe standards for the measurement of aircraft noise and establish regulations to abate noise. The Noise Control Act of 1972, which amends the Control and Abatement of Aircraft Noise and Sonic Boom Act of 1986, adds consideration of the protection of public health and welfare and adds the EPA to the rulemaking process for aircraft noise and sonic boom standards.

Per FAA Order 1050.1F, projects at airports that experience 90,000 annual piston-powered aircraft operations, 700 annual jet-powered aircraft operations, citing a new airport, runway relocation, runway strengthening, or a major runway expansion require a noise analysis including noise contour maps. PSC meets these criteria. Further noise analysis is included in the Land Use Chapter.

Socioeconomic, Environmental Justice, Children’s Environmental Health and Safety Risks

Council on Environmental Quality regulations in 40 CFR, Section 1508, requires environmental documents prepared for federally funded projects to address potential social impacts.

The evaluation of a proposed project on the human environment must address the following:

- Disproportionate impacts to low-income and minority populations
- Potential relocation of homes or businesses
- Division or disruption of an established community
- Disruptions to orderly planned development
- Notable project-related changes in employment
- Impacts on health and safety risks to children

Socioeconomic Impacts

Improvements at PSC are not expected to create significant change in population, public service, and economic activity, but are expected to have positive impacts through creation of employment opportunity, business growth, and economic activity. According to a search of the United States Census Bureau Small Area Income and Poverty Estimates database, the poverty level in Franklin County is 14.9 percent. Resource agencies should be coordinated with prior to implementation.

FAA Order 1050.1F states, "If acquisition of real property or displacement of persons is involved, 49 CFR Part 24 (implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), as amended, must be met for federal projects and projects involving federal funding. Otherwise, the FAA, to the fullest extent possible, observes all state and local laws, regulations, and ordinances concerning zoning, transportation, economic development, housing, etc. when planning, assessing, or implementing the proposed action or alternative(s)."

Environmental Justice

FAA Order 1050.1F states, "…the FAA must provide for meaningful public involvement by minority and low-income populations. In accordance with DOT Order 5610.2(a), this public involvement must provide an opportunity for minority and low-income populations to provide input on the analysis, including demographic analysis, which identifies and addresses potential impacts on these populations that may be disproportionately high and adverse."

If an impact would affect low-income or minority populations at a disproportionately higher rate, an environmental justice impact is likely. In such cases, the environmental documents are expected to include the following:

- Demographic information about the affected populations
- Information about the population(s) that have an established use for the significantly affected resource, or to whom that resource is important (i.e. subsistence fishing)

- Results of analysis to determine if a low-income or minority population using that resource sustains more of the impact than any other population segments
- Identification of disproportionately affected low-income and minority populations
- Discussion of alternatives that would reduce the effect on those populations
- Description of possible mitigation to reduce the effect on the disproportionately affected low-income and minority populations

The NEPA process requires environmental justice review and impact analysis for airport improvements. According to a search of the United States Census Bureau Population Estimates Program, the percentage of minority populations is 9.9 percent in Franklin County.

Children's Environmental Health and Safety Risks

FAA Order 1050.1F states "Pursuant to Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, Federal agencies are directed, as appropriate and consistent with the agency's mission, to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. The FAA is encouraged to identify and assess environmental health risks and safety risks that the agency has reason to believe could disproportionately affect children. Environmental health risks and safety risks include risks to health or safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to."

McGee Elementary School is located approximately 0.25 miles from PSC property. According to a search of the United States Census Bureau Population Estimates Program database, the percentage of children under 18 is 22.6 percent in Franklin County.

Light Emissions and Visual Impacts

FAA Order 1050.1F defines light emissions as light that emanates from a light source into the surrounding environment (i.e. airfield and apron flood lighting, NAVAIDs, terminal lighting, parking lighting, roadway lighting, safety lighting). Visual resources may include structures or objects that obscure or block other landscape features (i.e. buildings, sites, traditional cultural properties, or other manmade landscape features).

Lighting for aviation security, obstruction identification, and navigation can be considered light emissions. The introduction of a new, or relocation of an existing, airport lighting facility is to be analyzed for effect on residential or other light sensitive land uses. The nearest residential area is located approximately 2,300 feet to the west of the Runway 12 threshold with an unobstructed line of sight. Light emissions and visual impacts should be reviewed under a NEPA analysis on a project to project basis.

Water Resources

Wetlands

The Clean Water Act (CWA) defines wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Federal regulations require that proposed actions avoid, to the greatest extent possible, long-term and short-term impacts to wetlands, including the destruction and altering of the functions and values of wetlands.

The USFWS National Wetlands Inventory (NWI) online mapping system was reviewed to identify mapped wetlands near PSC. According to the NWI, a freshwater emergent wetland fed by a riverine habitat is located on the southwest side of airport property, as well as a riverine habitat that enters airport property from the north and flows southwest. (See **Figure 1-13**)

Floodplains

A floodplain is generally a flat, low-lying area adjacent to a stream or river that is subject to inundation during high flows. The relative elevation of a floodplain determines its frequency of flooding.

Executive Order 11988 requires federal agencies "to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of 100-year floodplains (i.e., areas subject to inundation by a 1 percent annual chance of flood) and to avoid direct or indirect support of floodplain development whenever there is a practical alternative."

The State of Washington Department of Ecology (DOE) Flood Hazard Areas identifies floodplains contained within the airport area. Flood Insurance Rate Maps identify the northern airport area in Zone A floodplain with a "High – 1% annual chance" of flood risk.

Surface Waters

Surface water is water that occurs above ground such as a wetland, river, stream or lake. Aside from wetlands (see **Figure 1-13**), no surface water resources occur on airport property. The nearest major surface water is the Columbia River, which is located approximately 3 miles south of PSC.

Groundwater

Groundwater is a subsurface water that occupies the space between sand, clay, and rock formations. Aquifers are the geologic layers that store or transmit groundwater to wells, springs and other water sources. The Safe Drinking Water Act and its implementing regulations (40 CFR Parts 141-149) prohibit federal agencies from funding actions that would contaminate an EPA-designated sole source aquifer or its recharge area. State and local agencies may also promulgate regulations to protect sole source aquifers and their recharge areas.

The State of Washington DOE's Environmental Information Management System for groundwater sources lists six monitoring wells on airport property. However, there were no sole source aquifers or recharge areas identified.

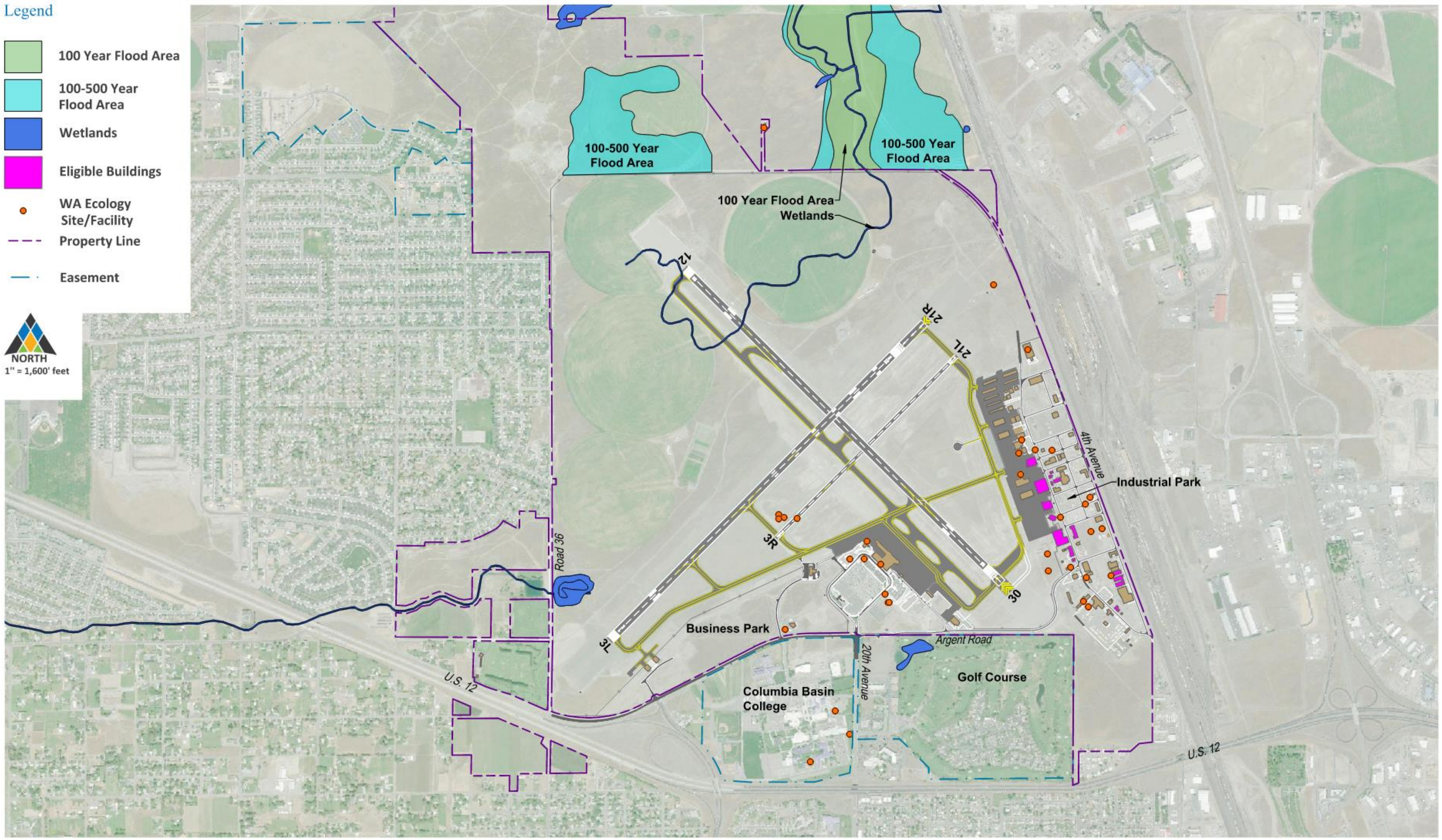
In November 2005, the DOE determined that PSC is exempt from permitting under the General Permit as the airport drains to the underground water table and PSC has not been deemed a significant contributor of pollutants to groundwater.

Wild and Scenic Rivers

Wild rivers are free of obstructions such as canals and dams, and normally so remote as to only be accessible by trail. Scenic rivers are free of obstructions and have undeveloped shorelines but may have road access. Wild and scenic rivers are protected by the 1986 Wild and Scenic Rivers Act. Wild and scenic rivers are managed by the Bureau of Land Management, the National Park Service, the USFWS, and the U.S. Forest Service.

A review of the National Wild and Scenic Rivers System indicated there are no wild and scenic rivers within or around PSC. The nearest wild and scenic river is the Wenaha River in Oregon, which is approximately 67 miles away.

Figure 1-13: Environmental Considerations



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SUMMARY

PSC serves a wide variety of general and commercial aviation users. PSC and the FAA continue to invest in aviation facilities to support current and future use of PSC. PSC continues to serve as a link to the NAS. These key airport attributes identified in this Inventory and Environmental Chapter will be assessed and evaluated in further detail:

- Runway Length for Runway 12/30 to meet demands of existing and future critical aircraft
- Future taxiway width requirements for transition from TDG 5 to TDG 3 design group critical aircraft
- Expansion of GA Apron to provide additional tie-down parking
- Evaluation of two existing taxiway and runway intersection hotspots to identify potential solutions

NEXT STEPS

The Forecast Chapter will evaluate current activity levels, and the factors that affect activity level at an airport including national trends and regional socio-economic factors, such as population, employment, income levels, and economic development. The Forecast Chapter evaluates aircraft fleet mix for potential changes to the designated critical aircraft category. The critical aircraft designation in turn affects runway and taxiway design criteria dimensions, which are discussed in the Facilities Requirements Chapter.

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CHAPTER 2

AVIATION ACTIVITY FORECASTS

CHAPTER 2 - AVIATION ACTIVITY FORECASTS

CHAPTER OVERVIEW

Aviation activity forecasts help determine if existing airport facilities have the capacity to meet future demand (passenger, cargo, operational, and based aircraft) or if facility modifications are needed. The FAA Seattle Airports District Office will review forecasts for rationality and comparison to the FAA TAF.

The chapter is organized in the following sections:

- Community Profile
- Aviation Activity Profile
- Scheduled Service Forecasts
- General Aviation Forecasts
- Peaking and Critical Aircraft
- Forecast Summary

FORECAST SUMMARY

The Kennewick-Richland Metropolitan Statistical Area (MSA) in Washington State is made up of Benton and Franklin Counties. An MSA is a geographical region defined by the U.S. Office of Management and Budget with at least one urbanized area of over 50,000 people with adjacent counties having close economic ties. The Kennewick-Richland MSA is the third largest in Washington and is growing across population and economic indicators. The cities of Kennewick, Pasco, and Richland (Tri-Cities) anchor the MSA. The Tri-Cities area has been one of the fastest growing areas in Washington between 2007 and 2017. The population has grown by 21 percent; total employment by 27 percent; and gross regional product (GRP) by 39 percent. The region was not as affected by the 2009 recession as the rest of the United States due to the high level of federal funding attracted by the U.S. Department of Energy's Hanford Site located northwest of the MSA. The MSA socioeconomic indicators are forecasted to increase in the next 20 years. MSA population is expected to grow an average 1.6 percent annually and the GRP by 2.0 percent annually, while national GDP is also expected to grow at an average 2.0 percent annually.

The regional socioeconomic growth is reflected in the growth in aviation activity at PSC. From 2007 to 2017, passenger enplanements have grown an average of 7.3 percent annually. The growth is expected to continue during the forecasting period at an average of 3.1 percent annually. Air carrier operations are forecasted to shift towards larger aircraft with more seats which will be balanced out with lower frequency to keep load factors at an estimated 80 percent. This is in line with the nation-wide trend of narrow-body jets replacing smaller jets. Air cargo volume has declined by 2.1 percent over the same period, reflecting a global movement towards electronic mail substitutes, increased air cargo screenings, and a shift towards truck transport. The Federal Aviation Administration (FAA) Aerospace Forecast indicates that this shift to trucks has mostly already occurred and predicts air cargo volumes will stabilize in the future. General aviation (GA) is expected to grow slowly over time, however there are multiple airports in the region that compete for market share, especially regarding GA. A summary of the demand forecasts is presented in **Table 2-1**, and the methodology behind each forecast variable is explored in this chapter.

Table 2-1: Forecast Summary

Fiscal Year	2007	2017	2037	CAGR ('17-'37)
Enplanements	238,471	379,624	691,000	3.0%
Air Cargo (Tons)	1,635	2,372	1,860	-1.2%
Operations	64,069	47,616	53,130	0.5%
Itinerant Operations				
Air Carrier	6,491	9,569	14,130	2.0%
Air Taxi	15,234	4,728	2,000	-4.2%
Itinerant GA	20,518	14,140	16,000	0.6%
Itinerant Military	716	1,380	1,400	0.1%
Local Operations				
Local GA	20,063	15,461	17,300	0.6%
Local Military	1,047	2,338	2,300	-0.1%
Based Aircraft	111	121	123	0.1%
Single Engine Piston	83	80	69	-0.7%
Jet and Turbo Prop	6	14	26	3.1%
Multi Engine Piston	17	23	19	-1.0%
Helicopter	5	4	4	0.0%
Other / Experimental	0	0	5	N/A

2017 Air Carrier and Air Taxi Operation counts are from T-100 and the difference from TAF records is explained in Section 3, Aviation Activity Profile
Other = Light sport aircraft, gliders, experimental aircraft, ultralights, UAS
CAGR = Compound Annual Growth Rate
Source: 2018 TAF, U.S. DOT T-100

INTRODUCTION TO FORECASTS

Aviation activity forecasts evaluate future demand at an airport. This chapter will analyze and forecast the following activity levels at PSC:

- Passenger Enplanements
- Air Cargo Volume
- Based Aircraft
- Itinerant and Local Operations

The forecasts have a base year of 2017 and use the FAA fiscal year (October to September). The forecast period is 20 years from the base year with reporting intervals of every five years. Each topic is evaluated using multiple forecasting methods and is compared to the 2018 FAA Terminal Area Forecast (TAF), released in January 2019. Data from the past ten years (2007 to 2017) is used as the basis of analysis of historical trends. Using the previous ten years includes periods of economic expansion and contraction that help forecasts account for various economic conditions and gives a perspective on the effects of economic change on aviation activity.

Definitions for terms used the chapter may be found in the Glossary (**Appendix E**).

Table 2-2 describes the data sources used in this chapter.

Table 2-2: Description of Data Sources

Source	Description
FAA Traffic Flow Management System Counts Data (TFMSC)	The TFMSC includes data collected from flight plans. These operations are categorized by aircraft type and used to identify trends in the PSC fleet mix. The advantage of the TFMSC data is its degree of detail and its insights into the itinerant users of PSC. A disadvantage of TFMSC data is that it does not include local operations or operations that did not file a flight plan. As such, the utility of TFMSC data is limited to larger aircraft, including scheduled commercial passenger, cargo, and charter operations, and private business jets.
FAA TAF	The FAA TAF, published in February 2019, provides historical records and forecasts for passenger enplanements, aircraft operations and based aircraft at PSC. These forecasts serve as a comparison for forecasts prepared as part of this planning effort and provide historical information on aircraft activity. The TAF is included as **Attachment 1.**
FAA Aerospace Forecast	The Aerospace Forecast 2018-2038 is a national-level forecast of aviation activity. The Aerospace Forecast helps guide local forecasts by serving as a point of comparison between local trends and national trends.
U.S. Department of Transportation (USDOT) T-100 Database	Scheduled, charter passenger, and air cargo airlines fill out the T-100 form monthly. The T-100 database is an online repository of the data recorded on the forms, such as number of seats sold, number of seats available, freight transported, aircraft used, and departures performed. The T-100 provides a detailed look at the operations of passenger and cargo airlines.
Socioeconomic Data	Socioeconomic data is provided by data vendor Woods & Poole Inc. (W&P). W&P provides data for gap years in the U.S. Census. The W&P dataset considers the Kennewick-Richland MSA, which is equivalent to the boundary of Benton and Franklin Counties. The dataset provides 124 data categories with records from 1970 to 2016 and forecast through 2040. Data categories considered include employment, earnings and income, and GRP.

	Historical and forecasted population data was provided by the Washington State Office of Financial Management (OFM). Population data for Benton and Franklin counties were added together to get total population of the MSA. The OFM population data was used for forecasting over W&P population data since local city/county/regional planning agencies use OFM population data. The Tri-City Development Council (TRIDEC) and Eastern Washington University provided information about local population, employment and economic activity trends in the MSA.
Stakeholder Interviews	The Consultant conducted interviews with stakeholders during site visits. Interviews included the Air Traffic Control Tower (ATCT), Transportation Security Administration (TSA), Aircraft Rescue and Fire Fighting (ARFF), FAA Tech Ops, and fixed based operators, the City of Pasco, Franklin County, Benton-Franklin Governmental Conference, and TRIDEC. Airlines interviewed were Horizon Air (operating for Alaska), SkyWest Airlines (operating for United and Delta Airlines), and Allegiant Air.
FlightWise	FlightWise is a third-party data provider that keeps records of instrument flight plans.
OPSNET	OPSNET (Operations Network) is the source of National Airspace System (NAS) air traffic operations and delay data. Provided information about IFR (instrument flight rules) and VFR (visual flight rules) operations.
Washington State Aviation System Plan Report (WASP)	The Washington State Department of Transportation (WSDOT)'s Aviation Division plans and advocates for the preservation of aviation facilities, safe air transportation, airport capacity to meet demand, and mitigation of environmental impacts. The WASP is part of long-term planning to address the challenge and maintaining and improving the state aviation system. The WASP focuses on public-use airports throughout the state. The report analyzes existing facilities, evaluates future needs, and provides policy recommendations for future development.

COMMUNITY PROFILE

Population

The State of Washington's Office of Financial Management (OFM) provides estimates of state and local population and monitors changes in state economy, labor, state budget, and public policy research. The historical population estimate uses decennial (10-year) census counts, state-certified special census counts, and estimates from between census years. The OFM forecast uses the most recent decennial census and incorporates multiple factors such as fertility, mortality, and migration trends to forecast the total population. The OFM population forecast projects three different growth rates – low, medium, and high. The medium population forecast is selected for this demand forecast chapter because this same forecast is used by the cities of Pasco, Richland, and Kennewick; Benton and Franklin counites; and the Benton-Franklin Council of Governments for their long-range planning. **Figure 2-1** shows the area covered by the MSA.

Table 2-3 shows historical and forecasted population data from 2007 to 2037 by the OFM. Based on the OFM data, MSA population grew at a compound annual growth rate (CAGR) of 1.9 percent between 2007 and 2017, the total population increasing by more than 49,000. The OFM projects the population growing from 283,830 to 393,509 between 2017 and 2037, a CAGR of 1.6 percent. Major drivers of population growth include the growing healthcare industry and family growth from the many young, large families settled in the region.

Table 2-3: Kennewick-Richland MSA Population

Calendar Year	Population	Percent Change
2007	234,678	-
2012	262,500	11.9%
2017	283,830	8.1%
2022	313,117	10.3%
2027	339,703	8.5%
2032	366,665	7.9%
2037	393,509	7.3%
CAGR (2007-2017)	1.9%	N/A
CAGR (2017-2037)	1.6%	N/A
CAGR = Compound Annual Growth Rate Source: Washington Office of Financial Management Medium Forecast		

Figure 2-1: **Map of Kennewick-Richland Metropolitan Statistical Area**

Employment and Economic Development

The employment rates of the Kennewick-Richland MSA were not greatly impacted by the 2007-2009 recession. Total employment increased at an annual average rate of 2.4 percent from 2007 to 2017. Based on Woods & Poole forecasts, employment is expected to continue to grow at an average annual rate of 1.8 percent.

Job diversity has increased as the MSA moves beyond employment related to the Hanford Site to other top employers in the Tri-Cities area, such as:

- Pacific Northwest National Laboratory (PNNL) – A Department of Energy (DOE) national laboratory
- Kadlec Regional Medical Center – Not-for-profit private regional healthcare system
- Lamb Weston – Processing and manufacturing of potato and vegetable products
- Bechtel National – Engineering and construction firm working on the Hanford Waste Treatment Plant
- Kennewick School District – Local school district and largest employer in the city of Kennewick
- Washington River Protection Solutions – A contractor working on the Hanford Site

The Hanford Site located along the Columbia River in Benton County is listed as a Superfund site that requires environmental remediation of nuclear waste. The site employs over 9,000 DOE federal and contractor employees and has been a consistent employer in the MSA. The Hanford site is a reliable source of employment for the foreseeable future as the cleanup mission is expected to continue to 2050 or even to 2060.

The employment rate for the site is relatively flat with predicted changes involving a shift from trade-oriented jobs to more technical jobs as cleanup operations progress. Technical jobs are more likely to demand higher wages as positions require specialists in their field. The shift towards more specialized technical jobs will likely result in more travel as specialists from other regions of the country travel to the site. **Table 2-4** presents the total employment and employment per capita. The employment rate has been steady at 0.52 jobs per capita from 2007 to 2017 as MSA population has grown. This is indicative of the region's resilience. Based on the Woods & Poole forecast, employment per capita is expected to continue growing at an average annual rate of 0.3 percent for the next 20 years.

Table 2-4: Kennewick-Richland MSA Employment

Calendar Year	Total Employment	Percent Change	Employment per Capita
2007	117,523		0.52
2012	137,445	17%	0.52
2017	148,777	8%	0.52
2022	166,800	12%	0.54
2027	181,647	9%	0.55
2032	196,798	8%	0.55
2037	211,771	8%	0.56
Compound Annual Growth Rates			
2007-2017	2.4%	N/A	0.0%
2017-2037	1.8%	N/A	0.3%

GRP per Capita = GRP / Total Population.
GRP is inflation-adjusted 2017 dollars
Sources: Employment: Woods & Poole, Population: Washington State Office of Financial Management

The Pacific Northwest National Laboratory (PNNL) is the top single employer in the Tri-Cities area, with 4,500 government employees according to TRIDEC data. The government sector has been a major and consistent source of employment in the MSA, even becoming the top employer in 2017. Having the Hanford Site and PNNL in the area means the Tri-Cities have the most scientists and engineers per capita in the United States. Agriculture also remains a top source of employment with the Lamb Weston plant employing 3,000 people. The growth in the health care industry is also further diversifying local employment and economic development. It is expected that health care employment will outpace government employment in the future. Retail sales data show gas station retail sales dropping out of the top 5 after 2012 with the eating and drinking places growing and taking over the fourth spot over building material sales. **Tables 2-5 and 2-6** show the top industries by employment and sales. Looking past individual companies and at local industries, the health care sector will return to be the top employer as government employment stabilizes and health care grows. State and federal government employment also includes government employees working on the Hanford Site and PNNL.

Table 2-5: **Kennewick-Richland MSA Top 5 Industries by Employment and Sales (2007-2017)**

Top 5 Industries by Employment								
Rank	2007		2012			2017		
	Industry	Jobs	Industry	Jobs	Δ	Industry	Jobs	Δ
1	State + Local Gov't	15,097	State + Local Gov't	16,991	12.5%	State + Local Gov't	18,748	26.8%
2	Retail Trade	14,344	Retail Trade	14,789	3.1%	Retail Trade	17,627	23.1%
3	Professional + Tech Serv.	13,374	Health Care	14,324	7.1%	Health Care	16,460	-3.1%
4	Health Care	10,808	Professional + Tech Serv.	13,489	24.8%	Professional + Tech Serv.	13,341	-1.1%
5	Admin + Waste Serv.	9,726	Admin + Waste Serv.	12,005	23.4%	Admin + Waste Serv.	12,723	6.0%
Top 5 Industries by Retail Sales								
Rank	2007		2012			2017		
	Industry	Sales ($M)	Industry	Sales ($M)	Δ	Industry	Sales ($M)	Δ
1	Motor Vehicles	$741.73	Motor Vehicles	$812.29	9.5%	Motor Vehicles	$1051.66	29.5%
2	General Merchandise	$671.53	General Merchandise	$749.13	11.6%	General Merchandise	$784.33	4.7%
3	Food + Bev Retail	$401.20	Food + Bev Retail	$434.06	8.2%	Food + Bev Retail	$489.76	12.8%
4	Gas Station Retail	$323.82	Gas Station Retail	$362.94	12.1%	Eating + Drinking Places	$416.93	29.6%
5	Building Materials	$290.99	Eating + Drinking Places	$321.69	25.0%	Building Materials	$310.38	30.2%

Table 2-6: **Kennewick-Richland MSA Top 5 Industries by Employment and Sales (2017-2037)**

Top 5 Industries by Employment								
Rank	2017		2027			2037		
	Industry	Jobs	Industry	Jobs	Δ	Industry	Jobs	Δ
1	State + Local Gov't	18,748	Health Care	23,177	40.8%	Health Care	30,858	33.1%
2	Retail Trade	17,627	State + Local Gov't	22,634	20.7%	State + Local Gov't	26,691	17.9%
3	Health Care	16,460	Retail Trade	21,353	21.1%	Retail Trade	24,832	16.3%
4	Professional + Tech Serv.	13,341	Professional + Tech Serv.	15,797	18.4%	Professional + Tech Serv.	18,639	18.0%
5	Admin + Waste Serv.	12,723	Admin + Waste Serv.	14,035	10.3%	Admin + Waste Serv.	15,321	9.2%
Top 5 Industries by Retail Sales								
Rank	2017		2027			2037		
	Industry	Sales ($M)	Industry	Sales ($M)	Δ	Industry	Sales ($M)	Δ
1	Motor Vehicles	$1051.66	Motor Vehicles	$1206.18	14.7%	Motor Vehicles	$1362.10	12.9%
2	General Merchandise	$784.33	General Merchandise	$1021.43	30.2%	General Merchandise	$1239.97	21.4%
3	Food + Bev Retail	$489.76	Food + Bev Retail	$544.98	11.3%	Food + Bev Retail	$640.74	17.6%
4	Eating + Drinking Places	$416.93	Eating + Drinking Places	$516.68	23.9%	Eating + Drinking Places	$604.86	17.1%
5	Building Materials	$310.38	Building Materials	$394.51	27.1%	Building Materials	$448.14	13.6%

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GRP

GRP is the value of goods and services produced in the MSA and serves as an index for the health of the overall economy. GRP grows as the economy increases by producing more goods that are more valuable. The GRP per capita shows that the 2007-2009 recession did not impact the MSA as it has other communities. This is largely due to the presence of the Hanford Site, which receives consistent federal funding through the American Recovery and Reinvestment Act of 2009 even during the recession.

Woods & Poole projections show that the GRP will increase at a higher rate than the MSA population. This can be explained by the increasing production of high value goods and services in the healthcare and technical research industries. These industries produce higher value goods per person than agriculture. **Table 2-7** shows the MSA GRP from 2007 to 2037.

Table 2-7: Kennewick-Richland MSA Gross Regional Product

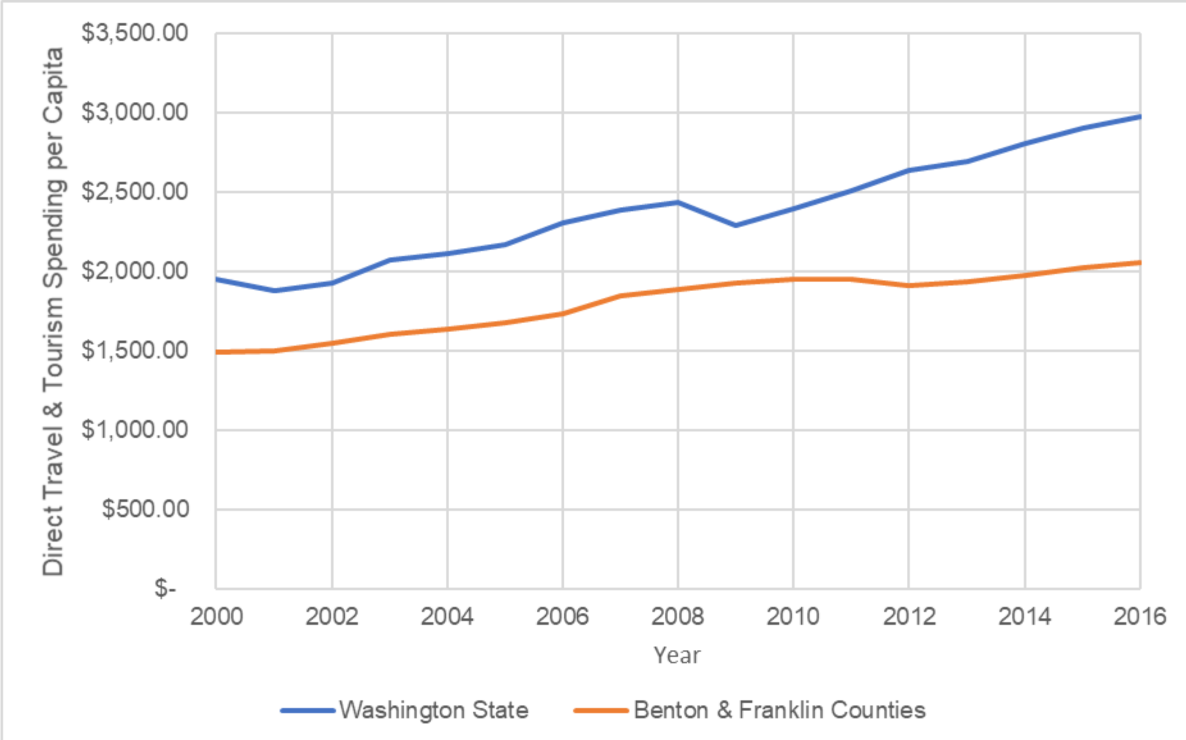
Calendar Year	GRP ($M)	Percent Change	GRP ($M) per Capita
2007	$9,543	--	$0.041
2012	$12,914	35%	$0.049
2017	$13,264	39%	$0.047
2022	$14,819	12%	$0.047
2027	$16,365	10%	$0.048
2032	$18,023	10%	$0.049
2037	$19,747	10%	$0.050
Compound Annual Growth Rates			
2007-2017	3.3%	N/A	1.4%
2017-2037	2.0%	N/A	0.4%

GRP per capita = GRP / Total Population.
GRP is inflation-adjusted 2017 dollars
Sources: GRP: Woods & Poole, Population: Washington State Office of Financial Management

Tourism

Figure 2-2 shows tourism spending per capita increased at a CAGR of 1.7 percent from 2006 to 2016 (data provided by the Tri Cities Visitor and Convention Bureau did not include 2017 data). Overall per capita travel and tourism spending is lower than that of the rest of the state of Washington; however, there is tourist traffic that passes through the Tri-Cities to visit the region's wineries. While tourism is not considered a driving factor for passenger enplanements, it is a growing industry. PSC does not currently survey passengers to determine if they are traveling for tourism purposes.

Figure 2-2: Per Capita Direct Travel and Tourism Spending



Tourism impacts to hospitality facilities vary by day of the week. Hotels are mainly filled with business travelers on the weekdays. Sporting events and wineries in the area attract travelers on the weekends. Geographically, the Tri-Cities are located near the confluence of the Yakima, Snake, and Columbia Rivers. The Tri-Cities Visitor and Convention Bureau promotes these waterways as attractions for locals and visitors to partake in sailing, boating, fishing, and other water related activities. Other notable attractions mentioned in the area include 10 golf courses, and pedestrian and bike trails.

Regional General Aviation Airports

Figure 2-3 shows the catchment area and the locations of the GA airports. **Table 2-8** describes neighboring airports, primary markets, and key facilities. The presence of these airports offers users a variety of choices, services, and competition. See **Chapter 1** for more detail about each airport.

Figure 2-3: **Regional General Aviation Airports in PSC Catchment Area**

Table 2-8: Regional General Aviation Airports

Airport	Characteristics			Primary Markets			
	Primary Runway Length	IAP	Jet A	Large Jets	Small Jets	Turbo-Props	Piston
Tri-Cities Airport (PSC)	7,711' (3L/21R)	Precision	Yes	Yes	Yes	Yes	Yes
Walla Walla Regional (ALW)	6,527' (2/20)	Precision	Yes	Yes	Yes	Yes	Yes
Eastern Oregon Regional (PDT)	6,301' (7/25)	Non- Precision	Yes	No	Yes	Yes	Yes
Hermiston (HRI)	4,500' (5/23)	No	Yes	No	No	Yes	Yes
Prosser (S40)	3,451' (8/26)	No	No	No	No	Yes	Yes
Richland (RLD)	4,009' (1/19)	Non- Precision	Yes	No	No	Yes	Yes
Yakima (YKM)	7,604' (9/27)	Non- Precision	Yes	Yes	Yes	Yes	Yes

IAP = Instrument Approach Procedure. Precision = vertically and laterally guided. Non-precision = laterally guided only.
Source: FAA Airport Facilities Directory. Market determination based on instrumentation, runway length, and fuel availability.

The primary market of an airport reflects the presence of facilities and services available at an airport that cater to the needs of a specific market. For example, piston aircraft owners typically have fewer requirements of the airport where they choose to base their aircraft than business jet owners. Business jets typically require longer runways to operate at full payload and require operational capability regardless of weather conditions, which requires airport instrumentation. Piston aircraft do not generally operate during low visibility weather conditions and do not need Jet A fuel or long runways.

PSC and Yakima Air Terminal (YKM) are the only two airports in the catchment area that can serve large jets. PSC is the only airport in the catchment area that has precision landing instrumentation. This makes PSC appealing to users who require instrumentation to operate. PSC also has a control tower that may deter some GA users who prefer to fly without oversight. These users might prefer to base their aircraft at airports without towers such as Hermiston (HRI), Prosser (S40), or Richland (RLD).

AVIATION ACTIVITY PROFILE

The aviation activity profile provides context for historical trends in airport activity and attempts to explain the changes that have occurred. The profile serves as a baseline for the forecasts and includes information on passenger and air cargo airline service, GA, and military aviation activity.

The PSC Air Traffic Control Tower (ATCT) and Terminal Radar Approach Control (TRACON) track flights from 6:00 a.m. to 10:00 p.m. Operations that occur outside of these hours are not included in records submitted to the FAA. Commercial airline operations are reported to the U.S. Department of

Transportation (USDOT) and captures operations occurring outside of ATCT operating hours. USDOT does not record GA operations. FlightWise.com records capture GA operations that file Instrument Flight Rules (IFR) flight plans and exclude those that do not.

Airline Service

Airline service encompasses scheduled passenger flights, cargo flights, and non-scheduled charter flights. The following sections describe the airline profile, opportunities for additional air service, passenger enplanements, commercial operations, and air cargo service at PSC.

Airline Profile

Four scheduled passenger airlines served PSC in 2017: Delta Air Lines, Alaska Airlines, United Airlines, and Allegiant Air. Alaska is operated by regional airline Horizon Air and SkyWest Airlines, Compass Airlines, and GoJet Airlines operate Delta and United flights. Airlines serving PSC provide non-stop service to Seattle (SEA), Portland (PDX), Los Angeles (LAX), Las Vegas (LAS), Phoenix-Mesa (IWA), Salt Lake City (SLC), Denver (DEN), and Minneapolis (MSP). LAX flights have operated seasonally with daily service starting in March 2019. The others operate throughout the year.

The 2017 Alaska Air Group pilot shortage had some effect on service to Pasco. Flights operated under the Alaska Airlines brand were serviced by the CRJ200 which has 26 fewer seats than the Q400 aircraft that historically operate the Seattle route. However, the net impact on passenger activity at PSC was minimal because Delta Airlines entered the market in September 2017, which added the lost capacity back on the Seattle route. The net effect of the Alaska Air Group pilot shortage was a shift in market share away from Alaska Airlines over to Delta Airlines. Total passenger volume remained stable.

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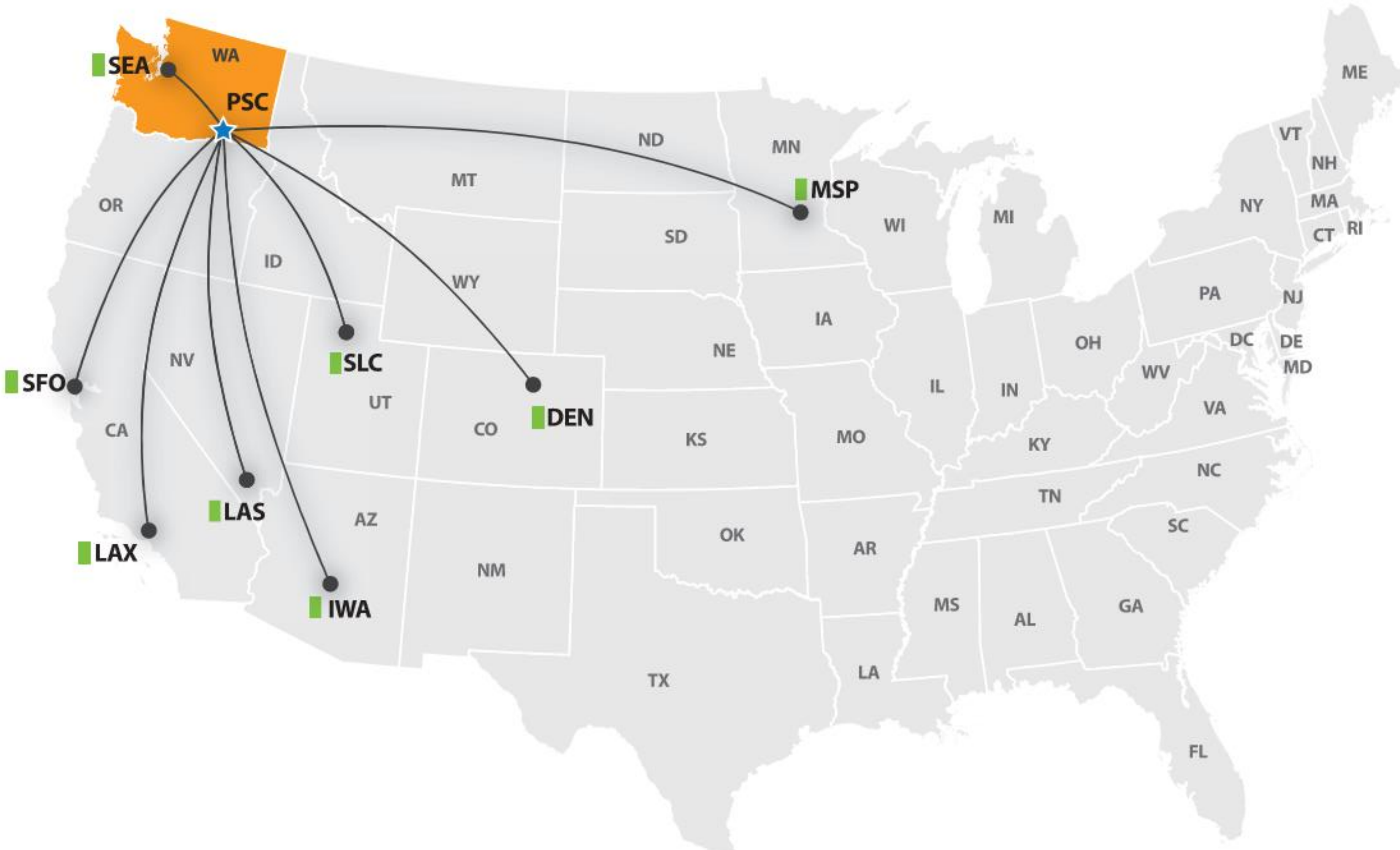
Figure 2-4: **Current Non-Stop PSC Service Routes**



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Scheduled air cargo service at PSC includes Alaska Airlines transporting cargo in commercial aircraft, Empire Airlines operating on behalf of Federal Express (FedEx) and Ameriflight operating on behalf of United Parcel Service (UPS). FedEx flies to Spokane (GEG) and Ameriflight flies to Boeing Field (BFI), where air cargo is transferred to larger aircraft and flown to its destination. Delta and Horizon carry some cargo on scheduled passenger flights. United and Allegiant do not carry air cargo from PSC.

New Air Service Opportunities

New air service opportunities at PSC would be accomplished by primarily establishing non-stop service to hub airports east of PSC. There is a gap in the current schedule for flights to major cities such as Chicago (ORD), Houston (IAH), and Phoenix (PHX). Adding service to these cities is the next logical step as PSC grows. Direct daily service to LAX is planned to begin in March 2019. Allegiant currently provides seasonal service between PSC and LAX in the summer peak seasons. This is mainly fueled by families traveling during summer vacation.

Table 2-9 describes the market share of domestic traffic in the PSC catchment area by PSC o
and other nearby commercial service airports. The information is based on the 2017 Tri-Cities Airport Leakage and Retention Study (2017 Leakage Study) which was provided by the airport. The study examines passenger activity in the PSC market area and provides information on passenger use of PSC and other nearby airports. It illustrates what the market size is for the most popular destinations for passengers departing from the PSC catchment area.

Information in the 2017 Leakage Study can be used to assess new routes and demand. According to the 2017 Leakage Study, PSC captured 43.7 percent of domestic traffic in the catchment area. YKM and ALW captured 28.3 percent of traffic in the PSC catchment area; however, both of these airports actually fall within the PSC catchment area boundaries. SEA, with more airlines and additional options for non-stop flights, draws 18.1 percent of the PSC market.

Table 2-9: PSC Domestic Market Size by Top 10 Destinations

Market Share					
Metro Area	Market Size	PSC	SEA	YKM	ALW
Seattle	127,349	28.7%	N/A	37.5%	31.4%
Los Angeles Basin	118,479	37.6%	24.8%	14.5%	3.2%
Las Vegas	56,612	60.5%	11.9%	13.0%	4.1%
Phoenix/Mesa	39,165	63.1%	7.6%	7.0%	3.0%
San Francisco Bay Area	32,522	52.1%	15.3%	9.5%	6.4%
Denver	23,360	46.0%	24.3%	9.6%	4.6%
San Diego	20,367	51.3%	17.8%	13.0%	3.3%
Dallas/Ft. Worth	20,331	32.2%	21.3%	11.3%	2.7%
Washington/Baltimore	17,849	60.9%	17.7%	5.0%	6.9%
Chicago	17,301	30.8%	39.6%	8.3%	6.2%
All Markets	758,653	43.7%	18.1%	15.3%	10.2%

Top 10 metro areas listed
Source: Tri-Cities Airport Leakage and Retention Study 2017

New air service opportunities would also likely come from airline changes in aircraft. Airlines are transitioning from smaller aircraft (like the 50-seat Bombardier CRJ-200) to larger narrow-body jets (like the Embraer 175, CRJ-700/900, Boeing 737, and Airbus A319/320). The shift to higher capacity aircraft makes longer routes more profitable and feasible for the air carriers to establish service, provided the market has demand to fill the additional seats. Delta, Allegiant, and United operate A319ceo aircraft with United having additional A319ceo aircraft on order. Operations at PSC using the A319 have increased more than 100 percent from 2016 to 2017. Switching to larger aircraft allows airlines to accommodate more passengers without increasing frequency of flights. Delta is transitioning to the A321 with both current and new engine options on order. Allegiant and United also have A321neo aircraft orders in place. The A321neo has more seats and a longer range compared to the A319 currently in use. Alaska is in the process of replacing the Bombardier Q400 with the Embraer E175, which is more capable but has identical seating capacity. The longer range and faster speed of the E175 reduces operating costs for longer routes.

Passenger Enplanements and Airline Operations

The FAA TAF defines a passenger enplanement as a passenger who boards a scheduled commercial or chartered aircraft with more than nine seats for turboprops (or any number of seats for jet aircraft). The aircraft must be operating under Title 14 Code of Federal Regulations (CFR) Part 121 that applies to air carriers and commercial operators.

Passenger enplanements include revenue and non-revenue passengers who paid taxes and passenger facility charges (PFC) for their carriage. Passenger enplanements do not include pilots, flight attendants, and any other members of the airline crew.

Table 2-10: TAF Airline Classification System

TAF Airline Classification System		
Classification	Air Carrier	Air Taxi
Enplanements	Operated by a mainline carrier	Operated by a regional carrier
Operations	60 or more seats	59 or fewer seats

Passenger enplanements are categorized as air carrier or air taxi/commuter based on the type of carrier that is operating the route. For example, passengers on a Delta Air Lines A320 flown by Delta pilots would be categorized as air carrier enplanements, whereas passengers on a Delta Air Lines CRJ-900 flown by SkyWest pilots would be categorized as air taxi enplanements. Airline operations are categorized based on aircraft seating capacity (see **Table 2-10**).

Enplanements from 2007 to 2017 are shown in **Table 2-11**. PSC passenger enplanements have increased by over 100,000 between 2007 and 2017 with a CAGR of 4.8 percent. Both air carrier and air taxi/commuter service have seen an overall increase in enplanements during this period. The decrease in enplanements in 2013 is due to Allegiant reducing flights to LAX from year-round to summer-only service. The change in service decreased the number of flights from PSC to LAX by more than 70 percent in 2013 compared to 2012. Additionally, Allegiant also decreased the frequency of flights to LAS by 20 percent from 210 departures in 2012 to 158 in 2013.

Table 2-11: Passenger Enplanements

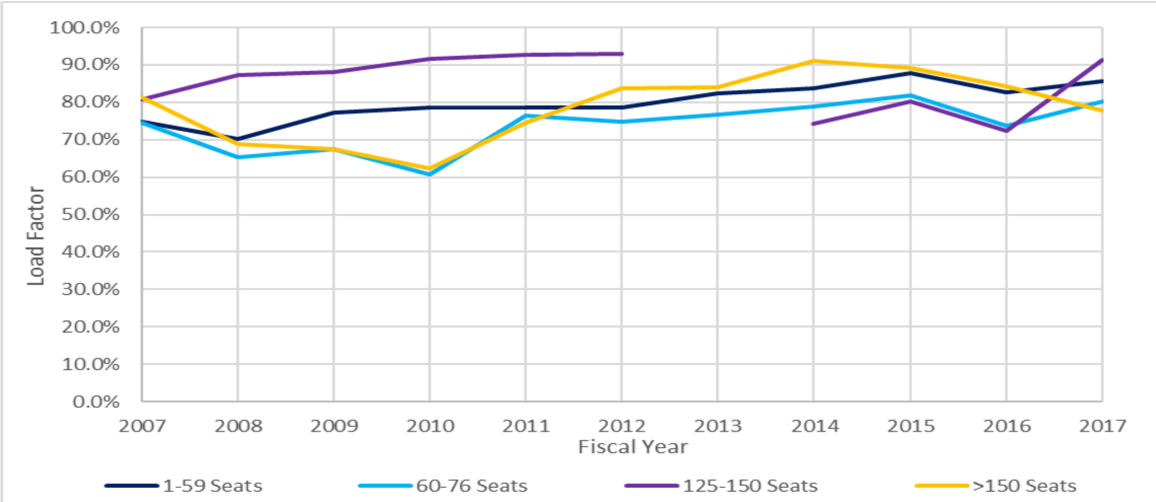
Fiscal Year	Air Carrier	Air Taxi/Commuter	Total	% Change
2007	23,676	214,795	238,471	
2008	23,897	225,450	249,347	4.6%
2009	25,343	219,693	245,036	-1.7%
2010	44,732	256,540	301,272	23.0%
2011	52,396	272,800	325,196	7.9%
2012	57,929	274,918	332,847	2.4%
2013	44,108	280,776	324,884	-2.4%
2014	48,048	277,840	325,888	0.3%
2015	85,385	255,132	340,517	4.5%
2016	72,628	297,075	369,703	8.6%
2017	70,814	308,810	379,624	2.7%
CAGR	11.6%	3.7%	4.8%	N/A

CAGR = Compound Annual Growth Rate
Source: 2018 TAF

Scheduled Passenger Airline Load Factor

Load factor is a metric that airlines use to determine performance and is a method for showing the difference between supply and demand. It is calculated by dividing the number of passengers (demand) by the number of available seats (supply). Load factor grows as demand approaches supply and declines when supply increases faster than demand. Load factors at PSC for the past 10 years have been trending towards 80 percent. **Figure 2-5** shows the load factors for four groups of aircraft categorized by seating capacity. Aircraft with 77-125 seats are not included as these aircraft only operated a few times per year from 2012 to 2015.

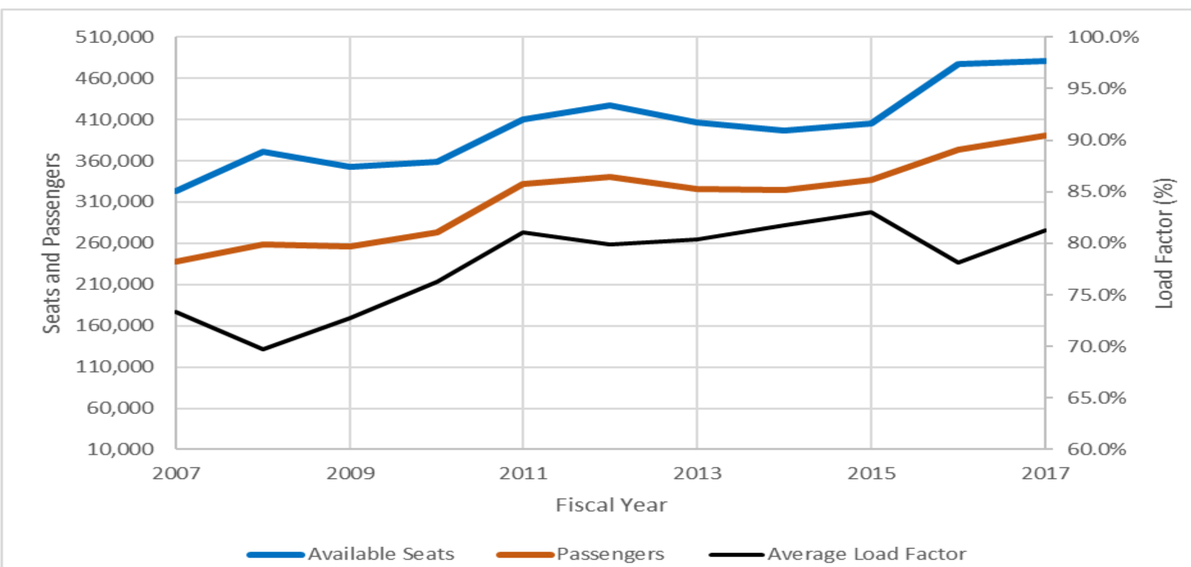
Figure 2-5: Load Factor by Aircraft Seating Capacity



Source: USDOT T-100. Data presented includes load factors for outbound travel
125-150 Seats data does not exist for 2013.

The 2018 FAA Aerospace Forecasts report an average domestic load factor for U.S regional air carriers of 78.7 percent, down from 80.0 percent in 2016. PSC saw an average load factor of 81.2 percent in 2017, up from 78.1 percent in 2016. Performance consistent with, or exceeding, industry averages helps PSC market itself to airlines and encourages airlines to consider service to additional routes. **Figure 2-6** presents the historical load factor data along with the available seats and number of passengers carried.

Figure 2-6: PSC Average Load Factor, Available Seats, and Passengers



Source: USDOT T-100. Data presented includes passengers, seats, and load factors for outbound travel

Scheduled Air Cargo

PSC scheduled air cargo data looks only at Empire Airlines data provided in the T-100 (defined in **Table 2-2**) and Ameriflight landing fee records provided by the airport which only covers 2010 to 2017. Ameriflight does not report to the USDOT due to their operating certificate and the airport did not collect information for 2007-2009 so these three years are not included in the analysis.

Air cargo volume (expressed in tons) at PSC has declined over the past seven years with an average annual decline of 2.1 percent from 2010 to 2017. Similarly, air cargo operations have decreased an average 3.0 percent annually in the same period. The U.S. Domestic Market in terms of revenue ton miles has experienced an average annual increase of 0.1 percent in the same period. Both PSC and the U.S. domestic market saw an increase in air cargo from 2016 to 2017. The FAA Aerospace Forecast suggests that U.S. air cargo has been declining due to air cargo security regulations and a "…shift from air to other modes (especially truck)," and the use of mail substitutes such as e-mail. This may explain the lack of growth in PSC air cargo volume even with local GRP growth. The increase in ground freight transport is supported by the proximity of FedEx and UPS service centers located approximately 41 miles southwest of PSC. These service centers serve as hubs for cargo to be distributed by ground transport, avoiding the need for additional flights to reach the final destinations. Air cargo operations and volumes are shown in **Table 2-12**.

Table 2-12: Table 2-12: Cargo Airline Operations and Activity

Fiscal Year	PSC				U.S. Domestic Market	
	Operations	Total Cargo (Tons)	% Change Operations	% Change Cargo	Revenue Ton Miles (Millions)	% Change
2010	2,083	2,757.9	N/A	N/A	11,243	N/A
2011	1,808	2,714.9	-13.2%	-1.6%	10,601	-5.7%
2012	1,566	3,067.0	-13.4%	13.0%	10,886	2.7%
2013	1,632	2,583.1	4.2%	-15.8%	10,996	1.0%
2014	1,606	2,459.5	-1.6%	-4.8%	11,226	2.1%
2015	1,391	2,125.1	-13.4%	-13.6%	11,636	3.7%
2016	1,411	1,952.7	1.4%	-8.1%	11,851	1.8%
2017	1,682	2,371.6	19.2%	21.5%	13,031	10.0%
CAGR	-3.0%	-2.1%	N/A	N/A	2.1%	N/A

CAGR: Compound Annual Growth Rate
Source: U.S.DOT T-100.
PSC data only includes Empire Airlines records.

PSC provided Ameriflight landing fee records for January 2010 to July 2018. The records show an average 4.9 percent annual decline in operations during this period. Total cargo volume decreased a CAGR of 1.4 percent with deplaned cargo increasing by an average of 0.6 percent annually while enplaned cargo decreasing an average of -5.0 percent per year. No information about load factors or payload capacity was provided.

General Aviation

GA refers to flight activities that do not include scheduled air services, unscheduled air transport operations, or military operations. GA activities include, but are not limited to, flight training, recreational flying, private and corporate air transportation, and flight testing.

General Aviation Businesses

GA businesses include companies that offer services to the flying public (e.g. fixed based operators [FBOs]), companies that design and build aircraft, and companies that use aircraft as part of their services (e.g. aerial photography, sightseeing, employee transport). PSC has two FBOs. Services offered by each FBO are described in **Chapter 1**, Section 3. J&D Aircraft Sales specializes in buying and selling corporate aircraft and is based at PSC. The Battelle Memorial Institute manages the Pacific Northwest National Laboratory (PNNL) in Richland and bases a Gulfstream-1 research aircraft used for analyzing air particles at PSC.

Itinerant Operations

Itinerant operations are those that originate and terminate at different airports. These operations include business travelers coming to and from the community, recreational pilots, and student pilots performing cross country training flights. Itinerant operations made up 48 percent of overall GA operations in 2017 and have been declining at an average annual rate of 3.7 percent for the past ten years. This is a faster rate of decline than the national decline average of 2.8 percent per year provided by the 2018 FAA Aerospace Forecast. Compared to the state, regional, and national TAF, itinerant GA operations at PSC correlate more with regional and national itinerant GA operations (both with correlation coefficients over 0.9) while not correlating with state trends (correlation coefficient of 0.7).

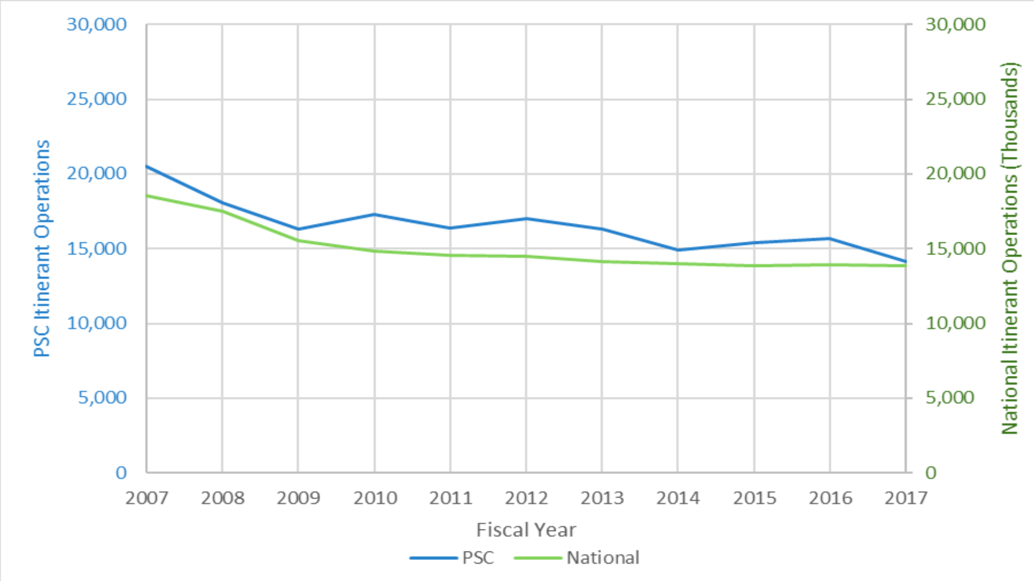
Table 2-13 and **Figure 2-7** compare PSC itinerant GA operations to national itinerant GA operations as provided by the 2018 FAA Aerospace Forecast.

Table 2-13: Itinerant General Aviation Operations

Fiscal Year	PSC	% Change	National	% Change
2007	20,518	N/A	18,575,000	N/A
2008	18,037	-12.1%	17,493,000	-5.8%
2009	16,342	-9.4%	15,571,000	-11.0%
2010	17,271	5.7%	14,863,856	-4.5%
2011	16,361	-5.3%	14,527,903	-2.3%
2012	17,012	4.0%	14,521,656	0.0%
2013	16,293	-4.2%	14,117,424	-2.8%
2014	14,907	-8.5%	13,978,996	-1.0%
2015	15,428	3.5%	13,886,711	-0.7%
2016	15,651	1.4%	13,904,397	0.1%
2017	14,140	-9.7%	13,838,029	-0.5%
CAGR	-3.7%	N/A	-2.9%	N/A

CAGR: Compound Annual Growth Rate
Source: 2018 TAF for PSC, 2018 FAA Aerospace Forecast for National

Figure 2-7: Itinerant General Aviation Operations



The national GA market is declining overall; however, there are some sectors that are experiencing growth. The 2018 FAA Aerospace Forecast suggests that the decline in the fixed-wing piston fleet will be offset by growth in turbine, experimental, and light sport fleets. Fixed-wing piston aircraft have historically made up the largest segment of the GA fleet. The Aerospace Forecast predicts a decline in fixed-wing aircraft at an average annual rate of 0.8 percent for the next 20 years. Light sport aircraft are forecasted to be the fastest growing category, growing at an average rate of 3.6 percent annually, more than doubling the current fleet. The Aerospace Forecast expects the number of GA hours flown for turbine (including rotorcraft) and light sport aircraft to increase, offsetting the overall decline in operation numbers caused by the decrease in the fixed-wing aircraft fleet.

Local General Aviation Operations

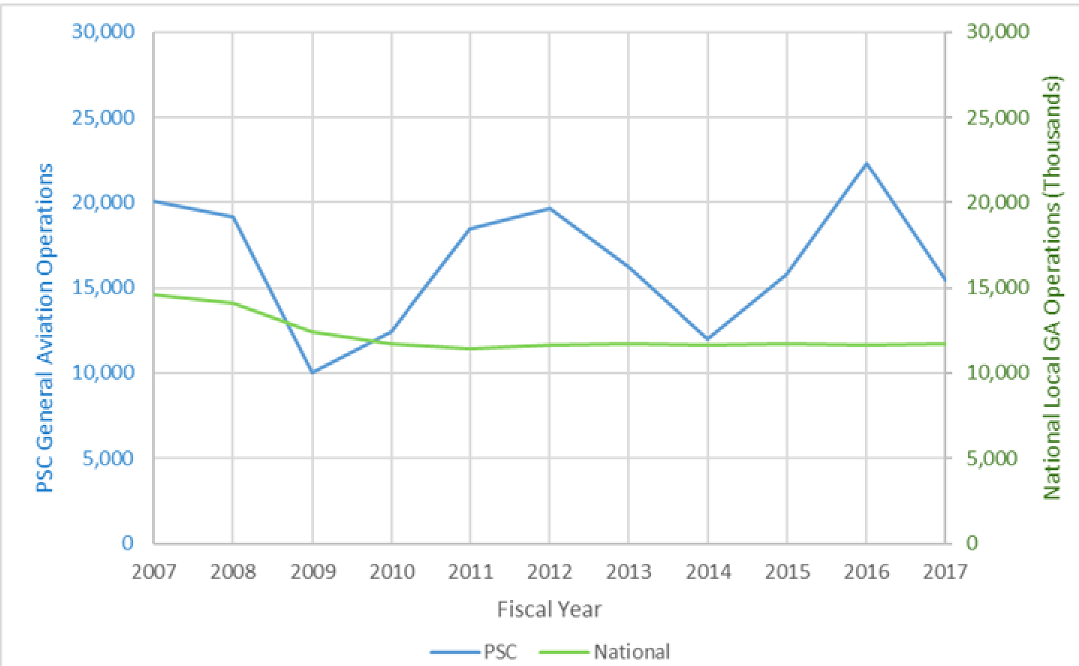
Local GA operations originate and terminate at the same airport. These operations are generally performed by pilots practicing landings. Touch-and-go operations, where aircraft land, slow, then accelerate and take off without leaving the runway, count as two operations. Depending on the traffic pattern, an aircraft can perform more than six operations in an hour when practicing touch-and-goes. Local operations are highly sensitive to the amount of flight training occurring at an airport. PSC does not have a full-fledged flight school; however, it does experience student pilots performing cross country practice flights, and the FBOs offer flight training. The ATCT indicates that these students come from nearby airports such as Pendleton (PDT) and Walla Walla (ALW). **Table 2-14** and **Figure 2-8** show the historical local GA operations at PSC and national local GA operations as provided by the 2018 FAA Aerospace Forecast.

Table 2-14: Local General Aviation Operations

Fiscal Year	PSC	% Change	National	% Change
2007	20,063	N/A	14,557,000	N/A
2008	19,172	-4.4%	14,081,000	-3.3%
2009	10,017	-47.8%	12,448,000	-11.6%
2010	12,445	24.2%	11,716,274	-5.9%
2011	18,429	48.1%	11,437,028	-2.4%
2012	19,659	6.7%	11,608,306	1.5%
2013	16,170	-17.7%	11,688,301	0.7%
2014	12,002	-25.8%	11,675,040	-0.1%
2015	15,767	31.4%	11,691,338	0.1%
2016	22,314	41.5%	11,632,078	-0.5%
2017	15,461	-30.7%	11,731,596	0.9%
CAGR	-2.6%	N/A	-2.1%	N/A

CAGR: Compound Annual Growth Rate
Source: 2018 TAF for PSC, 2018 FAA Aerospace Forecast for National

Figure 2-8: Local General Aviation Operations



PSC local operations are unique in that they have not historically correlated with state, regional, or national local GA trends (all have correlation coefficients lower than 0.25). This is most likely due to the historically volatile local operations at PSC.

The fluctuation in local general aviation activity over the past ten years is attributed to several factors. ATCT staff report that much of the traffic comes from students learning to fly at flight schools of nearby airports such as Walla Walla and Martin Field. Peaks and valleys primarily correspond to airline hiring activities, and to a lesser degree airfield construction and NAVAID relocation. ATCT staff have indicated the strong demand for airline pilots cause local operations to increase as students look to build hours and improve instrument procedure proficiency.

Based Aircraft

The FAA categorizes aircraft by engine with the main categories being Single-Engine Piston (SEP), Multi-Engine Piston (MEP), Jet aircraft with turbine engines (includes turboprops and turbojets), Helicopters, and Other which includes experimental sport, glider, and ultralight aircraft. More details on each category can be found in the Glossary (**Appendix E**).

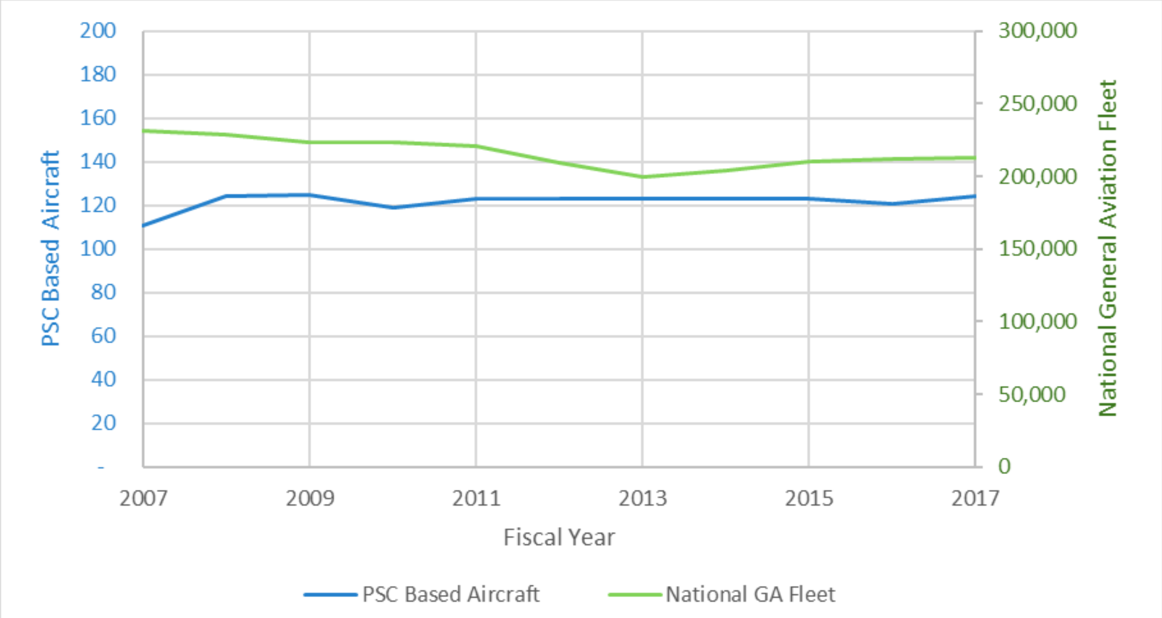
Based aircraft are those stored in a hangar or apron at PSC. Based aircraft do not include itinerant aircraft temporarily stored at PSC. The FAA categorizes based aircraft by the aircraft's propulsion system, engine configuration, and weight. The Airport reviewed and accepted the based aircraft count provided by the TAF. **Table 2-15** and **Figure 2-9** shows the based aircraft records from 2007 to 2017. As of 2017, 66 percent of based aircraft at PSC are SEP. No aircraft categorized as "Other" have been based at PSC for the past ten years.

Table 2-15: PSC Based Aircraft

Fiscal Year	SEP	MEP	Jet	Helicopter	Other	Total	% Change
2007	83	17	6	5	0	111	N/A
2008	88	20	11	5	0	124	11.7%
2009	89	20	11	5	0	125	0.8%
2010	83	20	11	5	0	119	-4.8%
2011	83	24	12	4	0	123	3.4%
2012	83	24	12	4	0	123	0.0%
2013	83	24	12	4	0	123	0.0%
2014	83	24	12	4	0	123	0.0%
2015	83	24	12	4	0	123	0.0%
2016	80	23	14	4	0	121	-1.6%
2017	80	23	14	4	0	121	0.0%
CAGR	-0.4%	3.1%	8.8%	-2.2%	N/A	0.9%	N/A

CAGR: Compound Annual Growth Rate
Source: 2018 TAF, FAA Aerospace Forecast

Figure 2-9: PSC Based Aircraft



Based aircraft at PSC has remained steady in the last decade. Growth in MEP and jet based aircraft has offset the decline in SEP. The FAA Aerospace Forecast shows SEP aircraft have declined an average of 1.2 percent per year from 2007 to 2017. The number of MEP and jets based at PSC is growing faster than the national fleet, with PSC MEP aircraft have increased while MEP numbers have decreased in the national general fleet. Nationally, MEP aircraft saw a 3.9 percent average annual decline from 2007-2017. The national jet fleet has increased an average of 1.7 percent annually in the same period. Helicopters based in PSC have decreased, however, the higher rate of decline at PSC relative to the national fleet is due to the already small of based helicopters.

Military

PSC does not have based military aircraft and mainly experiences touch-and-go operations and training overflights from Naval Air Station Whidbey Island, located approximately 220 miles northeast of PSC. Military activity is driven by the needs of the U.S. Department of Defense rather than by economic forces. Therefore, for planning purposes, military operations are projected to remain flat. Historical military operations are shown in **Table 2-16**.

Table 2-16: PSC Military Operations

Fiscal Year	Itinerant	Local	Total	% Change
2007	716	1,047	1,763	
2008	622	1,414	2,036	15.5%
2009	787	1,445	2,232	9.6%
2010	780	821	1,601	-28.3%
2011	1,396	2,724	4,120	157.3%
2012	1,152	1,864	3,016	-26.8%
2013	1,055	2,861	3,916	29.8%
2014	1,298	2,419	3,717	-5.1%
2015	970	1,824	2,794	-24.8%
2016	1,389	3,633	5,022	79.7%
2017	1,380	2,338	3,718	-26.0%
CAGR	6.8%	8.4%	7.7%	N/A

CAGR: Compound Annual Growth Rate
Source: 2018 TAF

FAA TAF

The FAA TAF is the official FAA forecast that is prepared annually by FAA Headquarters for each airport in the FAA National Plan of Integrated Airport Systems (NPIAS). The TAF uses the FAA fiscal year (October to September). TAF data comes from the USDOT T-100 database, ATCT records, and FAA Form 5010, which airports submit annually to the FAA.

Forecasting methodology used for the TAF is summarized in the Forecast Process for 2018 TAF which can be found on the FAA TAF website. Passenger enplanement and commercial operations forecasts at airports such as PSC use a quarterly 10 percent sample of passenger activity to complete “regressions analysis using fares, regional demographics, and regional economic factors.” Commercial operations are based on USDOT T-100 data for airport pair and segment pair.

The FAA reviews Master Plan forecasts by comparing them to the TAF. Forecasts within 10 percent of the TAF over the five-year period, and 15 percent within the ten-year period can be approved by the Airports District offices. Forecasts outside of these tolerances go to FAA Headquarters for review.

The TAF forecasts passenger enplanements, operations, and based aircraft. It does not forecast operations by aircraft type, peak activity level, critical aircraft, or air cargo. The TAF used for this forecast was published in February 2019. **Table 2-17** summarizes the TAF prepared for PSC.

Table 2-17: FAA TAF Summary

Fiscal Year	2017	2022	2027	2032	2037	CAGR
Enplanements	379,624	473,613	505,459	544,141	586,451	2.2%
Operations	45,940	53,355	55,413	57,021	58,760	1.2%
Air Carrier	7,790	14,856	16,825	18,108	19,510	4.7%
Air Taxi	4,831	2,401	2,290	2,415	2,547	-3.2%
Itinerant GA	14,140	17,248	17,428	17,608	17,793	1.2%
Itinerant Military	1,380	1,350	1,350	1,350	1,350	-0.1%
Local GA	15,461	15,994	16,014	16,034	16,054	0.2%
Local Military	2,338	1,506	1,506	1,506	1,506	-2.2%
Based Aircraft	121	133	144	154	164	1.5%
Single Engine Piston	80	90	100	110	120	2.0%
Jet	14	14	14	14	14	0.0%
Multi Engine Piston	23	25	25	25	26	0.4%
Helicopter	4	4	5	5	5	1.1%
Other	0	0	0	0	0	N/A
Other = Light sport aircraft, gliders, experimental aircraft, ultralights Source: 2018 TAF						

The TAF is a generally reliable source of information. However, most recent data trends tend to lag a year behind airport records. Values for 2018 onward feature data updated with the 2018 TAF. The TAF data does not match airport management records in certain areas, shown in **Table 2-18**. An assessment of how the PSC TAF has aligned with actual activity over the past ten years is included as **Attachment 2**.

Table 2-18: 2017 Airport Management Records and TAF Comparison

Category	Airport Records	TAF	Difference	% Difference
Operations	50,626	45,940	4,686	10.2%
Air Carrier	11,843	7,790	4,053	52.0%
Air Taxi	5,464	4,831	633	13.1%
Enplanements, Itinerant GA and Military, and Local GA and Military numbers are from TAF records.				

One of the primary drivers in the difference between the TAF and the airport management records is the operations that occur when the ATCT is closed. The ATCT is open from 8AM to 10PM, and reports operations that occur during this time to the FAA. Operations that occur outside of these hours are not reported. Airport management receives information from the airlines, which includes flights that that operate when the ATCT is closed. Airport management records were checked against the T-100 database. Demand forecasts rely on airport management records rather than TAF records due to absence of nearly 5,000 commercial operations in the TAF. Reliance on TAF figures would produce inaccurate forecast analysis as it would overstate load factors (same number of annual passengers on 4,686 fewer flights).

SCHEDULED SERVICE FORECASTS

This section discusses the methods, assumptions, risk, and uncertainty of the enplanement, air cargo volume, and commercial operation forecasts. A preferred method is selected for each forecast and is then compared with the FAA TAF. These forecasts help determine the future facility requirements at PSC.

Passenger Enplanements

Methods

The passenger enplanement forecast looked at historical trends and multi-variable regression methods to project passenger enplanements. Regression models tested variables that highly correlated (greater than 0.8) with passenger enplanements in the past ten years. Correlation describes how strongly related two variables are to each other. The stronger the correlation, the more linear their relationship is – a positive correlation means two variables increase together while a negative correlation means two variables decrease together. The stronger the positive correlation, the closer the correlation coefficient approaches the value of 1.0. Strong negative correlations are closer to -1.0 while having no correlation equals a correlation coefficient of 0. The four variables with the highest correlation with PSC passenger enplanements are: MSA population, MSA GRP, U.S. Gross Domestic Product (GDP), and MSA income per capita.

These four variables were checked against passenger enplanements from 2007 to 2017 using regression analysis. The validity of each equation is measured by the R-squared value. The R-squared value describes how well the regression equation replicates the historical observed outcomes. The closer the R-squared value is to 1.00, the more confidence can be placed in the equation's ability to explain historical variability rather than occurring by chance. **Table 2-19** shows the correlation coefficient of each variable.

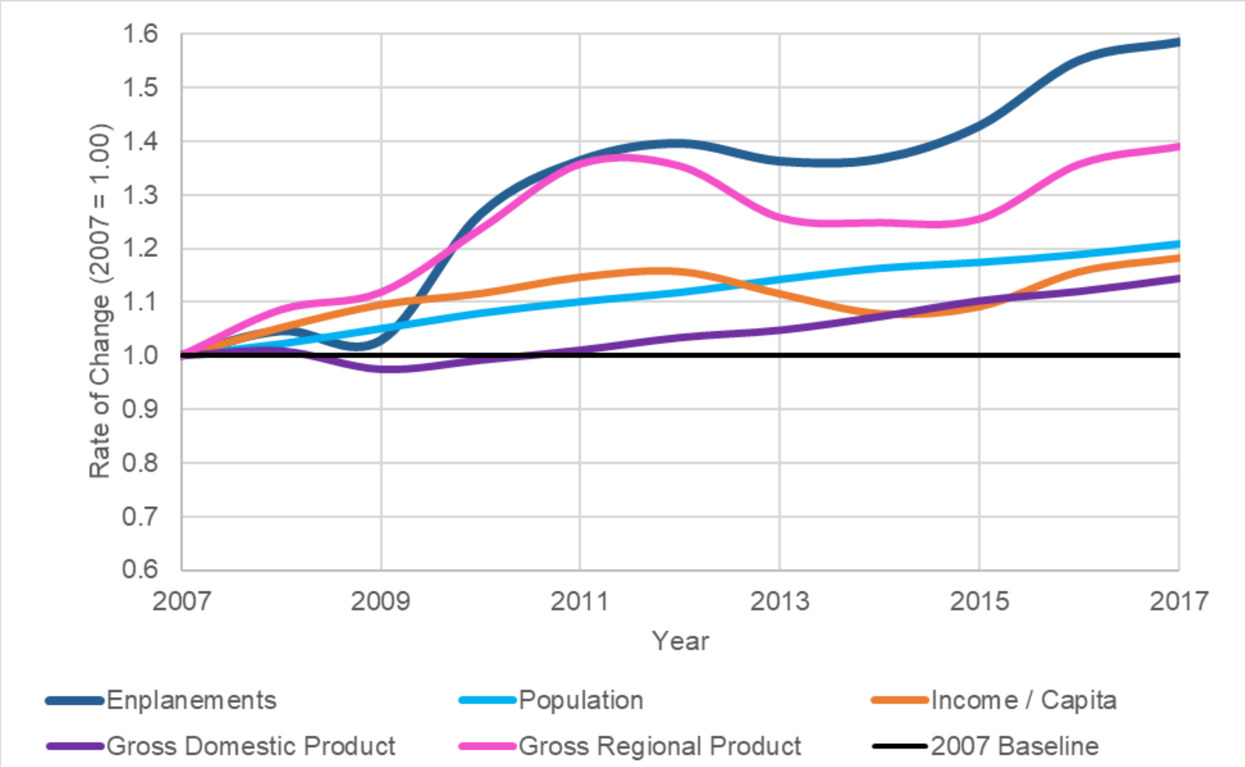
Table 2-19: Enplanement Correlation and Regression Analyses

Variable	Correlation Coefficient
MSA Population[1]	0.95
MSA Gross Regional Product (GRP)[2]	0.93
U.S. Gross Domestic Product (GDP)[3]	0.84
MSA Income per Capita[3]	0.81
Sources: 1) Washington Office of Financial Management, 2) U.S. Bureau of Economic Analysis, 3) Woods & Poole	

Table 2-20: Multi-Variable Regression Analyses

Variables	Adjusted R Squared Value
Population[1], GRP[2], GDP[3], Income/Capita[3]	0.973
Population[1], GRP[2], GDP[3]	0.959
Population[1], GRP[2]	0.923
Population[1], Income/Capita[3]	0.957
Sources: 1) Washington Office of Financial Management, 2) U.S. Bureau of Economic Analysis, 3) Woods & Poole	

Figure 2-10: Multi-Variable Regression Analyses



Based on the results of the regression analyses (see **Table 2-20** and **Figure 2-10** above), the equation accounting for population, GRP, GDP, and MSA income per capita was selected to model passenger enplanement forecasts. The equation is displayed below:

Passenger Enplanement Regression Equation: $y=m_1(x_1)+m_2(x_2)+m_3(x_3)+ m_4(x_4)+b$

y = Passenger Enplanements, b = Intercept from Regression Analysis

$$y = (0.53 \times \text{Population}) + (-5.34 \times \text{MSA Income/Capita}) + (16.77 \times \text{GDP}) + (31.88 \times \text{GRP}) - 251{,}924$$

Forecasts for each variable were considered throughout the forecast period. The MSA Population forecast is sourced from the Washington OFM and is the sum of the medium level forecast for Franklin and Benton Counties, the two counties that form the Kennewick-Richland MSA. The medium OFM population forecast is used by the cities and counties within the MSA for long-range planning. The MSA GRP and MSA income per capita forecasts are provided by Woods & Poole. The US GDP forecast comes from the Organization for Economic Cooperation and Development (OECD). The forecasts for each variable were used in the regression equation to produce a passenger enplanement forecast for the next 20 years.

The regression-based method of forecasting incorporates a statistical analysis to give confidence that the variables chosen for forecasting have exhibited a degree of correlation with passenger enplanements in the past. The risk to this method is that future forecasts are ultimately based on one set of external projections.

Forecasting is increasingly uncertain the further into the future projections are assessed, as unforeseen future events that will impact aviation activity at PSC are more likely to occur. To address this, the passenger enplanement regression equation uses the Monte Carlo simulation process to try to account for future uncertainty.

Addressing Risk and Uncertainty

Forecasts rely on a set of future variables that are assumed to be true at the time of consideration. This assumption is inherently risky as the forecasted values may not be met. One way to mitigate this uncertainty is to incorporate a range for each variable's forecast. This is accomplished by evaluating the historical volatility of the four variables in the equation and assuming future values may deviate from the forecast accordingly.

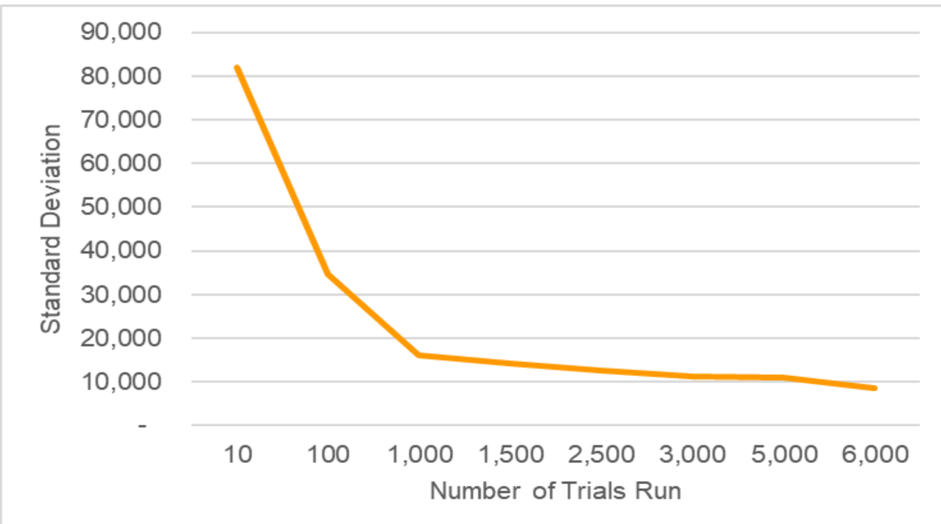
As an example, the U.S. GDP in 2021 will be $21 trillion dollars based on the OECD forecasts. Historical volatility shows that U.S. GDP could sway by plus or minus $3 trillion dollars, which means that the actual value for 2021 could be as low as $18 trillion (in an economic recession), or as high as $24 trillion (in a period of strong growth). Since the value of U.S. GDP is one of the drivers of the enplanement forecasts, it makes sense to account for this volatility in the future and not assume that the U.S. GDP is guaranteed to grow as it has exhibited contraction in the past. The method chosen to account for this volatility is known as Monte Carlo simulation.

The Monte Carlo simulation considers the range of future values for each variable in each forecast year. Historical volatility is applied to the forecast value and results in a range that the forecast will likely be within. This process is established for each variable and then trials are run for each forecast year. Each variable independently and randomly fluctuates within the defined range for thousands of trials. This results in trials considering situations where some or all variables grow and decline. However, it is important to note that the Monte Carlo simulation requires the range that the variables can fluctuate within must be defined before the trials. Once established, the model will randomly pick the values of each variable.

The simulation can be run multiple times to reduce the impact of outliers (e.g. scenarios where all variables are at their maximum or minimum values), and the results are interpreted using percentiles. Percentiles measure the probability of a value being higher or lower than the given value. For example, if the 25th percentile value for passenger enplanements for 2037 is 690,000, then out of the thousands of trials run for 2037, 25 percent of the results were below 690,000 and 75 percent were above. This can also be expressed as a 25 percent probability of the 2037 passenger enplanement will be 690,000 or below.

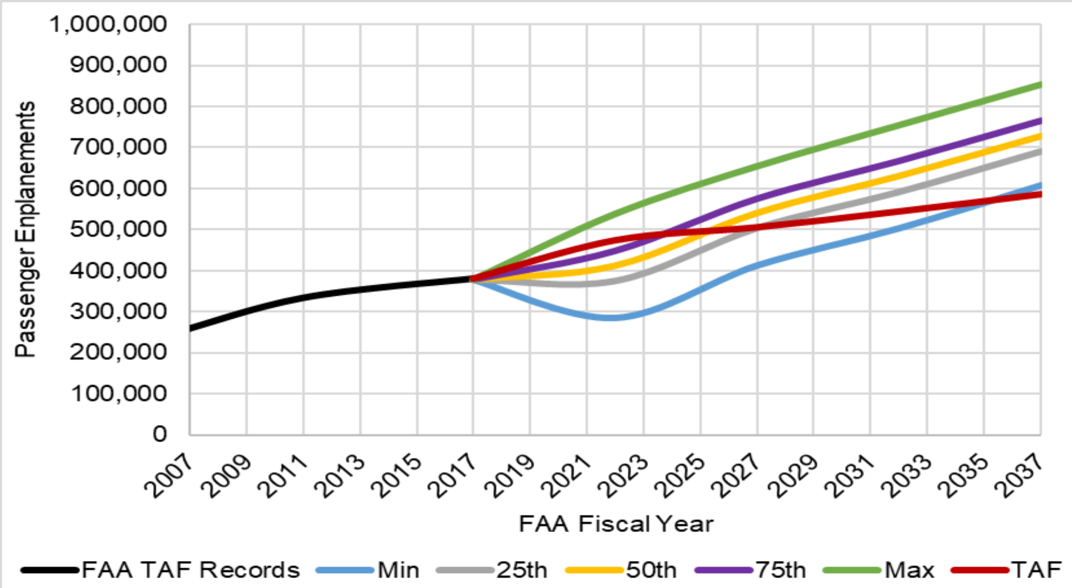
The Monte Carlo simulation was run for 6,000 trials to reduce the effect of outliers. Multiple trials result in the results converging around the mean. The law of diminishing returns applies as the results differ less and less beyond 1,000 trials. This effect is shown in **Figure 2-11.**

Figure 2-11: Effects of Multiple Trials on Monte Carlo Range



The 6,000 trials are distinguished by using percentiles, minimums, and maximums. The PSC enplanement forecasts are presented with the minimum, 25th, 50th, 75th, and maximum percentiles. **Figure 2-12** shows the results plotted with the 2018 TAF for comparison.

Figure 2-12: Passenger Enplanement Forecast Monte Carlo Simulation



Preferred Passenger Enplanement Method and TAF Comparison

The variables used in the simulation have a high degree of historical correlation with passenger enplanements. The population forecast used is the same used for local planning, which the local stakeholders find reasonable. What is known about the airlines' future routes and fleet plans also supports the use of these forecasts. The Monte Carlo simulation provides a sensitivity analysis for future passenger enplanements should the MSA grow quicker or slower than expected. The preferred passenger enplanement forecast is used to derive the scheduled commercial operations and peak enplanement numbers.

The preferred passenger enplanement forecast method is a hybrid of the 25th and 50th percentile Monte Carlo results. Based on available information, historical performance, and known changes in airline operation at PSC, the 75th percentile forecast is preferred for short-range (1-5 year) passenger enplanement purposes. The 25th percentile is preferred for long-range (5-20 year) passenger enplanement purposes. This results in a 20-year 3.1 percent CAGR. This is higher than that of the TAF, which is due to PSC being in a growing market with increasing passenger demand. The TAF and Aerospace Forecast are driven more by mature markets with slower growth. The preferred enplanement forecast is shown in **Table 2-21** and **Figure 2-13** and is compared to the 2018 TAF in **Table 2-22**.

Figure 2-13: Preferred Passenger Enplanement Forecast

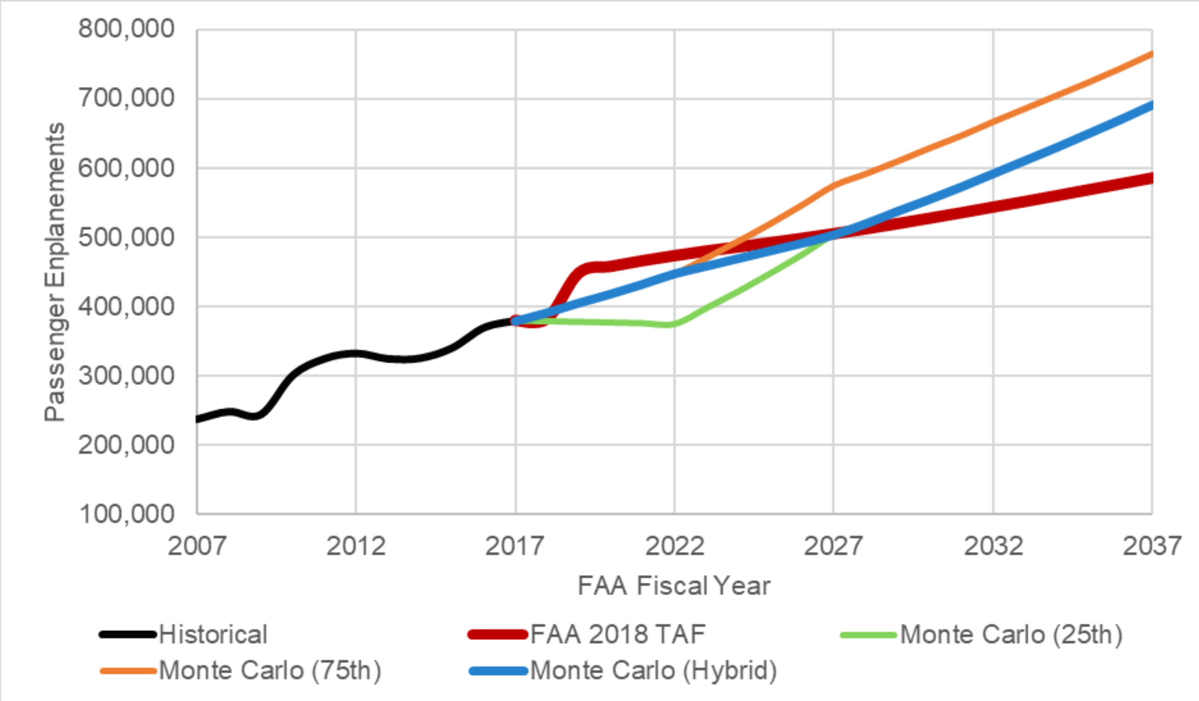


Table 2-21: Preferred Passenger Enplanement Forecast

Fiscal Year	Monte Carlo (25th)	Monte Carlo (75th)	Preferred Forecast	2018 TAF
2017	379,624	379,624	379,624	379,624
2022	375,000	448,000	448,000	473,613
2027	504,000	575,000	504,000	505,459
2032	592,000	667,000	592,000	544,141
2037	691,000	765,000	691,000	586,451
CAGR	3.0%	3.6%	3.0%	2.2%
CAGR = Compound Average Growth Rate				

Table 2-22: Passenger Enplanement Forecast – TAF Comparison

Fiscal Year	2018 TAF	Forecast	Total Difference	% Difference
2017	379,624	379,624	0	0.0%
2022	473,613	448,000	-25,613	-5.4%
2027	505,459	504,000	-1,459	-0.3%
2032	544,141	592,000	47,859	8.8%
2037	586,451	691,000	104,549	17.8%
CAGR	2.2%	3.0%	N/A	N/A
CAGR = Compound Average Growth Rate				

Air Cargo

Methods

Air cargo at PSC did not exhibit strong historical correlation with any socioeconomic variables considered. This is because air cargo contracted while economic indicators grew. In the absence of correlated data, historical trends at PSC and GRP growth rates were used in forecasting because they better reflect the local economic conditions compared to national aviation trends and GDP. Air cargo operations are expected to remain flat in the next 20 years as cargo load from 2010 to 2017 has averaged 45.6 percent which means any increases in air cargo volume can be accommodated for in the existing operations. Three methods considered for the air cargo forecast are the following:

- Trend forecast using 2010-2017 data
- MSA GRP growth rate time series analysis
- Regional Logistics method accounting for development of nearby logistics facilities.

Forecast

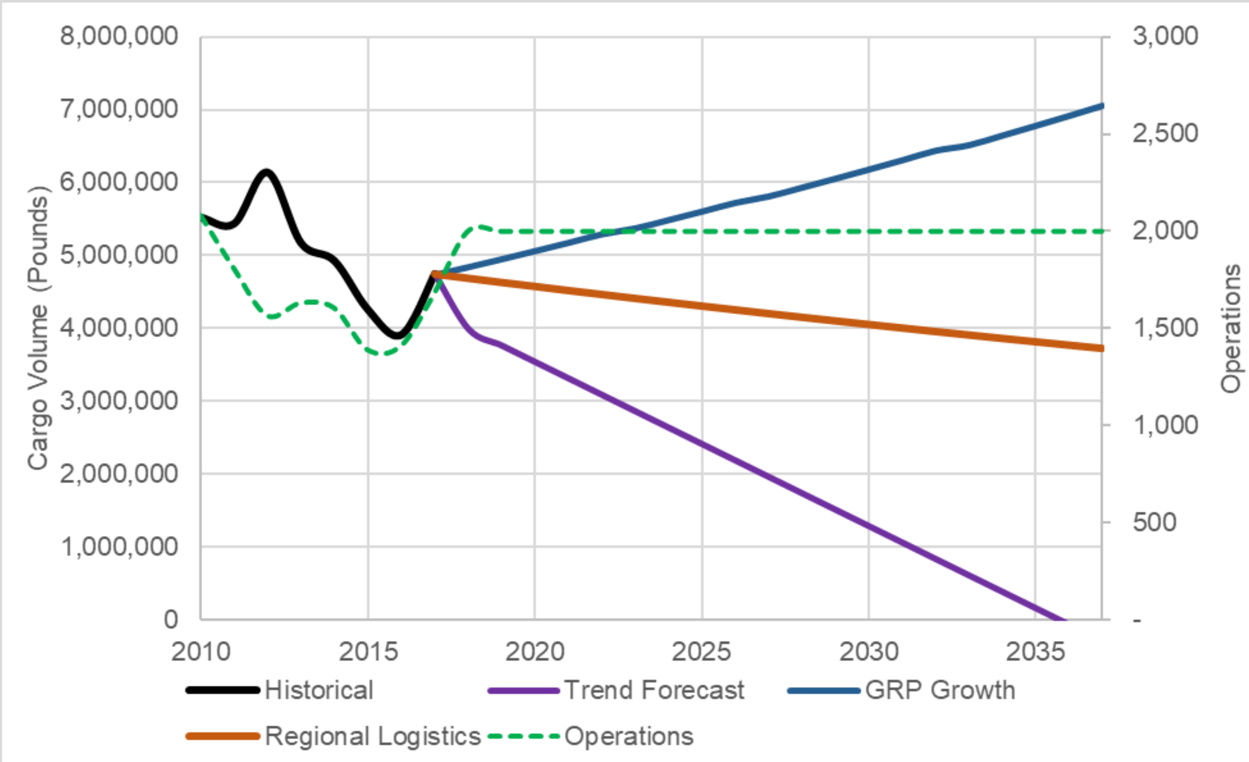
Analysis using historical trends predicts the continued decline of air cargo, with air cargo volume reaching zero between 2035 and 2036. This contrasts with the FAA Aerospace Forecast's projection of an increase in air cargo volume nationally in response to the expected U.S. and world economic growth. This sharp decline can be attributed to the general decline of air cargo volume at PSC in combination with the small historic data sample size of 7 years (2010-2017). The trend forecast on its own is not considered a preferred method due to the disproportionately large impact the small sample size has on the projections.

The regression analysis is based on Woods & Poole MSA GRP forecasts, and it projects an increase in air cargo volume at a CAGR of 2 percent from 2017 to 2037. This is just below the FAA Aerospace Forecast national CAGR of 2.3 percent for the same period. This difference can be attributed to the types of industry growing and prevalent in the community such as research and healthcare services, which do not demand as much air cargo services as other industries.

The regional logistics method uses a historical window of 2014 to 2017. This period represents the bottom of a decline in air cargo volume following the construction of logistics centers at the intersection of Interstates 82 and 84 near Hermiston, Oregon. These sites are within an hour's drive of PSC, and within a two-day drive of most major cities west of the Mississippi River, and fit into the national trend of online retailers like Amazon and Walmart incentivizing their customers to use "free" two-day shipping rather than overnight at cost.

The FAA Aerospace Forecast acknowledges that many types of shipments that traditionally traveled by air are now being shipped by truck. The logistics centers near PSC are the local incarnation of this national trend. These forecasts are presented in **Figure 2-14**.

Figure 2-14: Air Cargo Forecasts



Preferred Method

The preferred air cargo forecast is the Regional Logistics method because it takes the recent development of ground freight hubs in the region into account.

It would normally be expected that the growth in the local economy would increase overall air cargo movements. However, the trend is changing from cargo transported by aircraft towards more ground transportation due to cost and the development of service centers spread throughout the country that make expedited ground deliveries possible. These service centers serve as hubs for freight trucks to be dispatched and can be located near airports to reduce cost and time needed for air transport.

Commercial Aircraft Operations

Commercial aircraft operations are performed by scheduled and charter passenger airlines and cargo aircraft. Business jets using the FBO and private hangars are not considered commercial operations and are counted as part of GA.

Methods

Scheduled passenger and air cargo operations made up 99.8 percent of commercial operations at PSC in 2017. The remaining 0.2 percent were performed by on-demand charter airlines. Charter airline data from PSC was limited and did not encompass the 10-year historical period used as the basis of the forecast. USDOT T-100 records show operations by charter airlines operations for various years from 2007 and 2017 with Sun Country Airlines being the only charter airline operating consistently at PSC in that period. Data from five charter airlines was provided by PSC for fiscal years 2016 and 2017. Future charter operation estimates were extrapolated from the data provided by PSC.

TAF classifications of scheduled operations are split into two categories: air carrier and air taxi. Air carrier aircraft have 60 or more seats while air taxi aircraft have less than 60 seats. The commercial aircraft operations forecast is based on the following assumptions:

- Airlines will add service to meet the level of demand in the passenger enplanement forecast.
- Air taxi aircraft will be retired by 2022 following the FAA Aerospace Forecast projection of "Carriers [removing] 50 seat regional jets […] while adding 70-90 seat jets […] after 2020." It is expected the smaller jets will be replaced mainly with narrow-body jets.
- Average number of seats per departure will increase as smaller jets are replaced with larger aircraft. Airlines will adjust flight frequency to keep load factors at levels similar to the past ten years, which has been trending towards 80 percent. However, as airlines transition to the larger aircraft, load factors are expected to decrease temporarily with an adjustment period before rising back up to the expected 80 percent average load factor.

Summary and TAF Comparison

The next three tables present information on future commercial aircraft operations. **Table 2-23** presents scheduled passenger aircraft operations only, excluding air cargo aircraft, non-scheduled passenger aircraft, and air tanker aircraft operations. As noted previously, the load factors for air carrier operations decrease from 2017 to 2022 before recovering in 2027 due to the transition from regional aircraft to larger jets. **Table 2-24** presents the all commercial aircraft operations. Finally, **Table 2-25** compares commercial aircraft operations against the TAF.

The operations forecast is based on having enough operations and seats for the forecasted passenger enplanements. Seat averages are based on aircraft orders by the carriers serving PSC along with national trends for the aviation industry.

Table 2-23: Scheduled Passenger Aircraft Operations

Year	Enplanements	Air Carrier			Air Taxi/Commuter		Total Scheduled	
		Operations	Average Load Factor	Seats	Operations	Average Load Factor	Seats	Operations
2007	238,471	2,426	77.8%	83	10,704	74.8%	42	13,130
2012	332,847	7,532	79.8%	83	4,504	78.6%	50	12,036
2017	379,624	9,534	83.1%	85	3,046	80.3%	50	12,580
2022	448,000	13,430	78.8%	85	0	0.0%	0	13,430
2027	504,000	14,260	80.0%	95	0	0.0%	0	14,260
2032	592,000	13,596	80.0%	109	0	0.0%	0	13,596
2037	691,000	14,090	80.0%	123	0	0.0%	0	14,090
CAGR	3.0%	2.0%	-0.2%	1.9%	-100%	-100%	-`00%	0.6%

CAGR from 2017-2037
CAGR = Compound Average Growth Rate
Source: USDOT T-100 Database and Airport Records

Table 2-24: Commercial Aircraft Operations Forecast

Year	Air Carrier			Air Taxi/Commuter			Total
	Scheduled Passenger	Non-Scheduled Passenger	Sub-Total	Scheduled Passenger	Air Cargo	Sub-Total	
2007	2,426	0	2,426	10,704	921	11,625	14,051
2012	7,532	0	7,532	4,504	1,566	6,070	13,602
2017	9,534	35	9,569	3,046	1,682	4,728	14,297
2022	13,430	40	13,470	0	2,000	2,000	15,470
2027	14,260	40	14,300	0	2,000	2,000	16,300
2032	13,596	40	13,636	0	2,000	2,000	15,636
2037	14,090	40	14,130	0	2,000	2,000	16,130
CAGR	2.0%	0.7%	2.0%	-100%	0.9%	-4.2%	0.6%

CAGR from 2017-2037
CAGR = Compound Average Growth Rate
Source: Historical data comes from airport records

Table 2-25: Commercial Aircraft Operations Forecast – TAF Comparison

Year	2018 TAF	Forecast	Total Difference	% Difference
2017	12,621	14,297	1,676	13.3%
2022	13,622	14,340	718	5.3%
2027	14,398	15,140	742	5.2%
2032	15,448	15,112	-336	-2.2%
2037	16,591	15,640	-951	-5.7%
CAGR	1.4%	0.4%	N/A	N/A

CAGR = Compound Average Growth Rate
Source: 2018 TAF

The TAF underreports historic commercial aircraft operations. As explained in Section 3, Aviation Activity Profile, operations occurring outside the ATCT hours are not reported to the FAA OPSNET; therefore, the FAA data excludes the earliest and latest daily operations. Airport records and T-100 data provide a more accurate count of aircraft operations relative to the TAF.

GENERAL AVIATION FORECASTS

Itinerant General Aviation Operations

Methods

Itinerant GA operations were forecast using three methods: a regression analysis using the most strongly correlated variables (national itinerant operations, applying the 2018 FAA Aerospace Forecast growth rate, and using a market share analysis.

Itinerant GA operations at PSC have exhibited high historical correlation with national itinerant GA operations with a correlation coefficient of 0.9. Itinerant GA operations have been declining for the past 10 years locally and nationally. The average annual decline at PSC was 3.7 percent from 2007 to 2017, which is a faster decline than the national average decline for the same period was 2.8 percent. The high level of correlation supports comparison of the two variables. Recent diversification in the local economy means that trends that impact itinerant operations locally are likely to be similar to the trends that impact itinerant operations nationally.

The FAA Aerospace forecast method uses the 2018 FAA Aerospace Forecast growth rate to forecast operations. The 2018 FAA Aerospace Forecast projects the national GA itinerant operations will grow at an average annual rate of 0.2 per year in the next 20 years. This method directly uses the CAGR provided in the Aerospace Forecast while the regression method uses the regression equation.

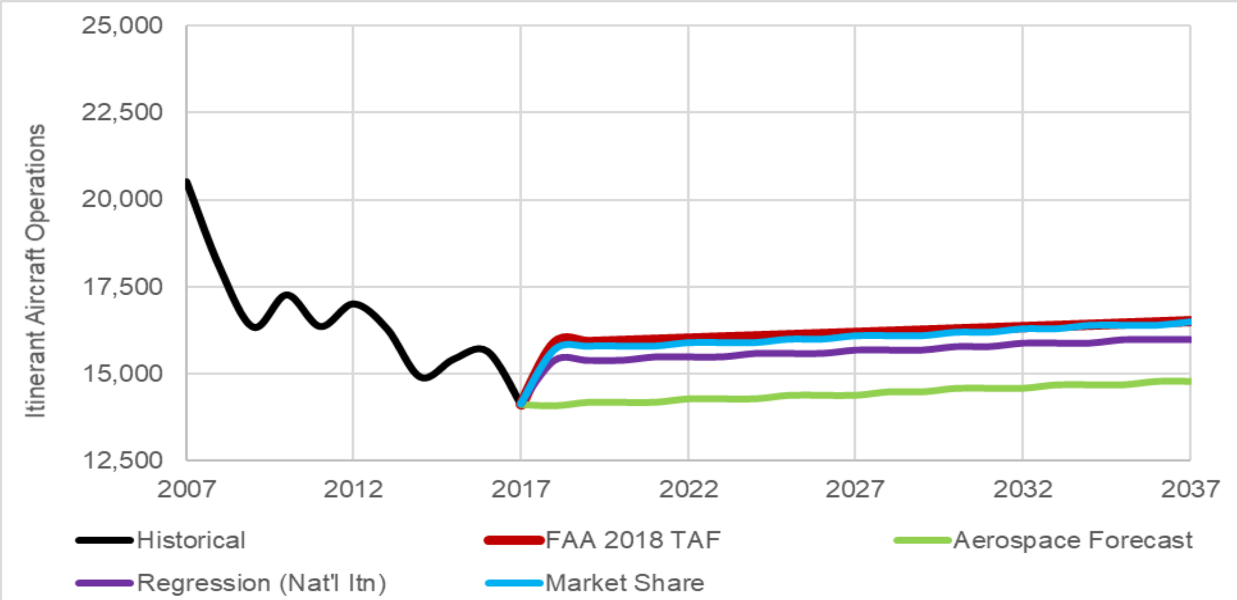
The Market Share forecast is based on the percentage of national itinerant GA operations occurring at PSC for the past ten years (0.11 percent). The forecast assumes PSC will retain this percentage against the projected national itinerant GA operations in the 2018 FAA Aerospace Forecast.

Table 2-26 and **Figure 2-15** presents the forecast along with the 2018 TAF for comparison purposes.

Table 2-26: Itinerant General Aviation Operations Forecast

Fiscal Year	Regression	Aerospace	Market Share	2018 TAF
2017	14,140	14,140	14,140	14,140
2022	15,500	14,300	15,700	16,031
2027	15,700	14,400	15,900	16,196
2032	15,900	14,600	16,100	16,361
2037	16,000	14,800	16,300	16,531
CAGR	0.6%	0.2%	0.7%	0.8%
CAGR = Compound Average Growth Rate				

Figure 2-15: Itinerant General Aviation Operations Forecast



Preferred Method and TAF Comparison

Itinerant GA operations at PSC are most strongly correlated to national itinerant GA operations. Because the FAA Aerospace Forecast projects slight growth in the national itinerant GA operations, support for growth at PSC is provided. While usage of SEP category is declining, other categories including turbine, experimental, and light sport aircraft are growing. The facilities at PSC can accommodate larger jet aircraft and will not constrain growth. Local demand drivers that influence itinerant GA traffic at PSC were also taken into consideration when determining the preferred forecast including the following:

- PNNL Gulfstream-1 research aircraft
- J&D Aircraft Sales buying and selling aircraft
- Abundant regional outdoor recreation destinations such as golf and watersports
- Presence of two FBOs at PSC with one offering aircraft rentals.

The preferred itinerant GA aircraft operations forecast is the Regression forecast. This preference is due to the strong correlation between historical PSC GA operations and the national fleet indicators. **Table 2-27** shows the preferred itinerant GA aircraft operations forecast is within 2 percent of the TAF in the five- and ten-year reporting periods.

Table 2-27: Itinerant General Aviation Operations Forecast – TAF Comparison

Fiscal Year	2018 TAF	Forecast	Total Difference	% Difference
2017	14,140	14,140	0	0.0%
2022	16,031	15,500	-531	-3.3%
2027	16,196	15,700	-496	-3.1%
2032	16,361	15,900	-461	-2.8%
2037	16,531	16,000	-531	-3.2%
CAGR	0.8%	0.6%	N/A	N/A

CAGR = Compound Average Growth Rate
Source: 2018 TAF

Local Operations

Methods

Local GA operations at PSC have been volatile for the past ten years. While there has been an overall decrease in operations from 2007 to 2017, 2016 experienced peak operation levels. Regression analysis found that none of the national aviation variables examined had strong historical correlation with PSC local operations. This excluded the regression analysis forecast from consideration. As discussed in Section 3.3.2, local GA operations are heavily influenced by the presence of flight training occurring at an airport, and PSC does not have a flight school. Therefore, it can be reasoned that local GA operations at PSC are subject to local factors such as the frequency of touch-and-go operations. Touch-and-go frequency is based on the local economy and population growth, increasing as more local pilots own aircraft in which they are likely to practice flying.

Historical trend analysis, the 2018 FAA Aerospace Forecast growth rate, and market share analysis methods were employed to forecast local GA operations. The trend analysis extrapolates the number of local operations from 2007 to 2017 and expects local GA operations to increase by an CAGR of 0.6 percent in the next 20 years. The aerospace growth rate uses the rates provided in the 2018 FAA Aerospace Forecast and projects growth in operations by a CAGR of 0.3 percent. The market share analysis uses the percentage of national local operations that have occurred at PSC over the past ten years (0.13 percent) and forecasts that future local operations will maintain this ratio to the projected national operations contained in the 2018 FAA Aerospace Forecast.

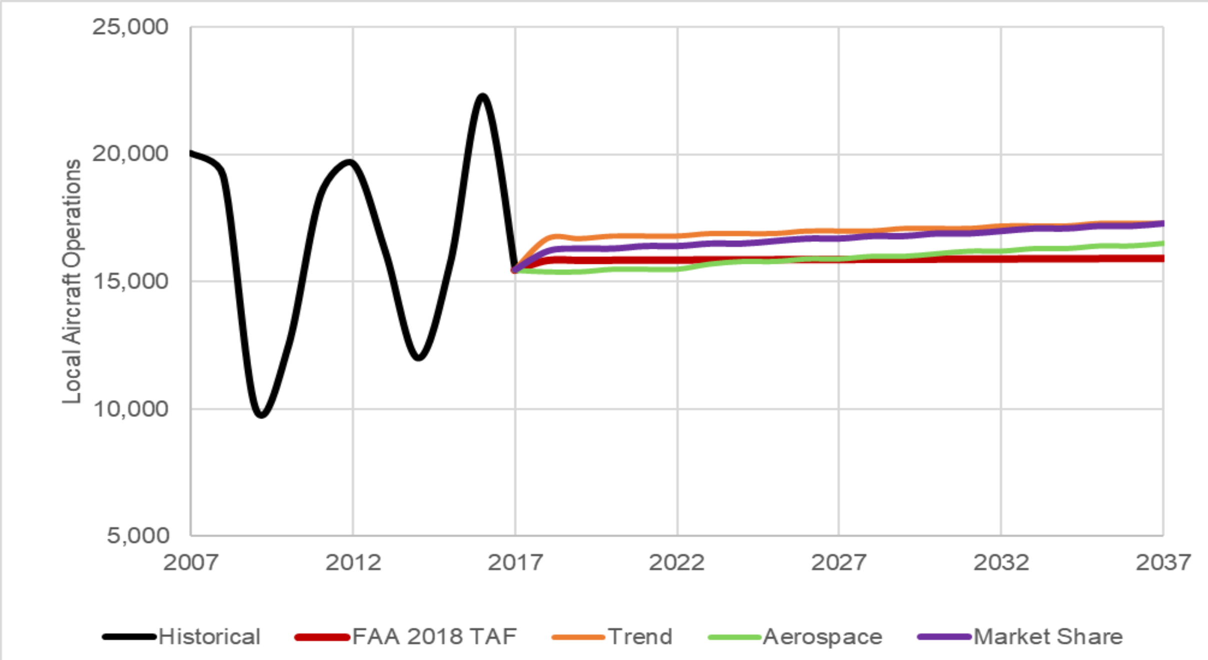
The local GA operations forecasts are shown in **Table 2-28** and **Figure 2-16** along with the 2018 TAF for comparison.

Table 2-28: Local General Aviation Operations Forecast

Fiscal Year	Trend	Aerospace	Market Share	2018 TAF
2017	15,461	15,461	15,461	15,461
2022	16,800	15,500	16,100	15,834
2027	17,000	15,900	16,400	15,854
2032	17,200	16,200	16,700	15,874
2037	17,300	16,500	17,000	15,894
CAGR	0.6%	0.3%	0.5%	0.1%

CAGR = Compound Average Growth Rate

Figure 2-16: Local General Aviation Operations Forecast



Preferred Method and TAF Comparison

Given the historically volatile nature of local operations at PSC and the poor correlation with historical national aviation variables, it would be difficult to apply national growth rates in projecting future operations. Thus, the Trend forecast is the preferred method as it would tend to reflect local factors that have affected the volatile number of historical local operations. While it is unlikely that local GA operations will increase as smoothly as the forecast depicts, there is a slight trend upward in the number of local aircraft operations at PSC. As noted in the 2018 FAA Aerospace Forecast, the GA fleet is seeing growth in experimental and light-sport aircraft. This growth should offset the decline in SEP aircraft related to the "unfavorable pilot demographics… and increasing cost of aircraft ownership" described in the FAA Aerospace Forecast. **Table 2-29** shows the preferred local GA operations forecast.

Table 2-29: Local General Aviation Operations Forecast – TAF Comparison

Fiscal Year	2018 TAF	Forecast	Total Difference	% Difference
2017	15,461	15,461	N/A	0.0%
2022	15,834	16,800	966	6.1%
2027	15,854	17,000	1,146	7.2%
2032	15,874	17,200	1,326	8.4%
2037	15,894	17,300	1,406	8.8%
CAGR	0.1%	0.6%	N/A	N/A

CAGR = Compound Average Growth Rate
Source: 2018 TAF

Based Aircraft

Based aircraft are aircraft stored at PSC either in hangars or tie-downs. Scheduled commercial aircraft that routinely fly to and from PSC are not considered based aircraft. Based aircraft forecasts are primarily used to define future aircraft parking and storage needs.

Methods

Three methods are used to project the size and composition of the PSC based aircraft fleet. The first is a growth rate analysis based on historical change in each aircraft category from the last five years. The five-year growth rate is selected since the ten-year growth rate would include the inordinate one-year increase from 6 to 11 jets between 2007 to 2008. This level of growth is realistic at a small scale, but it begins to produce growth of 10 to 20 jet aircraft per year later in the forecast, which is not considered sustainable. Therefore, the five-year historical growth rate was used for this forecast method. The five-year growth rate allows for a more gradual change and does not produce spikes in the growth rate due to a large influx of additional aircraft.

The second method uses the growth rate for each aircraft category contained in the 2018 FAA Aerospace Forecast and applies it to based aircraft at PSC to project future growth. The third method compares the market share of the number of PSC based aircraft for each aircraft type with the national aircraft fleet from 2007 to 2017. The three methods are compared to the 2018 TAF.

A regression analysis using national aviation indicators and the GDP showed weak correlation with PSC based aircraft with all variables having correlation coefficients less than 0.6; therefore, these methods were not used.

Preferred Forecast and Preferred Method

The 2018 FAA Aerospace Forecast expects nationwide SEP aircraft to decline an average of 0.9 percent annually in the next 20 years. Jet aircraft are expected to grow 2.0 percent; helicopters, 1.8 percent; and other aircraft, 1.0 percent in the same period.

The growth rate forecast projects a CAGR of 0.5 percent in based aircraft at PSC. This method projects SEP aircraft to decline by 0.7 percent CAGR while jets grow at 3.1 percent CAGR. MEP aircraft are expected to remain stable. Other aircraft are expected to increase in the future as the market for light sport and experimental aircraft grows.

The aerospace growth rate forecast expects SEP aircraft to decline between 2018 and 2038 by 1.0 percent annually, and MEP aircraft to decline by 0.5 percent annually. Jets and other aircraft will both increase at an average of 2.0 percent per year in the same period. While there are currently no aircraft categorized as other based at PSC, the growing light sport and experimental aircraft market is expected to become more common as they replace aging SEP aircraft.

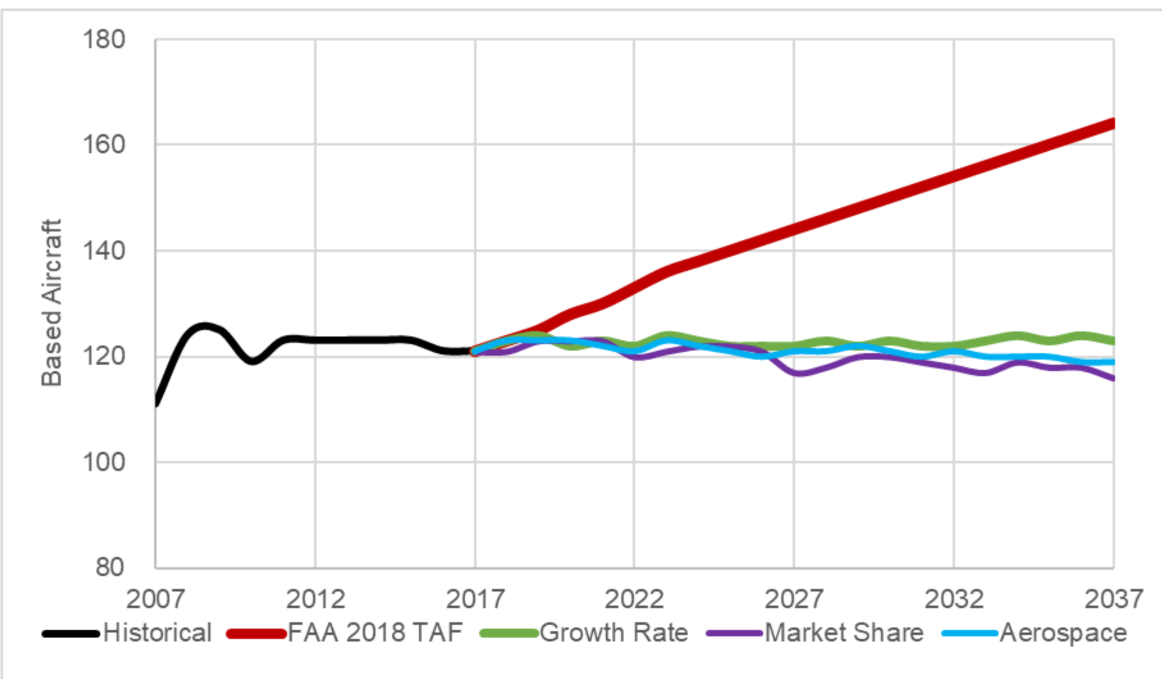
The market share forecast shows SEP and MEP aircraft declining while jets and other aircraft increase. Using this method, the total number of based aircraft is expected to decline by a CAGR of 0.1 percent. The light sport and experimental aircraft are expected to replace retiring SEP aircraft. However, the market share forecast reflects the national GA aircraft trends which do not correlate with the historic based aircraft numbers at PSC. Therefore, the market share forecast was no selected as a preferred method.

Table 2-30 and **Figure 2-17** presents the forecasted based aircraft with each of the three methods and the 2018 TAF shown for reference.

Table 2-30: Based Aircraft Forecasts

Fiscal Year	Growth Rate	Aerospace	Market Share	2018 TAF
2017	121	121	121	121
2022	122	121	120	133
2027	122	121	117	144
2032	122	121	118	154
2037	123	119	116	164
CAGR	0.1%	-0.1%	-0.2%	1.5%
CAGR = Compound Average Growth Rate				

Figure 2-17: Based Aircraft Forecasts



The correlation coefficient between the PSC based aircraft fleet and the national GA aircraft fleet is 0.07, which is considered weak; therefore, it is not recommended that PSC based aircraft forecasts be sourced from national trends. This eliminates the market share and aerospace forecasts. While the market share forecast is based on the historical number of based aircraft at PSC, it still ultimately relies on the national fleet numbers. The growth rate reflected in the 2018 TAF is not considered realistic because its exceptionally high projections have not been experienced during the past 10 years, and there are no underlying local factors that would cause such growth.

The growth rate forecast is preferred. This forecast is based on historical conditions at PSC with some consideration of market trends for Other aircraft since there are currently no aircraft of this category based at PSC. The breakdown of the growth rate forecast by aircraft type is shown in **Table 2-31**. **Table 2-32** shows that the preferred forecast is within 10 percent of the TAF in five years and 15 percent of the TAF within 10 years.

Table 2-31: Preferred Based Aircraft Forecast

Fiscal Year	SEP	MEP	Jet	Helicopter	Other	Total
2017	80	23	14	4	0	121
2022	77	22	16	4	3	122
2027	74	21	19	4	4	122
2032	72	20	22	4	4	122
2037	69	19	26	4	5	123
CAGR	-0.7%	-1.0%	3.1%	0.0%	N/A	0.1%

CAGR = Compound Average Growth Rate

Table 2-32: Based Aircraft Forecast – TAF Comparison

Fiscal Year	2018 TAF	Forecast	Total Difference	% Difference
2017	121	121	0	0.0%
2022	133	122	-11	-8.3%
2027	144	121	-23	-16.0%
2032	154	121	-33	-21.4%
2037	164	119	-45	-27.4%
CAGR	1.5%	0.1%	N/A	N/A

CAGR = Compound Average Growth Rate
Source: 2018 TAF

PEAK FORECASTS AND CRITICAL AIRCRAFT

Peak Period Forecasts

Peak forecasts estimate when certain airport facilities will be at their busiest. Peak forecasts are used to assess level of service of airfield and terminal facilities and to right-size improvement projects. Improvement projects are not typically designed for the busiest hour of the busiest day of the year because such a design would lead to over-building. Instead, peak forecasts look at a typical busy period throughout the year. Forecasts use historical records to project future peaking; therefore, it is essential that peak forecasts be reevaluated if a change in user or aircraft type occurs. **Table 2-33** presents the peak forecasts.

Table 2-33: Peak Period Forecasts

Category	Period	Factor	2017	2022	2027	2032	2037
Enplanements and Deplanements	Annual	100%	379,624	448,000	504,000	592,000	691,000
	Peak Month	10%	38,000	45,000	51,000	60,000	69,000
	Peak Day	3%	1,300	1,500	1,700	2,000	2,300
	Peak Hour – Enplanements[1]	16%	210	240	270	320	370
	Peak Hour – Deplanements[1]	13%	170	200	220	260	300
Total Passengers	Annual	100%	759,248	896,000	1,008,000	1,184,000	1,382,000
	Peak Month	10%	76,000	90,000	101,000	119,000	139,000
	Peak Day	3%	2,500	3,000	3,400	4,000	4,600
	Peak Hour[1]	10%	257	307	366	436	520
Aircraft Operations	Annual	100%	47,616	51,470	52,700	52,436	53,130
	Peak Month	12%	5,500	6,000	6,100	6,100	6,200
	Peak Day	5%	300	300	300	300	300
	Peak Hour	18%	55	55	55	55	55

1) Peak hour forecasts adjusted to reflect average load factor, depicted in **Figure 2-6**.
Peak Enplanements / Deplanements / Passengers: Month: FAA T-100 Database. Day and Hour: Airline Schedules
Peak Aircraft Operations: Peak Month and Day: FlightWise IFR Flight Records, PSC radar flight tracks, PSC ATCT.

Peak enplanement and deplanement passenger forecasts are driven by growth in total passenger numbers and the trends in airlines transitioning from smaller to larger aircraft. T-100 data and airline schedules show that PSC experiences peak passenger numbers in the month of August. This coincides with school holidays and increased service by Allegiant Air to vacation destinations like Phoenix-Mesa, Los Angeles, and Las Vegas. Daily peaks occur at different times, with enplaned passenger peaks occurring during the morning rush between 5 a.m. and 6 a.m., and again at noon. The deplaned passenger peak occurs at noon as well.

Peak aircraft operations occur in June and are driven by a mix of GA and commercial service traffic. While the operations peak does not directly coincide with the passenger peak, both occur during the summer when schools are on vacation and there are fewer days of bad weather to discourage recreational flying.

Future peaking analysis assumes that peak percentages, shown in **Table 2-33**, will remain the same into the future. The peaking analysis is included as **Appendix C**.

Critical Aircraft

The critical aircraft is the most demanding type or group of aircraft that has more than 500 annual non touch-and-go operations at an airport. Operations data by aircraft type is provided by the Traffic Flow Management System Counts (TFMSC). The TFMSC only captures operations with flight plans filed.

Therefore, flight training aircraft that operate more frequently than those listed are not represented. **Table 2-34** identifies the critical aircraft.

Table 2-34: Existing Critical Aircraft

Rank	Aircraft	Role	Operations	ARC
1	DH8D - Bombardier Q400	Passenger Airline	4,578	B-III
2	CRJ2 - Bombardier CRJ-200	Passenger Airline	3,043	C-II
3	CRJ7 - Bombardier CRJ-700	Passenger Airline	2,291	C-II
4	CRJ9 - Bombardier CRJ-900	Passenger Airline	1,219	C-II
5	BE9L - Beech King Air 90	Business Turboprop	596	B-II
6	C25B - Cessna Citation CJ3	Business Jet	576	B-II
7	E120 - Embraer Brasilia EMB 120	Cargo Airline	518	B-II
8	A319 - Airbus A319	Passenger Airline	468	C-III
Source: TFMSC				

There is currently no single aircraft with an Airport Reference Code (ARC) of C-III providing over 500 non-touch-and-go operations per year at PSC. However, a combination of aircraft with an Aircraft Approach Category (AAC) C and an Airplane Design Group (ADG) III easily exceeds 500 annual operations. This indicates having airport facilities that meet ARC C-III design standards is appropriate at PSC. This is further supported by the average seat capacity for air carrier aircraft operating at PSC is expected to increase from 83 to 127 by 2037, as shown in **Table 2-23** in Section 4, Commercial Operations, Summary and TAF Comparison. It is expected that A319 aircraft operations will increase along with other narrow-body jet aircraft as larger aircraft replace smaller passenger aircraft. Alaska Airlines has announced it is replacing the Q400 with the Embraer 175 regional jet (E175) (ARC C-III), which will operate with the same number of seats as the Q400.

The exact composition of the future fleet is unknown. Based on airline orders of Boeing and Airbus aircraft, the new Boeing 737 MAX and A320neo are expected to replace their less fuel efficient, less advanced existing counterparts while keeping similar physical characteristics. Regional jets at PSC are expected to transition to the E175 and the 90-seat Mitsubishi Regional Jet (MRJ) (ARC C-III). SkyWest, which operates regional routes for United and Delta, has an order for 100 MRJs.

The future air carrier fleet mix will determine the future critical aircraft for PSC. Estimates for future operations are based on enplanement, commercial operation, aircraft seating capacity, and load factor forecasts. Aircraft classified as air taxi (less than 60 seats) were not included in projections as they are expected to be phased out by 2022. ATCT say that Runway 3R/21L is primarily used by GA aircraft, has an ARC of B-II, and is expected to remain as such, with the critical aircraft being the Beech King Air. The future critical aircraft for Runways 3L/21R and 12/30 is expected to be the Boeing 737 -8 MAX, with an ARC of D-III. **Table 2-35** shows the future operations by air carriers distinguished by aircraft seating capacity.

Table 2-35: Future Air Carrier Operations by Aircraft Type

Seating Capacity	Typical Aircraft	ARC	2022	2027	2032	2037
60-76	E175, MRJ	C-II	11,930	10,200	7,736	6,230
100-124	A220, E195-E2	C-III	200	1,460	1,460	1,460
125-150	A319, A320, A321	C-III	300	1000	1,800	3,000
> 150	737 MAX 8	D-III	1,000	1,600	2,600	3,400
0-59 seat aircraft are expected to be phased out by 2022. Aircraft with 77-99 seats did not operate many flights at PSC in the past ten years so there is insufficient data.						

FORECAST SUMMARY

The forecast summary is presented in **Figure 2-18** and **Figure 2-19**. Highlights of the forecast are below.

- The MSA is growing, and its economy is diversifying.
- The MSA population is expected to grow an average 1.6 percent annually.
- Passenger enplanement growth is expected to continue, driven by population growth and economic development in the MSA. Load factors for airlines are near industry average at PSC, which can encourage airlines to establish additional routes and increase frequencies.
- The average number of seats per departure will continue to increase as airlines transition to larger aircraft. Commercial aircraft operations will remain steady as the total number of seats increases. Air taxi aircraft (less than 60 seats) are expected to exit the market in the next five years as airlines retire these aircraft.
- Air cargo volume is projected to remain steady with aircraft operations also remaining steady.
- Local and itinerant GA operations are expected to increase slowly. Neither are well explained by national aviation trends.
- The SEP aircraft fleet will continue to decrease as they are retired faster than they are replaced. Helicopter and MEP aircraft will remain flat while jets, light-sport, and experimental aircraft grow. The overall number of based aircraft at PSC is expected to be relatively flat as retiring SEP aircraft are replaced by aircraft from the growing segments.
- Future ARCs of the runways will remain the same. The critical aircraft for Runway 3R/21L (B-II) will be the Beech King Air. The critical aircraft for Runway 3L/21R (D-III) and Runway 12/30 (D-III) are narrow body transports like the Boeing 737-8 MAX.

Figure 2-18: Forecast/TAF Comparison

AIRPORT NAME: PASCO TRI-CITIES AIRPORT

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2017	379,624	379,624	0%
Base yr. + 5yrs.	2022	448,000	473,613	-5%
Base yr. + 10yrs.	2027	504,000	505,459	0%
Base yr. + 15yrs.	2032	592,000	544,141	9%
Commercial Operations				
Base yr.	2017	14,297	12,621	13%
Base yr. + 5yrs.	2022	15,470	17,257	-10%
Base yr. + 10yrs.	2027	16,300	19,115	-15%
Base yr. + 15yrs.	2032	15,636	20,226	-23%
Total Operations				
Base yr.	2017	47,616	45,940	4%
Base yr. + 5yrs.	2022	51,470	53,355	-4%
Base yr. + 10yrs.	2027	52,700	55,413	-5%
Base yr. + 15yrs.	2032	52,436	57,021	-8%

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

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Figure 2-19: TAF Forecast Worksheet

A. Forecast Levels and Growth Rates

AIRPORT NAME: PASCO TRI-CITIES AIRPORT **Specify base year:** 2017

	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.	Average Annual Compound Growth Rates Base yr. to +1	Base yr. to +5	Base yr. to +10	Base yr. to +15
Passenger Enplanements									
Air Carrier	70,814	78,000	83,000	149,000	294,000	10.1%	3.2%	7.7%	10.0%
Commuter	308,810	314,000	365,000	355,000	298,000	1.7%	3.4%	1.4%	-0.2%
TOTAL	379,624	392,000	448,000	504,000	592,000	3.3%	3.4%	2.9%	3.0%
Operations									
Itinerant									
Air carrier	9,569	10,286	13,470	14,300	13,636	7.5%	7.1%	4.1%	2.4%
Commuter/air taxi	4,728	2,444	2,000	2,000	2,000	-48.3%	-15.8%	-8.2%	-5.6%
Total Commercial Operations	14,297	12,730	15,470	16,300	15,636	-11.0%	1.6%	1.3%	0.6%
General aviation	14,140	15,400	15,500	15,700	15,900	8.9%	1.9%	1.1%	0.8%
Military	1,380	1,400	1,400	1,400	1,400	1.4%	0.3%	0.1%	0.1%
Local									
General aviation	15,461	16,700	16,800	17,000	17,200	8.0%	1.7%	1.0%	0.7%
Military	2,338	2,300	2,300	2,300	2,300	-1.6%	-0.3%	-0.2%	-0.1%
TOTAL OPERATIONS	47,616	48,530	51,470	52,700	52,436	1.9%	1.6%	1.0%	0.6%
Instrument Operations	18,439	17,220	19,991	20,868	20,252	-6.6%	1.6%	1.2%	0.6%
Peak Hour Operations	21	25	55	55	55	19.0%	21.1%	10.0%	6.6%
Cargo/mail (enplaned+deplaned tons)	4,743,150	4,685,918	4,463,813	4,200,928	3,953,524	-1.2%	-1.2%	-1.2%	-1.2%
Based Aircraft									
Single Engine (Nonjet)	80	79	77	74	72	-1.3%	-0.8%	-0.8%	-0.7%
Multi Engine (Nonjet)	23	14	22	21	20	-39.1%	-0.9%	-0.9%	-0.9%
Jet Engine	14	23	16	19	22	64.3%	2.7%	3.1%	3.1%
Helicopter	4	4	4	4	4	0.0%	0.0%	0.0%	0.0%
Other	0	3	3	4	4	0.0%	0.0%	0.0%	0.0%
TOTAL	121	123	122	122	122	1.7%	0.2%	0.1%	0.1%

B. Operational Factors

	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.
Average aircraft size (seats)					
Air carrier	153	152	154	143	153
Commuter	67	75	76	76	76
Average enplaning load factor					
Air carrier	80%	79%	80%	74%	80%
Commuter	81%	80%	80%	72%	80%
GA operations per based aircraft	245	261	265	268	271

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ATTACHMENT 1 – TERMINAL AREA FORECAST

ISSUED MARCH 2019

U.S. Department
of Transportation
Federal Aviation
Administration

Northwest Mountain Region
Seattle Airports District Office
2200 S. 216th Street
Des Moines, WA 98198

March 28, 2019

Mr. Donald "Buck" Taft
Airport Director
Tri-Cities Airport
3601 North 20th
Pasco, WA 99301

Tri-Cities Airport (PSC) Aviation Forecast Approval

Dear Buck:

The Federal Aviation Administration (FAA), Seattle Airports District Office has reviewed the aviation forecast for the Tri-Cities Airport (PSC) Master Plan Update, submitted March 8, 2019. The FAA approves these forecasts for airport planning purposes, including for Airport Layout Plan (ALP) development. The FAA approval is based on the following:

1. The difference between the FAA Terminal Area Forecast (TAF) and Tri-Cities's forecast for passenger enplanements, commercial operations, total operations, and based aircraft is within the 10 percent and 15 percent allowance for the 5-year and 10-year planning horizons.
2. The forecast is based on reasonable planning assumptions, current data and appropriate forecasting methodologies.

Based on the approved forecast, the FAA also approves the existing and future critical aircraft best typified by the Airbus A320neo and Boeing 737 MAX (RDC C-III).

The approval of the forecast and critical aircraft does not automatically constitute a commitment on the part of the Unites States to participate in any development recommended in the master plan or shown on the ALP. All future development will need to be justified by current activity levels at the time of proposed implementation. Further, the approved forecasts may be subject to additional analysis or the FAA may request a sensitivity analysis if this data is to be used for environmental or Part 150 noise planning purposes.

If you have any questions about this forecast approval, please call me at (206) 231-4135.

Sincerely,

Jennifer I Kandel Digitally signed by Jennifer I Kandel
Date: 2019.03.28 13:34:46 -07'00'

Jennifer I. Kandel
Planner, FAA Seattle Airports District Office

U.S. Department
of Transportation
Federal Aviation Administration

Northwest Mountain Region
Seattle Airports District Office
2200 S. 216th Street
Des Moines, WA 98198

January 17, 2020

Mr. Donald "Buck" Taft
Airport Director
Tri-Cities Airport
3601 North 20th
Pasco, WA 99301

Re: Tri-Cities Airport (PSC) Aviation Forecast Approval - revision

Dear Buck:

The previous aviation forecast approval for Tri-Cities Airport (PSC), dated March 28, 2019, contained an error.

Based on the approved forecast, the FAA approves the existing critical aircraft best typified by the Embraer 175 (RDC C-III) and the future critical aircraft best typified by the Airbus A320neo and Boeing 737-MAX (RDC D-III).

I apologize for any confusion. Thank you for your understanding. If you have any questions about this revision, do not hesitate to call me at (206) 231-4135.

Sincerely,

Jennifer I Kandel

Digitally signed by Jennifer I Kandel
Date: 2020.01.17 16:53:11 -08'00'

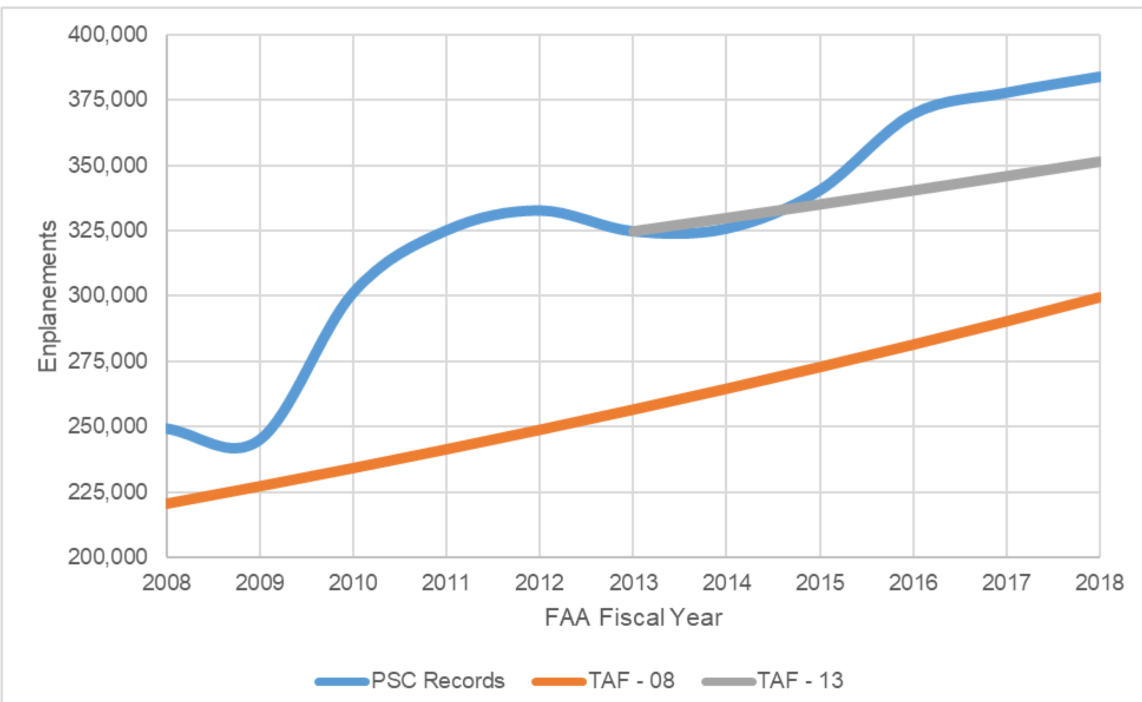
Jennifer I. Kandel
Planner, FAA Seattle Airports District Office

ATTACHMENT 2 – HISTORICAL TAF PERFORMANCE

The FAA issues the TAF every year with an update to reflect new trends and changes in the aviation system. The TAF for airports like PSC are updated based on regional information and observed trends, and a statistical analysis specific to the market that PSC serves is not performed. Master Plan forecasts provide FAA forecasters with much more detailed information that they normally receive for PSC and similarly sized airports.

Attachment 2 evaluates the historical performance of previous TAF forecasts (FY2008 and FY2013) in relation to actual performance of PSC. Categories evaluated are passenger enplanements (air carrier, air taxi, and commuter), commercial operations (air carrier and air taxi), itinerant general aviation operations, and local general aviation operations. The comparison between the TAFs and PSC records in shown in Figure A2-1 to Figure A2-4.

Figure A2-1: Passenger Enplanement TAF Comparison



Actual passenger enplanements outperformed both TAFs, with the exception of the 2013/2014 decreased caused by a change in Allegiant Airlines service. Strong local economic growth, not considered during TAF development, is likely one of the primary reasons that PSC outperformed the TAF projections.

Figure A2-2: Itinerant Commercial Operations TAF Comparison

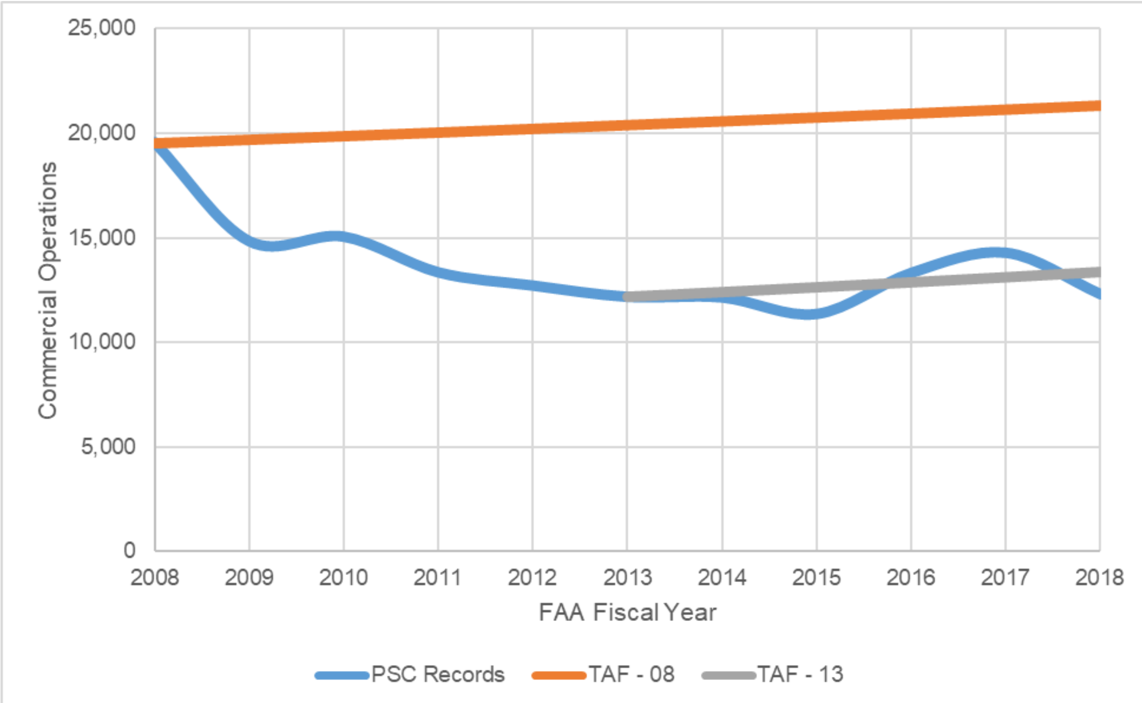


Figure A2-3: Itinerant GA Operations TAF Comparison

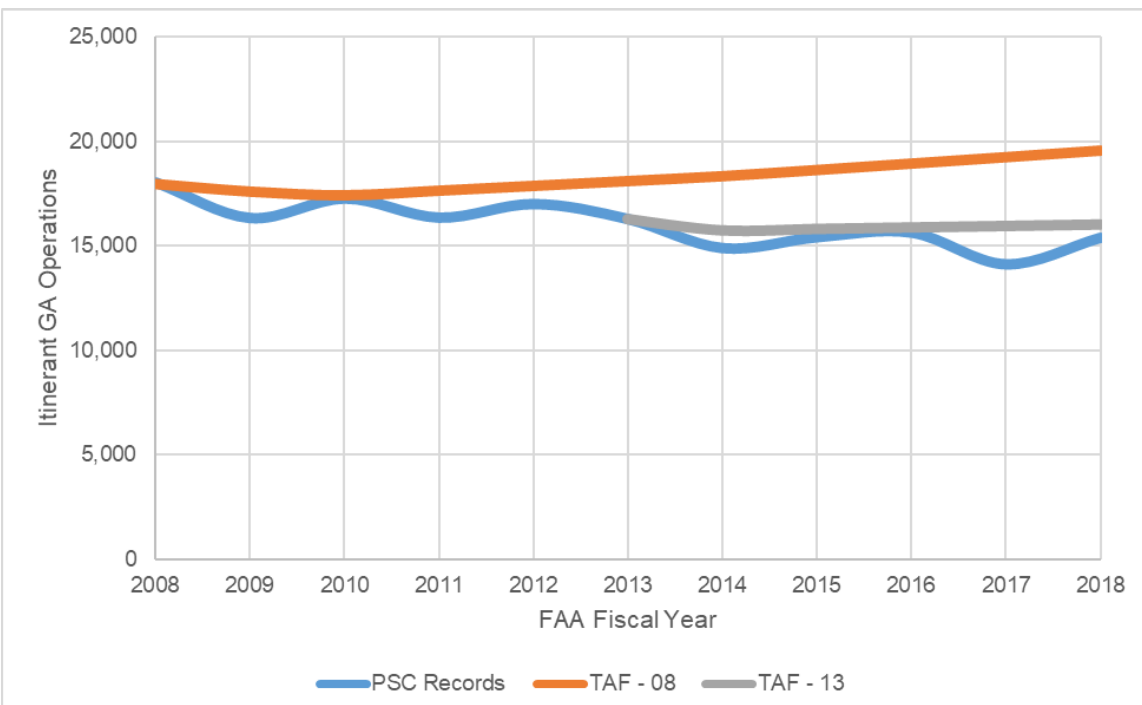
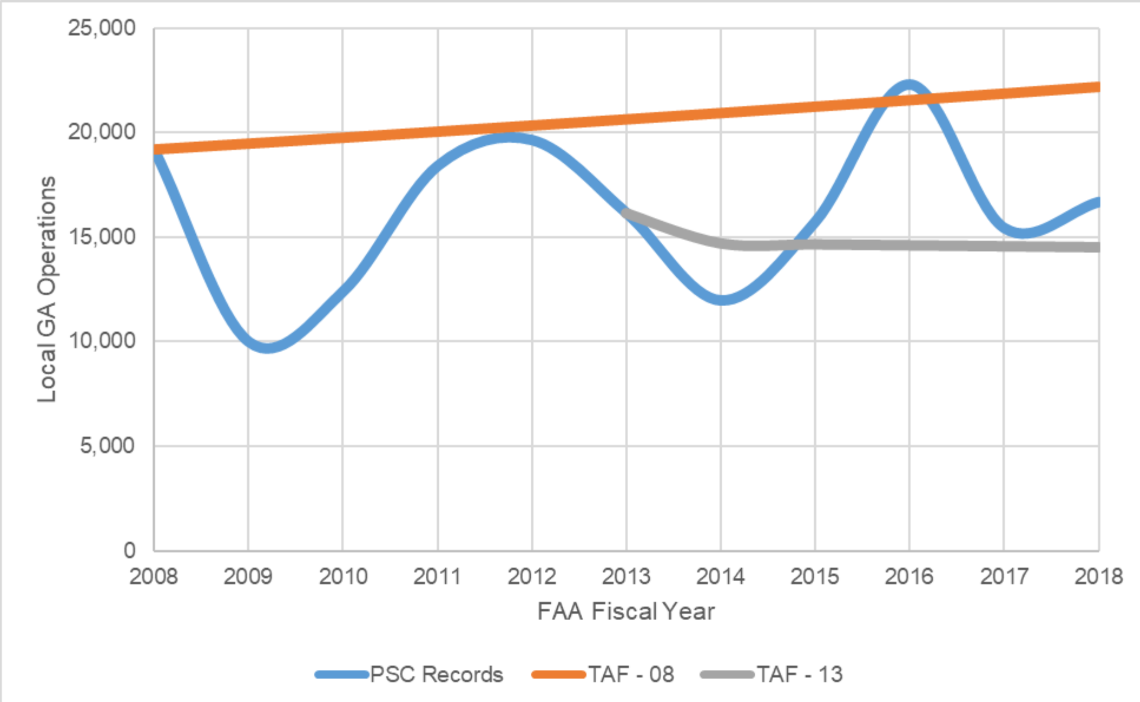


Figure A2-4: **Local GA Operations TAF Comparison**



Operations at PSC have underperformed the TAF for commercial and GA activities. The primary reason for the drop in commercial operations at PSC is that strong local demand for scheduled passenger air travel, combined with the national pilot shortage and retirement of smaller aircraft, has caused the airlines to use larger aircraft at PSC, thus reducing flight frequencies. The 2013 TAF better reflects this trend than the 2008 TAF.

Similarly, the 2008 TAF for itinerant and local GA operations was overly optimistic for PSC. PSC itinerant GA traffic performed in line with the 2013 TAF, which projected that 2018 itinerant GA operations would remain at the same level as 2013 itinerant GA operations. Local GA operations at PSC have been highly influenced by airline hiring sprees, and the proximity of PSC to flight schools in Walla Walla and Oregon. This up and down effect is not replicated by the TAF and TAF creators have not been privy to information about the flight schools prior to the completion of this Master Plan.

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TRI-CITIES AIRPORT • PSC

CHAPTER 3

FACILITY REQUIREMENTS

CHAPTER 3 - FACILITY REQUIREMENTS

CHAPTER OVERVIEW

This chapter identifies facility recommendations and requirements to accommodate the forecasted level of demand at Tri-Cities Airport (PSC). The recommendations and requirements are developed in coordination with the aviation activity forecasts presented in **Chapter 2 Aviation Activity Forecasts**, PSC management and stakeholders, and Federal Aviation Administration (FAA) Advisory Circulars (AC) 150/5070-6B, *Airport Master Plans;* AC 150/5300-13A, *Airport Design;* and AC 150/5060-5, *Airport Capacity and Delay*. This chapter is organized into the following sections:

- Airport Design Standards
- Runway Utilization and Airfield Capacity
- Airfield and Airspace Facilities
- Runway Length Analysis
- Passenger Terminal Building
- Terminal Area and Support Facilities
- Landside and Other Support Facilities
- Vehicle Parking and Access
- Summary

The facility improvements are identified to resolve existing deficiencies, to accommodate projected growth, and to satisfy airport development goals. As a result, facility improvements respond to demand rather than being planned for a specific year. Facilities expected to be needed beyond the 20-year planning horizon are identified as ultimate design.

AIRPORT DESIGN STANDARDS

FAA Design Standards

The FAA is responsible for the overall safety of civil aviation in the United States. Therefore, FAA design standards and policy focus first on safety, with secondary goals including efficiency and utility. The FAA's design standards, presented in a series of ACs, heavily influence design and construction of airport facilities.

FAA AC 150/5300-13A uses a coding system to determine design standards for airports based on the operational and physical characteristics of the aircraft that operate or intend to operate at an airport. Two categories yield the Airport Reference Code (ARC): the Aircraft Approach Category (AAC), based on aircraft approach speed, and Airplane Design Group (ADG), based on the wingspan and tail height. The Runway Design Code (RDC) adds a third component to the ARC based on runway approach visibility minimums, expressed as Runway Visual Range (RVR). The RDC, which is the FAA classification for the airfield design, determines the scale and setbacks of airfield facilities based on the critical design aircraft. RDC coding classifications are shown in **Table 3-1**.

Table 3-1: Runway Design Code Designations

Aircraft Approach Category (AAC)		
AAC	Approach Speed	
A	Approach Speed less than 91 knots	
B	Approach speed 91 knots or more but less than 121 knots	
C	Approach speed 121 knots or more but less than 141 knots	
D	Approach speed 141 knots or more but less than 166 knots	
E	Approach speed 166 knots or more	
Airplane Design Group (ADG)		
Group Number	Wingspan (in feet)	Tail Height (in feet)
I	< 49'	< 20'
II	49' - < 79'	20' - < 30'
III	79' - < 118'	30' - < 45'
IV	118' - < 171'	45' - < 60'
V	171' - < 214'	60' - < 66'
VI	214' - < 262'	66' - < 80'
Approach Visibility Minimums		
RVR (Feet)	Flight Visibility Category (statue miles)	
VIS	Runways designed for visual approach use only	
5000	Not lower than 1 mile	
4000	Lower than 1 mile but not lower than ¾ mile	
2400	Lower than ¾ mile but not lower than ½ mile	
1600	Lower than ½ mile but not lower than ¼ mile	
1200	Lower than ¼ mile	

Source: FAA AC 150/5300-13A, *Airport Design*.

Critical Design Aircraft

The critical design aircraft is the most demanding aircraft type or group of aircraft with similar characteristics that regularly use an airport with more than 500 annual operations. There can be different critical design aircraft for different runways based on intended design and use.

Runway 3L/21R, the primary runway and Runway 12/30, the secondary runway are intended for use by commercial aircraft with instrument approach capabilities. As determined in the **Chapter 2 Aviation Activity Forecasts**, the existing critical aircraft for Runway 3L/21R and Runway 12/30 is the Embraer 175 or Airbus A319 with an ARC C-III. The future critical design aircraft are the Boeing 737 MAX 8 and Airbus A320. These aircraft have an ARC D-III classification and fall within similar weight class and performance categories.

The Air Traffic Control Tower (ATCT) personnel report that Runway 3R/21L is primarily used by single and twin piston aircraft operating under visual flight rules (VFR) conditions. Having parallel 3/21 runways allows separation of aircraft fleet mix by approach speed. As airspace around PSC becomes busier, the ATCT will need Runway 3R/21L to continue to provide this separation. The critical design aircraft for Runway 3R/21L is a Beechcraft King Air, which has an ARC B-II classification.

Runway Design Standards

Runway design standards are based on the requirements to conduct aircraft operations for existing and expected users of PSC and the condition and location of existing facilities. To receive FAA funding, airside facility improvements must meet FAA design standards. Facilities must be sized and located appropriately. They must also be designed to meet the needs of the critical design aircraft, to minimize environmental impact, and to consider ongoing operation and maintenance. The design standards include safety areas, object free areas, runway protection zones, and runway setbacks for taxiways and other airport facilities. Runway length has additional design criteria and will be assessed in separate section of this chapter.

Runway 3L/21R

Runway End 21R is equipped with an Instrument Landing System (ILS) approach and visibility minimums are as low as ½ statute mile. The RDC for Runway 3L/21R is D-III-2400. Runway blast pads provide erosion protection beyond runway ends and are recommended on runways that typically serve jet aircraft. Runway End 3L has no blast pads, and Runway 21R has a blast pad that is 150 feet wide and 90 feet long. Design standards recommend that blast pads are 200 feet wide and 200 feet long for D-III-2400 runways.

A summary of Runway 3L/21R design standards is included in **Table 3-2**.

Table 3-2: Runway 3L/21R Design Standards Compliance

Runway Design	Design Standards D-III-2400	Runway 3L/21R Existing Dimensions	
		Runway 3L	Runway 21R
Runway Width	150’	150’	
Paved Shoulder Width (Recommended)	25’	25’	
Blast Pad Width	200’	None	150’
Blast Pad Length	200’	None	90’
Runway Safety Area (RSA)			
Length Beyond Departure End	1,000’	1,000’	
Length Prior to Threshold	600’	1,000’	
Width	500’	500’	
Runway Object Free Area (ROFA)			
Length Beyond Departure End	1,000’	1,000’	
Length Prior to Threshold	600’	600’	
Width	800’	800’	
Precision Obstacle Free Zone (POFZ)			
Length	200’	N/A	200’
Width	800’	N/A	800’
Runway Separation			
Runway Centerline to:			
Parallel Runway Centerline	700’	800’	
Holding position	250’	250’, 300’	465’
Parallel Taxiway	400’	400’	
Aircraft parking area	500’	700’+	

Notes: Tan cells indicate non-standard condition.
N/A – Not Applicable.
Source: Mead & Hunt analysis using FAA AC 150/5300-13A.

Runway 12/30

Runway 12/30 has Area Navigation (RNAV) Global Positioning System (GPS) non-precision approaches with visibility minimums as low as ¾ statute mile to both ends; therefore, the RDC for Runway 12/30 is D-III-4000. The 1,000-foot RSA length design standard southeast of Runway End 30 is attained by using declared distances. Declared distances are when published runway lengths differ from the actual pavement length. Declared distances state the maximum length available for takeoff, rejected takeoff, and landing. The published Accelerate Stop Distance Available (ASDA) and Landing Distance Available (LDA) lengths for operations on Runway End 12 are both 7,503 feet, 200 feet less than the pavement length of 7,703 feet. Declared distances are used in this case as an incremental improvement technique because it is not practical to fully meet the RSA requirements without relocating the runway. Applicable airport design standards for this runway are presented in **Table 3-3**.

Table 3-3: Runway 12/30 Design Standards Compliance

Runway Design	Design Standards D-III-4000	Runway 12/30 Existing Dimensions	
		Runway 12	Runway 30
Runway Width	150'	150'	
Paved Shoulder Width (Recommended)	25'	± 25'	
Blast Pad Width	200'	0	200'
Blast Pad Length	200'	0	190'
Runway Safety Area (RSA)			
Length Beyond Departure End	1,000'	1,000'	
Length Prior to Threshold	600'	600'	
Width	500'	500'	
Runway Object Free Area (ROFA)			
Length Beyond Departure End	1,000'	1,000'	
Length Prior to Threshold	600'	600'	
Width	800'	800'	
Precision Obstacle Free Zone (POFZ)			
Length	200'	N/A	
Width	800'	N/A	
Runway Separation			
Runway Centerline to:			
Parallel Runway Centerline	700'	N/A	
Holding Position	250'	250'	
Parallel Taxiway	400'	400'	
Aircraft Parking Area	500'	500'	

Notes: Tan cells indicate non-standard condition.
N/A – Not Applicable.
Source: Mead & Hunt analysis using FAA AC 150/5300-13A.

Runway 12/30 meets or exceeds most of the specified design standards; however, Runway End 12 does not have a blast pad, and Runway End 30 has a blast pad that is 200 feet wide and 190 feet long, 10 feet shorter than recommended.

Runway 3R/21L

Runway 3R/21L has visual approaches and the RDC is B-II-VIS. Applicable design standards for this runway are presented in **Table 3-4**. Runway 3R/21L meets or exceeds all the specified design standards. Runway 3R/21L was ineligible for FAA Airport Improvement Program (AIP) funding in 2019; however, the Airport has chosen to maintain with Airport funds.

Table 3-4: Runway 3R/21L Design Standards Compliance

Runway Design	Design Standards B-II-VIS	Runway 3R/21L Existing Dimension	
		Rwy 3R	Rwy 21L
Runway Width	75’	75’	
Paved Shoulder Width (Recommended)	10’	± 25’	
Blast Pad Width	95’	N/A	N/A
Blast Pad Length	150’	N/A	N/A
Runway Safety Area (RSA)			
Length Beyond Departure End	300’	300’	
Length Prior to Threshold	300’	300’	
Width	150’	150’	
Runway Object Free Area (ROFA)			
Length Beyond Departure End	300’	300’	
Length Prior to Threshold	300’	300’	
Width	500’	500’	
Precision Obstacle Free Zone (POFZ)			
Length	N/A	N/A	
Width	N/A	N/A	
Runway Separation			
Runway Centerline to:			
Parallel Runway Centerline	700’	800’	
Holding Position	125’	200’, 250’	
Parallel Taxiway	240’	N/A	
Aircraft Parking Area	250’	500’	
Notes: N/A – Not Applicable. Source: Mead & Hunt analysis using FAA AC 150/5300-13A.			

No non-standard conditions are identified for Runway 3R/21L. Runway 3R/21L serves only light general aviation (GA) aircraft, so blast pads are not recommended.

Runway Line of Sight

Line of sight standards exist to allow pilots to observe runway and taxiway surfaces for assurance that they are clear of aircraft, vehicle, wildlife, and other hazardous objects. According to the longitudinal (along the length of the runway) line of sight standards contained in AC 150/5300-13A, any two points located 5 feet above the runway centerline must be mutually visible for the entire length of the runway. However, if the runway is served by a full-length parallel taxiway, the requirement is reduced to one half the runway length. More detailed descriptions of each runway line of sight evaluation can be found in **Attachment 1 Runway Line of Sight**.

The longitudinal profile evaluation from each end of Runway 3L/21R, Runway 12/30 and Runway 3R/21L to the individual runway midpoint at 5 feet above the runway surface indicates a clear line of sight is achieved on all runways.

Intersecting Runways

When airfield geometry includes intersecting runways, line of sight standards indicate there must be an unobstructed view from any point 5 feet above the runway centerline to any other point 5 feet above the intersecting runway within the Runway Visibility Zone (RVZ). At PSC, the RVZ is defined as an area formed by imaginary lines connecting the two runways' line of sight points. Because the runway ends are more than 1,500 feet from the runway intersection, the line of sight points are established one-half the distance from the intersecting runway centerline to the runway ends. An RVZ analysis was conducted using the Airports GIS survey data collected in 2018 and no obstructions to line of sight were found.

Runway Design Standards Recommendation: Future capital improvement projects should consider adding blast pads to Runway End 3L and Runway End 12 and expanding the blast pad surfaces on Runway End 21R and Runway End 30 to meet standard dimensions. It is recommended that improvement alternatives evaluate meeting the standard 1,000-foot RSA length southeast of Runway End 12.

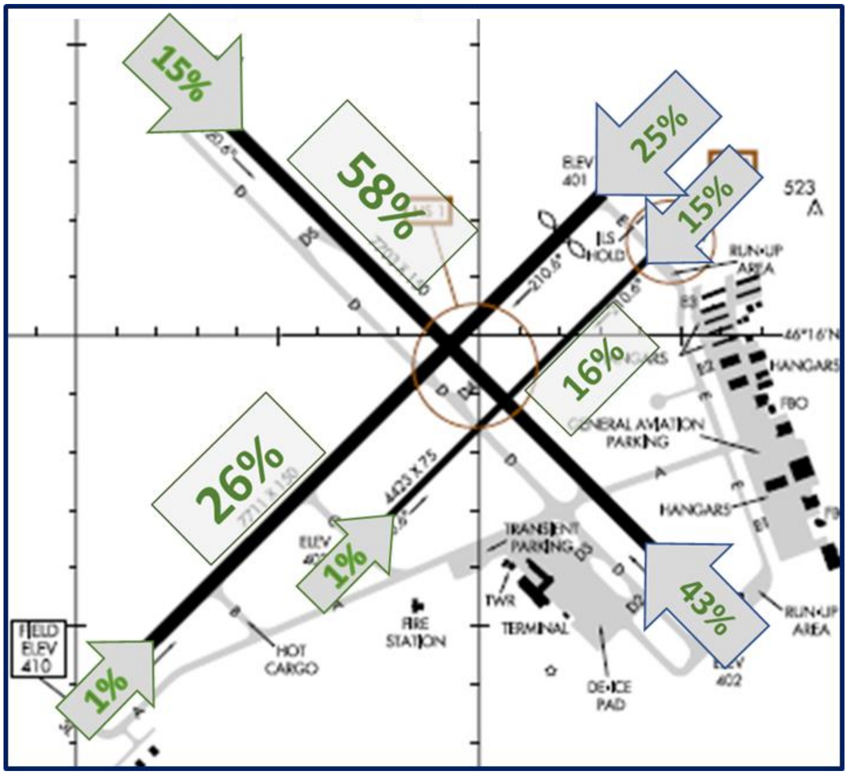
RUNWAY UTILIZATION AND AIRFIELD CAPACITY

An airport's annual capacity, known as the Annual Service Volume (ASV), is the number of aircraft operations an airfield can accommodate during a year. Existing and forecast annual aircraft operations, discussed in **Chapter 2**, are compared with the ASV to determine what percent of capacity the airport is operating at, and to gauge the need and timing of future airfield capacity improvements.

Runway Utilization

Runway utilization is defined by the distribution and frequency of aircraft operations on the runway system. PSC has three runways; however, the primary Runway 3R/21L and secondary Runway 12/30 intersect so they can be used simultaneously. When an aircraft is using one runway, aircraft using the other runway must wait. **Figure 3-1** illustrates the runway utilization. The data are from radar flight tracks for FAA Fiscal Year 2017. Splits between Runway 3R and 3L, and 21R and 21L cannot be determined by the radar data alone and are based on ATCT staff observations collected during stakeholder outreach sessions in 2018.

Figure 3-1: Runway Utilization



Airfield Capacity Factors

The method used to calculate PSC's ASV and hourly capacity comes from the FAA AC 150/5060-5 *Airport Capacity and Delay*. Airport Cooperative Research Program (ACRP) Report 79: *Evaluating Airfield Capacity* was consulted as an additional reference. The ASV was calculated based on PSC's annual, monthly, and hourly operational levels for these factors:

- Mix Index (aircraft types and weight categories) and Peak Utilization
- Runway orientation and utilization
- Taxiway system configuration
- Runway instrumentation and Air Traffic Control Procedures
- Meteorological conditions (visual, instrument, low instrument/airport closed)

Mix Index and Peak Utilization

The aircraft mix index is the relative percentage of aircraft operations that have a Maximum Takeoff Weight (MTOW) over 12,500 pounds. The mix index is determined by the equation (C+3D), where C represents the percent of aircraft over 12,500 pounds but under 300,000 pounds, and D represents the percent of aircraft over 300,000 pounds. **Table 3-5** outlines the data used to determine the Mix Index.

Table 3-5: Aircraft Mix Index

Mix Index	
Operations (> 12,500 pounds)[1]	13,148
General Aviation Operations (> 12,500 pounds)[2]	975
Total 2017 Operations	40,162
Percentage of Category C Aircraft	35.2
Percentage of Category D Aircraft	0.00
Mix Index	35.2

Notes: 1 Includes air carrier/air taxi/commuter/air tanker/air cargo for aircraft over 12,500 pounds
2 GA operations include Flight Aware data for aircraft over 12,500 pounds.
Source: Mead & Hunt analysis using methodology in FAA AC 150/5060-5.

Runway Orientation and Utilization

Runway orientation and utilization are described in **Figure 3-1**. Touch-and-go operations are normally associated with flight training. The number of these operations usually decreases as the number of air carrier operations increase, as demand for service approaches runway capacity, or as weather conditions deteriorate. The existing percentage of touch-and-go operations at PSC is 37.4 percent, with an expectation to decrease slightly to 37.2 percent by 2037.

Light GA traffic conducting touch-and-go operations are directed by the ATCT to utilize Runway 3L/21R to separate light aircraft traffic from commercial and corporate aircraft activity on the longer runways.

Taxiway System Configuration

The amount, spacing, and design of exit taxiways influence how long aircraft occupy runways by providing aircraft the ability to exit runways as quickly and safely as possible. PSC has an adequate exit taxiway system in place to minimize runway occupancy times and maximize airfield capacity.

Runway Instrumentation and Air Traffic Control Procedures

The FAA specifies aircraft separation criteria and operational procedures for aircraft at an airport, contingent upon the aircraft size, availability of radar, availability of approach instrumentation, available Air Traffic Control (ATC) facilities, and sequencing of operations. The impact of ATC on airfield capacity is most influenced by aircraft separation requirements dictated by the mix of aircraft using an airport. PSC has available radar control and ATC availability, and Runway 21R is equipped with an ILS.

Meteorological Conditions

Weather conditions specific to an airport location not only influence the airfield layout but also impact capacity. Weather variations resulting in limited cloud ceilings and reduced visibility typically lower capacity. Three categories of celling and visibility minimums are prescribed for capacity and delay calculations. VFR conditions occur whenever the cloud ceiling is greater than or equal to 1,000 feet above ground level (AGL), and visibility is greater than or equal to 3 statute miles. These conditions occur approximately 96 percent of the time at PSC. Instrument Flight Rules (IFR) conditions occur whenever the cloud ceiling is less than 1,000 feet AGL, and/or visibility is less than 3 statute miles, but cloud ceiling is greater than or equal to 500 feet AGL, and visibility is greater than or equal to 1 statute mile. These conditions occur approximately 3 percent of the time at PSC. Poor visibility and celling conditions exist whenever the cloud ceiling is less than 500 feet AGL, and/or visibility is less than 1 statute mile. These conditions occur approximately less than 1 percent of the time at PSC.

Airfield Capacity Methodology

Table 3-6 summarizes the ASV findings. Metrics in AC 5060-5 based on the conditions listed above provide an airfield capacity of 233,000 aircraft operations per year based on the runway layout at PSC. The airfield is at 20.4 percent of annual capacity in 2017 and will be at 22.6 percent of annual capacity in 2037.

Table 3-6: Annual Service Volume (ASV) and Demand Capacity Analysis

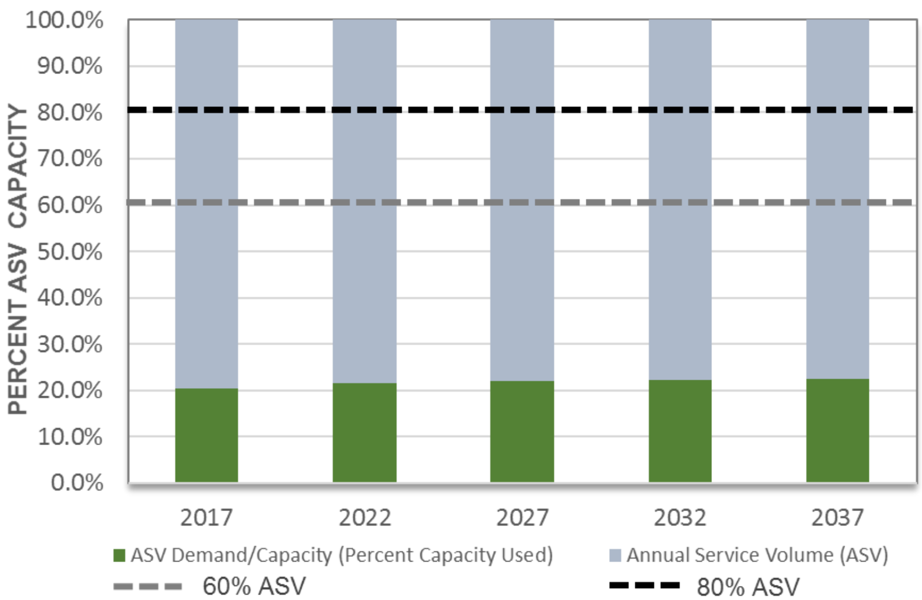
ASV Capacity Components	2017	2022	2027	2032	2037
Annual Operations (Existing & Forecasted)	47,616	50,340	51,540	51,912	52,640
Airport Operational Peaking (FAA ASV Equation)					
Peak Month Operations	5,500	5,800	6,000	6,000	6,100
Average Day Peak Month (ADPM) Operations	300	300	300	300	300
Peak Hour Operations	55.0	55.0	55.0	55.0	55.0
ASV Formula Inputs					
Daily Demand 'D' (Annual Operations ÷ Peak Day)	158.7	167.8	171.8	173.0	175.5
Hourly Demand Ratio 'H' (Peak Day ÷ Peak Hour)	5.5	5.5	5.5	5.5	5.5
Weighted Hourly Capacity 'C' (FAA ASV Diagrams)	101.5	101.5	101.5	101.5	101.5
ASV Outputs					
Annual Service Volume (ASV)	233,000	233,000	233,000	233,000	233,000
ASV Demand/Capacity (Percent Capacity Used)	**20.4%**	**21.6%**	**22.1%**	**22.3%**	**22.6%**

ASV Inputs: Operations Forecasts data from **Chapter 2 Forecasts** and Mead & Hunt Analysis using FAA AC 150/5060-5
Operational data comes from FAA Aviation System Performance Metrics (ASMP) databases, including Traffic Flow Management System Counts. Supplemental information provided by Airport Management from airport traffic control tower records.
Percent VFR Traffic = 97.8% | Percent IFR Traffic = 1.3% | Percent Closed Airport = 0.90%
Percent (C+3D) Traffic = 36.8% | Percent Touch & Go = 5.0% | Percent Arrivals = 50.0%
Note: Weighted Hourly Capacity (C) factors: 1) touch and go traffic and 2) taxiway exit configuration.
Note: VFR Traffic: FAA ASV Diagram 81 | IFR Traffic: FAA ASV Diagram 82
Note: Peak month, day and hour values computed using FAA ASV formulas.
Note: ASV computation involves using individual and simultaneous runway use.

Figure 3-2 compares the calculated ASV to the existing and projected aircraft operations expressed as a percentage of ASV. When 60 percent of the ASV is reached, an airport should begin planning ways to increase capacity, and when 80 percent of the ASV is reached then construction of facilities to increase capacity should be initiated.

The ASV analysis does not indicate areas of systemic airfield capacity challenges occurring annually. The existing airfield configuration provides adequate capacity for the operations forecasted for 2037. Future operations are not expected to exceed the 60 percent threshold to trigger planning for airfield capacity improvements.

Figure 3-2: Annual Service Volume (ASV) and Demand Capacity Comparison



Peak Hour Volume Delay Analysis

FAA traffic counts indicate that the 2017 peak traffic month had 5,500 operations, averaging 300 operations per day with a peak demand of 55 operations per hour. Should activity remain similarly distributed in the future, there should be a peak hour demand of 55 operations in 2037. Delays during peak demand periods will increase as PSC becomes busier. The existing average delay per aircraft is estimated at 20 seconds in 2017, expected to increase to 40 seconds in 2037. This change is due to the change in fleet where larger aircraft are expected to operate more frequently in 2037 than they did in 2017, and smaller aircraft are expected to operate less frequently.

Individual aircraft may experience delays greater than the average 20 seconds during peak hour operations. Table 2-2 in AC 5060-5 indicated that an average delay of 2.6 minutes is considered low for the PSC runway configuration. The existing and future delays are below the 2.6 minute delay threshold; therefore, plans for runway capacity and delay improvements are not expected to be needed PSC. However, there are points of congestion in airfield circulation that could be mitigated through airfield design. These areas are discussed in the next section.

Airfield Design and Peak Hour Capacity

Bypass entrance taxiway connectors and high-speed exit taxiways are two airfield designs that could mitigate delays. Runway End 21R and Runway End 30 have the highest percentage of use for arrivals and departures. When there is only a single runway access point at a runway end, there can be delays at higher use density intersections when more than one aircraft is holding to depart. Aircraft conducting engine run up checks can also delay other aircraft when blocking an access taxiway. Runway up areas provide a location for aircraft still preparing for takeoff and keep the taxiway open for aircraft ready to depart. As improvements are developed for **Chapter 4 Improvement Alternatives**, airfield circulation will focus on areas that can be modified to improve traffic flow and reduce delay during peak periods.

Airport Capacity Recommendations: Evaluate a taxiway bypass and run-up areas for each runway end to help alleviate congestion and delay during peak periods.

AIRFIELD AND AIRSPACE FACILITIES

Runway Hot Spots

PSC has two FAA identified hot spots. A hot spot is a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary. Taxiway geometry analysis is found in **Attachment 5 Taxiway Design Standards.**

Hot Spot 1 encompasses the intersections with Runway 12/30 and the 3/21 parallel runways. Pilots landing on Runway End 30 must listen to ATCT instructions and be prepared to exit onto Runway 3R/21L or Runway 3L/21R. Pilots risk exiting at the wrong runway because directional signs are not available.

Hot Spot 2 is at the intersection of Runway End 21L and Taxiway E. Pilots expecting to use Runway End 21R for takeoff sometimes cross Runway End 21L without ATCT authorization and continue taxiing to Runway End 21R. When the ATCT is operational, ATC clearance is required to enter or cross Runway End 21L.

Runway Hot Spots Recommendation: Evaluate solutions to remove or mitigate sources of pilot confusion associated with the two hot spots. Include assessments for additional signage, markings, lighting, and other means of improving pilot situational awareness at these locations.

Runway Protection Zones

Runway Protection Zones (RPZs) are trapezoidal areas at the end of runways, the purpose of which is to enhance safety for aircraft operations and for people on the ground. This is achieved through airport ownership of the RPZ. Where this is impractical, the airport works with property owners to keep the RPZ clear of incompatible land uses. Incompatible land uses described in the 2012 FAA memo *Interim Guidance on Land Uses Within a Runway Protection Zone* include buildings, recreational land uses, roads and railroads, fuel storage, and utility infrastructure.

Changes in critical AAC and improvements to instrument approach systems and lighting that reduce visibility minimums can increase RPZ dimensions. Changes in RPZ size can introduce incompatible land uses into an RPZ. Summary tables are included in **Attachment 2, Runway Protection Zone Dimensions**.

Runway 3L/21R and Runway 3R/21L

RPZ dimensions for Runway End 3L are 1,700 feet in length, 1,000 feet in inner width, and 1,510 feet in outer width. RPZ dimensions for Runway End 21R are 2,500 feet in length, 1,000 in inner width, and 1,750 feet in outer width. The Runway End 21R RPZ extends beyond airport property onto a rail yard. The Runway End 3L RPZ extends beyond airport property across West Argent Way and I-182. Runway 3L/21R RPZs are presented in **Figure 3-3.** PSC does not have easements for control over the railroad and roadways; however, these land uses existed prior to the 2012 FAA RPZ guidance.

RPZ dimensions for Runway End 3R are 1,000 feet in length, 500 feet in inner width, and 700 feet in outer width. RPZ dimensions for Runway End 21L are 1,000 feet in length, 500 feet in inner width, and 700 feet in outer width. The RPZs are located entirely on airport property.

Runway 12/30

RPZ dimensions for Runway End 12 are 1,700 feet in length, 1,000 feet in inner width, and 1,510 feet in outer width. RPZ dimensions for Runway End 30 are 1,700 feet in length, 1,000 in inner width, and 1,510 feet in outer width. The Runway End 30 RPZ extends beyond airport property into the Sun Willows Golf Course, as presented in **Figure 3-4**. PSC does have an easement from the City of Pasco for this area.

Runway Protection Zone Recommendation: Evaluate alternatives that implement improved Instrument Approach Procedures (IAPs) with reduced visibility minimums and the effect it will have on RPZ dimensions in **Chapter 4 Improvement Alternatives.**

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Figure 3-3: Runway 3L/21R Runway Protection Zones

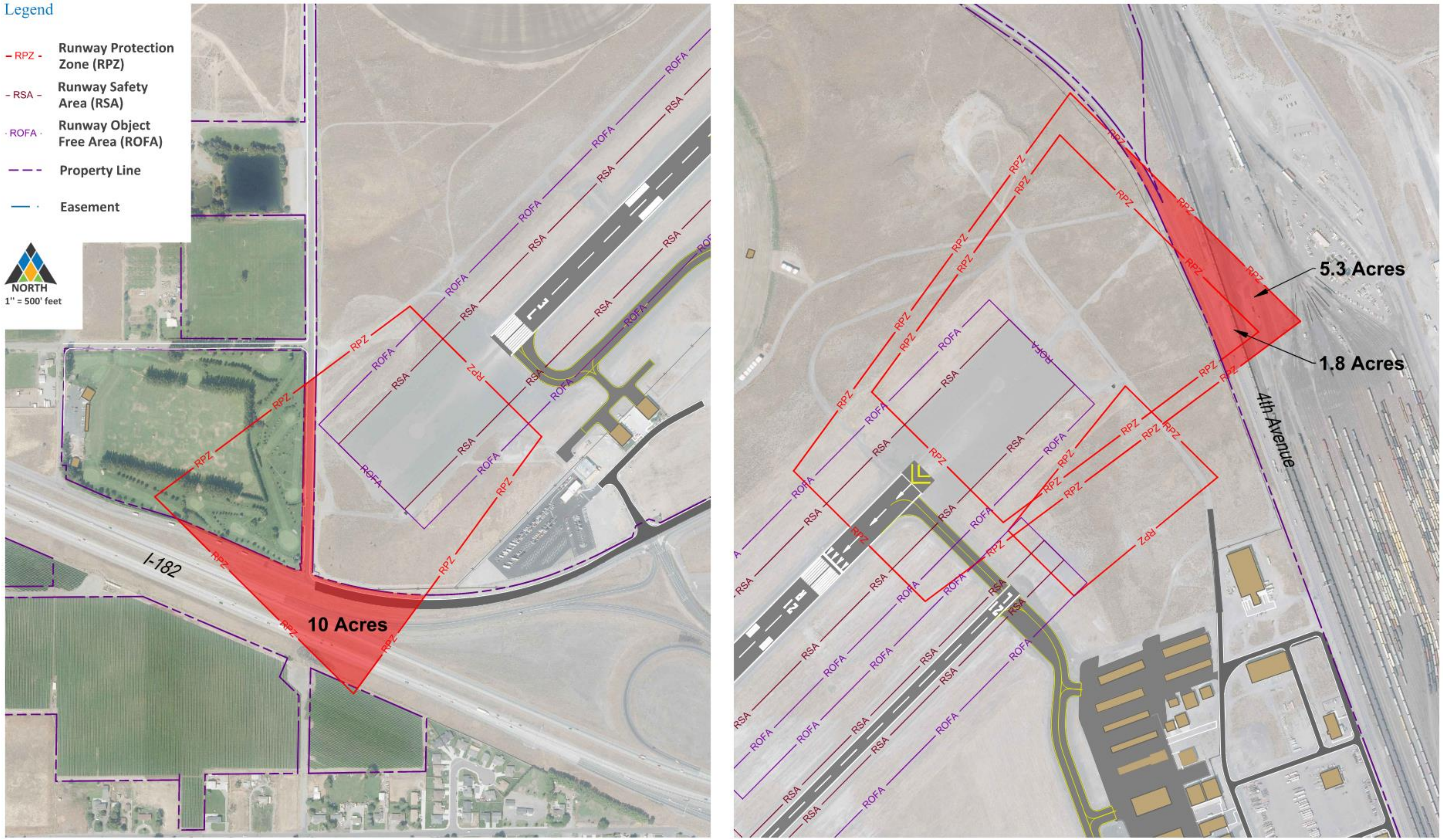

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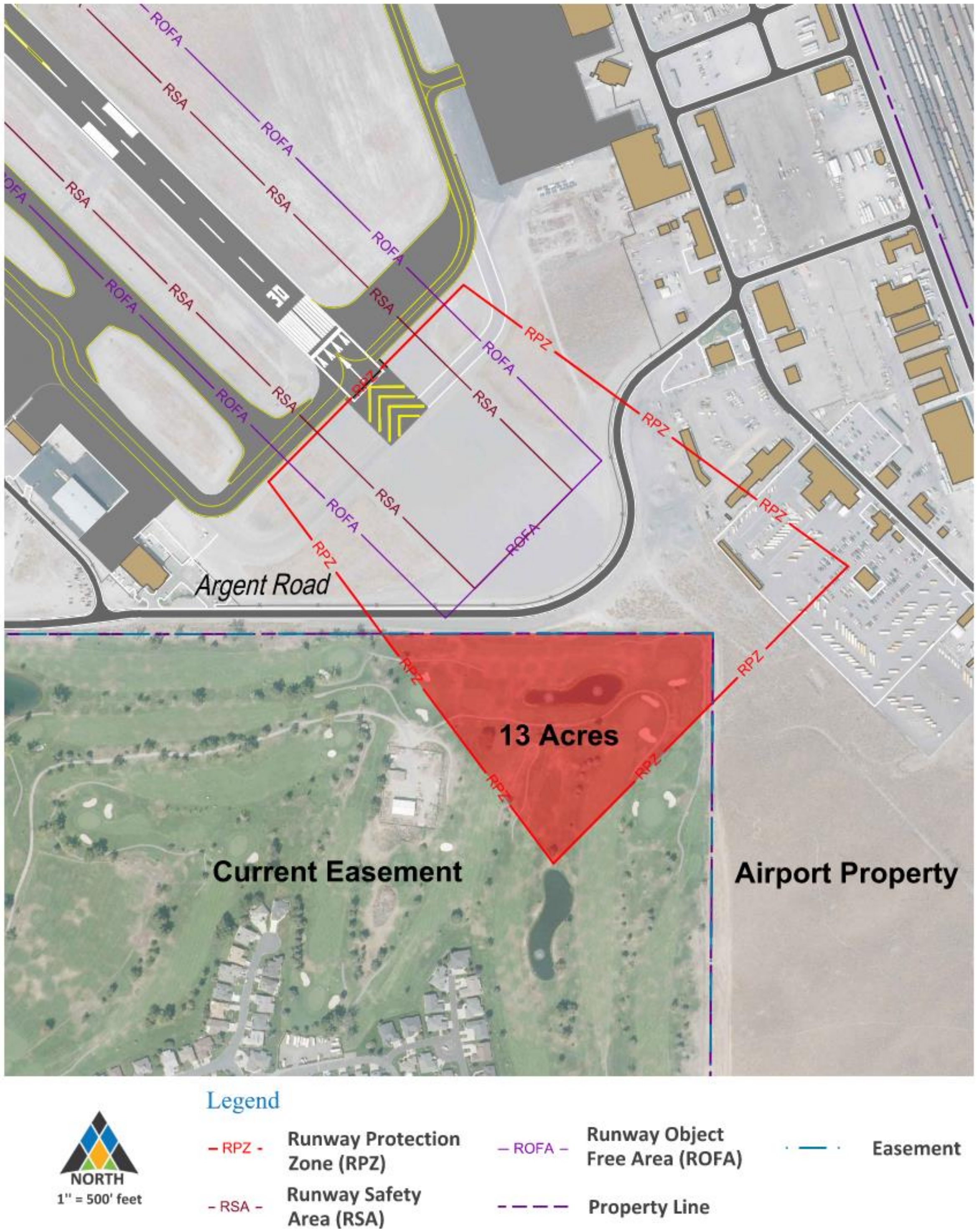
Figure 3-4: Runway 12/30 Runway Protection Zone Dimensions



Pavement Strength

FAA pavement design considers the pavement strength needed based on the fleet of aircraft expected to frequently use the pavement. No single critical design aircraft is designated for pavement strength. Pavement design strength does not necessarily prohibit airport use by heavier aircraft. However, if routine use by an aircraft heavier than the pavement strength is anticipated, then it would be recommended that pavement strength be increased during the next capital project.

Pavement strength ratings are presented for multiple landing gear configurations. Aircraft with more tires distribute their weight differently than aircraft with fewer tires. A section of pavement will have a higher strength rating for aircraft with multiple tires than for aircraft with single tires.

Runway 3L/21R

The Runway 3L/21R pavement strength is 120,000 pounds single wheel configuration (S), 170,000 pounds dual wheel gear (DWG) configuration, and 320,000 pounds dual tandem wheel gear (DTWG) configuration. Runway 3L/21R is used by narrow body jets due to its length, width, and instrument approach capabilities.

Runway 12/30

The Runway 12/30 pavement strength is 150,000 pounds (S), 200,000 pounds (DWG), and 400,000 (DTWG). Runway 12/30 is also used by narrow body jets due to length, width and instrument approach capabilities.

Runway 3R/21L

The Runway 3R/21L pavement strength is rated at 52,000 pounds (S), 85,000 pounds (DWG), and 150,000 pounds (DTWG). In practice however, Runway 3R/21L is used by General Aviation (GA) aircraft weighing less than 12,500 pounds due to deteriorating pavement surface conditions. A Pavement Strength Summary table is included in **Attachment 3 Pavement Strength**.

Pavement Strength Recommendation: Continuously monitor and assess pavement conditions with the ongoing pavement management program to maintain and improve runway pavement strength that accommodates the 737 MAX 8 and A320 design aircraft.

Evaluate Runway 3R/21L pavement conditions for rehabilitation or reconstruction to improve the runway surface and weight bearing capacity for GA aircraft.

Pavement Markings, Lighting, Signage

The minimum requirements for surface marking schemes used for runways are a direct function of the approach category for each runway threshold. A precision approach runway has an instrument approach procedure that provides course and vertical path guidance conforming to ILS minimums. Non-precision approach runways typically do not provide vertical guidance and have visibility minimums greater than ½ statute mile.

PSC is an FAA Part 139 commercially certificated airport that is inspected annually for compliance with standards, including markings, lighting and signage. The inspection conducted in April 2018 revealed full compliance with standards. Summary tables with details of pavement markings, lighting, and signage are found in **Attachment 4 Pavement Markings, Lighting, and Signage Summary** at the end of the chapter.

Markings, Lighting and Signage Recommendations: Evaluate implementing improved IAPs with reduced visibility minimums and its potential effects on airfield markings, lighting, and signage in **Chapter 4 Improvement Alternatives**.

Taxiway System

This section identifies taxiway system recommendations to meet forecast demand and FAA standards. The previous master plan recommended Taxiway A be realigned to cross Runway 12/30 perpendicularly and be parallel with Runway 3L/21R between the terminal apron and the GA apron on the east side of PSC. This taxiway realignment project, which began in 2018 and is expected to be completed in October 2019, is illustrated in **Figure 3-5**. Summary tables of taxiway dimensions and taxiway design methodologies are found in **Attachment 5 Taxiway Design Standards.**

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Figure 3-5: Taxiway A Realignment Project

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Taxiway Dimensional Criteria

Taxiway and taxilane clearance requirements are based upon the required wingtip clearance, a function of aircraft wingspan, and are determined by the ADG as it relates to critical design aircraft. Taxiway and taxilane pavement design standards are related to the Taxiway Design Group (TDG), which is based on the Main Gear Width (MGW) and the Cockpit to Main Gear (CMG) distance of the critical design aircraft. PSC does experience regular use by Bombardier Q400 (operated by Horizon Air), which are TDG 5 aircraft. However, the Q400 is expected to be slowly phased out of Horizon's fleet as it is replaced with narrow-body regional jets such as the EMB-175, which is a TDG 3 aircraft. PSC experiences occasional use by other TDG 5 aircraft, such as the Navy's Lockheed P-3 Orion. However, this aircraft is also being phased out from the Navy inventory. The Boeing 737 and Airbus A320 series are TDG 3 and are the most demanding aircraft taxiway design group expected to regularly operate at PSC in the future

A portion of Taxiway E between the intersection with Taxiway A and the entrance to Runway 30 is 50 feet wide, meeting ADG III and TDG 3 design criteria. This portion of Taxiway E is used by light GA and corporate aircraft that do not require wider taxiways.

ADG III and TDG 5 standards are appropriate for the design of the existing taxiway system serving Runway 3L/21R and Runway 12/30, based on the existing fleet mix at PSC and specifically meet the requirements for the Q400 TDG 5.

ADG II and TDG 2 standards are appropriate for the existing and future Runway 3R/21L. Runway 3R/21L is used by light GA Aircraft. However, the taxiways supporting Runway 3R/21L also support the higher design group runways serving commercial aircraft and must retain the higher taxiway design group standards.

ADG III and TDG 3 standards are appropriate for the design of the future taxiway system serving Runway 3L/21R and Runway 12/30 based on future fleet mix presented in **Chapter 2 Aviation Activity Forecast**.

Exceeds Taxiway Dimensional Criteria

The taxiway shoulder width of 40+ feet of paved shoulders along Taxiway A, B, and C exceeds ADG III and TDG 5 design standard of 30 feet paved shoulder width.

The connector taxiways E1, E2, and E3 with 75 feet width exceeds design standards of TDG 3 width of 50 feet. This meets TDG 5 width standards. All other taxiways meet design standards.

Exit Taxiways

Optimally located exit taxiways minimize runway occupancy times and allow the airfield to be used more efficiently. AC 150/5300-13A, Table 4-13 provides the cumulative percentages of aircraft observed exiting runways at specific exit taxiway locations, given in 500-foot increments. Percentages for both wet and dry runway conditions are included, as are right-angled and acute-angled taxiway configurations.

Runway 3L/21R

Runway 3L/21R does not have a high-speed exit taxiway. **Table 3-7** provides the location of the exit taxiways serving Runway 3L/21R and the approximate percentages of landing aircraft types that can exit the runway in a safe and efficient manner using data from AC 150/5300-13A Table 4-13. The location of Runway 3R/21L limits the installation of additional exit taxiways that would allow greater percentages of aircraft the ability to exit the runway more efficiently. However, an additional exit taxiway located between Taxiways A and B would increase the percentage of large aircraft with MTOW between 12,500 and 300,000 pounds the ability to exit when landing to Runway 21R from just over 49 percent to between 75 and 98 percent (depending on actual location) during dry conditions. During wet conditions the percentage of large aircraft would increase from just over 12 percent to between 27 and 71 percent (depending on actual location).

Table 3-7: Runway 3L/21R Exit Taxiway Analysis

Taxiway	Distance from Landing Threshold	Percentage of Landing Aircraft Exiting Runway					
		Dry Conditions			Wet Conditions		
		S	T	L	S	T	L
Runway 3L							
Taxiway B	1,900’	<84%	<1%	0%	<60%	0%	0%
Taxiway C	3,350’	100%	<81%	<2%	96%	10%	0%
Taxiway D	5,050’	100%	100%	>49%	100%	100%	>12%
Taxiway E	7,700’	100%	100%	100%	100%	100%	100%
Runway 21R							
Taxiway D	2,000’	84%	1%	0%	60%	0%	0%
Taxiway C	3,800’	100%	<98%	<8%	100%	<80%	<1%
Taxiway B	5,100’	100%	100%	>49%	100%	100%	>12%
Taxiway A	7,000’	100%	100%	100%	100%	100%	88%

Notes: S = small, single engine aircraft with MTOW 12,500 pounds or less.
T = small, twin engine aircraft with MTOW 12,500 pounds or less.
L = large aircraft with MTOW between 12,500 pounds and 300,000 pounds.
Source: Mead & Hunt analysis using AC 150/5300-13A, Airport Design.

Runway 12/30

There is a high-speed exit taxiway located 5,300 feet from the Runway 30 threshold. The exit provides a course reversal turn onto Taxiway D for aircraft landing on Runway 30 and reduces runway occupancy times.

Runway 12/30 Exit Taxiway Analysis

Table 3-8 provides the location of the exit taxiways serving Runway 12/30 and the approximate percentages of landing aircraft types that can exit the runway in a safe and efficient manner. Runway 12/30 appears to be adequately supplied with exit taxiways. The existing Airport Layout Plan (ALP) indicates an acute-angled exit taxiway for aircraft landing to Runway 12 at approximately 5,100 feet will replace the existing Taxiway A intersection.

Table 3-8: Runway 12/30 Exit Taxiway Analysis

Taxiway	Distance from Landing Threshold	Percentage of Landing Aircraft Exiting Runway					
		Dry Conditions			Wet Conditions		
		S	T	L	S	T	L
Runway 12							
Taxiway D4	4,050'	100%	98%	8%	100%	80%	1%
Future Taxiway A	4,800'	100%	100%	<49%	100%	100%	<12%
Taxiway A	5,700'	100%	100%	>75%	100%	100%	>27%
Taxiway D1	7,700'	100%	100%	100%	100%	100%	>97%
Runway 30							
Taxiway A	1,800'	<84%	<1%	0%	<60%	0%	0%
Future Taxiway A	2,700'	>99%	>10%	0%	>84%	>1%	0%
Taxiway D4	3,500'	100%	100%	>49%	99%	41%	0%
Taxiway D5*	5,300'	100%	100%	<92%	100%	100%	<27%
Taxiway D6	7,500'	100%	100%	100%	100%	100%	97%

Notes: S = small, single engine aircraft with MTOW 12,500 pounds or less.
T = small, twin engine aircraft with MTOW 12,500 pounds or less.
L = large aircraft with MTOW between 12,500 pounds and 300,000 pounds.
* Taxiway D5 is an acute-angled exit taxiway.
Source: Mead & Hunt analysis using AC 150/5300-13A, Airport Design.

Runway 3R/21L

Runway 3R/21L does not have a high-speed exit taxiway. **Table 3-9** provides the location of the exit taxiways serving Runway 3R/21L and the approximate percentages of landing aircraft types that can exit the runway in a safe and efficient manner. Because this runway is limited to GA aircraft with MTOW less than 12,500 pounds, it is unlikely that additional taxiways will be provided.

Table 3-9: Runway 3R/21L Exit Taxiway Analysis

Taxiway	Distance from Landing Threshold	Percentage of Landing Aircraft Exiting Runway			
		Dry Conditions		Wet Conditions	
		S	T	S	T
Runway 3R					
Taxiway D	1,800'	<84%	<1%	<60%	0%
Taxiway E	4,400'	100%	100%	100%	<97%
Runway 21L					
Taxiway D	2,600'	100%	>10%	>84%	>1%
Taxiway C	4,400'	100%	100%	100%	<97%

Notes: S = small, single engine aircraft with MTOW 12,500 pounds or less.
T = small, twin engine aircraft with MTOW 12,500 pounds or less.
Source: Mead & Hunt analysis using AC 150/5300-13A, Airport Design.

Taxiway System Recommendation: Evaluate the location and configuration of the following taxiway conditions in **Chapter 4 Improvement Alternatives**:

- An exit taxiway from Runway 12/30 onto Taxiway D near Terminal Apron
- A right-angled taxiway from Runway 3L/21R between Taxiways A and B onto Taxiway A
- A future partial parallel taxiway northeast of Runway 12/30 (Taxiway G)

Navigational Aids, Lighting Systems, and Shelters

AC 150/5070-6B, defines Navigational Aids (NAVAIDs) as "aids to navigation [that] provide pilots with information to assist them in locating the airport and to provide horizontal and/or positional guidance during landing." The type, mission, and volume of aeronautical activity, in association with airspace, meteorological conditions, and capacity data, determine the need and eligibility for NAVAIDs. NAVAID requirements are based on guidelines contained in FAA Handbook 7031.2C *Airway Planning Standard Number One*, and AC 150/5300-13.

The FAA is transitioning away from IAPs that use ground-based NAVAIDs to those that utilize the satellite-based GPS. GPS procedures exist at PSC that have no associated ground-based facilities or equipment. PSC has an on-airfield Very High Frequency Omni-Directional Range (VOR) station. The VOR is utilized for en route navigation for airways as well as non-precision instrument approaches to Runways 21R and 30.

Runway 21R is equipped with an ILS precision approach. Two antenna that provide the vertical and horizontal guidance for the approach comprise the ILS. The localizer provides horizontal guidance and is located 1,000 feet prior to the Runway 3L threshold. The glide slope antenna is located to the right of Runway 21R, 1,050 feet beyond the Runway 21R threshold. The equipment shelter for the glide slope is co-located with the antenna.

The Runway 21R ILS precision approach is supported by a Medium Intensity Approach Lighting System with Runway Alignment Indicators (MALSR) that aids pilots in establishing visual contact with the runway environment during periods of low visibility. Runway 30 has a system of white flashing omni-directional approach lights to assist pilots with identifying the runway environment and runway alignment.

Runway Ends 3L and 12 have RNAV Localizer Performance with Vertical Guidance (LPV) approaches, but do not have an approach lighting system and do not have precision runway markings. To support any future precision IAPs, these runways should have an ALS and precision runway markings.

Instrument Approach Procedures

Increased airport access can be provided by reducing the visibility minimums associated with IAPs. The FAA Western Flight Procedures office has indicated that adding precision markings to Runway 30 and precision runway markings and an ALS to Runways 3L and 12 will aid pilots. This addition also is a step in receiving a precision IAP certification (i.e., having visibility minimums not less than ½ statute mile or 2,400 feet RVR). Based on an IFR wind analysis, Runways 3L and 30 provide the best wind coverage during IFR weather conditions at greater than 97 percent using the 20-knot crosswind component. Runway 21L is not far behind by providing greater than 96 percent wind coverage using the 20-knot crosswind component. Finally, Runway 12 provides the least wind coverage at 84 percent using the 20-knot crosswind component. This analysis indicates that PSC benefits more from providing IAPs with visibility minimums not less than ½ statute mile to Runways 3L and 30 than it would by providing the same IAP to Runway 12.

The implementation of a Category (CAT) II/III IAP would reduce the amount of time PSC is closed when visibility minimums are below ½ statute mile. A CAT II/III system consists of elaborate in-pavement lighting, approach lights, and pavement markings. CAT II IAPs allow visibility down to 1,200 feet RVR, and CAT III IAPs allow aircraft to use an auto-land feature, with no visibility minimum. CAT II/III IAPs also require special aircraft equipment and flight crew training. IFR weather conditions below a ceiling height of 200 feet and visibility minimums less than ½ statute mile occur approximately 1 percent of the time annually at PSC. Therefore, the benefits derived from a CAT II/III IAP are not expected to outweigh the cost involved with implementing the required components.

IAP Recommendations: Evaluate the ability to implement improved future GPS-based procedures in **Chapter 4 Improvement Alternatives**. Coordinate the procedures with the FAA Western Flight Procedures. The suggested IAP improvements are:

- Precision IAPs with visibility minimums not less than ½-statute mile to Runways 3L, 12, and 30.
- In conjunction with the proposed IAP improvements to Runways 3L, 12, and 30, evaluate the implementation of MALSR and precision markings.

Airspace Surfaces

FAA airport design standards are created for safe aircraft operations. These standards are identified in AC 150/5300-13A and include runway end siting requirement surfaces. Part 77 of the Code of Federal Aviation Regulations (FAR) identifies the airspace around PSC to be protected from obstructions, and includes the approach, primary, transitional, conical, and horizontal surfaces.

Runway End Siting

Criteria contained in AC 150/5300-13A provide guidance for the proper siting of runway ends and thresholds. The criteria are in the form of evaluation surfaces that are typically trapezoidal shaped and extend away from the runway along the centerline at a specific slope, expressed in horizontal feet by vertical feet (e.g., a 20:1 slope rises one unit vertically for every 20 units horizontally). Like RPZs, the specific size, slope, and starting point of the surfaces depend on the visibility minimums and aircraft type associated with the runway end.

Threshold Siting Analysis

Thresholds are located to provide proper clearance over obstacles for landing aircraft on approach to a runway end. When an object obstructs the airspace required for aircraft to land at the beginning of the runway, and it is beyond an airport owner's ability to remove, relocate, or lower, the landing threshold may require a relocation (displaced threshold). In response to the obstacles in the threshold siting surface that cannot be removed, there are displaced thresholds at Runways 21R and 30. **Table 3-10** presents the existing dimensions for PSC.

Table 3-10: Threshold Siting Surface Dimensions

Threshold Siting Surface	Distance from Runway End	Inner Width	Length	Outer Width	Slope	Existing Obstruction
Existing Dimensions						
Runway 3L	200'	400'	10,000'	3,400'	20:1	None
Runway 21R	200'	800'	10,000'	3,400'	34:1	Pole
Runway 12	200'	400'	10,000'	3,400'	20:1	None
Runway 30	200'	400'	10,000'	3,400'	20:1	Tree
Runway 3R	0'	400'	10,000'	1,000'	20:1	None
Runway 12R	0'	400'	10,000'	1,000'	20:1	None
Source: FAA AC 150/5300-13A.						

Glide Path Qualification Surface Analysis

The Glide Path Qualification Surface (GQS) is an imaginary surface used to evaluate precision approaches and approaches providing vertical guidance. When objects that cannot be mitigated exceed the height of the GQS, then approaches with vertical guidance cannot be authorized. The existing GQS criteria for Runway 21R are presented in **Table 3-11**. Runway 21R is the only runway currently provided with an approach with vertical guidance; therefore, it is the only runway with a GQS analysis. There are no objects that penetrate the surface.

Table 3-11: GQS Dimensions

Glide Path Qualification Surface	Distance from Runway End	Inner Width	Length	Outer Width	Slope	Existing Obstruction
Existing Dimensions						
Runway 21R	0'	350'	10,000'	1,520'	30:1	None
Standard Dimensions						
Glideslope Qualifying Surface	0'	Runway Width + 200'	10,000'	1,520'	30:1	None
Source: FAA AC 150/5300-13A.						

Departure Runway End Analysis

Departure ends of runways normally mark the end of the full-strength runway pavement available and suitable for departures. Departure surfaces, when clear of obstacles, allow pilots to follow standard departure procedures. If obstacles penetrate the departure surface, then the obstacles must be evaluated through the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) process. After the OE/AAA process, departure procedure amendments such as non-standard climb rates, non-standard (higher) departure minimums, or a reduction in the length of takeoff distance available may be required. The size, shape, slope, and criteria for PSC are presented in **Table 3-12**.

There are no obstacles identified in the 40:1 standard departure slope from the ends of existing runway pavements.

Table 3-12: Departure Runway Surface Dimensions

Departure Surface	Distance From Runway End	Inner Width	Length	Outer Width	Slope	Existing Obstruction
Existing Dimensions						
Runway 3L	0	1,000’	10,200'	6,466'	40:1	None
Runway 21R	0	1,000’	10,200'	6,466'	40:1	None
Runway 12	0	1,000’	10,200'	6,466'	40:1	None
Runway 30	0	1,000’	10,200'	6,466'	40:1	None
Standard Dimensions						
Departure Surface	0	1,000’	10,200’	6,466’	40:1	None

Source: FAA AC 150/5300-13A.

Runway End Siting Recommendations: Evaluate the future runway end siting requirements for any changes to runway ends or IAP improvements that provide vertical guidance in **Chapter 4 Improvement Alternatives**.

Federal Aviation Regulations (FAR) Part 77 Analysis

Safe and efficient landing operations at an airport require that certain areas on and near an airport are clear of objects or restricted to objects with certain functions, composition, and/or height.

Primary Surface

The primary surface is longitudinally centered on the runway. It extends 200 feet beyond each end of the runway, and the width varies based on the existing instrument approach visibility minimums of the runway. At PSC, the primary surfaces for Runways 3L/21R and 12/30 are 1,000 feet wide (500 feet from the centerline). Runway 3R/21L is a visual runway for small aircraft, so its primary surface is 500 feet wide (250 feet from the centerline).

There are primary surface penetrations at PSC associated with lighting and NAVAIDs equipment, but they are permitted as the equipment is required for navigational purposes.

Transitional Surface

The transitional surface is a sloped surface that extends upward and outward at right angles to the runway centerline, and the extended runway centerline begins at the edges of the primary surface. The transitional surface has a slope of 7:1. At PSC, the penetrations to the transitional surfaces are associated with rising terrain to the northwest of Runway 12. Future extension of Runway 12/30 should include evaluation of additional penetrations and the likely requirements to mitigate the obstructions.

Approach Surface

The approach surface is longitudinally centered on the extended runway centerline and extends outward and upward from each end of the primary surface at a specified slope. An approach surface is applied to each end of the runway based on the type of approach available or planned for that runway end. The inner width of the approach surface is the same as the primary surface and expands uniformly. The Runway 21R approach surfaces consists of a 10,000-foot-long segment at a 50:1 slope, then a 40,000-foot-long segment at a 40:1 slope, uniformly expanded to an ultimate width of 16,000 feet. The Runway 3L, 12, and 30 existing approach surfaces consist of a 10,000-foot-long segment at a 34:1 slope, uniformly expanding to an ultimate width of 3,500 feet. In conjunction with any precision IAP improvements to Runways 3L, 12, and 30, the approach surfaces will change to match the Runway 21R criteria.

The approach surfaces associated with Runways 3R/21L are 5,000 feet long at a slope of 20:1 expanding to a width of 1,500 feet. Unlike the threshold siting surfaces, the approach surfaces are not based on displaced thresholds, but on the physical end of pavement.

FAR Part 77 Recommendations: Evaluate penetrations to future Part 77 surfaces as runway improvements are evaluated in **Chapter 4 Improvement Alternatives**.

Airfield Vehicle Access Routes

Automobile access for the airside areas is provided by a perimeter access road for use by authorized vehicles only. A paved portion of the perimeter road provides auto access between the GA apron area and the main terminal facility and reduces the need for vehicles to cross Runway 30 using the taxiway system. This mitigates aircraft and vehicle conflicts on the movement areas between the GA and Terminal facilities. Fuel trucks from Fixed-Base Operators (FBOs) that serve air carriers are also able to use the paved portion of the access road. Because the service road passes through the Runway 30 safety area and object free area, clearance is required from the ATCT prior to crossing. As additional airport facilities are constructed, adequate vehicle access and parking for the airside will be included.

Airfield Vehicle Access Recommendations: Identify areas where the perimeter road system can be improved by paving, resurfacing, or relocating to improve access for Aircraft Rescue and Firefighting (ARFF) and Maintenance vehicles.

RUNWAY LENGTH ANALYSIS

The runway length analysis recommends the length necessary to meet existing and future aircraft demands. The analysis considers aircraft design characteristics and annual activity levels. Assessment on how the recommended runway length can be accommodated at PSC is discussed in **Chapter 4 Improvement Alternatives**. The analysis methods, including temperature inputs and density altitude calculations, are described in **Attachment 6**. The runway length analysis follows these steps:

- Identify design aircraft
- Define applicable design guidance using AC 150/5325-4B.
- Perform the analysis and interpret results.
- Recommend the runway length.

Runway Length Design Aircraft

Runway 3L/21R and Runway 12/30 serve air carrier and the full range of general aviation aircraft. Runway 3R/21L serves smaller general aviation aircraft exclusively. The future design aircraft for Runway 3L/21R and Runway 12/30 are expected to be aircraft narrow-body airliners such as the ARC C-III Airbus A220 and A320, the ARC C-III Embraer E175 (E175), and the ARC D-III Boeing 737 MAX 8 (MAX 8). These aircraft weight over 60,000 pounds; and AC 5325-4B dictates that aircraft planning manuals be used to determine a recommended runway length.

The aircraft under consideration are those that the airlines serving PSC are operating (or are soon to operate). Variants of these aircraft have scheduled operations at PSC in 2019. A summary of which of aircraft utilization and operations frequency is shown in the **Table 3-13.**

The design aircraft for Runway 3R/21L are multi-engine piston general aviation aircraft that between 12,500 pounds and 60,000 pounds of maximum takeoff weight. The most demanding aircraft include turboprops and small business jets. Runway 3R/21L is not eligible for FAA funding as of fiscal year 2019 and the Port funds continued operation of the runway out of its own budget. This runway will be maintained at its existing length and width at the Port's discretion.

Table 3-13: Aircraft Operated by Airlines

Operator	Aircraft			
	MAX 8	A220	A320ceo/neo	E175
Alaska[1]	✈		✈	✈
Allegiant			✈	
American	✈			✈
Delta[2]		✈	✈	✈
Frontier			✈	
Hawaiian			✈	
Moxy		✈		
JetBlue			✈	
Southwest	✈			
Spirit			✈	
United[1]			✈	✈
FY18 Operations[3]	94	0	680	4,002

Notes: 1 Alaska and United also have the larger 737 MAX 9 on order.
2 Delta has the 737-900ER on order.
3 MAX 8 total is for 737-700, -800, and -900. A320 total is for A319 and A320, E175 is for E170 and E175.

Applicable Design Guidance

AC 150/5325-4B provides guidance for this assessment. The recommended runway length should be suitable to meet the takeoff and landing requirements of the design aircraft (or family of aircraft with similar characteristics) that exceed the regular use threshold of 500 annual operations (excluding touch-and-goes). There are three methods for assessing runway length in AC 5325-4B, and the appropriate method depends on the MTOW of the aircraft being considered:

- Small aircraft (MTOW of less than 12,500 pounds)
- Large aircraft (MTOW of between 12,500 pounds and 60,000 pounds)
- Aircraft with a MTOW of more than 60,000 pounds.

The performance requirements of the design aircraft determine an airport's recommended runway length. Performance capabilities of individual aircraft are affected by factors including the aircraft payload and fuel load, runway elevation, wind conditions, and air temperature. Aircraft performance information for small and large aircraft is determined using charts in AC 5325-4B. Aircraft performance information for aircraft with a MTOW of over 60,000 pounds comes from the airport planning manuals (APMs) produced by the aircraft manufacturers.

Analysis and Results

The assessment uses the payload and range table and the takeoff performance table contained in the APMs for each aircraft. These tables, and the process used to extract information from them, are included in **Attachment 6 Runway Length Analysis**. The APMs base aircraft performance on airport elevation and temperature. PSC has an elevation of 410 feet above mean sea level and the average summer high temperature of 91 degrees Fahrenheit. The density altitude at 91 degrees Fahrenheit is 2,700 feet.

Existing Runway Length Recommendation

The existing most demanding aircraft at PSC in terms of runway length is the E175. While this aircraft is not the largest or heaviest, both the A320 and B737 are larger and heavier, the E175 is used on the longest routes from PSC. These include Minneapolis (MSP) and Chicago (ORD), which are both over 1,000 nautical miles in length. The E175 performance chart, shown in **Figure 3-6,** indicates that the E175 requires the full length of Runway 3L/21R and Runway 12/30 to be available to successfully serve these routes at near maximum takeoff weight throughout the year.

In FY 2019, there were 512 scheduled departures to MSP. ORD service will begin in 2020 and is expected to be once daily, with 365 departures per year. This means that aircraft flying routes greater than 1,000 nautical miles from PSC are expected to perform 1,754 operations in 2020. This exceeds the 500-operations threshold required to maintain runway length in the event a runway improvement project needs to be justified. Both ORD and MSP would be out of range of the E175 on certain days of the year if either runway was shorter than it exists in 2020.

It is recommended that the current lengths of Runway 3L/21R and Runway 12/30 be maintained to support 1,754 annual scheduled operations to MSP and ORD.

Future Runway Length Recommendation

The B737 MAX 8 is the most demanding aircraft evaluated and is expected to be the future critical aircraft at PSC. While the MAX 8 has been grounded by the FAA since March 2019, there were 94 operations by other 737-series aircraft in 2019. These aircraft, and smaller regional jets, are expected to be replaced in the years following the MAX 8 return to service. The MAX 8 is forecasted to have 1,000 annual operations by 2022, increasing to 3,400 in 2037. The MAX 8 APM, shown in **Figure 3-7**, recommends a runway length of up to 11,000 feet to accommodate the aircraft at MTOW. Runway length requirements for MAX 8 departures at weights less than MTOW will be evaluated in **Chapter 4**.

It is recommended that PSC plan for a future runway length of up to 11,000 feet to support the forecasted MAX 8 operations.

Figure 3-6: E175 Takeoff Length Requirements

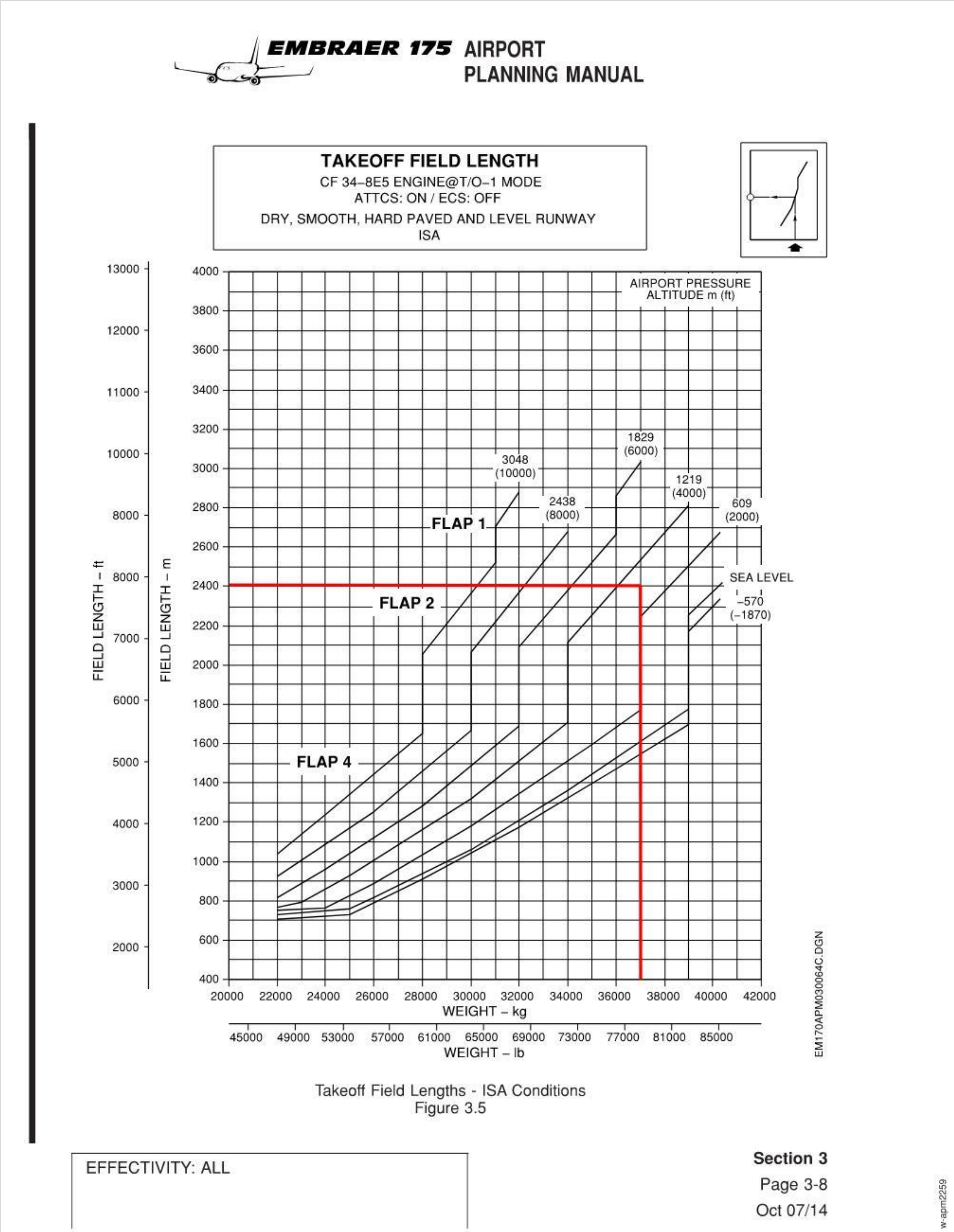

Figure 3-7: 737 Takeoff Length Requirements

737-7 / -8-200 INFORMATION IS PRELIMINARY

3.3.2 FAA/EASA Takeoff Runway Length Requirements - Standard Day, Dry Runway: Model 737-8 (LEAP-1B25 Engine)

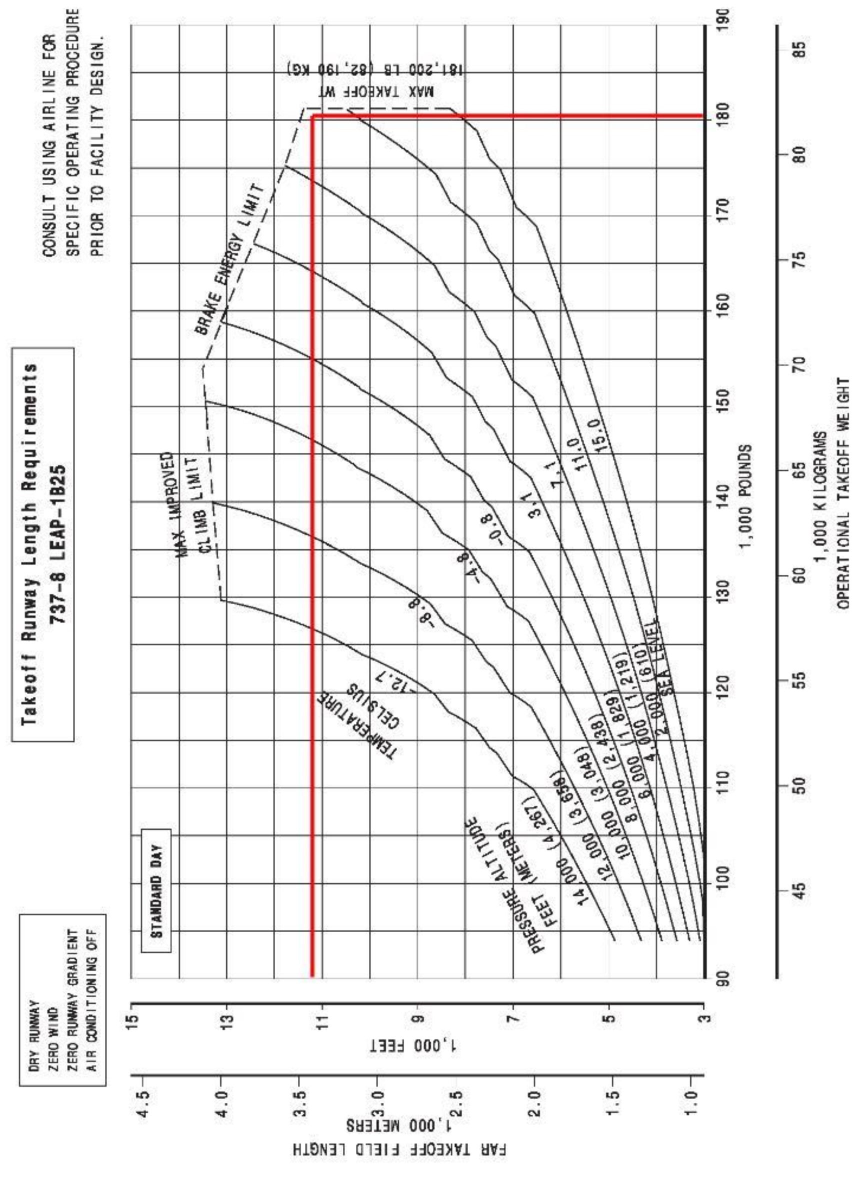

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Table 3-14: Runway Length Summary

Scenario	Critical Aircraft	Recommended Length[1]	Annual Operations[2]	Justification
Existing (2019)	E175	7,703 Feet	1,754	Maintain existing runway length based on needs of E175 service to MSP and ORD.
Future (2037)	MAX 8	11,000 Feet	3,400	Recommend runway length based on APM when aircraft is at MTOW during average summer day.

Notes: 1 Recommended length determined by the Airport Planning Manuals for each aircraft, produced by the aircraft manufacturer.
2 2037 MAX 8 operations determined in the Master Plan Forecast in **Chapter 2**, approved by the FAA in 2019.

The runway length analysis supports maintaining the existing lengths of Runway 3L/21R and Runway 12/30 to support existing service to MSP and ORD on the E175. A reduction in runway length may negatively impact the ability of the airlines to serve these routes throughout the year. It is recommended that PSC consider providing up to 11,000 feet of runway length in the future if demand for trans-continental service on the MAX 8 materializes.

Chapter 4 Improvement Alternatives will evaluate future runway extension.

PASSENGER TERMINAL BUILDING

The passenger terminal building is the face of PSC to the community and the front door to the Tri-Cities for many airport users. Available amenities encourage the traveling public to use PSC, add value to the passenger experience, and improve the perception of PSC. This kind of focus on the passenger experience guided the 2016 renovation to the passenger terminal facility and expansion of the passenger boarding areas.

The objective of noting facility requirements for the terminal is to identify the type, quality and quantity of the facilities that are required for it to operate safely and efficiently through the planning period. Additionally, the relationships between related facilities are considered for their impact how efficiently the terminal operates. While many of the recommendations made for PSC intend to address specific shortfalls, others are to improve general performance. These recommendations were developed by observing peak periods in the terminal, by considering the consultant's prior experience with other airport facilities, and by using guidelines from standard references for terminal planning and design.

This section analyzes the existing state of the terminal and considers the future needs based on forecasted levels of activity. It also evaluates areas of expansion in response to growth in airline service, to increasing aircraft size and capacity, and to annual passenger enplanements. This evaluation also considers how the phased approach to renovation has met growth needs as they occur.

Terminal - Airside Facilities

Concourse

The concourse currently has five ground boarding gates, Gates 1, 2, 3, 4 and 5. Gate 4 is the only gate also serviced by a Passenger Boarding Bridge (PBB). As presented in **Chapter 2 Aviation Activity Forecasts**, at the time of writing this report, airlines are revising the aircraft fleet mix PSC by phasing out the smaller ADG II aircraft and replacing them with larger ADG III planes. Although ADG III aircraft can be ground boarded, they typically use PBBs for boarding and deplaning because it is more efficient, safe, and secure for passengers.

The forecasted changes in fleet mix will reduce ground boarding needs from four gates to two by 2037 For planning purposes, PBB needs increase by approximately one every five years and by 2037 five will be needed to adequately serve the terminal. The most probable gate locations for PBBs are Gates 2, 3, and 5. Gate 1 should be reserved for ground boarding. A sixth PBB will require extending the terminal to accommodate an additional gate and departure lounge will be necessary.

Departure Gates

The current size of the departure lounges, podium, and queueing at the gates are adequately sized for current use. However; with the anticipated changeover to larger aircraft, the size of the departure lounges and queueing areas will need to increase as well as the need for PBBs. Current demand suggests that an additional PBB is needed now, and future demand indicates one additional PBB will be needed every five years. It is projected that six PBBs will be needed by 2037. With a sixth PBB, an additional departure lounge and podium space will be needed, and the expansion of the terminal will be necessary.

Public Circulation

The layout and amount of space for public circulation on the secure side of the terminal is suitable through 2027. However, with the increase of the peak period of passengers resulting from the increased seating capacity per aircraft, congestion in the circulation areas will be more common. With the addition of new gates to meet the growth in demand, additional circulation space will be needed. This analysis indicates a consistent growth every five years from the current 7,367 square feet, with a considerable jump from 7,631 square feet required in 2022 to 9,157 square feet in 2027. The projected need increases 11,312 square feet by 2037, an increase of 65 percent.

At the intersection of the two concourses and the secure area is a large public seating lounge. This area of this space is 3,082 square feet. This serves as both a waiting area and dining space for the restaurant and coffee shop.

Restrooms

There are two restroom modules on the concourse. Gates 1-2 have one module, and Gates 3-5 have one module. Both modules have a family/unisex restroom, and separate men's and women's restrooms with eight plumbing fixtures for men and seven for women. The number and types of restroom facilities meet recommendations contained in ACRP Report 130, *Airport Terminal Restroom Planning and Design,* and are expected to be sufficient for the 20-year planning period. Possible improvements to each restroom module would be a mother's room and a flip down step to facilitate children's handwashing.

Table 3-15 outlines the square footage requirements for the post screening concourse facility.

Table 3-15: Terminal Airside Facility Space Assessment

Peak Hour Enplaned Passengers	*Existing Facility*	*2017* 210	*2022* 230	*2027* 270	*2032* 320	*2037* 370
	GSF	**Recommended Gross Square Footage**				
Concourse						
Number of Gates (Ground Boarding)	**4**	**3**	**3**	**3**	**2**	**1**
Gate Seating & Podium Area	12,794	2,779	2,901	3,144	2,949	2,753
Number of Gates (w/Bridges)	**1**	**2**	**2**	**3**	**4**	**6**
Gate Seating & Podium Area	3,197	4,883	5,195	6,620	8,202	10,183
Circulation	7,367	9,815	10,175	12,209	13,167	15,082
General Seating	3,548	2,444	2,665	3,156	3,733	4,310
Restrooms	2,684	2,207	2,310	2,413	2,599	2,671
Concourse Total	**29,590**	**22,128**	**23,246**	**27,543**	**30,650**	**35,000**

GSF = Gross Square Footage

Source: Mead & Hunt

Terminal Landside Facilities - Security

Security Checkpoint

Currently, TSA has two security checkpoint lanes. Based on the forecast number of peak hour passengers by 2032, it is projected that a third checkpoint lane will be needed using guidelines contained in the TSA's *Checkpoint Design Guide*. The 2016 construction project provided enough square footage to accommodate two additional lanes. The new screening equipment and layout are to be coordinated with TSA, as is the possible addition of a dedicated Precheck lane.

Security Queueing

TSA's *Checkpoint Design Guide* recommends a screening lane should correspond to 300 square feet per passenger. The existing amount of queueing area for TSA screening is approximately 1,200 square feet, suitable for the next 20 years. Because the queueing area uses only a small portion of the atrium space, PSC has added seating for passengers to use while waiting for the checkpoint to open, or for meeter/greeters who are awaiting arriving passengers.

Security Exiting

PSC's secure exiting currently opens to the meeter/greeter lounge by the means of a sliding glass door activated by a motion detector on the secure side of the passage. It is currently monitored by a TSA employee. In 2032, it is expected that increased deplanements will require two automated secure exit lanes that would remove the need for the sliding glass door. The secure exit lanes would also eliminate the supervision by a TSA employee.

Table 3-16 outlines the square footage requirements for the TSA Screening lanes, queueing and exit lanes.

Table 3-16: Security Checkpoint Space Assessment

Peak Hour Enplaned Passengers	*Existing Facility*	*2017*	*2022*	*2027*	*2032*	*2037*
		0	46	54	64	74
	GSF	**Recommended Gross Square Footage**				
Security Checkpoint						
Number of Lanes	**2**	**2**	**2**	**2**	**3**	**3**
Passenger Screening	5,542	2,700	2,700	2,700	4,050	4,050
Checkpoint Queueing	1,240	600	600	600	900	900
Checkpoint Exit	1,554	1,200	1,200	1,200	1,800	1,800
Checkpoint Total	**8,336**	**4,500**	**4,500**	**4,500**	**6,750**	**6,750**

GSF = gross square footage
Source: Mead & Hunt

Terminal Landside Facilities – Operational

Circulation and Queuing

The ability to move freely inside the passenger terminal building affects the passenger experience. Congested areas can restrict ease of access and cause delays for passengers transiting the terminal facility. Circulation and public space are measured with regard to corridor width between passenger facilities and lobby area seating. This process is used to identify any potential congestion areas within the terminal building and analyze the area's ability to handle the projected passenger demand. The analysis indicates that the current landside circulation is undersized for the current use, especially in areas not addressed by recent building improvements. Circulation currently is impeded at peak hours, causing congestion in ticketing, meeter/greeter lobby, baggage claim, and rental car counters when flight times overlap.

Cross traffic circulation occurs when ticketing queues block the terminal's main entry and interfere with circulation through the ticketing lobby. Rental car customers must return through the terminal and pass by the ticketing counters to retrieve their cars adding to the congestion. Passengers exiting the terminal must pass through the meeter/greeter area and then to the baggage claim. The current space allocation for circulation and queuing on the landside terminal is 15,580 square feet. This analysis indicates that these needs will increase significantly by 2027 to over 20,000 square feet. By 2037, it is estimated that the landside terminal circulation needs expand to over 24,000 square feet.

Airline Ticket Counters

According to ACRP 25: *Airport Passenger Terminal Planning and Design*, the ticketing and baggage check-in counters currently provide adequate length and number of stations to support commercial flights forecasted through 2037. But the addition of another airline or increased service will increase the number of ticketing stations needed. PSC is currently planning for the addition of one ticketing station to meet the anticipated growth.

The active check-in area is adequate for near-term needs, but the ticket queueing area currently experiences significant congestion at peak hours due to multiple flights with similar departure times. Congestion in the ticketing area also increases with the addition of low-cost carrier flights, due to the increased baggage needs of passengers flying for recreation.

Self-service kiosks are located along the wall opposite the ticketing counters. When the ticketing queues back up, the lines block the circulation area between the kiosks and the counters. To mitigate the passenger circulation blockages at the entrance and ticketing areas, the space afforded the ticketing lines needs to be increased. This may be helped by relocating the self-service kiosks. Additional measures to mitigate ticketing area congestion may include providing bag drop counters, self-tagging stations, extending the ticket hall to allow kiosks to be located between the ticket counters, and/or curbside check-in.

To continue to support existing operations and to allow sufficient queuing space, the queuing area depth should expand by an additional 5 to 10 feet to help eliminate the congestion. The maximum expansion would add 1,100 square feet to the queueing area. This extension would eliminate the current circulation area, thus necessitating an expansion of the ticketing area.

Baggage Claim

The existing baggage claim area is served by two flat plate carousels with each carousel having approximately 60 linear feet of public profile length. The carousels are less than 14 feet apart. When multiple flights arrive in close succession this area becomes congested with passengers and greeters. The limited space between the carousels is also used to retrieve oversized baggage adding to the congestion. The industry standard for access space around each carousel is 12 to 15 feet, twice the distance that is currently provided between carousels. Additionally, the carousels are not long enough to meet the capacity demand for baggage associated with multiple arrivals.

While most of the congestion currently is directly related to orientation of the baggage retrieval systems, the linear length of the carousels needs to expand by nearly double the existing length in 2037. Along with the addition of longer conveyors, the square footage of the space will need expansion to 6,800 square feet from the current 2,259 square feet. The appropriate square footage needed for this area will be affected by the type of equipment used within the space.

There is currently no space provided for seating in the baggage claim area and the circulation of returning passengers is constrained. Any expansion of the baggage claim area would impact the adjacent rental car counter and office spaces (RAC), forcing the relocation of the RACs.

Rental Car Agencies

Even though the ACRP Report 25: *Airport Passenger Terminal Planning and Design* indicates that the current rental car agencies (RACs) are adequate to meet forecasted demands for the next 20 years, the proximity of the baggage carousels to the queuing area for several of the RAC counters can cause congestion. Also, there is no room for expansion if an additional agency wishes to enter the PSC market. The orientation of the baggage claim and the RAC counters are interdependent to one another. Any expansion of either area will impact the other.

The location of the counters in relation to the rental car parking is problematic. After the customer completes the counter transaction, they must travel to the opposite end of the terminal through the airline ticket queuing area and then outside to the rental car location. A more efficient connection between the RAC counters and the rental car lots should be considered.

Restrooms

The existing public access restroom facility has one female, one male, and one family/unisex restroom. The existing square footage and fixture counts will serve the landside area for the next 20 years. Similar to the concourse restrooms, possible additions to each restroom facility would be a mother's room and a flip down step to facilitate children's handwashing. Any expansion of the terminal may create distance issues between the new areas and existing restrooms, which could require additional restroom facilities.

Meeter/Greeter

PSC is unique with regard to the number of people that enter the terminal to greet deplaning passengers and send off departing ones. The terminal has a dedicated waiting area adjacent to the termination of the secure exiting lane and the landside concession. There is dedicated seating area with flight monitors providing an area for greeters to linger. Often the number of greeters spill out into the circulation area creating congestion for movement through that space.

Concessions (Landside)

The current landside concession contains a small retail space, a counter that serves snacks, beverages and sandwiches and is adjacent to the Meeter/Greeter area. This area provides table and chairs for customers. The size of the concession area will be adequate for the next 20 years.

Support Space

Support spaces, which are those areas that provide passenger amenities, include areas for bag cart and wheelchair storage and information kiosks. As the terminal facility expands to meet demands this square footage is expected to more than double by 2037. **Table 3-17** outlines the square footage requirements public accessible areas pre-screening for passenger ticketing, baggage claim, car rental, restrooms and lounge areas.

Table 3-17: Terminal Landside Facility Space Assessment

Peak Hour Enplaned Passengers	*Existing Facility*	*2017* 210	*2022* 230	*2027* 270	*2032* 320	*2037* 370
	GSF	**Recommended Gross Square Footage**				
Terminal Landside						
Circulation	12,063	13,555	14,051	16,861	18,183	20,828
Ticketing Queue & Kiosks	3,283	2,580	2,599	2,986	3,463	3,943
Bag Claim	2,259	3,206	3,459	4,184	4,926	5,669
Car Rental Queue	671	900	990	1,089	1,198	1,318
Public Restrooms	2,047	1,124	1,159	1,237	1,327	1,418
Meeter / Greeter Lounge and Vending	2,379	1,905	2,066	2,444	2,843	3,266
Terminal Total	**22,702**	**23,270**	**24,324**	**28,799**	**31,941**	**36,441**

GSF = gross square footage
Source: Mead & Hunt

Terminal Non-Public Facilities

Concessions

The leased area for concessions on the secure side of the terminal includes a bar, a full-service restaurant with kitchen, a coffee shop, and a gift shop. The current area, consisting of 3,049 square feet, is projected to be increased starting in 2032, with an additional 1,200 square feet needed by 2037 to adequately accommodate the increased enplanements. The square footage needs will increase to over 4,000 square feet by 2037. Currently, the kitchen is marginally sized to meet the current needs of the concessionaire and should be an emphasis for expansion as soon as possible.

The current landside concession contains a small retail space, a counter that serves snacks, beverages and sandwiches and is adjacent to the Meeter/Greeter area. This area provides table and chairs for customers. The size of the concession area is expected to be adequate for the next 20 years.

Airport Administration

The administrative suites are located on the second floor of the landside portion of the terminal. It currently contains administrative offices, a law enforcement office, security badging, two conference rooms, a server room, and male and female restrooms. The analysis indicates the need for expansion for this suite as staffing needs increase with expanded service at the airport. The expansion needed in this area grows by approximately 100 square feet per every five years.

Airline Operations Areas

There are currently two unoccupied Airline Ticketing Offices (ATOs) allowing for expansion of the current carriers or for the introduction of a new airline. The analysis of office space indicates the need for expansion of the ATOs by 2027 to approximately 4,000 square feet by 2022 and over 6,000 square feet in 2037.

There is currently no office space dedicated to unclaimed/delayed bags. The addition of this space could be coordinated with baggage storage for the carriers. This analysis indicates that 480 square feet are currently required but the need is expected to double the size of that area by 2037. The size of this operation would be dependent on if this office was a shared space, or if the airlines would require individual offices. This space could be provided in the baggage claim area. It was also noted that the door from the ATOs to Outbound Baggage was undersized and does not allow baggage to easily pass through.

TSA Offices

Adjacent to the screening area, TSA's suite contains office space, a breakroom, training space, and a secure server location. The forecasts indicate that a modest expansion will be necessary to account for the growth in personnel needed to meet the increased passenger levels.

Outbound Baggage Screening

The TSA baggage inspection area was upgraded in 2019 to a medium volume In-line Baggage System that includes two automated inspection lines. Using the TSA's *Planning Guidelines and Design Standards for Checked Baggage Inspection Systems*, the throughput is expected to meet PSC needs through 2037.

Outbound Baggage Makeup

The outbound baggage room has one carousel for all airlines and is undersized. In is noted by the airlines that the space is constrained when baggage operations are shared, and it is difficult for baggage cart tug vehicles to pass one another in the room. An additional carousel and expansion of drive lanes are necessary. The appropriate square footage needed for this area can be impacted by the type of equipment used within the space.

Inbound Baggage

The inbound baggage room consists of three access points for baggage dispersal, one each for the two flat plate conveyors and an oversized baggage portal. The tug hauling the baggage carts park one behind the other to unload and it can be difficult for tugs and baggage carts to pass each other as they leave the room. As the need for an additional carousel is addressed, the inbound unloading area would need to expand. The square footage needs would be determined by the type and location of new carousel.

Building Utilities

Utility and mechanical systems include:

- Electrical
- Plumbing
- Heating, ventilation, storage and air conditioning (HVAC)
- Security
- Telecommunications systems spaces.

The analysis indicates that the expanded square footage needed would be 8,000 square feet by 2037.

Table 3-18 outlines the areas for administration, operations, and security, which are not typically used by the public.

Table 3-18: Terminal Non-Public Facility Space Assessment

Peak Hour Enplaned Passengers	*Existing Facility*	*2017* 210	*2022* 230	*2027* 270	*2032* 320	*2037* 370
	GSF	**Recommended Gross Square Footage**				
Terminal Nonpublic Facility Space						
Baggage Screening	*4,822*	*4,600*	*4,600*	*4,600*	*4,600*	*4,600*
Inbound & Outbound Baggage	*7,338*	*11,567*	*12,081*	*13,236*	*14,535*	*15,834*
Airline Areas	*5,080*	*5,198*	*5,693*	*6,683*	*7,920*	*9,158*
Car Rental Areas	*1,420*	*1,230*	*1,292*	*1,356*	*1,424*	*1,495*
Concession BOH: Concourse	*2,500*	*3,636*	*3,946*	*4,899*	*5,796*	*6,806*
Concession: Concourse Retail	*549*	*615*	*689*	*771*	*864*	*968*
Concession BOH: Terminal	*843*	*1,417*	*1,545*	*1,890*	*2,220*	*2,591*
Leased Space	*2,006*	*2,099*	*2,138*	*2,184*	*2,230*	*2,278*
Airport Offices and Support Areas	*6,647*	*6,829*	*7,088*	*7,772*	*8,315*	*9,015*
Training & Badging	*476*	*420*	*441*	*463*	*486*	*511*
Subtotal Nonpublic	***31,681***	***37,611***	***39,513***	***43,855***	***48,391***	***53,256***
Building Utilities and Chases	*13,522*	*15,626*	*16,236*	*19,175*	*20,788*	*23,624*
Nonpublic Space Total	**45,203**	**53,237**	**55,749**	**63,029**	**69,178**	**76,881**

GSF = gross square footage

Source: Mead & Hunt

Summary

Due to increased enplanements, the replacement of aging, smaller, and less efficient aircraft, the possibility of additional airlines and/or expansion of service, PSC will need to proactively pursue planning for alterations at the terminal. Core areas that would be difficult to expand without major facility redesign effort include the security checkpoint, ticketing counters, and restrooms. While the individual areas are expected to be adequately sized through 2037, the interaction between circulation and use specific areas near each other results in peak period congestion. Areas that currently demonstrate difficulty with existing demand are the ticket queueing area, baggage claim (with expansion impacting rental car counter operations), and outbound baggage. Long term issues are the addition of PBBs, improved circulation within the pre-security areas of the terminal, expansion of the airport administrative area, and a larger area to support Meeter/Greeter activity.

Passenger Terminal Building Recommendation: Evaluate methods to mitigate the congestion experienced in pre-security areas including the ticket queueing area, baggage check-in counters, the Meeter/Greeter lobby, improved circulation, and the baggage claim area in **Chapter 4 Improvement Alternatives**. There are demonstrated peak period capacity constraints and undersized facilities that impacts passenger circulation efficiencies between areas. Expansion of the baggage claim area will impact the rental car counters and offices requiring additional consideration for relocating these facilities.

Evaluate post-security area improvements that increase the number of PBBs, add boarding gate lounge areas, improve public circulation, and increase square footage needed for additional seating capacity in **Chapter 4 Improvement Alternatives**. Alternatives that meet the additional aircraft parking requirements on the apron are to be included in the terminal airside areas alternatives evaluation.

Evaluate non-public area alternatives that include expansion of the airport administrative offices, ATOs, a dedicated lost baggage storage area, and increasing the area for baggage security screening and baggage cart maneuvering. This analysis will be conducted in **Chapter 4 Improvement Alternatives**.

TERMINAL AREA AND SUPPORT FACILITIES

Air Cargo Facilities

Air cargo tonnage is projected to decrease at a CAGR of -0.3 percent in the next 20 years. As a result, aircraft operations are expected to remain relatively flat. Recent trends indicate more cargo is being transported by ground instead of by aircraft due to cost and development of service centers. It is expected that dedicated air cargo carriers will continue to transport air cargo. Some cargo will also continue to be carried by passenger flights.

FedEx

FedEx has a dedicated sorting facility that was recently expanded to approximately 50,850 square feet. The FedEx aircraft apron consists of approximately 44,000 square feet. Three air cargo aircraft currently serve PSC, depending on the day of the week: either the ATR-42 or the ATR-72 (Monday through Friday), or the Cessna 208 (Saturday). FedEx representatives have indicated it is rare for more than one aircraft to be on the apron at any given time, except for aircraft diversions such as when Yakima is fogged in.

Charter Cargo Carriers

Charter cargo carriers Ameriflight and Airpac use the GA apron to transfer cargo. On occasion, these carriers provide services for United Parcel Service.

Cargo on Passenger Airlines

The FAA and Transportation Security Administration (TSA) have increased screening requirements for cargo that is transported on passenger aircraft. In addition, the U.S. Postal Service contracts with FedEx to transport air mail. As a result, the volume of cargo transported on passenger aircraft has declined.

The TSA mandated that 100 percent of cargo carried on passenger aircraft be screened in the same way that passenger baggage is screened since August 2010. This process requires screening of air cargo as individual items, rather than as pallets of several items. The facilities needed to break down, screen, and reassemble large cargo shipments have placed a heavy demand on air carrier baggage facilities, and have prompted air carriers to outsource cargo shipments to dedicated cargo carriers. At PSC, Alaska Airlines currently ships individual items but limits them to less than 150 pounds. The TSA screens the individual items just as they would check passenger luggage.

Air Cargo Facilities Recommendation: None. The FedEx facilities expansion factored in growth potential for many years so no additional improvements to these facilities are anticipated. PSC should continue to coordinate with all the air cargo carriers to determine facility requirements and improvements well in advance of demand, so demand does not exceed capacity.

Air Traffic Control Tower (ATCT)

The existing ATCT is in the southern portion of airport property, just northwest of the passenger terminal building. It is operational from 6:00 a.m. to 10:00 p.m., with vehicle access provided by 20th Avenue. Additional supporting details outlining the requirements for air traffic control tower siting found in FAA Order 6480.4B, *Airport Traffic Control Tower Siting Process*, and AC 150/5300-13A, *Airport Design*, are found in **Attachment 7 Air Traffic Control Tower Siting.**

ATCT personnel indicate no existing obstructions block the view to any airfield surfaces, but the height of the terminal building can be an issue for viewing Runway 30. Additionally, local ATCT controllers are stationed in the west corner of the tower cab, facing the final approach areas to Runways 12 and 21R. To view the final approach to Runway 21L, controllers must turn approximately 20 degrees to the right. To view final approaches to Runway 3L, controllers must turn approximately 15 degrees to the left. To view the final approaches to Runway 30, controllers must turn approximately 180 degrees. Controllers are trained for these conditions, and the existing tower location is functional for PSC, but FAA preference is for controllers to not be required to turn while performing their duties. The ATCT personnel desire construction of a new tower on the west side of PSC to eliminate these operational conditions and to increase tower height to maximize visibility performance requirements to all controlled movement areas.

ATCT Recommendation: Reserve space for a future ATCT on the west side of airport property, with the understanding that existing infrastructure to the area is limited and might not be cost effective to provide at the present time.

GENERAL AVIATION FACILITIES

GA facilities at PSC support the based and transient aircraft fleet. GA traffic represented approximately 62 percent of total operations in 2017 and is expected to comprise 63 percent in 2037. Based aircraft are anticipated to grow from 124 in 2017 to approximately 137 in 2037.

An FBO is a business that provides aircraft services such as fuel sales, aircraft maintenance, flight training, and aircraft storage, primarily serving GA aircraft owners and pilots. There are two FBOs at PSC. Multiple FBOs tend to keep prices consistent with other airports, which benefits aircraft owners and pilots. The facility requirements for the FBOs depend on their staffing and equipment to keep up with an anticipated increase in demand. New and expanded FBO buildings might be necessary as companies reach capacity in their existing locations. Upgrades and maintenance to existing hangars and buildings have been identified as high priority needs by the FBOs to meet future demand.

GA Facilities Recommendation: Plan for new and expanded FBO facilities as demand dictates.

Aircraft Hangars

Based on the high investment cost of owning and operating aircraft, hangars are generally the most desired option for both short- and long-term aircraft storage. Aircraft hangar storage at PSC consists of T-hangars and multi-aircraft box hangars in the GA area and in the Airport Business Center.

The T-hangar spaces are contained in seven hangars located at the north end of the GA apron. Of the 17 box hangars, 14 are in the GA area and three are in the Airport Business Park near the southwest end of Taxiway A. There are 0.57 hangar spaces available for every based aircraft at PSC, confirming that box hangars are storing multiple aircraft since few based aircraft utilize apron tiedown storage. This ratio is used to estimate future storage recommendations, as it is expected that future storage facilities will reflect many of the existing characteristics of the current storage patterns. **Table 3-19** presents the estimated aircraft hangar storage demand throughout the planning period.

Table 3-19: Hangar Storage Requirements, 2017-2037

Year	Based Aircraft	T-hangar Units	Box Hangars
2017[1]	124	54	17
2022	128	54	19
2027	131	54	21
2032	133	54	22
2037	137	54	24

Source: Mead & Hunt projections

The based aircraft forecast presented in **Chapter 2 Aviation Activity Forecast** projected an increase of 12 based turboprop and jet aircraft, an increase of five "other" aircraft (i.e., light sport aircraft, gliders, experimental aircraft, and ultralights), and a decrease of four based single-engine piston aircraft. In consideration of similar storage preference characteristics, it is expected that no additional T-hangar units will be needed, but as many as seven box hangars may be needed in the future at PSC. The development of future hangars will require improvements to vehicular access and parking, as well as aircraft access and circulation via taxiways and taxilanes. The actual number, size, and location of future hangars will depend on user needs and financial feasibility at the time demand occurs.

Aircraft Hangar Recommendation: Reserve ample space for additional hangars in the GA area and the Airport Business Park.

Apron and Aircraft Servicing Areas

There are three aprons at PSC – the terminal apron, the transient apron, and the GA apron. The terminal and transient aprons are connected but serve different purposes. The GA apron is used by based and transient aircraft.

Terminal Apron

The terminal apron has nine aircraft parking spaces surrounding the terminal building, and three additional remote aircraft parking spaces. Turn time, which is the time it takes an aircraft to land, unload, load, and depart, is used to estimate apron capacity. ACRP Report 23 provides an estimated turn time of 52 minutes for an aircraft with 201 passengers, which is 0.258 minutes per passenger. Using this ratio, **Table 3-20** presents the turn times as adjusted for the types of aircraft operating or expected to operate at PSC. The ratio is then used to estimate the one-hour capacity of the terminal apron. The shorter turn times have been capped at 30 minutes minimum to account for pilot and cabin crew pre-flight preparation, availability of fuel services, and potential delay during the boarding process.

This analysis indicate that PSC's terminal apron can accommodate up to 18 aircraft in an hour, unless one is an aircraft with more than 120 seats, which lowers the total to 17.

Table 3-20: Terminal Apron Capacity Analysis

Aircraft	Seats	Turn Time Minutes
ERJ 175	76	30
MRJ	90	30
ERJ 195	100	30
A220	109	30
A319	132	34
A320	160	41
B 737 8 MAX	172	44
B 737 9 MAX	179	46
A321	192	50

Sources: ACRP Report 23, Airport Passenger-Related Processing Rates Guidebook (2009).
Airline Seating Charts.

Analysis of commercial service operations from **Chapter 2, Aviation Activity Forecast** indicate that PSC currently experiences six peak hour operations (both arrivals and departures) and will experience the same number of peak hour operations by 2037 as larger aircraft are used by the airlines. It appears that the terminal apron capacity is not constrained by turn times or peak hour operations but by the number of terminal building boarding gates. The five boarding gates have a limit of 10 operations per hour using 30-minute minimum turn times. Should PSC expand the number of terminal boarding gates, adequate space is available for additional terminal apron. Additionally, with the relocation of Taxiway A between Taxiways C to E, additional space is provided for expanding the terminal building and apron between Taxiways C and D.

Transient Apron

The transient apron is primarily used by GA aircraft. This apron does not have access to fuel facilities but can be used as overflow for the GA apron and as storage for air carrier aircraft that are not in use. This apron will become more important if there is an extended period of time between flights for a certain aircraft, and other aircraft need access to the gate. Growth of this apron is constrained by Taxiway A, the ATCT, and the employee parking lot. There is room to expand this apron to the southwest towards the ARFF facility.

General Aviation Apron

The GA apron is primarily used by the FBOs, transient aircraft, and based aircraft for access to hangars, tiedowns, and services. Currently, there are 22 tiedowns on the GA apron. Itinerant GA operations are forecasted to increase and place additional demand on the apron. Recent improvements to Taxiway E and additional private hangar development eliminated some apron storage space used by the FBOs.

Apron storage requirements are based on the estimated amount of itinerant and based aircraft utilizing tiedowns or apron storage spaces. Itinerant aircraft typically only require short-term, temporary storage on the aprons, while based aircraft typically use tie-downs for a longer term and require more permanent apron storage. Space calculations for based aircraft used 360 square yards of apron for each aircraft tiedown. Calculations for iterant aircraft used 500 square yards of apron for each itinerant aircraft. There are two reasons for the larger space requirements for itinerant aircraft. First, itinerant aircraft users will not be as familiar with the layout of and circulation patterns at PSC, and additional maneuvering space is essential. Second, whereas typically smaller, single-engine based aircraft use apron storage, various sized itinerant aircraft will use temporary apron storage. Therefore, it is necessary to provide additional space to accommodate the larger aircraft.

As presented in **Table 3-21**, the amount of anticipated demand for GA apron space is expected to exceed existing capacity throughout the planning period. The FBOs have identified additional itinerant apron space as a high priority need for them to accommodate the expected growth in GA itinerant aircraft operations.

Table 3-21: Apron Storage Requirements, 2017-2037

Fuel Type	2017	2022	2027	2032	2037
Apron Storage					
Itinerant GA Apron (square yards)	N/A	8,525	8,635	8,745	8,800
Based GA Apron (square yards)	N/A	1,520	1,555	2,105	2,710
Total Apron (square yards)	9,440[1]	10,045	10,190	10,850	11,510

Notes: 1 Existing GA aircraft storage apron, which is not divided into specific itinerant and based aircraft use areas. Does not include transient apron adjacent to the terminal apron.
Source: Mead & Hunt projections.

Apron and Aircraft Servicing Areas Recommendation: Reserve additional terminal apron space northwest of the existing apron between Taxiways C and D. Provide additional GA apron space within the GA area and preserve the land southwest of the existing transient apron for future apron expansion.

Aircraft Fuel Storage and Dispensing

The two FBOs at PSC provide both Jet A and 100 Low Lead (100LL) AvGas fuel sales to GA, commercial, and military aircraft. According to fuel sales estimates provided by PSC and the FBOs, the past five years of fuel sales have averaged between 350,000 and 400,000 gallons of Jet A fuel per year and between 50,000 and 60,000 gallons of 100LL AvGas per year. Based on 2017 total aircraft operations, this equates to approximately 18 gallons of Jet A fuel sold per turbine-powered aircraft operation and slightly less than 2 gallons of 100LL AVGAS fuel sold per piston-powered aircraft operation. Typically, as operations increase, fuel storage requirements can be expected to increase proportionately. Increasing the ratio of gallons sold per operation yields an estimate of a two-week supply for future fuel storage needs during the peak month of operations. **Table 3-22** presents the demand for fuel storage compared to the existing capacity.

Table 3-22: Fuel Storage Requirements, 2017-2037

Fuel Type	2017	2022	2027	2032	2037
Jet A					
Average Day of Peak Month Turbine-Powered Aircraft Operations	128	123	126	125	128
Two Weeks of Operations	1,789	1,725	1,759	1,754	1,786
Gallons Per Operation	18.0	19.0	20.0	22.0	25.0
Fuel Storage (gallons)	80,000[1]	32,775	35,180	38,580	44,640
100LL AVGAS					
Average Day of Peak Month Piston-Powered Aircraft Operations	172	177	174	175	172
Two Weeks of Operations	2,411	2,475	2,441	2,446	2,414
Gallons Per Operation	1.9	1.9	2.0	2.1	2.2
Fuel Storage (gallons)	27,300[2]	4,705	4,880	5,140	5,310

Notes: 1 Existing Jet A fuel storage capacity (80% of storage tank capacity is considered full).
2 Existing 100LL AVGAS fuel storage capacity (80% of storage tank capacity is considered full), but one 12,300-gallon tank is not currently in use.
Source: Mead & Hunt projections.

Aircraft Fuel Storage and Dispensing Recommendation: It appears that PSC's future fuel storage demand can be accommodated throughout the forecast period. However, the ability to expand or add additional storage tanks at the FBOs' individual fuel farms should be preserved.

Aircraft Deicing

PSC has two deicing pads between the terminal apron and the FedEx facility, with each pad capable of accommodating an ADG III aircraft. Because of the lack of maneuvering space, if two aircraft are using the pads at the same time the aircraft on the pad farthest away from Taxiway D must wait until the other aircraft is finished deicing before adequate space is provided to taxi from the pads. The lack of maneuvering space indicates the deicing pads do not operate as efficiently as they should.Up to five peak hour air carrier departures are forecasted by 2037. However, the peak hours are expected to occur during the summer months when the deicing pads are not needed. Winter peak hour operations will be reduced from this peak.

Aircraft Deicing Recommendation: Evaluate improvements to the existing deicing pads through redesign and/or expansion of the existing site. If this is not possible, then select a new site meeting all requirements to accommodate two ADG III aircraft simultaneously.

Aircraft Rescue and Firefighting (ARFF)

The ARFF facility was completed in 2007 and is a dual-use facility serving the community and PSC. FAR Part 139, *Certification of Airports* includes requirements for ARFF equipment and staffing, which are defined in **Chapter 1 Inventory**. Currently, PSC maintains an ARFF Index B classification, which accommodates the existing commercial aircraft fleet serving PSC (i.e., Bombardier Q400, CRJ 700, CRJ 900, and A319). ARFF requirements and representative aircraft are presented in **Table 3-23**.

Table 3-23: ARFF Index Requirements and Representative Air Carrier Aircraft

ARFF Index	Aircraft Length Criteria (feet)	Vehicles	Water (gallons)	Dry Chemical (pounds)	Representative Aircraft
A	< 90	1	100	500	CRJ 200, ERJ 135
B	90 < 126	1 or 2	1,500	500	A220, A318, A319, A320, B737, CRJ 900, DH8D, ERJ 145, ERJ 175, ERJ 195
C	126 < 159	2 or 3	3,000	500	A310, A321, B737-MAX 8/-MAX 9, CRJ 1000, ERJ 195, MD 88, MD 90
D	159 < 200	3	4,000	500	A300, A330, A340, B757, B767
E	> 200	3	6,000	500	A330, A340, A380, B747, B777

Source: CFR Part 139.317.

Commercial service aircraft operations forecasts indicate that operations of the A321 and 737 MAX 8 could surpass five average daily departures by the latter part of the forecast period. Therefore, PSC would be classified as an ARFF Index C. PSC's ARFF facility operates two rapid response vehicles, each capable of carrying 500 pounds of dry chemical and 1,500 gallons of water. Therefore, if PSC becomes classified as an ARFF Index C facility, the existing equipment can accommodate the necessary requirements. However, on-site staffing would need to increase to maintain the number of ARFF-trained personnel capable of manning the second vehicle in the event of an incident. Additionally, due to age, one response vehicle serves as the existing backup vehicle and is nearing the end of its useful life and would need to be replaced.

ARFF Recommendation: Closely monitor changes to the daily departure of aircraft types and be prepared for the re-classification as an ARFF Index C facility in the future. When that happens, additional on-site staffing of ARFF-trained personnel would also need to increase, and a new second response vehicle would be needed.

AIRPORT MAINTENANCE AND MATERIAL STORAGE

Airport maintenance handles the upkeep, protection, and preservation of airport facilities, and the snow and ice removal from pavements. Currently, a 14,000-square-foot building east of the GA area within the East Side Industrial Park maintenance houses the snow removal equipment.

PSC needs a separate Snow Removal Equipment (SRE) building to house existing and future- equipment as the existing maintenance facility is nearing capacity. A location close to airfield pavements providing easy response for maintenance personnel would expedite the snow and ice removal process and make it more efficient. AC 150/5220-18A, *Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*, provides siting factors that should address the following safety details:

- Prevent activities such as egress/ingress by SRE crews from interfering with fire lane use by ARFF service or aircraft taxiing operations.
- Provides SRE crews with direct airfield access instead of using perimeter roads or circuitous routes to reach runways and taxiways to reduce wear and tear of equipment and improve response time.
- Minimize runway incursions by eliminating the need for employee, private, and service vehicles to cross active airfield pavements to access the building.
- Consider the effect the SRE building has on other airport facilities and services such as air cargo and fueling, with attention given to avoiding existing and future revenue producing areas to the extent practical.

According to AC 150/5220-18A, how airports determine SRE needs is based on the total paved runway area identified in a winter storm management plan for the removal of snow, ice, and/or slush. Runway 3L/21R has more than 1,000,000 square feet of pavement, thus PSC is classified as a very large airport. This classification influences SRE needs, building configuration and size, material storage needs, and personnel requirements.

Airport Maintenance and Material Storage Recommendation: Reserve adequate space for an SRE building located closer to the airfield and engage an architect to right-size the building prior to construction. When the SRE is relocated to the new facility, ample space should remain within the airport maintenance building to accommodate additional equipment and service needs.

AIRPORT FENCING AND GATES

The security fence that surrounds the airport property is a 6-foot chain link topped with a 2-foot section of three strands of barb wire. PSC staff indicate this is adequate for existing and future needs. Approximately 23 secure gates placed at strategic locations around the perimeter fence provide access for vehicles from the non-secure landside areas to secure landside and airside facilities. Ten gates are in the GA area, seven gates are in the terminal area, and one gate is at the ARFF facility. Five other gates are scattered around the perimeter fence providing access to the more remote areas of PSC.

Airport Fencing and Gates Recommendation: Maintain the security fence and provide additional gates as needs arise.

LANDSIDE AND OTHER SUPPORT FACILITIES

Airport Tenant Buildings and Ground Facilities

The Airport Industrial Park is almost fully developed with very few vacant lots. Vacancies within existing facilities are typically filled promptly. However, the less than ideal condition of some of the existing buildings creates leasing challenges. The Port of Pasco and PSC share the responsibility for maintenance and upkeep of the industrial park. PSC is responsible for facilities maintenance, and the Port is responsible for road maintenance. PSC staff reports that warehouses in the 5,000- to 10,000-square-foot range are currently in highest demand from potential customers seeking facilities in the Airport Industrial Park.

Airport Industrial Park Recommendation: PSC should continue to plan and program for additional revenue generating, non-aeronautical/airport compatible uses within the Airport Industrial Park.

Airport Business Park

The Port of Pasco is working with developers to develop the 90-acre Airport Business Park. Existing uses within the park consist of an auto auction and three hangars located at the west end of the park. A hotel is to be constructed at the east end of the park near the airport entrance road at the intersection of Argent Road and 20th Avenue. The park is an important element of the future development at PSC because it offers the opportunity to generate and enhance airport revenues from diverse uses that will improve PSC's economic situation.

There is ample space available to continue development of non-aeronautical uses within the Airport Business Park. The non-aeronautical uses should be compatible with airport operations and not constrain future growth.

Airport Business Park Recommendation: PSC should continue to market this property for future non-aeronautical/airport compatible development that also generates revenue.

Utilities for Undeveloped Parcels

Water, sewer, power, and telephone/communication mainline trunk services are currently available in the west, south, and east sides of PSC, and with direct connection to the passenger terminal building along 20th Avenue. Natural gas mainlines currently provide service to the south and east sides of PSC. Undeveloped airport property parcels in the south and east areas have readily available utilities that should not limit expected future uses. While not as convenient as undeveloped parcels elsewhere, undeveloped parcels in the west part of PSC can be provided service by extensions of existing utilities from Road 36.

Utilities for Undeveloped Parcels Recommendation: PSC should coordinate with the city of Pasco for future extensions, expansions, and upgrades in utility services, especially for long-term development of the west side of airport property.

Airport Property Interests

PSC currently owns a total of 2,235 acres of property and reports that existing property is sufficient to meet their development needs well into the future. The approximate 84 acres of land west of Road 36 and north of Argent Place is considered surplus property, as it was acquired from 1972 through 1977 for the potential construction of a parallel runway northwest of Runway 3L/21R that never materialized. The remainder of airport property is considered essential for future development and should be retained. It is not anticipated that more property will be required in the future.

Airport Property Recommendation: PSC should continue to explore the possibility of releasing or selling land west of Road 36 and north of Argent Place for non-aeronautical/airport compatible development.

Vehicle Parking and Access

PSC is served by a total of eight surface parking lots containing 2,184 total parking spaces. The parking system is currently managed by Republic Parking. Road access to PSC is provided by 20th Avenue. At its intersection with Argent Road, 20th Avenue transitions from a four-lane, two-way arterial to a one-way, three-lane circular loop road providing access to all parking lots and the passenger terminal building.

A detailed vehicle parking, roadway access, and terminal area curbside capacity analysis is contained in the **Attachment 9 Vehicle Parking and Access.** This section provides a summary of the analysis and findings.

Existing Vehicle Parking

Customer Parking Sufficiency

Baseline parking occupancy conditions were established using historical average overnight monthly parking occupancy totals, and weekday and weekend daytime peak hour counts. Average overnight parking occupancy rates help in tracking the monthly variations in parking usage for long-term and credit card facilities. The average length of stay for long-term parkers is between 2.5 to 3.0 days, meaning that many parkers will be reflected in the overnight occupancies. However, the overnight counts do not necessarily identify peak hour usage during the daytime hours, especially for short-term visitors, daily commuters, and employees.

All parking facilities were utilized more during the daytime than during overnight hours. Short-term parking facilities were heavily utilized during the daytime with average occupancies increasing from 14 to 22 percent (or a factor of almost two times) over late-night activity. The peak travel months for PSC passengers using the parking system appear to be in March, May, and November – likely corresponding to increased activity over spring break, summer break, and Thanksgiving holidays.

It appears that PSC has ample parking spaces to meet the existing customer and visitor needs. The overall peak occupancy occurred in March 2017 with a total of 960 parking spaces, which is 59 percent of the existing 1,617 parking spaces for all passenger and visitor lots (i.e., short-term, long-term and credit card lots). The overall sufficiency was 657± parking spaces.

Rental Car and Employee Parking Sufficiency

Of the 2,184 parking spaces at PSC, there are approximately 567 parking spaces allocated to airport, rental car, and FAA employees. Airport employees are allocated 177 spaces, with rental car employees using 363 spaces and FAA employees, 35 spaces. The 355-space rental car lot is allocated by agreement to the six rental car agencies and is used exclusively for storage, operations, and customer returns. PSC also has an agreement with the rental car agencies to use the gravel area southeast of the paved lot that can hold an additional 40-100 cars. The four rental car agencies are allotted spaces accordingly:

- Avis/Budget – 125
- Enterprise – 72
- Hertz – 87
- National – 79

According to PSC, the existing rental car parking is generally enough for the current demand, though on occasion the rental car agencies have used the gravel area southeast of the paved lot. It is not reported how many additional spaces were used on these occasions.

The employee and FAA lots contain 212 parking spaces, with access to these lots controlled via key card or pin code access (for FAA employees). PSC currently has 361 key cards issued for these 212 stalls, an oversell factor of 1.7. Airlines and TSA represent the largest groups of key card holders, with 33 percent and 15 percent respectively.

The existing employee lot was recently expanded to meet current demand. Since the lot is managed via key card access, the parking operator (i.e., Republic Parking) has some control over the number of parking passes assigned so that the parking spaces can be used efficiently. No breakdown of employee lot occupancies for weekday or weekend usage was provided that suggests a space deficiency, so it is assumed that the employee and FAA lots provide ample spaces to accommodate existing demand.

Future Vehicle Parking

For future conditions, application of a blended planning ratio based on the baseline conditions data (over an 18-month sample), to the month(s) in future years with the largest number of projected enplanements. An effective supply factor of 8 percent is also applied to the planning ratio. Strategies to mitigate parking shortages are found in **Attachment 9 Vehicle Parking and Access**

A typical methodology for calculating future parking needs is to apply a ratio between parking demand and total enplanements on a month-to-month basis. A review of 2017-2018 monthly enplanements indicated the overall peak month was July, which does not correlate directly with the peak month for parking usage. This would indicate that there is some variation in travel behaviors by month, such as a greater percentage of drop-off passengers versus originating parking passengers during certain times of the year.

To avoid over or underbuilding for a future design day, an average demand ratio of parking spaces needed per enplanement was calculated. The recommended planning ratio includes a supply cushion of eight percent. This adjustment helps to ensure that modest variations in travel behaviors from month to month do not result in unexpected shortages. Additionally, the effective supply ratio helps to ensure that the parking system can be used efficiently by allowing a cushion of spaces within the lots so that drivers are not circulating searching for the last few available spaces.

With an overall planning ratio of 0.0293 per monthly enplanement established, a similar methodology was applied to determine appropriate planning ratios for short- and long-term parking and credit card lots. The short-term parking ratio of 0.0027 per monthly enplanement and a long-term parking ratio of 0.0266 per monthly enplanement have been applied directly to forecast enplanements:

Table 3-24 presents the recommended future parking needs based on annual enplanement forecasts, peak month enplanements, and the application of the calculated parking planning ratios throughout the forecast period. For employee parking needs, a linear growth as a ratio of existing spaces compared to current enplanements and future spaces based on future enplanements was applied. For rental car storage and operations, a no-growth model was assumed, but an additional 40 parking spaces were provided to allow for some flexibility for overflow.

Table 3-24: Recommended Future Parking Needs, 2017-2037

Year	Annual Enplanements	Peak Month Enplanements	Projected Parking Needs				Total
			Short-Term	Long-Term (Including Credit Card)	Employee	Rental Car	
2017	377,897	38,000	100	1,000	210	400	1,710
2022	412,000	41,000	110	1,0\80	230	400	1,820
2027	504,000	51,000	130	1,350	280	400	2,170
2032	592,000	60,000	150	1,590	330	400	2,480
2037	691,000	69,000	180	1,820	380	400	2,790

Source: Walker Consultants, 2019.

The existing PSC parking supply of 2,184 parking spaces should be enough to accommodate the projected parking demand through 2027. A parking garage or additional surface parking would become more critical in the near-term if PSC plans to displace some of the existing surface lots to accommodate other non-parking uses. Additional passenger terminal building amenities such as a restaurant or retail uses were not fully evaluated, but the existing parking sufficiency would allow some expansion of uses, especially if they generate demand that is off-peak with typical weekday travel patterns.

Beyond the 10-year planning period, a modest expansion of parking capacity is recommended to accommodate the projected 2,480 parking spaces by 2032. Beyond the 2032 planning period, the influence of developing technologies such as fully autonomous vehicles (AVs) becomes more uncertain, making the roughly linear projections of parking demand less reliable. Most current sources do not anticipate major disruptions for AVs until 2040 or later. However, the opinions of some sources differ on the timing and level of AV disruption.

In response to TNCs, some larger airports have experienced a decrease in overall parking needs, though the largest impact has been in rental car usage. The impact of TNCs on long-term rental car needs for PSC is not at all definitive, though PSC may want to monitor this during lease renewals with the four agencies. In some markets, the TNC market share has already matured. For PSC, it has been assumed that some percentage of airport travelers will shift to using more TNCs over the next few years.

Future Vehicle Parking Recommendation: Plan for and evaluate the potential of additional parking spaces in **Chapter 4 Improvement Alternatives**, especially the location and feasibility of a parking garage.

Vehicle Access and Circulation

Vehicles enter the PSC Commercial Terminal at the Argent Road and 20th Avenue intersection and proceed counterclockwise around the terminal area. Access to most parking facilities, including all passenger parking facilities, is available before vehicles cross in front of the passenger terminal building, with the exceptions of the FAA and the employee lots. These lots are west of the terminal. Access to the employee lots is also available via Varney Road. The rental car lot is east of the terminal building and can be accessed by the terminal roadway as well as via an unnamed access road east of PSC.

Three through lanes serve the terminal area, with approximately 400 feet of curbside loading space in a fourth lane directly in front of the passenger terminal building. The loading space provides passenger drop-off/pick-up for both departing and arriving passengers. An additional 200 feet of curbside space west of the passenger terminal building is reserved for short-term taxi and shuttle staging.

Terminal Area Roadway Capacity

In the absence of existing traffic data for the airport area itself, several ways to project existing and future circulation and curbside loading needs for PSC are acceptable to the industry. *Airport Curbside and Terminal Area Roadway Operations* (The National Academic Press, 2010) provides a quick estimation method for the level of service (LOS) of airport terminal area access and circulation roadways. LOS is a function of the volume and composition of the traffic and the speeds attained and is a measurement of driver satisfaction (from best to worst) designated by the letters A-E. LOS calculations start with the free flow speed of the roadway, with academic research providing information based on the free flow speed in increments of 5 miles per hour (mph) from 25 mph to 50 mph.

To calculate the existing and future LOS of PSC's terminal area roadway, these data and assumptions were used:

- 380 existing peak hour passengers – 210 enplanements/170 deplanements
- 670 forecast year 2037 peak hour passengers – 370 enplanements/300 deplanements
- Three roadway through lanes from entrance to parking area
- Two roadway through travel lanes in the passenger terminal area (assumes third through lane is used for drop-off/pick-up activity in addition to the curbside lane during peak periods of activity)
- 1.2 as the average number of passengers per vehicle
- 40 percent of existing passengers arriving curbside via private vehicles, taxis, TNCs, or other shuttles
- 60 percent of future passengers arriving curbside via private vehicles, autonomous vehicles, taxis, TNCs, or other shuttles.

Table 3-25 summarizes the terminal area roadway LOS calculations using the quick estimation method. The existing number of lanes before and through the passenger terminal area are currently operating at, and are projected to continue to operate at, a LOS A.

Table 3-25: Existing and Future LOS Determination

Scenario	Peak Hour Passengers	Percent of Passengers Arriving Curbside	Passengers Per Vehicle	Number of Lanes	Vehicles Per Lane	LOS 'A' Flow Rate	LOS
Existing (2017) – Terminal Area	380	40%	1.2	2.0	63	250	A
Existing (2017) – Entrance to Parking	380	N/A	1.2	3.0	106	250	A
Future (2037) – Terminal Area	670	60%	1.2	2.0	168	250	A
Future (2037) – Entrance to Parking	670	N/A	1.2	3.0	186	250	A

Source: Walker Consultants, 2019.
Note: N/A, Not Applicable.

Based on the assumptions and calculations, PSC has adequate terminal area roadway capacity. This analysis is based on a free flow facility. However, three uncontrolled crosswalks across the terminal area roadway connect the main passenger parking area to the passenger terminal building. The behavior of motorists and pedestrians in the crosswalks would determine the decrease in roadway capacity, but it is anticipated that the resulting LOS would still be A or B in front of the passenger terminal building – depending on the number of pedestrians at a given time.

Terminal Curbside Loading Capacity

Airport Curbside and Terminal Area Roadway Operations provides several methods to evaluate airport curbside operations. The recommended performance measure is curbside utilization, which measures a roadway's ability to accommodate existing and projected requirements for vehicle loading and unloading curbside. A utilization factor of 1.30 or less (65% of the combined capacity of the inner and second curbside lanes) is the desirable planning target for new curbside roadways. A utilization factor of 1.70 is considered acceptable for existing facilities. However, the ultimate measure of acceptable utilization is ultimately up to the individual airport operator and their policies and goals.

To calculate the existing and future LOS of PSC's curbside loading area, these data and assumptions were used:

- 380 existing peak hour passengers – 210 enplanements/170 deplanements
- 670 forecast year 2037 peak hour passengers – 370 enplanements/300 deplanements
- 1.2 average number of passengers per vehicle
- 40 percent of existing passengers arriving curbside via private vehicles, taxis, TNCs, or other shuttles
- 80 percent/20 percent existing private vehicle to taxi/TNC ratio
- 60 percent of future passengers arriving curbside via private vehicles, autonomous vehicles, taxis, TNCs, or other shuttles
- 60 percent/40 percent future private vehicle to taxi/TNC ratio.

Table 3-26 summarizes the existing and future curbside length requirements of the lanes for private vehicles and taxis/TNCs using the above assumptions and quick estimation method. It is also calculated before considering a peak hour factor (i.e., the peak 15 minutes in an hour).

Table 3-26: Existing and Future Curbside Lane Requirements

Scenario	Existing Curbside Length	V (Hourly Volume of Vehicles Curbside)	D (Dwell Time In Minutes)	L (Length of Average Space)	R (Curbside Length)
Existing (2017) – Private Vehicles	400	101	2	20	67
Existing (2017) – Taxi/TNCs	200	25	2	20	17
Future (2037) – Private Vehicles	425	201	2	20	134
Future (2037) – Taxi/TNCs	200	134	2	20	89

Source: Walker Consultants, 2019.

For airports with small curbside loading requirements such as PSC, it is recommended that a peak hour factor of 0.5 be utilized to ensure adequate curbside loading/unloading is provided. This factor would effectively double the future 2037 curbside space requirements for private vehicles from 134 to 268 feet of curbside loading, and for taxis/TNCs it would increase from 89 to 178 feet. Assuming PSC will allow for two lanes of curbside loading and unloading, given the recommended peak hour length of 268 feet per lane, and the peak hour demand of 134 spaces, PSC has a projected LOS between A and B due to the resulting 1.0 utilization rate (0.5 per lane). The same LOS between A and B is projected for the 178 feet of curbside loading required for taxis/TNCs.

Based on the assumptions and calculations and given the existing curbside length of approximately 400 feet in front of the terminal building for private vehicles, and the approximate 200 feet of existing curb length for taxis and shuttles, PSC has adequate terminal curbside capacity to meet existing and projected future needs.

Vehicle Access and Circulation Recommendation: None. It is expected that the roadway capacity and curbside length will be adequate during the planning period.

SUMMARY

Consistent with the Tri-Cities region, PSC is projected to experience sustained growth, as evidence by forecasted aircraft operations and based aircraft. To accommodate the future demand, PSC will need to increase the runway length to mitigate effects of high ambient temperatures that impact jet aircraft useful loads and range. The Airport is constrained in terms of existing adjacent road systems, railroad yards, property development and city boundaries. The primary Runway 3L/21R needs to accommodate narrow-cabin commercial aircraft. The secondary Runway 12/30 has similar needs to meet commercial air carrier demands. The areas beyond the airfield need to accommodate new aircraft hangars, aeronautical tenants, and growth in air carrier operations at the passenger terminal area. Therefore, airport improvements will be needed to meet the region's future transportation needs and land use interests.

The recommended improvements and tasks from the facility requirements assessment are listed here:

Runway Design Criteria

- Add blast pads to Runways 3L and 12 and expanding the blast pad surfaces on Runway 21R and 30 to meet standard dimensions.
- In the runway alternatives evaluation, consider ways to meet the standard 1,000-foot RSA length before the approach end of Runway 30 to remove the use of the Runway 30 LDA declared distance. This should be performed in conjunction with runway length alternatives analysis.

Runway Utilization and Capacity

- Evaluate facility expansion and development with respect to peak hour airfield capacity.
- Evaluate a taxiway bypass and run-up areas for each runway end to help alleviate congestion and delay during peak periods.

Airfield and Airspace Facilities

- Evaluate solutions to remove or mitigate sources of pilot confusion associated with the two hot spots. Include assessments for additional signage, markings, lighting, and other means of improving pilot situational awareness at these locations.
- Evaluate alternatives that implement improved IAPs with reduced visibility minimums and the effect it will have on RPZ dimensions in **Chapter 4 Improvement Alternatives.**
- Continuously monitor and assess pavement conditions with the ongoing pavement management program to maintain and improve runway pavement strength to accommodate Boeing 737 8 MAX and Airbus A320 design aircraft.
- Evaluate Runway 3R/21L pavement conditions for rehabilitation or reconstruction to improve the runway surface and weight bearing capacity for GA aircraft.
- Retain existing Runway 3R/21L length and width for use by GA aircraft and provide separation between dissimilar aircraft type operations.
- Evaluate implementing improved IAPs with reduced visibility minimums and its potential effects on airfield markings, lighting, and signage.
- Evaluate the location and configuration of a high-speed exit taxiway from Runway 12/30 onto Taxiway D.
- Evaluate the location of a right-angled exit taxiway from Runway 3L/21R between Taxiways B and C onto Taxiway A.

- Evaluate the location and configuration of a future partial parallel taxiway northeast of Runway 12/30 (Taxiway G).
- Evaluate a precision IAP with visibility minimums not less than ½-statute mile to Runways 30, 3L, and 12 in **Chapter 4 Improvement Alternatives**.
- Evaluate the implementation of MALSR and precision markings in conjunction with the proposed IAPs to Runways 30, 3L and 12.
- Evaluate future runway end siting requirements for any changes to runway ends or IAP improvements that provide vertical guidance in **Chapter 4 Improvement Alternatives**.
- Evaluate penetrations to future Part 77 surfaces as runway improvements are evaluated in **Chapter 4 Improvement Alternatives**.
- Identify areas where the perimeter road system can be improved by paving, resurfacing, or relocating to improve access for ARFF and Maintenance vehicles.

Runway Length

- Plan for a runway extension to a total length of at least 11,000 feet to accommodate future air service.
- Evaluate improvement alternatives potential for Runways 3L/21R and 12/30 to be extended and identify key constraints and challenges associated with each. Previous planning studies have concluded that an extension of Runway 12/30 to the northwest is the most viable option for runway extension because of the roads, highways, and rail yards off the other runway ends.

Passenger Terminal Building

- Evaluate methods to mitigate the congestion experienced in pre-security areas including the ticket queueing area, baggage check-in counters, the meeter/greeter lobby, improved circulation, and the baggage claim area.
- Evaluate post-security area improvements that increase the number of passenger boarding bridges, add boarding gate lounge areas, improve public circulation, and increase square footage needed for additional seating capacity.
- Evaluate non-public area alternatives that include expansion of the airport administrative offices, ATOs, a dedicated lost baggage storage area, and increasing the area for baggage security screening and baggage cart maneuvering.

Terminal Area and Support Facilities

- Reserve space for a future ATCT on the west side of airport property, with the understanding that existing infrastructure to the area is limited and might not be cost effective to provide at the present time.

- Plan for new and expanded FBO facilities as demand dictates.
- Reserve ample space for additional hangars in the GA area and the Airport Business Park.
- Reserve additional terminal apron space northwest of the existing apron between Taxiways C and D. Provide additional GA apron space within the GA area and preserve the land southwest of the existing transient apron for future apron expansion.
- Reserve the ability to expand or add additional storage tanks at the FBOs' individual fuel farms.
- Evaluate improvements to the existing deicing pads through expansion and/or redesign of the existing site, or select a new site meeting all requirements to accommodate two ADG III aircraft simultaneously.
- Monitor changes to the daily departure of aircraft types and be prepared for the re-classification as an ARFF Index C facility in the future. When that happens, additional on-site staffing of ARFF-trained personnel would need to increase, and a new second response vehicle would be needed.
- Reserve adequate space for an SRE building located closer to the airfield and engage an architect to right-size the building prior to construction. When the SRE is relocated to the new facility, ample space should remain within the airport maintenance building to accommodate additional equipment and service needs.
- Maintain the security fence and provide additional gates as needs arise.

Landside Facilities

- Plan and program for additional revenue generating, non-aeronautical/airport compatible uses within the Airport Industrial Park.
- Continue to market the Airport Business Park property for future non-aeronautical/airport compatible development that also generates revenue.
- Coordinate with the city of Pasco for future extensions, expansions, and upgrades in utility services, especially for long-term development of the west side of airport property.
- Continue to explore the possibility of releasing or selling land west of Road 36 and north of Argent Place for non-aeronautical/airport compatible development.
- Plan for and evaluate the potential of additional parking spaces in Chapter 3 Improvement Alternatives, especially the location and feasibility of a parking garage.
- Base rental car storage and operations on a no growth model but an additional 40 parking spaces have been provided to allow for some flexibility for overflow.

Vehicle Parking and Access

- Plan the parking system to accommodate parking demand correlating to a 95th percentile design day.
- Plan for and evaluate the potential of additional parking spaces especially the location and feasibility of a parking garage.

ATTACHMENT 1 – RUNWAY LINE OF SIGHT

Runway 3L/21R

Runway 3L/21R is served by a full-length taxiway system through the existing Taxiway A and a connection to Taxiway E. Taxiway A is being realigned to cross Runway 12/30 perpendicularly and form a full-length taxiway serving both runway ends. The longitudinal profile evaluation from each end of Runway 3L/21R to the midpoint at 5 feet above the runway surface shows a clear line of sight.

Runway 12/30

Runway 12/30 is served by the full-length parallel Taxiway D. The longitudinal profile evaluation from each end of Runway 12/30 to the mid-point at 5 feet above the runway surface shows a clear line of sight.

Runway 3R/21L

Runway 3R/21L is parallel to Runway 3L/21R and is also served by the existing Taxiway A and a connection to Taxiway E. With the realignment project that is in process, Taxiway A will form a full-length taxiway that serves both runway ends. The longitudinal profile evaluation from each end of Runway 3R/21L at 5 feet above the runway surface shows a clear line of sight for the full length of the runway.

ATTACHMENT 2 – RUNWAY PROTECTION ZONE DIMENSIONS

Table A2-1: Runway 3L/21R Runway Protection Zone Dimensions

Runway Protection Zone	Design Standards D-III-2400	Existing Dimensions	
		Runway 3L	Runway 21R
Approach RPZ	ILS	Non-Precision	ILS
Length	2,500’	1,700’	2,500’
Inner Width	1,000’	1,000’	1,000’
Outer Width	1,750’	1,510’	1,750’
Airport Control Entire Area		No	No
Existing Incompatible Land Uses		Roadways	Roadway and Railroad
Departure RPZ			
Length	1,700’	1,700’	1,700’
Inner Width	500’	500’	500’
Outer Width	1,010’	1,510’	1,510’
Airport Control Entire Area		No	No
Existing Incompatible Land Uses		Roadway and Railroad	Roadway

Source: Mead & Hunt analysis using FAA AC 150/5300-13A.

Table A2-2: Runway 12/30 Runway Protection Zone Dimensions

Runway Protection Zone	Design Standards D-III-4000	Existing Dimensions	
		Runway 12	Runway 30
Approach RPZ	Non-Precision	Non-Precision	Non-Precision
Length	1,700’	1,700’	1,700’
Inner Width	1,000’	1,000’	1,000’
Outer Width	1,510’	1,510’	1,510’
Airport Control Entire Area		Yes	Yes
Existing Incompatible Land Uses		None	Golf Course
Departure RPZ			
Length	1,700’	1,700’	1,700’
Inner Width	500’	500’	500’
Outer Width	1,010’	1,010’	1,010’
Airport Control Entire Area		Yes	Yes
Existing Incompatible Land Uses		Golf Course	None

Source: Mead & Hunt analysis using FAA AC 150/5300-13A.

Table A2-3: Runway 3R/21L Runway Protection Zone Dimensions

Runway Protection Zone	Design Standards B-II-VIS	Existing Dimension	
		Runway 3R	Runway 21L
Approach RPZ	Visual	Visual	Visual
Length	1,000’	1,000’	1,000’
Inner Width	250’	500’	500’
Outer Width	450’	700’	700’
Airport Control Entire Area		Yes	Yes
Existing Incompatible Land Uses		None	None
Departure RPZ			
Length	1,000’	1,000’	1,000’
Inner Width	250’	500’	500’
Outer Width	450’	700’	700’
Airport Control Entire Area		Yes	Yes
Existing Incompatible Land Uses		None	None

Source: Mead & Hunt analysis using FAA AC 150/5300-13A.

ATTACHMENT 3 – PAVEMENT STRENGTH

Current pavement strengths at PSC shown in **Table A3-1** are adequate for the aircraft that they serve. The highest MTOW of the 737 series exceeds the recommended weight bearing capacity of Runway 3L/21R. Aircraft loads should be adjusted accordingly to avoid stress on the pavement.

Table A3-1: Pavement Strength Summary

Aircraft Type/Category	Aircraft Seats (Typical)	FAA ARC	Aircraft Type	(MTOW) - Pounds	Gear Type	Applicable Airfield Pavement
Existing Runway 3L/21R Pavement Strength: 120,000 (SWG), 170,000 (DWG), 320,000 (DTWG)						
Existing Runway 3R/21L Pavement Strength: 52,000 (SWG)						
Existing Runway 12/30 Pavement Strength: 150,000 (SWG), 200,000 (DWG), 400,000 (DTWG)						
Airport critical design aircraft						
Boeing 737-800	170+	D-III	Transport Jet	174,200	DWG	Terminal Apron
Airbus A320	170+	C-III	Transport Jet	166,450	DWG	Terminal Apron
Representative aircraft categories						
Large Cabin Business Jet	10 to 16	C/D-III	GA Jet	65,000 to 90,000	DWG	GA Apron
Medium Cabin Business Jet	8 to 12	C/D-II	GA Jet	28,000 to 60,000	DWG	GA Apron
Small Cabin Business Jet	6 to 8	B/C-II	GA Jet	15,000 to 22,000	SWG	GA Apron
Turboprop	4 to 10	B-II	GA Turboprop	10,500 to 15,000	DWG	GA Apron
Single/Twin Piston	2 to 6	A/B-I	GA Piston	2,500 to 6,500	SWG	GA Taxilane
Helicopters	4 - 8	N/A	Turbine	20,000 to 50,000	--	GA Apron
Note: The gear type and configuration dictate how the aircraft weight is distributed to the pavement and determines the pavement response to aircraft loadings. (SWG): single-w heel gear aircraft – each landing gear is supported by a single tire. (DWG): dual-wheel gear aircraft – each landing gear consists of a single axle with two tires per axle that equally share the weight of the aircraft and provide for greater weight distribution.						

ATTACHMENT 4 – PAVEMENTS, MARKINGS, LIGHTING AND SIGNAGE SUMMARY

Table A4-1: Pavement Markings, Lighting, and Signage Summary

Markings, Lighting and Signage	Runway		Runway		Runway	
	3L	21R	3R	21L	12	30
Runway Markings	Non-Precision	Precision	Visual	Visual	Non-Precision	Non-Precision
Aim Points	Yes	Yes	None	None	Yes	Yes
Centerline	Yes	Yes	Yes	Yes	Yes	Yes
Threshold Bars	Yes	Yes	None	None	Yes	Yes
Runway Number and Edge lines	Yes	Yes	Yes	Yes	Yes	Yes
TDZE Distance Markers	None	Yes	None	None	None	None
Taxiway Holding Position Lines	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Centerline	Yes	Yes	Yes	Yes	Yes	Yes
Runway Lighting	HIRL	HIRL	None	None	MIRL	MIRL
Approach Light System (ALS)	None	MALS-R	None	None	None	ODALs
Precision Approach Path Indicator	PAPI-4L	PAPI-4L	None	None	VASI-4L	PAPI-4L
Runway End Identifier Lights	Yes	None	None	None	Yes	None
Rotating Beacon - On Airport	Yes					
Runway and Taxiway Signage						
Distance Remaining Signs	Yes	Yes	None	None	Yes	Yes
Runway Entry Hold Signs	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Location Signs	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Directional Signs	Yes	Yes	Yes	Yes	Yes	Yes

ATTACHMENT 5 – TAXIWAY DESIGN STANDARDS

The taxiway design standards are presented in **Table A5-1** and **Table A5-2**. The non-standard criteria within the taxiway system are noted with tan color cells and are due to the existing pavement exceeding standards for width.

Table A5-1: Taxiway Design Standards Based on ADG III/TDG 5

Taxiway Design Standard	Standard Dimension	Taxiway					
		A	Future A	B	C	D	D1
ADG III							
Taxiway Safety Area	118’	118’	118’	118’	118’	118’	118’
Taxiway Object Free Area	186’	186’	186’	186’	186’	186’	186’
Taxiway Centerline to Parallel Taxiway/Taxilane	152’	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Taxiway Centerline to Fixed or Movable Object	93’	93’	93’	93’	93’	93’	93’
TDG 5							
Taxiway Width	75’	75’	75’	75’	75’	75’	75’
Taxiway Edge Safety Margin	15’	15’	15’	15’	15’	15’	15’
Taxiway Shoulder Width	30’	40’	30’	40’+	40’+	30’	30’
Taxiway Design Standard	**Standard Dimension**	**Taxiway**					
		D2	D3	D4	D5	D6	E (from A to RW 21R
ADG III							
Taxiway Safety Area	118’	118’	118’	118’	118’	118’	118’
Taxiway Object Free Area	186’	186’	186’	186’	186’	186’	186’
Taxiway Centerline to Parallel Taxiway/Taxilane	152’	N.A.	N.A.	N.A.	N.A.	N.A.	152’
Taxiway Centerline to Fixed or Movable Object	93’	93’	93’	93’	93’	93’	93’
TDG 5							
Taxiway Width	75’	75’	75’	75’	75’	75’	75’
Taxiway Edge Safety Margin	15’	15’	15’	15’	15’	15’	15’
Taxiway Shoulder Width	30’	30’	30’	30’	30’	30’	30’

Note: Tan cells indicate non-standard condition.
Source: Mead & Hunt analysis using FAA AC 150/5300-13A.

Table A5-2: Taxiway Design Standards Based on ADG III/TDG 3

Taxiway Design Standard	Standard Dimension	Taxiway			
		E (from A to RW 30	E1	E2	E3
ADG III					
Taxiway Safety Area	118’	118’	118’	118’	118’
Taxiway Object Free Area	186’	186’	186’	186’	186’
Taxiway Centerline to Parallel Taxiway/Taxilane	152’	>200’	N.A.	N.A.	N.A.
Taxiway Centerline to Fixed or Movable Object	93’	93’	93’	93’	93’
TDG 3					
Taxiway Width	50’	50’	75’	75’	75’
Taxiway Edge Safety Margin	10’	10’	10’	10’	10’
Taxiway Shoulder Width	20’	20’	20’	20’	20’

Note: Tan cells indicate non-standard condition.
Source: Mead & Hunt analysis using FAA AC 150/5300-13A.

Taxiway Design Methodology

Taxiways are designed for “cockpit over centerline” taxiing with pavement width being sufficient to allow a certain amount of wander. Potential runway incursions should be kept to a minimum by proper taxiway design, choosing simplicity over complexity wherever possible. AC 150/5300-13A provides basic taxiway design concepts and methodologies that are outlined in the following narrative.

Increased Pilot Awareness

Taxiway intersections should be kept simple by utilizing the “three-node concept,” which means that a pilot is presented with no more than three choices at each intersection – ideally, left, right, and straight ahead. Ideally, intersection angles should be 90° wherever possible, but standard angles of 30°, 45°, 60°, 120°, 135°, and 150° are acceptable.

Limit Runway Crossing

Opportunities for human error can be reduced by limiting the need for runway crossings, especially crossings within the middle third of runways defined as high energy intersections. Limiting runway crossings to the outer thirds of the runway keeps clear the portion of the runway where pilots can least maneuver to avoid collisions. At PSC, Taxiway A can function as a crossover taxiway on Runway 12/30, but its location is outside the middle third of the runway. A replacement connector taxiway from the terminal apron to Taxiway G and the GA apron is to be included on the new ALP.

A partial parallel taxiway on the east side of Runway 30 and the GA apron would provide alternate taxi routes for aircraft between the main terminal facility, the realigned Taxiway A, and Runway 21R. This would mitigate the need to use Runway 12/30 as a taxiway when opposite direction traffic is occupying Taxiway D.

Increase Visibility

Right angle intersections, both between taxiways and between taxiways and runways, provide the best visibility to the left and right for a pilot. Acute angle exit taxiways provide greater runway efficiency but should not be used for runway entrance or crossing points. Taxiway A currently intersects Runway 12/30 at less than 90°. A new connector taxiway between Taxiway D and the proposed Taxiway G will have 90° intersections and provide alternate route to Runway 21R when Taxiway D is occupied. The new connector will be within the first third of Runway 30. On the northeast side of the runway, the existing ALP indicates Taxiway A is to be reconstructed into a right-angled taxiway intersection with Taxiway G, a future, partial parallel taxiway located 400 feet from the Runway 12/30 centerline.

Indirect Access

Taxiways should not lead directly from an apron to a runway without requiring a turn. This design leads to confusion when a pilot typically expects to encounter a parallel taxiway. Taxiway A is a direct access from the GA Apron to Runway 12/30. The Taxiway A realignment project currently underway will remove the existing northeast Taxiway A intersection with Runway 12/30. Ultimately, as the existing ALP indicates, Taxiway A will be reconstructed into a right-angled taxiway intersection with future partial parallel Taxiway G.

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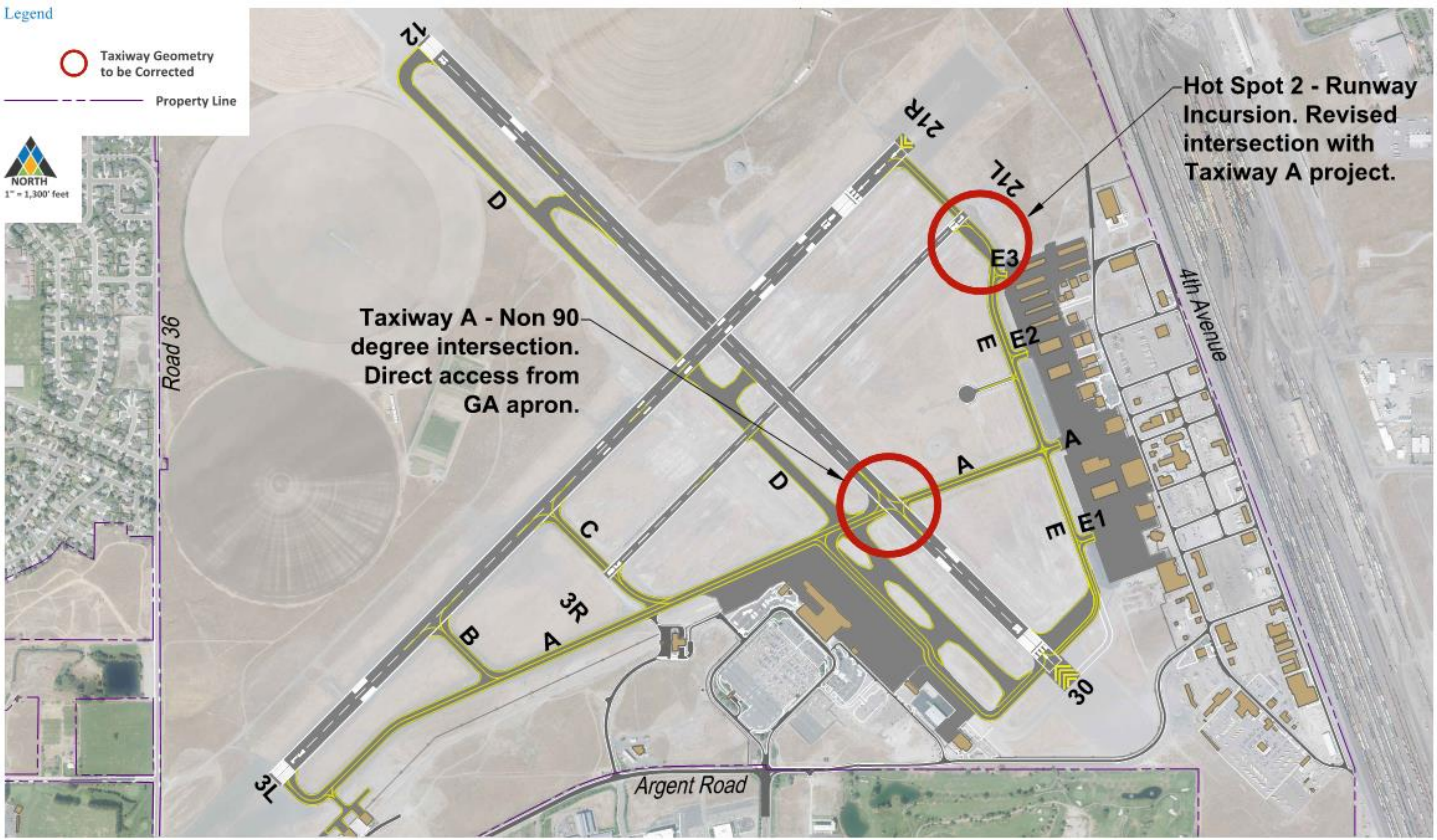
Figure A5-1: Taxiway Geometry Corrections



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ATTACHMENT 6 – RUNWAY LENGTH ANALYSIS

There are five steps established by the FAA in AC 5325-4B to determine recommended runway lengths. The information from these steps are to be used for airport design and not for flight operations. The five steps are listed below, and more detail is included in the following section.

Step #1: Identify Potential Design Airplanes

This step identifies design airplanes that will use the runway regularly for a period of at least five years. The aircraft that were chosen for this analysis were the Boeing 737 MAX 8, Airbus 320, Airbus 220, and the Embraer 175. These were chosen based on current and future operations at PSC.

Step #2: Identify the Most Demanding Airplanes

This step identifies the airplanes that require the longest runway lengths at MTOW. AC 5325-4B categorizes aircraft as small (MTOW of less than 12,500 pounds), large (MTOW between 12,500 pounds and 60,000 pounds) or having a MTOW of more than 60,000 pounds. The aircraft that were considered in this analysis were all over 60,000 pounds.

Step #3: Determine Method

This step compares the aircraft identified in Step 2 with the appropriate methodology for establishing the recommended runway length, using Table 1-1 in AC 5325-4B that categorizes potential design airplanes into groupings according to MTOW. The appropriate runway length methodology for aircraft with MTOW greater than 60,000 pounds is to consult individual airplane manufacturers airport planning manuals (APMs). As stated above, the aircraft are all over 60,000 pounds; therefore, the APMs were used to determine the necessary runway length.

Step #4: Select the Recommended Runway Length

This step selects the recommended runway length using the method determined in Step 3. For this analysis, the Payload and Range tables and Runway Length Performance tables were used to determine the necessary runway length. These tables are included in this attachment.

Runway Length Terms

Design Aircraft:

The aircraft (or group of aircraft with similar characteristics) with the greatest runway length requirements that meet the substantial use threshold.

Similar Characteristics:

Aircraft having comparable operational performance or physical dimensions.

Substantial Use Threshold:

FAA-funded projects require design aircraft to have at least 500 annual operations (landings and takeoffs) to demonstrate "substantial use." The substantial use threshold can be met by an individual aircraft or a family of aircraft with similar characteristics.

Useful Load:

The amount of payload and fuel that an aircraft can carry. The useful load is the difference between the operating empty weight and the maximum takeoff weight.

Step #5: Adjustments

This step allows necessary adjustments to be applied to the runway length determined in the previous step.

The initial runway length calculations documented in the preceding steps require adjustments for runway gradient. The effective runway gradient is the difference in elevation between runway ends plus 14 feet to the takeoff requirement for every foot in elevation difference.

Runway Length Factors

An understanding of the factors that impact aircraft performance is necessary to use the APMs to analyze the runway requirements. The terminology and variables used in the runway length assessment are explained below.

Elevation

Aircraft performance declines at higher altitudes because the air is less dense. Higher elevations negatively impact thrust produced by the aircraft on takeoff and the aerodynamic performance of the aircraft. PSC has six runway ends, ranging in elevation from 395.5 feet above mean sea level (AMSL) to 410.2 feet AMSL. The elevation of 410.2 feet AMSL was used for this analysis.

International Standard Atmosphere (ISA)

ISA is a mathematical model that describes how the earth's atmosphere, or air pressure and density, changes relative to altitude. The atmosphere is less dense at higher elevations. ISA is frequently used in aircraft performance calculations because conditions that deviate from ISA will affect aircraft performance. ISA at sea level occurs when the temperature is 59° Fahrenheit (F). According to the 1976 Standard Atmosphere Calculator, the ISA at PSC's 410.2 feet AMSL occurs when the temperature is 57° F.

Density Altitude (DA)

DA compares air density to ISA at a point in time and specific location and is also a critical component of aircraft performance calculations. DA is used to describe how aircraft performance differs from the performance that would be expected under ISA. DA is primarily influenced by elevation and air temperature. The comparison below illustrates the effect of both variables on DA.

When elevation is constant: When air temperature increases, DA increases. When air temperature decreases, DA decreases. This comparison is often used when analyzing aircraft performance at an airport during different temperatures.

Altitude Calculations

Pressure Altitude:

Pressure Altitude = (Standard Pressure – Pressure Setting at Airfield) x 1000 + Field Elevation.

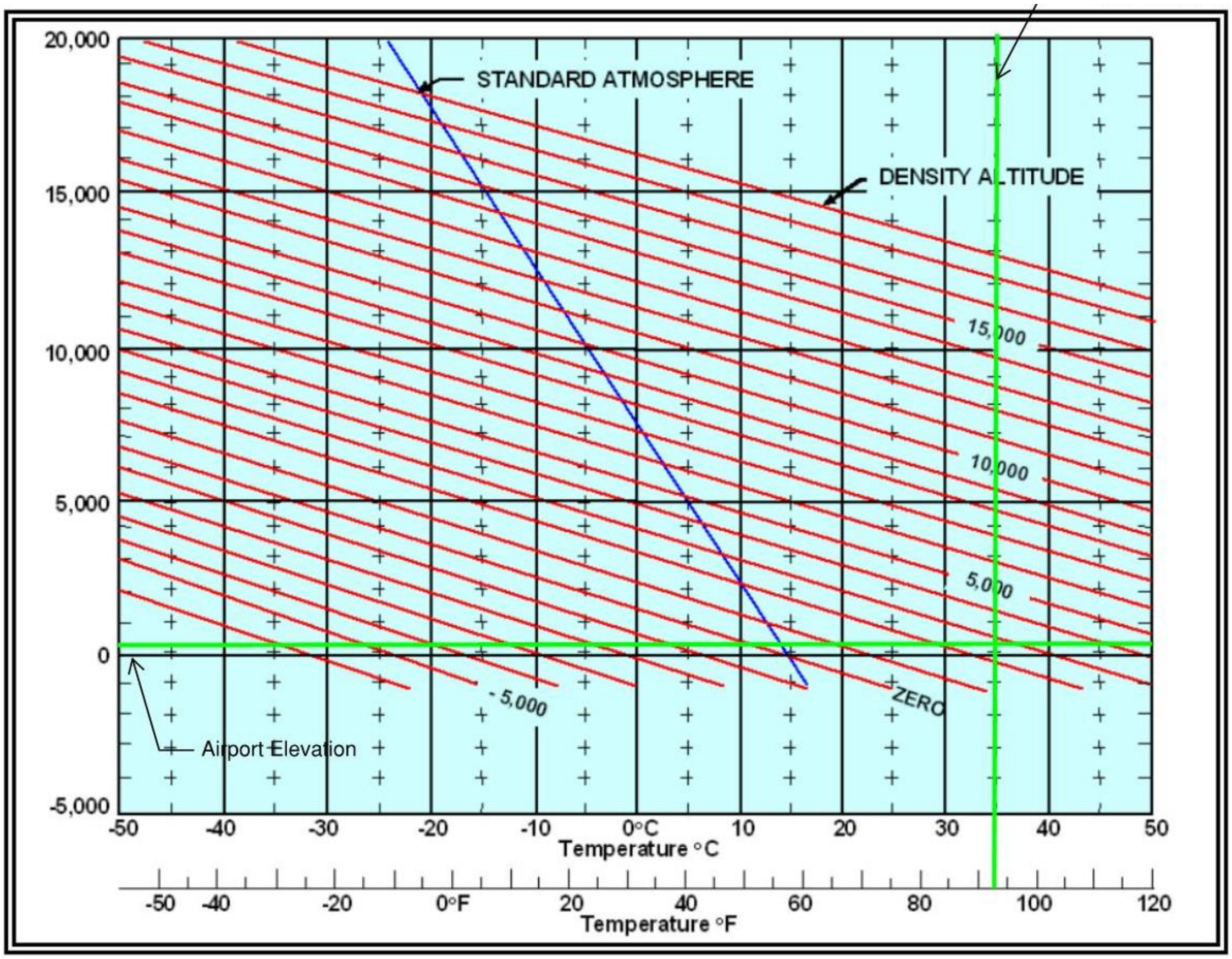
Density Altitude:

Density Altitude = pressure altitude + [120 x (outside air temperature – ISA temperature)].

When temperature is constant: When elevation increases, DA increases. When elevation decreases, DA decreases. This comparison, which is not often used, can be employed to compare aircraft performance at different airports under identical climate conditions.

Figure A6-1: Density Altitude for PSC Average Maximum Temperature illustrates how DA is impacted when factoring in the average maximum temperature of the hottest month. The PSC DA during the hottest month, when the ambient air temperature is 91.3° F, is 2,700 feet. As a measure of high temperature impacts on aircraft performance, this DA is used in aircraft performance assessment.

Figure A6-1*:* Density Altitude for PSC Average Maximum Temperature

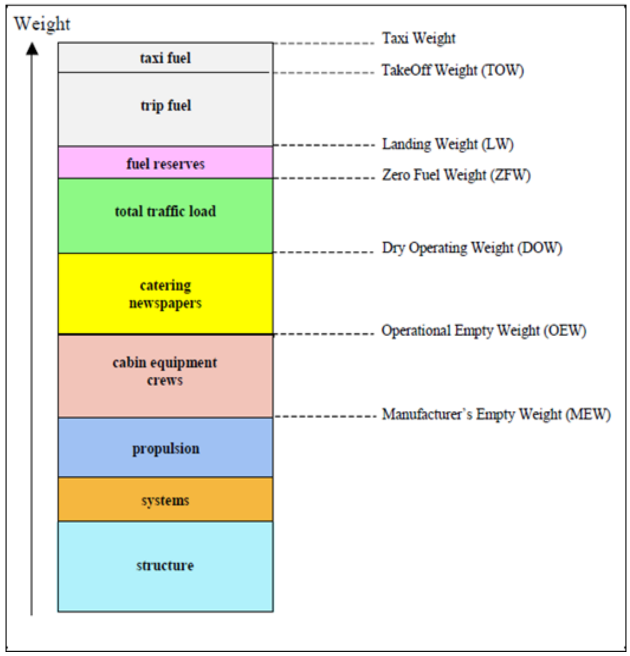


Takeoff Weight

DA, aircraft takeoff weight, and aircraft performance are the three primary factors that affect runway length requirements. Aircraft takeoff weight is directly related to the distance of the flight and the load that the aircraft is carrying. For shorter distances, aircraft may be able to depart with a full passenger load and less than full fuel tanks. In those instances, the aircraft will typically be departing below MTOW and will not require a longer runway. Aircraft will require more fuel for longer trips, and the longest trips may require restrictions on the passengers and cargo that can be carried.

A full passenger load and full load of fuel will be close to the aircraft's MTOW. A typical breakdown of an aircraft's weight is shown in **Figure A6-2: Aircraft Weights.**

Figure A6-2: Aircraft Weights



Source: Getting to Grips with Aircraft Performance, Airbus Coorporation.

Future Aircraft Fleet and Destinations

Passenger demand affects market viability and aircraft choice. Airlines look to sell as many seats as possible and the average load factor (seats sold / seats available) was 80 percent at PSC in Fiscal Year 2018. Mainline carriers (Alaska, American, Delta, Southwest, and United) typically serve destinations at least once daily to cater to the needs of business travelers. Markets that do not have the passenger demand to support daily service may be served less frequently or offered connecting service through a hub. Low cost carriers (Allegiant, Frontier, and Spirit) may serve a destination less frequently (one to two times a week). The A320 and 737 MAX 8 have between 150 and 200 seats depending on the configuration. The E175 and A220 have between 70 and 110 seats. The E175 and A220 give airlines the option to provide non-stop service to markets that lack sufficient daily demand to fill a larger aircraft.

Runway Lengths Considered

Four runway lengths are considered in this analysis. First, the existing runway length of 7,700 feet is the baseline that will be used to assess the benefits of an extension. Second is a mid-extension length to 9,200 feet. The third length is a runway extension to 10,000 feet. The fourth is a maximum runway extension to 11,000 feet, which is based on the longest length required by the most demanding aircraft (737 MAX 8) at MTOW. The assessment will compare the performance and range benefits offered by each runway length and recommend which length to use for planning purposes.

Analysis and Results

The runway length assessment uses the payload and range table and the takeoff performance table contained in the APMs for each aircraft. These tables, and the process used to extract information from them, are included in in this attachment. Two load factor scenarios were considered: 85 percent and 100 percent. The 85 percent load factor represents normal operations, and the 100 percent load factor represents peak demand operations. The analysis process used this workflow:

- DA was calculated based on temperature and elevation. Data for this comes from the FAA and National Oceanic and Atmospheric Administration (NOAA).
- The allowable takeoff weight (ATOW) was determined based on the runway length and DA. In some instances, the ATOW is less than the MTOW. Data for this comes from the takeoff performance chart in the APM.
- The weight of payload was determined based on a fixed weight per passenger (248 pounds with luggage). Other than Alaska Airlines, most scheduled commercial carriers do not carry cargo from PSC. Therefore, cargo weight was not included in the model.
- Fuel carrying capacity was determined based on the difference between the zero-fuel weight (see Figure A6-2: Aircraft Weights) and the ATOW. Data for this comes from the aircraft specifications in the APM.
- Range possible was based on how much fuel can be carried. Data for this comes from the payload and range chart in the APM.
- Improvement to the maximum range possible for each length of runway was compared.

The process for conducting a runway length analysis are detailed along with how the variables were assessed to arrive at a possible range are included in this attachment. The analysis assumed that if an airline wishes to offer non-stop service from PSC to a given market, they will select the appropriate aircraft based on passenger demand. If demand does not support a 737 MAX 8 or an A320, the airlines may use a smaller E175 or A220.

Aircraft Range

The following tables and figures show the ranges of the four aircraft analyzed at both 85 percent and 100 percent load factors from the current runway length and extended runways. The 85 percent load factor was used as a normal passenger load factor for aircraft at PSC. The 100 percent load factor was used to reflect the peak passenger load factor for each aircraft. Possible ranges are for each aircraft are shown in **Table A6-1: Aircraft Range**.

Table A6-1: **Aircraft Range**

Runway Length (FT)	Aircraft Type								
	B737 MAX 8		A320		A220		E175		Avg. Change
	Range (NM)	Change	Range (NM)	Change	Range (NM)	Change	Range (NM)	Change	
85% Load Factor									
7,700[1]	2,200	-	2,400	-	2,200	-	1,400	-	-
9,200	3,000	+800	2,600	+200	2,700	+500	1,800	+400	+475
10,000	3,100	+100	2,600	+0	2,900	+200	1,800	+0	+75
11,000	3,200	+100	2,600	+0	2,900	+0	1,800	+0	+25
100% Load Factor									
7,700	1,400	-	1,900	-	1,600	-	1,000	-	-
9,200	2,200	+800	2,100	+200	2,200	+600	1,500	+500	+525
10,000	2,300	+100	2,100	+0	2,300	+100	1,500	+0	+50
11,000	2,500	+200	2,100	+0	2,300	+0	1,500	+0	+25

Note: 1 Because 7,700 is the baseline for comparison, there is no change data for either load factor.
Source: Mead & Hunt and Aircraft Performance Manuals

Using the 85 percent load factor, a runway length of 11,000 feet offers 25 nautical miles (NM) of average range increase compared to the 10,000-foot runway length, 100 NMs of incremental average range increase compared to the 9,200-foot runway length, and 575 NMs of incremental average range increase compared to the existing 7,700-foot runway.

Using the 100 percent load factor, a runway length of 11,000 feet offers 25 NMs of average range increase compared to the 10,000-foot runway length, 75 NMs of incremental average range increase compared to the 9,200-foot runway length, and 600 NMs of incremental average range increase compared to the existing 7,700-foot runway length.

The next step in the analysis process was to plot the ranges on a map and determine which of the markets identified in **Table A6-2: PSC Existing and Potential Service Destinations** are within range of the four aircraft based on the four runway length scenarios. This assessment illustrated whether a longer runway would help airlines offer new non-stop service from PSC by identifying which additional markets can be served through the possible range increase of the aircraft. **Table A6-2** also shows the markets with the highest daily passenger demand from passengers originating at PSC. The following figures show aircraft ranges for both the 85 percent and 100 percent load factors based on each runway length scenario: **Figure A6-3 Ranges from 7,703-Foot Runway, Figure A6-4 Ranges from 9,200-Foot Runway, Figure A6-5 Ranges from 10,000-Foot Runway** and **Figure A6-6 Ranges from 11,000-Foot Runway**.

Table A6-2: PSC Existing and Potential Service Destinations

Existing Destination	Code	Distance (NM)	Daily Passenger Demand[1]	
			2017	2037[4]
Seattle International Airport	SEA	149	349	655
Salt Lake City International Airport	SLC	453	32	60
San Francisco International Airport[2]	SFO	539	89	167
McCarran International Airport	LAS	636	155	291
Los Angeles International Airport	LAX	739	235	441
Denver International Airport	DEN	741	64	120
Phoenix-Mesa Gateway Airport[1, 2]	IWA	849	107	202
Minneapolis-St. Paul International Airport	MSP	1,090	27	50
Potential Destination	**Code**	**Distance (NM)**	**Daily Passenger Demand**	
			2017	2037[4]
Portland International Airport	PDX	174	21	40
San Jose International Airport[2]	SJC	631	89	167
San Diego International Airport	SAN	939	56	105
Phoenix Sky Harbor International Airport[1, 2]	PHX	962	107	202
Tucson International Airport	TUS	1,069	8	16
Dallas-Fort Worth International Airport	DFW	1,488	56	105
Chicago O-Hare International Airport	ORD	1,570	47	89
George Bush Intercontinental Airport	IAH	1,702	37	69
Atlanta International Airport	ATL	2,016	26	48
Washington Dulles International Airport	IAD	2,157	49	92
Daniel K. Inouye International Airport	HNL[3]	2,774	58	109

Notes: [1] Daily Passenger Demand represents the number of passengers flying to/from an airport. It does not include connecting passengers, which will increase the number of passengers on a particular flight to a hub. The Year-End First Quarter 2017 (YEQ1 2017) Traffic Retention and Leakage Study, provided by PSC, was used to determine the current Daily Passenger Demand. Future Daily Passenger Demand was based on the 3.1 percent Compound Annual Growth Rate (CAGR) determined in **Chapter 2**.

[2] The daily passenger demand from SFO and SJC applies to the entire San Francisco Bay Area, not each airport. The same principal applies to the Phoenix Metropolitan Area.

[3] Hawaiian Islands includes demand for Honolulu (HNL), Maui (OGG), Lihue (LIH), and Kona (KOA).

[4] 2037 passengers based on 3.1% CAGR from demand forecast presented in **Chapter 2**.

Figure A6-3: Ranges from 7,703-foot Runway

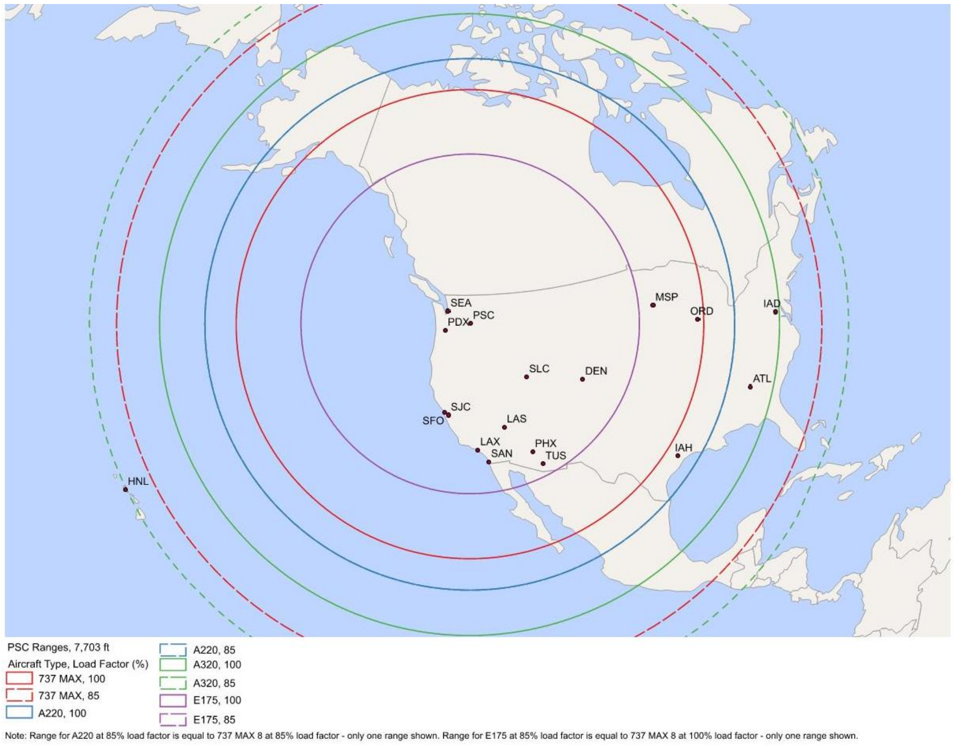


Figure A6-4: Ranges from 9,200-foot Runway

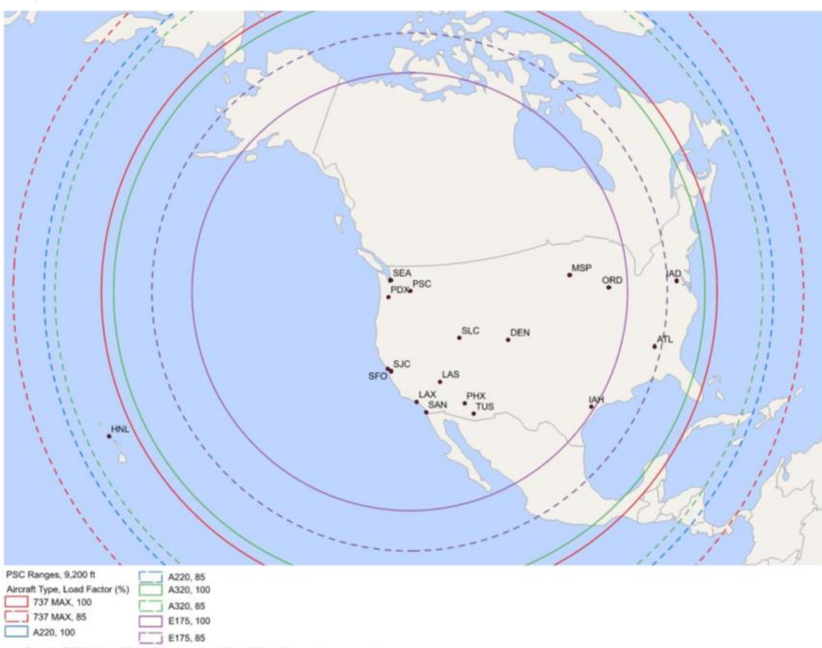


Figure A6-5: Ranges from 10,000-foot Runway

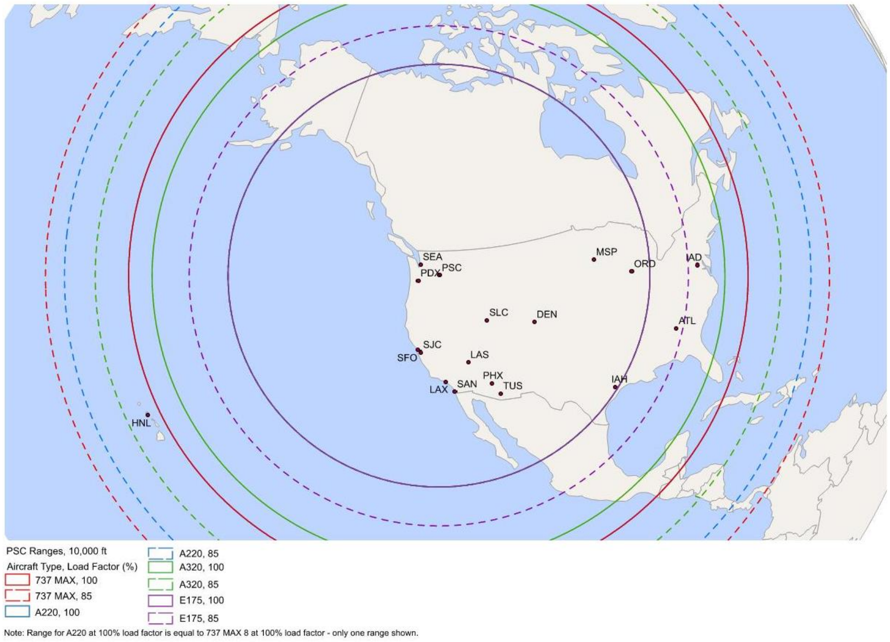
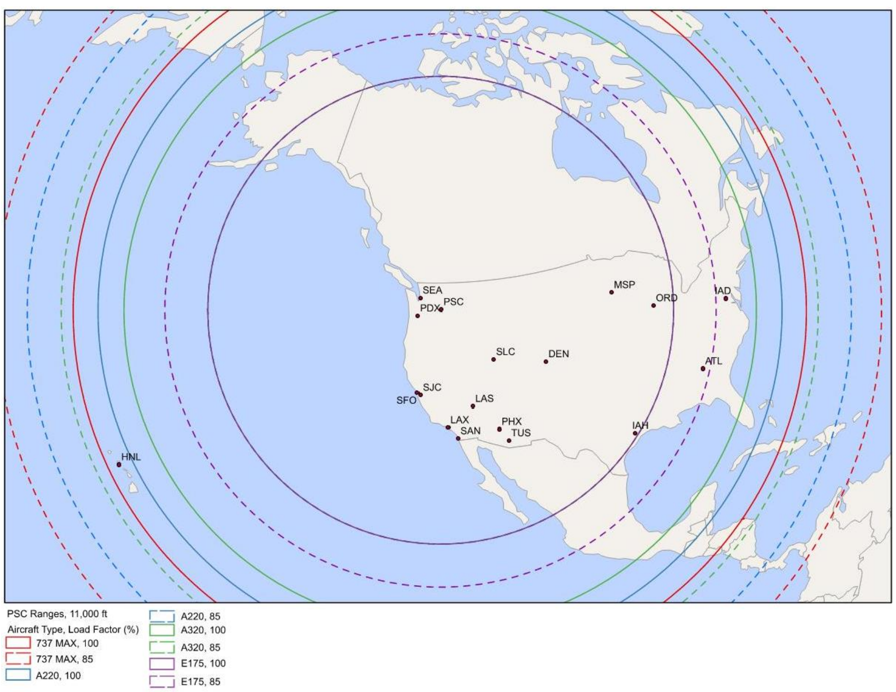


Figure A6-6: Ranges from 11,000-foot Runway



The 737 MAX 8 is designed to perform similarly to the larger Boeing 757 aircraft that it is replacing in many airline fleets. Improvements in engine technology and aerodynamic aircraft design have produced greater maximum ranges than previous generations of narrow-body airliners without dramatically increasing the runway length requirements. Older aircraft, such as the Boeing MD-80 series, the Boeing 757 series, and the Bombardier CRJ series, require longer runways to fly distances comparable to their next-generation peers.

The 737 MAX 8 can reach all the destinations considered in the continental United States at an 85 percent load factor on the existing runway length. Hawaii is not within range unless the runway is extended to at least 9,200 feet. As payload is increased, the 737 MAX 8 is unable to reach destinations beyond 1,400 NMs such as Houston (IAH), Atlanta (ATL), and Washington-Dulles (IAD). Transcontinental service to hubs on the east coast will require a longer runway.

The A320 performs similarly to the 737 MAX 8 at an 85 percent load factor and can serve all destinations in the continental United States on the existing runway length. At an 85 percent load factor, Hawaii is in range with a runway extension. The A320 has better range than the 737 MAX 8 at 100 percent load factor and can still service the continental United States; however, Hawaii is out of range regardless of runway length at this load factor.

The A220 can reach all but the farthest destination, Honolulu (HNL), on the existing runway length at 85 percent load factor. Extending the runway to 9,200 feet brings this destination within range. The A220 is certified for 180 minutes (three hours) of extended-range twin-engine operating performance (ETOPS). This means that the aircraft can fly on one engine for up to three hours, making West Coast to Hawaii operations theoretically possible. Hawaii is out of range for all runway lengths considered at 100 percent load factor. Other destinations beyond 1,500 NM (ATL and IAD) require a runway extension up to 9,200 feet.

The E175 is not intended to be a long-range aircraft and has the shortest possible ranges of the four aircraft considered. Still, the E175 is often used by airlines to serve markets that cannot support A320 and 737 MAX 8 service, such as Alaska's many routes from SEA and PDX to the Midwest. Destinations west of the Mississippi are within range on the existing runway length at a load factor of 85 percent, but destinations beyond 1,400 NM (IAH, ATL, and IAD) are out of range. Hawaii is not possible under any circumstances because the E175 is not ETOPS certified. The E175 is limited to a 1,000 NM range at 100 percent load factor on the existing runway, which puts the existing destination Minneapolis-St. Paul International Airport (MSP) out of range. A runway extension to at least 9,200 feet puts parts of the eastern United States in range of the E175.

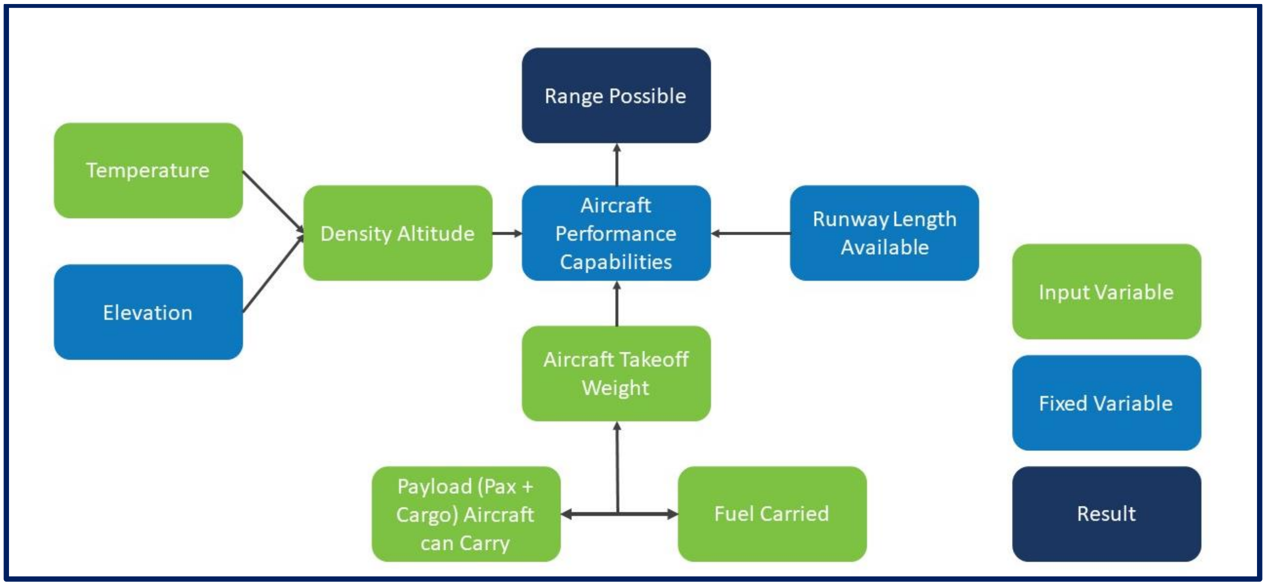
Runway Length Recommendation: Plan for a runway extension to a total length of at least 9,200 feet to accommodate future air service. The performance improvements that are possible with an extension from 9,200 feet to 10,000 or 11,000 feet are less significant than those possible with an extension from 7,700 feet to 9,200 feet. While range did improve with the additional runway length up to 11,000 feet, none of the aircraft assessed were able to serve a destination on 10,000 feet or 11,000 feet of runway that they could not serve on 9,200 feet – all other variables being equal.

Due to existing facilities that include highways and railyards off either end, Runway 3L/21R is constrained from further extension and is recommended to remain at current length of 7,711 feet, with a 600-foot displaced threshold at Runway End 12R. Runways 3L/21R serves light GA aircraft only, with the critical aircraft designated as the Beechcraft King Air. In addition, Runway 3R/21L is constrained for further lengthening by existing taxiways and property boundaries. Existing length of 4,423 feet continues to serve the length requirements for a King Air at MTOW.

Previous planning studies have concluded that an extension of Runway 12/30 to the northwest is the most viable option for runway extension because of the roads, highways, and rail yards off the other runway ends. It is recommended that alternatives for shifting Runway 30 to resolve existing RSA compliance, and extending Runway 12/30 to the northwest for a total length 9,200 feet be evaluated in **Chapter 4 Improvement Alternatives.**

The following flow chart shows the process when runway length is fixed:

Figure A6-7: Runway Length Process Model



Source: Mead & Hunt created logic model

Takeoff Length Requirement Chart Process

- Locate runway takeoff length

- Locate the pressure altitude for airport
- Draw lines to intersect these points
- Takeoff weight is determined by drawing these lines

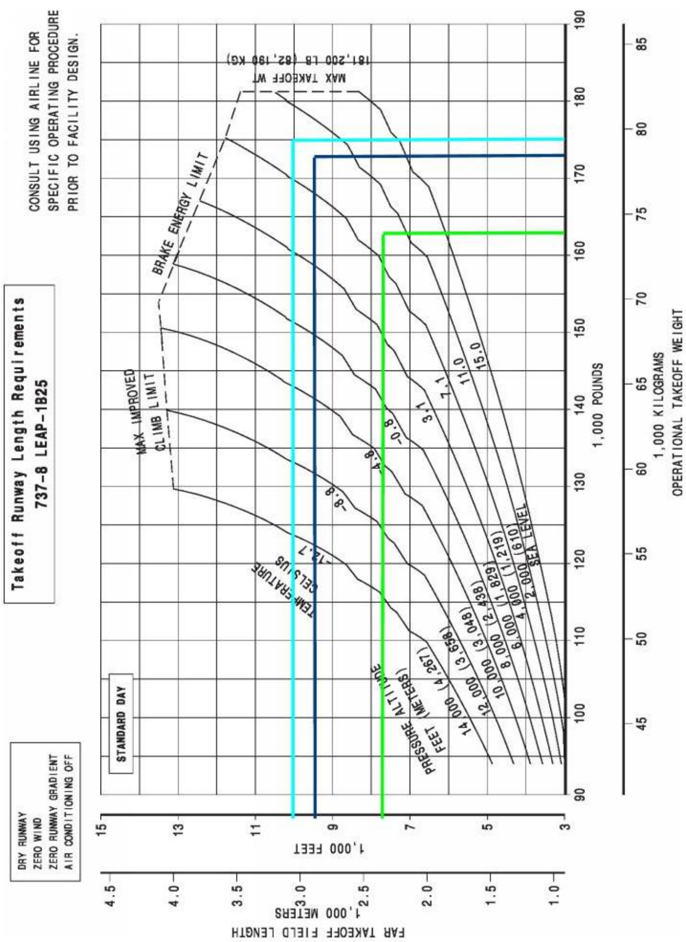
Payload and Range Chart Process

- Draw vertical lines at 500 NM intervals
- Draw horizontal lines on the payload axis to connect to the vertical line
- Payload decreases with range

Figure A6-8: 737 Takeoff Length Requirements

737-7 / -8-200 INFORMATION IS PRELIMINARY

3.3.2 FAA/EASA Takeoff Runway Length Requirements - Standard Day, Dry Runway: Model 737-8 (LEAP-1B25 Engine)



*Green = 7,703'; Blue = 9,200'; Cyan = 10,000'

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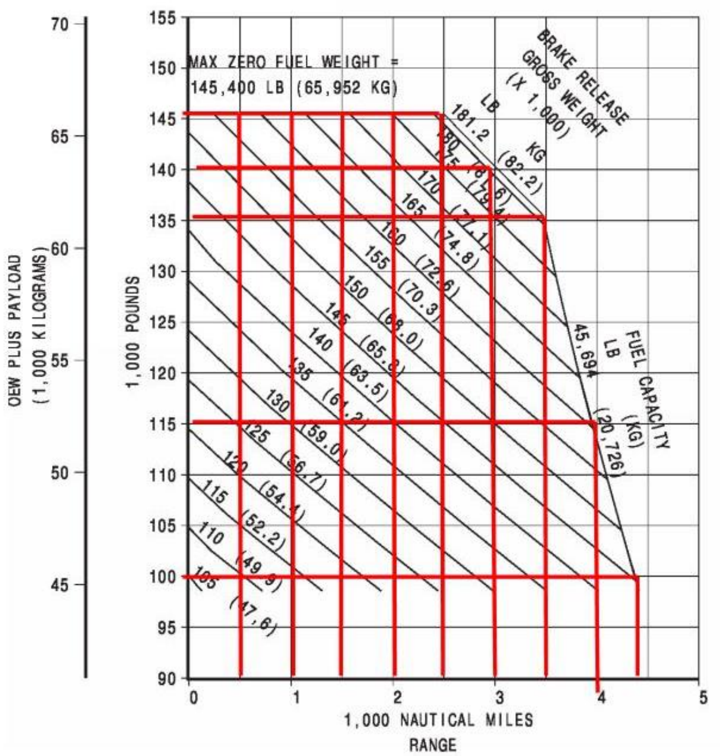
Figure A6-9: 737 Payload/Range

737-7 / -8-200 INFORMATION IS PRELIMINARY

3.2.2 Payload/Range for Long Range Cruise: Model 737-8

Payload/Range
737-8 (LEAP-1B series)

- STANDARD DAY, ZERO WIND
- CRUISE MACH = LRC
- NORMAL POWER EXTRACTION AND AIR CONDITIONING BLEEDS
- TYPICAL MISSION RULES
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE AND OEW PRIOR TO FACILITY DESIGN.



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November 2018

3-32

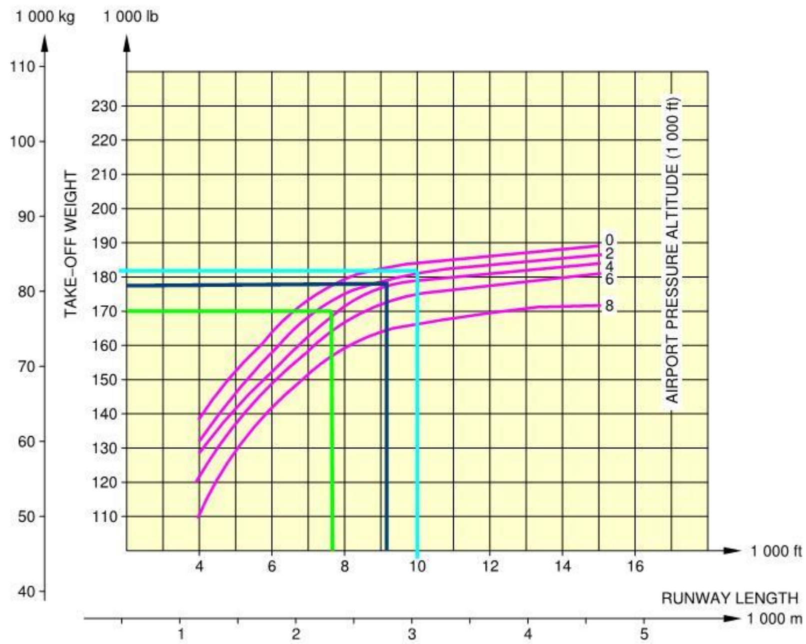
Figure A6-10: Airbus A320 Takeoff Weight Limitations

A320

AIRCRAFT CHARACTERISTICS - AIRPORT AND MAINTENANCE PLANNING

**ON A/C A320-200

NOTE: THESE CURVES ARE GIVEN FOR INFORMATION ONLY
THE APPROVED VALUES ARE STATED IN THE "OPERATING MANUALS" SPECIFIC TO THE AIRLINE OPERATING THE AIRCRAFT.



N_AC_030301_1_0050101_01_01

Take-Off Weight Limitation - ISA Conditions
CFM56 Series Engine
FIGURE-3-3-1-991-005-A01

*Green = 7,703'; Blue = 9,200'; Cyan = 10,000'

3-3-1

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Figure A6-11: A320 Payload/Range

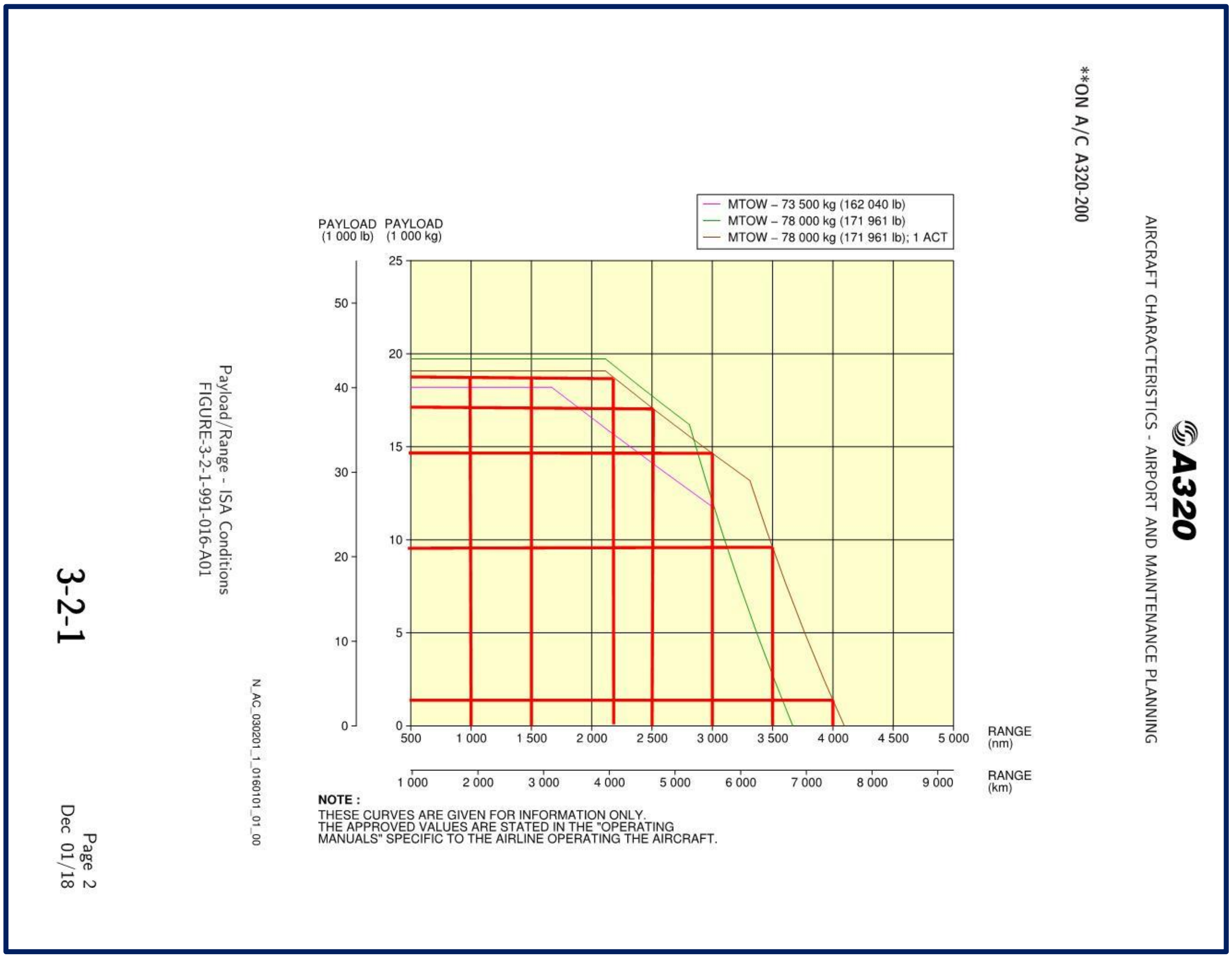
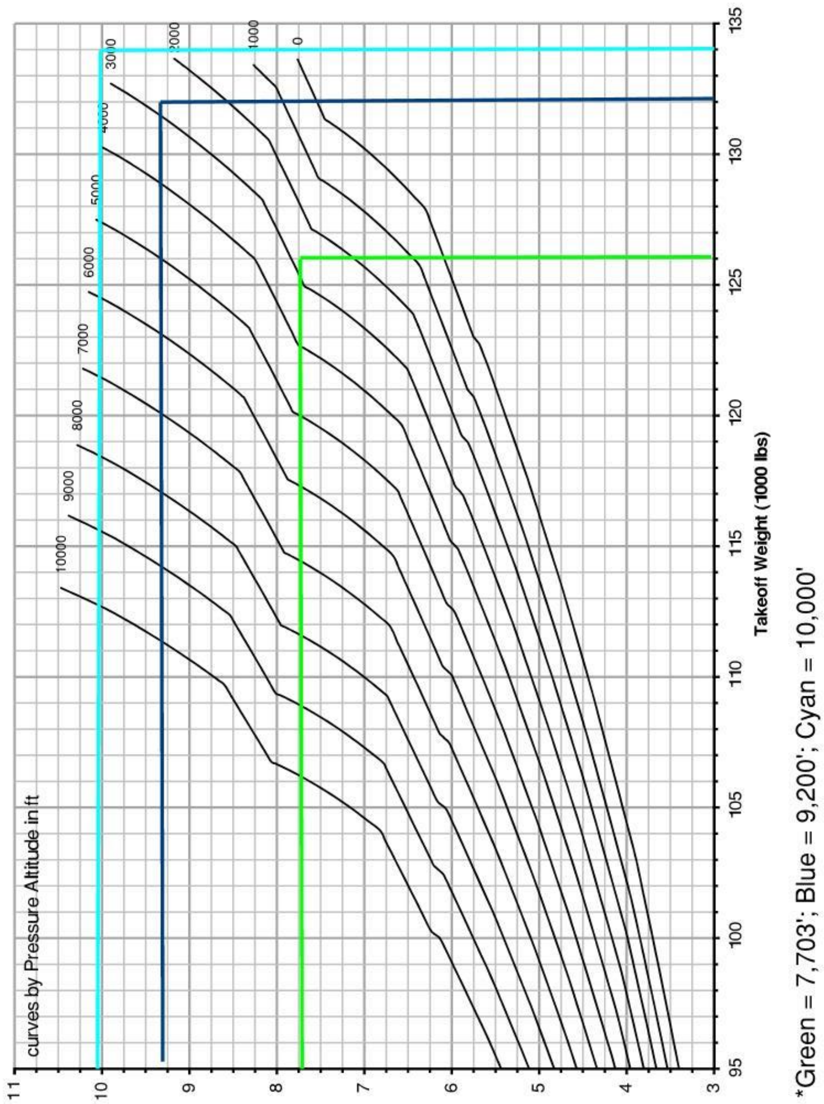


Figure A6-12: A320 Payload/Range

CSERIES

BD500-3AB48-22000-00



ICN-BD500-A-J000000-A-3AB48-01753-A-002-01

Figure 2 Takeoff field length - ISA - PW1519G

See applicability on the
first page of the DM
BD500-A-J00-00-00-13AAA-030A-A

BD500-A-J00-00-00-13AAA-030A-A

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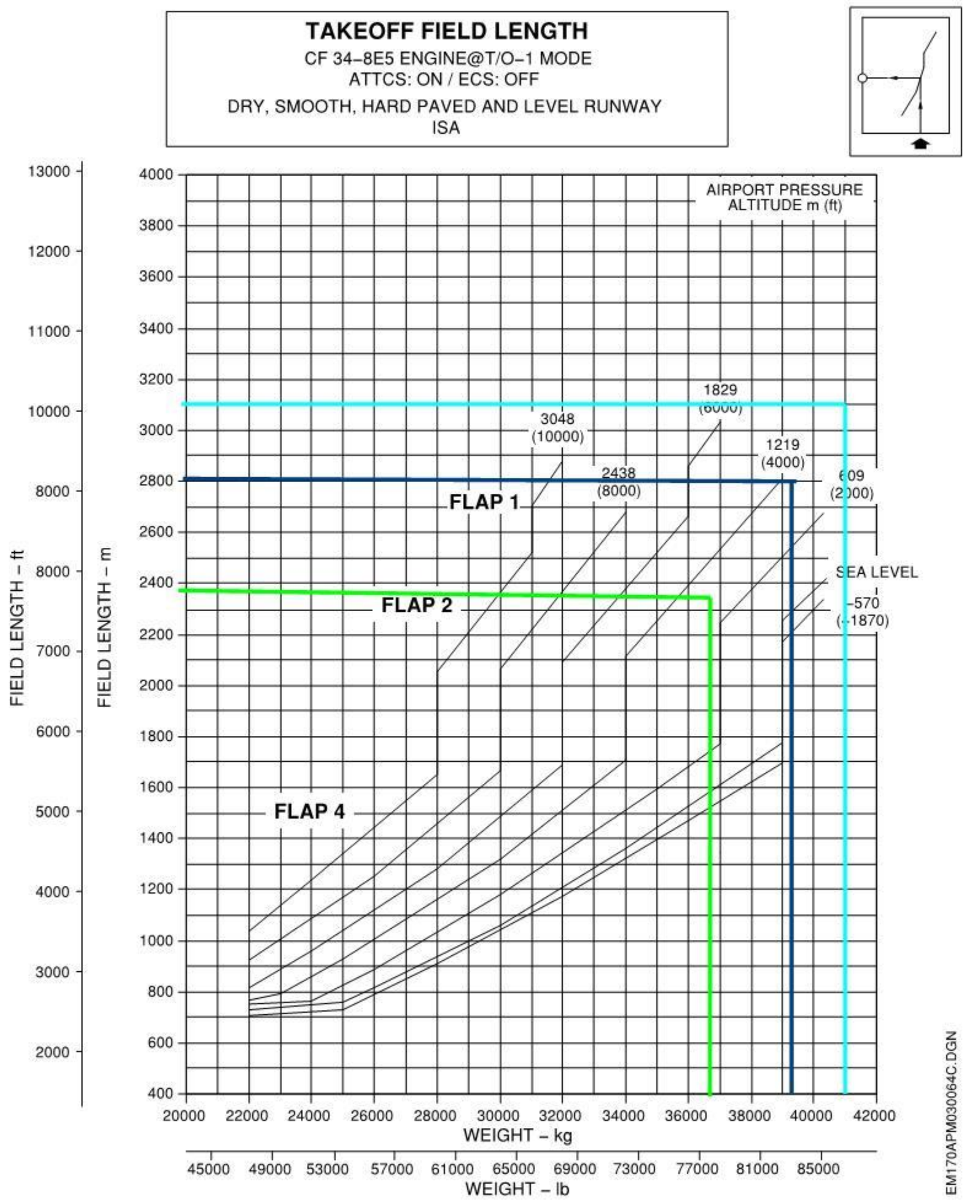
Figure A6-13: Embraer 175 Takeoff Length

EMBRAER 175 AIRPORT PLANNING MANUAL



Takeoff Field Lengths - ISA Conditions
Figure 3.5

*Green = 7,703'; Blue = 9,200'; Cyan = 10,000'

EFFECTIVITY: ALL

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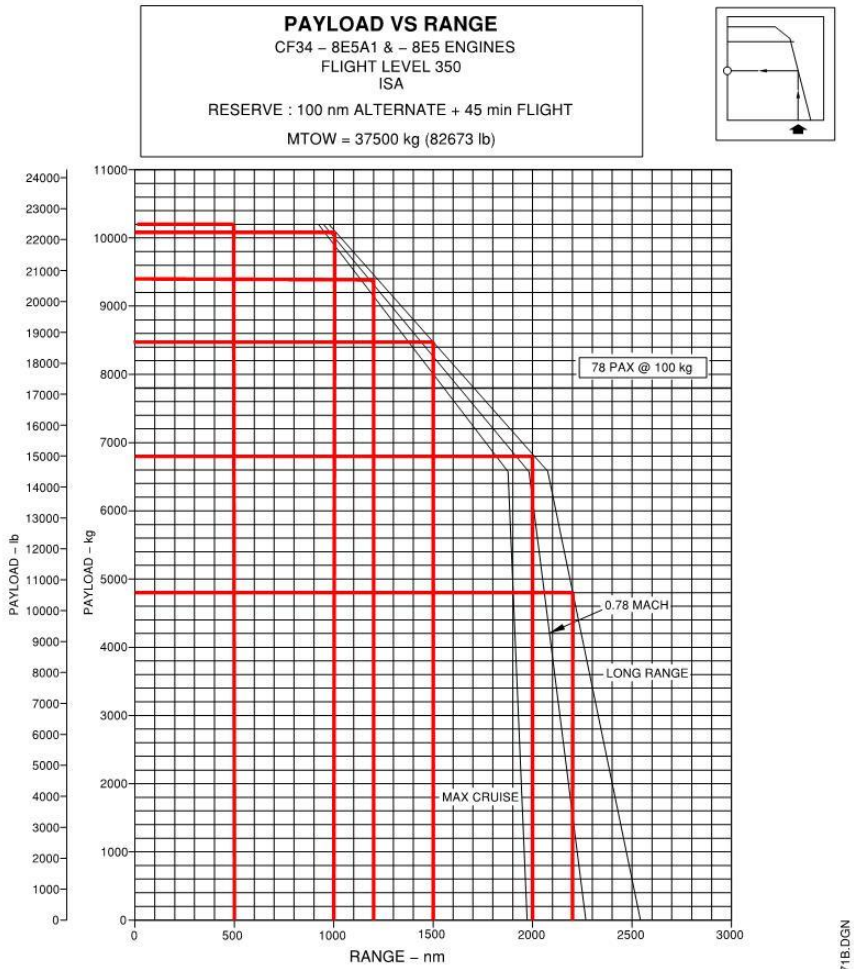
Figure A6-14: Embraer 175 Payload/Range

EMBRAER 175 AIRPORT PLANNING MANUAL



NOTES:
MAX TAKEOFF WEIGHT - - - - - - - - - - - - - - - 37500 kg (82673 lb)
MAX ZERO FUEL WEIGHT - - - - - - - - - - - - - - 31700 kg (69887 lb)
BASIC OPERATING WEIGHT - - - - - - - - - - - - - 21500 kg (47399 lb)
MAX USABLE FUEL - - - - - - - - - - - - - - - - - 9428 kg (20785 lb)

Payload x Range - ISA Conditions
Figure 3.1

EFFECTIVITY: EMBRAER 175 STD ACFT MODEL

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Figure A6-15: B737 MAX 8 Range at 85% Load Factor

Boeing 737 MAX 8 Average Temperature 91.3˚F at 85% Load Factor					
Runway Length		7,703	9,200	10,000	11,000
Maximum Range (NM)		2,200	3,000	3,100	3,200
Destination	Distance (NM)	Is the Destination Within Range?			
Seattle (SEA)	149	YES	YES	YES	YES
Salt Lake City (SLC)	453	YES	YES	YES	YES
San Francisco (SFO)	539	YES	YES	YES	YES
Las Vegas (LAS)	636	YES	YES	YES	YES
Los Angeles (LAX)	739	YES	YES	YES	YES
Denver (DEN)	741	YES	YES	YES	YES
Phoenix Mesa Gateway (AZA)	849	YES	YES	YES	YES
Minneapolis (MSP)	1,090	YES	YES	YES	YES
Portland (PDX)	151	YES	YES	YES	YES
San Jose (SJC)	548	YES	YES	YES	YES
San Diego (SAN)	816	YES	YES	YES	YES
Phoenix Sky Harbor (PHX)	836	YES	YES	YES	YES
Tucson (TUS)	929	YES	YES	YES	YES
Dallas (DWF)	1,293	YES	YES	YES	YES
Chicago (ORD)	1,364	YES	YES	YES	YES
Houston (IAH)	1,479	YES	YES	YES	YES
Atlanta (ATL)	1,752	YES	YES	YES	YES
Washington DC (IAD)	1,874	YES	YES	YES	YES
Honolulu (HNL)	2,410	NO	YES	YES	YES

Figure A6-16: B737 MAX 8 Range Map at 85% Load Factor

Map Key

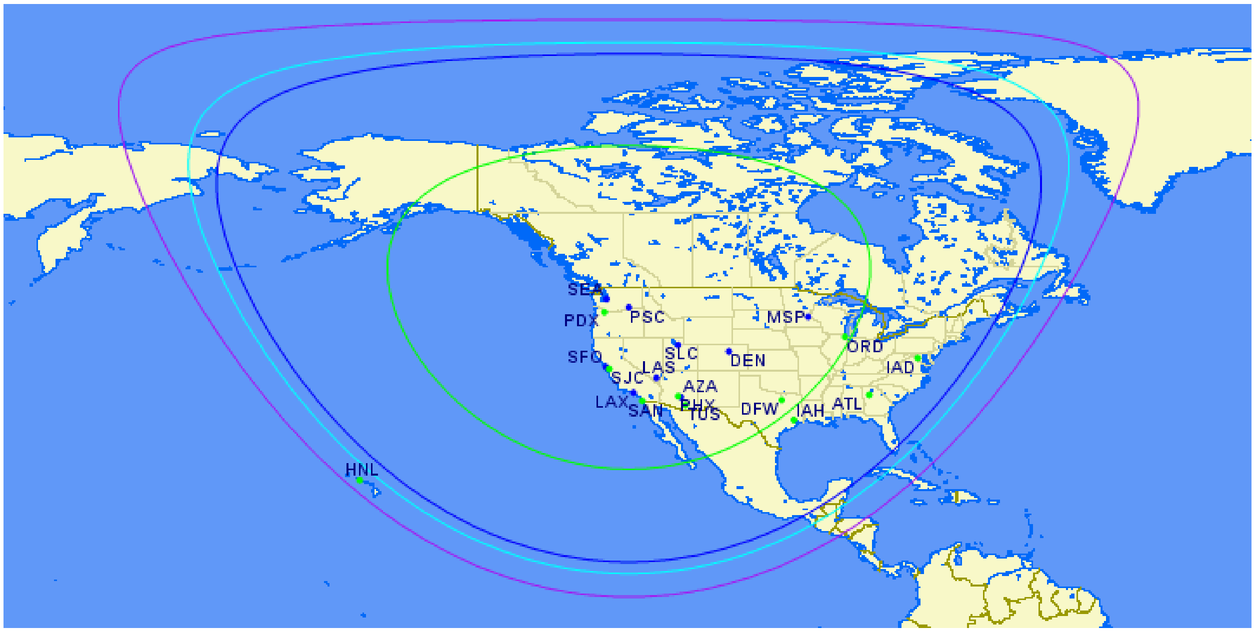
Ranges:	Airport Markers:
Green = 7,703'	Blue = Current Service
Blue = 9,200'	Green = Potential Service
Cyan = 10,000'	
Purple = 11,000'	

Source: Mead & Hunt, Boeing 737 MAX APM

Figure A6-17: B737 MAX 8 Range at 100% Load Factor

Boeing 737 MAX 8 Average Temperature 91.3˚F at 100% Load Factor					
Runway Length		7,703	9,200	10,000	11,000
Maximum Range (NM)		1,400	2,200	2,300	2,500
Destination	Distance (NM)	Is the Destination Within Range?			
Seattle (SEA)	149	YES	YES	YES	YES
Salt Lake City (SLC)	453	YES	YES	YES	YES
San Francisco (SFO)	539	YES	YES	YES	YES
Las Vegas (LAS)	636	YES	YES	YES	YES
Los Angeles (LAX)	739	YES	YES	YES	YES
Denver (DEN)	741	YES	YES	YES	YES
Phoenix Mesa Gateway (AZA)	849	YES	YES	YES	YES
Minneapolis (MSP)	1,090	YES	YES	YES	YES
Portland (PDX)	151	YES	YES	YES	YES
San Jose (SJC)	548	YES	YES	YES	YES
San Diego (SAN)	816	YES	YES	YES	YES
Phoenix Sky Harbor (PHX)	836	YES	YES	YES	YES
Tucson (TUS)	929	YES	YES	YES	YES
Dallas (DWF)	1,293	YES	YES	YES	YES
Chicago (ORD)	1,364	YES	YES	YES	YES
Houston (IAH)	1,479	NO	YES	YES	YES
Atlanta (ATL)	1,752	NO	YES	YES	YES
Washington DC (IAD)	1,874	NO	YES	YES	YES
Honolulu (HNL)	2,410	NO	NO	NO	YES

Figure A6-18: B737 MAX 8 Range Map at 100% Load Factor



Map Key

Ranges:
Green = 7,703'
Blue = 9,200’
Cyan = 10,000’
Purple = 11,000’

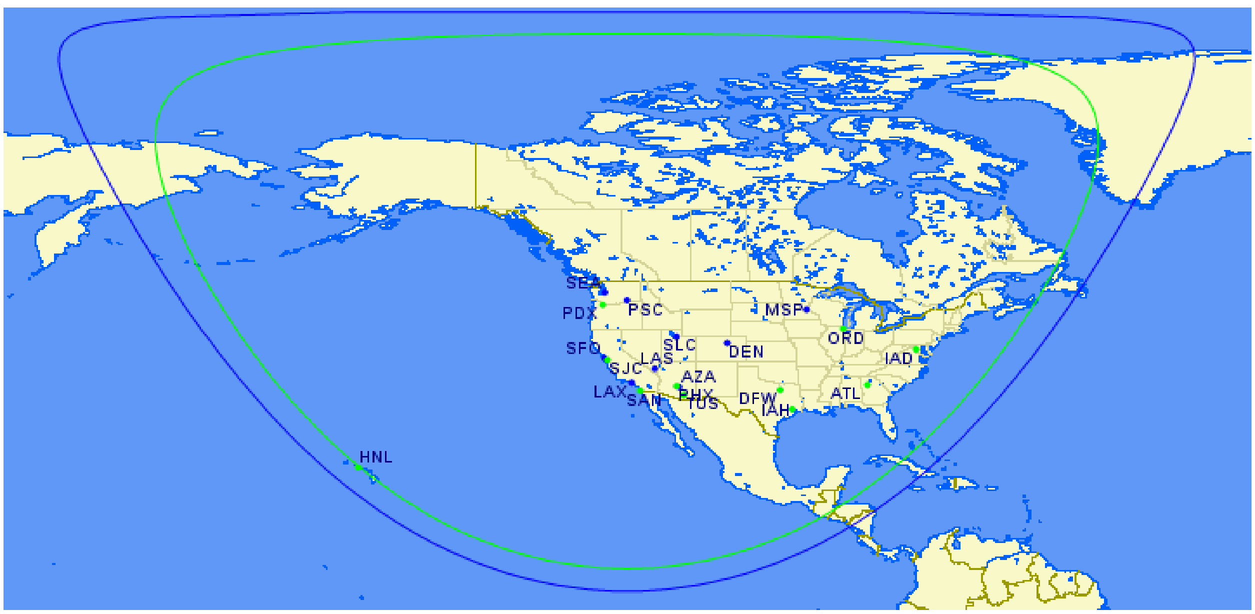
Airport Markers:
Blue = Current Service
Green = Potential Service

Source: Mead & Hunt, Boeing 737 MAX APM

Figure A6-19: A320 Range at 85% Load Factor

A320 Average Temperature 91.3˚F at 85% Load Factor					
Runway Length		7,703	9,200	10,000	11,000
Maximum Range (NM)		2,400	2,600	2,600	2,600
Destination	Distance (NM)	Is the Destination Within Range?			
Seattle (SEA)	149	YES	YES	YES	YES
Salt Lake City (SLC)	453	YES	YES	YES	YES
San Francisco (SFO)	539	YES	YES	YES	YES
Las Vegas (LAS)	636	YES	YES	YES	YES
Los Angeles (LAX)	739	YES	YES	YES	YES
Denver (DEN)	741	YES	YES	YES	YES
Phoenix Mesa Gateway (AZA)	849	YES	YES	YES	YES
Minneapolis (MSP)	1,090	YES	YES	YES	YES
Portland (PDX)	151	YES	YES	YES	YES
San Jose (SJC)	548	YES	YES	YES	YES
San Diego (SAN)	816	YES	YES	YES	YES
Phoenix Sky Harbor (PHX)	836	YES	YES	YES	YES
Tucson (TUS)	929	YES	YES	YES	YES
Dallas (DWF)	1,293	YES	YES	YES	YES
Chicago (ORD)	1,364	YES	YES	YES	YES
Houston (IAH)	1,479	YES	YES	YES	YES
Atlanta (ATL)	1,752	YES	YES	YES	YES
Washington DC (IAD)	1,874	YES	YES	YES	YES
Honolulu (HNL)	2,410	NO	YES	YES	YES

Figure A6-20: A320 Range Map at 85% Load Factor



Map Key

Ranges:	Airport Markers:
Green = 7,703'	Blue = Current Service
Blue = 9,200’	Green = Potential Service
Cyan = 10,000’	
Purple = 11,000’	

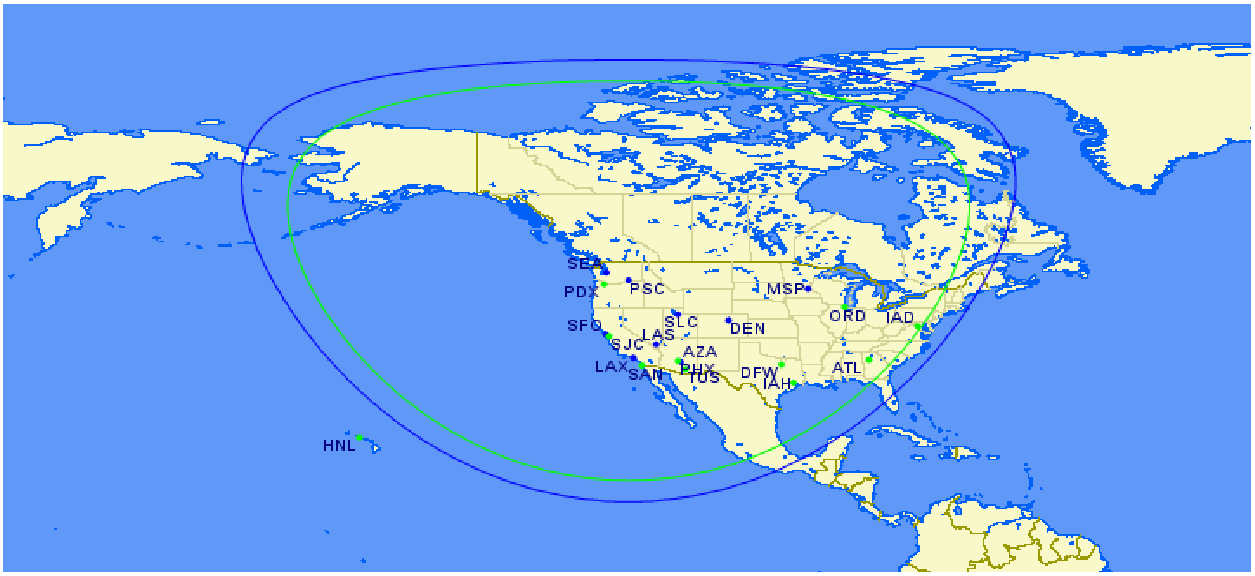
Note: 9,200’, 10,000’ and 11,000’ ranges are equal – only one range shown.

Source: Mead & Hunt, A320 APM

Figure A6-21: A320 Range at 100% Load Factor

A320 Average Temperature 91.3˚F at 100% Load Factor					
Runway Length		7,703	9,200	10,000	11,000
Maximum Range (NM)		1,900	2,100	2,100	2,100
Destination	Distance (NM)	Is the Destination Within Range?			
Seattle (SEA)	149	YES	YES	YES	YES
Salt Lake City (SLC)	453	YES	YES	YES	YES
San Francisco (SFO)	539	YES	YES	YES	YES
Las Vegas (LAS)	636	YES	YES	YES	YES
Los Angeles (LAX)	739	YES	YES	YES	YES
Denver (DEN)	741	YES	YES	YES	YES
Phoenix Mesa Gateway (AZA)	849	YES	YES	YES	YES
Minneapolis (MSP)	1,090	YES	YES	YES	YES
Portland (PDX)	151	YES	YES	YES	YES
San Jose (SJC)	548	YES	YES	YES	YES
San Diego (SAN)	816	YES	YES	YES	YES
Phoenix Sky Harbor (PHX)	836	YES	YES	YES	YES
Tucson (TUS)	929	YES	YES	YES	YES
Dallas (DWF)	1,293	YES	YES	YES	YES
Chicago (ORD)	1,364	YES	YES	YES	YES
Houston (IAH)	1,479	YES	YES	YES	YES
Atlanta (ATL)	1,752	YES	YES	YES	YES
Washington DC (IAD)	1,874	YES	YES	YES	YES
Honolulu (HNL)	2,410	NO	NO	NO	NO

Figure A6-22: A320 Range at 100% Load Factor



Map Key

Ranges:	Airport Markers:
Green = 7,703'	Blue = Current Service
Blue = 9,200'	Green = Potential Service
Cyan = 10,000'	
Purple = 11,000'	

Note: 9,200', 10,000' and 11,000' ranges are equal – only one range shown.

Source: Mead & Hunt, A320 APM

Figure A6-23: A220 Range at 85% Load Factor

A220 (CS100) Average Temperature 91.3˚F at 85% Load Factor					
Runway Length		7,703	9,200	10,000	11,000
Maximum Range (NM)		2,200	2,700	2,900	2,900
Destination	Distance (NM)	Is the Destination Within Range?			
Seattle (SEA)	149	YES	YES	YES	YES
Salt Lake City (SLC)	453	YES	YES	YES	YES
San Francisco (SFO)	539	YES	YES	YES	YES
Las Vegas (LAS)	636	YES	YES	YES	YES
Los Angeles (LAX)	739	YES	YES	YES	YES
Denver (DEN)	741	YES	YES	YES	YES
Phoenix Mesa Gateway (AZA)	849	YES	YES	YES	YES
Minneapolis (MSP)	1,090	YES	YES	YES	YES
Portland (PDX)	151	YES	YES	YES	YES
San Jose (SJC)	548	YES	YES	YES	YES
San Diego (SAN)	816	YES	YES	YES	YES
Phoenix Sky Harbor (PHX)	836	YES	YES	YES	YES
Tucson (TUS)	929	YES	YES	YES	YES
Dallas (DWF)	1,293	YES	YES	YES	YES
Chicago (ORD)	1,364	YES	YES	YES	YES
Houston (IAH)	1,479	YES	YES	YES	YES
Atlanta (ATL)	1,752	YES	YES	YES	YES
Washington DC (IAD)	1,874	YES	YES	YES	YES
Honolulu (HNL)	2,410	NO	YES	YES	YES

Figure A6-24: A220 Range Map at 85% Load Factor

Map Key

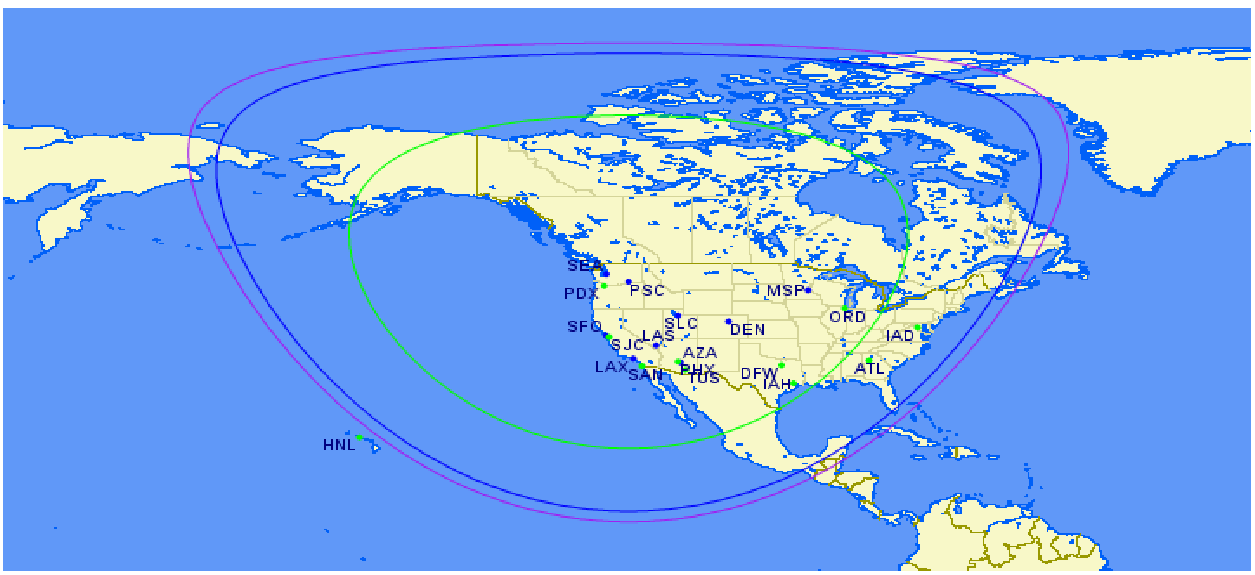
Ranges:	Airport Markers:
Green = 7,703'	Blue = Current Service
Blue = 9,200'	Green = Potential Service
Cyan = 10,000'	
Purple = 11,000'	

Source: Mead & Hunt, A220 APM

Figure A6-25: A220 Range at 100% Load Factor

A220 (CS100) Average Temperature 91.3˚F at 85% Load Factor					
Runway Length		7,703	9,200	10,000	11,000
Maximum Range (NM)		1,600	2,200	2,300	2,300
Destination	Distance (NM)	Is the Destination Within Range?			
Seattle (SEA)	149	YES	YES	YES	YES
Salt Lake City (SLC)	453	YES	YES	YES	YES
San Francisco (SFO)	539	YES	YES	YES	YES
Las Vegas (LAS)	636	YES	YES	YES	YES
Los Angeles (LAX)	739	YES	YES	YES	YES
Denver (DEN)	741	YES	YES	YES	YES
Phoenix Mesa Gateway (AZA)	849	YES	YES	YES	YES
Minneapolis (MSP)	1,090	YES	YES	YES	YES
Portland (PDX)	151	YES	YES	YES	YES
San Jose (SJC)	548	YES	YES	YES	YES
San Diego (SAN)	816	YES	YES	YES	YES
Phoenix Sky Harbor (PHX)	836	YES	YES	YES	YES
Tucson (TUS)	929	YES	YES	YES	YES
Dallas (DWF)	1,293	YES	YES	YES	YES
Chicago (ORD)	1,364	YES	YES	YES	YES
Houston (IAH)	1,479	YES	YES	YES	YES
Atlanta (ATL)	1,752	NO	YES	YES	YES
Washington DC (IAD)	1,874	NO	YES	YES	YES
Honolulu (HNL)	2,410	NO	NO	NO	NO

Figure A6-26: A220 Range Map at 100% Load Factor



Map Key

Ranges:	Airport Markers:
Green = 7,703'	Blue = Current Service
Blue = 9,200’	Green = Potential Service
Cyan = 10,000’	
Purple = 11,000’	

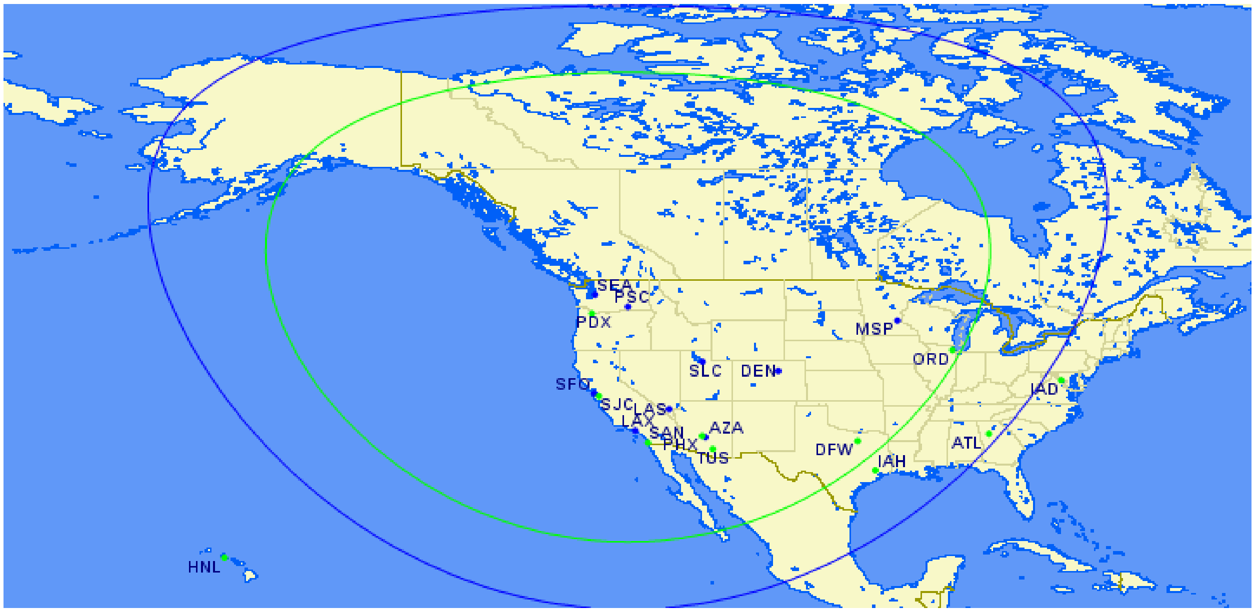
Note: 10,000’ and 11,000’ ranges are equal – only one range shown.

Source: Mead & Hunt, Boeing A220 APM

Figure A6-27: E175 Range at 85% Load Factor

E175 Average Temperature 91.3˚F at 85% Load Factor					
Runway Length		7,703	9,200	10,000	11,000
Maximum Range (NM)		1,400	1,800	1,800	1,800
Destination	Distance (NM)	Is the Destination Within Range?			
Seattle (SEA)	149	YES	YES	YES	YES
Salt Lake City (SLC)	453	YES	YES	YES	YES
San Francisco (SFO)	539	YES	YES	YES	YES
Las Vegas (LAS)	636	YES	YES	YES	YES
Los Angeles (LAX)	739	YES	YES	YES	YES
Denver (DEN)	741	YES	YES	YES	YES
Phoenix Mesa Gateway (AZA)	849	YES	YES	YES	YES
Minneapolis (MSP)	1,090	YES	YES	YES	YES
Portland (PDX)	151	YES	YES	YES	YES
San Jose (SJC)	548	YES	YES	YES	YES
San Diego (SAN)	816	YES	YES	YES	YES
Phoenix Sky Harbor (PHX)	836	YES	YES	YES	YES
Tucson (TUS)	929	YES	YES	YES	YES
Dallas (DFW)	1,293	YES	YES	YES	YES
Chicago (ORD)	1,364	YES	YES	YES	YES
Houston (IAH)	1,479	NO	YES	YES	YES
Atlanta (ATL)	1,752	NO	YES	YES	YES
Washington DC (IAD)	1,874	NO	NO	NO	NO
Honolulu (HNL)	2,410	NO	NO	NO	NO

Figure A6-28: E175 Range Map at 85% Load Factor



Map Key

Ranges:
Green = 7,703'
Blue = 9,200'
Cyan = 10,000'
Purple = 11,000'

Airport Markers:
Blue = Current Service
Green = Potential Service

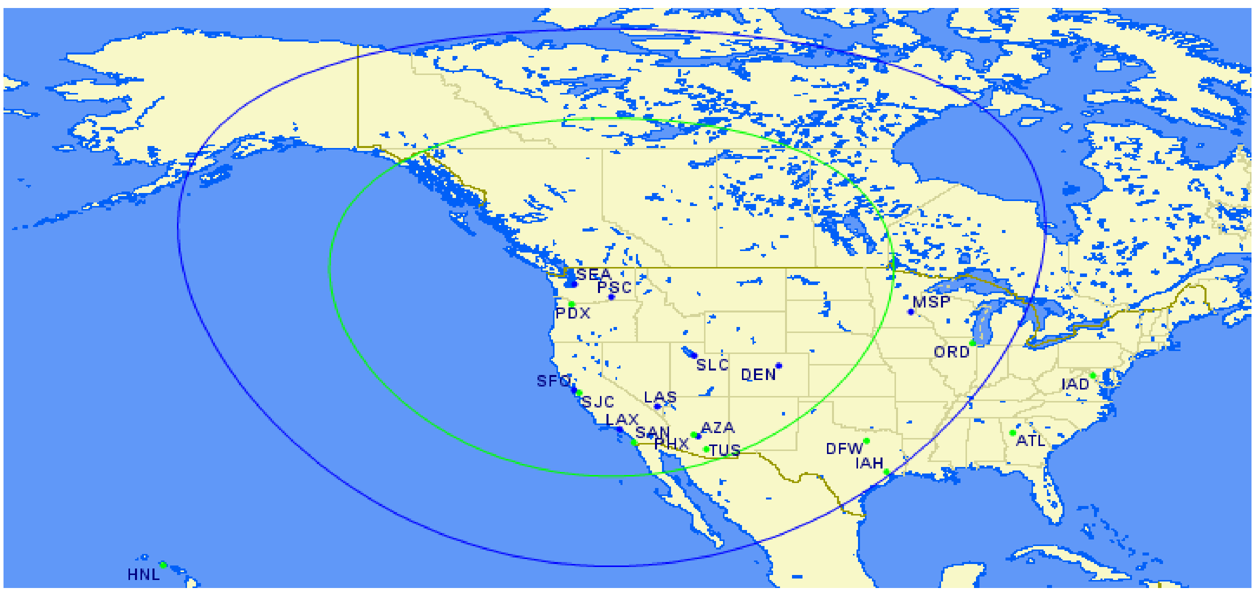
Note: 9,200', 10,000' and 11,000' ranges are equal – only one range shown.

Source: Mead & Hunt, E175 APM

Figure A6-29: E175 Range at 100% Load Factor

E175 Average Temperature 91.3˚F at 100% Load Factor					
Runway Length		7,703	9,200	10,000	11,000
Maximum Range (NM)		1,000	1,500	1,500	1,500
Destination	Distance (NM)	Is the Destination Within Range?			
Seattle (SEA)	149	YES	YES	YES	YES
Salt Lake City (SLC)	453	YES	YES	YES	YES
San Francisco (SFO)	539	YES	YES	YES	YES
Las Vegas (LAS)	636	YES	YES	YES	YES
Los Angeles (LAX)	739	YES	YES	YES	YES
Denver (DEN)	741	YES	YES	YES	YES
Phoenix Mesa Gateway (AZA)	849	YES	YES	YES	YES
Minneapolis (MSP)	1,090	NO	YES	YES	YES
Portland (PDX)	151	YES	YES	YES	YES
San Jose (SJC)	548	YES	YES	YES	YES
San Diego (SAN)	816	YES	YES	YES	YES
Phoenix Sky Harbor (PHX)	836	YES	YES	YES	YES
Tucson (TUS)	929	YES	YES	YES	YES
Dallas (DFW)	1,293	NO	YES	YES	YES
Chicago (ORD)	1,364	NO	YES	YES	YES
Houston (IAH)	1,479	NO	YES	YES	YES
Atlanta (ATL)	1,752	NO	NO	NO	NO
Washington DC (IAD)	1,874	NO	NO	NO	NO
Honolulu (HNL)	2,410	NO	NO	NO	NO

Figure A6-30: E175 Range Map at 100% Load Factor



Map Key

Ranges:	Airport Markers:
Green = 7,703'	Blue = Current Service
Blue = 9,200’	Green = Potential Service
Cyan = 10,000’	

Note: 9,200’, 10,000’ and 11,000’ ranges are equal – only one range shown.

Source: Mead & Hunt, E175 APM

ATTACHMENT 7 – AIR TRAFFIC CONTROL TOWER SITING

Details outlining the requirements for air traffic control tower siting found in FAA Order 6480.4B, *Airport Traffic Control Tower Siting Process*, and AC 150/5300-13A, *Airport Design*, are listed here:

- Be of sufficient height to provide unobstructed views of all controlled movement areas of an airport, including all runways, taxiways and ramp areas.
- Provide unobstructed views of airborne traffic patterns and runway approaches.
- Be oriented so that the primary operational view faces north or alternatively east, west, or south in that order of preference.
- Enhance visibility and perception of the controller's line-of-sight by being perpendicular or oblique, not parallel to the airport's runway/taxiway system.
- Prevent the impairment of visibility by direct or indirect external light sources such as ramp lights, parking area lights, rising or setting sun, and reflective surfaces.
- Prevent degrading or affecting the performance of existing or planned communications, navigation, and surveillance equipment.
- Avoid adverse impacts to any current or planned terminal instrument procedures.
- Comply with FAR Part 77, *Objects Affecting Navigable Airspace* and must undergo a Non-Rulemaking Action.
- Comply with airport surfaces such as Runway Obstacle Free Zones, Precision Obstacle Free Zones, Approach Obstacle Free Zones, Runway Object Free Areas, RPZs, RSAs, and building restriction lines.
- Comply with security requirements in FAA Order 1600.69, *Facility Security Management Program*.
- Consider connectivity of all FAA cabling and utilities.

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CHAPTER 4

MPROVEMENT ALTERNATIVES

CHAPTER 4 - IMPROVEMENT ALTERNATIVES

CHAPTER OVERVIEW

This chapter documents improvement alternatives and the recommended development plan to satisfy the facility requirements described in **Chapter 3** for the Tri-Cities Airport (PSC). A description of the various factors, influences, concepts, and issues that will form the basis for the ultimate plan and program is provided in the following sections:

- Assumptions and Goals
- Alternatives Approach
- Airside Alternatives
- Passenger Terminal Alternatives
- Landside Facilities Alternatives
- Other Support Facilities Alternatives
- Auto Parking and Circulation Alternatives
- Alternatives Summary

ASSUMPTIONS AND GOALS

The evaluation of the PSC future development plan and alternatives begins with establishing several basic assumptions and goals to direct and guide the evaluation process, establish continuity, and subscribe to the intent, direction, purpose, and strategic vision of and for PSC. Stakeholders, airport management, and the Federal Aviation Administration (FAA) contributed the input used to formulate the assumptions and goals described below.

Development Assumptions

The assumptions are based on the inventory findings, aviation activity forecasts, and demand considerations. The assumptions reflect a commitment for continued airport development that supports economic development objectives in the region.

Assumption One

PSC will continue to be developed and operated in a manner that is consistent with local ordinances and codes, federal and state statutes, federal grant assurances, and FAA regulations.

Assumption Two

Runways 3L/21R and 12/30 will be maintained to RDC D-III-2400 design standards.
Runway 3R/21L will be maintained to B-II-VIS design standards.

Assumption Three

Runway extension alternatives will be evaluated to determine the feasibility of providing ultimate runway lengths of 9,200 and 10,000 feet. The longest runway length required by the most demanding aircraft (737 MAX 8) at MTOW is 11,000 feet. However, the 11,000-foot length was evaluated in Chapter 3 *Facility Requirements Attachment 6* and found to have little to no benefit for increasing aircraft range or load factors and did not result in serving any additional destinations.

Assumption Four

Runways 12, 30, and 3L will be evaluated for future precision Instrument Approach Procedure (IAP) improvements with visibility minimums not less than ½-mile visibility minimums.

Assumption Five

The potential development of aviation landside facilities will be maximized through a combination of infill development and expansion, which includes the re-design of airport property for aviation-related and non-aviation related development areas that cannot be provided access to the airfield system.

Assumption Six

To the maximum extent possible, PSC will be designed to enhance the compatibility of airport operations with the surrounding environs.

Development Goals

The following goals have several short - and long-term categorical considerations. These considerations relate to future facility needs including safety, capital improvement, land use compatibility, financial and economic conditions, noise, public interest and investment, and community recognition and awareness.

- Plan to accommodate the forecast aircraft fleet safely, with facilities sized to accommodate the projected demand.
- Plan for future development that will continue to accommodate schedule and charter passenger air carriers, cargo, general aviation and military users.
- Promote financial sustainability and feasibility.
- Develop land acquisition and disposal priorities related to airport safety, future development, land use compatibility, aeronautical need, and contractual obligations.

- Encourage the protection of existing public and private investment in land and facilities.
- Promote compatibility with surrounding land uses and zoning ordinances.
- Plan and develop PSC in a manner that is sensitive to the surrounding environment.
- Tie airport ground transportation development to the goals of the communities in Benton and Franklin counties.

ALTERNATIVES APPROACH

Alternatives are systematically evaluated so that a preferred alternative can be selected. The preferred alternatives will make up the 20-year development plan for PSC. The process used to develop, evaluate, refine, and select the preferred alternative and key considerations are described in the following sections.

Alternatives Methodology

The alternatives will be developed and evaluated for meeting demand and facility requirement needs in accordance with FAA design standards. The alternatives evaluated based on operational performance, construction feasibility, environmental considerations, and financial feasibility. The preferred alternative will reflect the results of the alternative evaluation, airport development goals, and best planning practices.

The process of defining and evaluating alternatives is iterative, beginning with a comprehensive range of possibilities. The possible alternatives are then refined based on evaluation criteria and PSC development goals. The different functional areas of PSC may have unique screening criteria during evaluation that reflect the appropriate purpose and considerations of each area.

The analysis of the alternatives followed these steps:

- Assessment Criteria and Level of Service (LOS) Factors
  - Operational capabilities and performance requirement benchmarks
  - Environmental considerations
  - Constructability, affordability, phasing, and implementation factors
- Quantitative and Qualitative Evaluation/Ranking – Elimination of Alternatives
- Alternative Refinement
- Selection of Preferred Alternative, which will go on the Airport Layout Plan (ALP).

AIRSIDE ALTERNATIVES

Runway layout influences the development of the other airport facilities. Runway layout determines where taxiways need to go, and runway and taxiway design determines where buildings and aircraft parking areas can be located.

Changing of runway end locations may affect instrument procedures and noise patterns. An objective of the alternatives process is to assess the potential for providing instrument procedures with lower visibility and ceiling minimums. The reduction in minimums can help improve airport utilization and air carrier reliability during inclement weather events.

Alternatives Shared Factors

Several attributes are common for each of the airside alternatives including runway modifications, taxiway modifications, instrument approach surfaces assessment, and adjustments to Part 77 airspace that result from new runway end locations. The common elements include evaluation of upgrading the four ends of the primary and secondary runways to plan for and protect precision approach capability. Not all runway end alternatives will result in a precision approach capability, but each runway end will be evaluated for that potential. Similarly, each alternative will evaluate the feasibility for approach lighting upgrades with a Medium Intensity Approach Light System with Runway Alignment Lights (MALSR).

FAA Runway Design Standards Common Elements

- Runway 30 end shifts 350 feet northwest to meet FAA design standards and accommodate an airport service road.
- New Taxiway D and E connectors serve relocated Runway 30 end.
- Runway 30 Approach Light System (ALS) White Flashing Omni-Directional Approach Lights (ODALs) are replaced with MALSR.
- The Runway 30 Precision Approach Path Indicator (PAPI) must be relocated to match the 350-foot shift in the runway end location.
- Blast pads will be enlarged or installed to meet FAA design standards.
- Runway markings will match instrument approach capabilities to that runway.
- Runway 12/30 remains 150 feet wide.
- Runway 3L/21R and 3R/21L length and width are not changed.
- Runway 12 Visual Approach Slope Indicator (VASI) is recommended to be replaced with PAPI when the relocation occurs.

- Each runway end alternative includes an obstruction evaluation of the Threshold Siting Surface (TSS).
- Each runway end alternative with vertically guided instrument procedure will include an evaluation of the Glideslope Qualifications Surfaces (GQS).

Analysis of the proposed airside alternatives helps to determine the relative levels of potential impact each may have on the environmental conditions presented in **Chapter 1 Inventory**. By identifying the anticipated range of impacts, alternatives can be considered in terms of anticipated environmental impact and potential mitigation measures. The following common elements are associated with the potential environmental impacts.

Environmental Analysis Common Elements

- Temporary impacts associated with noise produced by construction (noise impacts produced by aircraft are addressed in **Chapter 5 Land Use Compatibility**
- Air quality
- Traffic impacts on local roads
- Use and storage of fuel to operate construction vehicles and equipment
- Debris and solid waste produced from construction that will be disposed of in accordance with Washington State Waste Plan determined by the Department of Ecology
- Energy consumption
- The presence of environmentally sensitive areas (wetlands, endangered and threatened species habitat)
- The presence of floodplains

Runway Extension

Four alternatives evaluate the future disposition of Runway 12/30. As presented above, an ultimate runway length of 11,000 feet was evaluated in Chapter 3 *Facility Requirements Attachment 6* but rejected due to the lack of substantive improvement in aircraft range, load factors, or destinations. Each alternative will require runway re-marking and runway light relocation. These alternatives include the following modifications to Runway End 12.

- Alternative One – No extension. Future runway length is 7,353 feet.
- Alternative Two – 350-foot extension. Future runway length is 7,703 feet.

- Alternative Three –1,847-foot extension. Future runway length is 9,200 feet.
- Alternative Four –2,647-foot extension. Future runway length of 10,000 feet.

Runway Alternative One – Runway 12 Existing Location

- This alternative will not extend Runway End 12 to match the 350-foot relocation of Runway End 30, resulting in a shorter runway length of 7,353 feet.
- Existing Runway End 12 was assessed for the 34:1 TSS and GQS slopes associated with a precision approach having visibility minimums not less than ½-statute mile. The assessment did not identify any penetrating terrain or obstacles.
- The last light station of the MALSR will be beyond the access road and perimeter fence but it remains on airport property. Property acquisition is not expected.

Figure 4-1 shows the area of the Runway Protection Zone (RPZ), MALSR, 34:1 TSS, and GQS. The Runway End 12 RPZ is sized for visibility minimums of not less than ½-statute mile.

Alternative One Environmental Review

No areas off airport property will be disturbed based on the location and nature of the relocated Runway End 30. Areas on airport property that have pavement demolition and construction have been previously disturbed.

Alternative One Advantages

- A precision IAP with visibility minimums not less than ½-statute mile to Runway End 12 may be feasible. Further validation by FAA Western Flight Procedures is necessary.
- Existing instrument procedures into Runway End 12 do not have to be re-evaluated.
- Compared to Alternatives Two, Three, and Four, Alternative One requires less construction because only Runway End 30 is relocated.

Alternative One Disadvantages

- Alternative One does not meet the runway length facility requirement of 9,200 feet.
- Alternative One shortens Runway 12/30 to 7,353 feet. This reduces takeoff and landing distance available and will affect the possible range of aircraft operating at PSC unless payload limitations are put in place.

While Alternative One is less complicated than others considered due to fewer runway ends being impacted, it does not meet the long-term needs of the Airport and may adversely impact existing aircraft operations during warmer periods. **Alternative One is not recommended.**

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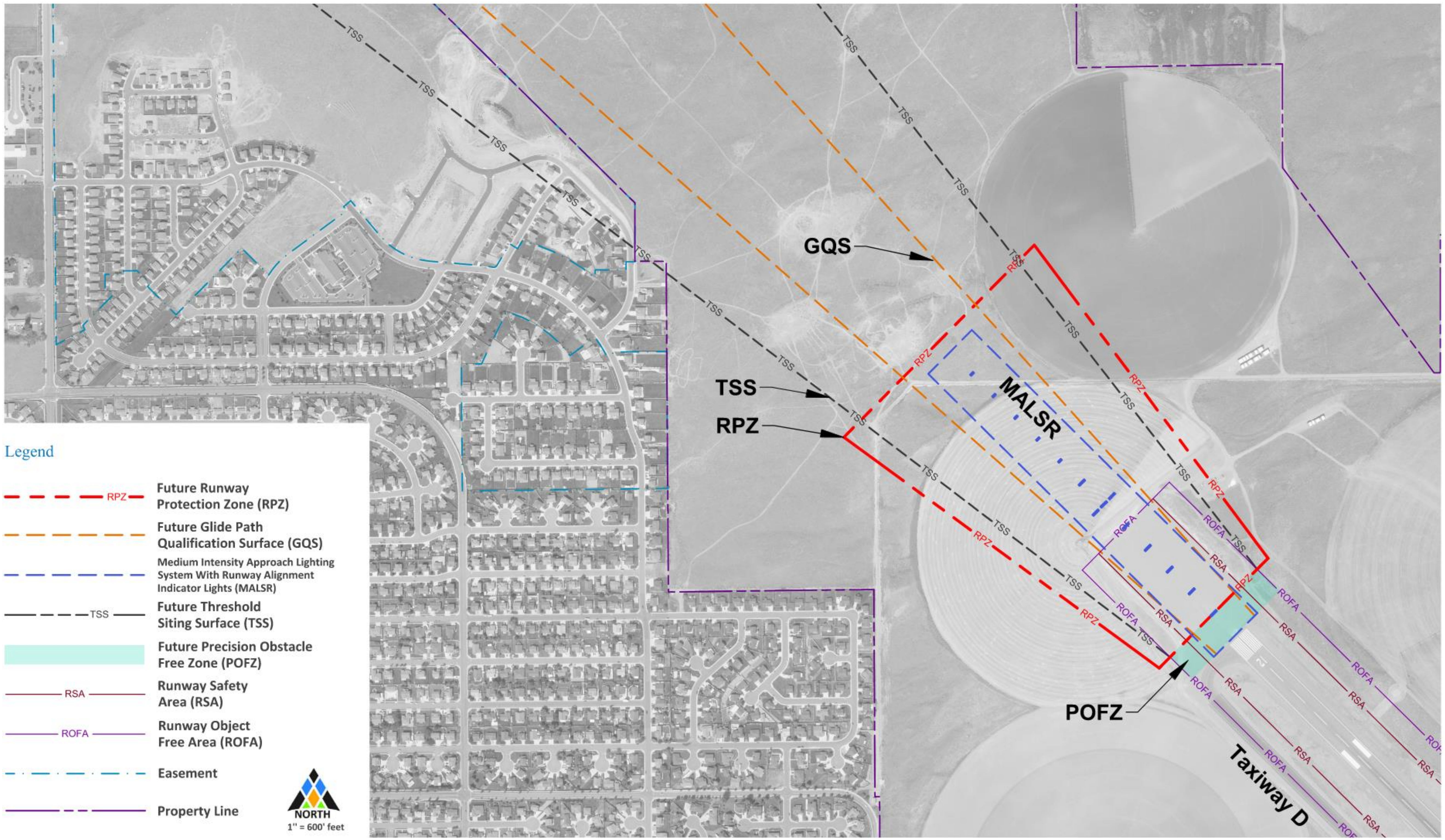
Figure 4-1: Alternative One – Runway End 12 Existing Location with Precision Approach



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Runway Alternative Two – Runway End 12 Extension of 350 Feet

- Runway End 12 will be extended by 350 feet to match the 350-foot relocation of Runway End 30, resulting in maintenance of the existing runway length of 7,703 feet.
- The RSA and ROFA will remain on airport property and will be graded and cleared to meet FAA design standards during construction.
- The RPZ will extend beyond the existing perimeter fence and access road but remain on airport property.
- The last three light stations of the MALSR will be beyond the access road and perimeter fence, but they will remain on airport property. Property acquisition is not expected.
- Future Runway End 12 was assessed for the 34:1 TSS and GQS slopes associated with a precision approach having visibility minimums not less than ½-statute mile. The assessment estimated 850 cubic yards of terrain penetrate the TSS. This terrain will have to be removed.
- Taxiway D will be extended by 350 feet to meet relocated Runway End 12. Taxiway D6 will be retained to provide an additional exit location for aircraft landing on Runway 30.

Figure 4-2 shows the area of the RPZ, MALSR, 34:1 TSS, and GQS. The Runway End 12 RPZ is sized for visibility minimums of not less than ½-statute mile.

Alternative Two Environmental Review

The pavement extension will not disturb off-airport property and will occur within the graded RSA. RSA and TSA grading may affect a riverine wetland north of current Runway End 12. The extension will require the removal of 850 cubic yards of terrain to clear the TSS. No farmland of statewide importance will be affected by the terrain removal. It is expected that an environmental analysis will be conducted prior to implementation.

Alternative Two Advantages

- Extending Runway End 12 by 350 feet retains the existing runway length.
- With terrain removal, a precision IAP is feasible.

Alternative Two Disadvantages

- Future RSA and TSA grading will disturb property outside of the existing RSA and TSA. .
- Alternative Two does not meet the runway length facility requirement of 9,200 feet.
- Approximately 850 cubic yards of terrain may need to be removed.

Alternative Two maintains existing conditions while addressing Runway End 30 declared distances. It does not meet the facility requirements. **Alternative Two is not recommended.**

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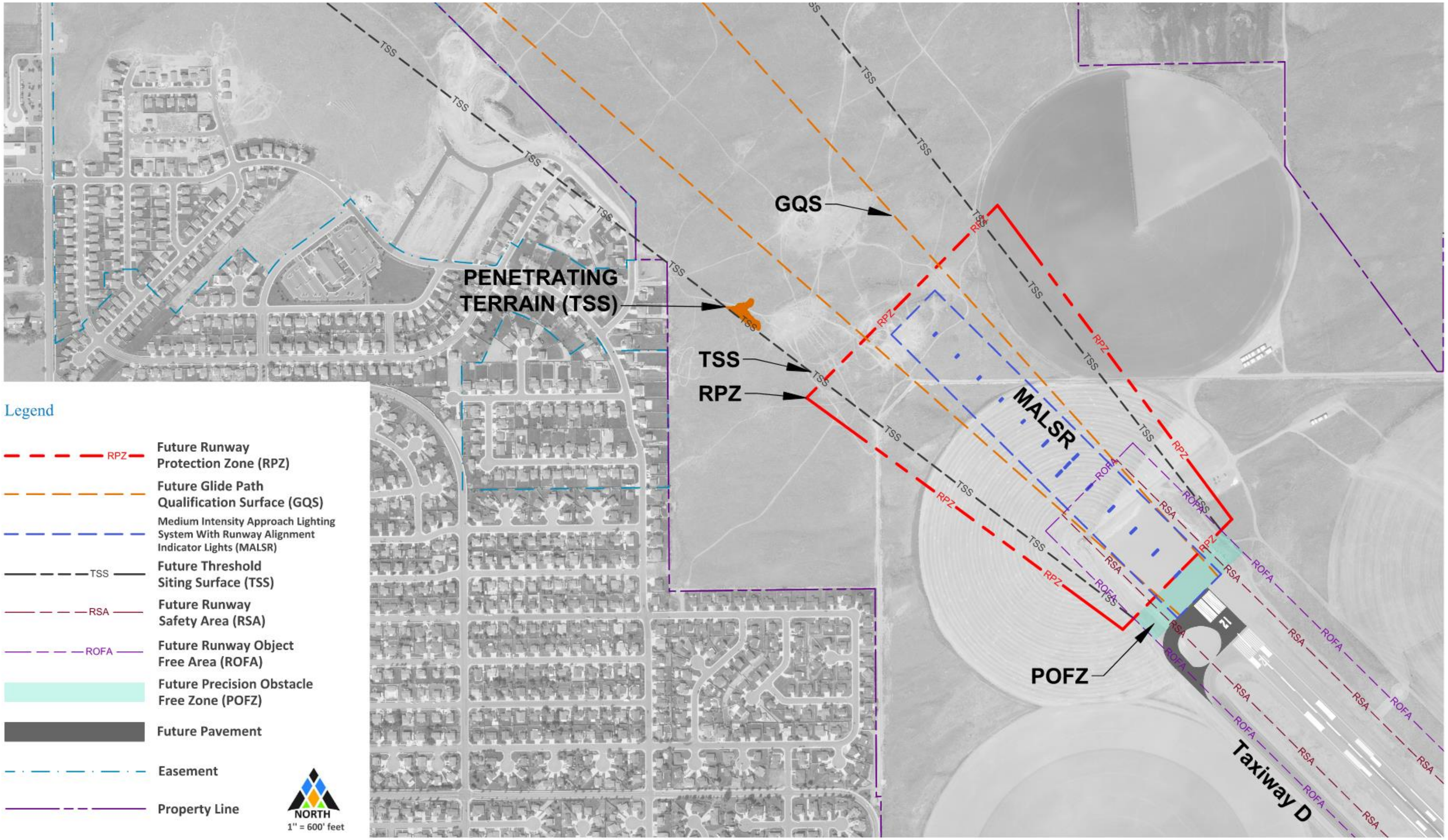
Figure 4-2: Alternative Two – Runway 12 End Extension 350 Feet



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Runway Alternative Three - Runway End 12 Extension of 1,847 Feet

- Runway End 12 will be extended to the northwest by 1,847 feet, resulting in a total length of 9,200 feet.
- The RSA, ROFA, and RPZ will remain on existing airport property. The RPZ falls on property recently acquired by the Airport which may be considered part of this project.
- The last ten light stations of the MALSR will be beyond the access road and perimeter fence but remain on airport property. Property acquisition is not expected.
- Taxiway D will be extended by 1,847 feet to match the runway extension.
- Alternative Three(a), presented in **Figure 4-3** assesses visibility minimums of not less than ½-statute mile. The terrain to the northwest penetrates both the TSS and the GQS. Approximately 940,000 cubic yards of terrain will need to be removed. Up to half an acre of property acquisition may be required.
- Alternative Three(b), presented in **Figure 4-4** assesses visibility minimums of not less than ¾-statute mile. Approximately 30 cubic yards of terrain penetrate the TSS. Property acquisition is not expected.

Alternative Three(a) Environmental Review

The runway and taxiway extension and terrain removal will affect land that PSC leases for agricultural use. Approximately 940,000 cubic yards of material may need to be removed to implement the precision IAP. Terrain removal may impact 54.1 acres of farmland of statewide importance, 31.2 acres of prime farmland, and the 100-500-year floodplain. The property would not be farmland or irrigated if PSC did not lease the land. Agriculture is a temporary use until the property is need for something else.

Alternative Three(b) Environmental Review

Terrain removal may impact to 13.9 acres of farmland of statewide importance, 29.7 acres of prime farmland, and the 100-500-year floodplain.

Alternative Three(a/b) Advantages

- Alternative Three(a/b) meets the facility requirements.
- The longer runway will support existing air service and demanding GA users, and facilitate attraction of new users.
- With terrain removal, a precision IAP is feasible with Alternative 3(a).
- Alternative Three(b) provides the required runway length with less terrain removal.

Alternative 3(a/b) Disadvantages

- Terrain removal may require property acquisition with Alternative Three(a).
- Alternative Three(b) does not provide meet the intended instrument minimums.
- Further environmental study is necessary to quantify impacts and determine mitigation strategies.
- Alternative Three (a/b) require the removal or relocation of the airport maintenance road, power lines, and the airport perimeter fence.

Alternative Three meets the required runway length, providing PSC with additional opportunity to meet the needs of its local community and the traveling public. While the amount of terrain removal required will increase the project cost and environmental footprint, it is possible to implement the project in phases. The runway extension with a non-precision approach would meet the needs of departing aircraft, and aircraft needing a precision approach could use the ILS into Runway End 21R and the required navigation performance (RNP) and localizer performance with vertical guidance (LPV) procedures into Runway End 30. **Alternative Three is recommended**.

Figure 4-3: Alternative Three(a) Runway 12 Extension 1,847 Feet with Precision Approach

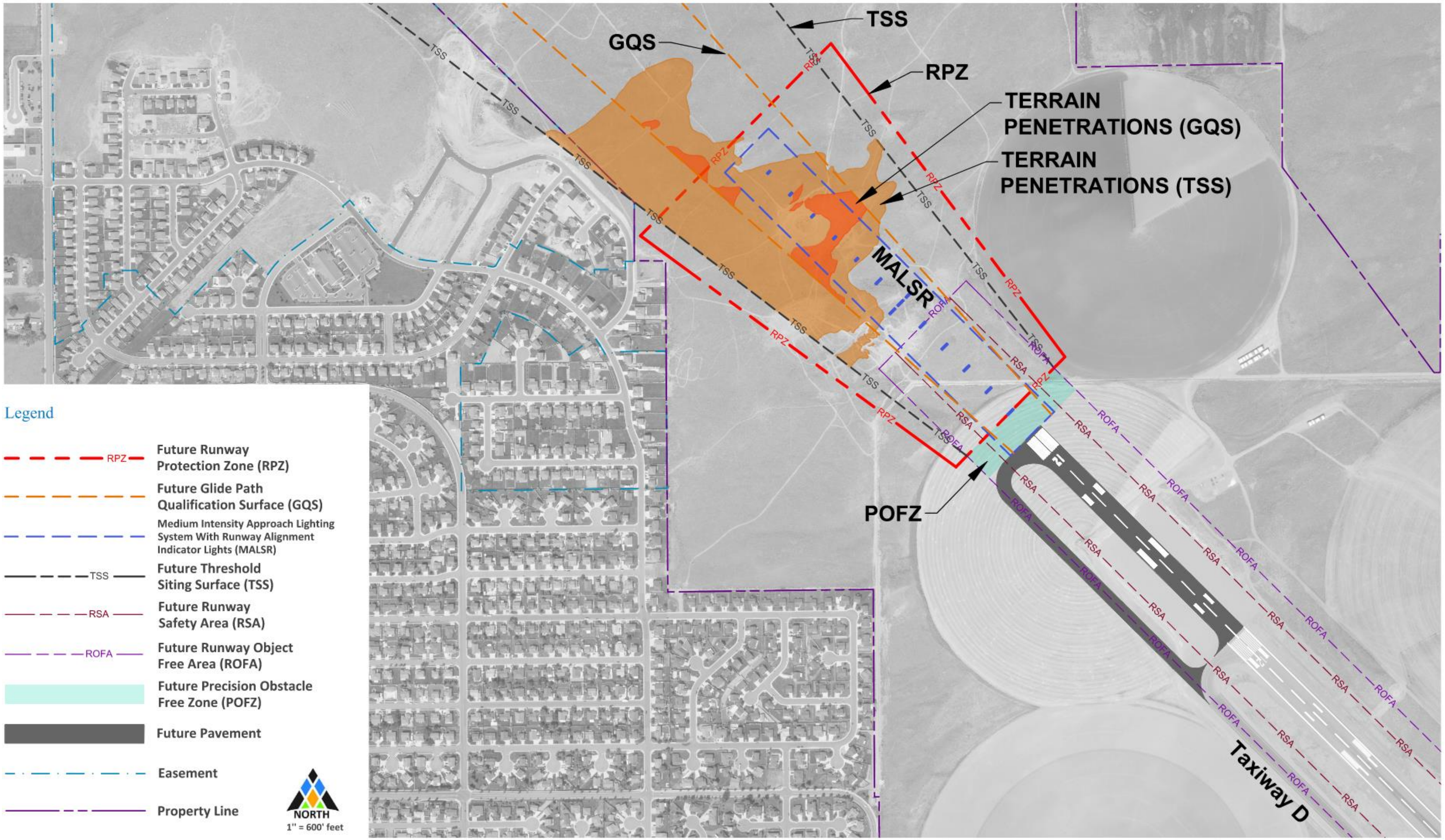


Figure 4-4: Alternative Three(b) Runway 12 Extension 1,847 Feet with Non-Precision Approach

Runway Alternative Four - Runway 12 Extension 2,647 Feet

- Runway End 12 will be extended by 2,647 feet, resulting in a total length of 10,000 feet.
- Taxiway D will be extended by 2,647 feet to match the runway extension.
- The RSA and ROFA will remain on airport property, as will the Alternative Four(b) RPZ.
- The Alternative Four(a) RPZ extends 1.1 acres beyond airport property, onto property with existing avigation easements.
- The MALSR will remain on airport property.
- Alternative Four(a), presented in **Figure 4-5**, assesses visibility minimums of not less than ½-statute mile requirements. Approximately 3,077,000 cubic yards of terrain penetrate the TSS and GQS.
- Alternative Four(b), presented in **Figure 4-6**, assess visibility minimums of not less than ¾-statute mile. Approximately 410,000 cubic yards of terrain penetrate the TSS.

Alternative Four(a) Environmental Review

The runway and taxiway extension and terrain removal will affect land that PSC leases for agricultural use. The project may impact up to 72.2 acres of farmland of statewide importance, 31.1 acres of prime farmland, previously undisturbed terrain, the 100- to 500-year floodplain, and a riverine wetland north of Runway End 12. The property would not be farmland or irrigated if PSC did not lease the land. Agriculture is a temporary use until the property is need for something else.

Alternative Four(b) Environmental Review

The runway and taxiway extension and terrain removal may impact up to 39.1 acres of farmland of statewide importance, 31.3 acres of prime farmland, previously undisturbed terrain, and a riverine wetland north of current Runway End 12.

Alternative Four(a/b) Advantages

- Alternative Four(a/b) meets and exceeds the facility requirements.
- The longer runway will support existing air service and demanding GA users, and facilitate attraction of new users.
- With terrain removal, a precision IAP is feasible with Alternative 4(a).
- Alternative Four(b) provides beyond the required runway length with less terrain removal.

Alternative Four(a/b) Disadvantages

- Alternative Four(a) has the greatest amount of terrain removal (3,077,000 cubic yards).
- Alternative Four(b) does not provide meet the intended instrument minimums.
- Further environmental study is necessary to quantify impacts and determine mitigation strategies.
- This alternative requires 1.1 acres of property acquisition.
- Alternative Four(a/b) require the removal or relocation of the airport maintenance road. Powerlines, and the airport fence.

Alternative Four provides more runway length than needed. Analysis in **Chapter Three** shows that the incremental benefit of 800 additional feet of runway over Alternative Three makes little difference to the destinations that existing and future fleet operating at PSC could serve. The additional pavement and terrain removal are expected to make Alternative Four the most expensive alternative of those considered, and it will likely have the greatest environmental impact due to its larger footprint. **Alternative Four is not recommended**.

Preferred Runway Alternative

Alternative Three(b) was selected as the preferred alternative following review by the Airport and the Planning Advisory Committee. This alternative does not provide the lowest visibility minimums due to terrain penetration; however, the runway length meets the facility requirements and lower minimums are available on Runway End 21R and Runway End 30. Visibility minimums can be lowered through a terrain removal project in the future.

Compared to Alternative Two, which does not meet runway length requirements, and Alternative Four, which exceeds them, Alternative Three will be scaled appropriately for existing needs without overbuilding. Alternative Three will address the declared distances caused by non-standard conditions at Runway End 30. **Alternative Three(b) is recommended**.

Figure 4-5: Alternative Four(a) Runway 12 Extension 2,647 Feet with Precision Approach

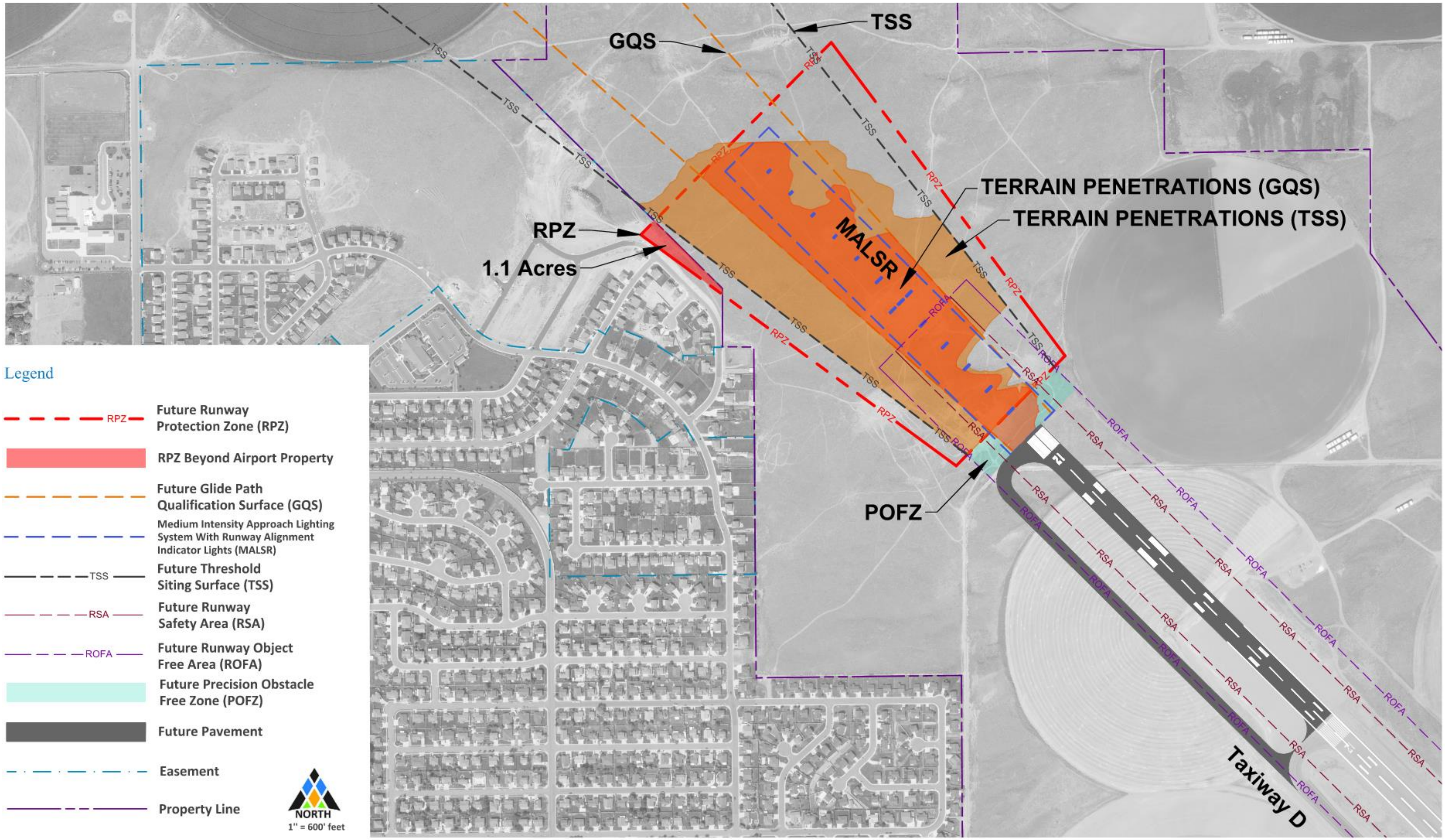
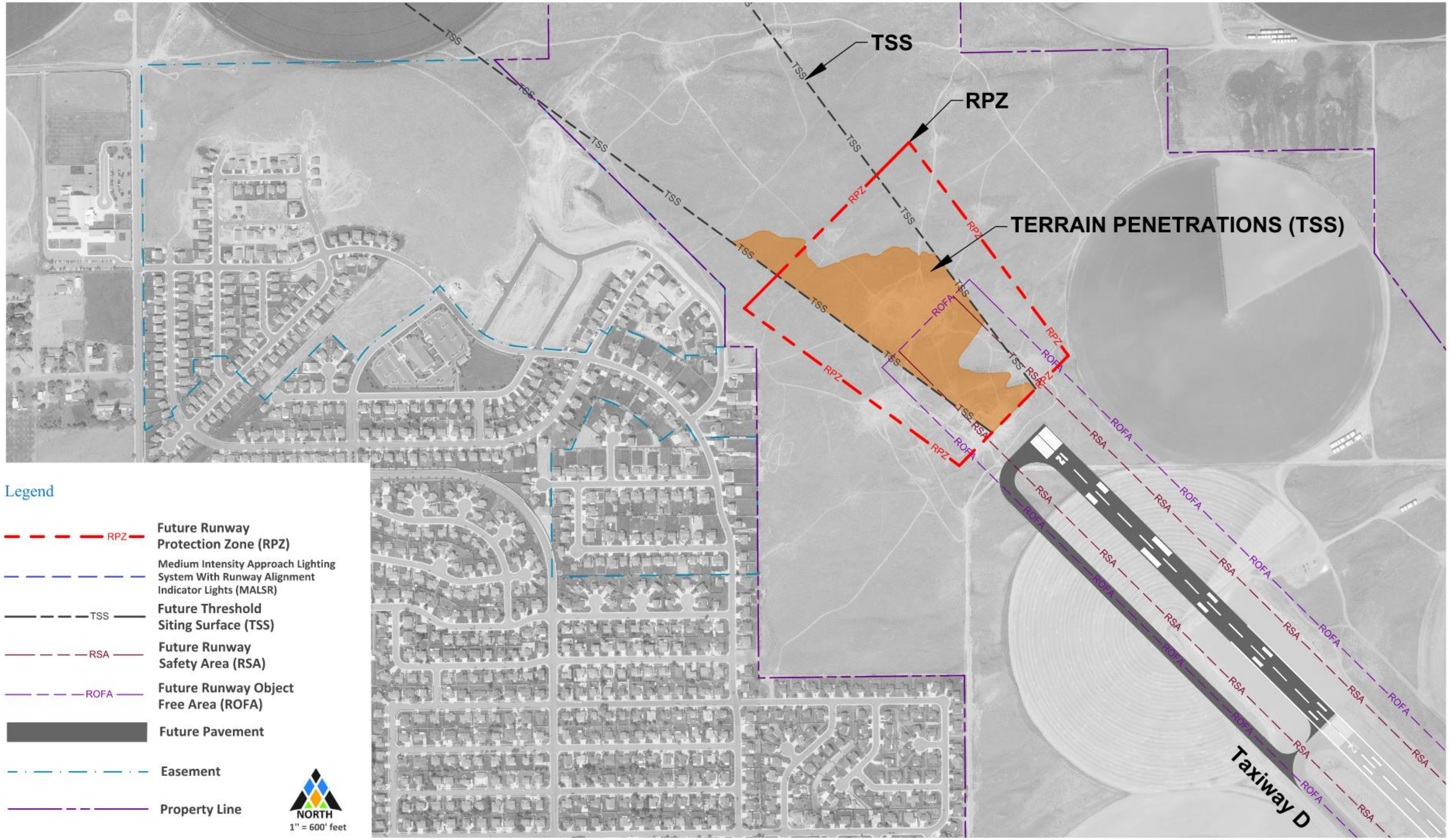


Figure 4-6: Alternative Four(b) Runway 12 Extension 2,647 Feet with Non-Precision Approach



Instrument Procedure and Lighting System Analysis

Feasibility of a precision IAP and a MALSR are evaluated to improve the utility of Runway Ends 3L and 30 during low visibility conditions. FAA Order 8260.3C, *United States Standard for Terminal Instrument Procedures (TERPS)* Table 3-3-1 indicates that minimums below ¾ mile are not possible without a full approach lighting system, such as a MALSR or an approach lighting system with sequenced flashing lights (ALSF). Reduction in the approach visibility minimums will increase the RPZ dimensions. If the RPZ changes size, assessment of the land uses introduced into the RPZ will occur using the 2012 FAA Memo *Interim Guidance on Land Uses Within a Runway Protection Zone (*2012 FAA RPZ Memo*)*.

Runway End 30 Instrument Approach Procedures and Lighting System

The preferred runway alternative, Alternative 3(b), moves Runway End 30 to the northwest by 350 feet. As of November 2019, Runway End 30 has three IAPs. The lowest minimums and vertical guidance are offered by the RNAV (GPS) Y RWY 30 LPV approach, which gets pilots down to 300 feet above ground level with as little as ¾ mile visibility.

Figure 4-7 shows the TSS, GQS, and MALSR installation required for a precision approach to relocated Runway End 30. The TSS and GQS show no terrain or obstructions in the approach areas. If minimums are lowered, the RPZ size increase will encompass 22 acres of property owned by the Sun Willows Golf Course. The Airport has an avigation easement for this property, so no additional land acquisition or avigation easements are needed. Installation of the MALSR may affect a golf course green.

The 2012 FAA RPZ Memo specifically identifies golf courses as a land use that requires coordination with FAA Headquarters (APP-400). If the MALSR project moves ahead, concurrence that the golf course is an acceptable land use within the RPZ from APP-400 will be required. Alternatives that the memo will need review include:

- Not implementing the MALSR and leaving the RPZ at its existing size.
- Shifting Runway End 30 2,100 feet to the northwest to clear the golf course and Argent Road.
  - This shift could result in a 5,603-foot-long runway if Runway End 12 is not extended.
  - This shift will require 0.3 acres of property acquisition if Runway End 12 is extended to match the existing length, and 1.2 acres if it is extended to meet the facility requirement of 9,200 feet.
- Working with the golf course owner to remove the land use from the RPZ, either in entirety or within the central portion. This will likely require a re-design of the golf course, and property acquisition for the relocated facilities.
- Leaving the golf course where it is and implementing the MALSR because the other alternatives presented above are not feasible.

Runway End 3L Instrument Approach Procedures and Lighting System Alternative

The runway alternatives do not plan to move Runway End 3L from its existing location. Any shift would cause the runway object free area to leave airport property and pass over Road 36, which connects the communities to the west of PSC with major arterial Argent Road. As of November 2019, Runway End 3L has two IAPs. The lowest minimums and vertical guidance are offered by RNAV (GPS) Y RWY 3L, which gets pilots down to 200 feet above ground level with as little as ¾ mile visibility.

Figure 4-8 shows the TSS, GQS, and MALSR installation to evaluate the potential for a precision approach to Runway End 3L. The RPZ size increases, and property outside of PSC control will go from 10 acres to 23 acres. Installation of the MALSR within the Highway I-182 right of way will require additional coordination with the Washington Department of Transportation (WSDOT); however, it is possible to install the MALSR over the highway using a cantilever system. There are above-ground utility lines that run along Road 36 south of Interstate 182 that would be within the expanded RPZ.

The 2012 FAA RPZ Memo specifically identifies transportation facilities (e.g. Argent Road and Interstate 182) and above-ground utility lines as a land use that requires coordination with APP-400. If the MALSR project moves ahead, concurrence that the transportation infrastructure is an acceptable land use within the RPZ from APP-400 will be required. Alternatives that the memo will need review include:

- Not implementing the MALSR and leaving the RPZ at its existing size.
- Shifting Runway End 3L 2,200 feet to the northeast to clear I-182 and Argent Road.
  - This shift could result in a 5,511-foot-long runway if Runway End 21R is not extended.
  - This shift will require at least 75 acres of property acquisition or easement for RPZ control and the approach lighting system if Runway End 21R is extended to match the existing length. The BNSF train line and 4th Avenue would pass through the relocated RPZ. Realignment of these land uses would be highly expensive and possible politically and legally unfeasible
- Working with the City of Pasco, WSDOT, and Federal Highways to remove the land use from the RPZ, either in entirety or within the central portion. This will require rerouting or tunneling Argent Road and I-182. The property impact of this action will be substantial.
- Leaving the road and highway where they are and implementing the MALSR because the other alternatives presented above are not feasible.

Figure 4-7: Runway End 30 with Visibility Minimums Below ¾ Mile

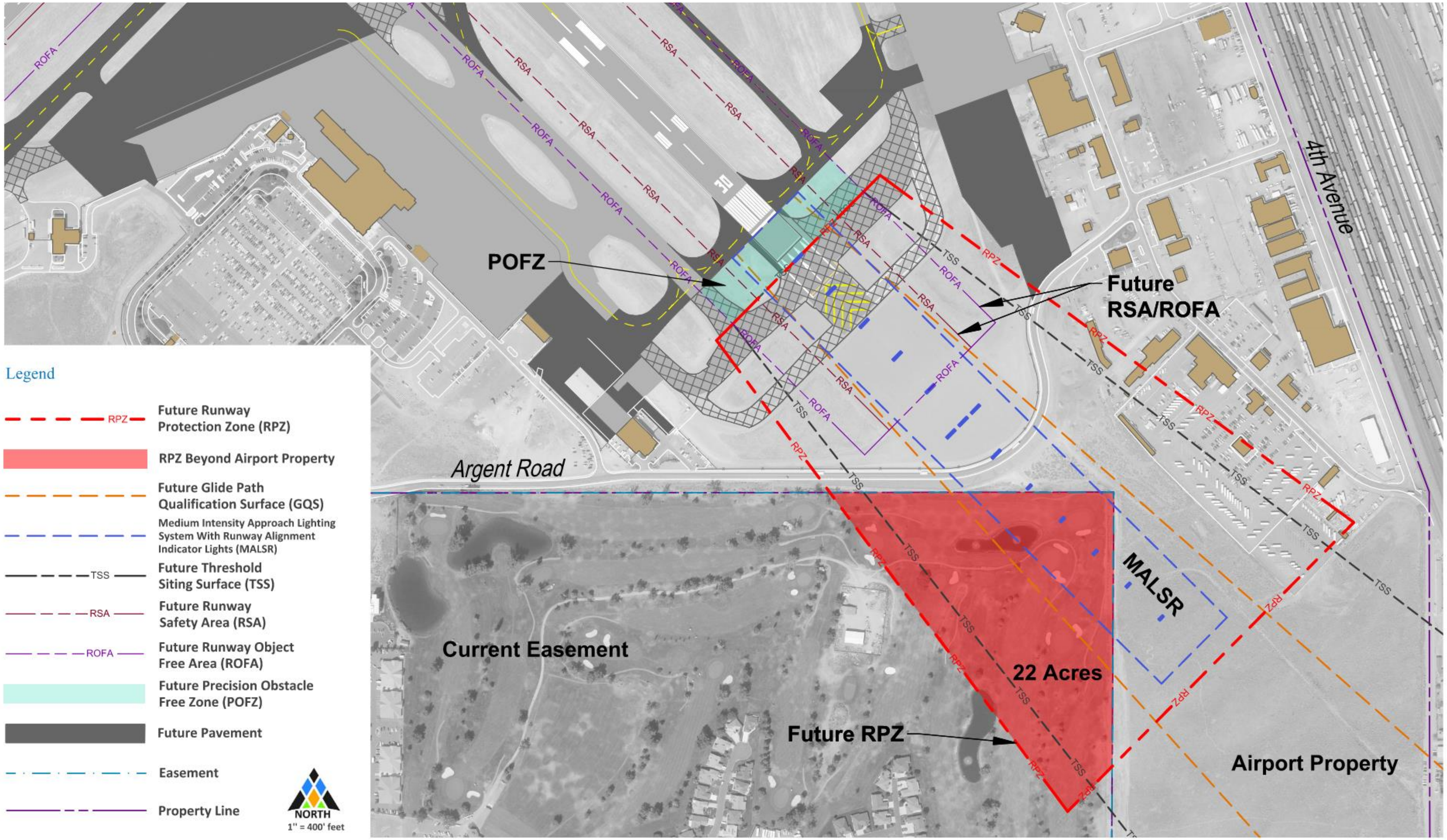


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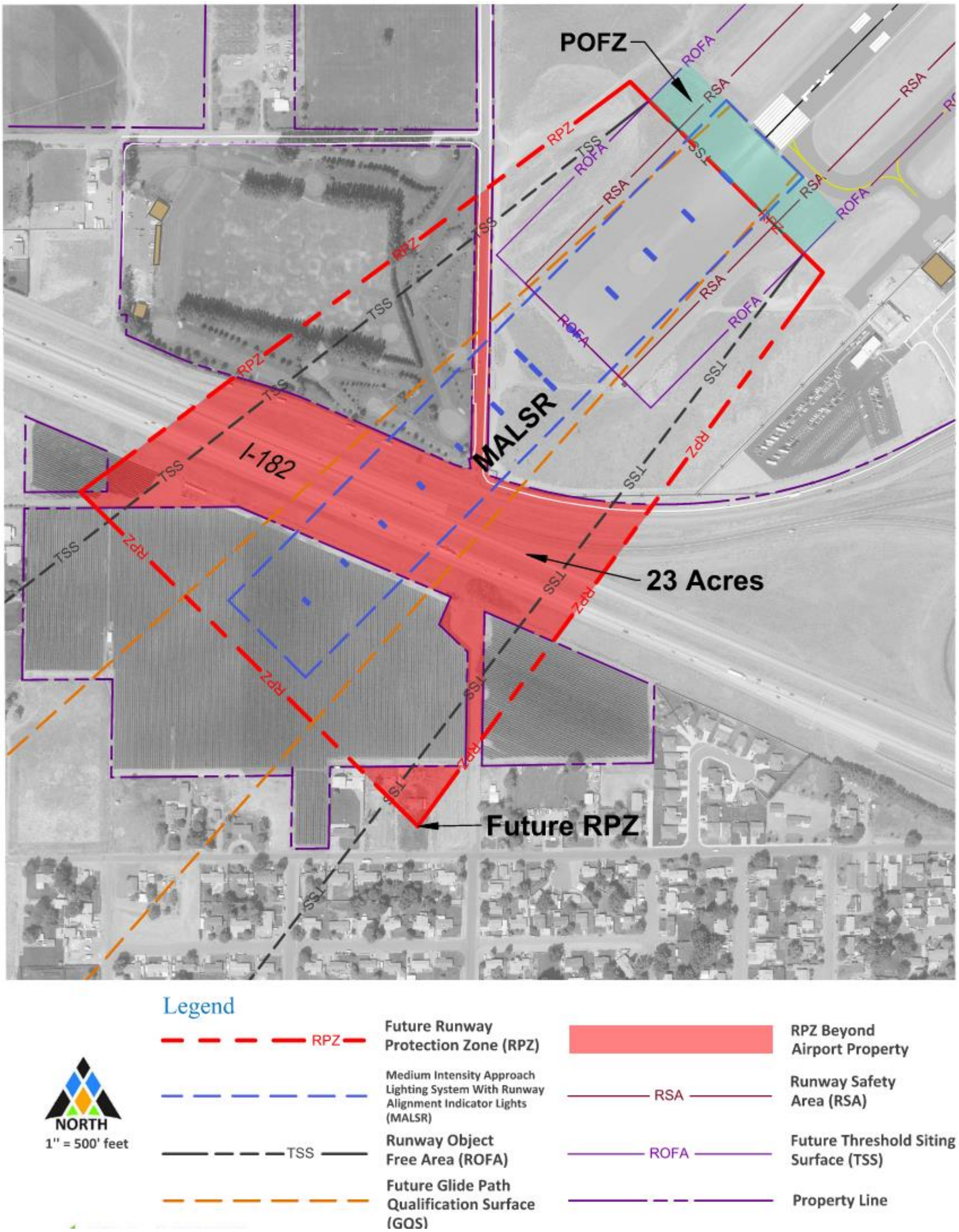
Figure 4-8: **Runway 3L Precision Instrument Approach Procedure**



Taxiway Improvements

Taxiway system improvements tie the preferred runway alternative to aircraft parking and storage areas. Taxiways are designed to accommodate the most demanding users, which include air carrier jets, corporate aircraft, general aviation, and military aircraft. Taxilanes serving hangars may be designed for smaller aircraft if larger aircraft are not accommodated by the hangars they serve.

FAA Taxiway Geometry

Existing non-standard taxiway geometry conditions addressed by the taxiway projects include:

- Taxiway connectors with direct access from the general aviation (GA) apron to Runway 12/30 will be removed to reduce potential runway incursions.
- Non-perpendicular taxiway intersections with runways will be eliminated and perpendicular taxiways provided to improve pilot visual awareness along the runways.

Runway 12/30 Exit Taxiway

A new exit taxiway from Runway 12/30 that replaces the former Taxiway A connector will allow aircraft to use the taxiway system more efficiently. The location of the proposed taxiway will be southeast of the former Taxiway A and connect to Taxiways D and G. Aircraft landing on Runway End 12 using the proposed exit taxiway will use either Taxiway D to the entrance to the Passenger Terminal Apron, or Taxiway G to the entrance of the GA Apron.

New Partial Parallel Taxiway G

Existing Taxiway A is being realigned as a true parallel taxiway for Runway 3L/21R. After realignment, the central connection from the GA Apron to Runway 12/30 will be removed. To restore airfield accessibility, a new Taxiway G will provide perpendicular intersections and connect between Taxiways A and E. Taxiway G will be designed to Airplane Design Group (ADG) III standards to preserve wingtip clearances and Taxiway Design Group (TDG) 2 standards with a pavement width of 35 feet. The taxiway connector between the east side GA Apron and the middle of the new Taxiway G will need a new taxiway designator assigned to replace the Taxiway A designator used previously.

New Runway 3L/21R Right-Angled Exit Taxiway

A right-angled exit taxiway is proposed for Runway 3L/21R between existing Taxiways A and B to reduce runway occupancy times for aircraft landing on Runway 21R. The new taxiway will be located 6,000 feet from Runway End 21R. This location will allow 92 percent of large aircraft to exit when landing on Runway End 21R during dry conditions. During wet conditions the percentage of large aircraft able to exit will be 48 percent. This reduces the need for large aircraft to continue their rollout another 900 feet. Runway occupancy will be reduced, and airfield efficiency will be improved. Taxiway modifications are shown in **Figure 4-9**

Figure 4-9: Taxiway System Improvements

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PASSENGER TERMINAL ALTERNATIVES

This section provides an overview of the passenger terminal building improvement alternatives and details the analysis of the various terminal building spaces. Generally, the terminal building is in good shape for meeting the future projected passenger needs. However, the analysis indicated several areas for improvement, including:

- Pre-security areas circulation including the airline ticketing queueing area, baggage check-in counters, the meeter/greeter lobby, and the baggage claim area.
- Post-security areas that increase the number of Passenger Boarding Bridges (PBBs), increase the number of boarding gate lounges, improve public circulation, and increase square footage needed for additional seating capacity.
- Non-public areas including the airport administrative offices, Airline Ticketing Offices (ATOs), a dedicated lost baggage storage room, and increased area for baggage security screening and baggage cart maneuvering.

Passenger Terminal Alternatives Shared Factors

Several improvements are common to each of the passenger terminal alternatives. Common elements consist of those areas for which there are no real practical alternatives. Reasons for this are provided in the following narrative but tend to revolve around limitations to the building's existing functional layout and the need to maintain realistic costs of the improvements.

Meeter/Greeter

This area is currently restrained by the concessions on the west side, the structural bracing on the east side, and secure exiting to the north. These physical boundaries make expansion difficult. The only viable option will be to reduce the furnishings in this space allowing for additional standing room.

Baggage Claim

The baggage claim area's only functional expansion area, without considering total relocation, is to the west. This expansion will necessitate the relocation of the Rental Agency Counter and office spaces (RAC) facility. New and expanded baggage carousels and ample circulation space can be provided. A shared baggage claim office for the airlines to process and store delayed or lost baggage will be included with this expansion. Additionally, this expansion will require the modification of the access road to the west of the existing passenger terminal building.

Outbound Baggage

The outbound baggage area's only functional expansion area is to the east. This expansion will allow for one large shared carousel, or multiple carousels dedicated to separate departing flights. The expansion and relocation of the outbound carousels will provide wider travel lanes for the tugs and carts.

TSA Security

The current space allocated for Transportation Security Administration (TSA) screening was designed with an oversized footprint to allow for future expansion. The screening area will need only to add the necessary TSA equipment to meet future growth requirements.

Security Exiting

The secure exiting is currently monitored by a TSA employee. The installation of two automated secure exit lanes will eliminate the need for the monitoring and meet future needs. The current exiting area is appropriately sized for both exit lanes for the duration of the planning period.

Restrooms

In conjunction with additional boarding gates and boarding lounges, additional restrooms will be required. The alternatives contained in the analysis section have allocated adequate space within the overall footprint of the expanded concourse to accommodate additional restroom modules.

Concessions

In conjunction with any concourse expansion, additional concession space will be required. The alternatives contained in the analysis section have allocated adequate space within the overall building footprint to accommodate additional concessions area.

Administration

The current administration suite located upstairs cannot be expanded beyond the current footprint due to the limitation of the structural support system for the first-floor roof. Minimal expansion can be accomplished by relocating badging and security to the first floor, enclosing the outdoor deck area to the north, and repurposing the smaller conference room. Other expansion possibilities are a freestanding building connected to the landside portion of the terminal or possibly expanding the upstairs suite that bridges the terminal roadway southward.

Rental Car Counter

Relocation of the RAC facility will be needed with the expansion of baggage claim area. No other solution will allow the RAC facility to remain within the terminal building. Options available for the relocation will be further analyzed in the Parking and Circulation section but are listed here for information purposes.

Passenger Terminal

Two passenger terminal alternatives have been developed. With either option, additional restrooms and concession space will be required when additional gates and boarding lounges are provided.

Passenger Terminal Alternative One

Airline Ticketing Counters/Queueing Area

This alternative extends the current airline ticketing counters to the east and adds one station to the west. This configuration will mitigate the congestion at the ticketing and baggage check-in counters as well as the queueing area by increasing available area. Additional ATOs will extend behind the new ticket counters to provide additional support space.

Gate Expansion

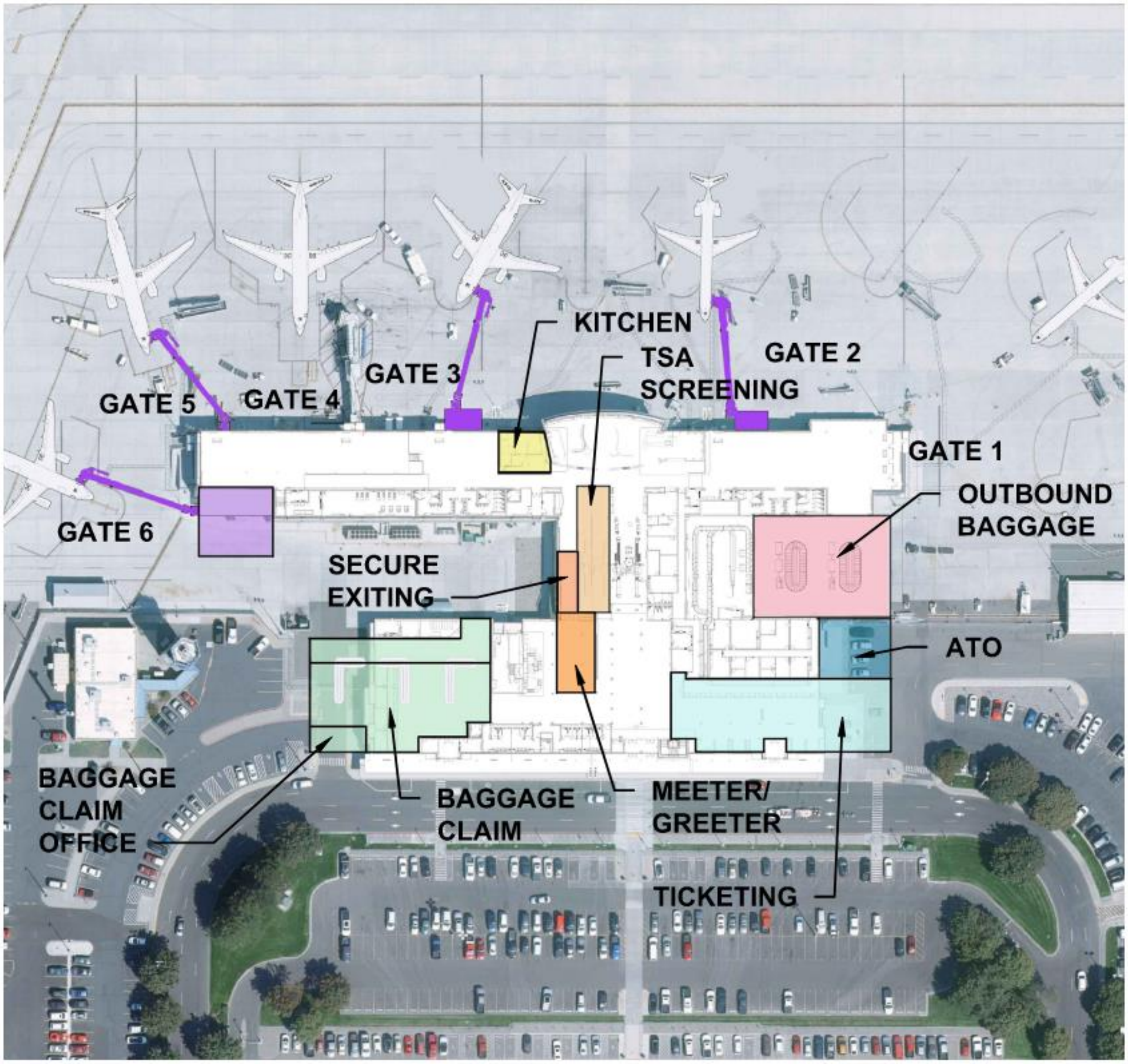
Along with the addition of passenger boarding bridges at Gates 2, 3, and 5, additional boarding gates, boarding gate lounges, and seating area will be needed. Currently, the boarding gate lounges are single loaded, meaning the boarding lounges are located on only one side of the circulation path. This alternative will add a new boarding gate and boarding lounge south of Gate 5, on the opposite side of the concourse. This will allow for any future expansion to use a more efficient double-loaded design.

Kitchen Expansion

The main kitchen on the post-security side of the terminal building is currently maximized for food preparation. When the terminal expands, additional food preparation space will be needed. Alternative One expands the kitchen to the south and removes the food service counter. The food service counter could be relocated to the west as the terminal expands beyond Gate 5.

Figure 4-10 presents the optional improvements available for Alternative One.

Figure 4-10: Passenger Terminal Alternative One



Passenger Terminal Alternative Two

Airline Ticket Counters/Queueing Area

This alternative relocates the current ticketing counters to the north by replacing the southern ATOs. This configuration will provide greater depth to the queueing area, allowing for longer vertical ticketing lines without impeding the circulation flow.

Gate Expansion

This alternative expands the terminal building to the west by adding a new boarding gate, boarding gate lounge, and seating to the west of Gate 5. This alternative will continue the single-loaded lounge design used in the existing terminal.

Kitchen Expansion

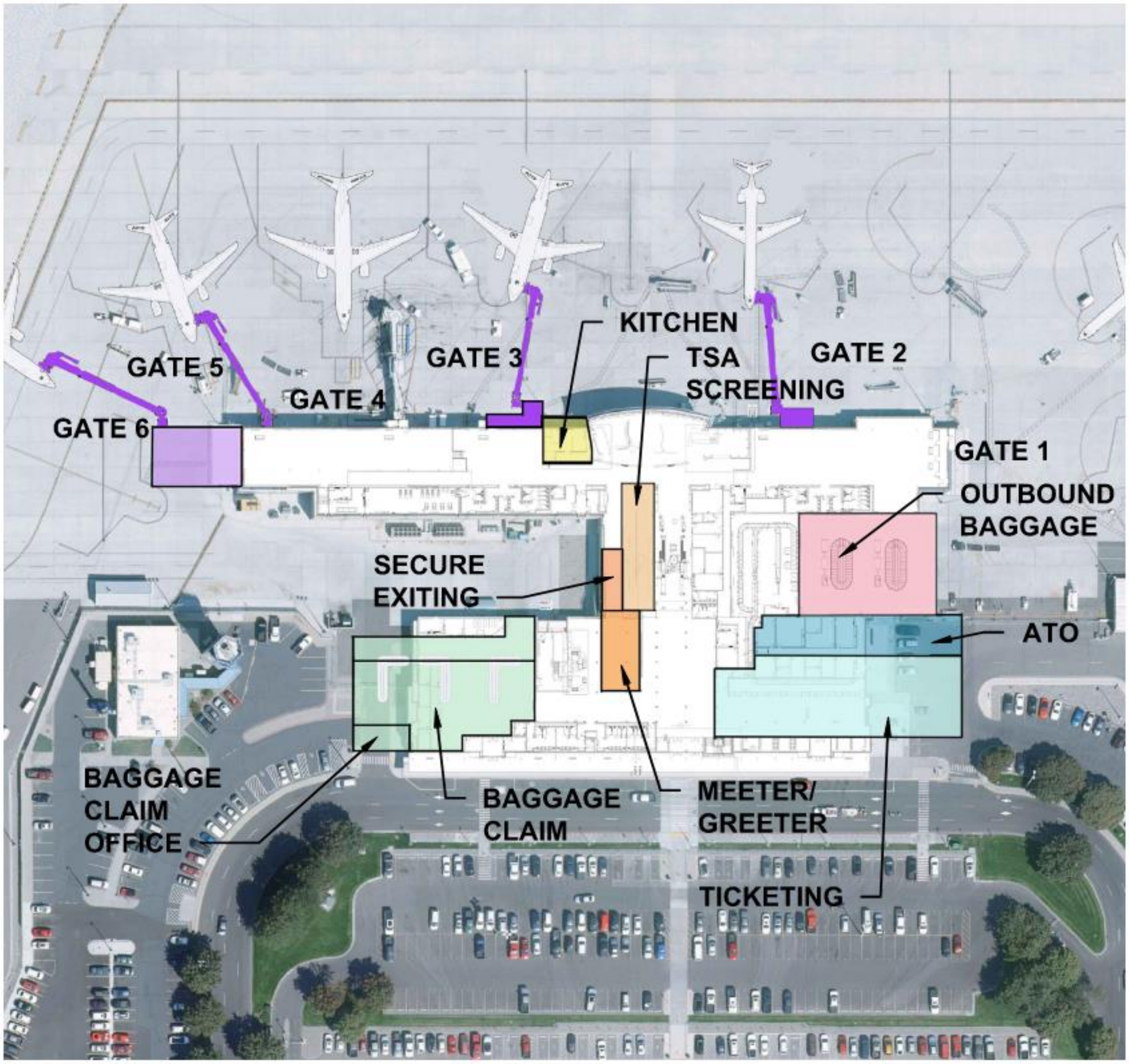
This alternative expands the kitchen to the north with the addition of an enclosed building space for ramps providing passengers from ground level Gate 3 access to the passenger boarding bridge. This extension could move to the east to provide additional kitchen space.

Figure 4-11 presents the optional improvements available associated with Alternative Two.

Passenger Terminal Expansion Summary

Several areas of immediate concern have been identified for expansion or improvement include ticketing, baggage claim, and outbound baggage. These areas should have priority for future implementation of passenger terminal upgrades. The expansion of the baggage claim area does impact access routes currently used for food and beverage delivery vehicles as well as garbage removal services. To accommodate the baggage claims expansion, the vehicle access lane would move to the west resulting in the reduction of total parking spaces near the ATCT.

Figure 4-11: Passenger Terminal Alternative Two



LANDSIDE FACILITIES ALTERNATIVES

The following section describes the future landside facilities. Landside facilities are on-airport used to support aircraft parking and storage, on-airport businesses, and airport administration, operations, and maintenance.

Terminal Apron Alternatives

The terminal apron at PSC is adequate to meet the existing air carrier aircraft demand. As passenger terminal building needs increase, boarding gates are added, and the size of air carrier aircraft increase, redevelopment and expansion of the terminal apron will be necessary. The two terminal apron alternatives presented here closely tied to the passenger terminal building alternatives.

Terminal Apron Common Elements

- Gate 1 will be reserved for ground boarding and will retain the three aircraft parking positions.
- With the addition of PBBs at Gates 2 and 3, the three existing aircraft parking positions serving these two gates will likely be reduced to two.
- The existing aircraft parking positions at Gates 4 and 5 can adequately serve the expected larger aircraft with the addition of the PBB at Gate 5.
- The 2019 relocation of Taxiway A provides space for terminal apron expansion.

Terminal Apron Alternative One

With the expansion of an additional boarding gate and PBB to the south of Gate 5, Terminal Apron Alternative One can accommodate a smaller Airplane Design Group (ADG) III aircraft in the existing parking position with some modification of the striping. A minimal amount of additional terminal apron will be required. **Figure 4-12** presents the terminal expansion and apron modification associated with this alternative.

Terminal Apron Alternative Two

With the expansion of an additional boarding gate and PBB to the west of Gate 5, Terminal Apron Alternative Two can accommodate a longer ADG III aircraft but will require a greater amount of additional terminal apron and modification of the aircraft parking position. **Figure 4-13** presents the terminal expansion and apron modification associated with this alternative.

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Figure 4-12: Terminal Apron Alternative One

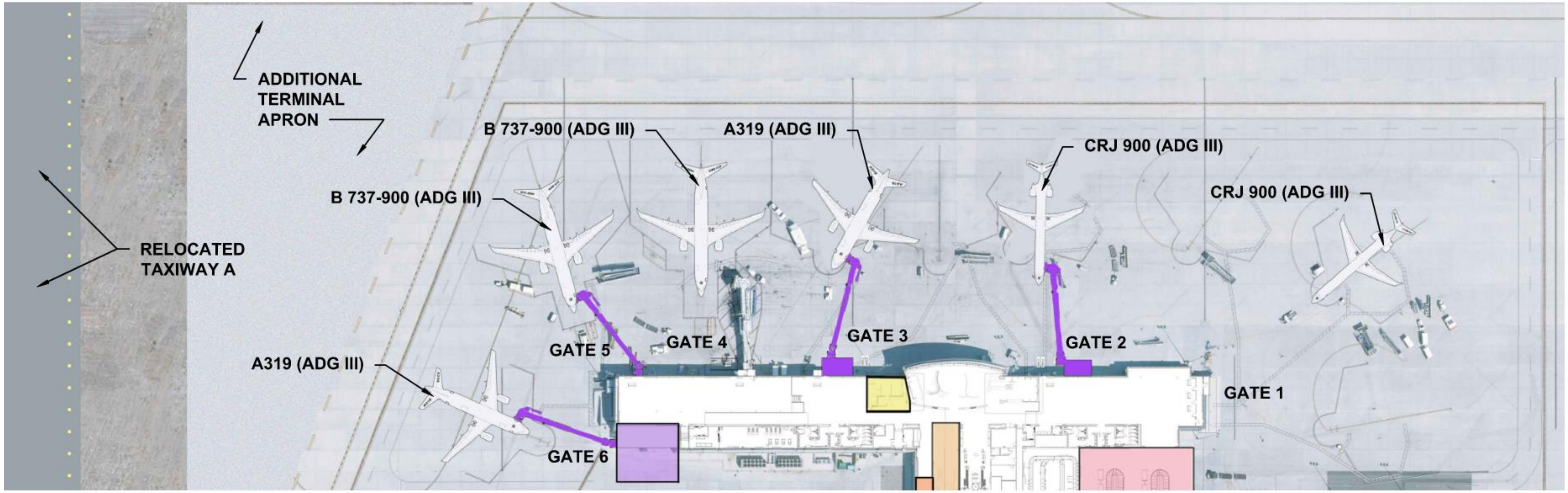
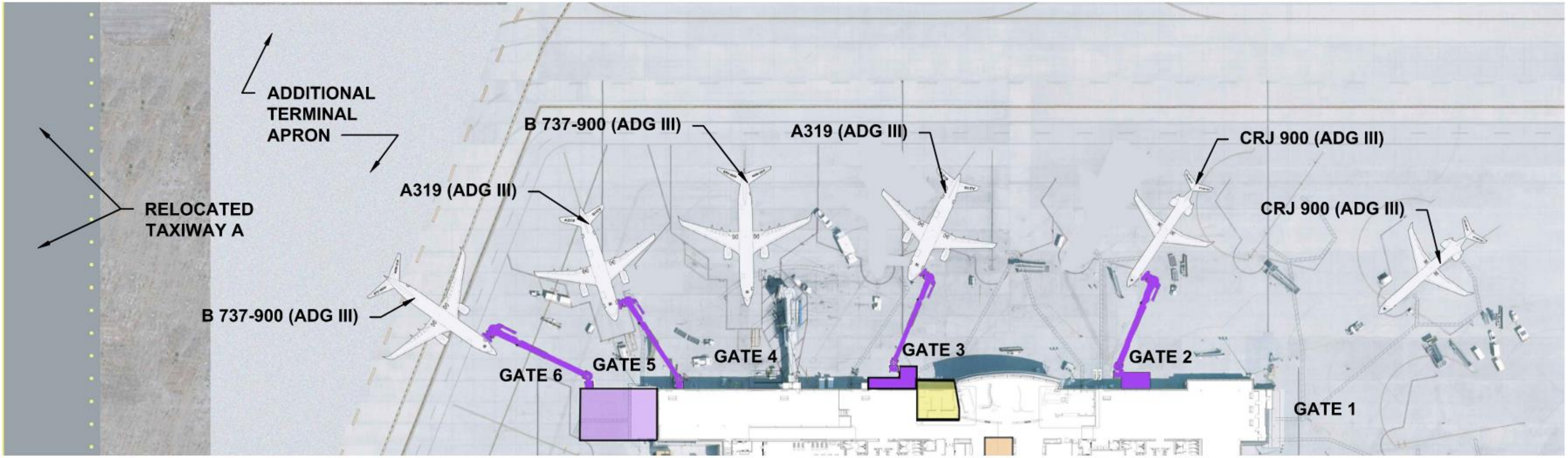


Figure 4-13: Terminal Apron Alternative Two



Preferred Passenger Terminal and Apron Alternative

After review by the Airport and stakeholders in the Planning Advisory Committee, the preferred alternative for the Passenger Terminal and the Passenger Terminal Apron is Alternative Two. Alternative Two provides improved passenger flow for queuing at the ticketing counters, additional kitchen space for concessions, an added passenger boarding gate, and improved baggage handling capacity.

General Aviation and Fixed Base Operator (FBO)

This section identifies the location of GA and FBO improvements under consideration with these key facility components:

- FBO building/offices – Rehabilitate or new
- FBO Hangars – Rehabilitate or new
- 100 low lead (100LL) Fuel tank – Replacement/expansion
- Future FBO or executive hangar site development
- Reserve areas for future GA activities
- Dedicated apron parking

Future hangar sites are required for new based aircraft owners, tenant expansion, and obsolete or removed hangars must also be replaced. Nearly all future based aircraft are expected to be stored in hangars. The turbine-based aircraft are forecast to increase from 14 in 2017 to 26 by 2037. An increase in executive or box hangars will be needed to accommodate that growth. PSC based helicopters are also expected to increase, and FBO tenants have asked for a separate and dedicated helicopter operations apron. Separation of dissimilar aircraft types improves apron efficiency and mitigates the risk of damage to light aircraft due to rotor wash or jet blast. GA piston-based aircraft are forecasted to decrease from 80 in 2017 to 69 in 2037. **Figure 4-14** illustrates potential new GA development for the area east Taxiway E. To open the central area to development Taxiway E would be made a taxilane and considered a non-movement area.

The demand for piston-driven aircraft parking and hangars is expected to decrease as GA fleet mix trends in favor of turbine-powered aircraft. Hangars that no longer are serviceable, or do not meet user needs will be removed to allow repurposing of areas. With apron and hangar areas designated for certain class of aircraft, development can occur as demand warrants without hindering future development.

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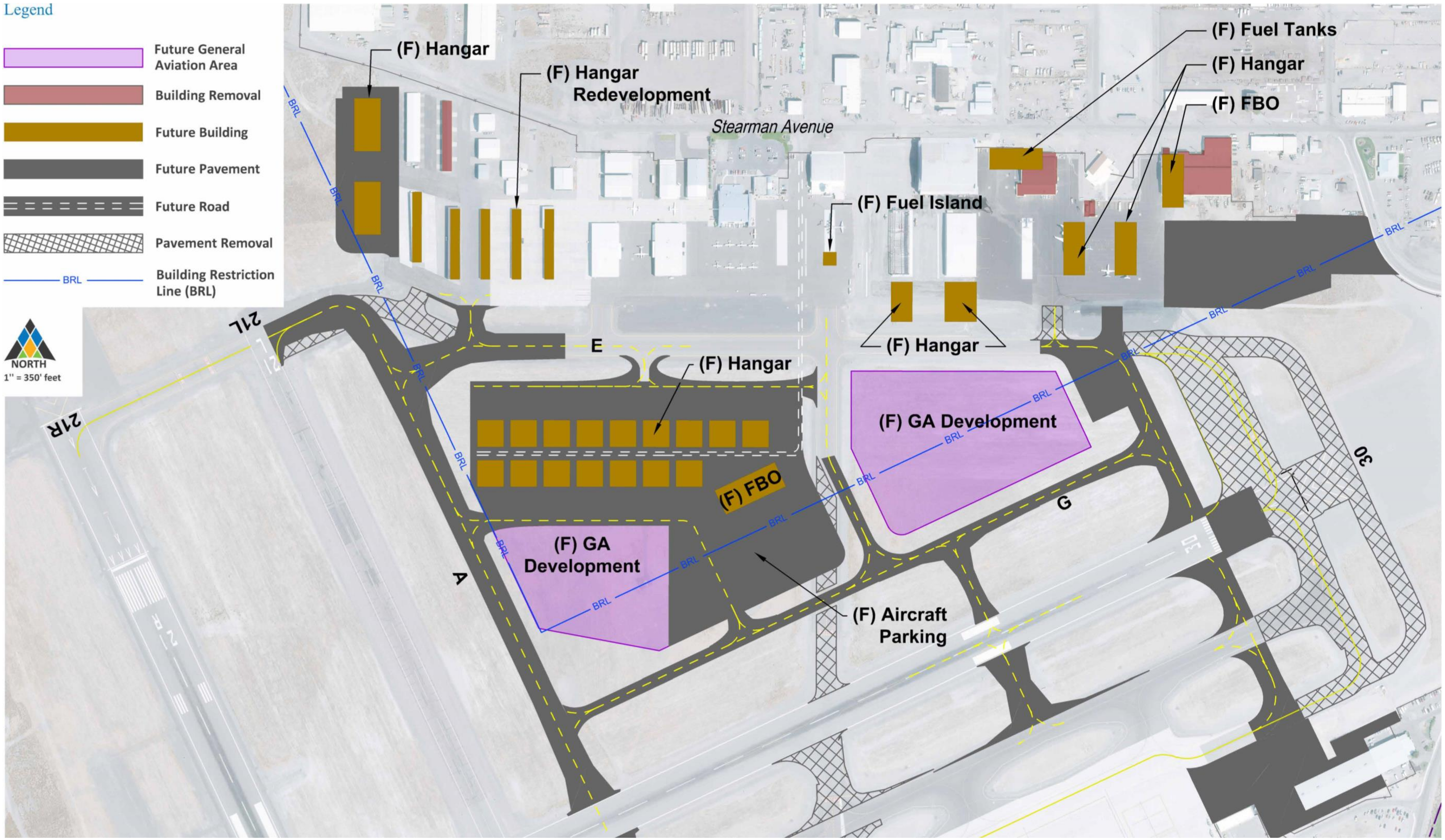
Figure 4-14: East GA Apron and Hangar Development



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To access the proposed future GA apron, Taxiway E will be reduced to a non-movement area taxilane, while still meeting ADG III and TDG 3 design criteria. This will allow for designated drive lanes to permit vehicle access hangar and apron sites. Future turbine-powered aircraft and helicopter operations areas will be in the in-field to separate dissimilar aircraft types and improve apron utilization of existing facilities.

Additional improvements to the east side GA apron area include consolidation of fuel storage tank sites and installation of a light aircraft self-fuel island. The self-fueling site will reduce the need for fuel trucks to drive on aprons.

The east side hangar and FBO areas have traditionally served GA aircraft at PSC and provided separation from commercial aircraft operations at the passenger terminal. There are several existing buildings recommended for demolition, especially those that are World War II era or otherwise in poor condition. Demolition plans may require evaluation of historical significance and FAA coordination.

A second area intended for executive and turbine-powered aircraft hangar development has been initiated on the west side of the Airport. Access to the Airport Business Center is from Morasch Lane and Rickenbacker Drive. **Figure 4-15** illustrates the existing and planned development along Rickenbacker Drive.

The following list identifies general hangar siting considerations:

- Hangars should be developed in a linear, modular manner. Hangar locations should be centralized or grouped by type, function, and aircraft size categories (piston, turboprop, jets, rotor) to promote efficient airfield and landside access. Hangars should be constructed along existing flight lines as much as possible to minimize costs associated with expanded paved areas, drainage, utilities, auto parking, and secured access.
- Hangar orientation should consider weather conditions and provide adequate drainage with minimal slope differential.
- Hangars must be constructed beyond the runway and taxiway safety areas, object free areas, and NAVAID critical areas. Hangars must remain beyond visibility line of sights and regulated by height to prevent encroachment of airspace surfaces.
- Hangars should be separated to meet, at a minimum, FAA taxilane object free area distances while providing enough access, maneuvering, and apron space for the expected class of aircraft.

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Figure 4-15: Airport Business Center

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Airport Property Release

PSC owns property designated as aeronautical use that is subject to FAA grant obligations. A release of property from aeronautical use is a formal written authorization discharging and relinquishing the grant assurances for the property. A formal release is needed to change the property to non-aeronautical use or to dispose of the property. Various conditions and circumstances affect the manner and degree of release. The ALP and Exhibit “A” Property Map must reflect the land areas and airport facilities associate with this action.

There are two areas that PSC is interested in releasing from aeronautical use. One is a group of five parcels west of Road 36 that was originally purchased to protect airspace for a third runway in the 3/21 configuration (West Property Release). The other area is within the controlled activity area of the Runway 30 RPZ (East Property Release).

West Property Release

PSC intends to release the five parcels, 84 acres, from aeronautical use and seek non-aeronautical/airport compatible development. The purpose for which these parcels were acquired, a third 3/21 configured runway, is no longer seen as a long-range development goal and is not depicted on the ALP or supported by demand/capacity modeling. Aeronautical use of these parcels is no longer likely. The parcels were purchased with Port of Pasco funds and included in the Exhibit “A” Property Map. The parcels are outside of the FAA 65 Day-Night Average Sound Level (DNL) noise contour for the 2037, shown in **Chapter 5 Land Use Compatibility**. The parcels and surrounding area are shown in **Figure 4-16**.

East Property Release

PSC intends to release part of one parcel, six acres, from aeronautical use and seek to lease it to the Pasco School District Support Services for equipment storage. This land use is characterized by stationary equipment, such as school busses, and low concentrations of people. It would be an expansion of a use that already exists in the RPZ. The site would not be open to the general public and would not be used for airport parking. The parcel and surrounding area is shown in **Figure 4-17,**

Figure 4-16: West Property Release

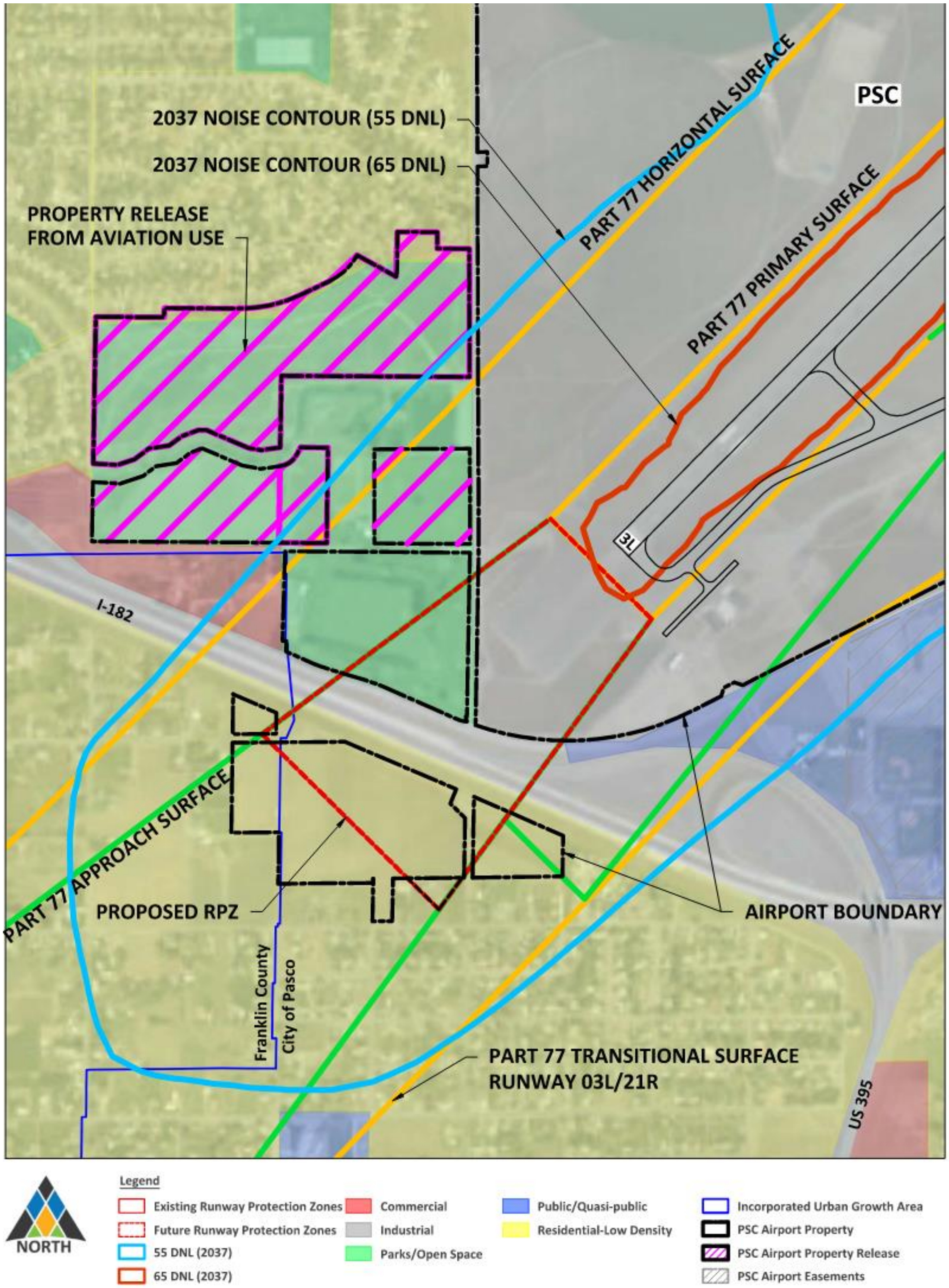
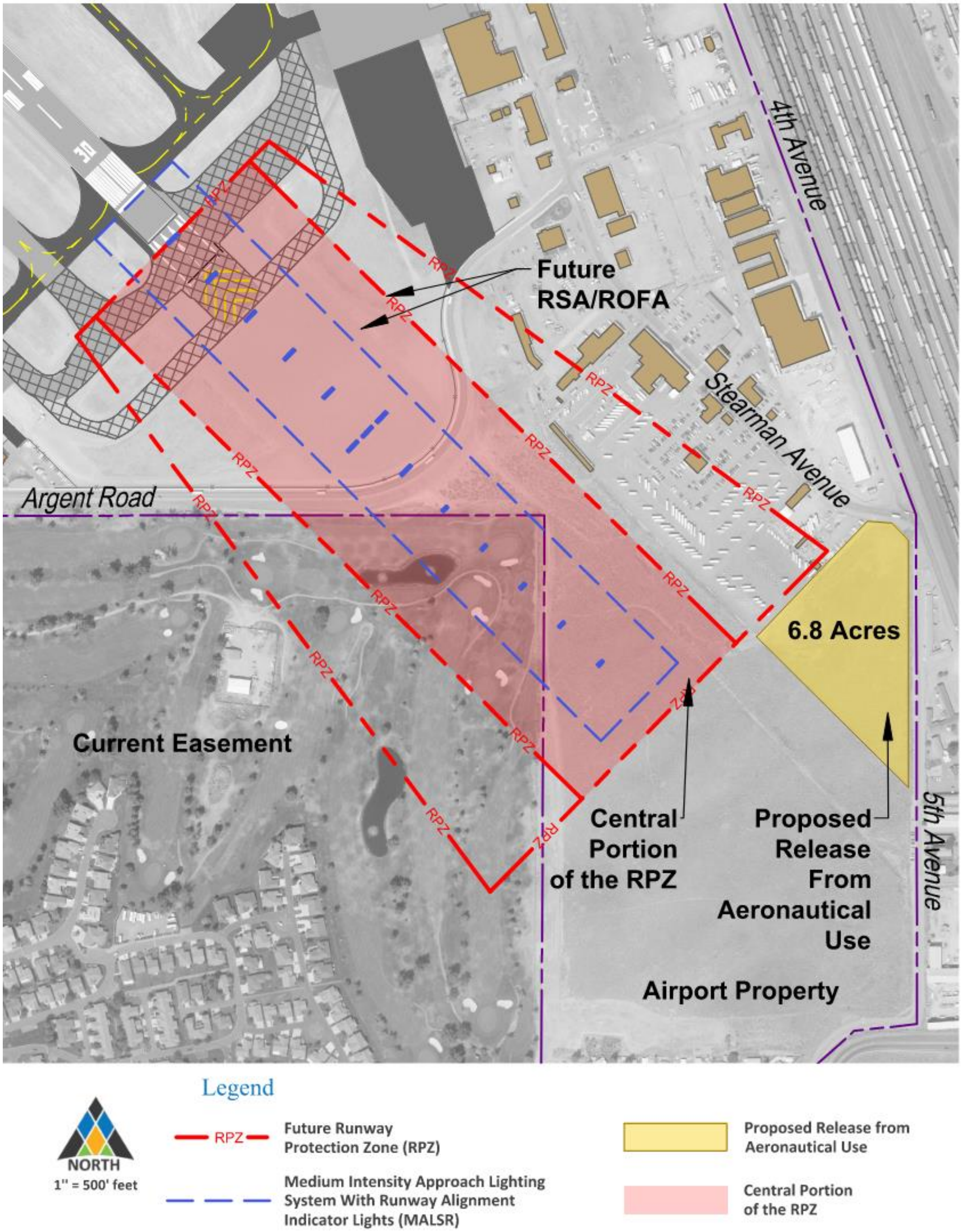


Figure 4-17: East Property Release



OTHER SUPPORT FACILITIES ALTERNATIVES

This section describes and evaluates alternatives for airside support facilities, including Aircraft Rescue and Firefighting (ARFF) equipment, an ARFF facility; a Snow Removal Equipment (SRE) facility; aircraft deicing pads; and a site for Air Traffic Control Tower (ATCT). These facilities are necessary to serve existing users and to meet forecasted growth.

Index C ARFF Equipment Alternatives

ARFF requirements are based on Title 14 of the Code of Federal Regulations, Part 139, Sections 315-319. The existing ARFF Index is B, and demand forecasts expect it to change to Index C in the next twenty years as the Boeing 737 series and Airbus A320 series approach five daily departures. PSC ARFF has two Class 4 ARFF vehicles that are capable of meeting Index C requirements. However, due to age, one response vehicle serves as the backup and is nearing the end of its useful service life. There are two alternatives to meet ARFF Index C requirements:

Alternative One: Two Vehicles

- One Class 1 ARFF vehicle carrying the extinguishing agents with 500 pounds of sodium-based dry chemical, halon 1211, or clean agent; or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of Aqueous Film Forming Foam (AFFF) to total 100 gallons for simultaneous dry chemical and AFFF application; and,
- One Class 5 ARFF vehicle carrying water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons.

Alternative Two: Three Vehicles

- One Class 1 ARFF vehicle carrying the extinguishing agents with 500 pounds of sodium-based dry chemical, halon 1211, or clean agent; or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100 gallons for simultaneous dry chemical and AFFF application; and,
- Two Class 4 ARFF vehicles carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by all three vehicles is at least 3,000 gallons.

Preferred ARFF Equipment Alternative

After review by the Airport and stakeholders in the Planning Advisory Committee, the preferred alternative for the ARFF equipment is Alternative Two. PSC can meet the Index C requirements with two Class 4 ARFF Vehicles because one of the Class 4 trucks carries the chemicals of the Class 1 vehicle.

Index C ARFF Facility Alternatives

The City of Pasco provides PSC's ARFF and medical emergency service under a contract agreement with PSC. The ARFF facility is a dual-use response facility that serves the community and PSC. If PSC's ARFF classification increases to Index C, additional on-site ARFF-trained personnel will be needed to operate the additional vehicles unless it maintains the two Class 4 vehicles with sufficient water and chemicals to meet Index C requirements. Having additional staff on duty 24 hours a day may require additional crew quarters, increased inventory of protective equipment, and increased ancillary support facilities for kitchen, training, showers, and parking.

The existing ARFF facility has three equipment bays for ARFF response directly onto the airside, and three equipment bays for response directly onto public streets. The existing ARFF equipment bays are 50 feet long, 23 feet 8 inches wide, and 26 feet high. ARFF facility requirements dictate that at least 5 feet of space shall be provided between the front of the ARFF vehicle and the door, and 5 feet from the back of the vehicle to the back wall.

In addition to housing the primary response vehicles, equipment, and stockpiles of AFFF and dry-chemical agents, an ARFF facility may also have vehicle bays eligible for FAA funding based on support needs for training, maintenance, cleaning, and backup equipment. FAA Advisory Circular 150-5210-15A *ARFF Station Building Design,* Chapter 3-2 provides justification for additional vehicle bays being eligible based upon:

- ARFF departments response for Emergency Medical Service (EMS) calls. This could be a separate vehicle from the required Index vehicles.
- There should be a reserve ARFF truck in case the scheduled maintenance or repairs take an ARFF vehicle out of service. If a reserve ARFF vehicle is not available to replace an Index-required vehicle, an airport must drop down to the next lower ARFF Index until rectified.
- Bays can be used for the re-supply of foam and water during an incident response.
- The need for a Hazardous Material (HAZMAT) vehicle is now a consideration to meet new environmental regulations.
- An additional apparatus bay may be required for a vehicle that performs training, water rescue, or hazardous material response functions.

PSC has three ARFF facility options available based on equipment, staffing, and storage needs:

ARFF Facility Alternative One

Alternative One will expand the existing facility to house additional equipment to meet Index C response levels and include capacity for additional staffing levels, vehicle maintenance, certification training, personnel protective gear, support equipment and materials storage. Building expansion will be restricted by the Taxiway A TOFA.

ARFF Facility Alternative Two

Alternative Two will develop a second ARFF facility site to be fully capable as an ARFF station with personnel quarters, equipment bays, and direct access to airside to meet the Part 139 response requirements. This site will host one vehicle, while the other vehicle will remain at the existing ARFF location. This site will not serve as a dual use station and will require hiring of additional ARFF personnel.

ARFF Facility Alternative Three

Alternative Three will repurpose the building spaces currently dedicated to providing structural fire and medical response capability to become a facility dedicated to ARFF responses only. Utilizing the station for only ARFF operations will mitigate the need to expand or modify the existing facility or build a second ARFF station. The existing agreements between the City of Pasco and PSC will need renegotiation. The new agreements will have PSC take primary responsibility for administration, staffing and facility ownership. This alternative will result in an ARFF facility with the necessary bays to house Index C equipment, backup vehicles, support vehicles, training equipment, materials inventories, on-site vehicle maintenance, with additional space for future growth. The repurposing of existing structural response living quarters for ARFF response living quarters will provide for the expanded ARFF staffing requirements.

Preferred ARFF Facility Alternative

After review by the Airport and stakeholders in the Planning Advisory Committee, the preferred alternative for the ARFF facility is Alternative Three that utilizes the existing facility to house the two Class 4 ARFF Vehicles, as is the practice now. Future expansion of the ARFF for training, equipment storage, cleaning, and maintenance can utilize the existing facility. Use of the existing fire station dedicated to just ARFF response can be accommodated by changing the perimeter fence and access gate location.

Snow Removal Equipment (SRE)

Chapter 3 Facility Requirements described a need and desire for a future SRE facility located closer to the airfield and sized to accommodate necessary equipment and service needs.

PSC meets SRE equipment minimums for an airport of this size and expected snow loads. However, the minimum equipment does not have the capacity to meet the required 30-minute clearing time of primary surfaces under Part 139 so additional equipment acquisition is recommended. Equipment acquisition is an operational consideration with implications to facility size, number of staff, and on-going maintenance costs. The following recommendations are based on FAA guidance's intended to meet the 30-minute clearing time.

Equipment Acquisition Recommendations

- Two Class V Rotary Plow units (may be attachments for larger multi-purpose blower/sweeper/plow vehicles)
- Two Class V Displacement Plow Trucks with 30-foot blades (may be combined with solid anti-ice spreader truck similar in capacity to the two P-Series Oshkosh trucks currently in inventory)
- Two broom sweeper trucks of similar capacity to current sweeper
- Two anti-ice solid material spreader trucks

PSC has identified equipment acquisition in the capital improvement plan (CIP) schedule to include the following:

- One Deice fluid tanker with spreader booms
- Two Multi-functional SRE trucks with quick-change attachments for Plow/Broom/Blower

SRE and Maintenance Facility Alternatives

The existing SRE facility consists of two buildings providing approximately 16,000 square feet of space located outside the airport operations area (AOA) in the industrial park adjacent to the GA apron and hangar areas. The SRE facility size requirement is determined by the equipment and materials storage needs. The SRE facility will need to expand to 36,000 square feet to accommodate the existing and recommended equipment. Three SRE Facility alternatives have been developed.

SRE Alternative One - Expand Existing Facility

Alternative One will expand the existing SRE building, doubling the size of the equipment bay with extensions to the north and south and adding an in-fill structure between the equipment bay and materials storage shed to meet that square footage requirement.

SRE Alternative One Advantages

- PSC can approach facility expansion in phases as equipment is acquired.
- Equipment and personnel remain in one location.
- Opportunity to modernize existing facilities.
- Equipment acquisition and facility expansion can be phased over time.
- Capital investment in the expansion of an existing building may be lower than that of a new facility (Alternatives Two and Three), depending on how each are designed.

SRE Alternative One Disadvantages

- The facility will remain outside the AOA.
- This alternative will not improve airfield access or response time.
- The building setback from the road is reduced leaving less room for vehicle maneuvering.

SRE Alternative Two - New Facility Southwest Corner of GA Apron

Alternative Two includes a new SRE building with access to the airfield on Taxiway E. The building will be placed on the southern edge of existing GA Apron, replacing a storage materials laydown yard. The building will include a central drive lane to access equipment bays and facilitate in building storage for equipment and accessories.

SRE Alternative Two Advantages

- Inside the AOA with simplified access to taxiways, runways, and aprons.
- A drive-through floor plan for efficient movement of vehicles in and out of the bays.
- If desired, the building can be dedicated to SRE equipment and the existing facility can be dedicated to maintenance and materials storage.

SRE Alternative Two Disadvantages

- Splitting vehicles and materials between two sites is less efficient than a co-located site.
- Ingress and egress route may displace aircraft tie-down parking spaces.
- Displaces the materials storage yard.
- Capital investment in a new building may be higher than expanding the existing facility (Alternative One), depending on how each are designed.

SRE Alternative Three - New Facility West of ARFF Facility

Alternative Three includes a new SRE building with access to the airfield on Taxiway A. The building will be located to the west of the ARFF facility on Varney Lane. The building will include a central drive lane to access equipment bays and facilitate in building parking for equipment and accessories.

SRE Alternative Three Advantages

- Inside the AOA with simplified access to taxiways, runways, and aprons.
- A drive-through floor plan for efficient movement of vehicles in and out of the bays.
- Closer to passenger terminal apron which will improve response time.

SRE Alternative Three Disadvantages

- This alternative will displace potential hangar development along Taxiway A.
- Capital investment in a new building may be higher than expanding the existing facility (Alternative One), depending on how each are designed.

Location alternatives for the SRE and Maintenance Facility are shown in **Figure 4-18**.

Preferred SRE Facility Alternative

After review by the Airport and stakeholders in the Planning Advisory Committee (PAC), the preferred alternative for the SRE facility location is Alternative Three. The building will be located to the west of the ARFF facility on Varney Lane. This site was preferred for the following reasons.

- Staff want to locate the SRE equipment inside the fence.
- It is expected that materials and equipment can both be stored in the new facility.
- Compared to SRE Alternative Two, the preferred alternative is closer to the passenger terminal, and does not displace existing development.

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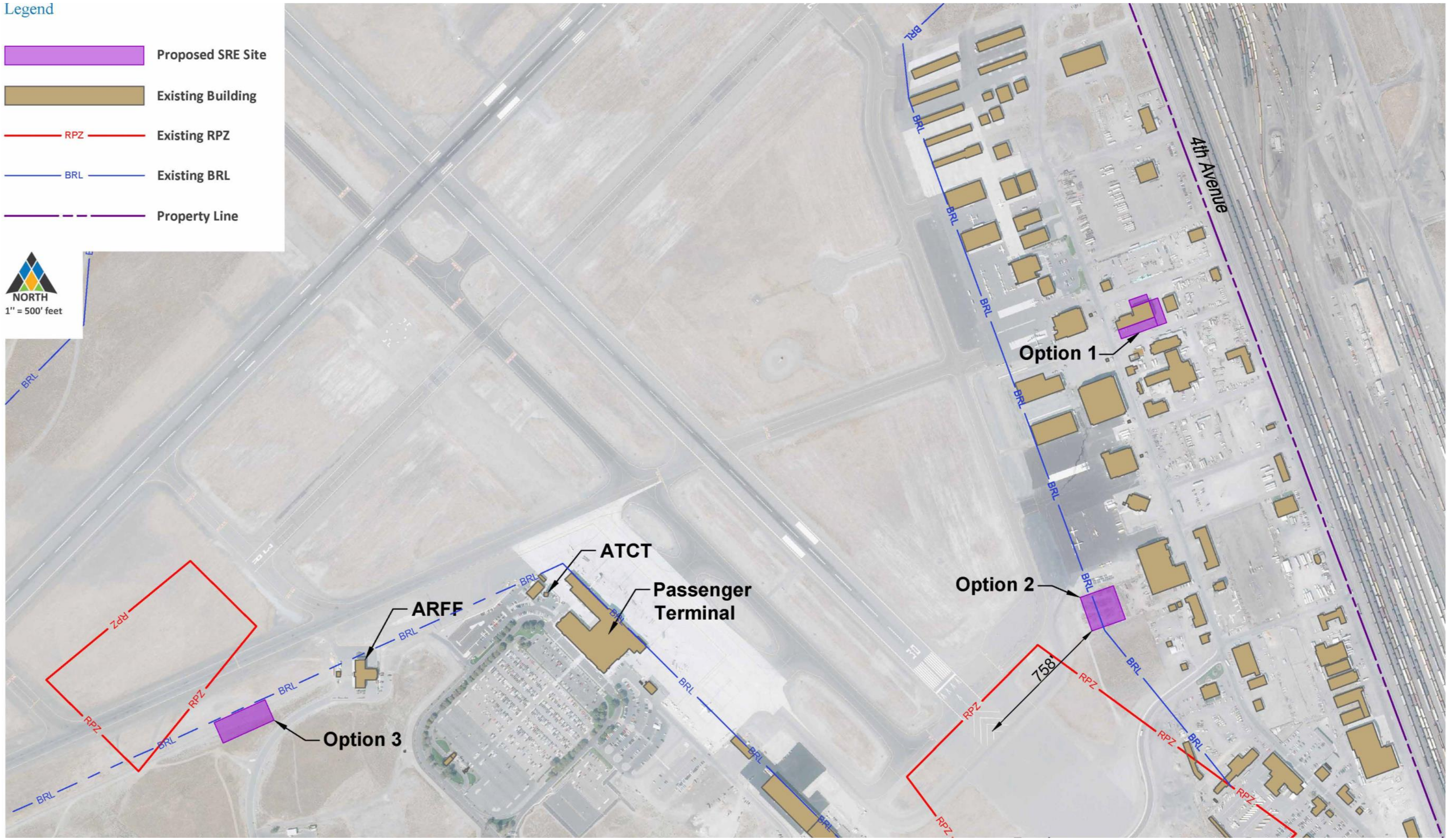
Figure 4-18: SRE & Maintenance Facility Alternative Locations



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Deicing Pad Alternatives

The existing deicing pads can accommodate two ADG III aircraft simultaneously, but a lack of maneuvering space into and out of the deice pads reduces efficiency. Redesigning the existing pads or providing improvements in the same general area will accommodate more aircraft simultaneously and minimize the taxi time from the deicing pads to the departure runway. There are five deicing pad alternatives.

Deicing Pad Alternative One

Alternative One expands the deicing pad to accommodate two ADG III (B 737-900 or A321-200) aircraft simultaneously with additional aircraft queuing. Portions of the air cargo apron will be displaced to allow aircraft to enter and exit under their own power. **Figure 4-19** shows the deicing pad configuration.

Deicing Pad Alternative One Advantages

- This alternative will meet the capacity requirements for two ADG III aircraft.
- This alternative will utilize the existing fluid containment system with moderate changes.

Deicing Pad Alternative One Disadvantages

- This alternative displaces a portion of the air cargo apron.
- This alternative requires removal of the old FAA Service Tech building.
- This alternative requires relocation of the deicing fluid tank and ground service equipment storage.

Deicing Pad Alternative Two

Alternative Two is identical to Alternative One except the air cargo apron will not be affected. Alternative Two requires moving Security Identification Display Area (SIDA) apron markings 46 feet closer to the terminal building. This shift allows aircraft to enter and exit under their own power. **Figure 4-20** shows the deicing pad configuration.

Advantages

- This alternative meets the capacity requirements for two ADG III aircraft.
- This alternative utilizes the existing fluid containment system with minimal changes.
- This alternative does not displace a portion of the air cargo apron.

Disadvantages

- This alternative requires removal of the old FAA Service Tech building.
- This alternative may require relocation of deicing fluid tank.
- This alternative requires relocation of the ground service equipment storage area.
- This alternative requires relocation of the SIDA markings closer to terminal.

Deicing Pad Alternative Three

Alternative three expands the existing deicing pad to allow room for three ADG II (Q400, ATR-72, and CRJ 700) aircraft to deice simultaneously and allow additional ADG II aircraft to be in the queue. Alternative Three also provides three sub-alternatives to accommodate an additional ADG III-sized aircraft deicing pad to be located inline on a taxiway or taxilane. ADG III aircraft Alternative One will be southeast of the existing deicing pads. ADG III aircraft Alternative Two will be on a future taxilane connecting to Taxiway D. ADG III aircraft Alternative Three will be north of the existing deicing pads along the terminal apron taxilane. **Figure 4-21** shows the deicing pad reconfiguration.

Deicing Pad Alternative Three Advantages

- Three ADG II aircraft can deice simultaneously.
- Retains the existing fluid containment system with minor changes (ADG III Alt. One).
- The deicing fluid tank may not need to be relocated.

Deicing Pad Alternative Three Disadvantages

- Capacity for only one ADG III aircraft at a time.
- Removal of the old FAA Service Tech building.
- Relocation of the ground service equipment storage area.
- Requires modification to the existing fluid containment system (ADG III Alts. Two and Three)
- ADG III aircraft Alternative Two is unlikely to share deicing vehicles with the ADG II deicing pads, increasing equipment and staffing requirements.

Deicing Pad Alternative Four

Alternative Four is identical to Alternative Three except that the SIDA markings will be relocated 46 feet closer to the terminal building. The ADG III aircraft deicing pad Option Three shifts to the north to accommodate taxiing aircraft out of the ADG II deicing pads. **Figure 4-22** shows the deicing pad configuration.

Deicing Pad Alternative Four Advantages

- The same as Alternative Three, except that this alternative does not affect the FAA service tech building.

Deicing Pad Alternative Four Disadvantages

- Capacity for only one ADG III aircraft at a time.

Figure 4-19: Deicing Pad Alternative One

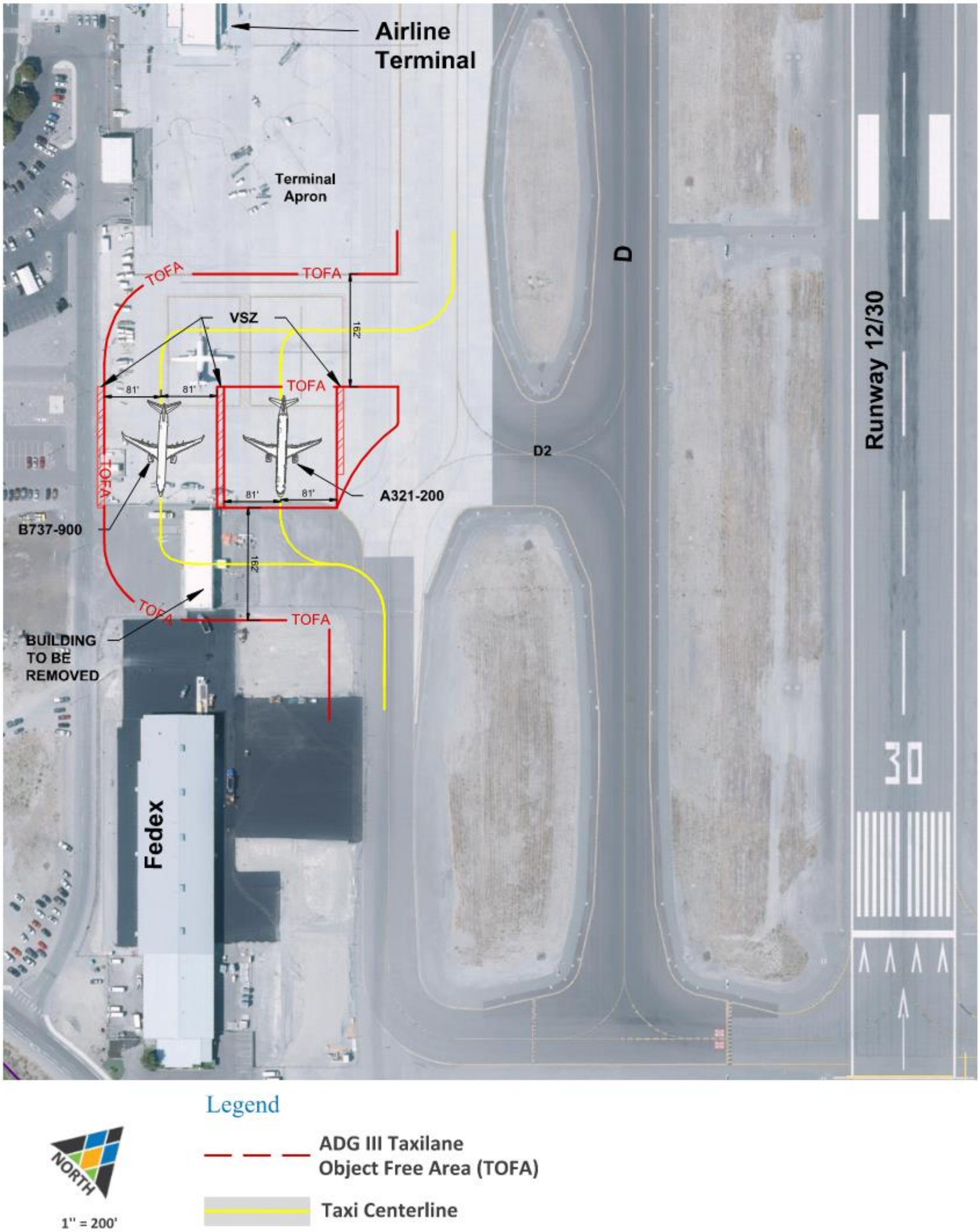


Figure 4-20: Deicing Pad Alternative Two

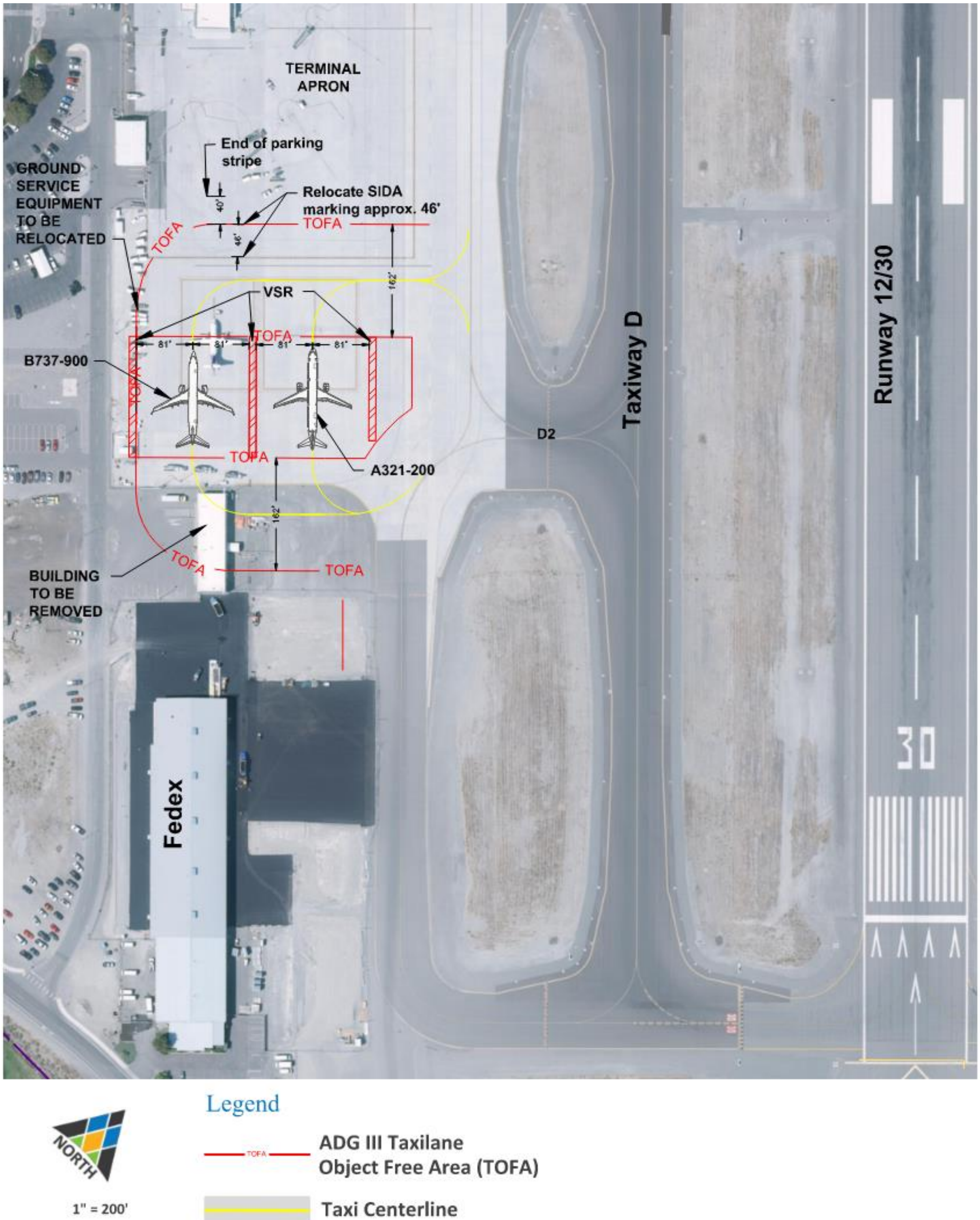


Figure 4-21: Deicing Pad Alternative Three

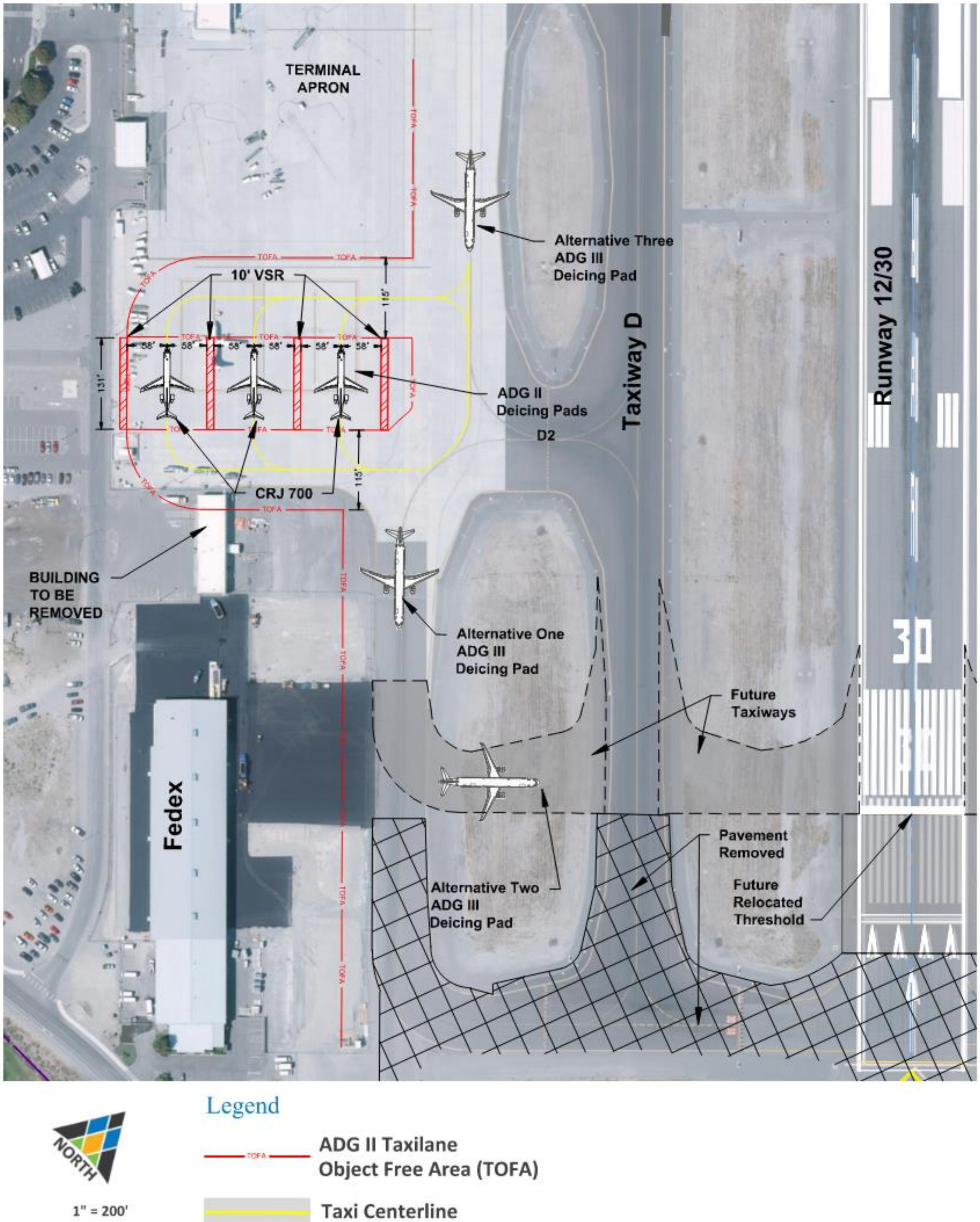
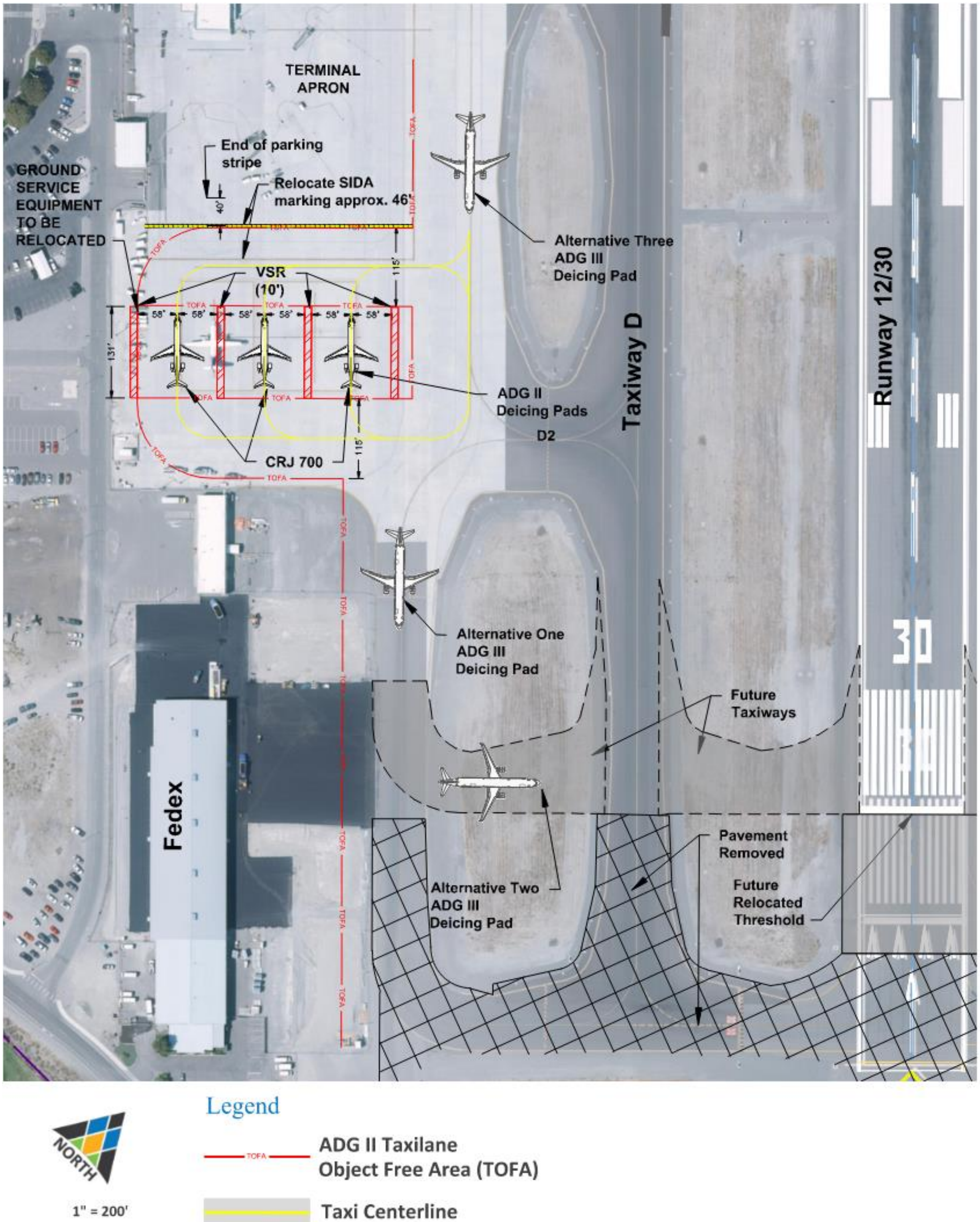


Figure 4-22: Deicing Pad Alternative Four



Deicing Pad Alternative Five

Alternative Five expands the existing deicing pad with space for one ADG III aircraft and one ADG II aircraft to deice simultaneously and will allow for additional aircraft to be in the queue. The SIDA markings will be relocated 46 feet closer to the terminal building to allow aircraft to taxi into and out of the deicing pads under their own power without affecting the air cargo apron and the existing deicing fluid tank. **Figure 4-23** shows the deicing pad reconfiguration.

Advantages

- Efficiency of the existing deicing pads is improved as aircraft can taxi in and out from both at the same time.
- The existing fluid containment system can be utilized with minimal changes.
- The deicing fluid tank is not affected.
- The air cargo apron is not affected.

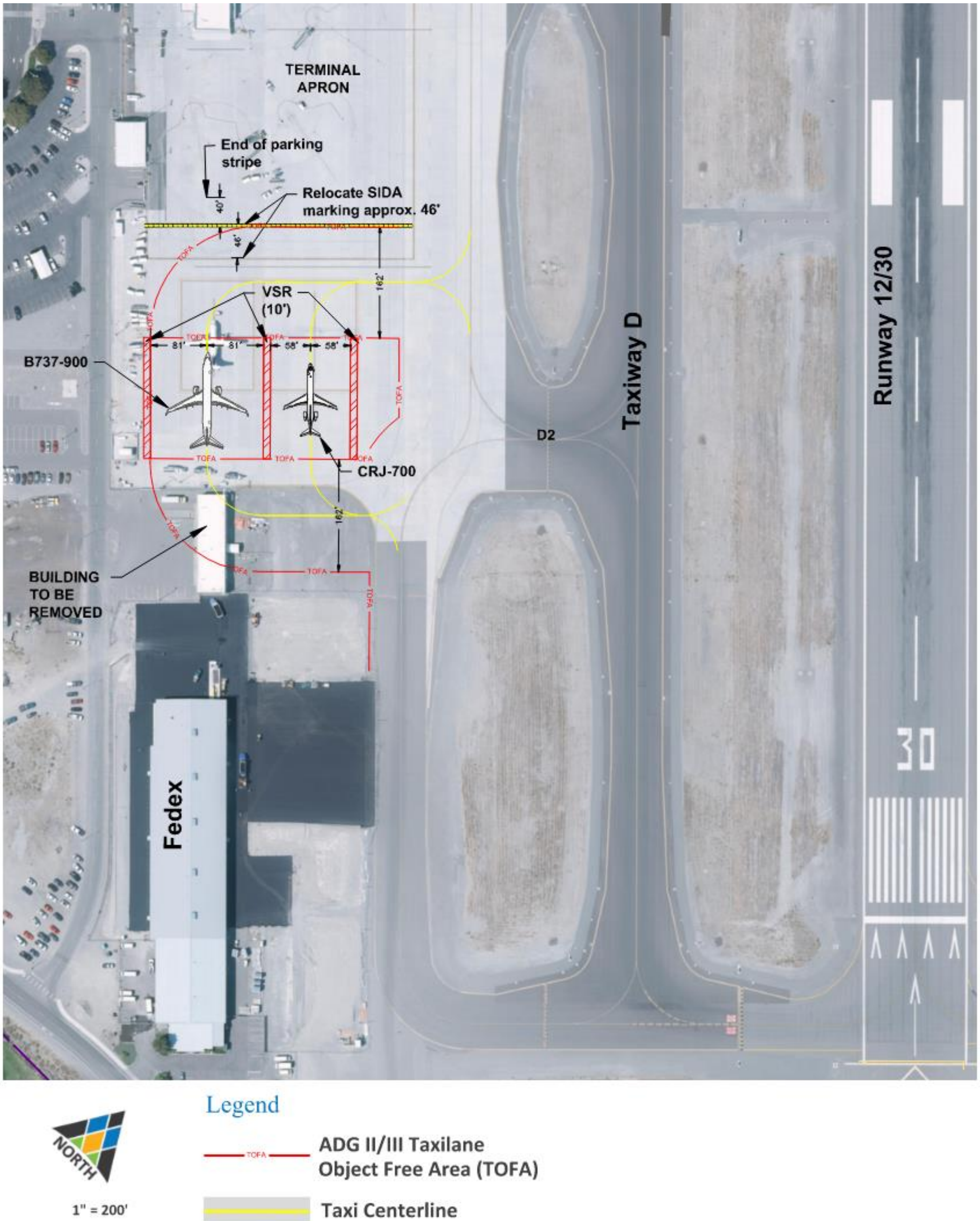
Disadvantages

- Capacity is only provided for one ADG III aircraft and one ADG II aircraft.

Preferred Deice Pad Alternative

After review by the Airport and stakeholders in the Planning Advisory Committee, the preferred deicing pad alternative is Alternative Three. This alternative provides access for three ADG II aircraft on the existing deice pad with the least modifications to existing facilities and structures. It also provides for an ADG III aircraft on a deice pad incorporated into the new taxiway design for the relocated Runway End 30.

Figure 4-23: Deicing Pad Alternative Five



ATCT Siting Alternatives

ATCT personnel desire a new tower on the west side of PSC to eliminate unfavorable operational conditions and to maximize visibility to all controlled movement areas. The existing tower eye height of 51.5 feet was used for the line of sight and shadow study. The determination of a future tower height is not set as it is beyond the scope of services for this Master Plan.

ATCT Alternative One

The ATCT Alternative One site will be located 1,900 feet west of the intersection of Runways 3L/31R and 12/30. This location provides uninterrupted views of all controlled movement areas, but the terminal building will obstruct views to the uncontrolled movement area of the taxilane along the air cargo apron. The maximum turning angle to view Runway End 3L and future Runway End 12 will be an approximate 230 degrees. The viewing distances to all existing and future runway ends is balanced, with the distance to future Runway End 12 the greatest of the four alternatives. ATCT Alternative One is shown in **Figure 4-24**.

ATCT Alternative One Advantages

- This is the closest site of the four alternatives to the controlled movement areas.
- Views of the controlled movement areas are unobstructed.

ATCT Alternative One Disadvantages

- A maximum turning angle required to view all existing and future runway ends.
- The terminal obstructs views of the taxilane along air cargo apron.
- This alternative has the greatest viewing distance to future Runway End 12.

ATCT Alternative Two

ATCT Alternative Two will be located 2,900 feet west of the intersection of Runways 3L/21R and 12/30. This location reduces the maximum turning angle required to view the ends of existing Runway End 3L and future Runway End 12 to 200 degrees. However, the terminal building obstructs views to the controlled movement area of the south end of Taxiway D and D1, as well as the air cargo apron and portions of the terminal apron taxilane. The viewing distances to all existing and future runway ends is comparable to Alternative One. ATCT Alternative Two is shown in **Figure 4-25**.

ATCT Alternative Two Advantages

- Turning angle required to view the runway ends is less than Alternative One.
- Viewing distances to the runway ends are more balanced than Alternative One.

ATCT Alternative Two Disadvantages

- The terminal obstructs views of the taxilane along air cargo apron.

Figure 4-24: **ATCT Siting Alternative One**

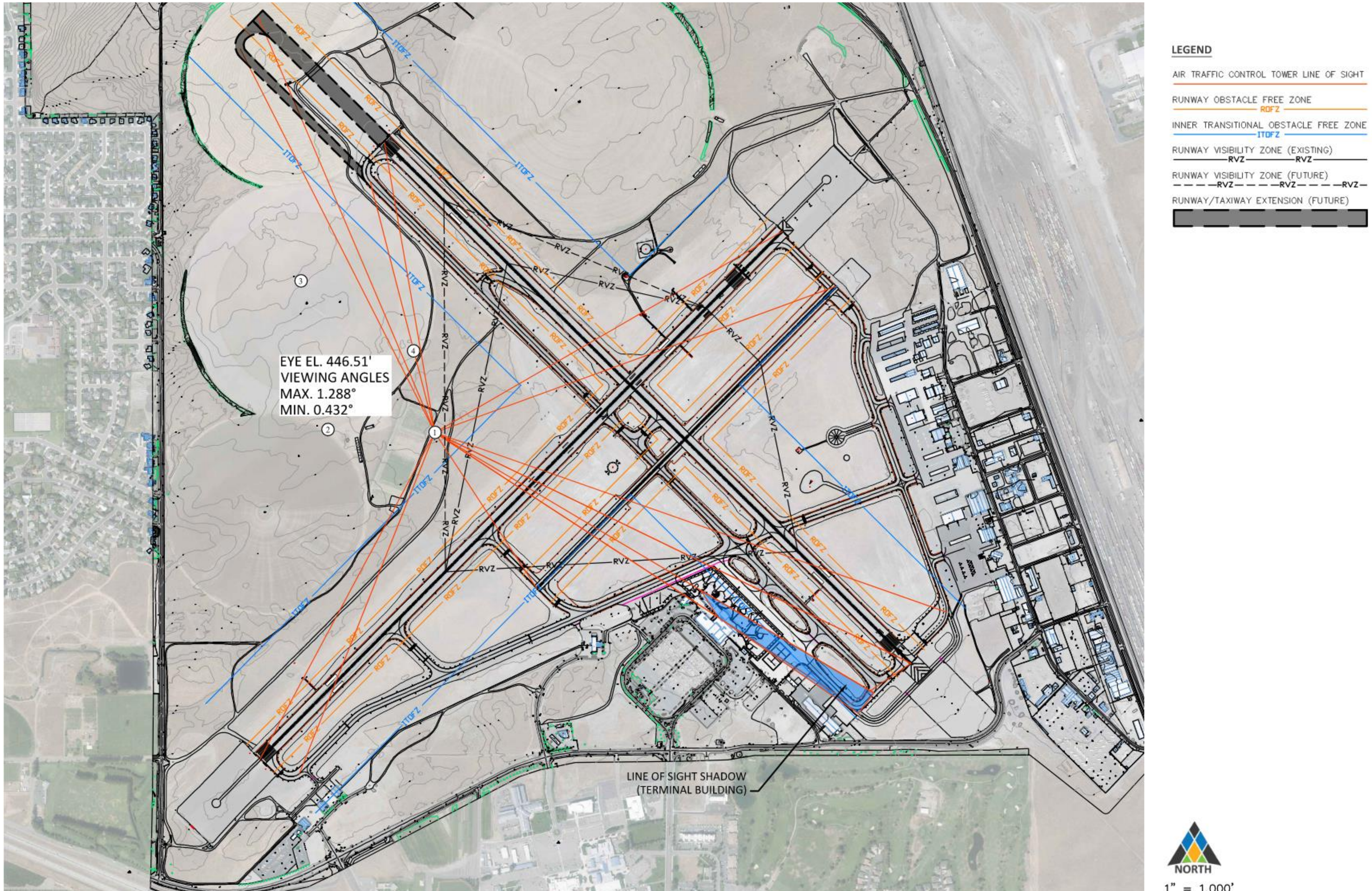
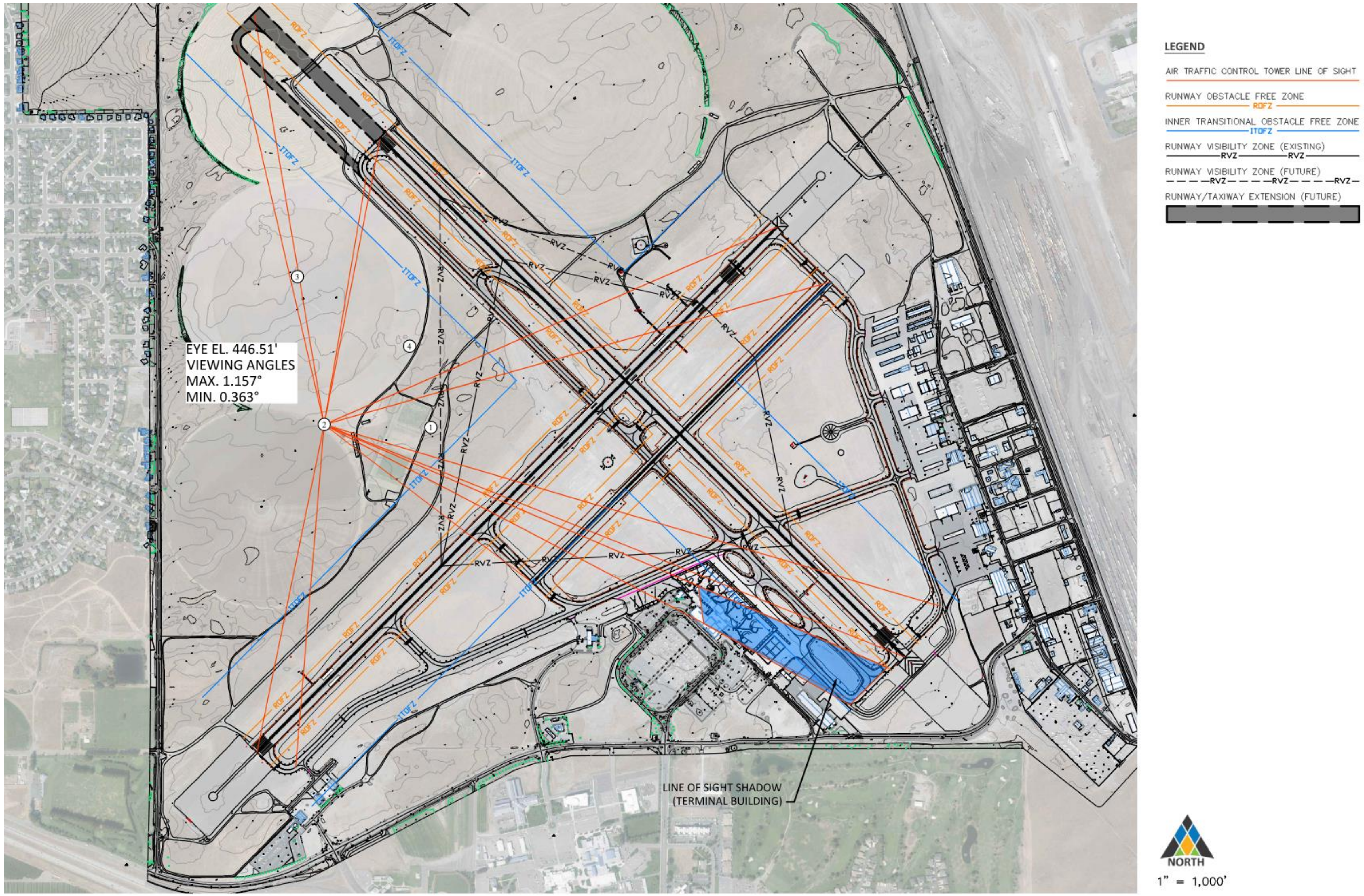


Figure 4-25: ATCT Siting Alternative Two



ATCT Alternative Three

This alternative is 3,600 feet northwest of the intersection of Runways 3L/31R and 12/30. This location reduces the maximum turning angle required to view the ends of Runway End 3L and future Runway End 12 to an approximate 194 degrees. However, in this location the VORTAC will obstruct views to Runway End 21R. This site has the greatest viewing distance to Runway End 30 and the terminal apron of the four alternatives. ATCT Alternative Three is shown in **Figure 4-26**.

ATCT Alternative Three Advantages

- The lowest turning angle to view all existing and future runway ends.

ATCT Alternative Three Disadvantages

- The VORTAC antenna will obstruct views to Runway End 21R.
- Greatest viewing distance to Runway End 30 and the terminal apron.

ATCT Siting Alternative Four

This alternative is 2,300 feet northwest of the intersection of Runways 3L/21R. This location uses the favorable components of the three previous alternatives while minimizing the unfavorable ones. There are unobstructed views to the controlled and uncontrolled movement areas. The maximum turning angle to view Runway End 3L and future Runway End 12 is 226 degrees. The viewing distances to existing and future runway ends is comparable to Alternative One. ATCT Alternative Four is shown in **Figure 4-27**.

ATCT Alternative Four Advantages

- Unobstructed views to controlled and uncontrolled movement areas.

ATCT Alternative Four Disadvantages

- The second greatest turning angle to view all existing and future runway ends.

PREFERRED ATCT SITING ALTERNATIVE

After review by the Airport and stakeholders in the Planning Advisory Committee, the preferred alternative for a future ATCT location is Alternative Four. This alternative is closer to the primary and secondary runway ends than the others considered and does not have a blind spot associated with the terminal building like the other alternatives.

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Figure 4-26: ATCT Siting Alternative Three

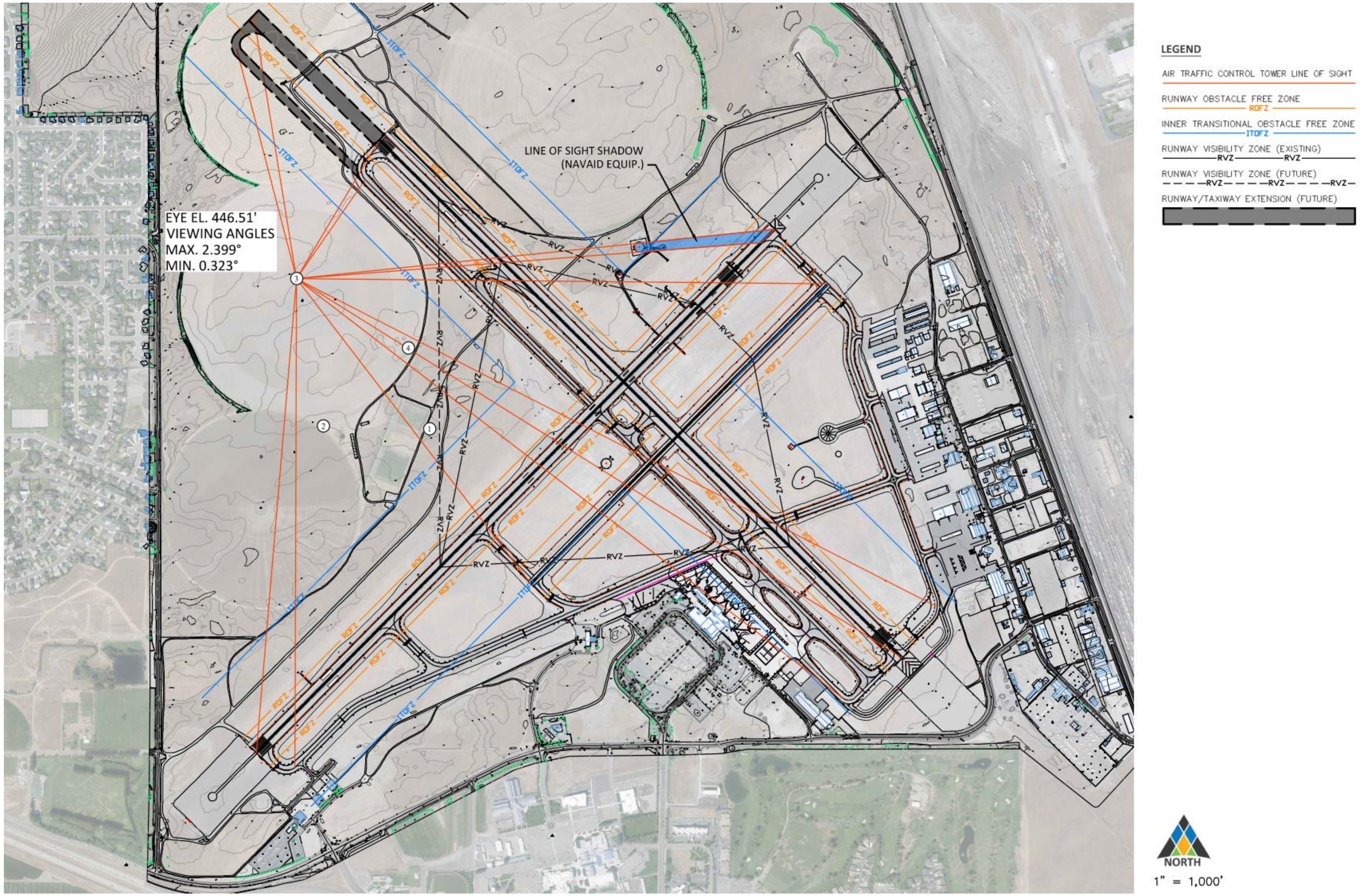
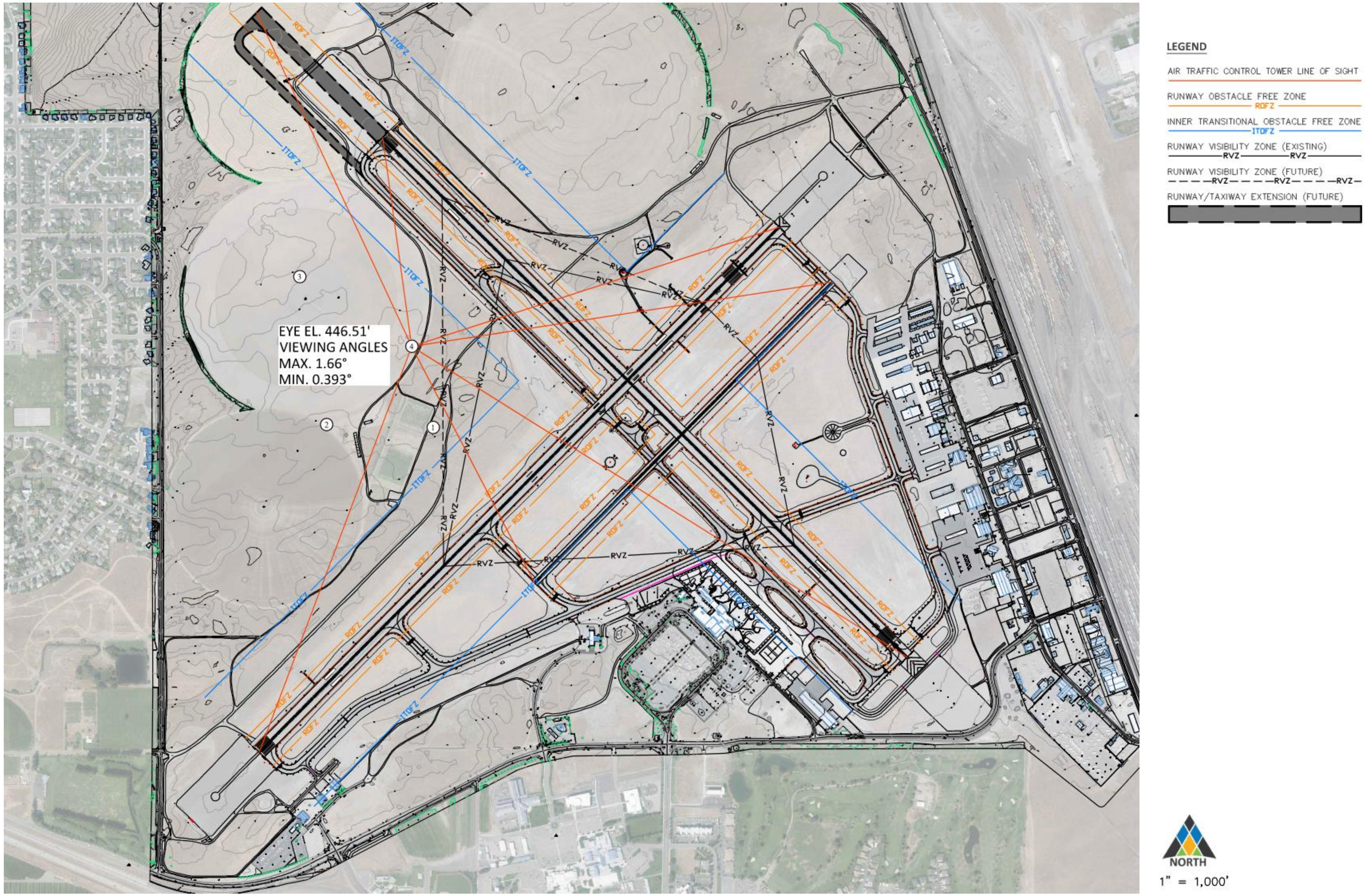


Figure 4-27: ATCT Siting Alternative Four



AUTO PARKING AND CIRCULATION ALTERNATIVES

This section provides an overview of parking and circulation design alternatives. These are based on future enplanement projections and a projected overall parking deficit of roughly 300 spaces by about 2032. The alternatives presented here are not exhaustive; many opportunities are available to expand surface parking to the east and south of the credit card lot, and for garage design and location.

The existing parking inventory at PSC is 2,184 spaces, excluding a roughly 50-space unpaved area used for rental car overflow. Assuming no changes to the current parking inventory, PSC is projected to have enough capacity to accommodate projected demand through roughly 2027. Most of the parking deficit after 2027 is expected to occur in long-term parking, employee parking, and rental car spaces.

Cell Phone Waiting Lot

In early 2019, PSC added a 10-space cell phone waiting lot located within a portion of the existing employee parking lot. Drivers who are picking up passengers may use this parking lot for free but must remain inside their vehicle. For the future supply alternatives, a new cell phone waiting lot is located just south of the improved and/or expanded credit card overflow lot. Many airports choose to locate their cell phone waiting areas prior to the terminal. This way, drivers do not have to circulate past the terminal before arriving at the cell phone lot, and do not have to circulate back around for pick-up. Additionally, locating the cell phone lot to the south of the overflow lot will allow for future expansion as needed. A separate curb cut for ingress and egress may be needed to allow for access to the new cell phone lot without a credit card.

Auto Parking Alternatives

Auto Parking Alternative Criteria and Assumptions

Four garage and surface parking lot alternatives have been developed based on the following criteria and assumptions:

- A new 3,000-square-foot RAC facility can be incorporated into one of the possible garage alternatives, likely on the ground level, or can be located as a freestanding building in one of the surface lots.
- Garage alternatives are scalable, with the option to add bays and floors.
- All alternatives will maintain the existing counter-clockwise circulation on the terminal roadway and will limit (to the extent possible) cross-traffic conflicts between pedestrians, parking customers, drop-off/pick-up at the terminal building, and rental car operations.
- All garage options shown are relatively efficient and can be constructed in the range of $65/square foot, or around $20,000 - $25,000 per space.

Garage Parking Alternative One

Garage Alternative One will develop a mixed-use parking garage on the location of the existing short-term parking surface lot. User groups for this garage will be rental cars on the ground level, and public (short-term and premium long-term) parking on levels two and three. This brings rental car pickup and drop off operations closer to the center of the terminal building, which will enhance the customer experience. The garage could have vehicular entries and exits located to complement the existing roadway circulation system and not create cross traffic. Express ramps could create user group separation and allow for all flat floor parking in the garage, which enhances wayfinding and passive security on each level. it is possible to add additional bays to the south side of the garage if more structure capacity is needed.

Rental car staging and quick turnaround area (QTA) areas are located just east of the terminal roadway providing convenient access for rental car operations to and from the ready-return area. Access across the terminal roadway for rental car activities would need additional analysis to avoid conflicts with public access on the main road.

Long term and credit card parking would remain in surface lots south of the rental car garage. As shown in **Table 4-1,** this alternative provides PSC with roughly 2,633 parking spaces, assuming staging for up to roughly 115 rental cars in the QTA facility at peak times. **Figure 4-28** shows this alternative relative to the terminal roadway, terminal building, and existing surface parking lots.

Table 4-1: Garage Parking Alternative One Parking Supply

	Existing Supply (remaining)	Projected Supply	Projected Need (2032)	Projected Surplus/Deficit
Short-term Parking				
Garage (Level 2)	0	200		
Short-Term Totals	**0**	**200**	**160**	**40**
Long-Term Parking				
Long-Term Lot	1,224	1,169		
Credit Card Lot	110	110		
Rental Car west (reassigned)	250	250		
Garage premium (Level 3)	0	200		
Long-Term Totals	**1,584**	**1,729**	**1,590**	**139**
Employee Parking				
Employee Lot	177	177		
FAA (ATCT)	35	35		
Overflow (reassigned)	92	92		
Employee Totals	**304**	**304**	**330**	**(26)**
Rental Parking				
Rental Car - east	105	105		
Rental Car QTA (as needed)	0	115		
Garage (Level 1)	0	180		
Rental Car Totals	**105**	**400**	**400**	**0**
TOTALS:	**1,993**	**2,633**	**2,480**	**153**

Source: Walker Consultants, 2019

Advantages

- Provides the most ultimate parking spaces (i.e., 2,633).
- Provides the highest LOS for rental car and garage customers.
- Improves LOS for many long-term customers.
- Many parking customers bypass the terminal roadway on exiting.

Disadvantages

- Higher cost for garage construction than surface lots.
- Greatest level of operational disruptions during construction.
- Less convenient path of travel for rental car operations between ready-return and QTA.

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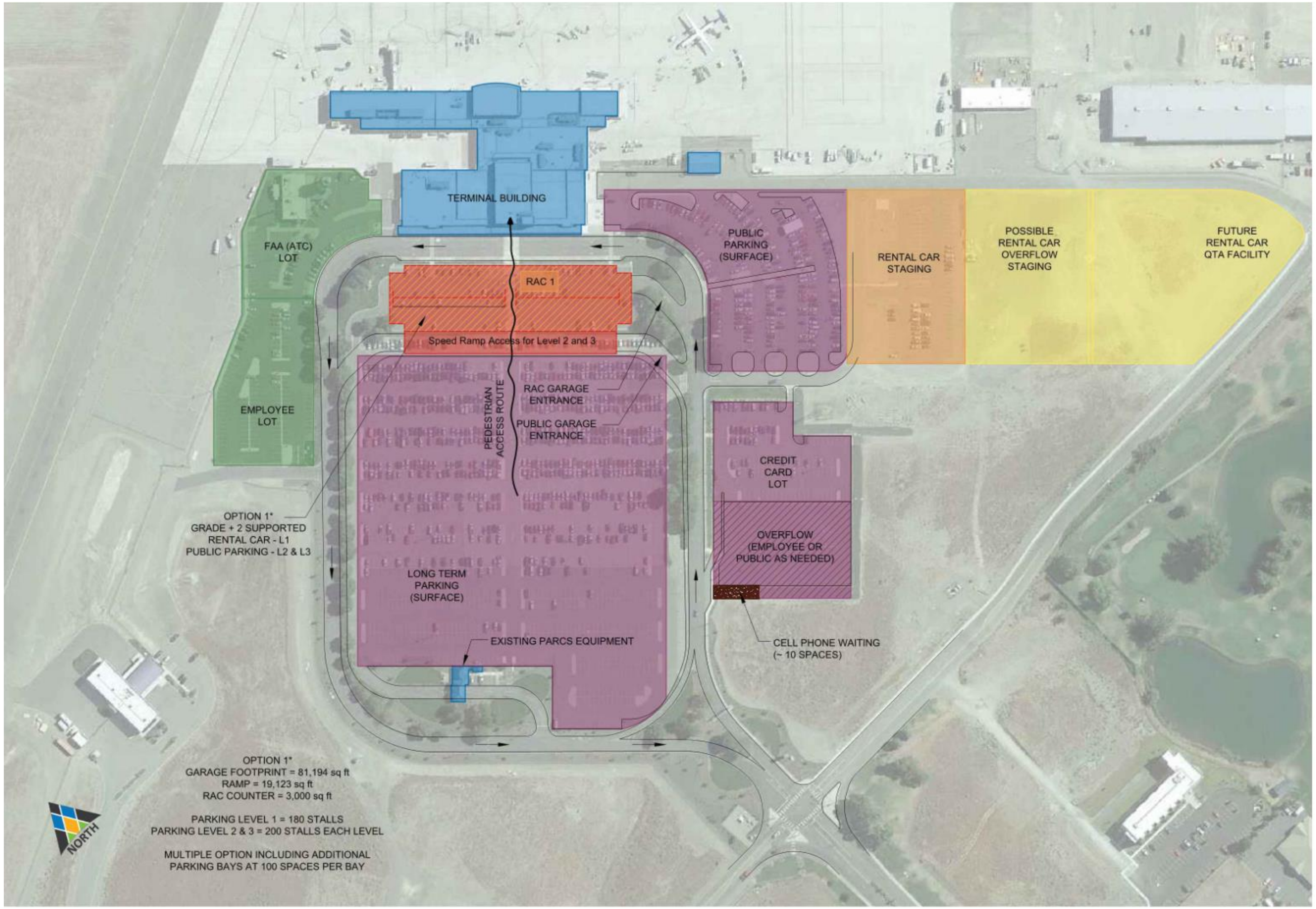
Figure 4-28: Garage Parking Alternative One



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Garage Parking Alternative Two

Garage Alternative Two locates a mixed-use parking garage just east of the terminal roadway on the existing rental car surface lot. Rental car users will use the ground level of this garage, and public (premium long-term) parking will be on levels two and three. This alternative will bring rental car pickup and drop off operations closer to the east end of the main terminal building, which will enhance the customer experience on both drop off and pickup. An express ramp can be located on the east side of the garage that can create user group separation and allow for all flat floor parking in the garage, which will enhance wayfinding and passive security on each level. It is possible to add additional bays to the garage on the east side if more structure capacity is needed.

Rental car staging and QTA areas are located just east of the proposed structure, which will improve the proximity of these areas compared to Garage Parking Alternative One. Having the rental car staging and QTA areas in this location will essentially eliminate all intermingling of public and rental car operations.

Long-term and credit card parking will remain in the surface lots south of the rental car garage, and short-term parking can remain directly across from the terminal. As shown in **Table 4-2,** this alternative will provide PSC with roughly 2,601 parking spaces and require less staging of rental cars in the QTA facility. **Figure 4-29** shows alternative relative to the terminal roadway, terminal building, and existing surface parking lots.

Table 4-2: Garage Parking Alternative Two Parking Supply

	Existing Supply (remaining)	Projected Supply	Projected Need (2032)	Projected Surplus/Deficit
Short-Term Lot	191	191		
Short-Term	**191**	**191**	**160**	**31**
Long-Term Lot	1,224	1,224		
Credit Card Lot	110	110		
Garage premium (Levels 2 and 3)	0	372		
Long-Term	**1,334**	**1,706**	**1,590**	**116**
Employee Lot	177	177		
FAA (ATCT)	35	35		
Overflow (reassigned)	92	92		
Employee	304	304	330	(26)
Rental Car - east	105	105		
Rental Car QTA (as needed)	0	109		
Garage (Level 1)	0	186		
Rental Car	105	400	400	0
TOTALS:	**1,934**	**2,601**	**2,480**	**121**

Source: Walker Consultants, 2019

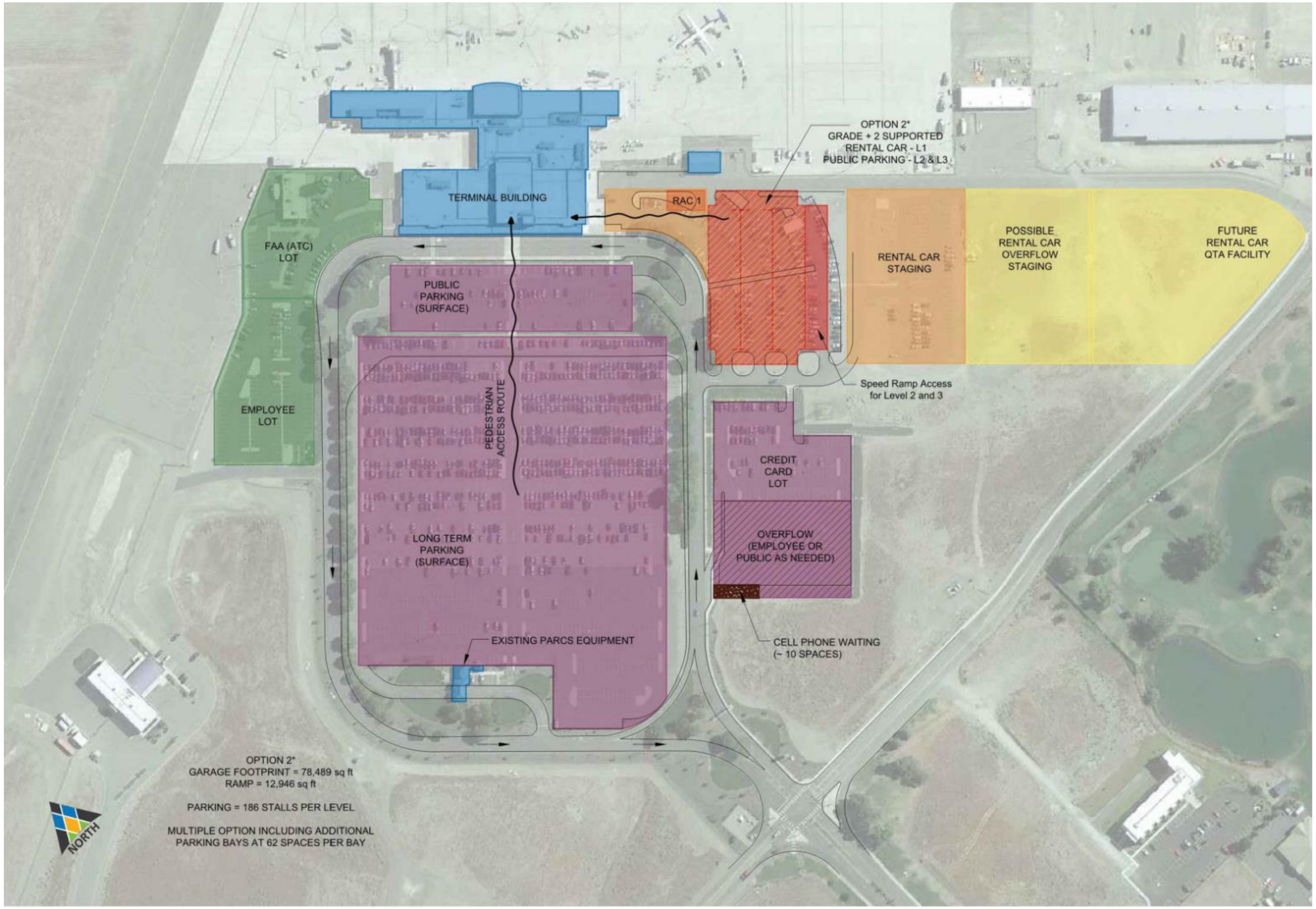
Advantages

- Alternative Two provides 2,601 parking spaces.
- This alternative nearly equals the LOS improvements offered by Garage Parking Alternative One.
- This alternative offers the best option for rental car operations with minimal conflicts with other users.
- This alternative has fewer disruptions to operations during construction, except for the RAC.
- This alternative offers a safer and potentially covered pedestrian connection between the terminal and the RAC/parking garage.

Disadvantages

- This alternative will generate a higher cost for garage construction than surface lots.
- Vehicles exiting garage will have to pass by terminal building, adding to congestion.

Figure 4-29: **Garage Parking Alternative Two**



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Surface Parking Alternative One

Surface Alternative One provides short-term parking and rental car pickup and drop off on the location of the existing short-term parking surface lot. Locating both functions across from the terminal building will create a greater customer experience. Creating an access roadway on the south side will allow for entry and exit on the south rather than creating additional traffic on the terminal roadway at the front door of the terminal. Separating the rental car lot (on the east) and the short-term lot (on the west) with an enhanced pedestrian connection reduces the amount of pedestrian/vehicular conflicts.

Rental car staging and QTA areas will be located on the east side of the existing terminal roadway creating convenient access to and from the ready-return area. However, access across the existing terminal roadway for rental car activities will need additional analysis to prevent conflicts with public access on the main roadway. This alternative creates a back-door access to rental car staging on the east side of the terminal building. Other alternatives for this area may warrant additional study.

This alternative allows for an additional employee parking east of the terminal building as needed. As shown in **Table 4-3,** this alternative will provide PSC with roughly 2,528 spaces and staging for up to 130 rental cars in the QTA facility. **Figure 4-30** shows this alternative relative to the terminal roadway, terminal building, and existing surface parking lots.

Table 4-3: Surface Parking Alternative One Parking Supply

	Existing Supply (remaining)	Projected Supply	Projected Need (2032)	Projected Surplus/Deficit
New Short-term lot	0	200		
Short-Term	**0**	**200**	**160**	**40**
Long-Term Lot	1,224	924		
Credit Card Lot	110	110		
Overflow Lot	92	92		
Expanded Surface Lot	0	470		
Long-Term	**1,426**	**1,596**	**1,590**	**6**
Employee Lot	177	177		
FAA (ATCT)	35	35		
Expanded Surface Lot	0	120		
Employee	**212**	**332**	**330**	**2**
RC - East and West	0	100		
Rental Car QTA (as needed)	0	130		
New ready-return Lot	160	170		
Rental Car	**160**	**400**	**400**	**0**
TOTALS:	**1,798**	**2,528**	**2,480**	**48**

Source: Walker Consultants, 2019

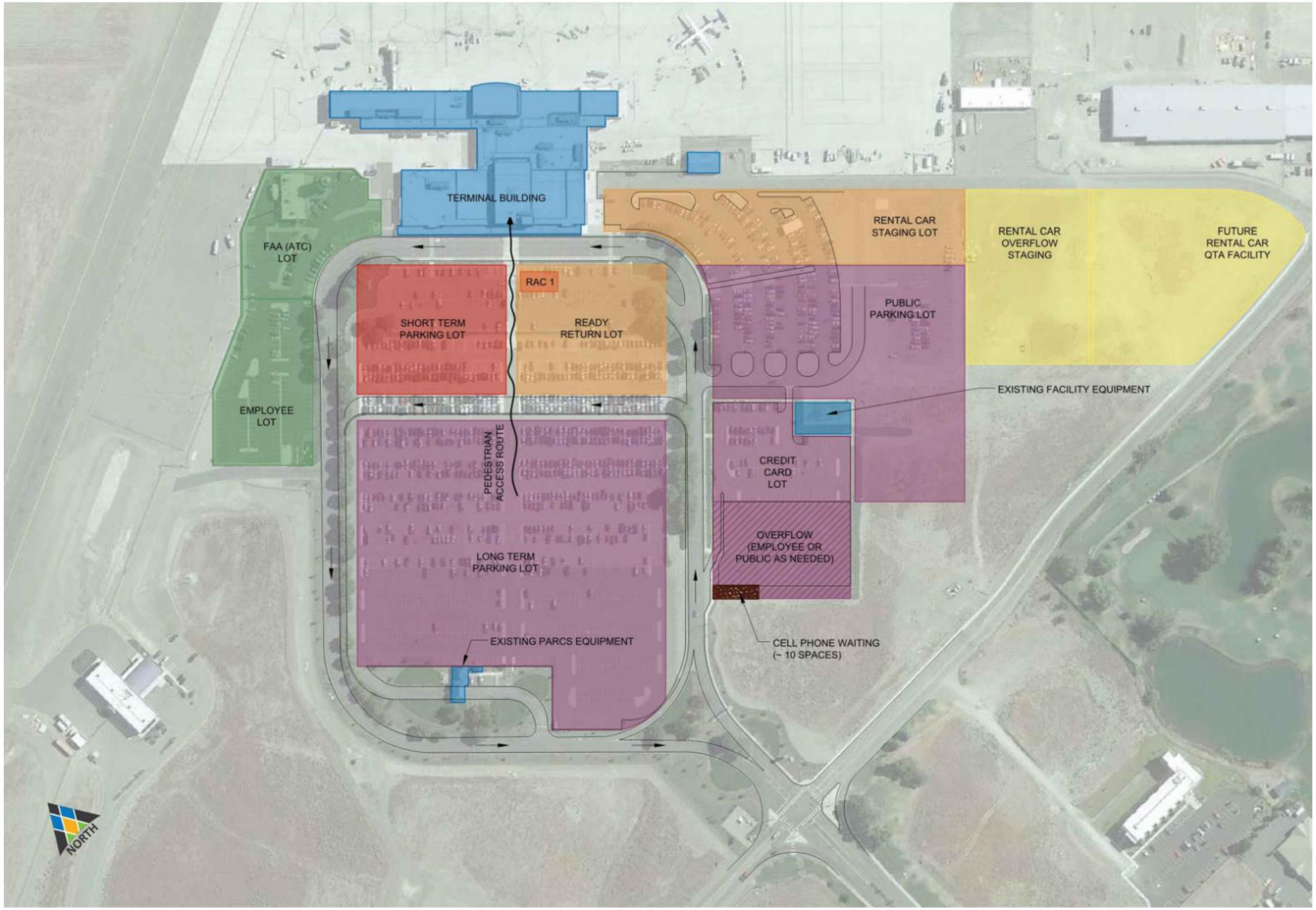
Advantages

- Surface Alternative One lowers costs because of surface parking construction rather than a parking garage.
- This alternative represents a high LOS for RAC and ready return.
- Many parking customers will bypass the terminal roadway on exiting.

Disadvantages

- This alternative provides the least number of ultimate parking spaces (i.e., 2,528).
- This alternative offers a lower LOS for long-term parking than the garage alternatives.
- This alternative means a moderate level of operational disruptions during construction.
- This alternative offers a less convenient path of travel for rental car operations between ready-return and QTA.

Figure 4-30: Surface Parking Alternative One



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Surface Parking Alternative Two

Surface Alternative Two will locate all rental car activities to the east of the terminal building and roadway. A covered or enclosed walkway will provide access to the customer counters and will not require customers to cross the terminal roadway.

This alternative locates rental car staging and QTA areas on the east side of the existing terminal roadway creating convenient access to and from the ready-return area. This will effectively eliminate all intermingling of public and rental car operations. Employee overflow parking and additional long-term parking can be created adjacent to the existing credit card lot.

This alternative would likely be the least expensive to build and would leave many facilities with the same configuration as they have today. As shown in **Table 4-4,** this alternative will provide PSC with roughly 2,529 spaces and staging for up to 75 rental cars in the QTA facility. **Figure 4-31** presents this alternative in relation to the terminal roadway, terminal building, and existing surface parking lots.

Table 4-4: Surface Parking Alternative Two Parking Supply

	Existing Supply (remaining)	Projected Supply	Projected Need (2032)	Projected Surplus/Deficit
Short-Term Lot	191	191		
Short-Term	**191**	**191**	**160**	**31**
Long-Term Lot	1,224	1,224		
Credit Card Lot	110	110		
Overflow Lot	92	92		
Expanded Surface Lot	0	180		
Long-Term	**1,426**	**1,606**	**1,590**	**16**
Employee Lot	177	177		
FAA (ATCT)	35	35		
Expanded Surface Lot	0	120		
Employee	**212**	**332**	**330**	**2**
Rental Car - East	105	105		
Rental Car - West	250	220		
Rental Car QTA (as needed)	0	75		
Rental Car	**355**	**400**	**400**	**0**
TOTALS:	**2,184**	**2,529**	**2,480**	**49**

Source: Walker Consultants, 2019

Advantages

- Alternative Two is the least expensive to construct.
- This alternative creates the lowest level of operational disruptions during construction.
- This alternative represents a high LOS for RAC with minimal conflict with other users.
- Many parking customers will bypass the terminal roadway on exiting.

Disadvantages

- This alternative provides only 2,529 parking spaces.
- This alternative will not significantly improve upon existing operations.
- This alternative represents the lowest LOS for some long-term customers.

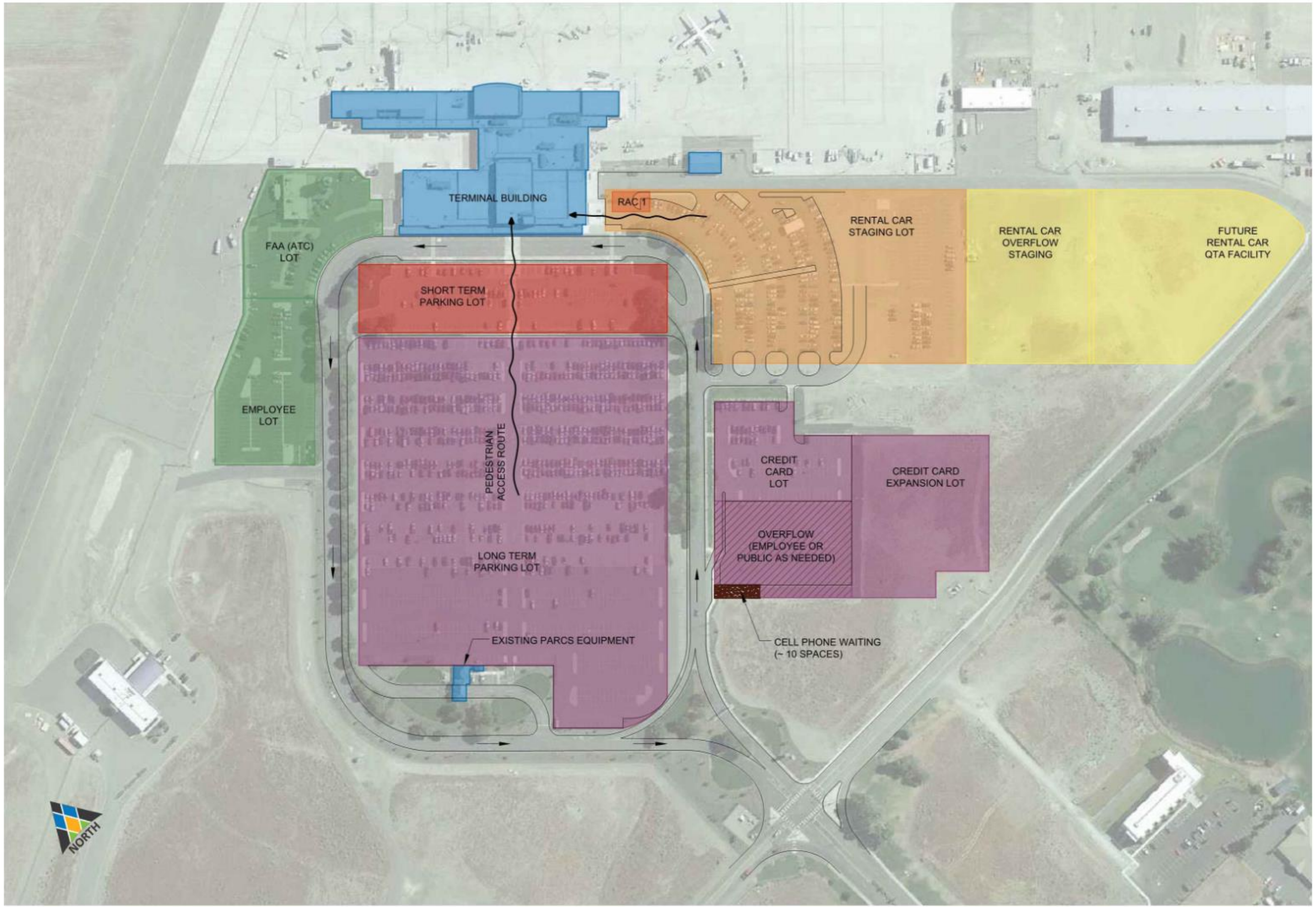
Parking Summary

The four alternatives accomplish the parking supply objective to expand capacity to meet the projected parking needs under future conditions by 2032. All are scalable if growth occurs more rapidly than projected. Also, the alternatives are not mutually exclusive, meaning that PSC could opt to pursue Surface Parking Alternative Two and still develop Garage Parking Alternative Two later.

PREFERRED PARKING ALTERNATIVE

After review by the Airport and stakeholders in the Planning Advisory Committee, the preferred alternative for the future parking configuration is Garage Parking Alternative Two. Additionally, PSC is considering making use of solar panels over the short-term parking areas to offset the electrical demands for lighting.

Figure 4-31: Surface Parking Alternative Two



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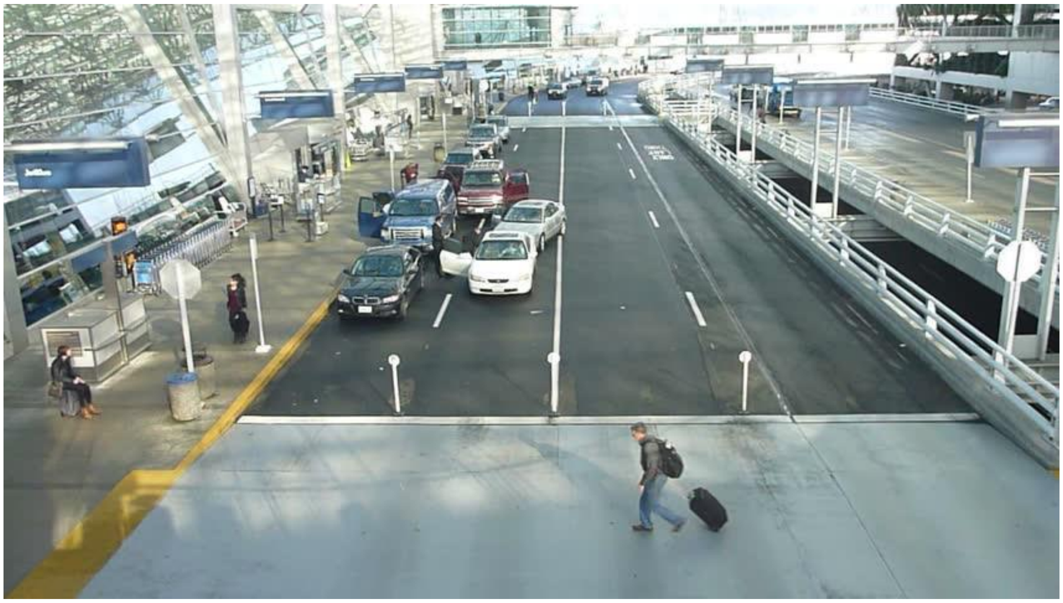
Roadway Configuration Options

No additional roadway lane capacity will be needed for the terminal roadway to accommodate projected traffic. However, it is recommended that the roadway adjacent to the terminal building be widened by roughly 5 feet and restriped to add extra width to the two lanes nearest the terminal. This will accommodate two lanes of customer pick-up and drop-off. Additional enforcement is also recommended to keep traffic moving.

All parking alternatives presented show a widened roadway with either the removal or re-design of the existing sidewalk on the south side of the terminal. Under this Alternative, east-west pedestrian circulation will occur on the north side of the road, adjacent to the terminal building, and/or can be included in the design parameters for Garage Parking Alternative One or Surface Parking Alternative One. **Figure 4-32** and **Figure 4-33** shows the single lane load/unload at PSC, and the Two-Lane load/unload from Portland International Airport

Figure 4-32: Single Lane Load/Unload Example

Figure 4-33: Two Lane Load/Unload Example



Other Design Related Considerations

EV Charging Stations

As of 2018, the electric vehicle (EV) market is the fastest growing segment of the automobile industry for new vehicle sales. Industry sources project the cost of batteries for EVs will continue to decline while battery range will increase enough to make EVs cost-effective for the average consumer. This is expected to occur sometime between 2020 and 2025. Morgan Stanley projects that EVs will reach 50 percent of new car sales by 2040.

it is recommended that PSC consider adding EV charging stations (EVCS) to their existing and planning parking facilities. Though many EVCSs are currently provided for free due to subsidies and investment by companies such as Tesla, it is projected that EVSCs will soon become a pay-for service where the cost of the electricity and infrastructure maintenance can be offset (at minimum) by a usage fee. Over the mid-range, EV charging may become a revenue positive business model for facilities such as airports where customers generally park for periods long enough to fully recharge a vehicle using Level 2 equipment. **Table 4-5** provides the recommended number of Level 2 equipped EVCS spaces.

Table 4-5: Recommended EV Charging Station Guidelines

Total Parking Spaces	Residential		Workplace/Visitor	
	Power for EVCS[1] (spaces or percent of total)	Min EVCS[1] (spaces or percent of total)	Power for EVCS[1] (spaces or percent of total)	Min EVCS[1] (spaces or percent of total)
1 to 25	8	1	4	1
26 to 50	10	1	5	1
51 to 75	16	2	8	1
76 to 100	20	3	10	2
101 to 150	20%	4	10%	2
151 to 200	18%	5	9%	3
201 to 300	16%	6	8%	3
301 to 400	14%	7	7%	4
401 to 500	12%	8	6%	4
501 and over	10%	2%	5%	1%

Note: Level 2 equipment recommended for residential and commercial usage. Equipment should have coupler with both data as well as electricity, provide 204V, 40-amp electrical capability, take approximately 7 hours for fully charge, and provide between 12 and 26 miles per charge hour.
Source: Walker Consultants, 2019

Automated Parking Guidance Systems

Automated Parking Guidance Systems (APGS), **Figure 4-34** shows and example of APGS which are already popular at many larger airports and starting to gain popularity with smaller airports and other commercial parking facilities. The advantage of an effective APGS system is to limit the amount of time that customers spend looking for a parking stalls and allow facilities to be nearly 100 percent utilized at peak periods, rather than maintaining a large surplus of empty spaces to help with circulation.

Single-space APGS applications can still add a cost premium (roughly $500-$600 per space) for a new design. However, in some applications, sonar-based, loop-detection, or camera-based systems can be installed at a facility with a much lower price point. It is recommended that PSC investigate the cost to install APGS, when they decide to move forward with any of the parking garage alternatives.

Figure 4-34: APGS Example

ALTERNATIVES SUMMARY

The main goals of this chapter are to identify airport improvements to accommodate existing and future demand safely and to develop PSC in a financially feasible and environmentally sustainable manner as demand is realized. The alternatives are based on input and comments provided by airport users and key airport and community stakeholders. Key improvements that will be carried forward to the Capital Improvement Plan (CIP) and will be depicted on the ALP drawings are summarized below. **Figure 4-35** provides a graphic depiction of the preferred alternatives.

Preferred Airside Concepts

Runway 12/30

- Runway 30 is shortened by 350 feet.
- Runway 30 is provided with an IAP with visibility minimums less than 3/4 mile.
- A MALSR is installed to serve Runway 30 in conjunction with the improved IAP.
- Runway 12 is extended 1,847 feet for a total Runway 12/30 length of 9,200 feet.
- The Runway 12 IAP with visibility minimums not less than ¾ mile is retained.

Runway 3L/21R

- Runway 3L is provided with an IAP having visibility minimums less than ¾ mile.
- A MALSR is installed to serve Runway 3L in conjunction with the improved IAP.
- An avigation easement is attained for land use compatibility within the increased Runway 3L RPZ associated with implementing the improved IAP.

Taxiways

- Taxiway A is realigned as a full-length parallel taxiway.
- Taxiway D is extended in conjunction with the Runway 12 extension.
- Taxiway D and E are modified to connect with the relocated Runway 30 end.
- Partial parallel Taxiway G is provided to improve airfield access to the GA Apron.
- A runup apron is provided where realigned Taxiway A connects to Taxiway E.
- Runway 12/30 exit taxiways are provided to connect to Taxiways D and G.
- An exit taxiway for Runway 3L/21R is provided between Taxiways A and B.
- Designate the portion of Taxiway E adjacent to the GA Apron to be an uncontrolled taxilane.

Preferred Landside Concepts

- Passenger terminal building expansion and reconfiguration
- Terminal apron expansion
- Deice pad modifications
- Terminal parking garage
- Terminal roadway improvements
- GA hangar and apron development on east side and Airport Business center
- SRE vehicles acquisition
- New SRE facility
- Relocated ATCT
- Non-aviation land use development for commercial and industrial areas
- Non-Aviation use property released

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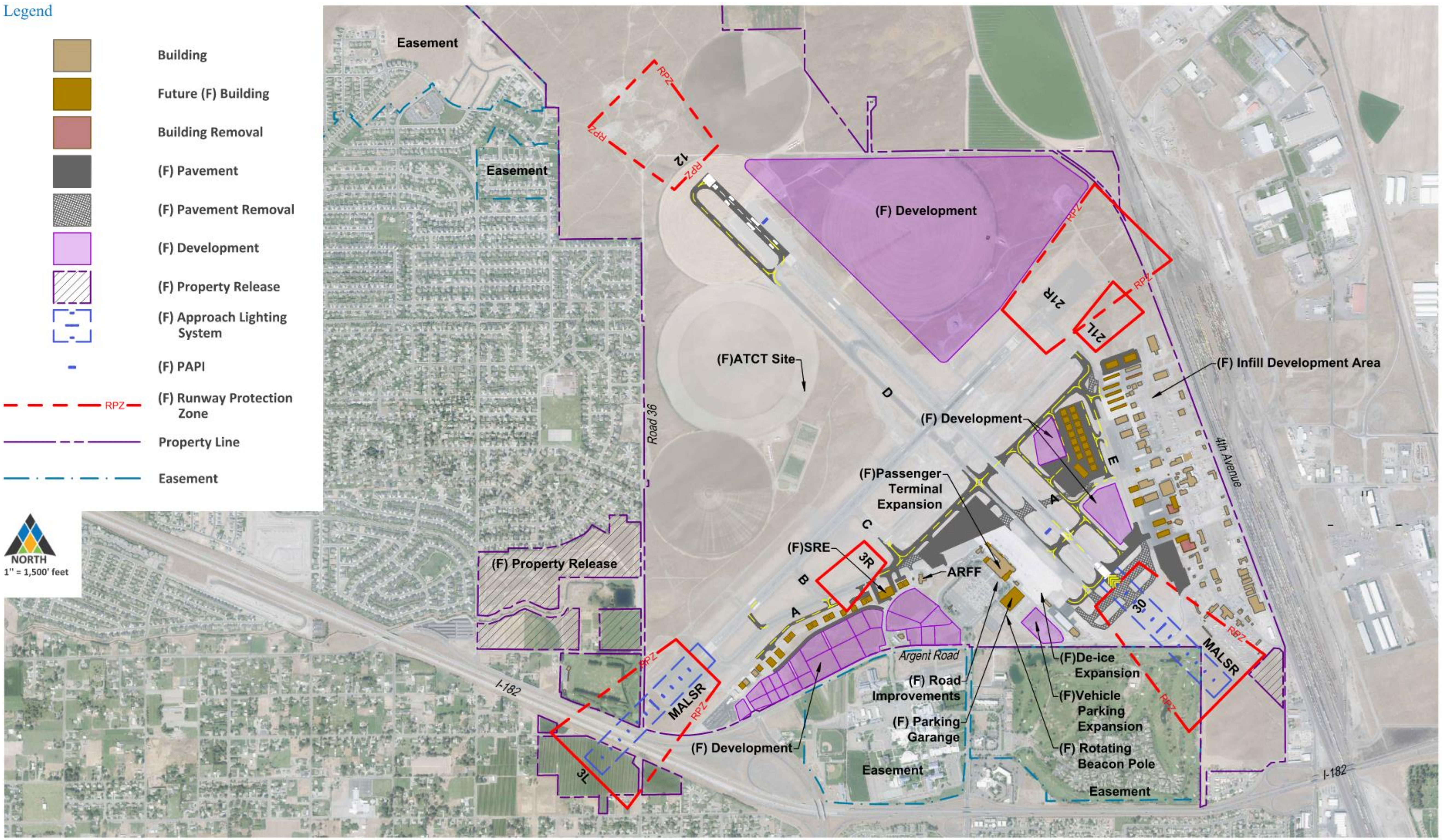
Figure 4-35: Preferred Development Concept



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CHAPTER 5
LAND USE COMPATIBILITY

CHAPTER 5 - LAND USE COMPATIBILITY

CHAPTER OVERVIEW

Incompatible land uses are one of the largest issues facing airports today. Development that is incompatible threatens the utility of airports and aircraft operations, and results in conflicts between airports and their communities. The Federal Aviation Administration (FAA), airport sponsors, state aviation departments, and local jurisdictions must encourage compatible land uses around airports to protect these important transportation and economic assets.

Tri-Cities Airport (PSC) is the largest airport in the Southeastern Washington and Northeastern Oregon region. PSC is the third busiest air carrier airport for number of passengers in the State of Washington offering connections to eight hubs (**Figure 5-1**). In recognition of PSC's regional significance, a specific goal of this Master Plan is to protect PSC from encroachment of incompatible land uses.

Figure 5-1: PSC Commercial Routes

Source: Tri-Cities Airport, April 2019.

This chapter describes existing and planned patterns of land use around PSC and the local, state, and national guidance pertaining to compatibility. An assessment of potential compatibility impacts associated with the recommended development plan for PSC is also summarized. A set of recommended actions appear at the end of the chapter. These recommendations include modifications to local regulations to maintain airport land use compatibility.

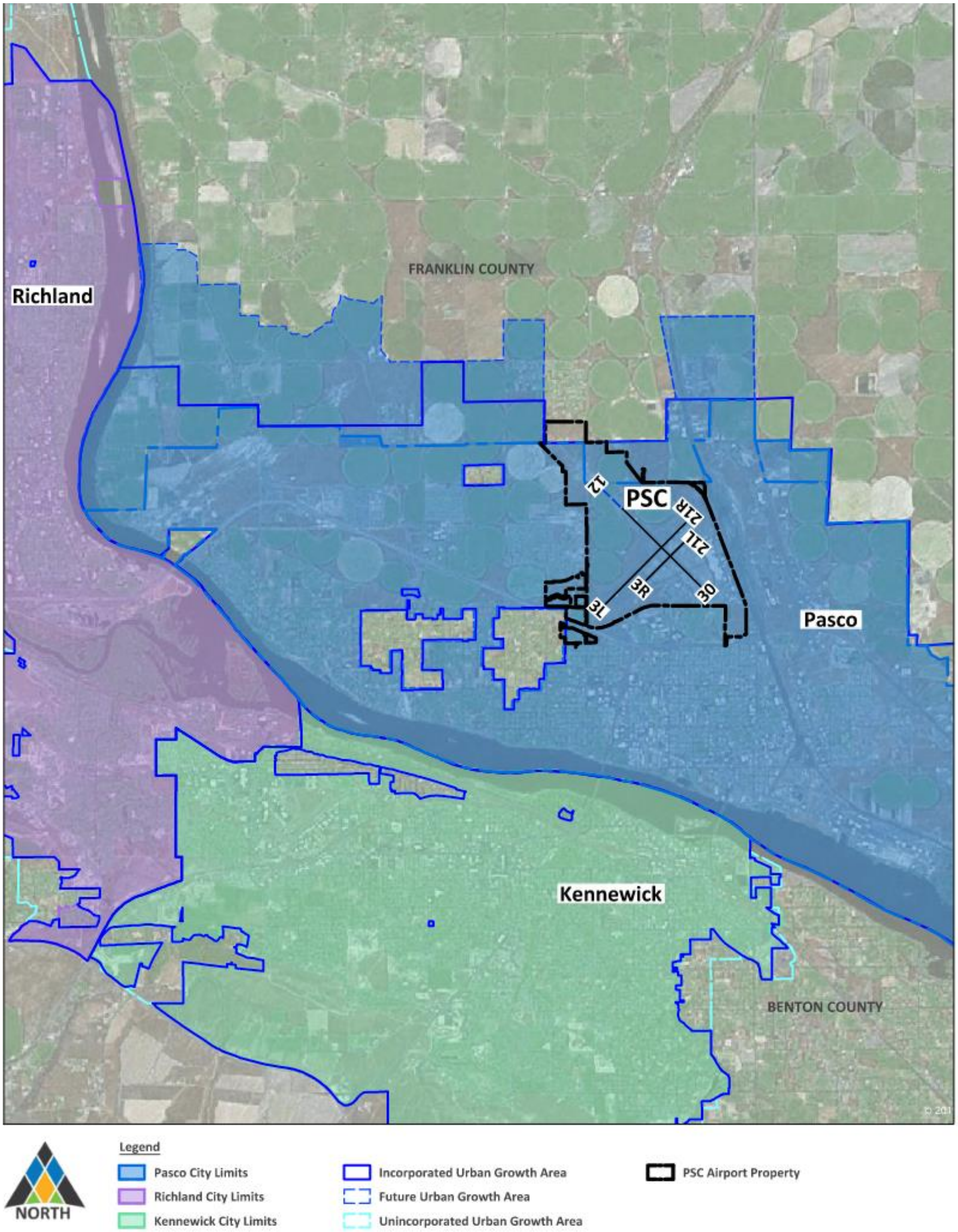
COMPATIBILITY CONTEXT

Land Use Setting

Airport Environs

PSC is located on the northern edge of the city of Pasco and is part of the metropolitan area known as the Tri-Cities. The Tri-Cities area includes the cities of Pasco, Kennewick (south of Pasco, across the Columbia River) and Richland (west of Pasco, across the Columbia River). Unincorporated lands of Franklin County border PSC to the north, and several isolated areas encircled by the city of Pasco exist to the west. The cities of Richland and Kennewick are in Benton County flanking the western and southern edge of the Columbia River (see **Figure 5-2**).

Figure 5-2: PSC Neighboring Jurisdictions



Existing Land Uses

Existing land uses around PSC include populated areas of downtown Pasco to the south, residential subdivisions to the west, rural residential neighborhoods and agricultural uses to the north, and industrial and agricultural uses to the east. Franklin County and cities of Pasco and Kennewick are the three principal jurisdictions that have land use authority around PSC. Existing land use patterns for these three jurisdictions are described below and depicted in **Figure 5-2.**

- **Franklin County**: PSC is located within the southern portion of Franklin County in the Urban Growth Area (UGA) for the city of Pasco. The area north of PSC includes predominately agricultural uses. A rural residential neighborhood exists north of Runway 12, and industrial uses exist to the northeast along the BNSF railroad tracks.
- **City of Pasco:** PSC is in the northeastern portion of the City. Land uses that border PSC to the south include the Sun Willows Golf Course, hotels, and Columbia Basin College. Existing residential neighborhoods are located immediately east of PSC. Industrial uses exist to the east along the Burlington Northern Santa Fe (BNSF) railroad.
- **City of Kennewick:** PSC is located north of the city of Kennewick across the Columbia River. Land flanking the Columbia River closest to PSC includes the Columbia Park and a mix of commercial, industrial, and residential uses east of US Highway 395.

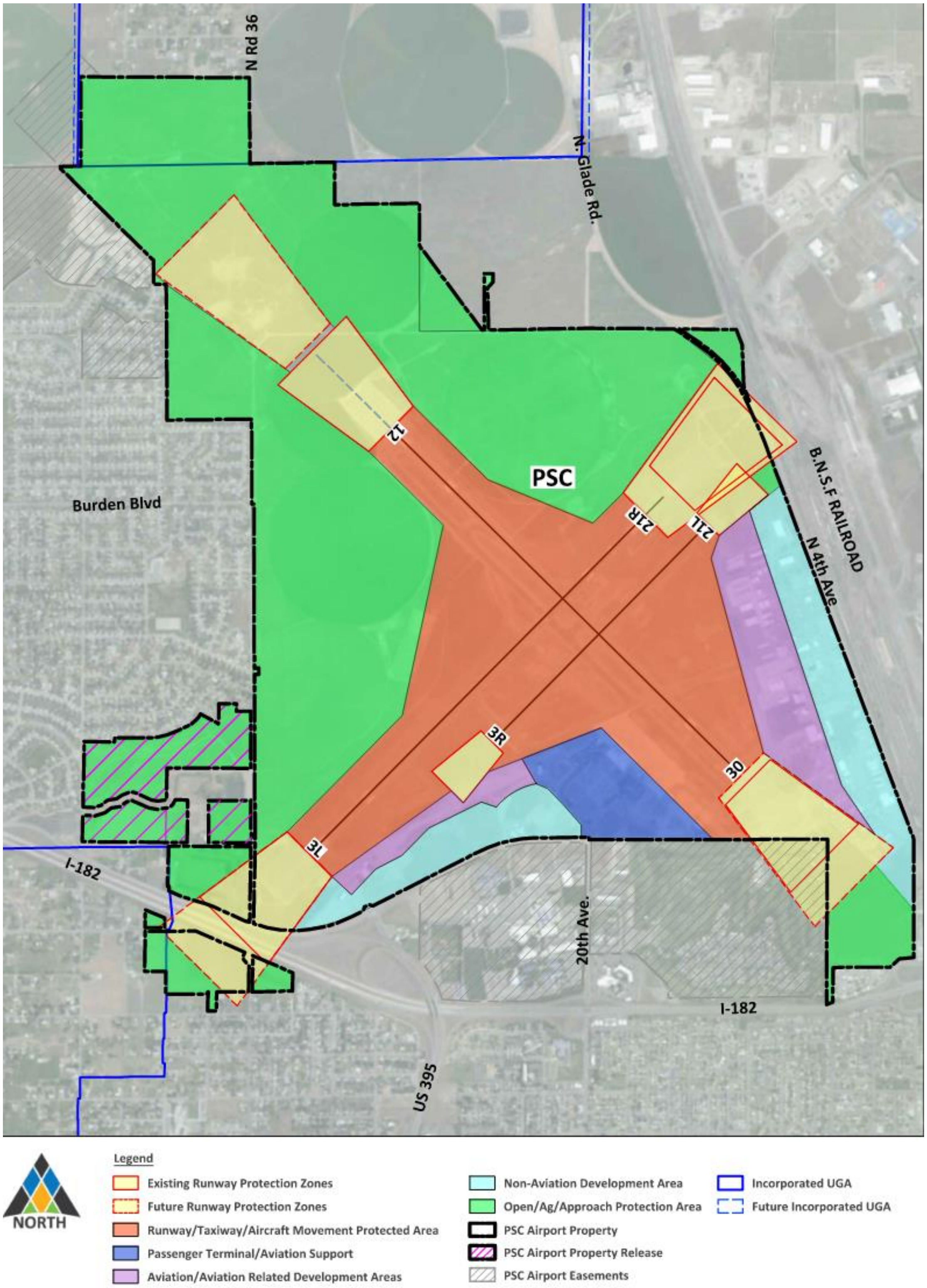
On-Airport Land Use

PSC encompasses 2,335 acres of land. On-airport land uses include areas designated for airport operations, aviation use, and non-aviation use, which are described below.

- **Airport operations**: Includes the airfield (aircraft movement areas) plus the FAA-defined safety areas and Runway Protection Zones (RPZs).
- **Aviation use**: Includes aviation and aviation-related uses such as the terminal area, fixed-based operator (FBO) facilities, general aviation hangars, airport maintenance facilities, Airport Traffic Control Tower (ATCT), areas for NAVAIDs, and other aviation facilities.
- **Non-aviation use**: Allows for the development of compatible non-aviation uses such as highway, commercial, light industrial, business park, and hotel uses. This designation also includes agricultural and open space land uses.

Figure 5-3 shows the on-airport land use designations for PSC. The areas north and west of the airfield are designated open space and approach protection area. The areas east and south of the airfield provide for aviation and non-aviation development. The passenger terminal area is located south of the airfield.

Figure 5-3: PSC On-Airport Land Uses



Regulatory Framework

Federal Airport Compatibility Regulations

The FAA does not have authority to regulate off-airport land uses. However, the FAA does have a technical advisory role based on its interest in protecting its financial investment in airport facilities and the airspace associated with an airport as part of the national airspace system. The FAA plays a part in regulating on-airport land use through approval of the Airport Layout Plan (ALP). In fulfilling that role, the FAA requires that airport sponsors comply with FAA Airport Improvement Program (AIP) grant assurances to fulfill funding obligations. The assurances include measures to maintain, to the extent reasonable, off-airport land use compatibility and to protect the aeronautical function of an airport by restricting the location of non-aviation land uses. **Table 5-1** summarizes key federal regulations and guidance. These key regulations were considered in the compatibility assessment for PSC summarized below.

Table 5-1: Federal Regulations and Guidance for Compatible Land Use

Grant Assurances
An airport must agree to certain contractual obligations (or grant assurances) to accept federal grants for airport development projects. These obligations require an airport to operate safely, efficiently, and to conform with certain conditions. The FAA's authority to enforce most regulations and grant assurances is limited to within the airport boundaries. The FAA's only authority to regulate off-airport compatible land use planning is through the grant assurances to which airport sponsors must adhere to obtain the federal funding. In most cases, the most effective methods for a sponsor to effect compatible land use outside of the airport's property is through land acquisition, easements, or zoning. Grant assurances 20 and 21 pertain to compatible land use around airports. These grant assurances require airport sponsors to take reasonable action to protect the airspace and restrict land uses in the immediate vicinity to those compatible with airport operations. *20. Hazard Removal and Mitigation. Airport sponsor will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operation to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.* *21. Compatible Land Use. Airport sponsor will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.*

14 CFR Part 77

Title 14 of the Code of Federal Regulations Part 77 (14 CFR Part 77), *Safe, Efficient Use and Preservation of the Navigable Airspace*, establishes standards to protect the airspace surrounding airports from natural or constructed obstructions that could constitute a hazard to landing aircraft. The FAA has the authority to review proposed construction through FAA Form 7460-1, *Notice of Construction or Alteration process*.

The FAA's aeronautical review addresses compatibility both on- and off-airport based on the potential for creating a "hazard to air navigation" that is associated with obstructions/penetrations in defined airspace. FAA airspace reviews include 14 CFR Part 77 surfaces, Terminal Instrument Procedures (TERPS) surfaces, visual runway traffic patterns, and protected airspace for visual navigational aids (e.g., visual approach slope indicator [VASI] lights and a precision approach path indicator [PAPI]).

When a proposed structure penetrates navigable airspace, the FAA will issue a Notice of Presumed Hazard, which is a letter objecting to the proposed action (determination of presumed hazard to air navigation) for the consideration of local authorities. When proposed actions do not represent a hazard to air navigation, a "no hazard" determination is issued. However, the FAA's analysis is based solely on FAA obstruction criteria and does not address other land use compatibility concerns nor is the evaluation coordinated with the airport sponsor and local agencies. Therefore, a proposed action receiving a no hazard determination from the FAA may still be considered incompatible with airport operations.

The FAA recommends that local jurisdictions include the following language in their development codes: *"Nothing in this chapter shall diminish the responsibility of project proponents to submit a Notice of Construction or Alteration to the FAA if required in accordance with 14 CFR Part 77."*

Interim Guidance on Land Uses Within a Runway Protection Zone

In 2012, the FAA Office of Airports issued a memorandum entitled, *Interim Guidance on Land Uses Within a Runway Protection Zone (RPZ)*. The memorandum presents interim policy guidance to FAA Regional Offices and Airport District Offices (District Office) on what constitutes a compatible land use and how to evaluate proposed land uses within an RPZ. The purpose of the memorandum is to clarify statements in Advisory Circular (AC) 150/5300-13A Change 1, Airport Design such as: "It is desirable to clear the entire RPZ of all above-ground objects. When this is impractical, the RPZ should be clear of all facilities supporting incompatible activities." The interim policy only addresses new or modified land uses within the RPZ and proposed changes to RPZ size or location. Existing incompatible land uses are to be addressed by the airport sponsors in coordination with Regional and District Office staff. The guidance requires Regional and District Office staff to consult with the National Airport Planning and Environmental Division when any of the following land uses enter the limits of the RPZ:

- Buildings and structures (Example: residences, schools, churches, commercial/industrial buildings, etc.)
- Recreational land use (Example: golf courses, sports fields, places of public assembly, etc.)
- Transportation facilities (Example: Rail facilities, public roads/highways, parking facilities, etc.)
- Fuel storage facilities (above and below ground)
- Hazardous material storage (above and below ground)
- Wastewater treatment facilities
- Above-ground utility infrastructure (for example, electrical substations), including solar panel installations

FAA Advisory Circular 150/5020-1, Noise Control and Compatibility Planning for Airports
14 CFR, Part 150, *Airport Noise Compatibility Planning* (Part 150), is the primary federal regulation guiding and controlling planning for aviation noise compatibility on and around airports. AC 150/5020-1 provides guidance to airport sponsors preparing airport noise exposure maps and airport noise compatibility programs for Part 150 submissions. The purpose of the Part 150 study is to mitigate the noise impacts of airports upon their neighbors while protecting or increasing airport access and capacity, as well as maintaining the efficiency of the national aviation system. Although the regulations contained in the Part 150 study are voluntary, the approved Part 150 noise compatibility program is the primary vehicle for gaining approval of applications for federal grants for noise abatement projects and provides the required analyses for evaluating the impacts of any proposed constraints upon an airport's operations. The Part 150 study also identifies those land uses that are normally compatible with various levels of exposure to noise by individuals.

FAA Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants on or near Airports
14 CFR, Part 139, Certification of Airports, Subpart D (Part 139) requires airport sponsors to comply with maintaining a safe operating environment that includes conducting Wildlife Hazard Assessments and Wildlife Hazard Management Plans. AC 150/5200-33B provides guidance on the types of land uses that have the potential to attract wildlife on or near public-use airports. Land uses considered to be potentially hazardous wildlife attractants include waste disposal operations (e.g., landfills), water management facilities (e.g., wastewater and storm water facilities), wetlands, dredge spoil containment areas, specific agricultural activities (e.g., livestock), golf courses, and certain landscaping practices. When considering proposed land uses, the potential of increasing wildlife hazards must be considered. Separation criteria between the Airport Operations Area (AOA) and the hazardous wildlife attractants are provided. The separation distances are as follows: - 5,000 feet from the nearest AOA for airports serving piston-powered aircraft - 10,000 feet from the nearest AOA for airports serving turbine-powered aircraft

State Airport Compatibility Regulations

Revised Code of Washington

The Revised Code of Washington (RCW) requires cities and counties to create comprehensive plans that discourage siting incompatible land uses around public-use airports. Laws pertaining to airports, airspace, and land use compatibility include the following:

- **RCW 14.12, Airport Zoning Act:** This act enables local jurisdictions to adopt airport zoning regulations to prevent the creation of an airport hazard that would endanger the public or reduce the utility of the airport and the public investment therein. Airport zoning regulations may divide the airport hazard area into zones and specify the land uses and height restrictions within each zone.
- **RCW 36.70, Planning Enabling Act:** This act requires local jurisdictions to discourage the siting of incompatible uses adjacent to public-use general aviation airports through their respective comprehensive plans and development regulations (§36.70.547). The law also requires local jurisdictions to consult with airport owners, Washington State Department of Transportation

Aviation Division (WSDOT Aviation), and other aviation stakeholders before formally adopting or amending a comprehensive plan or development regulations.

- **RCW 36.70A, Growth Management Act:** This act establishes goals and requirements to guide the development and adoption of comprehensive plans and development regulations. Section 36.70A.210 requires local comprehensive plans to include a process for identifying and siting essential public facilities, such as airports. The same section specifies that development regulations may not preclude the siting of essential public facilities.

WSDOT Aviation

WSDOT Aviation is responsible for advocating for the preservation and protection of public-use airports. While WSDOT does not have regulatory authority over land use decisions, it offers technical assistance to local and regional planning authorities through its Airport Land Use Compatibility Program. WSDOT Aviation's principal compatibility guidance is described below.

- ***WSDOT Airport and Compatible Land-Use Guidebook (January 2011):*** This guidebook provides guidance to airports, local jurisdictions, and elected officials to help them meet planning requirements outlined in state law. The guidebook describes airport land use compatibility planning and its relationship to community comprehensive planning and provides a process to identify and evaluate compatibility conflicts. The guidebook recommends delineating an airport influence area to define the land use compatibility area. It also provides sample airport compatibility zones and criteria. The criteria emphasize airspace protection and discourage residential development, schools, and hospitals adjacent to airports, especially along the extended centerline of the airport runway.

Franklin County Airport Compatibility Regulations

The Franklin County Planning Department serves the citizens of the unincorporated areas of Franklin County. Their services include reviewing and processing land use development proposals to see that they conform with the County's Comprehensive Plan and other County policies and regulations. A summary of airport compatibility-related policies from the County's Comprehensive Plan and development regulations follows.

- **Franklin County Comprehensive Plan (2008):** This plan establishes community goals and policies that direct the orderly and coordinated physical development of the county. Although not specific to PSC, the following goals and policies apply to private and personal airstrips:

  - Provide airfields with reasonable protection from airspace obstructions, incompatible land uses, and nuisance complaints that could restrict operations (§10.1).

  - Residential lands underlying the air approach should be kept at very low density to protect against potential accidents (§10.1.1).

- To minimize noise problems, open space uses are most desirable around an airport. Industrial uses are appropriate if located in a planned park. Very low-density residential uses with sound-reduction are also acceptable (§10.1.2).

- **Franklin County Comprehensive Plan Designations (2008):** As reflected in Figure 5-4, planned land uses north of PSC include mainly agricultural, rural residential, and rural industrial land uses.

- **Franklin County Airport Zoning Code (Chapter 17.76):** This zoning code establishes the Airport Overlay District (AOD) for PSC in recognition of its significance to the community. The AOD regulations encourage compatible land uses, densities, and reducing hazards that may endanger the lives and property of the public and aviation users. Key components of the AOD are summarized below.

  - Future 14 CFR Part 77 Zones Map and the Airport Safety Compatibility Zones Map provided in the 2012 PSC Master Plan form the basis of the AOD. All lands lying within these airport overlay zones are subject to the AOD building and use restrictions.

  - Height limits are established consistent with the Code of Federal Regulations 14 CFR Part 77 criteria. The AOD prohibits the creation of an airspace obstruction and requires permission to install marking or lighting of existing airspace penetrations as deemed necessary by the airport sponsor or FAA.

  - Use restrictions preclude uses that would create electrical, visual, and bird strike hazards. Lighting generated by adjacent uses must be shielded to reflect light away from PSC and cannot imitate airport lighting. Approval of communication facilities must include a condition requiring their removal within 90 days of decommissioning.

  - Airport Safety Compatibility Zones preclude certain uses from each zone. **Table 5-2** lists the land use restrictions.

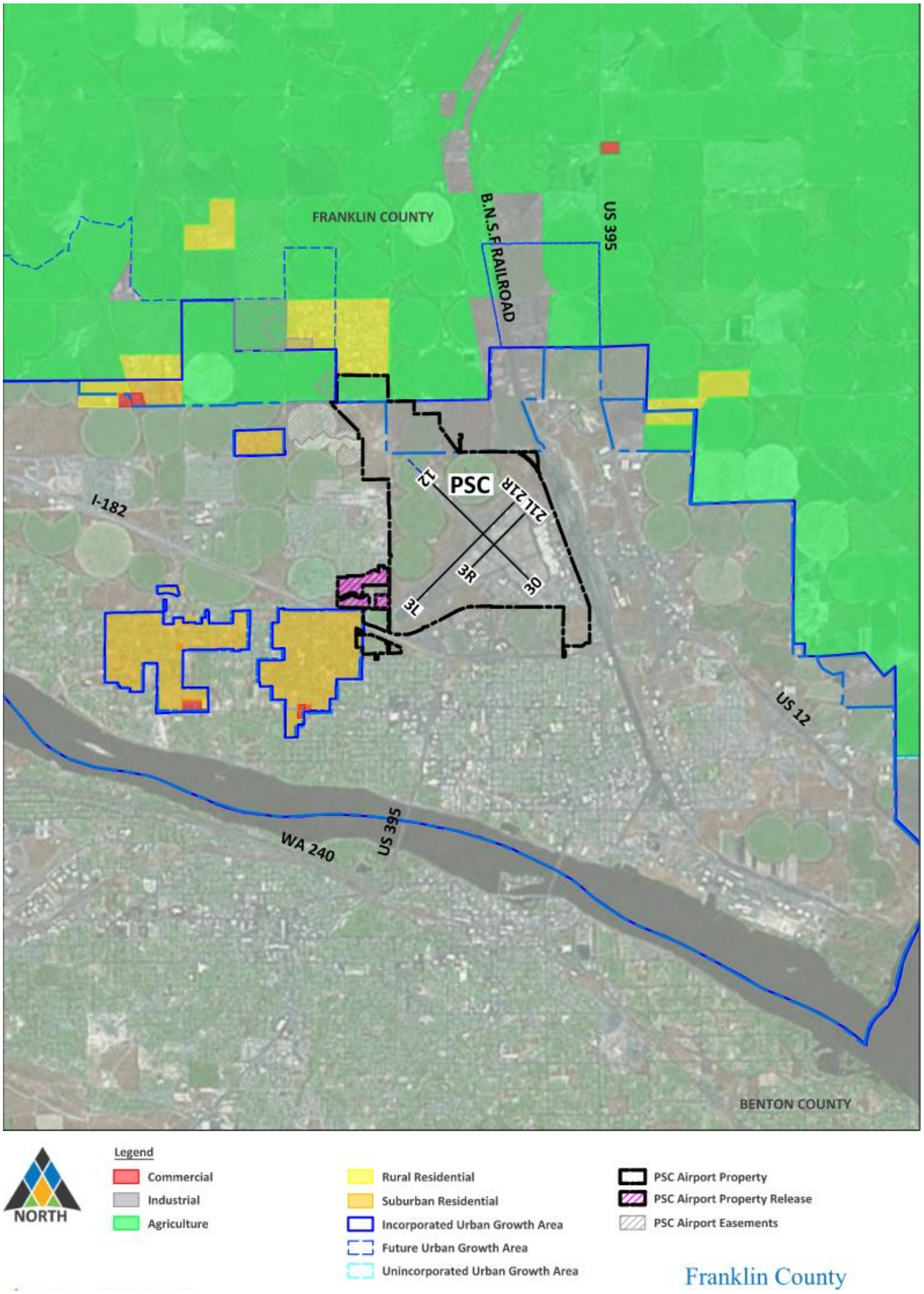
  - Review procedures require certain permit applications within the AOD to be submitted to the Port of Pasco Administrative Office for Port Review. Development proposals within 20 feet of a 14 CFR Part 77 airspace surface must also include a copy of FAA Form 7460-1.

  - The following property disclosure statement must be listed on all approved plats and deeds, and property owners are advised to make buyers aware of the disclosure during real estate transactions.

    "Properties near the Tri-Cities Airport may be subject to varying noise levels and vibration. Properties near the airport may be located within height and use restriction zones as described and illustrated by Federal standards and regulations and the Franklin County Zoning and Development Regulations. There is the potential that standard flight patterns will result in aircraft

passing over the properties at low altitudes and during all hours of the day. Future airport expansion including a potential 1850 foot runway extension to the northwest may impact the size and number of aircraft that utilize the airport. Generally, it is not practical to redirect or severely limit airport usage and/or planned airport expansion. Developments near the airport should assume that at any given time there will be some impact from air traffic."

Figure 5-4: Franklin County Comprehensive Land Use Plan Designations



Franklin County

Table 5-2: Franklin County Airport Safety Compatibility Zone Restrictions

Zone	Restrictions
Zone 1 Runway Protection Zone (RPZ)	Only airport uses and activities are allowed within the RPZ.
Zone 2 Inner Approach/ Departure Zone	Prohibited land uses within this zone are places of public assembly such as churches, schools (K-12), colleges, hospitals; high density office, retail or service buildings; shopping centers and other uses with similar concentrations of persons. Residential is permitted on legal lots of record and on new lots provided the density is not greater than four dwelling units per 20 acres. Clustering of residential lots to preserve open space adjacent to approach corridors and the new runway end is preferred. South of I-182, infill residential is allowed, provided the density is similar to the existing residential development in the area. North of I-182, infill residential is allowed provided the land is zoned rural residential, and the density is similar to the existing residential development in the area. All new lots and infill residential development must include the disclosure statement in Section 17.76.110 on plats, short plats and binding site plans. Production of asphalt paving and roofing materials or rock crushing are also prohibited. Fuel storage facilities or the storage or use of significant amounts of materials that are explosive, flammable, toxic, corrosive, or otherwise exhibit hazardous characteristics shall not be located within the inner approach/departure zone. Hazardous wildlife attractants including waste disposal operations, water management and storm water facilities with above-ground water storage, and man-made wetlands shall not be allowed within the inner approach/departure zone.
Zone 3 Inner Turning Zone	Prohibited land uses within this zone are schools (K-12) and hospitals. New residential development is prohibited unless it is infill residential similar in density to the existing residential development. All new infill residential development must include the disclosure statement in Section 17.76.110 on plats, short plats and binding site plans.
Zone 4 Outer Approach/ Departure Zone	Prohibited land uses within this zone are places of public assembly such as churches, schools (K-12), hospitals, shopping centers and other uses with similar concentrations of persons. Residential is permitted on legal lots of record and on new lots provided the density is not greater than four dwelling units per 20 acres. Clustering of residential lots to preserve open space adjacent to approach corridors and the new runway end is preferred. South of I-182, infill residential is allowed provided the density is similar to the existing residential development in the area. North of I-182, infill residential is allowed provided the land is zoned rural residential and the density is similar to the existing residential development in the area. All new lots and infill residential development must include the disclosure statement in Section 17.76.110 on plats, short plats and binding site plans.
Zone 5 Sideline Zone	Prohibited land uses within this zone are residences, except residences that are constructed to replace existing residences, of like size and type, damaged by fire and other causes, places of public assembly, such as churches, schools, hospitals, shopping centers and other uses with similar concentrations of persons. Mining, including sand and gravel pits are prohibited in the sideline zone.
Zone 6 Traffic Pattern Zone	Prohibited land uses within this zone are new schools (K-12), hospitals and other uses with similar concentrations of persons. Replacement or expansion of existing schools is permitted. All new residential developments must include the disclosure statement in Section 17.76.110 on plats, short plats and binding site plans.
Source: Franklin County Airport Zoning District, Chapter 17.76.	

City of Pasco Compatibility Regulations

The city of Pasco's Planning Division is charged with overseeing state-mandated updates of the Comprehensive Plan and promoting the general welfare of the city by ensuring that all development activity follows the city's Comprehensive Plan and Zoning Ordinance of the Municipal Code. A summary of the city's plans pertaining to airport compatibility are summarized below.

- **Pasco Comprehensive Plan (2007-2027):** The plan acknowledges PSC as an essential public facility and designates some 277 acres of land outside PSC as Airport Reserve (Figure 5-5). This land was purchased by the Port of Pasco to protect the public investment and future use of PSC. The city establishes this area as Parks/Open Space to preclude development that is not compatible with airport operations. The Plan also provides a summary of airport operations and facilities and references the 2012 Airport Master Plan.
- **Pasco Comprehensive Plan Land Use Map (2007 – 2027):** As shown in Figure 5-5, most of the PSC-property and the area to the east are designated as Industrial. The areas identified by the Comprehensive Plan as Airport Reserve are designated as Parks/Open Space in the Land Use Map. Several undeveloped areas of the PSC-property (northwest of Runway 12 and southwest of Runway 3L and Interstate-182) are designated for Residential – Low-Density. Areas west of PSC are designated Residential – Low-Density. The area immediately south of PSC is designated as Public/Quasi-Public (for the Columbian Basin College campus), Commercial, and Parks/Open Space and High-Density Residential (for the Sun Willows Golf Course).
- **Pasco Comprehensive Plan Update (2017-2037):** In 2017, Pasco initiated the state-mandated update of the Comprehensive Plan. The draft Plan proposes an amendment to the UGA boundaries to accommodate projected population growth. Pasco's population is estimated to increase by more than 50,000 and reach 121,828 by 2038. An estimated 15,300 new housing units will be needed. The proposed UGA boundary is shown in Figure 5-5 and includes lands northwest of Runway 12 . In June 2018, Pasco submitted the UGA application to the County Commission for approval of the proposed UGA expansion.
- **Pasco Zoning Designations (October 2017):** Figure 5-6 shows Pasco's zoning districts, which are generally consistent with the land use designations shown in the city's Land Use Map, with one key exception. The Airport Reserve areas that are designated as Parks/Open Space in the Land Use Map are zoned Residential Transition. Additionally, the zoning map shows Low-Density Residential for the Columbian Basin College campus and Sun Willows Golf Course, which exist south of PSC.

- **Pasco Airport Overlay District (Chapter 25.190):** The AOD establishes the Airport Influence Area for PSC based on the Future 14 CFR Part 77 Zones map and the Airport Safety Compatibility Zones map established by the Airport Master Plan. The AOD regulations discourage the siting of incompatible uses adjacent to PSC. The Airport Authority is responsible for providing updated maps to the City when updates to the Master Plan are made. The purpose of the AOD is to protect the viability of Tri-Cities Airport as a significant resource to the community by encouraging compatible land uses, densities, and reducing hazards that may endanger the lives and property of the public and aviation users.

City of Kennewick Regulations

The city of Kennewick Community Planning Department oversees all building, land use and development activity within the city. Kennewick's Comprehensive Plan (2017-2037) does not reference PSC, nor does it establish an AOD. As shown in **Figure 5-7**, land flanking the Columbia River is designated as Parks/Open Space, Mixed Use, and Industrial.

Figure 5-5: **City of Pasco Planned Comprehensive Land Use Designations**

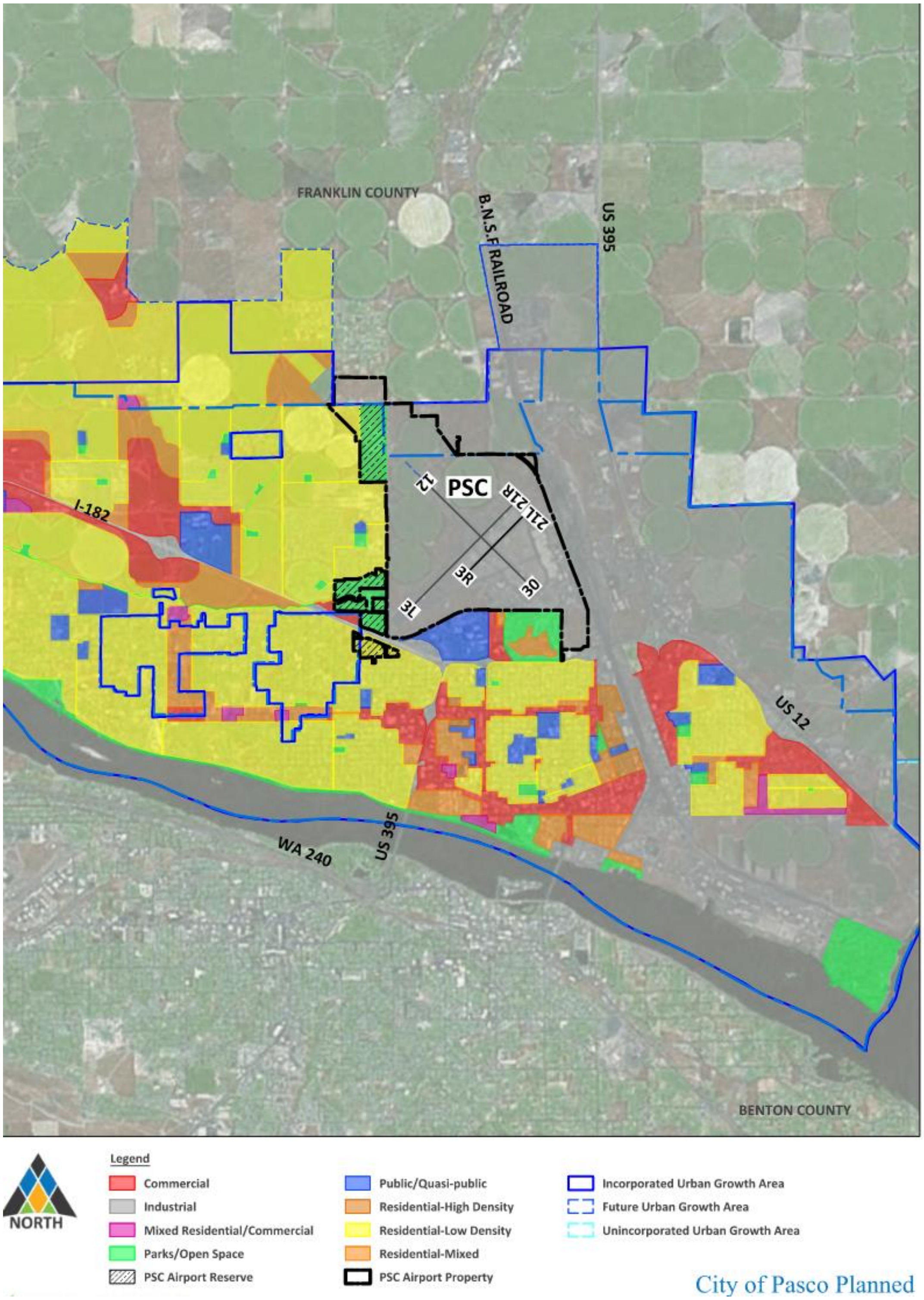


Figure 5-6: Pasco Zoning Designations

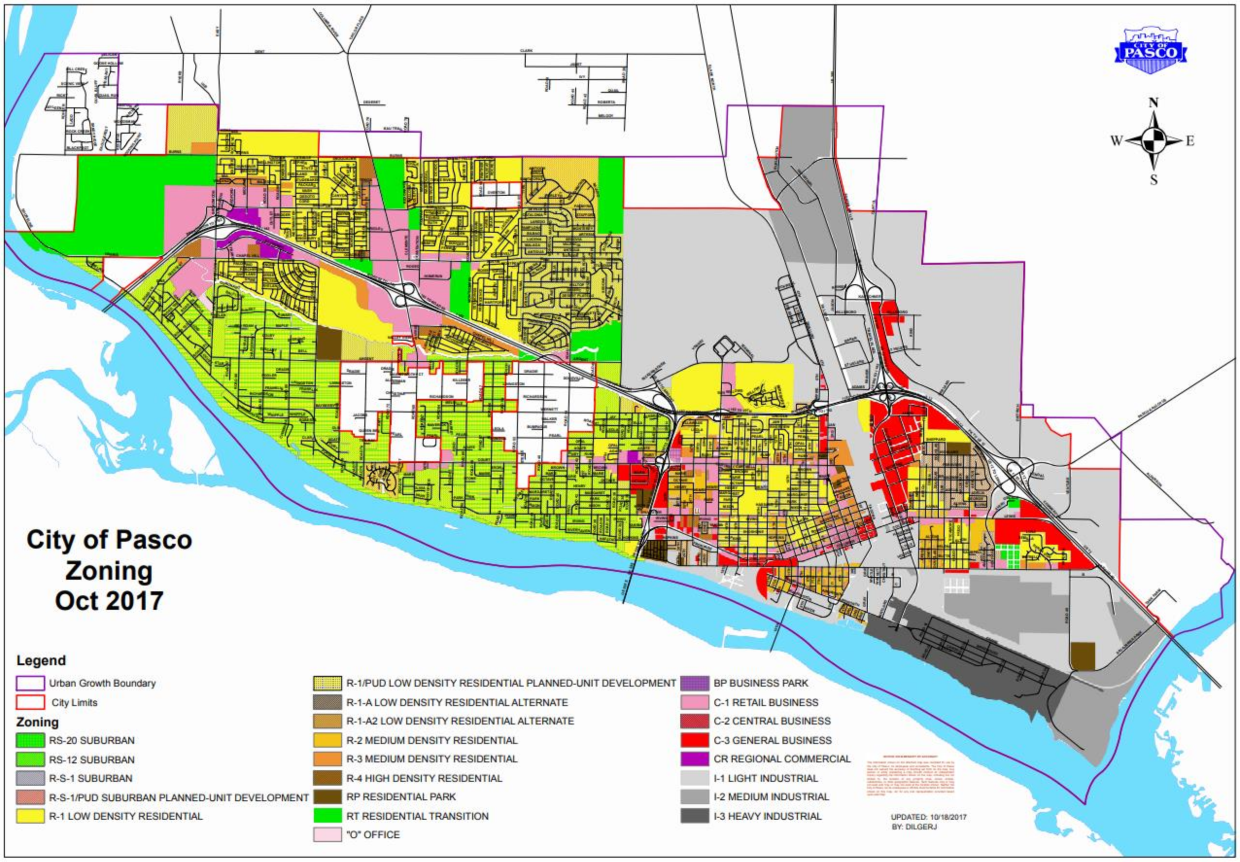
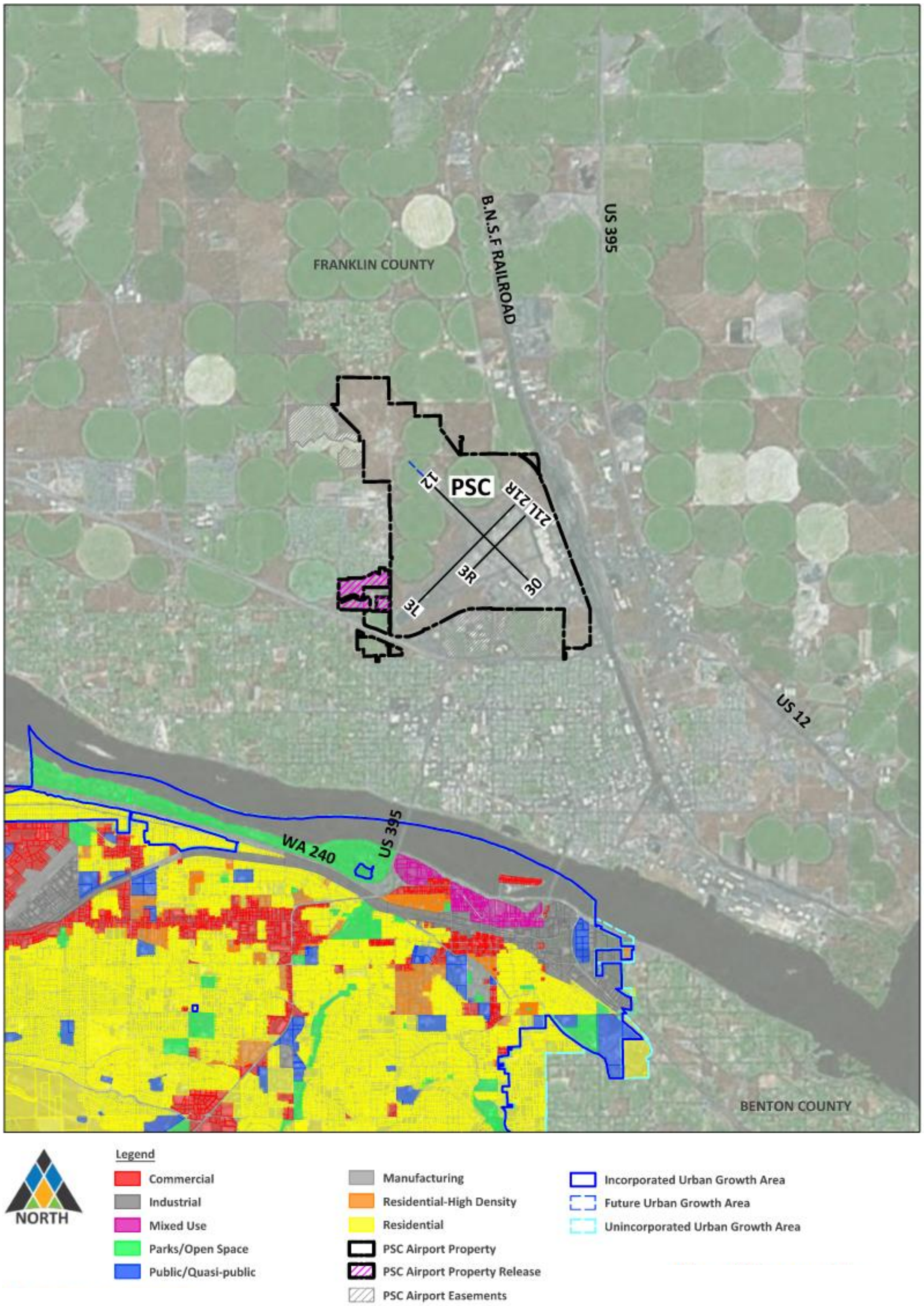


Figure 5-7: City of Kennewick Comprehensive Planned Land Use Designations



AIRPORT COMPATIBILITY ASSESSMENT

The objective of airport compatibility planning is to guide off-airport land use development to be compatible with existing and future airport operations and to maintain quality of life for airport neighbors. This section evaluates potential land use compatibility conflicts between the contemplated PSC expansion plans and existing and planned land uses. The land use compatibility assessment herein addresses four types of compatibility concerns:

- **Noise**: Locations exposed to potentially disruptive levels of aircraft noise
- **Overflight**: Locations where aircraft overflights can be intrusive and annoying to many people
- **Safety**: Areas where the risk of an aircraft accident poses heightened safety concerns for people and property on the ground
- **Airspace Protection**: Places where height and certain other land use characteristics need to be restricted to protect the airspace required for operation of aircraft to and from the airport.

PSC Future Expansion

Chapter 4 Improvement Alternatives presented the preferred development concepts to enable PSC to meet the 20-year facility requirements and user demand for expanded services. This airport compatibility assessment reflects the Master Plan's preferred development plan. Key airfield development proposals having an influence on airport land use compatibility are summarized below.

- **Runway 12/30 Relocation and Extension:** Runway 12/30 is 7,703 feet long. The Master Plan proposes an 1,847-foot extension of Runway 12 to the northwest and a 350-foot relocation of Runway 30 to the northwest, resulting in a future runway length of 9,200 feet.
- **Runway 30 Precision Instrument Approach:** Runway 30 is currently served by non-precision instrument approach procedure. A future precision instrument approach procedure is proposed that will increase the size of the RPZ.
- **Runway 3L Precision Instrument Approach:** Runway 3L is currently served by a non-precision instrument approach procedure. A future precision instrument approach procedure is proposed that will result in a larger RPZ.

Noise

Aircraft noise exposure is often a major concern for communities surrounding an airport. Therefore, noise compatibility is an important factor to consider when evaluating future airport expansion plans with existing and planned land uses around PSC. Proactive land use planning and protection can help minimize airport noise impacts on the surrounding community.

PSC Noise Modeling

The FAA evaluates airport noise impacts using the day-night average sound level (DNL), which is measured in decibels (dB). The DNL represents average noise levels during a 24-hour period, adjusted to account for lower tolerances to noise during nighttime periods relative to the daytime. The FAA uses the 65 dB DNL as the threshold of significance for assessing noise impacts. This threshold is defined in the FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Appendix A, paragraph 14.3.

The FAA's Aviation Environmental Design Tool utilizes information concerning aircraft operation numbers, types of aircraft (fleet mix), time of day (day and night), flight tracks, and runway use to generate a noise exposure map. The noise exposure maps for PSC use the historical and forecasted activity levels documented in **Chapter 2, Aviation Activity Forecasts**. For comparison, **Figures 5-8** and **5-9** show the 65 and 55 DNL noise contours for the years indicated below. The 55 DNL noise contours are below the FAA threshold of 65 dB DNL, and is shown to identify areas where noise-sensitive uses (e.g., residential, children's schools, churches) may be affected by aircraft overflight.

- 2017 (29,817 annual operations)
- 2022 (32,370 annual operations)
- 2037 (33,530 annual operations)

Noise Assessment

As shown in **Figure 5-8**, the 65 DNL noise contours remain on PSC property, except for a portion of the 2037 65 DNL noise contour of approximately 0.1 acre that extends into the golf course property southeast of Runway 30. This property is covered by an existing avigation easement.

For local community planning purposes, the existing and forecast 55 DNL noise contours are shown in **Figure 5-9.** These noise contours extend beyond the PSC property, particularly to the northwest and southeast as 58 percent of total aircraft operations occur on Runway 12/30. The 55 DNL noise contours extending beyond the PSC property boundary encompass the following land uses:

- **Northeast (Pasco)**: Industrial lands, which are not susceptible to noise impacts
- **Southeast (Pasco)**: Mix of existing industrial, commercial, and low-density residential uses

- **Southwest (Pasco)**: Interstate 182 and residential uses in Pasco and unincorporated portions of Franklin County
- **Northwest (Franklin County/Pasco)**: Agricultural lands in unincorporated Franklin County. The City of Pasco has identified this area as part of its proposed UGA. Planned land uses within the proposed UGA include residential development, which can be susceptible to noise impacts. The Port of Pasco has recently acquired avigation easements over a portion of this property. An agreement has been approved for additional avigation easements which will go into effect if the land is added to the City of Pasco UGA.

Figure 5-8: PSC 65 DNL Noise Contours

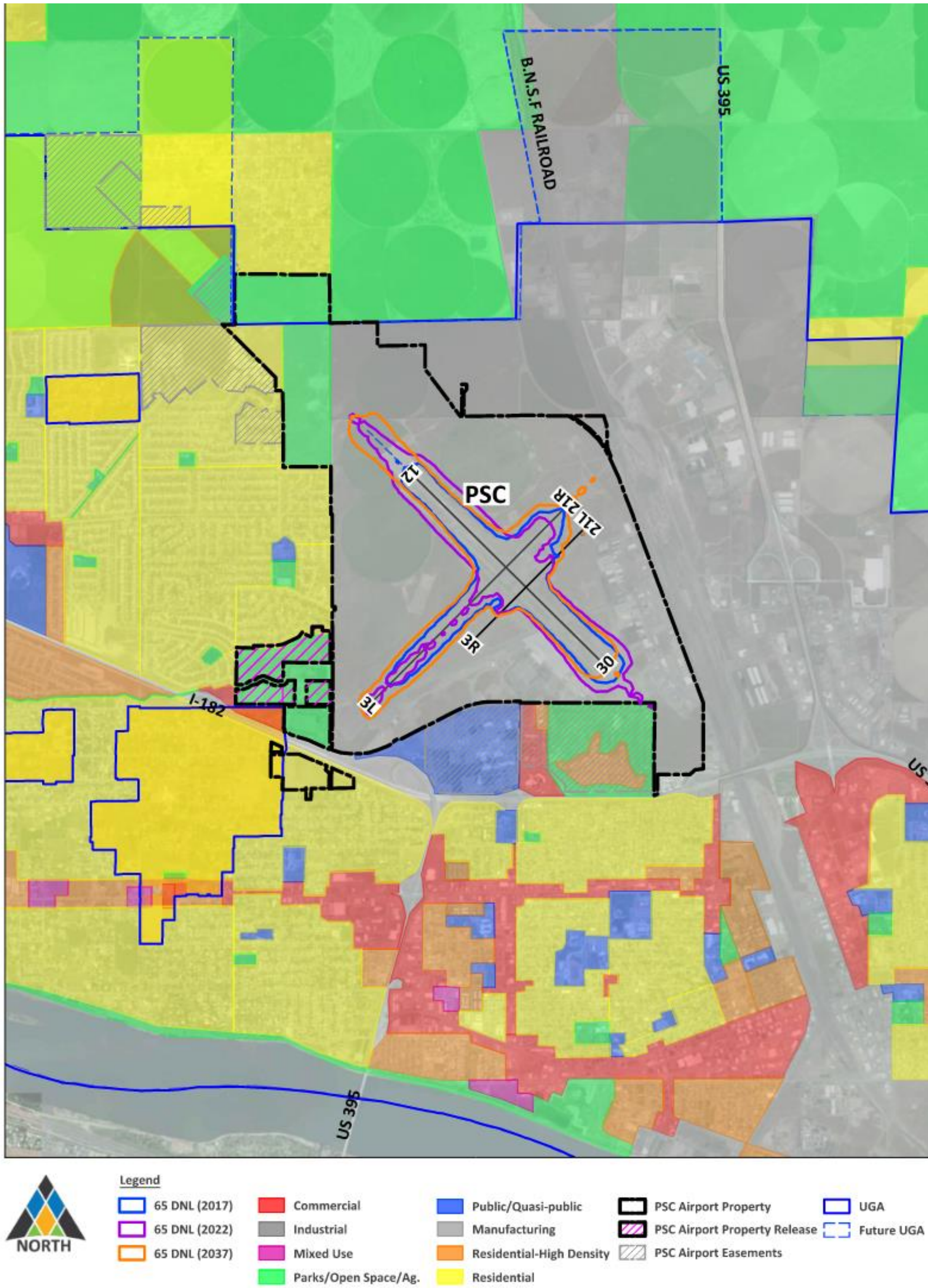
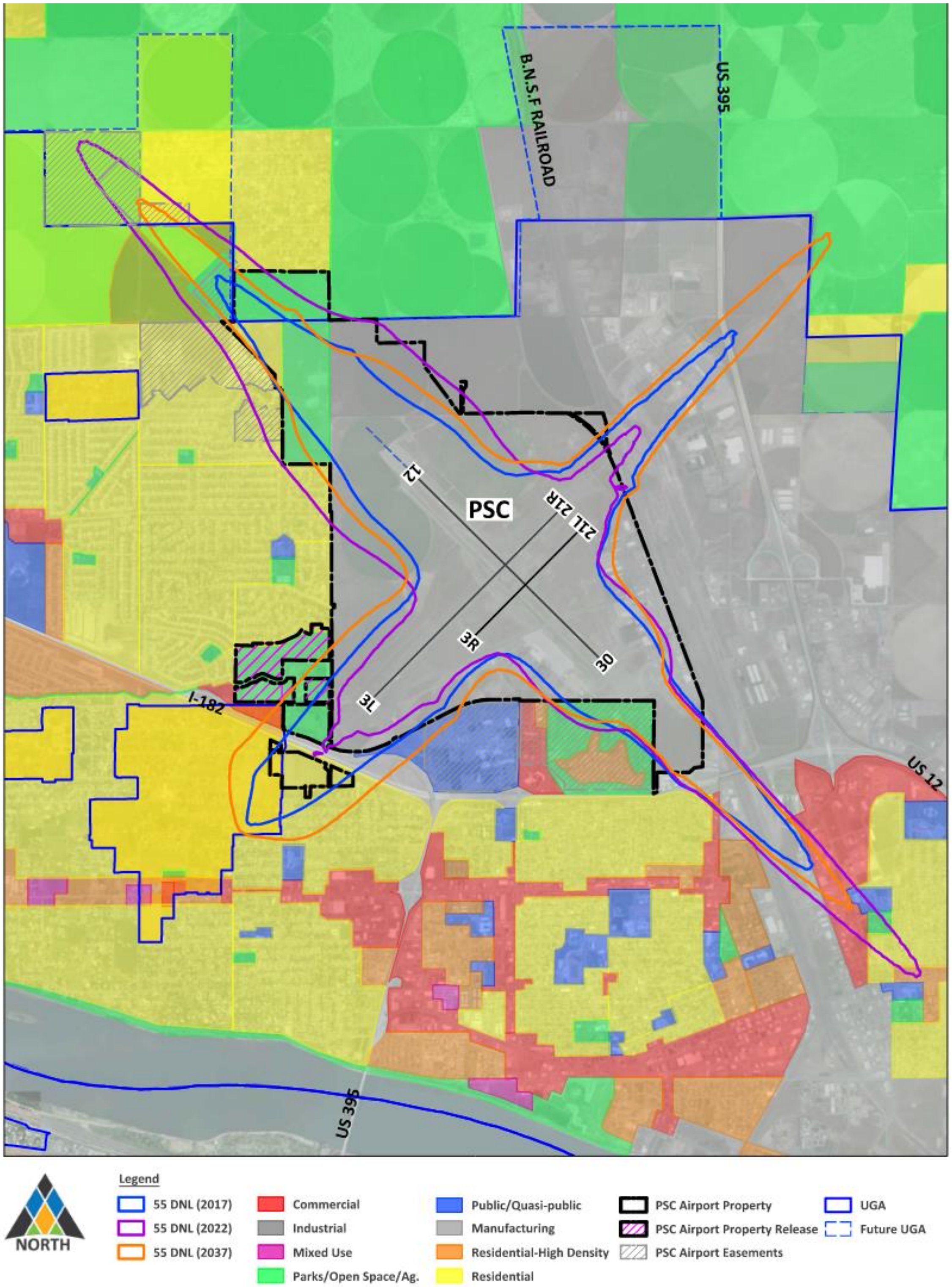


Figure 5-9: PSC 55 DNL Noise Contours



Overflight

Aircraft flying overhead can be perceived as a single noise event intrusion or annoyance to residents living outside of the noise contours. Sensitivity to aircraft overflights varies from person to person. The basic intent of overflight policies is to advise people that are considering property near an airport of the presence of aircraft so that they can make informed decisions regarding the acquisition or lease of property within the airport influence area.

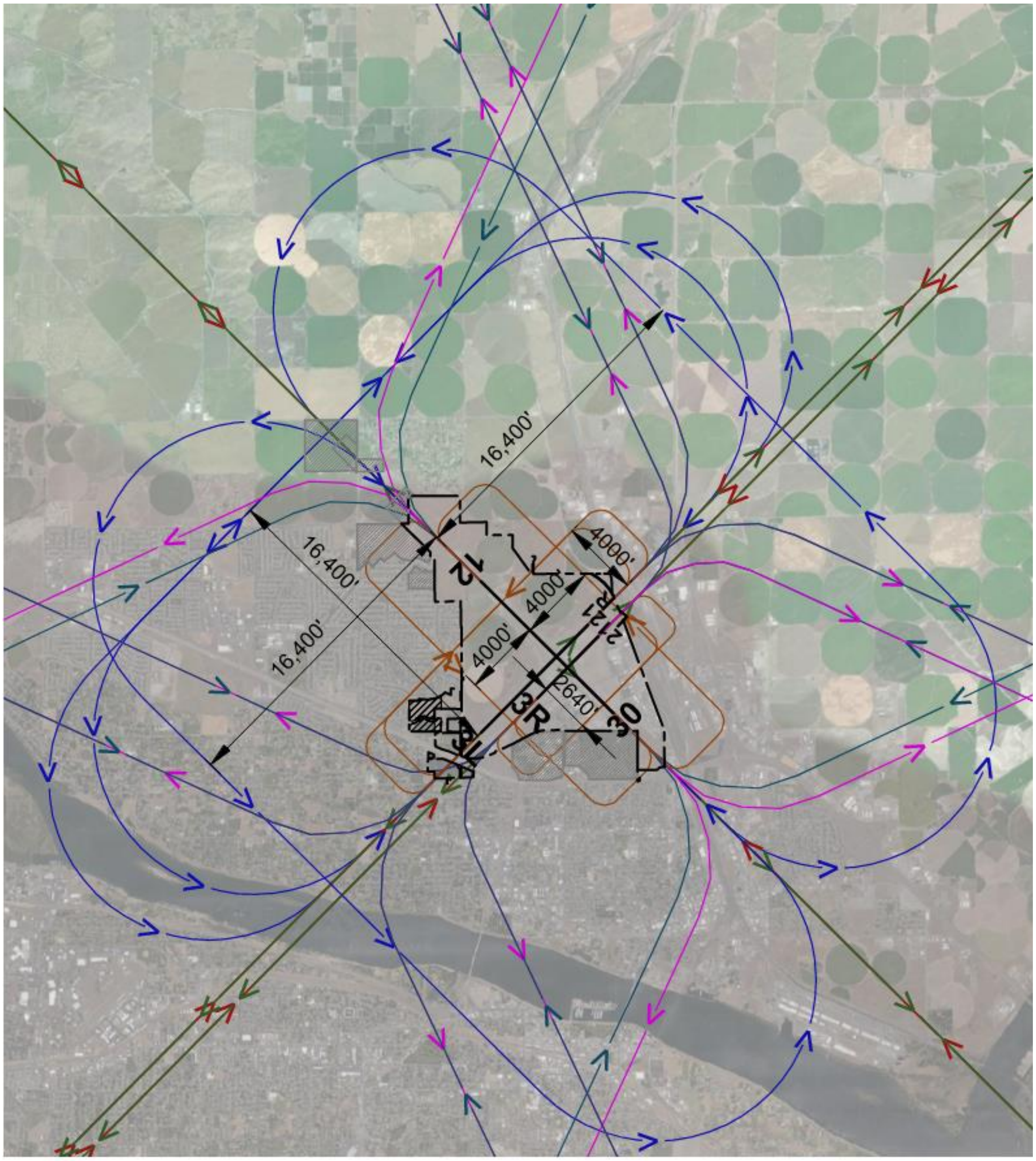
PSC Traffic Patterns

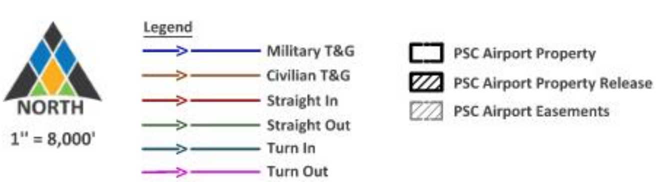
Aircraft at PSC operate under both visual flight rules and instrument flight rules. **Figure 5-10** shows the common flight patterns at PSC. The patterns include straight-in and straight-out arrivals and departures, as well as touch-and-go patterns for all three runways. Most of the traffic occurs on Runway 12/30 where aircraft arrive from the south and depart to the north. Military aircraft at PSC conduct touch-and-go patterns in a larger flight pattern compared to civilian aircraft. These wider military patterns extend 5-10 miles from the airfield.

Overflight Assessment

Aircraft flight patterns extend over the city of Pasco, the city of Kennewick, and Franklin County. The areas within the city of Pasco's proposed UGA would introduce new residential uses into the overflight areas associated with aircraft operating at PSC. However, both Franklin County's and Pasco's AOD regulations require disclosure statements be listed on all approved subdivision plats, short plats, binding site plans, and deeds within the AOD boundaries. Therefore, no significant compatibility conflicts are anticipated.

Figure 5-10: PSC Common Flight Patterns





Note: The depicted aircraft traffic patterns are based on standardized procedures and demonstrate the variance in pattern size due to aircraft type, size, aircraft performance and operating procedures. The actual path of aircraft over the ground can also vary due to air traffic control instructions, pilot experience, and weather conditions. The depicted flight tracks are not intended to represent mandatory paths.
Source: FAA Aeronautical Information Manual

Safety

PSC RPZs

The RPZ's function is to enhance protection of people and property on the ground. The FAA's primary area of concern is development within RPZs. FAA policy is to have the entire RPZ clear of all above-ground objects. The AOD regulations for Franklin County and Pasco indicate that only airport land uses, and activities are allowed within an RPZ.

RPZ Assessment

As depicted in **Figure 5-11,** portions of the existing and future RPZs extend beyond the PSC property boundary and encompass the following land uses:

- **Northeast (Pasco)**: 5.3 acres of the existing approach and departure Runway 21R RPZs extend beyond PSC property across N 4th Avenue and into the BNSF Railway yard.
- **Southeast (Pasco)**: 22 acres of the future Runway 30 precision approach RPZ extends across Sun Willows Golf Course, which is covered by an existing avigation easement held by the Port of Pasco.
- **Southwest (Pasco)**: 23 acres of the future Runway 3L precision approach RPZ extends across Argent Road and Interstate-182. Most of the future RPZ overlies property owned by the Port of Pasco with the exception of an approximate 1-acre area in the far south corner. This 1-acre area extends beyond PSC property and encompasses an existing residential property. Pasco's Land Use map designates this area, including the noncontiguous PSC property south of Interstate 182, as Low-Density Residential.
- **Northwest (Franklin County/Pasco)**: The future Runway 12 non-precision approach RPZ remains entirely within PSC property.

FAA Implications

The future RPZs for Runway 3L, 12, and 30 may increase in size if their instrument flight procedures change from non-precision to precision. In accordance with the FAA 2012 RPZ memorandum, any airport development proposal that would potentially increase the RPZ and amount of incompatible land uses within an RPZ would be subject to review by the FAA. Although most of the land within the future RPZs are controlled by the Port of Pasco through land ownership or avigation easement, 23 acres of Interstate 182 and associated rights-of-way and a 1-acre residential parcel remain uncontrolled (see **Figure 5-11**).

Local Agency Implications

The AOD regulations of Franklin County and Pasco reflect both the existing and future RPZs and prohibit nonaeronautical development within these RPZs. Therefore, no significant compatibility conflicts are anticipated for the areas underlying the existing and future RPZs. Local AOD zoning regulations and existing avigation easements would preclude new incompatible development within the RPZs. However, Pasco's land use maps designate the lands underlying these RPZs, including the areas owned by the Port of Pasco, as Low-Density Residential. Both Pasco's Comprehensive Land Use Map and Zoning Map should be updated to designate PSC-property as Open Space or another compatible land use designation.

Local Airport Safety Compatibility Zones

Franklin County's and Pasco's AOD regulations include safety compatibility zones that extend beyond the limits of the RPZs. Local AOD regulations establish land use restrictions within Safety Compatibility Zones 1 through 6 as documented in **Table 5-2** earlier in this chapter and depicted in **Figure 5-12** below. Local AOD regulations restrict residential densities to the following:

- **Zone 1 and 5**: No new residential uses
- **Zone 2 and 4**: Franklin County restricts maximum density to 1 dwelling unit per 5 acres.

  City of Pasco requires that all new residential developments must include the disclosure statement in PMC 25.190.100 on plats, short plats and binding site plans. In Zone 4, City of Pasco permits residential infill south of I-182, and in all other Zone 4 areas density is limited to suburban residential district RS-20, with minimum lot size of 20,000 square feet and one dwelling unit per lot.
- **Zone 3**: Infill residential uses only.
- **Zone 6**. No density limits. New residential uses must include disclosure statements.

Safety Compatibility Zone Assessment

The Airport Safety Compatibility Zones primarily encompass lands within the city of Pasco, as well as Pasco's proposed UGA boundary northwest of PSC. Much of these areas are designated for residential uses of varying densities. No significant compatibility conflicts are anticipated if Pasco's AOD residential density limits are applied. There are low-density residential areas planned for northwest of Runway 12 in the City's updated Comprehensive Plan. However, this area is covered by existing or proposed avigation easements.

Figure 5-11: PSC Runway Protection Zones

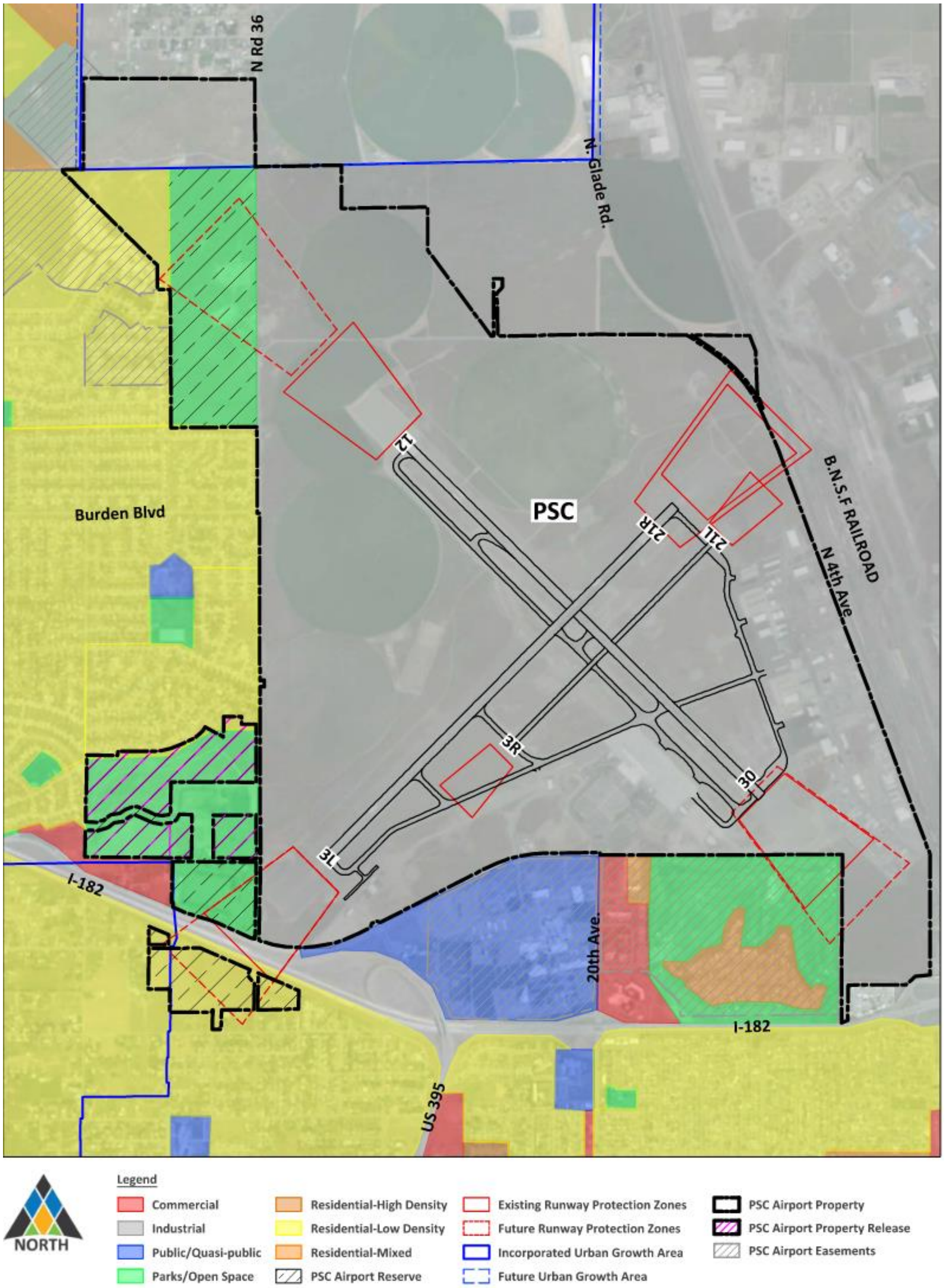
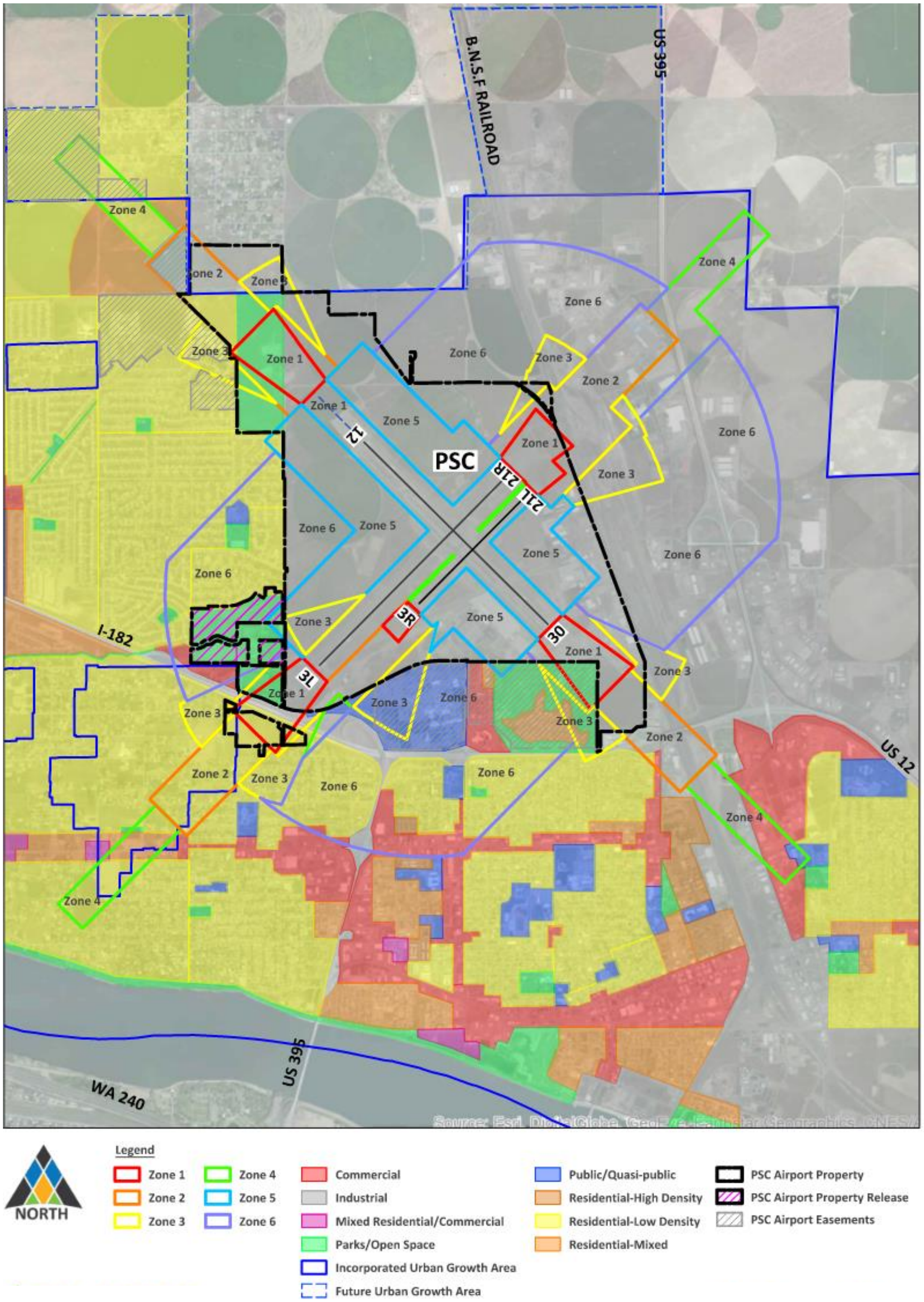


Figure 5-12: PSC Airport Safety Compatibility Zones



Airspace Protection

Airspace protection seeks to prevent the creation of land use features that can be hazards to the airspace required by aircraft in flight and have the potential for causing an aircraft accident. Airspace hazards fall into three categories: Physical (e.g., tall structures, bird attractants, thermal plumes); visual (e.g., lights, sources of glare, dust, team); and electronic (e.g., interfere with aircraft communications and navigation). As described above, 14 CFR Part 77 establishes standards to protect the airspace surrounding airports from natural or constructed obstructions that could constitute a hazard to flying aircraft. Franklin County's and Pasco's AOD stipulate that no object may exceed the height limits established by 14 CFR Part 77.

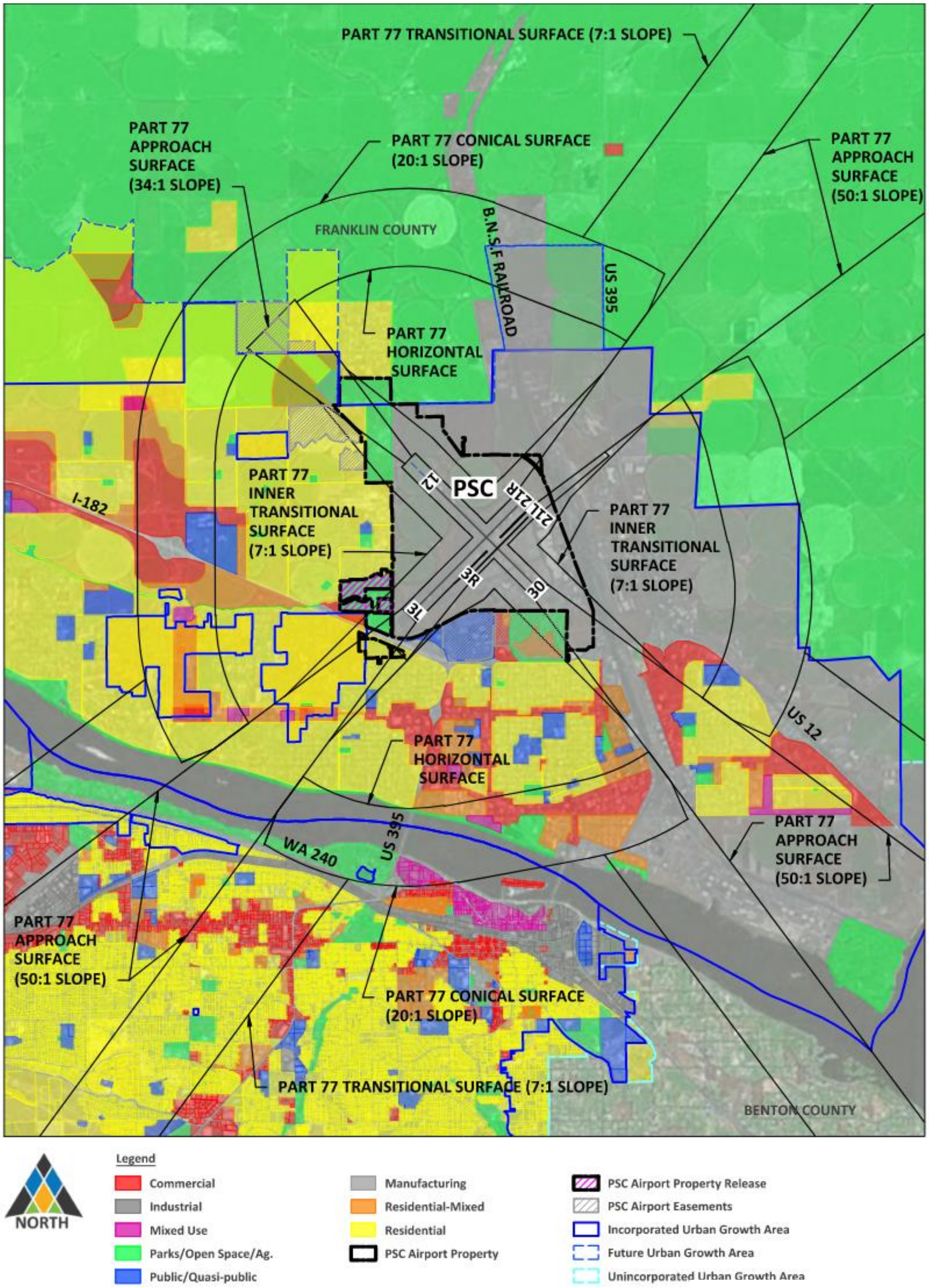
PSC Part 77 Airspace Surfaces

Figure 5-13 depicts the 14 CFR Part 77 airspace surfaces and reflects precision instrument approach surfaces for Runway 21R (existing) and Runways 30 (future) and 3L (future). Allowable heights for natural and constructed objects are determined by comparing the height limits established by 14 CFR Part 77 and the underlying ground elevation.

Airspace Compatibility Assessment

The areas subject to height limits of 35 feet or less remain on PSC property. For areas beyond airport property, local AOD regulations prohibit structures or natural growth to obstruct the 14 CFR Part 77 airspace surfaces. Local regulations also require that the Port of Pasco's Administrative Office must review development proposals for structures within 20 feet of any of the height limitation zones or over 200 feet high. As such, no significant airspace conflicts are anticipated.

Figure 5-13: PSC Part 77 Airspace Surfaces



Compatibility Findings

The following summarizes the compatibility assessment documented above for the following four compatibility factors:

- **Noise**: The future 65 DNL noise contour remains on airport property. The 55 DNL noise contour, which is not a federal threshold for noise impacts, extends beyond PSC property. Residential uses identified in Pasco's proposed UGA northwest of PSC may be susceptible to future noise impacts.
- **Overflight**: No significant impacts are anticipated. Local regulations require airport disclosure statements as a condition of approval of subdivision plats, short plats, binding site plans, and deeds within the AOD boundaries.
- **Safety**: Local AOD regulations address safety compatibility concerns and protect PSC against encroachment by incompatible land uses. However, a small portion of the future Runway 3L precision approach RPZ encompasses a 1-acre residential parcel. Ideally, the Port of Pasco would control this 1-acre site through land acquisition or an avigation easement. Finally, increasing the size of the RPZs and incorporating additional incompatible land uses will initiate additional analysis and coordination with the FAA per the 2012 RPZ Memorandum.
- **Airspace**: The most stringent height restrictions of 35 feet or less affect areas on PSC property. Local AOD regulations address potential airspace hazards and require clearance of 14 CFR Part 77 surfaces. The AOD regulations also enable the Port of Pasco Administrative Office to review and comment on proposed projects.

RECOMMENDED ACTIONS

The principle objective of this Master Plan is to protect the long-term viability of PSC so that it may continue to serve the region's residents, businesses, and visitors. As such, this Master Plan recommends that certain actions be taken by the Port of Pasco, Frankly County, and city of Pasco to protect PSC from encroachment of incompatible land uses and to protect residents from airport impacts.

Port of Pasco

- **Easement Acquisition.** Acquire an avigation easement for the 1-acre residential property encompassed by the future Runway 3L precision approach RPZ .
- **Airport Land Release.** There are five parcels being considered by the Port of Pasco for FAA-release for non-aeronautical use or sale are zoned as Residential Transition (5-acre lots). The parcels are identified on the current PSC Exhibit A Property Map. The land release includes Areas XII, XIII, XIV, XV, and XVI. The Exhibit A Property Map also lists the tax parcel numbers as 117-301-018, 117-301-017, 117-322-013, 117-322-031, and 117-322-040. respectively. Although not in a highly impacted area, the proximity of these parcels to Runway 3L would warrant a land use designation other than residential. If released for non-aeronautical use or sale, the parcels would

not impact the safe and efficient operation of existing aircraft, would not adversely affect the safety of people or property on the ground adjacent to PSC, and would not adversely affect the value of federal investments to a significant extent. Additionally, the parcels were not acquired with FAA monies, but since that time PSC has accepted federal funds with grant assurance requirements. It is recommended that the Port of Pasco work with the city of Pasco to identify a non-residential land use designation that would be appropriate for these five parcels.

Franklin County

- As part of the next update of the Comprehensive Plan, specifically reference PSC's presence in the county and its regional significance to the local economy and traveling public.
- Amend the AOD to reference this Master Plan by date.

City of Pasco

- Amend the AOD to reference this Master Plan by date.
- Amend the city of Pasco's Comprehensive Plan Land Use Map and 2017 Zoning map to ensure that the entirety of PSC property, particularly the parcels purchased by the Port of Pasco for airport protection purposes, are not designated for Residential uses or Parks. Additionally, the zoning map should be updated to remove the Low-Density Residential designation for the Columbian Basin College campus and Sun Willows Golf Course that exist south of PSC.
- Designate lands within the proposed UGA northwest of PSC and underlying the 55 DNL contour and Airport Safety Compatibility Zones for uses other than Residential (preferred). Alternatively, restrict future residential uses to a maximum density of 1 dwelling unit per 5 acres.

SUMMARY

Incompatible land use can compromise PSC's viability to serve the community and contribute to the local economy. Franklin County and the city of Pasco are the two jurisdictions that have the greatest influence on guiding land use patterns around PSC. Both jurisdictions have adopted an AOD with comprehensive regulations that address compatibility concerns such as noise, safety, and airspace protection. Based on the compatibility assessment summarized in this chapter, only minor modifications to local community land use plans and regulations are recommended to preclude incompatible development within proximity of PSC.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
2200 S. 216th Street
Des Moines, WA 98198

June 16, 2020

Mr. Buck Taft
3601 N. 20th Ave.
Pasco WA 99301

Dear Mr. Taft:

Thank you for your inquiry regarding whether or not the FAA has approval authority of the proposed development of the Business Park at Tri-Cities Airport (PSC).

Recent changes in federal law have required the Federal Aviation Administration (FAA) to revisit whether FAA approval is needed for certain types of airport projects throughout the nation. On October 5, 2018, HR 302, the "FAA Reauthorization Act of 2018" (the Act) was signed into law (P.L. 115-254). In general, Section 163(a) limits the FAA's authority to directly or indirectly regulate an airport operator's transfer or disposal of certain types of airport land. However, Section 163(b) identifies exceptions to this general rule. The FAA retains authority:

1. To ensure the safe and efficient operation of aircraft or safety of people and property on the ground related to aircraft operations;
2. To regulate land or a facility acquired or modified using federal funding;
3. To ensure an airport owner or operator receives not less than fair market value (FMV) in the context of a commercial transaction for the use, lease, encumbrance, transfer, or disposal of land, any facilities on such land, or any portion of such land or facilities;
4. To ensure that that airport owner or operator pays not more than fair market value in the context of a commercial transaction for the acquisition of land or facilities on such land;
5. To enforce any terms contained in a Surplus Property Act instrument of transfer; and
6. To exercise any authority contained in 49 U.S.C. § 40117, dealing with Passenger Facility Charges.

In addition, Section 163(c) preserves the statutory revenue use restrictions regarding the use of revenues generated by the use, lease, encumbrance, transfer, or disposal of the land, as set forth in 49 U.S.C. §§ 47107(b) and 47133.

Section 163(d) of the Act limits the FAA's review and approval authority for Airport Layout Plans (ALPs) to those portions of ALPs or ALP revisions that:

1. Materially impact the safe and efficient operation of aircraft at, to, or from the airport;
2. Adversely affect the safety of people or property on the ground adjacent to the airport as a result of aircraft operations; or
3. Adversely affect the value of prior Federal investments to a significant extent.

Proposed Project

The airport sponsor is requesting a release of obligations for airport-owned land to be used for non-aeronautical purposes (business park) near Runway 3L. Within the business park a hotel and auto auction facility were previously approved, but the sponsor would like to release the aeronautical obligations for the entire business park for non-aeronautical commercial facility development, which would be privately funded.

Determination Regarding the Airport Layout Plan

For the purpose of determining whether the ALP change for the proposed project requires FAA approval, we have determined that the proposed project would have no impact on aircraft operations at, to, or from PSC and would not adversely affect the safety of people or property on the ground adjacent to the airport as a result of aircraft operations. We have also determined that the proposed expansion would not have an adverse effect on the value of prior Federal investments to a significant extent. Therefore, the FAA lacks the legal authority to approve or disapprove the ALP for the proposed business park development.

FAA's Authority to Regulate Land Use

The land subject to the proposed project was sponsor acquired, without federal assistance. Because the land for the proposed project was acquired without federal assistance, and will not affect the safe and efficient operation of aircraft or safety of people and property on the ground related to aircraft operations, the FAA lacks the authority to regulate the land use associated with this project.

Applicability of the National Environmental Policy Act (NEPA)

Because the FAA lacks the legal authority to approve or disapprove changes to the ALP, the agency does not have an action subject to the National Environmental Policy Act (NEPA).

Sponsor Obligations Still In Effect

As a reminder, Section 163 still requires the airport to receive not less than fair market value for the use, lease, encumbrance, transfer, or disposal of land, any facilities on such land, or any portion of such land or facilities. The airport must also ensure that all revenues generated as a result of this lease may only be expended for the capital or operating costs of the airport; the local airport system; or other local facilities which are owned or operated by the owner or operator of the airport and which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes on or off the airport.

The sponsor also has the responsibility to comply with all federal, state, and local environmental laws and regulations.

Additionally, this development is still subject to airspace review under the requirements of 14 CFR Part 77, and Grant Assurance 29 still requires the airport to maintain a current ALP. Please provide an updated ALP that depicts the business park if the project is completed.

If you have further questions or need for clarification, please feel free to contact me at 206-231-4145.

Sincerely,

Digitally signed by WILLIAM C GARRISON
Date: 2020.06.16 11:35:02 -06'00'

William C. Garrison
Acting Manager, Seattle Airports District Office

cc: Valerie Thorsen, Airport Capacity Program Manager, ANM Airports Division

TRI-CITIES
AIRPORT • PSC

CHAPTER 6
FINANCIAL IMPLEMENTATION ANALYSIS

CHAPTER 6 - FINANCIAL IMPLEMENTATION ANALYSIS

FINANCIAL ANALYSIS OBJECTIVES

The primary objective of the Financial Implementation Analysis for the Tri-Cities Airport (PSC) Master Plan is to evaluate the Airport's capability to fund the Capital Improvement Program (CIP) and to finance Airport operations. The program is planned for implementation through three phases of development including a five-year Short-Term period (2020-2024), a five-year Mid-Term period (2025-2029) and a ten-year Long-Term period (2030-2039). The analysis includes development of a detailed Financial Implementation Plan. Objectives for developing the Financial Implementation Plan include presenting the results of the implementation evaluation and providing practical guidelines for matching an appropriate amount and timing of financial sources with the planned use of funds.

OVERALL APPROACH

The overall approach for conducting the Financial Implementation Analysis included the following steps:

- Gathering and reviewing key Airport documents related to historical financial results, capital improvement plans, operating budgets, regulatory requirements, Port policies, airline agreements and other operating agreements with Airport users
- Interviewing key Airport officials to gain an understanding of the existing operating and financial environment, relationships with the airlines and overall management philosophy
- Reviewing the Aviation Activity Forecast previously developed in the Master Plan
- Reviewing the Capital Improvement Program project cost estimates and development schedules anticipated for the planning period and projecting the overall financial requirements for the program
- Determining and analyzing the sources and timing of capital funds available to meet the financial requirements for operating the Airport and financing the Capital Improvement Program
- Analyzing historical operations and maintenance expenses, developing operations and maintenance expense growth assumptions, reviewing assumptions with Airport management and projecting future operations and maintenance expenses for the planning period
- Analyzing historical revenue sources, developing revenue growth assumptions, reviewing assumptions with Airport management and projecting future airline and non-airline revenues for the planning period
- Completing results of the review in a Financial Analysis Summary that evaluates the financial reasonableness of the Capital Improvement Program.

ORGANIZATION, ACCOUNTING AND BUDGETING

Governmental Organization and Administration

The Tri-Cities Airport is owned and operated by the Port of Pasco. The Port is a municipal corporation of the State of Washington and was created in 1940. The Port is governed by a three-member, elected Commission who serve staggered six-year terms. The day-to-day affairs of the Port and the Airport are managed by a professional staff of key administrators whose responsibilities include policy implementation, capital planning, financial planning and control, operations and maintenance, and personnel supervision.

Accounting and Budgeting Practices

Accounting records for the Port are maintained in accordance with methods prescribed by the State Auditor under the authority of chapter 43.09 RCW. The Port uses the Uniform System of Accounts for Port Districts in the State. The full accrual basis of accounting is utilized in which revenues are recognized when earned and expenses are recognized when incurred. The State Auditor is required to examine the affairs of port districts in Washington at least once every two years. Every year the State audits the Port's financial statements, evaluates internal controls and evaluates compliance with major federal programs such as the Airport Improvement Program and the Passenger Facility Charge program. The Port is also subject to an Accountability Audit conducted by the State which examines the Port's compliance with State laws and regulations as well as the Port's own policies and procedures.

The annual budget serves as the foundation for the Port's financial planning and control. Budget targets are developed and submitted to the Executive Director's Office for the Airport as well as other major departments of the Port for review and analysis. Budget requests are evaluated in terms of program goals, anticipated outcomes and the necessity of these goals toward achieving the goals and mission of the Port. After the administration's review and revision, the budget for all departments is presented to the Port Commission for further review and revision prior to the budget being adopted by the Commission for the coming fiscal year.

AVIATION FORECASTS

In Chapter 2 of the Master Plan, aviation activity forecasts are developed to determine if existing airport facilities have the capacity to meet future demand or if facility modifications are needed. These forecasts, which include passenger enplanements, aid in the development and prioritization of the projects included in the CIP. The passenger enplanement forecasts are important in the projection of various capital funding sources described below. Specifically, AIP entitlement funds, Passenger Facility Charges, Customer Facility Charges and a number of operating revenues, described in Section 6.6.4 below, are projected based on these forecasts.

CAPITAL FUNDING SOURCES

In the past, the Airport has used a combination of FAA Airport Improvement Program (AIP) entitlement and discretionary grants, Passenger Facility Charges, debt financing and cash reserves/net operating revenues to fund capital improvements as well as some Department of Homeland Security Grants (TSA and FEMA) and economic development funds. These funding sources, as well as additional sources of capital funding, will continue to be important to finance the Airport's Master Plan Capital Improvement Program (CIP) during the future twenty-year planning period.

Airport Improvement Grants

The Airport receives grants from the Federal Aviation Administration (FAA) to finance the eligible costs of certain capital improvements. These federal grants are allocated to commercial passenger service airports through the Airport Improvement Program (AIP). AIP grants include passenger entitlement grants, which are allocated among airports by a formula that is based on passenger enplanements and discretionary grants which are awarded in accordance with FAA guidelines. After several years of continuing budget resolutions and other short-term legislative measures implemented by Congress, the FAA Reauthorization Act of 2018 was enacted on October 5, 2018. The Act authorized funding for the AIP through September 30, 2023.

Under current AIP authorization legislation, eligible projects are funded on a 90% AIP grant/10% local match basis for small and non-hub airports. Under this authorization, the Airport received entitlements of about $2.8 million in 2020 and future annual grants are projected to grow to $3.6 million by 2039 - the end of the planning period. Non-hub airports (currently those with annual enplanements between approximately 10,000 passengers and 450,000 passengers) can accumulate and carryover up to three years of unspent entitlements plus the current year before the awards are revoked. In 2020, the Airport had no unspent entitlements to carryover for use in 2020. The implementation analysis assumes the application of annual AIP passenger entitlement funds will be about $15.2 million during the Short-Term planning period, $16.4 million during the Mid-Term and $34.9 million during the Long-Term.

The approval of AIP discretionary funding is based on a project eligibility ranking method the FAA uses to award grants, at their discretion, based on a project's priority and importance to the national air transportation system. In 2014 and 2018, Tri-Cities received discretionary funding to support Taxiway D and Taxiway A rehabilitation and realignment projects as well as funds related to security enhancements in their terminal construction project. It is reasonable to assume that the Airport will receive additional discretionary funding during the planning period for higher priority, eligible projects, such as runway projects. The implementation analysis assumes that $9.2 million of AIP discretionary funds will be required during the Short-Term for the shift of Runway 12/30. The implementation analysis also assumes that AIP discretionary grants of about $11.2 million will be available for the rehabilitation of Runway 3L/21R and the construction of a new SRE Building during the five-year Mid-Term period. In the Long-

Term, $31.6 million in discretionary funds are assumed for the expansion of the terminal apron as well as the extension of Runway 12/30.

Since the future availability of AIP discretionary grants is not certain until an actual grant is awarded, it should be noted that any CIP projects which have discretionary funds indicated as a funding source in the financial Implementation plan may need to be delayed until such funds actually become available.

The implementation analysis further assumes that the current AIP program will continue to be extended through 2039 and that future program authorizations will provide substantially similar funding levels as it currently does and as it has historically provided since the program was established in 1982.

Washington State Department of Transportation Aviation Division Airport Aid Program

The Washington State Department of Transportation (WSDOT), Aviation Division's grant program is funded through an 11-cent-per gallon fee on aviation fuel, along with aircraft excise tax and registration fees. Grant funds are distributed through three major project categories: 1) pavement projects, 2) safety projects, and 3) maintenance, security and planning projects. For projects receiving federal funds, the Airport Aid Program has historically provided one-half of the required local match. For projects not federally funded, WSDOT Aviation may fund an eligible project's costs up to a maximum of 95% of eligible costs with a minimum 5% match from the airport sponsor. The maximum amount WSDOT Aviation can grant to any one individual sponsor in any one single grant is $750,000.

The Master Plan CIP includes several projects during the planning period that are assumed to be partially funded from the WSDOT Airport Aid Program - $1.1 million in the Mid-Term and $200 thousand in the Long-Term. These funds are anticipated to support the construction of a new SRE building, Runway 3L/21R rehabilitation, expansion of the outbound baggage facility, and the expansion of the terminal apron.

Passenger Facility Charges

The Aviation Safety and Capacity Expansion Act of 1990 established the authority for commercial service airports to apply to the FAA for imposing and using a Passenger Facility Charge (PFC) of up to $3.00 per eligible enplaned passenger. With the passage of AIR-21 in June 2000, airports could apply for an increase in the PFC collection amount from $3.00 per eligible enplaned passenger to $4.50. The proceeds from PFCs are eligible to be used for AIP eligible projects and for certain additional projects that preserve or enhance capacity, safety or security; mitigate the effects of aircraft noise; or enhance airline competition. PFCs may also be used to pay debt service on bonds (including principal, interest and issue costs) and other indebtedness incurred to carry out eligible projects. In addition to funding future planned projects, the legislation permits airports to collect PFCs to reimburse the eligible costs of projects that began on or after November 5, 1990.

PSC currently collects PFC revenues in an approved open application at the $4.50 collection level. The Airport plans to submit a new application for additional PFC eligible capital projects identified in the Master Plan and to continue collection without interruption of its collection authority. Current collections at the $4.50 collection level are approximately $1.7 million per year and are projected to grow to $2.5 million per year by the end of the planning period. The implementation analysis assumes that the Airport will submit additional PFC applications and amendments, as required, to ensure that the collection of PFC revenues continues beyond the authorized expiration date through the end of the twenty-year planning period in 2039. The implementation analysis further assumes that PFCs will be used on a pay-as-you-go basis to fund approximately $1.8 million in eligible project costs during the Mid-Term and $13.5 million in the Long-Term. No PFCs are assumed to fund any projects in the Short-Term as all PFC collections during the Short-Term are required to fund existing PFC debt service through 2034.

Rental Car Customer Facility Charges

In the last several years, rental car Customer Facility Charges (CFCs) have become common financing tools for landside improvements at airports in the U.S. Such charges are collected by rental car companies that provide services to commercial passengers at the airports they serve. CFCs are collected by the rental car companies on behalf of, and for the benefit of, the airports where they operate. The charge is typically based on a fee per rental car transaction day that is added to rental car contracts. In Washington State, CFCs are required to be used for the financing, designing, constructing, operating, and maintaining of consolidated car rental facilities and common use transportation equipment and facilities which are used to transport the customer between the consolidated car rental facilities and other airport facilities.

The Airport currently collects a CFC of $3.00 per rental car transaction day to support capital expenditures for improving and expanding rental car facilities. The Master Plan CIP includes projects to construct a rental car service facility and parking expansion, a new rental car building (offices and customer counters) relocated from the existing terminal building, and a portion of the construction of a parking garage which would include an area for rental car vehicles and operations. The implementation analysis assumes that CFCs will be used on a pay-as-you-go basis to fund approximately $8.0 million in project costs during the Short-Term and approximately $10.8 million in the Long-Term.

Cash Reserves/Airport Net Operating Revenue

The Airport's cash reserves and future net operating revenues are significant sources of funds for the implementation of the projects included in the CIP. Net operating revenues represent the remaining funds available from the generation of operating revenues less payment of operating expenses as well as debt service requirements on the non-PFC funded portion of the Airport's debt obligations. The projection of Operating Expenses and Operating Revenues is further discussed in Sections 6.6.3 and 6.6.4. In the Short-Term, net operating revenue generated per year and available for capital development is estimated to be approximately $3 million per year and grows to approximately $4 million per year in the Mid-Term. In the Long-Term, the net operating revenues available for capital development grows significantly to an average of $6 million per year, after the majority of the Airport's outstanding debt is retired in 2029.

At the beginning of 2020, the Airport had accumulated about $2.6 million in unrestricted cash reserves available for operations and capital project funding. The implementation analysis assumes that Airport cash reserves/net operating cash flow will be used throughout the planning period to fund about $60.3 million in project costs. This will include local grant match requirements, project components ineligible for federal funding, or projects which federal and/or state funding may not be available. The implementation analysis assumes $8.7 million during the Short-Term, $15.1 million in the Mid-Term and $36.5 million in the Long-Term.

FINANCIAL ANALYSIS AND IMPLEMENTATION PLAN FOR THE MASTER PLAN CAPITAL IMPROVEMENT PROGRAM

This analysis, along with the Schedules presented at the end of Chapter 6, provides the results of evaluating the financial reasonableness of implementing the Master Plan Capital Improvement Program during the planning period from 2020 through 2039.

Estimated Project Costs and Development Schedule

The Capital Improvement Program (CIP) Estimated Project Costs and Development Schedule is derived from previous results of the Master Plan analysis. The CIP for capital expansion and improvement projects is projected on an annual basis for the Short-Term planning period from 2020 through 2024, in total for the Mid-Term planning period from 2025 through 2029 and in total for the Long-Term planning period from 2030 through 2039. Projects in the Mid-Term and Long-Term are reflected in total, not by specific year, to provide flexibility for changes or adjustments to the timing and priority of projects based on the needs of the airport as it progresses through the planning periods. For each of these planning periods, **Schedule 6-1** (provided at the end of Chapter 6) presents the Capital Improvement Program including estimated costs and anticipated development schedule for the identified projects.

As shown in **Schedule 6-1**, the total estimated cost of projects is $154,700,226 in 2019 dollars. The estimated costs for projects scheduled during the period 2020 through 2039 are adjusted by an assumed 3% rate of annual inflation. The resulting total project costs escalated for inflation are $214,161,178. **Table 6-1** presents a summary of the Schedule and provides a comparison of 2019 base year costs with escalated costs adjusted for inflation for each of the planning periods.

Table 6-1: Summary of 2019 Base Year and Total Escalated Costs for the Master Plan Capital Improvement Program

Planning Periods	2019 Base Year Costs	Total Escalated Costs
Short-Term Projects (2020-2024)	$36,342,216	$41,082,449
Mid-Term Projects (2025-2029)	36,539,250	45,607,768
Long-Term Projects (2030-2039)	81,818,760	127,470,962
Total Project Costs	$154,700,226	$214,161,178

Note: Addition errors are due to rounding of calculated amounts.
Source: Leibowitz & Horton AMC analysis

Sources and Uses of Capital Funding

Funding sources for the CIP depend on many factors, including AIP and PFC project eligibility, the ultimate type and use of facilities to be developed, management's current and desired levels of the Airport's airline cost per enplaned passenger, the availability of other financing sources and the priorities for scheduling project completion. For example, airfield projects such as runways and taxiways are typically eligible for AIP and PFC funding, so such projects are primarily funded by those sources and do not require use of airport generated funds. However, revenue producing projects such as parking lots or non-aeronautical development projects are not eligible for AIP or PFC funding, so such projects are typically funded with airport operating revenues. For master planning purposes, assumptions were made related to the funding source of each capital improvement.

Schedule 6-2 (provided at the end of Chapter 6) lists each of the CIP projects, their estimated costs (escalated annually for inflation) and the assumed funding sources and amounts. During the twenty-year planning period, it was assumed that AIP entitlement grants would partially fund the construction, rehabilitation and extension of various runways and taxiways, terminal apron expansion and deicing pads, acquisition of ARFF equipment, the construction of a new Snow Removal Equipment Building, rehabilitation and reconstruction of general aviation aprons, terminal improvements including expansion of both inbound and outbound baggage facilities, installation of passenger loading bridges, expansion of the ticketing area, and Gate 6 boarding area expansion, and finally, future master plan updates, required environmental assessments and a relocation study for the Air Traffic Control Tower. It was assumed that AIP discretionary grants would partially fund the rehabilitation of Runway 3L/21R, construction of a new SRE Building, expansion of the terminal apron as well as the extension of Runway 12/30. It was assumed that WSDOT aviation grants would support the construction of a new SRE building, Runway 3L/21R rehabilitation, expansion of the outbound baggage facility, and the expansion of the terminal apron. PFC pay-as-you-go revenues were assumed to fund the local match of most AIP projects in the Mid and Long-Term periods as well as provide funding for the expansion of the terminal building ticketing area in the Long-Term. CFC revenues were assumed to fund the construction of a rental car service facility and parking expansion, a new rental car building (offices and customer counters) relocated from the existing terminal building, and a portion of the construction of a parking garage which would include an area for rental car vehicles and operations. Available cash reserves were assumed to fund the ineligible projects such as parking improvements, improvements to the business and industrial parks, and operating equipment. Additionally, cash reserves were assumed to fund ineligible portions of AIP projects such as ineligible portions of terminal improvements and the SRE building construction. Finally, cash reserves were assumed to fund the required local matches for AIP grants in the Short-Term when PFC funds are not available to do so.

A summary of the sources of capital funding by type and uses of capital funding by planning period for the CIP is presented in **Table 6-2**.

Table 6-2: Summary of Sources and Uses of Capital Funding for the Master Plan Capital Improvement Program

Sources of Capital Funding	Short-Term (2020-2024)	Mid-Term (2025-2029)	Long-Term (2030-2039)	Totals
AIP Entitlement Grants	$ 15,171,233	$ 16,392,283	$ 34,917,820	$ 66,481,337
AIP Discretionary Grants	9,198,525	11,249,215	31,581,568	52,029,309
WSDOT Aviation Grants	-	1,100,000	200,000	1,300,000
Passenger Facility Charges	-	1,778,601	13,502,278	15,280,879
Customer Facility Charges	7,998,991	-	10,759,108	18,758,099
Cash Reserves/Net Ops Cash Flow	8,713,699	15,087,668	36,510,187	60,311,554
Total Sources of Capital Funding	$ 41,082,449	$ 45,607,768	$127,470,962	$214,161,178
Uses of Capital Funding				
Runway/Taxiway Improvements	$ 26,618,047	$ 9,131,726	$ 25,706,462	$ 61,456,236
Terminal Apron Improvements	-	1,497,823	20,409,373	21,907,196
Terminal Roadway and Parking Improvements	2,815,916	3,969,230	33,963,690	40,748,836
Terminal Building	412,000	9,175,101	27,967,073	37,554,174
General Aviation Facility Improvements	1,222	-	6,621,362	6,622,583
Snow Removal Equipment Building	-	14,978,228	-	14,978,228
ARFF Facilities and Equipment	-	1,645,109	-	1,645,109
Business Center/Industrial Park Improvements	525,777	2,090,087	-	2,615,863
Other Airport Funded Improvements and Equipment	2,011,363	3,120,464	7,789,837	12,921,664
Other Improvements	8,698,124	-	5,013,165	13,711,289
Total Uses of Capital Funding	$ 41,082,449	$ 45,607,768	$127,470,962	$214,161,178

Note: Addition errors are due to rounding of calculated amounts.

Source: Leibowitz & Horton AMC analysis

A summary of the application of the different capital funding sources to specific categories of CIP projects is presented in **Table 6-3**.

Table 6-3: Table 6-3. Summary of Application of Funding Sources to Master Plan Capital Project Categories

Summary of Project Types	AIP Entitlements	AIP Discretionary	WSDOT Aviation Grants	Passenger Facility Charges	Rental Car Customer Facility Charges	Cash Reserves/ Net Revenues	Total Funding
Runway/Taxiway Improvements	$24,070,320	$31,024,589	$ 200,000	$3,283,819	-	$2,877,508	$ 61,456,236
Terminal Apron Improvements	$4,948,041	$14,768,436	$200,000	$1,990,720	-	-	$21,907,196
Terminal Roadway and Parking Improvements	-	-	-	-	$7,866,177	32,882,659	$40,748,836
Terminal Building	$23,911,377	-	$700,000	$8,426,076	$1,000,000	$3,516,720	$37,554,174
General Aviation Facility Improvements	$5,903,139	-	-	$655,904	-	$63,540	$6,622,583
Snow Removal Equipment Building	$3,200,000	$6,236,284	$200,000	$500,000	-	$4,841,944	$14,978,228
ARFF Facilities and Equipment	$1,011,030	-	-	$112,337	-	$521,742	$1,645,109
Business Center/Industrial Park Improvements	-	-	-	-	-	$2,615,863	$2,615,863
Other Airport Funded Improvements and Equipment	-	-	-	-	-	$12,921,664	$12,921,664
Other Improvements	$3,437,431	-	-	$312,023	$9,891,922	$69,913	$13,711,289
Total Uses of Capital Funding by Project Type	$66,481,337	$52,029,309	$1,300,000	$15,280,879	$18,758,099	$60,311,554	$214,161,178

Note: Addition errors are due to rounding of calculated amounts.

Source: Leibowitz & Horton AMC analysis

Projected Operations and Maintenance Expenses

Operations and maintenance expense projections for the Short-Term (2020 to 2024), the Mid-Term (2025 to 2029) and the Long-Term (2030 to 2039) planning periods are based on the Airport's 2019 actual expenses, the Airport's 2020 budget, the anticipated impacts of inflation, aviation traffic increases, facility improvements and the recent experience of other airports with similar levels of aviation activity.

Operations and Maintenance Expense Projection Assumptions

Operations and maintenance expense growth assumptions, as reflected in **Schedule 6-3**, were developed to project the Airport's operating expenses during the planning period. Actual amounts for 2017 through 2019, and budgeted amounts for 2020 provide a comparison with expenses that are projected for the period 2021 through 2039.

For each of the following expense categories listed below, projections are based on 2020 budgeted amounts with an assumed 3% annual rate of inflation beginning in 2021.

- Personnel Expenses
- Supplies
- Contractual Services
- Utilities
- Repairs & Maintenance
- Other Operating Expenses
- Local Governmental Services

Projection of Operations and Maintenance Expenses and Operating Expenses Per Enplaned Passenger

The projection of operations and maintenance expenses is provided in **Schedule 6-3** (provided at the end of Chapter 6). As shown in the Schedule, total expenses are expected to grow from $6,604,200 budgeted in 2020 to $7,433,085 projected in 2024 reflecting an overall growth rate of 3.0% per year and a total of $35,062,595 during the Short-Term planning period. Mid-Term expenses are projected to total $40,647,157 reflecting a 3% annual growth rate for the five-year period 2025-2029 and Long-Term expenses are projected to total $101,747,575 reflecting a 3% annual growth rate for the ten-year period 2030-2039.

Schedule 6-3 also provides a comparison of Tri-Cities' total operating expenses per enplaned passenger versus non-hub airports with similar levels of aviation activity. Tri-Cities' operating expenses per enplaned passenger are projected to increase from $14.96 for 2020 to an average of $16.70 during the Long-Term planning period. Over the same period of time, the overall non-hub industry average grows from $44.22 in 2020 to $46.46 during the Long-Term (Source: Non-Hub Airports, FAA Operating and Financial Summary Report #127 and FAA Air Carrier Activity Information System enplanement database). These comparisons show that budgeted and projected operating expenses at Tri-Cities are substantially lower than other non-hub airports of similar size during all three phases of the twenty-year planning period. This implies that the Airport currently manages operations and controls expenses in a manner that is more cost efficient than other comparable non-hub airports.

Projected Operating Revenues

Operating revenue projections for the Short-Term (2020 to 2024), the Mid-Term (2025 to 2029) and the Long-Term (2030 to 2039) planning periods are based on the Airport's 2019 actual expenses, the Airport's 2020 budget, current rates and charges methodology, current leasing practices, the anticipated impacts of inflation, aviation traffic increases, facility expansions and the recent experience of other airports with similar levels of aviation activity.

Operating Revenue Projection Assumptions

Operating revenue growth assumptions, as reflected in **Schedule 6-4** (provided at the end of Chapter 6), were developed to project the Airport's operating revenues during the planning period. Actual amounts for 2017 through 2019, and budgeted amounts for 2020 provide a comparison with revenues that are projected for the period 2021 through 2039. This analysis organizes revenues into categories for airline revenues, non-airline revenues and non-operating revenues. Annual revenue growth assumptions for the period 2021 through 2039 are provided in the following sections.

Airline Revenues

Airline Revenues, which include landing fees and terminal rents, account for approximately 36% of the Airport's annual operating revenue. The airlines currently serving Tri-Cities are Delta Air Lines, United Airlines, Alaska Airlines and Allegiant Air. All four airlines operate under signatory agreements similar to those which have been in place since 2003. The current agreements expire in December 2022, and the Airport expects that all of its current signatory airlines, or replacement airlines, will continue to operate under future agreements with substantially similar provisions throughout the planning period.

Landing fees – The annual landing fee calculation is based on a formula using a "residual" approach that determines the landing fee by dividing the landing fee requirement by projected airline aircraft landed weight for each year. The landing fee requirement includes all budgeted direct and allocated indirect operations and maintenance expenses reduced by non-airline airfield revenues. Additionally, the landing fee is further reduced by a landing fee subsidy. Airline landing fee projections beginning in 2021 are based on the Airport's 2020 budget with growth thereafter at a 3% annual rate of inflation plus increases in aircraft landed weight assuming one half the annual growth rate of forecasted passenger enplanements. This reflects the airlines' practice of managing increased load factors before additional flights are provided.

Terminal Rents – At PSC, air carriers pay terminal rents for exclusive use space (ticket counters, queuing space, offices and operations areas) and joint use space (holdrooms, baggage claim and baggage cart circulation areas). The calculation of terminal rent is based on a formula using a "compensatory" approach that determines the rental rate per square foot per year by dividing the terminal requirement by the total leaseable square footage for all tenants in the terminal building. The terminal requirement includes all budgeted direct and allocated indirect operations and maintenance expenses for the terminal building cost center with no offsetting of any other terminal revenues. Similar to the landing fee, the terminal rental rate is further reduced by a subsidy, but that subsidy is expected to be eliminated by 2022. Projections for air carrier terminal rents beginning in 2021 are based on the 2020 budget with growth thereafter at a 3% annual rate of inflation.

Non-Airline Revenues

Non-Airline Revenues account for approximately 64% of the Airport's annual operating revenue. The most significant of these consist of public automobile parking, and rental car revenues. The airport also generates significant revenue in the form of various leases including land, office, hangar, warehouse and building leases.

Non-Airline revenue projections beginning in 2021 for the following categories are based on the Airport's 2020 budget with growth thereafter at a 3% annual rate of inflation plus increases in aircraft landed weight assuming one half the annual growth rate of forecasted passenger enplanements:

- Other Carrier Landing Fees
- Fuel Flowage Fees

Non-Airline revenue projections beginning in 2021 for the following categories are based on the Airport's 2020 budget with growth at a 3% annual inflation rate plus the annual rate of forecast enplanement growth:

- Car Rental Concession Fees
- Restaurant/Gift Shop Rent

Non-Airline revenue projections beginning in 2021 for the following categories are based on the Airport's 2020 budget with growth at a 3% annual inflation rate thereafter:

- Rental Car Space Rents
- Office Leases
- Advertising Display Fees
- Hangar Leases
- Land Leases
- Warehouse Leases
- Building Leases
- ARFF Reimbursements
- TSA Security Reimbursements
- Security Fees
- Miscellaneous Income

Projections for Public Parking Fees beginning in 2021 are based on the Airport's 2020 budget plus the annual rate of forecast enplanement growth. This very conservatively assumes the Airport's parking fee rate structure remains unchanged throughout the planning period.

Non-Operating Revenues

Non-Operating revenue projections beginning in 2021 for Investment Income are based on the Airport's 2020 budget and are assumed to remain flat throughout the planning period.

Projection of Operating Revenues, Airline Cost Per Enplaned Passenger and Operating Revenues Per Enplaned Passenger

The projection of operating revenues is provided in **Schedule 6-4** at the end of Chapter 6. As shown in the Schedule, airline revenues are expected to grow from $3,690,000 budgeted for 2020 to $4,204,036 projected for 2024 with a total of $19,688,889 during the five-year Short-Term planning period. During the five-year Mid-Term period, airline revenues are projected to total $23,352,361 and during the ten-year Long-Term period, revenues are projected to total $60,774,434. The overall annual growth rate for airline revenues is 3.4% during the twenty-year planning period. Non-Airline revenues are expected to increase from $6,493,800 budgeted for 2020 to $7,245,239 projected for 2024 with a total of $34,171,566 during the Short-Term period. During the Mid-Term period, non-airline revenues are projected to total $40,216,374 and during the Long-Term period, non-airline revenues are projected to total $104,535,512. The overall annual growth rate for non-airline revenues is 3.2%. Total Airport revenues (including non-operating revenues) are expected to increase from $10,193,800 budgeted for 2020 to $11,459,274 projected for 2024 with a total of $53,910,454 during the Short-Term period. During the Mid-Term period, revenues are projected to total $63,618,735 and during the Long-Term period, revenues are projected to total $165,409,946. The overall annual growth rate for total Airport revenues is 3.3%.

Schedule 6-4 also provides a comparison of the Airport's airline cost per enplaned passenger (CPEP) versus non-hub airports with similar levels of aviation activity. The airline CPEP (all airline fees and rentals divided by enplaned passengers) is a measure that airlines use to compare their cost of operations among the airports they serve. Tri-Cities' airline CPEP is projected to grow from $8.36 in 2020 to an average of $9.97 during the Long-Term planning period. Over the same period, the overall non-hub industry average grows from $9.16 in 2020 to $9.62 during the Long-Term (Source: Non-Hub airports, FAA Operating and Financial Summary Report #127 and FAA Air Carrier Activity Information System enplanement database).

Tri-Cities' CPEP is reflective of its rates and charges strategy. Through a gradual reduction of the subsidies provided for the landing fee rate and terminal building rental rate, airline revenues and the resulting CPEP are comparable and competitive with the non-hub industry average.

Schedule 6-4 additionally provides a comparison of Tri-Cities' total operating revenue per enplaned passenger versus an average for other non-hub airports. The Airport's total operating revenue per enplaned passenger is projected to grow from $23.07 budgeted for 2020 to an average of $27.13 during the Long-Term planning period. Over the same period, the overall non-hub industry average grows from $46.59 in 2020 to $48.95 during the Long-Term (Source: Non-Hub airports, FAA Operating and Financial Summary Report #127 and FAA Air Carrier Activity Information System enplanement database). This comparison indicates that total Airport revenues are currently about 47% lower than the non-hub industry average and are expected to remain lower throughout the twenty-year planning period. Automobile parking and rental car revenues per passenger are within the industry averages but other non-airline revenues appear to be the main reason why total revenues are below those of other airports with similar levels of aviation operations and property leasing activity. When agreement terms allow, the Airport could consider increasing non-airline, aviation related rentals and fees on a gradual annual basis to make rates more in line with other non-hub airports.

Financial Plan Summary for the Master Plan Capital Improvement Program

The Financial Plan Summary presented in **Schedule 6-5** at the end of Chapter 6 includes a Capital Cash Flow section that presents a summary of projected capital funding (from **Schedule 6-2**) and scheduled capital expenditures (from **Schedule 6-1**) with the cash flow that results from implementing the Master Plan Capital Improvement Program. **Schedule 6-5** also includes an Operating Cash Flow section that summarizes totals for operating revenues (from **Schedule 6-4**) and operating expenses (from **Schedule 6-3**) with the addition of beginning cash reserve balances to provide the cash flow that results from these activities.

In **Schedule 6-1** of the Financial Implementation Analysis, practical approaches were provided for scheduling capital expenditures to match the availability of capital funding. **Schedule 6-2** provided practical approaches for matching specific capital funding sources with each of the identified projects. As shown in **Schedule 6-5**, positive year end cash reserves are projected throughout the twenty-year planning period 2020 to 2039. Additionally, the projected year-end cash balances are expected to remain at or above minimum acceptable balances to the Port as determined necessary to provide the required resources to meet operating cost needs, to allow for unforeseen circumstances, and to provide protection resulting from unexpected fluctuations of revenue sources.

Based on the assumptions underlying the Financial Implementation Analysis summarized in the Capital Cash Flow section of **Schedule 6-5**, implementation of projects in the Master Plan CIP that are scheduled throughout the twenty-year planning period are projected to be financially reasonable.

Implementation of capital projects during the 2020-2039 planning period that have AIP discretionary or WSDOT grants indicated as a funding source are subject to the availability of those grants which are provided at the sole discretion of the FAA and WSDOT. If the identified portion of discretionary funding is not awarded by the FAA or WSDOT, then these projects may need to be delayed until funding is available or until alternative funding is identified.

Additionally, the Financial Implementation Analysis relies on achievement of the aviation activity and passenger enplanement forecast. However, the achievement of any financial projection is dependent on future events, the occurrence of which cannot be assured. Actual aviation traffic may temporarily vary from the projected levels of activity without a significant adverse impact on the capital program. If decreased traffic levels occur and persist, the differences between the projected and actual results could be material and the implementation of all the proposed projects may not be financially feasible. It should also be noted, however, that if the forecast activity levels are not met, then a number of the planned capital improvements may not be necessary.

FINANCIAL ANALYSIS SCHEDULES

Financial analysis Schedules 6-1 through 6-5 are presented on the following pages.

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Master Plan - Financial Implementation Analysis
Estimated Project Costs and Development Schedule

01-May-20

Capital Improvement Program	Funding Schedule								
	Short Term						Mid Term	Long Term	Total
	2020	2021	2022	2023	2024	Total	2025-2029	2030-2039	Funding
Funds Used for Capital Improvement Projects									
AIP Entitlement Grants:	$2,835,810	$3,058,240	$3,075,233	$3,092,352	$3,109,600	$15,171,234	$16,392,284	$34,917,820	$66,481,339
AIP Entitlements carryover from the prior years	0	2,835,810	4,536,309	196,296	1,893,805	0	0	0	0
AIP Entitlement unspent current year + carryover	(2,835,810)	(4,536,309)	(196,296)	(1,893,805)	0	0	0	0	0
AIP Discretionary Grants	0	0	0	0	9,198,525	9,198,525	11,249,215	31,581,568	52,029,309
WSDOT Aviation Grants	0	0	0	0	0	0	1,100,000	200,000	1,300,000
Passenger Facility Charges:	1,743,935	1,756,943	1,770,048	1,812,239	1,855,436	8,938,602	10,016,054	22,127,227	41,081,883
PFC beginning year unliquidated balance	357,126	356,610	371,968	395,894	464,876	357,126	577,533	97,507	357,126
Less PFC Funded Debt Service	(1,744,451)	(1,741,586)	(1,746,122)	(1,743,257)	(1,742,779)	(8,718,195)	(8,717,479)	(8,722,456)	(26,158,130)
PFC unspent current year + carryover	(356,610)	(371,968)	(395,894)	(464,876)	(577,533)	(577,533)	(97,507)	0	0
RAC Customer Facility Charges	800,000	805,967	811,979	831,333	851,149	4,100,428	4,594,690	7,190,719	15,885,837
CFC beginning year unliquidated balance	2,872,262	3,672,262	4,478,229	5,290,208	6,121,541	2,872,262	(1,026,301)	3,568,389	2,872,262
CFC unspent current year + carryover	(3,672,262)	(4,478,229)	(5,290,208)	(6,121,541)	1,026,301	1,026,301	(3,568,389)	0	0
Net Operating Cash Flow	2,951,976	2,847,674	2,908,002	3,057,828	3,220,620	14,986,100	19,635,134	61,915,874	96,537,108
Funds Available Current Year	2,951,976	4,205,414	10,323,248	4,452,671	25,421,542	47,354,851	50,155,233	152,876,649	250,386,733
Beginning Cash Balance/Funds Carried Over from Prior Year	2,581,516	4,168,417	5,582,603	6,883,204	9,052,217	2,581,516	8,853,918	13,401,384	2,581,516
Funds Used Current Year	(1,365,075)	(2,791,228)	(9,022,647)	(2,283,657)	(25,619,841)	(41,082,449)	(45,607,768)	(127,470,962)	(214,161,178)
Funds Carried Over to Next Year	$4,168,417	$5,582,603	$6,883,204	$9,052,217	$8,853,918	$8,853,918	$13,401,384	$38,807,071	$38,807,071

	Capital Project Description	2019 Base Year Costs	Estimated Project Costs and Development Schedule								
			Short Term						Mid Term	Long Term	Total Escalated
			2020	2021	2022	2023	2024	Total	2025-2029	2030-2039	Costs
Short Term Projects (2020-2024)											
Capital Projects 2020											
ST-44	Taxiway A Relocation	$232,690	$239,671					$239,671			$239,671
ST-45	Terminal Landscaping	400,000	412,000					412,000			412,000
ST-46	Terminal Sidewalk Lighting to Hotel	85,000	87,550					87,550			87,550
ST-47	Art Install	18,000	18,540					18,540			18,540
ST-48	Industrial Building Demo, Phase 1	75,000	77,250					77,250			77,250
ST-49	Utility Extensions to leased property	25,000	25,750					25,750			25,750
ST-50	Snow Removal Equipment	210,795	217,119					217,119			217,119
ST-51	Miscellaneous Operating Equipment (Airport Funded)	176,000	181,280					181,280			181,280
ST-60	East GA Ramp Phase 2	1,186	1,222					1,222			1,222
ST-61	Runway Intersection Underdrains	54,645	56,284					56,284			56,284
ST-62	TSA Inline System	12,000	12,360					12,360			12,360
ST-63	Building 35 Fire System	35,000	36,050					36,050			36,050
	Total Capital Projects 2020	$1,325,316	$1,365,075	$0	$0	$0	$0	$1,365,075	$0	$0	$1,365,075
Capital Projects 2021											
ST-1	Master Plan Project Environmental Assessment	$659,000		$699,133				$699,133			$699,133
ST-2	Taxiway G, Design	763,000		809,467				809,467			809,467
ST-3	Pave and Stripe Credit-Card Overflow Lot	300,000		318,270				318,270			318,270
ST-4	Conference Room AV	56,000		59,410				59,410			59,410
ST-5	Industrial Building Demo	235,000		249,312				249,312			249,312
ST-6	Miscellaneous Operating Equipment (Airport Funded)	336,000		356,462				356,462			356,462
ST-7	North Land Fencing	282,000		299,174				299,174			299,174
	Total Capital Projects 2021	$2,631,000	$0	$2,791,228	$0	$0	$0	$2,791,228	$0	$0	$2,791,228

TRI-CITIES AIRPORT (PSC)
Port of Pasco, Washington

Master Plan - Financial Implementation Analysis
Estimated Project Costs and Development Schedule

01-May-20

Capital Improvement Program	Funding Schedule: Short Term 2020	2021	2022	2023	2024	Total	Mid Term 2025-2029	Long Term 2030-2039	Total Funding
Funds Used for Capital Improvement Projects									
AIP Entitlement Grants:	$2,835,810	$3,058,240	$3,075,233	$3,092,352	$3,109,600	$15,171,234	$16,392,284	$34,917,820	$66,481,339
AIP Entitlements carryover from the prior years	0	2,835,810	4,536,309	196,296	1,893,805	0	0	0	0
AIP Entitlement unspent current year + carryover	(2,835,810)	(4,536,309)	(196,296)	(1,893,805)	0	0	0	0	0
AIP Discretionary Grants	0	0	0	0	9,198,525	9,198,525	11,249,215	31,581,568	52,029,309
WSDOT Aviation Grants	0	0	0	0	0	0	1,100,000	200,000	1,300,000
Passenger Facility Charges:	1,743,935	1,756,943	1,770,048	1,812,239	1,855,436	8,938,602	10,016,054	22,127,227	41,081,883
PFC beginning year unliquidated balance	357,126	356,610	371,968	395,894	464,876	357,126	577,533	97,507	357,126
Less PFC Funded Debt Service	(1,744,451)	(1,741,586)	(1,746,122)	(1,743,257)	(1,742,779)	(8,718,195)	(8,717,479)	(8,722,456)	(26,158,130)
PFC unspent current year + carryover	(356,610)	(371,968)	(395,894)	(464,876)	(577,533)	(577,533)	(97,507)	0	0
RAC Customer Facility Charges	800,000	805,967	811,979	831,333	851,149	4,100,428	4,594,690	7,190,719	15,885,837
CFC beginning year unliquidated balance	2,872,262	3,672,262	4,478,229	5,290,208	6,121,541	2,872,262	(1,026,301)	3,568,389	2,872,262
CFC unspent current year + carryover	(3,672,262)	(4,478,229)	(5,290,208)	(6,121,541)	1,026,301	1,026,301	(3,568,389)	0	0
Net Operating Cash Flow	2,951,976	2,847,674	2,908,002	3,057,828	3,220,620	14,986,100	19,635,134	61,915,874	96,537,108
Funds Available Current Year	2,951,976	4,205,414	10,323,248	4,452,671	25,421,542	47,354,851	50,155,233	152,876,649	250,386,733
Beginning Cash Balance/Funds Carried Over from Prior Year	2,581,516	4,168,417	5,582,603	6,883,204	9,052,217	2,581,516	8,853,918	13,401,384	2,581,516
Funds Used Current Year	(1,365,075)	(2,791,228)	(9,022,647)	(2,283,657)	(25,619,841)	(41,082,449)	(45,607,768)	(127,470,962)	(214,161,178)
Funds Carried Over to Next Year	$4,168,417	$5,582,603	$6,883,204	$9,052,217	$8,853,918	$8,853,918	$13,401,384	$38,807,071	$38,807,071

	Capital Project Description	2019 Base Year Costs	Estimated Project Costs and Development Schedule: Short Term 2020	2021	2022	2023	2024	Total	Mid Term 2025-2029	Long Term 2030-2039	Total Escalated Costs
	Capital Projects 2022										
ST-8	Taxiway G, Construction	$7,540,000			$8,239,162			$8,239,162			$8,239,162
ST-9	Airport Parking Lot, Repave 3 & 4	594,000			649,080			649,080			649,080
ST-10	Miscellaneous Operating Equipment (Airport Funded)	123,000			134,405			134,405			134,405
	Total Capital Projects 2022	$8,257,000	$0	$0	$9,022,647	$0	$0	$9,022,647	$0	$0	$9,022,647
	Capital Projects 2023										
ST-11	Runway 12/30 Shift, Design	$1,377,000				$1,549,826		$1,549,826			$1,549,826
ST-12	Industrial Center - Roads	177,000				199,215		199,215			199,215
ST-13	Miscellaneous Operating Equipment (Airport Funded)	31,000				34,891		34,891			34,891
ST-14	Cell Phone Parking Lot	444,000				499,726		499,726			499,726
	Total Capital Projects 2023	$2,029,000	$0	$0	$0	$2,283,657	$0	$2,283,657	$0	$0	$2,283,657
	Capital Projects 2024										
ST-15	Runway 12/30 Shift, Construction	$13,611,900					$15,779,923	$15,779,923			$15,779,923
ST-16	Rehabilitate East Long-Term Parking	1,088,000					1,261,290	1,261,290			1,261,290
ST-52	Miscellaneous Airport Funded Projects	500,000					579,637	579,637			579,637
ST-54	Rental Car CONRAC	6,900,000					7,998,991	7,998,991			7,998,991
	Total Capital Projects 2024	$22,099,900	$0	$0	$0	$0	$25,619,841	$25,619,841	$0	$0	$25,619,841
	Total Short Term Project Costs	$36,342,216	$1,365,075	$2,791,228	$9,022,647	$2,283,657	$25,619,841	$41,082,449	$0	$0	$41,082,449

Master Plan - Financial Implementation Analysis
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Capital Improvement Program	Funding Schedule								
	Short Term						Mid Term	Long Term	Total
	2020	2021	2022	2023	2024	Total	2025-2029	2030-2039	Funding
Funds Used for Capital Improvement Projects									
AIP Entitlement Grants:	$2,835,810	$3,058,240	$3,075,233	$3,092,352	$3,109,600	$15,171,234	$16,392,284	$34,917,820	$66,481,339
AIP Entitlements carryover from the prior years	0	2,835,810	4,536,309	196,296	1,893,805	0	0	0	0
AIP Entitlement unspent current year + carryover	(2,835,810)	(4,536,309)	(196,296)	(1,893,805)	0	0	0	0	0
AIP Discretionary Grants	0	0	0	0	9,198,525	9,198,525	11,249,215	31,581,568	52,029,309
WSDOT Aviation Grants	0	0	0	0	0	0	1,100,000	200,000	1,300,000
Passenger Facility Charges:	1,743,935	1,756,943	1,770,048	1,812,239	1,855,436	8,938,602	10,016,054	22,127,227	41,081,883
PFC beginning year unliquidated balance	357,126	356,610	371,968	395,894	464,876	357,126	577,533	97,507	357,126
Less PFC Funded Debt Service	(1,744,451)	(1,741,586)	(1,746,122)	(1,743,257)	(1,742,779)	(8,718,195)	(8,717,479)	(8,722,456)	(26,158,130)
PFC unspent current year + carryover	(356,610)	(371,968)	(395,894)	(464,876)	(577,533)	(577,533)	(97,507)	0	0
RAC Customer Facility Charges	800,000	805,967	811,979	831,333	851,149	4,100,428	4,594,690	7,190,719	15,885,837
CFC beginning year unliquidated balance	2,872,262	3,672,262	4,478,229	5,290,208	6,121,541	2,872,262	(1,026,301)	3,568,389	2,872,262
CFC unspent current year + carryover	(3,672,262)	(4,478,229)	(5,290,208)	(6,121,541)	1,026,301	1,026,301	(3,568,389)	0	0
Net Operating Cash Flow	2,951,976	2,847,674	2,908,002	3,057,828	3,220,620	14,986,100	19,635,134	61,915,874	96,537,108
Funds Available Current Year	2,951,976	4,205,414	10,323,248	4,452,671	25,421,542	47,354,851	50,155,233	152,876,649	250,386,733
Beginning Cash Balance/Funds Carried Over from Prior Year	2,581,516	4,168,417	5,582,603	6,883,204	9,052,217	2,581,516	8,853,918	13,401,384	2,581,516
Funds Used Current Year	(1,365,075)	(2,791,228)	(9,022,647)	(2,283,657)	(25,619,841)	(41,082,449)	(45,607,768)	(127,470,962)	(214,161,178)
Funds Carried Over to Next Year	$4,168,417	$5,582,603	$6,883,204	$9,052,217	$8,853,918	$8,853,918	$13,401,384	$38,807,071	$38,807,071

	Capital Project Description	2019 Base Year Costs	Estimated Project Costs and Development Schedule								Total Escalated Costs
			Short Term						Mid Term	Long Term	
			2020	2021	2022	2023	2024	Total	2025-2029	2030-2039	
Mid Term Projects (2025-2029)											
MT-17	ARFF Equipment Acquisition	$900,000						$0	$1,123,367		$1,123,367
MT-18	Terminal Roadway Improvements-Pick Up/Drop Off Lanes	100,000						0	124,819		124,819
MT-19	Business Center - Phase 3 Infrastructure	1,674,500						0	2,090,087		2,090,087
MT-20	ARFF Training Facility	418,000						0	521,742		521,742
MT-21	SRE Building (est 70% eligible)	12,000,000						0	14,978,228		14,978,228
MT-22	Rehabilitate Runway 3L/21R (include TA1, TA2, TC1, TA5)	6,566,000						0	8,195,587		8,195,587
MT-31	Rehabilitate Runway 3L/21R and 12/30 Intersection	750,000						0	936,139		936,139
MT-24	Expand Outbound Baggage Facility Space to the East	4,920,750						0	6,142,010		6,142,010
MT-26	Building Mods	2,430,000						0	3,033,091		3,033,091
MT-27	De-ice Pad Expansion	1,200,000						0	1,497,823		1,497,823
MT-28	EV Charging Stations for Short-Term Lot (Premium)	80,000						0	99,855		99,855
MT-29	Expand the Existing Credit Card Parking Lot to the East	3,000,000						0	3,744,557		3,744,557
MT-55	Miscellaneous Airport Funded Projects	2,500,000						0	3,120,464		3,120,464
	Total Mid Term Project Costs	$36,539,250	$0	$0	$0	$0	$0	$0	$45,607,768	$0	$45,607,768

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Capital Improvement Program	Funding Schedule: Short Term 2020	2021	2022	2023	2024	Total	Mid Term 2025-2029	Long Term 2030-2039	Total Funding
Funds Used for Capital Improvement Projects									
AIP Entitlement Grants:	$2,835,810	$3,058,240	$3,075,233	$3,092,352	$3,109,600	$15,171,234	$16,392,284	$34,917,820	$66,481,339
AIP Entitlements carryover from the prior years	0	2,835,810	4,536,309	196,296	1,893,805	0	0	0	0
AIP Entitlement unspent current year + carryover	(2,835,810)	(4,536,309)	(196,296)	(1,893,805)	0	0	0	0	0
AIP Discretionary Grants	0	0	0	0	9,198,525	9,198,525	11,249,215	31,581,568	52,029,309
WSDOT Aviation Grants	0	0	0	0	0	0	1,100,000	200,000	1,300,000
Passenger Facility Charges:	1,743,935	1,756,943	1,770,048	1,812,239	1,855,436	8,938,602	10,016,054	22,127,227	41,081,883
PFC beginning year unliquidated balance	357,126	356,610	371,968	395,894	464,876	357,126	577,533	97,507	357,126
Less PFC Funded Debt Service	(1,744,451)	(1,741,586)	(1,746,122)	(1,743,257)	(1,742,779)	(8,718,195)	(8,717,479)	(8,722,456)	(26,158,130)
PFC unspent current year + carryover	(356,610)	(371,968)	(395,894)	(464,876)	(577,533)	(577,533)	(97,507)	0	0
RAC Customer Facility Charges	800,000	805,967	811,979	831,333	851,149	4,100,428	4,594,690	7,190,719	15,885,837
CFC beginning year unliquidated balance	2,872,262	3,672,262	4,478,229	5,290,208	6,121,541	2,872,262	(1,026,301)	3,568,389	2,872,262
CFC unspent current year + carryover	(3,672,262)	(4,478,229)	(5,290,208)	(6,121,541)	1,026,301	1,026,301	(3,568,389)	0	0
Net Operating Cash Flow	2,951,976	2,847,674	2,908,002	3,057,828	3,220,620	14,986,100	19,635,134	61,915,874	96,537,108
Funds Available Current Year	2,951,976	4,205,414	10,323,248	4,452,671	25,421,542	47,354,851	50,155,233	152,876,649	250,386,733
Beginning Cash Balance/Funds Carried Over from Prior Year	2,581,516	4,168,417	5,582,603	6,883,204	9,052,217	2,581,516	8,853,918	13,401,384	2,581,516
Funds Used Current Year	(1,365,075)	(2,791,228)	(9,022,647)	(2,283,657)	(25,619,841)	(41,082,449)	(45,607,768)	(127,470,962)	(214,161,178)
Funds Carried Over to Next Year	$4,168,417	$5,582,603	$6,883,204	$9,052,217	$8,853,918	$8,853,918	$13,401,384	$38,807,071	$38,807,071

Capital Project Description		2019 Base Year Costs	Estimated Project Costs and Development Schedule: Short Term 2020	2021	2022	2023	2024	Total	Mid Term 2025-2029	Long Term 2030-2039	Total Escalated Costs
Long Term Projects (2030-2039)											
MT-23	Rehabilitate East Apron Phase 3	$2,310,000						$0		$3,598,905	3,598,905
MT-25	Terminal Apron Expansion	13,100,000						0		20,409,373	20,409,373
MT-30	Reconstruct East GA Apron Phase 4 (North Taxilanes)	1,900,000						0		2,960,138	2,960,138
LT-32	Construct New Rental Car Building	1,215,000						0		1,892,930	1,892,930
LT-33	Install Secure Exiting Lanes	202,500						0		315,488	315,488
LT-34	Counter Spaces	6,358,500						0		9,906,336	9,906,336
LT-35	Expand Ticketing Area (est 80% Eligible)	7,205,000						0		11,225,155	11,225,155
LT-36	Master Plan Update	1,402,760						0		2,185,454	2,185,454
LT-37	GA Development-Taxiway E Converted into Non-Movement Area	40,000						0		62,319	62,319
LT-38	Master Plan EA	450,000						0		701,085	701,085
LT-39	Runway 12/30 Extension 1,500'	16,500,000						0		25,706,462	25,706,462
LT-40	Restrooms in Boarding Gate A	4,185,000						0		6,520,094	6,520,094
LT-41	Construct Parking Garage Option #2 (or Similar)	15,300,000						0		23,836,901	23,836,901
LT-42	PV Panels / Car Covers for Short-Term Lot	6,500,000						0		10,126,788	10,126,788
LT-43	ATCT Relocation Study	150,000						0		233,695	233,695
LT-57	Miscellaneous Airport Funded Projects	5,000,000						0		7,789,837	7,789,837
	Total Long Term Project Costs	$81,818,760	$0	$0	$0	$0	$0	$0	$0	$127,470,962	$127,470,962
Total Project Costs		$154,700,226	$1,365,075	$2,791,228	$9,022,647	$2,283,657	$25,619,841	$41,082,449	$45,607,768	$127,470,962	$214,161,178

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Capital Improvement Projects		Total Escalated Costs	AIP Entitlement Funding	AIP Discretionary Funding	Total AIP Funding	WSDOT Aviation Grants	Passenger Facility Charges (PAYG)	Rental Car Customer Facility Charge	Cash Reserves/ Net Revs	Total Funding
Short Term Projects (2020-2024)										
Capital Projects 2020										
ST-44	Taxiway A Relocation	$239,671			$0				$239,671	$239,671
ST-45	Terminal Landscaping	412,000			0				412,000	412,000
ST-46	Terminal Sidewalk Lighting to Hotel	87,550			0				87,550	87,550
ST-47	Art Install	18,540			0				18,540	18,540
ST-48	Industrial Building Demo, Phase 1	77,250			0				77,250	77,250
ST-49	Utility Extensions to leased property	25,750			0				25,750	25,750
ST-50	Snow Removal Equipment	217,119			0				217,119	217,119
ST-51	Miscellaneous Operating Equipment (Airport Funded)	181,280			0				181,280	181,280
ST-60	East GA Ramp Phase 2	1,222			0				1,222	1,222
ST-61	Runway Intersection Underdrains	56,284			0				56,284	56,284
ST-62	TSA Inline System	12,360			0				12,360	12,360
ST-63	Building 35 Fire System	36,050			0				36,050	36,050
	Totals for 2020	$1,365,075	$0	$0	$0	$0	$0	$0	$1,365,075	$1,365,075
Capital Projects 2021										
ST-1	Master Plan Project Environmental Assessment	$699,133	$629,220		$629,220				$69,913	$699,133
ST-2	Taxiway G, Design	809,467	728,520		728,520				80,947	809,467
ST-3	Pave and Stripe Credit-Card Overflow Lot	318,270			0				318,270	318,270
ST-4	Conference Room AV	59,410			0				59,410	59,410
ST-5	Industrial Building Demo	249,312			0				249,312	249,312
ST-6	Miscellaneous Operating Equipment (Airport Funded)	356,462			0				356,462	356,462
ST-7	North Land Fencing	299,174			0				299,174	299,174
	Totals for 2021	$2,791,228	$1,357,740	$0	$1,357,740	$0	$0	$0	$1,433,488	$2,791,228
Capital Projects 2022										
ST-8	Taxiway G, Construction	$8,239,162	$7,415,245		$7,415,245				$823,916	$8,239,162
ST-9	Airport Parking Lot, Repave 3 & 4	649,080			0				649,080	649,080
ST-10	Miscellaneous Operating Equipment (Airport Funded)	134,405			0				134,405	134,405
	Totals for 2022	$9,022,647	$7,415,245	$0	$7,415,245	$0	$0	$0	$1,607,401	$9,022,647
Capital Projects 2023										
ST-11	Runway 12/30 Shift, Design	$1,549,826	1,394,843		$1,394,843				$154,983	$1,549,826
ST-12	Industrial Center - Roads	199,215			0				199,215	199,215
ST-13	Miscellaneous Operating Equipment (Airport Funded)	34,891			0				34,891	34,891
ST-14	Cell Phone Parking Lot	499,726			0				499,726	499,726
	Totals for 2023	$2,283,657	$1,394,843	$0	$1,394,843	$0	$0	$0	$888,814	$2,283,657
Capital Projects 2024										
ST-15	Runway 12/30 Shift, Construction	$15,779,923	$5,003,405	$9,198,525	$14,201,930				$1,577,992	$15,779,923
ST-16	Rehabilitate East Long-Term Parking	1,261,290			0				1,261,290	1,261,290
ST-52	Miscellaneous Airport Funded Projects	579,637			0				579,637	579,637
ST-54	Rental Car CONRAC	7,998,991			0			7,998,991	0	7,998,991
	Totals for 2024	$25,619,841	$5,003,405	$9,198,525	$14,201,930	$0	$0	$7,998,991	$3,418,920	$25,619,841
	Total Short Term Project Funding	$41,082,449	$15,171,233	$9,198,525	$24,369,759	$0	$0	$7,998,991	$8,713,699	$41,082,449

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	Capital Improvement Projects	Total Escalated Costs	AIP Entitlement Funding	AIP Discretionary Funding	Total AIP Funding	WSDOT Aviation Grants	Passenger Facility Charges (PAYG)	Rental Car Customer Facility Charge	Cash Reserves/ Net Revs	Total Funding
Mid Term Projects (2025-2029)										
MT-17	ARFF Equipment Acquisition	$1,123,367	$1,011,030		$1,011,030		$112,337		$0	$1,123,367
MT-18	Terminal Roadway Improvements-Pick Up/Drop Off Lanes	124,819			0				124,819	124,819
MT-19	Business Center - Phase 3 Infrastructure	2,090,087			0				2,090,087	2,090,087
MT-20	ARFF Training Facility	521,742			0				521,742	521,742
MT-21	SRE Building (est 70% eligible)	14,978,228	3,200,000	6,236,284	9,436,284	200,000	500,000		4,841,944	14,978,228
MT-22	Rehabilitate Runway 3L/21R (include TA1, TA2, TC1, TA5)	8,195,587	2,363,097	5,012,932	7,376,028	200,000	619,559		0	8,195,587
MT-31	Rehabilitate Runway 3L/21R and 12/30 Intersection	936,139	842,525		842,525		93,614		0	936,139
MT-24	Expand Outbound Baggage Facility Space to the East	6,142,010	4,897,809		4,897,809	700,000			544,201	6,142,010
MT-26	Install Passenger Boarding Bridge to Existing Gates and Building Mods	3,033,091	2,729,782		2,729,782		303,309		0	3,033,091
MT-27	De-ice Pad Expansion	1,497,823	1,348,041		1,348,041		149,782		0	1,497,823
MT-28	EV Charging Stations for Short-Term Lot (Premium)	99,855			0				99,855	99,855
MT-29	Expand the Existing Credit Card Parking Lot to the East	3,744,557			0				3,744,557	3,744,557
MT-55	Miscellaneous Airport Funded Projects	3,120,464			0				3,120,464	3,120,464
	Total Mid Term Project Funding	$45,607,768	$16,392,283	$11,249,215	$27,641,499	$1,100,000	$1,778,601	$0	$15,087,668	$45,607,768
Long Term Projects (2030-2039)										
MT-23	Rehabilitate East Apron Phase 3	$3,598,905	3,239,014		$3,239,014		$359,890		$0	$3,598,905
MT-25	Terminal Apron Expansion	20,409,373	3,600,000	14,768,436	18,368,436	200,000	1,840,937		0	20,409,373
MT-30	Reconstruct East GA Apron Phase 4 (North Taxilanes)	2,960,138	2,664,124		2,664,124		296,014		0	2,960,138
LT-32	Construct New Rental Car Building	1,892,930			0			1,892,930	0	1,892,930
LT-33	Install Secure Exiting Lanes	315,488			0				315,488	315,488
LT-34	Expand Inbound Baggage-Relocate Rental Car Offices and Counter Spaces	9,906,336	8,015,702		8,015,702		890,634	1,000,000	0	9,906,336
LT-35	Expand Ticketing Area (est 80% Eligible)	11,225,155	2,400,000		2,400,000		6,580,124		2,245,031	11,225,155
LT-36	Master Plan Update	2,185,454	1,966,909		1,966,909		218,545		0	2,185,454
LT-37	GA Development-Taxiway E Converted into Non-Movement Area	62,319			0				62,319	62,319
LT-38	Master Plan EA	701,085	630,977		630,977		70,109		0	701,085
LT-39	Runway 12/30 Extension 1,500'	25,706,462	6,322,684	16,813,132	23,135,816		2,570,646		0	25,706,462
LT-40	Hold Room - Gate 6 Boarding Area Expansion, Additional Restrooms in Boarding Gate A	6,520,094	5,868,084		5,868,084		652,009		0	6,520,094
LT-41	Construct Parking Garage Option #2 (or Similar)	23,836,901			0			7,866,177	15,970,724	23,836,901
LT-42	PV Panels / Car Covers for Short-Term Lot	10,126,788			0				10,126,788	10,126,788
LT-43	ATCT Relocation Study	233,695	210,326		210,326		23,370		0	233,695
LT-57	Miscellaneous Airport Funded Projects	7,789,837			0				7,789,837	7,789,837
	Total Long Term Project Funding	$127,470,962	$34,917,820	$31,581,568	$66,499,388	$200,000	$13,502,278	$10,759,108	$36,510,187	$127,470,962
Total Project Funding		$214,161,178	$66,481,337	$52,029,309	$118,510,646	$1,300,000	$15,280,879	$18,758,099	$60,311,554	$214,161,178

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Master Plan - Financial Implementation Analysis
Actual, Budgeted and Projected Operations & Maintenance Expenses

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				Short Term							
	Actual	Actual	Actual	Budget	Projected					Mid Term	Long Term
Operations & Maintenance Expenses	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**Total**	**2025-2029**	**2030-2039**
Personnel Expenses:											
Salaries	$1,307,708	$1,283,817	$1,386,064	$1,502,000	$1,547,060	$1,593,472	$1,641,276	$1,690,514	$7,974,322	$9,244,425	$23,140,556
Fringe Benefits	756,941	506,940	841,813	950,000	978,500	1,007,855	1,038,091	1,069,233	5,043,679	5,847,006	14,636,170
Unemployment	8,887	0	0	16,200	16,686	17,187	17,702	18,233	86,008	99,707	249,585
Total Personnel Expenses	$2,073,536	$1,790,757	$2,227,877	$2,468,200	$2,542,246	$2,618,513	$2,697,069	$2,777,981	$13,104,009	$15,191,138	$38,026,311
Supplies:											
Fuel	$44,807	$30,929	$46,369	$42,000	$43,260	$44,558	$45,895	$47,271	$222,984	$258,499	$647,073
Maintenance Supplies	83,395	20,194	29,150	28,000	28,840	29,705	30,596	31,514	148,656	172,333	431,382
Office Supplies	18,816	34,502	38,465	40,000	41,200	42,436	43,709	45,020	212,365	246,190	616,260
Total Supplies	$147,018	$85,625	$113,984	$110,000	$113,300	$116,699	$120,200	$123,806	$584,005	$677,022	$1,694,714
Contractual Services:											
Janitorial Supplies & Service	$468,993	$481,125	$509,943	$575,000	$592,250	$610,018	$628,318	$647,168	$3,052,753	$3,538,978	$8,858,735
Labor Consultants	11,196	2,805	4,163	1,500	1,545	1,591	1,639	1,688	7,964	9,232	23,110
Consultants	1,002	47,577	36,742	21,500	22,145	22,809	23,494	24,198	114,146	132,327	331,240
Property Insurance	174,879	128,027	149,283	167,000	172,010	177,170	182,485	187,960	886,626	1,027,842	2,572,885
Technical Support	0	31,381	30,688	45,000	46,350	47,741	49,173	50,648	238,911	276,963	693,292
Legal Fees	33,901	60,485	32,435	40,000	41,200	42,436	43,709	45,020	212,365	246,190	616,260
Professional Services	142,749	13,580	5,800	10,000	10,300	10,609	10,927	11,255	53,091	61,547	154,065
Personal Services	121,950	403,911	89,959	100,000	103,000	106,090	109,273	112,551	530,914	615,474	1,540,650
Accounting	0	16,327	5,429	5,000	5,150	5,305	5,464	5,628	26,546	30,774	77,032
Audit Costs	0	21,745	22,489	24,000	24,720	25,462	26,225	27,012	127,419	147,714	369,756
Federal Representation	2,000	13,259	13,257	14,000	14,420	14,853	15,298	15,757	74,328	86,166	215,691
Advertising	169,159	83,266	74,353	110,000	113,300	116,699	120,200	123,806	584,005	677,022	1,694,714
Advertising - Website	0	2,597	19,683	2,000	2,060	2,122	2,185	2,251	10,618	12,309	30,813
A & G Insurance	-27,123	87,669	101,340	108,000	111,240	114,577	118,015	121,555	573,387	664,712	1,663,901
Total Contractual Services	$1,098,706	$1,393,754	$1,095,564	$1,223,000	$1,259,690	$1,297,481	$1,336,405	$1,376,497	$6,493,073	$7,527,251	$18,842,144
Utilities:											
Utilities	$306,358	$376,618	$399,894	$370,000	$381,100	$392,533	$404,309	$416,438	$1,964,380	$2,277,255	$5,700,403
Telephone	-101	19,840	19,503	20,500	21,115	21,748	22,401	23,073	108,837	126,172	315,833
Total Utilities	$306,257	$396,458	$419,397	$390,500	$402,215	$414,281	$426,710	$439,511	$2,073,218	$2,403,427	$6,016,236
Repairs & Maintenance:											
Building Maintenance	$131,677	$190,315	$194,735	$163,000	$167,890	$172,927	$178,115	$183,458	$865,389	$1,003,223	$2,511,259
Airfield Maintenance	230,957	5,850	6,300	0	0	0	0	0	0	0	0
Road Maintenance	4,983	1,616	26,576	13,000	13,390	13,792	14,205	14,632	69,019	80,012	200,284
Lawns & Grounds	66,491	32,648	33,421	47,500	48,925	50,393	51,905	53,462	252,184	292,350	731,809
Snow Removal	27,750	16,950	57,656	85,000	87,550	90,177	92,882	95,668	451,277	523,153	1,309,552
Fences & Gates	0	12,256	3,676	10,000	10,300	10,609	10,927	11,255	53,091	61,547	154,065
Lighting	0	6,196	21,753	15,000	15,450	15,914	16,391	16,883	79,637	92,321	231,097
Signs	0	13,389	4,929	9,000	9,270	9,548	9,835	10,130	47,782	55,393	138,658
Pavement Maintenance	3,590	53,863	32,523	31,000	31,930	32,888	33,875	34,891	164,583	190,797	477,601
Paint	0	68,599	20,474	37,500	38,625	39,784	40,977	42,207	199,093	230,803	577,744
Wildlife	4,840	6,856	10,899	7,000	7,210	7,426	7,649	7,879	37,164	43,083	107,845

TRI-CITIES AIRPORT (PSC)
Port of Pasco, Washington

Master Plan - Financial Implementation Analysis
Actual, Budgeted and Projected Operations & Maintenance Expenses

01-May-20

				Short Term							
	Actual	Actual	Actual	Budget	Projected					Mid Term	Long Term
Operations & Maintenance Expenses	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**Total**	**2025-2029**	**2030-2039**
Equipment Maintenance	70,101	53,753	67,486	57,000	58,710	60,471	62,285	64,154	302,621	350,820	878,170
Total Repairs & Maintenance	$540,389	$462,291	$480,428	$475,000	$489,250	$503,928	$519,045	$534,617	$2,521,840	$2,923,503	$7,318,085
Other Operating Expenses:											
Training	$13,859	$32,631	$22,680	$36,000	$37,080	$38,192	$39,338	$40,518	$191,129	$221,571	$554,634
Travel	40,563	20,652	23,888	42,500	43,775	45,088	46,441	47,834	225,638	261,577	654,776
Taxes	19,941	36,937	38,793	43,500	44,805	46,149	47,534	48,960	230,947	267,731	670,183
Security Access/Badging	11,282	15,560	9,164	30,000	30,900	31,827	32,782	33,765	159,274	184,642	462,195
Security - Screening	8,143	0	0	4,500	4,635	4,774	4,917	5,065	23,891	27,696	69,329
Security Equipment/LEOS	11,236	8,843	19,551	10,000	10,300	10,609	10,927	11,255	53,091	61,547	154,065
Equipment Rental	0	11,358	11,534	10,500	10,815	11,139	11,474	11,818	55,746	64,625	161,768
Meals and Banquets	4,923	10,043	10,976	11,000	11,330	11,670	12,020	12,381	58,400	67,702	169,471
Promotional/Hosting	0	147	12	2,500	2,575	2,652	2,732	2,814	13,273	15,387	38,516
Membership Dues & Fees	14,200	13,293	20,712	17,000	17,510	18,035	18,576	19,134	90,255	104,631	261,910
Publications & Networks	0	296	100	500	515	530	546	563	2,655	3,077	7,703
Marketing	0	18,224	9,939	63,500	65,405	67,367	69,388	71,470	337,130	390,826	978,312
Meetings & Registrations	0	8,410	8,605	10,000	10,300	10,609	10,927	11,255	53,091	61,547	154,065
Uncollectible Revenue	0	32,899	0	0	0	0	0	0	0	0	0
Miscellaneous	12,211	27,481	18,655	12,000	12,360	12,731	13,113	13,506	63,710	73,857	184,878
Total Other Operating Expenses	$136,358	$236,774	$194,609	$293,500	$302,305	$311,374	$320,715	$330,337	$1,558,231	$1,806,417	$4,521,806
Local Governmental Services:											
City of Pasco - ARFF	$733,370	$754,229	$872,397	$914,000	$941,420	$969,663	$998,752	$1,028,715	$4,852,550	$5,625,436	$14,081,537
Port of Pasco - Administration	831,764	717,330	734,391	730,000	751,900	774,457	797,691	821,621	3,875,669	4,492,963	11,246,741
Total Local Governmental Services	$1,565,134	$1,471,559	$1,606,788	$1,644,000	$1,693,320	$1,744,120	$1,796,443	$1,850,336	$8,728,219	$10,118,398	$25,328,278
Total Operations & Maintenance Expenses	$5,867,398	$5,837,218	$6,138,647	$6,604,200	$6,802,326	$7,006,396	$7,216,588	$7,433,085	$35,062,595	$40,647,157	$101,747,575
Annual Growth Rate	-	-0.5%	5.2%	7.6%	3.0%	3.0%	3.0%	3.0%	3.9%	3.0%	3.0%
Operating Expenses Per Enplaned Passenger:											
Tri-Cities Airport	$15.60	$14.76	$14.01	$14.96	$15.30	$15.64	$15.73	$15.83	$15.50	$16.03	$16.70
Non-Hub Industry Average	$45.54	$43.92	$44.07	$44.22	$44.37	$44.52	$44.67	$44.82	$44.52	$45.28	$46.46

PSC - MP - 2020 - 3

Schedule 6-4

TRI-CITIES AIRPORT (PSC)
Port of Pasco, Washington

Master Plan - Financial Implementation Analysis
Actual, Budgeted and Projected Operating Revenues

01-May-20

Revenues	Actual 2017	Actual 2018	Actual 2019	Short Term: Budget 2020	Short Term: Projected 2021	Short Term: Projected 2022	Short Term: Projected 2023	Short Term: Projected 2024	Short Term: Total	Mid Term 2025-2029	Long Term 2030-2039
					LDW - Landed Weight Growth + Inflation						
					ENP - Enplanement Growth + Inflation						
					ENP - Enplanement Growth Only						
AIRLINE REVENUES											
Landing Fees	$1,117,072	$1,551,775	$1,360,081	$1,430,000	$1,478,393	$1,528,424	$1,593,039	$1,660,386	$7,690,242	$9,442,641	$25,955,755
Terminal Rent	1,497,120	2,085,526	2,117,580	2,260,000	2,327,800	2,397,634	2,469,563	2,543,650	11,998,647	13,909,720	34,818,679
Total Airline Revenues	$2,614,192	$3,637,301	$3,477,661	$3,690,000	$3,806,193	$3,926,058	$4,062,602	$4,204,036	$19,688,889	$23,352,361	$60,774,434
Annual Growth Rate	-	39.1%	-4.4%	6.1%	3.1%	3.1%	3.5%	3.5%	3.9%	3.6%	3.4%
Airline Cost Per Enplaned Passenger:											
Tri-Cities Airport	$6.95	$9.20	$7.94	$8.36	$8.56	$8.76	$8.86	$8.95	$8.70	$9.21	$9.97
Non-Hub Industry Average	$9.01	$9.09	$9.12	$9.16	$9.19	$9.22	$9.25	$9.28	$9.22	$9.38	$9.62
NON-AIRLINE REVENUES											
Other Carrier Landing Fees	$68,544	$81,862	$55,897	$60,000	$62,030	$64,130	$66,841	$69,667	$322,667	$396,195	$1,089,053
Fuel Flowage Fees	19,661	28,049	23,251	15,000	15,508	16,032	16,710	17,417	80,667	99,049	272,263
Car Rental Concession Fees	1,035,558	1,139,082	1,254,919	1,300,000	1,348,987	1,399,821	1,476,183	1,556,711	7,081,702	9,205,917	27,756,320
Car Rental Space Rents	106,064	153,164	119,334	275,000	283,250	291,748	300,500	309,515	1,460,012	1,692,554	4,236,786
Office Leases	88,161	109,174	109,174	109,000	112,270	115,638	119,107	122,680	578,696	670,867	1,679,308
Advertising Display Fees	41,834	52,514	35,827	50,000	51,500	53,045	54,636	56,275	265,457	307,737	770,325
Public Parking Fees	2,734,409	2,798,136	2,957,772	2,800,000	2,820,885	2,841,925	2,909,666	2,979,022	14,351,498	16,081,416	38,653,004
Hangar Leases	132,530	151,278	157,756	158,000	162,740	167,622	172,651	177,830	838,843	972,449	2,434,226
Land Leases	771,151	751,226	842,686	798,000	821,940	846,598	871,996	898,156	4,236,690	4,911,485	12,294,383
Restaurant/Gift Shop Rent	143,188	166,415	194,347	175,000	181,594	188,437	198,717	209,557	953,306	1,239,258	3,736,428
Warehouse Leases	23,480	24,066	24,765	24,000	24,720	25,462	26,225	27,012	127,419	147,714	369,756
Building Leases	511,155	527,823	536,402	549,000	565,470	582,434	599,907	617,904	2,914,716	3,378,954	8,458,166
ARFF Reimbursement		35,491	19,700	30,000	30,900	31,827	32,782	33,765	159,274	184,642	462,195
TSA Security Reimbursement	112,931	112,611	116,120	116,800	120,304	123,913	127,631	131,459	620,107	718,874	1,799,479
Security Fees (Badging)	7,145	4,662	9,933	4,000	4,120	4,244	4,371	4,502	21,237	24,619	61,626
Miscellaneous Income	0	29,482	35,541	30,000	30,900	31,827	32,782	33,765	159,274	184,642	462,195
Total Non-Airline Revenues	$5,795,811	$6,165,035	$6,493,424	$6,493,800	$6,637,119	$6,784,703	$7,010,705	$7,245,239	$34,171,566	$40,216,374	$104,535,512
Annual Growth Rate	-	6.4%	5.3%	0.0%	2.2%	2.2%	3.3%	3.3%	2.2%	3.6%	3.2%
NON-OPERATING REVENUES											
Interest Income	$3,663	$732	$45,989	$10,000	$10,000	$10,000	$10,000	$10,000	$50,000	$50,000	$100,000
Total Non-Operating Revenues	$3,663	$732	$45,989	$10,000	$10,000	$10,000	$10,000	$10,000	$50,000	$50,000	$100,000
Annual Growth Rate	-	-80.0%	6182.7%	-78.3%	0.0%	0.0%	0.0%	0.0%	-26.3%	0.0%	-27.5%
Total Revenues	$8,413,666	$9,803,068	$10,017,074	$10,193,800	$10,453,312	$10,720,761	$11,083,307	$11,459,274	$53,910,454	$63,618,735	$165,409,946
Annual Growth Rate	-	16.5%	2.2%	1.8%	2.5%	2.6%	3.4%	3.4%	2.7%	3.6%	3.3%
Operating Revenues Per Enplaned Passenger:											
Tri-Cities Airport	$22.36	$24.79	$22.76	$23.07	$23.48	$23.91	$24.14	$24.38	$23.81	$25.08	$27.13
Non-Hub Industry Average	$45.76	$46.27	$46.43	$46.59	$46.75	$46.91	$47.07	$47.23	$46.91	$47.71	$48.95

TRI-CITIES AIRPORT (PSC)
Port of Pasco, Washington

Master Plan - Financial Implementation Analysis
Financial Plan Summary
Budgeted and Projected Net Revenues, Capital Funding and Capital Expenditures

01-May-20

Operating/Capital Cash Flow	Short Term						Mid Term	Long Term
	Budget	Projected						
	2020	2021	2022	2023	2024	Total	2025-2029	2030-2039
Passenger Enplanements	441,391	444,683	448,000	458,679	469,612	2,262,365	2,535,068	6,093,244
Annual Growth Rate	-	0.75%	0.75%	2.38%	2.38%	1.56%	2.74%	1.92%
Operating Cash Flow								
Revenues:								
Airline Revenues	$3,690,000	$3,806,193	$3,926,058	$4,062,602	$4,204,036	$19,688,889	$23,352,361	$60,774,434
Non-Airline Revenues	6,493,800	6,637,119	6,784,703	7,010,705	7,245,239	34,171,566	40,216,374	104,535,512
Non-Operating Revenues	10,000	10,000	10,000	10,000	10,000	50,000	50,000	100,000
Total Revenues	$10,193,800	$10,453,312	$10,720,761	$11,083,307	$11,459,274	$53,910,454	$63,618,735	$165,409,946
Operations & Maintenance Expenses	(6,604,200)	(6,802,326)	(7,006,396)	(7,216,588)	(7,433,085)	(35,062,595)	(40,647,157)	(101,747,575)
Net Operating Cash Flow	$3,589,600	$3,650,986	$3,714,365	$3,866,720	$4,026,189	$18,847,860	$22,971,578	$63,662,370
Less Existing Debt Service	(637,624)	(803,312)	(806,363)	(808,892)	(805,569)	(3,861,760)	(3,336,444)	(1,746,496)
Total Net Operating Cash Flow Available For Capital Expenditures	$2,951,976	$2,847,674	$2,908,002	$3,057,828	$3,220,620	$14,986,100	$19,635,134	$61,915,874
Capital Cash Flow								
Beginning Cash Balance	$2,581,516	$4,168,417	$5,582,603	$6,883,204	$9,052,217	$2,581,516	$8,853,918	$13,401,384
Other Capital Funding Sources:								
AIP Entitlement Grants:	$2,835,810	$3,058,240	$3,075,233	$3,092,352	$3,109,600	$15,171,234	$16,392,284	$34,917,820
AIP Entitlement unspent current year + carryover	(2,835,810)	(4,536,309)	(196,296)	(1,893,805)	0	0	0	0
AIP Entitlements carryover from the prior years	0	2,835,810	4,536,309	196,296	1,893,805	0	0	0
AIP Discretionary Grants	0	0	0	0	9,198,525	9,198,525	11,249,215	31,581,568
WSDOT Aviation Grants	0	0	0	0	0	0	1,100,000	200,000
Passenger Facility Charges:	1,743,935	1,756,943	1,770,048	1,812,239	1,855,436	8,938,602	10,016,054	22,127,227
PFC beginning year unliquidated balance	357,126	356,610	371,968	395,894	464,876	357,126	577,533	97,507
Less PFC Funded Debt Service	(1,744,451)	(1,741,586)	(1,746,122)	(1,743,257)	(1,742,779)	(8,718,195)	(8,717,479)	(8,722,456)
PFC unspent current year + carryover	(356,610)	(371,968)	(395,894)	(464,876)	(577,533)	(577,533)	(97,507)	0
RAC Customer Facility Charges	800,000	805,967	811,979	831,333	851,149	4,100,428	4,594,690	7,190,719
CFC beginning year unliquidated balance	2,872,262	3,672,262	4,478,229	5,290,208	6,121,541	2,872,262	(1,026,301)	3,568,389
CFC unspent current year + carryover	(3,672,262)	(4,478,229)	(5,290,208)	(6,121,541)	1,026,301	1,026,301	(3,568,389)	0
Total Other Capital Funding Sources	$0	$1,357,740	$7,415,246	$1,394,843	$22,200,922	$32,368,751	$30,520,100	$90,960,775
Total Funds Available for Capital Expenditures	$5,533,492	$8,373,831	$15,905,851	$11,335,875	$34,473,759	$49,936,367	$59,009,151	$166,278,033
Capital Improvement Program Expenditures	1,365,075	2,791,228	9,022,647	2,283,657	25,619,841	41,082,449	45,607,768	127,470,962
Ending Cash Balance	$4,168,417	$5,582,603	$6,883,204	$9,052,217	$8,853,918	$8,853,918	$13,401,384	$38,807,071

TRI-CITIES
AIRPORT • PSC

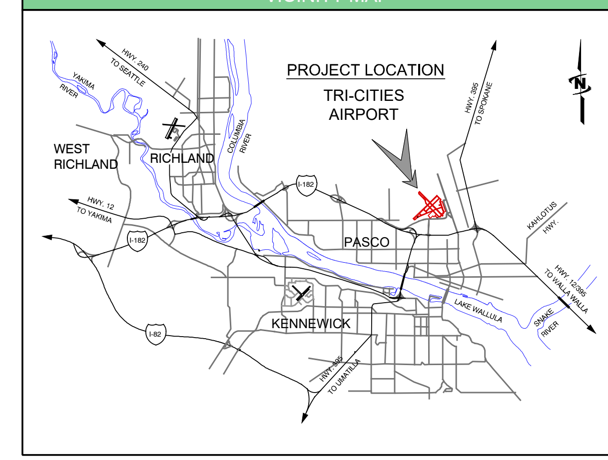
AIRPORT LAYOUT PLAN (ALP)

Tri-Cities Airport
Airport Layout Plan
Port of Pasco
Pasco, Washington
December 2020
AIP Grant # 3-53-0046-2018

Mead & Hunt
Mead and Hunt, Inc.
9600 NE Cascades Parkway,
Suite 100
Portland, OR 97220
phone: 503-548-1494
meadhunt.com

LOCATION MAP

VICINITY MAP



REVISION BLOCK

#	DESCRIPTION	BY	DATE
1	ALP Update	M&H	07/27/20

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2. AIRPORT LAYOUT PLAN
3. AIRPORT DATA SHEET
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5. RUNWAY 21R INNER APPROACH SURFACE (EXISTING/FUTURE)
6. RUNWAY 3L INNER APPROACH SURFACE (FUTURE)
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8. RUNWAY 21L INNER APPROACH SURFACE (EXISTING/FUTURE)
9. RUNWAY 12 INNER APPROACH SURFACE (EXISTING)
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11. RUNWAY 12 INNER APPROACH SURFACE (FUTURE)
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13. RUNWAY 3L/21R DEPARTURE SURFACES
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18. AIRPORT AIRSPACE DRAWING PLAN VIEW (RUNWAY 21R)
19. AIRPORT AIRSPACE DRAWING PROFILE VIEW
20. AIRPORT AIRSPACE DRAWING PROFILE VIEW
21. RUNWAY CENTERLINE PROFILES
22. TERMINAL AREA PLAN
23. BUSINESS PARK PLAN
24. GENERAL AVIATION PLAN
25. LAND USE VICINITY AERIAL
26. AIRPORT PROPERTY MAP - EXHIBIT 'A'

ALP Approval & Exhibit A Acceptance

Tri-Cities Airport (PSC) | Pasco, WA

February 8, 2021

Background

The updated Airport Layout Plan (ALP) for the Tri-Cities Airport (PSC) consists of Sheets 1 through 25 dated July 2020 and Exhibit A - Airport Property Map consists of Sheet 26 dated December 2020. These documents were developed based on the conclusions of the 2020 Airport Master Plan study. An aeronautical study (no. 2020-ANM-2463-NRA) was conducted on the proposed development. This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

This ALP approval is conditioned on acknowledgement that any development on airport property requiring Federal environmental approval must receive such written approval from FAA prior to commencement of the subject development. This ALP approval is also conditioned on acceptance of the plan under local land use laws. We encourage appropriate agencies to adopt land use and height restrictive zoning based on the plan.

Approval of the plan does not indicate that the United States will participate in the cost of any development proposed. AIP funding requires evidence of eligibility and justification at the time a funding request is ripe for consideration. When construction of any proposed structure or development indicated on the plan is undertaken, such construction requires normal 45-day advance notification to FAA for review in accordance with applicable Federal Aviation Regulations (i.e., Parts 77, 157, 152, etc.). More notice is generally beneficial to ensure that all statutory, regulatory, technical and operational issues can be addressed in a timely manner.

ALP

The ALP consists of Sheets 1 through 25. It was prepared in accordance with current FAA airport design standards, FAA Standard Operating Procedure 2.00. The last ALP for the Tri-Cities Airport was approved by FAA in May 2013. Major changes in this 2020 ALP from the previous version include:

- Runways
  - Future design aircraft for Runways 3L/21R and 12/30 is D-III 737 MAX 8. It was the C-IV 757-200.
    - Runway 3R/21L remains unchanged at B-II.
  - Runway End 12 extended to the northwest by 1,847 feet (was 1,850 feet) for total length of 9,200 feet.
- Taxiways
  - Connector from Taxiway D across Runway 12/30 to Taxiway G added.
  - Taxiway E will eventually become a taxilane as GA area develops.
  - Taxiway G partial parallel reduced width from 75 feet for Taxiway Design Group (TDG) 5 to 50 feet for TDG 3.
  - Runup apron at Runway End 21L removed.
  - Runup apron near Taxiway E1 modified to meet AC-13A guidance.
  - Taxiway geometry at intersection of A and E simplified.
  - Taxiway B renamed Taxiway A2 (Future A3)
- Landside
  - Passenger terminal expansion has been reconfigured, remains in existing area.
  - Deice pads have been reconfigured to accommodate more aircraft simultaneously.
  - GA hangar and apron development east of Taxiway G has been shown.
  - Buildout of the Airport Business Center has been depicted.
  - New SRE facility is located west of existing aircraft rescue and firefighting station.
  - Proposed relocation site for the airport traffic control tower defined

Exhibit A

The Exhibit A - Airport Property Map consists of Sheet 26. It has been prepared in accordance with FAA Standard Operating Procedure 3.00 and developed based on the following:

- Airport parcels
  - Existing fee and easement parcels are based on recorded conveyance documents obtained through Airport and local records.
  - Future and ultimate airport property interests are shown based on the development plans and design standards shown on the ALP.
- Existing fee and easement parcels, as well as recorded encumbrance boundaries, were drawn as legally described in conveyance documents.
- A review of the Federal grant history and associated parcel naming convention was completed.

The last Exhibit A - Property Map was updated in December 2012. Major changes in this December 2020 Exhibit A Update from the previous version includes:

- Updated with existing and future layout changes, and additional easements located to the north and west of Runway End 12.
- New easements are listed on Property Legend after XXIX.
- Property that is intended to be released, consisting of non-contiguous parcels across Road 36 from Runway End 3L are depicted with cross-hatching.

Signature Blocks

The FAA signature below acknowledges approval of the ALP and acceptance of the Exhibit A.

FAA:

BENJAMIN JOSEPH MELLO — Digitally signed by BENJAMIN JOSEPH MELLO Date: 2021.02.10 07:20:36 -08'00'

Airport Sponsor:

[signature]

Consultant:

Mitchell Hooper — Mitchell R. Hooper, Vice President, February 10, 2021

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration as provided under Title 49 U.S.C., Section 47104. The contents do 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 or would have justification in accordance with appropriate public laws.

TRI-CITIES AIRPORT LAYOUT PLAN

3601 North 20th Avenue
Pasco, Washington
99301

REVISIONS

#	DESCRIPTION	BY	DATE
1	ALP Update as part of Master Plan	SMF	12/22/20

M&H NO.: 1624500-172210.01
DATE: December 2020
DESIGNED BY: MH
DRAWN BY: TE
CHECKED BY: KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
COVER SHEET

SHEET NO.

NOT FOR CONSTRUCTION

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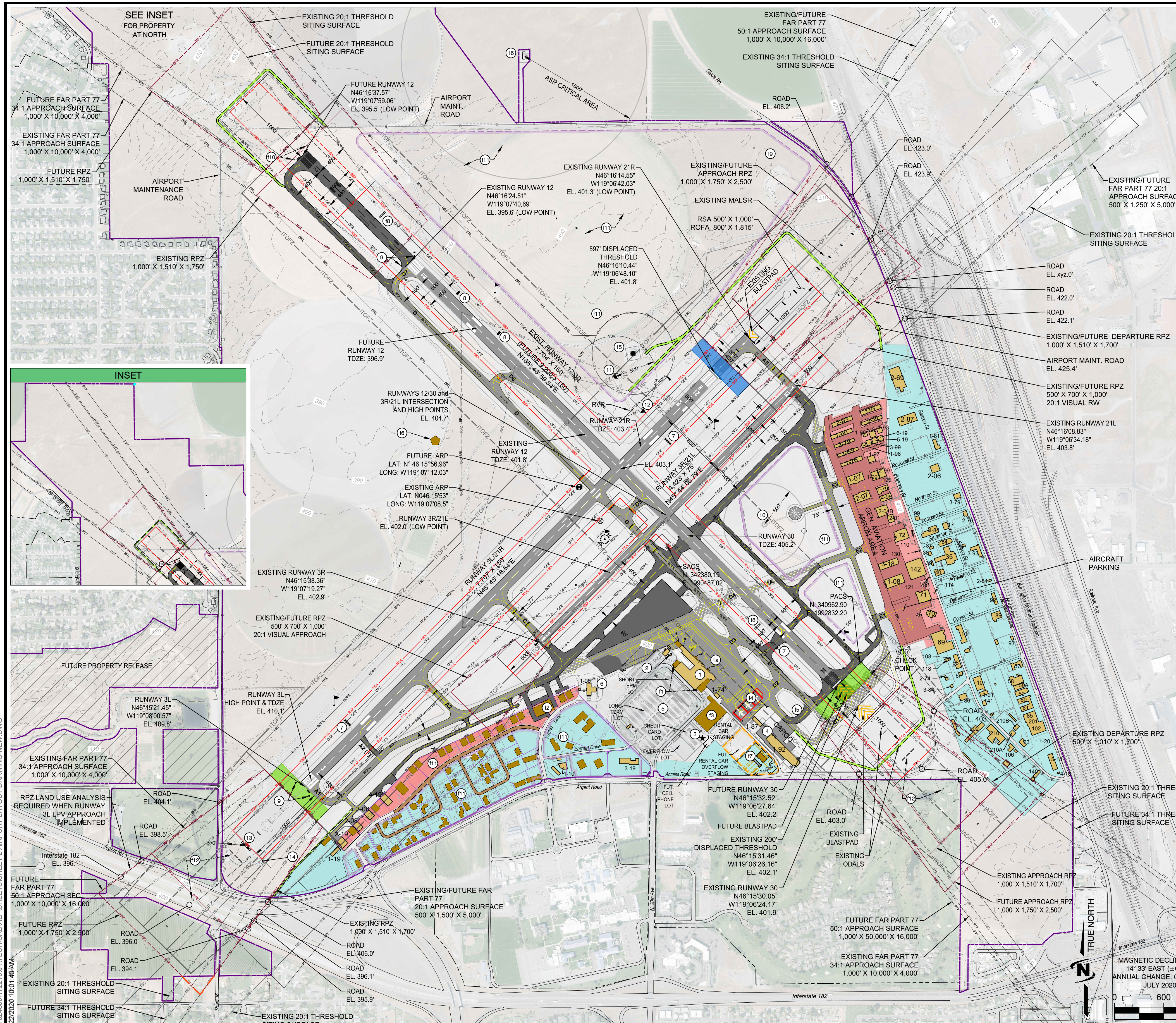

INSET

X:\1624500\172210.01\TECH\CAD\ALP\SHEETS\SHEET 2 AIRPORT LAYOUT DRAWING-NEW.DWG
12/22/2020 10:01:40 AM

DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED (AIRFIELD & ROAD)	N/A	
AIRPORT PROPERTY		
FUTURE DEVELOPMENT AREA	N/A	
FUTURE AUTO PARKING EXPANSION AREA	N/A	
AVIGATION EASEMENT		N/A
AIRPORT REFERENCE POINT		
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY PROTECTION ZONE (RPZ)	RPZ	RPZ
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	ROFA
OBSTACLE FREE ZONE (OFZ)	OFZ	OFZ
RUNWAY VISIBILITY ZONE (RVZ)	RVZ	RVZ
BUILDING RESTRICTION LINE (BRL)	BRL	BRL
PRECISION OBSTACLE FREE ZONE		
INNER APPROACH OFZ	IAOFZ	IAOFZ
INNER TRANSITIONAL OFZ	ITOFZ	ITOFZ
FAR PART 77 APPROACH SURFACE	P77	P77
THRESHOLD SITING SURFACE (TSS)	TSS	TSS
TAXIWAY / LANE MARKING		
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	TOFA
BUILDING - ON AIRPORT		
BUILDING - OFF AIRPORT		N/A
MONUMENT (PACS and SACS)		N/A
LIGHTS (THRESHOLD / REIL / MALSR)		
BEACON		
PRECISION APPROACH PATH INDICATOR (PAPI)		
WIND CONE		N/A
GLIDE SLOPE ANTENNA		
GLIDE SLOPE CRITICAL AREA (GCA)	GCA	GCA
LOCALIZER		N/A
LOCALIZER CRITICAL AREA (LCA)	LCA	N/A
AUTO. SURFACE OBSERVING SYSTEM (ASOS)		N/A
ASOS CRITICAL AREA (ACA)	ACA	N/A
VOR/DME		N/A
PUBLIC ROAD		
FUTURE AIRPORT ACCESS ROAD	N/A	
GRAVEL ROAD		N/A
RAILROAD		N/A
FENCE / GATE (8ft. High)		
CHANNEL / DITCH		N/A
TERRAIN CONTOUR	400'	N/A
CENTER SECTION MARKER		N/A

EXISTING FACILITIES

ALP #	FACILITY NAME	ELEVATION (MSL)
1	Air Carrier Passenger Terminal	439.7
1a	Air Carrier Passenger Terminal Apron	N/A
2	Air Traffic Control Tower	459.4
3	Airport Beacon	482.8
4	Cargo Building/Facilities	425.1
5	Automobile Parking	N/A
6	Airport Rescue and Fire Fighting (ARFF)	429.4
7	PAPI (Precision Approach Path Indicator)	N/A
8	VASI (Visual Approach Slope Indicator)	N/A
9	REIL (Runway End Indicator Lights)	N/A
10	Wind Equipment	404.6
11	Automated Surface Observing System (ASOS)	401.5
12	Glide Slope Antenna	401.6
13	Localizer	410.1
14	Localizer Antenna Equipment Building	425.6
15	VOR/DME	405.6
16	Airport Surveillance Radar (ASR)	424.1

FUTURE FACILITIES

ALP #	FACILITY NAME	ELEVATION (MSL)
f1	Future Air Carrier Passenger Terminal Expansion	TBD
f2	Future Snow Removal Equipment Building (SRE)	TBD
f3	Future Auto Parking Garage	TBD
f4	Future ADG II Deicing Apron	TBD
f5	Future ADG III Deicing Apron	TBD
f6	Future Air Traffic Control Tower	TBD
f7	Future Rental Car Quick Turn Around (QTA) Facility	TBD
f8	Future PAPI (Precision Approach Path Indicator)	TBD
f9	Future Aircraft Rescue and Fire Fighting Training Facility	TBD
f10	Future REIL (Runway End Indicator Lights)	TBD
f11	Future Development Area	TBD
f12	Future MALSR (Medium Intensity Approach Lighting System)	TBD

To Be Determined = TBD

NOTES

1. RPZ land use analysis required when Runway 3L and 30 LPV approaches implemented.

FAA APPROVAL

FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
SEATTLE AIRPORTS DISTRICT OFFICE

DATE

SPONSOR APPROVAL

PORT OF PASCO

DATE

Mead & Hunt

Mead and Hunt, Inc.
9600 NE Cascades Parkway,
Suite 100
Portland, OR 97220
phone: 503-548-1494
meadhunt.com

TRI-CITIES AIRPORT • PSC

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DRAWN BY: TE
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DO NOT SCALE DRAWINGS

SHEET CONTENTS

AIRPORT LAYOUT PLAN

SHEET NO.

NOT FOR CONSTRUCTION

EXISTING TAXIWAY DATA

NAME	WIDTH	SHOULDER	ADG	TDG	TSA	TOFA	TESM	LIGHTING	OBJECTS INSIDE TSA AND TOFA	SEPARATION FROM TAXIWAY CL TO FIXED MOVABLE OBJECT
TAXIWAY A	75	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY A1	75	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY A2	75	30	III	5	118	186	15	MITL	N/A	82
TAXIWAY A3	75	30	III	5	118	186	15	MITL	N/A	82
TAXIWAY A5	75	30	III	5	118	186	15	MITL	N/A	82
TAXIWAY C	75	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY D	75	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY D1	75	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY D2	150	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY D3*	150	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY D4*	90	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY D5	95	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY D6	90	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY D7	90	30	III	5	118	186	15	MITL	N/A	81
TAXIWAY E	50	20	III	3	118	186	10	MITL	N/A	81
TAXIWAY E1	50	20	III	3	118	186	10	MITL	N/A	81
TAXIWAY E2	50	20	III	3	118	186	10	MITL	N/A	81
TAXIWAY E3	50	20	III	3	118	186	10	MITL	N/A	81
TAXIWAY E4	50	20	III	3	118	186	10	MITL	N/A	81

FUTURE TAXIWAY DATA

NAME	WIDTH	SHOULDER	ADG	TDG	TSA	TOFA	TESM	LIGHTING	OBJECTS INSIDE TSA AND TOFA	SEPARATION FROM TAXIWAY CL TO FIXED MOVABLE OBJECT
TAXIWAY A2(F)*	75	30	III	5	118	186	15	MITL	N/A	93
TAXIWAY A4	75	30	III	5	118	186	15	MITL	N/A	93
TAXIWAY D1(F)	75	30	III	5	118	186	15	MITL	N/A	93
TAXIWAY D2(F)*	75	30	III	5	118	186	15	MITL	N/A	93
TAXIWAY D4(F)*	75	30	III	5	118	186	15	MITL	N/A	93
TAXIWAY D8	75	30	III	5	118	186	15	MITL	N/A	93
TAXIWAY G	35	15	III	2	118	131	7.5	MITL	N/A	65.5
TAXIWAY G1	35	15	III	2	118	131	7.5	MITL	N/A	65.5
TAXIWAY G2	35	15	III	2	118	131	7.5	MITL	N/A	65.5

* Future Taxiway/Taxilanes will be renamed following conventions in FAA Engineering Brief No. 89

EXISTING DECLARED DISTANCES

ITEM	RUNWAY 3L	RUNWAY 21R	RUNWAY 3R	RUNWAY 21L	RUNWAY 12	RUNWAY 30
TAKEOFF RUN AVAILABLE (TORA)	7,707 FEET	7,707 FEET	4,423 FEET	4,423 FEET	7,704 FEET	7,704 FEET
TAKEOFF DISTANCE AVAILABLE (TODA)	7,707 FEET	7,707 FEET	4,423 FEET	4,423 FEET	7,704 FEET	7,704 FEET
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	7,707 FEET	7,707 FEET	4,423 FEET	4,423 FEET	7,504 FEET	7,704 FEET
LANDING DISTANCE AVAILABLE (LDA)	7,707 FEET	7,110 FEET	4,423 FEET	4,423 FEET	7,504 FEET	7,504 FEET

FUTURE DECLARED DISTANCES

ITEM	RUNWAY 3L	RUNWAY 21R	RUNWAY 3R	RUNWAY 21L	RUNWAY 12	RUNWAY 30
TAKEOFF RUN AVAILABLE (TORA)	7,707 FEET	7,707 FEET	4,423 FEET	4,423 FEET	9,200 FEET	9,200 FEET
TAKEOFF DISTANCE AVAILABLE (TODA)	7,707 FEET	7,707 FEET	4,423 FEET	4,423 FEET	9,200 FEET	9,200 FEET
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	7,707 FEET	7,707 FEET	4,423 FEET	4,423 FEET	9,200 FEET	9,200 FEET
LANDING DISTANCE AVAILABLE (LDA)	7,707 FEET	7,110 FEET	4,423 FEET	4,423 FEET	9,200 FEET	9,200 FEET

AIRPORT DATA

	EXISTING	FUTURE
AIRPORT REFERENCE CODE	C-III	D-III
MEAN MAX. TEMPERATURE (HOTTEST MONTH)	91.3°F	N/A
AIRPORT ELEVATION (AMSL NAVD88)	410.2	410.2
ELECTRONIC NAVIGATION AIDS	ILS, RNAV GPS, VOR, NDB	ILS, RNAV GPS, VOR
UNICOM (MHz)	122.950	SAME
CONTROL TOWER (MHz)*	135.3 323.3	135.3 323.4
AIRPORT REFERENCE POINT (ARP)	N46° 15' 52"	N46° 15' 55.77"
	W119° 07' 10"	W119° 07' 13.87"
MISCELLANEOUS FACILITIES	PAPI, VASI, REIL, ASOS, WINDCONE	PAPI, REIL, ASOS, WINDCONE
CRITICAL AIRCRAFT	A319	737 MAX 8
AIRPORT MAGNETIC VARIATION (FEB 2020)	14° 35' E ± 0° 23'	0° 6' W ANNUAL RATE OF CHANGE
NPIAS CATEGORY	PRIMARY COMMERCIAL / NONHUB	SAME
STATE EQUIVALENT SERVICE ROLE	COMMERCIAL SERVICE	SAME

MODIFICATION OF STANDARDS

NO.	DESCRIPTION	STANDARD	EXISTING	DISPOSITION	PROPOSED	APPROVED
1	NONE REQUIRED					
2						
3						
4						

NONSTANDARD CONDITIONS

		RDC				
ITEM	DESCRIPTION	EXISTING	FUTURE	EXISTING CONDITIONS	STANDARD	MITIGATION
1	RUNWAY 30 RUNWAY SAFETY AREA (RSA) LENGTH	C-III-4000	D-III-2400	800'	1000'	CONDITION CORRECTED WITH RUNWAY END 30 RELOCATION OF 350' TO THE NORTHWEST

RUNWAY DATA

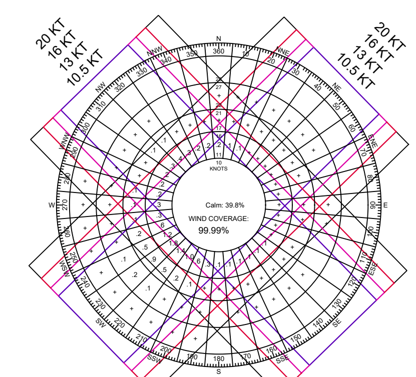
	RUNWAY 3L		RUNWAY 21R		RUNWAY 3R		RUNWAY 21L		RUNWAY 12		RUNWAY 30	
	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE
UTILITY/OTHER THAN UTILITY	OTHER THAN UTILITY		OTHER THAN UTILITY		UTILITY		UTILITY		OTHER THAN UTILITY		OTHER THAN UTILITY	
RUNWAY DESIGN CODE	C-III-4000	D-III-2400	C-III-2400	D-III-2400	B-II-VIS	SAME	B-II-VIS	SAME	C-III-4000	D-III-4000	C-III-4000	D-III-2400
RUNWAY REFERENCE CODE	C-III-4000	D-III-2400	C-III-2400	D-III-2400	B-II-VIS	SAME	B-II-VIS	SAME	C-III-4000	D-III-4000	C-III-4000	D-III-2400
STRENGTH BY WHEEL LOADING (IN 1000 LBS.)	S-150, DWL-200, DTWL-400	SAME	S-150, DWL-200, DTWL-400	SAME	S-52, DWL 85, DTWL 150	SAME	S-52, DWL 85, DTWL 150	SAME	S-150, DWL-200, DTWL-400	SAME	S-150, DWL-200, DTWL-400	SAME
STRENGTH BY PCN	47 F/B/X/T	SAME	47 F/B/X/T	SAME	13 /F/B/X/T	SAME	13 /F/B/X/T	SAME	53 /F/C/X/T	SAME	53 /F/C/X/T	SAME
RUNWAY SURFACE TYPE	GROOVED ASPHALT		GROOVED ASPHALT		ASPHALT		ASPHALT		GROOVED ASPHALT		GROOVED ASPHALT	
EFFECTIVE RUNWAY GRADIENT %	0.11%	SAME	0.11%	SAME	0.02%	SAME	0.02%	SAME	0.08%	0.07%	0.08%	0.07%
RUNWAY LENGTH AND WIDTH	7,707' x 150'	7,707' x 150'	7,707' x 150'	7,707' x 150'	4,423' x 75'	SAME	4,423' x 75'	SAME	7,704' x 150'	9,200' X 150'	7,704' x 150'	9,200' X 150'
RUNWAY SHOULDER WIDTH	25'	SAME	25'	SAME	25'	SAME	25'	N/A	25'	SAME	25'	SAME
DISPLACED THRESHOLD COORDINATES	N/A	N/A	N46° 16' 10.437"	SAME	N/A	N/A	N/A	N/A	N/A	N/A	N46° 15' 31.462"	N/A
	N/A	N/A	W119° 6' 48.113"	SAME	N/A	N/A	N/A	N/A	N/A	N/A	W119° 06' 26.156"	N/A
DISPLACED THRESHOLD ELEVATION	N/A	SAME	401.8 FEET	SAME	N/A	SAME	N/A	SAME	N/A	SAME	402.1 FEET	N/A
RUNWAY SAFETY AREA LENGTH BEYOND RW END	1,000 FEET	SAME	1,000 FEET	SAME	300 FEET	SAME	300 FEET	SAME	1,000 FEET	SAME	1,000 FEET	SAME
RUNWAY SAFETY AREA WIDTH	500 FEET	SAME	500 FEET	SAME	150 FEET	SAME	150 FEET	SAME	500 FEET	SAME	500 FEET	SAME
RUNWAY END COORDINATES	N46° 15' 21.446"	SAME	N46° 16' 14.552"	SAME	N46° 15' 38.356"	SAME	N46° 16' 08.827"	SAME	N46° 16' 24.510"	N46° 16' 37.568"	N46°15' 30.048"	N46° 15' 32.523"
	W119° 08' 00.570"		W119° 06' 42.025"		W119° 07' 19.268"		W119° 06' 34.184"		W119° 07' 40.691"	W119° 07' 59.046"	W119°06' 24.167"	W119° 06' 27.643"
RUNWAY END ELEVATIONS	409.8	SAME	401.3	SAME	402.9	SAME	403.8	SAME	395.6	395.5	402.0	402.2
RUNWAY LIGHTING TYPE	HIRL	SAME	HIRL	SAME	N/A	SAME	N/A	SAME	MIRL	SAME	MIRL	SAME
RUNWAY PROTECTION ZONE DIMENSIONS	1,000' X 1,700' X 1,510'	1,000' X 2,500' X 1,750'	1,000' X 2,500' X 1,750'	SAME	500' X 1,000' X 700'	SAME	500' X 1,000' X 700'	SAME	1,000' X 1,700' X 1,510'	SAME	1,000' X 1,700' X 1,510'	1,000' X 1,700' X 2,500'
RUNWAY MARKING TYPE	NON-PRECISION	PRECISION	PRECISION	SAME	BASIC	SAME	BASIC	SAME	NON-PRECISION	SAME	NON-PRECISION	PRECISION
14 CFR PART 77 APPROACH CATEGORY	D	PIR	PIR	SAME	B(V)	SAME	B(V)	SAME	D	SAME	D	PIR
14 CFR PART 77 APPROACH SLOPE	34:1	50:1 / 40:1	50:1 / 40:1	SAME	20:1	SAME	20:1	SAME	34:1	SAME	34:1	50:1 / 40:1
APPROACH VISIBILITY MINIMUMS	3/4 MILE	1/2 MILE	1/2 MILE	SAME	N/A	SAME	N/A	SAME	3/4 MILE	SAME	3/4 MILE	1/2 MILE
TYPE OF AERONAUTICAL SURVEY REQUIRED	VERTICALLY GUIDED	SAME	VERTICALLY GUIDED	SAME	VISUAL	SAME	VISUAL	SAME	VERTICALLY GUIDED	SAME	VERTICALLY GUIDED	SAME
RUNWAY DEPARTURE SURFACE	YES	SAME	YES	SAME	NO	SAME	NO	SAME	YES	SAME	YES	SAME
RUNWAY OBJECT FREE AREA LENGTH BEYOND RW END	1,000 FEET	SAME	1,000 FEET	SAME	300 FEET	SAME	300 FEET	SAME	1,000 FEET	SAME	1,000 FEET	SAME
RUNWAY OBJECT FREE AREA WIDTH	800 FEET	SAME	800 FEET	SAME	500 FEET	SAME	500 FEET	SAME	800 FEET	SAME	800 FEET	SAME
OBSTACLE FREE ZONE LENGTH BEYOND RW END	200 FEET	SAME	200 FEET	SAME	200 FEET	SAME	200 FEET	SAME	200 FEET	SAME	200 FEET	SAME
OBSTACLE FREE ZONE WIDTH	400 FEET	SAME	400 FEET	SAME	250 FEET	SAME	250 FEET	SAME	400 FEET	SAME	400 FEET	SAME
THRESHOLD SITING SURFACE	TYPE 4	TYPE 5	TYPE 5	SAME	TYPE 3	SAME	TYPE 3	SAME	TYPE 4	SAME	TYPE 4	TYPE 5
INNER APPROACH OBSTACLE FREE ZONE LENGTH	N/A	200' FROM RUNWAY THRESHOLD X 200' BEYOND LAST LIGHT IN THE ALS	200' FROM RUNWAY THRESHOLD X 200' BEYOND LAST LIGHT IN THE ALS	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	200' FROM RUNWAY THRESHOLD X 200' BEYOND LAST LIGHT IN THE ALS
INNER APPROACH OBSTACLE FREE ZONE WIDTH	N/A	400 FEET	400 FEET	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	400 FEET
INNER-TRANSITIONAL OBSTACLE FREE ZONE WIDTH	N/A	810 FEET*	860 FEET*	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	856 FEET*
PRECISION OBSTACLE FREE ZONE DIMENSIONS	N/A	200' X 800'	200' X 800'	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	200' X 800'
VISUAL AND INSTRUMENT NAVAIDS	REIL, PAPI, LOC	MALSR, REIL, PAPI, LOC,	MALSR, PAPI, GS, RVR(T)	SAME	N/A	SAME	N/A	SAME	REIL, VASI	REIL, PAPI	ODALS, PAPI	MASLR, PAPI
TOUCHDOWN ZONE ELEVATIONS	410.1	SAME	403.4	SAME	404.7	SAME	404.7	SAME	401.8	396.9	405.2	SAME
TAXIWAY DESIGN GROUP	TDG 5	TDG 3	TDG 5	TDG 3	TDG 2	SAME	TDG 2	SAME	TDG 5	TDG 3	TDG 5	TDG 3
PARALLEL/CONNECTOR TAXIWAY WIDTH	75 FEET	SAME	75 FEET	SAME	75 FEET	SAME	75 FEET	SAME	75 FEET	SAME	75 FEET	SAME
RUNWAY CL TO TAXIWAY CL SEPARATION	400 FEET	SAME	400 FEET	SAME	400 FEET	SAME	400 FEET	SAME	400 FEET	SAME	400 FEET	SAME
RUNWAY CL TO HOLDLINE SEPARATIONS	250 FEET	SAME	250 FEET**	250 FEET	200 FEET***	SAME	200 FEET***	SAME	250 FEET	SAME	250 FEET	SAME
RUNWAY CL TO AIRCRAFT PARKING SEPARATIONS	500 FEET	SAME	500 FEET	SAME	500 FEET	SAME	500 FEET	SAME	500 FEET	SAME	500 FEET	SAME
VERTICAL AND HORIZONTAL DATUM	NAVD88, NAD83				NAVD88, NAD83				NAVD88, NAD83			
CRITICAL AIRCRAFT	A319	737 MAX 8	A319	737 MAX 8	BEECHCRAFT KING AIR	SAME	BEECHCRAFT KING AIR	SAME	A319	737 MAX 8	A319	737 MAX 8
WINGSPAN	111.9 FEET	117.85 FEET	111.9 FEET	117.85 FEET	57.92 FEET	SAME	57.92 FEET	SAME	111.9 FEET	117.85 FEET	111.9 FEET	117.85 FEET
TAIL HEIGHT	39.7 FEET	40.85 FEET	39.7 FEET	40.85 FEET	14.34 FEET	SAME	14.34 FEET	SAME	39.7 FEET	40.85 FEET	39.7 FEET	40.85 FEET
APPROACH SPEED	126 KNOTS	143 KNOTS	126 KNOTS	143 KNOTS	107 KNOTS	SAME	107 KNOTS	SAME	126 KNOTS	143 KNOTS	126 KNOTS	143 KNOTS
MAIN GEAR WIDTH	29.4 FEET	22.98 FEET	29.4 FEET	22.98 FEET	17.17 FEET	SAME	17.17 FEET	SAME	29.4 FEET	22.98 FEET	29.4 FEET	22.98 FEET
COCKPIT TO MAIN GEAR	44.9 FEET	56.43 FEET	44.9 FEET	56.43 FEET	16.25 FEET	SAME	16.25 FEET	SAME	44.9 FEET	56.43 FEET	44.9 FEET	56.43 FEET
MAXIMUM TAKEOFF WEIGHT	168,653 LBS	181,200 LBS	168,653 LBS	181,200 LBS	12,600 LBS	SAME	12,600 LBS	SAME	168,653 LBS	181,200 LBS	168,653 LBS	181,200 LBS

*FROM RUNWAY CENTERLINE

**NOT ALL EXISTING HOLDING POSITIONS LINES TO C-III STANDARD OF 250'. EXCEEDING NON-STANDARD CONDITION WILL BE RECTIFIED AND STANDARD DIMENSION WILL BE PROVIDED

***NOT ALL EXISTING HOLDING POSITION LINES TO B-II STANDARD OF 200'. EXCEEDING NON-STANDARD CONDITION WILL BE RECTIFIED AND STANDARD DIMENSION WILL BE PROVIDED

ALL-WEATHER WINDROSE

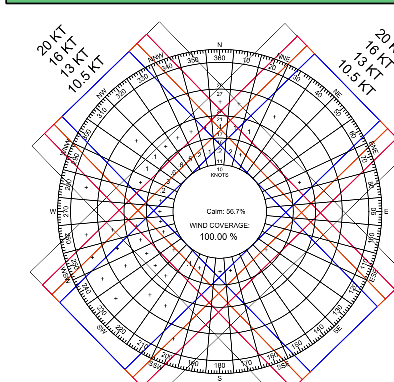


PERCENT WIND COVERAGE

Runway	10.5 Knots (12 mph)	13 Knots (15 mph)	16 Knots (18.5 mph)	20 Knots (23 mph)
12/30	89.32%	92.62%	96.48%	98.78%
3/21	96.78%	98.20%	99.52%	99.90%
Combined	99.47%	99.84%	99.96%	99.99%

Source: FAA AGIS
National Climatic Data Center
Station: 727845 Tri-Cities Airport
Period: 2008-2017
Number of Observations: 93,210

IFR WINDROSE



PERCENT WIND COVERAGE

Runway	10.5 Knots (12 mph)	13 Knots (15 mph)	16 Knots (18.5 mph)	20 Knots (23 mph)
12/30	98.93%	99.22%	99.48%	99.71%
3/21	96.68%	97.97%	99.47%	99.88%
Combined	99.62%	99.84%	99.95%	100.00%

Source: FAA AGIS
National Climatic Data Center
Station: 727845 Tri-Cities Airport
Period: 2008-2017
Number of Observations: 8,419

Mead & Hunt

Mead and Hunt, Inc.
9600 NE Cascades Parkway, Suite 100
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phone: 503-548-1494
meadhunt.com

TRI-CITIES AIRPORT • PSC

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3601 North 20th Avenue
Pasco, Washington
99301

REVISIONS

#	DESCRIPTION	BY	DATE
1	ALP Update as part of Master Plan	SMF	12/22/20

M&H NO.: 1624500-172210.01
DATE: December 2020
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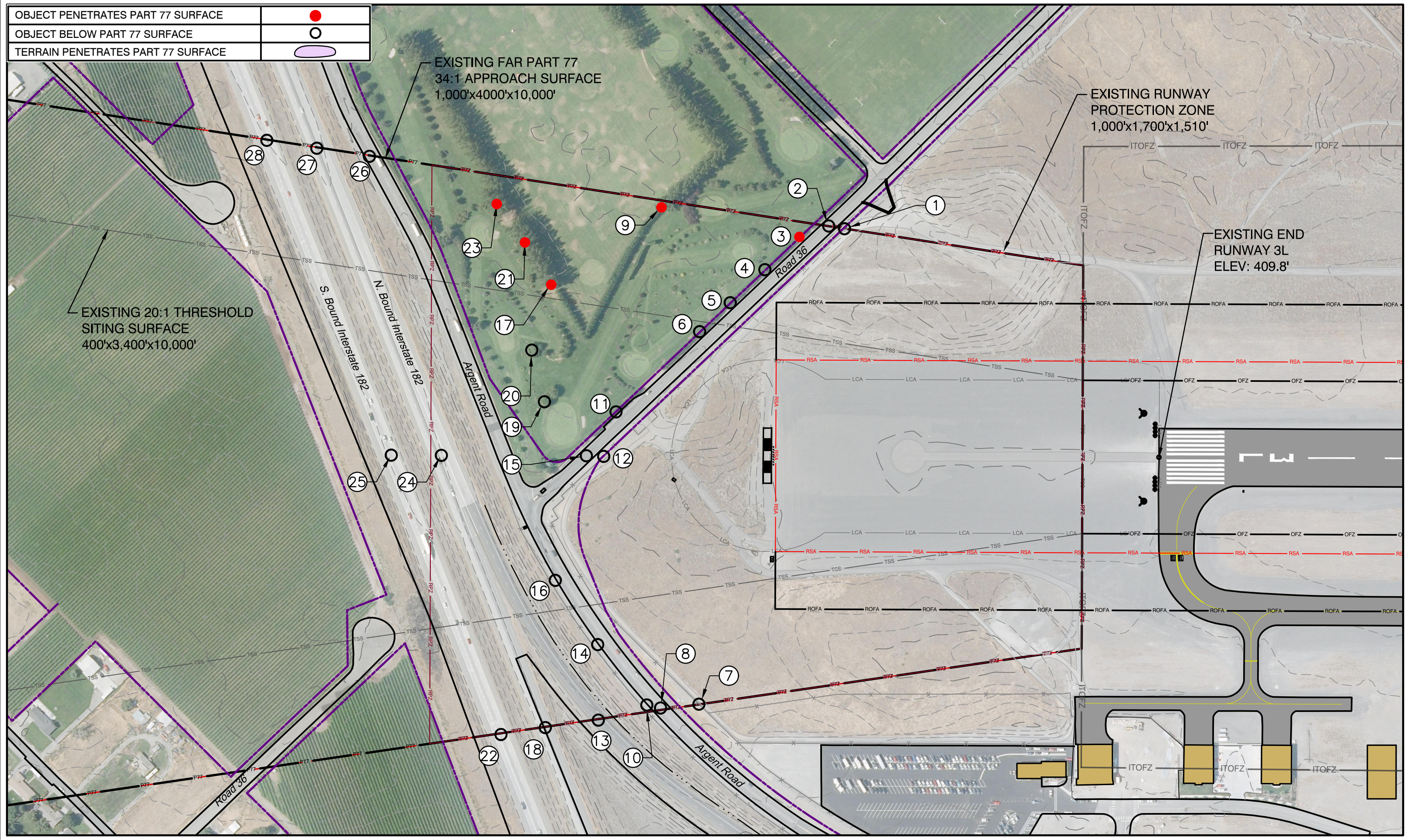
DRAWN BY: TE
CHECKED BY: KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
AIRPORT DATA

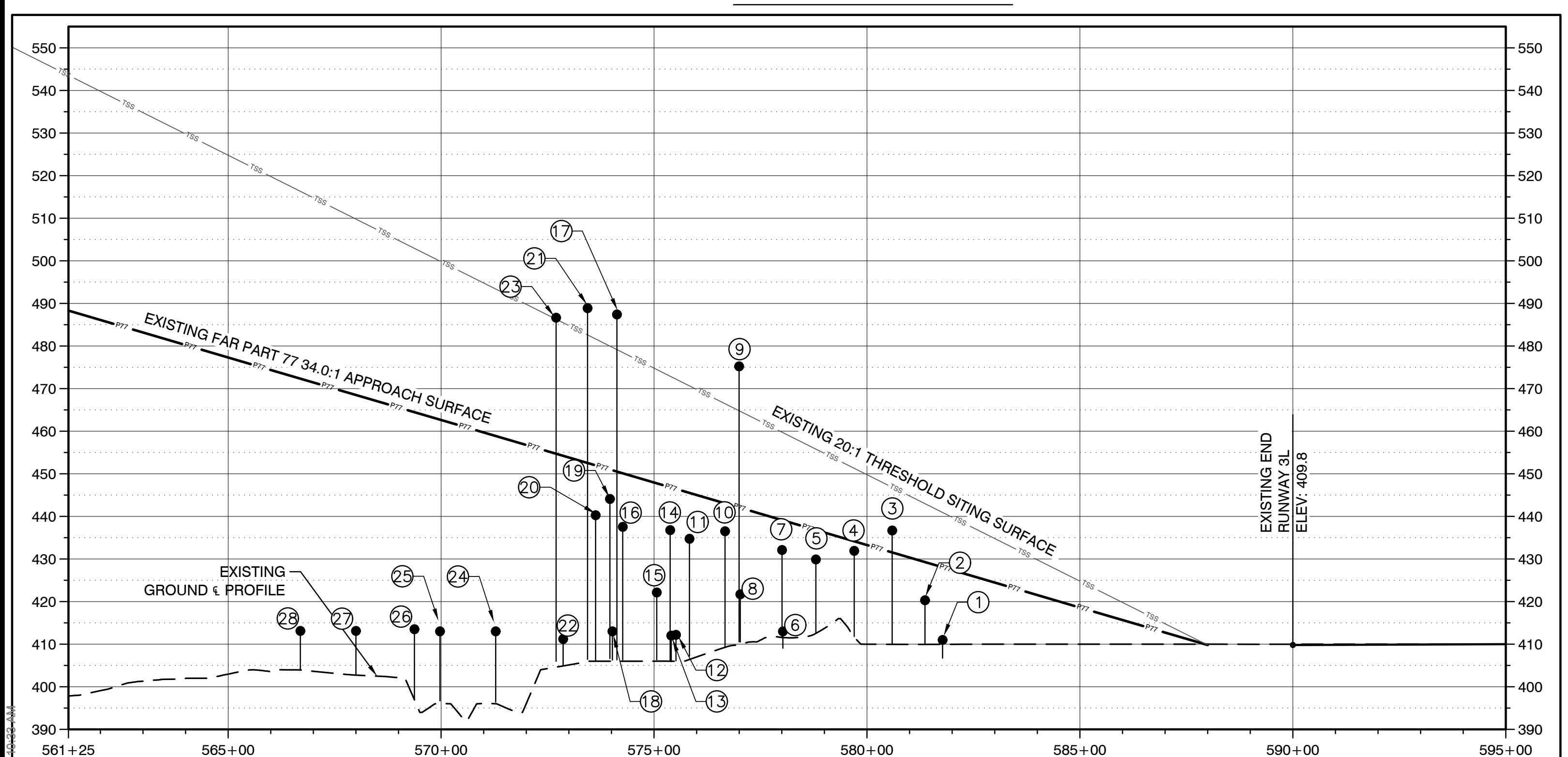
SHEET NO.

NOT FOR CONSTRUCTION

X:\1624500\172210.01\TECH\CAD\ALP\SHEETS\SHEET 3 AIRPORT DATA SHEET.DWG
12/22/2020 9:48 AM



RUNWAY END 3L - PLAN



RUNWAY END 3L - PROFILE

DRAWING LEGEND

	EXISTING		EXISTING
ACTIVE AIRFIELD PAVEMENT / SHOULDER		LIGHTS (EDGE / GROUP / REIL / MALSR)	
		PRECISION APPROACH PATH INDICATOR (PAPI)	
AIRPORT PROPERTY		RUNWAY / TAXIWAY SIGN	
AVIGATION EASEMENT		WIND CONE	
RUNWAY SAFETY AREA (RSA)	RSA	GLIDE SLOPE ANTENNA	
RUNWAY PROTECTION ZONE (RPZ)	RPZ	GLIDE SLOPE CRITICAL AREA (GCA)	GCA
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	LOCALIZER	
OBSTACLE FREE ZONE (OFZ)	OFZ	LOCALIZER CRITICAL AREA (LCA)	LCA
RUNWAY VISIBILITY ZONE (RVZ)	RVZ	AUTO. SURFACE OBSERVING SYSTEM (ASOS)	
BUILDING RESTRICTION LINE (BRL)	BRL	ASOS CRITICAL AREA (ACA)	ACA
FAR PART 77 APPROACH SURFACE	P77	RUNWAY VISUAL RANGE (RVR)	N/A
THRESHOLD SITING SURFACE (TSS)	TSS	PUBLIC ROAD	
TAXIWAY / LANE MARKING		GRAVEL ROAD	
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	RAILROAD	
INNER TRANSITIONAL OFZ	ITOFZ	FENCE / GATE	
BUILDING		CHANNEL / DITCH	
		TERRAIN CONTOUR	450'

RUNWAY 3L EXISTING INNER APPROACH SURFACE OBSTRUCTIONS

NO.	OBJECTID	OBSTRUCTION	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1		FENCE	8.0	411.0	-17.1	
2		ROAD 36	15.0	420.3	-9.0	
3	1455	TREE	31.3	436.7	5.0	TO BE LOWERED/REMOVED
4	2483	TREE	28.8	431.9	-2.4	TO BE LOWERED/REMOVED
5	2484	TREE	26.0	429.9	-7.1	TO BE LOWERED/REMOVED
6	2485	TREE	28.2	432.1	-7.2	TO BE LOWERED/REMOVED
7		FENCE	8.0	413.0	-26.1	
8		ARGENT ROAD	15.0	421.7	-20.4	
9	2487	TREE	76.8	475.2	33.0	TO BE LOWERED/REMOVED
10	1557	POLE	29.6	436.5	-6.7	*TO BE LOWERED/REMOVED/LIGHTED
11	1553	TREE	27.6	434.7	-10.9	TO BE LOWERED/REMOVED
12		FENCE @ CL.	8.0	412.2	-34.3	
13		FWY. ON RAMP	17.0	412.0	-34.9	
14	1558	POLE	30.1	436.8	-10.2	*TO BE LOWERED/REMOVED/LIGHTED
15		ROAD 36 @ CL.	15.0	422.2	-25.7	
16	1556	POLE	31.1	437.5	-12.7	*TO BE LOWERED/REMOVED/LIGHTED
17	1468	TREE	86.8	487.4	36.7	TO BE LOWERED/REMOVED
18		INT. 182 NORTH BOUND	17.0	413.0	-37.9	
19	1431	TREE	38.2	444.1	-7.1	TO BE LOWERED/REMOVED
20	1432	TREE	33.6	440.3	-11.9	TO BE LOWERED/REMOVED
21	186	TREE	90.2	488.9	36.2	TO BE LOWERED/REMOVED
22		INT. 182 SOUTH BOUND	17.0	411.2	-43.1	
23	1469	TREE	86.8	486.6	31.8	TO BE LOWERED/REMOVED
24		INT. 182 NORTH BOUND @ CL.	17.0	413.0	-46.0	
25		INT. 182 SOUTH BOUND @ CL.	17.0	413.0	-49.8	
26		ARGENT ROAD	15.0	413.5	-51.1	
27		INT. 182 NORTH BOUND	17.0	413.1	-55.5	
28		INT. 182 SOUTH BOUND	17.0	413.1	-59.4	

* TO BE FURTHER STUDIED IN INDIVIDUAL AIRSPACE CASE.

RUNWAY 3L EXISTING THRESHOLD SITING SURFACE OBSTRUCTIONS

NO.	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
		NO THRESHOLD SITING SURFACE PENETRATIONS				

NOTES:

1. OBJECT ELEVATIONS IN FEET (NAVD88).
2. OBSTRUCTION ELEVATIONS ARE FOR PLANNING PURPOSES ONLY AND WERE NOT SURVEYED. ACTUAL ELEVATIONS SHOULD BE FIELD VERIFIED PRIOR TO ANY PROPOSED DESIGN OR CONSTRUCTION WORK.
3. 10' ADDED TO THE ELEVATIONS OF PRIVATE ROADWAYS, 15' ADDED TO THE ELEVATIONS OF PUBLIC NON-INTERSTATE ROADWAYS, 17' ADDED TO INTERSTATE ROADWAYS, AND 23' ADDED TO RAILWAYS TO DETERMINE CLEARANCE PER FAR PART 77 CRITERIA.
4. THE AIRPORT WILL CONTINUE TO WORK TOWARDS REMOVING EXISTING ROADS WITHIN RPZ WHERE FEASIBLE.
5. AIRPORT MAINTENANCE ROAD ACCESS ONLY.

MAGNETIC DECLINATION:
14° 33' EAST (±0° 23')
ANNUAL CHANGE: 0° 6' WEST
JULY 2020

TRUE NORTH

HORZ 0 200 400
VERT 0 20 40
SCALE IN FEET

Mead & Hunt
Mead and Hunt, Inc.
9600 NE Cascades Parkway, Suite 100
Portland, OR 97220
phone: 503-548-1494
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TRI-CITIES AIRPORT • PSC

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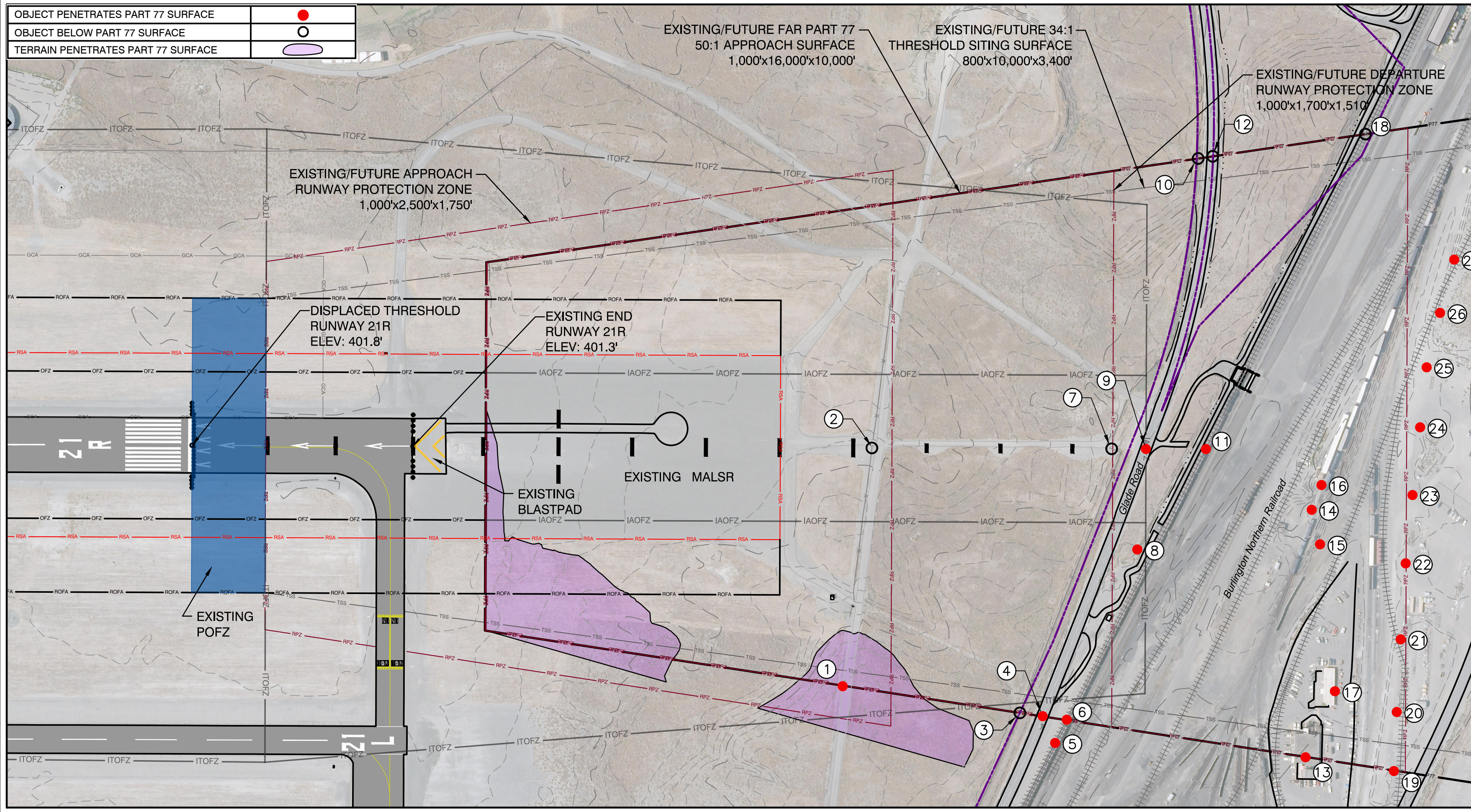
DRAWN BY: TE
CHECKED BY: KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
RUNWAY 3L INNER APPROACH SURFACE (EXISTING)

SHEET NO.

NOT FOR CONSTRUCTION



RUNWAY END 21R - PLAN

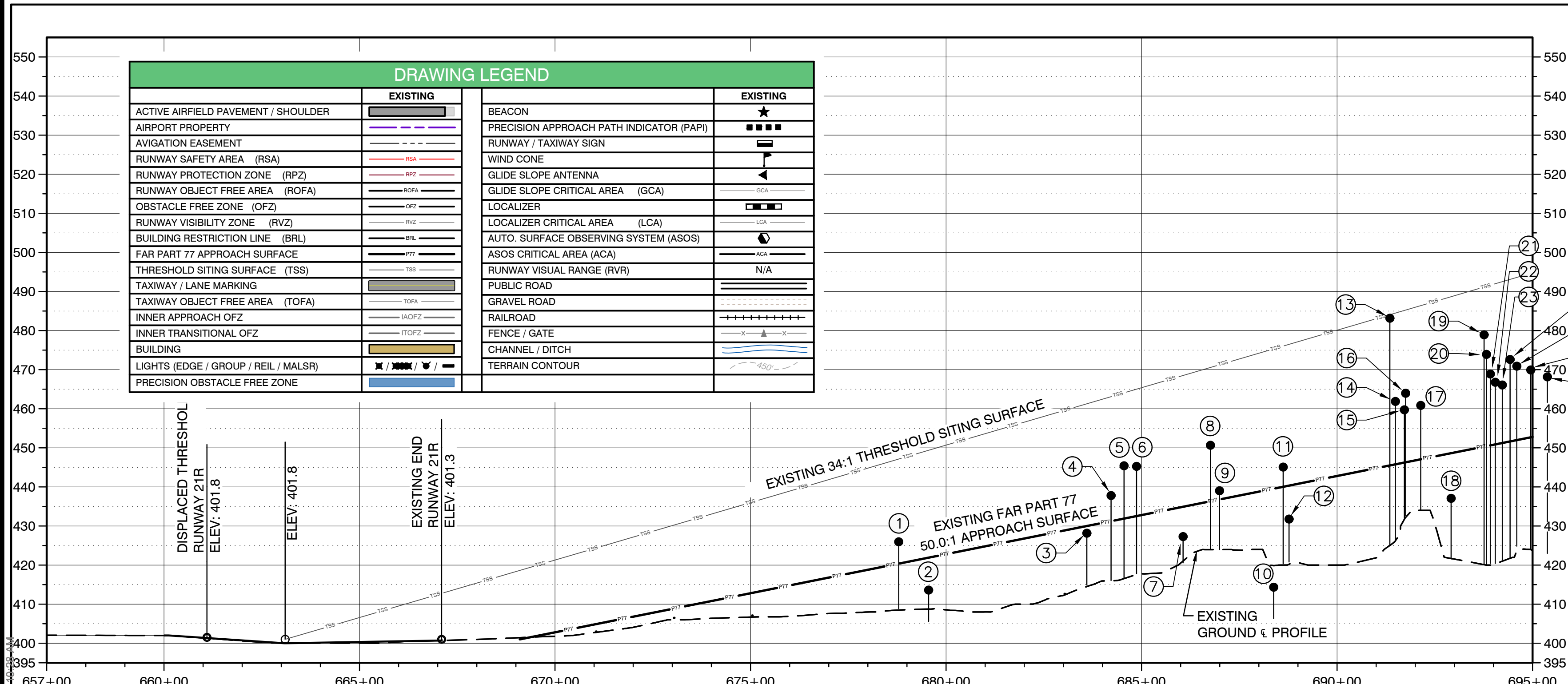
RUNWAY 21R EXISTING/FUTURE INNER APPROACH SURFACE OBSTRUCTIONS

NO.	OBJECTID	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1		ACCESS ROAD	APPROACH	0.0	426.0	5.3	TO BE LOWERED
2		FENCE @ CL.	APPROACH	8.0	413.6	-8.7	
3		FENCE @ CL.	APPROACH	8.0	428.2	-2.2	
4		GLADE ROAD	APPROACH	15.0	437.8	6.6	*TO BE DETERMINED
5	1842	RAILROAD	APPROACH	23.0	445.4	0.7	*TO BE DETERMINED
6		RAILROAD	APPROACH	23.0	445.3	12.4	*TO BE DETERMINED
7		FENCE	APPROACH	8.0	427.3	-8.0	
8	1538	POLE	APPROACH	26.4	450.7	1.5	*TO BE LOWERED/REMOVED/LIGHTED
9		GLADE ROAD @ CL.	APPROACH	15.0	439.0	1.9	*TO BE DETERMINED
10		FENCE	APPROACH	8.0	414.3	-25.6	
11		RAILROAD @ CL.	APPROACH	23.0	445.1	4.7	*TO BE DETERMINED
12		GLADE ROAD	APPROACH	15.0	431.8	-8.9	
13	1272	BUILDING	APPROACH	59.7	483.2	24.9	*TO BE LOWERED/REMOVED/LIGHTED
14	1517	POLE	APPROACH	28.7	461.9	3.3	*TO BE LOWERED/REMOVED/LIGHTED
15	1518	POLE	APPROACH	37.9	459.7	0.7	*TO BE LOWERED/REMOVED/LIGHTED
16	1516	POLE	APPROACH	27.7	464.0	4.8	*TO BE LOWERED/REMOVED/LIGHTED
17	2205	POLE	APPROACH	36.9	460.9	1.0	*TO BE LOWERED/REMOVED/LIGHTED
18		RAILROAD	APPROACH	23.0	437.1	-11.9	
19	1868	POLE	APPROACH	53.4	478.9	15.8	*TO BE LOWERED/REMOVED/LIGHTED
20	1844	POLE	APPROACH	48.6	473.9	10.7	*TO BE LOWERED/REMOVED/LIGHTED
21	1845	POLE	APPROACH	44.0	468.9	5.4	*TO BE LOWERED/REMOVED/LIGHTED
22	1511	POLE	APPROACH	44.3	466.8	3.1	*TO BE LOWERED/REMOVED/LIGHTED
23	1510	POLE	APPROACH	44.6	466.1	2.0	*TO BE LOWERED/REMOVED/LIGHTED
24	1509	POLE	APPROACH	49.0	472.6	8.2	*TO BE LOWERED/REMOVED/LIGHTED
25	2329	POLE	APPROACH	46.6	470.9	6.1	*TO BE LOWERED/REMOVED/LIGHTED
26	1508	POLE	APPROACH	43.0	469.9	4.4	*TO BE LOWERED/REMOVED/LIGHTED
27	2330	POLE	APPROACH	40.3	468.4	2.1	*TO BE LOWERED/REMOVED/LIGHTED

* TO BE FURTHER STUDIED IN INDIVIDUAL AIRSPACE CASE.

RUNWAY 21R EXISTING/FUTURE THRESHOLD SITING SURFACE OBSTRUCTIONS

NO.	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
		NO THRESHOLD SITING SURFACE PENETRATIONS				



RUNWAY END 21R - PROFILE

NOTES:

1. OBJECT ELEVATIONS IN FEET (NAVD88).
2. OBSTRUCTION ELEVATIONS ARE FOR PLANNING PURPOSES ONLY AND WERE NOT SURVEYED. ACTUAL ELEVATIONS SHOULD BE FIELD VERIFIED PRIOR TO ANY PROPOSED DESIGN OR CONSTRUCTION WORK.
3. OBJECT REMOVAL IN THE APPROACH TO RUNWAY 21R MAY BE ECONOMICALLY UNFEASIBLE WHEN COMPARING THE IMPROVED APPROACH SLOPE GAIN TO THE COST IMPACT TO RAILROAD FACILITIES. THRESHOLD OF RUNWAY 21R IS DISPLACED TO MITIGATE FAR PART 77 OBSTRUCTIONS IN RAILWAY YARD.
4. THE AIRPORT WILL CONTINUE TO WORK TOWARDS REMOVING EXISTING ROADS WITHIN RPZ WHERE FEASIBLE.
5. AIRPORT MAINTENANCE ROAD ACCESS ONLY.
6. 10' ADDED TO THE ELEVATIONS OF PRIVATE ROADWAYS, 15' ADDED TO THE ELEVATIONS OF PUBLIC NON-INTERSTATE ROADWAYS, 17' ADDED TO INTERSTATE ROADWAYS, AND 23' ADDED TO RAILWAYS TO DETERMINE CLEARANCE PER FAR PART 77 CRITERIA.

MAGNETIC DECLINATION:
14° 33' EAST (±0° 23')
ANNUAL CHANGE: 0° 6' WEST
JULY 2020

TRUE NORTH

HORZ 0 200 400
VERT 0 20 40
SCALE IN FEET

Mead & Hunt
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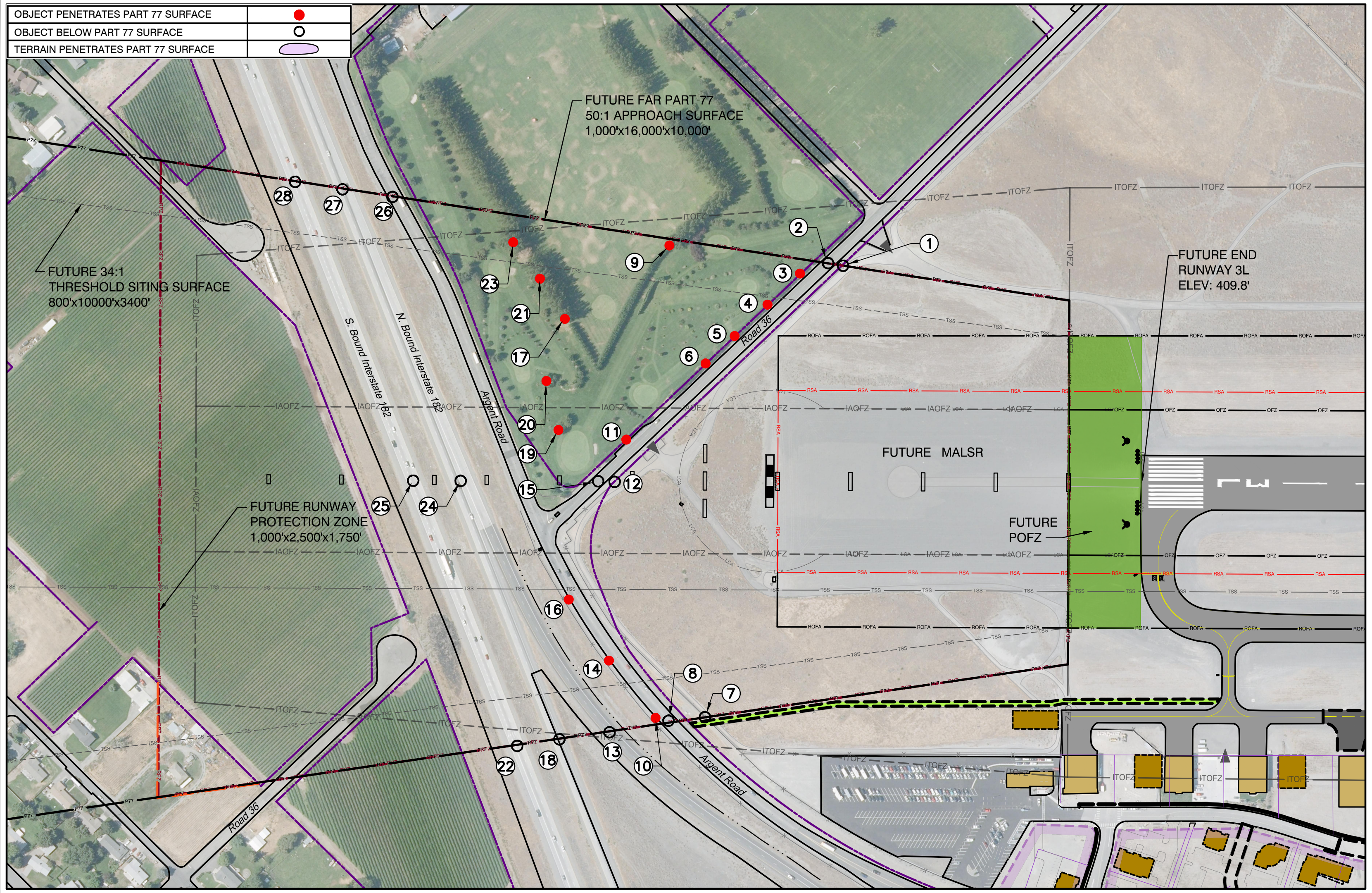
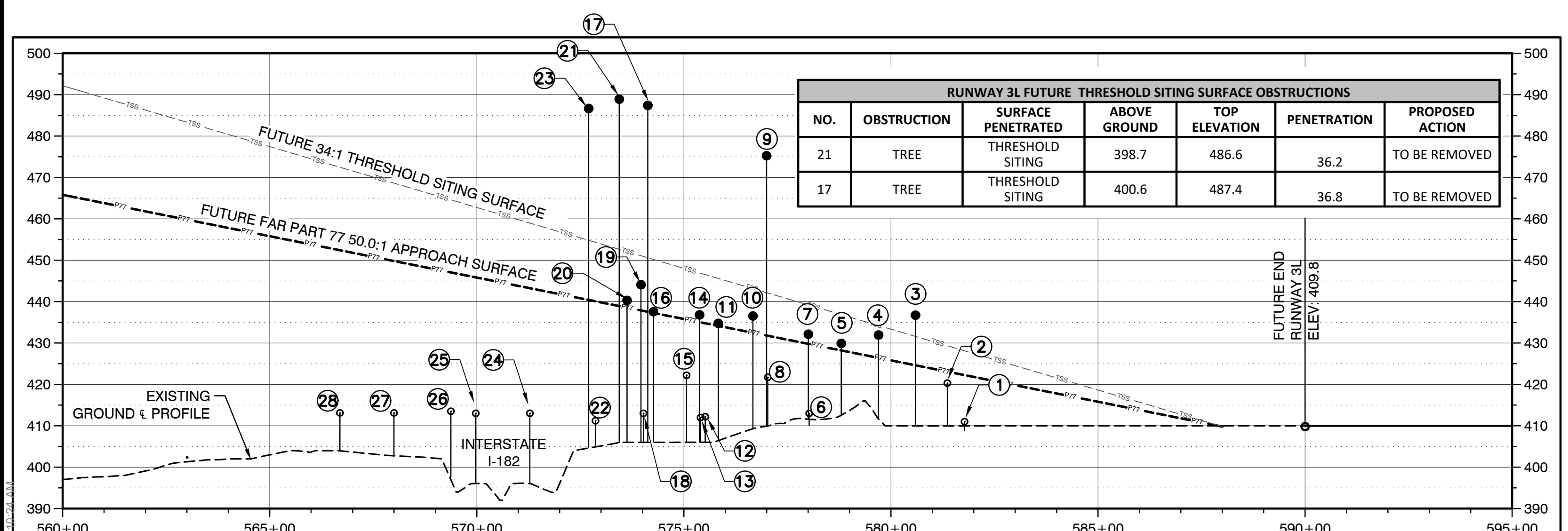
RUNWAY 21R INNER APPROACH SURFACE (EXISTING/FUTURE)

SHEET NO.

NOT FOR CONSTRUCTION



RUNWAY END 3L - PLAN



RUNWAY 3L FUTURE THRESHOLD SITING SURFACE OBSTRUCTIONS						
NO.	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
21	TREE	THRESHOLD SITING	398.7	486.6	36.2	TO BE REMOVED
17	TREE	THRESHOLD SITING	400.6	487.4	36.8	TO BE REMOVED

RUNWAY END 3L - PROFILE

EXISTING DRAWING LEGEND

	EXISTING		EXISTING
ACTIVE AIRFIELD PAVEMENT / SHOULDER		BEACON	
AIRPORT PROPERTY		PRECISION APPROACH PATH INDICATOR (PAPI)	
AVIGATION EASEMENT		RUNWAY / TAXIWAY SIGN	
RUNWAY SAFETY AREA (RSA)	RSA	WIND CONE	
RUNWAY PROTECTION ZONE (RPZ)	RPZ	GLIDE SLOPE ANTENNA	
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	GLIDE SLOPE CRITICAL AREA (GCA)	GCA
OBSTACLE FREE ZONE (OFZ)	OFZ	LOCALIZER	
RUNWAY VISIBILITY ZONE (RVZ)	RVZ	LOCALIZER CRITICAL AREA (LCA)	LCA
BUILDING RESTRICTION LINE (BRL)	BRL	AUTO. SURFACE OBSERVING SYSTEM (ASOS)	
FAR PART 77 APPROACH SURFACE	P77	ASOS CRITICAL AREA (ACA)	ACA
THRESHOLD SITING SURFACE (TSS)	TSS	PUBLIC ROAD	
TAXIWAY / LANE MARKING		GRAVEL ROAD	
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	RAILROAD	
INNER APPROACH OFZ	IAOFZ	FENCE / GATE	
INNER TRANSITIONAL OFZ	ITOFZ	CHANNEL / DITCH	
BUILDING		TERRAIN CONTOUR	
LIGHTS (EDGE / GROUP / REIL / MALSR)			

FUTURE DRAWING LEGEND

	FUTURE		FUTURE
ACTIVE AIRFIELD PAVEMENT		FENCE	
PAVEMENT TO BE REMOVED (AIRFIELD & ROAD)		INNER APPROACH OFZ	IAOFZ
AIRPORT PROPERTY		INNER TRANSITIONAL OFZ	ITOFZ
RUNWAY SAFETY AREA (RSA)	RSA	PRECISION APPROACH PATH INDICATOR (PAPI)	
RUNWAY PROTECTION ZONE (RPZ)	RPZ	GLIDE SLOPE ANTENNA	
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	GLIDE SLOPE CRITICAL AREA (GCA)	GCA
OBSTACLE FREE ZONE (OFZ)	OFZ	TAXIWAY OBJECT FREE AREA (TOFA)	TOFA
RUNWAY VISIBILITY ZONE (RVZ)	RVZ	BUILDING - ON AIRPORT	
BUILDING RESTRICTION LINE (BRL)	BRL	LIGHTS (EDGE / GROUP / REIL / MALSR)	
FAR PART 77 APPROACH SURFACE	P77	PRECISION OBSTACLE FREE ZONE	
THRESHOLD SITING SURFACE (TSS)	TSS		

RUNWAY 3L FUTURE APPROACH SURFACE OBSTRUCTIONS							
NO.	OBJECTID	OBSTRUCTIONS	SURFACE PENTRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1		FENCE	APPROACH	8.0	411.0	-11.3	
2		ROAD 36	APPROACH	15.0	420.3	-2.8	
3	1455	TREE	APPROACH	31.3	436.7	12.0	TO BE LOWERED/REMOVED
4	2483	TREE	APPROACH	28.8	431.9	5.4	TO BE LOWERED/REMOVED
5	2484	TREE	APPROACH	26.0	429.9	1.6	TO BE LOWERED/REMOVED
6	2485	TREE	APPROACH	28.2	432.1	2.2	TO BE LOWERED/REMOVED
7		FENCE	APPROACH	8.0	413.0	-16.8	
8		ARGENT ROAD	APPROACH	15.0	421.7	-10.1	
9	2487	TREE	APPROACH	76.8	475.2	43.3	TO BE LOWERED/REMOVED
10	1557	POLE	APPROACH	29.6	436.5	3.9	*TO BE LOWERED/REMOVED/LIGHTED
11	1553	TREE	APPROACH	27.6	434.7	0.5	TO BE LOWERED/REMOVED
12		FENCE @ CL.	APPROACH	8.0	412.2	-22.6	
13		FWY. ON RAMP	APPROACH	17.0	412.0	-23.0	
14	1558	POLE	APPROACH	30.1	436.8	1.6	*TO BE LOWERED/REMOVED/LIGHTED
15		ROAD 36 @ CL.	APPROACH	15.0	422.2	-13.5	
16	1556	POLE	APPROACH	31.1	437.5	0.2	*TO BE LOWERED/REMOVED/LIGHTED
17	1468	TREE	APPROACH	86.8	487.4	49.8	TO BE LOWERED/REMOVED
18		INT. 182 NORTH BOUND	APPROACH	17.0	413.0	-24.8	
19	1431	TREE	APPROACH	38.2	444.1	6.1	TO BE LOWERED/REMOVED
20	1432	TREE	APPROACH	33.6	440.3	1.6	TO BE LOWERED/REMOVED
21	186	TREE	APPROACH	90.2	488.9	49.9	TO BE LOWERED/REMOVED
22		INT. 182 SOUTH BOUND	APPROACH	17.0	411.2	-28.9	
23	1469	TREE	APPROACH	86.8	486.6	46.1	TO BE LOWERED/REMOVED
24		INT. 182 NORTH BOUND@ CL.	APPROACH	17.0	413.0	-30.3	
25		INT. 182 SOUTH BOUND@ CL.	APPROACH	17.0	413.0	-32.9	
26		ARGENT ROAD	APPROACH	15.0	413.5	-33.6	
27		INT. 182 NORTH BOUND	APPROACH	17.0	413.1	-36.7	
28		INT. 182 SOUTH BOUND	APPROACH	17.0	413.1	-39.3	

* TO BE FURTHER STUDIED IN INDIVIDUAL AIRSPACE CASE.

NOTES:

1. OBJECT ELEVATIONS IN FEET (NAVD88).
2. OBSTRUCTION ELEVATIONS ARE FOR PLANNING PURPOSES ONLY AND WERE NOT SURVEYED. ACTUAL ELEVATIONS SHOULD BE FIELD VERIFIED PRIOR TO ANY PROPOSED DESIGN OR CONSTRUCTION WORK.
3. 10' ADDED TO THE ELEVATIONS OF PRIVATE ROADWAYS, 15' ADDED TO THE ELEVATIONS OF PUBLIC NON-INTERSTATE ROADWAYS, 17' ADDED TO INTERSTATE ROADWAYS, AND 23' ADDED TO RAILWAYS TO DETERMINE CLEARANCE PER FAR PART 77 CRITERIA.
4. THE AIRPORT WILL CONTINUE TO WORK TOWARDS REMOVING EXISTING ROADS WITHIN RPZ WHERE FEASIBLE.
5. AIRPORT MAINTENANCE ROAD ACCESS ONLY.

TRUE NORTH

MAGNETIC DECLINATION:
14° 33' EAST (±0° 23')
ANNUAL CHANGE: 0° 6' WEST
JULY 2020

HORZ 0 200 400
VERT 0 20 40
SCALE IN FEET

Mead &Hunt

Mead and Hunt, Inc.
9600 NE Cascades Parkway,
Suite 100
Portland, OR 97220
phone: 503-548-1494
meadhunt.com

TRI-CITIES AIRPORT • PSC

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TRI-CITIES AIRPORT LAYOUT PLAN

3601 North 20th Avenue
Pasco, Washington
99301

REVISIONS

#	DESCRIPTION	BY	DATE
1	ALP Update as part of Master Plan	SMF	12/22/20

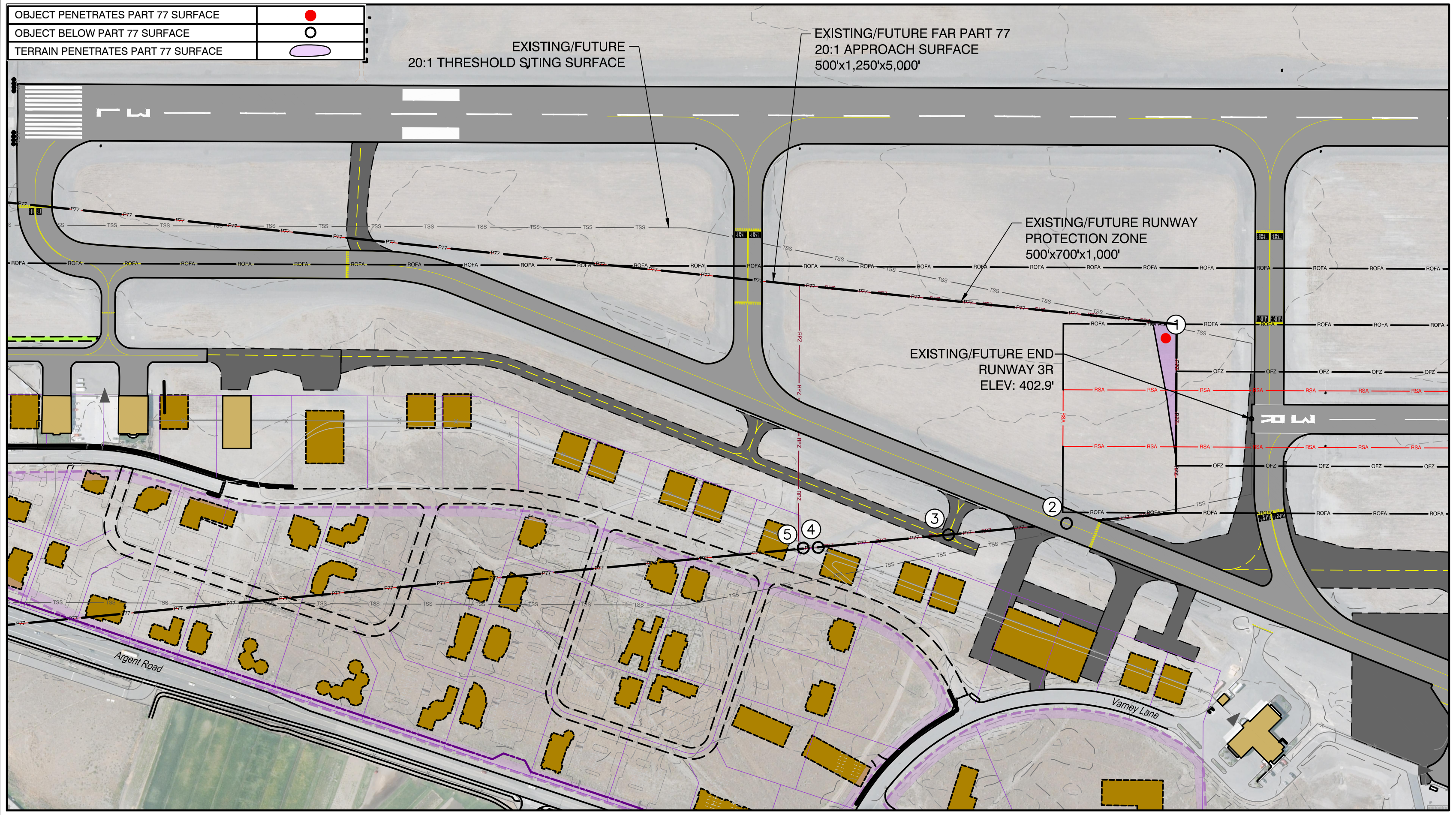
M&H NO.: 1624500-172210.01
DATE: December 2020
DESIGNED BY: MH
DRAWN BY: TE
CHECKED BY: KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS

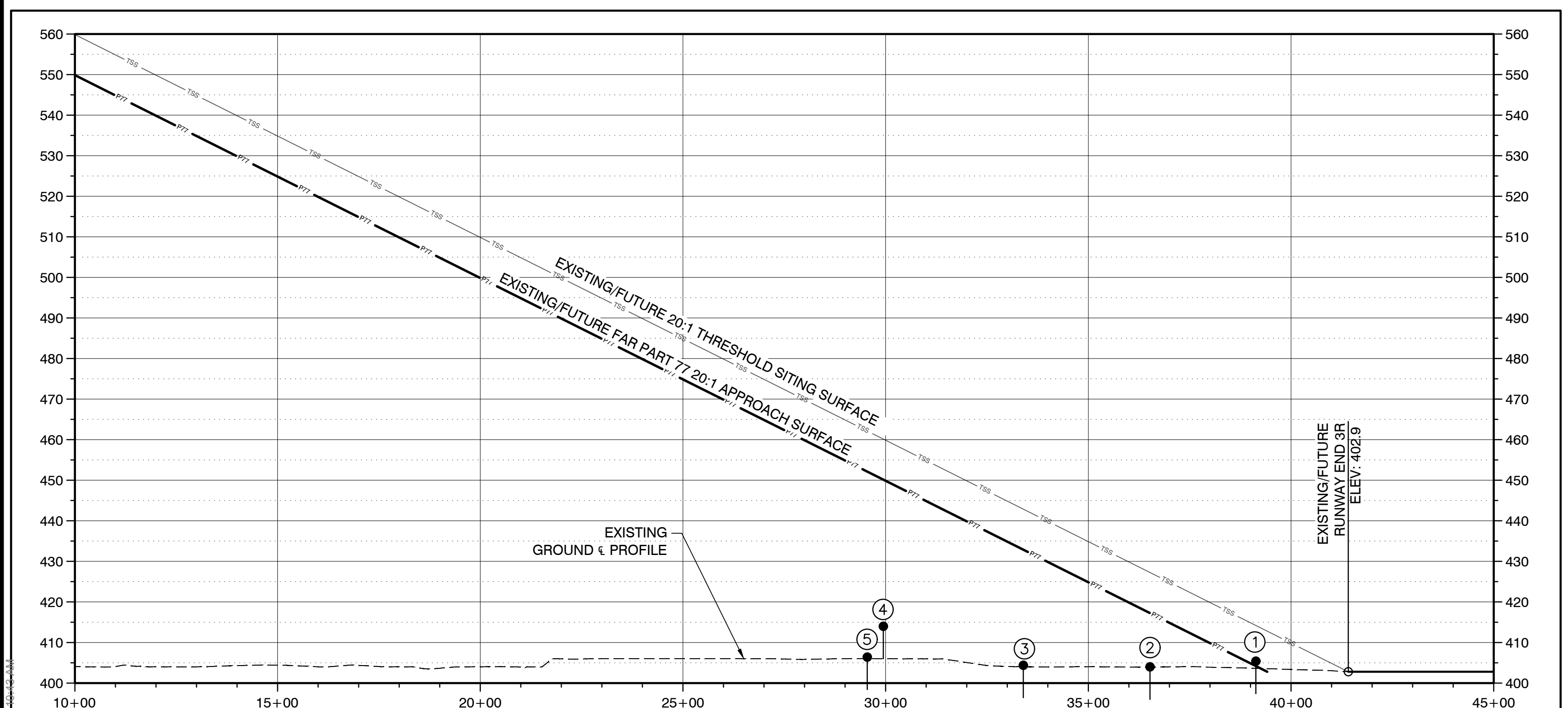
RUNWAY 3L INNER APPROACH (FUTURE)

SHEET NO.

NOT FOR CONSTRUCTION



RUNWAY END 3R - PLAN



RUNWAY END 3R - PROFILE

DRAWING LEGEND

	EXISTING
ACTIVE AIRFIELD PAVEMENT / SHOULDER	
AIRPORT PROPERTY	
AVIGATION EASEMENT	
AIRPORT REFERENCE POINT	
RUNWAY SAFETY AREA (RSA)	RSA
RUNWAY PROTECTION ZONE (RPZ)	RPZ
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
OBSTACLE FREE ZONE (OFZ)	OFZ
RUNWAY VISIBILITY ZONE (RVZ)	RVZ
BUILDING RESTRICTION LINE (BRL)	BRL
FAR PART 77 APPROACH SURFACE	P77
THRESHOLD SITING SURFACE (TSS)	TSS
TAXIWAY / LANE MARKING	
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA
BUILDING	
LIGHTS (EDGE / GROUP / REIL / MALSR)	
BEACON	
PRECISION APPROACH PATH INDICATOR (PAPI)	
RUNWAY / TAXIWAY SIGN	
WIND CONE	
GLIDE SLOPE ANTENNA	
GLIDE SLOPE CRITICAL AREA (GCA)	GCA
LOCALIZER	
LOCALIZER CRITICAL AREA (LCA)	LCA
AUTO. SURFACE OBSERVING SYSTEM (ASOS)	
ASOS CRITICAL AREA (ACA)	ACA
RUNWAY VISUAL RANGE (RVR)	N/A
PUBLIC ROAD	
GRAVEL ROAD	
RAILROAD	
FENCE / GATE	
CHANNEL / DITCH	
TERRAIN CONTOUR	

RUNWAY 3R EXISTING/FUTURE INNER APPROACH SURFACE OBSTRUCTIONS

NO.	OBJECTID	OBSTRUCTION	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1		LAND MASS	0.0	405.4	2.5	TO BE LOWERED
2		TAXIWAY A	0.0	404.0	-13.3	
3		CONNECTOR TAXIWAY	14.3	404.4	-28.5	
4		FENCE	8.0	414.0	-27.4	
5		ACCESS ROAD	0.0	406.4	-45.8	

RUNWAY 3R EXISTING/FUTURE THRESHOLD SITING SURFACE OBSTRUCTIONS

NO.	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
	NO THRESHOLD SITING SURFACE PENETRATIONS					

NOTES:

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MAGNETIC DECLINATION:
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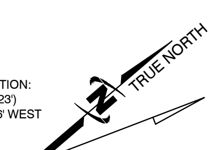
ANNUAL CHANGE: 0° 6' WEST
JULY 2020



HORZ 0 200 400
VERT 0 20 40
SCALE IN FEET

Mead & Hunt
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TRI-CITIES AIRPORT • PSC

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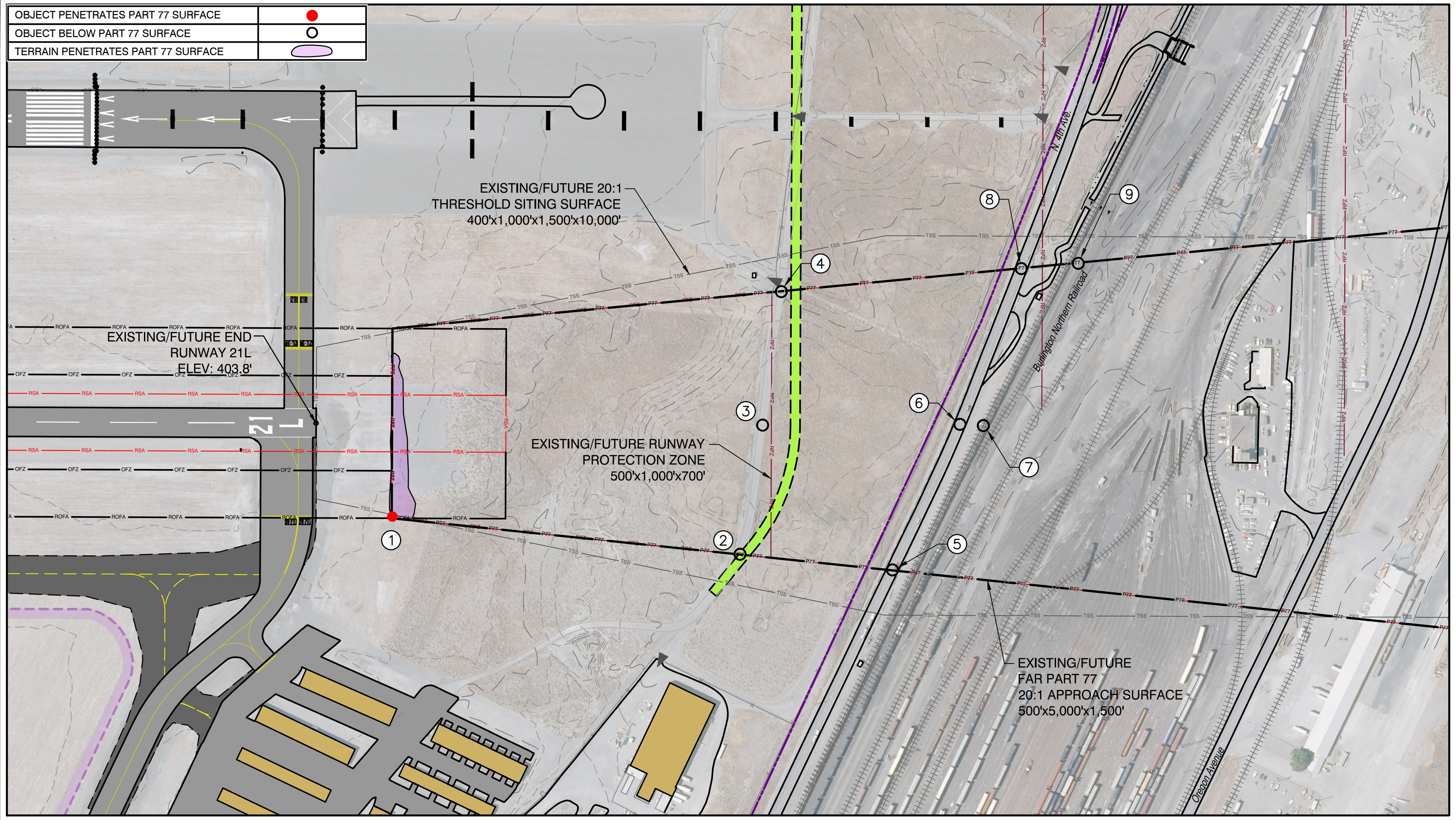
SHEET CONTENTS
RUNWAY 3R INNER APPROACH (EXISTING/FUTURE)

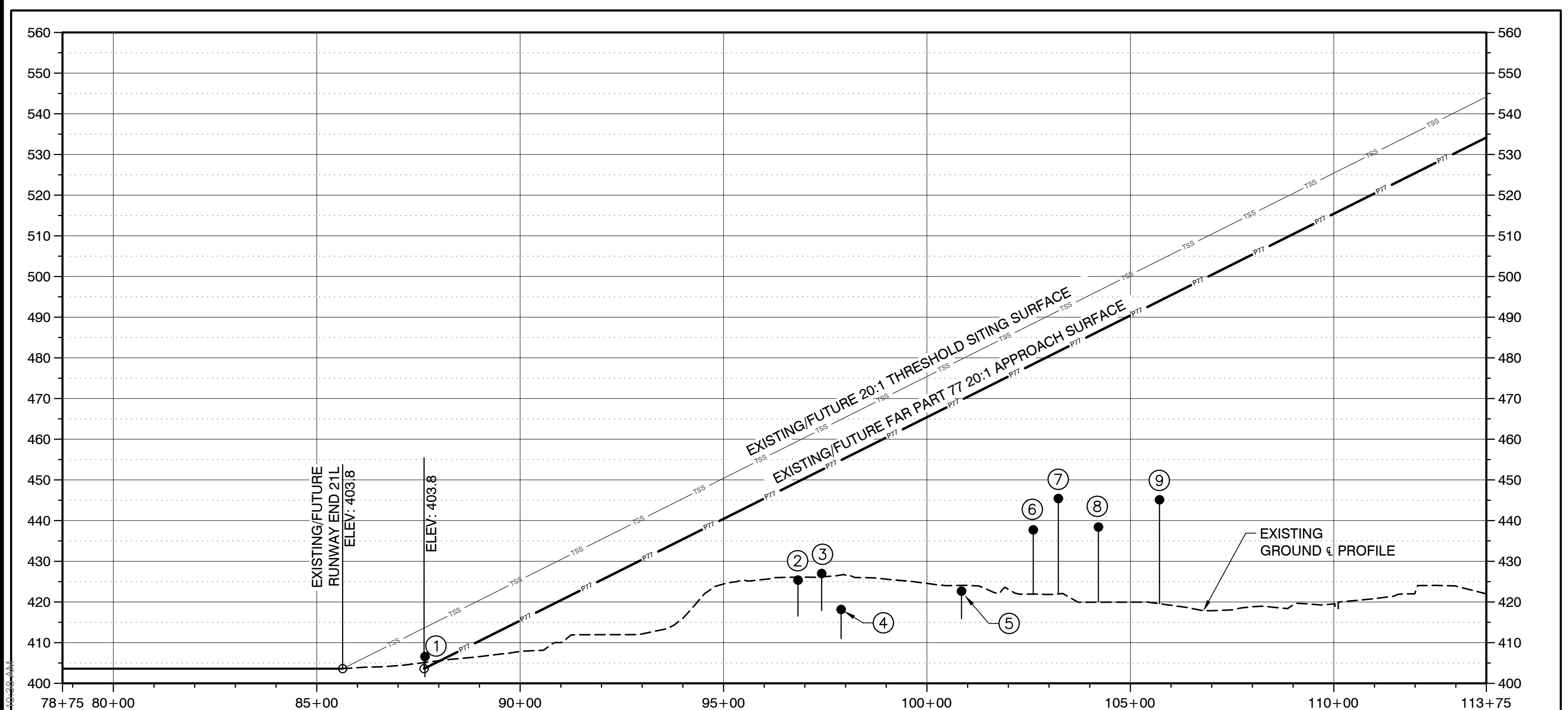
SHEET NO.

NOT FOR CONSTRUCTION

X:\1624500\172210.01\TECH\CAD\ALP\SHEETS\SHEET 7-8 3R-21L INNER APPROACH.DWG



RUNWAY END 21L - PLAN



RUNWAY END 21L - PROFILE

DRAWING LEGEND

	EXISTING
ACTIVE AIRFIELD PAVEMENT / SHOULDER	
AIRPORT PROPERTY	
AVIGATION EASEMENT	
AIRPORT REFERENCE POINT	
RUNWAY SAFETY AREA (RSA)	
RUNWAY PROTECTION ZONE (RPZ)	
RUNWAY OBJECT FREE AREA (ROFA)	
OBSTACLE FREE ZONE (OFZ)	
RUNWAY VISIBILITY ZONE (RVZ)	
BUILDING RESTRICTION LINE (BRL)	
FAR PART 77 APPROACH SURFACE	
THRESHOLD SITING SURFACE (TSS)	
TAXIWAY / LANE MARKING	
TAXIWAY OBJECT FREE AREA (TOFA)	
BUILDING	
LIGHTS (EDGE / GROUP / REIL / MALSR)	
BEACON	
PRECISION APPROACH PATH INDICATOR (PAPI)	
RUNWAY / TAXIWAY SIGN	
WIND CONE	
GLIDE SLOPE ANTENNA	
GLIDE SLOPE CRITICAL AREA (GCA)	
LOCALIZER	
LOCALIZER CRITICAL AREA (LCA)	
AUTO. SURFACE OBSERVING SYSTEM (ASOS)	
ASOS CRITICAL AREA (ACA)	
RUNWAY VISUAL RANGE (RVR)	N/A
PUBLIC ROAD	
GRAVEL ROAD	
RAILROAD	
FENCE / GATE	
CHANNEL / DITCH	
TERRAIN CONTOUR	

RUNWAY 21L EXISTING/FUTURE INNER APPROACH SURFACE OBSTRUCTIONS

NO.	OBJECTID	OBSTRUCTION	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1		GROUND	0.0	406.6	2.7	TO BE LOWERED
2		ACCESS ROAD	0.0	425.4	-24.2	
3		ACCESS ROAD @ CL.	0.0	427.0	-35.5	
4		ACCESS ROAD	0.0	418.1	-36.8	
5		N. 4th AVENUE	15.0	437.7	-31.9	
6		N. 4th AVENUE @ CL.	15.0	437.7	-50.8	
7		RAILROAD @ CL.	23.0	445.4	-46.1	
8		N. 4th AVENUE	15.0	438.4	-48.1	
9		RAILROAD	23.0	445.1	-48.9	

RUNWAY 21L EXISTING/FUTURE THRESHOLD SITING SURFACE OBSTRUCTIONS

NO.	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
NO THRESHOLD SITING SURFACE PENETRATIONS						

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JULY 2020

TRUE NORTH

HORZ 0 200 400
VERT 0 20 40
SCALE IN FEET

Mead & Hunt

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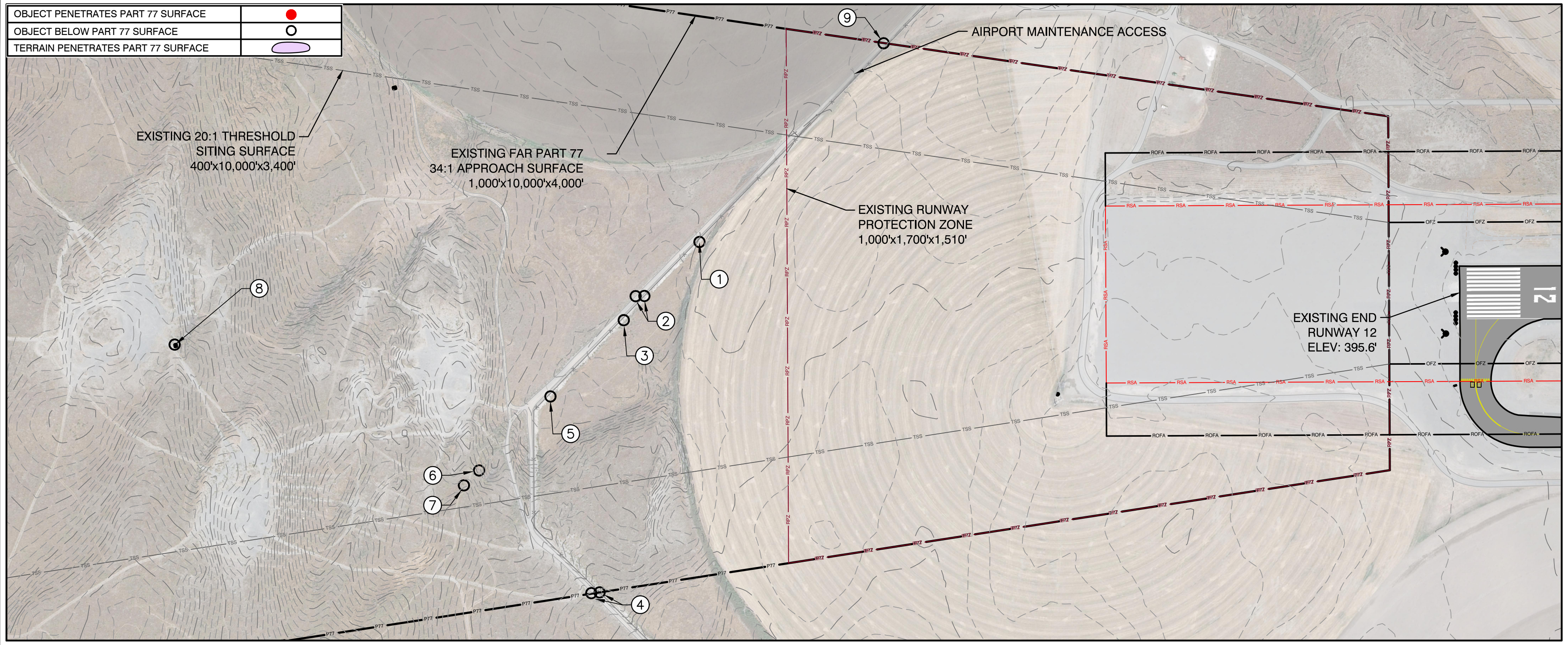
RUNWAY 21L INNER APPROACH (EXISTING/FUTURE)

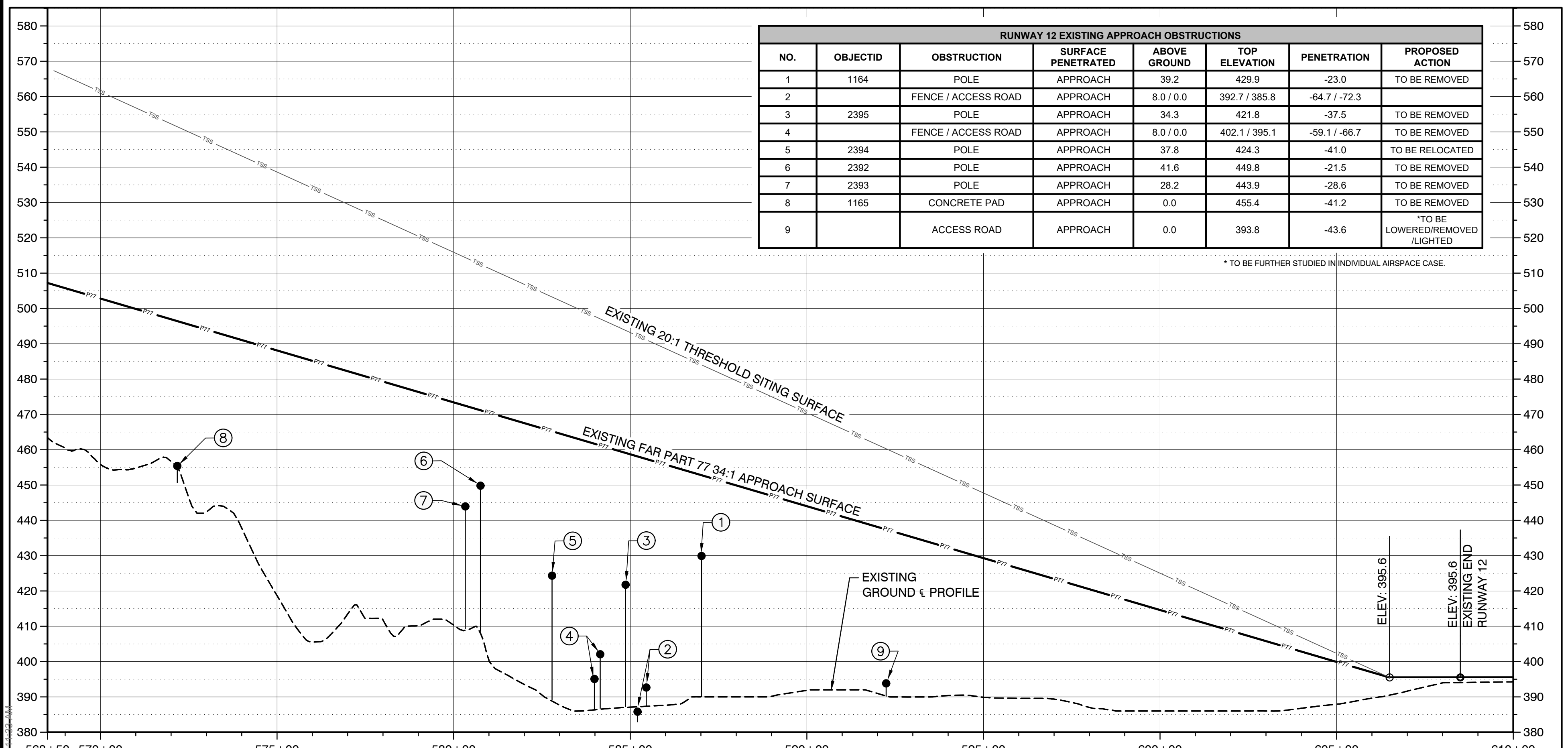
SHEET NO.

NOT FOR CONSTRUCTION

X:\1624500\172210.01\TECH\CAD\ALP\SHEETS\SHEET 7.8 3R-21L INNER APPROACH.DWG



RUNWAY END 12 - PLAN



RUNWAY 12 EXISTING APPROACH OBSTRUCTIONS							
NO.	OBJECTID	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1	1164	POLE	APPROACH	39.2	429.9	-23.0	TO BE REMOVED
2		FENCE / ACCESS ROAD	APPROACH	8.0 / 0.0	392.7 / 385.8	-64.7 / -72.3	
3	2395	POLE	APPROACH	34.3	421.8	-37.5	TO BE REMOVED
4		FENCE / ACCESS ROAD	APPROACH	8.0 / 0.0	402.1 / 395.1	-59.1 / -66.7	TO BE REMOVED
5	2394	POLE	APPROACH	37.8	424.3	-41.0	TO BE RELOCATED
6	2392	POLE	APPROACH	41.6	449.8	-21.5	TO BE REMOVED
7	2393	POLE	APPROACH	28.2	443.9	-28.6	TO BE REMOVED
8	1165	CONCRETE PAD	APPROACH	0.0	455.4	-41.2	TO BE REMOVED
9		ACCESS ROAD	APPROACH	0.0	393.8	-43.6	*TO BE LOWERED/REMOVED /LIGHTED

* TO BE FURTHER STUDIED IN INDIVIDUAL AIRSPACE CASE.

RUNWAY END 12 - PROFILE

DRAWING LEGEND	EXISTING
ACTIVE AIRFIELD PAVEMENT / SHOULDER	
AIRPORT PROPERTY	
AVIGATION EASEMENT	
RUNWAY SAFETY AREA (RSA)	
RUNWAY PROTECTION ZONE (RPZ)	
RUNWAY OBJECT FREE AREA (ROFA)	
OBSTACLE FREE ZONE (OFZ)	
RUNWAY VISIBILITY ZONE (RVZ)	
BUILDING RESTRICTION LINE (BRL)	
FAR PART 77 APPROACH SURFACE	
THRESHOLD SITING SURFACE (TSS)	
TAXIWAY / LANE MARKING	
TAXIWAY OBJECT FREE AREA (TOFA)	
BUILDING - ON AIRPORT	
BUILDING - OFF AIRPORT	
MONUMENT (PACS and SACS)	
LIGHTS (EDGE / GROUP / REIL / MALSR)	
BEACON	
PRECISION APPROACH PATH INDICATOR (PAPI)	
RUNWAY / TAXIWAY SIGN	
WIND CONE	
GLIDE SLOPE ANTENNA	
GLIDE SLOPE CRITICAL AREA (GCA)	
LOCALIZER	
LOCALIZER CRITICAL AREA (LCA)	
AUTO. SURFACE OBSERVING SYSTEM (ASOS)	
ASOS CRITICAL AREA (ACA)	
RUNWAY VISUAL RANGE (RVR)	N/A
PUBLIC ROAD	
GRAVEL ROAD	
RAILROAD	
FENCE / GATE	
CHANNEL / DITCH	
TERRAIN CONTOUR	

RUNWAY 12 EXISTING THRESHOLD SITING SURFACE OBSTRUCTIONS						
NO.	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
NO THRESHOLD SITING SURFACE PENETRATIONS						

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HORZ 0 200 400
VERT 0 20 40
SCALE IN FEET

TRUE NORTH

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ANNUAL CHANGE: 0° 6' WEST
JULY 2020

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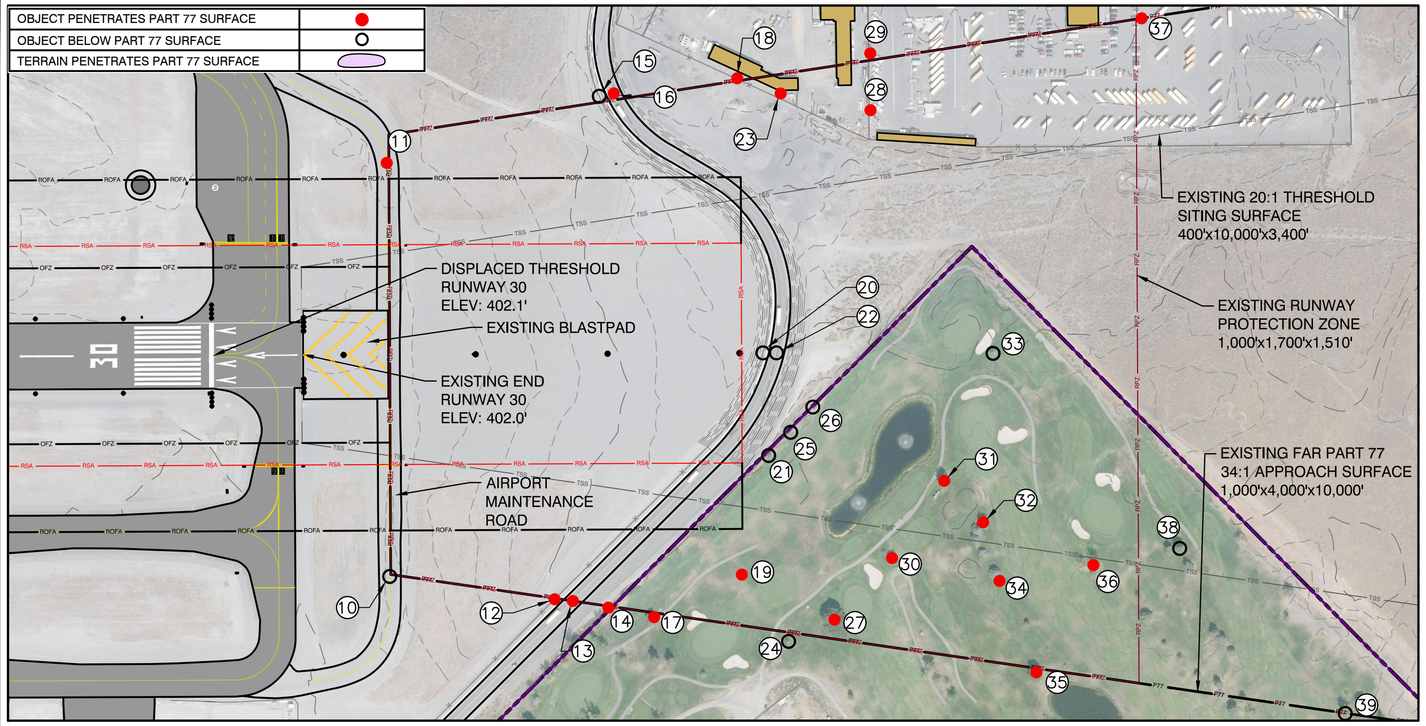
RUNWAY 12 INNER APPROACH SURFACE (EXISTING)

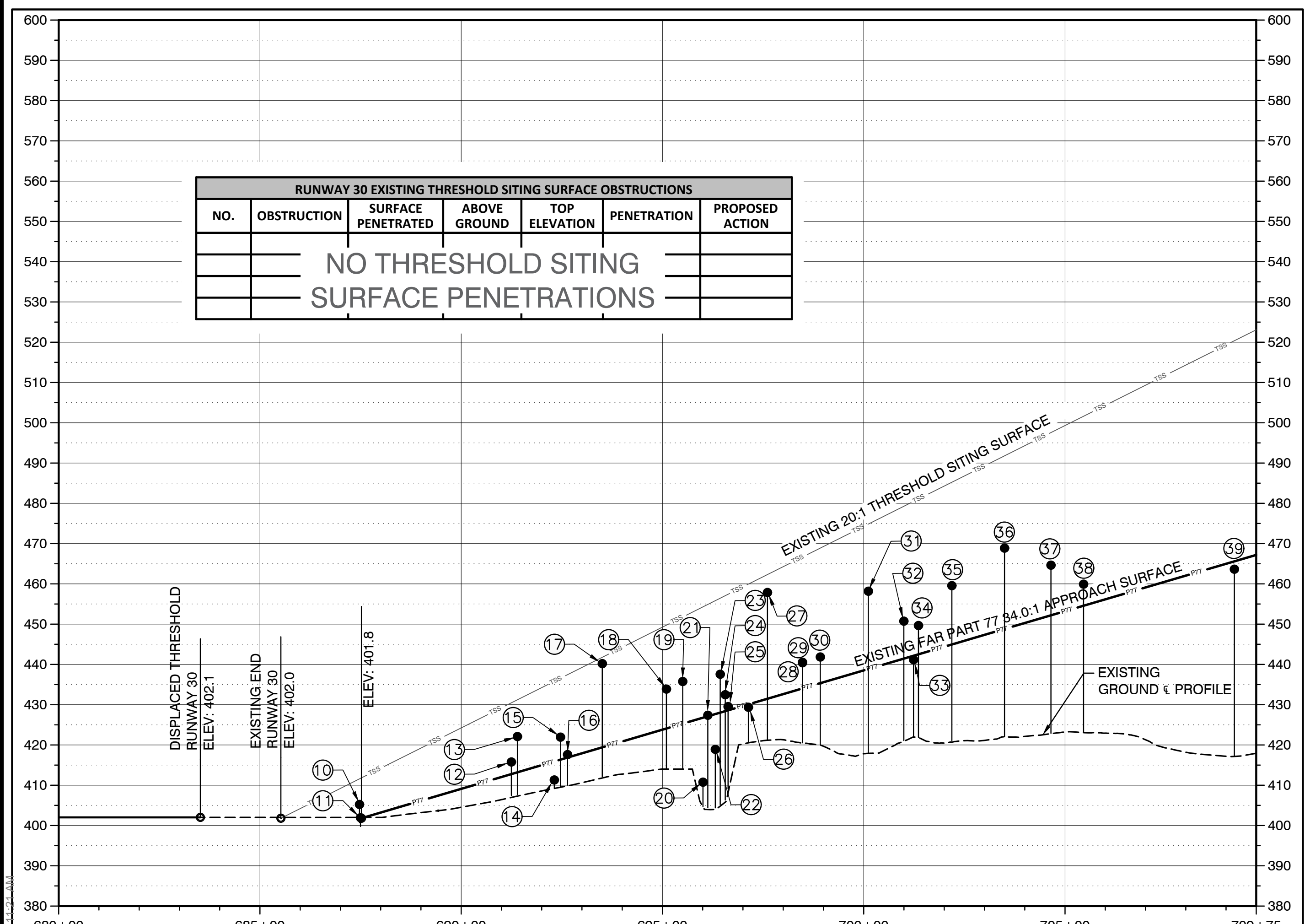
SHEET NO.

NOT FOR CONSTRUCTION

X:\1624500\172210.01\TECH\CAD\ALP\SHEETS\SHEET 9-10 12-30INNER APPROACH-EXISTING.DWG
12/22/2020



RUNWAY END 30 - PLAN



RUNWAY 30 EXISTING THRESHOLD SITING SURFACE OBSTRUCTIONS

NO.	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
NO THRESHOLD SITING SURFACE PENETRATIONS						

RUNWAY END 30 - PROFILE

DRAWING LEGEND

	EXISTING
ACTIVE AIRFIELD PAVEMENT / SHOULDER	
AIRPORT PROPERTY	
AVIGATION EASEMENT	
RUNWAY SAFETY AREA (RSA)	
RUNWAY PROTECTION ZONE (RPZ)	
RUNWAY OBJECT FREE AREA (ROFA)	
OBSTACLE FREE ZONE (OFZ)	
RUNWAY VISIBILITY ZONE (RVZ)	
BUILDING RESTRICTION LINE (BRL)	
FAR PART 77 APPROACH SURFACE	
THRESHOLD SITING SURFACE (TSS)	
TAXIWAY / LANE MARKING	
TAXIWAY OBJECT FREE AREA (TOFA)	
BUILDING - ON AIRPORT	
BUILDING - OFF AIRPORT	
MONUMENT (PACS and SACS)	
LIGHTS (EDGE / GROUP / REIL / MALSR)	
BEACON	
PRECISION APPROACH PATH INDICATOR (PAPI)	
RUNWAY / TAXIWAY SIGN	
WIND CONE	
GLIDE SLOPE ANTENNA	
GLIDE SLOPE CRITICAL AREA (GCA)	
LOCALIZER	
LOCALIZER CRITICAL AREA (LCA)	
AUTO. SURFACE OBSERVING SYSTEM (ASOS)	
ASOS CRITICAL AREA (ACA)	
RUNWAY VISUAL RANGE (RVR)	N/A
PUBLIC ROAD	
GRAVEL ROAD	
RAILROAD	
FENCE / GATE	
CHANNEL / DITCH	
TERRAIN CONTOUR	

RUNWAY 30 EXISTING APPROACH SURFACE OBSTRUCTIONS

NO.	OBJECTID	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
10		ACCESS ROAD	APPROACH	0.0	401.9	-0.1	TO BE REMOVED
11		ACCESS ROAD	APPROACH	0.0	405.2	3.2	TO BE REMOVED
12		FENCE	APPROACH	8.0	415.8	3.0	TO REMAIN
13	929	PRIMARY ROAD	APPROACH	15.0	422.1	8.1	*TO BE DETERMINED
14		FENCE	APPROACH	8.0	421.9	5.5	*TO BE DETERMINED
15		FENCE	APPROACH	8.0	411.3	-4.8	
16		ARGENT ROAD	APPROACH	15.0	417.6	0.7	
17	680	TREE	APPROACH	27.8	440.2	14.7	*TO BE LOWERED/REMOVED
18	943	POLE	APPROACH	26.8	433.9	3.7	*TO BE LOWERED/REMOVED/LIGHTED
19	579	TREE	APPROACH	16.1	435.7	4.4	*TO BE LOWERED/REMOVED
20		FENCE @ CL.	APPROACH	8.0	410.7	-16.1	
21	59	SCRUB	APPROACH	3.9	427.4	-5.8	
22		ARGENT ROAD @ CL.	APPROACH	15.0	418.9	-8.8	
23	937	POLE	APPROACH	29.1	437.5	3.5	*TO BE LOWERED/REMOVED/LIGHTED
24	578	TREE	APPROACH	14.2	432.5	-2.0	
25	58	SCRUB	APPROACH	4.8	429.5	-5.1	
26	1188	FENCE	APPROACH	3.6	429.3	-6.8	
27	580	TREE	APPROACH	37.5	457.8	20.3	*TO BE LOWERED/REMOVED
28	936	POLE	APPROACH	32.9	440.4	0.3	*TO BE LOWERED/REMOVED/LIGHTED
29	935	POLE	APPROACH	32.7	440.5	0.4	*TO BE LOWERED/REMOVED/LIGHTED
30	577	TREE	APPROACH	16.5	441.8	0.5	*TO BE LOWERED/REMOVED
31	55	TREE	APPROACH	33.2	458.2	13.3	*TO BE LOWERED/REMOVED
32	583	TREE	APPROACH	25.3	450.7	3.3	*TO BE LOWERED/REMOVED
33	54	TREE	APPROACH	19.3	441.1	-7.0	
34	584	TREE	APPROACH	24.6	449.6	1.1	*TO BE LOWERED/REMOVED
35	576	TREE	APPROACH	32.4	459.5	8.6	*TO BE LOWERED/REMOVED
36	585	TREE	APPROACH	43.7	468.9	14.0	*TO BE LOWERED/REMOVED
37	930	POLE	APPROACH	54.6	464.6	6.4	*TO BE LOWERED/REMOVED/LIGHTED
38	586	TREE	APPROACH	36.1	459.9	-0.7	
39	587	TREE	APPROACH	40.5	463.6	-8.0	

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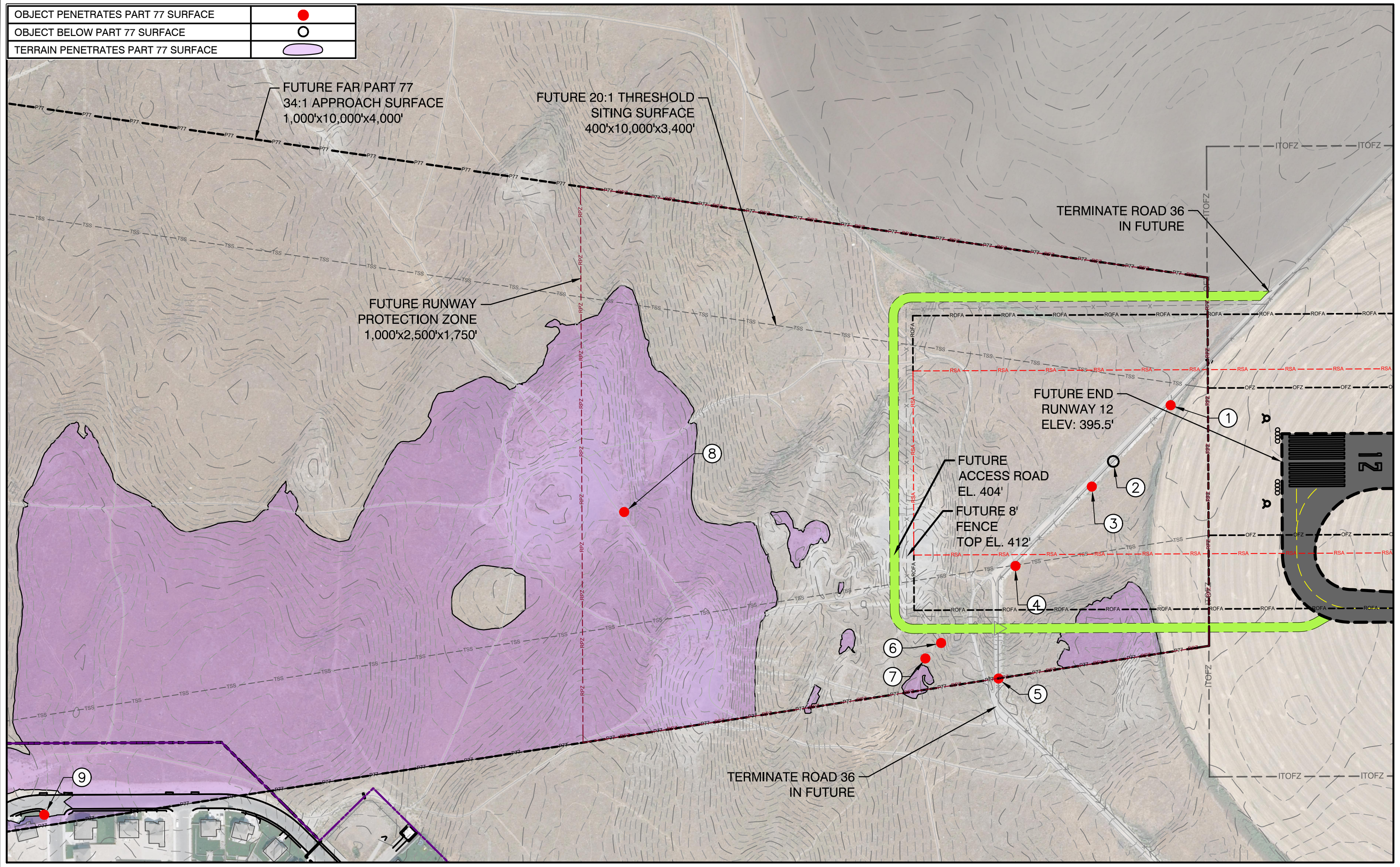
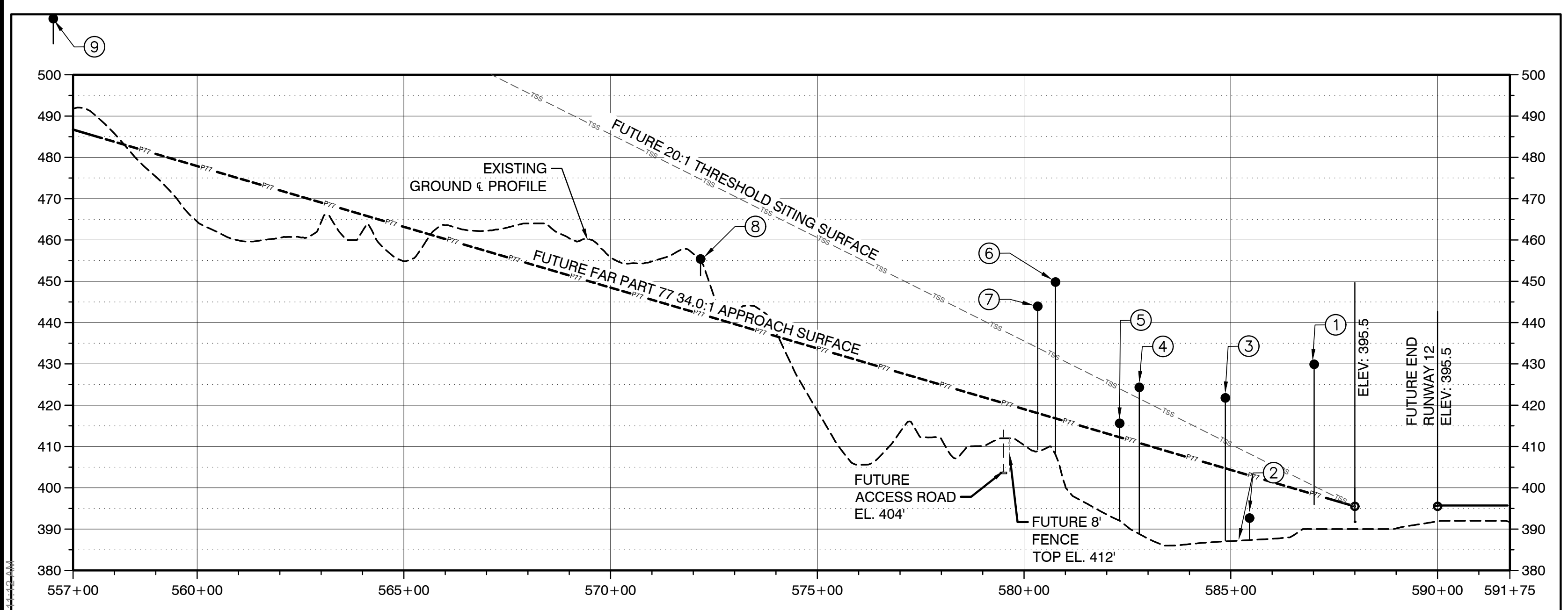
SHEET CONTENTS
RUNWAY 30 INNER APPROACH SURFACE (EXISTING)

SHEET NO.
10 of 26

NOT FOR CONSTRUCTION



RUNWAY END 12 - PLAN



RUNWAY END 12 - PROFILE

DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED (AIRFIELD & ROAD)	N/A	
AIRPORT PROPERTY		N/A
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY PROTECTION ZONE (RPZ)	RPZ	RPZ
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	ROFA
OBSTACLE FREE ZONE (OFZ)	OFZ	OFZ
RUNWAY VISIBILITY ZONE (RVZ)	RVZ	RVZ
BUILDING RESTRICTION LINE (BRL)	BRL	N/A
FAR PART 77 APPROACH SURFACE	P77	P77
THRESHOLD SITING SURFACE (TSS)	TSS	TSS
TAXIWAY / LANE MARKING		
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	TOFA
INNER APPROACH OFZ	N/A	IAOFZ
INNER TRANSITIONAL OFZ	N/A	ITOFZ
BUILDING		
LIGHTS (EDGE / GROUP / REIL / MALSR)	/ / /	/ / /
BEACON	★	☆
PRECISION APPROACH PATH INDICATOR (PAPI)	■■■■	□□□□
RUNWAY / TAXIWAY SIGN		
WIND CONE		N/A
GLIDE SLOPE ANTENNA		
GLIDE SLOPE CRITICAL AREA (GCA)	GCA	GCA
LOCALIZER		N/A
LOCALIZER CRITICAL AREA (LCA)	LCA	N/A
AUTO. SURFACE OBSERVING SYSTEM (ASOS)		N/A
ASOS CRITICAL AREA (ACA)	ACA	N/A
RUNWAY VISUAL RANGE (RVR)	N/A	
PUBLIC ROAD		N/A
GRAVEL ROAD		N/A
AIRPORT ACCESS ROAD	N/A	
RAILROAD		N/A
FENCE / GATE		
CHANNEL / DITCH		N/A
TERRAIN CONTOUR	450'	N/A

RUNWAY 12 FUTURE APPROACH SURFACE OBSTRUCTIONS

NO.	OBJECTID	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1	1164	POLE	APPROACH	39.2	429.9	31.4	TO BE REMOVED
2		FENCE @ CL.	APPROACH	8.0	392.7	-10.4	
3	2395	POLE	APPROACH	34.3	421.8	17.0	TO BE REMOVED
4	2394	POLE	APPROACH	37.8	424.3	13.4	TO BE REMOVED
5		FENCE	APPROACH	8.0	415.6	3.3	TO BE RELOCATED
6	2392	POLE	APPROACH	41.6	449.8	33.0	TO BE REMOVED
7	2393	POLE	APPROACH	28.2	443.9	25.8	TO BE REMOVED
8	1165	CONC. PAD	APPROACH	0.0	455.4	13.3	TO BE REMOVED
9	2414	POLE	APPROACH	29.8	517.1	28.6	*TO BE LOWERED/REMOVED/LIGHTED

* TO BE FURTHER STUDIED IN INDIVIDUAL AIRSPACE CASE.

RUNWAY 12 FUTURE THRESHOLD SITING SURFACE OBSTRUCTIONS

NO.	OBJECTID	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1	1164	POLE	THRESHOLD SITING	39.2	429.9	29.4	TO BE REMOVED
3	2395	POLE	THRESHOLD SITING	34.3	421.8	10.5	TO BE REMOVED
4	2394	POLE	THRESHOLD SITING	37.8	424.3	2.4	TO BE REMOVED

HORZ 0 200 400
VERT 0 20 40
SCALE IN FEET

TRUE NORTH

MAGNETIC DECLINATION:
14° 33' EAST (±0° 23')
ANNUAL CHANGE: 0° 6' WEST
JULY 2020

NOTES:
1. OBJECT ELEVATIONS IN FEET (NAVD88)
2. OBSTRUCTION ELEVATIONS ARE FOR PLANNING PURPOSES ONLY AND WERE NOT SURVEYED. ACTUAL ELEVATIONS SHOULD BE FIELD VERIFIED PRIOR TO ANY PROPOSED DESIGN OR CONSTRUCTION WORK.
3. AIRPORT MAINTENANCE ROAD ACCESS ONLY.
4. THE AIRPORT WILL CONTINUE TO WORK TOWARDS REMOVING EXISTING ROADS WITHIN RPZ WHERE FEASIBLE.
5. TERMINATE IN FUTURE OR RELOCATE.

Mead & Hunt
Mead and Hunt, Inc.
9600 NE Cascades Parkway,
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TRI-CITIES AIRPORT • PSC

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TRI-CITIES AIRPORT LAYOUT PLAN

3601 North 20th Avenue
Pasco, Washington
99301

REVISIONS

#	DESCRIPTION	BY	DATE
1	ALP Update as part of Master Plan	SMF	12/22/20

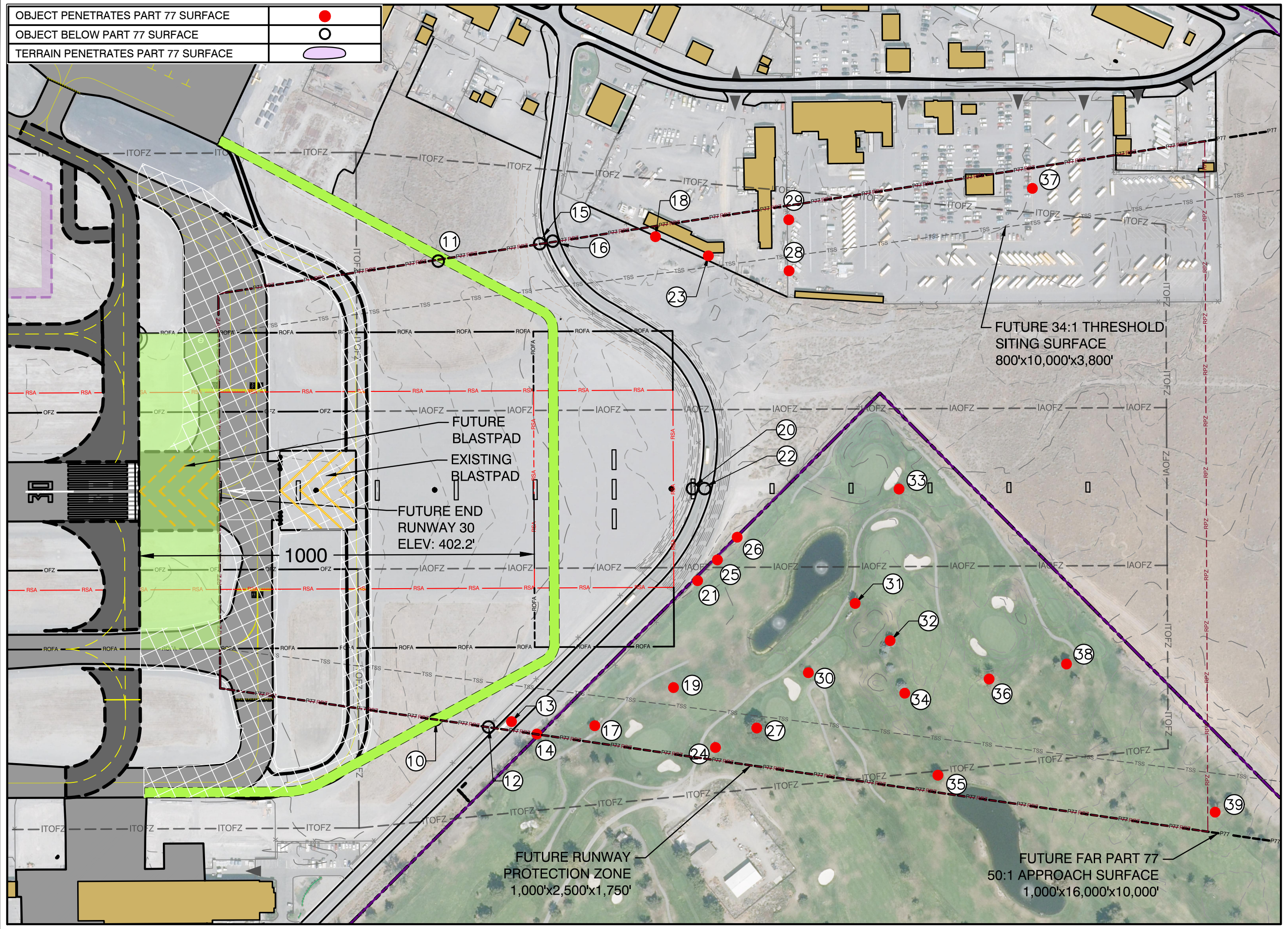
M&H NO.: 1624500-172210.01
DATE: December 2020
DESIGNED BY: MH
DRAWN BY: TE
CHECKED BY: KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
RUNWAY 12 INNER APPROACH SURFACE (FUTURE)

SHEET NO.
11 of 26

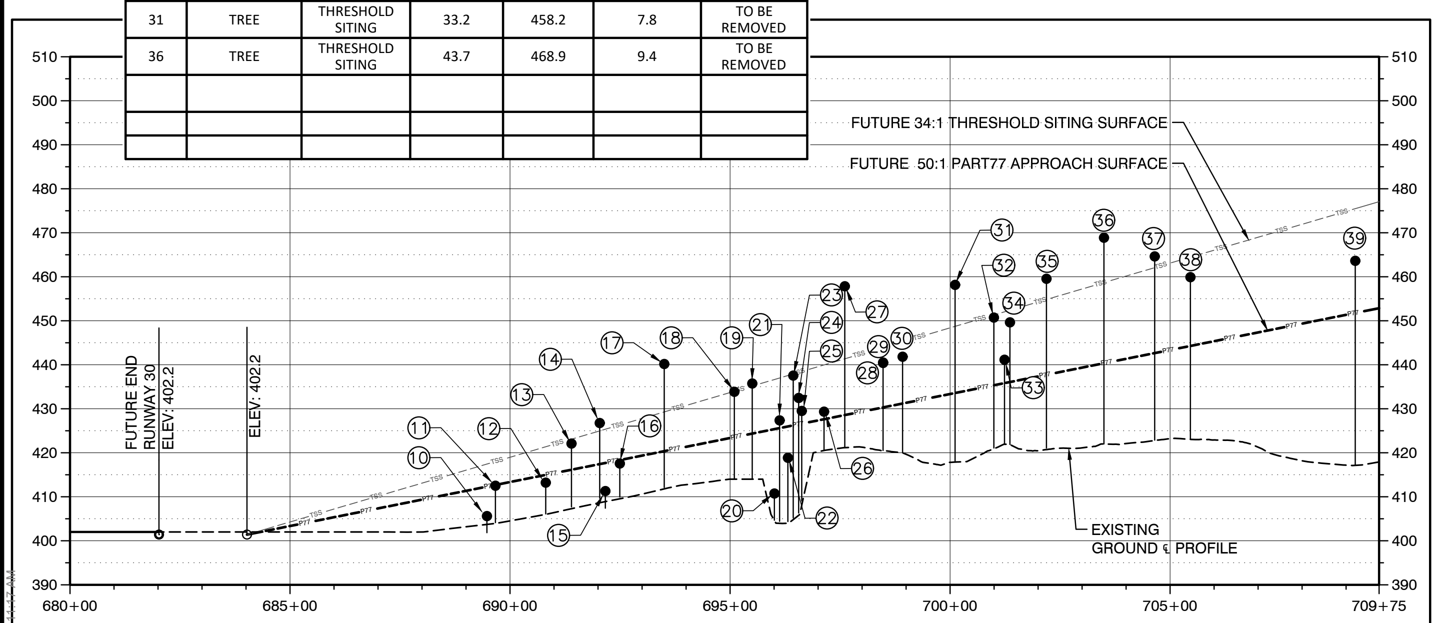
NOT FOR CONSTRUCTION

OBJECT PENETRATES PART 77 SURFACE	
OBJECT BELOW PART 77 SURFACE	
TERRAIN PENETRATES PART 77 SURFACE	



RUNWAY END 30 - PLAN

RUNWAY 30 FUTURE THRESHOLD SITING SURFACE OBSTRUCTIONS						
NO.	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
31	TREE	THRESHOLD SITING	33.2	458.2	7.8	TO BE REMOVED
36	TREE	THRESHOLD SITING	43.7	468.9	9.4	TO BE REMOVED



RUNWAY END 30 - PROFILE

DRAWING LEGEND		
	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED (AIRFIELD & ROAD)	N/A	
AIRPORT PROPERTY		
AVIGATION EASEMENT		N/A
RUNWAY SAFETY AREA (RSA)		
RUNWAY PROTECTION ZONE (RPZ)		
RUNWAY OBJECT FREE AREA (ROFA)		
OBSTACLE FREE ZONE (OFZ)		
RUNWAY VISIBILITY ZONE (RVZ)		
BUILDING RESTRICTION LINE (BRL)		N/A
FAR PART 77 APPROACH SURFACE		
THRESHOLD SITING SURFACE (TSS)		
TAXIWAY / LANE MARKING		
TAXIWAY OBJECT FREE AREA (TOFA)		
INNER APPROACH OFZ	N/A	
INNER TRANSITIONAL OFZ	N/A	
BUILDING		
LIGHTS (EDGE / GROUP / REIL / MALSR)		
BEACON		
PRECISION APPROACH PATH INDICATOR (PAPI)		
RUNWAY / TAXIWAY SIGN		
WIND CONE		N/A
GLIDE SLOPE ANTENNA		
GLIDE SLOPE CRITICAL AREA (GCA)		
LOCALIZER		N/A
LOCALIZER CRITICAL AREA (LCA)		N/A
AUTO. SURFACE OBSERVING SYSTEM (ASOS)		N/A
ASOS CRITICAL AREA (ACA)		N/A
RUNWAY VISUAL RANGE (RVR)	N/A	
PUBLIC ROAD		N/A
GRAVEL ROAD		N/A
AIRPORT ACCESS ROAD	N/A	
RAILROAD		N/A
FENCE / GATE		N/A
CHANNEL / DITCH		N/A
TERRAIN CONTOUR		N/A
PRECISION OBSTACLE FREE ZONE		

RUNWAY 30 FUTURE APPROACH SURFACE OBSTRUCTIONS							
NO.	OBJECTID	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
10		FUTURE ACCESS ROAD	APPROACH	0.0	405.6	-7.5	
11		FUTURE ACCESS ROAD	APPROACH	0.0	412.5	-0.8	
12		FENCE	APPROACH	8.0	413.2	-2.6	
13	929	PRIMARY ROAD	APPROACH	15.0	422.1	5.2	*TO BE LOWERED/REMOVED
14	1193	FENCE	APPROACH	4.0	426.8	8.6	*TO BE LOWERED/REMOVED
15		FENCE	APPROACH	8.0	411.3	-7.2	
16		ARGENT ROAD	APPROACH	15.0	417.6	-1.5	
17	680	TREE	APPROACH	27.8	440.2	19.0	*TO BE LOWERED/REMOVED
18	943	POLE	APPROACH	26.8	433.9	9.6	*TO BE LOWERED/REMOVED/LIGHTED
19	579	TREE	APPROACH	16.1	435.7	10.6	*TO BE LOWERED/REMOVED
20		FENCE @ CL.	APPROACH	8.0	410.7	-15.5	
21	59	SCRUB	APPROACH	3.9	427.4	1.0	TO BE REMOVED
22		ARGENT ROAD @ CL.	APPROACH	15.0	418.9	-7.9	
23	937	POLE	APPROACH	29.1	437.5	10.5	*TO BE LOWERED/REMOVED/LIGHTED
24	578	TREE	APPROACH	14.2	432.5	5.2	*TO BE LOWERED/REMOVED
25	58	SCRUB	APPROACH	4.8	429.5	2.1	TO BE REMOVED
26	1188	FENCE	APPROACH	3.6	429.3	1.0	*TO BE LOWERED/REMOVED
27	580	TREE	APPROACH	37.5	457.8	28.5	*TO BE LOWERED/REMOVED
28	936	POLE	APPROACH	32.9	440.4	9.3	*TO BE LOWERED/REMOVED/LIGHTED
29	935	POLE	APPROACH	32.7	440.5	9.4	*TO BE LOWERED/REMOVED/LIGHTED
30	577	TREE	APPROACH	16.5	441.8	9.9	*TO BE LOWERED/REMOVED
31	55	TREE	APPROACH	33.2	458.2	23.8	*TO BE LOWERED/REMOVED
32	583	TREE	APPROACH	25.3	450.7	14.6	*TO BE LOWERED/REMOVED
33	54	TREE	APPROACH	19.3	441.1	4.5	*TO BE LOWERED/REMOVED
34	584	TREE	APPROACH	24.6	449.6	12.8	*TO BE LOWERED/REMOVED
35	576	TREE	APPROACH	32.4	459.5	21.1	*TO BE LOWERED/REMOVED
36	585	TREE	APPROACH	43.7	468.9	27.8	*TO BE LOWERED/REMOVED
37	930	POLE	APPROACH	54.6	464.6	21.2	*TO BE LOWERED/REMOVED/LIGHTED
38	586	TREE	APPROACH	36.1	459.9	14.9	*TO BE LOWERED/REMOVED
39	587	TREE	APPROACH	40.5	463.6	11.1	*TO BE LOWERED/REMOVED

* TO BE FURTHER STUDIED IN INDIVIDUAL AIRSPACE CASE.

HORZ 0 200 400
VERT 0 20 40
SCALE IN FEET

TRUE NORTH

MAGNETIC DECLINATION:
14° 33' EAST (±0° 23')
ANNUAL CHANGE: 0° 6' WEST
JULY 2020

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#	DESCRIPTION	BY	DATE
1	ALP Update as part of Master Plan	SMF	12/22/20

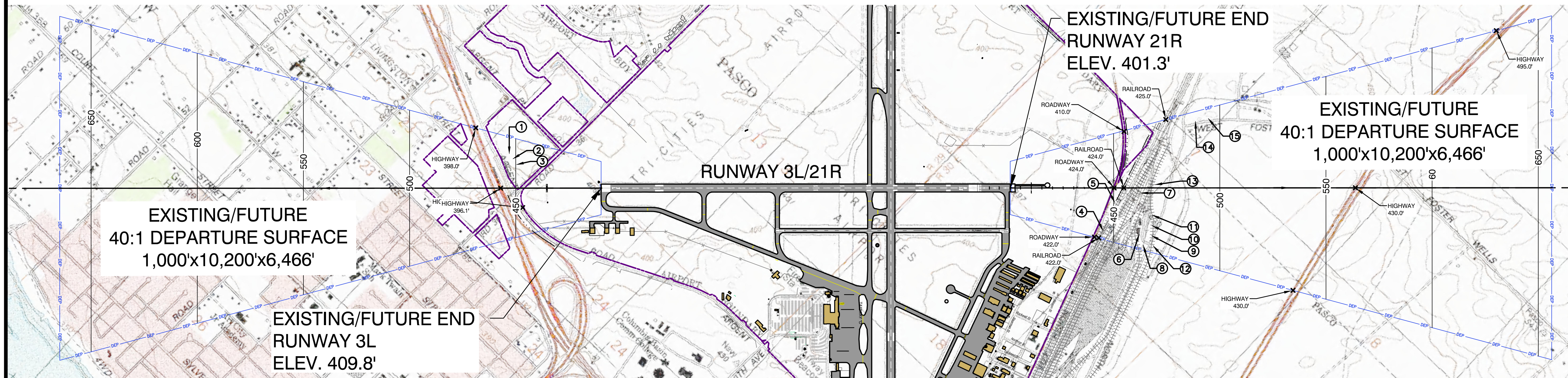
REVISIONS

M&H NO.: 1624500-172210.01
DATE: December 2020
DESIGNED BY: MH
DRAWN BY: TE
CHECKED BY: KM
DO NOT SCALE DRAWINGS

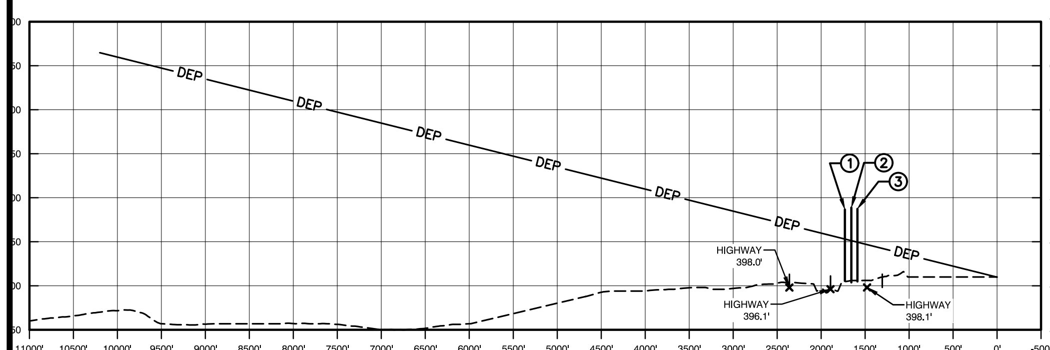
SHEET CONTENTS
RUNWAY 30 INNER APPROACH SURFACE (FUTURE)

SHEET NO.

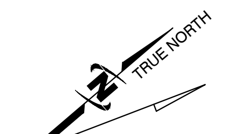
NOT FOR CONSTRUCTION



OVERALL DEPARTURE SURFACE - RUNWAY END 3L/21R - PLAN



DEPARTURE SURFACE - RUNWAY 21R PROFILE



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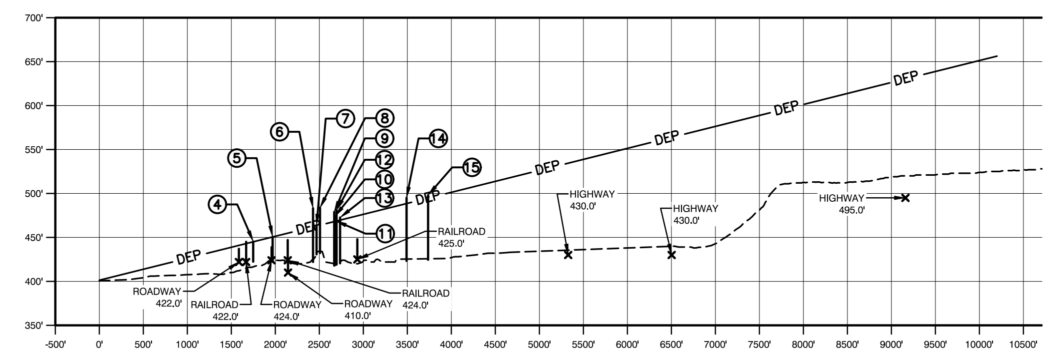
SCALE IN FEET



DEPARTURE SURFACE - RUNWAY 3L PROFILE

OBJECTS WITHIN RUNWAY 21R DEPARTURE SURFACE (RW 3L END)

NO.	OBJECT	SURFACE PENETRATED	GROUND ELEVATION	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1	TREE	40:1 DEPARTURE	398.9'	486.6	33.6'	TO BE REMOVED
2	TREE	40:1 DEPARTURE	398.0'	488.9	37.7'	TO BE REMOVED
3	TREE	40:1 DEPARTURE	400.1'	487.4	37.9'	TO BE REMOVED

DEPARTURE SURFACE DIMENSIONS CHANGED SUBSEQUENT TO THE SUBMITTAL OF THE DRAFT ALP SET. MANY OF THE IDENTIFIED OBJECTS IN THIS TABLE WILL NOT BE CONSIDERED OBSTRUCTION IN THE FUTURE ANALYSIS.

OBJECTS WITHIN RUNWAY 3L DEPARTURE SURFACE (RW 21R END)

NO.	OBJECT	SURFACE PENETRATED	GROUND ELEVATION	TOP ELEVATION	PENETRATION	PROPOSED ACTION
4	RAILROAD	40:1 DEPARTURE	422.41	445.41	0.40	*TO BE DETERMINED
5	POLE	40:1 DEPARTURE	424.24	450.65	0.10	*TO BE DETERMINED
6	BUILDING	40:1 DEPARTURE	423.42	483.16	21.10	*TO BE DETERMINED
7	POLE	40:1 DEPARTURE	436.26	463.95	0.95	*TO BE DETERMINED
8	COMM TOWER	40:1 DEPARTURE	422.30	483.59	19.62	*TO BE DETERMINED
9	POLE	40:1 DEPARTURE	425.56	478.92	10.91	*TO BE DETERMINED
10	POLE	40:1 DEPARTURE	425.29	473.90	5.72	*TO BE DETERMINED
11	POLE	40:1 DEPARTURE	424.89	468.88	0.46	*TO BE DETERMINED
12	POLE	40:1 DEPARTURE	420.90	480.93	12.26	*TO BE DETERMINED
13	POLE	40:1 DEPARTURE	423.58	472.61	2.93	*TO BE DETERMINED
14	POLE	40:1 DEPARTURE	432.83	494.92	6.38	*TO BE DETERMINED
15	POLE	40:1 DEPARTURE	432.23	498.09	3.41	*TO BE DETERMINED

* TO BE FURTHER STUDIED IN INDIVIDUAL AIRSPACE CASE.
DEPARTURE SURFACE DIMENSIONS CHANGED SUBSEQUENT TO THE SUBMITTAL OF THE DRAFT ALP SET. MANY OF THE IDENTIFIED OBJECTS IN THIS TABLE WILL NOT BE CONSIDERED OBSTRUCTION IN THE FUTURE ANALYSIS.

LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
AIRPORT PROPERTY		N/A
40:1 DEPARTURE SURFACE	DEP	DEP
BUILDING/STRUCTURE		
ROADWAY		
AIRPORT MAINTENANCE ROAD		
OBSTRUCTION CALLOUT	TOP OF OBSTRUCTION	
LAND MASS OBSTRUCTION		

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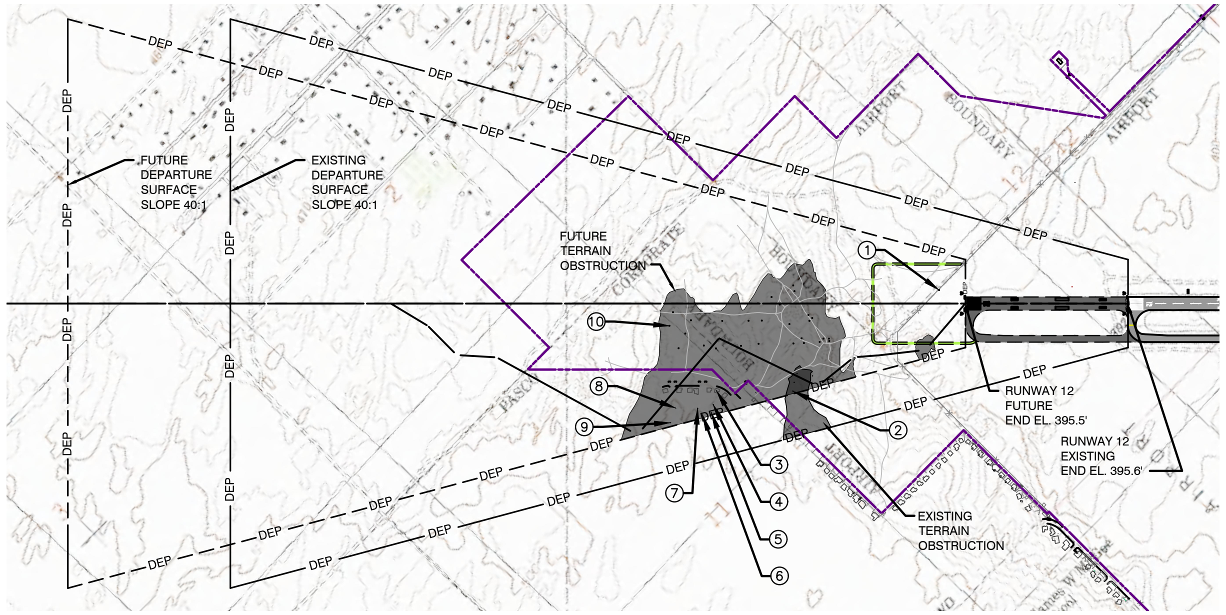
DO NOT SCALE DRAWINGS

SHEET CONTENTS
DEPARTURE SURFACE RUNWAY 3L/21R

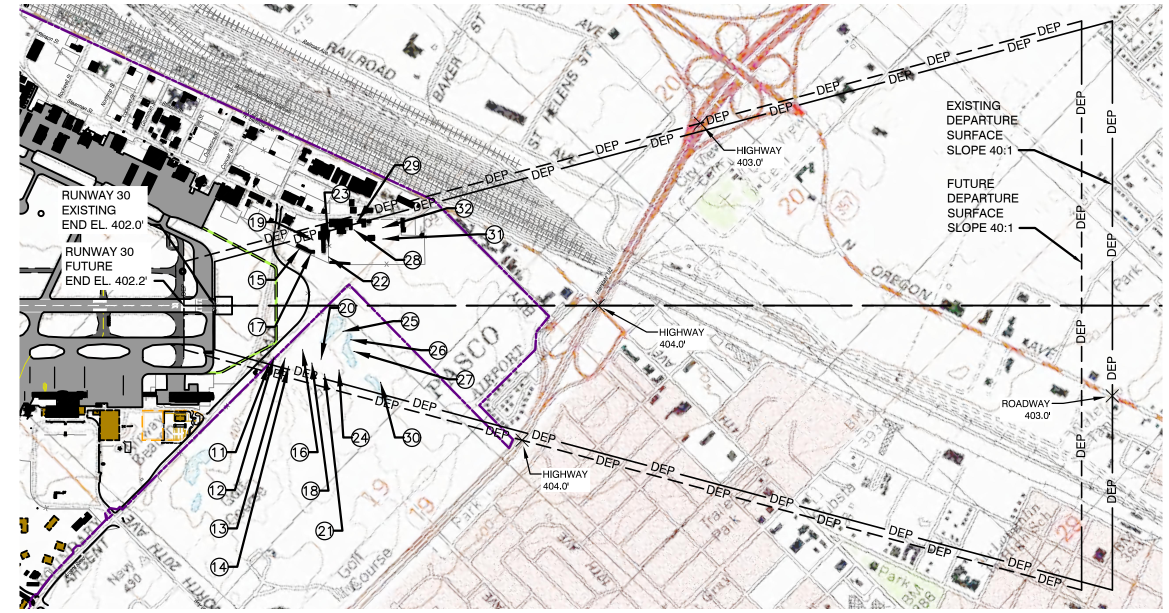
SHEET NO.
13 of 26

NOT FOR CONSTRUCTION

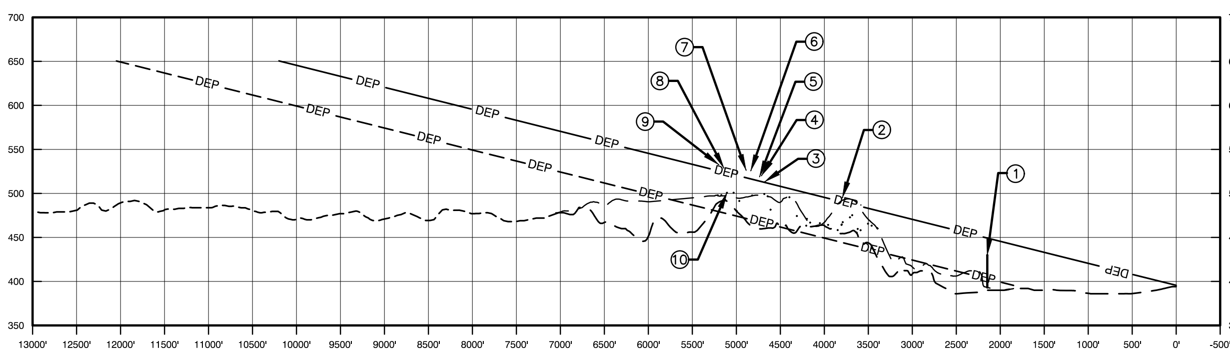
X:\1624500\172210.01\TECH\CAD\ALP\SHEETS\SHEET 13 DEPARTURE 3L-21R.DWG
12/22/2020 11:06 AM



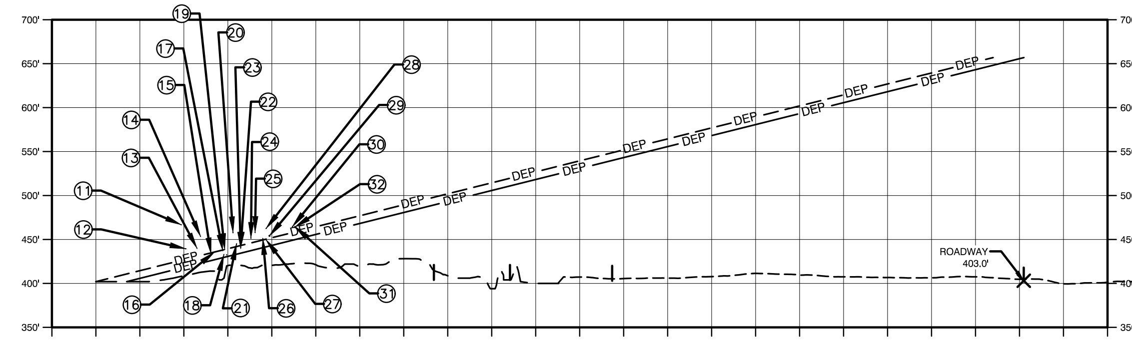
EXISTING AND FUTURE DEPARTURE SURFACE - RUNWAY 30 PLAN



EXISTING AND FUTURE DEPARTURE SURFACE - RUNWAY 12 PLAN



EXISTING AND FUTURE DEPARTURE SURFACE - RUNWAY 30 PROFILE



EXISTING AND FUTURE DEPARTURE SURFACE - RUNWAY 12 PROFILE

OBJECTS WITHIN RUNWAY 30 DEPARTURE SURFACE (RW 12 END)

NO.	OBJECT	SURFACE PENETRATED	GROUND ELEVATION	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1	POLE	40:1 DEPARTURE (FUTURE)	390.70	429.90	26.94	TO BE REMOVED
2	TERRAIN	40:1 DEPARTURE (FUTURE)	495.06	495.06	50.99	*TO BE DETERMINED
3	BUILDING	40:1 DEPARTURE (FUTURE)	485.15	513.38	46.46	*TO BE DETERMINED
4	BUILDING	40:1 DEPARTURE (FUTURE)	496.42	520.28	52.03	*TO BE DETERMINED
5	BUILDING	40:1 DEPARTURE (FUTURE)	497.65	519.29	51.06	*TO BE DETERMINED
6	BUILDING	40:1 DEPARTURE (FUTURE)	497.36	526.03	56.04	*TO BE DETERMINED
7	BUILDING	40:1 DEPARTURE (FUTURE)	497.97	526.59	55.18	*TO BE DETERMINED
8	POLE	40:1 DEPARTURE (FUTURE)	497.56	528.92	51.49	*TO BE DETERMINED
9	BUILDING	40:1 DEPARTURE (FUTURE)	503.23	532.80	51.13	*TO BE DETERMINED
10	TERRAIN	40:1 DEPARTURE (FUTURE)	497.83	497.83	23.51	*TO BE DETERMINED

* TO BE FURTHER STUDIED IN INDIVIDUAL AIRSPACE CASE.

DEPARTURE SURFACE DIMENSIONS CHANGED SUBSEQUENT TO THE SUBMITTAL OF THE DRAFT ALP SET. MANY OF THE IDENTIFIED OBJECTS IN THIS TABLE WILL NOT BE CONSIDERED OBSTRUCTIONS IN FUTURE ANALYSIS.

OBJECTS WITHIN RUNWAY 12 DEPARTURE SURFACE (RW 30 END)

NO.	OBJECT	SURFACE PENETRATED	GROUND ELEVATION	TOP ELEVATION	PENETRATION	PROPOSED ACTION
11	TREE	40:1 DEPARTURE (FUTURE)	419.8	466.8	40.9	*TO BE DETERMINED
12	TREE	40:1 DEPARTURE (FUTURE)	418.6	439.4	11.8	*TO BE DETERMINED
13	TREE	40:1 DEPARTURE (FUTURE)	412.3	440.2	8.3	*TO BE DETERMINED
14	TREE	40:1 DEPARTURE (FUTURE)	422.5	453.7	22.2	*TO BE DETERMINED
15	POLE	40:1 DEPARTURE (FUTURE)	407.1	433.9	-0.7	*TO BE DETERMINED
16	TREE	40:1 DEPARTURE (FUTURE)	419.6	435.7	0.1	*TO BE DETERMINED
17	POLE	40:1 DEPARTURE (FUTURE)	408.4	437.5	-0.4	*TO BE DETERMINED
18	TREE	40:1 DEPARTURE (FUTURE)	418.2	432.5	-5.8	*TO BE DETERMINED
19	POLE	40:1 DEPARTURE (FUTURE)	407.3	438.7	0.2	*TO BE DETERMINED
20	TREE	40:1 DEPARTURE (FUTURE)	420.3	457.8	16.9	*TO BE DETERMINED
21	TREE	40:1 DEPARTURE (FUTURE)	425.9	444.8	2.9	*TO BE DETERMINED
22	POLE	40:1 DEPARTURE (FUTURE)	407.5	440.4	-2.7	*TO BE DETERMINED
23	POLE	40:1 DEPARTURE (FUTURE)	407.8	440.5	-2.7	*TO BE DETERMINED
24	TREE	40:1 DEPARTURE (FUTURE)	422.8	451.5	5.5	*TO BE DETERMINED
25	TREE	40:1 DEPARTURE (FUTURE)	425.0	458.2	10.9	*TO BE DETERMINED
26	TREE	40:1 DEPARTURE (FUTURE)	425.5	450.7	1.4	*TO BE DETERMINED
27	TREE	40:1 DEPARTURE (FUTURE)	425.1	449.6	-0.6	TO BE DETERMINED
28	POLE	40:1 DEPARTURE (FUTURE)	408.7	462.7	12.4	*TO BE DETERMINED
29	TREE	40:1 DEPARTURE (FUTURE)	409.1	454.1	3.3	*TO BE DETERMINED
30	TREE	40:1 DEPARTURE (FUTURE)	432.0	464.7	6.7	*TO BE DETERMINED
31	POLE	40:1 DEPARTURE (FUTURE)	410.0	464.6	5.1	*TO BE DETERMINED
32	POLE	40:1 DEPARTURE (FUTURE)	410.2	463.9	6.1	*TO BE DETERMINED

* TO BE FURTHER STUDIED IN INDIVIDUAL AIRSPACE CASE.

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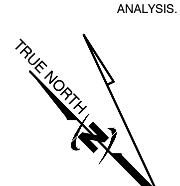
HORZ 0 2000 4000

VERT 0 100 200

SCALE IN FEET



MAGNETIC DECLINATION: 14° 33' EAST (±0° 23') ANNUAL CHANGE: 0° 6' WEST JULY 2020

LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
AIRPORT PROPERTY		N/A
40:1 DEPARTURE SURFACE	DEP	DEP
BUILDING/STRUCTURE		
ROADWAY		
AIRPORT MAINTENANCE ROAD		
OBSTRUCTION CALLOUT	TOP OF OBSTRUCTION	
LAND MASS OBSTRUCTION		

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TRI-CITIES AIRPORT LAYOUT PLAN

3601 North 20th Avenue
Pasco, Washington
99301

REVISIONS

#	DESCRIPTION	BY	DATE
1	ALP Update as part of Master Plan	SMF	12/22/20

M&H NO.: 1624500-172210.01
DATE: December 2020
DESIGNED BY: MH
DRAWN BY: TE
CHECKED BY: KM

DO NOT SCALE DRAWINGS

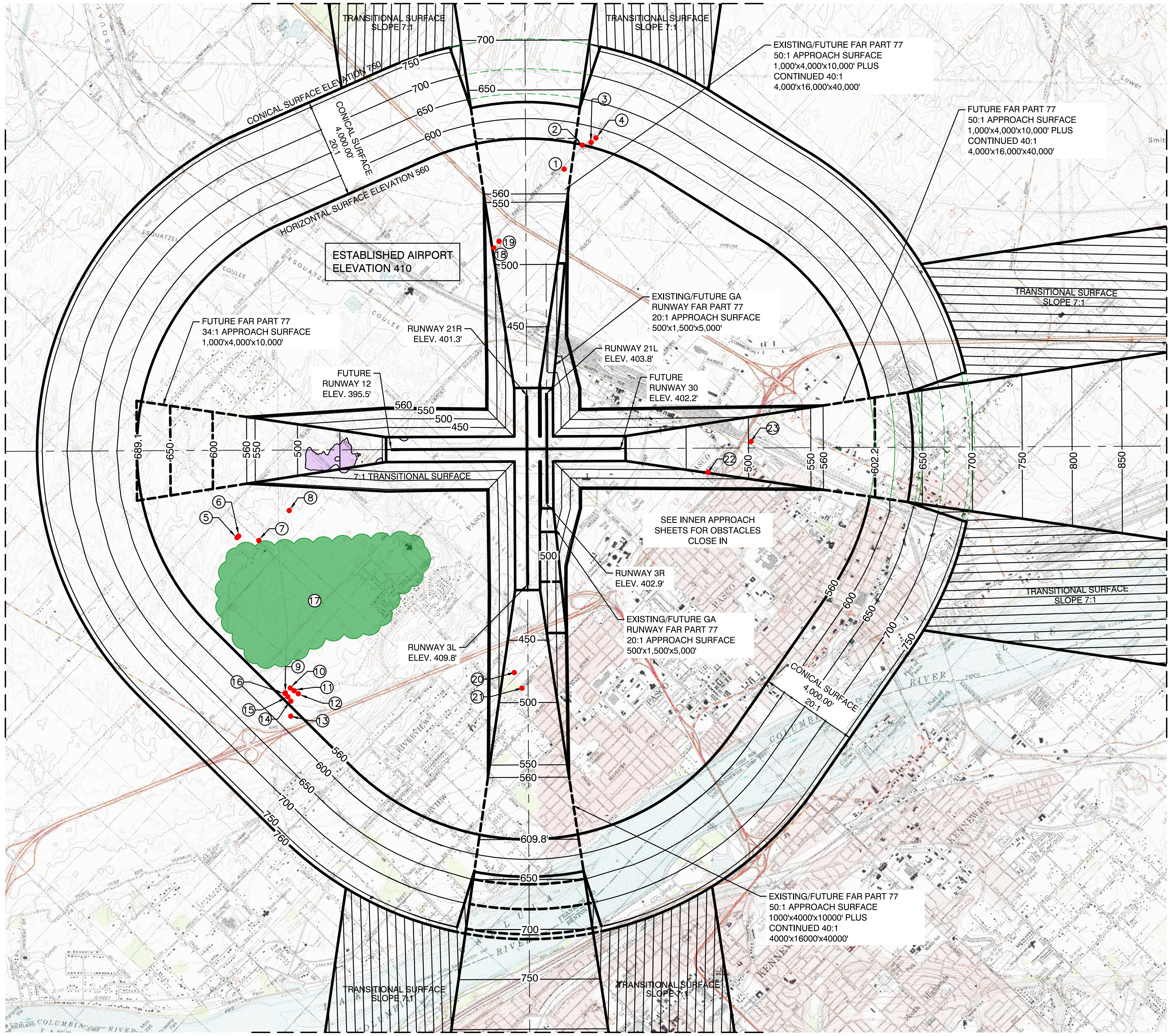
SHEET CONTENTS:
RUNWAY 12/30 DEPARTURE SURFACES

SHEET NO.

NOT FOR CONSTRUCTION

X:\1624500\172210.01\TECH\CAD\ALP\SHEETS\SHEET 14 DEPARTURE 12-30.DWG
12/22/2020 11:38 AM

RUNWAY 21R
SEE SHEET 18



RUNWAY 3L
SEE SHEET 17

HORIZONTAL and CONICAL SURFACE OBSTRUCTIONS							
NO.	OBJECTID	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED ACTION
1	2360	TREE	HORIZONTAL	69.3	568.5	8.5	*TO BE DETERMINED
2	1321	POLE	HORIZONTAL	40.3	562.6	2.6	*TO BE DETERMINED
3	1311	TREE	CONICAL	32.6	570.3	1.2	*TO BE DETERMINED
4	1312	TREE	CONICAL	44.8	582.9	2.1	*TO BE DETERMINED
5	428	BUILDING	HORIZONTAL	48.9	565.6	5.6	*TO BE DETERMINED
6	427	BUILDING	HORIZONTAL	49.6	565.8	5.8	*TO BE DETERMINED
7	423	POLE	HORIZONTAL	43.3	560.4	0.4	*TO BE DETERMINED
8	432	STEEPLE	HORIZONTAL	69.9	579.6	19.6	*TO BE DETERMINED
9	126	POLE	HORIZONTAL	90.7	601.8	41.8	*TO BE DETERMINED
10	127	POLE	HORIZONTAL	90.0	600.6	40.6	*TO BE DETERMINED
11	1399	POLE	HORIZONTAL	92.9	597.0	37.0	*TO BE DETERMINED
12	220	POLE	HORIZONTAL	90.3	590.9	30.9	*TO BE DETERMINED
13	118	POLE	CONICAL	82.1	581.6	7.4	*TO BE DETERMINED
14	1398	POLE	HORIZONTAL	89.4	590.5	30.5	*TO BE DETERMINED
15	1400	POLE	HORIZONTAL	92.3	598.4	38.4	*TO BE DETERMINED
16	125	SIGN	HORIZONTAL	89.8	600.1	40.1	*TO BE DETERMINED
17		TREE GROUP	HORIZONTAL	43.0-79.6	560.4-595.6	0.4-35.6	*TO BE DETERMINED
18	2352	TREE	RUNWAY 21R APPROACH	89.1	526.9	0.7	*TO BE DETERMINED
19	575	TREE	RUNWAY 21R APPROACH	92.7	532.3	0.4	*TO BE DETERMINED
20	1268	TREE	RUNWAY 3L APPROACH	76.2	477.1	1.2	*TO BE DETERMINED
21	183	TREE	RUNWAY 3L APPROACH	97.8	492.9	4.3	*TO BE DETERMINED
22	652	TREE	RUNWAY 30 APPROACH	57.5	480.7	12.4	*TO BE DETERMINED
23	35	COMM TOWER	RUNWAY 30 APPROACH	110.0	520.5	18.0	*TO BE DETERMINED

* TO BE FURTHER STUDIED IN INDIVIDUAL AIRSPACE CASE.

LEGEND	
FUTURE	DESCRIPTION
TOP OF OBSTRUCTION (PROFILE VIEW)	OBSTRUCTION CALLOUT
	LAND MASS OBSTRUCTION
	TREE GROUP OBSTRUCTION
OBSTRUCTION (PLAN VIEW)	PART 77 PENETRATION

NOTES:

1. INFORMATION SOURCE: USGS BASE MAPS AND PREVIOUS AIRPORT PLANS.
2. THIS PLAN IS INTENDED TO PRESERVE AND PROTECT FOR PRECISION INSTRUMENT APPROACHES TO RUNWAYS 21R, 3L, 12, AND 30, A NON-PRECISION APPROACH TO RUNWAY 12, AND VISUAL APPROACHES FOR RUNWAYS 3R AND 21L.
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4. SEE INNER PORTION OF THE APPROACH SHEETS FOR CLOSE IN OBSTRUCTIONS.
5. THE CITY OF PASCO HAS ESTABLISHED THE PASCO AIRPORT OVERLAY DISTRICT (CHAPTER 25.190), THAT ESTABLISHES THE AIRPORT INFLUENCE AREA BASED ON THE FUTURE 14 CFR PART 77 ZONES MAP AND THE AIRPORT SAFETY COMPATIBILITY ZONES MAP ESTABLISHED BY THE AIRPORT MASTER PLAN. THE DISTRICT REGULATIONS DISCOURAGE THE SITING OF INCOMPATIBLE USES ADJACENT TO THE AIRPORT AND TO PROTECT THE VIABILITY OF THE AIRPORT AS A SIGNIFICANT RESOURCE TO THE COMMUNITY BY ENCOURAGING COMPATIBLE LAND USES, DENSITIES, AND REDUCING HAZARDS THAT MAY ENDANGER THE LIVES AND PROPERTY OF THE PUBLIC AND AVIATION USERS.
6. OBSTRUCTION DATA SOURCE: AIRPORT AND AERONAUTICAL SURVEY IN ACCORDANCE WITH ACS 150/5300 - 16, -17, -18 (2008), JUB ENGINEERS, 2018.

TRUE NORTH

MAGNETIC DECLINATION:
14° 33' EAST (±0° 23')
ANNUAL CHANGE: 0° 6' WEST
JULY 2020

Mead & Hunt
Mead and Hunt, Inc.
9600 NE Cascades Parkway, Suite 100
Portland, OR 97220
phone: 503-548-1494
meadhunt.com

TRI-CITIES AIRPORT • PSC

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SHEET CONTENTS
AIRPORT AIRSPACE DWG. PLAN VIEW (CENTER)

SHEET NO.

NOT FOR CONSTRUCTION

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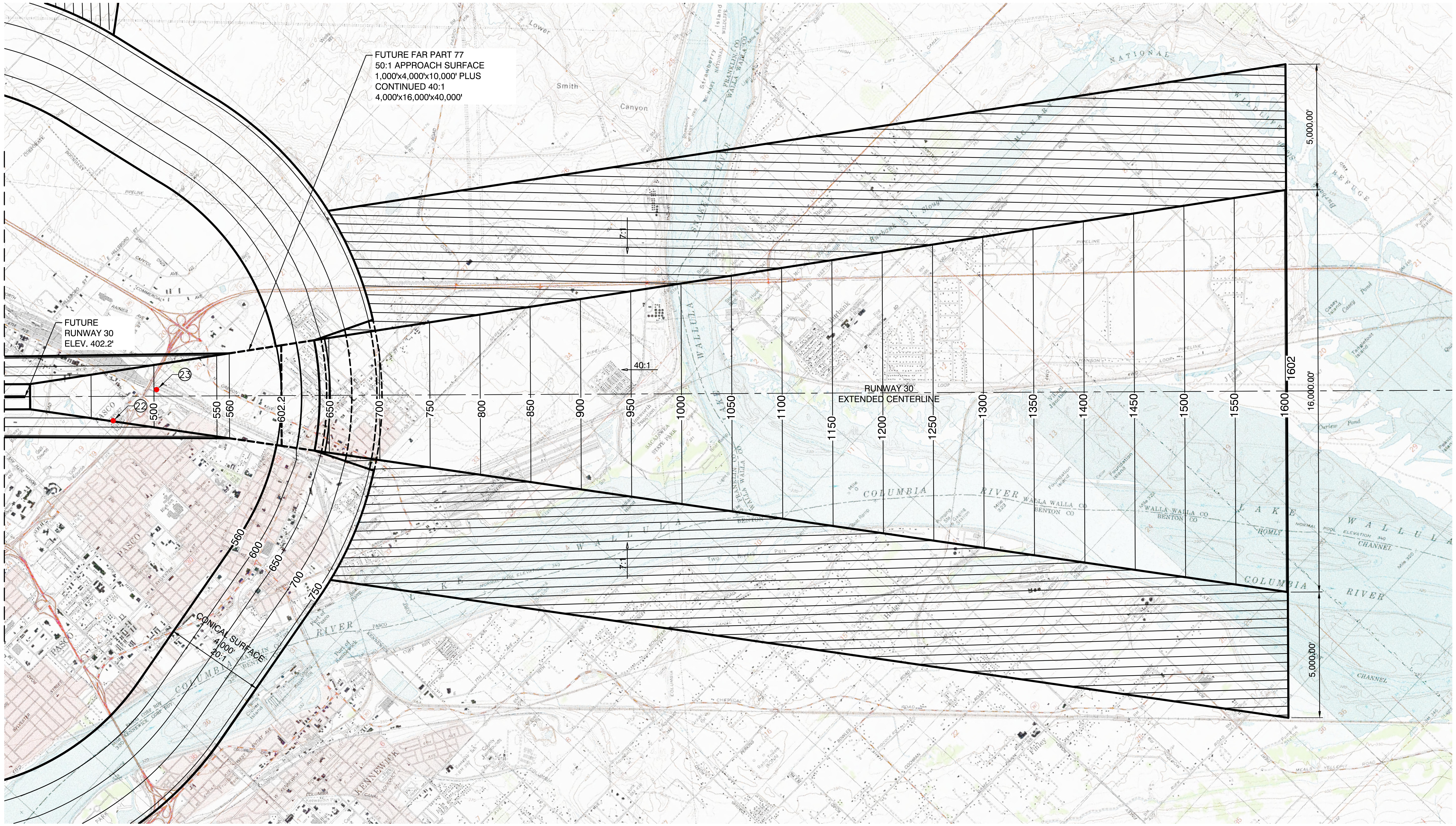
12/22/2020 12:02 PM



LEGEND

FUTURE	DESCRIPTION
(X) TOP OF OBSTRUCTION (PROFILE VIEW)	OBSTRUCTION CALLOUT
	LAND MASS OBSTRUCTION
	TREE GROUP OBSTRUCTION
OBSTRUCTION (PLAN VIEW)	PART 77 PENETRATION

RUNWAY 30 OUTER APPROACH SURFACE OBSTRUCTIONS

NO.	OBJECTID	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED DISPOSITION
22	652	TREE	RUNWAY 30 APPROACH	57.5	480.7	12.4	*TO BE DETERMINED
23	35	COMM TOWER	RUNWAY 30 APPROACH	110.0	520.5	18.0	*TO BE DETERMINED

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SHEET CONTENTS:
AIRPORT AIRSPACE DWG. PLAN VIEW (RUNWAY 30)

SHEET NO.

NOT FOR CONSTRUCTION

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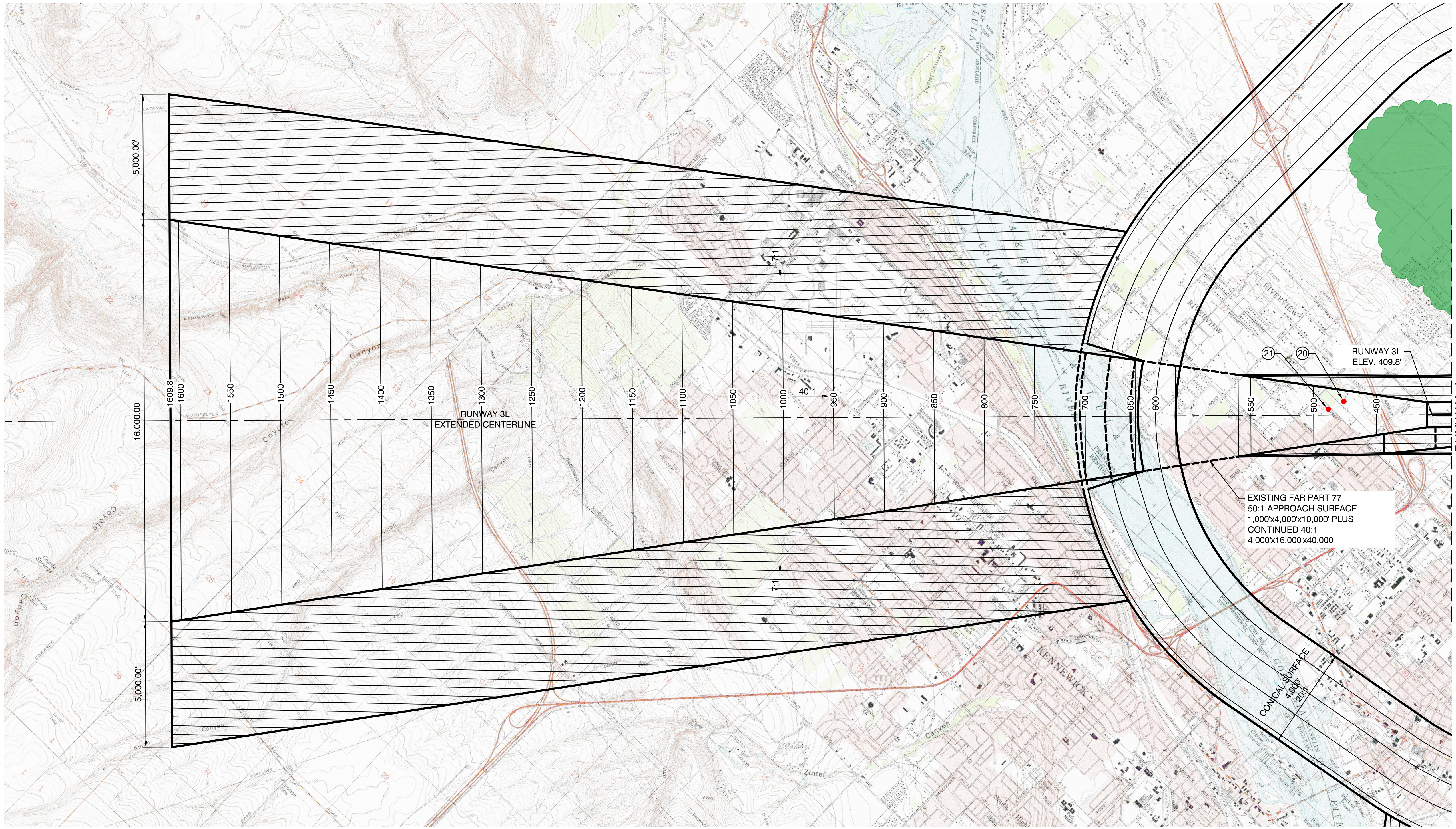

LEGEND

FUTURE	DESCRIPTION
TOP OF OBSTRUCTION (PROFILE VIEW)	OBSTRUCTION CALLOUT
	LAND MASS OBSTRUCTION
	TREE GROUP OBSTRUCTION
OBSTRUCTION (PLAN VIEW)	PART 77 PENETRATION

RUNWAY 3L FUTURE OUTER APPROACH SURFACE OBSTRUCTIONS

NO.	OBJECTID	OBSTRUCTION	SURFACE PENTRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED DISPOSITION
20	1268	TREE	APPROACH	76.2	477.1	1.2	*TO BE DETERMINED
21	183	TREE	APPROACH	97.8	492.9	4.3	*TO BE DETERMINED

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SHEET CONTENTS:
AIRPORT AIRSPACE DWG. PLAN VIEW (RUNWAY 3L)

SHEET NO.

NOT FOR CONSTRUCTION

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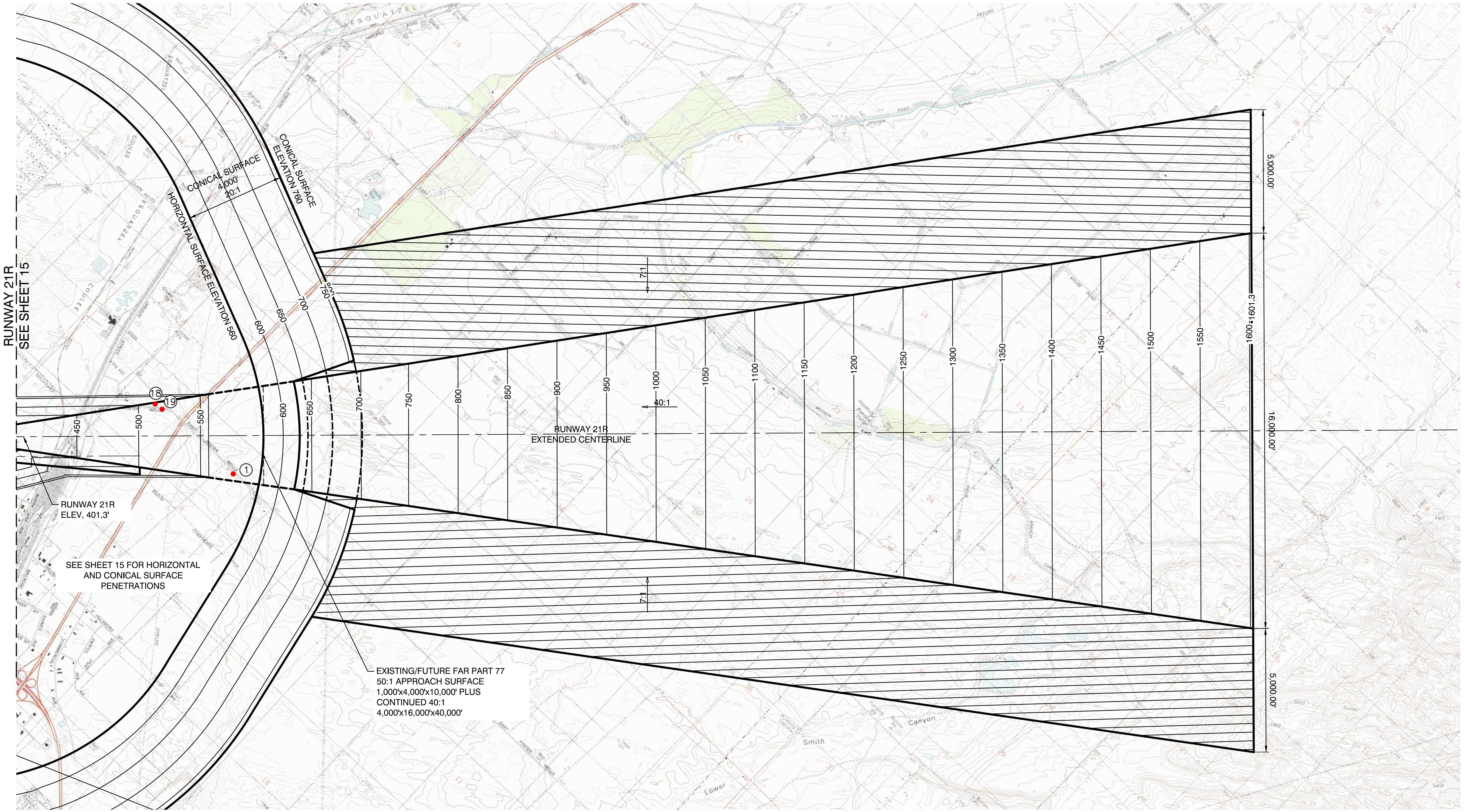
12/22/2020 11:58 AM



LEGEND

FUTURE	DESCRIPTION
TOP OF OBSTRUCTION (PROFILE VIEW)	OBSTRUCTION CALLOUT
OBSTRUCTION (PLAN VIEW)	PART 77 PENETRATION

RUNWAY 21R OUTER APPROACH SURFACE OBSTRUCTIONS							
NO.	OBJECTID	OBSTRUCTION	SURFACE PENETRATED	ABOVE GROUND	TOP ELEVATION	PENETRATION	PROPOSED DISPOSITION
1	2360	TREE	HORIZONTAL	69.3	568.5	8.5	*TO BE DETERMINED
18	2352	TREE	RUNWAY 21R APPROACH	89.1	526.9	0.7	*TO BE DETERMINED
19	575	TREE	RUNWAY 21R APPROACH	92.7	532.3	0.4	*TO BE DETERMINED

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SHEET CONTENTS
AIRPORT AIRSPACE DWG. PLAN VIEW (RUNWAY 21R)

SHEET NO.

NOT FOR CONSTRUCTION

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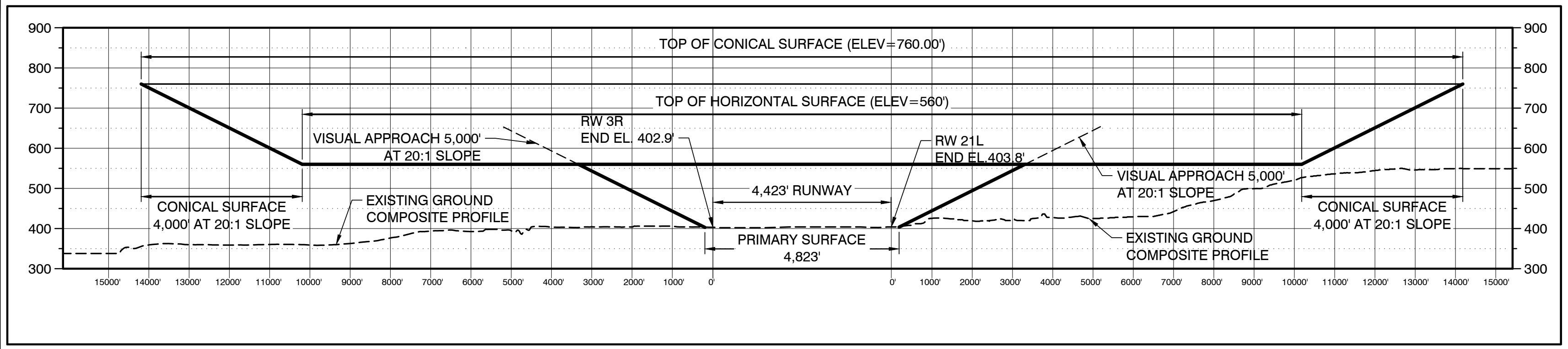
RUNWAY 3R/21L (EXISTING/FUTURE)



REFER TO INNER APPROACH PLANS FOR OBSTRUCTION DETAILS

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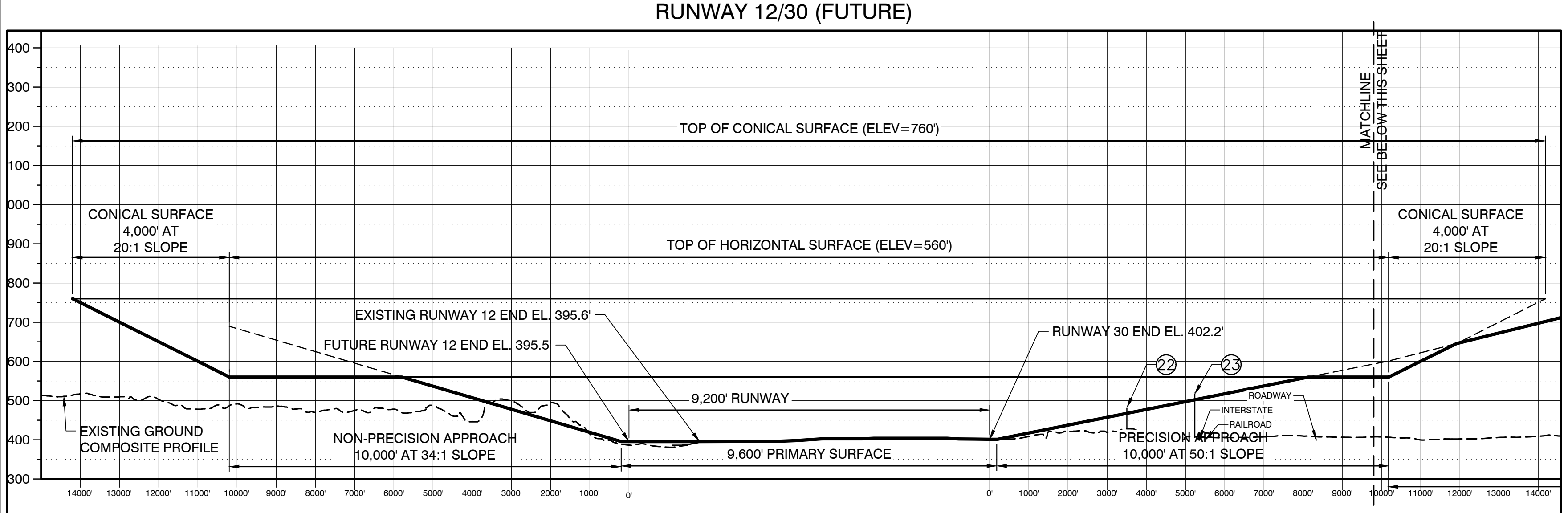
RUNWAY 12/30 (FUTURE)



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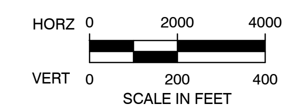
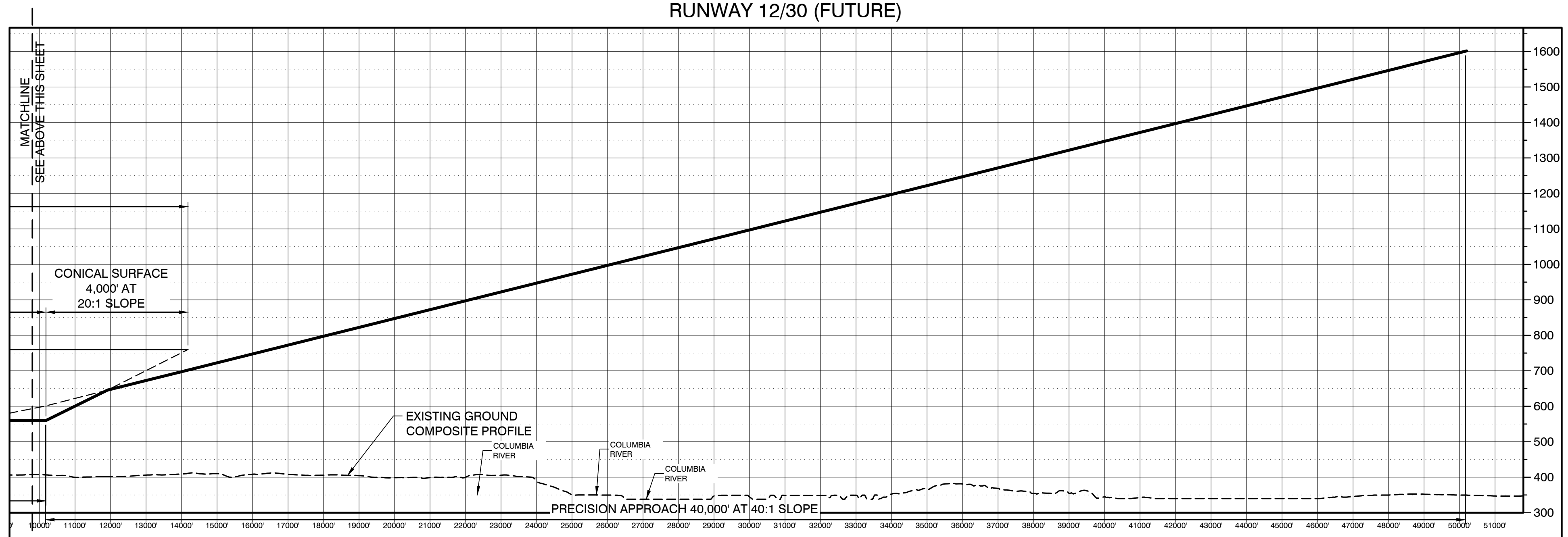


RUNWAY 12/30 (FUTURE)



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12/22/2020 12:16 PM

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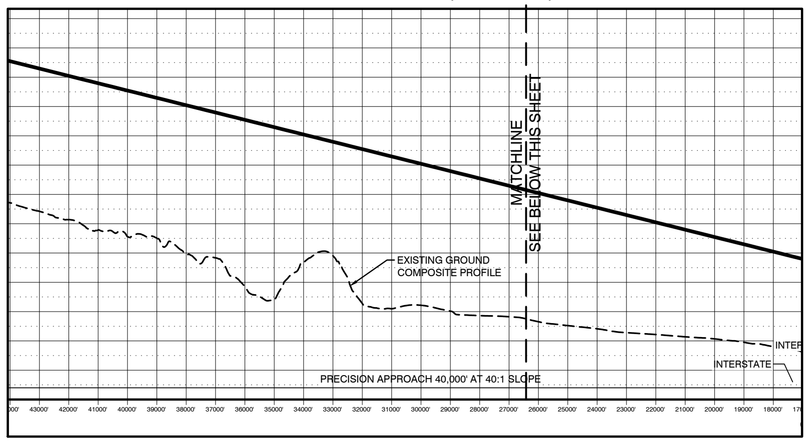
SHEET CONTENTS:
AIRPORT AIRSPACE DRAWING PROFILE VIEW

SHEET NO.

NOT FOR CONSTRUCTION

RUNWAY 3L/21R (FUTURE)



RUNWAY 3L FUTURE OUTER APPROACH SURFACE OBSTRUCTIONS

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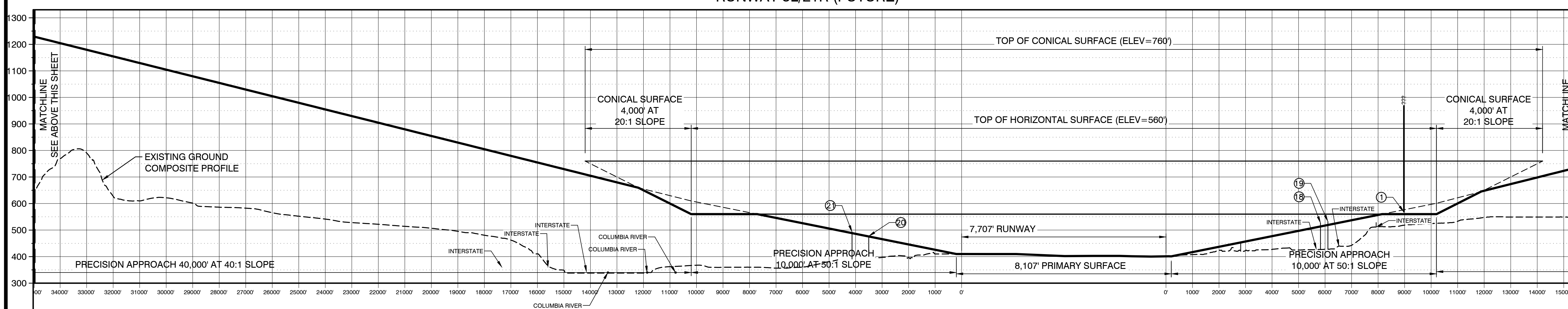
LEGEND

FUTURE	DESCRIPTION
(X) TOP OF OBSTRUCTION	OBSTRUCTION CALLOUT

HORZ 0 2000 4000
VERT 0 200 400
SCALE IN FEET

RUNWAY 3L/21R (FUTURE)



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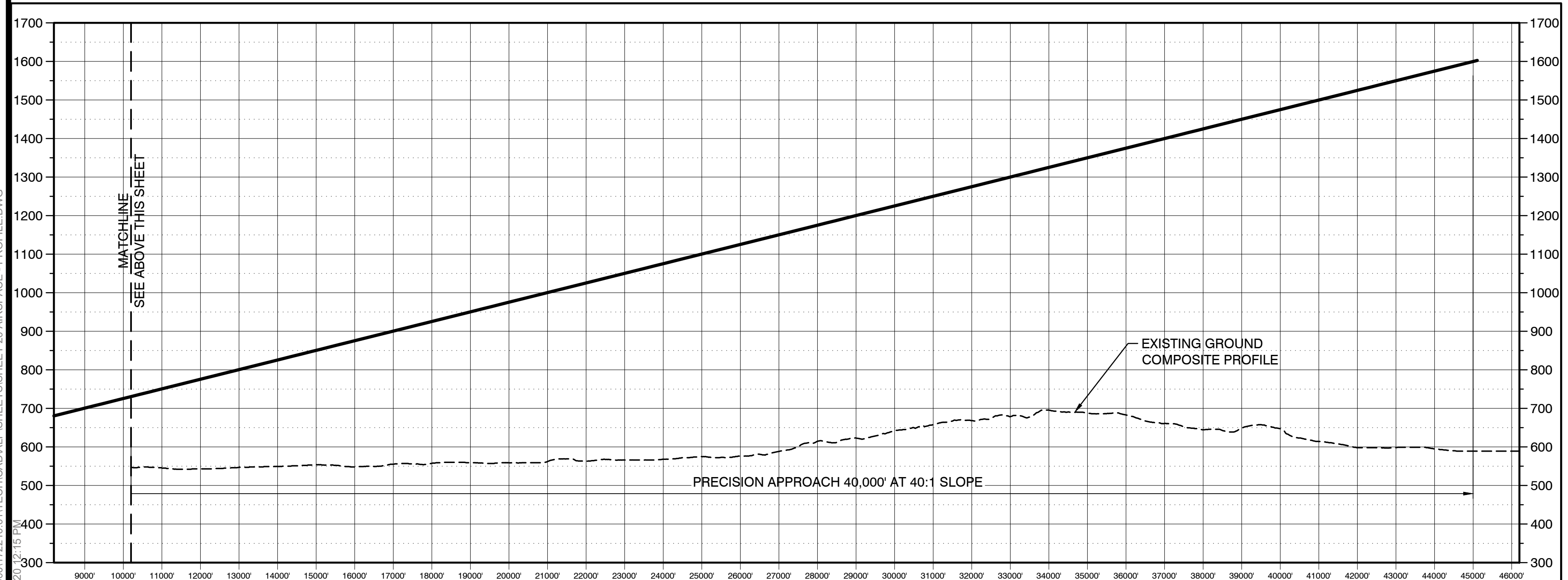
RUNWAY 3L/21R (FUTURE)



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SHEET CONTENTS:
AIRPORT AIRSPACE DRAWING PROFILE VIEW

SHEET NO.

NOT FOR CONSTRUCTION

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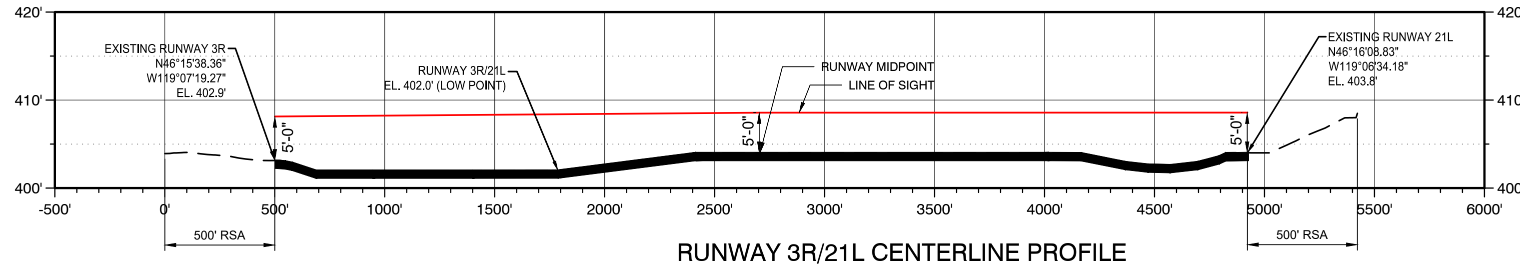
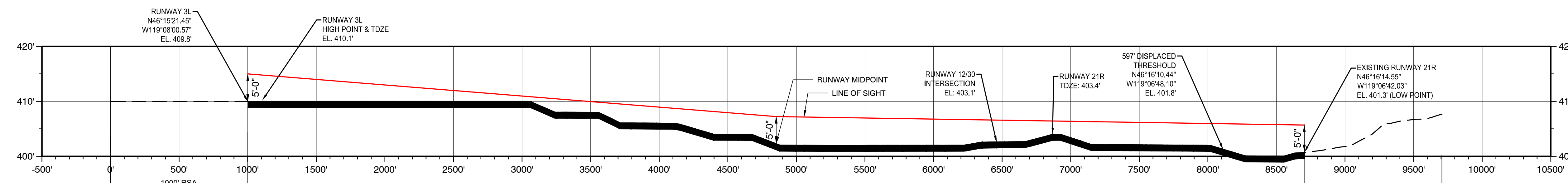
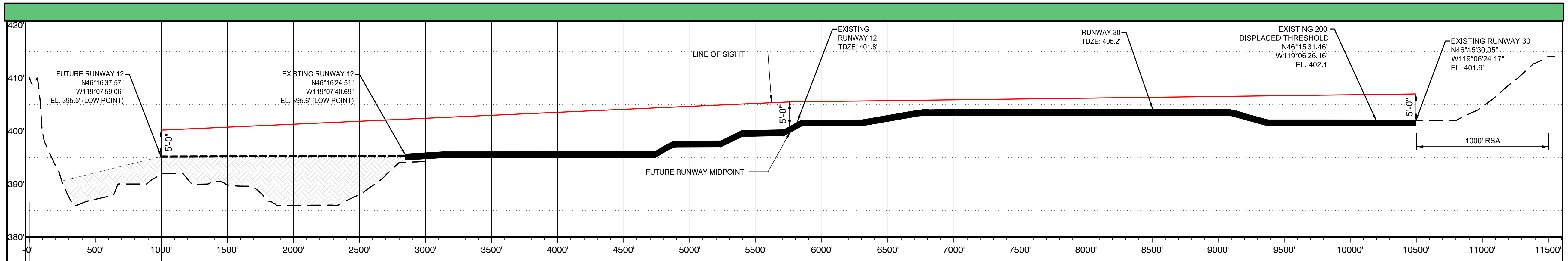


RUNWAY 3R/21L CENTERLINE PROFILE



RUNWAY 3L/21R CENTERLINE PROFILE



RUNWAY 12/30 CENTERLINE PROFILE

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TRI-CITIES AIRPORT LAYOUT PLAN

3601 North 20th Avenue
Pasco, Washington
99301

REVISIONS

#	DESCRIPTION	BY	DATE
1	ALP Update as part of Master Plan	SMF	12/22/20

M&H NO.: 1624500-172210.01

DATE: December 2020

DESIGNED BY: MH

DRAWN BY: TE

CHECKED BY: KM

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SHEET CONTENTS

RUNWAY CENTERLINE PROFILES

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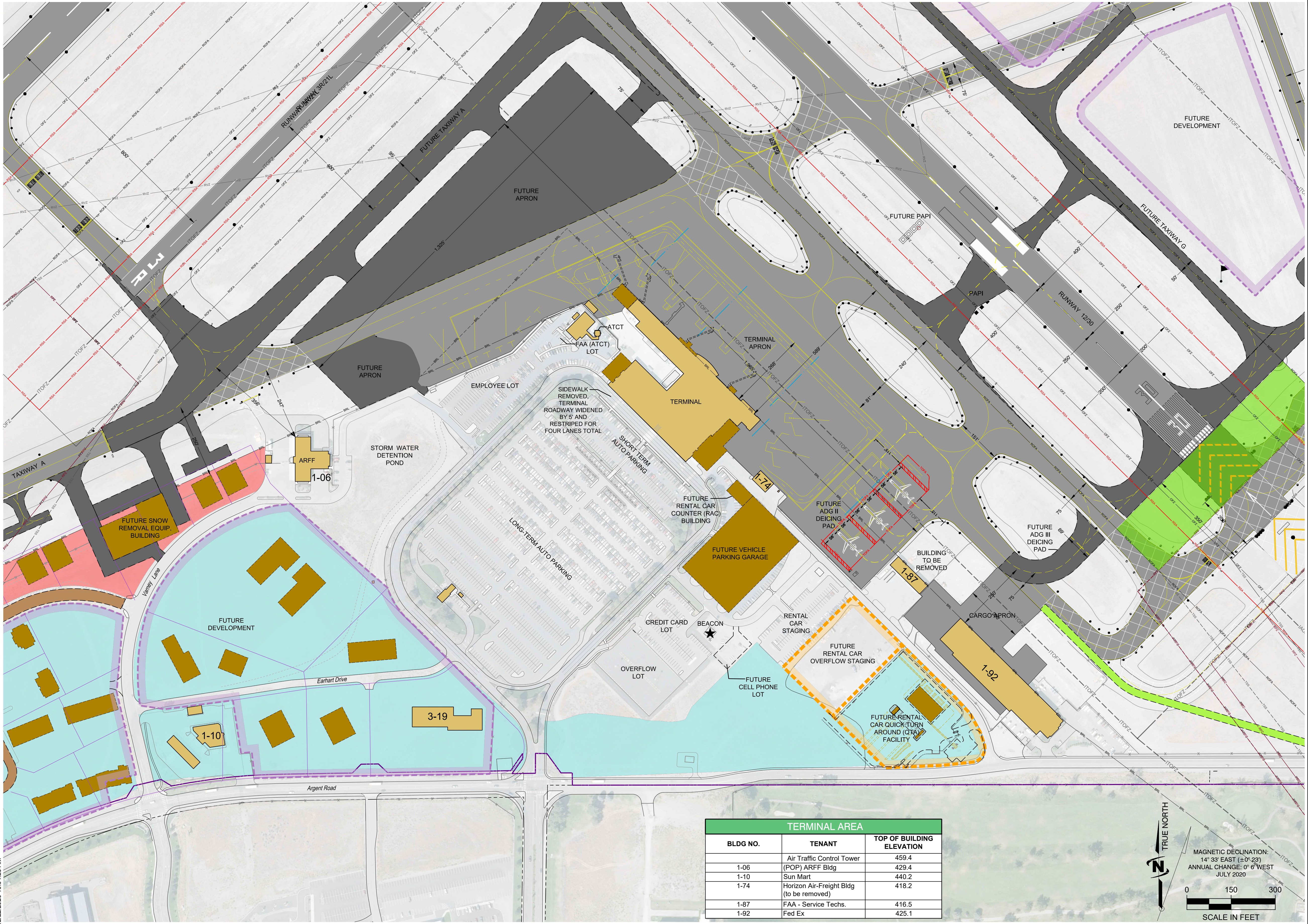

TERMINAL AREA		
BLDG NO.	**TENANT**	**TOP OF BUILDING ELEVATION**
	Air Traffic Control Tower	459.4
1-06	(POP) ARFF Bldg	429.4
1-10	Sun Mart	440.2
1-74	Horizon Air-Freight Bldg (to be removed)	418.2
1-87	FAA - Service Techs.	416.5
1-92	Fed Ex	425.1

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SHEET CONTENTS

TERMINAL AREA PLAN

SHEET NO.

NOT FOR CONSTRUCTION

BUSINESS PARK

BLDG NO.	TENANT	TOP OF BUILDING ELEVATION
1-06	(POP) ARFF Bldg	429.4
2-08	Cory Benton	435.0
3-08	Chep Gaunnt	430.0
1-10	Sun Mart	440.2
1-19	Musser Auction	430.0
2-19	Musser Hangar	436.0
3-19	Hotel	465.0
4-19	Battele Hangar	435.0

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SHEET CONTENTS

BUSINESS PARK PLAN

SHEET NO.

23 of 26

NOT FOR CONSTRUCTION

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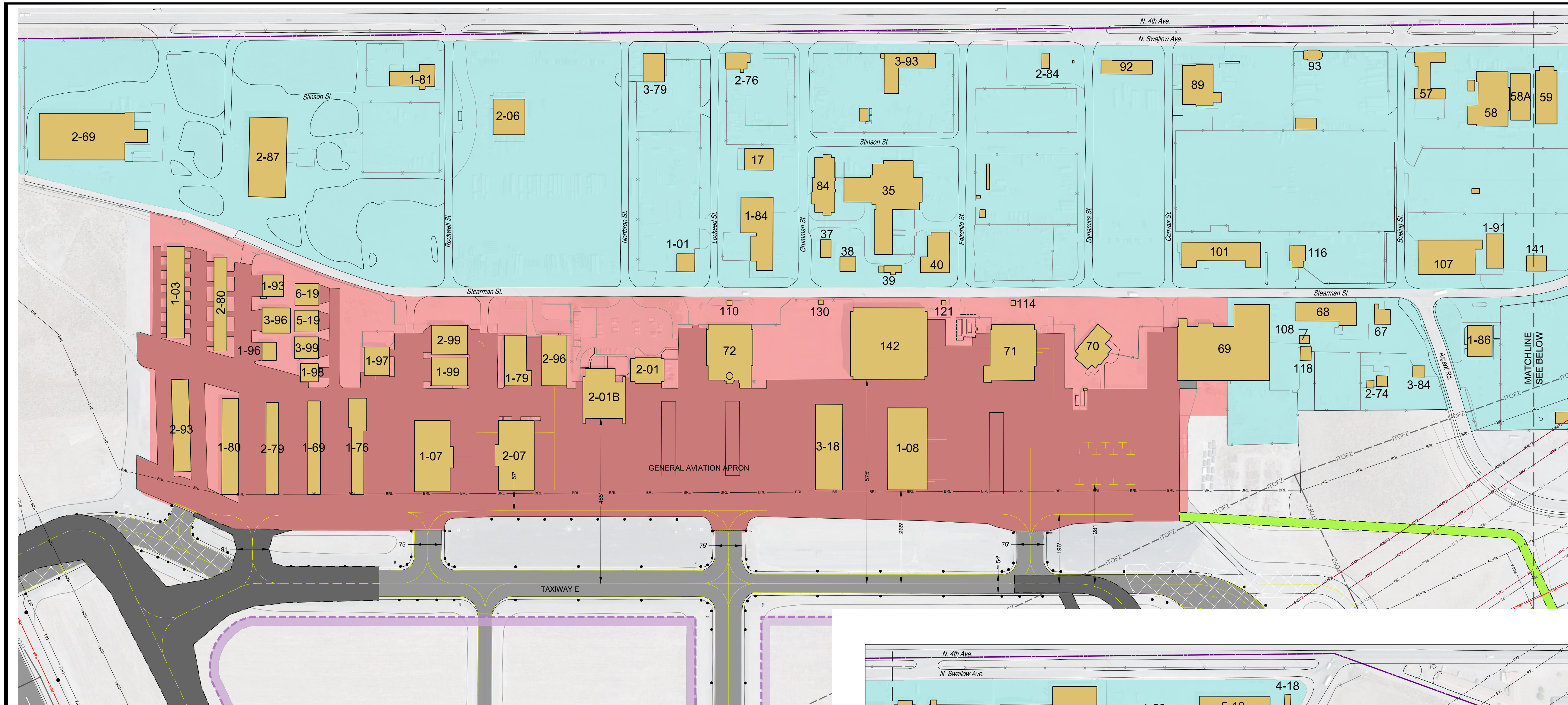

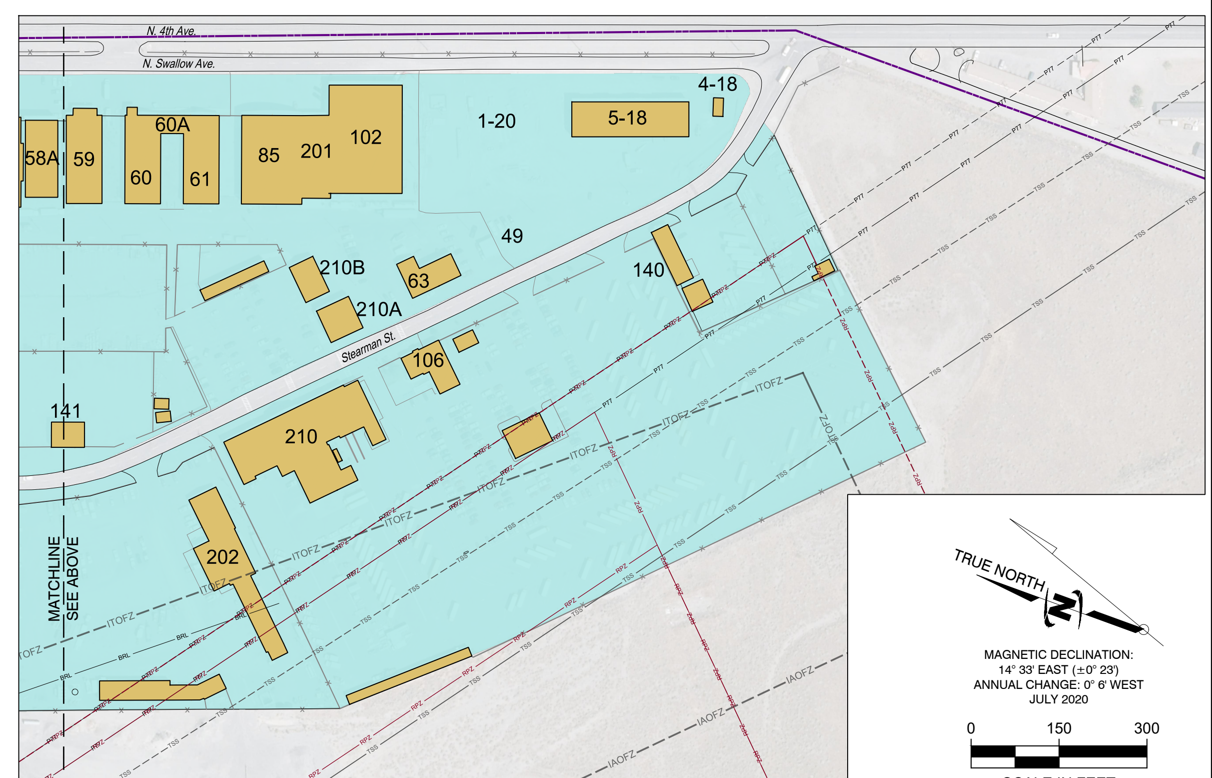

GENERAL AVIATION

BLDG NO.	TENANT	TOP ELEV.	BLDG NO.	TENANT	TOP ELEV.	BLDG NO.	TENANT	TOP ELEV.
17	Port Maintenance - Sand Storage	439.3	110	Port of Pasco	420.4	1-98	McNeill, Jim	424
35	Power City; Les Schwab Tires, Inc.; Heaton, Troy	441.8	114	Kiwanis Club	418.9	1-99	MacHugh, Dave & Ami - Hangar	435.5
37	Port of Pasco	431.1	116	Wolfjohn & Associates	441.9	2-01	(POP) Bergstrom Aircraft	428.6
38	Port of Pasco	432.8	118	VACANT	417.5	210A	Pasco School District	434.3
39	VACANT	446.7	121	VACANT	416.5	210B	Pasco School District	426.9
40	GLB Farms / Port of Pasco	431.5	130	VACANT	421.2	2-01B	Inter-Avionics	440.23
57	Office Emerg Management	428.9	140	Systems Storage NW Craig-Co Electric	427.6	2-06	Easterday Farms	440.2
58	Andrews, Goodwill, Terry's Dairy Goodwill Industries	427.6	141	All Seasons Cont. LLC	424.9	2-07	Pasco Hangar II, LLC	430.9
59	R.W. Cox Drilling	433.9	142	Bergstrom Aircraft, Inc. Viper Aircraft	467.9	2-69	Donaldson LLC	443.2
60	Columbia Basin College Help-U-Move	434.2	201	BPA	434.4	2-74	Avis - Service Center	420.9
61	Columbia Basin College	433.5	202	Franklin County Shops	425.4	2-76	ECS/VP Equipment/Griffith	429.5
63	Wolfjohn & Associates	434.3	210	Pasco School District	437.5	2-79	Pat Funk T-Hangar	426.5
67	Franklin County	424.5	1-01	Sandbourne (HD Waterworks)	434.8	2-80	Peterson, Robert T-Hangar	429
68	Franklin County Four Rivers	426.5	1-03	Funk, Pat	427.9	2-84	Connell Oil - Card Station	428.9
69	Layne of WA, Inc.; Tri-Cities Waterfollies Columbia Basin College; Scheerer Construction; BPA	441.3	1-07	Pasco Hangar, LLC	431.1	2-87	Cost Less Carpet	446
			1-08	Pasco Hangar III, LLC	431.5	2-93	Wirth, Terri - Hangar	423.3
70	Pasco FBO Partners LLC	432.4	1-20	Chep Gauntt		2-96	Col. Bsn LLC-Hangar	429.7
71	Battelle Northwest Bergstrom Aircraft	440.1	1-69	Port-T-Hangar	422.5	2-99	Lampson Int'l Limited - Hangar	435.2
72	Viper Aircraft	443.9	1-76	Port T-Hangar	427.3	3-18	Loren Watts Hangar	436
84	American Linen	438.7	1-79	Doug Watts	433.1	3-79	Sierra Electric, Inc.	432.6
85	BPA	446.5	1-80	Pat Funk T-Hangar	425.3	3-84	Avis/Budget - Car Wash	424.5
89	Bogert In'tl	426.5	1-81	Astley's Transmission, Inc.	432.1	3-93	Big D Construction	432.5
92	Scott's Cabinets	429.2	1-84	Port Maintenance	441.8	3-96	Duzan, Tom - Hangar	430.9
93	Unoccupied	430.5	1-86	Franklin County Engineering	427.2	3-99	Whitten Family Farms - Hangar	425.2
101	Franklin County Sheriff Pierce, Norman L.	424.5	1-91	Bogert Int'l	435.8	4-18	Coffee Shop	
102	BPA	438.3	1-93	Klein, Douglas - Hangar	439.9	5-18	Chep Gauntt	434.7
106	Pasco School District	422.5	1-96	Buxbaum, Mark - Hangar	429.2	5-19	Whitten Hangar	425
107	Astley's Auto Warehouse	429.0	1-97	Napier, Art - Hangar	431.2	6-19	Peterson Hangar	425
108	Unoccupied	420.4						

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GENERAL AVIATION PLAN

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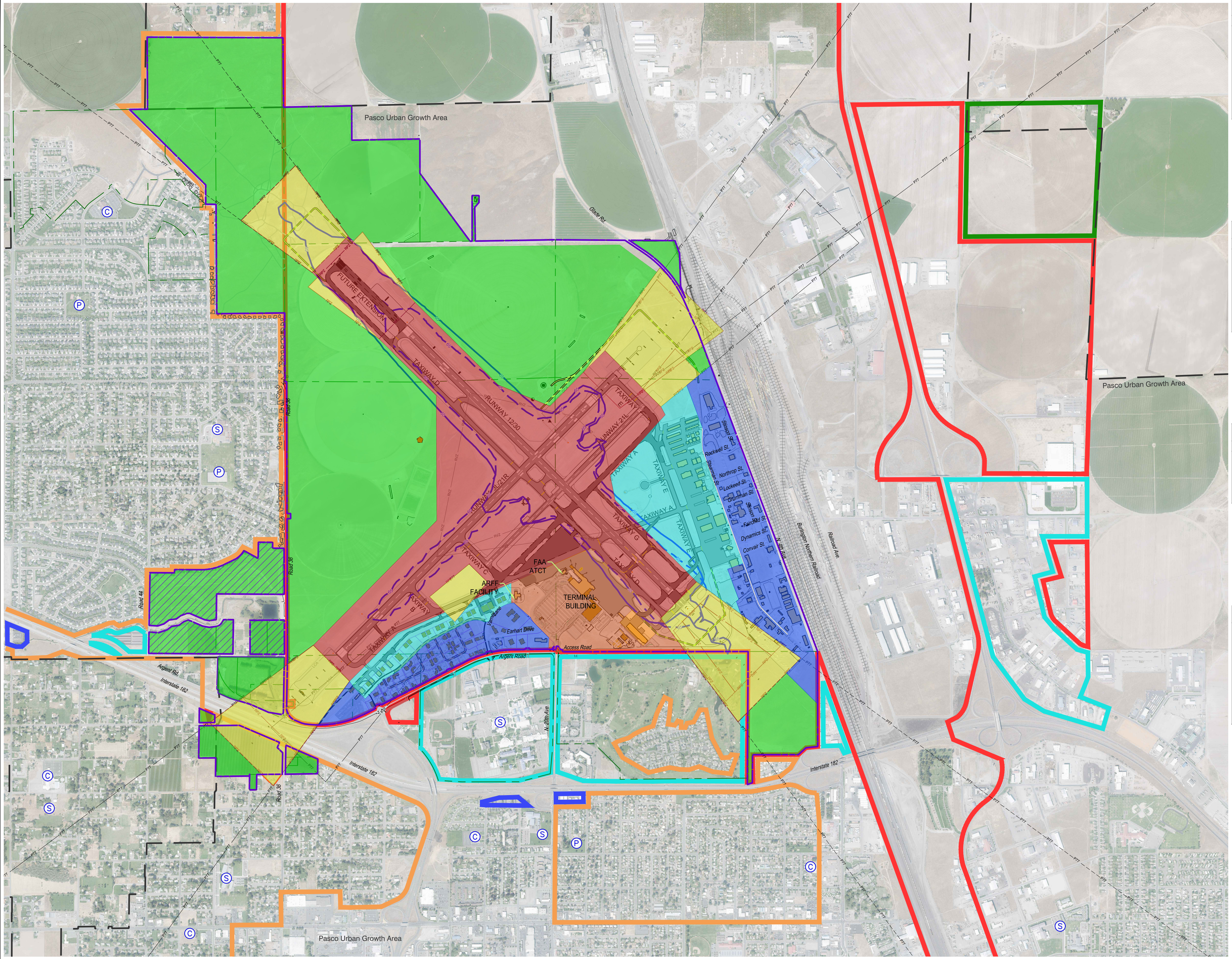

DRAWING LEGEND	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED (AIRFIELD & ROAD)	N/A	
AIRPORT PROPERTY		N/A
AVIGATION EASEMENT		N/A
NOISE CONTOUR 65 DNL	65	65
PASCO URBAN GROWTH AREA BOUNDARY		N/A
PARK	(P)	N/A
CHURCH	(C)	N/A
SCHOOL	(S)	N/A

ON-AIRPORT LAND USES	EXISTING	FUTURE
AIRFIELD - MOVEMENT AREA		N/A
RUNWAY PROTECTION ZONES		N/A
PASSENGER TERMINAL/AVIATION SUPPORT		N/A
AIR CARGO		N/A
AVIATION/AVIATION RELATED DEVELOPMENT		N/A
NON AVIATION RELATED DEVELOPMENT		N/A
OPEN/AG/APPROACH PROTECTION		N/A
PSC AIRPORT PROPERTY RELEASE		N/A

OFF-AIRPORT LAND USES	EXISTING	FUTURE
INDUSTRIAL ZONE		N/A
COMMERCIAL ZONE		N/A
OPEN SPACE/UNDEVELOPED ZONE		N/A
SINGLE FAMILY/RESIDENTIAL ZONE		N/A
MULTI-FAMILY /RESIDENTIAL ZONE		N/A

NOTES

The City of Pasco has established the Pasco Airport Overlay District (Chapter 25.190), that establishes the Airport Influence Area based on the Future 14 CFR Part 77 Zones map and the Airport Safety Compatibility Zones map established by the Airport Master Plan. The District regulations discourage the siting of incompatible uses adjacent to the Airport and to protect the viability of the Airport as a significant resource to the community by encouraging compatible land uses, densities, and reducing hazards that may endanger the lives and property of the public and aviation users.

MAGNETIC DECLINATION:
14° 33' EAST (±0° 23')
ANNUAL CHANGE: 0° 6' WEST
JULY 2020

MAGNETIC TRUE

0 1,000 2,000
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LAND USE VICINITY AERIAL

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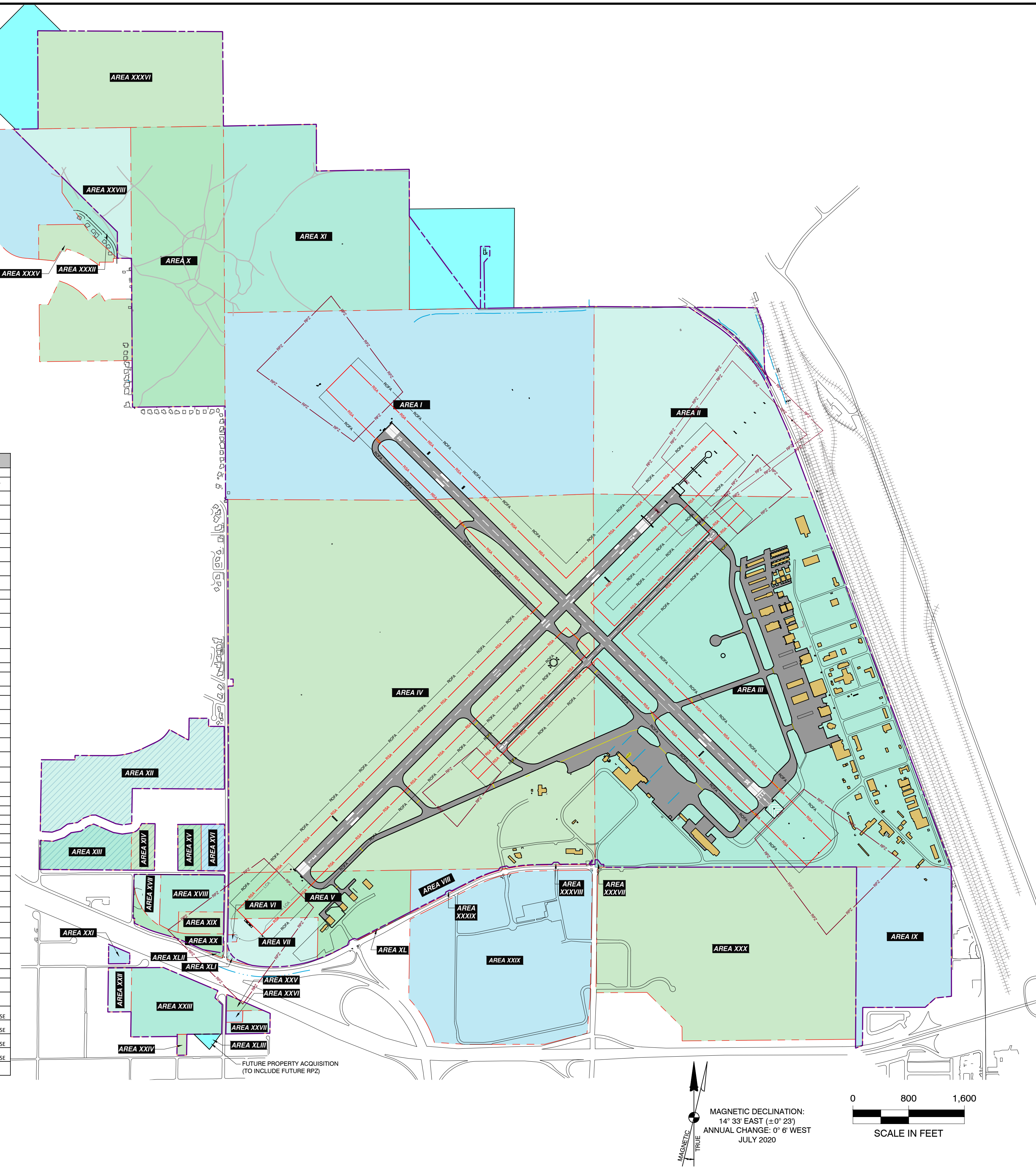
LEGEND

(dashed purple line)	AIRPORT PROPERTY LINE (APL)
RPZ ——— RPZ ——— RPZ	RUNWAY PROTECTION ZONE
(hatched box)	LAND WHICH THE AIRPORT WILL SEEK TO BE RELEASED.

NOTE:
1. AREA XXVIII AND XXIV WERE NOT TRANSFERRED TO THE PORT OF PASCO WITH THE REMAINDER OF THE PROPERTY, HOWEVER THE PORT WAS GRANTED AND MAINTAINS AN AVIGATION EASEMENT OVER THE PROPERTY WHICH PERMITS THEM TO OPERATE AN AIRPORT IN PERPETUITY.

PROPERTY LEGEND

AREA	ACREAGE: ACQUIRED	ACREAGE: RELEASED	ACREAGE: FUTURE	GRANTOR	GRANTEE	RECORDED LIBER	INSTRUMENT OF TITLE	RECORDING DATE	TAX PARCEL NO.	ADAP NO.	OWNERSHIP
I	329.3 Acres			City of Pasco, WA	Port of Pasco	A portion of Auditors File No. 250543	Quit-Claim Deed	7/23/1963	116-570-015		FEE SIMPLE
II	164.1 Acres			Franklin County, WA	Port of Pasco	A portion of Auditors File No. 323930	Quit-Claim Deed	3/24/1971	113-120-024		FEE SIMPLE
III	504.9 Acres			City of Pasco, WA	Port of Pasco	A portion of Auditors File No. 250543	Quit-Claim Deed	7/23/1963	113-290-029		FEE SIMPLE
IV	642.76 Acres			City of Pasco, WA	Port of Pasco	A portion of Auditors File No. 250543	Quit-Claim Deed	7/23/1963	117-010-010		FEE SIMPLE
V	48.2 Acres			City of Pasco, WA	Port of Pasco	A portion of Auditors File No. 250543	Quit-Claim Deed	7/23/1963	119-210-023		FEE SIMPLE
VI	0.3 Acres			Sophia Job	Port of Pasco	Auditors File No.380816	Statutory Warranty Deed	5/10/1973	119-222-010		FEE SIMPLE
VII	19.4 Acres			Norbert & Marion Job	Port of Pasco	Auditors File No. 380012	Statutory Warranty Deed	4/13/1978	119-222-029		FEE SIMPLE
VIII	8.859 Acres			State of Washington	Port of Pasco	Auditors File No. 424435	Quit-Claim Deed	4/15/1983	119-180-011		FEE SIMPLE
IX	63.5 Acres			City of Pasco, WA	Port of Pasco	A portion of Auditors File No. 250543	Quit-Claim Deed	7/23/1963	113-300-017		FEE SIMPLE
X	122.7 Acres			Burlington Northern Inc.	Port of Pasco	Auditors File No. 398404	Warranty Deed	1/24/1980	116-330-033		FEE SIMPLE
XI	143.3 Acres			United States of America, Secretary of the Interior	Port of Pasco	Auditors File No. 394131	Warranty Deed	8/12/1979	116-530-022		FEDERAL SURPLUS
XII	52.7 Acres			Didco Corporation	Port of Pasco	Parcel A, Auditors File No. 333135	Statutory Warranty Deed	8/23/1972	117-301-018		FEE SIMPLE
XII						Auditors File No. 375093	Plat Vacation	11/2/1977	117-301-018		FEE SIMPLE
XIII	15.9 Acres			Didco Corporation	Port of Pasco	Parcel B, Auditors File No. 333135	Statutory Warranty Deed	8/23/1972	117-301-017		FEE SIMPLE
XIII						Auditors File No. 375093	Plat Vacation	11/2/1977	117-301-017		FEE SIMPLE
XIV	4.9 Acres			Didco Corporation	Port of Pasco	Parcel C, Auditors File No. 333135	Statutory Warranty Deed	8/23/1972	117-322-013		FEE SIMPLE
XV	5.2 Acres			Donald & Lois Avery	Port of Pasco	Auditors File No. 375622	Statutory Warranty Deed	11/22/1977	117-322-031		FEE SIMPLE
XVI	5.2 Acres			Beatrice Huston	Port of Pasco	Auditors File No. 373780	Statutory Warranty Deed	9/16/1977	117-322-040		FEE SIMPLE
XVII	4.7 Acres			Warren & Mary Ann Cornett	Port of Pasco	Auditors File No 373159	Statutory Warranty Deed	8/16/1977	119-012-078	6-53-0046-04	FEE SIMPLE
XVIII	12.7 Acres			Dale & Ardella Ratchford, Et al.	Port of Pasco	Auditors File No. 364090	Statutory Warranty Deed	9/20/1976	119-012-078	6-53-0046-04	FEE SIMPLE
XIX	4.6 Acres			Franklin County Irrigation District No. 1	Port of Pasco	Auditors File No. 379053	Quit-Claim Deed	3/15/1978	119-012-078	6-53-0046-04	FEE SIMPLE
XIX				Andrew & Christina Job	Port of Pasco	Auditors File No. 379054	Statutory Warranty Deed	3/15/1978	119-012-078	6-53-0046-04	FEE SIMPLE
XX	5.7 Acres			State of Washington	Port of Pasco	Auditors File No. 408374	Quit-Claim Deed	3/5/1981	119-012-078	6-53-0046-04	FEE SIMPLE
XXI	1.5 Acres			State of Washington	Port of Pasco	Auditors File No. 408377	Quit-Claim Deed	3/5/1981	119-021-077	6-53-0046-06	FEE SIMPLE
XXII	4.9 Acres			State of Washington	Port of Pasco	Auditors File No. 409825	Quit-Claim Deed	4/17/1981	119-031-011	6-53-0046-06	FEE SIMPLE
XXIII	25.4 Acres			State of Washington	Port of Pasco	Auditors File No. 405321	Quit-Claim Deed	10/20/1980	119-041-091	6-53-0046-06	FEE SIMPLE
XXIV	1.0 Acres			State of Washington	Port of Pasco	Auditors File No. 409263	Quit-Claim Deed	3/27/1981	119-041-073	6-53-0046-06	FEE SIMPLE
XXV	1.5 Acres			State of Washington	Port of Pasco	Auditors File No. 414857	Quit-Claim Correction Deed	12/9/1981	119-232-170	6-53-0046-06	FEE SIMPLE
XXVI	0.9 Acres			State of Washington	Port of Pasco	Auditors File No. 405428	Quit-Claim Deed	10/23/1980	119-232-081	6-53-0046-06	FEE SIMPLE
XXVII	3.8 Acres			State of Washington	Port of Pasco	Auditors File No. 405318	Quit-Claim Deed	10/20/1980	119-232-090	6-53-0046-06	FEE SIMPLE
XXVIII	34.04 Acres			EE Properties, LLC	Port of Pasco	Auditors File No. 1793616 (aka Parcels A and B)	Statutory Warranty Deed	12/31/2012	116-340-143		FEE SIMPLE
XXIX	132.8 Acres			Columbia Basin College	Port of Pasco	Auditors File No. 178988 (See Notes)	Easement		119-170-013		EASEMENT
XXX	135.2 Acres			City of Pasco, WA	Port of Pasco	Auditors File No. 250542 (See Notes)	Easement		113-300-106		EASEMENT
XXXII	6.4 Acres			EE Properties, LLC	Port of Pasco	Auditors File No. 1793619 (aka Parcel C)	Easement	12/31/2012	116-340-115, 116-350-034		EASEMENT
XXXIV	155..5 Acres			EE Properties, LLC	Port of Pasco	Auditors File No. 1793619 (Remainder)	Easement	12/31/2012	116-340-115		EASEMENT
XXXV	43.6 Acres			EE Properties, LLC	Port of Pasco	Auditors File No. 1793619 (Remainder)	Easement	12/31/2012	116-350-034		EASEMENT
XXXVI	98.7 Acres			Bureau of Reclamation	Port of Pasco	Auditors File No. 18444422	Dedication Deed	3/24/2016	114-031-013		FEE SIMPLE
XXXVII		0.147 Acres		Port of Pasco	City of Pasco, WA	Auditors File No. 1924091	Quit-Claim Deed	10/27/2020	113-290-029		FEE SIMPLE RELEASE
XXXVIII		0.466 Acres		Port of Pasco	City of Pasco, WA	Auditors File No. 1923260	Quit-Claim Deed	10/14/2020	117-010-010, 119-180-011		FEE SIMPLE RELEASE
XXXIX			0.387 Acres	Information to be included.							FUTURE FEE SIMPLE RELEASE
XL			0.213 Acres	Information to be included.							FUTURE FEE SIMPLE RELEASE
XLI			0.37 Acres	Information to be included.							FUTURE FEE SIMPLE RELEASE
XLII			0.25 Acres	Information to be included.							FUTURE FEE SIMPLE RELEASE
XLIII			0.95 Acres	Information to be included.							FUTURE FEE SIMPLE



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SHEET CONTENTS:
EXHIBIT "A"
AIRPORT PROPERTY INVENTORY MAP

SHEET NO.

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APPENDICES

APPENDIX A. ALP REVIEW CHECKLIST

The following checklist shall be used in lieu of FAA AC 150/5070-6B, Appendix F, Airport Layout Plan Drawing set. This checklist is intended for use when submitting a new or updated ALP to the FAA for review and approval. Consultants and/or sponsors should indicate "Yes," "No" or "N/A" (not applicable) for every item on the checklist. The same checklist shall be provided to FAA for review and verification. For all reviewers: It is important that each item listed be shown on the respective plan.

Airport Identification (to be completed by Sponsor or Consultant)			
Airport	Tri-Cities Airport		
City and State	Pasco, WA	Location Identifier	PSC
Airport Owner	Port of Pasco		

ALP Submission Information (to be completed by Sponsor or Consultant)		
ALP Prepared by	Mead & Hunt	
	Name of Consulting Firm	
	Click here to enter text.	Click here to enter text.
	Name of Individual	Date
	Click here to enter text.	
	Telephone	
	Click here to enter text.	
	Email address	
Consulting QA/QC Review	Click here to enter text.	Click here to enter text.
	Name and Title of Individual	Date
Sponsor Review	Buck Taft Director of Airports	Click here to enter text.
	Name and Title of Individual	Date

FAA Review (to be completed by FAA)	
Name and Title of Individual	Date

Critical Design Aircraft or Family of Aircraft:

	Make	Model	Annual Itinerant Operations
Existing	Airbus	A319	468
Future	Boeing	737 MAX 8	3,400

Forecasted Year: 2037

Airport Reference Code (ARC): D-III

Runway Design Code (RDC) & Runway Reference (RRC):

Runway	RDC	RRC
Runway 3L/21R	C/D-III-2400	D-III-2400
Runway 12/30	C/D-III-4000	D-III-4000
Runway 3R/21R	B-II-VIS	B-II-VIS

Approach Minimums:

Rwy End	Minimum	Rwy End	Minimum
Runwy 3L	½-Mile	Runway 21R	½-Mile
Runway 12	¾-Mile	Runway 30	½-Mile
Runway 3R	Visual	Runway 21L	Visual
Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

Runways (Existing and Future):

Runway	Existing		Future		Departure Surface (Y or N/A)
	Length (ft)	Width (ft)	Length (ft)	Width (ft)	
Runway 3L/21R	7,711	150	7,711	150	Y
Runway 12/30	7,703	150	9,200	150	Y
Runway 3R/21L	4,423	75	4,423	75	N/A
Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

For the balance of the checklist, enter a mark (✔ or X) to confirm inclusion.

A.1. Narrative Report

Narrative Report					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Executive Summary – A concise summary of the findings/ recommendations of the master planning effort or changes to the ALP. This should include a description of planned projects, an implementation plan/timeline, and identification of benchmarks or actions that will be conducted to either verify the original planning assumptions or proceed with project implementation.	From AC 150/5070-6, Section 202: An accompanying ALP Narrative Report should explain and document those changes and contain at least the following elements: – Basic aeronautical forecasts. – Basis for the proposed items of development. – Rationale for unusual design features and/or modifications to FAA Airport Design Standards. – Summary of the various stages of airport development and layout sketches of the major items of development in each stage. – An environmental overview to document environmental conditions that should be considered in the identification and analysis of airport development alternatives and proposed projects.			×	
1. Identify Projects along with description				×	
2. Create a Timeline for each Project				×	
3. Identify and List:				×	
a. Proposed Projects (e.g., Hangar development)				×	
b. Milestones/ Triggering Events (e.g., 1. All hangars are full, 2. There is a waiting list long enough to fill a new development, 3. Hangars have reached their useful life, etc.)				×	
c. Action items/Next Steps (e.g., 1. Maintain log and gather data, 2. Discuss plan with ADO, 3. Coordinate with ADO regarding potential for inclusion in FAA ACIP (Airports Capital Improvement Program), 4. Identify funding sources.)				×	
d. Funding Plan	Capital Improvement Plan for the forecast horizons. See AC 150/5070-6, Chapter 11. Only a rough, order-of-magnitude report is needed in the executive summary.			×	

Narrative Report					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
B. Basic aeronautical forecasts (0-5, 6-10, 11-20 years): Basic aeronautical forecasts (0-5, 6-10, 11-20 years):	Forecasts of future levels of aviation activity as approved by the FAA. These projections are used to determine the need for new or expanded facilities. See AC 150/5070-6, Chapter 7.			×	
1. Total annual operations	Total local and itinerant aircraft operations at the airport.			×	
2. Annual itinerant operations by all aircraft	Itinerant operations by aircraft that leaves the local airspace, generally 25 miles or more from the airport. See AC 150/5070-6, Chapter 7, Section 702.a. and Figure 7-2.			×	
3. Annual itinerant operations by current critical aircraft				×	
4. Annual itinerant operations by future critical aircraft				×	
5. Number of based aircraft	Aircraft that use the subject airport as a home base, i.e., have hangar or tie-down space agreements. See AC 150/5070-6, Chapter 7, Section 702.a. and Figure 7-2.			×	
6. Annual instrument approaches	Number of instrument approaches expected to be executed during a 12-month period. See AC 150/5070-6, Chapter 7, Section 702.a. and Figure 7-2.			×	
7. Number of enplanements	See AC 150/5070-6, Chapter 7, Section 702.a. and Figure 7-2.			×	

Narrative Report					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
8. Critical Aircraft (also referred as “design aircraft” or “critical design aircraft)	The critical aircraft is the most demanding aircraft identified in the forecast that will use the airport. Federally funded projects require that the critical aircraft will make substantial use of the airport in the planning period. Substantial use means either 500 or more annual itinerant operations or scheduled service. The critical aircraft may be a single aircraft or a composite of the most demanding characteristics of several aircraft. Provide the aircraft, AAC, and ADG. (e.g. Boeing 737-400, C-III) See AC 150/5300-13A, Paragraph 105(b) and FAA Order 5090.3C, 3-4.			×	
9. Runway Design Code (RDC)	Describe the RDC for each runway. For the purpose of airport geometric design, each runway will contain a RDC which signifies the design standards to which the runway is to be built. The RDC consists of three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG) and the approach visibility minimums. These parameters represent the aircraft that are intended to be accommodated by the airport, regardless of substantial use. See AC 150/5300-13A, Paragraph 105(c).			×	
10. Runway Reference Code (RRC)	Describe the RRC for each runway. The RRC describes the current operational capabilities of a runway where no special operating procedures are necessary. The RRC consists of the same three components as the RDC, but is based on planned development and has no operational application. See AC 150/5300-13A, Paragraph 318.			×	
C. Alternatives/Proposed Development				×	

Narrative Report					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
11. Explanation of proposed development items	Specific projects can be described as project listings on a master table, on individual project data sheets, or in projects booklets.			×	
12. Discuss near-term and future Approach Procedure Requirements or effects (e.g., LPV, Circling, etc.)	Based on existing or forecast usage. See FAA Order 7400.2, Figures 6-6-3 and 6-3-9.			×	
13. Navigational Aids or Other Equipment Needs (e.g., Approach Lights, Wind Cones, AWOS, etc.)	The need for new or additional navigational aids is a function of the fleet mix, the percentage of time that poor weather conditions are present, and the cost to the users of not being able to use the airport while it is not accessible.			×	
14. Wind coverage. Is it adequate for existing and future runway layouts? Has wind data been updated?	This analysis determines if additional runways are needed to provide the necessary wind coverage. Reference AC 150/5300-13A, Appendix 2 for guidance on wind coverage analysis techniques.			×	
D. Modification to Standards.	Any approved nonconformance to FAA standards, other than dimensional standards for RSAs and OFZs, require FAA approval. A description of all approved modification to standards shall be provided. See AC 150/5300-13A, Paragraph 106(b) and FAA Order 5300.1.			×	
E. Obstruction Surfaces (14 CFR Part 77 and Threshold Siting Surface)	Reference 14 CFR Part 77 and AC 150/5300-13A, Paragraph 303.			×	
F. Runway Protection Zone	A description of any incompatible land uses inside the RPZ shall be provided. Prior to including new or modified land use in the RPZ, the Regional and ADO staff must consult with the National Airport Planning and Environmental Division, APP-400. This policy is exempt from existing land uses in the RPZ. See AC 150/5300-13A, Paragraph 310 and FAA memorandum dated September 27, 2012.			×	

Narrative Report					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
G. Development summary (including sketches, schedules, and cost estimates) for stages of construction for: Development summary (including sketches, schedules, and cost estimates) for stages of construction for:	Documentation provided should include any electronic spreadsheets and files to facilitate in modifying the financial plan on an as-needed basis.			×	
15. Development Projects Completed Since Last ALP				×	
16. 0-5 years				×	
17. 6-10 years				×	
18. 11-20 years				×	
H. Shadow or line-of-sight study for towered airports (negative or positive statements are required).	Reference FAA Order 6480.4. This can be from the Airway Facilities Tower Integration Laboratory (AFTIL) or simpler GIS-generated studies.			×	
I. Letters of coordination with all levels of government, as needed.	Affected private and/or governmental groups, agencies, commissions, etc., that may have input on the plans. See AC 150/5070-6, Chapter 3.			×	
J. Wildlife Hazard Management Issues Review (in narrative).	Reference AC 150/5200-33.			×	
K. Preliminary Identification of Environmental Features	Potential or known features only. Further environmental analysis will be necessary. Reference FAA Order 5050.4B. Begin framework for NEPA analysis.			×	
19. Major airport drainage ditches				×	
20. Wetlands				×	
21. Flood Zones				×	
22. Historic or Cultural features				×	
23. Section 4(f) features				×	
24. Flora/Fauna				×	

Narrative Report					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
25. Natural Resources				×	
26. Etc. (other features identified in Order 5050.4B)				×	
L. Note Action Items from Runway Safety Program Office	List and note status of items from Runway Safety Program Office or Runway Safety Action Plan.			×	
M. Declared Distance (DD)	The narrative on declared distances is used to aid in understanding the maximum distances available and suitable for meeting takeoff, rejected takeoff, and landing distances performance requirements for turbine powered aircraft. The narrative shall also provide clarification on why declared distances have been implemented. Declared distances data must be listed for all runway ends. The TORA, TODA, ASDA, and LDA will be equal to the runway length in cases where a runway does not have displaced thresholds, stopways, or clearway, and have standard RSAs, ROFAs, RPZs, and TSS. Reference AC 150/5300-13A, Paragraph 323.			×	
Remarks					
See Master Plan					

A.2. Title Sheet

- The scale of the Title Sheet should be developed to include the items listed below.
- The minimum size for the final drawing set is 22" X 34" (ANSI D) and 24" X 36" (ARCH D). Coordinate use of 34" x 44" (ANSI E) and 26" X 48" (ARCH E) with FAA. Color drawings may be acceptable if they are still usable if reproduced in grey scale.

Title Sheet						
Item	Instructions	Sponsor/Consultant			FAA	
		Yes	No	N/A		
A. Title and revision blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	×				
B. Airport sponsor approval block	Provide an approval block for the sponsoring authority's representative to sign. Include space for name, title, and date.	×				
C. Date of ALP (date the airport sponsor signs the ALP)	The month and year of signature prominently shown near the title.	×				
D. Index of sheets (including revision date column)	Airport Layout Drawing, Airport Airspace Drawing, Inner Portion of the Approach Surface Drawing, Terminal Area Drawing, Land Use Drawing, Airport Property Map, Airport Departure Surface, etc.	×				
E. State Aeronautics Agency Approval Block (as needed)	Provide an approval block for the sponsoring authority's representative to sign. Include space for name, title, and date.			×		
F. State outline with county boundaries. County in which airport is located should be highlighted.	Provide as needed.	×				
G. Location map (general area)		×				
H. Vicinity map (specific airport area)		×				
Remarks						

A.3. Airport Data Sheet

- For smaller airports, some of the ALP sheets may be combined if practical and approved FAA.

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	×			
B. Wind Rose (all weather and IFR) with appropriate airport reference code and runway orientation depicted, crosswind coverage, and combined coverage, source of wind information and time period covered (for IFR runways applicable minimums should be included):	Assembly and analysis of wind data to determine ultimate runway orientation and also provides the operational impact of winds on existing runways. If instrument procedures are present or will be requested then both all-weather and instrument meteorological condition wind roses are required. See AC 150/5300-13A, Appendix 2.	×			
1. 10.5, 13, 16, 20 knots wind rose (based on appropriate airport reference code)	When a runway orientation provides less than 95 percent wind coverage for any aircraft forecasted to use the airport on a regular basis, a crosswind runway is recommended. The 95 percent wind coverage is computed on the basis of the crosswind not exceeding 10.5 knots for Airport Reference Codes A-I and B-I, 13 knots for Airport Reference Codes A-II and B-II, 16 knots for Airport Reference Codes A-III, B-III, and C-I through D-III, and 20 knots for Airport Reference Codes A-IV through D-VI. See also AC 150/5300-13A, Paragraph 302(c)(3) and AC 150/5300-13A, Appendix 2.	×			
2. Percentage of wind coverage/crosswind		×			
3. Source of data	Wind data may be obtained from NOAA at http://www.ncdc.noaa.gov/ Reference AC 150/5300-13A, Appendix 2, Paragraph A2-5 and A2-6.	×			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
4. Age of data (last 10 consecutive years of data with most current data no older than 10 years)	Data must be from the latest 10-year period from the reporting station closest to the airport. Reference AC 150/5300-13A, Appendix 2, Paragraph A2-5.	×			
C. Airport Data Table		×			
1. ARC for Airport	List the Airport Reference Code (ARC) for airport. 5300-13AARC is an airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. Reference AC 150/5300-13A.	×			
2. Mean maximum temperature of hottest month	List the mean maximum temperature and the hottest month for the airport location as listed in "Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree-Days" (Climatography of the United States No. 81). See AC 150/5325-4, 506.b.	×			
3. Airport elevation (highest point of the landing areas, nearest 0.1 foot) – using North American Vertical Datum of 1988 (NAVD88)	List the Airport Elevation, the highest point on an airport's usable runway expressed in feet above mean sea level (MSL). Use NAVD88. Reference AC 150/5300-13A, Paragraph 102(g) All elevations shall be in NAVD88. A note shall be put on the Airport Layout Drawing that denotes that the NAVD88 vertical control datum was used.	×			
4. Airport Navigational Aids, including ownership (NDB, TVOR, ASR, Beacon, etc.)	List the electronic aids available at the airport.	×			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
5. Airport reference point coordinates, nearest second (existing, future if appropriate, and ultimate) - NAD83	List the Airport Reference Point, the latitude and longitude of the approximate center of the airport. Use the North American Datum of 1983 (NAD83) coordinate system. See AC 150/5300-13A, Paragraph 207. All latitude/longitude coordinates shall be in NAD83. A note shall be put on the Airport Layout Drawing that denotes that the NAD83 coordinate system was used.	×			
6. Miscellaneous facilities (taxiway lighting, lighted wind cone(s), AWOS, etc.) [Including type/model and any facility critical areas]	List any other facilities available at the airport.	×			
7. Airport Reference Code and Critical Aircraft (existing & future)	List the existing and ultimate Airport Reference Code and Critical Aircraft, the most demanding aircraft identified in the forecast that will use the airport. Federally funded projects require that critical design airplanes have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes. See AC 150/5325-4, 102.a.(8) and AC 150/5070-6, 702.a. Indicated dimensions for wingspan and undercarriage, along with approach speed.	×			
8. Airport magnetic variation, date and source	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, "Flight Procedures and Airspace." Chapter 2, Section 5, for further information.	×			
9. NPIAS service level (GA, RL, P, CS, etc.)	See FAA Order 5090.3C.	×			

Airport Data Sheet					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
10. State equivalent service role	As applicable pursuant to State Aviation Department System Plan.	×			
D. Runway Data Table	The Runway Data Table should show information for both existing and ultimate runways.	×			
1. Runway identification (Include identifying runways that are "utility")	A column for each runway end should be present. List the runway end number and if pavement strength is less than 12,500 pounds (single-wheel), then note as utility.	×			
2. Runway Design Code (RDC)	5300-13AThe first component, depicted by a letter, is the AAC and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristics); whichever is more restrictive. The third component relates to the visibility minimums expressed by RVR values in feet of 1200, 1600, 2400, and 4000. List the RDC for each runway. See AC 150/5300-13A, Paragraph 105(c).	×			
3. Runway Reference Code (RRC)	The RRC describes the current operational capabilities of a runway where no special operating procedures are necessary. Like the RDC, it is composed of three components: AAC, ADG, and visibility minimums. List the RRC for each Runway. See AC 150/5300-13A, Paragraph 318.	×			
4. Pavement Strength & Material Type	Indicate the runway surface material type, e.g., turf, asphalt, concrete, water, etc.	×			
a. Strength by wheel loading	List the existing and ultimate design strength of the landing surface. See AC 150/5320-6, Chapter 3.	×			
b. Strength by PCN	See AC 150/5335-5.	×			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
c. Surface treatment	Note any surface treatment: grooved, PFC, etc.	×			
5. Effective Runway Gradient (%) Author to note maximum grade within runway length. Note to included statement that the runway meets line of sight requirements	List the maximum longitudinal grade of each runway centerline. See AC 150/5300-13A, Paragraph 313.	×			
6. Percent (%) Wind Coverage (each runway)	List the percent wind coverage for each runway for each Aircraft Approach Category. See AC 150/5300-13A, Appendix 2.				
7. Runway dimensions (length and width)	Dimensions determined for the Critical Design Aircraft by using graphical information in AC 150/5325-4.	×			
8. Displaced Threshold	Provide the pavement elevation of the runway pavement at any displaced threshold. See AC 150/5300-13A, Paragraph 303(2).	×			
9. Runway safety area dimensions (actual existing and design standard)	List the existing and ultimate dimensions of the Runway Safety Area (RSA). See AC 150/5300-13A, Paragraph 307.	×			
10. Runway end coordinates (NAD83) (include displaced threshold coordinates, if applicable) to the nearest 0.01 second and 0.1 foot of elevation.	Show the latitude and longitude of the threshold center and end of pavement (if different) to the nearest .01 of a second and 0.1 foot of elevation.	×			
11. Runway lighting type (LIRL, MIRL, HIRL)	List the existing and ultimate type of runway lighting system for each runway, e.g., Reflectors, Low Intensity Runway Lighting (LIRL), Medium Intensity Runway Lighting (MIRL), or High Intensity Runway Lighting (HIRL). LIRLs will typically not be shown for new systems. See AC 150/5340-30, Ch. 2.	×			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
12. Runway Protection Zone (RPZ) Dimensions	List the existing and ultimate Runway Protection Zone (RPZ) dimensions. See AC 150/5300-13A, Paragraph 310. Prior to including new or modified land use in the RPZ, the Regional and ADO staff must consult with the National Airport Planning and Environmental Division, APP-400. This policy is exempt from existing land uses in the RPZ. See AC 150/5300-13A, Paragraph 310 and FAA memorandum dated September 27, 2012.	×			
13. Runway marking type (visual or basic, non-precision, precision)	Indicate the existing and ultimate pavement markings for each runway. See AC 150/5340-1, Section 2.	×			
14. 14 CFR Part 77 approach category (50:1; 34:1; 20:1) Existing and Future	List the existing and ultimate approach surface slope. See FAA Order 7400.2, Figures 6-6-3 and 6-3-9.	×			
15. Approach Type (precision, non-precision, visual)	List the existing and ultimate Part 77 Approach Use Types. See FAA Order 7400.2, Figures 6-6-3 and 6-3-9.	×			
16. Visibility minimums (existing and future)	List the existing and ultimate visibility minimums for each runway. See AC 150/5300-13A, Table 1-3.	×			
17. Type of Aeronautical Survey Required for Approach (Vertically Guided, not Vert. Guided)	List the type of aeronautical survey required for the visibility minimums given. See AC 150/5300-18, Section 2.7 and AC 150/5300-13A, Table 3-4 and Table 3-5.	×			
18. Runway Departure Surface (Yes or N/A)"	Determine applicability of 40:1 Departure Obstacle Clearance Surface (OCS) as defined in Paragraph 303(c) of AC 150/5300-13A.	×			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
19. Runway Object Free Area	List the existing and ultimate dimensions of the Runway Object Free Area (OFA). See AC 150/5300-13A, Paragraph 309. Objects non-essential for air navigation or aircraft ground maneuvering purposes must not be placed in the ROFA, unless a modification to standard has been approved.	×			
20. Obstacle Free Zone	The OFZ clearing standard precludes aircraft and other object penetrations, except for frangible NAVAIDs that need to be located in the OFZ because of their function. Modification to standards does not apply to the OFZ. List the Runway OFZ, Inner-approach OFZ, Inner-transitional OFZ, and Precision OFZ if applicable.	×			
21. Threshold siting surface (TSS)	List the existing and ultimate threshold siting surface (i.e. approach and departure surfaces). Identify any objects penetrating the surface. If none, state “No TSS Penetrations”. Reference AC 150/5300-13A, Paragraph 303.	×			
22. Visual and instrument NAVAIDs (Localizer, GS, PAPI, etc.)	List the existing and ultimate visual navigational aids serving each runway.	×			
23. Touchdown Zone Elevation	List the highest runway centerline elevation in the existing and ultimate first 3000 feet from landing threshold. See FAA Order 8260.3, Appendix 1.	×			
23. Taxiway and Taxilane width	List the existing and ultimate width of the taxiways and taxilane. Reference AC 150/5300-13A, Paragraph 403 and Table 4-2.	×			
24. Taxiway and Taxilane Safety Area dimensions	List the existing and ultimate taxiway and taxilane safety area dimensions. Reference AC 150/5300-13A, Paragraph 404(c) and Table 4-1.	×			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
25. Taxiway and Taxilane Object Free Area	List the existing and ultimate taxiway and taxilane object free area dimensions. Reference AC 150/5300-13A, Paragraph 404(b) and Table 4-1.	×			
26. Taxiway and Taxilane Separation	List any objects located inside the Taxiway/Taxilane Safety Area and Taxiway/Taxilane Object Free Area. Also provide the distance from the taxiway/taxilane centerline to the fixed or movable object. Reference Paragraph 404(a) and Table 4-1.	×			
27. Taxiway/Taxilane lighting	List the existing and ultimate type of taxiway lighting system, e.g., Reflectors, Low Intensity Taxiway Lighting (LITL), Medium Intensity Taxiway Lighting (MITL), or High Intensity Taxiway Lighting (HITL). LITLs will typically not be shown for new systems. See AC 150/5340-30, Chapter 4.	×			
28. Identify the vertical and horizontal datum	All latitude/longitude coordinates shall be in North American Datum of 1983 (NAD 83). A note shall be put on the Airport Layout Drawing that denotes that the NAD 83 coordinate system was used. All elevations shall be NAVD88. A note shall be put on the Airport Layout Drawing that denotes that the NAVD88 vertical control datum was used.	×			
E. Modification to Standards Approval Table (if applicable, a separate written request, including justification, should accompany the modification to standards). Show: Approval Date/ Airspace Case No. / Standard to be Modified / Description	Provide a table to list all FAA approved Modifications to Standards. See AC 150/5300-13A, Paragraph 106(b), and FAA Order 5300.1. List “None Required” on the table if no Modifications have yet been proposed or approved.	×			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
F. Declared Distances Table	Required even if Declared Distances are not in effect. Declared distances are only to be used for runways with turbine-powered aircraft. The TORA, TODA, ASDA, and LDA will be equal to the runway length in cases where a runway does not have displaced thresholds, stopways, or clearways, and have standard RSAs, ROFAs, RPZs, and TSS. Reference AC 150/5300-13A, Paragraph 323.	×			
1. Take Off Run Available (TORA)	List the runway length declared available and suitable for the ground run of an airplane taking off, i.e., Take Off Run Available (TORA). The TORA may be reduced such that it ends prior to the runway to resolve incompatible land uses in the departure RPZ, and/or to mitigate environmental effects. Reference AC 150/5300-13A, Paragraph 323(d)(1).	×			
2. Take Off Distance Available (TODA)	List the length of remaining runway or clearway (CWY) beyond the far end of the TORA ADDED TO the TORA. The resulting sum is the Take Off Distance Available (TODA) for the runway. The TODA may be reduced to mitigate penetrations to the 40:1 instrument departure surface, if applicable. The TODA may also extend beyond the runway end through the use of a clearway Reference AC 150/5300-13A, Paragraph 323(d)(2).	×			
3. Accelerate Stop Distance Available (ASDA)	5300-13A List the length the length of runway plus stopway (if any) declared available and suitable for satisfying accelerate-stop distance requirements for a rejected takeoff. Additional RSA and ROFA can be obtained by reducing the ASDA. Reference AC 150/5300-13A, Paragraph 323(d)(3).	×			

Airport Data Sheet					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
4. Landing Distance Available (LDA)	5300-13A List the length of runway declared available and suitable for satisfying landing distance requirements. The LDA may be reduced to satisfy the approach RPZ, RSA, and ROFA requirements. Reference AC 150/5300-13A, Paragraph 323(e).	×			
G. Legend	Provide a Legend that identifies all symbols and line types used on the drawing. Lines must be clear and readable with sufficient scale and quality to discern details.		×		

Remarks

B.4. Wind data uses latest data available when originally ordered for the Master Plan Update (i.e., 2017).
D.23-27. All taxiway data contained in the Taxiway Data Block.
G. Legends provided on each individual sheet.

A.4. Airport Layout Plan Drawing

- For smaller airports, some of the ALP sheets may be combined if practical and approved by FAA.
- Two, or more, sheets may be necessary for clarity, existing and proposed. The reviewer should be able to differentiate between existing, future, and ultimate development. If clarity is an issue, some features of this drawing may be placed in tabular format. North should be pointed towards the top of the page or to the left. (scale 1”=200’ to 1”=600’)

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	×			
B. Space for the FAA approval stamp	Leave a blank four-inch by four-inch area for the FAA approval stamp.	×			
C. Layout of existing and proposed facilities and features:	To assure full consideration of future airport development in 14 CFR Part 77 studies, airport owners must have their plans on file with the FAA. The necessary plan data includes, as a minimum, planned runway end coordinates, elevation, and type of approach for any new runway or runway extension. See AC 150/5300-13A, Paragraph 106.	×			
1. True and magnetic North arrow with year of magnetic declination	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, "Flight Procedures and Airspace." Chapter 2, Section 5, for further information.	×			
2. Airport reference point – locate by symbol a Lat./Long. To nearest second (existing, future, and ultimate) NAD 83	List the Airport Reference Point, the latitude and longitude of the approximate center of the airport. Use the NAD 83 coordinate system. See AC 150/5300-13A, Paragraph 207.	×			
3. Wind cones, segmented circle, beacon, AWOS, etc.	Show as applicable pursuant to AC 150/5300-13A, Chapter 6.	×			×

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
4. Contours (showing only significant terrain differences)	Topography, budget, and future uses of the base mapping, will dictate what intervals of topographical contours to use on the maps. Topographic issues may be important in the alternatives analysis, which may require that reduced contour intervals be used. See AC 150/5070-6, 1005.	×			
5. Elevations: All NAVD88	All latitude/longitude coordinates shall be in NAD83/NAVD88.	×			
a. Runway – existing, future, and ultimate ends (nearest 0.1 ft.)	Show the latitude and longitude of the threshold center and end of pavement.				
b. Touchdown Zone Elevation (highest point in first 3,000 ft. of runway)	List the highest runway centerline elevation in the existing and ultimate first 3000 feet from landing threshold. See FAA Order 8260.3, Appendix 1.				
c. Runway high/low points (existing and future)	For all runways identify high and low points (centerline) and provide elevation information.				
d. Label runway/runway intersection elevations	Label the pavement elevation of runway intersections where the centerlines cross.	×			
e. Displaced Thresholds (if any)	Label the pavement elevation and coordinates of the runway pavement at any displaced threshold. See AC 150/5300-13A, Paragraph 303(a)(2).	×			
f. Roadways & Railroads (where they intersect Approach surfaces, the extended runway centerline, and at the most critical points)	Provide elevation information for the traverse ways' centerline elevation where they intersect the Part 77 Approach surfaces (existing and ultimate). Note whether this elevation is the actual elevation or the traverseway elevation plus the traverseway adjustment (23' for railways, 17' for interstate highways, 15' for other public roads, or 10' for private roads). See also 14 CFR Part 77.	×			

Airport Layout Plan Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
g. Structures, Buildings, and Facilities	All buildings on the Airport Layout Drawing should be identified by an alphanumeric character. List these identifiers in a table and give a description of the building. If no Terminal Area drawing is done, also include the top of structure elevation in MSL. If any of the structures violate any airport or approach surfaces give an ultimate disposition to remedy the violation. Don't forget navigation aid shelters, AWOS/ASOS, RVRs, PAPIs, Fueling systems, REILs, etc. Also identify the structure use (hangar, FBO, crew quarters, etc.), as needed. Some lesser objects may be identified by symbols in the legend.				
h. Define features to include: trees streams, water bodies, etc.	Provide information and delineate trees, streams, water bodies, etc., on or near airport property and approach surfaces.	×			
6. Runway Details					
a. Runway Design – runway length, runway width, shoulder width, blast pad width, blast pad length, and cross wind component. (existing, future, and ultimate)	AC 150/5325-4 describes procedures for establishing the appropriate runway length. AC 150/5300-13A, Table 3-4 and Table 3-5 provides the minimum runway length. AC 150/5300-13A, Table 3-8 provides the standard dimensions of the runway width, shoulder width, blast pad width, blast pad length, and crosswind component based on RDC. Clearly denote the runway numbers at the thresholds. Show location of existing and future threshold lights.	×			
b. Orientation – true bearing to nearest 0.01 second (and runway numbers)	Show the true bearing to the nearest .01 of a degree of the runway centerline.	×			

Airport Layout Plan Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
c. End Coordinates – existing, future, and ultimate degrees, minutes, seconds (to the nearest 0.01 second)	Show the latitude and longitude of the threshold center and end of pavement (if different) to the nearest .01 of a second.	×			
d. Runway Safety Areas (RSA) – actual, existing, future, and ultimate (including dimensions)	Show the extents of the existing and ultimate RSA 5300-13A. Reference AC 150/5300-13A, Paragraph 307.	×			
e. Runway Object Free Areas (ROFA)	Show the extents of the existing and ultimate ROFA. Reference AC 150/5300-13A, Paragraph 309.	×			
f. Precision Obstacle Free Zone (POFZ)	Show the extents of the existing and ultimate POFZ. Reference AC 150/5300-13A, Paragraph 308(d).				
g. Obstacle Free Zone (OFZ)	Show the extents of the existing and ultimate OFZ. Reference AC 150/5300-13A, Paragraph 308.	×			
h. Clearways and Stopways	Show any/all clearways and stopways/overruns and the markings used to denote these areas. See AC 150/5300-13A, Paragraph 311 and 312; and AC 150/5340-1, Section 2, Paragraph 14.			×	
i. Runway Protection Zone (RPZ) - Dimensions (existing, future, and ultimate)	Show existing and ultimate RPZ. See AC 150/5300-13A, Paragraph 310. Show the existing and ultimate protective area/zone type of ownership. Identify any incompatible objects and activities inside the RPZ. Prior to including new or modified land use in the RPZ, the Regional and ADO staff must consult with the National Airport Planning and Environmental Division, APP-400. This policy is exempt from existing land uses in the RPZ. See AC 150/5300-13A, Paragraph 310 and FAA memorandum dated September 27, 2012.	×			

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
j. 14 CFR Part 77 Approach Surfaces	Show the portion of the existing and ultimate approach surfaces that are over airport and adjacent property and identify the approach surface dimensions and slope. See FAA Order 7400.2, Figure 6-3-9.	×			
k. Threshold Siting Criteria: Approach/Departure Surface (existing, future, and ultimate) 5300-13A	Determine and identify pursuant to AC 150/5300-13A, Paragraph 303(b) and 303(c).	×			
l. Terminal Instrument Procedures (TERPS)surface and TERPS GQS, if applicable.	Determine and identify pursuant to AC 150/5300-13A, Paragraph 303(a)(4)(a), Table 3-4, and Table 3-5. Reference FAA Order 8260.3.	×			
m. Navigation Aids (NAVAIDS) – PAPI, ILS, GS, LOC, ALS, MALSR, REIL, etc., (plus facility critical area's)	Show all NAVAIDS and provide clearance distances from runways, taxiways, etc. Reference AC 150/5300-13A, Chapter 6.	×			
n. Marking – thresholds, hold lines, etc.	Show on the runway the type and location of markings, existing and ultimate. See AC 150/5340-1, Section 2.	×			
o. Displaced threshold coordinates and elevation	Show the latitude, longitude, and the pavement elevation of the runway pavement at any displaced threshold. See AC 150/5300-13A, Paragraph 303(a)(2).5300-13A.	×			
p. Runway centerline separation distances	Show the runway centerline separation distances to parallel runway centerline, holding position, parallel taxiway/taxilane centerline, aircraft parking area, and helicopter touchdown pad, if applicable. Reference AC 150/5300-13A, Paragraph 321 and Table 3-8.	×			
7. Taxiway Details	Show the taxiway centerline separation distances to parallel taxiway/taxilane centerlines, fixed or movable objects.	×			

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
a. Dimensions – width (existing & ultimate)	Taxiway width based on Taxiway Design Group (TDG). See AC 150/5300-13A, Table 4-2.	×			
b. Taxiway Edge Safety Margin (TESM)	TESM dimension based on TDG. See AC 150/5300-13A, Table 4-2.	×			
c. Taxiway Shoulder Width	Taxiway shoulder width based on TDG. See AC 150/5300-13A, Table 4-2.	×			
b. Taxiway/Taxilane Object Free Area (TOFA)	TOFA width based on Taxiway Design Group (TDG). TOFA extend the entire length of taxiway. See AC 150/5300-13A, Table 4-1.	×			
c. Taxiway/Taxilane Safety Area (TSA)	TSA width based on TDG. TSA extend the entire length of taxiway. See AC 150/5300-13A, Table 4-1.	×			
d. Taxiway/Taxilane Centerline Separation from:		×			
i. Runway centerline	Show the distance from centerline of runway to centerline of taxiway. See AC 150/5300-13A, Table 4-1.	×			
ii. Parallel taxiway	Show the distance from centerline of taxiway to centerline of parallel taxiway. See AC 150/5300-13A, Table 4-1.			×	
iii. Aircraft parking	Show the distance from centerline of taxiway to marked aircraft parking/tie downs. See AC 150/5300-13A, Table 4-1.	×			
iv. Fixed or Movable Objects	Show the distance from centerline of taxiway to airport objects such as buildings, facilities, poles, etc. See AC 150/5300-13A, Table 4-1.	×			
8. Fences (identify height)	Show the location of existing and ultimate fences and identify height.	×			

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
9. Aprons					
a. Dimensions (square footage, dimension, or length and width)	Include dimensions of apron and distance from runway and taxiway centerlines. Apron should be sized using activity forecast and the apron design spreadsheet. See AC 150/5300-13A, Chapter 5 and FAA Engineering Brief No. 75.	×			
b. Identify aircraft tie-down layout	Show proposed tie-down layout on the apron area. See AC 150/5300-13A, Figure A5-1, AC 20-35, and AC 150/5340-1.	×			
c. Identify Special Use Areas (e.g., deicing or aerial application areas on or near apron)	Show as applicable and pursuant to representative ACs.			×	
10. Roads	Label all roads.	×			
11. Legend	Provide a Legend that identifies all symbols and line types used on the drawing. Lines must be clear and readable with sufficient scale and quality to discern details.	×			
12. Items to be identified with distinct line types	Use distinct line types to identify different items and differentiate between existing and ultimate.				
a. NAVAID Critical Areas (Glide Slope, Localizer, AWOS, ASOS, VOR, RVR, etc.)	Show the critical area outline for all Instrument Landing System and other electronic Navigational Aids located on the airport. See AC 150/5300-13A, Chapter 6 for general guidance and FAA Order 5750.16 for critical area dimensions.	×			
b. Building Restriction Lines 5300-13A(BRL)	The BRL is the line indicating where airport buildings must not be located, limiting building proximity to aircraft movement areas. See AC 150/5300-13A, Paragraph 213(a).	×			
c. Runway Visibility Zone (RVZ)	Show the RVZ for the existing and ultimate airport configurations. See AC 150/5300-13A, 305(c).			×	

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
d. Airport Property Lines and Easements (existing, future, and ultimate)	Show the airport property boundaries, including easements, for the existing and ultimate airport configurations.	×			
13. Survey Documentation		×			
a. Survey Monuments (PACS/SACS, see AC 150/5300-16)	Show the location of all established survey monuments located on or near the airport property. Identify Primary and Secondary Airport Control Stations (PACS/SACS) if they exist. See AC 150/5300-16. Show the location of all section corners on or near the airport property.	×			
b. Offsets, stations, etc.	Show as applicable.			×	
14. Any Air Traffic Control Tower (ATCT) line of sight/shadow study areas (use separate sheet if necessary)	Reference FAA Order 6480.4.			×	
15. General Aviation development area (e.g., fuel facilities, FBO, hangars, etc.) – greater detail can be shown on the terminal area drawing	Show as applicable.	×			
16. Facilities and movement areas that are to be phased out, if any, are described	Show as applicable.	×			

Remarks

6.a. Runway Shoulder Width listed in Runway Data Table on Data Sheet
6.k. Departure Surfaces provided in the Departure Surface Drawing.
7.b., c., b., c. Taxiway details listed in Taxiway Data Table on Data Sheet.
7.d.iii., iv Taxiway details illustrated on Terminal Area Plan.
9.a., b. Apron details illustrated on Terminal Area Plan.

A.5. Airport Airspace Drawing

- A required drawing.
- Scale 1" = 2000' plan view, 1" = 1000' approach profiles, 1"=100' (vertical) for approach profiles.
- 14 CFR Part 77, Objects Affecting Navigable Airspace, defines this as a drawing depicting obstacle identification surfaces for the full extent of all airport development. It should also depict airspace obstructions for the portions of the surfaces excluded from the Inner Portion of the Approach Surface Drawing.

Airport Airspace Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Block	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	×			
B. Plan view (based on ultimate runway lengths) Include location of water or sewage facilities if inside horizontal surface.					
1. U.S. Geological Survey (USGS) Quad Sheet for base map	Use the most current USGS Quadrangle(s) as a base map for the airspace drawing.	×			
2. Runway end numbers	Show the ultimate runways and runway numbers. Contact the FAA before renumbering existing runways.	×			
3. Part 77 Surfaces (Horizontal, Conical, Transition, based on ultimate). Including elevations at the point where surfaces change.	Show the extents of the Part 77 imaginary surfaces. For airports that have precision approach runways show balance of the 40,000' approach on a second sheet, if necessary. See 14 CFR Part 77.19.	×			
4. 50' elevation contours on sloping surfaces (NAVD88)	Show contour lines on all sloping Part 77 imaginary surfaces. See 14 CFR Part 77.19.	×			
5. Top elevations of penetrating objects for the inner portion of the approach surface drawing	Identify by unique alphanumeric symbol all objects beyond the Runway Protection Zones that penetrate any of the Part 77 surfaces. See 14 CFR Part 77.	×			
6. Note specifying height restriction (ordinances/statutes)	List any local zoning restrictions that are in place to protect the airport and surrounding airspace. See AC 150/5190-4.	×			

Airport Airspace Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
7. North Arrow with magnetic declination and year	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, "Flight Procedures and Airspace." Chapter 2, Section 5, for further information.	×			
C. Profile view					
1. Airport Elevation	List the Airport Elevation, the highest point on an airport's usable runway expressed in feet above mean sea level (MSL). Use NAVD88 datum. See AC 150/5300-13A, Chapter 1, Paragraph 102(g).	×			
2. Composite Ground Profile along extended Runway Centerline (Representing the composite profile, based on the highest terrain across the width and along the length of the approach surface)	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.	×			
3. Significant objects (bluffs, rivers, roads, schools, towers, etc.) and elevations	Identify all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions. Use the objects' same alphanumeric identifier that was used on the plan view. Identify the top elevations of all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions.	×			
4. Existing, future, and ultimate runway ends and approach slopes	Show existing and ultimate runway ends and FAR Part 77 approach surface slopes. See 14 CFR Part 77.19.	×			

Airport Airspace Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
D. Obstruction Data Tables (identify obstacles not depicted on the Inner Portion of the Approach Surface Drawing)					
1. Object identification number	Identify all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions. Use the objects alphanumeric identifier that was used on the plan view.	×			
	Identify the top elevations of all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions.				
2. Description	Provide a brief description of the object, e.g., Power Pole, Cell Tower, Natural Gas Flare, etc.	×			
3. Date of Obstruction Survey	Provide the date of latest obstruction survey.	×			
4. Ground Surface Elevation	Provide the ground surface elevation (MSL) at the base of each object.	×			
5. Object Elevation	List the above ground level (AGL) height and the top of object elevation (above mean sea level / AMSL / MSL) for each object.	×			
6. Amount of surface penetration	List the surface that is penetrated and the amount the object protrudes above the surface. See 14 CFR Part 77.	×			
7. Proposed or existing disposition of the obstruction	Provide a proposed or existing disposition of the object to remedy the penetration. See AC 70/7460-1.	×			
a. Proposed Disposition (existing)					
b. Proposed Disposition (future)					

Airport Airspace Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
Remarks D.1-7. Approximately 5,650 objects identified as Part 77 obstructions – too numerous to provide on tables. Ground and tree obstructions outside of approach surfaces and beyond airport property identified with hatches. Off-airport trees within approach surfaces and on-airport trees within Part 77 surfaces identified as "To Be Removed".					

A.6. Inner Portion of the Approach Surface Drawing

- A required drawing.
- Scale 1"=200' Horizontal, 1"=20' Vertical, two sheets may be necessary for clarity. Typically, the plan view is on the top half of the drawing and the profile view is on the bottom half. Views should be drawn from the runway threshold to a point on the approach slope 100 feet above the runway threshold elevation, at a minimum, or the limits of the RPZ, whichever is further.
- Drawings containing the plan and profile view of the inner portion of the approach surface to the runway and a tabular listing of all surface penetrations. The drawing will depict the obstacle identification approach surfaces contained in 14 CFR Part 77, Objects Affecting Navigable Airspace. The drawing may also depict other surfaces, including the threshold-siting surface, Glideslope Qualification Surface (GQS), those surfaces associated with United States Standards for Instrument Procedures (TERPS), or those required by the local FAA office or state agency. The extent of the approach surface and the number of airspace obstructions shown may restrict each sheet to only one runway end or approach.

Inner Portion of the Approach Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Block	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	×			
B. Plan View (existing, future, and ultimate)					
1. Inner portion of approach surface	Show the area from the runway threshold out to where the ultimate approach surface slope is 100 feet above the threshold elevation.	×			
2. Aerial photo for base map	Use an aerial photograph for the base map.	×			
3. Objects (identified by numbers)	Identify all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions using an alphanumeric character.	×			
4. Property line within approaches	Show the property lines that are within the area/portion of airport shown.	×			

Inner Portion of the Approach Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
5. Road & railroad elevations, plus movable object heights	Provide elevation information for the traverse ways' centerline elevation where they intersect the Part 77 Approach surfaces (existing and ultimate). Note whether this elevation is the actual elevation or the traverse way elevation plus the traverse way adjustment (23' for railways, 17' for interstate highways, 15' for other public roads, or 10' for private roads). See also 14 CFR Part 77.	×			
6. Part 77 Approach Surface clearance over Roads and Railroads at the most critical points, the Centerline and Edge of the surface.	Provide elevation information for the traverse ways where they intersect the edges and centerline of the Part 77 Approach surfaces (existing and ultimate). Note whether this elevation is the actual elevation or the traverseway elevation plus the traverseway adjustment (23' for railways, 17' for interstate highways, 15' for other public roads, or 10' for private roads). See also 14 CFR Part 77.	×			
7. Physical end of runway, end number, elevation (NAVD88) Nearest 0.1 foot	Show the existing and ultimate runway end, runway number, and the elevation of the threshold center.	×			
8. Airport Design Surfaces					
a. Runway Safety Area	Show the extents of the existing and ultimate Runway Safety Area (RSA). See AC 150/5300-13A, Paragraph 307 and Table 3-8.	×			
b. Runway Object Free Area	Show the extents of the existing and ultimate Object Free Area (OFA). See AC 150/5300-13A, Paragraph 309 and Table 3-8.	×			
c. Runway Obstacle Free Zone (OFZ)	Show the extents of the existing and ultimate OFZ which includes the inner-approach OFZ, inner-transitional OFZ, and the Precision OFZ (POFZ), if applicable. See AC 150/5300-13A, Paragraph 308.	×			

Inner Portion of the Approach Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
d. Runway Protection Zone (RPZ)	Show the extents of the existing and ultimate RPZ. Prior to including new or modified land use in the RPZ, the Regional and ADO staff must consult with the National Airport Planning and Environmental Division, APP-400. This policy is exempt from existing land uses in the RPZ. See AC 150/5300-13A, Paragraph 310, Table 3-5 and FAA memorandum dated September 27, 2012.	×			
e. NAVAID critical area	Show the critical area outline for all Instrument Landing System and other electronic Navigational Aids located on the airport. See AC 150/5300-13A, Chapter 6 for general guidance and FAA Order 5750.16 for critical area dimensions.	×			
9. Ground contours	Show ground contour lines in 2', 5', or 10' intervals. Topographic issues may be important in the alternatives analysis, which may require that reduced contour intervals be used. See AC 150/5070-6, Paragraph 1005.	×			
10. North arrow with magnetic declination and year	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, Chapter 2, Section 5, for further information.	×			
C. Profile view		×			
1. Existing and proposed runway centerline ground profile (list elevations at runway ends & at all points of grade changes) (representing the composite profile based on the highest terrain across the width and along the length of the approach surface)	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 to where the ultimate approach surface slope is 100 feet above the threshold elevation. A more effective presentation may be a rendering of a composite critical profile.	×			

Inner Portion of the Approach Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
2. Future development from plan view	Identify future development using same alphanumeric identifier that was used on the plan view.	×			
3. Part 77 Approach/transition surface; existing and future VASI/PAPI siting surface	Show the boundaries of the existing and ultimate Part 77 Approach Surface. See FAA Order 7400.2, Figure 6-3-9, See also 14 CFR Part 77.	×			
4. Threshold Siting Surface	Depict any applicable siting requirements pursuant to Table 3-2 of FAA AC 150/5300-13A.	×			
5. Terrain in approach area (fences, streams, etc.)	Show all significant terrain(fences, streams, mountains, etc.) within the approach surfaces, regardless of whether or not they are obstructions	×			
6. Objects – identify the controlling object (same numbers as plan view)	Show all significant objects (roads, rivers, railroads, towers, sign and power poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions. Identify the objects using same alphanumeric identifier that was used on the plan view.	×			
7. Cross section of road & railroad	Show the cross-section of any roads and/or railroads that cross the area shown. Indicate cross section elevations of roads and railroads at edges and extended centerlines that cross the area shown.	×			
8. Existing and proposed property and easement lines	Show the airport property boundaries, including easements, for the existing and ultimate airport configurations. AC 5300-13A Note easements for pipelines and residential through the fence gateways.	×			
D. Obstruction tables for each approach surface (surface should be identified)	A separate table for each runway end must be used to enhance information clarity.				
1. Object identification number	List each object by the same alphanumeric symbol used in the plan view.	×			

Inner Portion of the Approach Surface Drawing

Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
2. Description	Provide a brief description of the object, e.g., Power Pole, Cell Tower, Natural Gas Flare, etc.	×			
3. Date of Obstruction Survey and Survey Accuracy	Provide the date of latest obstruction survey.	×			
4. Surface Penetrations	5300-13A For any object that penetrates the Part 77 surface, the approach surface, or the obstacle free zone, describe the vertical length the object protrudes.	×			
5. Proposed disposition of surface penetrations	Provide a proposed disposition of the object to remedy the penetration as described in item 4 above. See AC 70/7460-1 for Part 77 violations. “Removal” and/or “Lower” should be listed for any Airports safety area/zone violations. See AC 150/5300-13A, Paragraph 303 and 308.	×			
6. Object elevation	List the Above Ground Level (AGL) height and the top of object elevation in MSL for each object.	×			
7. Triggering Event (e.g., a runway extension) – Timeframe/expected date for removal	List the surface that is penetrated and the amount the object protrudes above the surface. See 14 CFR Part 77 and AC 150/5300-13A, Paragraphs 303 and 308.			×	
8. Allowable approach surface elevation (if applicable)		×			
9. Amount of approach surface penetration (if applicable)		×			
10. Proposed disposition of approach surface obstruction (if applicable)	Provide a proposed disposition of the object to remedy the penetration. See AC 70/7460-1 for Part 77 violations. “Removal” and/or “Lower” should be listed for any Airports safety area/zone violations. See AC 150/5300-13A, Paragraph 303.	×			

Inner Portion of the Approach Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
11. Obstacle Free Zone (OFZ)	Determine and depict the applicable OFZ surfaces, see AC 150/5300-13A, Paragraph 308. Provide a proposed disposition of the object to remedy the penetration. Note: Modification to the OFZ standard is not permitted.	×			
E. Runway Centerline Profile	This may be shown on the Inner Portion of the Approach Surface drawing if there is space to show the runway and Runway Safety Area in sufficient detail otherwise a separate sheet may be necessary. At a minimum this drawing is to show the full length of the runway and Runway Safety Area including: runway elevations, runway and Runway Safety Area gradients, all vertical curves, and a line representing the 5' line-of-sight. See AC 150/5300-13A, Paragraph 305.	×			
1. Scale	The vertical scale of this drawing must be able to show the separation of the runway surface and the 5' Line-of-Sight line. See AC 150/5300-13A, Paragraph 305.	×			
2. Elevation	Show runway elevations, runway and Runway Safety Area gradients, and all vertical curve data. See AC 150/5300-13A, Paragraph 318.	×			
3. Line of Sight	The vertical scale of this drawing must be able to show the separation of the runway surface and the 5' Line-of-Sight line. See AC 150/5300-13A, Section 305.	×			

Remarks

D. Because of the amount of obstructions, obstruction data tables included on Sheet 9, "Approach Obstruction Tables."

E. Runway centerline profile illustrated on Sheet 5, "Airport Airspace Profiles."

A.7. Runway Departure Surface Drawing

- Required where applicable. For each runway that is designated for instrument departures.
- This drawing depicts the applicable departure surfaces as defined in Paragraph 303 of FAA AC 150/5300-13A. The surfaces are shown for runway end(s) designated for instrument departures.
- 40:1 for Instrument Procedure Runways (Scale, 1” = 1000’ Horizontal, 1” = 100’ Vertical, Out to 10,200’ beyond Runway threshold) 62.5:1 for Commercial Service Runways (Scale, 1” = 2000’ Horizontal, 1” = 100’ Vertical, Out to 50,000’ beyond Runway threshold).
- Contact the FAA if the scale does not allow the entire area to fit on a single sheet. The depiction of the One Engine Inoperative (OEI) surface is optional; it is not currently required.

Runway Departure Surface Drawing

Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
A. Title and Revision Blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	×			
B. Plan view (existing & future)	See AC 150/5300-13A, Paragraph 303(c).				
1. Aerial Photo for base map	Use an aerial photograph for the base map. A USGS 7.5 minute series map is also acceptable.		×		
2. Runway end numbers and elevations (nearest 1/10 of a foot)	Show the existing and ultimate runway end, runway number, and the elevation of the threshold center. For runways that have a clearway, depict this surface and the relocated departure surface. Reference AC 150/5300-13A, Paragraph 303(c)(1).	×			
3. 50’ elevation contours on sloping surfaces (NAVD88)	Show contour lines on the Part 77 imaginary surfaces. See 14 CFR Part 77.19.	×			
4. Depict property line, including easements	Show the property line(s) that are within the area/portion of airport shown.	×			
5. Identify, by numbers, all traverse ways with elevations and computed vertical clearance in the departure surface	Identify all significant objects (roads, rivers, railroads, towers, poles, etc.) within the departure surfaces, regardless of whether or not they are obstructions using unique alphanumeric characters.	×			

Runway Departure Surface Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
6. Ground contours	Show ground contour lines in 2', 5', or 10' intervals. Topographic issues may be important in the alternatives analysis, which may require that reduced contour intervals be used.	×			
C. Profile view (existing & future)					
1. Ground profile	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 departure surface to extents of the surface dimensions.	×			
2. Significant objects (bluffs, rivers, roads, buildings, fences, structures, etc.)	Show all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions using an alphanumeric character.	×			
3. Identify obstructions with numbers on the plan view	Identify the objects using same alphanumeric identifier that was used on the plan view.	×			
4. Show roads and railroads with dashed lines at edge of the departure surface	Show the cross-section of any roads and/or railroads that cross the area shown.	×			
D. Obstruction Data Tables					
1. Object identification number	Identify all significant objects (roads, rivers, railroads, towers, poles, etc.) within the departure surfaces, regardless of whether or not they are obstructions using unique alphanumeric characters. List each object by the same alphanumeric symbol used in the plan view.	×			
2. Description	Provide a brief description of the object, e.g., Power Pole, Cell Tower, Tree, Natural Gas Flare, etc.	×			
3. Object Elevation	List the Above Ground Level (AGL) height and the top of object elevation in MSL for each object.	×			

Runway Departure Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
4. Amount of surface penetration	List the object protrudes above the departure surface. See AC 150/5300-13A, Paragraph 303(c).	×			
5. Proposed or existing disposition of the obstruction	Provide a proposed disposition of the object to remedy the penetration. See AC 150/5300-13A, Paragraph 303(c).	×			
6. Separate table for each departure surface	A separate table for each runway end must be used to enhance information clarity.	×			

Remarks

B.1 USGS quad sheets used for base map as aerial photographs do not extend to full length of departure surfaces.

A.8. Terminal Area Drawing

- Scale 1"=50' or 1"=100'. Plan view of aprons, buildings, hangars, parking lots, roads.
- This plan consists of one or more drawings that present a large-scale depiction of areas with significant terminal facility development. Such a drawing is typically an enlargement of a portion of the ALP. At a commercial service airport, the drawing would include the passenger terminal area, but might also include general aviation facilities and cargo facilities. See AC 150/5300-13A, Appendix 5.
- Use scale that allows the extent of the terminal/FBO apron area to best fit the chosen sheet size, e.g., typical GA airports may be able to use 1"=50' scale on a 22" X 34" sheet, but a complex hub airport with multiple terminal areas may require a 1"=100' scale on a 36" X 48" sheet. Contact FAA if an airport layout requires scaling or sheet sizing other than what is listed.
- This drawing is not needed at every airport type and is therefore optional.

Terminal Area Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	×			
B. Building data table	All buildings on the Airport Layout Drawing should be identified by an alphanumeric character. List these identifiers in a table and give a description of the building. If no Terminal Area drawing is done, also include the top of structure elevation in MSL.				
1. Structure identification number		×			
2. Top elevation of structures (AMSL)		×			
3. Obstruction marking/lighting (existing/future)	Show the location of existing and ultimate hangars. Include dimensions of apron and distance from runway and taxiway centerlines. See AC 150/5300-13A, Appendix 5. Show the elevation of the highest point of each structure.	×		×	
C. Buildings to be removed or relocated noted	If any of the structures violate any airport or approach surfaces give an ultimate disposition to remedy the violation.	×			
D. Fueling facilities, existing and future	Show the location of existing and ultimate fueling facilities. Include dimensions of apron and distance from runway and taxiway centerlines.	×			

Terminal Area Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
E. Air carrier gates positions shown (existing/future)	Show the existing and ultimate air carrier gate positions. See AC 150/5300-13A, Chapter 5.			×	
F. Existing and future security fencing with gates	Show the existing and ultimate security fencing and gates. See AC 150/5300-13A, Paragraph 606.	×			
G. Building restriction line (BRL)	Show the Building Restriction Line (BRL) that is within the area/portion of airport shown. The BRL identifies suitable building area locations on airports. This should be located where the Part 77 surfaces are at 35' above the airport elevation unless a different height is coordinated with the FAA. See AC 150/5300-13A, Paragraph 213(a).	×			
H. Taxiway or Taxilane centerlines designated	Show centerlines of all taxiway and taxilanes within the area/portion of airport shown.	×			
I. Dimensions					
1. Clearance Dimensions between runway, taxiway, and taxilane centerlines and hangars, buildings, aircraft parking, and other objects.	Show the location of existing and ultimate apron. Include dimensions of apron and distance from runway and taxiway centerlines. Apron should be sized using activity forecast and the apron design spreadsheet. See AC 150/5300-13A, Chapter 5 and FAA Engineering Brief No. 75.	×			
2. Dimensions of aprons, taxiways, etc. Apron/Hangar areas that do not meet dimensional standards of the critical aircraft should be identified and the wingspan/design group of the aircraft that can use that area depicted. Include tie down location with clearances	Show the dimensions between existing and ultimate runway, taxiway, and taxilane centerlines and existing and ultimate hangars, buildings, aircraft parking, and other fixed or movable objects. See AC 150/5300-13A, Chapter 3 and Chapter 4. Show proposed tie-down layout on the apron area as well as taxilane marking plan. See AC 150/5300-13A, Appendix 5, AC 20-35, and AC 150/5340-1.	×			
J. Property Line	Show the property line(s) that are within the area/portion of airport shown.	×			

Terminal Area Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
K. Auto parking (existing & ultimate)	Show the existing and ultimate auto parking areas. See AC 150/5300-13A, Appendix 5.	×			
L. Major airport drainage ditches or storm sewers	Show any significant airport drainage ditches or storm sewers within the area/portion of airport shown.			×	
M. Special Use Area (e.g., Agricultural spraying support, Deicing, or Containment)	Show any special use areas within the area/portion of airport shown.			×	
N. North Arrow with magnetic declination and year	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, "Flight Procedures and Airspace." Chapter 2, Section 5, for further information.	×			
O. Fence	Show the existing and ultimate perimeter fencing or general area fencing.	×			
P. Entrance Road	Show the existing and ultimate entrance road. See 5300-13AFAA Order 5100.38, Chapter 6, Section 2.	×			
Remarks					

A.9. Land Use Drawing

- Scale 1”=200’ to 1”=600’.
- A drawing depicting on- and off-airport land uses and zoning in the area around the airport. At a minimum, the drawing must contain land within the 65 DNL noise contour. For medium or high activity commercial service airports, on-airport land use and off-airport land use may be on separate drawings. The Airport Layout Drawing should be used as a base map.
- Drawing optional. Need based on scope of work.

Land Use Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	×			
B. Airport boundaries/property, existing & future (fee and easement)	Show the existing and ultimate property lines. If known, show property lines for parcels surrounding the airport.	×			
C. Plan view of land uses by category (Agricultural, Aeronautical, Commercial, Residential, etc.). Use local land use categories.					
1. On-Airport (existing & future)	Label existing and ultimate on-airport property by usage, e.g., Terminal Area, Air Cargo, Public Ramp, Airfield - Movement, Airfield - Non-movement, etc. Include existing and future airport features (e.g., runways, taxiways, aprons, safety areas/zones, terminal buildings and navigational aids).	×			
2. Off-Airport (existing & future) [to the 65 DNL Contour at a minimum, if contour known]	Label existing and ultimate off-airport property by usage and zoning, e.g., Agricultural, Industrial, Residential, Commercial, etc.	×			
D. Boundaries of local government	List any local zoning restrictions that are in place to protect the airport and surrounding airspace. See AC 150/5190-4.	×			
E. Land use legend	Provide a legend that identifies all symbols and line types used on the drawing. Lines must be clear and readable with sufficient scale and quality to discern details.	×			

Land Use Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
F. Public facilities (schools, hospitals, parks, churches etc.)	Identify public facilities, e.g., schools, parks, etc.	×			
G. Runway visibility zone for intersecting runways	Show the Runway Visibility Zone(s) for the existing and ultimate airport configurations. See AC 150/5300-13A, Section 305.			×	
H. Show off-airport property out to 65 DNL if available	Label existing and ultimate off-airport property by usage and zoning, e.g., Agricultural, Industrial, Residential, Commercial, etc.	×			
I. Airport Overlay Zoning or Zoning Restrictions	List any local zoning restrictions that are in place to protect the airport and surrounding airspace. See AC 150/5190-4.	×			
J. North arrow with magnetic declination and year	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, "Flight Procedures and Airspace." Chapter 2, Section 5, for further information.	×			
K. Drawing details to include runways, taxiways, aprons, RPZ, terminal buildings and NAVAIDS	Show existing and future airport features (e.g., runways, taxiways, aprons, safety areas/zones, terminal buildings and navigational aids, etc.). See AC 150/5300-13A.	×			
L. Crop Restrictions	Show the Crop Restriction Line (CRL). See AC 150/5300-13A, Paragraph 322 and AC 150/5200-33.			×	
Remarks					

A.10. Airport Property Map / Exhibit A

- Scale 1”=200’ to 1”=600’.

Airport Property Map / Exhibit A					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Will Property Map serve as Exhibit A? – **If YES,** follow the directions to the right. – **If NO,** go to item B below.	If prepared in accordance with AC 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects, use ARP SOP no. 3.00 Exhibit A guidance instead of below checklist.	×			
If Property Map *will not* serve as Exhibit A:					
B. Title and Revision Blocks					
C. Plan view showing parcels of land (existing, future, and ultimate)					
1. Fee land interests (existing and future)					
2. Easement interests (existing and future)					
a. Part 77 protection					
b. Compatible Land Use					
c. RPZ protection					
3. Airport Property Line					
D. Legend – shading/cross hatching, survey monuments, etc.					
E. Data Table					
1. Depiction of various tracts of land acquired to develop airport	If any obligations were incurred as a result of obtaining property, or an interest therein, they should be noted. Obligations that stem from Federal grant or an FAA-administered land transfer program, such as surplus property programs, should also be noted. The drawing should also depict easements beyond the airport boundary.				

Airport Property Map / Exhibit A					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
2. Method of acquisition or property status (fee simple, easement, etc.)					
3. Type of Acquisition Indicated	(e.g., AIP-noise, AIP-entitlement, PFC, surplus property, local purchase, local donation, condemnation, other)				
4. Acreage					
F. Access point(s) for through-the-fence arrangements including residential					
Remarks					

APPENDIX B - AIRPORT ENVIRONMENTAL REVIEW

This environmental review section is not intended to satisfy environmental clearance requirements outlined in FAA Order 1050.1F, *Environmental Impacts and Procedures*, nor is it intended to fulfill requirements of the National Environmental Policy Act (NEPA). NEPA requires an action involving federal funding or permit approval to undergo an environmental analysis that evaluates and documents the action's proposed impacts to the environment.

ENVIRONMENTAL OVERVIEW

The Environmental Overview provides an initial review of environmental resources that are known to occur on or near an airport. The intent of the preliminary review is to assist in the avoidance and minimization of environmental effects throughout the airport master planning process. Environmental overview conditions were assessed primarily through research of existing studies and documents, agency database searches, local inquiry, and with limited field investigation and agency coordination. The following review is not intended to satisfy the requirements of NEPA, and the need for a formal NEPA review will be determined on a project-by-project basis by environmental specialists at the Seattle Airports District Office. The overview analysis includes these environmental categories:

- Air Quality
- Biological Resources
- Climate
- Coastal Resources
- Construction Impacts
- Department of Transportation Act, Section 4(f)
- Farmlands and Soils
- Hazardous Materials, Pollution Prevention, and Solid Waste
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise-Compatible Land Use
- Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks
- Light Emissions and Visual Impacts
- Water Resources

Table B-1 describes data sources, including links, used in this Airport Environmental Review.

Table B-1: Description of Data Sources

Source	Description
Federal	
Environmental Protection Agency (EPA): National Ambient Air Quality Standards (NAAQS)	The Clean Air Act requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment.
Environmental Protection Agency: SIP Status Report: Status of Washington Designated Areas	State Designated Area Reports describe the status of a state's submissions and EPA actions on those submissions.
US Department of Agriculture: Natural Resources Conversion Service: Web Soil Survey	Web Soils Survey provides soil data and information produced by the National Cooperative Soil Survey.
National Wild and Scenic Rivers System	The National Wild and Scenic Rivers systems preserves certain rivers with outstanding natural, cultural, and recreational values in free-flowing condition.
US Census Bureau: Small Area Income and Poverty Estimates (SAIPE)	The SAIPE Program produces estimates of median household incomes for states and counties, and poverty for states, counties, and school districts.
US Census Bureau: Population Estimates Program	Population Estimates Program uses current data on births, deaths, and migration to calculate population change.
US Fish and Wildlife Service (USFWS): Information Planning and Consultation (IPaC)	IPaC offers the ability to obtain an informal list of endangered species, critical habitat, migratory birds, wildlife refuges, and wetlands under the USFWS jurisdiction that are known or expected to be on or near the project area.
US Geological Survey: National Water Information System National Wetlands Inventory (NWI)	NWI produces and provides information on the characteristics, extent, and status of the Nation's wetlands and deep-water habitats and other wildlife habitats.
State	
Washington Department of Fish & Wildlife: Priority Habitats and Species (PHS)	Provides basic information about the known location of PHS in Washington State.
Washington Information System of Architectural & Archeological Records Data (WISAARD)	WISAARD is the state's digital repository for architectural and archaeological resources and reports.
Washington Department of Ecology: WA Coastal Zone Management	WA Coastal Zone Management Program meets the national interests of protecting, restoring, and responsibly developing the state's marine shorelines.
Washington Department of Ecology: Coastal Atlas, Flood Hazards Areas	Provides access to flood hazard maps to determine the flood risk to homes or businesses.
Washington Department of Ecology: Facility/Site Database	Facility/Site Database and map search tool includes information on State cleanup sites; Federal Superfund cleanup sites, Hazardous waste generators.

AIR QUALITY

An air quality analysis generally applies to projects that, due to their size, scope, or location, have the potential to change or diminish air quality standards. These standards, governed by the Clean Air Act of 1970 (CAA) and the Environmental Protection Agency (EPA), are known as National Ambient Air Quality Standards (NAAQS).

EPA standards address six pollutants known as *criteria air pollutants:* carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), and two types of particulate matter (PM_{10} and $PM_{2.5}$). Federal regulations require states to define areas for NAAQS as *attainment, non-attainment,* or *maintenance* areas. Areas defined as attainment meet NAAQS; non-attainment and maintenance areas have concentrations of pollutants that exceed NAAQS. States develop an EPA-approved State Implementation Plan (SIP) to address air quality and identify a plan to bring non-attainment and maintenance areas into compliance. Compliance with NAAQS means that ambient outdoor levels of defined air pollutants are safe for human health and the environment.

The EPA *Green Book of Nonattainment Areas for Criteria Pollutants* and the Washington State Department of Ecology *Status of Washington Designated Areas* indicate that PSC is considered to be in attainment for all criteria air pollutants, which is in compliance with NAAQS.

BIOLOGICAL RESOURCES (THREATENED AND ENDANGERED SPECIES)

Section 7(a)(2) of the Federal Endangered Species Act (ESA) requires the FAA ensure that a proposed action does not jeopardize the continued existence of any endangered or threatened species or adversely affect its habitat. Project sponsors who seek federal agency approvals or funding must coordinate with the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) concerning listed or candidate species.

USFWS identifies federally listed threatened, endangered, or candidate species or their critical habitats known to occur on or near PSC. Based on data obtained from USFWS Environmental Conservation Online System (ECOS), the following species have the potential to occur on or near PSC: yellow-billed cuckoo (*Coccyzus americanus*); bull trout (*Salvelinus confluentus*); white bluffs bladderpod (*Physaria douglasii* ssp. *tuplashensis*); gray wolf (*Canis lupis*); and, Columbia basin pygmy rabbit (*Brachylagus idahoensis*).

A search of the USFWS Information for Planning and Consultation (IPaC) database indicates that the gray wolf, yellow-billed cuckoo, and bull trout may be found in Franklin County. However, there are no critical habitats located on airport property.

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) report identifies PSC property as part of a regular concentration area for black-tailed jackrabbit (*Lepus californicus*) and burrowing owl (*Athene cunicularia*). PSC is listed as a breeding area for the burrowing owl and greater sage-grouse (*Centrocercus urophasianus*).

CLIMATE

The Council on Environmental Quality (CEQ) has indicated that global climate change should be considered in a NEPA analysis. However, CEQ states that, "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand." Scientific research is ongoing to better understand climate change, but any increased concentrations of greenhouse gases (GHGs) in the atmosphere can affect global climate change. GHGs are defined as including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Air analyses performed to support NEPA compliance will identify the extent to which GHGs could be produced during construction and operation of proposed master plan projects. The air quality analyses will occur as part of formal environmental analysis undertaken to comply with NEPA.

COASTAL RESOURCES

The Coastal Zone Management Act established the Federal Coastal Zone Management Program to encourage and assist states in preparing and implementing management programs to “preserve, protect, develop, and where possible, to restore or enhance the resources of the nation’s coastal zones.” PSC is not located in a coastal zone management area.

CONSTRUCTION IMPACTS

FAA Advisory Circular (AC) 150/5370-10, Standards for Specifying Construction of Airports, contains provisions to minimize impacts to air quality, water quality, and soil erosion associated with projects. The AC directs that construction and demolition debris be disposed of according to applicable state and federal criteria.

The construction of proposed master plan projects can cause temporary impacts associated with construction noise, air quality, traffic impacts on local roads, and the use and storage of fuel to operate construction vehicles and equipment. Best management practices are available to avoid or reduce temporary construction impacts. Potential construction impacts will be considered in forthcoming environmental analyses performed in accordance with NEPA.

DEPARTMENT OF TRANSPORTATION SECTION 4(F) PROPERTIES

Section 4(f) provides that the Secretary of Transportation “may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance, only if there is no feasible and prudent alternative to using that land and the program or project includes all possible planning to minimize harm resulting from the use.” The U.S. Department of Transportation Act – Section 4(f) protects certain properties from use for DOT projects unless the FAA determines there is no feasible and prudent alternative.

No Section 4(f) properties are known to be present on or near PSC. The nearest Section 4(f) property to PSC is the Sun Willows Golf Course located south of PSC.

FARMLANDS AND SOILS

The Farmland Protection Policy Act (FPPA) was enacted to minimize the extent to which federal actions and programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. The FPPA classified farmland as prime farmland, unique farmland, or farmland of statewide or local importance. Prime farmland has the best combination of physical and chemical characteristics for producing food, forage, fiber, and oilseed crops. Unique farmland is land other than prime farmland used to produce specific high-value food and fiber crops such as citrus, tree nuts, olives, cranberries, fruits, and vegetables. Farmland of statewide or local importance includes soils that do not meet prime farmland criteria, but economically produce high yields of crops when treated and managed. A federal action that may result in conversion of farmland to non-agricultural use requires coordination with the U.S. Department of Agriculture Natural Resource Conservation Services (NRCS).

The NRCS online web soil survey system was used to identify soil types on the airport and adjacent property. Mapping and table details regarding the mapped soils within PSC are contained within the USDA/NRCS Soil Report. Airport soils are listed below in **Table B-2**.

Table B-2: Airport Soils

Soil Type	Percentage of Area of Interest (AOI)	Farmland Classification
Quincy loamy fine sand, 0 to 15 percent slopes	70.1%	Farmland of statewide importance
Urban land-Torripsamments complex, gently rolling	13.2%	Not prime farmland
Winchester loamy coarse sand, 2 to 5 percent slopes	8.1%	Not prime farmland
Royal loamy fine sand, 0 to 10 percent slopes	4.3%	Farmland of statewide importance
Novark silt loam, 2 to 5 percent slopes	1.5%	Prime farmland if irrigated
Quincy loamy fine sand, 15 to 30 percent slopes	1.0%	Not prime farmland

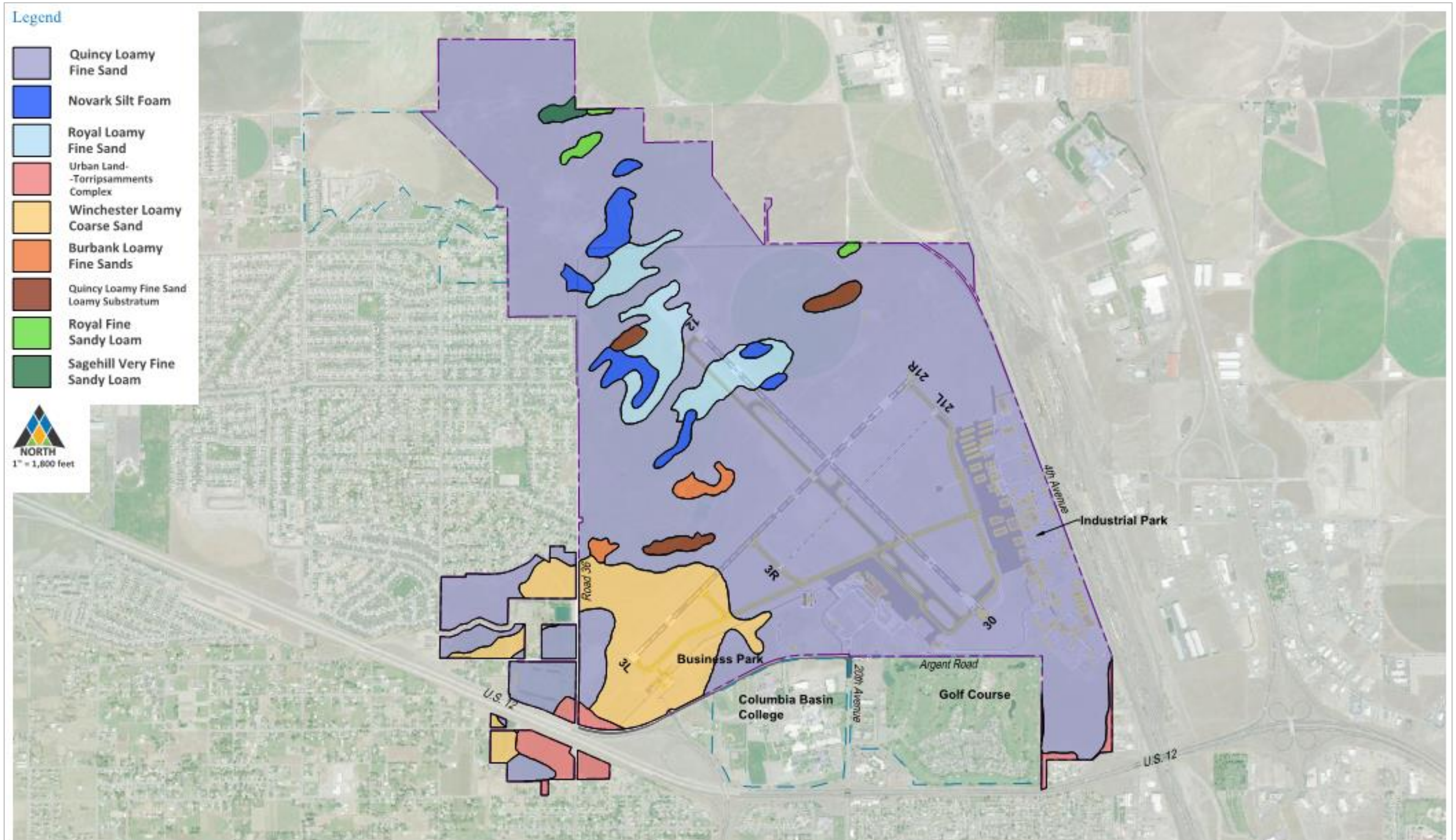
Quincy loamy fine sand, loamy substratum, 0 to 10 percent slopes	0.9%	Farmland of statewide importance
Burbank loamy fine sand, 0 to 5 percent slopes	0.7%	Not prime farmland
Royal fine sandy loam, 0 to 2 percent slopes	0.1%	Prime farmland if irrigated
Hezel loamy fine sand, 0 to 15 percent slopes	0.0%	Farmland of statewide importance

Source: USDA, NRCS, Soil Resource Report for Franklin County, WA, August 2018.

According to the NRCS, the Quincy loamy fine sand with 0 to 15 percent slope is the dominant soil type accounting for approximately 70.1 percent of the airport area. This soil type is considered farmland of statewide importance. The soil types and locations are shown on **Figure B-1**.

The sandy soils are non-hydric soils (meaning non-wetland soils) and have a drainage class that falls within the excessively drained category. Vegetation consists of upland grasses, cheat-grass, and crested wheatgrass.

Figure B-1: Soil Data



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HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

Hazardous materials are defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) 42 United States Code (USC) 6901-6992. Hazardous materials include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or the environment.

The two statutes of concern to the FAA are the RCRA, as amended by the Federal Facilities Compliance Act, and the CERCLA, as amended by the Superfund Amendments Reauthorization Act (SARA) and by the Community Environmental Response Facilitation Act. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of release of a hazardous substance, excluding petroleum, into the environment.

Sites of interest are defined as state cleanup sites, federal superfund cleanup sites, hazardous waste generators, solid waste facilities, underground storage tanks, dairies, and enforcement actions. The State of Washington DOE Facility website noted several sites of interest on the airport property listed in **Table B-3**.

Executive Order 12088, *Federal Compliance with Pollution Control Standards,* directs federal agencies to comply with applicable pollution control standards, in the prevention, control, and abatement of environmental pollution. The order also directs federal agencies to consult with the EPA, state, interstate, and local agencies concerning the techniques and methods available for the prevention, control, and abatement of environmental pollution.

Solid waste produced on site from construction operations is to be disposed of in accordance with the Washington Department of Environmental Quality (DEQ).

Table B-3: Sites of Interest on PSC

Facility/Site Name	Facility/Site ID No.	Location	Status: Open/Closed
Astleys Tran	91627192	4302 Swallow Ave	Closed
US DOE BPA Pasco Maintenance HQ	67343615	3404 Swallow Ave Bldg 102	Open
J&D Aircraft Sales LLC	62999486	4218 Stearman Ave	Open
Rd 54 Boat Launch Improvement	8330893	N/A	Open
Road 54 Boat Launch	6861768	4316 N Stearman Ave	Open
HD Supply Waterworks	2094718	645 Lockheed St	Open
Tri City Fuel Association	72629964	Stearman Ave	Closed
Connell Oil	38665323	Pasco Airport Industrial Park	Closed
Pasco Rifle and Pistol Club	22813	602 Dynamics St	Open
Battelle Pacific NW Div Hangar 71	17176	3804 Stearman Ave	Open
Connell Oil Swallow Ave	1329543	3802 Swallow Ave	Open
Truax Harris Energy	3161252	3802 Swallow Ave	Open
Pasco School Dist 1	38161865	3412 Stearman Bldg 210	Open
Pasco Port Dicks U Drive	16491467	Argent Rd & Ave C	Closed
FedEx Express PSC	6593543	1705 W Argent	Closed
WA AGR Franklin 2	34759515	3416 Stearman Ave	Open
Pacific Fruit & Produce	51453993	Bldg 58 N 4th A	Closed
Franklin Co. Pub Works	87115	3414 Stearman Ave	Open
BPA PSC Maintenance Garbage	4776808	3618 Stearman Bldg 69	Open
Bergstrom Aircraft Inc	26669153	Bldg 72 Tri City Airport	Open
Franklin County Highway UST 4391	43564182	Bldg 202 Pasco Airport	Open
Tri Cities Airport	2125987	3601 N 20th Ave	Open
FAA PSC ATCT	25253	3601 N 20th Ave	Open
PSC TRACON	32877413	LAT 46 15 38 N	Open
US DHS TSA Tri Cities	4737143	3601 N 20th Ave	Open
Horizon Air Pasco	65829775	3601 N 20th Ave	Open
AVIS Rent A Car System	61147819	3601 N 20th Ave	Open
Power City Electric Inc	59789184	Bldg 35 Pasco Airport	Open
Delta Air Lines Inc	16766475	Tri Cities Airport	Open
US DOT FAA Pasco	36133324	Pasco Airport Bldg 1 87	Closed
Tri City Water Follies Assoc.	19466487	Bldg 72 Tri Cities Airport	Closed
Sun Mart 34	20730	2305 W Argent Rd	Open

Source: Department of Ecology, State of Washington, Facility/Site Search, September 12, 2018

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Historical, architectural, archaeological, and cultural resources encompass a range of sites, properties, and physical resources associated with human activities, society, and cultural institutions. Federal law requires project sponsors who require federal funds or approvals to consider how their proposed projects would affect historic properties. In accordance with NEPA and Section 106 of the National Historic

Preservation Act (NHPA), the FAA is the federal lead agency for identifying the potential impacts of a proposed project on these resources and consulting with the federally recognized tribes, the State Historic Preservation Office (SHPO), and other agencies as necessary.

Section 106 of the NHPA recommends measures to coordinate federal historic preservation activities and to comment on federal actions affecting historic properties included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). The Archaeological and Historic Preservation Act "provides the survey, recovery, and preservation of significant scientific, prehistorical, historical, archeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally licensed, or federally funded project."

A cultural resources survey and report was conducted for the Tri-Cities Airport East Development Area (12 acres) in August 2017. The goal of the survey was to locate all discoverable sites within, and adjacent to, the Area of Potential Effect (APE) that could have been impacted by proposed development projects. The survey team discovered no prehistoric cultural resources within or adjacent to the 12-acre site. The survey team did not identify any historic sites within the survey area. No pre-contact, historic sites, or isolated finds were identified within the 12-acre site. The survey concluded that the proposed 12-acre East Development project would have "no effect" on any NRHP eligible sites since there were no NRHP sites located in the APE.

Sixteen archaeological and cultural resource surveys were conducted previously within an approximate 1-mile radius of PSC. The survey conducted nearest to the airport property was conducted by Transect Archaeology in 2012 (NADB# 1689507). The 16 surveys did not identify prehistoric or historic sites on the Airport. However, a 2012 cultural and archeological survey completed by Transect Archaeology prior to a 12-acre apron construction project noted the presence of a WWII era bunker outside of the survey's boundary on airport property, confirming the potential for the presence of WWII era historic cultural resources in the vicinity of PSC. This site should be reviewed under a NEPA analysis on a project to project basis.

The Pasco Naval Air Station is located on airport property and identified in the Washington Information System for Architectural and Archaeological Records Database (WISAARD). The station includes: hangars; a link trainer building; an assembly and repair building; supply warehouses; inflammable stores; public works shops; a service station; free gunnery training; a central heating plant; a parachute loft; the firehouse; and the brig. The station is not listed on the NRHP. This environmental overview did not include research or evaluations to determine whether inventoried buildings qualify as eligible for listing in the NRHP. The eligibility of these sites may need to be evaluated with future development.

LAND USE

Compatible land use protects the health, safety, and welfare of those living and working near PSC, while protecting airspace for safe and efficient aircraft operations. Airports that receive federal funds must prevent the development of incompatible uses on land and ensure that proposed airport actions, including the adoption of zoning laws, have 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 activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. Compatible land use will be addressed in the Land Use Chapter.

NATURAL RESOURCES AND ENERGY SUPPLY

Energy or natural resources impacts result from implementation of projects that have a measurable effect or result in significant changes in the use or demand placed on local supplies. Energy requirements associated with an airport usually fall into two categories: demands for stationary facilities and demands for the movement of air and ground vehicles.

FAA guidance states that airport improvement projects not increase the consumption of energy or natural resources to the point of significant impacts, unless it is found that implementation of a project would cause demand to exceed supply. Airport improvement projects may cause increased energy consumption during construction, but increases are expected to be temporary and not significant.

NOISE AND NOISE-COMPATIBLE LAND USE

According to the FAA Order 1050.1F, Desk Reference, Chapter 11, Noise and Noise-Compatible Land Use, “noise” is defined as unwanted sound that may interrupt activities such as sleep, conversation, or student learning. Aviation noise typically comes from the operation of aircraft during departures, arrivals, overflights, taxiing, and engine run-ups.

The Control and Abatement of Aircraft Noise and Sonic Boom Act of 1986 authorizes the FAA to prescribe standards for the measurement of aircraft noise and establish regulations to abate noise. The Noise Control Act of 1972, which amends the Control and Abatement of Aircraft Noise and Sonic Boom Act of 1986, adds consideration of the protection of public health and welfare and adds the EPA to the rulemaking process for aircraft noise and sonic boom standards.

Per FAA Order 1050.1F, projects at airports that experience 90,000 annual piston-powered aircraft operations, 700 annual jet-powered aircraft operations, citing a new airport, runway relocation, runway strengthening, or a major runway expansion require a noise analysis including noise contour maps. PSC meets these criteria. Further noise analysis is included in the Land Use Chapter.

SOCIOECONOMIC, ENVIRONMENTAL JUSTICE, CHILDREN’S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Council on Environmental Quality regulations in 40 CFR, Section 1508, requires environmental documents prepared for federally funded projects to address potential social impacts. The evaluation of a proposed project on the human environment must address the following:

- Disproportionate impacts to low-income and minority populations
- Potential relocation of homes or businesses
- Division or disruption of an established community
- Disruptions to orderly planned development
- Notable project-related changes in employment
- Impacts on health and safety risks to children

Socioeconomic Impacts

Improvements at PSC are not expected to create significant change in population, public service, and economic activity, but are expected to have positive impacts through creation of employment opportunity, business growth, and economic activity. According to a search of the United States Census Bureau Small Area Income and Poverty Estimates database, the poverty level in Franklin County is 14.9 percent. Resource agencies should be coordinated with prior to implementation.

FAA Order 1050.1F states, "If acquisition of real property or displacement of persons is involved, 49 CFR Part 24 (implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), as amended, must be met for federal projects and projects involving federal funding. Otherwise, the FAA, to the fullest extent possible, observes all state and local laws, regulations, and ordinances concerning zoning, transportation, economic development, housing, etc. when planning, assessing, or implementing the proposed action or alternative(s)."

Environmental Justice

FAA Order 1050.1F states, "…the FAA must provide for meaningful public involvement by minority and low-income populations. In accordance with DOT Order 5610.2(a), this public involvement must provide an opportunity for minority and low-income populations to provide input on the analysis, including demographic analysis, which identifies and addresses potential impacts on these populations that may be disproportionately high and adverse."

If an impact would affect low-income or minority populations at a disproportionately higher rate, an environmental justice impact is likely. In such cases, the environmental documents are expected to include the following:

- Demographic information about the affected populations

- Information about the population(s) that have an established use for the significantly affected resource, or to whom that resource is important (i.e. subsistence fishing)
- Results of analysis to determine if a low-income or minority population using that resource sustains more of the impact than any other population segments
- Identification of disproportionately affected low-income and minority populations
- Discussion of alternatives that would reduce the effect on those populations
- Description of possible mitigation to reduce the effect on the disproportionately affected low-income and minority populations

The NEPA process requires environmental justice review and impact analysis for airport improvements. According to a search of the United States Census Bureau Population Estimates Program, the percentage of minority populations is 9.9 percent in Franklin County.

Children's Environmental Health and Safety Risks

FAA Order 1050.1F states "Pursuant to Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, Federal agencies are directed, as appropriate and consistent with the agency's mission, to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. The FAA is encouraged to identify and assess environmental health risks and safety risks that the agency has reason to believe could disproportionately affect children. Environmental health risks and safety risks include risks to health or safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to."

McGee Elementary School is located approximately 0.25 miles from PSC property. According to a search of the United States Census Bureau Population Estimates Program database, the percentage of children under 18 is 22.6 percent in Franklin County.

LIGHT EMISSIONS AND VISUAL IMPACTS

FAA Order 1050.1F defines light emissions as light that emanates from a light source into the surrounding environment (i.e. airfield and apron flood lighting, NAVAIDs, terminal lighting, parking lighting, roadway lighting, safety lighting). Visual resources may include structures or objects that obscure or block other landscape features (i.e. buildings, sites, traditional cultural properties, or other manmade landscape features).

Lighting for aviation security, obstruction identification, and navigation can be considered light emissions. The introduction of a new, or relocation of an existing, airport lighting facility is to be analyzed for effect on residential or other light sensitive land uses. The nearest residential area is located approximately 2,300 feet to the west of the Runway 12 threshold with an unobstructed line of sight. Light emissions and visual impacts should be reviewed under a NEPA analysis on a project to project basis.

WATER RESOURCES

Wetlands

The Clean Water Act (CWA) defines wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Federal regulations require that proposed actions avoid, to the greatest extent possible, long-term and short-term impacts to wetlands, including the destruction and altering of the functions and values of wetlands.

The USFWS National Wetlands Inventory (NWI) online mapping system was reviewed to identify mapped wetlands near PSC. According to the NWI, a freshwater emergent wetland fed by a riverine habitat is located on the southwest side of airport property, as well as a riverine habitat that enters airport property from the north and flows southwest. (See **Figure B-2**)

Floodplains

A floodplain is generally a flat, low-lying area adjacent to a stream or river that is subject to inundation during high flows. The relative elevation of a floodplain determines its frequency of flooding.

Executive Order 11988 requires federal agencies "to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of 100-year floodplains (i.e., areas subject to inundation by a 1 percent annual chance of flood) and to avoid direct or indirect support of floodplain development whenever there is a practical alternative."

The State of Washington Department of Ecology (DOE) Flood Hazard Areas identify floodplains contained within the airport area. Flood Insurance Rate Maps identify the northern airport area in Zone A floodplain with a "High – 1% annual chance" of flood risk.

Surface Waters

Surface water is water that occurs above ground such as a wetland, river, stream or lake. Aside from wetlands (see **Figure B-2**), no surface water resources occur on airport property. The nearest major surface water is the Columbia River, which is located approximately 3 miles south of PSC.

Groundwater

Groundwater is a subsurface water that occupies the space between sand, clay, and rock formations. Aquifers are the geologic layers that store or transmit groundwater to wells, springs and other water sources. The Safe Drinking Water Act and its implementing regulations (40 CFR Parts 141-149) prohibit federal agencies from funding actions that would contaminate an EPA-designated sole source aquifer or its recharge area. State and local agencies may also promulgate regulations to protect sole source aquifers and their recharge areas.

The State of Washington DOE's Environmental Information Management System for groundwater sources lists six monitoring wells on airport property. However, there were no sole source aquifers or recharge areas identified.

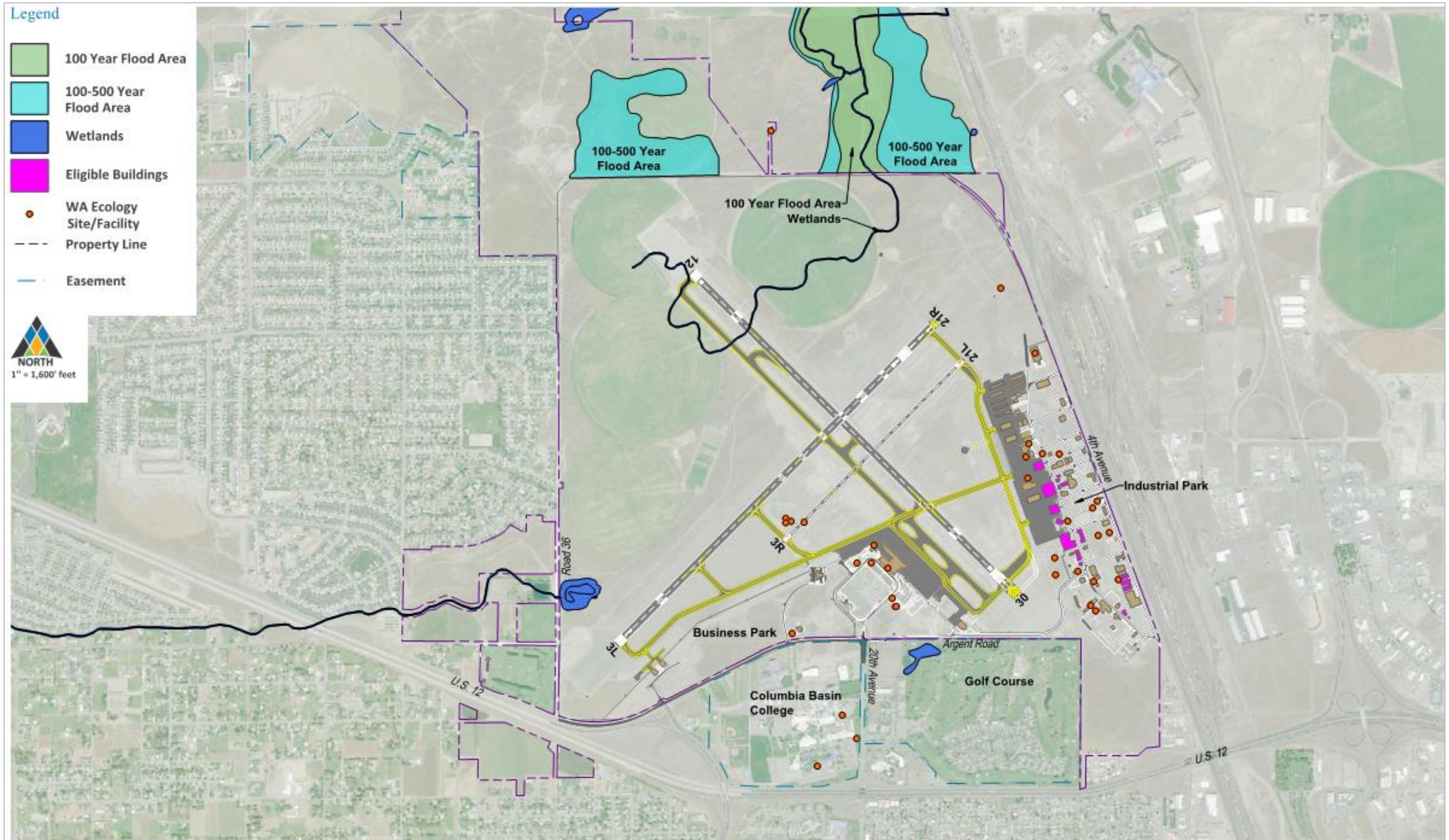
In November 2005, the DOE determined that PSC is exempt from permitting under the General Permit as the airport drains to the underground water table and PSC has not been deemed a significant contributor of pollutants to groundwater.

Wild and Scenic Rivers

Wild rivers are free of obstructions such as canals and dams, and normally so remote as to only be accessible by trail. Scenic rivers are free of obstructions and have undeveloped shorelines but may have road access. Wild and scenic rivers are protected by the 1986 Wild and Scenic Rivers Act. Wild and scenic rivers are managed by the Bureau of Land Management, the National Park Service, the USFWS, and the U.S. Forest Service.

A review of the National Wild and Scenic Rivers System indicated there are no wild and scenic rivers within or around PSC. The nearest wild and scenic river is the Wenaha River in Oregon, which is approximately 67 miles away.

Figure B-2: Environmental Considerations



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SUMMARY

PSC serves a wide variety of general and commercial aviation users. PSC and the FAA continue to invest in aviation facilities to support current and future use of PSC. PSC continues to serve as a link to the NAS. These key airport attributes identified in this Inventory and Environmental Chapter will be assessed and evaluated in further detail:

- Runway Length for Runway 12/30 to meet demands of existing and future critical aircraft
- Future taxiway width requirements for transition from TDG 5 to TDG 3 design group critical aircraft
- Expansion of GA Apron to provide additional tie-down parking
- Evaluation of two existing taxiway and runway intersection hotspots to identify potential solutions

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APPENDIX C - PEAK DEMAND ANALYSIS

Peak demand analysis assesses when airport facilities are at their busiest and is used to determine facility requirements for the passenger terminal, aircraft parking aprons, and runway system. Data inputs include flight records from the Federal Aviation Administration (FAA) Traffic Flow Management System Counts (TFMSC), instrument flight records from data provider FlightWise, airline schedules from data provider DiioMi, and interviews with airport traffic control tower (ATCT) staff.

Peak demand analysis considers the busiest months, days, and hours to determine how demand is spread across time. Some airports experience highly concentrated peaks, with the most annual activity occurring during a single season, whereas others experience more even demand throughout the year. Peak periods are calculated for aircraft takeoffs and landings (called operations) and for passengers boarding (enplanements) and exiting (deplanements) aircraft.

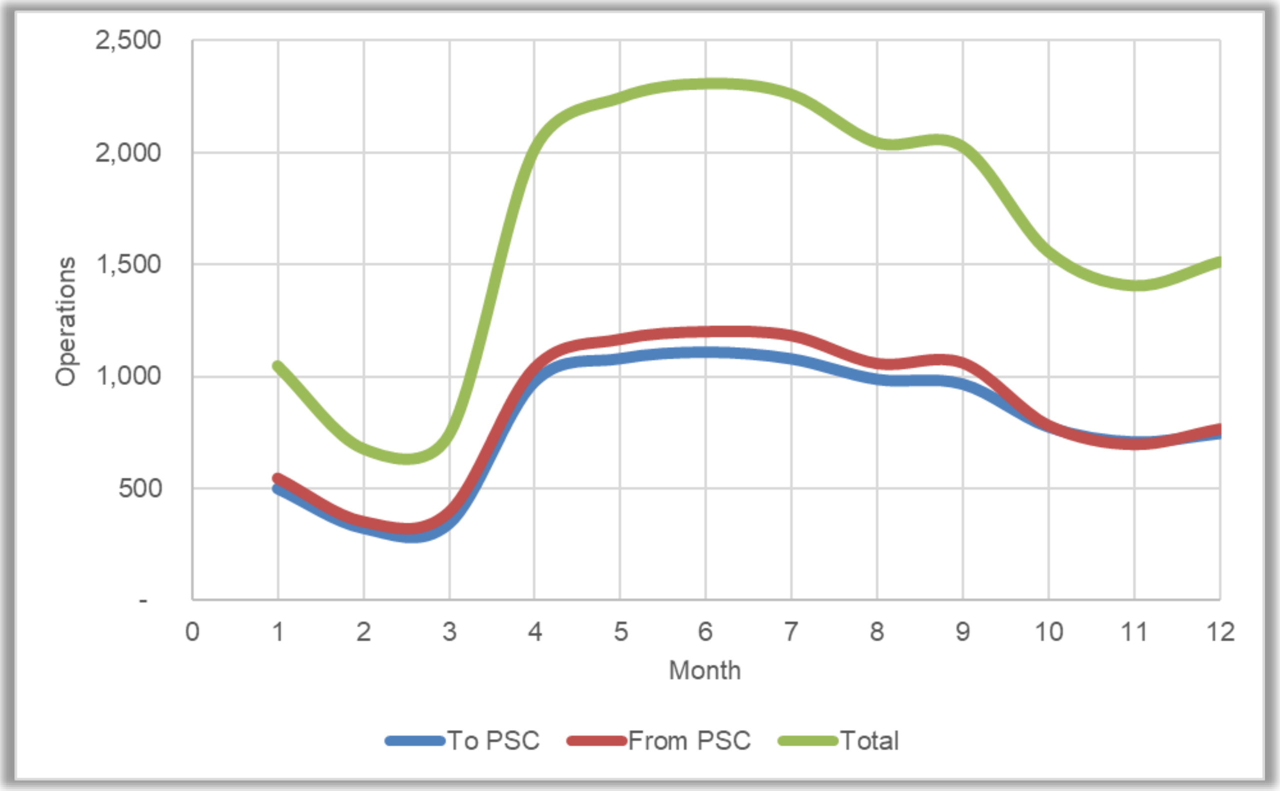
PEAK PERIOD OPERATIONS

Peak period operations consider how busy the runway system is throughout the year. Flight record data from FlightWise returned 19,811 records of arrivals and departures at PSC for FAA fiscal year 2017, which represents 40 percent of the 50,626 operations recorded by the PSC ATCT during the same period. FlightWise records operations that occur when the PSC ATCT is closed; however, it only captures operations that file a flight plan. Flights that occur under visual flight rules (VFR) are not captured and are therefore missing from the dataset. The missing data is estimated by using the following assumptions:

- The ATCT operations records are accurate.
- The ATCT staff indication that most operations occur during the daytime is accurate.
- The operations by larger aircraft, such as those by passenger and cargo airlines and business jets, are likely to include a flight plan and are counted by the data.
- The uncounted VFR operations occur more frequently during the summer months, when the weather is better for flying without reliance on instruments.
- The FlightWise sample size is statistically significant at 40 percent of total operations.
- The percentage of operations calculated using the FlightWise data can be applied to the total number of operations counted by ATCT staff to estimate peak periods of activity for all airport users.
- The analysis performed, in the absence of traffic counts that were not performed, provides a reliable basis for planning decisions. It is recommended that traffic counts be performed prior to implementing capital projects to address capacity challenges.

Peak period analysis begins by determining the busiest month or months of activity at PSC. The data, presented in **Figure C-1**, show two distinctive periods of activity: a busy season lasting from April to September, and a slower season lasting from October to March. There is a small uptick in activity in December and January over the winter holidays; however, this level of activity is less than 70 percent of the activity seen in a summer month.

Figure C-1: Peak Month Operations

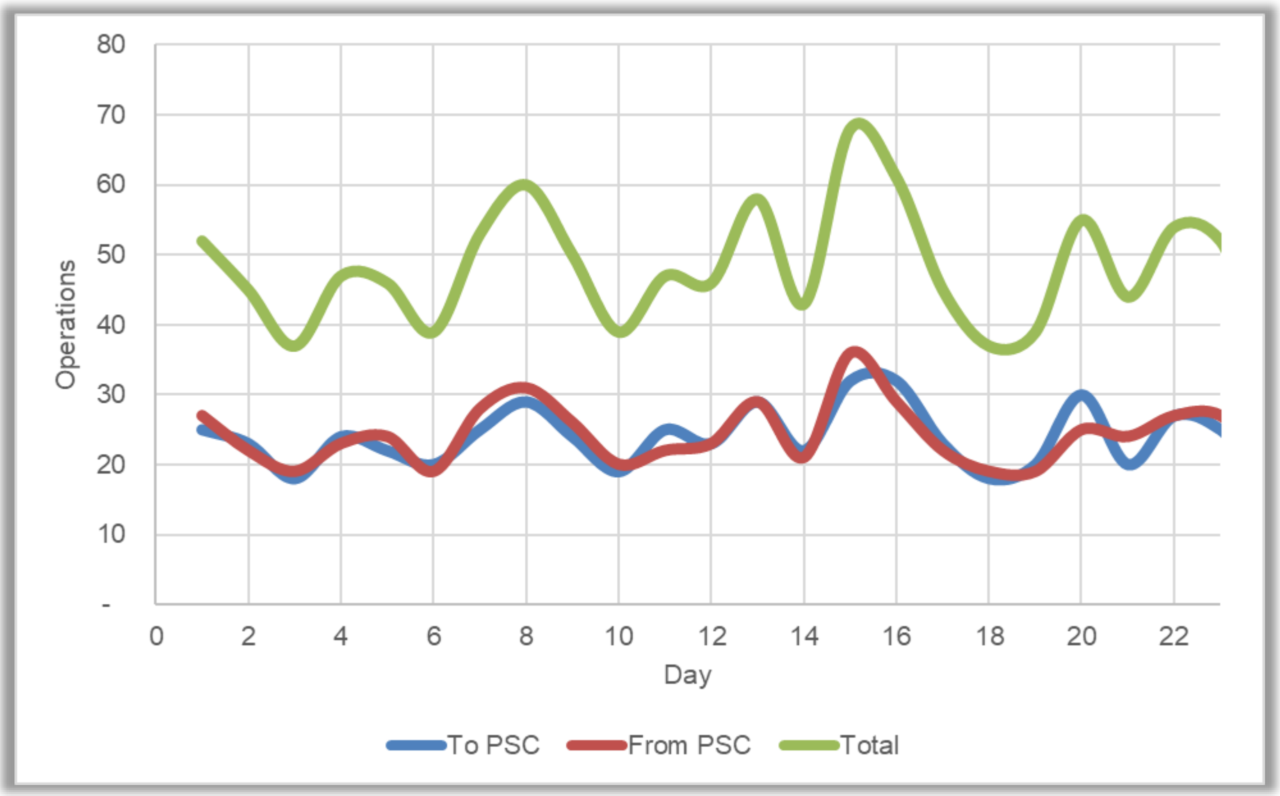


A perfectly distributed schedule, where the same number of operations occur every month of the year, would see 8.3 percent of annual activity in any given month. This scenario provides a metric to illustrate how concentrated an airport's peaks and valleys of activity are. June is the busiest month at PSC with 11.5 percent of annual operations, followed by July with 11.4 percent and May with 11.3 percent. These periods correspond with summer vacations and fewer days of cloudy weather. Airlines increase service to transport vacationers, and pilots have more opportunities to fly for fun under VFR. February is the slowest month with 3.4 percent of annual operations.

The operations distribution shows that PSC sees its highest level of demand last for several months during the summer. Should the facility requirements analysis in **Chapter 3** indicate that PSC faces capacity constraints, improvement projects designed to address this issue will be planned throughout the year.

The peak month analysis leads into peak day analysis. This involves reviewing operations records for every day of the peak month and determining how operations are distributed. Airlines tend to operate more flights during Sundays, Mondays, Wednesdays, and Fridays as these are peak business travel days. Tuesdays, Thursdays, and Saturdays tend to be slower. Low cost carriers, such as Allegiant, Spirit, and Frontier, may not serve a destination daily and tend to cluster their operations to a single day when serving multiple markets. FlightWise data shows that business GA operations are more evenly spread throughout the week; however, there are peaks in line with the airline demand. Recreational GA operations occur more frequently over the weekends. Flight training, which occurs at PSC on occasion, occurs throughout the week. Peak day data comes from FlightWise, and analysis for the month of June is shown in **Figure C-2**.

Figure C-2: Peak Day Operations

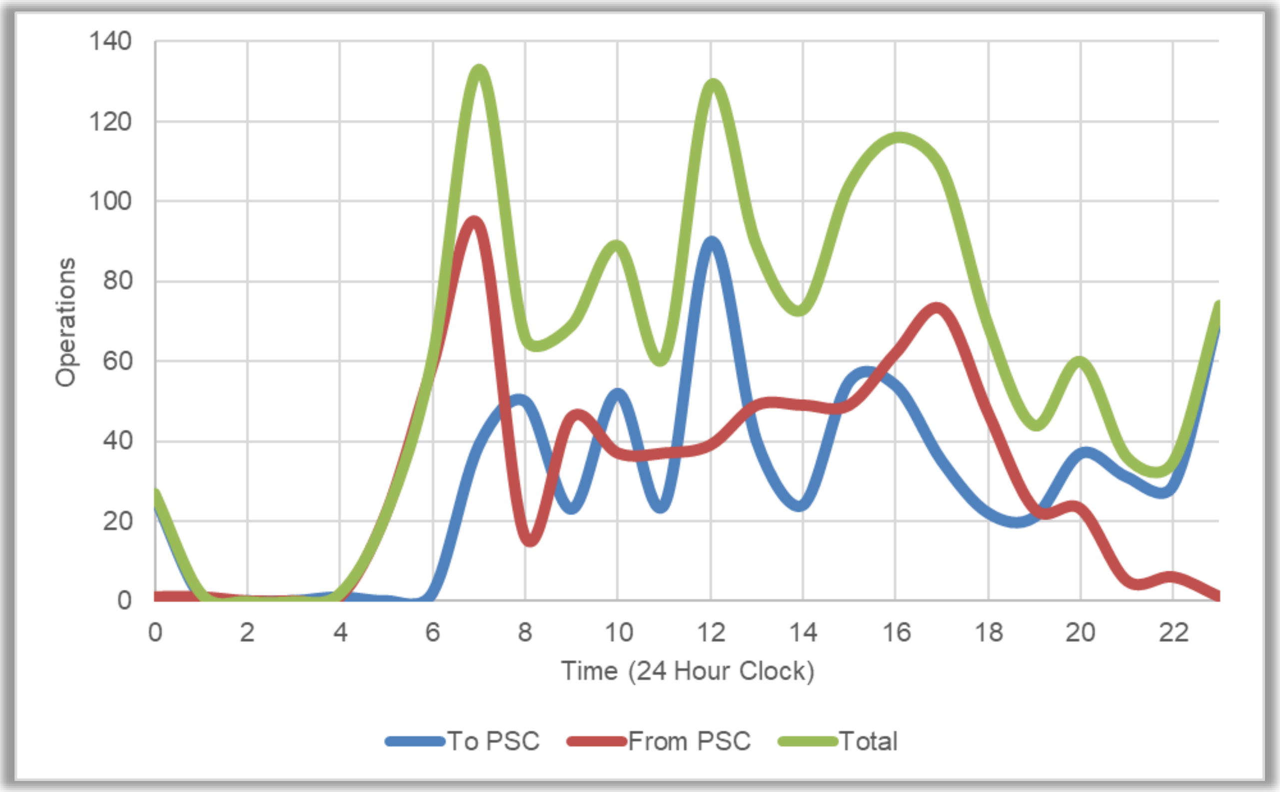


There are 30 days in June, which means that an even distribution of operations has 3.3 percent of monthly operations occurring per day. The peak day in June for fiscal year 2017 had 4.7 percent of monthly operations, and the busiest days of the week were consistently Wednesdays, Fridays, and Saturdays. There were 14 days with over 3.3 percent of monthly operations, and 16 days with fewer than

3.3 percent of monthly operations. This indicates that peak periods occur consistently throughout the month.

Peak hour operations consider the time of day that flights arrive and depart from PSC. Unlike peak month and peak day analysis, peak hour focuses on arrivals and departures separately because they affect airport facilities differently. Peak arrivals have implications for passenger terminal gate and parking apron utilization. Peak departures have implications for deicing facilities and taxiway use as aircraft queue and wait for departure. Peak hour analysis uses data from FlightWise from the peak month of June and includes 1,469 observations. This analysis, shown in **Figure C-3**, shows the average distribution of operations throughout the month on a 24-hour clock where 0 hours corresponds to midnight.

Figure C-3: Peak Hour Operations



An evenly distributed schedule would have 4.1 percent of operations occurring every hour. PSC sees 18 hours where hourly operations exceed 4.1 percent during busy days in the month of June. Peak departures, shown in **Figure C-3** in red, occur in the morning and correspond with the bank of airline departures. Peak arrivals occur in the middle of the day, with a slightly smaller peak at midnight. The peak activity is driven by commercial operations; however, GA operations occur throughout the day and help amplify the midday arrivals peak. PSC is consistently active from 7 a.m. to 8 p.m.

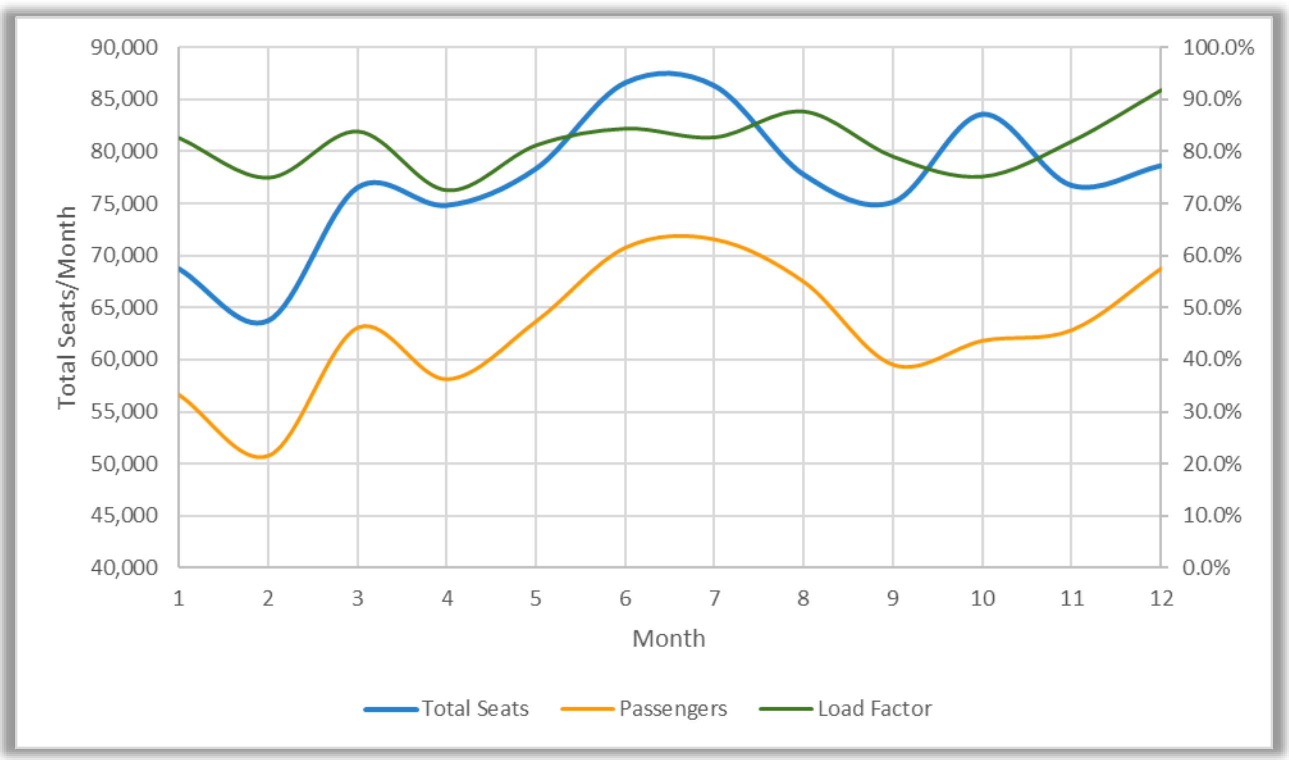
Peak operations analysis provides a percentage that can be used to estimate peak month, day, and hour operations from an annual total. This percentage is applied to operations forecasts and used to determine the adequacy of airside facilities in Chapter 3.

PEAK PERIOD PASSENGERS

Peak period passengers consider how many seats and enplanements there are through the year. USDOT T-100 records provide information on the number of seats on each aircraft and the number of operations each aircraft has.

Based on fiscal year 2017 USDOT T-100 records, June sees 9.34 percent of annual seats, followed by July with 9.31 percent and October with 9.02 percent. February is the month with the least passengers with 6.88 percent of annual seats. Average load factor for fiscal year 2017 was 81.5 percent with December (91.6 percent), August (87.6 percent), and June (84.3 percent) having the highest load factors. In terms of the total number of passengers, July has the most passengers with 71,510, June with 70,744, and December with 68,740. **Figure C-4** shows a distinct busy season during the summer when families are going on trips during summer vacation from school and an uptick of passengers enplaned in December.

Figure C-4: Peak Month Seats

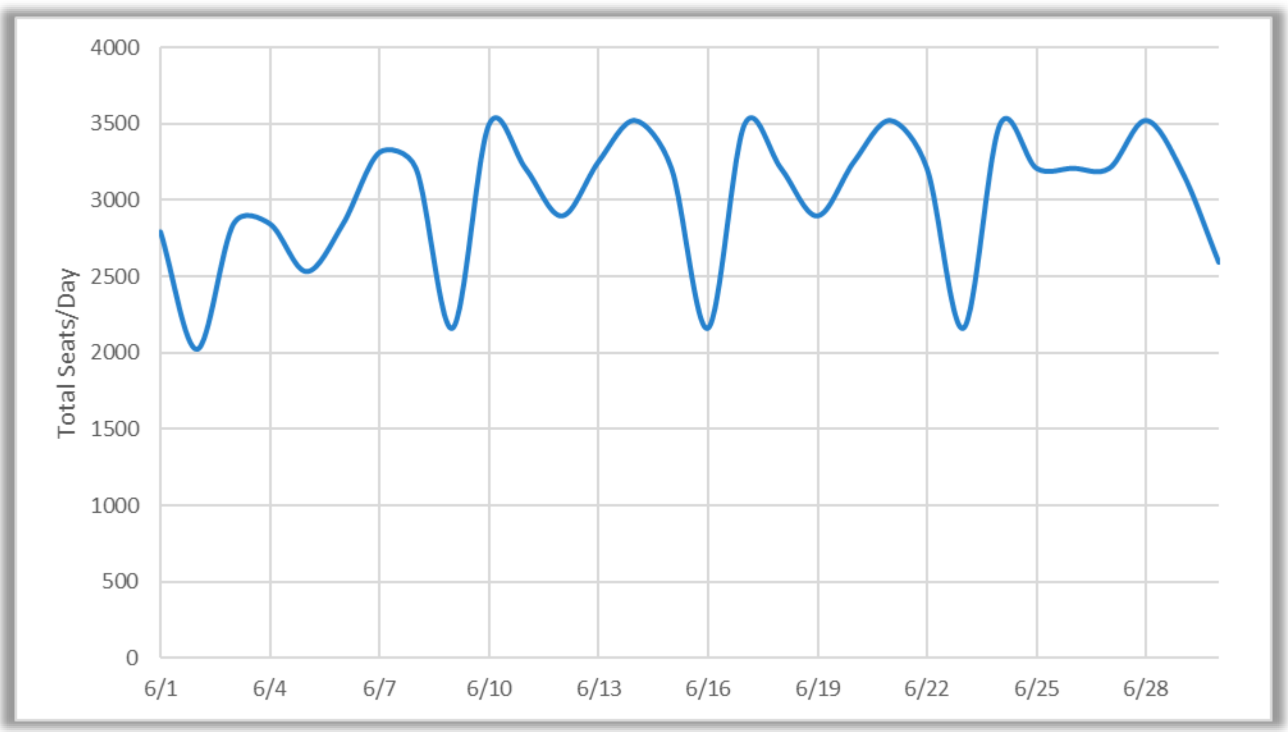


The spike in seats available in October is due to Horizon and SkyWest adding flights to routes to and from SEA. This is likely driven through competition over the SEA route to and from PSC. The increase in flights directly drives the increase to available seats but led to a decrease in load factor from an average 76.9 percent in September to an average 65.5 percent in October for Horizon and SkyWest flights between SEA and PSC.

While July has more passengers, June, with the slightly higher load factor, has the highest percent of annual seats. As facilities are not built specifically to the maximum conditions, it is more important to note the busiest periods. Thus, June is selected as the peak month for analysis as both June and July have very similar number of seats, load factor, and number of passengers enplaned.

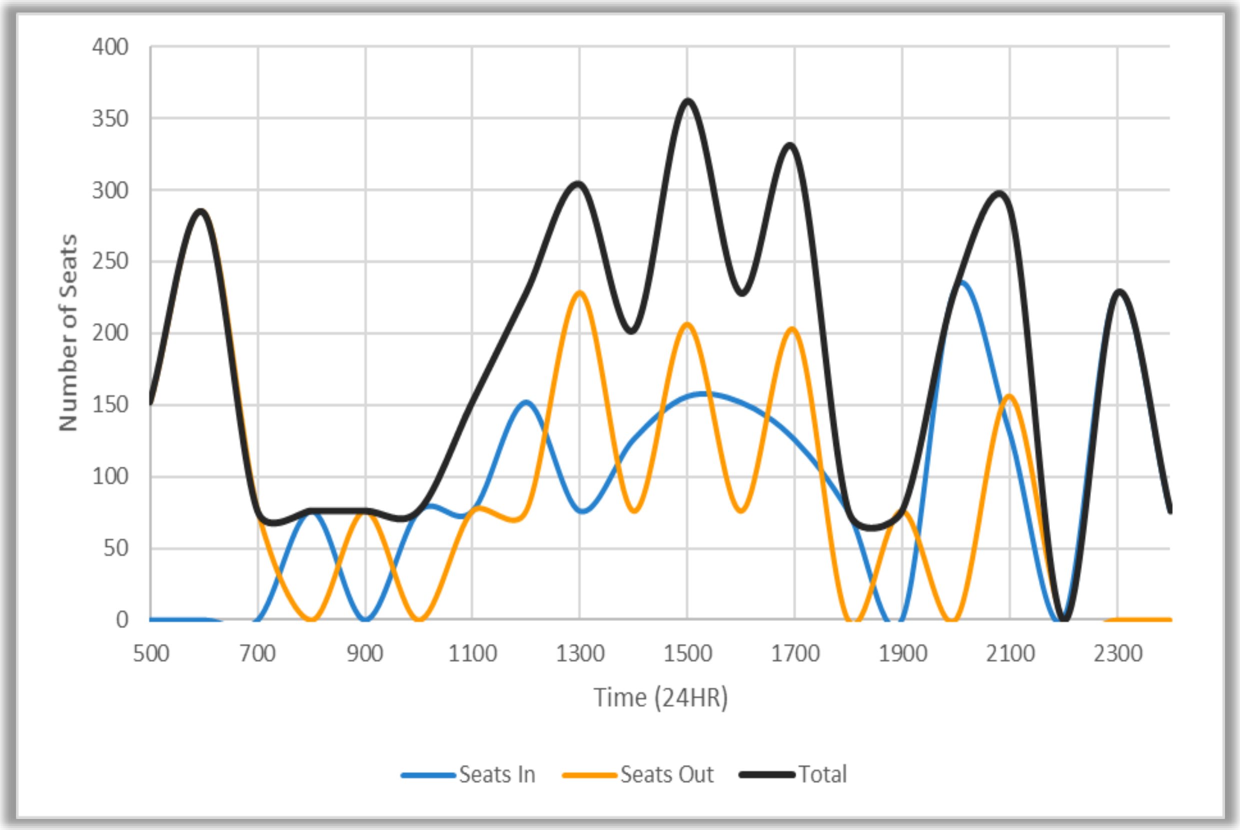
Peak day analysis involves reviewing operations and seating capacity records for every day of the peak month. In the 30 days of June, the busiest day in fiscal year 2017 was Wednesday with the scheduled flights to IWA and LAX. Records for June 2017 show weekly scheduled service to and from IWA and LAX on Wednesdays starting in June. **Figure C-5** shows the available number of seats on each day in June 2017.

Figure C-5: Peak Day Seats



Peak hour operations are based on the daily schedule of arrival and departures flights at PSC. Peak passenger enplanements reflect passenger terminal utilization. Diio Mi provided information on the daily service schedule and number of available seats. **Figure C-6** shows the number of seats on flights arriving and departing PSC during each of the scheduled flights, with a 24-hour clock where 0 hours corresponds to midnight. Based on the total number of seats from arriving and departing flights, 3:00 p.m. is the peak hour on the peak day of the year.

Figure C-6: Peak Hour Seats



Flights to large hub airports tend to depart early in the day and arrive in the later afternoon and evening to accommodate business travelers. As shown in **Figure C-6**, there are many departures before 7 a.m. with an increase at midday while most arrivals occur after 7 p.m.

Peak passenger analysis provides a percentage that can be used to estimate peak month, day, and hour operations from an annual total. This percentage is applied to enplanement forecasts and used to determine the adequacy of landside facilities, which will be provided in Chapter 3.

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APPENDIX D -AIRPORT RECYCLING PLAN

TRI-CITIES AIRPORT

RECYCLING PLAN

2019

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EXECUTIVE SUMMARY

The Port of Pasco (the Port) operator of Tri-Cities Airport (PSC) is committed to environmentally responsible operations. The Port is updating their master plan and is including planning for solid waste in keeping with the *FAA Modernization and Reform Act of 2012* (FMRA) requirements. The purpose of this task was to evaluate PSC's existing waste program and recommend ways to increase landfill diversion through waste reduction, reuse, and recycling.

Informal interviews with Port staff and a facility walk-through provided information to develop a baseline and identify areas of opportunity to divert waste from the landfill. The baseline information and identified opportunities formed the basis to develop recommendations appropriate for PSC's waste stream. Highlights of these recommendations include:

- Establish goals and objectives
- Track progress and report regularly
- Collect and donate food, beverages, and toiletries
- Maintain and paper, plastic, plastic bottle, aluminum can, and cardboard recycling
- Improve education and outreach for passengers, employees, tenants, and contractors
- Supplement, right size, collocate, and standardize recycling stations and garbage cans
- Update contracts/leases and establish purchasing policy
- Maintain and improve recycling program according to Plan Do Check Act cycle.

This range of recommendations will allow the Port the flexibility to implement those that are compatible with changing conditions and available resources, while providing the opportunity increase landfill diversion over time through a phased, comprehensive program.

INTRODUCTION

Regulatory Background and Project Purpose

Section 132(b) of the FMRA expanded the definition of airport planning to include "developing a plan for recycling and minimizing the generation of airport solid waste." FMRA Section 133 added a requirement that airports that prepare or update a master plan and receive Federal Aviation Administration (FAA) Airport Improvement Program (AIP) funding ensure that new or updated master plans address issues related to solid waste recycling. These issues include:

1) The feasibility of solid waste recycling
2) Minimizing the generation of solid waste
3) Operation and maintenance requirements

4) Review of waste management contracts

5) The potential for cost savings or revenue generation.

In September 2014, the FAA released a memorandum titled "Guidance on Airport Recycling, Reuse, and Waste Reduction Plans." This memo details the FAA's expectations and suggestions for an airport's recycling plan. To comply with FMRA and according to the FAA's guidance memo, the Port is preparing this recycling, reuse, and waste reduction plan. The purpose of this plan is to document and assess PSC's existing waste program based on the factors listed above and to recommend improvements.
An airport's waste and recycling program and documented plan depend on several factors including:

- The size, location, and layout of the airport
- The amount and type of waste generated
- Markets for recyclable commodities
- Costs for recycling
- Available local infrastructure
- The willingness of an airport and its tenants to implement recycling and other strategies.

The extent and accuracy of available information governed the content of this plan.

Airport Description

Tri-Cities Airport (PSC) is located in Pasco, Washington. PSC is a non-hub commercial service primary airport, owned and operated by the Port of Pasco (the Port). PSC is a public-use facility and is included in the FAA *National Plan of Integrated Airport Systems (NPIAS).*

As mentioned in *Chapter 1 Inventory* PSC is an FAA Class I Part 139 facility, with facilities and services to accommodate scheduled passenger aircraft with 30 or more passenger seats. The Washington Department of Aviation classifies PSC as a Category I – Commercial Service Airport.

PSC serves commercial, general aviation (GA), military, and US Forest Service (USFS) activity. In fiscal year 2016, PSC saw approximately 739,406 total passengers (369,703 enplanements), saw 56,322 total operations, and had 121 based aircraft. Four airlines serve PSC (Allegiant Air, American Airlines, Delta Airlines, and United Express), reaching eight domestic destinations. Additional background and activity information is available in the Airport Master Plan.

Waste Definitions and Plan Focus

Municipal Solid Waste (MSW) consists of everyday items that are used and then discarded. There are six primary types of MSW generated at airports:

- General MSW consists of common inorganic waste, such as product packaging, disposable utensils, plates and cups, bottles, and newspaper. Less common items, such as furniture and clothing, are also considered general MSW.
- Food waste is either food that is not consumed or the waste generated and discarded during food preparation. Food waste and green waste make up a waste stream known as "compostable" waste.
- Green waste consists of tree, shrub and grass clippings, leaves, weeds, small branches, seeds, pods and similar debris generated by landscape maintenance activities. Green waste and food waste together may be referred to as "compostables."
- Deplaned waste is a specific type of MSW that is removed from passenger aircraft. These materials include bottles and cans, newspaper and mixed paper, plastic cups, service ware, food waste, food soiled paper, and paper towels.
- Construction and Demolition Waste (C&D) is generally categorized as MSW and is any non-hazardous solid waste from land clearing, excavation, and/or the construction, demolition, renovation or repair of structures, roads, and utilities. C&D waste commonly includes concrete, wood, metals, drywall, carpet, plastic, pipes, land clearing debris, cardboard, and salvaged building components.

This plan focuses on the management of MSW and other materials that can be recycled or disposed of in a landfill. This plan does not address the management of other types of waste regulated by federal, state, and local laws, specifically:

- Hazardous waste
- Universal waste
- Industrial waste
- Waste from international flights
- C&D waste that is subject to special requirements or requires special handling (asbestos, lead, etc.).

Key Airport Buildings and Plan Scope

PSC buildings include an airline passenger terminal, airport support facilities (maintenance, Aircraft Rescue and Firefighting [ARFF], and industrial), GA facilities, and tenant facilities (for example, the Fixed-Base Operators [FBOs]).

Airline Passenger Terminal

The two-story passenger terminal serves airline passengers and provides space for airline-related services. The passenger terminal encompasses airport administration offices, airline ticketing offices and counters, law enforcement offices, Transportation Security Administration (TSA) facilities, several restrooms, food and retail space, meter/greeter area, baggage claim, rental car counters, children's play area, and two concourses with five gates.

The administration offices include a reception area, six offices, two conference rooms, one training room, four small storage rooms, a server room and a breakroom, which are located on the second floor. The Law Enforcement Officers have an office on the first floor adjacent to the security checkpoint.

Nine ticketing counters, associated queuing lines and kiosks, and eight airline offices are located within the first floor of the terminal, pre-security.

Four rental car facilities are located adjacent to the baggage claim area, and each has their own offices.

Figure D-1: The convenience store sells books, magazines, packaged food, and drinks, as well as souvenirs.

A shop offering packaged food and drinks and retail items, including souvenirs, is located in the pre-security area of the terminal (**Figure D-1**). Post-security are two retail and concessions spaces and a restaurant located between the two shops. Passengers access the security checkpoint via a queuing area (**Figure D-2**). TSA operates the security checkpoint, which offers two lanes for screening passengers and carry-on items. TSA personnel also have access to training areas, workrooms, offices, a breakroom, and a server room. Secure area food and retail space is occupied by a small convenience store that also offers packaged foods and drinks, as well as souvenirs (**Figure D-3**).

Three vending machines with pre-packaged food items and plastic containers are located within the post-security part of the terminal (**Figure D-4**).

A bar/restaurant (**Figure D-5**) is located in the secure area and features bar seating as well as tables and chairs with wait staff service. The restaurant also sells beverages in plastic containers.

Figure D-2: Terminal entrance, pre-security queuing area.

Figure D-3: Convenience store inside secured area. The store has a small coffee and condiments area with a built-in trash can.

Figure D-4 : Vending machines in secured area.

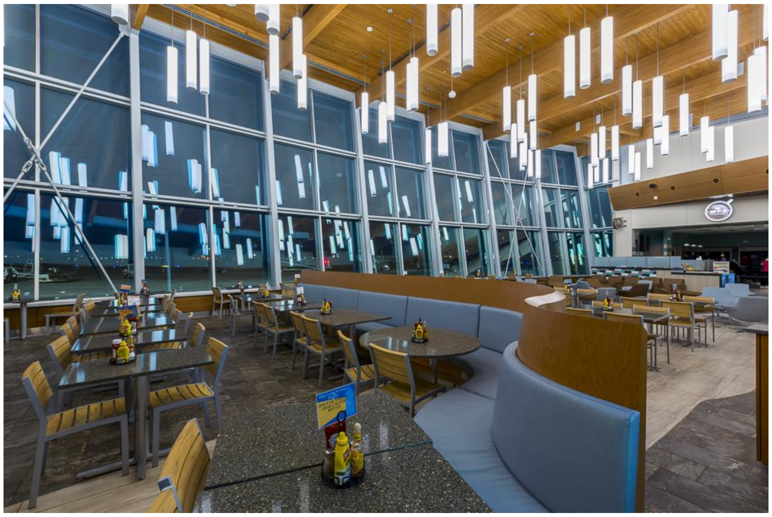

Figure D-5: Restaurant within the secured area of the terminal.

Five gates serve deplaning and enplaning passengers with each gate dedicated to one airline. Seating is available throughout the first floor of the terminal (**Figure D-6**).

ARFF Facility

The ARFF facility is located southwest of the property, near Runway End 3L. The ARFF facility is operated by the City of Pasco Fire Department. The Pasco Fire Department provides aircraft rescue and firefighting services for PSC.

The ARFF building houses on-duty firefighters, ARFF vehicles, a kitchen, a conference room, and equipment.

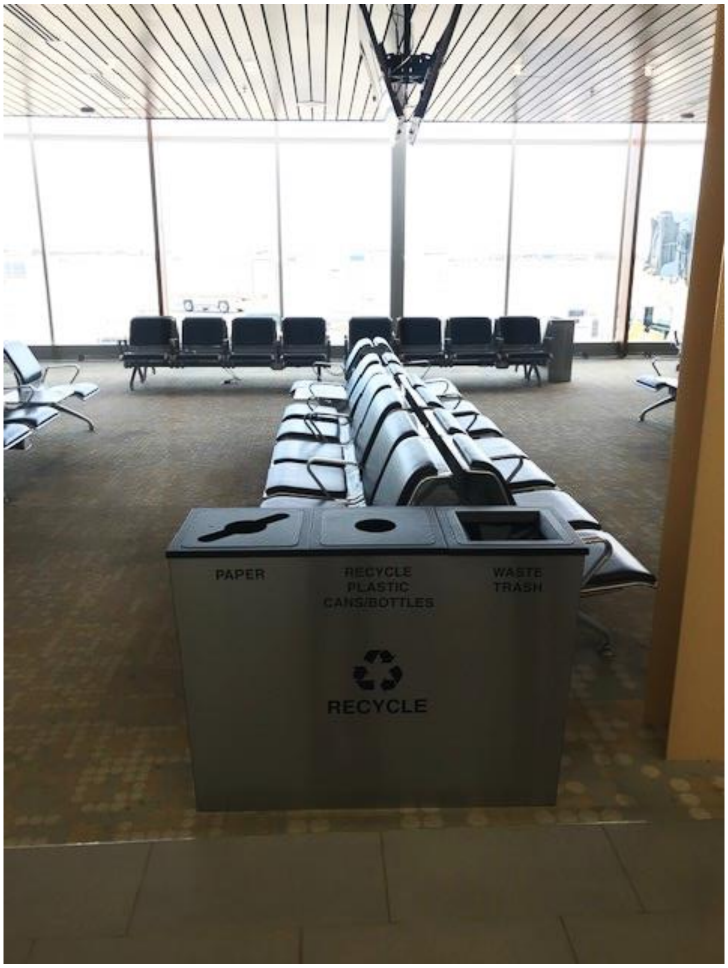

Figure D-6: Holdrooms, where passengers wait to board their flight, are located on the first floor of the terminal.

GA Facilities (Hangars and Storage)

Two FBOs offer services such as ground handling, aircraft maintenance, hangar rental, fueling, and pilot/passenger facilities to support GA activity at PSC. These facilities are located on the eastside GA apron. Their facilities include T-hangars, box hangars, and aircraft tie-downs.

Air Cargo/Freight Facilities

Cargo facilities are made up of hangars that the Port leases and adjacent areas of the aircraft ramp/apron. FedEx has a dedicated sorting facility and apron for their multiple aircraft. A charter cargo carrier uses the GA ramp to transfer cargo, and Alaska Airlines uses the terminal apron for cargo transfers.

Plan Scope

The facilities described above include buildings and areas over which the Port has direct control of waste management and others over which they have influence but not direct control.

According to FAA guidance, areas over which the Port has "direct control" or" influence" should be included in the Recycling, Reuse, and Waste Reduction Plan; areas outside airport control or influence may be excluded. The Port has direct control over operations and activities related to waste management in these areas:

- Passenger Terminal Building
  - Public use spaces
  - Airport administration offices
  - Other staff work areas
- Airport maintenance activities.

In addition, the Port can influence the management of waste and recyclables in tenant spaces through lease agreements and contracts, including:

- The Passenger Terminal Building
  - TSA spaces
  - Airline leased areas
    (including ticketing counters, offices, breakrooms, and deplaned waste)
  - Rental car tenant areas
  - Retail areas and bar/restaurant
- The FBO Building (leased by PSC)
- Aircraft hangars (leased by PSC)
- The ARFF Building (operated by City of Pasco).

The Port does not have control or influence over waste management in the FAA Air Traffic Control Tower (ATCT), nor areas adjacent to PSC property that neighboring businesses and property owners' control; therefore, those areas are excluded from this plan.

EXISTING PROGRAM

Drivers

The Port established the waste program to reduce the quantity of material disposed of in the landfill and to conserve resources, including financial resources. The Port's staff's commitment and practices drive the program.

Alignment with Local Programs

The Port, who owns and operates PSC, contracts with a waste hauling contractor, Basin Solid Waste Disposal (BDI), to provide solid waste collection services for residents, multifamily units, and commercial businesses. Recycling drop-off centers are provided for surrounding communities by BDI. BDI's parent company, Columbia Basin, provides business recycling collection services in the area.

Infrastructure

Employees, tenants, and passengers have access to a network of trash cans and recycling stations in the terminal. In general, there are many trash cans throughout the building and a few recycling stations in specific locations. The recycling stations and the garbage cans are lined/fitted with bags. In the ticketing lobby and airline counter area, are tall rectangular, metal garbage counts with round openings (**Figure D-7**).

Garbage cans located by the entrance of the security checkpoint contain three separate compartments for garbage, plastic/cans, and paper (**Figure D-8**).
The restaurant also provides passengers with a trash container with three separate compartments (**Figure D-9**). Several similar stations are located throughout the terminal building. The restaurant tenant continuously watches trends in airline ticket sales to allocate the appropriate amount of food and to minimize food waste.

Figure D-7: Garbage cans near the security queuing area.

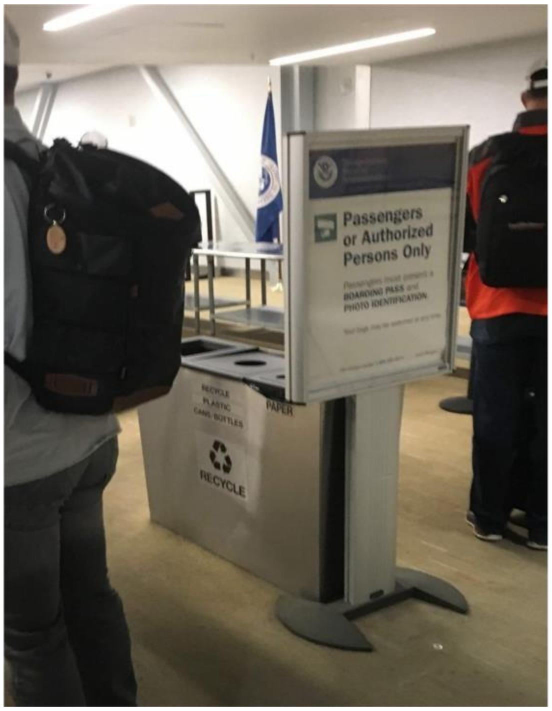

Figure D-8: Garbage cans near the security queuing area.

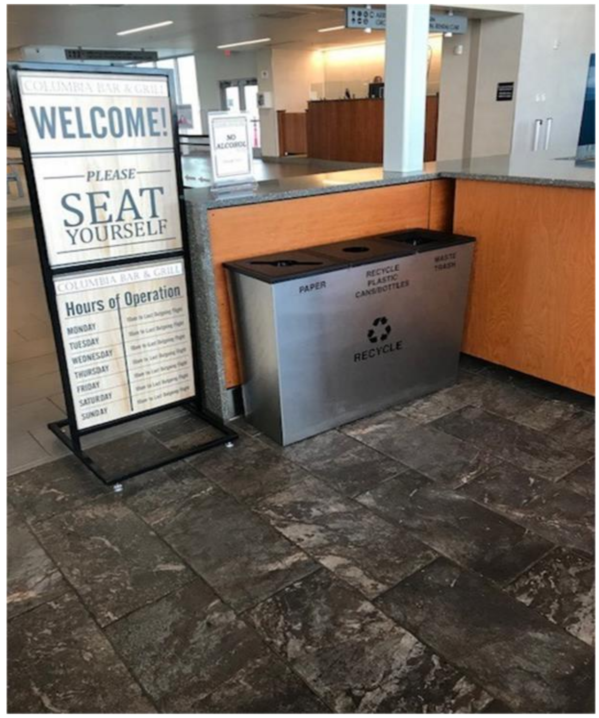

Figure D-9: Garbage can with three separate compartments located at the restaurant.

The holdrooms bins, presented in **Figure D-10**, are consistent with those placed throughout the terminal building. The paper and plastic/cans/bottles compartments collect comingled materials in two streams: 1) paper items and 2) plastic bottles and alumni cans. Janitorial staff transfers their contents to a large 20-yard recycling dumpster located outside the building and picked up by the recycling hauler.

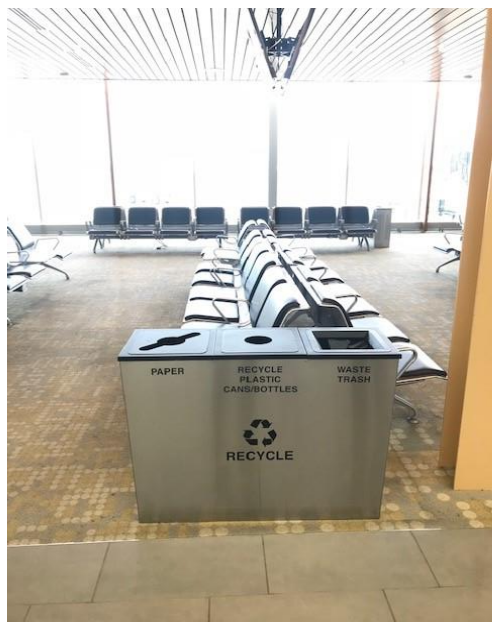

Figure D-10: Garbage can with three separate compartments.

An 8-yard garbage dumpster and a 4-cubic yard cardboard dumpster are also located outside of the terminal building (**Figure D-11**) in a central location for the retail and food tenants to dispose of their comingled recycling, garbage, and cardboard. The tenants and Port staff flatten cardboard boxes before placing it into the dumpster.

The large 20-cubic yard recycling dumpster is located outside of the terminal building is shown in **Figure D-12**.

Figure D-11: Garbage bin outside of the terminal building next to the cardboard recycling bin.

Figure D-12: Outdoor recycling dumpster, which accepts only comingled recycled items, such as paper, plastic, and aluminum.

The administration offices have separate bins for garbage, shredded paper, and paper for recycling, for example, printer paper and envelopes (**Figure D-13**).

Figure D-13: Recycling bin, shredding bin, shredder, and garbage bin in the administration offices.

The airlines have separate containers for recycling and trash within their offices and breakrooms (**Figure D-14**). The conference rooms on the second floor of the terminal have separate containers for the garbage and comingled recyclable items (**Figure D-15**).

Figure D-14: Recycling and garbage bin in the airline offices.

Figure D-15: Trash and recycling bins in the conference rooms.

The terminal restrooms feature both paper towel dispensers and air hand dryers (**Figure D-16**), with garbage cans positioned below the paper towel dispensers and small bins located in each toilet stall. PSC has several water-bottle filling stations throughout the terminal building (**Figure D-17**). These stations help reduce use and disposal of single-use plastic water bottles.

Figure D-16: Terminal restrooms offer both hand dryers and paper towel dispensers

Figure D-17: Water bottle filling station within terminal building.

Operation and Maintenance Requirements / Roles and Responsibilities

The Port's waste program is maintained by a contracted janitorial service and airport tenants and is supported by PSC management personnel.

The Chief of Police currently purchases all janitorial items, including paper towels, toilet paper, and trash bins.

The janitorial staff carry out day-to-day custodial activities and housekeeping in specific buildings and areas, including collecting waste and recyclables from cans and bins from the public-use spaces of the terminal and transferring these materials to the appropriate dumpsters. These spaces include:

- Passenger areas such as the ticketing lobby, departure gates, and restrooms
- TSA queuing areas
- Administration offices
- Other PSC spaces.

PSC's terminal tenants (restaurant and shop, rental car companies, and airlines) and tenants in some of the outlying buildings (FBOs and GA hangar tenants) are responsible for custodial activities in their areas including transferring waste to the appropriate dumpsters. Staff at the ARFF building are responsible for collecting their waste and disposing of it in their 8-cubic yard dumpster. The ARFF building does not currently recycle.

As noted previously, BDI and Columbia Basin are the primary waste and recycling haulers for PSC. BDI collects garbage daily from PSC's dumpsters and transports this material to the BDI Transfer Station, located approximately five miles east of PSC and the only transfer station in the County.

The majority of the waste accepted at the transfer station is exported to Finley Buttes Landfill, in Oregon, approximately 55 miles away from the transfer station. According to the 2010 Franklin County Integrated Solid Waste Management Plan, there are no MSW landfills operating in Franklin County. Both the New Waste and Pasco Sanitary Landfills are officially closed. The transfer station also sends a small amount of MSW to a transfer station in Prosser Washington, where it is then transferred to a landfill operated by Allied Waste in Roosevelt Washington.

Columbia Basin collects recyclable items from PSC on an on-call basis and transports these materials to the BDI Transfer Station, which does not have a composting facility on-site. Therefore, this facility does not offer composting collection.

Current Waste Reduction, Reuse, and Recycling Efforts

Waste Reduction

Also called “waste minimization,” *waste reduction* refers to reducing the volume of waste produced at its source. Changing habits and current practices, such as printing and purchasing, can be an effective way to accomplish this. The Port currently employs the following practices to reduce the total amount of waste generated:

- Double-sided printing in administration offices
- Email and internal websites for inter-office communication
- Shared drives for storage of documents.

Reuse

In a waste management context, *reuse* refers to using materials and items more than once and as many times as possible before disposal. Reuse can include using items and materials for the original purpose or repurposing something for a different use. Reuse can require purchasing durable materials and items instead of disposable or single use options.
The Port currently reuses:

- Ceramic coffee mugs and durable silverware, plates, bowls, and cups (instead of plastic, paper, or Styrofoam) in administration breakroom
- Office supplies
- Towels/rags in maintenance areas
- Office furniture.

Recycling

Using the infrastructure and resources described above, the Port currently recycles two streams: cardboard; and comingled paper, plastic bottles, and aluminum cans.

Terminal tenants likely generate the majority of the cardboard in the form of shipping boxes. The paper stream includes printer paper, mail, envelopes, and other paper from the administration offices as well as paper items, such as newspapers and magazines, collected in the public areas of the passenger terminal. The plastic and aluminum streams are primarily made up of beverage containers, collected from the public areas of the passenger terminal as well as the administration offices, restaurant, and shops.

The retail tenant sends expired magazines back to the supplier for recycling in exchange for a refund.

Construction and Demolition Debris, Green Waste, and Other Waste

The Port reuses and recycles the waste generated during construction projects where possible. Green waste (yard waste) generated from the maintenance of the property's landscaping is managed on-site where possible. The Port collects hazardous waste; used oil and filters; batteries; paint; used tires; and scrap metal for beneficial reuse, recycling, or return to supplier programs.

Tenant Efforts

In addition to the recycling program that the Port operates, tenants may be recycling on their own. In some instances, these tenants may be using PSC's bins, carts, and dumpsters.

Tracking and Performance

The Port does not currently track overall waste generation, recycled material volume, or other metrics. At present, the Port does not have specific waste or recycling objectives, targets, or goals.

WASTE AUDIT

The Port's staff provided information about:

- Airport buildings and facilities
- Areas that generate waste
- The types of waste generated in each area
- The materials that can be recycled under the current program.

Port staff and tenants have informally observed passenger and employee waste and recycling related behaviors and, for this document, described generally how waste flows through the facility. The staff also described waste and recycling collection and hauling practices.

An evaluation of the Port's information and records as well as aviation industry waste and recycling trends supported efforts to identify the source, composition, and quantity of waste generated, including areas under the Port's direct control or influence. This information then served as a foundation to identify opportunities to improve and monitor program effectiveness.

Quantity and Sources

The Port provided waste collection invoices for the ten-month period between January 2018 and October 2018, which included service for the terminal, maintenance, and ARFF building. The invoices detail the size and collection frequency for the recycling carts and dumpsters. These invoices provided the information about PSC's waste and recycling containers shown in **Table D-1**.

Table D-1: PSC Waste and Recycling Containers

Material	Container	Collection Schedule
Cardboard	One 4-yard dumpster	Twice a week
Comingled recyclables	One 20-yard dumpster	Monthly
Terminal MSW	One 8-yard front end load dumpster	Five times a week
Maintenance MSW	One 8-yard front end load dumpster	Once a week
ARFF MSW	One 8-yard front end load dumpster	Twice a week

Based on a 75 percent load factor and waste volume to weight conversion factors from the United States Environmental Protection Agency (EPA), the Port recycles approximately 600 pounds of cardboard a week and approximately 2,330 pounds of commingled recyclables monthly (assuming the Port calls the hauler once a month, according to invoices). This would total approximately 59,100 pounds (30 tons) of recyclable material each year.

Based on the same load and conversion factors, the Port disposes of approximately 344,450 pounds (172 tons) of MSW each year. Together, waste and recyclables total an estimated 403,450 pounds (202 tons) total waste generated, including comingled recyclables, cardboard, and MSW each year. Using these numbers, the Port's recycling rate at PSC is about 14 percent.

Based on industry averages, the overall contribution of waste and recyclables from various areas and activities at PSC is likely similar to the distribution shown in **Table D-2**.

Table D-2: Estimated Generation at PSC by Area/Activity

PSC Area/Activity	Estimated Percent	Estimated Weight
Deplaned	20%	40 tons
Other Airline	24%	48 tons
Administration	3%	6 tons
Public Areas	35%	72 tons
Concessions	18%	36 tons
Total	100%	202 tons

Based on this distribution, programs that focus on the airlines and public areas may represent the best opportunities to reduce waste generation and increase landfill diversion. A physical waste sort could provide more detailed information about the amount and proportion of waste generated in total and by each area, activity, tenant, etc.

Composition

Based on the activities taking place at PSC, a varied waste stream can be expected. According to industry case studies and previous waste planning projects, an airport's waste stream is approximately 40 percent recyclable, 35 percent compostable, and 25 percent waste that cannot be recycled or composted due to current technologies and, as a result, must be placed in a landfill.

Table D-3 lists each area included in the scope of this plan and the type(s) of waste likely generated there. A physical waste sort could provide more detailed information about the specific composition of waste at PSC. This information may include:

- The types of items included in each general category
- The contamination rate of the recycling stream (items that are not recyclable in the recycling bins)
- The recovery rate for recycling (the proportion of recyclable items that are segregated properly).

The data from a waste audit can also be used to identify opportunities to improve the composition of the waste stream (by item substitution, by improving recycling to reduce the volume of waste, etc.).

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Table D-3: Tri-Cities Airport Waste by Area and Material

Area | Material	Office Paper	Newspapers	Magazines	Plastic	Aluminum	Cardboard	Glass	Food Waste	Paper Products	Liquids	Toiletries	Packaging	Styrofoam	Metals	Deplaned Waste	Green / Yard Waste	Construction and Demolition	Other Waste
Airline Terminal Building																		
Public Passenger Areas Curbs, ticketing lobby, restrooms, security screening queuing area, sterile gate areas, public "meet and greet" spaces, baggage claim area		x	x	x	x			x	x	x	x	x						x
Tenant Areas Shops, bar/restaurant, café, and associated activities	x	x	x	x	x	x	x	x	x	x		x						x
Airline Areas Offices, ticketing counters, gate stations, breakrooms, underwing services, and deplaned waste	x	x	x	x	x	x		x	x	x		x			x			x
Rental Car areas Offices, counters, return areas, service areas	x			x	x			x	x	x								x
TSA Spaces	x	x	x	x	x			x	x	x	x	x						x
Airport Administration Offices	x	x	x	x	x	x		x	x			x						x
ARFF Building	x	x	x	x	x	x	x	x	x			x						
Airport Maintenance Activities															x	x	x	x

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The following sections describe in more detail some of the waste and recyclable materials generated at an airport like PSC: toiletries, food and beverages at security screening, and liquids throughout the facility.

Toiletries, Food, and Beverages – TSA Restrictions

The TSA restricts the volume of liquids, gels and aerosols that can be carried onto an aircraft. Passengers are allowed three-ounce containers of toiletries in one, one-quart baggie (3-1-1) in their carry-on luggage. Even though these restrictions have been in place for longer than 10 years, security screening regularly reveals toiletries, beverages, and food items that do not meet the requirements contained in passenger luggage.

When these items are found, the TSA gives passengers three options: pack the item in a checked bag, give the item to a non-traveling family member or friend, or forfeit the item. By law, the TSA cannot retain any items removed from passenger luggage, so items that passengers do not repack or hand off end up in the trash. Some problematic items that end up in the trash at security checkpoints include: bottled water, other bottled or canned beverages, toothpaste, shampoo and/or conditioner, sunscreen, and aloe gel. Some other, less obvious unallowable items are peanut butter, yogurt, applesauce, and maple syrup.

It is expected that the garbage cans and recycling station located in the security queuing area receive a fair amount of liquids and beverage containers due to TSA restrictions. These items end up in the waste stream where the liquids are difficult to manage, and the containers cannot be recycled. Liquids add significant weight to the waste stream, contaminate other materials like paper, and may be rejected by a recycler, which can result in them being landfilled.

In addition, discovery of a restricted item in a passenger's carry-on or bag may subject the passenger to additional screening, which requires extra time and can interrupt the flow at a security screening checkpoint.

Liquids

Liquids contaminate and degrade other materials within the recycling stream and add weight to recycling or waste streams where they are found. In some cases, liquids are thrown away in their containers, which means the recyclable material found in water bottles, aluminum soda cans, and plastic beverage containers is not captured for recycling.

Purchases

The Port does not currently track the quantity and type of disposable items and supplies purchased for the facility. However, the Port does purchase several janitorial materials made from recyclable material. This information could provide insight on some of the materials coming into PSC that will go back out as waste (other materials are brought on-site by passengers, employees, and vendors). The purchase list may include:

- Items that have reusable or recyclable alternatives (foam cups)
- Items that could be eliminated (by converting paper forms to digital to reduce paper waste generated)
- Items that indicate scale of the activity at PSC (paper towel and garbage bags).

REVIEW OF WASTE MANAGEMENT CONTRACTS

As noted in Section 1, the FMRA lists the review of waste management contracts as an element of addressing solid waste recycling at an airport. The FAA memorandum titled "Guidance on Airport Recycling, Reuse, and Waste Reduction Plans" explains that the purpose of reviewing these contracts is to "identify opportunities for improving (waste) program scope and efficiency, as well as identify constraints."

In general, a few of the Port's contracts and leases address housekeeping requirements and related expectations for managing trash and provide limited information about recycling. These contracts and leases do not necessarily impede recycling or other waste management strategies; however, they do not explicitly require conformance with or support of the Port's recycling and related efforts. The following sections describe the content of various contracts related to waste and recycling.

Custodial Contracts

The Port contracts for janitorial services for the areas under the Port's control. The Port has provided a copy of the last Request for Proposals (RFP) for custodial services. The RFP states that services provided by the janitorial contractor will include participation in PSC's recycling program. This includes sorting trash, collecting recyclables, and taking the recyclables to the designated recycling containers. These services also include emptying trash cans within the terminal building, including the rental car counters.

Tenant Leases

A copy of a restaurant, bar, and gift shop tenant lease was provided. This agreement states that the Port will provide trash removal services from a central receptacle, but that the Lessee will be responsible for taking the trash to the central receptacle.

An example of hangar lease agreement titled "Lease Modification #1" requires proper maintenance and repair of the premises. The Lessee is not allowed to accumulate waste of any kind on the premises or adjoining platforms, nor dispose of any waste material on property the Port owns.

An agreement titled "Rental Car Concession and Lease Agreement" states that the operator will be responsible for "the sanitary handling and removal of all trash, garbage, and other refuse caused as a result of the Operator's operations at the premises in a manner and area designated by the Port." The Lessee, or operator, is responsible for providing the appropriate receptacles for all the garbage and refuse in the premises.

An airline agreement example titled, "Airline Operating Agreement and Terminal Building Lease" does not include any waste responsibilities. However, the agreement does require the airline tenants to maintain the premises free of all litter, debris, refuse, and petroleum products or grease that result from passengers or employees.

An agreement titled "Terminal Automobile Parking Concession Agreement" states that the Port will pay for all utility services, including garbage disposal charges that the parking company uses in its operations. The parking company shall not permit waste material or trash to accumulate on the premises.

The Port's agreement with the TSA states the Port will provide trash removal, restroom supplies, and janitorial services and supplies for TSA areas.

Expiring Leases and Contracts

Specific information regarding the expiration, extension and/or renewal dates of the Port's numerous leases was not reviewed under this project. As outlined in the FAA guidance memo, "this information can signal the airport's next opportunity to add recycling, reuse, and waste reduction objectives to existing leases and contracts."

Funding

Waste and recycling collection are funded in the Port's budget. The Port does not currently receive payment or rebates for recycled materials.

RECYCLING FEASIBILITY

Many factors impact the feasibility of recycling at PSC; some are universal, and others, specific to the facility. The following sections describe the more influential of these factors.

Commitment and Support

The willingness of the Port and its contractors and tenants to commit to and support the facility's recycling program are critical to the success of such a program. Without the commitment of resources such as funding, labor and time, space, and access to secure areas, a waste management program could struggle.

Airport Policy and Contractor Dedication

The Port's administration has supported the recycling program in the past, and their support is expected to continue in the foreseeable future.

Basin Disposal has been "providing complete garbage collection service in a safe and responsible manner since our beginnings in 1941. [The company's] philosophy has always been to partner with the communities we serve and that goes back three generations."

Airline Policies

Three of the four airlines that operate at PSC have established sustainability programs that include elements of waste and recycling.

Alaska started their inflight recycling program in the late 1980s. By 2010, Alaska had recycled more than 12,300 tons of recyclable items, such as paper, cans, bottles, and plastic. In 2017, Alaska reduced an additional 21 percent, contributing to a 54 percent reduction in per-passenger inflight waste since 2010. Alaska has set strategies to reduce waste from inflight service and to decrease paper consumption. Alaska's Green Team was able to successfully carry out the switch from bottles to cans for beverages. This switch makes recycling more assessible to many markets, weighs less, and is safer and easier to pack.

The airline is also working with inflight crews to keep unused disposable items such as cups and napkins on aircraft instead of returning them to the catering carts, where they are thrown away in the unstocking process. Alaska's goal is to ensure all inflight service ware items are recyclable, reusable, and/or sustainably sourced. Alaska has also taken steps to reduce dependence on printed paper using iPads, iPhones, and tailored applications ("apps") in their operations.

Per corporate policy, Delta is "committed to minimizing waste streams through diversion and re-use, waste, recycling programs, and [waste reduction]." Delta has been working to increase the number of cities where they recycle and the volume of material collected.

In addition, Delta tracks employee recycling at the headquarters campus in Atlanta and upcycles life vests, carpet, and leather seat covers. Aboard Delta flights, single stream materials, including plastic, aluminum, and paper, are collected by flight attendants in designated bags. Cabin service collects these materials and transports them to designated recycling containers. Delta's catering partners recycle the empty cans and bottles left in the beverage carts.

United Airlines is "committed to operating sustainably and responsibly" and has recycled over 28 million pounds of aluminum cans, paper, and plastic from flights and facilities. In 2014, United began to replace its hot beverage cups with fully recyclable alternatives made from recycled plastic water bottles. United Airlines' partnership with Clean the World, has helped collect and divert more than 137,386 pounds of hygiene materials from landfills since 2015. These materials are refurbished and recycled to create hygiene kits for people in need.

Offering recycling for deplaned waste at PSC aligns the Port with its airline partners.

Technical and Economic Factors

Local Markets and Infrastructure

Markets for recycled materials fluctuate widely based on many factors and interactions. Local waste haulers typically accept materials that can be recycled cost-effectively in the area. Manufacturers purchasing recycled material want it to be predictable and ready for use; therefore, recycling facilities are particular about what materials they accept and prefer materials that are of high value and clean and easy to separate.

The materials listed in **Table D-4** are accepted under the Franklin County's commercial recycling program. As noted above, inclusion in such programs typically indicates that the market and/or infrastructure for these materials is fairly strong. The Port currently recycles all the materials the County's commercial recycling program accepts.

Table D-4: Materials Accepted for Recycling in the Franklin County

Recyclable Materials – Franklin Count Recycling Program
Cardboard
Tin and aluminum
Plastic bottles, tubs, and jugs
Mixed paper, newspaper, magazines
Source: Basin Disposal Recycling Center website: https://basindisposal.com/basin-disposal-recycling/

As noted previously, BDI operates one transfer station in Franklin.

Logistical Considerations and Constraints

To maintain a recycling program at PSC, certain elements must be in place. These include:

- A proactive and engaged custodial staff

- A willing and affordable hauling contractor
- Space for bins, dumpsters, and compactors
- Access to secure areas of the facility (including airside ramps and sterile terminal areas).

At this time, these elements appear unconstrained; additional resources including custodial labor, waste hauling services, space, and airport access are anticipated to be available to support the continuation and/or expansion of the recycling program at PSC.

Contractual Issues

A detailed evaluation of the Port's contracts is included in Section 4. Major contractual issues with maintaining and improving the recycling program at PSC are not anticipated. The Port and the waste and recycling collection contractor will need to continue to collaborate to support the facility's recycling program.

Recycling and Landfill Facility Requirements

The recycling facility and landfill that accept waste from PSC have specific acceptance criteria and requirements. Adherence to these specifications protects the safety of employees handling these materials; the integrity and operation of the equipment and infrastructure used to transfer, sort, and convert these materials; and the value of the recyclable stream. Components that seem recyclable (plastic, glass, or metal parts) comprise some items generated at PSC; however, the recycling facility has specific material standards, so it is important that non-recyclable items are not included in the facility's recycling stream.

Waste items that may be generated at PSC, but are prohibited at the transfer station include:

- Cleaning agents
- Gasoline
- Paint
- Motor Oil
- Scrap Metal
- Batteries
- Fluorescent lamps and High Intensity Discharge (HID) lamps.

Some waste items cannot be recycled or landfilled, for example hazardous waste and chemicals, paint, batteries, and C&D waste. These items must be managed through hazardous waste or universal waste programs or disposed of at a specialized landfill, such as the Franklin County Collection Facility. This is a free service provided by Franklin County and BDI.

Costs

The Port strives for PSC to be as self-sustaining as feasible; therefore, it is imperative that programs implemented and maintained at the facility, including recycling, are as cost-effective as possible.

Guidelines and Policies

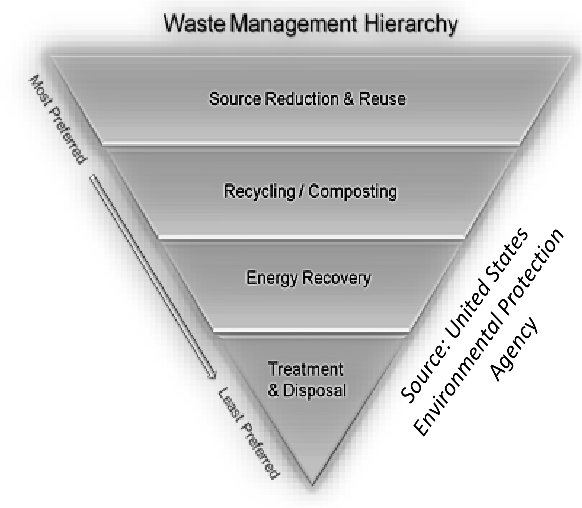
To evaluate PSC's existing waste plan in the context of local, state, and national requirements, federal, State of Washington, and local waste and recycling regulations and policies/factors were reviewed.

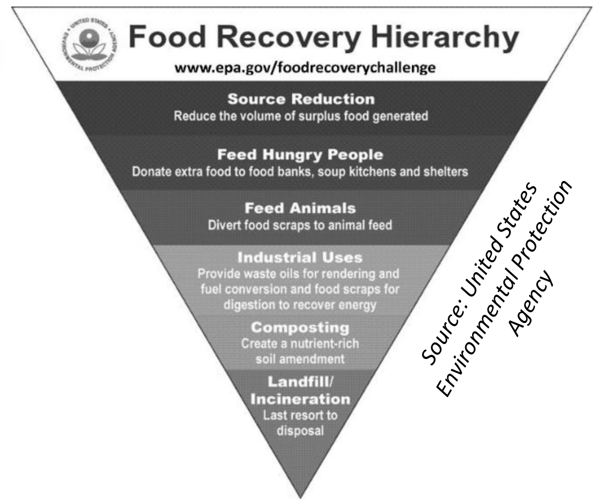
Federal

At the federal level, the EPA is responsible for developing a solid waste management program under the Resource Conservation and Recovery Act (RCRA) and related policies and guidance. RCRA provides the framework for management of hazardous and non-hazardous waste. All generators of hazardous waste, including airports, are required to comply with RCRA and all other federal waste laws and regulations.

As described in Section 1, the FAA's definition of "airport planning" was updated in 2012 through FMRA to include planning for recycling and waste minimization. The airport is required to address solid waste as part of airport master planning. The FAA provides guidance on airport waste and recycling in the September 2014 memo on the topic as well as in a synthesis document prepared in 2013 (both available on the FAA's website).

The EPA has developed a hierarchy of waste management strategies. This hierarchy, shown at left below, ranks these strategies from most- to least-environmentally preferred and places emphasis on reducing, reusing, and recycling. In addition to the general waste management hierarchy, the EPA has also developed a preference ranking of management strategies for food waste, as shown below at right.





State

The State of Washington (the State) requires local governments to produce a comprehensive solid waste management plan (SWMP). The Revised Code of Washington (RCW) section 70.95.080 states, "Each County within the State, in cooperation with the various cities located within such county, shall prepare a coordinated, comprehensive solid waste management plan." The purpose of the plan is to prevent land, air, and water pollution, and to preserve resources of the State. This plan helps guide the solid waste management efforts to meet the needs of each city and county within the State. The RCW 70.95 requires for local government's SWMP to demonstrate how Washington State's recycling goals are met. The following are Washington State's goals:

- Achievement of a statewide recycling rate of 50 percent
- Elimination of yard debris from landfills by 2012 in those areas where alternatives exist
- Source separation of waste (at a minim, separation into recyclables and non-recyclables)
- Steps towards making recycling at least as affordable and convenient to the ratepayer as mixed waste disposal."

The Washington Department of Ecology (DOE) has primary authority for waste management at the State level. The DOE assists local governments in developing the solid waste management plans, provides resources for the development of such plans, and reviews the waste facility permits for conformance with state law.

The DOE's website offers a collection of information and resources for waste management within the State and can serve as a valuable resource for the Port's waste and recycling efforts.

The State does not have mandatory collection laws, a container deposit program, or disposal bans for recyclable materials, but it does mandate solid waste planning. The State requires that all counties establish a Solid Waste Advisory Committee (SWAC) with the responsibility to develop solid waste programs and polices (under RCW 70.95.090). Franklin County has established a SWAC in compliance with the State law.

The RCW requires that the DOE develop and periodically update a solid and hazardous waste management plan, also known as the Beyond Waste Plan. This plan aims to improve the waste management systems within the State, to eliminate waste and toxics, and to use remaining wastes as resources. This plan identifies five of the following goals:

- Reduce most waste and use of toxic substances in Washington's industries
- Reduce small-volume waste from businesses and households
- Expand the recycling system in Washington for organic waste such as food wastes, yard waste, and crop residues
- Reduce the negative impacts from the design, construction, and operation of buildings
- Develop a system to measure progress in achieving the goals.

The State's laws and plans allow the local governments to implement programs to meet the statewide mandatory and individual voluntary goals.

State law requires airports that receive scheduled commercial service provide receptacles in its facility for the disposal of at least two of the following materials: aluminum, glass, newspaper, plastic, and tin (RCW 70.93.095). PSC currently recycles aluminum, newspapers, and plastic.

Local

Franklin County fulfills the State of Washington's requirements by providing the Franklin County Integrated SWMP in 2009. The SWMP replaces the 1992 Franklin Moderate Risk Waste Plan and combines the 1994 Comprehensive Solid Waste Management Plan for Benton and Franklin County. The SWMP integrates the Moderate Risk Waste plan. This Plan is a guide that sets up goals and strategies for a 20-year timeframe.

According to the Solid Waste Management, Reduction and Recycling Act Chapter 70.95, RCW counties are required to establish a SWAC to assist in the development of solid waste policies and programs prior to their adoption. Once the Plan is adopted, the SWAC will help promote waste reduction and recycling throughout the County, as well as help amendments to the Plan.

Franklin County is guided by the DOE's Beyond Waste Plan (2004), which helps strategize eliminating waste and use of toxic substances. Most of the funding for recycling expenses is provided by the DOE through Coordinated Prevention Grants (CPG) programs.
Franklin County goals are to:

- Achieve a diversion goal of 50 percent by 2028
- Establish a strategy to measure baselines and future progress
- Obtain accurate waste diversion data
- Emphasize programs that target commercial waste diversion
- And provide economic incentives for waste diversion.

The City of Pasco's Ordinance 07.06.15 Health and Sanitation 6.04.010-.340 states that "it is the intention to make the collection of solid waste within the City compulsory and universal, or its contractors, if any or person as provided herein may engage in the business of collection, transportation, and disposal of solid waste."

Other Incentives

As noted, in Section 5, most of the airlines serving PSC have recycling programs and targets. Aligning PSC's program with the airlines' practices provides the opportunity for a win-win scenario whereby the facility can reduce its environmental impact and, by helping the airlines reduce their impacts, generate goodwill with the airlines.

COST SAVINGS OR REVENUE GENERATION

The costs associated with a recycling program depend on available infrastructure, material markets, and the type of waste generated at a facility. These costs sometimes include capital costs for containers, landfill tipping fees, hauling costs, material rebates, and labor. An evaluation of the potential cost savings and revenue generation opportunities is required for an Airport Recycling, Reuse, and Waste Reduction Plan according to FMRA.

The Port provided several garbage collection invoices for the terminal building, ARFF, and maintenance and industrial facilities, that included collection fees and total waste costs. Because these invoices were from various months, they were not a complete years-worth of data. However, the calculations below are derived from the data provided.

The terminal building's invoices came from January 2018 to October 2018. A 4-yard cardboard dumpster pick-up twice a week is $60 a month with an additional $1 finance charge. An 8-yard FEL pick-up five times a week, costs $1,520 with a $15 finance charge and an additional $54 waste refuse collection tax

(3.5 percent), totaling $1,575 dollars each month. A 20-yard recycling haul service for the comingled recyclables, costs approximately $351 dollars a month, which includes two hauls and a comingled recyclable fee of $55 dollars. The maintenance building invoices state that an 8-yard pick-up each week costs $331 dollars each month, including the waste refuse collection tax of 3.6 percent. The ARFF building monthly pick-up totals $646 for an 8-yard dumpster twice a week. This calculation includes the waste refuse collection tax.

Assuming the Port spends a total of $2,963 each month, the Port spends approximately $35,556 each year for waste collection at PSC. Of the total yearly costs, the Port spends approximately $4,932 on recyclable items (14 percent).

Based on these high-level figures, recycling costs the Port approximately $164 per ton and disposal of MSW costs approximately $178 per ton. The Port may be able to save money by moving materials to the recycling stream (approximately $14 for each ton diverted). A reduction in the total amount of waste generated may further reduce costs by allowing for use of smaller dumpsters and/or reducing collection frequency.

RECOMMENDATIONS

This section documents recommendations for PSC, including waste reduction, reuse, and recycling strategies, based on the information presented earlier, specifically the waste audit and feasibility discussion.

Objectives and Targets

It is recommended that the Port set specific, measurable, achievable, realistic, and time-bound (SMART) goals for its waste program. Having an established set of objectives and targets provides a basis and foundation for subsequent activities and actions. Progress toward such goals does require tracking, but can also provide information on progress and improvements, which can be a valuable marketing and education tool.

The waste source, quantity, and composition information in Section 3 provides baseline data for establishing objectives and targets, and Section 5 describes the goal and target established by the State of Washington. The objectives and targets derived from this information can be used to calculate target levels for PSC. A physical material sort would further inform goal-setting efforts.

These are potential objectives and targets that the Port might adopt or use as inspiration for other goals:

- Recover 50 percent of waste generated by 2028
  (based on State of Washington and Franklin County's goal)

- Include recycling provisions in 100 percent of tenant leases
- Train 100 percent of PSC employees on recycling
(more details later in this section).

In the absence of established specific objectives and targets, the following sections present general, universal recommendations for increasing recycling and reducing waste generation at an airport like PSC.

Tracking and Reporting

As noted in Section 2, the Port does not currently track metrics associated with the waste management program. Regularly estimating and tracking the volume of waste sent to the landfill and the volume of material collected for recycling as well as the associated costs would reveal trends that can be assessed for issues or opportunities for improvement.

Since it is not tracked, PSC's waste and recycling performance is not currently reported to stakeholders. Reporting this information to management, employees, tenants, and interested external stakeholders on a regular basis serves the following purposes:

- To remind management employees, tenants, and contractors about the recycling program
- To communicate the port's commitment to its recycling program and its broader commitment to sustainability
- To solicit feedback and suggestions for improving the waste program.

It is recommended that the Port begin to regularly estimate and track the volume of waste sent to the landfill and the volume of material collected for recycling as well as the associated costs. It is also recommended that the Port proactively provide this information to management, employees, tenants, and interested external stakeholders regularly. The frequency of reporting is up to the Port but reporting at least annually gives the opportunity to quickly adjust and improve the program. The reporting schedule should also be updated as needed to accommodate changes to the program.

Reduce and Reuse

To reduce the facility's environmental impacts, the Port should focus on moving materials up the waste management hierarchy. Reduction is the most environmentally preferred waste management strategy as determined by the EPA. Waste reduction can be accomplished in many ways, including reusing items.
It is recommended that the Port evaluate the following reduction and reuse strategies to determine which, if any, are feasible and prudent for implantation.

- Substituting disposable items with durable alternatives in the administration office and other staff work areas
- Reusing items and materials where possible

- Working with the restaurant tenant to donate edible food to a community food security organization
- Collecting and donating unopened food, beverage, and toiletry items subject to TSA restrictions
- Encouraging reuse by passengers, tenants, and contractors.

Liquids

The garbage can in the security queuing area probably receives a fair amount of liquids and beverage containers due to TSA restrictions. Unfortunately, when these materials end up in the waste stream, the liquids are difficult to manage, and the containers cannot be recycled. Liquids add significant weight to the waste stream, contaminate other materials like paper, and may be rejected by a recycler, which will result in them being landfilled.

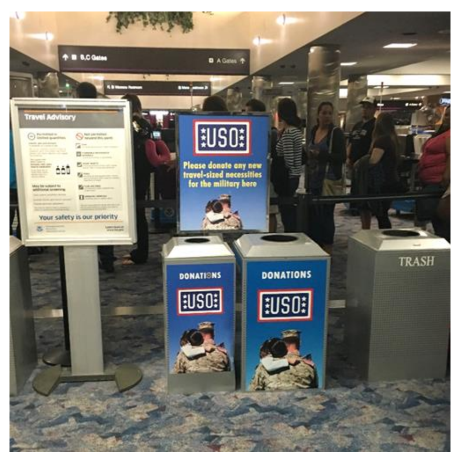
To minimize the amount of liquid discarded in the security checkpoint area and facilitate effective passenger flow through the screening process, it is recommended that the Port promote emptying of water bottles in the restroom sinks and refilling post security. Colorful, graphic signs in the terminal restrooms would encourage passengers to empty water bottles prior to security and to refill them after screening. These signs should be positioned at about eye-level. These signs could also encourage passengers to recycle disposable water bottles if they do not wish to refill them.

It is further recommended that the Port make a recycling station available in the immediate proximity of the pre-security restrooms so that passengers who do empty their disposable containers in the sinks have a convenient place to recycle the items they do not wish to refill.

Donation of Food, Beverages, and Toiletries

Feeding people is the second preferred strategy for addressing food waste according to the EPA. Federal and state laws protect organizations that donate food in good faith from liability. Some organizations will pick up food at the source which reduces the demand on the Port and concessionaire. Therefore, it is recommended that the Port work with the food and beverage concessionaire to assess the possibility of donating edible food to a local food bank, soup kitchen, or shelter for distribution to the populations they serve.

It is also recommended that the Port investigate the feasibility of collecting unopened bottles of water, other beverages, food and toiletries restricted from carry-on luggage and donating them to a local charity or other organization. These items can be very heavy and add weight to the waste stream.



Example Donation Collection at McCarran International Airport (LAS)

In compliance with TSA requirements, these items may need to be collected prior to the security checkpoint queuing area. The Port would collect these items by locating a container at the security checkpoint and storing the items until the receiving organization could collect them. To implement this recommendation, coordination between the Port, the designated receiving organization, and the TSA would be needed. An example of an airport with such a program is McCarran International Airport in Las Vegas, Nevada.

Recycle and Compost

Recycling is the second preferred waste management strategy, according to the EPA, after waste reduction/reuse. Recycling allows waste items to be processed into raw materials to make new products. The FAA guidance expects an airport's recycling, reuse, and waste reduction plan to document, at a minimum, the facility's existing program to recycle paper, plastic bottles, aluminum cans, and plastic cups. The Port recycles most of these materials as well as cardboard.

Paper

The Port is currently recycling paper (printer paper, mail, envelopes, and other items) collected from the administration offices as well as from the terminal (newspapers and magazines). These paper streams are comingled with other recyclables.

It is recommended that the Port continue to recycle paper and expand the program to additional areas, including the airline and rental car company offices, and encourage increased recycling of paper by employees, tenants, and passengers. Doing so reduces the environmental impacts associated with landfilling this material and manufacturing virgin paper.

Waste magazines and newspapers are generated aboard commercial flights and when they expire on the newsstand; it is recommended that the Port collaborate and coordinate with the airlines and concession tenant serving PSC to evaluate adding paper items from deplaned waste and newsstands to this program.

Plastic Bottles and Aluminum Cans

The Port is currently recycling plastic bottles and aluminum cans collected in the terminal building. Recycled plastic bottles and aluminum cans are comingled with paper items.

It is recommended that the Port continue the current program and expand to additional areas. Increased recovery of plastic bottles by employees, tenants, and passengers reduces the environmental impacts associated with landfilling this material and manufacturing virgin plastic.

Plastic cups

Plastic cups are typically generated aboard commercial flights. It is recommended that the Port collaborate and coordinate with the airlines to evaluate adding plastic cups from deplaned waste to the recycling program.

Cardboard

The Port currently recycles cardboard generated in the form of shipping boxes, collected from the terminal food and beverage tenants and the administration offices. This material is collected and managed separately from the comingled recyclables; this protects the value of the cardboard material by creating a single material stream (more desirable because it reduces contamination from liquids and requires less processing after collection). It is recommended that the Port continue to recycle cardboard.

It is also recommended that the Port communicate with the tenants on the progress and performance of this program and solicit their feedback regarding improvements that could be made to increase or support their participation. Marketing this program to all the terminal tenants could result in additional participation and remind existing participants of the program's specific requirements.

Glass

The Port does not currently recycle glass. If the Port identifies a consistent and significant source of glass and the County begins to accept glass in its recycling program, it is recommended that the Port collect and manage this material separately from the comingled recyclable and cardboard streams. This will protect the value of the other material by reducing contamination from broken glass.

Other Recyclables

As other recyclable materials are identified in PSC's waste stream, it is recommended that PSC work with the waste hauling contractor and County recycling facility to design and implement strategies to separate, collect, and process these materials. These materials may consist of Styrofoam, plastic bags, and other materials that are not currently recyclable but may be in the future.

Green Waste

It is recommended that the Port evaluate how green waste is managed and explore opportunities to align the facility's practices with the waste hierarchy; for example, by reducing the generation of this material at the source (mulching lawnmowers), reusing material where possible (chipped branches as mulch), composting (via the local facility), and disposing of the material on or off site as a last resort.

Food Waste Composting

According to industry case studies, food waste is typically a major component of the waste stream at an airport (on average, 35 percent). As described in Section 5, the EPA's food recovery hierarchy prioritizes composting of food waste over landfill of this material (after using it to feed people as discussed under

Reduce and Reuse). Composting is the process of decomposing food and other waste into a nutritious soil additive.

Composting at PSC largely depends on the availability of a local composting facility interested in accepting this material. As noted in Section 2, there does not appear to be a commercial composting facility in the area.

If a composting facility is found nearby or established in the area, the Port should evaluate implementing composting. In a terminal, pre-consumer food waste (waste generated by food preparation) is generally easier to compost because restaurant employees are at a facility more frequently and more regularly than passengers, so they are easier to train and educate on composting practices and requirements. The specific items accepted by a composting facility depend on that facility's design and the process used to break down the waste; some facilities accept all food waste (including meat and bones and breads), while others accept only vegetables and fruit.

One option for easing into composting gradually is to first implement a composting program for coffee grounds generated by restaurant and café tenants in the terminal. Coffee grounds have a pleasant odor, are easily identifiable (therefore easy to separate), are typically uncontaminated by other materials, and are generated in a predicable manner and quantity. Once tenants are comfortable composting coffee grounds, other materials can be added by name (banana peels, apple cores, etc.) and/or by type (fruits, vegetables, etc.) until all food waste appropriate for composting is included.

Paper Products

Once a commercial composting facility is available in the area, the Port may wish to collect paper towels and other paper products (napkins and tissues) for composting. Composting is environmentally preferred over landfilling this material.

Because PSC's restrooms are equipped with paper towel dispensers and nearby garbage cans, the waste stream collected in these cans will primarily consist of paper towel. This stream can be expected to contain low contamination and a steady volume of material, making it an attractive material for composting.

No modifications to the paper towel dispensers or garbage bins would be needed to implement paper towel composting. Alternative bins would need to be conveniently located and clearly labeled to accept other waste generated in the restrooms that is not paper towel, and the bins reserved for paper towel should be labeled "Paper Towel Only – Collected for Composting" (or similar) to instruct use and explain how this material is managed. The Port would also need a dedicated cart for this material and a procedure to collect and store it separately until it was collected by the waste hauling contractor for delivery to the composting facility.

Education and Outreach

Under the existing program, education of and outreach to employees, tenants, contractors and passengers is primarily accomplished through container labeling in the terminal.

To supplement these efforts, it is recommended that the Port improve the in-terminal messaging for passengers and provide brief, clear instructions for recycling. Providing clear, instructional signage at the recycling stations or recycling bins can improve passenger participation and reduce contamination. See below for information about signage.

It is recommended that the Port provide simple, on-going training for employees, tenants, and contractors that explains the recycling program, including its purpose and requirements. Such a training program will promote program participation and compliance, resulting in increased recycling and reduced contamination. In addition, training can designate a point of contact and a mechanism to receive feedback and ideas for improvement.

The format of employee training could take any number of forms, including emails, meetings, posters, etc. The content of such training should include:

- Reminders about the materials accepted for recycling at PSC and the location of the containers to be used for the program,
- Information about purchasing requirements, and
- Information about the positive effect the program is having on PSC's environmental impact.

Information and participation from the waste collection contractor should also be incorporated into the training program. In addition, different stakeholders and organizations involved in collection, housekeeping, recycling, composting, and other waste activities could also be asked to provide content or to be present during training.

It is recommended that the Port include a brief overview of the recycling program during employee on-boarding training and through recurrent refresher training at regular intervals. To use employee time effectively, waste training could be combined with other trainings or meetings.

The Port should consider providing introductory level information to new tenants and should provide training materials such as postings, postcards, etc. to existing tenants for use with their employees. As some airport tenants may experience significant employee turnover, providing this information regularly (for example, annually) will help keep everyone up to date on the program.

Once a training and education program is implemented, it is recommended that the Port actively maintain such a program to facilitate its continued success. The content of trainings should be updated as the program changes and grows.

Containers and Bins

Several existing recycling stations in the terminal are conjoined units with three compartments; others are separate compartments with labeling. Conjoined containers ensure a consistent format at every recycling station location; top facing signage has been shown to educate and instruct passengers to separate materials appropriately. It is recommended that PSC install additional recycling stations with recommended signage in high traffic areas of the terminal as resources allow.

In addition, the Port should consider removing some of the stand-alone garbage cans inside the public areas of the terminal. There are many garbage cans in the terminal, and they are typically closer/more available than a recycling station; therefore, in many cases, it is more convenient for passengers, employees, and tenants to locate and use a garbage can for all materials than to find and use a recycling station. These containers could be repurposed as recycling containers in other spaces for comingled or single stream recyclables (in offices for paper, in breakrooms for bottles and cans, etc.)

Since custodial staff conduct the daily waste activities, their insight is valuable in improving and maintaining the recycling program at PSC. They could identify which containers are underused or undersized to help inform changes to the location and size of existing and future recycling stations, recycling containers, and garbage cans.

Signage and Labeling

It is recommended that the Port provide recycling signage throughout the terminal. The signage should be adjacent to recycling stations and elaborate on the waste program.

A key location for signage is in the security checkpoint queuing area in the terminal where the TSA restrictions compel the generation and disposal of waste. Clear signage in this area would help educate passengers on the restrictions and their options to comply. This would in turn reduce wait times and the volume of items thrown away. Signage pertaining to the emptying of liquids and refill of containers post-security is discussed above.
Labeling for recycling bins in other areas of PSC is inconsistent or absent. That labeling could be improved with color, images, and short, clear, instructive text to improve understanding of which items are recyclable and which should be thrown away.

Other Recommendations

In addition to the strategies recommended above, the following recommended strategies would enhance the Port's waste program.

Contracts and Leases

As described in Section 4, contracts are a vehicle through which the Port can influence tenant behavior, including recycling. As contracts and leases expire, extend, or renew, it is recommended that the Port consider revising the new contract language to include waste management requirements or preferences, for example, support of the waste program. This could be a general clause stating a preference that tenants reduce, reuse, and recycle where practicable or specific information about recycling, reuse, or waste reduction objectives and requirements.

Purchasing Policies and Requirements

The Port's existing purchases may create waste. However, the Port currently purchases paper towels made from recyclable material which supports the manufacture of these types of items and demand for recycled paper fibers. It is recommended that the Port continue to purchase items with recycled content, as well as consider adopting a purchasing policy that prioritizes additional items that are durable (versus disposable), reusable, recyclable, compostable, and/or made from recycled content. Once established, this policy could be shared with the Port's tenants to encourage their own adoption of sustainability-minded purchasing practices.

Additional Facilities and New Development

The Port may wish to consider expanding the recycling program to additional areas of PSC, for example, in the buildings and activities excluded from this plan. Expanding recycling and waste reduction to areas outside the Port's control or influence will require cooperation and collaboration with the operators of those areas as well as with their housekeeping and waste hauling contractors. Expansion could be as simple as encouraging these areas to recycle and acting as a resource for their questions or as complex as assisting these areas with an evaluation of their facility and/or container selection and signage design.

As PSC grows and changes, it is recommended that recycling and waste management be considered as a part of designing and constructing new development projects. This could be accomplished by establishing construction specifications that outline waste management requirements or preferences for PSC projects (for example, any landfill diversion rate requirements or recycled-content material preferences) and involving the waste collection contractor in the design and planning of new facilities.

Any expansions of the existing program should be designed with care to maintain consistency and compatibility with the program in the terminal, administration offices, and other established areas.

Continuous Improvement

It is recommended that the Port maintains and implements improvements to the recycling program by following the Plan Do Check Act cycle.

Plan

The recommended strategies and supporting references make up the *plan* portion of the process. Defining success (for example, something like 50 percent recycling by 2028), establishing materials and areas of focus, collecting baseline information (waste audit, surveys, etc.), identifying sub-goals, and identifying strategies are all part of planning. In the future, additional areas of focus, baseline measurements, and goals will likely be needed.

Do

Implementation of strategies included in this plan represents the *do* portion of the process. This involves implementing the recommendations in this plan and making progress toward achieving the goals. In "doing," the Port will continue developing a culture of awareness for waste management and will begin to shape the practices and processes for improving and optimizing its activities associated with reduction, reuse, recycling, composting, and other waste management elements at the facility.

Check

As strategies are implemented, the *check* portion of the process involves reporting that requires regularly tracking and checking the progress toward meeting the goals. The Port has finite resources (financial, staffing, capital, etc.), therefore, the management and tracking of the plan must not be unnecessarily arduous. If tracking and checking become too difficult or time consuming, the entire plan may suffer. Checking may require the Port to develop and use tools for measuring success and identifying areas for improvement, including a mechanism for feedback and process for reviewing suggestions.

The following scenarios may trigger re-evaluation of the program and/or the constraints described in this document:

- New state recycling laws, requirements, or goals
- New Port programs or goals
- New City of Pasco programs or goals
- New Franklin County programs or goals
- New local infrastructure, for example, composting facility
- Changes within or expiration of franchise agreement with waste hauling contractor(s).

Act

The *act* portion of the process encompasses taking what has been learned in the previous stages and actively responding. It can be helpful to ask, "What did we learn?" and "How can we do better next time?" By re-evaluating the strategies, activities, goals, and metrics, adjustments can be identified and put into action.

It is recommended that meetings on waste and recycling be held on a regular basis to drive the continuous improvement cycle (review the recycling program and plan and implement improvements/adjustments). It is further recommended that these meetings include a representative from each of the following areas: the waste hauling company, the airlines serving PSC, the restaurant tenant, other terminal tenants, a hangar tenant, the community, and the traveling public.

Recommendations Summary

The recommendations outlined in this document do not require major capital improvements and were designed to be compatible with the Port's in-progress master plan, the existing recycling program, and other airport requirements. **Table D-5** summarizes recommendations for the PSC's waste program.

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Table D-5: Recommendations Summary

PSC Waste Program Recommendations
Objectives and Targets ▸ Set SMART goals (see Section 7).
Tracking and Reporting ▸ Regularly estimate and track: • Volume of waste to landfill • Volume of material collected for recycling • Recycling rate • Costs for waste and recycling services. ▸ Assess waste generation, landfill, recycling, and cost trends for issues or opportunities for improvement. ▸ Establish a regular reporting schedule ▸ Proactively provide information about the program.
Reduce and Reuse ▸ Substitute disposable items with durable alternatives. ▸ Reuse items and materials. ▸ Promote emptying of water bottles in restroom sinks and refilling post security. • Supplement water bottle emptying/refilling signs. • Encourage recycling of disposable water bottles through signage. • Place a recycling station in immediate proximity of the pre-security restrooms. ▸ Work with the restaurant tenant to donate edible food. ▸ Collect and donate unopened food, beverage, and toiletry items. ▸ Encourage reuse by passengers, tenants, and contractors.
Paper ▸ Continue the paper recycling program. ▸ Expand paper recycling program to additional areas, specifically airline deplaned newspapers and expired items from the newsstand.
Plastic Bottles and Aluminum Cans, Plastic Cups ▸ Continue the plastic bottle and aluminum can recycling program. ▸ Expand the program to additional areas, specifically airline deplaned beverage containers. ▸ Coordinate plastic cup recycling with the airlines serving PSC.
Cardboard ▸ Continue the cardboard recycling program. ▸ Provide feedback to tenants on the progress and performance of this program, solicit their feedback, and market the program to all tenants.
Glass ▸ Begin the glass recycling program. ▸ Work to address contamination in this material stream.
Other Recyclables ▸ Work with the waste hauling contractor to design and implement strategies for other materials as they are identified in the waste stream.
Green Waste ▸ Evaluate how this material is managed and explore opportunities to align with the EPA hierarchy.
Food Waste ▸ If a composting facility is established in the area, evaluate composting at PSC. • Start with coffee grounds, then expand to other pre-consumer food waste.
Paper Products ▸ If a composting facility is established in the area, evaluate composting at PSC.
Education and Outreach ▸ Provide in-terminal messaging for passengers. • Provide clear, instructional signage at recycling stations. ▸ Provide simple, on-going training for employees, tenants, and contractors.
Containers and Bins ▸ Install additional recycling stations in high traffic areas of the terminal. ▸ Remove stand-alone garbage cans in public areas of terminal. ▸ Standardize recycling bins and garbage cans as they are retired/replaced. ▸ Install additional recycling bins and garbage cans in other areas, as they are added to program.
Signage and Labeling ▸ Expand and improve signage to elaborate on the program and provide direction, specifically, in the checkpoint queuing area.
Contracts and Leases ▸ Revise new contract language to include waste management requirements/preferences.
Purchasing Policies and Requirements ▸ Adopt and continue a purchasing policy that prioritizes materials that are durable, reusable, recyclable, compostable, and/or made from recycled content. • Share with tenants to encourage them to adopt their own similar practices.
Additional Facilities and New Development ▸ Collaborate with operators of areas excluded from this plan to expand the program. ▸ Consider recycling and waste management as part of designing and constructing new development.
Continuous Improvement ▸ Maintain and improve the recycling and waste program according to Plan Do Check Act cycle.

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CONCLUSION

The Port currently has a simple waste program in place for PSC that includes basic elements and has the potential to be expanded in phases to further reduce the facility's environmental impact. This document has described the existing program and outlined recommended improvements that will allow PSC to potentially increase both landfill diversion and recycling volumes. In addition, this plan documents and supports PSC's compliance with the FMRA of 2012 and FAA guidance for recycling, reuse, and waste reduction.

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APPENDIX E - GLOSSARY

This glossary includes definitions of terms and acronyms used in the Plan. It is intended to serve as a reference for other Plan elements. Terms are defined and described in the chapters in which they appear.

A

AAB	Airport Advisory Board
AAC	Aircraft Approach Category: *An FAA classification based on how fast an aircraft approaches the runway on landing. Used to determine airfield design characteristics.* • *Category A: Speed less than 91 knots.* • *Category B: Speed 91 knots or more, but less than 121 knots.* • *Category C: Speed 121 knots or more, but less than 141 knots.* • *Category D: Speed 141 knots or more, but less than 166 knots.* • *Category E: Speed greater than 166 knots.*
AC	Advisory Circular: *FAA standards and guidelines on a variety of airport characteristics.* Also Asphalt Concrete (in Pavement Condition Index): *A composite material commonly used to surface roads, parking lots, and airports. It consists of mineral aggregate bound together with asphalt, laid in layers, and compacted.*
ACIP	Airport Capital Improvement Plan: *The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.*
ACRP	Airport Cooperative Research Program: *An industry-driven, applied research program that develops near-term, practical solutions to problems faced by airport operators. ACRP is managed by the Transportation Research Board (TRB) of the National Academies and sponsored by the Federal Aviation Administration (FAA). The research is conducted by contractors who are selected on the basis of competitive proposals.* (Transportation Research Board, 2014)
ADA	Americans with Disabilities Act: *Prohibits discrimination against people with disabilities in several areas including employment, transportation, public accommodations, communications and access to state and local government programs and services.*

ADG — Aircraft Design Group: *An FAA classification based on the wingspan and tail height of aircraft. Used to determine airfield design characteristics. The groups are as follows:*

- *Group I: Up to but not including 49 feet.*
- *Group II: 49 feet up to but not including 79 feet.*
- *Group III: 79 feet up to but not including 118 feet.*
- *Group IV: 118 feet up to but not including 171 feet.*
- *Group V: 171 feet up to but not including 214 feet.*
- *Group VI: 214 feet or greater.*

ADPM — Average Day Peak Month: *Number of Operations on an Average Day during Peak Month*

ADO — FAA Airports District Office: *The local ADO is in Seattle. Staff in the ADO oversee airport planning, permitting, and design projects, manage capital improvement programs, and allocate federal funding.*

AFFF — Aqueous Film Forming Foam: *is a highly efficient type of fire suppressant agent, used to attack flammable liquid pool fires.*

AGL — Above Ground Level: *Elevation of a point or surface above ground level.*

AIP — FAA Airport Improvement Program: *The AIP provides grants to public agencies — and, in some cases, to private owners and entities -- for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). Airports receive regular funding each year called "entitlement" and may compete against other airports nationwide for additional "discretionary" funding. (Federal Aviation Administration, 2014)*

Aircraft — *The terms aircraft and airplane are synonymous, referring to all types of fixed-wing airplanes, including gliders. A fixed-wing aircraft is heavier than air, and is supported in flight by the dynamic reaction of the air against its wings*

Airport Elevation — *The highest point on an airport's usable runways expressed in feet above mean sea level (MSL).*

Aircraft Operation — *A count of a takeoff, landing, or touch-and-go. Each time an aircraft touches the runway to take off or land, it counts as an operation.*

Airside

Airside is a collective term for those areas of the Airport that are accessible to aircraft including runways, taxiways, aprons, and hangar areas. Also referred to as the Airport Operations Area (AOA)

Airport Hazard	*Airport hazard is any structure or tree or use of land which obstructs the airspace required for the flight of aircraft in landing or taking-off at an airport or is otherwise hazardous to such landing or taking-off of aircraft.*
ALP	Airport Layout Plan: *is a scaled graphic representation of existing and proposed airport facilities, indicating their location on the airport and pertinent clearance and dimensional information required to show conformance with applicable standards.*
ALS	Approach Lighting System: *A series of lights before the runway end that guide aircraft landing in the dark and during periods of low visibility.*
ALSA	Adjacent Lands Study Area: *A general land use study of property adjacent to another parcel that may inventory variable features (acreage, values, zoning, etc.).*
AMSL	Above Mean Sea Level: *Elevation or Altitude above Sea Level*
APM	Airport Planning Manuals: *Aircraft manufacturer's performance charts and tables to determine runway length requirements.*
AOA	Aircraft Operations Area*: A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.*
ASDA	Accelerate-Stop Distance Available: *the runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff. Also see Declared Distances*
ARC	Airport Reference Code: *A combination of the AAC and ADG. These two elements combined set the design standards, setbacks, and dimensions of safety critical airport facilities, such as pavement to pavement separation, pavement width, safety areas, object free areas, and runway protection zones.*
ARTCC	Air Route Traffic Control Center: *In air traffic control an air route control center, also known as a center, is a facility responsible for controlling aircraft en route in a particular volume of airspace at high altitudes between airport approaches and departures.*
ARFF	

	Aircraft Rescue Firefighting: *is a special category of firefighting that involves the response, hazard mitigation, evacuation and possible rescue of passengers and crew of an aircraft involved in (typically) an airport ground emergency.*
ASOS	Automated Surface Observation System: *provides weather observations that include air and dew point temperature, wind, air pressure, visibility, sky conditions, and precipitation.*
ASR	Airport Surveillance Radar: *The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.*
ATCT	Airport Traffic Control Tower: *A manned observation tower in charge of managing ground traffic and air traffic in an airport's airspace. The ATCT staff help maintain safe separation between aircraft in the air, and aircraft and vehicles on the ground.*
ATIS	Automated Terminal Information Service: *The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.*
ATO	Airline Ticketing Offices
ATOW	Allowable Takeoff Weight
AV	Automated Vehicles
Aviation Use	Aviation Use includes aviation and aviation-related land uses on an Airport such as the terminal area, fixed-based operator (FBO) facilities, general aviation hangars, airport maintenance facilities, Airport Traffic Control Tower (ATCT), areas for NAVAIDs, and other aviation facilities.
AVGAS	Aviation Gasoline (also referred to at 100LL): *Leaded gasoline used in piston powered aircraft.*
AWOS	Automated Weather Observation System: *The AWOS provides general reports which include: temperature, dew point, sky condition, visibility, cloud heights, current weather, precipitation accumulations, icing conditions and sea level pressure.*

B

Based Aircraft	*Based Aircraft are aircraft that hangar or tie-down at an airport. These aircraft indicate that they are based at an airport on their registration form, and the owners typically live or work in the area.*
Blast Pad	*A surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash. A blast pad is not a stopway.*
BRL	Building Restriction Line: *identifies areas on an airport where structures can be located to be compatible with airfield operations. Buildings should not conflict with the recommended airport design standards defined for a particular runway-taxiway system or the protected airspace associated with the runway. The location of the BRL is measured from the runway centerline outward in a perpendicular direction.*
BTS	Bureau of Transportation Statistics: *The statistical arm of the U.S. Department of Transportation. The BTS mission is to create, manage, and share transportation statistical knowledge with public and private transportation communities and the Nation.* (U.S. Department of Transportation, 2014)

C

CAA	Clean Air Act of 1970: *Federal law that regulates air emissions from stationary and mobile sources*
CAC	Community Advisory Committee: *The CAC is made up of community stakeholders, including airport tenants, land use planning bodies, and economic development agencies. CAC members are tasked with reviewing Master Plan materials and providing comment from the perspective of the organizations of which they are a member of.*
CAGR	Compound Annual Growth Rates: *The average, annual rate of growth (or loss) over a period of multiple years.*
Catchment Area	*Catchment Area is the geographic boundary from which an airport draws its users, and airport activity is primarily influenced by the movement of people and products to and from the catchment area. Catchment areas are defined by the types of services offered*

at an airport, proximity of competitor airports, and the tendency of the local population

Category-1 *to use the airport*

(CAT-I). An instrument approach or approach and landing with a Height Above Threshold (HATh) or minimum descent altitude not lower than 200 ft (60 m) and with

Category-2 *either a visibility*

not less than ½ statute mile (800m), or a runway visual range not less than 1800 ft (550m).

Category-3 *(CAT-II). An instrument approach or approach and landing with a Height Above Threshold (HATh) lower than 200 ft (60 m) but not lower than 100 ft (30 m) and a runway visual range*

not less than 1200 ft (350m).

CEQ

(CAT-III). An instrument approach or approach and landing with a Height Above Threshold (HATh) lower than 100 ft (30m), or no HATh, or a runway visual range less

CERCLA *than 1200 ft*

(350m).

Council on Environmental Quality: *Coordinates federal environmental activities and assists in the development of environmental policy across the executive branch.*

Comprehensive Environmental Response, Compensation, and Liability Act: *Also known as Superfund, provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment.*

CFR Code of Federal Regulations: *The CFR annual edition is the codification of the general and permanent rules published in the Federal Register by the departments and agencies of the Federal Government.* (U.S. Government Printing Office, 2014)

CIP Capital Improvement Plan: *An airport's list of planned capital expenditures over the next five years, on file with the state and the FAA. The CIP is used by federal and state agencies to plan and allocate funding and use by airport sponsors to plan the local share of capital expenditures.*

Circling Approach *A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or is not desirable.*

Clearway — *A defined rectangular area beyond the end of a runway cleared or suitable for use in lieu of runway to satisfy takeoff distance requirements (see also Takeoff Distance Available* [TODA]).

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

- CLASS A: *Generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.*
- CLASS B: *Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.*
- CLASS C: *Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.*
- CLASS D: *Generally, that airspace from the surface to 2,500 feet above the 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 procedure. Unless otherwise authorized, all persons must establish two-way radio communication.*
- CLASS E: *Generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.*

- CLASS G: *Generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.*

Critical Aircraft — *A critical aircraft is the most demanding aircraft, or family of aircraft, to use an airport. Facility design standards and dimensions are set to accommodate the critical aircraft. For projects requiring FAA-funding, the critical aircraft must have scheduled operations of any number per year, or over 500 non-scheduled operations per year.*

Crosswind — *A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.*

CTAF — Common Traffic Advisory Frequency: *CTAF is a radio frequency used by pilots to communicate with each other at non-towered airports, or when the tower is closed at night. The CTAF may also be used to coordinate arrivals and departures and control airfield lighting systems.*

CWA — Clean Water Act: *establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.*

D

DA — Decision Altitude: *A specified altitude on a vertically-guided approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established. DA is referenced to mean sea level (MSL).*

dB — Decibel: *A decibel is a measure of the amplitude or strength of a sound wave. The strength, or loudness, of a sound wave is measured using decibels on a logarithmic scale. The range of audibility of a human ear is 0 dB (threshold of hearing) to 125 dB (pain begins). The use of a logarithmic scale often confuses people because it does not directly correspond to the perception of relative loudness. A common misconception is that if two noise events occur at the same time, the result will be twice as loud. In reality, the event will double the sound energy, but only result in a 3 dB increase in magnitude. For a sound event to be twice as loud as another, it must be 10 dB higher.*

dBA — Weighted Decibel: *Scientific studies have shown that people do not interpret sound the same way a microphone does. For example, humans are bias and sensitive to tones within a certain frequency range. The A-weighted decibel scale was developed to* *correlate sound tones with the sensitivity of the human ear. The A-weighted decibel is a "frequency dependent" rating scale which emphasizes the sound components within the frequency range where most speech occurs.*

Declared Distances — The distances the airport owner declares available for a turbine powered aircraft's takeoff run, takeoff distance, accelerate-stop distance, and landing distance requirements.

The distances are:

- TAKEOFF RUNWAY AVAILABLE (TORA): *The runway length declared available and suitable for the ground run of an airplane taking off.*
- TAKEOFF DISTANCE AVAILABLE (TODA): *The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.*
- ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): *The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.*
- LANDING DISTANCE AVAILABLE (LDA): *The runway length declared available and suitable for landing.*

DEQ — Department of Environmental Quality: *State of Washington DEQ protects, preserves, and enhances environment.*

Displaced Threshold — *A threshold that is located at a point on the runway beyond the beginning of the runway surface.*

DME — Distance Measuring Equipment: *is a transponder-based radio navigation technology that measures slant range distance by timing the propagation delay of Very-High Frequencies (VHF) or Ultra-High Frequencies (UHF) radio signals.*

DNL — Day/Night Average Sound Level: *The standard metric used to measure noise from aircraft is the Day-Night Noise Level, which measures the cumulative noise levels of all aircraft operations. DNL includes penalties for night operations (10pm-7am), when ambient noise levels tend to be lower and aircraft noise may be viewed as more disruptive.*

DOE — Department of Ecology: *An environmental regulatory agency for the State of Washington.*

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.*

DTWL

DWL

Dual-Tandem Wheel Landing Gear

Dual-Wheel Landing Gear

E

EA — Environmental Assessment: *An EA is a concise document that takes a hard look at expected environmental effects of a proposed action. EA's are required for projects that receive federal funding, pursuant to the National Environmental Policy Act and other applicable regulations. Should significant environmental impact be expected as part of a purposed action, then an environmental impact statement may be warranted.* (Federal Aviation Administration, 2006)

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

ECOS — Environmental Conservation Online System: *Serves a variety of reports related to the FWS Threatened and Endangered Species.*

EIS — Environmental Impact Statement: *If the EA indicates the proposed action's impacts would meet or exceed a significance threshold(s) for the affected resource(s), or that mitigation would not reduce the significant impact(s) below the applicable threshold(s), FAA must prepare an EIS. An EIS provides additional, detailed evaluations of the proposed action and its alternatives, including the No Action alternative.* (Federal Aviation Administration, 2006).

Entrance Taxiway — *A taxiway designed to be used by an aircraft entering a runway. Entrance taxiways may also be used to exit a runway.*

Enplanement — *The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.*

EPA — Environmental Protection Agency: *The purpose of the EPA is to ensure that Americans are protected from significant risks to health and the environment; that national efforts to reduce environmental risk are based on the best available scientific information; and that federal laws protecting health and the environment are enforced; that environmental* *protection is an integral consideration in U.S. policies concerning natural resources, human health, economic growth, energy, transportation, agriculture, industry, and international trade, and these factors are similarly considered in establishing environmental policy.* (U.S. Environmental Protection Agency, 2014)

ESA — Endangered Species Act: *The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the U.S. Fish and Wildlife Service and the Commerce Department's National Marine Fisheries Service.*

Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments. (U.S. Fish and Wildlife Service, 2013)

ETMSC — Enhanced Traffic Management System Counts: *Provides information on traffic counts by airport or by city pair for various data groupings such as aircraft type or by hour of the day. Data are created when pilots file flight plans and/or when flights are detected by the National Airspace System*

ETOPS — Extended-range Twin-engine Operating Performance: *Aircraft certified to fly on one engine for more than 3-hours to allow twin-engine aircraft to fly 90 minutes from the nearest airport over water.*

Exit Taxiway — *A taxiway designed to be used by an aircraft only to exit a runway*: *Acute-Angled Exit Taxiway – A taxiway forming an angle less than 90 degrees from the runway centerline. High Speed Exit Taxiway – An acute-angled exit taxiway forming a 30-degree angle with the runway centerline, designed to allow an aircraft to exit a runway without having to decelerate to typical taxi speed.*

F

FAA — Federal Aviation Administration: *The FAA's continuing mission is to provide the safest, most efficient aerospace system in the world.* (Federal Aviation Administration, 2010) *They are the regulatory authority on airports, airspace, aircraft, and pilots in the U.S.*

FAR — *FAA policy is created in Washington D.C. and administered by local regional and district offices.*

Federal Aviation Regulation: *Found in Title 14 of the United States Code of Federal Regulations (14 CFR); 14 CFR provides regulatory mandates that govern various elements of the civil aviation system.*

FAR Part 77 — Federal Aviation Regulation Part 77: *Establishes standards and notification requirements for objects affecting navigable airspace.*

FBO — Fixed Base Operator: *FBOs are airport businesses that provide a variety of general aviation services including aircraft parking, fuel, maintenance, charter and aircraft rental, pilot lounge, flight instruction and sales.*

FEMA — Federal Emergency Management Agency: *FEMA coordinates the federal government's role in preparing for, preventing, mitigating the effects of, responding to, and recovering from all domestic disasters, whether natural or man-made, including acts of terror.* (Federal Emergency Management Agency, 2014)

FONSI — Finding of No Significant Impact: *A federal agencies record of decision on an environmental assessment declaring that the p*roposed action poses no significant impact on natural and human resources included in the National Environmental Policy Act.

FPO — FAA Flight Procedures Office: *The FPO is responsible for establishing instrument procedure (departure, en route, arrival, approach) design and obstacle clearance standards, criteria, and policy for the existing National Airspace System flight procedure structure and to accommodate emerging technologies and flight operation capabilities. The FPO develops and establishes criteria for terminal instrument procedures for issuance in the current edition of United States Standard for Terminal Instrument Procedures and related 8260-series orders.* (Federal Aviation Administration, 2014)

FPPA — Farmland Protection Policy Act: *Intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses.*

Frangible — *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.*

FSDO FAA Flight Standards District Office: *The FSDO is the regulatory agency in charge of low-flying aircraft, accident reporting, air carrier certification and operations, aircraft maintenance, aircraft operational issues, aircraft permits, airmen certification (licensing) for pilots, mechanics, repairmen, dispatchers, and parachute riggers, certification and modification issues, enforcement of airmen & aircraft regulations.* (Federal Aviation Administration, 2013)

G

GA General Aviation: *General aviation refers to aircraft activity that is not scheduled for commercial purposes (e.g. airlines and cargo carriers) or conducted by the military. GA operations include charter and on-demand air transport, flight instruction, recreational flying, pipeline inspection, business, and charter users not operating as airlines under Federal Aviation Regulation (FAR) Part 121, Part 135, or military regulations.*
and emergency response.

GHGs Greenhouse Gases: *Gases that trap heat in the atmosphere.*

GIS Geographic Information System: *A computer system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.*

GPA Glide Path Angle: *is the angle of the final approach descent path relative to the approach*
surface baseline.

GPS Global Positioning System: *A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.*

GQS Glide Path Qualification Surface: *An imaginary surface extending from the runway threshold along the runway centerline extended to the Decision Altitude (DA) point.*

GRP Gross Regional Product: *is the value of goods and services produces in the County and serves as a health index for the overall economy.*

GS Glideslope: *is the vertical component of the instrument landing system (ILS) for the glide path guidance when combined with the lateral guidance of the localizer. The glideslope consists of the following:*

	- *Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or* - *Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.*
GSF	Gross Square Footage

H

HAA	Height Above Airport: *The height of the circling approach descent altitude (MDA) above the airport elevation.*
HAZMAT	Hazardous Materials: *materials that pose a risk to human health and safety, and the environment. Transport, storage, and disposal of these materials are regulated by state and federal environmental and transportation agencies.*
Helicopter	*Helicopters are characterized by having a rotor mounted above the cabin for lift and propulsion. Helicopters are commonly used for flight training, by law enforcement and emergency response, and by aerial businesses such as pipeline inspection, forestry, and aerial agriculture. Helicopters can be piston or turbine powered, and depending on the complexity of the model, can be operated by one pilot or two.*
HIRL	High Intensity Runway Lights: *HIRLs are used to outline the edges of runways during periods of darkness or reduced visibility.*
Horizontal Surfaces	*An imaginary obstruction-limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.*
Hot Spot	*A location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.*
HVAC	Heating, Ventilation, Air Conditioning: *Environmental control systems for a building*

I

IAF

Instrument Approach Fix: *The designated point at which the initial approach segment begins for an instrument approach to a runway.*

IAP

Instrument Approach Procedure: *consist of a series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight rules (IFR) conditions from the beginning of the initial approach to a landing, or to a point from which the landing can be made visually. IAPs are classified as precision instrument, with both horizontal and vertical guidance; non-precision instrument, with only horizontal guidance; and visual, without positional guidance*

ICAO

International Civil Aviation Organization: *ICAO is a United Nations specialized agency that works with Member States and global aviation organizations to develop international Standards and Recommended Practices (SARPs) which States reference when developing their legally-enforceable national civil aviation regulations.* (International Civil Aviation Organization, 2014)

IFR

Instrument Flight Rules: *IFR governs flight procedures when there is cloud ceiling less than 1,000 feet and/or visibility less than 3 miles. These rules require pilots to be specially licensed to navigate using instruments and air traffic control instruction, without visual reference.*

ILS

Instrument Landing System: *An instrument landing system operates as a ground-based instrument approach system that provides precision lateral and vertical guidance to an aircraft approaching and landing on a runway, using a combination of radio signals and, in many cases, high-intensity lighting arrays to enable a safe landing during instrument meteorological conditions (IMC), such as low ceilings or reduced visibility due to fog, rain, or blowing snow.*

IMC

Instrument Meteorological Conditions: *is an aviation flight category that describes weather conditions that require pilots to fly primarily by reference to instruments, and therefore under instrument flight rules (IFR), rather than by outside visual references under visual flight rules (VFR).*

IPaC

Information for Planning and Consultation: *A project planning tool which streamlines the USFWS environmental review process.*

Instrument Procedures

A series of predetermine maneuvers consisting of navigational waypoints, headings, and minimum altitudes, intended to guide aircraft between the terminal (airport area) phase of flight and the enroute phase of flight.

ISA	International Standard Atmosphere: *ISA is a mathematical model that describes how the earth's atmosphere, or air pressure and density, changes relative to altitude. The atmosphere is less dense at higher elevations. ISA is frequently used in aircraft performance calculations because conditions that deviate from ISA will affect aircraft performance*
Itinerant Aircraft	*An aircraft that is proceeding to or arriving from another location; or leaves the aerodrome traffic circuit but will be returning to land.*
Itinerant Operations	*An operation that originates and terminates at different airports. An example is an aircraft flying from PSC to another airport.*

J

Jet	*Jet aircraft are characterized for having a turbine engine instead of a piston engine. Jet aircraft range in size from small four-passenger business jets to the largest airliners. They can generally fly faster and at higher altitudes than SEP and MEP, making them better suited for business travel and emergency response. It is less common, but not unheard of, to see a jet used for recreational flying and flight instruction. Some smaller civilian jets can operate with a single pilot; however, most civilian jet aircraft require two.*
Jet A	*Jet A is gasoline used in turbine engine powered aircraft. These include jets and propeller aircraft with turbine engines. Jet A is kerosene, refined to meet aviation specifications.*

K

L

Large Aircraft	*An aircraft with a maximum certificated takeoff weight of more than 12,500 lbs.*
LDA	Landing Distance Available: *The runway length declared available and suitable for landing an aircraft.*
LIRL	Low Intensity Runway Lights: *The lowest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.*

LOC	Localizer: *is the lateral guidance component of the instrument landing system (ILS) for the runway center line when combined with the vertical guidance of the glide slope.*
Local Area Augmentation System	*A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy integrity, continuity, and availability.*
Local Traffic	*Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch-and-go training operations.*
Local Operation	*An operation that originates and terminates at the same airport. An example is an aircraft taking off from PSC, remaining near the airport to practice flight maneuvers, and then landing at PSC.*
LPV	RNAV Localizer Performance with Vertical Guidance: *GPS based approach system that provides vertical guidance with precision similar to a ground-based ILS system*

M

Magnetic Bearing	*This determines the numbering scheme of runways. Runways are measured based on their orientation to the magnetic north pole (not the true North Pole, located at 90 degrees north latitude).*
MALS	Medium-Intensity Approach Light System with Indicator Lights
MALSR	Medium-Intensity Approach Light System with Runway Alignment Indicator Lights: *medium-intensity approach light system 1,400 feet in length with runway alignment indicator lights.*
MDA	Minimum Decent Altitude: *The lowest authorized altitude on an approach that does not have vertical guidance. MDA is referenced to mean sea level (MSL).*
MEP	Multi-Engine Piston: *MEP have two or more engines and are typically larger than Single Engine Piston (SEP) aircraft. Multiple engines make the aircraft more capable and require additional flight instruction beyond what is needed to operate an SEP. MEP are primarily used for flight training and business aviation. MEP may require two pilots, but many variants can be operated with one.*

MGW	Main Gear Width
MIRL	Medium Intensity Runway Lights*: MIRLs are located along the edge of the runway and are used by pilots at night and in low visibility to land and take-off from the runway.*
MITL	Medium Intensity Taxiway Lights*: MITLs are located along the edge of the taxiway and are used by pilots at night and in low visibility to navigate on taxiways.*
Modification to Standards	*Any approved nonconformance to FAA standards, other than dimensional standards for Runway Safety Areas (RSAs), applicable to an airport design, construction, or equipment procurement project that is necessary to accommodate an unusual local condition for a specific project on a case-by-case basis while maintaining an acceptable level of safety.*
Movement Area	*The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft including helicopters and tilt-rotors, exclusive of loading aprons and aircraft parking areas*
MSL	Mean Sea Level: *is an average level of the surface of one or more of Earth's oceans from which heights such as elevations may be measured. MSL is a type of vertical datum – a standardized geodetic reference point – that is used, for example, as a chart datum in cartography and marine navigation, or, in aviation, as the standard sea level at which atmospheric pressure is measured to calibrate altitude and, consequently, aircraft flight levels.*

N

NAAQS	National Ambient Air Quality Standards: *The Clean Air Act requires the Environmental Protection Agency to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.* (U.S. Environmental Protection Agency, 2011)
NAS	

	National Airspace System: *is the airspace, navigation facilities and airports of the United States along with their associated information, services, rules, regulations, policies, procedures, personnel and equipment.*
NAVAID	Navigational Aid: *an electronic or visual guidance system that allows pilots to maintain situational and locational awareness during periods of low visibility. NAVAIDs include airfield lights and radio beacons that convey positional information to pilots.*
NHPA	National Historic Preservation Act: *Legislation intended to preserve historical and archaeological sites.*
NRCS	U.S. Department of Agriculture Natural Resources Conservation Service: *Provides technical assistance to farmers and other private landowners and managers.*
NDB	Non-Directional Beacon: *is a radio transmitter at a known location, used as an aviation or marine navigational aid.*
NEPA	National Environmental Policy Act: *The National Environmental Policy Act (NEPA) requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet NEPA requirements federal agencies prepare a detailed statement known as an Environmental Assessments and Environmental Impact Statements (EIS). EPA reviews and comments on EISs prepared by other federal agencies, maintains a national filing system for all EISs, and assures that its own actions comply with NEPA.* (U.S Environmental Protection Agency, 2014)
NM	Nautical Mile: 6076.1
NMFS	National Marine Fisheries Service: *Responsible for the stewardship of the nation's ocean resources and their habitat.*
NOAA	National Oceanic and Atmospheric Administration: *is an American scientific agency within the United States Department of Commerce that focuses on the conditions of the oceans, major waterways, and the atmosphere.*
Non-Aviation	*Non-Aviation land use on an airport allows for the development of compatible non-aviation uses such as highway, commercial, light industrial, business park, and hotel uses. This designation also includes agricultural and open space land uses.*

Non-Movement Area	*The areas of an airport that are used for taxiing or hover taxiing, or air taxiing aircraft including helicopters and tiltrotors but are not part of the movement area (i.e., the loading aprons and aircraft parking areas).*
NPA	Non-Precision Approach: *a straight-in instrument approach procedure that provides course guidance, with or without vertical path guidance, with visibility minimums not lower than 3/4 mile (4000 RVR).*
Non-Precision Instrument	*NAVAIDs and instrument procedures enabling only lateral guidance of aircraft, compared to precision instrument which provides lateral and vertical guidance. During periods of visibility below 3 a statute mile and when the cloud ceiling is below 1,000 feet above ground level, aircraft, airports, and pilots must be equipped and trained to fly non-precision instrument procedures, otherwise the airport must close until visibility improves.*
NOTAM	Notice to Airmen: *Federally issued notice pertaining to deviations from standard operating procedures in the national airspace system. NOTAMs typically pertain to airspace and runway closures, and special events such as air shows. Pilots are responsible for reviewing applicable NOTAMs in the airspace and airports within which they operate.*
NPIAS	National Plan of Integrated Airport Systems: *The NPIAS identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and thus eligible to receive Federal grants under the Airport Improvement Program (AIP). It also includes estimates of the amount of AIP money needed to fund infrastructure development projects that will bring these airports up to current design standards and add capacity to congested airports. The FAA is required to provide Congress with a 5-year estimate of AIP eligible development every two years. The NPIAS contains all commercial service airports, all reliever airports, and selected general aviation airports.* (Federal Aviation Administration, 2014)
NRHP	National Register of Historic Places: *Official list of the Nation's historic places worthy of preservation. Authorized by National Historic Preservation Act.*
NRI	Natural Resource Inventory: *A statistical survey of land use and natural resource conditions and trends on U.S. non-Federal lands, maintained by the US Department of Agriculture.*
NWI	National Wetlands Inventory: *A publicly available resource that provides detailed information on US wetlands.*

O

Obstacle	*An existing object at a fixed geographical location or which may be expected at a fixed location within a prescribed area with reference to which vertical clearance is or must be provided during flight operation.*
OCS	Obstacle Clearance Surface: *An evaluation surface that defines the minimum required obstruction clearance for approach or departure procedures.*
ODALS	Omni-Directional Approach Lights: *Omnidirectional approach lighting system consisting of seven omnidirectional flashing lights located in the approach area of a non-precision runway. Five lights are located on the runway centerline with the first light located 300 feet up from the threshold and extending at equal intervals up to 1,500 feet from the threshold. The other two lights are located, one on each side of the runway threshold, at a lateral distance of 40 feet from the runway edge, or 75 feet from the runway edge when installed on a runway equipped with a VASI.*
OE/AAA	FAA Obstacle Evaluation / Airport Airspace Analysis: *OE/AAA evaluates cases related to airspace in the U.S. Structures built within 20,000 feet of public airports or exceeding 200 feet above ground level must go through OE/AAA review. OE/AAA issues a determination on whether the proposed construction is or is not a hazard to air navigation.*
OFA	Object Free Area: *The OFA is centered about the runway or taxiway centerline. The OFA clearing standard requires clearing the OFA of above-ground objects protruding above the nearest point of the safety area, except those fixed by function. Buildings and parked aircraft are not permitted in the OFA* (Federal Aviation Administration, 2012).
OFZ	Obstacle Free Zone: *The OFZ clearing standard precludes aircraft and other object penetrations, except for frangible NAVAIDs that need to be located in the OFZ because of their function. Its shape is dependent on the approach minimums for the runway end and the aircraft on approach, and thus, the OFZ for a particular operation may not be the same shape as that used for design purposes.* (Federal Aviation Administration, 2012)
Operation	*An operation is data showing how many times aircraft have taken off, landed, or performed a touch-and-go at an airport. One visit to an airport counts as two operations (landing and takeoff).*

Other Aircraft — *This category includes experimental, sport, glider, and ultralight aircraft. These aircraft are used for recreational flying.*
Experimental aircraft refer to kit airplanes that are built by users or third-parties besides the original manufacturer. Experimental aircraft share many characteristics with SEP – the key differentiator is how and where the aircraft is assembled.
Sport aircraft are airplanes that have a specific weight and maximum speed in level flight. Sport aircraft require less training and a less strict medical certificate to pilot the aircraft.
Gliders are unpowered aircraft that are towed into flight and use thermal uplift to sustain altitude.
Ultralight aircraft weigh less than 155lbs and do not require the pilot operating the aircraft to have a private pilot's license or medical certificate.

P

PAPI — Precision Approach Path Indicator: *A series of lights that indicate to a pilot whether they are on, above, or below the prescribed glide path to a runway end. These devices have either two or four lights that alternate between white and red to indicate the pilot's position.*

PBB — Passenger Boarding Bridge: *An enclosed, elevated passageway which extends from an airport terminal gate to an airplane.*

PCI — Pavement Condition Index: *A numerical index used in transportation civil engineering between 0 and 100 which is used to indicate the general condition of a pavement.*

PFC — Passenger Facility Charge: *Publicly owned commercial service airports can assess a PFC on domestic, territorial, or international revenue passengers enplaned at the airport.*

PHS — Priority Habitats and Species: *PHS is the principal means by which WDFW provides important fish, wildlife, and habitat information to local governments, state and federal agencies, private landowners and consultants, and tribal biologists for land use planning purposes.*

Precision Instrument — *NAVAIDs and instrument procedures enabling both lateral and vertical guidance of aircraft. During periods of visibility below 1/2 a statute mile and when the cloud ceiling is below 200 feet above ground level, aircraft, airports, and pilots must be equipped and* *trained to fly precision instrument procedures, otherwise the airport must close until visibility improves.*

Primary Airport — *A commercial service airport that enplanes at least 10,000 annual passengers.*

Primary Surface — *An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.*

POFA — Precision Object Free Area: *An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard, which requires the POFA to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than ¾ mile visibility*.

PVC — Poor Visibility and Ceiling: *Used in determining Annual Service Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one statute mile.*

Q

R

RAC — Rental Car Counter and Offices

Radial — *A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.*

RCRA — Resource Conservation and Recovery Act: *RCRA gives EPA the authority to control hazardous waste. This includes generation, transportation, treatment, storage, and disposal of hazardous waste.*

RDC — Runway Design Code: *A combination of the AAC and ADG. These two elements combined set the design standards, setbacks, and dimensions, pavement width, safety areas, object free areas, and runway protection zones for a single runway.* (Federal Aviation Administration, 2012)

Regression Analysis	*Using projected change of one variable to forecast the change of another. Regression analysis typically identifies correlation between two variables historically, indicating whether these variables change in a similar fashion to each other, or inversely. Correlation and regression do not determine causation.*
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.*
REIL	Runway End Identifier Lights: *provide rapid and positive identification of the approach end of a runway. The system consists of a pair of synchronized flashing lights located laterally on each side of the runway threshold.*
RNAV	Area Navigation: *RNAV is a method of instrument flight rules (IFR) navigation that allows an aircraft to choose any course within a network of navigation beacons, rather than navigate directly to and from the beacons. Typically GPS system navigation.*
ROFA	Runway Object Free Area: *This is an object free area centered on the runway. See the definition of OFA.*
RPZ	Runway Protection Zone: *The RPZ is a trapezoidal feature, and its function is to enhance the protection of people and property on the ground by keeping the area clear of incompatible land uses. These land uses generally include noise sensitive land uses, land uses that are characterized by high concentrations of people; and fuel and hazardous material storage.*
RSA	Runway Safety Area: *The RSA is a safety area that is centered longitudinally on the runway. It must be clear of all objects, graded, drained, and capable of supporting snow removal equipment, firefighting equipment, and the passage of aircraft without damage to the aircraft.* (Federal Aviation Administration, 2012)
Runway	*A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of aircraft.*
Runway Incursion	*Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft.*
RVR	

	Runway Visibility Range: *An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.*
RVZ	Runway Visibility Zone: *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.*

S

SARA	Superfund Amendments and Reauthorization Act: *Amended CERCLA.*
SASO	Specialized Aviation Service *Operator: A single-service provider or special Fixed Based Operator performing less than full services.*
SASP	State Aviation System Plan.
SEL	Sound Exposure Level.
SEP	Single Engine Piston: *SEP have one piston-powered engine. These aircraft are generally smaller and are often used for flight training and recreational flying*
SHPO	State Historic Preservation Offices: *Responsible for operation and management of Office of Historic Preservation and preservation planning.*
SID	Standard Instrument Departure: *A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.*
SIP	State Implementation Plan: *United States state plan for complying with the federal CAA, administered by the EPA.*
Shoulder	*An area adjacent to the defined edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft and emergency vehicles deviating from the full-strength pavement; enhanced drainage; and blast protection.*
Small Aircraft	*An aircraft with a maximum certificated takeoff weight of 12,500 lbs (5670 kg) or less*.
Special-Use Airspace	

Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities.

Special-use airspace classifications include:

- ALERT AREA: *Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.*
- CONTROLLED FIRING AREA: *Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.*
- MILITARY OPERATIONS AREA (MOA): *Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.*
- PROHIBITED AREA: *Designated airspace within which the flight of aircraft is prohibited.*
- RESTRICTED AREA: *Airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.*
- *WARNING AREA: Airspace which may contain hazards to nonparticipating aircraft.*

SRE — Snow Removal Equipment: *Typical Airport SRE includes plow trucks, sweeper broom trucks, front loaders, dump trucks, and vehicles for de-icing chemical dispersal.*

Stopway — *An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff. A blast pad is not a stopway.*

STAR

Standard Terminal Arrival Route: *A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.*

Stop-and-Go — *A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A Stop-and-Go is recorded as two operations: one operation for the landing and one operation for the takeoff.*

SWL — *Single Wheel Landing Gear: Runway Weight Bearing Capacity for Aircraft with Single-Wheel Tandem Type Landing Gear.*

T

TACAN — Tactical Air Navigation: *An ultrahigh frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.*

TAF — Terminal Area Forecast: *The TAF is the annual FAA forecast of passengers, aircraft operations, and based aircraft for the National airspace system. This is a top down forecast, starting from the FAA national aerospace forecast and being distributed to the different airports. It is used as a basis for comparison for Master Plan generated forecasts.*

Taxilane — *A taxiway designed for low speed and precise taxiing. Taxilanes are usually, but not always, located outside the movement area, providing access from taxiways (usually an apron taxiway) to aircraft parking positions and other terminal areas.*

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

TDG — Taxiway Design Group: *Relates to the undercarriage dimensions of the aircraft. Taxiway/taxilane width and fillet standards, and in some cases, runway to taxiway and taxiway/taxilane separation standards are determined by TDG*

TESM — Taxiway Edge Safety Margin: *The distance between the outer edge of the landing gear of an airplane with its nose gear on the taxiway centerline and the edge of the taxiway pavement.*

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

TFMSC

Traffic Flow Management System Traffic Counts data: *The TFMSC includes data collected from flight plans. These operations are categorized by aircraft type and used to identify trends in the _____ fleet mix.*

THC

Threshold Crossing Height: *the TCH is the theoretical height above the runway threshold at which the aircraft's glideslope (GS) antenna would be if the aircraft maintains the trajectory established by the Instrument Landing System (ILS) GS, or the height of the pilot's eye above the runway threshold based on a visual guidance system.*

Threshold

The beginning of that portion of the runway available for landing. In some instances, the threshold may be displaced. "Threshold" always refers to landing, not the start of takeoff.

Tiedown

Tiedowns are located on aircraft parking aprons and used to secure parked aircraft so that they do not move in high winds.

TNC

Transportation Network Company: *On demand ride-share services such as Uber and Lyft*

TODA

Takeoff Distance Available*: The Takeoff Run Available (TORA) plus the length of any remaining runway or clearway beyond the far end of the TORA – Also see Declared Distances*

TOFA

Taxiway Object Free Area: *This is an object free area centered on the taxiway. See the definition of OFA.*

TORA

Takeoff Run Available*: The runway length declared available and suitable for the ground run of an aircraft taking off.*

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.

TRACON

Terminal Radar Approach Control.

TSA

Taxiway Safety Area: *The TSA is a safety area that is centered longitudinally on the taxiway. It must be clear of all objects, graded, drained, and capable of supporting snow removal equipment, firefighting equipment, and the passage of aircraft without damage to the aircraft.* (Federal Aviation Administration, 2012)

TSC	Technical Steering Committee: *The TSC is made up of Airport staff, members of the Airport Advisory Board, and others with an in-depth understanding of aviation. TSC members are tasked with becoming familiar with how the Airport operates and what facilities pilots and aviation-related businesses require.*
Turboprop	*Turboprop aircraft use gas turbine engines to drive a propeller. These aircraft tend to be slower than jets. Turboprops are used as small commuter aircraft due to lower fuel and maintenance costs.*

U

UAS	Unmanned Aircraft System: *The UAS is the combination of a pilotless vehicle and pilot that flies the vehicle remotely. This acronym is often used interchangeably with unmanned aerial vehicle; however, UAS refers to the vehicle and the pilot.*
UAV	Unmanned Aerial Vehicle: *A UAV is a pilotless vehicle. This acronym is often used interchangeably with unmanned aerial system; however, UAV refers to the vehicle itself, and not the pilot.*
Uncontrolled Airport	An airport without an air traffic control tower at which the control of Visual Flight Rules (VFR) traffic is not exercised.
Uncontrolled Airspace	Airspace within which aircraft are not subject to air traffic control.
UGB	Urban Growth Boundary: *A regional boundary, set by the local jurisdiction by mandating that the area inside the boundary be used for higher density urban development and the area outside be used for lower density development, with the hope of controlling urban sprawl.*
USACE	U.S. Army Corps of Engineers: *The USACE has regulatory over navigable waterways in the U.S. They manage river hydrology, flood prevention, and emergency response.*
USC	United States Code: *The United States Code is a consolidation and codification by subject matter of the general and permanent laws of the United States. It is prepared by the Office of the Law Revision Counsel of the United States House of Representatives*. (United States House of Representatives, 2014)

USFS — United States Forest Service: *An agency of the U.S. Department of Agriculture that administers the nation's national forests and national grasslands.*

USFWS — U.S. Fish and Wildlife Service: *USFWS is tasked with enforcing federal wildlife laws, protecting endangered birds and species, managing bird migrations and fisheries, restoring wetlands, and collecting excise taxes on fishing and hunting.* (U.S. Fish and Wildlife Service, 2014)

V

VASI — Visual Approach Slope Indicator: *An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/white, above path if* white/white, and *below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.*

VFR — Visual Flight Rules: *Under visual flight rules, pilots must be able to maintain separation from aircraft and objects visually, without the use of navigational aids (NAVAIDS). When weather reduces visibility below three statue miles then pilots may not operate under Visual Flight Rules (VFR) and must instead use Instrument Flight Rules (IFR).* (FAR Part 91).

VGSI — Visual Glide Slope Indicators: *Lighting systems located adjacent to runway son the airfield to assist aircraft with visually based vertical alignment on approach to landing.*

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

Visual Meteorological Conditions — *Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.*

VOR — Very High Frequency (VHF) omnidirectional range: *VOR NAVAIDS convey position and course (relative to the VOR) information to aircraft in flight. These NAVAIDs are used to establish airways across the U.S.*

VORTAC — Very High Frequency Omni-Directional Range | Tactile Air Navigation: *A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.*

W

WAAS — Wide Area Augmentation System: *WAAS is a ground-based global positioning system (GPS) signal augmentation service. WAAS antennas boost strength and reliability of satellite GPS signals, enabling aircraft to use GPS to fly instrument approach procedures.*

WDFW — Washington Department of Fish & Wildlife: *Providing information and resources to protect, restore, and enhance Washington's fish and wildlife.*

Weight Bearing Capacity — *The amount of weight a piece of pavement is capable of bearing under normal circumstances, without resulting in excessive wear. Aircraft that weigh more than a pavements weight bearing capacity may still use the pavement; however, frequent use by such aircraft will cause premature wear of the pavement, requiring earlier replacement.*

Wingspan — *The maximum horizontal distance from one wingtip to the other wingtip, including the horizontal component of any extensions such as winglets or raked wingtips.*

WISAARD — Washington Information System for Architectural and Archaeological Records Data: *an Online GIS map tool for locating designated historical sites listed on the state and national register.*

WHMP — *Wildlife Hazard Management Plan*

X

Y

Z

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