2015 AIRPORT MASTER PLAN
2020 ALP UPDATE

YAKIMA AIR TERMINAL / McALLISTER FIELD

2015 Master Plan

URS

HLA Engineering and Land Surveying, Inc.

2020 ALP Update

Century West Engineering

Mead & Hunt

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EXECUTIVE SUMMARY

1.1 2020 AIRPORT LAYOUT PLAN UPDATE

In 2020, the Yakima Air Terminal/McAllister Field (YKM) updated their Airport Layout Plan (ALP) to include obstruction data obtained from an Airport Geographic Information System (AGIS) survey. As part of the ALP update, the 2015 Airport Master Plan report was updated to reflect current information with an up-to-date aviation demand forecast through 2040. The updated forecast demand was then incorporated into updated facility requirements, an updated alternatives analysis, and updated capital improvement program. The scope for this project did not include an updated terminal building analysis or noise analysis.

1.2 2015 AIRPORT MASTER PLAN UPDATE

The airport master plan has been developed to guide future airport development to accommodate long-term growth in airline, air cargo, general aviation, aviation industrial and military needs. In 2015, YKM successfully completed this master plan as a result of a collaborative effort among airport and community stakeholders, which included the City of Yakima, the Federal Aviation Administration (FAA), Yakima County, the City of Union Gap, airport tenants, regional agencies and the general public. This process is depicted in Figure 1-1.

Figure 1-1: Master Planning Process

The YKM Master Plan followed a logical process that proceeded with consistent review and comments from the public and stakeholder groups throughout. Additionally, the master plan's scope was expanded to include three specialized analyses:

1. A detailed assessment of the passenger terminal building including recommendations for future terminal development,
2. An evaluation of all paved areas on the airport (including airfield, roadways and parking lots) and an update of the Pavement Conditions Index (PCI) report. The result is a detailed Pavement Maintenance Program that is included in the proposed Capital Improvement Program (CIP),
3. An analysis of the airport's financial condition and assessment of its ability to generate sufficient funds to implement the CIP.

The final master plan provides a phased schedule for development and gives the City advanced notice of pending needs to aid in future scheduling and budgeting. The master plan will guide the physical growth of the airport in coordination with future demand for services, available funding, and environmental considerations. The airport master plan uses text, drawings, pictures and graphs to explain plans for future development both on and around the airport.

1.3 WHAT IS THE GOAL OR PURPOSE OF THIS AIRPORT MASTER PLAN?

The goal of the master plan is to provide a framework to guide future airport development that will effectively satisfy aviation demand, while giving full consideration of potential environmental and socioeconomic impacts. The master plan provides the tools necessary to react to uncertainties by examining key trends in the aviation industry, such as changing airline business models, improvements in technology, and local/regional economics that could affect airport activity.

1.4 WHAT ARE THE PROJECT'S MISSION STATEMENTS?

At the initiation of the master plan, key stakeholders including airport tenants, users, neighbors, local governmental entities (City of Yakima, Yakima County, and City of Union Gap), economic development agencies (Chamber of Commerce, Economic Development Agencies), and others participated in stakeholder interviews and workshops to establish the community issues to be addressed during the development of the plan. As a result of these, project mission statements were developed to help guide the effort of the planning team. These are as follows:

1.4.1 Community and Agency Advisory Committee (CAAC) Statement

The CAAC included owners of property in the area surrounding the airport; elected representatives of the communities in the vicinity; planning commissioners from Union Gap, City of Yakima, and Yakima County; and economic development organizations and the Chambers of Commerce from those same communities. The input of this committee resulted in the following mission statement:

"The YKM master plan should result in an airport that serves the community (cities and county), provides reliable air service, and is a safe, first-class regional facility that remains compatible with the community."

1.4.2 Technical Advisory Committee (TAC)

The TAC was comprised of aviation, business, community, and public interests (i.e. pilots, passengers, airline representatives, local and regional governmental entities, airport tenants, Fixed Base Operator (FBO), air cargo companies, property owners, “at-large” positions (reserved for citizens) and former airport board members. The input of this committee resulted in the following mission statement:

“The YKM master plan should promote aviation, establish a clear vision to be followed by the City, be implementable, financially feasible, and adoptable by the FAA, county, and cities.”

1.5 WHAT ARE THE COMPONENTS OF AN AIRPORT MASTER PLAN?

Developing the master plan followed a process that included;

- Collect and analyze data regarding existing facilities, current activity and operations
- Develop aviation activity forecasts for a twenty-year time period
- Determine the future requirements for facility expansion or upgrade needed to accommodate activity growth
- Develop alternative concepts for airport development and analyze the best course for future development decisions with respect to cost, environmental factors, land use compatibility and other factors.
- Develop a financial implementation plan
- Conduct an environmental review/analysis
- Prepare the Airport Layout Plan (ALP) in accordance with federal airport operating and design standards

The following chart shows the process used over the course of the 2015 master plan development.

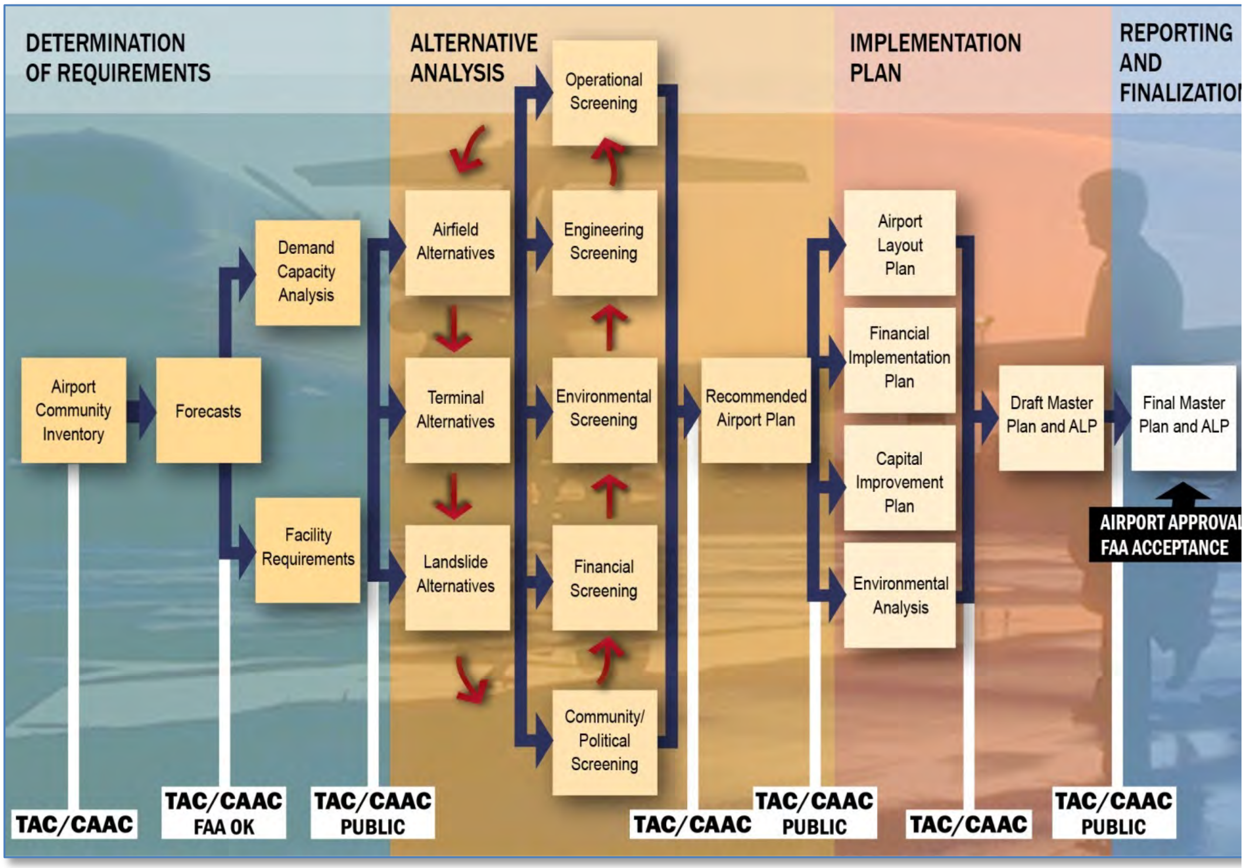


Figure 1-2: Airport Master Plan Components

1.6 WHAT WERE THE KEY ISSUES FOR THIS MASTER PLAN?

The key issues addressed in the 2015 Airport Master Plan included: (1) the need for an extension to Runway 9/27, (2) the future for Runway 4/22, (3) revisions to the Airport Safety Overlay Zone, (4) planning for a new passenger terminal, (5) the development of additional general aviation facilities, and (6) the preservation of airport lands for potential use by aircraft manufacturing or maintenance facilities.

The 2020 ALP update addressed reconfiguration of the intersection of Runway 22, Taxiway C, and Taxiway B, to eliminate a hotspot and aligned taxiway. It included an updated runway length analysis with a change in critical aircraft for both Runway 9/27 and 4/22. And an updated wind analysis was completed to determine FAA funding eligibility for the crosswind runway.

1.7 WHAT IS THE APPROVAL PROCESS FOR THE AIRPORT MASTER PLAN?

Airport master plans are approved by the legal sponsor, or "owner," of the airport, in this case the City of Yakima. FAA will accept the master plan once it is approved by the City. The FAA's acceptance of the plan represents acceptance of the general location of future facilities with respect to the safety, efficiency, and utility of the airport. However, additional approvals and steps are needed before the FAA will move a planned project into the design and construction phase.

Once formal approval of the master plan is complete, the local jurisdictions (Yakima County, the City of Yakima and the City of Union Gap) are encouraged to adopt the plan's recommendations into their Comprehensive Planning process.

1.8 STUDY FINDINGS

1.8.1 Updated 2020 Aviation Demand Forecasts

Forecasts of future activity were prepared using methods detailed in FAA Advisory Circular (AC) 150/5070-6B "Airport Master Plans." Details of the historical information used as the forecast base, the assumptions used, and final decisions regarding the development of the forecasts are contained in Chapter 3 and are summarized below:

The growth in the number of commercial passengers using YKM will continue to be influenced by the level of service at both the Tri-Cities and Seattle-Tacoma International Airports until such time as additional service destinations are added to the Yakima schedule. Efforts by the City of Yakima, Yakima County and other local supporters of the airport, such as the Chamber of Commerce and the Yakima Valley Development Agency successfully attracted SeaPort Airlines, which offered six daily flights to Portland International Airport and Pangborn Memorial Airport in Wenatchee beginning in March 2012 and ending in December 2012. This additional passenger service expanded the range of the commercial market at YKM, but was ultimately unsuccessful due to financial and operational factors common to start-up airlines.

In October 2015, Alaska Airlines added a flight into YKM increasing its scheduled service from three to four daily departures. An airline's decision regarding new destinations and additional daily flights is dependent on whether the airline is attaining satisfactory load factors on its existing flights. Since it is likely that service will continue to be offered on 75- to 100-passenger aircraft, such as the Bombardier Q400 or Embraer 175 currently being used by Alaska Airlines, this translates to an average of 80 percent loads or 60 to 80 passengers per departure.

Air cargo and air taxi operations are primarily carried out by the three carriers using turboprop aircraft such as the Cessna Caravan, Embraer 120, ATR 72, or Cessna 340. Cargo service will continue to expand as the population in the Yakima Valley grows; however, this service will continue to be offered by small "feeder" aircraft operating from YKM to the carriers' bases at Boeing Field, Spokane International Airport, or Seattle-Tacoma International Airport.

The general aviation community in YKM is healthy and active and the forecasts show continued growth is expected over the 20-year forecast period. It is assumed the business aviation sector will remain the most active and that business-related operations will increase in the future. Sport aviation and private flights in small, piston aircraft will also remain active at YKM.

The number of aircraft based at YKM will continue to grow as aircraft owners seek the services offered at YKM and take advantage of the good flying weather in the valley.

Military operations at YKM consist primarily of training on the Instrument Landing System (ILS). Future use by the military is unpredictable, but this forecast assumes the military will continue to use the airport as it has in the past. Table 1-1 shows the anticipated growth in activity levels forecast for YKM.

Table 1-1: 2020 Forecast Summary

	Actual	Forecast			
	2018	**2025**	**2030**	**2035**	**2040**
Enplaned Passengers	73,300	81,600	87,200	91,800	92,600
Operations					
Commercial	7,422	8,660	9,310	9,990	10,630
General Aviation	30,217	31,980	33,310	34,690	36,130
Military	1,805	1,810	1,810	1,810	1,810
Total Operations	39,444[1]	42,450	44,430	46,490	48,570
Based Aircraft	131	150	157	163	173

Source: 1. Total operations as reported by ATCT (hours of operation 0600-2200 daily).
Forecast – Mead & Hunt, Century West Engineering

1.8.2 Airport Facility Requirements

The master plan next looked at the existing facilities at YKM and assessed their ability to accommodate the forecast activity levels. Any capacity deficiencies were identified as were actions needed to correct them. Issues addressed were the ultimate configuration of the airfield, the passenger terminal, air cargo facilities, aircraft hangar and apron areas, Fixed Base Operator (FBO) facilities, access and vehicle parking, utilities, and aviation support facilities. A summary of the facility needs are presented in Table 1-2 and depicted in Figure 1-3.

Figure 1-3: Facility Needs

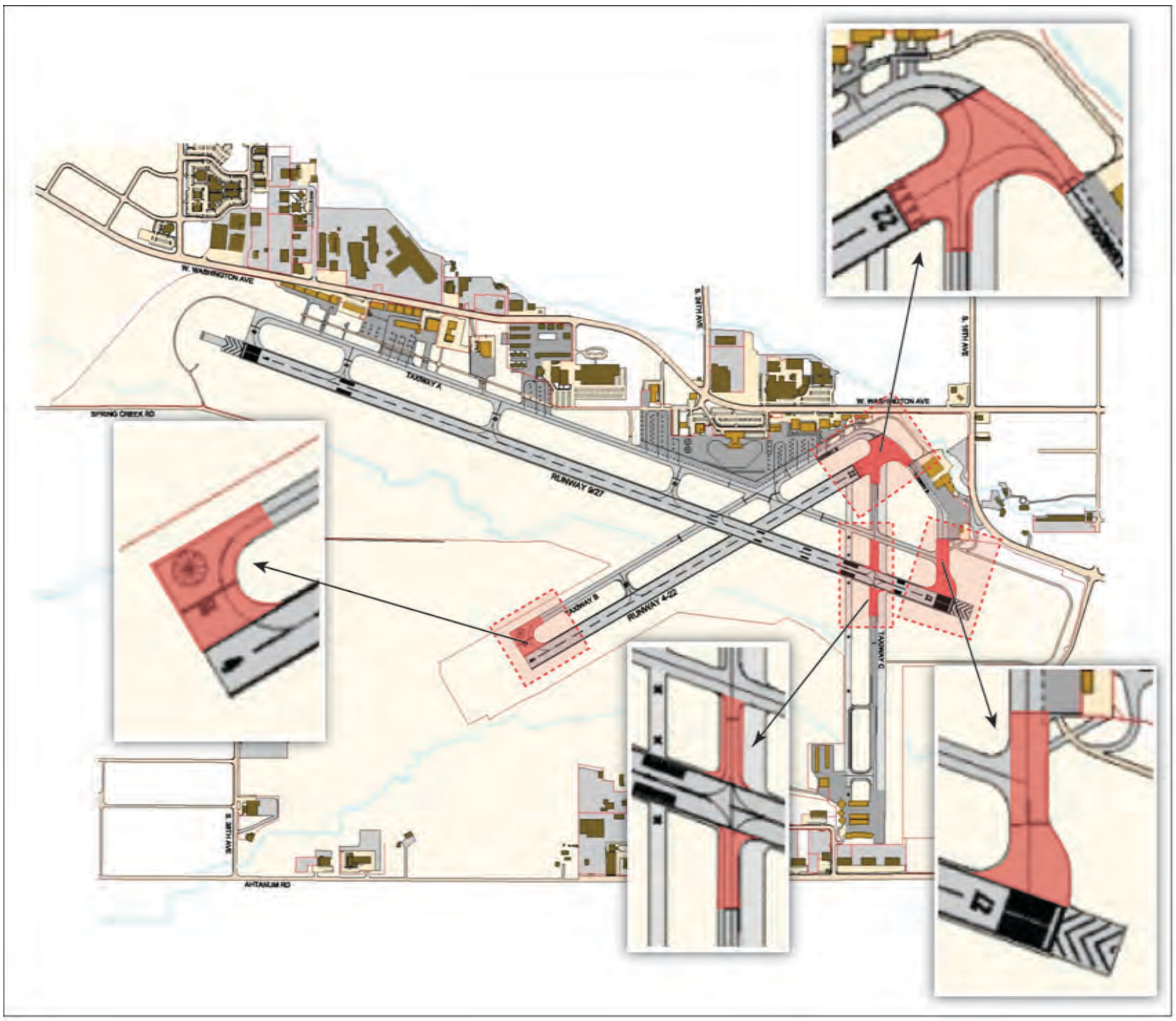


Table 1-2: Summary of Facility Requirements

Actual	Conclusions
Airfield System	The wind coverage and capacity needs at YKM are met by a single runway. Runway 9/27, at 7,604 feet, does not provide the take-off length for the future design aircraft. A future runway length of 7,800 feet is recommended for the E175. Maintaining Runway 4/22 at a future length of 4,000 feet is recommended due to a variety of operational factors described in this narrative.
Passenger Terminal	The existing passenger terminal building needs to be expanded and upgraded to meet future needs. If renovations or replaced are deferred, terminal layout and maintenance issues may require action to be taken sooner to maintain an acceptable level of service.
Automobile Parking	The current public parking lot is adequate to meet current needs. Parking lot expansion is recommended if airline frequency increases. The overflow parking lot should be maintained for peak travel seasons and charter flights. It is also recommended that the rent-a-car ready/return and rental car parking area be expanded prior to this time.
Air Cargo	Although air cargo is forecast to continue to consist of feeder service using the C208, ATR-42, ATR-72, Beechcraft 1900, and E120 aircraft, additional space will need to be provided in the future, either by remarking existing pavement or by constructing new.
Based Aircraft Hangar Storage	With the growth in based aircraft that has been forecast, as well as the existing unmet demand for hangar space, additional area for hangar development will need to be made available for future development.
FBO and support facility expansion	Expanded FBO facilities are required to provide support for the general aviation community. These facilities will provide not only aircraft maintenance hangars, but also pilot lounge areas, area for fueling aircraft, and sufficient space for transient aircraft parking.
Fueling	The current system is adequate, assuming the private sector continues to upgrade their facilities and improve delivery as needed.
Snow Removal Equipment & Maintenance Building	Expand the existing facility to provide sufficient parking for the airports current number of snow removal equipment. Or relocate the maintenance facility to another site that better suits the needs of the airport.
Air Traffic Control Tower	To remedy the line of sight concerns, it is recommended that FAA increase the height of the tower to improve visibility for the Air Traffic Controllers.

1.9 AIRPORT DEVELOPMENT PLAN

The facility requirements that require physical improvements are identified in the preceding and alternative ways to meet them were developed and compared with a preferred development plan selected as the basis for the Airport Layout Plan (ALP). The findings of the alternative analyses are summarized in the following table.

Table 1-3: Summary of Analysis of Alternatives

ISSUE	CONCLUSIONS	SUMMARY
Airport Classification and Design:		
FAA ARC Classification	Runway 9/27 – C-III Runway 4/22 – B-II	Runway 4/22 ARC has increased from B-I Small noted on the 2015 ALP to B-II based on upgraded aircraft operations data.
Runways:		
Runway Length	The recommendation is to extend the runway to 7,800 feet to accommodate the change in design aircraft from the Q400 to E175. A long-term reserve length of 9,100 feet is depicted based on a B737-800/900 aircraft. This is anticipated outside of the 20-year planning period.	The alternatives identify the future runway length and extension of Taxiway A and relocation of Taxiway A5 connector.
Crosswind Runway	FAA standards have shown that Runway 4/22 is not required for either capacity or wind coverage. Therefore, the runway is not eligible for continued FAA funding. FAA has indicated they will fund the Runway 22 end reconfiguration to eliminate the Hotspot and aligned taxiway.	The alternatives identified a reconfigured Runway 22 end to meet current FAA design standards. The City has determined that the runway should continue to function until the cost of maintenance exceeds the City's ability to finance them.

ISSUE	CONCLUSIONS	SUMMARY
Terminal Facilities:		
Passenger Terminal Building	The existing terminal building will need to be expanded or reconfigured to accommodate increases in enplaned passengers. Additionally, the condition of the existing building is such that major maintenance and rehabilitation efforts will be needed to keep it functional.	Two primary alternatives were considered: the first maintains operations in the existing terminal building and the second constructs a new terminal to replace the existing. It is recommended that a new terminal be constructed at the existing site in order to continue to use the aircraft apron and automobile parking facilities.
Support Facilities	The airline apron, automobile parking, and other facilities associated with the passenger terminal are included in the alternative discussion related to the terminal building.	These facilities will be improved to support the terminal and aeronautical activities. Additional automobile parking is anticipated.
General Aviation:		
General Aviation Facility	The existing GA areas will need to grow in order to accommodate the increased demand for hangar and aircraft parking aprons.	Primary consideration has been given to where new GA development should occur. The recommended actions are to extend taxilanes to support future hangar development in the south GA area. There are some additional spaces available in the west GA area for hangars, as well as in the east GA area across from Cub Crafters and McAllister Museum.
Based Aircraft Hangar Storage	Recommend construction of corporate and T-hangars	Private hangar construction is the most cost-effective solution, since any City-funded project would be required to pay prevailing wages, which increases construction costs.
Fixed Base Operator (FBO) and support facility expansion	New FBO facilities are required to provide support for the general aviation community	Hangar construction and aircraft parking needs.

ISSUE	CONCLUSIONS	SUMMARY
Support Facilities:		
Fueling	The current system is adequate. The private sector will continue to upgrade and improve as needed.	The alternatives identify a future location for McAllister's 100LL fuel tank to allow for easier aircraft access.
Airport Maintenance	Recommend expanding maintenance facility to accommodate the additional snow removal equipment acquired in recent years.	The alternatives identify remodeling the existing building to accommodate four large equipment vehicles as well as constructing a separate building for smaller equipment.

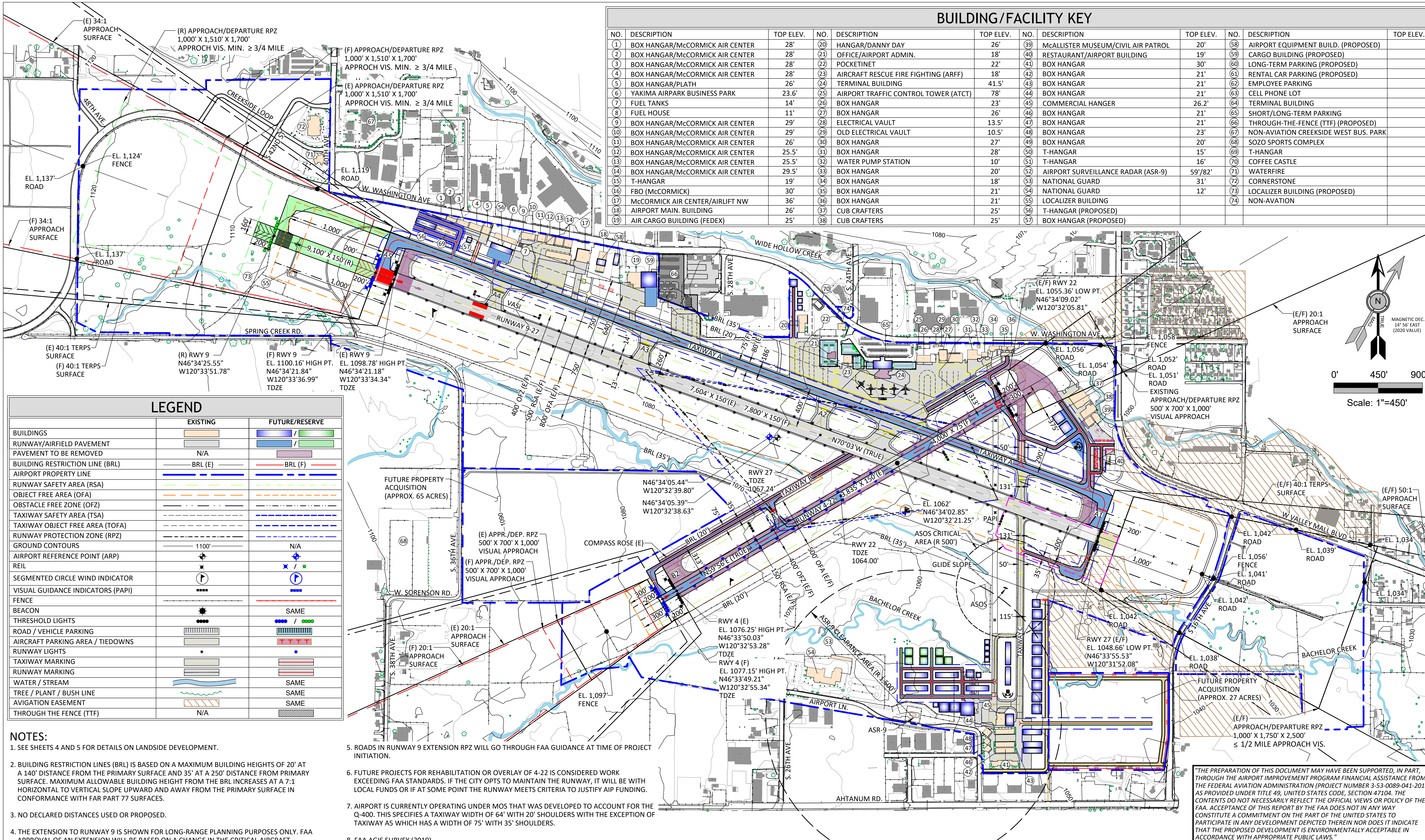
1.10 AIRPORT LAYOUT PLAN

The YKM Airport Layout Plan (Sheet 3 of 17) depicts the existing airport facilities and the recommended improvement projects. Specifically shown on these drawings are;

1. The extension of Runway 9/27 to a total length of 7,800 feet is planned to accommodate the change in design aircraft from the Bombardier Q400 to the Embraer 175, which is anticipated in the 20-year planning period
2. The continued maintenance of Runway 4/22 as pavement conditions deteriorates and the surface becomes unsuitable for aircraft operations. Repairs to this runway are not eligible for federal funds based on the updated wind analysis.
3. The intersection of Runway 22, Taxiway C, and Taxiway B will be reconfigured to eliminate the aligned taxiway to Runway 22, as well as mitigate the hotspot.
4. The addition of a partial parallel taxiway on the south side of Runway 9/27 to increase safety by providing runway crossings at the end of the runway instead of at the Taxiway C intersection.
5. Construction of a new passenger terminal building at the site of the existing building. This allows for the continued use of the access and parking facilities as well as of the concrete aircraft apron.
6. Property acquisition to accommodate increases in general aviation demand.

BUILDING/FACILITY KEY

NO.	DESCRIPTION	TOP ELEV.	NO.	DESCRIPTION	TOP ELEV.	NO.	DESCRIPTION	TOP ELEV.	NO.	DESCRIPTION	TOP ELEV.
1	BOX HANGAR/McCORMICK AIR CENTER	28'	20	HANGAR/DANNY DAY	26'	39	McALLISTER MUSEUM/CIVIL AIR PATROL	20'	58	AIRPORT EQUIPMENT BUILD. (PROPOSED)	
2	BOX HANGAR/McCORMICK AIR CENTER	28'	21	OFFICE/AIRPORT ADMIN.	18'	40	RESTAURANT/AIRPORT BUILDING	19'	59	CARGO BUILDING (PROPOSED)	
3	BOX HANGAR/McCORMICK AIR CENTER	28'	22	POCKETINET	22'	41	BOX HANGAR	30'	60	LONG-TERM PARKING (PROPOSED)	
4	BOX HANGAR/McCORMICK AIR CENTER	28'	23	AIRCRAFT RESCUE FIRE FIGHTING (ARFF)	18'	42	BOX HANGAR	21'	61	RENTAL CAR PARKING (PROPOSED)	
5	BOX HANGAR/PLATH	26'	24	TERMINAL BUILDING	41.5'	43	BOX HANGAR	21'	62	EMPLOYEE PARKING	
6	YAKIMA AIRPARK BUSINESS PARK	23.6'	25	AIRPORT TRAFFIC CONTROL TOWER (ATCT)	78'	44	BOX HANGAR	21'	63	CELL PHONE LOT	
7	FUEL TANKS	14'	26	BOX HANGAR	23'	45	COMMERCIAL HANGER	26.2'	64	TERMINAL BUILDING	
8	FUEL HOUSE	11'	27	BOX HANGAR	26'	46	BOX HANGAR	21'	65	SHORT/LONG-TERM PARKING	
9	BOX HANGAR/McCORMICK AIR CENTER	29'	28	ELECTRICAL VAULT	13.5'	47	BOX HANGAR	21'	66	THROUGH-THE-FENCE (TTF) (PROPOSED)	
10	BOX HANGAR/McCORMICK AIR CENTER	29'	29	OLD ELECTRICAL VAULT	10.5'	48	BOX HANGAR	23'	67	NON-AVIATION CREEKSIDE WEST BUS. PARK	
11	BOX HANGAR/McCORMICK AIR CENTER	26'	30	BOX HANGAR	27'	49	BOX HANGAR	20'	68	SOZO SPORTS COMPLEX	
12	BOX HANGAR/McCORMICK AIR CENTER	25.5'	31	BOX HANGAR	28'	50	T-HANGAR	15'	69	T-HANGAR	
13	BOX HANGAR/McCORMICK AIR CENTER	25.5'	32	WATER PUMP STATION	10'	51	T-HANGAR	16'	70	COFFEE CASTLE	
14	BOX HANGAR/McCORMICK AIR CENTER	29.5'	33	BOX HANGAR	20'	52	AIRPORT SURVEILLANCE RADAR (ASR-9)	59'/82'	71	WATERFIRE	
15	T-HANGAR	19'	34	BOX HANGAR	18'	53	NATIONAL GUARD	31'	72	CORNERSTONE	
16	FBO (McCORMICK)	30'	35	BOX HANGAR	21'	54	NATIONAL GUARD	12'	73	LOCALIZER BUILDING (PROPOSED)	
17	McCORMICK AIR CENTER/AIRLIFT NW	36'	36	BOX HANGAR	21'	55	LOCALIZER BUILDING		74	NON-AVATION	
18	AIRPORT MAIN. BUILDING	26'	37	CUB CRAFTERS	25'	56	T-HANGAR (PROPOSED)				
19	AIR CARGO BUILDING (FEDEX)	25'	38	CUB CRAFTERS	25'	57	BOX HANGAR (PROPOSED)				



LEGEND

	EXISTING	FUTURE/RESERVE
BUILDINGS		/
RUNWAY/AIRFIELD PAVEMENT		/
PAVEMENT TO BE REMOVED	N/A	
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
TAXIWAY SAFETY AREA (TSA)		
TAXIWAY OBJECT FREE AREA (TOFA)		
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS	1100'	N/A
AIRPORT REFERENCE POINT (ARP)		
REIL		/
SEGMENTED CIRCLE WIND INDICATOR		
VISUAL GUIDANCE INDICATORS (PAPI)		
FENCE		
BEACON		SAME
THRESHOLD LIGHTS		/
ROAD / VEHICLE PARKING		
AIRCRAFT PARKING AREA / TIEDOWNS		
RUNWAY LIGHTS		
TAXIWAY MARKING		
RUNWAY MARKING		
WATER / STREAM		SAME
TREE / PLANT / BUSH LINE		SAME
AVIGATION EASEMENT		SAME
THROUGH THE FENCE (TTF)	N/A	

NOTES:

1. SEE SHEETS 4 AND 5 FOR DETAILS ON LANDSIDE DEVELOPMENT.
2. BUILDING RESTRICTION LINES (BRL) IS BASED ON A MAXIMUM BUILDING HEIGHTS OF 20' AT A 140' DISTANCE FROM THE PRIMARY SURFACE AND 35' AT A 250' DISTANCE FROM PRIMARY SURFACE. MAXIMUM ALLOWABLE BUILDING HEIGHT FROM THE BRL INCREASES AT A 7:1 HORIZONTAL TO VERTICAL SLOPE UPWARD AND AWAY FROM THE PRIMARY SURFACE IN CONFORMANCE WITH FAR PART 77 SURFACES.
3. NO DECLARED DISTANCES USED OR PROPOSED.
4. THE EXTENSION TO RUNWAY 9 IS SHOWN FOR LONG-RANGE PLANNING PURPOSES ONLY. FAA APPROVAL OF AN EXTENSION WILL BE BASED ON A CHANGE IN THE CRITICAL AIRCRAFT.
5. ROADS IN RUNWAY 9 EXTENSION RPZ WILL GO THROUGH FAA GUIDANCE AT TIME OF PROJECT INITIATION.
6. FUTURE PROJECTS FOR REHABILITATION OR OVERLAY OF 4-22 IS CONSIDERED WORK EXCEEDING FAA STANDARDS. IF THE CITY OPTS TO MAINTAIN THE RUNWAY, IT WILL BE WITH LOCAL FUNDS OR IF AT SOME POINT THE RUNWAY MEETS CRITERIA TO JUSTIFY AIP FUNDING.
7. AIRPORT IS CURRENTLY OPERATING UNDER MOS THAT WAS DEVELOPED TO ACCOUNT FOR THE Q-400. THIS SPECIFIES A TAXIWAY WIDTH OF 64' WITH 20' SHOULDERS WITH THE EXCEPTION OF TAXIWAY A5 WHICH HAS A WIDTH OF 75' WITH 35' SHOULDERS.
8. FAA AGIS SURVEY (2019).

"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-53-0089-041-2018) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES

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

FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE: ______________

SIGNATURE

CITY OF YAKIMA APPROVAL

APPROVAL DATE: ______________

SIGNATURE

CENTURY WEST ENGINEERING
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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
SP	JLS	DM	AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

AIRPORT LAYOUT PLAN

FIGURE NO.
-

SHEET NO.
3 OF 17

1.11 IMPLEMENTATION PLAN

An estimate of the probable cost of each recommended project was prepared for all projects. These are shown in Table 1-4. The table also includes information regarding the possible sources of funding for the projects. As shown the cost of implementation is approximately $97 million over the 20-year planning period. In the short-term, the largest expense will be the design and construction of the new terminal building at approximately $25 million. The largest expense will be reconstructing the primary runway (9/27) and its parallel taxiway (Taxiway A) at a cost of $58 million. However, timing of these projects will be dependent on preventative maintenance and useful life of the pavement.

The majority of the projects are eligible for funding under the Airport Improvement Program (AIP). AIP funds are allocated by a formula driven by the number of annual enplaned passengers. The FAA evaluates all airport grant requests using a priority ranking system weighted toward safety, security, airfield pavement and airfield capacity projects. Other projects, such as terminal building construction and maintenance and construction of main access/entrance roads, are also eligible but receive lower priority rankings. Within the entitlement amount, up to 90 percent of eligible project costs are funded for non-hub airports such as YKM with the remaining 10 percent provided from other, local sources. Given current entitlement distribution formulas, the City can receive up to $1,000,000 per year from the AIP for use on eligible projects.

AIP discretionary grants are also occasionally awarded to airports for high priority projects that enhance safety, security or airport capacity but which would be difficult to fund within the entitlement program. These grants are over and above the airport’s entitlement funding. The amounts of individual discretionary grants vary but can be significant in comparison to entitlements. Discretionary grant applications are evaluated based on need, the FAA's project priority ranking system, the FAA's assessment of a project's significance within the national airport and airway system and funding availability.

Additionally the Aviation Safety and Capacity Expansion Act of 1990 established the authority for commercial service airports to apply to impose a Passenger Facility Charge (PFC) of up to $3 per enplaned passenger. AIR-21, enacted in 2000, increased the allowable PFC level to $4.50. The proceeds from PFCs are eligible to be used for AIP eligible projects and for additional projects that preserve or enhance airport 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 and other indebtedness incurred to carry out eligible projects. PFC funds are collected at YKM and the proceeds are dedicated to meeting the local funding requirements of the CIP.

Table 1-4: Estimated Cost of Recommended Improvements

Short-Term Projects		Total Project Costs
Year	Description	
2023	Terminal Building (Design Phase 1)	$2,004,400
2024	Terminal Building (Design Phase 2)	$200,440
2025	Terminal Building - Temporary Building	$1,803,860
	SHORT-TERM TOTAL (1-5 Years)	$4,008,700
Mid-Term Projects		Total Project Costs
Year	Description	
2026	Terminal Building (Construction Phase 3)	$20,044,700
2030	South GA Area - Taxilanes (Two at 35' x 900')	$1,200,000
	MID-TERM TOTAL (6-10 Years)	$21,244,700
Long-Term Project		Total Project Costs
Year	Description	
2031	RWY 4/22 Rehabilitation, MIRL, and Signage (3,865'x75')	$2,100,000
2031	SRE Building Expansion (Design & Const.)	$1,750,000
2032	RWY 27 End Connector (TWY A1) Reconfiguration Project & Partial Parallel TWY between TWY C and RWY 27 End and AC Holding Area (Design)	$434,026
2033	RWY 27 End Connector (TWY A1) Reconfiguration Project & Partial Parallel TWY between TWY C and RWY 27 End and AC Holding Area (Const.)	$4,900,000
2034	SRE Acquisition – Two High Speed Runway Plows & One Ramp Plow	$1,000,000
2036	TWY A and Connectors Maint. Project (Slurry Seal, Crackfill, Markings)	$200,000
2037	TWY C Maint. Project (Slurry Seal, Crackfill, Markings)	$40,000
2038	Vehicle Parking Rehabilitation (Overlay) – Terminal, Rental Car, Employee Parking Lots	$600,000
2039	Former Noland Decoto Apron Maintenance (reconstruction)	$40,000
2040	Cargo (McCormick) Apron Rehabilitation (Design & Const.)	$2,800,000
2041	Cargo (FedEx) Apron Rehabilitation & Expansion (Design & Const.)	$1,000,000
2042	Northeast GA Area Taxilane Maintenance (Slurry Seal, Crack fill, Markings) & Apron Rehab/Reconfiguration Project	$1,500,000
2043	RWY 9 & TWY A Extension & TWY A5 Relocation (Future RWY length 7,800')	$5,500,000
2044	Property Acquisition – Southeast Parcel (Owner – Hartshorn)	$401,730*
2045	Property Acquisition – Southwest Parcel (2) (Owner – Congdon)	$340,000*
2046	Airport Master Plan Update	$1,000,000
2047	TWY A Reconstruction (Widen to 75' to eliminate MOD) & Replace/Relocate MITL	$20,300,000
2048	RWY 9/27 Reconstruction	$27,600,000
	LONG-TERM TOTAL (11-20 Years)	$71,505,395
	TOTAL 20-YEAR PERIOD	$96,758,796

1.12 BUSINESS PLAN

The information in Table 1-4 shows the capital needs of the airport. The business analysis examined the airport's annual revenues and expenditures to determine whether it is in a financial position that provides an annual surplus or deficit. Since the City carries the financial responsibility for the maintenance, operation and capital improvements at the airport.

Airport revenue sources range from the direct such as fuel taxes, aircraft storage fees and other fees assessed for facility usage to the indirect such as contributions from area governmental entities. Operating revenues are those directly attributable to operation of the airport as a business enterprise. These can be expected to vary over time as changes in the level of activity at the airport and the commercial and general aviation industry as a whole have influence over the types of activity from which the revenues are generated.

Over the same period expenses at YKM include those directly related to the day-to-day operation and maintenance of the airport, capital projects needed to maintain and/or expand airport facilities, indirect costs associated with allocation of overhead, debt service on long-term loans and governmental fees and assessments. These have been estimated in the CIP and O&M projections in the master plan.

A complete breakdown of the airports revenue and expense budget as well as a rates and fees comparison is provided in Chapter 7.

Existing Conditions

2

2 EXISTING CONDITIONS

2.1 INTRODUCTION

Yakima Air Terminal/McAllister Field (YKM) is located in Yakima County within the City of Yakima and covers an area of 825 acres. The main entrance is at the intersection of South 24th Avenue and West Washington Avenue approximately three miles southwest from the Interstate 82/State Route 12 Interchange.

There are two active runways at the airport.

- Runway 9/27 is paved with asphalt and is 150 feet wide by 7,604 feet in length. There is a Localizer back course non-precision approach to Runway 9 and an ILS precision approach to Runway 27.
- Runway 4/22 is also paved with asphalt and is 150 feet wide by 3,835 feet in length. There are visual approaches to both runway ends.

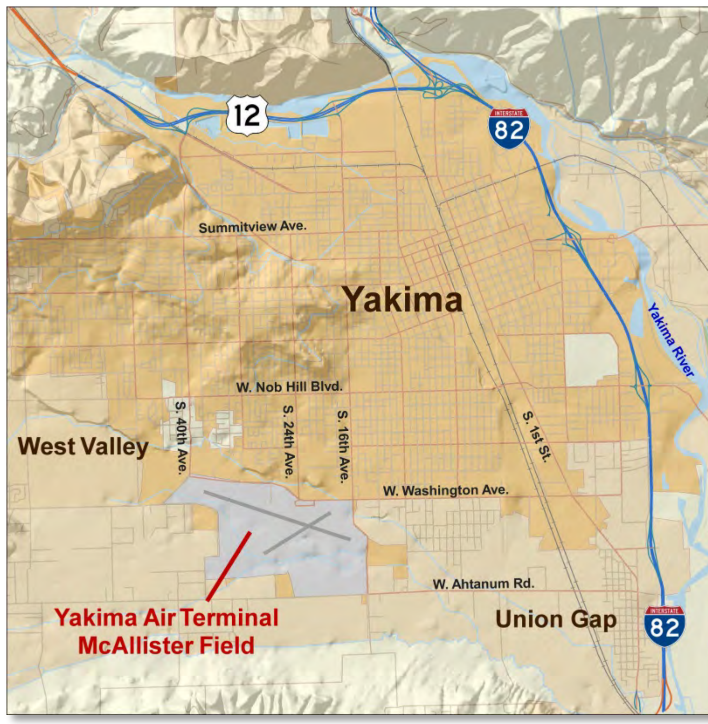


Figure 2-1: Airport Location Map

2.2 AIRPORT HISTORY

Yakima Air Terminal/McAllister Field provides the primary air transportation access for the City of Yakima (pop. 93,667 in 2017), Yakima County (pop. 250,193 in 2017) and the entire Yakima Valley. To accommodate the increasing population and commerce opportunities of the Yakima Valley, the airport has been continually upgraded since its inception in the early 20th century. The chronology of the airport is shown on the timeline and descriptions on the next three pages.

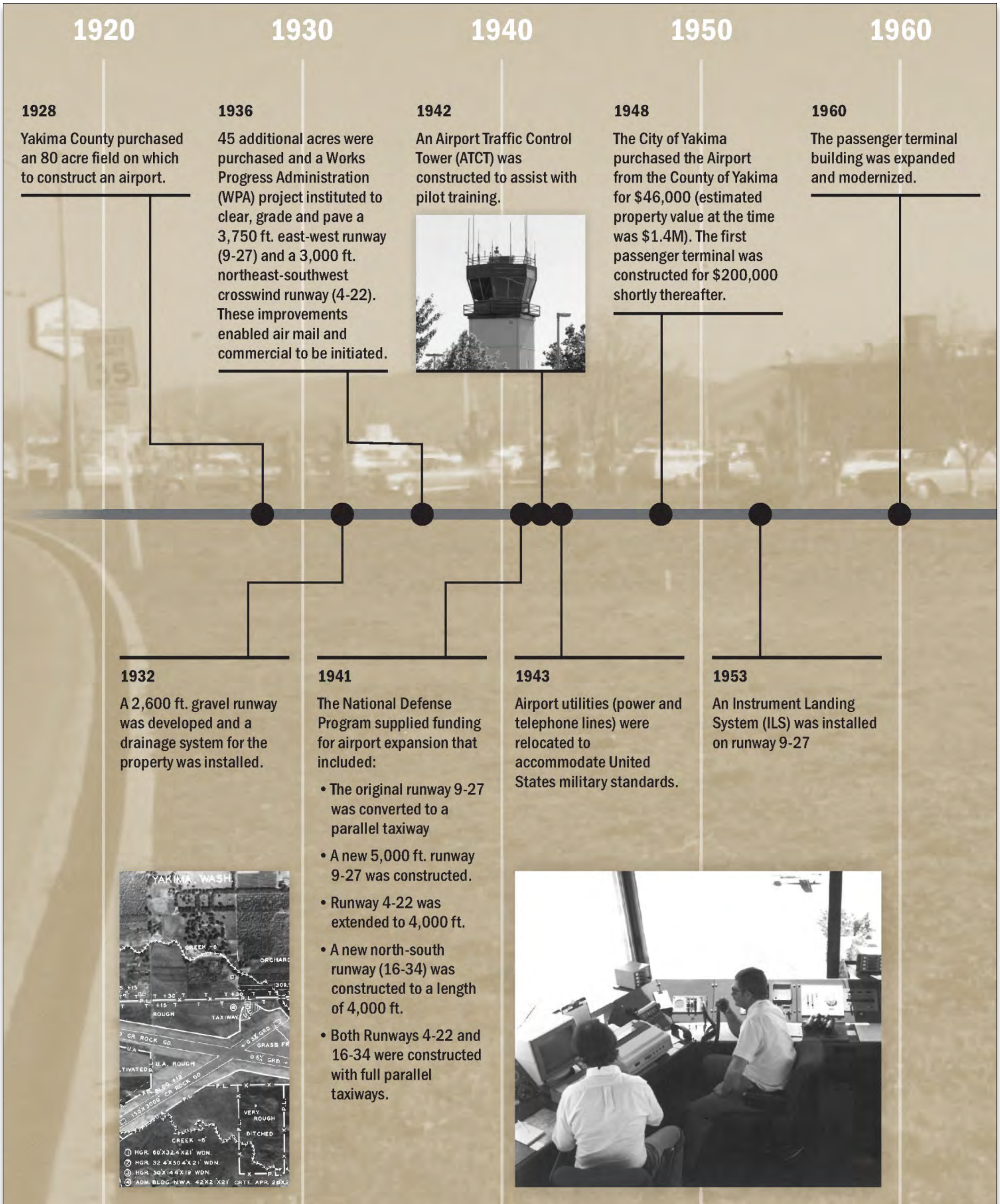


Figure 2-2: Yakima Air Terminal Development Timeline

1970 1980 1990 2000 2010

1967

- Runway 9-27 was extended by 1,100 ft. – to a total length of 7,604 ft. to accommodate increasing jet traffic.
- The passenger terminal building was expanded.
- Yakima Fire Station No. 4 was constructed adjacent to the terminal building to provide Aircraft Rescue and Fire Fighting (ARFF) capabilities at the airport.

1979

Runway 16-34 was closed and converted to a taxiway.

1982

The City of Yakima and Yakima County entered into a joint operational agreement to share operational and maintenance costs for the airport.

1988

The threshold for Runway 22 was relocated to allow safe clearances over West Washington Street, resulting in a runway length of 3,835 ft.

1996

Runway 9-27 was reconstructed with a new asphalt concrete overlay.

1999

The terminal building was rehabilitated and expanded.

2001

- Portions of taxiways Bravo and Charlie north of Runway 9-27 were overlaid.
- A new service/ARFF road was constructed from around the Runway 9 threshold to Spring Creek Road
- Runway End Identifier Lights (REILs) were installed on Runways 4 and 22, and Precision Approach Path Indicators (PAPIs) were installed on Runways 4, 22, and 27.

2002

Security fencing was installed around the southern perimeter of the airport.

2010

Runway 9-27 was reconstructed and brought to FAA standards.


2010
2012
2014
2016
2018
2020
2011
Airport Master Plan Update
$498,000
2013
Termination of Joint Operations Agreement between City of Yakima and Yakima County-Transition to a City department
CITY OF YAKIMA
2015
Rehabilitation of main terminal apron
$678,764
Acquired first Snow Removal Equipment–high speed runway broom
$515,512
2017
Security Improvements–11 vehicle gates and 9 pedestrian gates
$911,829
Extension of 21st Ave and realignment of Airport Lane
$716,650
2019
Rehabilitation of West General Aviation Apron
2010
Rehabilitation of primary Runway 9/27
$3,174,000
2014
Awarded Small Community Air Service Development Grant (4th flight added in 2015)
$290,000
Alaska
AIRLINES
2016
Taxiway Alpha Rehabilitation Project–new asphalt, LED taxiway guidance signs and lights, regulator
$10,400,000
2018
Acquired Snow Removal Equipment–High Capacity Blower
$693,762
Replacement of High Intensity Runway Light system regulator
$64,000
TERMINAL

2.3 EXISTING AIRPORT PLANS

2.3.1 Previous Master Plan Update

The latest Airport Master Plan prepared for the Yakima Air Terminal/McAllister Field was published in 2003. The following are key recommendations of this master plan:

1. Extend Runway 9/27 to a total length of 10,160 feet
2. Extend Runway 4/22 to 4,420 feet
3. Construct a new parallel taxiway south of Runway 9/27
4. Develop new air cargo facilities
5. Update and modify the passenger terminal
6. Acquire property to protect runway approach surfaces
7. Institute and follow a pavement rehabilitation program
8. Remove FAR Part 77 obstructions
9. Expand the general aviation area

In addition, a number of facility expansion and renewal projects intended to bring the airport into full compliance with FAA's Airport Design Standards were included. Since 2003, the recommendation to extend Runway 9/27 has been questioned and the local jurisdictions surrounding the airport have asked for additional information regarding its ultimate length. Additionally, wind analyses have shown Runway 4/22 may not meet FAA criteria for crosswind runway requirements and its future eligibility is in question. One of the goals of this master plan is to revisit these recommendations to reassess their need or to revise the recommendation.

2.4 APPLICABLE FEDERAL/STATE PLANS

2.4.1 FAA National Plan of Integrated Airport Systems (NPIAS)

The National Plan of Integrated Airport Systems (NPIAS) is used by the Federal Aviation Administration (FAA) to identify airports within the United States and its territories critical to the nation's air transportation system. Airports listed in the NPIAS are eligible for Federal Development Grants under the Airport Improvement Program (AIP). Yakima Air

Terminal/McAllister Field is listed as a 'Non-hub Primary Airport'[1] in the NPIAS and is one of ten such airports in Washington State.

2.4.2 Washington State Department of Transportation Long-Term Air Transportation Study (LATS)

The Washington State Department of Transportation's (WSDOT) Long-Term Air Transportation Study (LATS) is a strategic planning effort for the aviation system in Washington. According to the LATS, YKM is classified as a Commercial Service Airport

Commercial Service Airports provide scheduled passenger air carrier and/or commuter service to in-state, domestic, and (in some cases) international destinations. Some of these airports also serve regional air cargo demand and many accommodate significant levels of general aviation activity. Commercial Service Airports are mostly located in large population centers. The extent of a Commercial Service Airport's service area, as defined by driving time and population, depends upon the type of air service provided. Typically, these airports are classified as *primary* or *commercial service* airports in the NPIAS (WSDOT, 2009).

2.5 AIRPORT FACILITIES

Existing airport facilities at YKM include two active runways and a full parallel taxiway system, runway and taxiway lighting systems, visual and electronic navigational aids, general aviation hangars and tiedown aprons, a passenger terminal building and support facilities, airport offices and maintenance building. Figure 2-3 shows the existing facilities at YKM. These are discussed in the following section.

[1] *'Non-hub Primary Airport' - Commercial service airports that enplane less than 0.05 percent of all commercial passenger enplanements but have more than 10,000 annual enplanements are categorized as non-hub primary airports. There are 244 non-hub primary airports that together account for 3 percent of all enplanements. These airports are heavily used by general aviation aircraft with an average of 95 based aircraft per airport.*

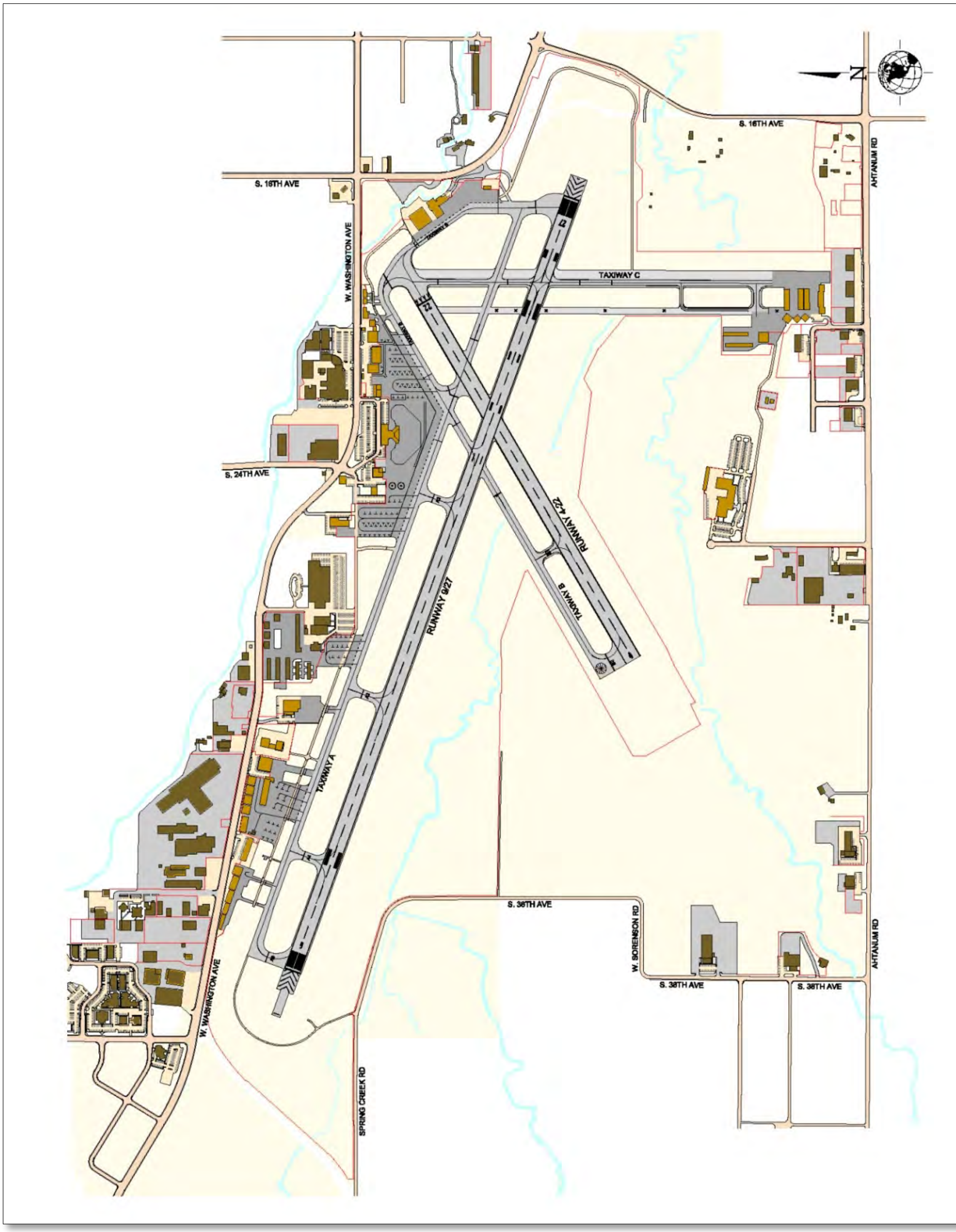


Figure 2-3: Existing Airport Facilities

2.5.1 Runways and Taxiways

The airfield at YKM consists of two runways, 9/27 and 4/22. Runway 9/27, the primary runway, is 7,604 feet long, 150 feet wide, and has a Category I precision instrument approach available on Runway 27 and non-precision approaches on Runway 9. Taxiway A is the full length parallel taxiway to Runway 9/27 with a runway/taxiway centerline separation distance of 400 feet. Runway 4/22 is the 3,835-foot-long, 150-foot-wide secondary runway. Runway 4/22 has a full length parallel taxiway (Taxiway B) with a runway/taxiway centerline separation of 313 feet. Taxiway C is 50 feet wide and provides access from Runway 22 and Taxiway B to the South General Aviation facilities. A portion of Taxiway C between Taxiway B and Taxiway A is often used for large commercial and military aircraft parking during diverts and military training exercises.

Table 2-1: Airport Runway Data (Existing as depicted on 2015 ALP)

		Runway 4/22		**Runway 9/27**	
Runway Dimensions	Length:	3,835’		7,604’	
	Width:	150’		150’	
Pavement Type		Asphalt		Grooved Asphalt	
Pavement Strength (in 1,000 lbs.)		70 (S), 80 (D), 120 (DT)		95 (S), 160 (D), 220 (DT), 550 (DDT)	
Runway Safety Area (RSA)		4,315’ x 120’		9,604’ x 500’	
Object Free Area (OFA)		4,315’ x 250’		9,604’ x 800’	
Obstacle Free Zone (OFZ)		4,215’ x 250’		8,004’ x 400’	
Runway Lighting		MIRL		HIRL	
Runway End		**4**	**22**	**9**	**27**
Runway Approach Category		Visual	Visual	Non-Precision	Precision
Runway Approach Slope		20:1	20:1	34:1	50:1
Runway Markings		Basic	Basic	Non-Precision	Precision
Instrumentation / Approach Aids		None	None	Localizer, GPS/RNAV	ILS
Visual Aids		PAPI	PAPI	VASI	PAPI; MALSR

Critical Aircraft	Beech Baron	Boeing 727
Wingspan:	37' 10"	108'
Weight:	5,500 lbs.	184,800 lbs.
Approach Speed:	98 knots	133 knots
Airport Reference Code (ARC)	B-I (small)	C-III

S - Single-wheel Gear *D - Dual-wheel Gear* *DT - Dual-tandem Gear* *DDT - Dual double Tandem Gear*
ILS - Instrument Landing System *MALSR - Medium Intensity Approach Lighting System*
MIRL - Medium Intensity Runway Lights *HIRL - High Intensity Runway Lights*
PAPI - Precision Approach Path Indicator *VASI - Visual Approach Slope Indicator*

Both runways have been constructed to meet FAA design standards for safety and operational efficiency. The Airport Reference Code (ARC) is the classification system developed by the FAA to relate airport design criteria to the operational and physical characteristics of the types of aircraft expected to operate at the airport on a regular basis. The ARC is based on two key characteristics of the designated critical aircraft. The first, denoted by a letter, is the aircraft approach category. This is determined based on the aircraft's approach speed in the landing configuration. Generally, aircraft approach speed affects runway length, exit taxiway locations, and runway-related facilities. Following are the ARC approach speed categories:

- 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 166 knots or more

The second component, depicted by a roman numeral, is the Airplane Design Group. This is based on the aircraft's wingspan and determines dimensional standards for the layout of airport facilities, such as separation criteria between runways and taxiways, taxilanes, buildings, or objects potentially hazardous to aircraft movement on the ground. Following are the design group categories:

- Design Group I: Wingspan up to but less than 49 feet
- Design Group II: Wingspan 49 feet up to but less than 79 feet
- Design Group III: Wingspan 79 feet up to but less than 118 feet
- Design Group IV: Wingspan 118 feet up to but less than 171 feet
- Design Group V: Wingspan 171 feet up to but less than 214 feet
- Design Group VI: Wingspan 214 feet up to but less than 262 feet

Based on the 2015 Airport Master Plan and previous planning, YKM has an Airport Reference Code (ARC) of C-III. Runway 9/27 is classified as a C-III runway based on use by Boeing 727 aircraft. Runway 4/22 is classified as a B-I (small) runway with operations confined to light single and twin engine piston aircraft. It should be noted that this runway as well as Taxiway B were constructed to meet B-III standards thus exceeding the B-I (small) standards.

The dimensional design criteria for a C-III category runway is shown in Table 2-2. This table also provides a comparison of the standards with existing conditions on Runway 9/27. Following this, Table 2-3 shows the Design Criteria for a B-I (small) runway along with the existing conditions. As seen in these tables, both runways meet FAA standards at the present time except in the areas of shoulder widths and blast pads.

Table 2-2: Existing Conditions vs. C-III Design Criteria (Runway 9/27)

Design Feature	Existing (ft.)	Standard (ft.)	Difference
Runway			
Width	150	150	Meets Standard
Runway Shoulder Width	10	25	15 feet
Runway Blast Pad Width	150	200	50 feet
Runway Blast Pad Length	200	200	Meets Standard
Runway Safety Area (RSA) Width	522	500	Meets Standard
Safety Area Length (beyond RW end)	1,000	1,000	Meets Standard
Object Free Area Width	800	800	Meets Standard
Object Free Area Length (beyond RW end)	1,000	1,000	Meets Standard
Obstacle Free Zone Width	400	400	Meets Standard
Obstacle Free Zone Length	8,004	8,004	Meets Standard
Taxiway			
Width	64	75	MOD for TDG 5 Standards
Safety Area Width	118	118	Meets Standard
Object Free Area Width	186	186	Meets Standard
Taxilane Object Free Area Width	162	162	Meets Standard
Runway Centerline to:			
Taxiway Centerline	400	400	Meets Standard
Aircraft Parking Area	500	500	Meets Standard
Taxiway Centerline to Fixed or Movable Object	93	93	Meets Standard
Taxilane Centerline to Fixed or Movable Object	81	81	Meets Standard

Source: FAA Advisory Circular 150/5300-13, Airport Design, Change 6

Note: Taxiway A Modification of Standards approved September 27, 2013.

Table 2-3: Existing Conditions vs. B-I (small) Design Criteria (Runway 4/22)

Design Feature	Existing (ft.)	Standard (ft.)	Difference
Runway			
Width	150	60	Exceeds Standard
Runway Shoulder Width	5	10	5 feet
Runway Blast Pad Width	None	80	80 feet
Runway Blast Pad Length	None	60	Meets Standard
Runway Safety Area (RSA) Width	200	120	Exceeds Standard
Safety Area Length (beyond RW end)	600	240	Exceeds Standard
Object Free Area Width	400	250	Exceeds Standard
Object Free Area Length (beyond RW end)	600	240	Exceeds Standard
Obstacle Free Zone Width	250	250	Meets Standard
Obstacle Free Zone Length	200	200	Meets Standard
Taxiway			
Width	75	25	Exceeds Standard
Safety Area Width	49	49	Meets Standard
Object Free Area Width	89	89	Meets Standard
Taxilane Object Free Area Width	79	79	Meets Standard
Runway Centerline to:			
Taxiway Centerline	300	150	Exceeds Standard
Aircraft Parking Area	420	125	Exceeds Standard
Taxiway Centerline to Fixed or Movable Object	44.5	44.5	Meets Standard
Taxilane Centerline to Fixed or Movable Object	39.5	39.5	Meets Standard

Source: FAA Advisory Circular 150/5300-13, Airport Design, Change 6
Note: Runway 4/22 and Taxiway B were constructed to meet B-III standards, which exceed B-I (small) standards.

2.5.1.1 Airfield Pavement

In 2018, the Washington State Department of Transportation – Aviation Division (WSDOT) conducted an analysis of the condition of runway, apron and taxiway pavements at YKM. The Pavement Condition Index (PCI) is provided to federal, state and local jurisdictions to support strategic pavement management and planning. The PCI ranges from 0–100 (failed to excellent).

YKM has approximately 4.28 million square feet of runway, taxiway, and apron pavements. In 2018, the airport's PCIs ranged from 4 to 100. Runway 9/27 had PCIs ranging from 87 to 95 and is in good condition. Runway 4/22 had PCIs ranging from 17 to 100, with the majority of the runway requiring rehabilitation. In 2017, Taxiway A and the runway connector taxiways (A1-A5, and portions of B, C, and Runway 4/22) were reconstructed and are in excellent condition. Taxiway B and the Runway 4/22 connectors (B, B1, andB2) are in fair condition and also require rehabilitation.

In 2010, Runway 9/27 underwent a rehabilitation project to replace its significantly deteriorated surface course. The Porous Friction Course (PFC) surface was replaced a few years ahead of its expected lifespan with grooved asphalt.

As part of the May 2015 master plan update, both airside and landside pavements were re-evaluated through an update to the PCI report. Surfaces analyzed in this update included approximately 5,573,055 square feet of pavement. The PCI report presents the results of the pavement evaluation and presents the pavement management plan for YKM pavements.

In 2018, WSDOT completed a pavement inspection with an updated PCI report for YKM. Figure 2-4 presents existing pavement conditions on the airport as identified in the 2018 PCI report. As shown, most of the airfield pavements are in good condition except for portions of Taxiway B, Runway 4/22, and its connector taxiways (B, B1, andB2), as well as several aprons and hangar taxilanes. Runway 4/22 received a fog seal in 2018 and is in need of reconstruction if it is to remain usable long-term. This master plan will address the future of this runway and its eligibility for funding.

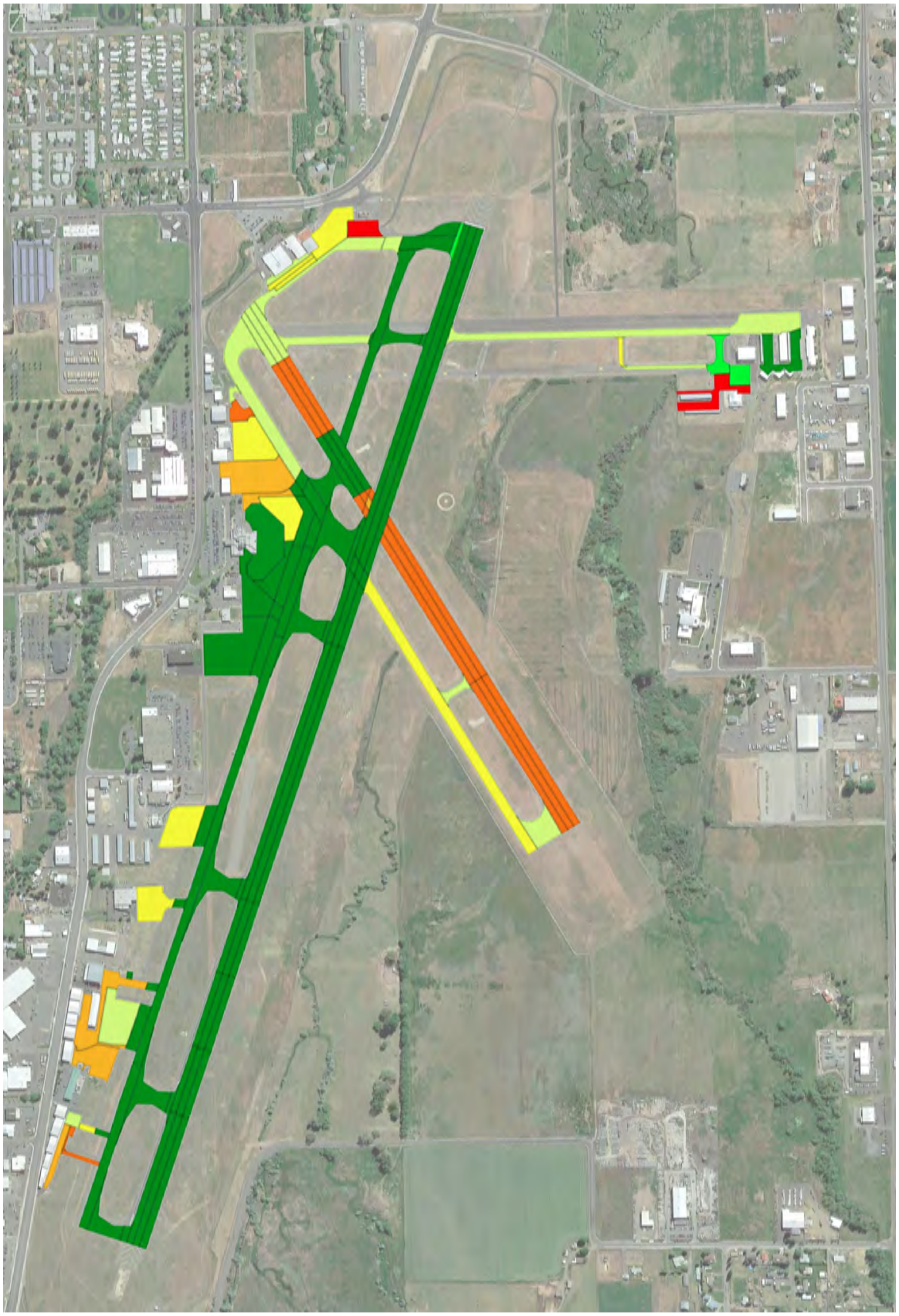


Figure 2-4: Existing Pavement Conditions

2.5.1.2 Airfield Lighting and Navigational Aids

The following visual and electronic navigation and landing aids are available at YKM. As indicated in Table 2-4, Runway 9 is equipped with a localizer for a non-precision approach with a 34:1 approach slope. The runway end has non-precision markings, a Visual Approach Slope Indicator (VASI), and High Intensity Runway Lights (HIRL).

Runway 27 is equipped with an Instrument Landing System (ILS) including a glide slope, and Medium Intensity Approach Lighting System (MALSR) for a precision instrument approach with a 50:1 approach slope. The runway end has precision runway markings, a Precision Approach Path Indicator (PAPI), and High Intensity Runway Lights (HIRL).

Runways 4 and 22 are visual approaches with 20:1 approach slopes. Both have visual runway markings, Precision Approach Path Indicator (PAPI), and Medium Intensity Runway Lights (MIRL).

Table 2-4: Navigational Aids

Navigational Aid	Rwy 4	Rwy 22	Rwy 9	Rwy 27
VASI			✈	
PAPI	✈	✈		✈
REIL	✈	✈	✈	
GPS			✈	✈
SDR-9				
Rotating Beacon	✈	✈	✈	✈
MALSR				✈
ILS – Glideslope Antenna				✈
Localizer			✈	
NPI			✈	✈
Compass Locator				✈
RVR				✈
Lighted Windsock	✈		✈	✈

2.5.1.3 Airfield Signage

The airport incorporates standard runway and taxiway signage and meets all FAA signage standards. In 2017, Taxiway A, Runway 9/27, and its connector taxiways (A1-A5, B, and C) signs were upgraded to Type 3 LED signs.

2.5.1.4 Published Instrument Approaches

Instrument Procedures

Precision instrument approaches are available to Runway 27 and non-precision approaches are available for Runway 9. The approach plates for these are contained in Appendix D to this report and summarized in Table 2-5.

Table 2-5: Published Procedures

Instrument Approach Procedures	Departure Procedures
ILS Y RWY 27	GROMO FOUR
ILS Z RWY 27	NACHES FOUR
RNAV (RNP) RWY 09	WENAS SEVEN
RNAV (RNP) Y RWY 27	YAKIMA SEVEN
RNAV (RNP) Z RWY 27	ZILLA THREE (OBSTACLE)
RNAV (GPS) X RWY 27	
LOC/DME BC-B	
VOR/DME OR TACAN RWY 27	
VOR-A	
COPTER NDB RWY27	

2.5.1.5 Runway Safety Areas

The Runway Safety Area (RSA) is a critical, two-dimensional area surrounding each active runway. The RSA must be:

- Cleared, graded, and free of potential hazardous surface variations;
- Properly drained;
- Capable of supporting ARFF equipment, maintenance equipment, and aircraft; and,
- Free of objects, except for those mounted using low-impact supports and whose location is fixed by function.

Based on FAA Criteria from Advisory Circular 150/5300-13 for a C-III runway, the RSA for Runway 9/27 needs to be 500 feet wide extending 1,000 feet beyond each runway end. Presently the RSA for both ends of the runway are generally in compliance with these standards except for occasional gopher activity that creates dirt mounds and holes. However, the airport maintains a robust Wildlife Hazard Mitigation Program to mitigate pocket gophers and airfield maintenance staff grade and roll the safety areas when needed.

For Runway 4/22, the RSA has been developed to meet the standards for a B-III aircraft. This includes an area 600 feet beyond each runway end measuring 200 feet wide.

2.5.1.6 Runway Object Free Areas

The runway object free area (OFA) is a two-dimensional ground area surrounding each runway. The ROFA clearing standard precludes parked aircraft or other objects, except NAVAIDs and other facilities whose locations are fixed by function from this area. For Runway 9/27, the ROFA is 800 feet wide, centered on the runway centerline, and extends 1,000 feet beyond the end of the runway. For Runway 4/22, the OFA dimensions are 250 feet wide and extend 400 feet off the runway end. Both ROFAs meet FAA Criteria.

2.5.1.7 Runway Protection Zone

The Runway Protection Zone (RPZ) is trapezoidal in shape and centered on the extended runway centerline for each runway end. Its function is to enhance the protection of people and property on the ground. It begins 200 feet beyond the permanent runway threshold (at the end of the primary surface). The RPZ dimensions are based on the type of aircraft using the runway, type of operations (visual or instrument) being conducted, and visibility minimums associated with the most demanding approach available. RPZ dimensional standards are defined in the FAA Advisory Circular 150/5300-13A, Airport Design. The dimensions for the RPZs at YKM are shown in Table 2-6 and meet these standards.

Table 2-6: Runway Protection Zone (RPZ)

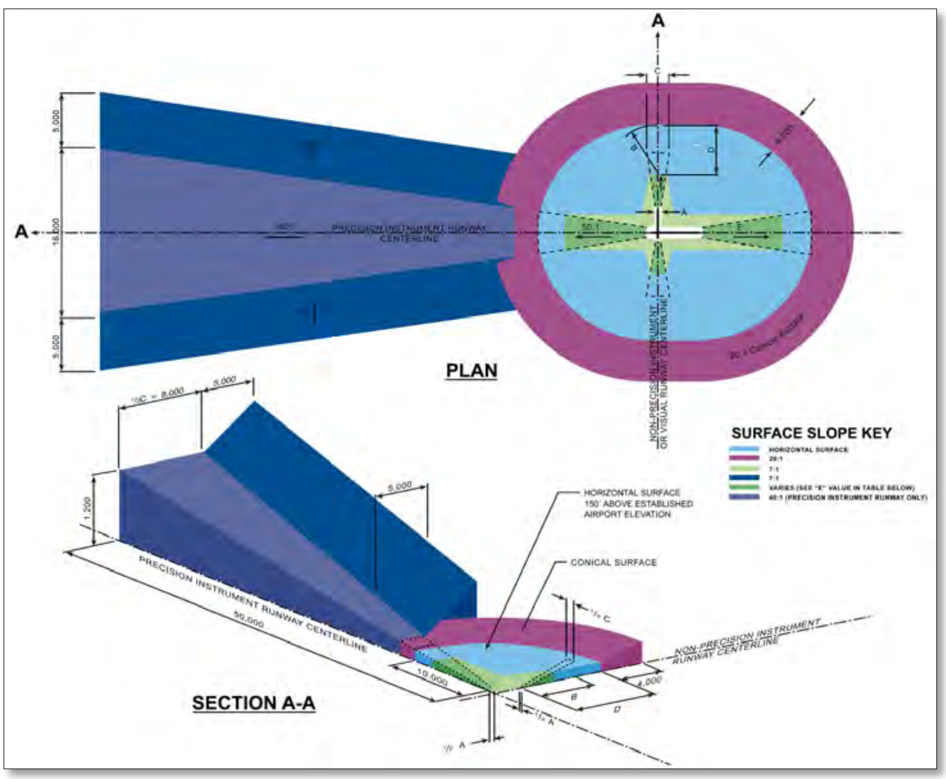
Runway	Aircraft Served	Approved Approach	Zone Length	Inner Width	Outer Width	Acres
09	Large	Non Precision	1,700’	1,000’	1,510’	48.978
27	Large	Precision	2,500’	1,000’	1,750’	78.914
04	Small	Visual	1,000’	250’	450’	8.035
22	Small	Visual	1,000’	250’	450’	8.035

The airport owns all property within the RPZ for each runway end.

2.5.1.8 FAR Part 77 Surfaces

Under Part 77 of the Federal Aviation Regulations (FAR), standards are established for determining obstructions to navigable airspace. The regulation also provides for aeronautical studies of obstructions to determine their effect on the safe and efficient use of airspace.

Local jurisdiction (both city and county) protects FAR Part 77 surfaces and has incorporated the requirements set forth by the FAA into its zoning regulations and practices. The objective is to maintain the surrounding airspace and keep it free of obstacles that impede aircraft operations. These regulations dictate the type of infrastructure and development allowed adjacent to and near the airport as well as the height of these objects. The five surfaces that make up the FAR Part 77, Imaginary Surfaces for a civil airport are the primary, approach, transitional, horizontal and conical surfaces. Figure 2-5 shows each element of the imaginary surfaces as they relate to each other and the runways, and Figure 2-6 shows the Part 77 Surfaces for YKM.



Source: Washington State Department of Transportation, Aviation Division

Figure 2-5: FAR Part 77, Imaginary Surfaces - Diagram

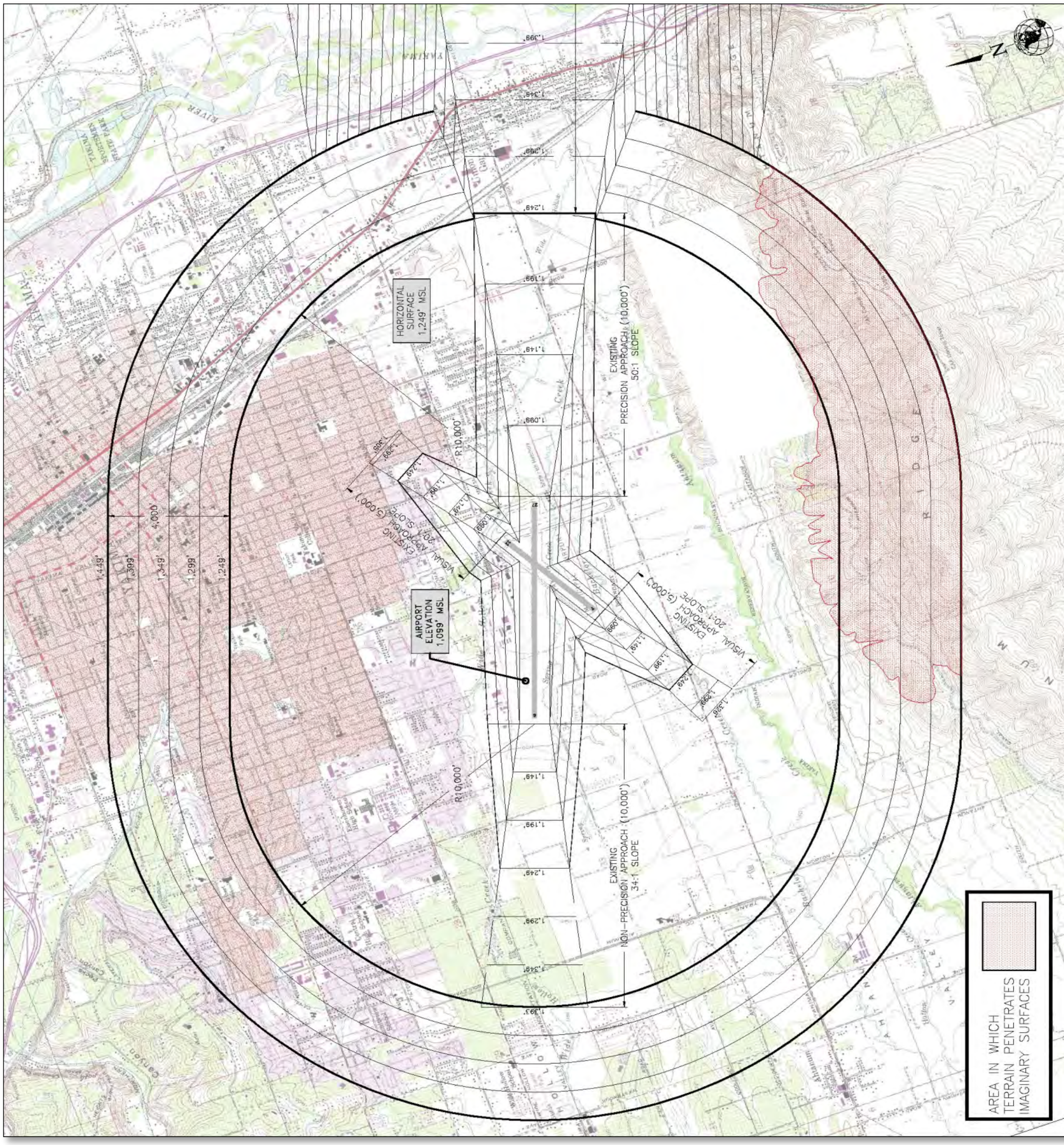


Figure 2-6: FAR Part 77, Imaginary Surfaces for YKM

Primary Surface

The primary surface is an imaginary surface longitudinally centered on the runway and extends 200 feet beyond the end of each runway. The elevation of any point of that surface is equal to the elevation of the nearest point on the runway centerline. The width varies, depending upon the type of approach available to the runway. For YKM, Runway 27 has a precision instrument approach with visibility minimums as low as three-fourths of a statute mile, while Runway 9 has a non-precision instrument approach. As a result, the primary surface for this runway is 1,000 feet wide centered on the runway centerline. Runway 4/22 is classified as a utility runway with visual approaches; therefore, the primary surface for this runway is 250 feet wide centered on the runway centerline.

Approach Surface

The approach surface is an inclined slope extending outward and upward from each end of the primary surface centered on the extended runway centerline. The inner width of the surface is the same as that of the primary surface. The approach surface is applied to each end of the runway based on the type of approach available or planned for that runway end.

Runway 27 is designated as a precision instrument runway. The approach surface for this runway is 1,000 feet wide where it intersects with the primary surface and expands uniformly for a distance of 10,000 feet at a slope of 50:1. It continues outward and upward for an additional 40,000 feet at a slope of 40:1 where the final width is 16,000 feet. Runway 9 is a non-precision runway with an approach surface starting at the primary surface with a width of 1,000 feet then expanding uniformly for a distance of 10,000 feet at a slope of 34:1 reaching a final width of 3,500 feet.

Both ends of Runway 4/22 have visual approaches. These surfaces are 250 feet wide at the intersection with the primary surface and expand uniformly for a distance of 5,000 feet at a slope of 20:1 to a final width of 1,250 feet.

Horizontal Surface

The horizontal surface is a horizontal plane 150 feet above the established airport elevation. YKM has an established elevation of 1,099 feet MSL (above Mean Sea Level) so the horizontal surface is 1,249 feet MSL. The perimeter of the surface is determined by arcs extending from the centerline of the runway and its intersection with the primary surface. The radii of these arcs correspond with the approach surface lengths for each of the runway ends. Runways designated as utility or visual use a radius of 5,000 feet, while all other runways use a radius of 10,000 feet.

Transitional Surface

The transitional surface is an inclined plane with a slope of 7:1, extending upward and outward at right angles to the runway centerline from the primary surface and the sides of the approach surfaces. These surfaces terminate where they intersect with the horizontal surface or another surface with more critical restrictions.

Conical Surface

The conical surface is an inclined plane at a slope of 20:1, extending upward and outward from the periphery of the horizontal surface for a distance of 4,000 feet.

2.5.2 Passenger Terminal Area

The passenger terminal area is located on the north side of the airport at the approximate intersection of Runways 9/27 and 4/22. The terminal area consists of the aircraft parking apron, the passenger terminal building, the surface access system and auto parking areas and the airport administrative offices, as shown in Figure 2-7. It is accessed using either West Washington Avenue or 24th Street onto the airport entry drive. Parking is located directly in front of the terminal with public parking, rental cars and employee parking provided in different areas.

2.5.2.1 Automobile Parking

Public parking is provided in a main parking lot directly north of the terminal. The lot contains spaces for short-term (17 spaces) and long-term (171 spaces) parking. Users can enter the lot either before or after the terminal entry. All users must exit through the ticket booth and proceed north to the intersection of West Washington Avenue and 24th Avenue.

Rental car parking is located east of the terminal with 36 spaces available in a restricted lot. Additional overflow rental car parking is located to the west of the airport administration building.

2.5.2.2 Passenger Terminal Building

For any passenger terminal building, services are required for the efficient processing of passengers arriving and departing on commercial flights. Enplaning services include the ticketing area, ticket counter, electronic ticket kiosks, queuing area, and airline offices. Processing services include passenger and bag screening facilities operated by the Transportation Security Administration (TSA). Deplaning services generally include baggage claim area and rental car counters. Other services necessary in a terminal building may include concessions, gift shops, restrooms, advertising and display areas, mechanical and utility rooms, and janitorial service and storage areas.

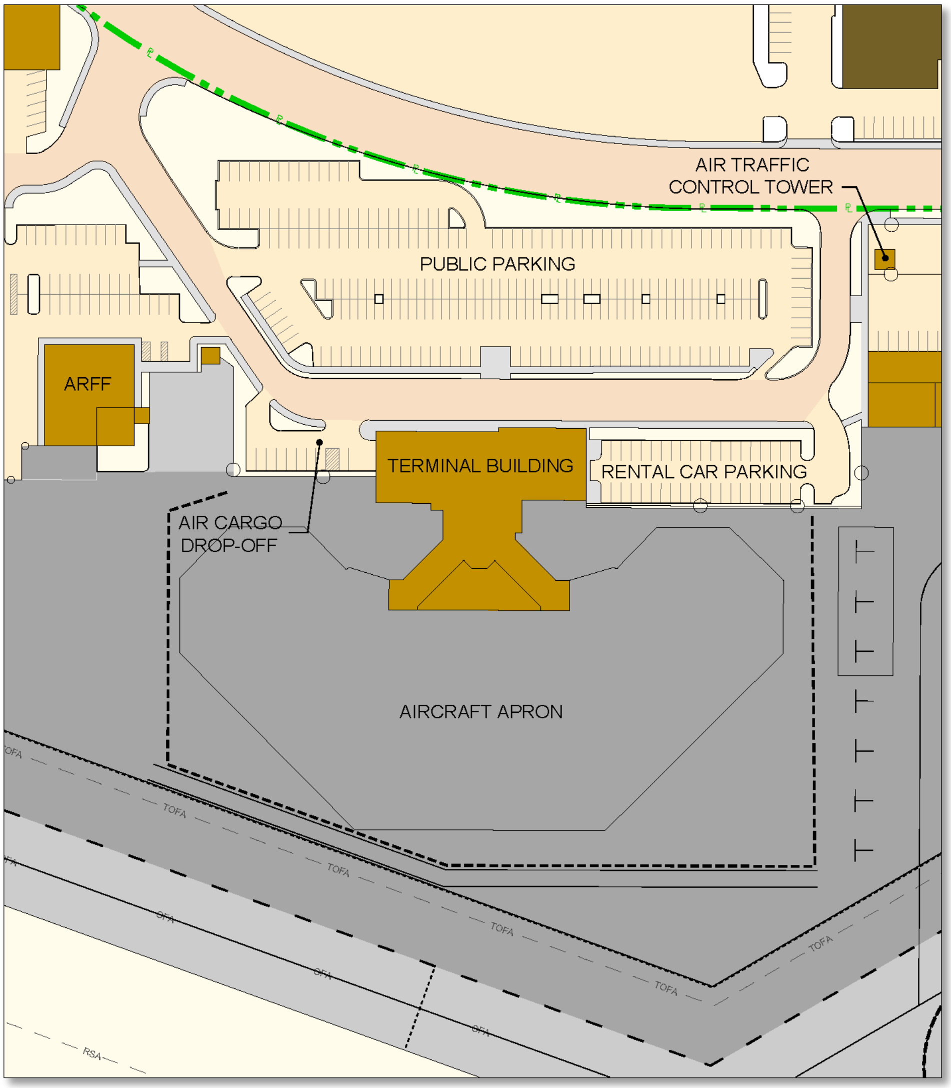


Figure 2-7: Terminal Area

Figure 2-88 and Figure 2-9 show the current floor plan for the passenger terminal. As seen the passenger enters the doorway and has two options for proceeding to the ticket counter, depending on what airline is being used. From ticketing they proceed to the TSA security screening area in the center of the building and, once screened, move into the spacious gate area. The YKM terminal currently provides concessions for the passengers from vending machines. Additionally, there is a vacant coffee/snack shop inside the terminal across from the elevator, next to the main entrance.

Departures Process

Curbside

Given current levels of commercial service, there is an ample length of available curbside for passenger loading and unloading. The drive in front of the terminal offers frontage for easy loading and unloading from private vehicles, taxis and buses, and extends eastward beyond the terminal should terminal user demand exceed the covered frontage available. The curbside immediately in front of the terminal is covered, providing passengers with shelter from inclement weather. However, the curbside width is somewhat narrow. The location of the concrete-clad steel columns which support the roof canopy overhead can interfere with the opening of passenger-side car doors along the curb. Also, the vestibule at the main terminal entrance is the only terminal entry on the curbside and serves both departing and arriving passengers, which can lead to congestion if departure and arrival traffic occur simultaneously. Just west of the terminal building is a cell phone waiting lot with 7 spaces.

Ticket Lobby

The Ticket Lobby is located immediately inside the main terminal entrance. Given current levels of commercial service, the number of ticket counter positions is adequate to handle passenger volumes. The orientation of the ticket counters (perpendicular to the curbside); the separated physical locations of airline ticket counters; as well as the inadequate size of the passenger queuing areas pose significant challenges to efficient passenger processing and circulation, as shown in 0. The current low level of passenger volumes has kept these shortcomings from being major problems.

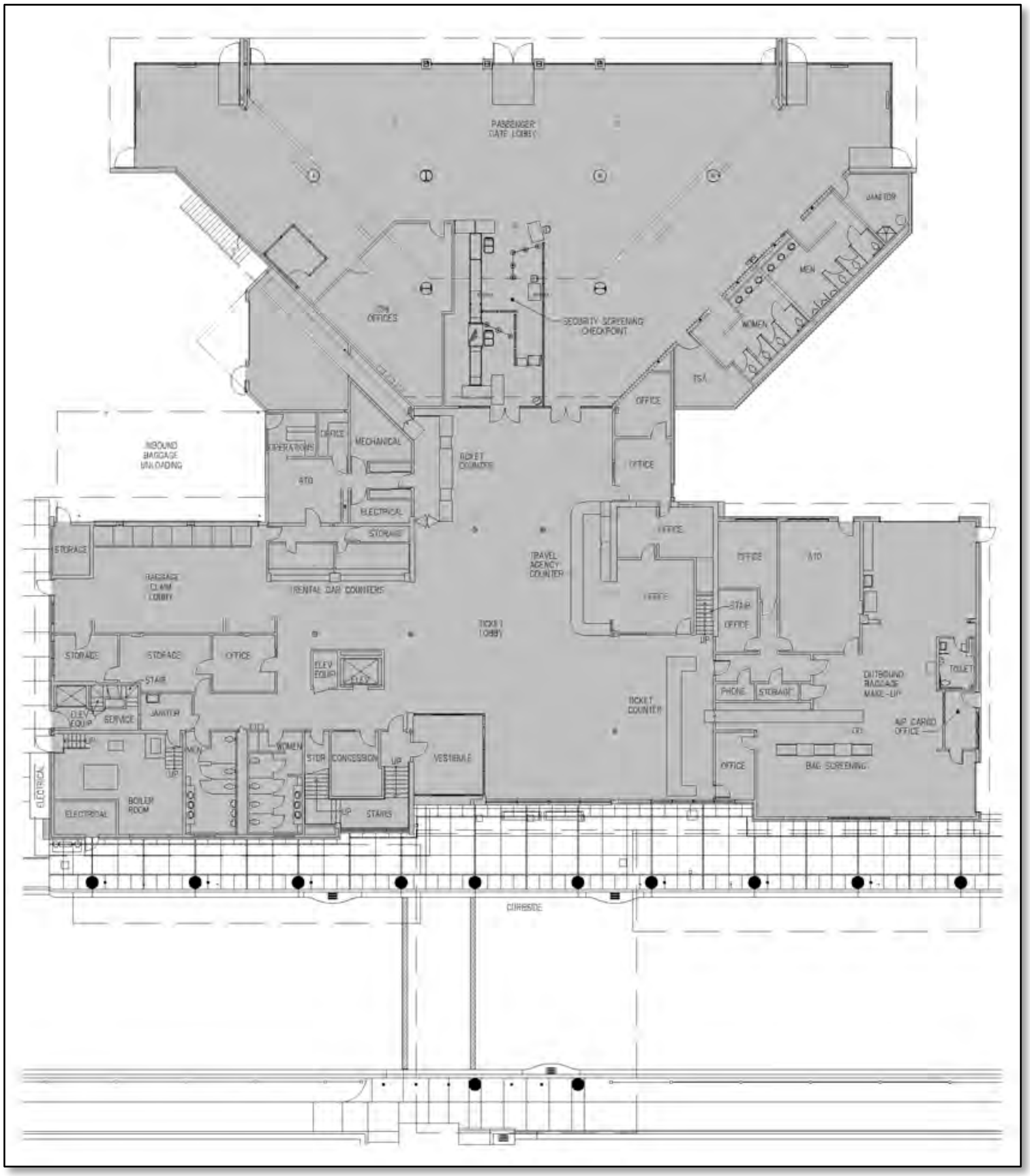


Figure 2-8: Terminal Floor Plan (First Floor)

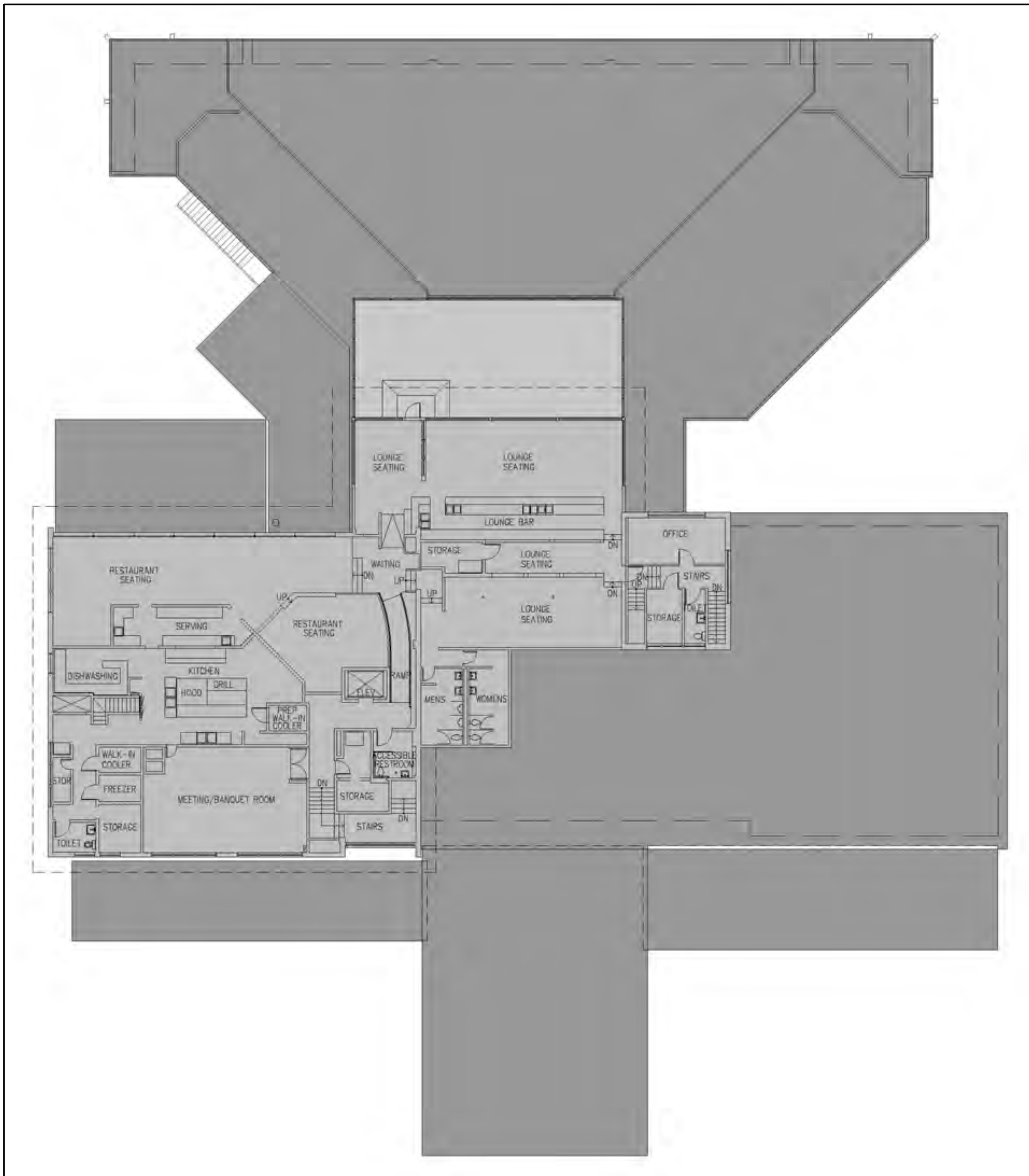


Figure 2-9: Terminal Floor Plan (Second Floor)

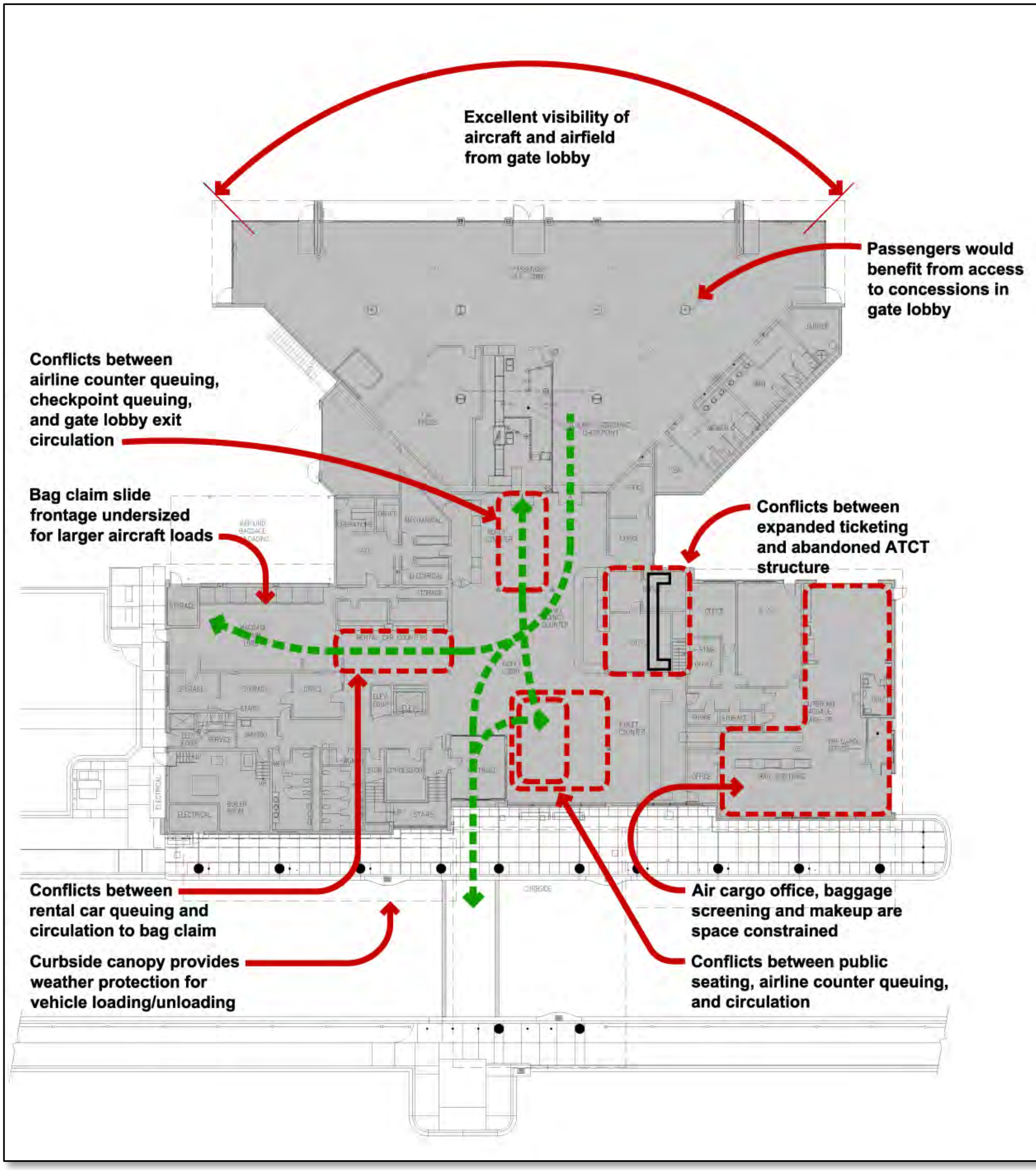


Figure 2-10: Terminal Facility Assessment

The former travel agency customer service counter in the ticket lobby has been converted to a rental car counter. This location could contribute to circulation congestion if passenger volumes were higher.

The overall passenger processing flow diagram for the terminal is a product of the original small-scale 1950 passenger terminal. Given the passenger demands in that era, the layout was efficient and properly scaled. Today's air passenger facility demands are far different and significant increases in passenger volumes would bring this terminal quickly to gridlock in a number of areas, including: the building entry, the ticketing queues, the ticket counters, and the circulation space connecting these functions.

Airline Ticket Office (ATO) and Baggage Operations

ATO space for Alaska Airlines and a future air carrier appear to be adequate for the immediate future. However, the physical separation of the ATO and baggage areas (as well as the ticket counters) is an inefficient configuration brought about by earlier decisions to expand the building in a cost efficient rather than functional manner.

The Alaska Airlines outbound baggage handling area is currently undersized, due to the addition of Transportation Security Administration (TSA) baggage screening operations in the makeup area. Baggage cart circulation is highly constrained, and the airline employee lockers and break area have no enclosed space. An air cargo operation coexists in the makeup room, with a public entry and transaction counter opening off of a small parking area west of the terminal building. Additional storage area for equipment would also be useful.

Concessions

Currently, food and beverage concession in the terminal building are provided through vending machines. There is a small vacant space on the ground floor for a coffee/snack type concession, and there is a vacant restaurant/lounge on the second floor. There are currently vending machines to serve as airside concessions. Passengers would benefit from full service concessions, but the small volume of passenger traffic cannot support the expense of providing the service. Also, an airside food and beverage concession, preferably with a view to airside, would be a big improvement to customer service if passenger volumes supported the investment.

Public Services

Public services include restrooms, vending machines, an automated teller machine (ATM), and other conveniences provided for the passengers. The primary public restrooms in the main terminal are adequately sized and have been renovated in recent years. Newer terminal buildings typically include a small “family restroom” wherever men’s and women’s rooms are located which is handicap-accessible and includes a baby-changing table. While this type of service may not be possible at the existing restroom location, it is an idea worth exploring should new restrooms be considered as part of future terminal improvements.

Currently the ATM machine in the terminal is a freestanding device located adjacent to the main entrance in the ticket lobby. Also, there is no business center or location to send a fax or plug in a notebook computer in the terminal. A small area with these provisions would provide an added level of service to the business traveler. There is free WiFi internet service available in the terminal building.

Security Screening

The passenger security screening checkpoint is located immediately adjacent to a currently vacant ticket counter area, resulting in an unfortunate conflict between ticketing and checkpoint queuing lines. These lines, when concurrent, contribute to overall congestion in the ticket lobby and the main circulation areas in the non-secure portion of the terminal building. If future traffic levels or TSA screening requirements dictated a larger footprint for screening, the terminal would have to give up lobby space to accommodate the increase.

Passenger Gate Lobby and Boarding Area

The passenger gate lobby and boarding area is south of the ticket lobby and adjacent to the aircraft apron at ground level. It was expanded during the 1997 to 2000 terminal rehabilitation project, filling in the space between the two diagonal passenger circulation concourses added during the 1968 expansion project. Unfortunately this infill diminished the airside views from the restaurant/lounge operation, one of primary assets of the second floor location concession.

Improvements to airside passenger service could be made by: family restrooms; providing food and beverage service; providing sit-down counters for working on laptop computers; or providing some café-type tables and chairs in addition to the traditional gate lobby seating.

Arrivals Process

Arrivals Entrance/Greeters' Area

Upon exiting their aircraft, passengers enter the terminal by way of one of five arrival/departure gates. Once inside the gate lobby, they proceed to the airside exit doors adjacent the passenger security checkpoint. These doors allow passage into the public lobby/ticket lobby space, which allows transit to rental car counters and the baggage claim lobby beyond. Because of the limited size of the Public Lobby/Ticket Lobby space, and because of the arrangement of functions requiring queuing in a main circulation area, this space can quickly become crowded if passenger and meeter/greeter numbers are substantial.

Baggage Claim/Rental Cars

The baggage claim lobby consists of approximately 32 linear feet of baggage slide frontage, and the rental car counters consist of two 12-foot public transaction counters. During the terminal assessment site visit arriving passenger traffic was not observed. The following discusses opinions on its functionality.

During a one flight operation by a Q-400 with 70% load factor, 1 bag/passenger ratio, and the plane-side bag claim option used by 50% of the passengers, it would be predicted that the 32 linear feet of baggage slide is adequate. If actual passenger traffic volume or baggage ratios become higher, this will affect the ability of the claim slide to display available baggage for claiming.

The standing space within the claim lobby is limited and could become congested if passengers are accompanied into the claim lobby by their meeter/greeter parties.

Rental car counter frontage is limited to three 12-foot counter frontages that are occupied. There are currently three rental car agencies serving YKM, but it is not uncommon to have up to 5 rental car companies interested in serving non-hub airports.

The rental car lobby space on which the rental car counters front is narrow and it is likely that during flight arrivals there is congestion resulting from completing demands for rental car customer queues and passengers circulating to baggage claim.

Public Services

Currently, there are small restrooms near the baggage claim area; however, these restrooms are not along the path of travel for arriving passengers and are therefore somewhat difficult to locate. Ideally, larger restrooms visible from the bag claim area would be preferable.

A number of other items in and around the baggage claim area that would improve passenger service include baggage trolleys, seating, and a visitor's welcome/information desk.

Arrivals Curb

See earlier discussion on departures process. The curbside has adequate length for current passenger volumes and is largely covered to keep passengers protected from the weather. As was noted with the departures curb, the columns supporting the roof canopy are positioned close to the drive and pose a hazard to passenger-side car doors.

Building Services

The terminal building operates for the most part as a stand-alone facility without dependence on centralized city or county services for daily operations. Relative to building services that the building requires on-site for daily operations (mechanical, electrical, communication, elevator rooms, etc.), the terminal has all the functions that it presently requires.

However, any future expansions must revisit the issue of fire protection with an eye toward present code requirements for fire sprinklers and anticipated facility size. While observing that the terminal has existing support spaces for utilities and services, these spaces are in some cases undersized due to incremental growth of demand or addition of new equipment over time. Relocation and/or resizing of spaces is deemed prudent if/when conceptual design for a facility expansion begins.

TSA-required facility security systems include an access control and monitoring system that monitors doors and gates along the airport operations perimeter. The operating system and software for this function are housed in the terminal for all the access doors and is connected to a computer system in the administration office. Approved airport personnel are issued badges that allow access via card readers at each door or gate.

Administrative Services

Airport administrative offices are located in a single-story building west of the fire station. Current functions include a reception area, small conference room, and offices for airport management.

Airport Emergency Operations Center (AEOC) Station 94 is located in the Aircraft Rescue and Fire Fighting (ARFF) station for coordinating smaller emergencies that do not require the County Emergency Operations Center to be activated. It may also serve as a command post depending on location of the accident/incident. Major emergency events are managed from city offices downtown. There is no airport police office at the airport. Police services are assigned from police department offices downtown. Neither of these services was mentioned by staff as being deficient.

2.5.2.3 Airline Apron Area

The apron area directly south of the terminal is designated for airline use. Space is provided for four aircraft parking positions, although they are seldom used at the same time. The apron also provides for airline service equipment and safe passenger circulation.

2.5.2.4 Air Cargo

Air cargo services at the airport are provided by Federal Express (Empire Airlines) and UPS (Ameriflight). FedEx (Empire Airlines) operates from a building east of the airport maintenance/snow removal equipment (SRE) building, which measures approximately 7,700 square feet. UPS utilizes Ameriflight who operates from the McCormick Air Center ramp.

2.5.2.5 Aircraft Rescue and Fire Fighting (ARFF)

The ARFF building is located west of the main terminal and measures approximately 4,000 square feet in area. The building houses an Oshkosh T-1500 fire truck and Oshkosh ST-1 Striker.

2.5.2.6 Airport Traffic Control Tower (ATCT)

The airport is served by a contract Level 1 ATCT with radar support from the Pasco TRACON. The tower is located just east of the terminal and has a height of 78 feet.

2.5.3 General Aviation Facilities

In 2018, the airport reported 131 general aviation aircraft based at YKM. These are housed in hangars or stored outdoors on tiedowns in four distinct areas on the airport; the northwest GA Area; the terminal area; the east GA area; and, the southeast GA area as shown in Figure 2-11.

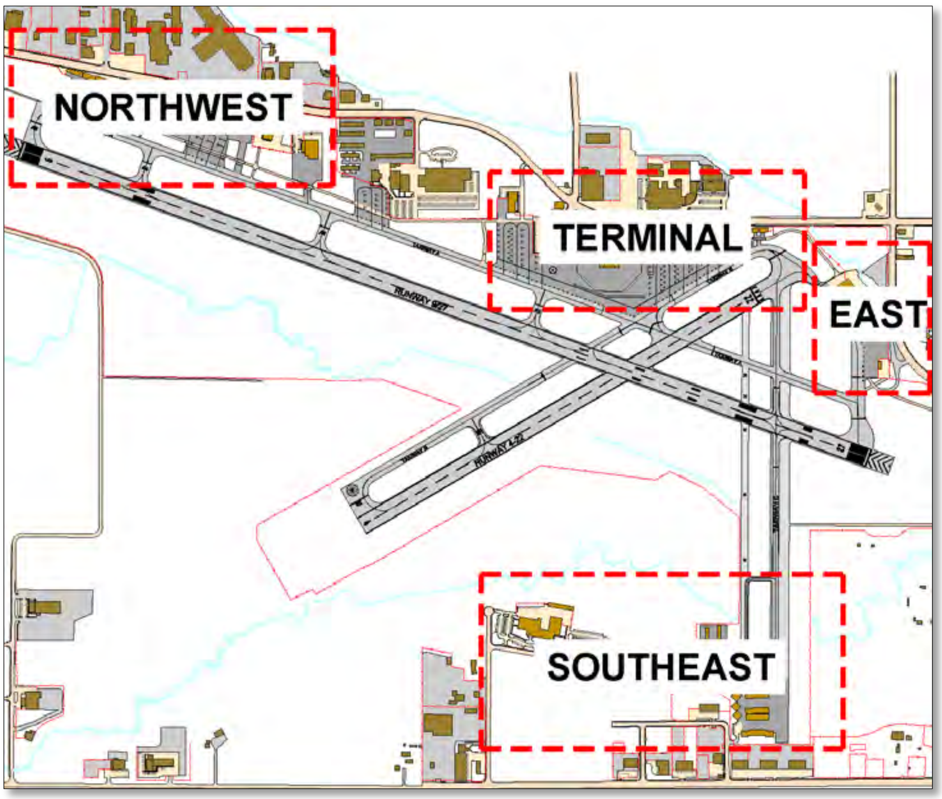


Figure 2-11: GA Facilities - Key Plan

2.5.3.1 Northwest General Aviation Area

This area measures more than 53 acres and includes aviation and non-aviation related buildings as well as the airport FBO (McCormick Air Center), Refer to Figure 2-2 and Table 2-7 for Northwest GA Area buildings.

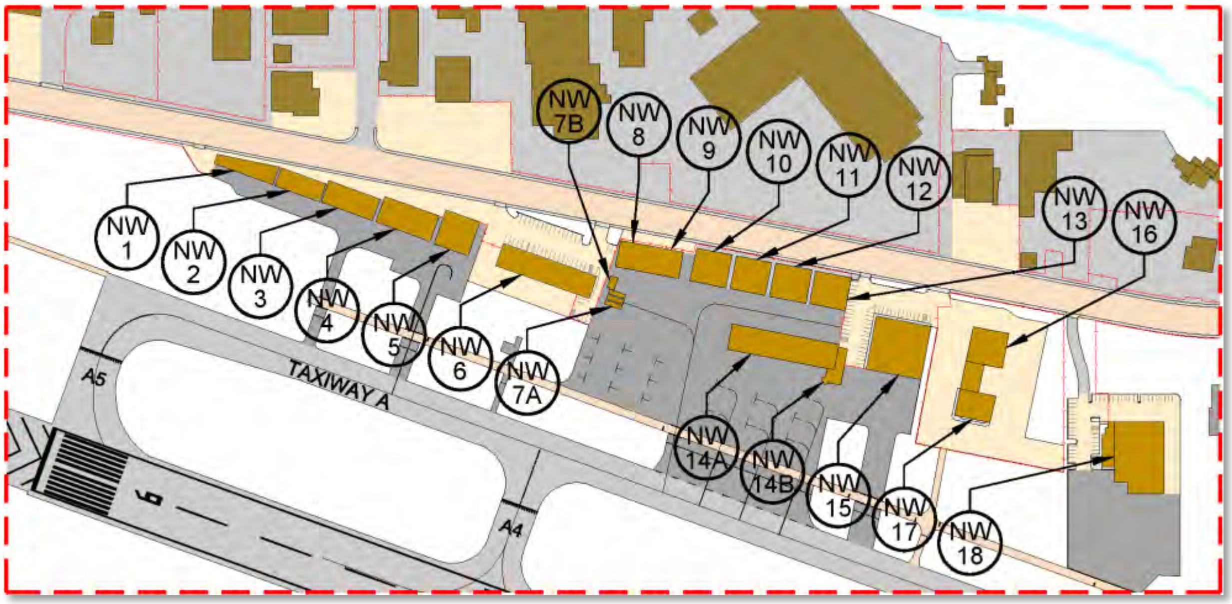


Figure 2-12: Northwest GA Area

Table 2-7: General Aviation Tenants (Northwest Area)

Building Number	Use	Building Height (feet above ground)
NW1	Box Hangar (McCormick Air Center)	28
NW2	Box Hangar (McCormick Air Center)	28
NW3	Box Hangar (McCormick Air Center)	28
NW4	Box Hangar (McCormick Air Center)	28
NW5	Box Hangar (McCormick Air Center)	26
NW6	Yakima Business Park Building (Non-Aviation)	23.6
NW7A	Fuel Tanks (McCormick Air Center)	14
NW7B	Fuel House (McCormick Air Center)	11
NW8	Box Hangar (McCormick Air Center)	29
NW9	Box Hangar (McCormick Air Center)	29
NW10	Box Hangar (McCormick Air Center)	26
NW11	Box Hangar (McCormick Air Center)	25.5
NW12	Box Hangar (McCormick Air Center)	25.5
NW13	Box Hangar (McCormick Air Center)	29.5
NW14A	T-Hangar (McCormick Air Center)	19
NW14B	McCormick Air Center FBO	30
NW15	McCormick Air Center FBO (Leased to Airlift NW)	36
NW16	Airport Maintenance Building	22
NW17	Airport Maintenance Building	26
NW18	Air Cargo Building (FEDEX)	25

2.5.3.2 GA Terminal Area

The GA terminal area includes the terminal building and covers a triangle shaped area measuring approximately 9 acres. Included are several hangars, 35 paved tiedown spaces, and other facilities. Refer to Figure 2-3 and for GA Terminal Area buildings.

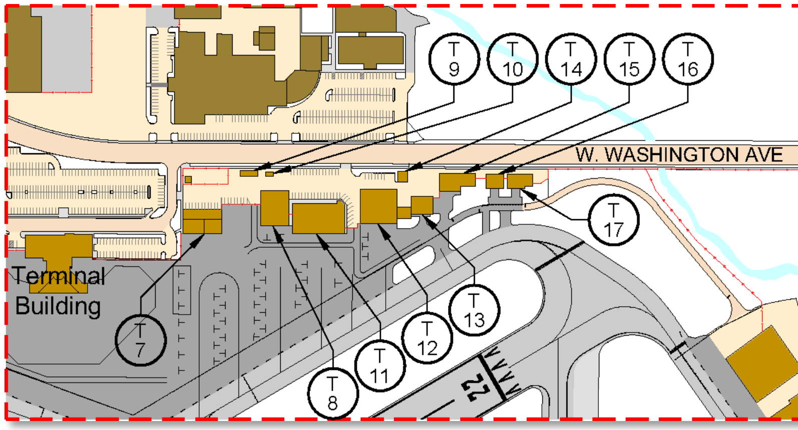


Figure 2-13: GA Terminal Area

Table 2-8: General Aviation Tenants (Terminal Area)

Building Number	Use	Building Height (feet above ground)
T7	Box Hangar (Swiftwater Cellars)	-
T8	Box Hangar (McCormick Air Center - Maintenance)	26’
T9	New Electrical Vault	13.5’
T10	Old Electrical Vault	10.5’
T11	Box Hangar (Odell – Advanced Life Systems)	27’
T12	Box Hangar (McCormick Air Center)	28’
T13	Box Hangar (Klingle)	20’
T14	Water Treatment Plant	10’
T15	Box Hangar (Pingrey)	18’
T16	Box Hangar	21’
T17	Box Hangar	21’

2.5.3.3

2.5.3.3 East General Aviation Area

The east general aviation area is the home of the McAllister Air Museum, Civil Air Patrol (CAP), and the CubCrafters manufacturing facility. The area encompasses 9 acres and provides space for 11 aircraft tiedowns. Refer to Figure 2-14 and Table 2-9 for East GA Area buildings.

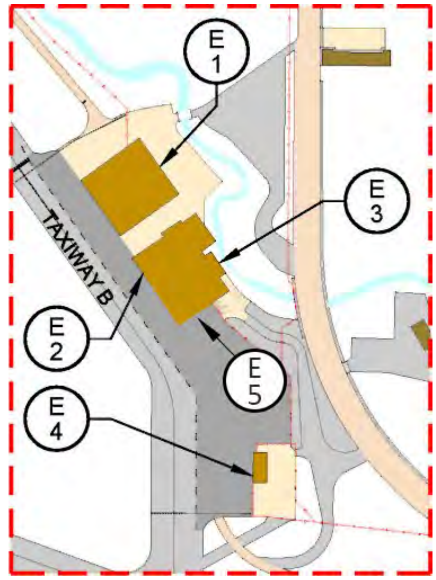


Figure 2-14: East GA Area

Table 2-9: General Aviation Tenants (East Area)

Building Number	Use	Building Height (feet above ground)
E1	CubCrafters	25’
E2	CubCrafters	25’
E3	McAllister Air Museum	20’
E4	Non-Aviation Building (Staci’s Catering)	19’
E5	Civil Air Patrol (CAP)	25’

2.5.3.4 South General Aviation Area

The south general aviation area is a mixture of old hangars owned by the airport and new privately-owned hangar buildings. The south area is the primary area where new development proposals are being considered. The area measures about 163 acres, most of it currently undeveloped with some area hampered by flood plains/ways as well as the existing landfill. In 2017, Airport Lane and 21st Avenue were realigned and paved to provide access to future development.

Refer to Figure 2-15 and Table 2-10 for East GA Area buildings.

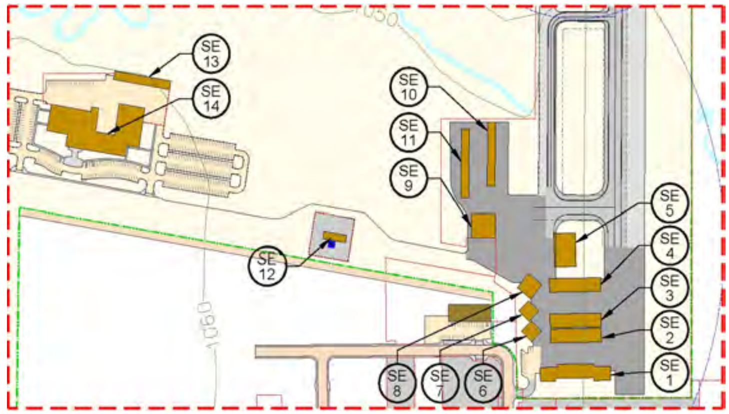


Figure 2-15: Southeast GA Area

Table 2-10: General Aviation Tenants (South Area)

Building Number	Use	Building Height (feet above ground)
SE1	Box Hangars	30’
SE2	Box Hangars	21’
SE3	Box Hangars	21’
SE4	Box Hangars	21’
SE5	Box Hangar (Generation Jets)	26.2’
SE6	Box Hangar	21’
SE7	Box Hangar	23’
SE8	Box Hangar (CubCrafters)	20’
SE 9	Box Hangar	-
SE10	T-Hangar (Richardson)	15’
SE11	T-Hangar (Richardson)	16’
SE12	Airport Surveillance Radar (ASR-9)	59’/82’
SE13	National Guard (Non-Aviation)	31’
SE14	National Guard (Non-Aviation)	-

2.5.3.5 FBO (Fixed Base Operator) and Support Services

YKM has one full-service fixed base operator, McCormick Air Center. McCormick Air Center is located on the airport's northwest and northeast general aviation areas. They offer the following services to both based and transient GA aircraft:

Fueling (DESC fuel provider)	Avionics
Aircraft maintenance	Flight training
Courtesy crew car	Rental cars
Wireless high speed internet	Oxygen & deicing
Hangars	Aircraft cleaning / washing / detailing
Aircraft parts	Support facilities
Fuel storage facilities	

2.5.4 Fuel Storage and Distribution

Fuel storage facilities for public sale of fuel are located at two places on the airport. McCormick Air Center owns and operates a fuel storage and dispensing area in the northwest general aviation area. This fueling facility has two 12,000-gallon aboveground storage tanks for Jet-A fuel. This is distributed using two dedicated trucks or through self-service. In addition, McCormick operates a 12,000-gallon aboveground storage tank for 100 LL Avgas. This is distributed via a single truck and/or self-service facilities.

On the east GA area, the McAllister Museum offers 100 LL fuel to pilots through a self-service facility. Storage is a 12,000-gallon aboveground tank.

Several tenants also provide their own fuel storage and self-service tanks or trucks. These operators do report quantities to airport administration and are required to meet all federal and local regulations.

2.5.5 Utility Systems

2.5.5.1 Water

Public water lines surround the airport property along Washington Avenue, Valley Mall Boulevard, South 16th Avenue, South 21st Avenue, Oak Avenue, and Ahtanum Road. Although located in the City of Yakima's water service boundary, the airport property can be served water by three different providers. City of Yakima currently provides water service to the airport and various airport and private buildings on the property.

Nob Hill Water currently has lines installed in West Washington Avenue near 48th Avenue and Spring Creek Road, and plans to extend their water system from Spring Creek Road to South 38th Avenue along the south side of the airport. At this time there are no known connections to the Nob Hill Water system by the Yakima Air Terminal, airport owned buildings or private businesses including the City of Yakima, Nob Hill Water and the City of Union Gap.

The City of Union Gap has installed a new 12-inch water main in Valley Mall Boulevard which borders airport property along the northeast corner. However, with the City of Yakima already having a water main in this area, it is unlikely a connection will be made to the City of Union Gap's water system unless needed to increase fire flow protection.

City of Yakima water mains and services have been extended into various parts of the airport to create water loops and enhance fire flow. The airport is served by two primary water mains; the 12-inch-diameter main located in West Washington Avenue between 48th and 24th Avenues, and a 16-inch line with an 8-inch companion line east of 24th Avenue. The 16-inch water main branches in Washington Avenue near the South 16th Avenue intersection and crosses the airfield between Runway 22 and CubCrafters.

The administration building is currently served by City water. No other domestic or irrigation wells are known to exist on airport property. However, there are several domestic wells in close proximity.

Additionally, there are several sets of monitoring wells around the airport and on airport property. Although they are not used to provide water, they have to remain in place until such time when their purpose is complete. The first set is located near Carpenter Ditch and were used to monitor ground water elevations. This monitoring project was completed this year. The second known set of monitoring wells was installed by Landau Associates in 2009.

2.5.5.2 Sewer (Sanitary and Storm)

Sanitary

The Cities of Yakima and Union Gap are the providers of public sewer services near airport property. The City of Yakima maintains two trunk lines; one in West Washington Avenue and the second in Pioneer Street/Valley Mall Boulevard. The City of Union Gap maintains a sanitary sewer main in Valley Mall Boulevard. The old terminal building adjacent to McAllister Museum was connected to this line in 2018.

All airport services and existing buildings (except the old terminal building and McAllister Museum) that require a discharge into the sewer system are connected to one of the two trunk lines maintained by the City of Yakima. There is one remaining known existing in-use septic system on airport property. McAllister Museum uses an onsite sewer disposal system which is maintained by McAllister Museum. .

Stormwater

There are two nearby stormwater conveyance systems; one is located in West Washington Avenue and one in Valley Mall Boulevard near the intersection with South 16th Avenue. The system in West Washington Avenue is maintained by the City of Yakima and outfalls into Wide Hollow Creek near CubCrafters. The storm drainage system in Valley Mall Boulevard and South 16th Avenue is maintained by the City of Union Gap and uses subsurface infiltration to dispose of generated stormwater from the roadway. No known stormwater conveyance systems from airport buildings or airport property are connected to either of these City systems.

All paved areas on the airfield drain toward an existing storm structure, namely a catch basin, or toward grass shoulders which act as filter strips. There are two creeks across the airport property, Wide Hollow Creek and Bachelor Creek, which ultimately receive all stormwater discharges that are not infiltrated into the underlying soils. Aside from the two creeks, there are no above ground surface detention systems.

Additionally, all taxiways and runways were constructed with subdrain systems to mitigate groundwater. These open joint subdrains also carry away surface stormwater that infiltrates and reaches the subdrains. The subdrain systems ultimately discharge to on-site creeks. The City of Yakima completed a stormwater study in 2010 to determine all discharge locations.

2.5.5.3 Electric

Electricity for the airport and surrounding areas is provided through Pacific Power and Light. There are several underground high voltage lines (20,000 volts) in and around the airport and on both the north and south sides of the airfield.

2.5.5.4 Gas

Natural gas is distributed by Cascade Natural Gas and exists around the Yakima Air Terminal in West Washington Avenue and in the south development area. Several private hangars are connected to natural gas. The terminal building, maintenance shop and administration offices are connected to natural gas. Additionally, Cascade Natural Gas extended their main gas line along 16th avenue in 2018 to provide additional support to southside hangar development and Borton Fruit Packing Facilities.

2.5.6 Perimeter Fencing

The Yakima Air Terminal has a perimeter security fence that meets FAA and TSA standards for a Part 139 certificated airport and TSA standards as outlined in 49 CFR 1542. The fencing consists of 7-foot-tall chain link fence with three strands of barbed wire. Most gates are accessed with a mechanism that requires a security code to be entered. However, some of the lesser-used gates intended to allow access by the lessees that are using the land for cattle-grazing or crops use lock and key access control.

2.6 ENVIRONMENTAL DATA

2.6.1 Hydrology

Water Resource Inventory Areas (WRIA) Inventory - Area 37 Lower Yakima.

The Yakima City area receives an average annual total of 8.29 inches precipitation with the wettest time of year being from November to March (USDA, 1985). Three permanent streams are located on YKM property: Bachelor Creek, Spring Creek and Wide Hollow Creek, and a permanent irrigation ditch, Carpenter Ditch.

A fish hatchery was located on Spring Creek, a tributary of Bachelor Creek, southeast of Runway 9/27. The portion of the hatchery above the ground surface has been removed. However, the weir (still located on site) remains an impediment to fish movement. In order to get upstream, fish have to pass through a weir box, small waterfall, and debris screen (which may be large enough to allow minnows/juvenile fish through). Flood irrigation is practiced in the vicinity of the weir. The irrigation ditch, Carpenter Ditch, diverts water from Spring Creek before it reaches Bachelor Creek. Water from the ditch provides irrigation water. The ditch berms are not well maintained and water leakage has created wetland like conditions within these riparian corridors.

Bachelor Creek

Bachelor Creek originates approximately 14.75 miles west of YKM. It transits within YKM from a start point near the southwest corner of the intersections of South 36th Avenue and Ahtanum Road. In general, Bachelor Creek runs westerly to easterly, passing through the middle of YKM, south of Runway 4/22. The Creek crosses under the former footprint of South 16th Avenue and the paved perimeter road and continues east to merge with Carpenter Ditch, an irrigation ditch and associated wetlands. Bachelor Creek crosses under the existing South 16th Avenue before meandering southeast approximately 1.5 miles under Ahtanum Road to converge with Ahtanum Creek (a tributary of the Yakima River). The Type 2 Creek requires a 25-foot buffer minimum and 75-foot buffer maximum from its delineated ordinary high water mark (OHWM) within YKM boundaries.

Wide Hollow Creek

Wide Hollow Creek originates approximately 15 miles west of YKM. It transits within YKM for approximately 1,000 lineal feet near the northeast portion of YKM. From a start point near the intersections of South 16th Avenue and West Washington Avenue, Wide Hollow Creek meanders through a vegetated channel under an access road for Cub Crafters and before exiting YKM under the recently improved South 16th Avenue. Wide Hollow Creek is a tributary of the Yakima River. The Type 2 Creek requires a 25-foot buffer minimum and 75-foot buffer maximum from its delineated OHWM within YKM boundaries.

Spring Creek

Spring Creek originates approximately 2,000 feet west of West Washington Avenue in two separate channels. These two channels merge near an agriculture field at West Washington Avenue. The creek crosses under West Washington Avenue into YKM and meanders out of, and back into the airport near the intersections of Spring Creek Road and South 36th Avenue. This is a location of an existing mitigation area for the Runway 27 Safety Area Improvement Project

(Widener and Associates September 2008). The creek continues in a partially channelized, partially vegetated, meandering ditch, under Runway 4 and further easterly towards the former South 16th Avenue footprint, towards the weir and former hatchery location, east of the perimeter road. Spring Creek becomes the Carpenter Irrigation Ditch at this location, regulating flows between the ditch and Bachelor Creek. Spring Creek a Type 3 stream (and associated wetlands) flows west to east and through YKM within both the City of Yakima and Yakima County boundaries. It requires a minimum 25-foot and maximum 50-foot buffer from the delineated OHWM.

Carpenter Irrigation Ditch

Carpenter Irrigation Ditch provides irrigation water to surrounding fields. Waters from the ditch exit airport property as Bachelor Creek, flowing under South 16th Avenue. This ditch is considered waters of the United States within YKM, and is jurisdictional under United States Army Corps of Engineers (Title 33 CFR).

Floodplains

Floodplains are defined by Executive Order 11988, Floodplain Management, as those areas with a one percent chance of flooding in any given year, or once in every 100 years. Examination of Federal Flood Insurance Maps, have revealed the existence of 100 year floodplains north of, within, east of, and west of YKM associated with the meanderings of Bachelor and Spring Creeks. Included in this floodplain area is the south end of Taxiway C and a small part of the proposed extension to Runway end 27 as indicated in the previous master plan. Figure 2- represents the floodplains as identified by Yakima County in 2011.

Wetlands

The US Army Corps of Engineers and the US Environmental Protection Agency (EPA) jointly define wetlands as follows: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and 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 (33 CFR 328.3). If an area is covered with water for short durations such that no effect occurs on moist vegetation, it is not considered a wetland, nor are the permanent waters of streams, reservoirs, and deep lakes.

From a regulatory stand point, the term wetlands is generally used to describe wet areas that may possess all three essential characteristics for a jurisdictional wetland under the Federal Clean Water Act (as defined in the Code of Federal Regulations Part 328.3[b]). These characteristics are: 1) hydrophytic vegetation, 2) hydric soils, and 3) wetland hydrology. There are approximately 2,000 named hydric soils in the US that occur in wetlands, these are further identified within the county hydric soils lists, and are used as indicator soils to detect the possible presence of wetlands. An examination of soil maps of the airport indicate that soils classified as hydric soils, or which have components that are considered to be hydric soils exist along the stream corridors of Bachelor, Spring and Wide Hollow Creeks, and along Carpenter Irrigation ditch, a jurisdictional water as determined from the Corps (Widener January 2009). An examination of the National Wetland Inventory Map indicates the presence of wetlands associated with these same creeks and the irrigation ditch system, within and outside of YKM. Wetlands have also been identified as part of two wetland mitigation sites that are within YKM. One is located at the northwest intersection of West Washington Avenue and South 48th Avenue, and the other is located along Spring Creek near the intersection of South 38th Avenue.

Wetlands have been identified within YKM as part of past project analysis, again these wetlands are identified within and along the channels of the same creek systems as those mentioned above. There are also wetland mitigation sites that have been identified and delineated as part of projects that have occurred in conjunction with the YKM expansion and improvement projects, and road projects in the vicinity of the YKM.

A floodplain map is included in Figure 2-16.

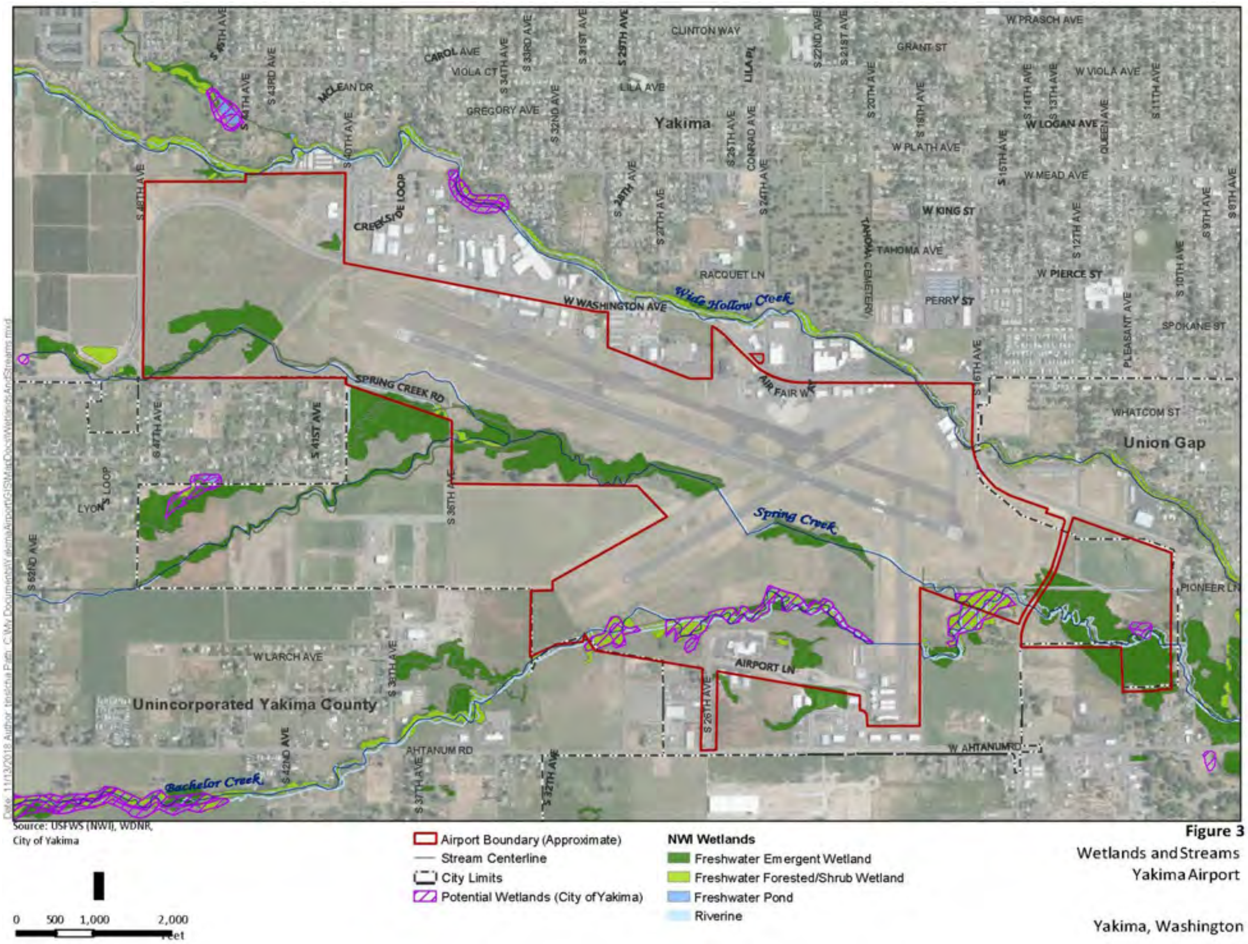


Figure 2-16: Floodplains

2.6.2 Landfill, Hazardous Materials, and Cleanup Sites

Yakima County use to run a landfill operation on site of the YKM. According to airport maintenance staff, the landfill was formerly located north of the existing Bachelor Creek and south of the existing Spring Creek. The landfill was capped and shut down approximately in the 1950s.

Fifty-five sites regulated for hazardous materials are located within a quarter mile buffer of the Yakima Airport (WA Department of Ecology 2018d). These sites include a mix of regulatory interactions, such as hazardous waste storage and management, hazardous waste generation, stormwater permits, enforcement actions, leaking underground storage tank (LUST), underground storage tank (UST), independent cleanup actions, voluntary cleanup sites, hazardous sites list, and state cleanup sites. Some of these regulatory databases indicate a confirmed release of hazardous materials to the environment and some only imply some level of potential for a release (See Attachment A). Considering the large number of sites regulated for hazardous materials located at the Yakima Airport or within the quarter-mile buffer, only sites with confirmed releases of hazardous materials are discussed.

Of the fifty-five hazardous materials sites identified, fourteen have required some level of clean up due to the release of one or more hazardous substances. Table 2-11 below lists the regulated facilities in the study area with confirmed releases that have required clean up. Once the contaminated site is remediated to regulatory satisfaction, Ecology will remove the site from the Hazardous Sites List and/or grant No Further Action (NFA). Locations of the hazardous materials and cleanup sites are shown on Figure 2-17 and Table 2-11.

Table 2-11: Hazardous Materials Sites List

Map ID	Site Name	Site Address	Cleanup Site Type	Cleanup Completed?
1*	Richardson Airways	Yakima Municipal Airport	State Cleanup Site	Yes
2	Irwin Research & Development	1702 South 24th Avenue	State Cleanup Site	Yes
10*	Yakima Air Terminal	2400 West Washington Avenue	State Cleanup Site	Yes
16	GE Aviation LLC Yakima	2720 West Washington Avenue	State Cleanup Site	Yes
18*	McAllister Flying Service	2000 South 16th Avenue	Independent Cleanup Site	Yes
22*	Wayne G. Turner Aircraft Service Inc.	2008 West Washington Avenue	Independent Cleanup Site	Yes
23*	Yakima City Airport	2300 West Washington Avenue	Independent Cleanup Site	Yes
26	Noland Decoto Flying Service Inc.	2804-2810 West Washington Avenue	Voluntary Cleanup Site	Yes
29	Western Recreational Vehicles Inc.	3401 West Washington Avenue	State Cleanup Site	Yes

34	Ronald Hartoon	1606 South 36th Avenue	Leaking Underground Storage Tank	Yes
36	Perry Technical Institute	2011 West Washington Avenue	Leaking Underground Storage Tank	Yes
42	Graham Equipment	3003 West Washington Avenue	Leaking Underground Storage Tank	Yes
52	Yakima County Ahtanum Youth Park	1000 West Ahtanum Road	Independent Cleanup Site	No
54	Pacific Power & Light Union Gap Substation	903 West Ahtanum Road	State Cleanup Site	No

Of the fourteen cleanup sites identified, twelve completed cleanup to regulatory satisfaction and were granted an NFA and/or were removed from the Hazardous Sites List. The two sites that have not yet achieved an NFA are the Yakima County Ahtanum Youth Park site and the Pacific Power & Light Union Gap Substation site. These two sites are described in further detail below; please note that neither of these sites are within the airport property boundary.

The Yakima County Ahtanum Youth Park site (Map ID 52, 1000 West Ahtanum Road) is located approximately 1,000 feet to the south of the east end of the airport property boundary. It currently operates as a public park and previously operated as a public works site. According to Ecology, petroleum contaminated soil and groundwater were encountered during the decommissioning of a UST in 1990. Samples taken from the tank basin indicated elevated levels of total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) associated with petroleum fuel as well as benzene, toluene, ethylbenzene, and xylene (BTEX). Petroleum contaminated soils were excavated, and sampling indicated the source contamination was removed but groundwater was still impacted. A limited subsurface site assessment was conducted to assess the extent of groundwater contamination. TPHs and VOCs were non-detect in soil samples but were detected in groundwater at concentrations exceeding Ecology's clean up levels. Various remedies and continued groundwater monitoring were recommended for the site, but no readily ascertainable records are available to confirm if additional clean up or monitoring continued after 1991.

However, considering the relative distance from the Yakima Airport as well as being downstream, the cleanup efforts conducted, and petroleum fuel's tendency to degrade under natural conditions, this site does not appear to present environmental concern to the Yakima Airport.

The Pacific Power & Light Union Gap Substation site (Map ID 54, 903 West Ahtanum Road) is located approximately 1,000 feet to the southeast of the east end of the airport property boundary. It currently operates as an electrical substation facility. According to Ecology, PacifiCorp crews discovered a large mineral oil leak from a non-PCB (polychlorinated biphenyl) transformer in 2007. The oil was pumped from the transformer vault and soils immediately adjacent to the transformer were excavated. Soil and groundwater samples from the excavation were non-detect for PCBs. However, diesel-range hydrocarbons were detected at (but not exceeding) cleanup levels in soil and two groundwater samples exceeded cleanup levels for oil-range and diesel-range hydrocarbons. Per a subsurface investigation report prepared by CH2M Hill in 2008, “PacifiCorp has removed the source of contamination and left only the small fraction of dissolved phase material. Due to the low and isolated concentrations as well as petroleum hydrocarbon’s tendency to degrade under natural conditions, CH2M Hill recommends no further investigation.” Considering the relative distance from the Yakima Airport, the cleanup efforts conducted, and CH2M Hill’s NFA recommendation, this site does not present environmental concern to the Yakima Airport.

Prior to development of sites with a previous history of hazardous materials and/or cleanup, it is recommended that a Phase I Environmental Site Assessment (ESA) be conducted to ascertain site history. If the Phase I ESA indicates the potential presence of contamination, site sampling may need to be conducted to confirm the presence and concentration of any contaminants that may be present.

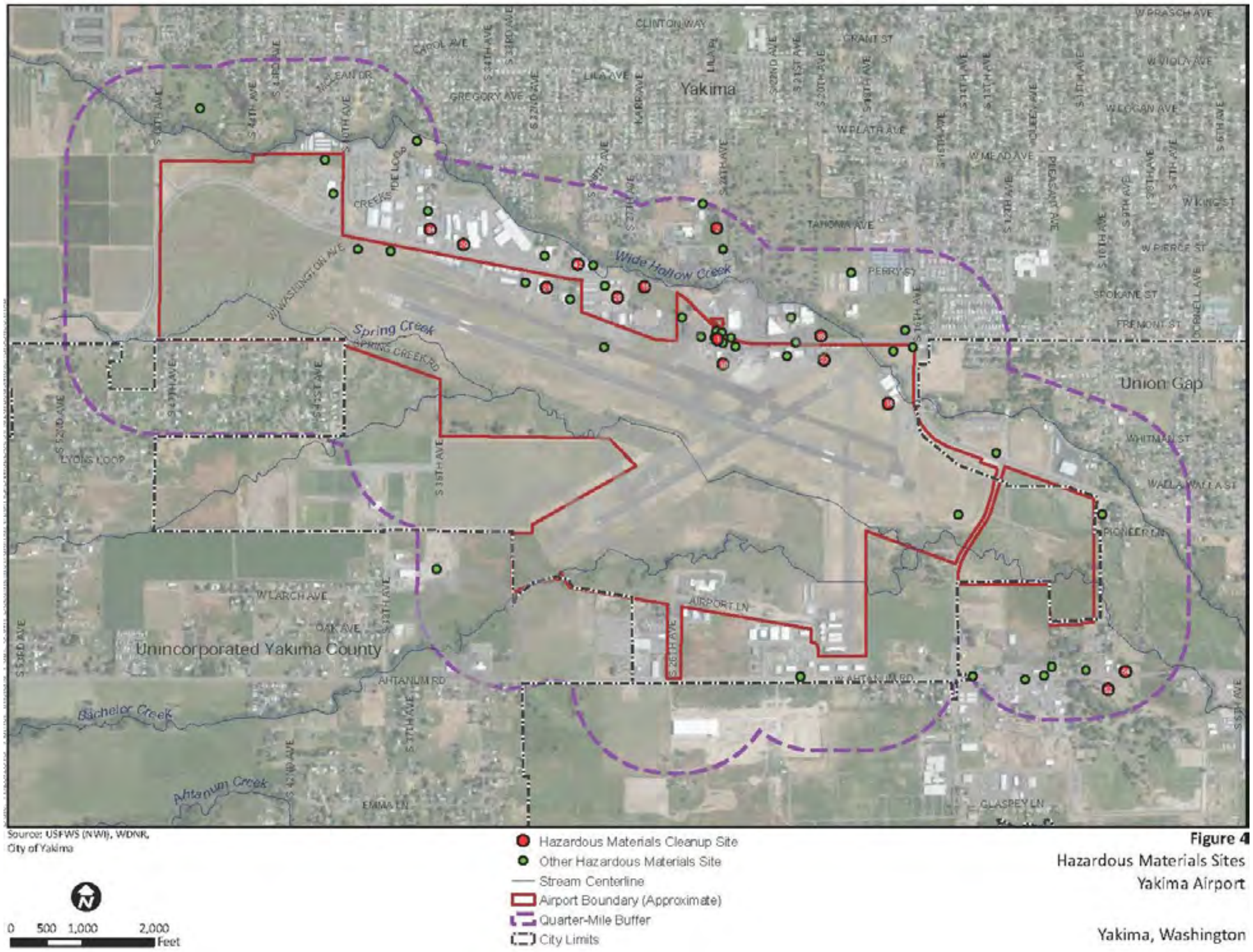


Figure 2-17: Hazardous Materials Sites

2.6.3 Wind and Weather

Weather conditions such as cloud ceiling, visibility, and wind, are significant factors in the operation of an airport. Weather has a direct impact on aircraft flight, primarily on the equipment needed in the aircraft to navigate to and land at airports, particularly for instrument flight conditions when less than clear weather exists. Accordingly, a weather condition classification system has been developed. Visual Meteorological Conditions (VMC) occur when visibility is at least three statute miles and the ceiling is a least 1,000 feet above ground level (AGL). Visual Flight Rules (VFR) are in effect under VMC. Instrument Meteorological Conditions (IMC) occur whenever visibility is at least one statute mile but less than three statute miles and/or the ceiling is at least 500 feet but less than 1,000 feet AGL. Instrument Flight Rules (IFR) are in effect under IMC. Poor Visibility and Ceiling (PVC) conditions exist whenever visibility is less than one statute mile and/or the ceiling is less than 500 feet AGL.

At YKM, VMC conditions occur on average 94.6% of the time. Therefore, IFR and PVC conditions occur only 5.4% of the year.

Crosswind coverage, expressed as a percentage, is the component of wind speed and direction blowing at right angles to the runway centerline. The FAA threshold for adequate crosswind coverage is 95 percent at 10.5 knots; meaning a small piston-engine aircraft can land and takeoff on a runway more than 95 percent of the time without exceeding the aircraft's 10.5-knot crosswind component. Crosswinds tend to affect smaller aircraft more than larger aircraft, especially light taildragger aircraft.

Figure 2-18 through 2-20 graphs the all-weather and peak wind conditions, in which wind directions are reported in reference to true north, with the percent crosswind runway computed in reference to the true runway bearing. The prevailing winds are out of the west and favors the use of Runway 27 for takeoff and landings. Peak gusts are primarily out of the northwest and south-southwest and favors Runway 27 and Runway 22. Annually, calm to light winds (0-10.5 knots) occur 91 percent of the time, strong winds (11-16 knots) occur 7 percent of the time, and gusty winds (greater than 20 knots) occur 2 percent.

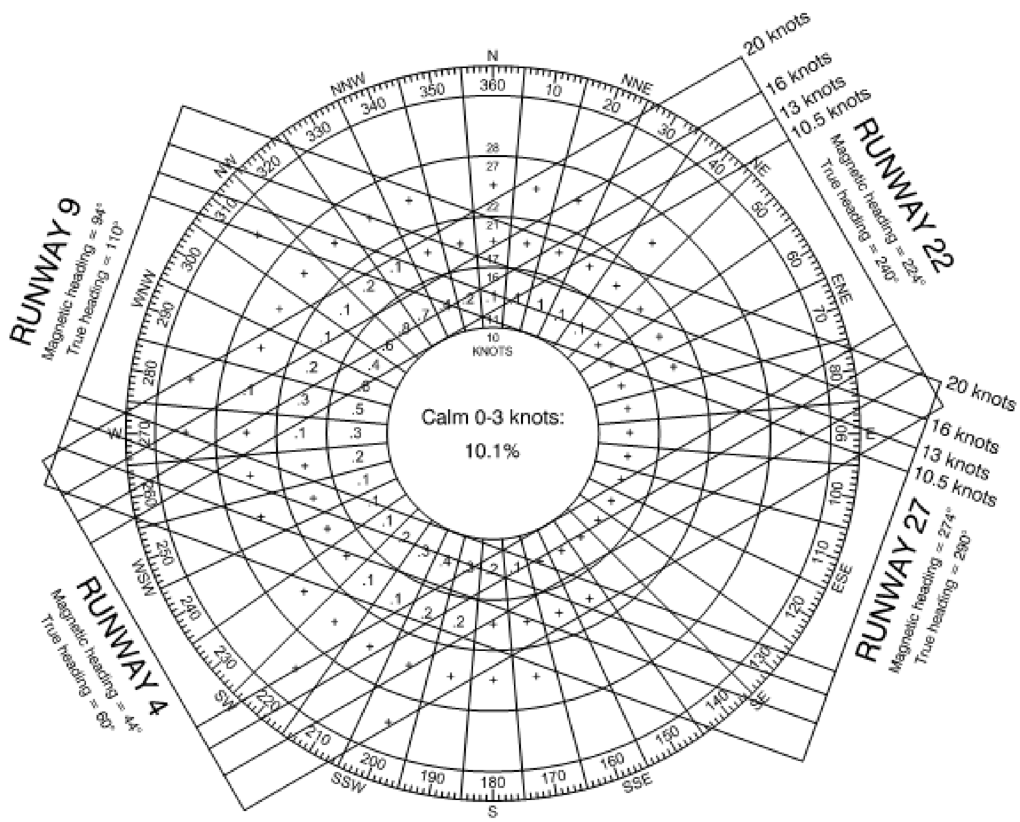
Table 2-12 lists the crosswind coverage for all-weather, instrument, and visual conditions for the 10.5, 13.0, 16.0, and 20.0 knot crosswind components. Wind data was obtained from the National Climatic Center (FAA AGIS site) for the 5-year period from 2011 through 2020. The wind data shows a similar crosswind coverage between all-weather, instrument, and visual conditions.

The primary Runway 9/27 achieve 96.52% all-weather crosswind coverage at 10.5 knots. Runway 4/22 does not achieve greater than 95% all-weather crosswind coverage until the 13-knot crosswind component. Combined, Runway 9/27 and 4/22 achieve 98.31% crosswind coverage at 10.5-knots. The Instrument (IFR) wind coverage follows a similar pattern. Therefore, based on FAA planning guidance, a single runway (Runway 9/27) provides adequate crosswind coverage.

CROSSWIND	RWY 04/22 (CROSSWIND)	RWY 09/27 (PRIMARY)	COMBINED RWY 9/27 RWY 4/22
All-Weather (ALW = 106,475 Wind Observations)			
10.5 knots	94.53%	96.52%	98.31%
13 knots	96.94%	97.94%	99.42%
16 knots	99.17%	99.17%	99.89%
20 knots	99.84%	99.79%	100%
Visual (VFR = 84,112 Wind Observations)			
10.5 knots	93.82%	96.17%	98.11%
13 knots	93.82%	97.75%	99.35%
16 knots	99.07%	99.11%	99.88%
20 knots	99.83%	99.78%	99.99%
Instrument (IFR = 11,342 Wind Observations)			
10.5 knots	99.60%	99.37%	99.76%
13 knots	99.75%	99.53%	99.92%
16 knots	99.85%	99.68%	99.99%
20 knots	99.92%	99.77%	100.00%

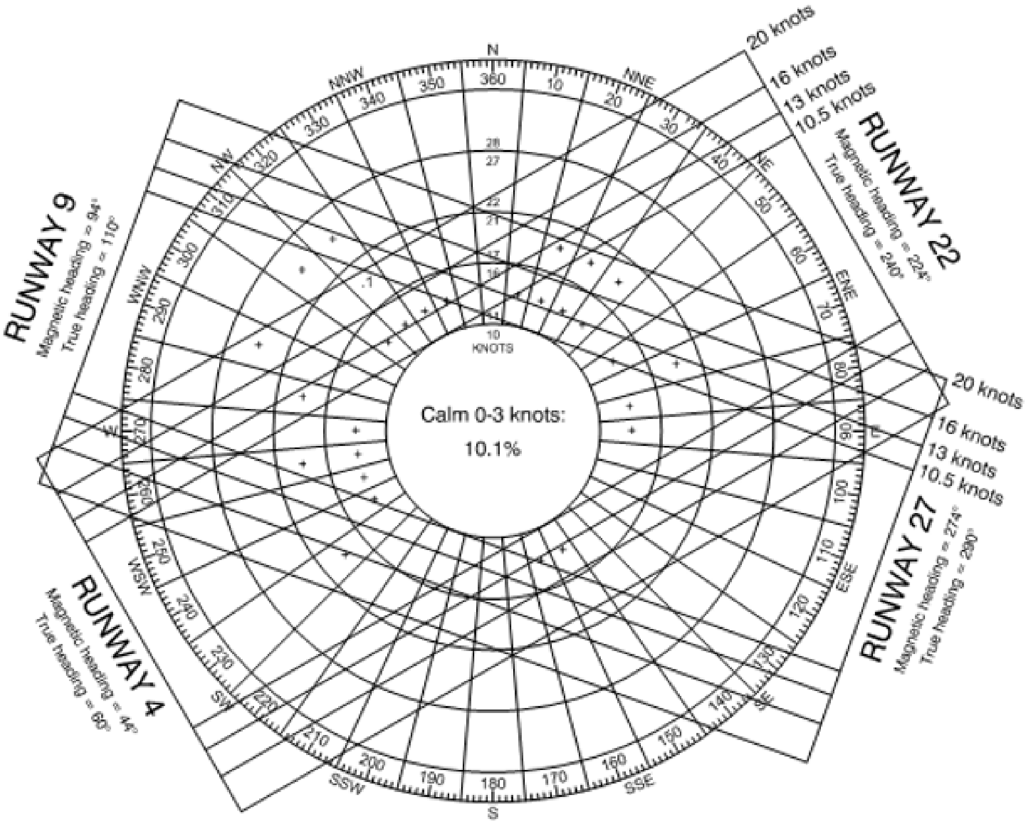
Source: National Oceanic and Atmospheric Administration, National Climatic Data Center (FAA AGIS Website)
Station 72781 - Yakima, Washington. Period of Record: 2011 to 2020
Red Text = less than 95% crosswind coverage
Gray Text = crosswind component does not apply to runway based on FAA standards
Note: Crosswind coverage computed using runway true bearing (Rwy 9/27 = 290º | Rwy 04/22 = 60º)
Note: 10.5 Knots = RDC A/B-I
13.0 knots = RDC A/B-II
16 Knots = RDC C/D-I, C/D-II, A/B/C/D-III
20 Knots = RDC A/B/C/D-IV, C/D-V, D-VI

Table 2-12: YKM Wind Data Summarized



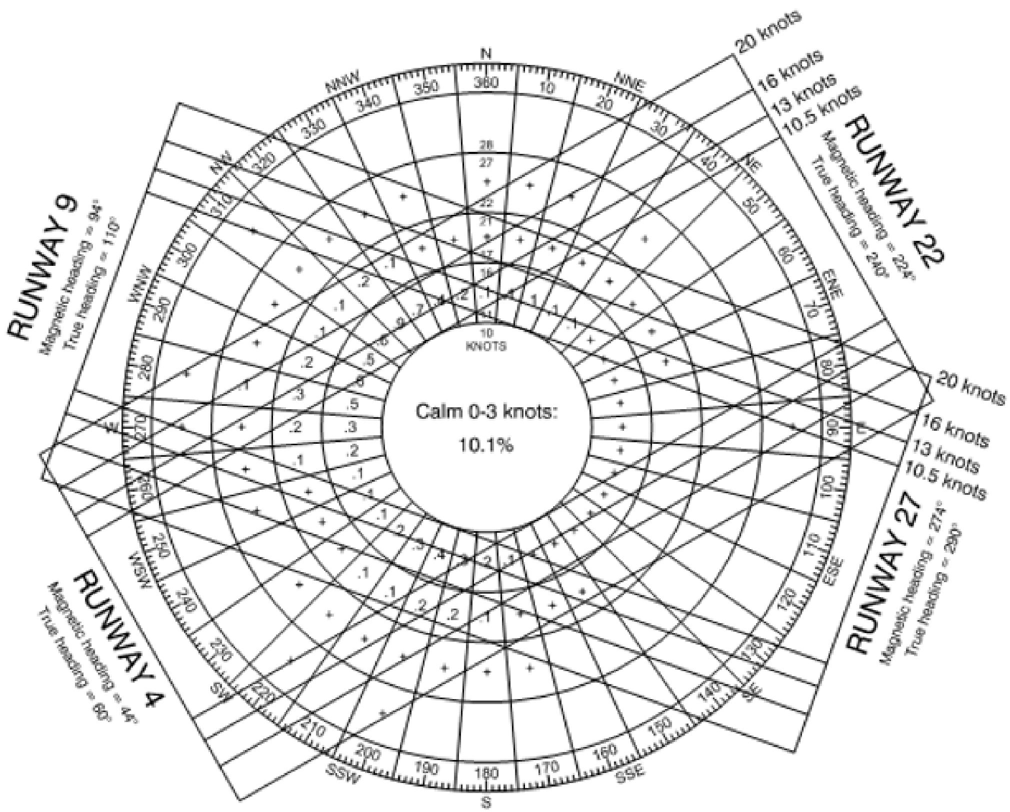
CROSSWIND	RWY 04/22 (CROSSWIND)	RWY 09/27 (PRIMARY)	COMBINED RWY 9/27 RWY 4/22
	All-Weather (ALW)		
10.5 knots	94.53%	96.52%	98.31%
13 knots	96.94%	97.94%	99.42%
16 knots	99.17%	99.17%	99.89%
20 knots	99.84%	99.79%	100%

Figure 2-18: All Weather Wind Rose



CROSSWIND	RWY 04/22 (CROSSWIND)	RWY 09/27 (PRIMARY)	COMBINED RWY 9/27 RWY 4/22
		Visual (VFR)	
10.5 knots	93.82%	96.17%	98.11%
13 knots	93.82%	97.75%	99.35%
16 knots	99.07%	99.11%	99.88%
20 knots	99.83%	99.78%	99.99%

Figure 2-19: Visual Flight Rules (VFR) Wind Rose



CROSSWIND	RWY 04/22 (CROSSWIND)	RWY 09/27 (PRIMARY)	COMBINED RWY 9/27 RWY 4/22
		Instrument (IFR)	
10.5 knots	99.60%	99.37%	99.76%
13 knots	99.75%	99.53%	99.92%
16 knots	99.85%	99.68%	99.99%
20 knots	99.92%	99.77%	100.00%

Figure 2-20: Instrument Flight Rules (IFR) Wind Rose

2.7 HISTORICAL AIRPORT ACTIVITY

2.7.1 Commercial Airline Service Area

The Yakima Air Terminal is one of five commercial service airports serving central Washington. The facilities listed in Table 2-13, compete directly for the same passengers as YKM.

Table 2-13: Commercial Service Airports

Airport	Airport Code	City	Distance from Yakima	Annual Enplaned Passengers (FY 2017)
Pangborn Memorial Airport	EAT	Wenatchee	58 miles N	60,335
Tri-Cities Airport	PSC	Pasco	71 miles SE	376,044
Seattle-Tacoma International Airport	SEA	Seattle	112 miles NW	22,639,124
Portland International Airport	PDX	Portland	126 miles SW	9,435,473

In February of 2010, an air service market analysis was conducted for YKM entitled "True Market Estimate." This estimated the number of inbound and outbound origin and destination (O/D) air travelers moving to and from the airport's catchment area. The catchment area was defined as that area where YKM was the most convenient airport and would be the natural choice for the consumer, were all other factors equal. It includes portions of Yakima, Lewis, King, and Kittitas Counties with a combined population of approximately 270,700 people. The analysis showed this catchment area generated 223,792 Origin and Destination (O&D) 2007 through 2008.

2.7.2 General Aviation Service Area

It is assumed airports within a 50-mile radius of YKM compete directly for general aviation activity. As seen in Table 2-14 and Figure 2-22, there are twelve airports within the 50-mile radius. Few of these, however, have the capability to compete for the corporate aviation sector customers. Six of the airports are privately owned and only Ellensburg's Bower's Field has a runway length capable of accommodating small corporate aircraft. The following table summarizes the facilities available at each of the airports located within 50 miles of YKM.

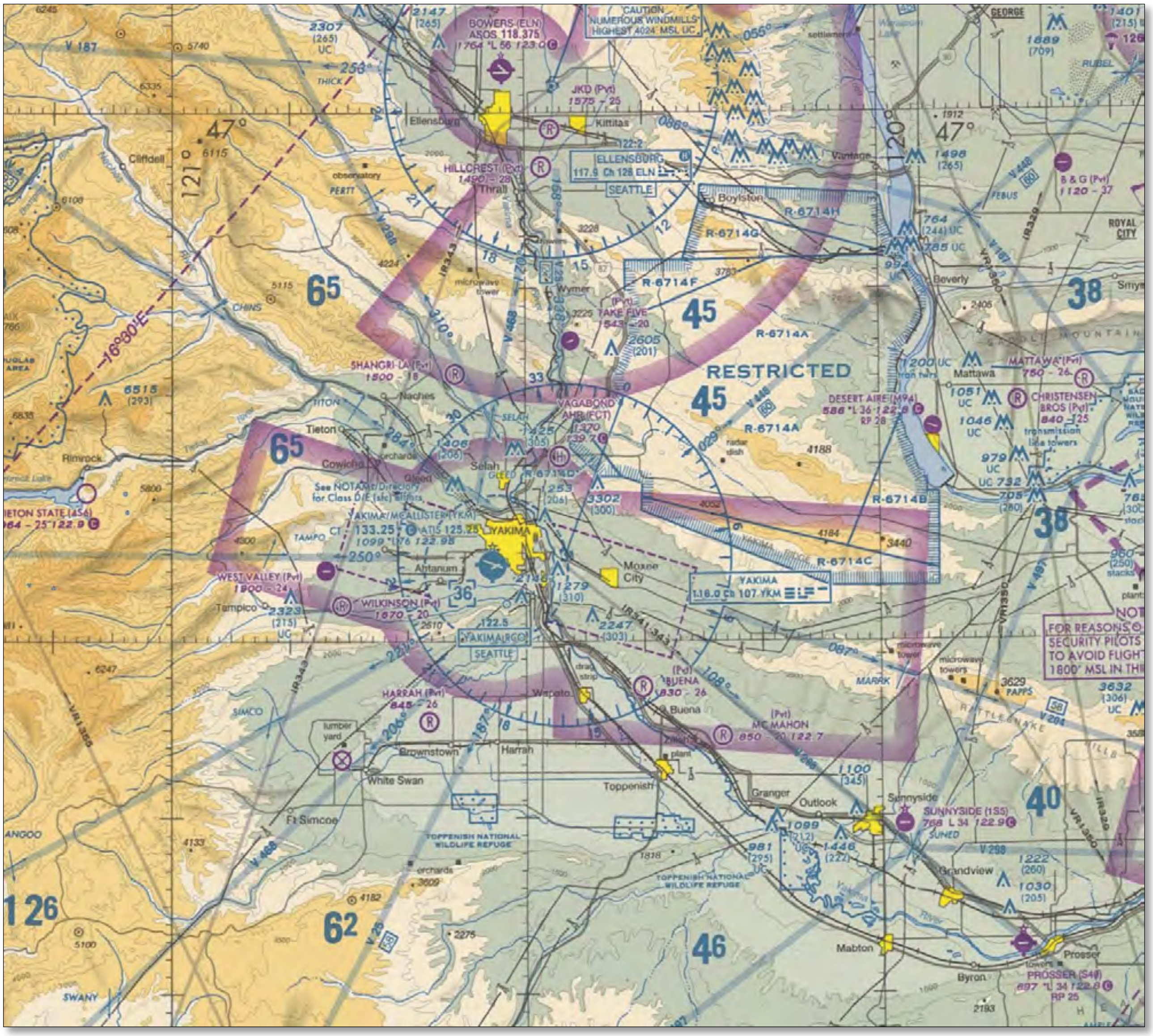
Data Source: Passenger Demand Analysis (Mead & Hunt, March 2005)

Figure 2-21: Commercial Service Airports

Table 2-14: Regional Airports

Airport	Location	Longest Runway	Approach
Vagabond Army Heliport	8 miles NE	NA	NA
Desert Aire	32 miles E	3,665	Visual
Christenson Brothers (pvt)	37 miles NE	2,506	Visual
Mattawa (pvt)	42 miles NE	2,600	Visual
McMahan (pvt)	18 miles SE	2,000 turf	Visual
Sunnyside Municipal	32 miles SE	3,423	Visual
Prosser	44 miles SE	3,453	Visual
Harrah (pvt)	12 miles SW	2,650 dirt	Visual
West Valley (pvt)	11 miles W	2,400	Visual
Tieton State	27 miles W	2,509 turf	Visual
Vantage (pvt)	34 miles NW	2,400 gravel	Visual
Bowers Field	34 miles N	4,301’	Non-Precision

Figure 2-22: Regional Airport Locations



2.7.2.1 Historical Operations Data

Airline service at Yakima has been relatively consistent over the past decade with service being primarily back and forth to the Seattle-Tacoma International Airport offered by Horizon Airlines using 35- to 76-seat aircraft and some unscheduled charter service offering flights to and from destinations associated with the gaming industry (Las Vegas, Reno, Elko, etc.) using 120- to 130-seat aircraft. Total passenger levels have ranged from 92,409 in 1997 to a low of 53,155 in 2004. In 2007, eastbound service to Salt Lake City was initiated by Delta Airlines. This resulted in an immediate increase in the number of enplaned passengers by approximately 15,000 per year. When this service was discontinued in 2009 the number of enplaned passengers immediately returned to the same passenger levels that were registered before the service was offered. In 2015 Horizon increased frequency to four flights daily, boasting enplanements. Annual enplanements are shown in Table 2-15.

Table 2-15: Annual Enplaned Passengers 2000 through 2017

Year	Charters	Scheduled	Total
2000	1,104	85,266	86,370
2001	1,338	80,544	81,882
2002	1,514	57,949	59,463
2003	1,543	55,756	57,299
2004	914	52,241	53,155
2005	1,567	55,752	57,319
2006	1,004	56,116	57,120
2007	1,281	64,750	66,031*
2008	1,678	73,034	74,712*
2009	1,509	60,062	61,571
2010	1,472	54,439	55,911
2011	1,943	55,356	57,299
2012	1,916	55,525**	57,441
2013	1,207	54,355	55,562
2014	1,798	57,474	59,272
2015	1,807	64,107	65,914
2016	1,085	72,293	73,378
2017	1,012	72,070	73,082

** Delta service to Salt Lake City*
*** Seaport service to Portland*
Source: YKM Boarding Reports (Departures)

Table 2-16 shows the total number of operations recorded at YKM for the period 2000 through 2018. This table reflects the data recorded by the FAA in the TAF. As is shown, operation levels experienced relative stability between 2000 and 2018. Chapter 3 Aviation Activity Forecasts further details existing and forecast operations.

Table 2-16: Annual Operations: 2000 through 2018

Year	Itinerant Operations					Local Operations			Total Operations
	Air Carrier	**Air Taxi or Commuter**	**General Aviation**	**Military**	**Total**	**General Aviation**	**Military**	**Total**	
2000	553	15,861	21,466	1,854	39,734	18,945	2,147	21,092	60,826
2001	237	14,485	19,393	1,712	35,827	18,264	1,185	19,449	55,276
2002	341	11,739	19,601	1,617	33,298	16,989	944	17,933	51,231
2003	90	11,635	18,935	932	31,592	15,074	565	15,639	47,231
2004	60	10,752	18,404	905	30,121	16,227	581	16,808	46,929
2005	96	10,241	18,483	1,044	29,864	18,553	971	19,524	49,388
2006	71	9,911	17,278	1,034	28,294	17,797	838	18,635	46,929
2007	590	9,856	16,888	925	27,728	19,008	1,222	20,230	47,958
2008	1,046	8,751	16,932	945	27,674	20,778	1,012	21,790	49,464
2009	354	16,919	18,471	1,809	37,553	16,567	2,188	18,755	56,308
2010	553	15,861	21,466	1,854	39,734	18,945	2,147	21,092	60,826
2011	237	14,485	19,393	1,712	35,827	18,264	1,185	19,449	55,276
2012	341	11,739	19,601	1,617	33,298	16,989	944	17,933	51,231
2013	90	11,635	18,935	932	31,592	15,074	565	15,639	47,231
2014	60	10,752	18,404	905	30,121	16,227	581	16,808	46,929
2015	96	10,241	18,483	1,044	29,864	18,553	971	19,524	49,388
2016	71	9,911	17,278	1,034	28,294	17,797	838	18,635	46,929
2017	59	9,856	16,888	925	27,728	19,008	1,222	20,230	47,958
2018	1,046	8,751	16,932	945	27,674	20,778	1,012	21,790	49,464

Source: FAA TAF (Issued January 2018)

2.8 EXISTING AIRPORT/COMMUNITY LAND USE COMPATIBILITY PLANNING

2.8.1 WSDOT – Airport Land Use Compatibility Program

In 1996, the Washington State Legislature amended the Growth Management Act (GMA) that requires cities and counties to protect airports from incompatible development. Senate Bill 6422 was codified to RCW 35.63.250, 35A.63.270, 36.70.547 and 36.70A.510. These provisions apply to GMA and Non-GMA jurisdictions (town, city and county) within Washington State.

RCW 36.70A GMA requires that within a comprehensive plan, maps, descriptive text covering objectives, principals and standards, and inventory of air, water, and ground transportation facilities are to be included. Cities or counties must take legislative action to review and revise, as needed, their comprehensive plan. Since airports are considered essential public facilities (EPF), local jurisdictions are not allowed to prohibit the siting, expansion or continuation of an EPF. Enhancing applicable mitigation measures is an allowable action under the GMA.

RCW 36.70.547, 36.70A.510, 35A.63.270, and 35.60.250 were adopted in 1996. Cities and counties must protect airport facilities through zoning regulations. Incompatible development is prohibited. Plans may not be adopted until formal consultation with airport owners, GA pilots, ports, and the WSDOT Aviation Division. Comprehensive plans must be filed with WSDOT aviation.

WSDOT recommends three areas be considered when developing comprehensive plans: building/structure heights; noise (over-flight noise 65 dbl or greater); and, safety (hazardous material). Airport master plans, layout plans, airport documents, aircraft/pilot characteristics, and airport operations should all be considered.

2.8.2 City and County Ordinances

The City of Yakima, City of Union Gap, and Yakima County zoning ordinances are closely outlined regarding airport protection and airport facilities. Both mandate that land-use around existing and future airports must be compatible with airport functions. The height of new and existing buildings is limited to the proximity of the imaginary surfaces designated by FAR Part 77 and the relative proximity to the ends and sides of the runway (500 ft. and 100 ft. respectively). Height limitations may be ignored if the FAA has not deemed the penetration to be a hazard to airspace and the reviewing official in conjunction with WSDOT or the airport manager deem it as a non-hazard. The applicable parts of the ordinances are included in Appendix E to this master plan.

2.8.3 Airport Safety Overlay

The Airport Safety Overlay (ASO) ordinances, as adopted by the City of Yakima (Chapter 15.30) and the City of Union Gap (Chapter 17.20), state that all buildings, structures, use, or trees that penetrate a FAA designated imaginary surface constitute an obstruction within the ASO. All aforementioned objects must conform to the requirements found within the chapter. Most notably, height requirements limit buildings to 35 ft., or, if greater than 35 ft., determination that it will not penetrate approach, transitional, horizontal, conical, or planned approaches defined in FAR Part 77.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3

FORECAST OF AVIATION (2018 UPDATE)

3.1 INTRODUCTION

This chapter presents the aviation activity forecasts for the Yakima Air Terminal/McAllister Field (YKM). The aviation demand forecasts identify the 20-year aeronautical activity levels. The forecast projections are used to assess the type, timing, and allocation of future Airport infrastructure, equipment, and service needs to support Master Plan facility recommendations, alternatives, and airport project funding strategies.

Forecasts have been prepared for the following activity elements:

Airline Passengers

- Base Passenger Forecast (Existing Airlines)
- Outlook Passenger Forecast Scenario (New Airline/Destination)

Commercial Aircraft Operations

- Airline Scheduled Carriers (Base and Outlook Scenario)
- Air Cargo/Freight Scheduled Carriers
- Air Taxi (FAR Part 135)

General Aviation Operations

- ♦ Total Aircraft Operations
- ♦ Flight Training Outlook Forecast

Military Operations

Based Aircraft

Operational Mix

- ♦ Itinerant and Local Operations
- ♦ Annual Instrument Operations

Peak-Period Operations

Critical Aircraft

- ♦ FAA Aircraft Category
- ♦ Critical Aircraft Designation

FAA Terminal Area Forecast (TAF) Comparison

Forecast Summary

3.2 FORECAST OUTCOMES

Figure 3-1 summarizes the preferred forecast levels and growth rates by activity component. Overall, the YKM aviation activity is projected to increase about one to two percent annually throughout the 20-year forecast period. The principal factors shaping the Airport's aviation demand forecasts are:

- The Yakima economy exhibits expansion and a future demand for aeronautical services
- Airline passenger demand growing with YKM air carrier service improvements
- Airline operations expand with potential new air carrier destination and transition to jets
- Air cargo activity is stable, and showing consistent annual growth
- General aviation business growth is occurring, largely through tenant expansion
- Continued transition towards higher-performance turbine aircraft
- Attraction for flight training, with the potential for substantial flight training increases

Figure 3-1: Forecast Summary

Demand Forecast Component (Annual Activity Totals)	Baseline Year Condition 2018	20-Year Forecast 2040-Low Scenario	20-Year Forecast 2040-High Scenario	Preferred Forecast Scenario	Preferred Forecast Scenario Direction
BASE FORECAST (PREFERRED FORECASTS)					
Airline Passengers (Enplaned-Boarded)	73,342	82,600	92,600	High	↑
Total Annual Aircraft Operations	39,444	41,500	48,600	High	↑
Commercial Operations	7,422	8,900	10,600	High	↑
General Aviation Operations	30,217	30,900	36,200	High	↑
Military Operations	1,805	1,805	1,805	FAA TAF	↔
Based Aircraft	131	121	173	High	↑
OUTLOOK SCENARIO FORECASTS (ADDITIVE ACTIVITY LEVELS - NOT INCLUDED IN BASE FORECAST)					
Airline Passengers (Enplaned-Boarded)	73,342	24,600		Outlook Scenario	↑
Flight Training Operations	2,954	10,000 to 15,000		Outlook Scenario	↑

Source: Consultant Forecast Projection, December 2018.

3.3 FORECASTING PROCESS

The forecasts quantify a realistic expectation of future aviation demand, as substantiated from YKM factors and aviation industry trends. The forecasts are prepared consistent with technical and procedural guidance from Federal Aviation Administration (FAA) Advisory Circular (AC)

150/5070-6B, Airport Master Plans. This process uses FAA data and methods to project aviation activity and to select a single preferred forecast for FAA approval and to carry-forward throughout the Master Plan.

Forecast Timeline: The YKM Master Plan forecast period covers a 20-year planning horizon (2020 to 2040) with 2018 as the existing baseline year. Forecasts are identified for three planning phases: the short-term (2020-2024); the mid-term (2025-2029); and the long-term (2030-2040); consistent with the 2015 YKM Master Plan 5-year forecast year increments. Forecasts reflect the FAA fiscal year from October to September, unless otherwise noted.

Forecast Process: The YKM Master Plan forecasts consider airport, community, and aviation industry factors to develop realistic projections. The forecasts follow FAA-acceptable statistical methods, including times-series trend, regression, comparative analysis, and market share techniques.

Forecast projections are developed for a low (constrained) and high (unconstrained) scenario, which establish boundaries for the minimum and maximum demand potential. The forecast scenarios are supported by qualitative and quantitative factors, reported for each forecast element to show possible upward and downward influences for the 20-year demand levels. This process is used to develop an appropriate forecast technique, to show a direct forecast correlation and causation, and achieve a high statistical confidence and assert forecast sustainability.

Unconstrained Forecast (High Range): Leaning towards an unfettered demand, not overly influenced by constraining demand factors.

Constrained Forecast (Low Range): Leaning towards factors restricting the projected demand and facility implementation.

Base Forecast: The prior 2015 YKM Master Plan forecast chapter projections were evaluated and re-assessed using 2018 activity levels and current YKM forecast trends. The 2015 YKM Master Plan forecast methods and outcomes, which were based on 2010 activity data, have been adjusted and modified to reflect YKM up-to-date forecast events. The Base Forecast results in the selection of a preferred forecast scenario for the YKM Master Plan.

Outlook Forecast: An outlook forecast has been prepared for: 1) airline passengers to a new destination, and 2) general aviation flight training operations. The outlook forecast is scenario-driven projection, in the event the activity is unfolds or is realized within the 20-year forecast period. The outlook forecast is supplemental to the Base Forecast, and can be used for Planning Activity Levels (PALS) in determining Facility Requirements and Alternatives Analysis.

FAA Terminal Area Forecasts (TAF) Forecasts

FAA TAF: The official FAA record of historic and projected airport activity, as prepared annually by the FAA for all airports in the *National Plan of Integrated Airport Systems (NPIAS).*

The *FAA Terminal Area Forecasts* (TAF) serve as the baseline for historical and forecast Airport activity. The TAF is prepared annually by the FAA as the official forecast of aviation activity for airports included in the FAA *National Plan of Integrated Airport Systems (NPIAS)*. The TAF forecasts are prepared for 1) passenger enplanements, 2) annual aircraft operations, and 3) total based aircraft. The TAF for the current-year activity tends to lag by one to two years in reporting actual levels. The TAF forecasts are developed in an unconstrained top-down manner without input of local forecast drivers, as the TAF forecast methodology for individual airports is not published.

3.4 FORECAST OF AIRLINE PASSENGERS

3.4.1 Overview

The airline passenger forecast quantifies passenger demand and is used to establish the airline aircraft operations forecast. The airline forecast directly influences airfield infrastructure, airline terminal area layout, air carrier building space allocation, aircraft apron parking, and auto parking/access.

3.4.2 YKM Airline Service

The following summarizes YKM airline service and activity levels:

- Airlines serving YKM in 2017/2018:

  Alaska Airlines/Horizon Air (Scheduled Mainline):

  Destination: SEA (Seattle-Tacoma International Airport)
  Flights (Scheduled): 3.8 Average Daily Departures | 27 Weekly | 1,404 Annual
  Aircraft: Bombardier Q400 Turboprop (76 seats)

  Sun Country Airlines (Scheduled Charter):

  Destination/Flight Frequency: IFP (Laughlin, Nevada)
  Flights: 1 to 2 Average Monthly Departures | 18 Annual Departures
  Aircraft: Boeing 737 (Narrowbody jet transport with 120 to 140 seats)

  Swift Airlines (Scheduled Charter):

  Destination: ENV (Wendover, Nevada)
  Flights: 1 Average Monthly Departure | 12 Annual Departures
  Aircraft: Boeing 737 (Narrowbody jet transport with 120 to 140 seats)

3.4.3 Historical Trends

Table 3-1 is a historical summary of airline passengers between 1990 and 2018, as measured by enplaned passengers at YKM. The highest passenger level was in 1991, with 95,779 enplanements. Since 2010, the enplaned passengers have increased 18,333 (2,292 per year), a 33.3 percent overall growth and a 3.66 percent annual growth rate.

In 2018, YKM Airport recorded 73,342 enplaned passengers, with 144,783 total enplaned and deplaned passengers. Alaska Airlines (Horizon Air) had 72,089 annual enplanements (98 percent) and the scheduled charter operators total 1,253 annual enplanements (2 percent). The YKM annualized passenger load factor ranges between 70 and 85 percent, with a high exceeding 90 percent. The ratio of enplaned to deplaned passengers is a 50-50 percent split of total passengers. December and January are historically the peak-passenger months, with an average of 5,000 to 6,000 monthly enplanements.

Table 3-1: Historical Enplaned Passengers (FY 1990 to 2018)

Year	FAA TAF	YKM Enplaned Passengers (FAA Boardings)			
		Scheduled Airline	Scheduled Charter	**Total Enplaned**	Total Period Change
1990	69,428	--	--	**69,428**	--
1995	85,018	80,717	4,301	**85,018**	15,590
2000	86,370	85,266	1,104	**86,370**	1,352
2005	57,319	55,756	1,567	**57,319**	-29,051
2010	55,009	54,439	1,798	**55,911**	-1,408
2015	60,114	64,107	1,807	**65,914**	10,003
2016	70,728	72,293	1,085	**73,378**	7,464
2017	71,679	72,070	1,012	**73,082**	-296
2018	73,342	72,089	1,253	**73,342**	260
Total Change	18,333	17,651	-545	17,431	--
Annual Change	2,292	2,206	-68	2,179	--
% Total	33.3%	32.4%	-30.3%	31.2%	--
% Annual	3.66%	3.57%	-4.41%	3.45%	--

Notes: Table includes scheduled passengers service; does not account for FAA Part 135 on-demand air taxi passengers | 'Enplaned Passenger' and 'Passenger Boardings' defined as the same | FAA TAF source was published in February 2019 | 2010 to 2018 enplaned data from YKM Airport records for calendar year | The total and percent annual change is calculated from 2010 to 2018
Source: Consultant Forecast Projection, December 2018.

3.4.4 YKM Airline Market Analysis

In 2010, a YKM True Market Estimate air service report was conducted to assess passenger demand and air service city markets. This report identified that the YKM catchment area consists of portions of Yakima, Lewis, King, and Kittitas Counties, with a combined population of 270,700 residents. In 2007/2008, the catchment area generated 223,792 annual Origin and Destination (O&D) passengers; in which YKM captures approximately 64 percent (223,792 catchment area passengers ÷ 144,000 total passengers); as the remaining air travelers drive to other surrounding commercial airports (SEA-Seattle, PSC-Pasco, and PDX-Portland).

According to the YKM True Market Estimate, air travelers tend to rely on PSC over SEA due to convenience, reliability, and costs. The YKM to PSC drive distance is 90 miles (approximately 1.5 hours) and the YKM to SEA drive is 120 miles (approximately 2.5 hours). SEA offers more flight options, but is more costly for vehicle parking and during the winter months the drive over the Cascade Mountain range can be unreliable. Flight connections through SEA can be challenging due to YKM flight frequency and times, and YKM flights are subject to unpredictable cancellations. Shuttle bus service between Yakima and Seattle also transports passengers to SEA.

Regional Airline: An air carrier providing service primarily via aircraft with 89 or less seats and whose routes serve mainly as feeders to the mainline carriers. Provides scheduled passenger service of five or more round trip flights per week on at least one route according to published flight schedules.

Charter Airline: Providing scheduled airlines service to point-to-point on-demand destinations, operating transport category aircraft under FAA Part 119 and 121 certification. Service is typically less than five or more round trip flights per week.

3.4.5 Yakima Regional Socioeconomic Profile

Socioeconomic data provides an understanding of demographic profiles and commerce trends. The purpose of this data is to quantify community development characteristics, and to identify socioeconomic indicators connected with YKM activity patterns. In accordance with FAA Advisory Circular 5070-6B guidance, the key indicators for aviation forecasting purposes are population, employment, and per capita personal income. The following are economic index projections (Woods & Poole) for Yakima County, including the percent annual change:

- Population: 256,500 in 2018 to 305,000 in 2040 (0.85% change)
- Employment: 137,900 in 2018 to 170,000 in 2040 (0.99% change)
- Per Capita Income (PCI): $10,900 in 2018 to $15,000 in 2040 (1.50% change)
- Gross Regional Product (GRP): $7.79 in 2018 to $11.40 in 2040 (1.91% change)
- Gross Domestic Product (GDP): $17.39 in 2018 to $25.80 in 2040 (1.99% change)

3.4.6 Regional/Charter Airline Industry Trends

YKM is primarily served by regional and low-cost charter airline service. Overall, the regional airline sector has experienced nationwide market share contraction and shrinking aircraft seat capacity, resulting in declining passengers, load factors, and yields (fare paid per mile). The *FAA Aerospace Forecasts* projects a competitive and profitable regional airline industry, characterized by increasing air travel demand and stable airfares. Quantified by available aircraft seat miles and revenue passengers, the regional airlines are forecast by the *FAA Aerospace Forecasts* to expand between 1.8 to 2.2 percent annually over the next 20 years, assuming continued national economic growth. The regional turboprop fleet will shrink by two-thirds in the short-term due to replacement of the smaller 50-seat regional jets with more fuel efficient 70 to 90-seat jets. The FAA projects a decline in the size and number of aircraft under 30 seats operated for rural regional markets, as turboprop and jet transport aircraft production has shifted to the over 40-seat market.

3.4.7 Airline Passenger Forecast Resources

Forecast data was collected from YKM records (monthly airline activity records), Airport interviews, FAA data (Terminal Area Forecasts and the *FAA Aerospace Forecasts*), United States Department of Transportation (USDOT) website data, and aviation industry publications. Community and socioeconomic data were also collected for Yakima County.

3.4.8 Forecast Factors

The following are airline service and passenger demand factors used in developing the passenger enplanement forecast scenarios:

- YKM airline service has been consistent and growing. Since 2000, five air carriers have served YKM (Alaska Airlines/Horizon Air, Sun Country, Swift Airlines, Delta, SeaPort Airlines), showing the ability for YKM to attract traveler demand under various types of airlines. Since 1990, enplaned passengers had reached nearly 100,000, as the 9/11 attack precipitously impacted passenger levels; dropping 30 percent. In the past 10 years, since 2008, YKM passenger enplanements historically averaged 63,000 (125,000 total enplaned and deplaned passengers). The ratio of enplaned-to-deplaned passengers is consistently within 1 percent of a 50-to-50 percent split of total passengers.

- Airline service and passenger demand is very much influenced by economic conditions. The Yakima commerce, which is heavily invested into agriculture and emerging tourism, will likely result in YKM experiencing a growing passenger demand as coinciding with Yakima economic expansion and population growth.

- Airline service and reliability is very important to the City. YKM is diligently pursuing opportunities to expand regional airline jet service, with a new airline and/or airport destination expected by 2023. The preferred destination would be San Francisco and/or reintroduction of eastbound service, such as to Salt Lake City (SLT) or Denver (DEN) as regional jet destinations are typically within 1,000 miles of a hub airport due to airline operating economics. The introduction of a new destination or airline would be expected to increase YKM passenger levels by 10,000 to 20,000 enplanements; as evidence of Delta service at YKM from 2007 to 2009. Delta Airlines introduced service to the SLC hub under a ticket guarantee program, in which YKM passenger volumes grew by 15,700 enplaned passengers and did not substantially impact the SEA passenger levels. In addition, multiple flight destinations served from YKM would likely diminish passenger disruptions resulting from flight cancellations.

- Although unlikely and not forecast, YKM scheduled air service could potentially experience prolonged declines or cease as the result of catastrophic economic conditions and/or changing airline practices. Alaska Airlines/Horizon Air service is forecast through the 20-year forecast period. If discontinued, another air carrier would be expected to serve YKM; perhaps with service to SEA or another comparable city/airport hub destination.
- YKM air service marketing and facility improvements are being advanced. The FLYYKM marketing program and a 2015 Small Community Air Service Development (SCASD) grant has been implemented, to generate passenger awareness of YKM flight advantages. Terminal building improvements are planned in 2024 which is expected to encourage additional passenger use.

The following are airline service events which could influence YKM forecast levels:

- **Added Mainline Service:** Additional Alaska/Horizon Air flight frequency is projected over the 10-year forecast period, with up to 4 additional weekly departure flights, or an additional 208 annual departures. However, the current Bombardier Q400 regional turboprop is expected to be phased-out of the Horizon Air fleet between 2025 to 2030. A transition to an equivalent regional turboprop (70 to 90 seats) or a regional transport jet (70 to 100 seats) is anticipated as part of the YKM forecast, as the larger aircraft transition may influence YKM passenger demand and result in a change to daily/weekly flight frequency.
- **Added Charter Service:** Additional scheduled charter flights are projected, increasing from an average of 30 to 40 annual departures. Point-to-point travel has been the low-cost charter model, and is also becoming the mainline airline model.
- **New Airline/Destination (Outlook Scenario):** New YKM airline destinations (city markets) are projected by 2023 (within 5 years of 2018); with a new destination anticipated to have 6 to 14 weekly departure flights.

3.4.9 Forecast of Enplaned Passengers

Multiple passenger enplanement forecasts were developed using various statistical techniques, resulting in 10 projections ranging between 75,000 to 127,000 annual enplanements by 2040. From the 10 enplanement projections, two were selected as the most reasonable for defining the low (constrained) forecast scenario and the high (unconstrained) forecast scenario. Following discussions with the Airport Staff, the high scenario was accepted as the preferred forecast to carry forward into the Master Plan. The forecast scenarios are described below:

Low Forecast Scenario: This forecast used the combined 20-year annualized County population (0.09%) and per capita income (1.53%) growth rate projections to forecast passengers. This method assumes passengers will increase directly proportional with the Yakima regional growth rates. This is a static forecast approach, assuming that airline service and passenger demand factors remain unchanged from current conditions. Alaska Airlines/Horizon Air would continue being the primary air carrier. This scenario resulted in enplaned passengers increasing to 82,568 (9,226 total and 419 per year), a 12.6 percent overall growth and a 0.54 percent annual growth rate. This forecast is reasonable in consideration of low to moderate economic expansion.

High Forecast Scenario (Preferred): This forecast method calculates passengers through the new mainline and charter airline service events anticipated over the 20-year planning period, including: 1) additional flight frequency by the mainline carrier (26 to 30 weekly flights) and scheduled charter operators (28 to 40 annual flights), and 2) load factor increases by the mainline carrier (80% to 90% percent) and increased enplanements-per-flight by the scheduled charter air carriers (70 to 90 passengers per flight). This scenario resulted in enplaned passengers increasing to 92,600 (17,800 total increase and 890 per year increase), a 24.3 percent overall growth and a 1.07 percent annual growth rate. This forecast is reasonable in consideration of a greater YKM passenger catchment/driving market share with SEA and PSC, YKM air service improvements (flight frequency, service/fare promotions, transition to regional jets); and remains within historical YKM enplanement levels experienced since 2000.

Planning Activity Level (Outlook Scenario Forecast): The outlook forecast is a scenario of introducing new airline service to a west-coast destination, anticipated to start during 2020 to 2030. As an outlook forecast, this would be a supplemental projection additive to the low or high forecast scenario. The outlook forecast calculated enplaned passengers using the following inputs: 1) destination to a west-coast hub airport within 1,000 miles of YKM, 2) 50 to 70-seat regional jet aircraft, 3) a graduated load factor increasing from 55 to 70 percent, 4) an average of 2 to 3 daily departure flights, 5) an average of 3 to 5 flight-days per week. This projection would result in a bump to YKM passengers, adding 8,000 to 15,000 enplanements during the initial service introduction, then growing with changes in flight schedule frequency. This scenario projects 24,600 enplaned passengers by 2040, or an average of 900 additional passengers per year.

FAA Terminal Area Forecasts (FAA TAF): Total 20-year airline enplaned passengers increase from 72,902 in 2020 to 98,649 in 2040 (25,747 passengers), a 35 percent overall growth and a 1.52 percent annual growth rate.

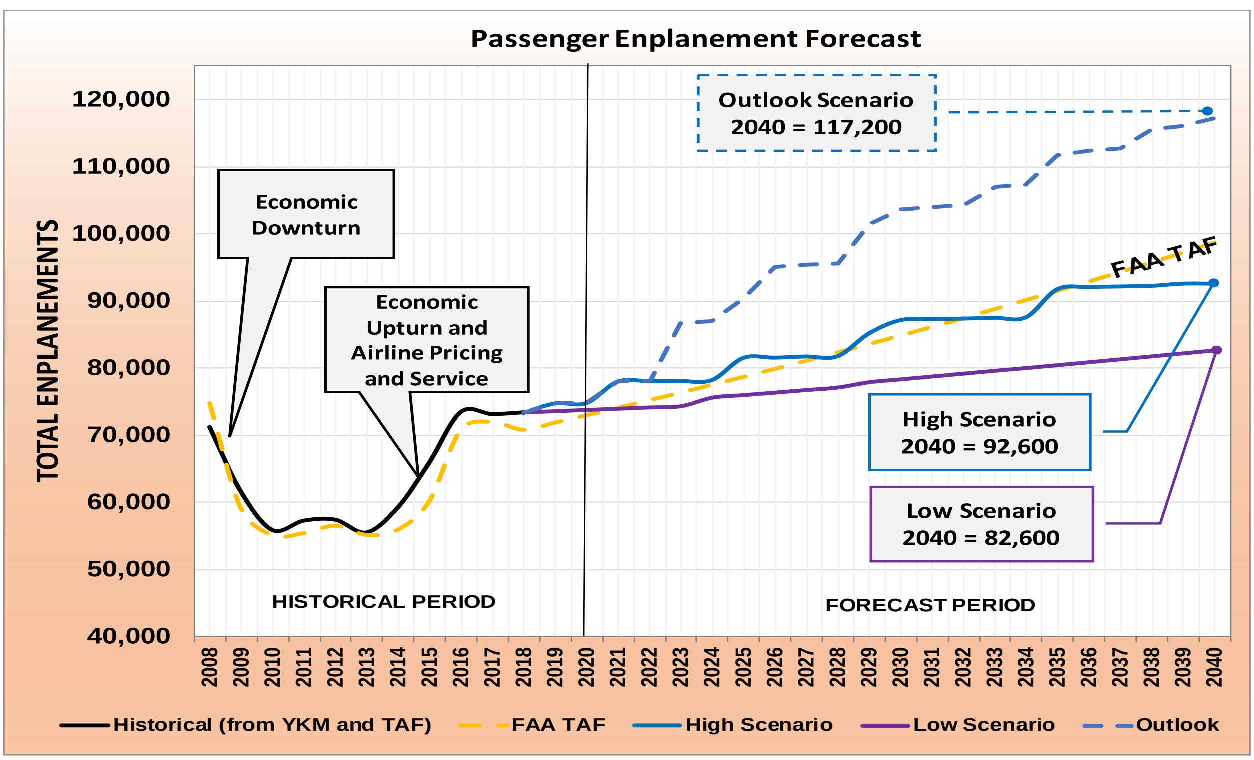
Table 3-2 and Figure 3-2 is a summary of the passenger forecasts for the low, high, and outlook scenarios, including the FAA TAF projection.

Table 3-2: Passenger Enplanement Forecast Scenarios

Forecast Year	Forecast Scenarios		Outlook Scenario	Planning Activity Level Outlook Scenario		FAA TAF
	Low	High		Low + Outlook	High + Outlook	
2018	73,342	73,342	0	--	--	70,736
2020	73,700	74,800	0	73,700	74,800	72,902
2025	75,900	81,600	8,800	84,700	90,400	78,616
2030	78,300	87,200	16,400	94,700	103,600	84,787
2035	80,400	91,800	20,000	100,400	111,800	91,451
2040	82,600	92,600	24,600	107,200	117,200	98,649
20-Year Change	8,900	17,800	24,600	33,500	42,400	25,747
% Total Change	12%	24%	180%	45%	57%	35%
% Annual Change	0.57%	1.07%	7.09%	1.89%	2.27%	1.52%

Note: FAA TAF published in February 2019 | Enplaned-to-deplaned passengers forecast at 50-50 percent.
Source: Consultant Forecast Projection, December 2018.

Figure 3-2: Enplaned Passenger Forecast Scenarios



Source: Consultant Forecast Projection Exhibit, December 2018.

Table 3-3 is a summary of the 'preferred' and 'outlook' passenger enplanement forecast scenario by enplaned, deplaned, and total passengers. The 'high' passenger enplanement scenario is the recommended forecast to carry-forward in the master plan as the preferred passenger enplanement projection. The preferred forecast reaches 92,600 enplaned passengers by 2040. However, YKM has historically exceeded 90,000 passenger enplanements and has been able to serve multiple airlines and multiple destinations. Therefore, the outlook forecast is considered as a supplemental planning activity level for alternate planning consideration. The 20-year outlook forecast includes an additional 24,600 enplaned passengers, reaching 117,200 total enplaned passengers by 2040.

Table 3-3: Preferred Passenger Enplanement Forecast

Preferred Forecast	Enplaned Passengers (Preferred Master Plan)	Deplaned Passengers (Preferred Master Plan)	Total Passengers (Preferred Master Plan)
2018	73,300	73,300	**146,600**
2020	74,800	74,800	**149,600**
2025	81,600	81,600	**163,200**
2030	87,200	87,200	**174,400**
2035	91,800	91,800	**183,600**
2040	92,600	92,600	**185,200**
Outlook Scenario	**Enplaned Passengers (Outlook)**	**Deplaned Passengers (Outlook)**	**Total Passengers (Outlook)**
2018	0	0	**0**
2020	0	0	**0**
2025	8,800	8,800	**17,600**
2030	16,400	16,400	**32,800**
2035	20,000	20,000	**40,000**
2040	24,600	24,600	**49,200**
Preferred + Outlook	**Enplaned Passengers (Preferred + Outlook)**	**Deplaned Passengers (Preferred + Outlook)**	**Total Passengers (Preferred + Outlook)**
2018	73,300	73,300	**146,600**
2020	74,800	74,800	**149,600**
2025	90,400	90,400	**180,800**
2030	103,600	103,600	**207,200**
2035	111,800	111,800	**223,600**
2040	117,200	117,200	**234,400**

Note: Deplaned passengers projected at 50 percent of total passengers.

Note: Preferred master plan forecast is the 'high' scenario projection

Note: Outlook projection considered as an alternate planning activity level (PAL).

Source: Consultant Forecast Projection, December 2018.

3.5 FORECAST OF ANNUAL OPERATIONS

3.5.1 Overview

Aircraft Operation: (defined as takeoffs and landings; each flight consists of two operations)

The following section describes the 20-year forecast of annual aircraft operations. The forecasts include operations by 1) commercial, 2) general aviation and 3) military traffic. The aircraft operations forecast directly influences the planning of airfield infrastructure and facilities, in addition to terminal/landside space allocation and access.

Table 3-4 is a historical summary of total airport operations between 1990 and 2018, as measured by annual aircraft operations. Significant changes occurring since 2010 include:

- Loss of based general aviation aircraft, and impact of operations when the Noland Decoto Through-the-Fence Agreement was terminated in 2011, resulting in the repositioning of 38 based aircraft; as aircraft were either retained at YKM or relocated to other airports.
- Transition of Central Washington University (CWU) flight training operator from Midstate Aviation to IASCO Flight Training (IFT) that occurred in 2014-2015, which caused a drop in general aviation traffic (flight training) at YKM.
- Historically, total annual operations reflect activity recorded during YKM Air Traffic Control Tower (ATCT) hours of operation. The Airport estimates 5 percent of the total operations are conducted during ATCT non-operating hours. For comparison, the 5 percent adjustment is recognized in Table 3-4.

Table 3-4: Historical Airport Operations

Calendar Year	Commercial	General Aviation	Military	Total (YKM ATCT Reported)	Adjusted Total (5% ATCT Adjustment)
1990	15,842	44,681	7,035	**67,558**	70,936
1995	18,523	50,638	5,346	**74,507**	78,232
2000	15,755	39,470	3,878	**59,103**	62,058
2005	10,177	37,363	2,112	**49,652**	52,135
2010	7,237	36,424	2,244	**45,905**	48,200
2015	5,142	29,754	1,873	**36,769**	38,607
2016	5,737	29,513	1,565	**36,815**	38,656
2017	6,092	28,565	1,701	**36,358**	38,176
2018	7,422	30,217	1,805	**39,444**	41,416

Note: Total are YKM Air Traffic Control Tower (ATCT) actual reported.
Note: Adjusted Total includes 5 percent adjusted of annual activity based on YKM ATCT non-operating hour reporting.

3.5.2 Forecast of Commercial Airline Operations

Air carrier operations include take-offs and landings of scheduled commercial air carrier aircraft having more than 60 passenger seats, which includes all of the scheduled airline activity at YKM. The following is a summary of air carrier operation activity levels.

YKM Airport records show 2,535 actual airline operations in 2018; including 2,477 by the mainline carrier (Alaska/Horizon Air) and 58 by the scheduled charters (Sun County and Swift Airlines). Based on the YKM airline daily departure/arrival schedule (27 weekly departure flights), excluding flight cancellations, there would be approximately 2,850 annual airline operations (27 departures x 52 weeks x 2 operations). Approximately 100 YKM airline flights (200 airline operations) are cancelled annually as the result of airline pilot-crew shortages, SEA traffic flow management, inclement weather, and aircraft mechanical. The 2,850 level is used as the baseline total for forecasting airline operations, as it accounts for the actual YKM airline flight schedules and true passenger demand.

The ratio of passenger enplanement demand to the aircraft seat capacity, expressed as the load factor, is typically used as the flight frequency gauge to forecast air carrier operations. When the air carrier load factor is consistently above 80 to 90 percent, the number of flights offered and/or larger aircraft with greater seating capacity is typically adjusted to serve the high-demand markets or routes. However, even with high load factors, airlines have been challenged to add flights to regional markets like YKM, due largely to pilot shortages and SEA traffic flow management.

The forecast of air carrier operations considered the following factors:

- ♦ Additional Alaska/Horizon Air flight frequency is projected at YKM, from 26 to 32 weekly departure flights over the 20-year forecast period, or an additional 416 annual operations. The transition from the 76-seat Q400 turboprop to a regional jet aircraft is projected during 2025 to 2030, with the jet aircraft (anticipated to be the Embraer EMB 170/175 or MRJ70/90 Series) possibly influencing the weekly flight schedule frequency.
- ♦ Outlook Forecast: A new YKM airline destination (airport/city market) is projected by 2025; with new service conservatively projected to have 6 to 14 weekly departure flights, which equates to nearly 1,400 annual airline operations.

Table 3-5 summarizes the historical and 20-year forecast of airline aircraft operations, for the preferred scheduled and outlook scenario passenger enplanement forecast. The airline operations forecast was calculated from the application of flight schedules and passenger load factors per aircraft departure.

Table 3-5: Forecasts of Annual Airline Operations

Year	Scheduled Airline (Mainline)	Scheduled Airline (Charter)	Scheduled Airline Total	Outlook Scenario (New Service)	Total Scheduled + Outlook
2018	2,530	60	**2,590**	--	2,590
2020	2,810	60	**2,870**	0	2,870
2025	3,020	70	**3,080**	620	3,710
2030	3,120	70	**3,190**	1,090	4,280
2035	3,220	70	**3,300**	1,250	4,540
2040	3,220	80	**3,300**	1,400	4,700

Note: Totals subject to rounding. | Note: Mainline is Alaska/Horizon Air or similar | Charter is Sun County, Swift Airlines and similar | 'New Service' scenario is an outlook projection which considers new YKM airline/destination service.
Source: Consultant Forecast Projection, December 2018.

3.5.3 Forecast of Commercial Air Cargo Operations

YKM has the following scheduled commercial air cargo operators and activity levels:

- **Empire Airlines** operates a feeder route for FedEx primarily using the Cessna Caravan 208 single-engine turboprop aircraft (three daily morning flights from Spokane with departures to Spokane and other cities in Washington State). The ATR 42/72 twin-engine turboprop aircraft is used during the peak holiday seasons when cargo increases. On average, Empire flights total 1,600 annual aircraft operations at YKM, or an average of 2.2 flights per day.
- **Ameriflight** operates as a feeder service to UPS using the Embraer 120 twin-turboprop aircraft (operate one flight per day arriving from Boeing Field each morning with a departure in the afternoon). On average, Ameriflight air cargo flights total 900 annual aircraft operations at YKM, or an average of 1.2 flights per day.

Combined, the scheduled air cargo operators account for 2,500 annual operations. YKM has other non-scheduled air cargo and freight flights, which appear to be reported as air taxi operations.

The forecast of air cargo operations considered the following factors:

- YKM air cargo/freight volumes are anticipated to experience steady growth dependent on regional commerce and retail patterns; as no significant changes in YKM air cargo volumes (tonnage) are expected.

- YKM air cargo is expected to be served by two integrated cargo operators (FedEx and UPS), operating similar turboprop aircraft to existing or similar inter-city airport destinations.
- YKM air cargo flights are projected to experience additional flight frequency, resulting from seasonal peak-period express package volumes and supplemental daily flights during the peak season; however, cargo trucks will continue being used to supplement large seasonal cargo volumes.
- The Yakima agricultural industry is not expected to rely extensively on air cargo/freight for the shipment of crops and produce, as even high-valued and time-sensitive farming products will continue relying on truck and railroad transport.

Table 3-5 summarizes the historical and 20-year forecast of air cargo operations. The FAA TAF does not forecast air cargo operations.

3.5.4 Forecast of Commercial Air Taxi Operations

Table 3-6 summarizes the 20-year forecast of air taxi operations. Air taxi includes flights conducted for non-scheduled passenger and cargo purposes, FAR Part 135 on-demand charter, fractional ownership, and medical flights; predominately using general aviation aircraft with fewer than 30 seats. YKM has three based FAR Part 135 charter outfits using fixed wing and helicopters, in addition to air taxi flights by transient commercial charter operators based at other airports.

Table 3-6: Forecast Summary of Preferred Commercial Operations

Year	Scheduled Airline	Scheduled Air Cargo	Air Taxi (Part 135)	Total Commercial
2018	2,530	2,540	2,350	**7,420**
2020	2,870	2,620	2,460	**7,950**
2025	3,080	2,810	2,770	**8,660**
2030	3,190	3,010	3,110	**9,310**
2035	3,300	3,200	3,500	**9,990**
2040	3,300	3,400	3,930	**10,630**

Note: 2018 airline and air cargo operations are based on Airport Staff records. | Note: 2018 air taxi operations reflect Airport Staff estimates based on Part 135 based aircraft and activity levels. | Note: FAA TAF record of commercial operations did not account for YKM commercial air cargo activity.
Source: Consultant Forecast Projection, December 2018.

3.5.5 Forecast of General Aviation Operations

3.5.5.1 Overview

General aviation represents the largest and most significant segment of the national air transportation system; accounting for 96 percent of all civilian airports, 97 percent of all civilian aircraft, 75 percent of all airport operations, and over 65 percent of all certified pilots. With nearly 70 percent of all general aviation flying conducted for business purposes, general aviation provides an important transportation link with commerce throughout the Yakima Valley.

3.5.5.2 Industry Trends

A review of industry trends, by general aviation market segment, provides insight into drivers of past change and emerging forecast directions. Nationwide, the general aviation industry is experiencing prolonged slow growth, and an aircraft fleet continuing to undergo transition in production and utilization. In terms of aircraft production and flight hour utilization, the piston fleet is declining by -0.5 percent annually, while the turbine (turboprop and business jet) fleet is growing at 2.5 percent annually; with turbine aircraft production exceeding piston aircraft production.

3.5.5.3 YKM General Aviation Operations

YKM reported 28,650 total general aviation aircraft operations in 2018, consistent with levels experienced since 2010. General aviation operations account for nearly 80 percent of the total YKM aircraft operations.

The forecast of general aviation operations considered the following factors:

- The Yakima area population is growing at 0.85 percent annually and commerce is growing 1.5 to 2.5 percent annually. Community growth is expected to translate into additional YKM activity and higher utilization; brought about by the expansion of YKM tenants involved in providing aeronautical services and the proposed southside hangar development. The Yakima agricultural industry relies heavily on general aviation air taxi services.

- The FAA Aerospace Forecast projects a 0.8 percent annual growth in the total general aviation aircraft fleet hours flown. This increase is realistic at YKM.

- General aviation activity at YKM is vibrant and stable. The Operations Per Based Aircraft (GA OPBA), which is the ratio of annual general aviation operations to total based aircraft, consistently measures and is forecast to remain between 150 and 200. The YKM turbine (turboprop and business jet) activity is expected to increase proportionally higher than the piston fleet, as reflective of turbine industry aircraft production and utilization trends.

YKM piston aircraft traffic will experience growth, including the proliferation of sport/light utility aircraft, as perpetuated by CubCrafters sales and training.

- The proposed southside hangar redevelopment would add 5 to 15 based aircraft, which could reasonably translate into an additional 1,500 to 2,500 annual operations.
- Flight training at YKM, largely associated with Central Washington University (CWU), is expected to increase as their flight program grows and they add additional aircraft to their fleet; future flight training activity could be substantial if CWU bases training facilities at YKM.

3.5.5.4 General Aviation Flight Training Operations

Flight training activity accounts for about 20 percent of the local general aviation traffic, or an estimated 2,500 to 3,500 annual operations per year, largely generated by flight training operators at YKM (McCormick's, Yakima Aerosport, and CubCrafters) and from the Central Washington University (CWU) program based at Bowers Field in Ellensburg, Washington. YKM provides an Air Traffic Control Tower (ATCT) facility useful for pilot training purposes during visual and instrument conditions, with nearly all flight training conducted during ATCT operating hours. The based flight training is generated through FAR Part 91 flight training/proficiency activity. The CWU flight training is largely generated by cross-county and ILS instrument training.

Base Forecast: Flight training growth at YKM would likely result from future CWU expansion of student pilot enrollments, curriculum expansion, and potential changes to the flight program and locations, which have the potential to impact YKM in the event CWU further utilizes or establishes training facilities at YKM in the future. Flight training activity during the 20-year forecast period is forecast to range between 3,000 to 4,000 annual aircraft operations at YKM. Flight training is expected to increase at YKM through 2025, principally in response to the airline industry demand for supplying professional pilots to meet domestic and international fleet acquisitions and to counter pilot shortages resulting from mandatory age retirements.

Outlook Scenario: As an outlook forecast scenario, CWU is evaluating their flight program and looking at YKM to either establish a satellite campus or move their entire flight program. Although no agreements have been finalized, either situation would greatly increase YKM operations. If CWU establishes flight training facilities at YKM, flight training operations would increase substantially. As an industry standard, each flight training aircraft operates between 300 and 600 hours annually and conducts 2,200 to 2,800 operations per year.

3.5.5.5 Summary of General Aviation Operations Forecast

The following documents the general aviation forecast methodologies:

- **Low Scenario:** This forecast approach uses the OFM low growth rate to project future general aviation operations. This results in 30,820 general aviation operations by 2040, an annualized is 0.1 percent growth rate. This forecast approach was dismissed from further consideration because it does not reflect the upward operational factors beyond 2018.
- **High Scenario:** This forecast approach uses the FAA 20-year general aviation fleet hours flown growth rate as derived from the FAA Aerospace Forecasts (FAA Table 29). This results in 34,252 general aviation operations by 2038, an annualized is 0.9 percent growth rate. This forecast approach assumes that influences at YKM will be positive for general aviation operations. Accordingly, this scenario reflects the growth in the YKM community, and the south side hangar development.
- **FAA Terminal Area Forecast (2019):** Total 20-year general aviation operations increase from 28,890 in 2020 to 31,350 in 2040 (2,460 total change), a 8.5 percent overall growth and a 0.41 percent annual growth rate.
- **Preferred Forecast Summary and Reasonableness (High Scenario):** Following discussions with the Airport Staff, the high scenario was accepted as the preferred forecast to carry forward into the Master Plan. The high forecast scenario more closely aligns with the YKM forecast factors. In addition, the high forecast scenario is consistent with a growing Yakima region and economy. The high forecast scenario exceeds the 2018 FAA TAF as attributed to: 1) planned southside hangar development, 2) continued increases in flight training, 3) FBO growth and aircraft acquisitions, 4) potential through-the-fence hangar occupancy. Table 3-7 shows the general aviation forecast scenarios.

Table 3-7: General Aviation Operations Forecast

		Low Scenario			High Scenario (Preferred)		
Year	FAA TAF	Itinerant	Local	Total	Itinerant	Local	**Total**
2010	38,170	18,154	20,016	38,170	18,154	20,016	38,170
2015	30,020	15,636	14,385	30,021	15,636	14,385	30,021
2018	28,650	16,958	13,259	30,217	16,958	13,259	**30,217**
2020	28,890	16,730	13,080	29,810	17,240	13,480	**30,710**
2025	29,480	16,830	13,160	29,990	17,950	14,030	**31,980**
2030	30,090	17,050	13,330	30,380	18,690	14,620	**33,310**
2035	30,710	17,220	13,460	30,680	19,470	15,220	**34,690**
2040	31,350	17,300	13,520	30,820	20,270	15,850	**36,130**
Change	2,460	570	440	1,010	3,030	2,370	5,420
Annual	123	29	22	51	152	119	271
% Total	8.5%	3.4%	3.4%	3.4%	17.6%	17.6%	17.6%
% Annual	0.41%	0.17%	0.17%	0.17%	0.81%	0.81%	0.82%

Note: FAA TAF published in February 2019.
Source: Consultant Forecast Projection, December 2018.

3.5.6 Forecast of Military Operations

Military activity is generated by the Yakima Training Center and traffic conducted by aircraft based at military/guard facilities throughout the State of Washington, and beyond. YKM reports 1,800 annual military operations in 2018, with 900 operation by local traffic and 900 itinerant operations associated with training exercises and flight training/proficiency.

Military activity is estimated to be 30 percent by fixed-wing planes and 70 percent by helicopters. The fixed-wing planes most frequently include the P3 Orion (4-engine turboprop), C-130 Hercules (4-engine turboprop), and C-17 (4-engine jet). The helicopters predominately include the Sikorsky Blackhawk based at the Yakima Training Center. The military, through an agreement with Airlift NW, provides Medevac flights out of YKM on a regular basis using the Blackhawk.

Military operations were not forecast as part of the YKM Master Plan, but are anticipated to remain about 2,000 annual operations, which is consistent with the FAA TAF. Military operations have been included, separately, as part of the total YKM airport operations, as FAA Advisory Circular 150/5000-17 states that facility planning should include consideration of military aircraft or other federally-owned aircraft operating at the airport.

Table 3-8 and Figure 3-3 summarizes the preferred annual aircraft operation scenarios, by user group, including the 20-year forecast change.

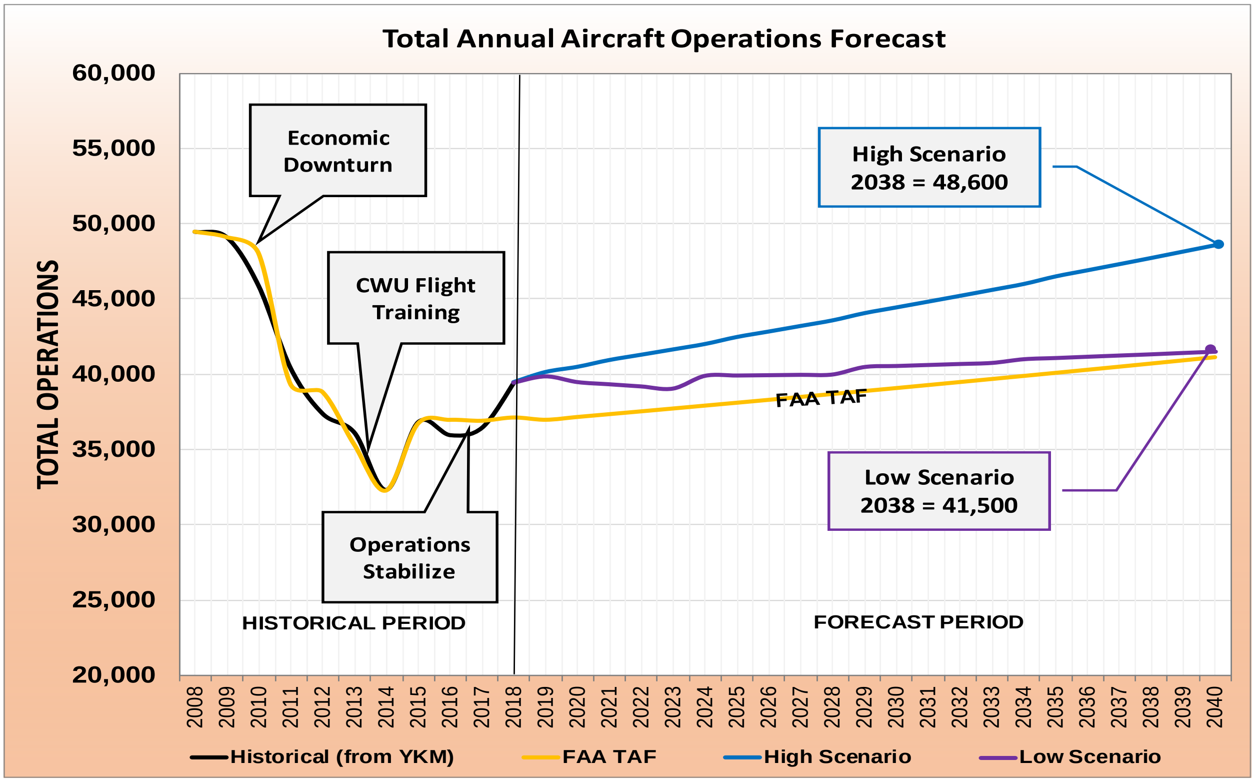
Table 3-8: Summary of Preferred Total Airport Operation Forecasts

Year	Commercial Airline	Commercial Air Cargo	Commercial Air Taxi	General Aviation	Military	Total Annual Operations
2018	2,530	2,540	2,350	30,220	2,000	**39,640**
2020	2,870	2,620	2,460	30,710	1,810	**40,470**
2025	3,080	2,810	2,770	31,980	1,810	**42,450**
2030	3,190	3,010	3,110	33,310	1,810	**44,420**
2035	3,300	3,200	3,500	34,690	1,810	**46,490**
2040	3,300	3,400	3,930	36,130	1,810	**48,560**
Total	430	780	1,470	5,420	0	8,090
Annual	22	39	74	271	0	405
% Total	15.0%	29.8%	59.8%	17.6%	0.0%	20.0%
% Annual	0.70%	1.31%	2.37%	0.82%	0.00%	0.92%

Note: Totals subject to rounding.

Source: Consultant Forecast Projection, December 2018.

Figure 3-3: Total Operations Forecast Scenarios



Source: Consultant Forecast Projection Exhibit, December 2018.

3.6 OPERATIONAL MIX FORECASTS

The follow section is a forecast of operational activity components derived from the preferred aircraft operational forecast. These forecast components are used to establish the peaking and critical aircraft forecast.

3.6.1 Forecast of Itinerant and Local Operations

On average, about 55 percent of the total YKM operations are transient/itinerant and 45 percent local. Future levels of local and itinerant activity were forecast using this distribution, as shown in Table 3-9.

Table 3-9: Forecast of Local and Itinerant Operations

Year	Transient/ Itinerant Operations	Transient/ Itinerant (% Total)	Local Operations	Local Operations (% Total)	Total Airport Operations
2018	**21,690**	55%	**17,750**	45%	**39,440**
2020	**22,260**	55%	**18,210**	45%	**40,470**
2025	**23,350**	55%	**19,100**	45%	**42,450**
2030	**24,430**	55%	**19,990**	45%	**44,420**
2035	**25,570**	55%	**20,920**	45%	**46,490**
2040	**26,710**	55%	**21,850**	45%	**48,560**

Note: 2010, 2015, 2018 activity from FAA TAF. | Note: Totals subject to rounding
Source: Consultant Forecast Projection, December 2018.

3.6.2 Forecast of Airport Instrument Operations

Table 3-10 summarizes the YKM 20-year forecast of instrument operations. An instrument operation is defined as any arrival or departure from an airport by aircraft operating in accordance with an Instrument Flight Rule (IFR) flight plan or with the provision of IFR separation from other aircraft by a terminal control facility; or, any contact with the ATCT by aircraft operating under an IFR flight plan. At YKM, instrument account for an estimated 28 percent the total flights.

Table 3-10: Forecast of Instrument Operations

Year	Total Airport Operations	Percent Instrument Operations	Total Annual Instrument Operations
2018	39,440	26.7%	**10,520**
2020	40,470	26.7%	**10,790**
2025	42,450	26.7%	**11,320**
2030	44,420	26.7%	**11,850**
2035	46,490	26.7%	**12,400**
2040	48,560	26.7%	**12,950**

Note: Percent Instrument Operations calculated from 2018 OPSNET
Source: Consultant Forecast Projection, December 2018.

3.7 OPERATIONAL PEAKING FORECASTS

Aircraft operational forecasts are used to assess Airport capacity needs, level of service, and space allocation requirements for airspace, airfield, and terminal purposes; as determined by various operational peaking components. Peak activity levels are derived from annual aircraft operations, broken-down by month, day, and hour periods. Per FAA AC 150/5060-5 *Airport Capacity and Delay* guidance, the average-day-peak-month (ADPM) is used to define the busy period, to avoid constructing facilities for capacity rarely used. Three key peak aviation indicators are:

- **Peak Month**: Defined as that month in the calendar year when the highest overall activity levels occur. The term "design month" is interchangeable with peak month. The peak month for YKM typically occurs during July and August, with the percent of peak month activity dependent on the type of traffic (commercial, general aviation and military).
- **Average Day**: Defined as the average day within the peak month. This indicator is developed by dividing the peak month activity by 30.4 days.
- **Design Hour**: Defined as the peak hour within the average day, typically ranging between 10 and 20 percent of the average day activity.

Table 3-11 summarizes operational peaking forecast during the 20-year period, including the peaking percentage. Aircraft operational forecasts are used to assess Airport capacity needs, level of service, and space allocation requirements for airspace, airfield, and terminal purposes; as determined by operational peaking components.

Table 3-11: Forecast of Peak-Period Activity

Year	Annual Activity	Peak Month Percent (%)	Peak Month	Average Day/ Peak Month (30.4 Days)	Peak Hour Percent (%)	Peak Hour
Enplaned Passengers						
2018	**73,300**	10%	**7,330**	**241**	35%	**84**
2020	**74,800**	10%	**7,480**	**246**	35%	**86**
2025	**81,600**	10%	**8,160**	**268**	35%	**94**
2030	**87,200**	10%	**8,720**	**287**	35%	**100**
2035	**91,800**	10%	**9,180**	**302**	35%	**106**
2040	**92,600**	10%	**9,260**	**305**	35%	**107**
Commercial Operations						
2018	**7,420**	8%	**594**	**20**	15%	**2.9**
2020	**7,950**	8%	**636**	**21**	15%	**3.1**
2025	**8,660**	8%	**693**	**23**	15%	**3.4**
2030	**9,310**	8%	**745**	**25**	15%	**3.7**
2035	**9,990**	8%	**799**	**26**	15%	**3.9**
2040	**10,630**	8%	**850**	**28**	15%	**4.2**
General Aviation Operations						
2018	**30,217**	11%	**3,324**	**109**	25%	**27.3**
2020	**30,710**	11%	**3,378**	**111**	25%	**27.8**
2025	**31,980**	11%	**3,518**	**116**	25%	**28.9**
2030	**33,310**	11%	**3,664**	**121**	25%	**30.1**
2035	**34,690**	11%	**3,816**	**126**	25%	**31.4**
2040	**36,130**	11%	**3,974**	**131**	25%	**32.7**
Military Operations						
2018	**1,805**	11%	**199**	**7**	25%	**1.6**
2020	**1,805**	11%	**199**	**7**	25%	**1.6**
2025	**1,805**	11%	**199**	**7**	25%	**1.6**
2030	**1,805**	11%	**199**	**7**	25%	**1.6**
2035	**1,805**	11%	**199**	**7**	25%	**1.6**
2040	**1,805**	11%	**199**	**7**	25%	**1.6**

Note: FAA TAF record of commercial operations did not include YKM commercial air cargo activity.
Source: Consultant Forecast Projection, December 2018.

3.8 OPERATIONAL MIX FORECAST

The aircraft operations forecast directly influences airfield and airspace utilization, taxiway system geometry, and airport infrastructure assets. Aircraft operations, defined as either a takeoff or a landing, determine the year-by-year total number of annual operations. The FAA classifies aircraft operations by single-engine piston, multi-engine piston, jet, helicopter, and other (includes experimental and light sport aircraft weighing less than 1,300 pounds).

The following assumptions were used in forecasting future operational fleet mix:

1. YKM scheduled air carrier service will transition towards more transport jet aircraft service, brought about by the retirement/replacement of turboprop aircraft and through the introduction of new airline service.
2. YKM air cargo flights will continue to consist of single and twin-turboprop aircraft, transitioning to more and larger twin-turboprop aircraft.
3. YKM general aviation traffic will continue to experience greater activity by higher-performance turbine aircraft (turboprop and jet), brought about by additional based turbine aircraft and greater utilization by turbine aircraft used for business and air taxi flights. Business jet activity, using FAA TMFSC data, averages 125 operations per month at YKM, or 1,500 to 2,000 operations per year. Small cabin jets (Category B) conduct an estimated 1,100 annual operations (60%), medium cabin jets (FAA Category C) conduct 550 annual operations (30%), and the large cabin jets (FAA Category D) conduct 190 annual operations (10%). The large-cabin business jets operating at YKM include the Gulfstream 400/500 Series and Bombardier Global Express Series. The transition towards more traffic by medium and large business jets at YKM is evidence of business jet utilization and manufacturing production (GAMA Annual Factbook).
4. YKM is a designated alternate airport for diverted SEA flights. On average, 2 to 3 flights a month divert to YKM due to poor weather or traffic flow conditions; or about 72 annual operations. Diversions include twin narrowbody transport jets such as the Boeing 737 700/800 Series (FAA Category C). These irregular operations at YKM are expected to continue as SEA becomes more congested.
5. YKM is used by Boeing Corporation for flight tests of transport-manufactured aircraft; including the B-737, B-767, B-777 and B-747 Series. On average, 2 to 6 Boeing flights per month use YKM; or about 144 annual operations. The Boeing activity is expected to increase at YKM, particularly with expanding Boeing B-737 MAX aircraft production levels.

Table 3-12 is a summary breakdown of annual operations by FAA aircraft category. This fleet mix forecast shows the future FAA critical aircraft category will continue to remain an AAC C and a ADG III; or a C-III Airport Reference Code.

Table 3-12: Forecast of Operations by Aircraft Type and FAA Category

FAA Aircraft Category	2018 Operations	2017/2018 % Operations	2040 Operations	2040 % Operations	Critical Aircraft Group
Total	**39,444**	**100.0%**	**48,557**	**100.0%**	
AAC A	23,470	59.6%	27,810	55.8%	
AAC B	8,380	21.3%	10,990	22.0%	
AAC C	**3,280**	**8.3%**	**5,800**	**11.6%**	**Existing /Future**
AAC D	300	0.8%	410	0.8%	
Helicopter	3,940	10.0%	4,850	9.7%	
ADG I	23,470	59.6%	27,810	55.8%	
ADG II	9,020	22.9%	11,920	23.9%	
ADG III	**2,860**	**7.3%**	**5,200**	**10.4%**	**Existing/Future**
ADG IV	80	0.2%	90	0.2%	
Helicopter	3,940	10.0%	4,850	9.7%	

Note: Totals subject to rounding. Bold denotes AAC and ADG Critical Aircraft classification.
Table Activity Sources: YKM Airport activity for ARC/RDC was documented from 1) interview with YKM Air Traffic Control Tower, 2) YKM Airport Staff interviews with key YKM tenants, 3) FAA OPSNET, 4) YKM ATC monthly operational reporting records, 5) FAA TFMSC data.
Source: Consultant Forecast Projection, December 2018.

3.9 AIRPORT CRITICAL AIRCRAFT FORECAST

This section describes the YKM critical aircraft forecast, as derived from the operational fleet mix forecast. The critical aircraft classification is assigned to each runway based on aircraft physical and performance characteristics to determine the applicable FAA standards to plan safe and efficient airport facilities. The critical aircraft is defined as that type (or combination of types) that regularly use, or are expected to use the airport. Regular use is defined as 500 or more annual operations. Below are the critical aircraft classifications as defined by FAA Advisory Circular 150/5300-13 *Airport Design:*

AAC: Aircraft Approach Category: alphabetic letter designating approach speed (knots).
ADG: Airplane Design Group: a roman numeral designating wingspan and tail height (feet).
TDG: Taxiway Design Group: number and alphabetic letter designating wheel configuration.

3.9.1 Runway Critical Aircraft Forecast

The following section describes the critical aircraft forecast for the Airport, Runway 9/27 (primary runway designation), and Runway 4/22 (crosswind, secondary, or additional runway designation).

The critical aircraft is the most demanding combination of similar aircraft conducting 500 regular-use annual operations, in reference to FAA aircraft classifications used for the Airport Reference Code (ARC) and Runway Design Code (RDC). The critical aircraft for primary runway also serves as the Airport's critical aircraft.

3.9.2 Primary Runway 9/27 Critical Aircraft Forecast

The following is the AAC and ADG critical aircraft determination for the primary runway based on existing and future activity levels, and other YKM unique factors. Figure 3-4 shows the critical aircraft characteristics.

AAC Determination: There were 3,186 total operations (3,024 civilian) by AAC C aircraft in 2017/2018; that number is projected to reach 5,825 total operations (5,525 civilian) in 2040. This exceeds the FAA regular use threshold; therefore, the AAC 'C' is justified.

ADG Determination: There were 2,828 total operations (2,666 civilian) by ADG III aircraft in 2017/2018; that number is projected to reach 5,770 total operations (5,070 civilian) by 2040. This exceeds the FAA regular use threshold; therefore, the AAC 'III' is justified.

Existing Critical Aircraft: The existing critical aircraft is the Bombardier Q400, which is a twin-turboprop transport aircraft currently operated by Alaska Airlines/Horizon Air. The Q400 conducts 2,500 operations annually on Runway 9/27. The Bombardier Q400 has a FAA ARC C-III and TDG-5 classification (Q400 operated with Category C approach speed in mountainous areas). Other similar aircraft frequently operating on the primary runway include:

- Boeing 737 Series (Scheduled Charter Flights, Manufacturer Flight Testing, Diversions)
- MD-80 Series (Scheduled Charter Flights, Diversions)
- Large Business Jets (Gulfstream G-400/500/600 and Bombardier Global Models)
- P-3 Orion and C-130 Hercules (Military Training)

Future Critical Aircraft: The future critical aircraft is a narrowbody jet aircraft, representative of the Embraer EMB 170/175 transport regional jet, with a FAA ARC C-III and TDG-2 classification. According to Alaska Airlines, the EMB 170/175 is a likely replacement for the Q400. Based on conversations with Alaska Airlines Fleet Management Department, the Q400 is being phased-out on the longer-distance routes and is anticipated to be retired from the fleet between 2025 and 2030, with no replacement turboprops identified. Although there are high-density and stretched versions of the Q400 being considered by the aircraft manufacturer, Alaska Airlines has not announced interest in new versions of the Q400. Depending on the Alaska Airlines regional airline affiliate, which is currently Horizon Air and SkyWest Airlines, the EMB 175 and Mitsubishi MRJ 70/90 would likely be the replacement jet for the Q400, phased-in on the higher-capacity YKM flights. Other similar regional jets include the CRJ 700/900/1000, EMB E-Jet, Airbus 220, Comac C919. The EMB 175 and MRJ 70/90 have similar dimensional and seating-capacity to the Q400, but are heavier and have more demanding performance and ground maneuvering/turning requirements. The EMB 175 was selected as the future critical aircraft because it is already in the Alaska Airlines/SkyWest fleet.

In addition, commercial, general aviation, and military aircraft larger and more demanding than the Q400 and EMB 175 operate at YKM, but are not forecast to conduct more than 500 operations per year. The Boeing-737 Series, with combined charter service, Boeing test flights, and SEA diversions, is forecast to operate at YKM between 250 and 300 operations per year.

For future planning purposes, the Airport's FAA design standards should accommodate aircraft with an AAC approach speed less than 141 knots, an ADG aircraft wingspan up to 117 feet, and a tail height up to 44 feet.

Figure 3-4: Runway 9/27 Critical Aircraft (Existing and Future)

Existing Critical Aircraft

Aircraft Design Characteristics:	
Aircraft Type:	Turboprop Transport
FAA ARC/TDG:	C-III; TDG 5
Approach Speed:	129 Knots
Wingspan:	93'
Length:	107'8"
Tailheight:	27.4'
Maximum Weight:	65,200 Pounds
Seating Configuration:	70 to 76 Passengers
Cockpit to Main Gear (CMG)	45.8'
Wheelbase	45.8'
Main Gear Width (MGW)	33.2'

Future Critical Aircraft

Aircraft Design Characteristics:	
Aircraft Type:	Regional Jet Transport
FAA ARC/TDG:	C-III; TDG 2
Approach Speed:	138 Knots
Wingspan:	85'
Length:	103'9"
Tailheight:	31.9'
Maximum Weight:	82,700 Pounds
Seating Configuration:	77 to 88 Passengers
Cockpit to Main Gear (CMG)	42.0'
Wheelbase	37.5'
Main Gear Width (MGW)	17.0'

Source: Consultant Forecast Projection, December 2018.

3.9.3 Runway 4/22 Critical Aircraft Forecast

The following is the AAC and ADG critical aircraft determination for Runway 4/22 based on existing and future activity levels.

AAC Determination: There were 1,200 total operations (1,200 civilian) by AAC B aircraft in 2018; that number is projected to reach 1,600 total operations (1,600 civilian) in 2040. This exceeds the FAA regular use threshold; therefore, the AAC 'B' is justified.

ADG Determination: There were 650 total operations (650 civilian) by ADG II aircraft in 2018; that number is projected to reach 900 total operations (900 civilian) by 2040. This exceeds the FAA regular use threshold; therefore, the AAC 'II' is justified.

Existing Critical Aircraft: The existing critical aircraft is represented by the Embraer 120 Brasilia (EMB-120), which is a twin-turboprop currently used for air cargo at YKM, and similar to other single and twin-turboprops used for commercial flights. The EMB-120 and similar turboprop aircraft conduct an estimated 600 operations annually on Runway 4/22. The EMB-120 has a FAA ARC B-II and TDG-2 classification. The turbine (turboprop and business jet) aircraft frequently operating on Runway 4/22 include:

- Embraer 120 Brasilia (air cargo twin-turboprop)
- ATR 42 (air cargo twin-turboprop)
- Cessna Caravan 208 Series (air cargo single-turboprop)
- Pilatus PC-12 (charter and air medical evacuation single-turboprop)
- Swearingen Metro SW3/SW4 (air cargo twin-turboprop)
- Beechcraft 99 (air cargo twin-turboprop)
- King Air 90/100/200/300 Series (charter and business pressurized twin-turboprop)
- Light/small/medium cabin business jets – based and itinerant
- ST-2 (US Forest Service aerial firefighting single-turboprop)

Future Critical Aircraft: The future Runway 4/22 critical aircraft is a twin turboprop with a FAA ARC B-II and TDG-2 classification. The critical aircraft is represented by the Beechcraft King Air 200/300/1900 Series, which is a large twin-turboprop aircraft (aircraft over 12,500 pounds maximum takeoff weight) currently based at YKM and operates on Runway 4/22 for commercial and business/corporate purposes, including scheduled air cargo, on-demand medical air lift. Figure 3-5 shows the Runway 4/22 critical aircraft characteristics.

Figure 3-5: Runway 4/22 Critical Aircraft (Existing and Future)

Existing Critical Aircraft

Aircraft Design Characteristics:	
Aircraft:	Embraer Brasilia 120
Aircraft Type:	Twin Engine Turboprop
FAA ARC/TDG:	B-II; TDG 2
Approach Speed:	113 Knots
Wingspan:	65'
Length:	66'
Tailheight:	22'
Maximum Weight:	26,400 Pounds
Seating Configuration:	2 Crew + 10± Passengers
Cockpit to Main Gear (CMG)	22'
Wheelbase	23'
Main Gear Width (MGW)	23'

Note: Aircraft dimensions and performances vary per model configuration.

Future Critical Aircraft

Aircraft Design Characteristics:	
Aircraft:	Beechcraft King Air 350/1900
Aircraft Type:	Twin Engine Turboprop
FAA ARC/TDG:	B-II; TDG 2
Approach Speed:	113 Knots
Wingspan:	58'
Length:	57'
Tailheight:	16'
Maximum Weight:	17,200 Pounds
Seating Configuration:	2 Crew + 10± Passengers
Cockpit to Main Gear (CMG)	16'
Wheelbase	24'
Main Gear Width (MGW)	17'

Note: Aircraft dimensions and performances vary per model configuration.

Source: Consultant Forecast Projection, December 2018.

3.10 FORECAST OF BASED AIRCRAFT

The based aircraft forecast is quantified by total civilian aircraft stored at YKM as part of a lease or parking rental-term agreement. The forecast includes total based aircraft by aircraft type (piston, turboprop, jet, helicopter) and engine number (single, twin). The forecast directly influences the planning of airside and terminal area facilities, space allocation, property assets, and access.

3.10.1 Local Factors

The following are forecast factors for based aircraft:

- YKM hangar-waiting list exceeds hangar availability (FBO hangar waiting list is proprietary). Tenants are seeking new hangars for all aircraft types, including piston, turboprop, and business jets.

- Airport tenants will drive new and additional based aircraft. YKM tenants involved with providing pilot/aircraft services and charter flights will continue to rely on higher performance aircraft and upgrade new technologies, a trend already evident with recent aircraft acquisitions and upgrades. Sport aviation will grow and potentially evolve further, particularly with CubCrafters building approximately 50 sport aircraft per year at YKM, and generating activity related to pilot training/proficiency, repairs, and support services.

- Airport is pursuing redevelopment and expansion of the southside hangar/FBO area. The proposed expansion concept would add 7 hangars and an estimated 5 to 15 additional based aircraft.

- The Seattle/Puget Sound Region airports are experiencing operational and land development constraints, which could cause spillover to the YKM as people seek options to operate at less crowded facilities, lower rents (hangars), and better flying weather. This is a trend already evident at YKM.

- Aging based aircraft, particularly the two to four-seat piston aircraft, will likely continue relocation and/or attrition as the result of aircraft sales, regulatory requirements, and operating costs.

3.10.2 Forecast of Based Aircraft

The based aircraft forecast are total civilian aircraft stored at YKM as part of a lease or parking rental-term agreement. The Airport reported 131 total based aircraft in 2018; comprised of 107 single-engine piston (82%), 8 multi-engine (6%), 7 turboprops (5%), 6 business jets (5%), and 3 helicopters (2%). The forecast includes total based aircraft by aircraft type (piston, turboprop, jet, helicopter) and engine number (single, twin). The forecast directly influences the planning of landside facilities, space allocation, property assets, and access. Historical records of the number of aircraft based at YKM since 2000 were examined as part of this master plan.

- **FAA Terminal Area Forecast (FAA TAF):** Total 20-year based aircraft increase from 132 in 2020 to 175 in 2040 (2.2 annual average), a 32 percent overall growth and a 1.4 percent annual growth rate. When indexed to the actual 132 based aircraft in 2018, the adjusted FAA TAF results in 178 based aircraft by 2038.

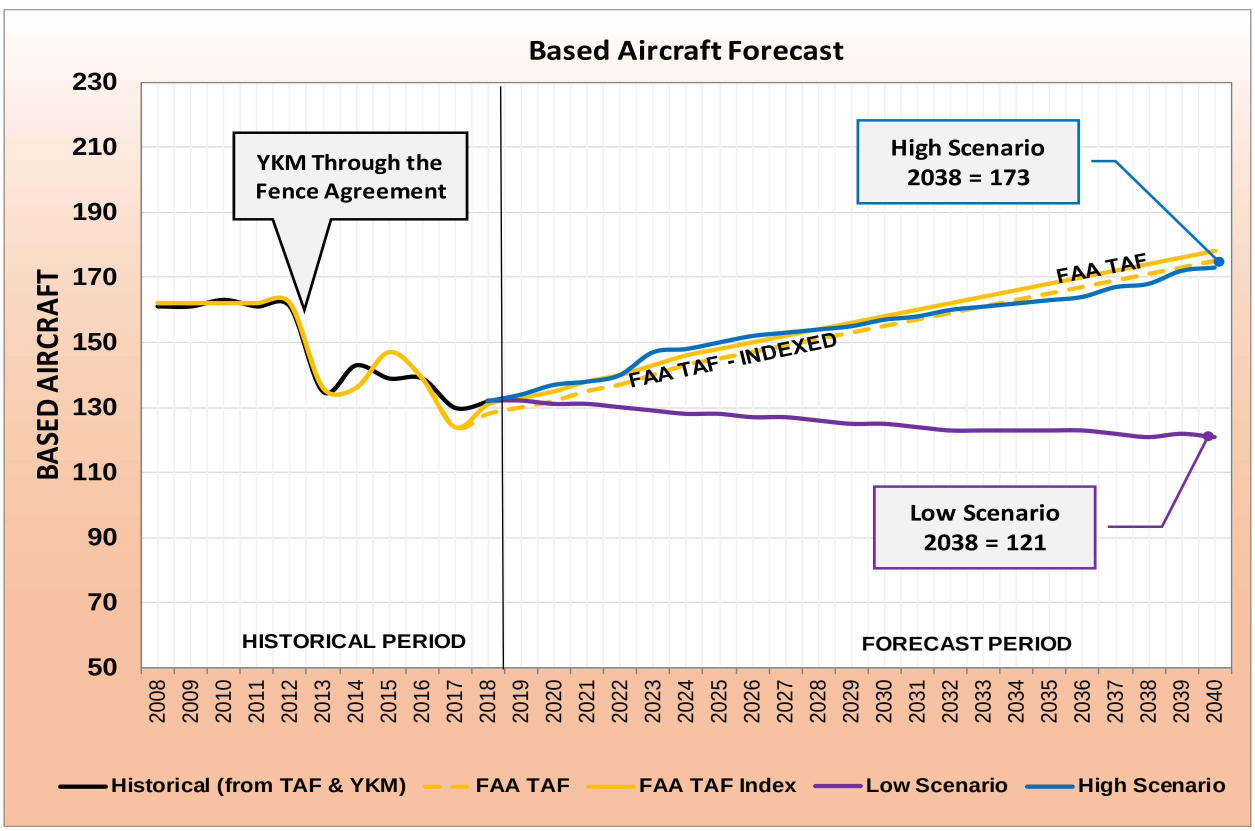
- **Low Scenario:** This forecast approach uses the FAA 20-year fleet growth rates applied to separate aircraft categories (single piston, multi piston, turboprop, jet, helicopter, other) as derived from the *FAA Aerospace Forecasts* (Table 28). The annual growth rates are: -1.0 percent for single engine piston, -0.4 percent for multi-engine piston, 1.7 percent for single turboprop, 1.7 percent for multi turboprop, 2.2 percent for light/small cabin business jets, 2.2 percent for medium/large cabin business jets, 1.5 percent for helicopters, and 1.1 percent for other aircraft. In addition, aircraft production rates published by the General

Aviation Manufacturing Association (GAMA) were reviewed to provide an understanding of delivery trends for specific fixed-wing and helicopter aircraft models.

- **High Scenario:** This forecast approach uses the Washington Office of Financial Management (OFM) medium growth rate to project future based aircraft. This forecast assumes the construction of additional hangars being planned for the next two to five years. This forecast approach assumes that influences at YKM will be positive for based aircraft. In addition, aircraft production rates published by the General Aviation Manufacturing Association (GAMA) were reviewed to provide an understanding of delivery trends for specific fixed-wing and helicopter aircraft models. Accordingly, this scenario reflects the following YKM forecast factors:
- **Preferred Forecast Summary and Reasonableness (High Scenario):** The high forecast scenario more closely aligns with the YKM forecast factors and hangar construction demand. In addition, the high forecast scenario is consistent with a growing Yakima region and economy. The high forecast scenario does not exceed the FAA TAF.

Figure 3-6 and Table 3-13 summarizes the preferred based aircraft forecast scenarios.

Figure 3-6: Based Aircraft Trend and Forecast Scenarios



Source: Consultant Forecast Projection Exhibit, December 2018.

Table 3-13: Forecasts for Total Based Aircraft

Year	2015 Preferred (Average)	FAA TAF	FAA TAF (Indexed to 2018)	Low Scenario	High Scenario (Preferred)
2018	175	128	131	131	131
2020	185	132	135	131	137
2025	196	145	148	128	150
2030	208	155	158	125	157
2035	N/A	165	168	123	163
2040	N/A	175	178	121	173
Total	--	43	43	-10	36
Annual	--	2.2	2.2	-0.5	1.8
% Total	--	32.6%	31.9%	-7.6%	26.3%
% Annual	--	1.42%	1.39%	-0.40%	1.17%

Note: FAA TAF published in February 2019. | Note: TAF indexed to actual 2018 based aircraft reported by the Airport.
Source: Consultant Forecast Projection, December 2018.

3.10.3 Based Aircraft Fleet Mix

The following is a forecast of the based aircraft mix type category and FAA classification. The FAA classifies aircraft operations by single-engine piston, multi-engine, jet (includes jets and turboprops), helicopter, and other (includes experimental and light sport aircraft weighing less than 1,300 pounds). The following defines the aircraft fleet mix categories:

- **Single-Engine/Piston (SE)**: Includes single-engine piston, piston light sport aircraft (LSA) weighing more than 1,300 pounds, and single-engine turboprop.
- **Multi-Engine/Piston (ME)**: includes multi-engine piston and multi-engine turboprop aircraft; excludes business jets.
- **Jet:** Includes business/corporate jet aircraft and very light jets (VLJ).
- **Rotor:** Includes piston and turbine-powered helicopters.

It is expected that this fleet will evolve based on changes in the aircraft manufacturing, delivery, and use trends being experienced nationally. Naturally the fleet will continue to be dominated by small private aircraft used as personal or business aircraft. However, the increasing reliance on jet aircraft by the corporate sector in general will be felt in Yakima as the population and economy continues to evolve. The recommended YKM fleet mix forecast for the benchmark years is presented in Table 3-14.

Table 3-14: Based Aircraft Fleet Mix Forecast

Year	Single Engine Piston		Multi Engine Piston		Turbine (Turboprop+Jet)		Rotor		Total	
	%	No.	%	No.	%	No.	%	No.	%	No.
2018	81.7%	107	6.1%	8	9.9%	13	2.3%	3	100%	**131**
2020	81.7%	112	6.1%	8	9.9%	14	2.3%	3	100%	**137**
2025	81.7%	123	6.1%	9	9.9%	15	2.3%	3	100%	**150**
2030	81.7%	128	6.1%	10	9.9%	16	2.3%	4	100%	**157**
2035	81.7%	133	6.1%	10	9.9%	16	2.3%	4	100%	**163**
2040	81.7%	141	6.1%	11	9.9%	17	2.3%	4	100%	**173**

Source: Consultant Forecast Projection, December 2018.

3.11 FAA TAF FORECAST COMPARISON

The YKM Master Plan forecasts are used to evaluate the type, size, and location of capital improvements. This serves as the basis for Plan decision-making and recommendations, used to analyze facility requirements, to assess alternatives, and to prioritize project improvements.

Forecast of FAA Planning Activity Levels

The preferred forecasts project anticipated demand levels. Based on various circumstances, certain aspects of forecast demand may deviate from the projected timeline or may not materialize as planned. Therefore, because actual year-to-year activity can deviate from forecast projections, the YKM should monitor the relationship between forecast demand and actual activity levels. As recommended by FAA Advisory Circular 150/5070-6B, the Airport should track planning activity levels, rather than specific years, to guide the thresholds for triggering Airport project improvements. This approach considers constrained and unconstrained forecasts, as a matter of reviewing the operational factors and events implicit in the forecast to determine if differing assumptions regarding those factors have affected the forecast results.

FAA Terminal Area Forecasts (TAF) Consistency

The FAA reviews and approves Master Plan forecasts. Table 3-15 summarizes and compares the preferred 20-year Master Plan forecasts with the currently approved FAA TAF (dated February 2019), in terms of consistency with FAA forecast tolerances. The Master Plan forecasts are considered consistent with the TAF if the forecasts differ by less than 10 percent in the five-year forecast period, and 15 percent in the 10-year forecast period. The FAA bases primary considerations in forecast review and approval on forecasts using reasonable planning assumptions, current data, and appropriate forecast methods.

The Master Plan forecasts, once approved by the FAA, are commonly accepted as the future FAA TAF forecast, and later used for environmental and financial planning purposes. The forecasts require review and approval by the FAA, as conducted per *FAA Review and Approval of Aviation Forecasts* dated June 2008.

Table 3-15: FAA TAF Forecast Comparison

Year	Master Plan (Preferred Forecast)	FAA TAF	FAA TAF Indexed	Airport/TAF (Difference)	Airport/TAF % Difference (2018 TAF)
Enplaned Passengers (FAA Boardings)					
2018	73,342	70,736	--	2,606	**3.7%**
2020	74,800	72,902	--	1,898	**2.6%**
2025	81,600	78,616	--	2,984	**3.8%**
2030	87,200	84,787	--	2,413	**2.8%**
2035	91,800	91,451	--	349	**0.4%**
2040	92,600	98,649	--	-6,049	**-6.1%**
Total Annual Airport Operations					
2018	39,440	37,136	--	2,304	**6.2%**
2020	40,470	37,171	--	3,299	**8.9%**
2025	42,450	38,115	--	4,335	**11.4%**
2030	44,420	39,088	--	5,332	**13.6%**
2035	46,490	40,097	--	6,393	**15.9%**
2040	48,570	41,137	--	7,433	**18.1%**
Total Based Aircraft					
2018	131	128	131	3	**2.3%**
2020	137	132	135	5	**3.8%**
2025	150	145	148	5	**3.4%**
2030	157	155	158	2	**1.3%**
2035	163	165	168	-2	**-1.2%**
2040	173	175	178	-2	**-1.1%**

Note: FAA TAF published in February 2019. | Note: Red Text notes forecast beyond FAA TAF tolerances.

Source: Consultant Forecast Projection, December 2018.

3.12 FORECAST SUMMARY

The following summarizes the YKM Master Plan forecasts:

- YKM forecast components increase about one to two percent annually throughout the 20-year forecast period; consistent with the YKM FAA Terminal Area Forecasts and the FAA *Aerospace Forecasts*.
- The Runway 9/27 critical aircraft to remain a FAA C-III Category; critical aircraft expected to transition from a turboprop to a regional jet beyond 2030.
- The Runway 4/22 critical aircraft is a FAA B-II Category; based on activity levels, the critical aircraft is a twin-turboprop used for commercial air cargo, medical emergency, and general aviation business charter flights.

4

4 FACILITY REQUIREMENTS

4.1 INTRODUCTION

This chapter assesses the facilities at Yakima Air Terminal/McAllister Field (YKM) and their ability to accommodate the activity levels developed in the Aviation Demand Forecasts. Capacity deficiencies are identified as are the actions needed to correct them. The first issue addressed is the ultimate configuration of the airfield followed by an analysis of the passenger terminal, air cargo facilities, aircraft hangar and apron areas, Fixed Base Operator (FBO) facilities, access and vehicle parking, utilities, and aviation support facilities. Table 4-1 summarizes the conclusions from this chapter.

Table 4-1: Existing Facilities Assessment & Recommendations

Actual	Conclusions
Airfield System	The wind coverage and capacity needs at YKM are met by a single runway. Runway 9/27, at 7,604 feet, does not provide the take-off length for the future design aircraft. Based on upgraded runway length analysis, a future runway length of 7,800 feet is recommended based on the forecast critical aircraft. Maintaining Runway 4/22 at a future length of 4,000 feet is recommended due to a variety of operational factors described in this narrative.
Passenger Terminal	The 2015 Airport Master Plan recommended expanding the existing passenger terminal building to meet future needs. If full expansion is deferred, terminal layout and maintenance issues may require action to be taken sooner to maintain an acceptable level of service.
Automobile Parking	The current public parking lot is adequate to meet current needs. Parking lot expansion is recommended if airline frequency increases. The overflow parking lot should be maintained for peak travel seasons and charter flights. It is also recommended that the rent-a-car ready/return and rental car parking area be expanded prior to this time.
Air Cargo	Although air cargo is forecast to continue to consist of feeder service using the C208, ATR-42, ATR-72, Beechcraft 1900, and E120 aircraft, additional space will need to be provided in the future, either by remarking existing pavement or by constructing new.
Based Aircraft Hangar Storage	With the growth in based aircraft that has been forecast, as well as the existing unmet demand for hangar space, additional area for hangar development will need to be made available for future development.
FBO and support facility expansion	Expanded FBO facilities are required to provide support for the general aviation community. These facilities will provide not only aircraft maintenance hangars, but

Actual	Conclusions
	also pilot lounge areas, area for fueling aircraft, and sufficient space for transient aircraft parking.
Fueling	The current system is adequate, assuming the private sector continues to upgrade their facilities and improve delivery as needed.
Snow Removal Equipment & Maintenance Building	Expand the existing facility to provide sufficient parking for the airports current number of snow removal equipment. Or relocate the maintenance facility to another site that better suits the needs of the airport.
Air Traffic Control Tower	To remedy the line of sight concerns, it is recommended that FAA increase the height of the tower to improve visibility for the Air Traffic Controllers.

4.2 AIRFIELD REQUIREMENTS

There are two active runways at YKM: the primary Runway 9/27 and secondary Runway 4/22. Runway 9/27 is 7,604 feet long and 150 feet wide. Runway 4/22 is 3,835 feet long by 150 feet wide. Both runways have parallel taxiway systems, with Taxiway A serving Runway 9/27 and Taxiway B serving Runway 4/22. Taxiway A was reconstructed in 2016 at a width of 64 feet, with an FAA-approved Modification of Standards (MOS)[1]; Taxiway B is 75 feet wide.

Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A, Airport Design (Change 1), requires that the future classification of the airport be used as the basis for airfield design. Based on the 2018 forecast update, the current critical aircraft at YKM was determined to be the Bombardier Q400 (Q400) and the future critical aircraft will be the Embraer 175 (E175). These aircraft have an Airport Reference Code (ARC) of C-III.

As noted in the updated forecasts, Runway 4/22 serves a variety of single- and multi-engine piston and turboprop aircraft. Based on existing and forecast activity, ARC B-II is recommended for Runway 4/22.

4.2.1 Runway 9/27 Facility Requirements

This section documents the Runway 9/27 facility requirements for current and forecast YKM user demands and the corresponding Runway Design Code (RDC) C-III critical aircraft design standards. Runway 9/27 is 7,604’ x 150’ and a precision instrument runway that accommodates commercial transport category turbine aircraft, large and small piston and turbine aircraft, and large turbine military aircraft.

[1] FAA MOS, Date 10/8/2013

4.2.2 Runway 9/27 Length Requirements

The required length of a runway at an airport is calculated based on the types of aircraft regularly using it. In 2018, YKM received 39,444 aircraft operations, with 7,422 of those being commercial activities (including 4,885 ARC C-III operations). As noted earlier, the current and future critical aircraft at YKM are the Q400 and the E175. Alaska Airlines long-term fleet transition plan includes reducing or phasing out the Q400 currently used on its shorter routes, to be replaced with the E175. In mid-2019, Alaska had 34 Q400s and 60 E175s in their fleet, in addition to 166 Boeing 737 aircraft.

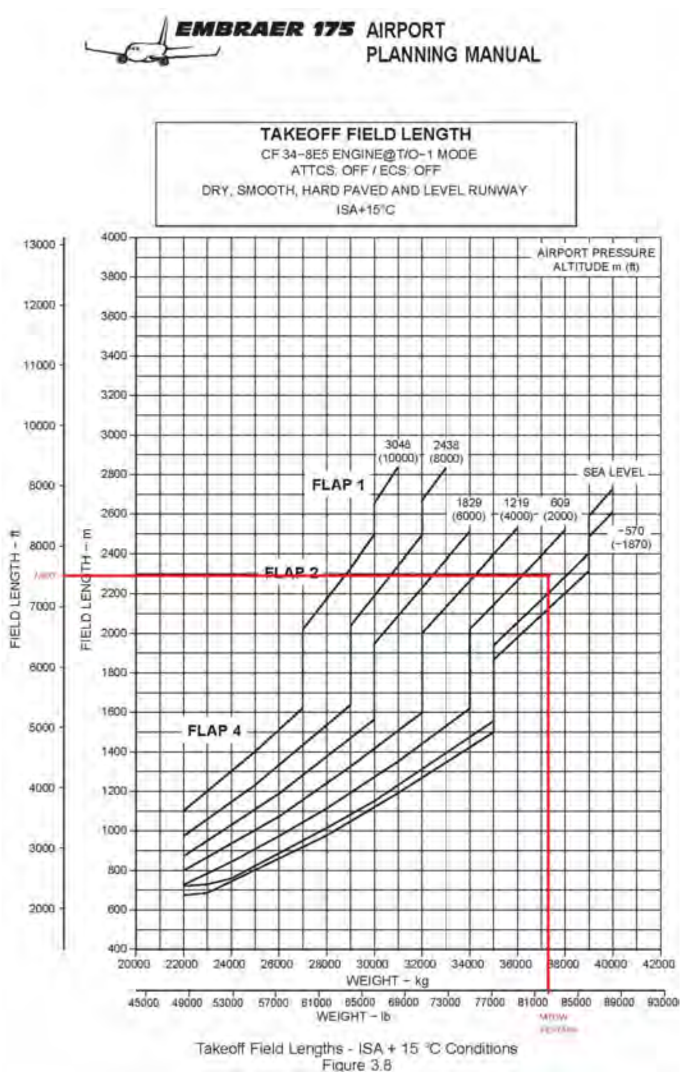
In addition, YKM accommodates a variety of non-scheduled flights involving ARC C-III aircraft (typically B737, MD80), including casino charters, federal Immigration and Customs Enforcement (ICE) contract transport, and Boeing manufacturing test flights. YKM also serves as a primary diversion airport for Seattle-Tacoma International Airport (SEA) during periods of inclement weather or severe traffic congestion.

Table 4-2 lists the representative group of critical aircraft using YKM today or forecast to use the airport in the future, with the corresponding runway take-off length requirements provided for each aircraft. The runway lengths assume an airport elevation of 1,099 feet MSL, a mean maximum temperature of 88 degrees Fahrenheit, and maximum gross takeoff weight for each aircraft. The runway lengths required for take-off at YKM vary from 6,200 feet for the Q400 to 9,000 feet for the MD-83.

Table 4-2: Existing and Future Critical Aircraft Use

Airport and Runway Data			
Airport elevation (mean sea level)			1,099 feet
Mean daily maximum temperature of the hottest month			88°F
Maximum difference in runway centerline elevation			49.8 feet
Length of haul for airplanes of more than 60,000 pounds			1,500 miles
FAA Class	**Aircraft Type**	**Required Take-off Runway Length (Feet)**	**Maximum Takeoff Weight (Pounds)**
Jets			
C-III	Embraer 170/175	7,800	82,673
C-III	Boeing 737 – 300	8,000	139,500
D-III	Boeing 737 – 800	8,847	174,200
C-III	McDonald Douglas 83	9,000	160,000
Turboprop			
C-III	Bombardier Q400	6,200	65,200
Source	*Bombardier Q400 – Airport Planning Manual (ISA + 15°c)* *Embraer 175 – Airport Planning Manual (ISA + 15°c)* *Boeing 737 – Airport Planning Manual (Std + 15°c)* *McDonald Douglas 83 – Airport Planning Manual (Std + 15°c)*		

Table 4-3: Future Critical Aircraft (E175) Length Calculator



Length Recommendation:

The recommended runway length is 7,800 feet based on the future critical aircraft (E175) as identified in Table 4-3. However, a runway length reserve of 8,847 feet is planned, based on the mix of large transport category jets (greater than 150,000 pounds) operating at YKM. In addition to the relatively high mean maximum temperature (88 degrees F), preserving the additional runway length will provide maximum development flexibility for the airport. As with any runway extension, an updated analysis of design aircraft activity will be required by FAA prior to design/construction in order to provide adequate justification for FAA funding.

Existing Condition: **7,604 Feet**
Planning Standard/Analysis:

7,604± to 7,800 Feet

Future Runway 9/27 Facility

Recommendation: **7,800 Feet**

4.2.3 Runway 9/27 Width Requirements

Runway 9/27 is 150 feet wide, previously constructed to meet RDC C-III standards for large aircraft traffic. Runway 9/27 is planned to remain a precision instrument runway.

Width Recommendation: Maintain the existing width of 150 feet.

Existing Condition**: 150 Feet**
Planning Standard (RDC C-III, Large Aircraft)**: 150 Feet**
Facility Recommendation (RDC C-III, Large Aircraft)**: 150 Feet**

4.2.4 Runway 9/27 Design Standards

The airfield at YKM is classified as ARC C-III. C-III is also the design classification for Runway 9/27. The information contained in Table 4-4 shows the standards for this category compared with the current layout features of the airport.

Table 4-4: Existing Conditions vs. C-III Design Criteria (Runway 9/27)

Design Feature	Existing (ft.)	Standard (ft.)	Difference
Runway:			
Width	150	150	Meets Standard
Runway Shoulder Width	10	25	-15 feet
Runway Blast Pad Width	160	200	-40 feet
Runway Blast Pad Length	200	200	Meets Standard
Runway Safety Area (RSA) Width	500	500	Meets Standard
Safety Area Length (beyond runway end)	1,000	1,000	Meets Standard
Object Free Area Width	800	800	Meets Standard
Object Free Area Length (beyond runway end)	1,000	1,000	Meets Standard
Obstacle Free Zone Width	400	400	Meets Standard
Obstacle Free Zone Length	7,804	7,804	Meets Standard
Taxiway A (Parallel):			
Width	64	75	-11 feet (MOS)
Safety Area Width	214	214	Meets Standard
Object Free Area Width	320	320	Meets Standard
Taxilane Object Free Area Width	162	162	Meets Standard
Taxiway Centerline to Fixed or Movable Object	160	160	Meets Standard
Taxilane Centerline to Fixed or Movable Object	138	138	Meets Standard
Runway Centerline to:			
Taxiway Centerline	400	400	Meets Standard
Aircraft Parking Area	500	500	Meets Standard

Source: FAA Advisory Circular 150/5300-13, Airport Design, Change 6

4.2.5 Runway 9/27 - Taxiway A Facility Standards

Taxiway A is the full-length parallel taxiway system supporting Runway 9/27. This taxiway expedites traffic maneuvering between Runway 9/27 and aircraft parking areas. The following analysis of the Taxiway A existing conditions is based on FAA RDC C-III and Taxiway Design Group (TDG) 5 critical aircraft standards:

Taxiway Width: **Existing is 64 feet | FAA TDG 5 Standard is 75 feet**
Taxiway Shoulders: **Existing is 20 feet (TWY A5 is 30 feet) | FAA Standard is 30 feet**
Taxiway-Runway Separation: **Existing is 400 feet | FAA Standard is 400 feet**
Taxiway Hold Position: **Existing is 261 feet | FAA Standard is 261 feet (standard is 250' +1' per 100' above MSL)**
Taxiway Edge Lighting: **Existing is MITL | FAA Standard is MITL**

4.2.6 Runway 4/22 Facility Requirements

This section documents the Runway 4/22 facility requirements for current and forecast YKM user demands. Runway 4/22 is 3,835' x 150', and a visual runway that accommodates piston and turbine aircraft with commercial and general aviation traffic. It's existing and future critical aircraft is a B-II Large, based on the updated forecasts.

4.2.7 Runway 4/22 Length Requirements

Runway length is determined by the greater of the takeoff or landing performance characteristics of critical aircraft or representative aircraft within the critical aircraft runway design code. The takeoff length is typically more demanding than the landing length because the takeoff length involves the takeoff run, takeoff distance, and accelerate-go/stop distance.

Runway 4/22 length analysis was assessed using two methods:

#1: FAA Advisory Circular 150/5325-4B *Runway Length Requirements for Airport Design*
#2: Critical aircraft takeoff/landing distances using manufacturer performance curves

Runway Length Analysis – FAA Design Standards (Small Aircraft >12,500lbs)

FAA Advisory Circular 150/5325-4B guidance (AC Steps #1 to #5) was followed for assessing the Runway 4/22 length requirement. The applicable FAA takeoff performance curve for Runway 4/22 is 100 percent of the general aviation propeller fleet with less than 10 passenger seats at maximum takeoff operating weight - MTOW (includes passengers, cargo payload, and fuel). The FAA performance curve was adjusted to compensate for YKM airfield elevation (1,099' mean sea level) and YKM monthly mean maximum ambient temperature (88°F July). See Table 4-5 for the length calculation for small general aviation aircraft (100% General Aviation Propeller Fleet, FAA AC Figure 2-1)

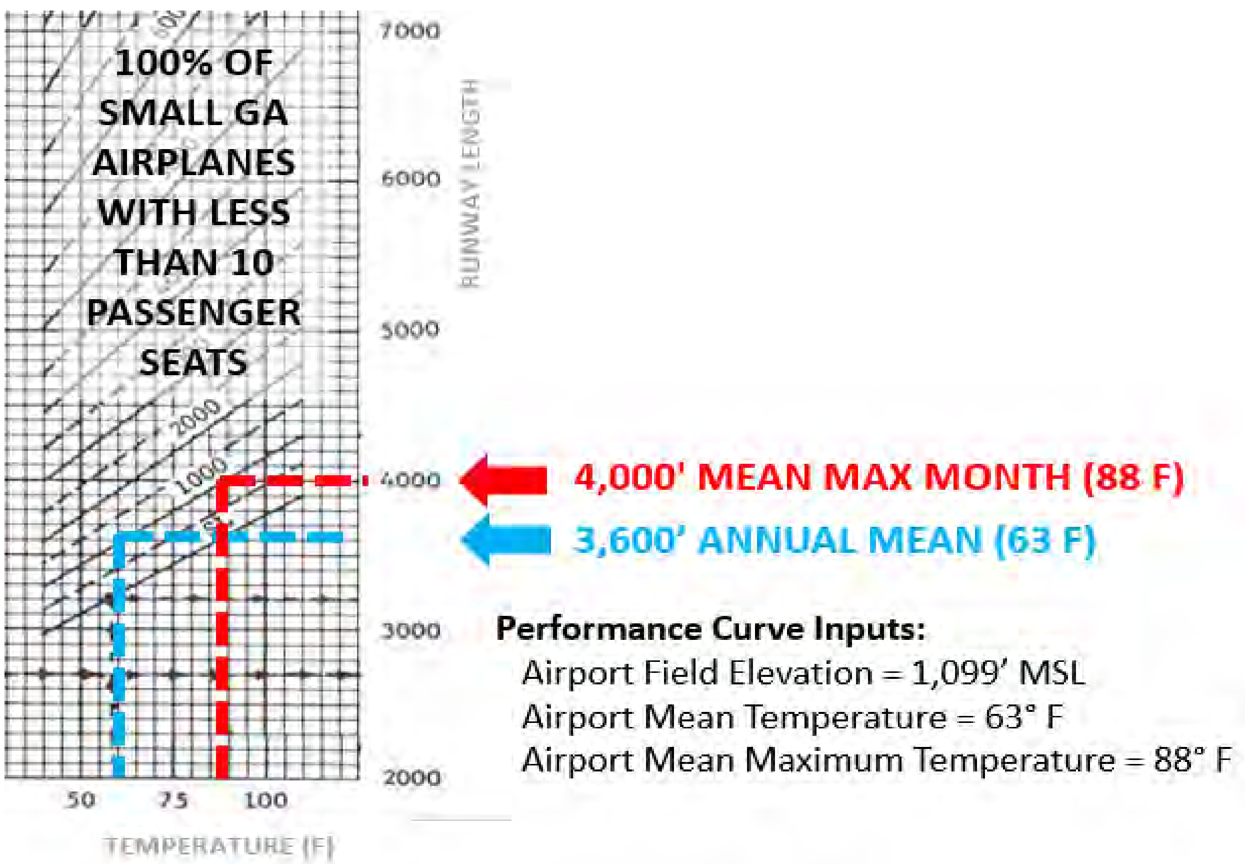
FAA Runway Length Curve (100% General Aviation Propeller Fleet at 88°F): **4,000 feet**

Runway 4/22 Critical Aircraft (King Air Series)

The Beechcraft King Air 300/1900 Series is the Runway 4/22 critical aircraft. These multi-engine turboprop models represent the most demanding aircraft regularly operated on Runway 4/22. Common uses include scheduled air cargo, medivac transport, and general aviation passenger and freight flights. The Beechcraft manufacturer takeoff performance curves for the King Air 300/1900 Series require an accelerate-go/stop takeoff distance ranging from 3,300 to 3,800 feet based on the YKM field elevation (1,099' MSL) and the annual/monthly mean maximum ambient temperatures (63°F Annual/88°F July).

King Air Series Critical Aircraft (Beechcraft Manuals at 63°F to 88°F): **3,800± feet**

Table 4-5: FAA Runway Length Curve (100% of Small Aircraft)



Source: FAA Advisory Circular 150/5325-4B, Figure 2-1.

Length Recommendation: The recommended future Runway 4/22 length is 4,000 feet. This length reflects the FAA requirements for 100 percent of the small airplane fleet operating at YKM based on the mean maximum monthly temperature, which also captures the mix of turbine aircraft operating requirements.

Existing Condition: **3,835 Feet**

Planning Standard/Analysis: **3,800± to 4,000 Feet**

FAA Curve (GA 100% Piston Propeller Fleet at 88°F)

FAA Curve (GA Turboprop Propeller Fleet with 10+ Passenger Seats at 63°F)

Beechcraft King Air 300/1900 Critical Aircraft Performance Data

Future Runway 4/22 Facility Recommendation: **4,000 Feet**

4.2.8 Runway 4/22 Width Requirement

Runway 4/22 is 150 feet wide, previously designed to meet RDC B-III standards for large turboprop traffic. Based on FAA RDC B-II design criteria, Runway 4/22, the 75-foot standard width is recommended for Runway 4/22. The 75-foot width accommodates the existing and future critical aircraft (Beechcraft King Air 300/1900) and is also consistent with the mix of piston and turbine traffic operating on the runway. Runway 4/22 is planned to remain a visual runway, although any future upgrade to non-precision instrument would not be affected by the 75-foot width.

Width Recommendation: Reduce the Runway 4/22 width from 150 to 75 feet. The runway narrowing could occur along or offset to the existing runway centerline, also in consideration of pavement profile, edge lighting, and the parallel taxiway separation distance. It is recommended that the Runway 4/22 width change be completed as part of a major Runway 4/22 pavement project.

Existing Condition**: 150 Feet**
Planning Standard (RDC B-II, Large Aircraft)**: 75 Feet**
Facility Recommendation (RDC B-II, Large Aircraft)**: 75 Feet**

4.2.9 Runway 4/22 - Taxiway B Facility Standards

Taxiway B is the full-length parallel taxiway system supporting Runway 4/22. This taxiway expedites traffic maneuvering between Runway 4/22 and aircraft parking areas. The following analysis of the Taxiway B existing conditions is based on FAA RDC B-II (Large Aircraft) and Taxiway Design Group (TDG) 2 critical aircraft standards:

Taxiway Width: **Existing is 75 feet | FAA TDG 2 Standard is 35 feet**
Taxiway Shoulders: **Existing is 0 feet | FAA Standard is 15 feet (recommended)**
Taxiway-Runway Separation: **Existing is 315 feet | FAA Standard is 240 feet**
Taxiway Hold Position: **Existing is 200 feet | FAA Standard is 200 feet**
Taxiway In-Line (Rwy 22 End): **Existing is 180 feet | FAA Standard is Removal**
Taxiway Edge Lighting: **Existing is MITL | FAA Standard is Reflectors/MITL**

Table 4-6 lists the standards for Runway 4/22. Many of the existing conditions either do not meet standards or exceed standards. The alternatives review will evaluate the configuration and recommend changes to meet standards.

Table 4-6: Existing Conditions vs. B-II Design Criteria (Runway 4/22)

Design Feature	Existing (ft.)	Standard (ft.)	Difference
Runway:			
Width	150	75	Exceeds Standard
Runway Shoulder Width	5	10	-5 Feet
Runway Blast Pad Width	None	95	-95 Feet
Runway Blast Pad Length	None	150	-150 Feet
Runway Safety Area (RSA) Width	200	150	Exceeds Standard
Safety Area Length (beyond runway end)	600	300	Exceeds Standard
Object Free Area Width	500	500	Meets Standard
Object Free Area Length (beyond runway end)	600	300	Exceeds Standard
Obstacle Free Zone Width	400	400	Meets Standard
Obstacle Free Zone Length	200	200	Meets Standard
Taxiway B (Parallel):			
Width	75	35	Exceeds Standard
Safety Area Width	118	79	Exceeds Standard
Object Free Area Width	186	131	Exceeds Standard
Taxilane Object Free Area Width	115	115	Meets Standard
Taxiway Centerline to Fixed or Movable Object	65.5	65.5	Meets Standard
Taxilane Centerline to Fixed or Movable Object	57.5	57.5	Meets Standard
Runway Centerline to:			
Taxiway Centerline	300	240	Exceeds Standard
Aircraft Parking Area	420	250	Exceeds Standard

Source: FAA Advisory Circular 150/5300-13A, Airport Design, Change 1
Note: Runway 4/22 and Taxiway B were constructed to meet B-III standards that exceed B-II standards.

4.3 AIRFIELD AND RUNWAY CAPACITY

Airfield capacity analysis is used to identify the type and timing of airfield enhancements to optimize operational efficiency and increase level of service. The Annual Service Volume (ASV) is the FAA method to quantify airport operational capacity. The ASV, as defined in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, is the number of annual aircraft takeoff and landing operations accommodated by the runway and taxiway system. The ASV is calculated using the following inputs:

- Airfield (runway and taxiway) geometric configuration
- Annual, monthly, and hourly peak-period operations
- Traffic patterns, aircraft type mix, and runway end arrival/departure utilization
- Runway instrumentation/meteorological conditions (visual and instrument).
- ASV Daily Factor = 203 | ASV Hourly Factor = 8.3 | ASV Hourly Capacity = 123

The current airfield configuration provides an ASV of 208,000 annual aircraft operations, in which the primary Runway 9/27 individually provides an ASV of 160,000. The following shows the percent ASV demand-to-capacity ratio based on 2018 and 2040 annual operation activity levels.

Airport ASV Capacity (Runway 9/27 and Runway 4/22)

2018 ASV Demand/Capacity Ratio = 19 Percent (39,440 Operations ÷ 160,000 ASV)
2040 ASV Demand/Capacity Ratio = 30 Percent (48,560 Operations ÷ 160,000 ASV)

The FAA recommends planning for airfield capacity improvements when the ASV demand/capacity ratio reaches 60 percent. Although the airfield provides adequate annualized ASV capacity for normal operating periods during visual and instrument conditions, the following factors should be considered in planning to accommodate unique and peak-period activity occurrences:

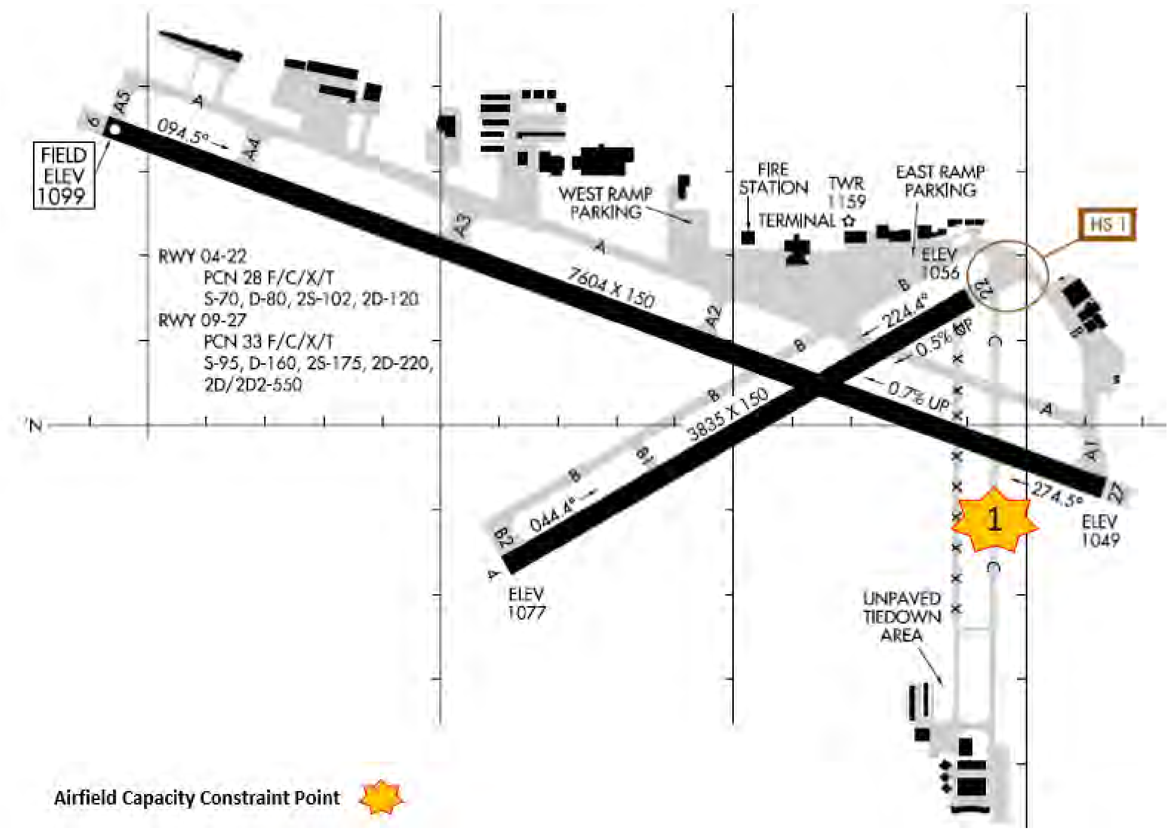
- Flight school instruction and training – instrument training
- Aircraft manufacturer flight training and proficiency
- Boeing aircraft flight tests
- US Forest Service
- Military helicopter activity
- Air Traffic Control Tower traffic assignment

Figure 4-1 depicts one area on the airfield where capacity can be constrained during peak-period demand. The existing runway/taxiway configuration contributes to congestion and delay, which is expected to worsen as activity increases. Upgrades in runway/taxiway configurations will be evaluated in the alternative's analysis.

Congestion and Delay Point 1: Runway 9/27 and Taxiway C

ASV Capacity Recommendation: The two-runway airfield configuration (Runway 9/27 and Runway 4/22) provides sufficient ASV capacity throughout the 20-year planning period for air traffic occurring during normal operating periods. Runway 9/27 and the full-length parallel Taxiway A, operating as a single-runway operation, provides adequate visual (VFR) and instrument (IFR) airfield capacity for existing and forecast operations. Runway 4/22 and the parallel Taxiway B offers, as a secondary runway, accommodates general aviation aircraft traffic during high-activity periods or crosswind conditions. In addition, peak-activity periods will necessitate future airfield infrastructure or procedural changes for specified congestion/delay locations to minimize runway and taxiway occupancy.

Figure 4-1: ASV Constraint Points



Source: Mead & Hunt ASV Graphic (August 2019).

4.4 AIRFIELD AND RUNWAY STANDARDS

4.4.1 Runway Safety Areas (RSA)

The RSA is a critical, two-dimensional area surrounding each active runway that must be:

- Cleared, graded, and free of potential hazardous surface variations;
- Properly drained;

- Capable of supporting Aircraft Rescue and Fire Fighting (ARFF) equipment, maintenance equipment, and aircraft under normal weather conditions; and
- Free of objects, except for those mounted using low-impact supports and whose location is fixed by function.

Based on FAA criteria from AC 150/5300-13A for a C-III runway, the RSA for Runway 9/27 needs to be 500 feet wide, extending 1,000 feet beyond each runway end. The existing RSA, including the areas extending beyond both runway ends, complies with FAA C-III standards.

For Runway 4/22, the RSA should meet the standards for a B-II aircraft. The RSA includes an area 300 feet beyond the runway end measuring 150 feet wide. The existing RSA, including the areas extending beyond both ends, exceeds the FAA B-II standards.

4.4.2 Runway Object Free Areas (OFA)

The ROFA is a two-dimensional ground area surrounding each runway. The ROFA clearing standard precludes parked aircraft or other objects from the area, except NAVAIDs and facilities whose locations are fixed-by-function. For Runway 9/27, the current OFA is 800 feet wide and extends 1,000 feet beyond the end of the runway, in accordance with C-III runway standards. For Runway 4/22, the OFA is 500 feet wide and extends 300 feet beyond the end of the runway. As with the RSAs, the OFA dimensions fall entirely on airport property and meet or exceed all FAA criteria.

4.4.3 Runway Protection Zones (RPZs)

The RPZ is trapezoidal in shape and centered on the extended runway centerline for each runway end. Its function is to enhance the protection of people and property on the ground. It begins 200 feet beyond the permanent runway threshold (at the end of the primary surface). The RPZ dimensions are based on the type of aircraft using the runway, type of operations (visual or instrument) being conducted, and the visibility minimums associated with the most demanding approach available. RPZ dimensional standards are defined in the FAA AC 150/5300-13, Airport Design. Table 4-7 shows the YKM RPZ dimensions. Small portions of Runway 9 and 27's RPZs extend beyond airport property and both ends have public roads penetrating the RPZ. Runway 22's RPZ extends beyond airport property and have two public roads penetrating.

Table 4-7: Runway Protection Zone (RPZ)

Runway	Aircraft Served	Approved Approach	Zone Length (feet)	Inner Width (feet)	Outer Width (feet)	Acres
09	Large	Non Precision	1,700	1,000	1,510	48.9
27	Large	Precision	2,500	1,000	1,750	78.9
04	Large and Small	Visual	1,000	500	700	13.8
22	Large and Small	Visual	1,000	500	700	13.8

4.5 TERMINAL REQUIREMENTS

The passenger terminal area is located on the north side of the airport at the approximate intersection of Runways 9/27 and 4/22. The terminal area consists of the passenger terminal building, terminal curbfront, commercial aircraft parking apron, the surface access system and automobile parking areas, and the airport administrative offices. The terminal area is accessed using either West Washington Avenue or South 24th Street onto the airport entry drive. Parking is located in front of the terminal with public parking, rent-a-car, and employee parking provided in different areas.

The apron directly south of the terminal building is designated for airline use. Four aircraft parking positions are marked on this pavement, although they are seldom used at the same time. The apron also provides for airline ground service equipment (GSE) and enplaning/deplaning passenger circulation.

Public automobile parking is provided in a main parking lot north of the terminal. The lot contains 188 spaces. Users can enter the lot either before or after the terminal curbside. Employee parking is located to the west of the public parking lot, on the north side of the Fire/ARFF Station 94.

Rental car parking is located east of the terminal with 36 spaces available in a restricted lot. Overflow parking is located on the west side of the Airport Administration building.

4.5.1 Passenger Terminal Building Requirements

Within the passenger terminal building, services are required for processing passengers arriving and departing on commercial flights. Enplaning services include ticketing, baggage, passenger service areas, and airline offices. Processing services typically include passenger and bag screening facilities operated by the Transportation Security Administration (TSA). Deplaning services include baggage claim, rental car counters, and parking prepay facilities. Other services necessary to plan for in a terminal building include concessions (restaurants and gift shops), restrooms, advertising and display areas, mechanical and utility rooms, and janitorial service and storage areas.

YKM is currently served by Alaska Airlines, which offers three to four daily commercial flights to and from SEA using the Q400 aircraft with 76 passenger seats. Occasional charter operations using narrow body aircraft with 100 to 147 seats operate at YKM on a nonscheduled basis, and YKM serves as a diversion stop for commercial flights when SEA is not accessible. A new terminal needs to be planned to ensure additional airlines and larger aircraft are not precluded from use should demand arise, as well as ensuring current and projected peak loads are accommodated.

The following section describes the facility requirements defined for a new passenger terminal at YKM in the 2015 Airport Master Plan update. Table 4-8 summarizes the forecast demand in 5-year increments, based on enplanement forecasts from the 2015 Airport Master Plan update. The 2018 plan update scope of work did not include an updated terminal facility requirements review.

Table 4-8: Terminal Building Requirements

		2010	2015	2020	2025	2030
Annual enplanements[1]		58,994	65,134	75,508	96,370	122,995
Peak hour enplanements		67	74	85	109	139
Peak hour airline operations		2	2	2	3	4
Facility Requirements	**Unit**					
Enplaning						
Ticket counter length	l.f	40	40	60	60	60
Agent work area	s.f.	480	480	720	720	720
Passenger queuing	s.f.	800	600	900	900	900
Circulation space	s.f.	400	400	600	600	600
Self-service kiosks	s.f.	40	40	60	60	60
Airline offices	s.f.	800	800	1,200	1,200	1,200
Airline baggage make-up	s.f.	1,000	2,000	3,000	3,000	3,000
TSA baggage screening	s.f.	1,000	1,000	1,000	1,000	1,000
Total enplaning requirement	**s.f.**	**4,520**	**5,320**	**7,480**	**7,480**	**7,480**
Security/Screening						
Passenger security lanes	no.	1	1	1	2	2
Screening area	s.f.	1,050	1,050	1,050	2,100	2,100
Passenger queuing area	s.f.	804	888	1,020	1,308	1,668
TSA administration	s.f.	700	700	700	700	700
Total security requirement	**s.f.**	**3,554**	**3,638**	**3,770**	**5,108**	**5,468**
Gate Areas						
Number of gates		2	2	2	2	4
Gate processing area	s.f.	300	300	600	600	1,200
Seating/waiting area	s.f.	1,072	1,184	1,360	1,744	2,224
Restrooms	s.f.	450	450	450	450	450
Concessions	s.f.	200	200	200	200	200
Circulation	s.f.	157	168	216	254	362
Total gate area requirement	**s.f.**	**2,179**	**2,302**	**2,826**	**3,248**	**4,436**

Table 4-8: Terminal Building Requirements (Continued)

		2010	2015	2020	2025	2030
Deplaning						
Baggage claim devices	units	1	1	1	1	1
Baggage claim active area	s.f.	240	240	240	240	240
Waiting area	s.f.	1,072	1,184	1,360	1,744	2,224
Circulation area	s.f.	131	142	160	198	246
Inbound baggage area	s.f.	375	750	750	750	750
Rental car						
Counter length	l.f.	32	32	32	32	32
Area	s.f.	384	384	384	384	384
Customer queuing	s.f.	320	320	320	320	320
Offices	s.f.	300	300	300	300	300
Parking prepay	s.f.	50	50	50	50	50
Total deplaning requirement	**s.f.**	**2,497**	**2,497**	**2,620**	**2,814**	**3,236**
Offices						
Airport management	s.f.	5,000	5,000	5,000	5,000	5,000
Other	s.f.	500	500	500	500	500
Total office requirement	**s.f.**	**5,500**	**5,500**	**5,500**	**5,500**	**5,500**
Other Needs						
Concessions	s.f.	750	750	750	750	750
Display area	s.f.	200	200	200	200	200
Restrooms	s.f.	450	450	450	450	450
Mechanical/electrical	s.f.	548	581	672	737	799
Janitorial	s.f.	365	388	448	491	533
Total other requirement	**s.f.**	**2,313**	**2,313**	**2,369**	**2,520**	**2,629**
Total Terminal Requirement	**s.f.**	**20,563**	**20,563**	**21,750**	**24,910**	**27,201**

1. Baseline enplanement data is from 2012 and included in the 2015 Airport Master Plan update. Terminal requirements were not updated as part of the 2018 update.

4.5.1.1 Passenger Enplaning Facilities

The terminal at YKM should provide ticket counter space and check-in kiosks for three airlines to accommodate the forecast activity levels and allow for future expansion. The requirements at the ticket counter were calculated assuming each airline would require two agents with space to process enplaning passengers, separated by a bag well between the agent positions to accommodate checked baggage.

Each airline will also require office space for administrative staff, employee break/locker areas, and air cargo offices. Space requirements for these are included in the calculations under the airline offices heading in Table 4-8.

Additionally, each airline will need baggage make-up space. This space includes the area needed to move the bags from the counters to the area where they are loaded onto carts to transport to the aircraft. Prior to, but adjacent to, these bag make-up spaces, a bag screening facility will need to be provided. This facility, operated by TSA, needs to be sufficient to accommodate the equipment and personnel necessary to screen peak-hour baggage.

4.5.1.2 Passenger Screening Checkpoint Facilities

Once passengers are ticketed, they proceed to the passenger-screening checkpoint. There is currently a single processing lane at YKM with a theoretical capacity of accommodating up to 120 passengers per hour. It is recommended that any expansion of the terminal building allow for two screening lanes, with one magnetometer and one carry-on screening machine per lane. TSA design standards require an average of 1,050 square feet per screening lane, including a seating-composure area, response corridor, law enforcement officer, and a private search room. For passengers waiting to access security screening, a queuing area is calculated assuming that no more than 75 percent of the peak-hour enplaning passengers will be in line at any given time and each will require 16 square feet of space.

TSA may also desire ancillary operations support space for employee break room and/or training room functions. These are not necessarily required to be adjacent to the checkpoint.

4.5.1.3 Gate Area

Once ticketed and through security, passengers proceed to the hold room/gate area to await aircraft boarding. This area requires sufficient seating for 90 percent of the peak-hour passengers. An estimated 20 square feet per seat is required for the seat and associated circulation space. In addition to seating, a departure podium, queuing area, and exit corridor add approximately 300 square feet total per airline gate.

Finally, space must be provided for restrooms and concessions, since this area is located behind the security checkpoint and passengers can no longer access non-secure facilities.

4.5.1.4 Deplaning Services

When passengers deplane, they proceed from the aircraft through the hold room to the baggage claim area. The future baggage claim area should include one automated baggage claim device.

Assuming a 25-foot-long device with a 12-foot-wide retrieval zone in front, the area for baggage claim will need to be approximately 300 square feet. Additionally, the area needs to accommodate people who are meeting incoming passengers. Given the peak-hour passenger levels projected, this "meeter/greeter" area will need to provide waiting area for about 85 people.

This area needs to provide for rental car agencies with customer service areas, queuing space, and parking prepay kiosks.

4.5.1.5 Other Services

In addition to facilities used for processing passengers, the terminal must also provide other public services such as restaurant/concessions (minimum of 1,000 square feet), restrooms in both secure and non-secure zones (450 square feet per restroom area to include one men's, one women's, and one family facility), a display area for advertising, and building systems and janitorial rooms.

4.5.1.6 Airport Administration Space

When a new terminal is constructed, it should include space for airport administration staff. Space requirements include one office for the Airport Manager, as well as one for the Assistant Manager and clerical, and support staff at 150 square feet per office. This space should also include a security badging workstation, conference/meeting area, kitchen/support area, circulation space, and restroom.

The current passenger terminal includes 30,838 square feet of space on two levels and the current airport administration building is 4,700 square feet. However, portions of the existing terminal are not used for passenger processing, so the comparison of raw square footage space is not adequate for determining terminal needs. The layout and condition of the building must also be considered. A detailed terminal conditions analysis was conducted as part of this master plan and is included as Appendix B. The analysis concluded the existing building was in fair condition, but requires a number of rehabilitation projects be undertaken over the next several years. These included replacement of mechanical systems, roof repairs, electrical system updates, and physical rehabilitation of interior spaces. Recently it has become clear the addition of a second airline has caused congestion points within the terminal that need to be addressed before enplanement levels increase in the future.

4.5.1.7 Terminal Apron

The existing commercial aircraft apron provides space for four aircraft parking positions that can accommodate the Q400. These are designed to allow for power in/power out aircraft operations.

In addition, the terminal apron has space allocated for taxilanes, area for ground servicing the aircraft, and storage of the ground service equipment (GSE).

The exact size of any future terminal apron will depend on the final footprint and layout of the terminal building. However, a minimum area equal to the current four aircraft gates should be provided into the future.

4.5.1.8 Automobile Parking

At YKM, public automobile parking is provided in the lot on the north side of the passenger terminal. This lot has 188 parking spaces, eight of which are handicapped accessible. The average occupancy for these spaces is about 70 percent. Given this, the calculated need for additional spaces must consider the excess capacity before recommending that new spaces be added.

To the immediate east of the terminal is a parking lot for rental cars with a capacity of 36 spaces. The requirement for additional spaces is based on the increase in annual enplaned passengers.

Additional spaces for cargo and package drop and employee parking is located in a restricted lot directly to the west of the terminal building. Employee parking is also available at the Administration Building, where 12 spaces are provided. Employee parking requirements should remain relatively stable over the forecast period, as the growth rates forecast for YKM will not trigger a need for additional administrative employees. The 2015 Airport Master Plan update forecast of automobile parking requirements are shown in Table 4-9. As noted earlier, the 2018 update did not include a terminal facility requirements review; however, updated 2018 enplanement data is included in Chapter 3 Forecast of Aviation.

Table 4-9: Automobile Parking Requirements

Year	Enplaned Passengers	Public	Employee	Rental Car	Total
2010	58,994	188	15	36	239
2015	65,134	188	17	40	202
2020	75,508	188	19	46	234
2025	96,370	215	25	59	298
2030	122,995	274	31	75	381

4.5.2 Air Cargo Activity

Two different carriers provide air cargo services at YKM. Empire Airlines operates a feeder route for FedEx using Cessna Caravan 208 and ATR 42/72 aircraft. Empire has three daily flights from Spokane.

Ameriflight operates as a feeder service for UPS using Embraer 120 aircraft. Ameriflight operates one flight per day, arriving from Spokane each morning with a departure in the afternoon.

FedEx operates from a building west of the terminal that measures approximately 7,700 square feet. UPS/Ameriflight operate from either the west GA ramp or McCormick Air Center (FBO). Each of these carriers require space for aircraft parking and processing.

The amount of space needed for air cargo processing is calculated at one and a half times the physical dimension (wingspan and length) of the airplane itself, multiplied by the number of aircraft expected to be on the ground at the same time. This provides space for both parking and loading/unloading the aircraft. The average day operations is used in evaluating the amount of spaces required, since cargo aircraft at YKM can remain for many hours before they depart to the next destination. This means, multiple aircraft can be on the ground at any given time.

Table 4-10: Air Cargo Requirements

Year	Annual Operations	Average Day Operations	Parking Need (spaces)	Area Required (s.f.)
2020	2,620	7	4	30,800
2025	2,810	8	4	30,800
2030	3,010	8	4	30,800
2035	3,200	9	5	38,500
2040	3,400	9	5	38,500

4.6 AIRCRAFT STORAGE REQUIREMENTS

In 2018, there were 131 general aviation aircraft based at YKM housed in hangars or stored outdoors on tiedowns in four distinct apron areas: the northwest GA area; the terminal area; the east GA area; and, the south GA area.

The northwest area consists of more than 53 acres and includes aviation and non-aviation-related buildings. The area includes 23 paved tiedowns and 2 helicopter landing pads. The GA terminal area covers a triangular area measuring approximately 9 acres. The area includes several hangars, 35 paved tiedown spaces, and other facilities. The east GA area is the home of the McAllister Air Museum and CubCrafters manufacturing facility. The area encompasses 9 acres and provides space for 11 aircraft tiedowns. The south GA area is a mixture of old hangars owned by the airport and new, privately owned hangar buildings. The area totals about 163 acres, with the majority currently undeveloped; development in some areas is limited by flood plains or an existing (closed) landfill site.

The long-term forecast for based aircraft at YKM anticipates 173 aircraft by 2040. This is an increase of 42 aircraft from the present 131 based aircraft.

The forecast shows that future based aircraft will consist of an increasingly higher percentage of high-performance twin and turbine aircraft whose owners prefer to shelter them indoors. The number and type of aircraft storage facilities needed over the course of the 20-year planning period is detailed in the sections below, with the majority of new aircraft hangared.

4.6.1 Hangar Storage Requirements

Covered aircraft storage is in demand at YKM. Forecast growth in based aircraft will lead to a need for additional hangars. Table 4-11 lists the assumed storage preferences for the aircraft types. Combining these with the based aircraft forecast produced the requirements for hangar space as shown in Table 4-12. As shown, demand for open-air tiedowns will remain low with the biggest growth in demand expected to be in corporate hangars.

It should be remembered the demand for aircraft hangars is based on forecasts that can change. Consequently, while it is recommended that these larger hangar facilities be reflected in the airport's long-term plans, it is recommended that hangars only be constructed as specific needs arise.

Table 4-11: Storage Distribution Percentages

Aircraft Type	T-hangars	Corporate Hangars	Tiedown
Single Engine Piston	80%	15%	5%
Multi-Engine Piston	50%	50%	0%
Turbine	0%	100%	0%
Rotor	0%	100%	0%

Table 4-12: Hangar Requirements

Year	T-Hangars	Corporate Hangars	Totals
2020	94	38	132
2025	102	41	143
2030	107	44	151
2035	111	45	156
2040	118	48	166

4.6.2 Based Aircraft Tiedown Storage Requirements

At present, some based aircraft are stored outside on tiedown aprons. These are generally small single engine piston aircraft. Space planning for these aircraft is calculated based on 360 square yards of apron for each parking space. This provides space for aircraft parking and circulation between the rows of aircraft. This space allowance assumes pilots have a certain degree of familiarity with the parking situation and, therefore represents a minimum that should be provided.

Table 4-13: Based Aircraft Tiedown Requirements

Year	Tiedown Spaces	Tiedown Area (s.y.)
2020	5	1,800
2025	7	2,520
2030	7	2,520
2035	7	2,520
2040	7	2,520

4.6.3 Transient Aircraft Tiedown Requirements

Tiedown space is also needed for transient aircraft. It is best to provide this space at or adjacent to FBO hangars. In calculating the area required for transient tiedowns, an allowance equal to 700 square yards per aircraft is used. This area is larger than applied to spaces for based aircraft tiedowns for two reasons. First, the user of the transient space may not be as familiar with the airport's ground movement patterns, and providing a greater margin of safety is prudent. Second, all types and sizes of aircraft are parked in the transient tiedown area, and a greater apron allowance provides more flexibility in how the tiedowns can be used. The following method was used to calculate the number of aircraft that will require transient aircraft parking spaces:

Table 4-14: Transient Tiedown Requirements

Year	Itinerant Operations				Transient Tiedowns Required
	Annual	Average day	Daily Arrivals	Transient Arrivals	
2020	17,240	47	24	12	6
2025	17,950	49	25	13	7
2030	18,690	51	26	13	7
2035	19,470	53	27	14	7
2040	20,270	56	28	14	7

- Determine the average day number of itinerant aircraft operations;
- Convert the itinerant operations to the number of arrival aircraft by dividing by two;

- Divide the number of aircraft performing itinerant operations by two to account for the fact that based aircraft performs some itinerant operations; and
- Assume that no more than 50 percent of the resulting daily transient aircraft operations will require storage at any one period.

Based on Chapter 3, Forecast of Aviation, itinerant operations are forecast to constitute 45 percent of overall operations, or 56 daily operations by 2040. Using the methodology cited above, 7 itinerant aircraft tiedown positions will be required.

4.6.4 Summary of Aircraft Storage Requirements

The preceding analyses show the focus for future aircraft storage should be on hangars (either group or T-hangars) instead of tiedowns. Table 4-5 shows the amount of space needed for aircraft storage throughout the forecast period.

4.6.5 Fixed Base Operator (FBO) Facilities

In the future, as the number of based aircraft increases and the level of operations continues to rise, the airport will need to ensure that adequate land is set aside for FBO facilities. In this report, this is calculated at 15 percent of the total area designated for based aircraft storage and transient tiedown space. Table 4-15 shows the number of aircraft the facility will need to accommodate. The area set aside for the FBO expansion should include the transient aircraft parking spaces discussed previously

Table 4-15: Aircraft Storage Requirements

Facility		2020	2025	2030	2035	2040
T-Hangars	Number	94	102	107	111	118
	Space (s.f.)	554,326	601,503	630,989	654,577	695,857
Corporate Hangars	Number	38	41	44	45	48
	Space (s.f.)	285,000	307,500	330,000	337,500	360,000
Based Tiedowns	Number	5	7	7	7	7
	Space (s.f.)	4,500	6,300	6,300	6,300	6,300
Transient Tiedowns	Number	5	5	6	6	6
	Space (s.f.)	12,500	12,500	15,000	15,000	15,000
Total Requirement	s.f.	856,326	927,803	982,289	1,013,377	1,077,157
	acres	19.7	21.3	22.5	23.3	24.7

Table 4-16: Total GA Facility Need

	2020	2025	2030	2035	2040
GA Needs					
Square feet	856,326	927,803	982,289	1,013,377	1,077,157
Acres	19.7	21.3	22.5	23.3	24.7
FBO Needs					
Square feet	128,449	139,170	147,343	152,006	161,574
Acres	2.9	3.1	3.4	3.5	3.7

4.7 AUTOMOBILE PARKING AND ACCESS

FAA and TSA are still developing overall security regulations for general aviation. However, it is clear that access to the airfield will become more limited in the future, especially in environments where commercial air carriers are operating, such as YKM. Vehicle access gates at YKM currently limit automobile access to the operations and hangar areas to the owners and operators of aircraft.

4.8 UTILITIES AND DRAINAGE

Existing utility services at YKM are discussed in Chapter 2, Existing Conditions. No deficiency was identified in the current level of services available. Consequently, no recommendation is provided for changes to the existing utility services.

As new facilities are developed, utilities will need to be extended or expanded to provide the necessary services. For the terminal and GA areas, utility services typically include electricity, water, data cables, and the collection of stormwater run-off.

4.9 AIRPORT SUPPORT FACILITIES

Analysis of airport support facilities and services includes requirements for the storage and distribution of aircraft fuel, facilities, and equipment required for maintenance of the airport.

4.9.1 Fuel Service

As noted in Chapter 2, Existing Conditions, fuel service at YKM is available for Jet A and 100LL aviation gasoline (AVGAS). McCormick Air Center owns three aboveground storage tanks located at the Fixed Base Operator's apron; each tank provides 12,000 gallons capacity. McAllister

Museum owns one above-ground 12,000-gallon 100LL fuel storage tank, which is located at the McAllister Museum apron. No change is recommended to the existing fuel service at this time.

4.9.2 Perimeter Fencing/Equipment

As indicated in Chapter 2, the Airport Operation Area (AOA) is completely enclosed by a perimeter security fence that meets the Transportation Security Act (TSA) standards required in the Airport Security Plan (ASP). It comprises 7- and 8-foot-high chain link fencing topped with 3-strand barbed wire. No change is recommended to the existing fencing at this time.

However, as new facilities are developed, any proposed changes to the existing security perimeter will require evaluation and TSA approval.

4.10 AIRFIELD GEOMETRY (CONFORMANCE)

4.10.1 Hotspots

A hotspot is defined as 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. At YKM, a hotspot has been identified at the intersection of Runway 22, Taxiway C, and Taxiway B. The hotspot description indicates that the runway hold lines are at an unusual distance from the runway edge, and the runway markings are not easily visible from the hold line.[2] The hotspot area is depicted in Figure 4-2.

4.10.2 Taxiways

4.10.2.1 90-Degree Taxiway Connectors; Aligned Taxiways

Taxiway design geometry is an area of FAA emphasis that has increased significantly since the 2015 Airport Master Plan was completed. A current focus is the elimination/replacement of exit taxiways that do not have standard 90-degree angles relative to the runway. This guidance does not include high speed exit taxiways. The runway exit taxiways at YKM were reviewed for consistency with the design guidance and several non-conforming taxiways were identified (see Figure 4-2):

[2] FAA Airport Diagrams, Hot Spot, Yakima Air Terminal/McAllister Fld (YKM) HS 1.

- Taxiway A1 to Runway 27 end;
- Taxiway B to Runway 22 end;
- Taxiway C to Runway 22 end; and
- Taxiway C to Runway 9/27.

The alternatives review will evaluate options for reconfiguring taxiways at YKM to meet current FAA design guidance.

The Runway 22 threshold has been relocated and is currently served by three taxiways that merge into an aligned taxiway. The overall configuration of these taxiways has created a documented hotspot, noted earlier. However, current FAA guidance is for airports to reconfigure aligned taxiways to remove them, whenever possible. Reconfiguration of the Runway 22 end to eliminate the hotspot, aligned taxiway, and to create 90-degree runway end connectors will be included in the alternative's analysis.

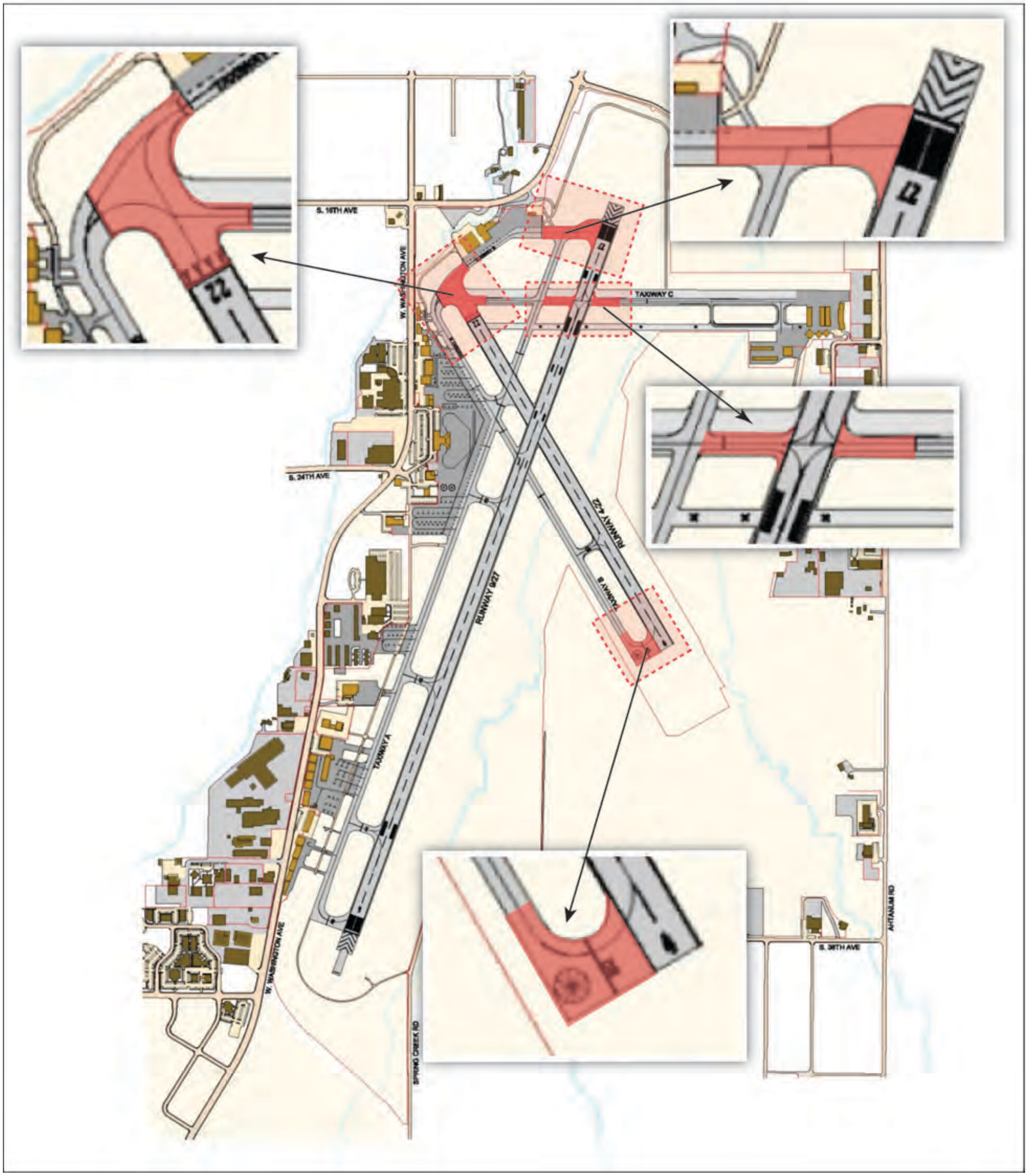
4.10.2.2 Taxiway Exit Location

The Runway 4 end taxiway (Taxiway B2) does not exit at the end of the runway. The pavement extends to the end; however, the lead-off lines exit approximately 240 feet prior to the end of pavement. The taxiway edge lights and signs coincide with taxiway centerline and configuration. It is recommended that the taxiway exit be reconfigured at the time of the next rehabilitation project.

4.10.2.3 Compass Calibration Pad

The location of Taxiway B2 allows for the compass calibration pad (also known as a compass rose) to be located at the south end of Taxiway B. The compass calibration pad is required to be located outside of airport design surfaces to satisfy the runway and taxiway clearances. The current location is outside of the Object Free Area (OFA) for Runway 4/22, but within the OFA for Taxiway B2. In its current location, Taxiway B2 should not be used when aircraft are utilizing the compass calibration pad in order to keep the OFA clear. However, due to the limited use of the compass for maintenance checks, it would be a minimal impact on aircraft operators using Runway 4/22. During operations, Air Traffic Control can direct aircraft to use Taxiway B1 to exit.

Figure 4-2: Airfield Geometry and Conformance to Standards



4.11 AIR TRAFFIC CONTROL TOWER (ATCT) LINE OF SIGHT

The Air Traffic Control Tower (ATCT) is owned by FAA and operated under a contract with SERCO. Facility upgrades would be at the discretion of FAA. The airport's ATCT is located on the northeast side of the terminal building behind a row of commercial hangars. Due to the height and location of the tower, Air Traffic Controllers are unable to see the entire airfield including the furthest west hangars owned and leased by the FBO, a portion of the FBO apron, as well as the south airpark hangar area. All of these areas are located within non-movement areas on the airfield, so ATCT does not require line of sight for aircraft until they request access into the aircraft movement area. However, it is ideal for ATCT to have visibility for movement and non-movement areas of an airfield.

In preliminary discussions with the Air Traffic Controllers, relocating the tower to the south side of the runways would allow better visibility of the airfield and hangar areas; however, it would reduce visibility of existing traffic patterns to monitor aircraft. Based on these factors, is it recommended that the existing location of the tower be maintained, with the ability to increase the height of the tower cab to increase visibility.

4.12 AIRPORT MAINTENANCE AND SNOW REMOVAL EQUIPMENT (SRE) BUILDING

The existing maintenance and snow removal equipment building is located on the north side of the airport between the FBO and FedEx buildings. This location could be redeveloped and utilized for FBO or cargo expansion if the maintenance facility is relocated to another site.

The existing building has three bays for large snow removal equipment parking, two bays for small field equipment, and four bays for airport vehicles and to perform maintenance. The building does not have sufficient storage space for the airport's current snow removal equipment fleet, which requires some outside equipment storage.

The existing building needs to be expanded based on space requirements to support the equipment storage areas, snow and ice control materials (including de/anti-icers), and an area for storing parts and accessories.[3]

[3] FAA Advisory Circular 150/5220-18A Building for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials.

4.13 AIRPORT RESCUE AND FIREFIGHTING BUILDING (ARFF)

The airport maintains an ARFF Index B, upgradable to Index C capabilities. Federal Aviation Regulations (FAR) Part 139 requires that the location of the Airport Rescue and Firefighting (ARFF) building be placed where personnel can respond to the midpoint of both runways within 3 minutes of an aircraft incident.

The existing ARFF building (Station 94), is located between the Airport Terminal and the Airport Administration building. This facility houses both airport ARFF equipment as well as the City of Yakima's structural fire equipment. The facility is staffed by the City of Yakima Fire Department who respond to both aircraft and structural fires. Due to the dual function of the facility, the fire jurisdiction of this station is determined by the building's location.

As noted earlier, the terminal area has limited developable space for vehicle parking and terminal building expansion. The Station 94 site could be redeveloped to support the terminal facility needs, including future terminal expansion or additional vehicle parking for rental cars, employees, and passengers. Options to relocate Station 94 while meeting all FAR Part 139 requirements and supporting the City's structural fire response will be evaluated as part of the alternatives analysis.

4.14 THROUGH-THE-FENCE (TTF)

According to Advisory Circular 150/6190-7, Minimum Standards for Commercial Aeronautical Activities, the FAA defines through-the-fence as "those activities permitted by an airport sponsor through an agreement that permits access to the public landing area by independent entities or operations offering an aeronautical activity or to owners of aircraft based on land adjacent to, but not part of, the airport property. The obligation to make an airport available for the use and benefit of the public does not -impose any requirement for the airport sponsor to permit ground access by aircraft from adjacent property."

The Yakima Airport had a former commercial through-the-fence agreement on the north side of the airport between FedEx and Triumph. This off-airport development has seven T-hangar buildings and an FBO building. A future through-the-fence agreement may be established to utilize these hangars for aircraft storage.

Additionally, CubCrafters owns three manufacturing buildings off-airport south of the Armory, and transports parts to their assembly buildings on-airport. Their operations may expand in the future and require through-the-fence operations, in which the Airport would establish an agreement with CubCrafters.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5

EVALUATION OF ALTERNATIVES

5.1 INTRODUCTION

The purpose of this chapter is to validate, refine, or revise the alternative development strategies developed for Yakima Air Terminal/McAllister Field (YKM) in the 2015 Airport Master Plan. The updated FAA-approved aviation activity forecast and facility requirements assessment (Chapter 3 and 4) provide the technical inputs for the updated assessment presented in this chapter.

A review of the development that has occurred at YKM since the last master plan provides an indication of areas of the airport that may require updated planning or concept refinement.

The consultant discussed recent development trends at YKM with airport management to gauge demand for new facilities and to validate the master plan's assumptions going forward. Recent tenant investment in hangars, coupled with airport infrastructure investments provide an indication of the airport's established development path and market demand. The evaluation also identifies the areas of the airport that have been most active in attracting new landside facilities, which Provides a natural connection to planning future improvements.

5.2 PRELIMINARY DEVELOPMENT CONCEPTS (2019/20 UPDATE)

In this chapter, alternative ways to meet the defined facility requirements are identified and compared, and the preferred development elements will be the basis for updating the 2020 YKM Airport Layout Plan (ALP). References to the 2015 Airport Master Plan alternatives evaluation chapter are maintained to maximum extent possible for consistency.

A revaluation of options for the relocation/development of new terminal area facilities (terminal building, aircraft apron, and auto parking) is not included in the ALP update scope of work. The original "Terminal Alternatives" recommendation to construct a new (replacement) terminal building within the existing terminal area is maintained with only minor refinements to the associated improvements. The terminal redevelopment project is scheduled in the 2025 time period, which will include further refinement of the recommended terminal alternative to be incorporated into the design.

The original "Airport Land Use" section is removed in the updated chapter and the information will be presented later, revised as needed for consistency with the preferred alternative, as a component of the Airport Layout Plan chapter (ALP and Land Use Plan drawings).

The updated alternatives evaluation process compares currently-defined facility needs with prior master plan development recommendations to determine which facilities require fresh assessments. The future improvements depicted on the 2015 FAA-approved ALP drawing represent the previous master plan's preferred development alternative. In this plan update, the 2015 ALP provides baseline facility recommendations that will either be maintained, modified, or eliminated based on the updated alternatives evaluation. At the completion of this study, the updated ALP drawing set will be presented to FAA for final review and approval (replacing the 2015 ALP).

In-depth discussions with airport management and key airport tenants provided updated information about facility needs and priorities for this evaluation. Preliminary development concepts were created for airside and landside facilities to support the updated forecasts and facility requirements assessments. A group of proposed improvements (airfield development concepts) were presented at a public meeting in Yakima on November 14, 2019. FAA and WSDOT Aviation staff were also briefed during periodic project coordination calls with the airport and planning team.

Figure 5-1 & Figure 5-2 consolidates the preliminary airfield development concepts presented at the meeting:

1. Airfield/Airside Facilities (runways and taxiways);
2. Terminal Landside Area; and
3. General Aviation Landside Areas (hangars and tiedowns):
    - Northwest Landside Area
    - Northeast Landside Area
    - South Landside Area

Two areas of potential property acquisition on the south side of the airfield are also depicted for future reference. These areas are identified for their long term landside development potential and include a parcel abutting the east side of the South Landside Area, and a parcel located south of the runway intersection, on the west side of Runway 4/22 and Taxiway B.

The public meeting provided an opportunity for all community members, including airport users, tenants, and neighbors, to participate in the evaluation process and provide valuable input. This broader public outreach supplemented the ongoing efforts of airport management to maintain open lines of communication with airport users on a daily basis. Through this process, a wide range of comments and suggestions were provided to the planning team that were then organized and evaluated for use in refining the preliminary development concepts. Detailed descriptions of the concepts for individual development areas are provided in the following sections.

Although all development proposals have alternatives (including "no action"), in some cases only one is feasible. The findings of these analyses and the associated recommendations are summarized in Table 5-1, and are reflected in the preliminary development alternatives/concepts depicted in Figure 5-1. As these concepts are refined leading the selection of the preferred development alternative, additional recommendations may be provided.

Table 5-1: Summary of Alternative Analyses (Preliminary)

AIRPORT CLASSIFICATION AND DESIGN		
Issue	**Conclusions**	**Recommendation**
FAA ARC Classification	C-III for primary runway and major taxiways; B-II for secondary runway and taxiways.	No alternatives were considered.
RUNWAYS		
Issue	**Conclusions**	**Recommendation**
Runway Length (Runway 9/27)	The FAA-defined wind coverage and capacity needs at YKM are met by the primary runway (9/27). However, at 7,604 feet, Runway 9/27 does not provide the 7,800-foot take-off length required for future critical aircraft (E175) operations at YKM during typical summer temperatures. The existing runway length also requires large transport category jets (greater than 150,000 pounds) operating at YKM to be weight limited during typical summer temperatures. The 2015 Airport Master Plan recommendation to extend Runway 9/27 to 8,847 feet was intended to accommodate this group of activity, although no change in the Q400 critical aircraft designation was recommended. The updated aviation activity forecasts project approximately 250 to 300 annual large transport category jet operations through the current planning period. Maintaining the previously-recommended runway extension as a long-term reserve is an appropriate measure to preserve a key element of YKM's broad strategic plan to attract new airport tenants and serve as a central component of community economic development. The reserve would also support unanticipated changes in critical aircraft activity that may occur during, or beyond the current planning period.	Based on the updated forecast fleet mix and runway length analyses, a length of 7,800 feet is recommended for Runway 9/27 to accommodate the future critical aircraft (E175). Consistent with previous runway extension evaluations, it is recommended that the additional 196 feet of runway be added to the Runway 9 end, in conjunction with a new blast pad, an extension of Taxiway A, and replacement of Taxiway A5. As noted in the 2015 Airport Master Plan, the existing localizer navigational aid will require relocation when the runway extension occurs. A 1,047-foot runway extension reserve is also recommended for the Runway 9 end, providing a runway reserve length of 8,847 feet. The reserve dimension is consistent with the 2015 Airport Master Plan's recommended runway length. Providing a runway reserve allows the Airport to evaluate development needs for adjacent areas on the airport while protecting the long-term potential for airside improvements. The existing and ultimate/reserve RPZs for Runway 9/27 are unchanged from the 2015 ALP. A new future RPZ for Runway 9 is required for the 196-foot runway extension.

Issue	Conclusions	Recommendation
Secondary Runway (4/22) Funding Eligibility and Recommended Dimensions	Updated demand-capacity and wind analyses indicate that Runway 4/22 is not required for YKM to meet FAA performance criteria for either capacity or wind coverage.	Based on the updated forecast fleet mix and runway length analyses, a length of 4,000 feet is recommended for Runway 4/22 to accommodate the future critical aircraft (Beechcraft King Air 350/1900).
	Airport management, air traffic controllers and airport users indicate that Runway 4/22 provides a critical operational function at YKM and the runway supports a wide range of general aviation, commercial, and military aircraft.	A minor (165 feet) runway extension is proposed to increase useable length to 4,000 feet, based on the requirements of the updated critical aircraft. The future extension is recommended to be located at the Runway 4 end.
	While the runway is not eligible for continued FAA funding based on wind coverage or capacity alone, determinations on full or partial FAA funding of future improvements to the runway and its associated facilities will be made on a case-by-case basis during project formulation to ensure that overall airfield function and systems interconnection is addressed.	The runway will be narrowed to 75 feet (currently 150 feet) as part of the next major rehabilitation project to meet FAA ADG II design standards. The protected areas surrounding the runway (RSA, OFA, OFZ, etc.) will be resized based on ADG II standards. Some re-grading and surface compaction may be required to meet FAA standards.
	The change in critical aircraft supports a change in runway design code (RDC) from B-I (small) to B-II.	The alternatives assume continued City commitment to use locally generated funds for the long-term maintenance and operation of the runway to the extent feasible to offset any absence of FAA funding. The City has determined that the runway should continue to function until the cost of maintenance exceeds the City's ability to finance the required improvements. Other potential funding sources, including WSDOT grants or loans, tenant funding, etc. will be utilized to the maximum extent possible.

<table>
<tr><th colspan="3">TAXIWAYS</th></tr>
<tr><th>Issue</th><th>Conclusions</th><th>Recommendation</th></tr>
<tr><td>Taxilanes and Taxiways</td><td>Existing taxiways provide access to full runway-taxiway system. Proposed improvements focus on addressing FAA design conformance and elimination of known areas of concern:
• Realign taxiways or use painted islands to eliminate direct access from parking aprons to the runway in order to reduce the potential for runway incursions.
• Address FAA-defined hot spot near the connection of Taxiway B and Runway 22.
• Eliminate aligned taxiway at Runway 22 threshold; remove obsolete pavement.
• Address other taxiway geometry to provide standard 90-degree connections to runways, where feasible.
• Provide new access taxilanes/ taxiways as appropriate to support new development areas.</td><td><u>Runway 9/27 Taxiways:</u>
• Taxiway A will be widened to 75 feet (currently 64 feet) to meet FAA ADG III design standards and eliminate the existing modification-to-standards (MOS) on width.
• New 90-degree connections are proposed for Taxiways A1 and at A5 following a runway extension.
• A new partial length section of parallel taxiway is proposed on the south side of Runway 9/27, extending from Taxiway C to Runway 27, to improve traffic flow between the south landside area and the runway-taxiway system.
<u>Runway 4/22 Taxiways:</u>
Reconfigured Taxiway B connection to Runway 22:
• The aligned taxiway to Runway 22 end is eliminated and replaced with 90-degree connecting taxiways on both sides of the runway.
• The FAA-identified hotspot on Taxiway B is eliminated by removing a section of existing taxiway and reconfiguring taxiway access, as described above.
• These taxiway modifications will also improve aircraft ground movement between the terminal area and adjacent northeast landside areas.
• Narrow Taxiway B from 75 feet to 35 feet to meet FAA ADG II design standards.
• Locate the narrowed Taxiway B within its current development footprint to simplify design and construction, particularly for the section located north of Taxiway A. The new parallel taxiway separation may exceed the B-II runway separation standard of 240 feet.
<u>Other Taxiways/Taxilanes:</u>
• New and/or reconfigured taxilanes are proposed in each of the landside area.</td></tr>
</table>

PAVEMENT MAINTENANCE		
Issue	**Conclusions**	**Recommendation**
Airfield pavements	The WSDOT Aviation airport pavement management program provides an effective tool for managing airfield pavements.	The Washington IDEA database for YKM includes a recent (2018) inspection and recommended pavement maintenance projects through 2025 that will be added to the Airport Master Plan capital improvement program. A summary of the current report is included as an appendix to the report.

TERMINAL FACILITIES		
Issue	**Conclusions**	**Recommendation**
Passenger Terminal Building	The terminal area evaluation provided in the 2015 Airport Master Plan provides direction for future terminal building improvements: • Construct a new terminal on the existing site in order to continue to use the aircraft apron and automobile parking facilities. Rationale: • The existing terminal building needs to be bigger based on the forecast increase in passengers. Additionally, the condition of the existing building is such that major maintenance and rehabilitation efforts would be needed to keep it functional over the long term.	The 2015 Airport Master Plan recommended terminal building be replaced in its current location.
Support Facilities	The terminal area evaluation provided in the 2015 Airport Master Plan provides direction for future airline apron, automobile parking, and other facilities associated with the passenger terminal.	Refinements to the 2015 Airport Master Plan vehicle parking areas and configurations located in the terminal area are recommended to be incorporated into the terminal design.

GENERAL AVIATION (GA)		
Issue	**Conclusions**	**Recommendation**
General Aviation Facility	YKM will continue to maximize use of existing hangar facilities to satisfy demand while facilitating continued development in the existing north and south GA areas. Infill development within the two north landside areas is expected to accommodate specific tenant development needs. Expansion of existing facilities in the south landside area is required to accommodate the overall forecast demand for hangar and aircraft-related facilities.	Proposed landside improvement options were created for the Northwest, Northeast and South GA Landside Areas. These areas in combination have sufficient capacity to accommodate forecast facility demands and will optimize existing and future investments in airfield facilities. The acquisition of adjacent privately-owned land parcels on the south side of the Airport has been identified as an opportunity to provide long-term development space and to protect the airport from potential development of land uses that are highly compatible with airport operations.
Fueling	The existing aircraft fueling system is adequate for near term use. Options for providing additional fueling capabilities in the south landside area should be considered as demand for based and transient aircraft services grows. It is assumed that the private sector will continue to upgrade and improve aircraft fueling facilities as needed.	Future fueling area location options are identified for the South Landside Area.

5.2.1 AIRSIDE FACILITIES

The 2015 Airport Master Plan airside recommendations were reevaluated for consistency with the updated aviation activity forecast, changes in critical aircraft, and applicable FAA design standards. In addition, several areas of "FAA emphasis" affecting airside facilities not specifically addressed in the 2015 Airport Master Plan, were added to this analysis and incorporated into the recommended improvements. These include hot spot mitigation, current FAA guidance on taxiway geometry, and right-sizing runway and taxiway widths for consistency with future critical aircraft.

5.2.1.1 Runway 9/27

The 2015 Airport Master Plan Recommendation

The preferred alternative increased the length of Runway 9/27 from 7,604 feet to 8,847 feet by adding a 1,243-foot extension at the end of Runway 9. The runway length recommendation was based in part on providing the *"flexibility in attracting new users."* The plan recognized that the recommended runway extension was *"for planning purposes and that there is no current demand driving implementation."* The 2015 Airport Master Plan documented YKM's mix of Boeing 737 and larger air traffic that would drive the runway extension, was at levels (existing and forecast) below the FAA's regular use threshold of 500 annual operations.

This recommended runway option was identified as Alternative 3 in the 2015 Airport Master Plan:

> ***"Extend Runway 9/27 to The Maximum Extent Possible on Existing Airport Property.*** *This alternative plans for a runway extension to obtain the maximum length possible (8,847 feet) while staying within current airport property. This positions the City to respond to future opportunities in aircraft manufacturing, maintenance or testing without requiring the purchase of additional land or creating adverse impacts on adjacent property owners. This alternative limits construction activities to the Runway 9 end. Only the localizer would need to be relocated."*

The existing and future critical aircraft (Bombardier Q400) defined for Runway 9/27 was included in Airport Reference Code (ARC) C-III.

2020 ALP Evaluation Update

The 2015 master plan recommendations for Runway 9/27 have been modified based on the updated forecasts and facility requirements assessment (see Chapters 3 and 4). The updated operational fleet mix forecast projects 250 to 300 annual operations generated by Boeing 737-series or large transport category aircraft during the current twenty year planning period, which is well below the FAA's regular use threshold. As a result, the previous recommendation to extend Runway 9/27 to 8,847 feet has been converted to a long-term planning reserve. The runway extension reserve preserves the intent of the 2015 Airport Master Plan while connecting project need/justification to future demand that is anticipated, but not currently defined.

The runway length requirements for the current twenty-year planning period are based on a change in future critical aircraft from the Bombardier Q400 to the Embraer 175 (E175). Since both aircraft are included in ARC C-III with a maximum weight below 150,000 pounds, the underlying runway design standards/facility requirements are unchanged, with the exception of the future runway length requirement (7,800 feet), which is critical aircraft-specific.

2020 ALP – Preliminary Recommended Improvements

A length of 7,800 feet is recommended for Runway 9/27 based on the operational requirements of the E175. The previous recommendation to locate a future runway extension at the Runway 9 end is maintained, and has been adjusted for length. Specific project elements include the following:

<u>Runway</u>

- 196-foot runway extension (at Rwy 9 end);
- Replace/relocate existing Runway 9 blast pad;

<u>Related Facilities</u>

- Extend Taxiway A (75 feet wide) to provide taxiway coverage for the full length of the runway;
- Replace/relocate Taxiway A5 to connect to the new runway end; and
- Extend runway and taxiway lighting systems, signs, and markings.

The existing localizer building and antennae will require relocating when the runway is extended and the previously-recommended relocation sites will be reserved for future navigational aids.

The 196-foot runway extension results in a portion of W. Washington Avenue traveling into the north side of the future runway protection zone (RPZ) for Runway 9, from the approximate mid-point of the RPZ to the outer end. This road was previously relocated to support a future longer runway extension. However, the impact of the roadway within the future RPZ may require a separate RPZ memo to obtain FAA development approval.

5.2.1.2 Runway 4/22

The 2015 Airport Master Plan Recommendation

It was determined that Runway 4/22 did not meet FAA funding criteria based on the wind coverage and airfield capacity provided by the primary runway (9/27). However, despite the limitations on FAA funding, maintaining Runway 4/22 was identified by the City as a priority, based on the flexibility it provides for most general aviation (GA) aircraft operating at YKM, including those used in commercial air cargo operations. It was also noted that during periods when Runway 9/27 has been unavailable because of construction or other reasons, commercial turboprop operations were often able to continue service at YKM using Runway 4/22.

The existing and future critical aircraft (Beechcraft Baron) defined for Runway 4/22 was included in Airport Reference Code (ARC) B-I (small).

Although several Runway 4/22 and related Taxiway B components have dimensions that reflect their original large aircraft design standards and use, no changes in pavement configuration (runway width, length; parallel taxiway width, runway separation; taxiway configurations, etc.) based on the B-I (small) critical aircraft were recommended, nor required by FAA for ALP approval in 2015.

2020 ALP Evaluation Update

Updated planning analyses reaffirmed the previous master plan recommendation to maintain Runway 4/22, but also reflected changes in forecast activity, critical aircraft and the ARC for the runway. The updated existing and future critical aircraft for Runway 4/22 was identified as a multi-engine turboprop (Beechcraft 200/300/1900 Series), included in ARC B-II. As noted in the updated facility requirements analysis (Chapter 5), a length of 4,000 feet was recommended for Runway 4/22 based on the specific requirements of the critical aircraft.

2020 ALP – Preliminary Recommended Improvements

The proposed improvements for Runway 4/22 and its taxiways are related primarily to conformance to FAA design group II standards and meeting the needs of the critical aircraft. This includes narrowing the runway and parallel taxiway widths; redefining the dimensional footprints of several runway and taxiway protected areas; and a small increase in runway length.

The minor runway extension (165 feet) is recommended to be located at the Runway 4 end, rather than Runway 22 end to avoid potential conflicts with existing roads or other development in the future RPZ. Only two small areas at the outer corners of the future Runway 4 RPZ extend beyond airport property (no incompatible land uses identified). The Runway 22 threshold location is unchanged, although the existing aligned taxiway is eliminated to conform to current FAA airfield design guidance. Specific project elements include the following:

<u>Runway</u>

- Narrow runway from 150 feet to 75 feet wide;
- 165-foot runway extension (at Rwy 4 end);

<u>Related Facilities</u>

- Narrow existing parallel taxiway (Taxiway B) from 75 feet to 35 feet wide;
- Extend Taxiway B to provide taxiway coverage for the full length of the runway;
- Replace/relocate Taxiway B2 to connect to the new runway end;
- Relocate the existing Compass Rose at Taxiway B2;
- Extend runway and taxiway lighting systems, signs, and markings; and
- Reconfigure taxiway access to the Runway 22 threshold, eliminate the aligned taxiway connection to Runway 22.

Table 5-2 summarizes the changes required to meet ADG II standards for Runway 4/22.

Table 5-2: B-II Design Criteria (Runway 4/22)

Design Feature	Existing (ft.)[1]	Standard (ft.)	Difference
Width	150	75	Reduce the runway width by 75 feet
Runway Shoulder Width	5	10	Increase runway shoulder width
Runway Blast Pad Width	None	95	Add new blast pads to the ends of the runway
Runway Blast Pad Length	None	150	Add new blast pads to the ends of the runway
Runway Safety Area (RSA) Width	200	150	Reduce RSA width
Safety Area Length (beyond runway end)	600	300	Reduce RSA length
Object Free Area Width	400	500	Increase OFA width
Object Free Area Length (beyond runway end)	600	300	Reduce OFA length
Obstacle Free Zone Width	250	400	Increase OFZ width
Obstacle Free Zone Length	200	200	Meets Standard
Runway-Parallel Taxiway Separation	350	240	Determine final taxiway separation during design (meet or exceed ADG II standard)

Source: FAA Advisory Circular 150/5300-13A, Airport Design
Note: Runway 4/22 and Taxiway B were constructed to meet B-III standards that exceed several B-II standards. 1. Existing dimensions depicted on 2015 ALP.

5.2.1.3 Taxiways

The taxiway system at YKM currently serves the runway system efficiently, allowing runway ingress/egress and safe access to the terminal and hangar areas. While the majority of the critical taxiway dimensions meet or exceed FAA Airport Design standards, several improvements are proposed based on the analysis of the taxiway system and the recommended runway improvements noted earlier.

2020 ALP – Preliminary Recommended Improvements

9/27 Taxiways

1. Taxiway A is widened to 75 feet, to meet the applicable TDG 5 standard. Taxiway A is currently 64 feet wide and has an FAA modification-to-standards (MOS) for width. For planning purposes, it is assumed that Taxiway A will maintain its existing centerline location (400-foot runway separation) when widened. The current MOS for Taxiway A will be eliminated.

2. Taxiway A is extended 196 feet (75 feet wide) at the Runway 9 end, in conjunction with the recommended Runway 9/27 extension to maintain taxiway access to the full runway.
3. Taxiway A5 will be relocated/replaced in conjunction with the recommended runway extension.
4. A reserve for Taxiway A and Taxiway A6 is defined to match the extension reserve for Runway 9/27.
5. Taxiway A1 is reconfigured to provide a standard 90-degree connection to Runway 27 end.
6. A partial length section of south parallel taxiway is proposed to connect Taxiway C and Runway 27. The new taxiway provides improved access to Runway 27 for departing aircraft accessing the runway from the south landside area and will reduce runway crossings on Taxiway C. The south parallel taxiway design is based on ADG II design standards.

4/22 Taxiways

1. Taxiway B is narrowed to 35 feet (currently 75 feet), to meet the applicable TDG 2 standards. For planning purposes, it is assumed that Taxiway B will maintain its existing centerline location (315-foot runway separation) when narrowed. The final taxiway centerline location will be determined during design and the runway separation can be reduced to as low as 240 feet.
2. The aligned taxiway that connects to the Runway 22 end is eliminated (pavement removed) and replaced with new 90-degree connecting taxiways on both sides of the runway.
3. The east end of the Taxiway B and the north section of Taxiway C are eliminated (pavement removed) as part of an overall taxiway reconfiguration. This includes the area previously identified by FAA as a hot spot (HS 1). All of the taxiway improvements related to Runway 4/22 are based on ADG II design standards.
4. Taxiway B2 (at Rwy 4 end) will be relocated/replaced in conjunction with the recommended 165-foot runway extension.

5.3 LANDSIDE FACILITIES

The evaluation of landside development at YKM addresses a variety of facility needs (aircraft parking, hangars, terminal, etc.) and operational functions anticipated during the current planning period, but also provides an opportunity to define the development direction for the airport that will extend well beyond the next twenty years.

YKM currently has three primary areas supporting general aviation (GA) landside development (northwest, northeast and south). The terminal area, which accommodates commercial air service facilities and activities, is located on the north side of the airport, bordered by Taxiways A and B between the northwest and northeast GA areas.

Individual views are provided for each of these areas in Figure 5-1 and 5-2 under section 5.3 Landside Facilities.

The GA landside areas on the north side of the airport are approaching full development. Options for providing infill development through incremental expansion or reconfiguration are explored to maximize the use of existing development areas. The South Landside Area has been a primary area for hangar construction in recent years and airport management indicates that the area is considered a prime development area for new hangar construction at YKM.

5.3.1 Terminal Landside Option

The evaluation of YKM terminal area needs in the 2015 Airport Master Plan provided four conceptual options, including two options that redeveloped the existing site north of the runways, bordered by Taxiways A and B and two relocation options (northeast corner and south side of airport).

The evaluation recommended developing a new terminal building (Alternative 2) within the existing site, which would allow continuous use of facilities during construction without interruptions of passenger service. This option was also determined to be the lowest cost "new building" option available. Additional detail will be added during the design phase of the terminal building project, which has been identified as a near term project (within the next five years). The 2015 Airport Master Plan terminal alternatives evaluation is provided for reference at the end of this chapter.

2020 ALP Evaluation Update

No additional evaluation to the previously-recommended terminal building location or configuration was conducted in this plan update, however some modifications to future vehicle parking areas (long term, employee, cell phone waiting lot, and rental car) are proposed to improve operational capabilities and movement within the terminal area. The existing airport management office is removed (to be replaced inside the expanded terminal building) and the area west of Fire Station 94 is converted to long term vehicle parking. An additional rental car parking lot is provided immediately adjacent to the new terminal building.

5.4 GENERAL AVIATION DEVELOPMENT ALTERNATIVES

5.4.1.1 Northwest Landside Area Option

The proposed improvements include new taxilanes to accommodate planned storage hangars near the end of Runway 9; expanded apron and building space for air cargo operations; expanded airport equipment storage buildings; and two helicopter parking hard stands west of the existing air cargo apron.

5.4.1.2 Northeast Landside Area Option A and B

The facility objectives for this area include providing an expanded apron area with new small airplane tiedowns, multiple conventional hangar sites, and improved taxilane/taxiway access between the east apron, the terminal area, and the adjacent runway-taxiway system. The proposed taxiway/taxilane modifications are compatible with the other changes to Taxiway B described earlier.

Option A

This option converts a section of Taxiway B running along the outer edge of the existing apron to a taxilane, which increases the useable apron area directly in front of the existing hangars located along the back edge of the apron. The apron taxilane will have connections to Taxiway A, B, C, and Runway 22.

A new section of apron is provided beyond the taxilane. The expanded section of apron is configured with three double-sided rows of tiedowns (15 tiedowns total), TDG 1 taxilanes, and a relocated fueling island with space for two aboveground fuel tanks. The relocated aircraft fueling island is needed to accommodate new hangar sites along the back section of the existing apron. As depicted, three new conventional hangar sites are provided (1 large and 2 small). The existing airport restaurant building is also eliminated to accommodate new hangars. The taxilane connection to Taxiway A/A1 and Runway 27 is narrowed to meet TDG 2 standards as part of an overall reduction in paved area and reconfiguration of A1.

Option B

This option reconfigures and expands the east apron and shifts the new access taxilane to the outer edge of the apron with connections to Taxiway A, B, C, and Runway 22. The new/expanded section of apron is configured with six double-sided rows of tiedowns (24 tiedowns total) and TDG 1 taxilanes. As depicted, two new small conventional hangar sites are provided. No changes are proposed for the existing fueling area or the restaurant building.

5.4.1.3 South Landside Area Option A and B

Recent private investment in hangars in the South Landside Area demonstrates the viability of the area to effectively accommodate future hangar demand. Improvements to taxiway/taxilane access, utility extensions, and vehicle access are key elements in creating a cohesive long-term plan for this area. The site has several unique environmental challenges that will need to be addressed to fully develop a viable concept. Future proposed development on the south side of the airport does not include the former (now covered) landfill site.

The South Landside Area was identified by airport management as a prime development area for new hangar construction at YKM. The 2015 Airport Master Plan alternatives evaluation provided limited guidance for this area, identifying it as “General Aviation Alternative #2” with eight new small conventional hangars recommended on the east side of Taxiway C, at its south end. The 2015 ALP drawing identified three existing hangars and surrounding apron located on the west side of Taxiway C as “to be removed,” although no replacement facilities were recommended.

Two new concepts (Options A and B) were created for the South Landside Area that provide on-airport hangar sites on the east and west sides of Taxiway C.

Both options identify a future landside development area on a privately-owned parcel located immediately east of the South Landside Area. The privately-owned parcel currently has limited rural residential land uses, but is expected to be developed in a significantly higher density in the future based on its Light Industrial (M-1) land use designation. Identifying a portion of this parcel as a future airport expansion area provides a viable long-term vision that complements ongoing development of available on-airport land areas while preserving long term airport opportunities. It also provides some measure of protection from potentially incompatible land uses that may occur as the area transitions from a rural to an urban setting.

In addition to meeting demand for aircraft storage, the South Landside Area provides the largest undeveloped area for accommodating future landside needs at YKM. The area is large enough to integrate existing facilities into new development concepts while providing opportunities to attract and accommodate airport tenants requiring mixed use facilities with a primary aeronautical function.

To aid in developing a fully integrated long-term planning concept, hangar sites are identified for both the current 20-year planning period, and beyond 20 years (reserves). Both options have the capacity to accommodate approximately 100 aircraft, depending on tenant needs, which is well above the net forecast increase of 42 based aircraft and provide substantial reserves that can be developed incrementally without requiring significant advance investment in infrastructure. The timing for actual development is dependent on demand and can be implemented incrementally.

Option A

The proposed hangar development on the west side of Taxiway C includes small aircraft T-hangars and small/medium conventional hangars with two east-west taxilane (TDG 1/TDG 2) connections to Taxiway C. The option assumes removal/replacement of two existing T-hangars and one conventional hangar located west of Taxiway C. As depicted, the west side of the proposed development area provides 9 T-hangars (8-10 units each) and 11 conventional hangars, including development reserves.

The proposed hangar sites on the east side of Taxiway C have direct access to the taxiway. The developable space between Taxiway C and the adjacent (east) property line limits the proposed development to single row. As depicted, thirteen conventional hangars are located along Taxiway C with west-facing doors. The sizes of the hangars vary and may include multi-unit buildings. Vehicle access to the east row of hangars is provided from S. 21st Avenue with controlled access gates for tenants. Alternative vehicle access options are depicted from Ahtanum Road and S. 16th Avenue.

A future aircraft fueling area and a conventional hangar site is identified within the development area to serve long-term demand for services.

An area roughly equal to the middle one-third of the adjacent eastern parcel noted earlier is identified for future airport use. The lower (southern) section of the parcel, which has direct frontage on Ahtanum Road and the intersection with S. 16th Avenue, is not proposed for airport development since it offers significant airport friendly non-aeronautical potential for a variety of land uses. Securing an alternate vehicle access route from S. 16th Avenue is proposed near the southwest corner of the parcel. The northern section of the parcel is also not proposed for airport development based on its surface conditions and potential for environmental issues associated with local drainages.

As depicted, this option protects future ADG II taxilane access to the new parcel by fully integrating it into the proposed on-airport hangar and taxilane development. Two hangar development areas are depicted with direct access to a future east-west stub taxilane that connects to Taxiway C. Specific hangar footprints are not defined outside the required taxilane clearances. This area has the potential of accommodating a wide range of mixed use aeronautical related activities including airport industrial, manufacturing and support.

A vehicle access road is proposed around the perimeter of the parcel to provide access to future hangars within the parcel and for on-airport sites located along the east side of Taxiway C. The proposed roadway corridor could also support utilities needed for airport development and the adjacent non-aeronautical parcels.

Option B

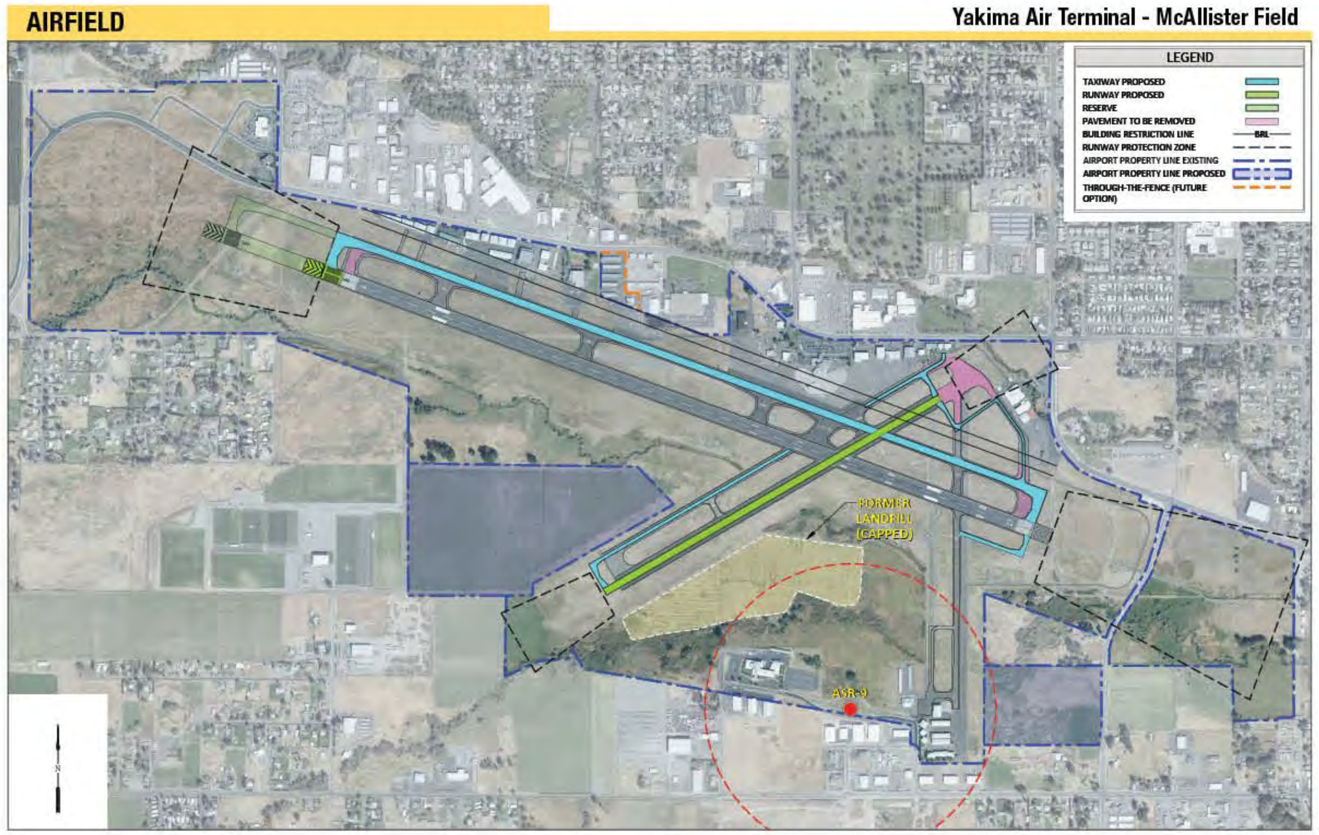
This option uses the same hangar layout for the center section of the development area (sites directly adjacent to Taxiway C) presented in Option A with only minor revisions. The hangar layouts proposed for the west and east areas provide a variation of the previous concept, although the components are similar. The proposed southern shift of the east-west taxilane in the development reserve requires some adjustment of the hangar sites located directly southeast of the end of Taxiway C.

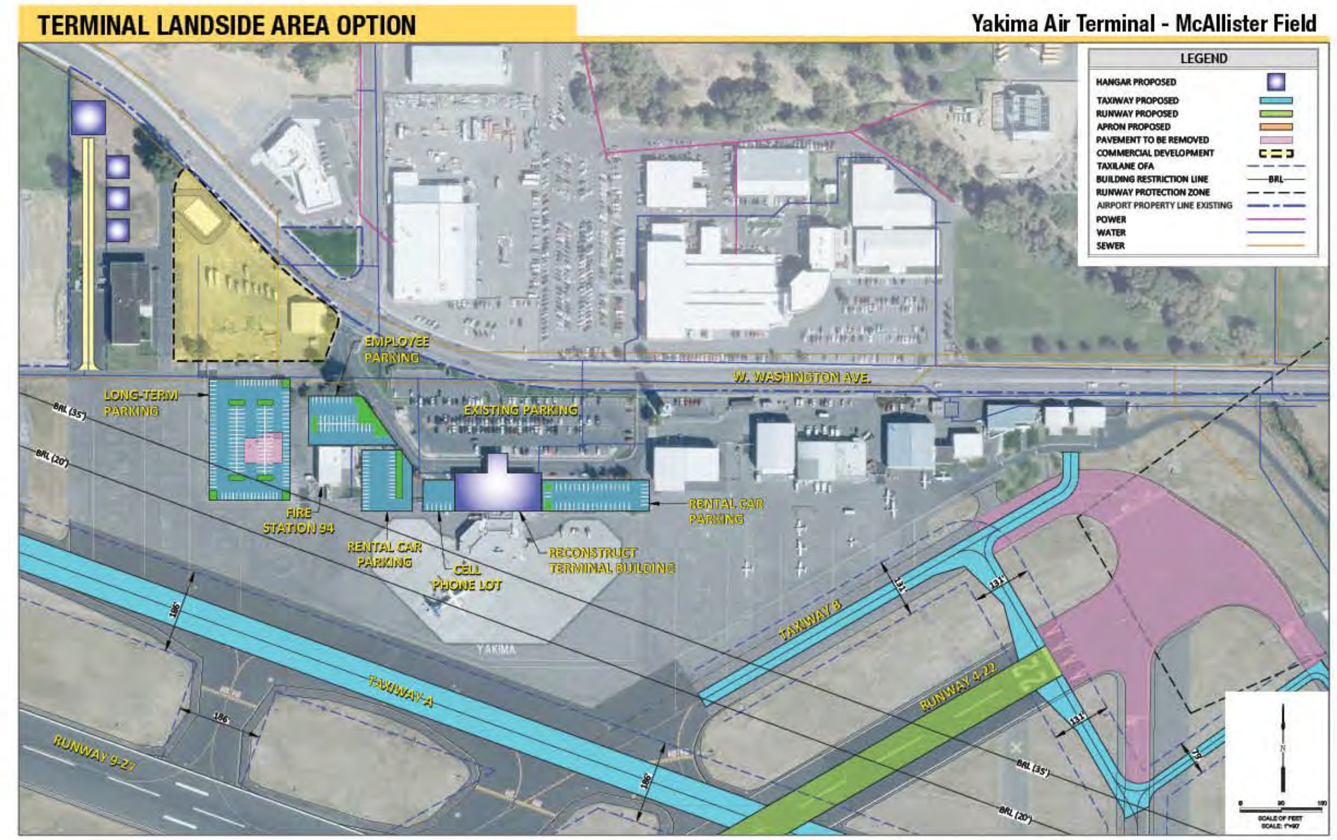
The proposed hangar development on the west side of Taxiway C includes small aircraft T-hangars oriented in two east-west rows with small/medium conventional hangar sites located around the outer perimeter of the taxilane system. Two hangar taxilane connections (TDG 1/TDG 2) are provided to Taxiway C. The option also assumes removal/replacement of the existing hangars described in Option A. As depicted, the west side of the proposed development area provides 7 T-hangars (8-10 units each) and 16 conventional hangars, including development reserves.

This option also protects future ADG II taxilane access to the new parcel by fully integrating it into the proposed on-airport hangar and taxilane development. A slightly larger portion of the parcel is required in order to provide the option of constructing new aircraft parking aprons directly adjacent to the main access taxilane. The east-west taxilane is shifted slightly south to accommodate the additional apron areas and hangars. Large and medium conventional hangar sites and vehicle access is provided around the perimeter of the site. Conceptual hangar footprints are defined outside the required taxilane clearances. Additional apron areas are provided between the taxilane and hangar sites. This area has the potential of accommodating a wide range of mixed use aeronautical related activities including airport industrial, manufacturing and support.

The proposed vehicle access connections with existing public roadways presented in Option A are unchanged.

Figure 5-1: Airport Layout Plan Update – Proposed Improvements





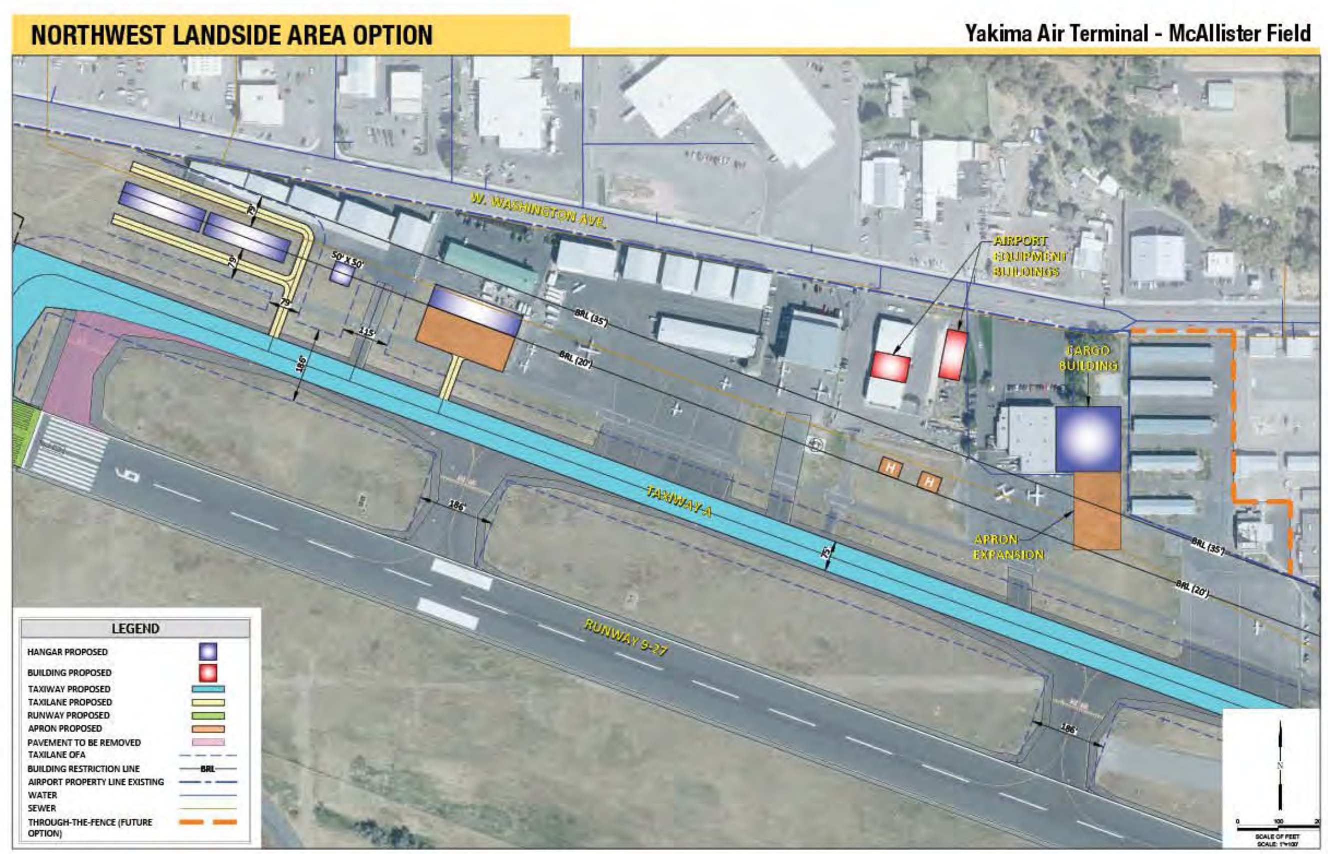
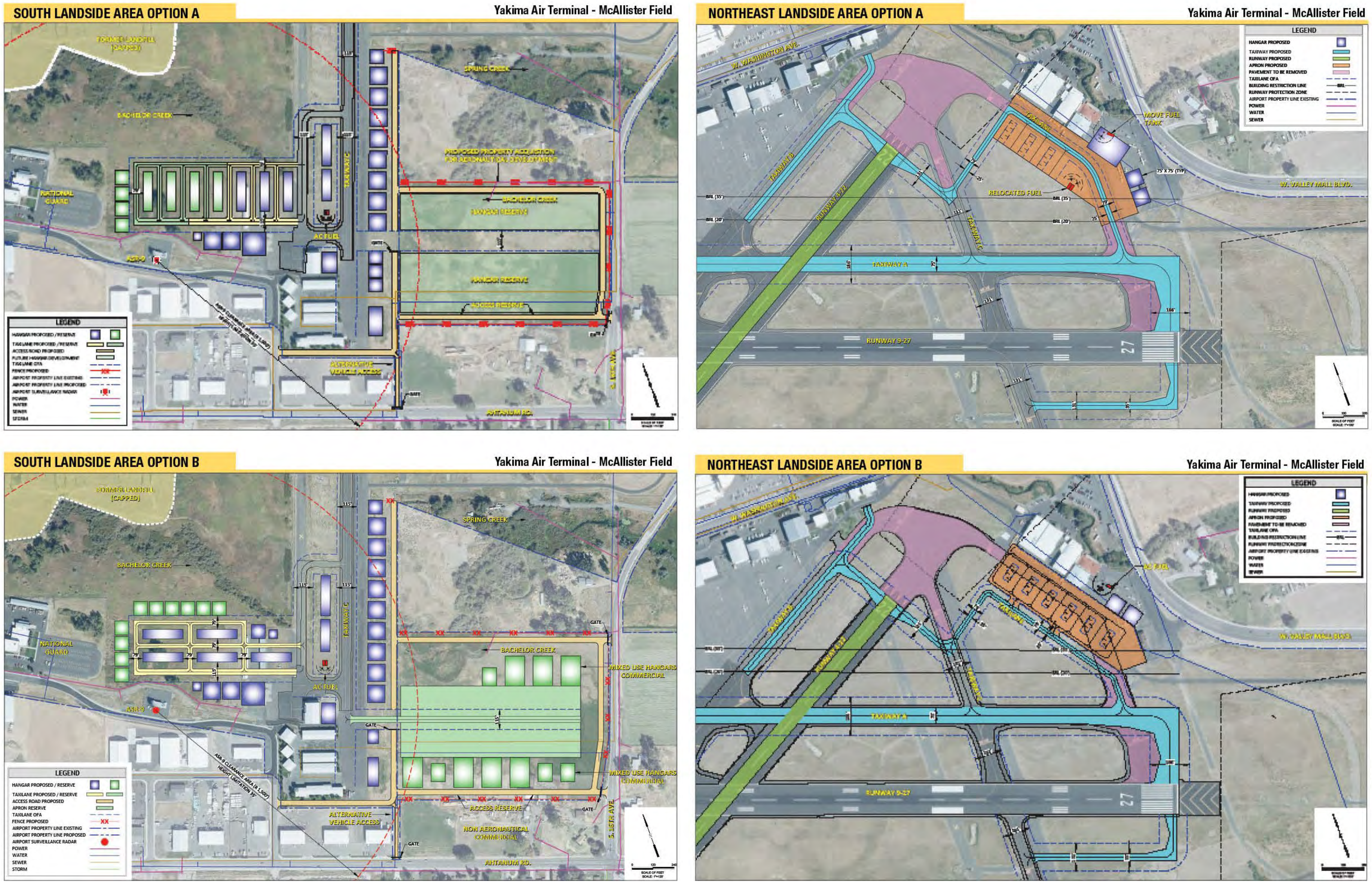


Figure 5-2: Airport Layout Plan Update – Proposed Improvements



5.5 REFINED ALTERNATIVES

The next step in the planning process involved organizing and evaluating the public input that was provided during the review of the proposed improvements. This led to refinement and consolidation of key project elements, which narrowed down the preferences for each airfield area.

To maintain consistency with the format of the original master plan chapter, the refined alternatives are organized by area (airside, terminal, various landside areas). In several cases, no significant revisions or refinements were required to the preliminary concepts described earlier in the chapter. The preferred or recommended options for each area of the airport are presented in Figures 5-3 to 5-7.

5.5.1 Refined Airside Alternatives

Figure 5-3 depicts the recommended airside improvements for Runway 9/27, Runway 4/22, and major taxiways. No changes were made to runway configuration proposed earlier.

Several refinements have been made to the proposed taxiway/taxilane improvements identified in the preliminary proposed improvements.

- The placement of recommended south parallel taxiway (proposed Taxiway D) for Runway 9/27 was modified to improve air traffic control for aircraft taxiing.

The runway-to-taxiway centerline separation was increased to 400 feet to move the new taxiway south of the existing aircraft hold line on Taxiway C; a second aircraft hold line will be required on the Taxiway D connection with Runway 27 (Taxiway D1). This configuration will allow air traffic controllers to clear aircraft on Taxiway D and hold at Taxiway D1 while the runway is occupied, rather than requiring aircraft to remain behind the existing designated hold area on Taxiway C, when heading to Runway 27 for departure or crossing to access Taxiway A.

- Minor revisions in taxiway/taxilane configuration in the Northeast Landside Area reflects the refinements made to the options that are described later in this section.

A notable addition to the preliminary airside alternatives are the three options to develop a 1,500 x 75-foot turf landing area adjacent to existing runways (Options A, B and C). The turf areas are not recommended as designated runways, but rather alternate turf landing areas. The FAA Seattle ADO has approved this type of configuration at several other northwest airports, but has not commented on this specific proposal. Additional coordination will be required to identify the preferred location among the three options identified, and to obtain FAA approval of the improvement.

The two parcels of privately-owned property previously identified for potential airport acquisition on the south side of the airfield are identified:

- The southeast parcel described in the South GA Landside Options, which would connect directly existing developed landside areas and utilize existing taxilane/taxiway access to the main areas of the airfield.
- The southwest parcel that is currently in agricultural use (Hop field). The property is in close proximity to the airfield and presents a strategic opportunity to both accommodate future airport development and protect the airport from potential future incompatible land uses.

It is recommended that these parcels are identified on the updated ALP as long term airport development reserves to enable potential eligibility for future FAA funding.

5.5.2 Refined Terminal Landside

Figure 5-4 depicts the recommended Terminal Area improvements. No major changes from preliminary options presented earlier.

5.5.3 Refined General Aviation Development Options

5.5.3.1 Refined Northwest GA Landside Area

Figure 5-5 depicts the recommended Northwest Landside improvements. No major changes from preliminary options presented earlier.

5.5.3.2 Refined Northeast GA Landside Area

Figure 5-6 depicts the recommended Northeast Landside Area improvements. The refined concept incorporates elements from both of the preliminary options presented earlier and includes two large hangar sites, relocated aircraft fueling, a reconstructed/reconfigured small airplane tiedown apron, and improved taxilane/taxiway connections.

The taxilanes/taxiways connecting the Northeast Landside Area to Taxiway A and B are upgraded to ADG II/TDG 2, which will allow larger corporate aircraft to access all sections of the airport. The recommended new taxilane connection between the northeast apron and Taxiway C has been modified to improve aircraft movement and access to Runway 22. Large areas of existing taxiway pavement extending from the northwest section of the apron to the reconfigured Taxiway B (east end of the terminal area flight line) and the Runway 22 threshold will be removed to meet FAA requirements.

The main taxilane (TDG 2) for the northeast apron will maintained in its existing location, with additional reconfigurations for the section extending south to Taxiway A (at A1). A secondary loop taxilane (TDG 1) will connect the main taxilane to provide access to a reconfigured small airplane tiedown apron (18 tiedowns) located in front, and adjacent to the airport restaurant.

Two large hangar sites (100' x 100' typical hangar footprints) are located opposite the existing commercial hangars on the south side of main apron taxilane. The relocated fuel island is also located on the south side of the main access taxilane, immediately east of the new taxilane connection to Taxiway C.

5.5.3.3 Refined South GA Landside Area

Figure 5-7 depicts the refined South Landside option (refined Option B). The refinements are primarily related to the configurations of the proposed hangars located on existing airport property.

The new hangar development located at the south end of Taxiway C (east side) has been revised to mirror the existing hangars directly opposite the site on the west side of Taxiway C: three multi-unit hangars (assumed 4 units per building) with east-west building orientations. Aircraft access is provided on the north or south side of each building with small stub taxilanes connecting to the existing north-south taxilane that extends beyond the south end of Taxiway C. ADG I taxilane access is maintained on the north-south access taxilane. The 79-foot wide ADG I TOFA will extend east from the east end (including landscaping) of the three existing multi-unit hangars and the new hangars will be sited based on TOFA clearance. As depicted, this section of the planned development area will accommodate up to 12 aircraft.

The individual box hangars and T-hangars located immediately adjacent to Taxiway C are unchanged from the preliminary proposed Option B. As depicted, these hangars will accommodate approximately 40 aircraft, depending on tenant needs.

The remaining proposed hangars on the west of side of Taxiway C have been reconfigured to include a mixture of T-hangars and small/medium box hangars. As depicted, these hangars will accommodate approximately 60 aircraft, depending on tenant needs and individual aircraft storage/building configurations. The planned hangar sites are capable of accommodating both aircraft storage and commercial activities. A fuel storage/dispensing area is identified to preserve potential demand for aircraft services on the south side of the airfield. Several additional hangar sites and taxilane reserves are depicted on the north side of planned T-hangar development, with an estimate capacity 14 additional aircraft.

The west section of the proposed hangar development area has been shifted eastward to increase clearance between the existing National Guard armory site and new hangars. This area is capable of accommodating a future ADG II north-south aircraft corridor (taxilane) that could connect to planned and existing taxiways/taxilanes to provide access to the other aircraft manufacturing facilities on airport property. Although not currently proposed, the ongoing development of aircraft manufacturing and assembly facilities on adjacent private property south of Airport Lane could eventually create an opportunity to provide a controlled through-the-fence (TTF) access point into the South Landside Area, similar to configurations used by Boeing at Renton Municipal Airport and King County Boeing Field.

The conceptual hangar footprints for the adjacent eastern parcel (long term development reserve) have been eliminated in favor of depicting available hangar and mixed use development areas with required setbacks for the ADG II/TDG 2 taxilane reserve (no change from Option B). The proposed surface access improvements within the adjacent parcel are unchanged.

As proposed, the South Landside Area has the immediate capacity (existing airport property) to accommodate more than 100 aircraft, which exceeds current 20-year forecast demand. Significant additional capacity is also provided by long term development reserves requiring future property acquisition.

Figure 5-3: Airside Improvements (Refined)

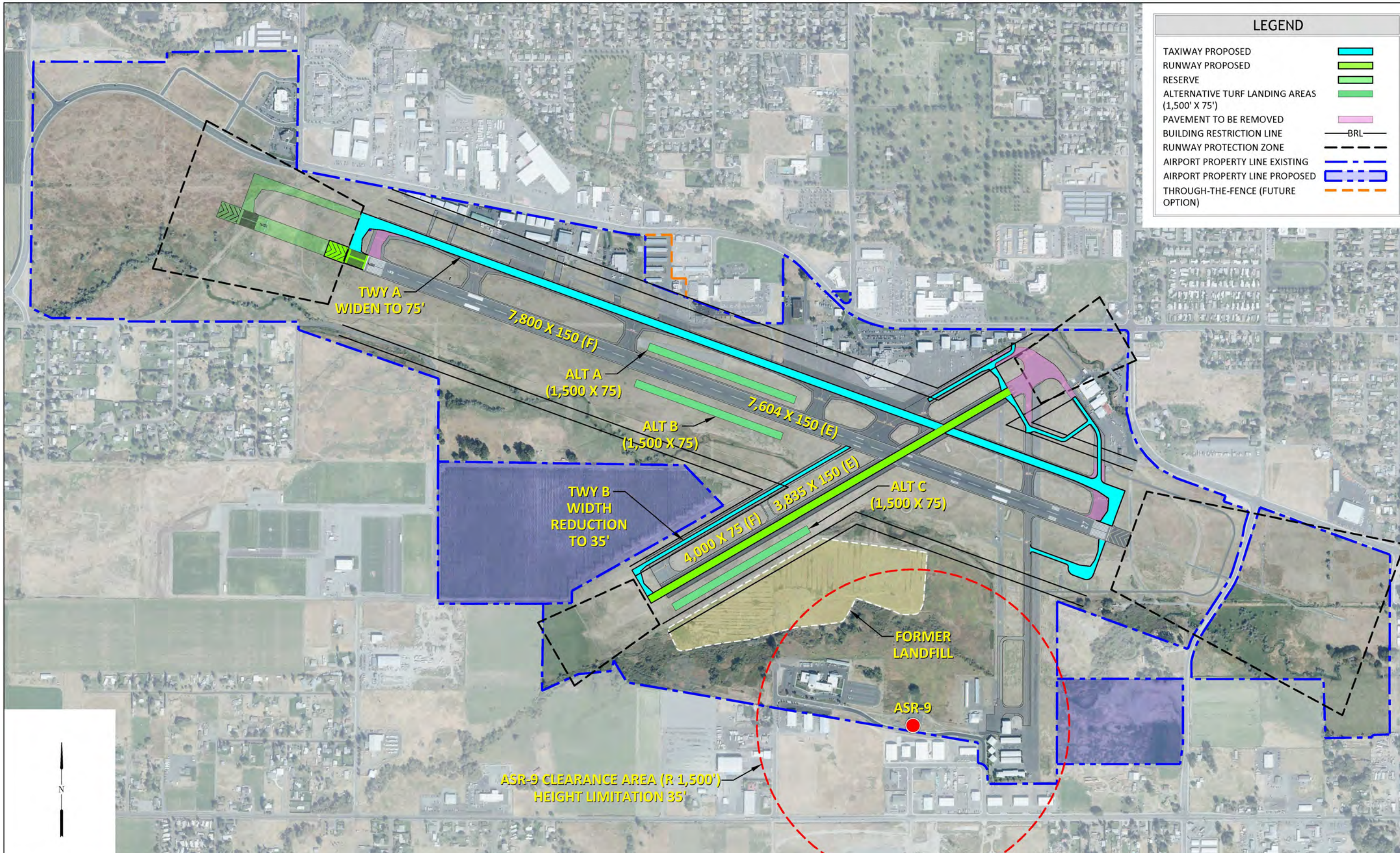


Figure 5-4: Terminal Area (Refined)

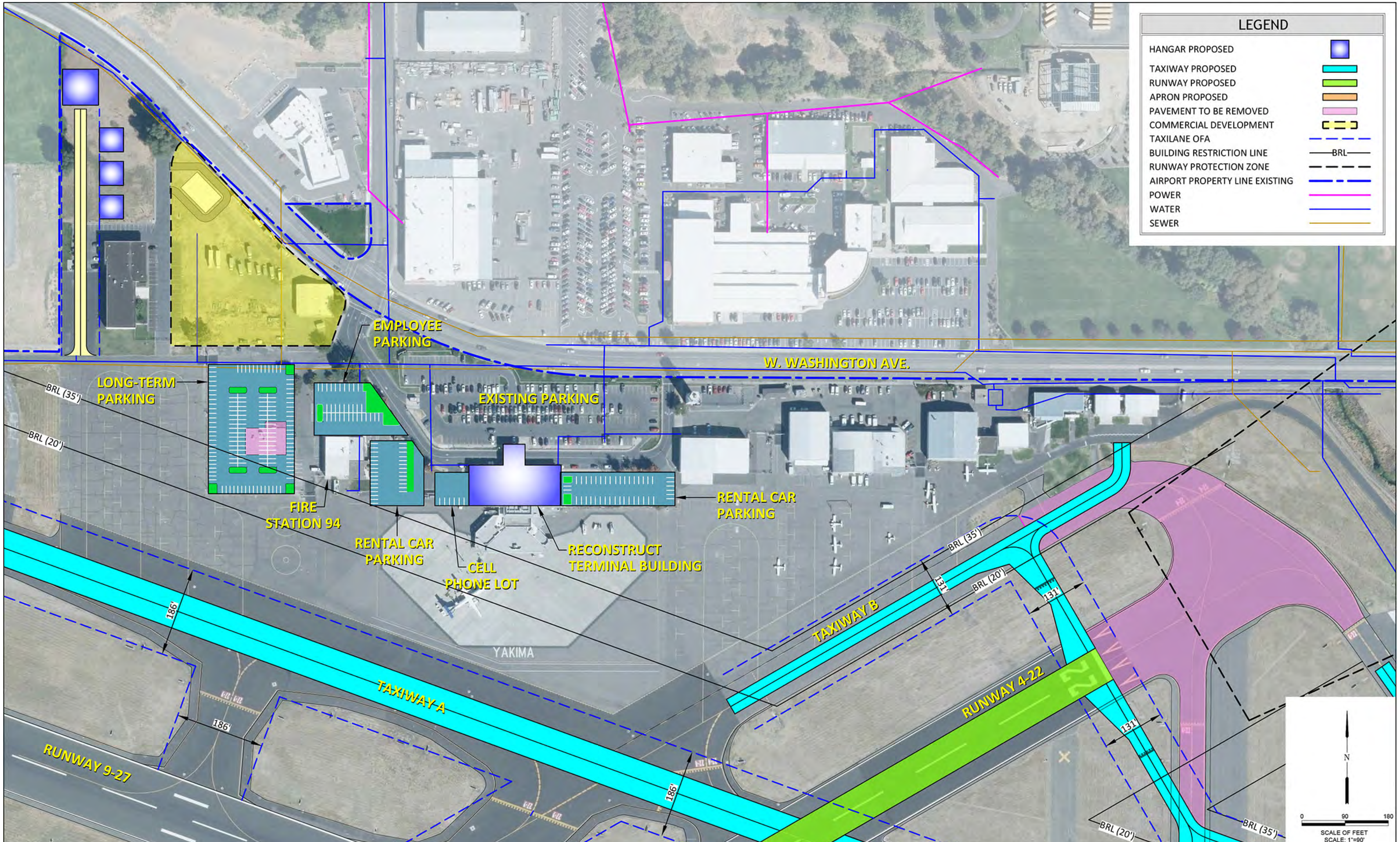


Figure 5-5: Northwest Area (Refined)

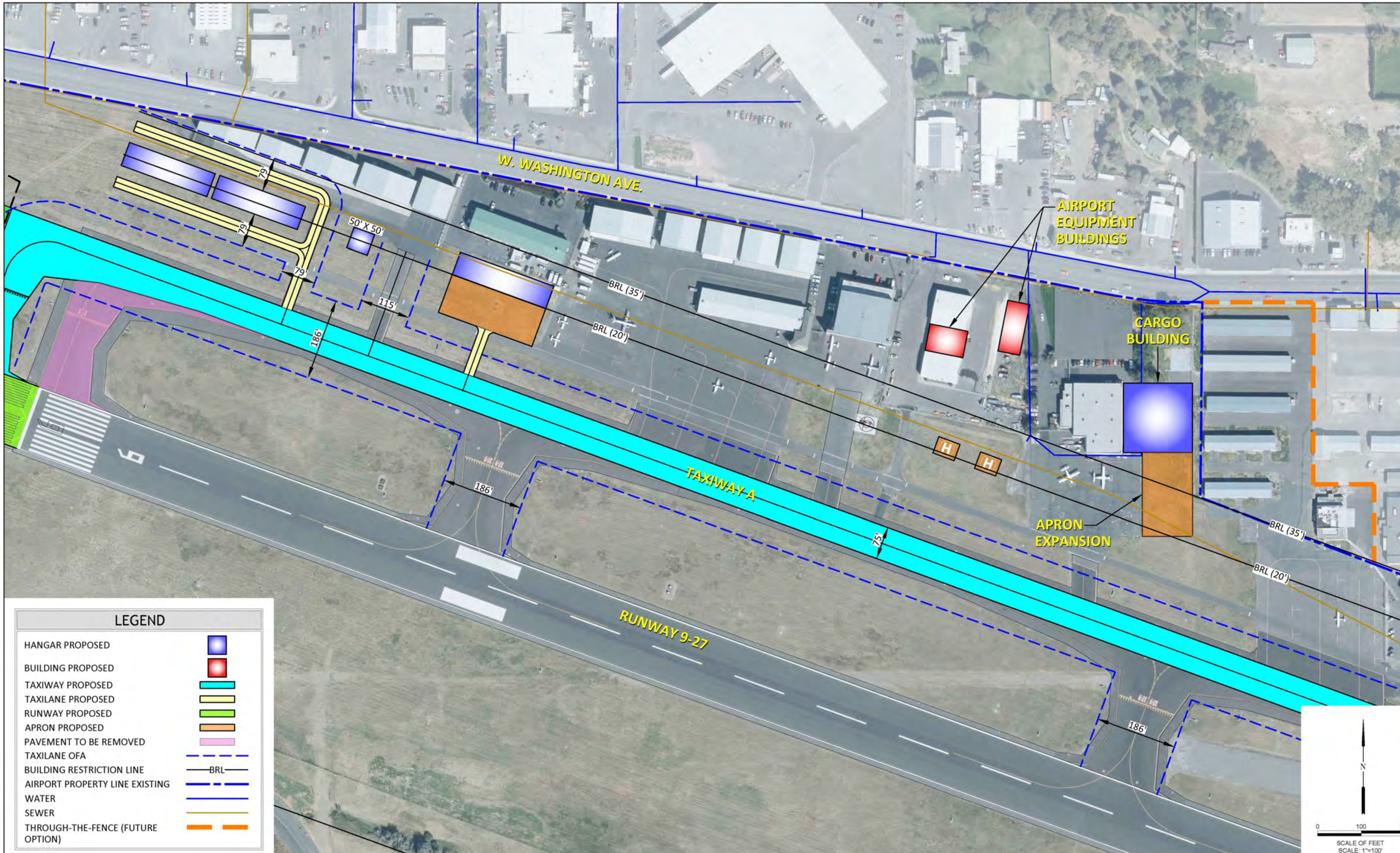


Figure 5-6: Northeast Area (Refined)

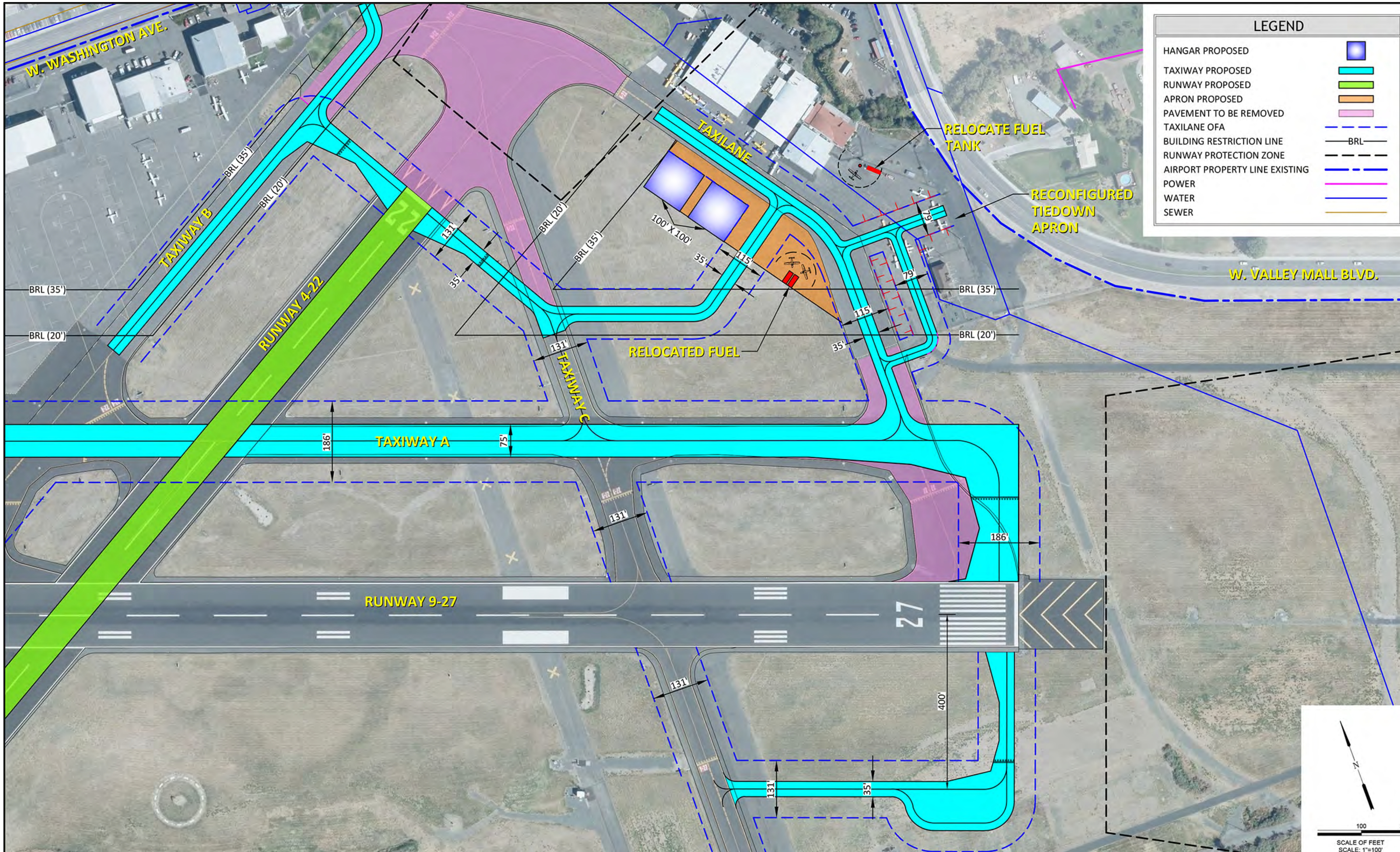
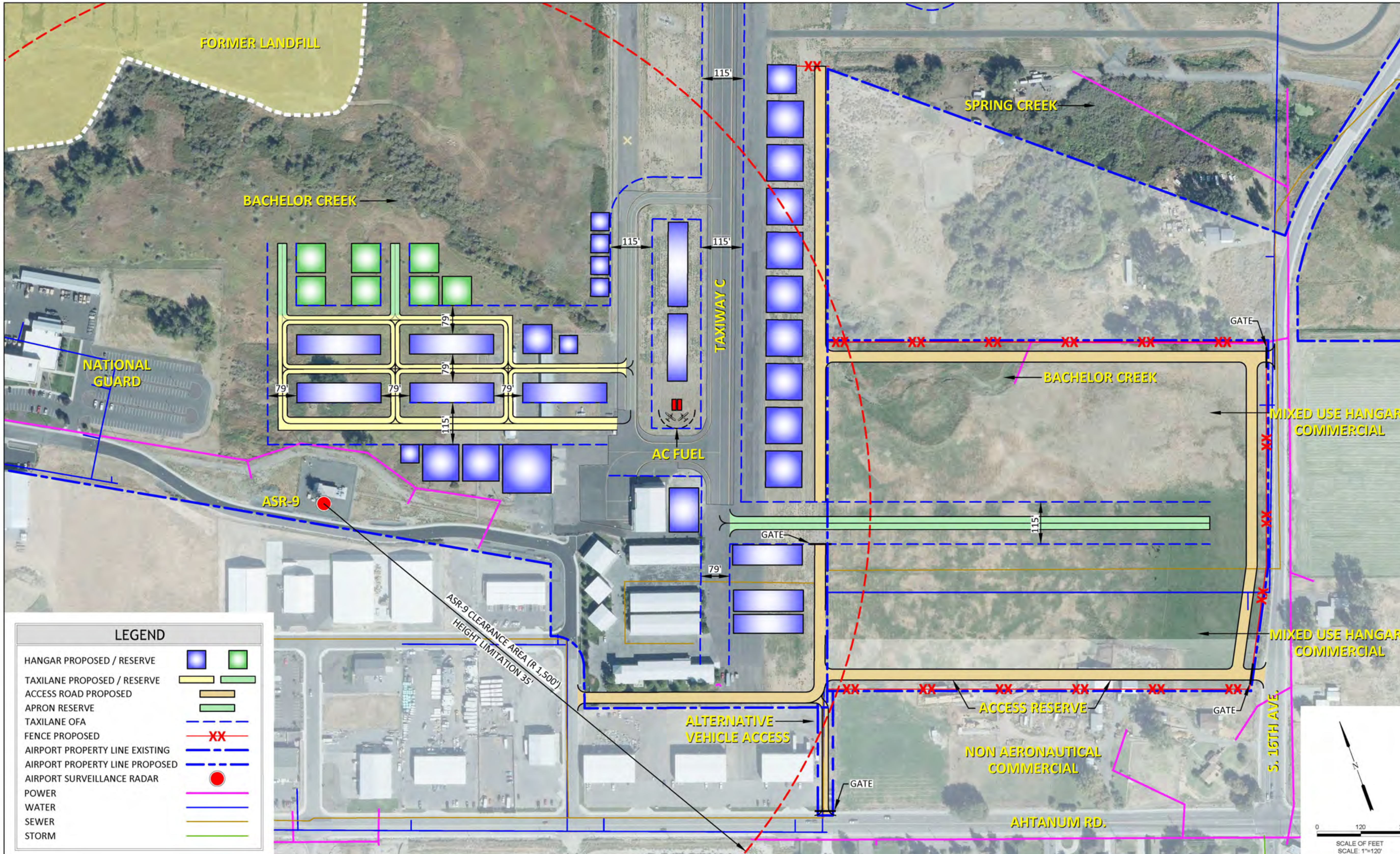
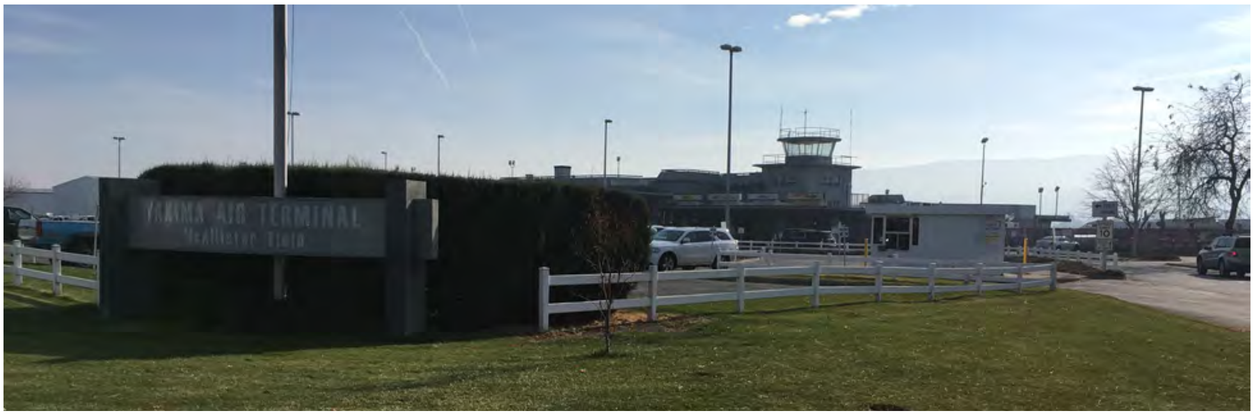


Figure 5-7: South Area (Refined)



5.6 TERMINAL ALTERNATIVES

2020 Note: This section was included in the 2015 Airport Master Plan. The previous recommendations are maintained and the information is presented for reference.



The passenger terminal facilities at YKM are located on the north side of the runway at the approximate intersection of Runways 9/27 and 4/22. The terminal area consists of the passenger terminal building, terminal curbfront, commercial aircraft parking apron, the surface access system and automobile parking areas, and the airport administration offices.

The terminal area is accessed using either West Washington Avenue or South 24th Street onto the airport entry drive.

The passenger terminal building was constructed in 1950 at a cost of $200,000. In 1968, a ground level concourse in a "V" configuration was added to provide enclosed circulation space behind the security checkpoint. The terminal was again expanded and renovated between 1997 and 2000, expanding the passenger hold room, adding toilets to the secure area, and installing a canopy over the baggage unloading area. On the landside, the project reconstructed the departures/arrivals curbside canopy and renovated the passenger ticketing and baggage claim lobbies.

The terminal currently has approximately 30,838 square feet of space on two levels. All passenger processing occurs on the ground floor. The second floor was a former restaurant space that has been converted to office space in 2019. The abandoned ATCT is above the terminal with access from the second floor.

A URS team conducted a Terminal Facility Assessment in June and July of 2011, a copy of which is contained in this report as Appendix B. The team included a terminal planner and architect, an electrical engineer, a mechanical engineer, and a structural engineer. The team evaluated the overall condition of the terminal building and assessed how well the building accommodates air passenger processing. The information included in this report is based on review of documents and information provided by the airport, on-site inspections, and comments and input received from airport personnel.

In addition to the assessment of the terminal, the Facility Requirements determination in the previous chapter showed that over the next 20 years, the space requirements within the terminal will need to be expanded. The alternatives being considered for the terminal begin with the decision as to whether the City should construct a new passenger terminal or renovate the existing. If the decision is made to construct a new building, the decision then becomes—where is the best location for the new terminal.

Making the first decision involves defining the level of renovation that would need to occur in the existing terminal and comparing the cost of this with the cost of constructing a new facility. The terminal assessment revealed several major factors that need to be addressed.

1. The interior layout is inefficient and creates points of conflict with passenger movements.
2. The interior layout includes fixed facilities such as walls and elevators that not only limit the flexibility of the space but also limit the use of the space for other functions. This is particularly noticeable in the area of the baggage claim and Rent-a-Car (RAC) facilities.
3. The current interior décor is outdated and needs upgrading.
4. Any rehabilitation of the terminal will require that it be brought into compliance with the 1997 Uniform Building Code.
5. The building's roof, while in good condition, shows signs of ponding and has numerous penetrations due to heating, cooling, and other mechanical units. The roof should be replaced within 5 years.
6. The building space on the terminal's second level is not suitable for use as a passenger terminal. Most facilities on this level have not been maintained at the same level as the public spaces on level one.
7. Portions of the fire suppression system may be undersized.
8. The heating, cooling, dampers, rooftop ductwork, and water heaters all should be replaced prior to 2015.
9. The building is not wired for modern communications and computer systems.

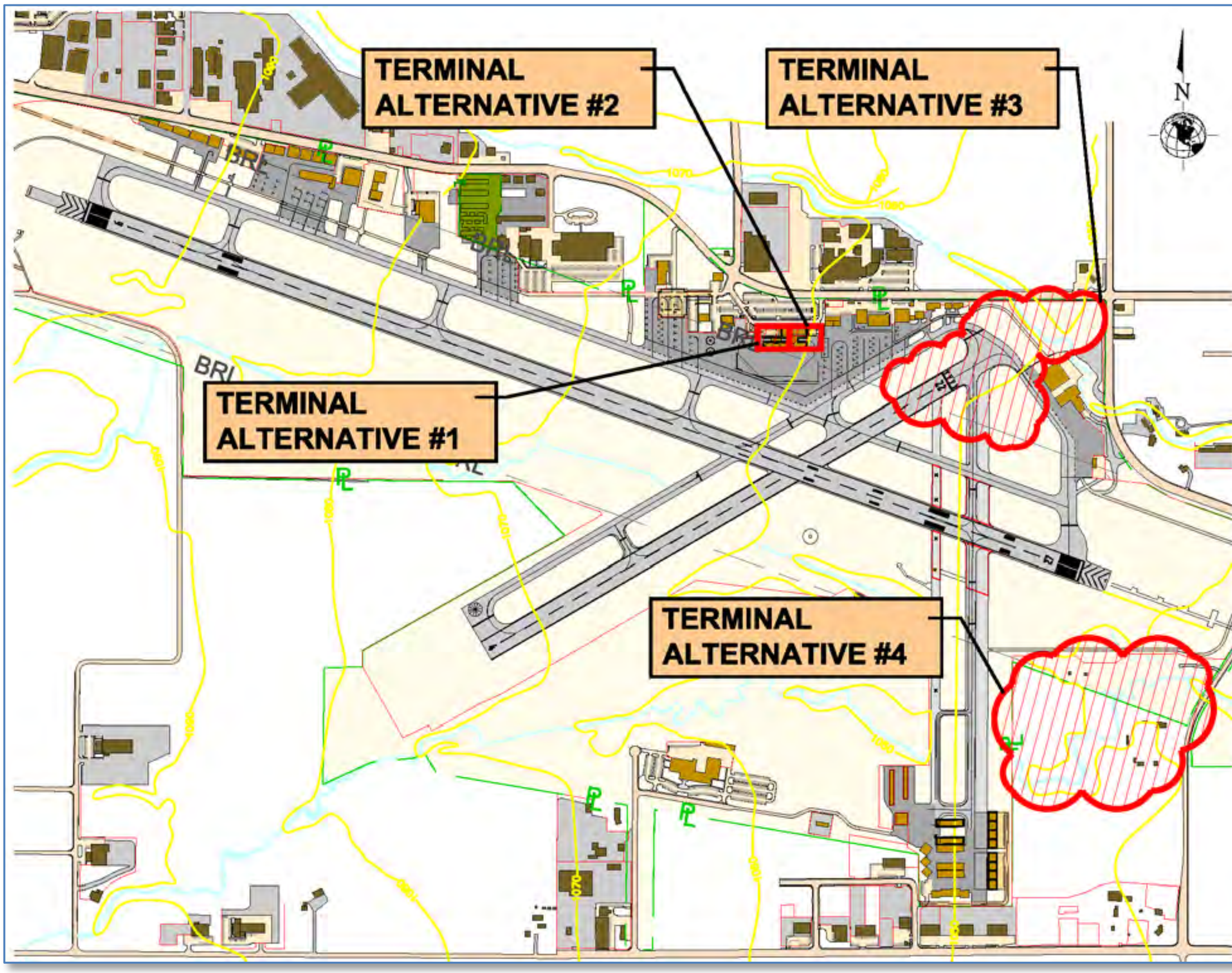
Based on these deficiencies the cost of a terminal upgrade is likely to be close to the cost of building a new terminal. In this case a preliminary estimate shows a cost of $14.5 million to rehabilitate the existing structure and expand to meet future needs. This is compared to a cost of roughly $18.4 million to construct a new building.

If it is determined that the City's preference is to construct a new terminal, the next decision is to select the site for the new building. The master plan has identified three potential sites for a new terminal. These are shown in Figure 5-6 and described as follows.

- **Terminal Alternative 1:** Rehabilitate the existing building and expand as needed.
- **Terminal Alternative 2**: Construct a new terminal building adjacent to the existing in order to maintain the existing roadway access, parking, apron area, and other support functions.
- **Terminal Alternative 3:** Relocate the terminal complex to the east of Runway 4/22 if the City determines to close the runway.
- **Terminal Alternative 4:** Relocate the terminal complex to the southeast.

These alternatives were compared to determine which would best serve the airport's needs. The criteria and a comparison of the positions are as follows.

Figure 5-8: Terminal Location Alternatives



5.7 ANALYSIS OF TERMINAL ALTERNATIVES

The following presents a summary of the alternative analysis for the terminal.

- **Meets FAR Part 77 Criteria:** No terminal location can be developed if it does not meet this criterion. Alternatives 1, 2, and 4 meet this criterion but the position of Alternative 3 only works if Runway 4/22 is closed. While this runway is currently not eligible for federal funds, it is in use and the City has decided to commit funds to its operation and maintenance. Therefore, construction of a terminal area would not be compatible as long as the runway is operational.

- **Available Land:** Is the site large enough to accommodate an expanded terminal building as well as to allow for flexibility in operations should conditions change in the future.

  All three alternatives have adequate land available although the City currently owns the land for Alternatives 1, 2, and 3 but would need to purchase approximately 40 acres of land to develop Alternative 4.

- **Can Site Adapt to Unforeseen Needs**: Any new terminal needs to be adaptive to unforeseen increases in demand levels. This includes the possibility that larger aircraft will be used, that additional airlines will offer service, or that passenger levels will increase faster than forecast.

  All of the alternatives are expandable.

- **Compatibility with Other Land Uses**: The passenger terminal area must compliment (or at least not conflict with) surrounding land uses. None of the sites create compatibility issues with surrounding land. Additionally, Alternative 4 would provide incentive for further development of adjacent land.

- **Design Issues**: This factor identifies whether there are any site-specific issues that could complicate the design and construction of terminal facilities. These factors could include soils, grading, removal of existing facilities, etc.

  For Alternative 1 the existing building would need to remain operational during the rehabilitation of the structure, adding a level of complexity and increased cost.

  For Alternatives 2, 3, and 4 the new terminal would be constructed separate from the existing building. Alternative 2 would have the advantage of being able to use the existing aircraft parking apron, the auto parking lots, and the surface access system. Alternatives 3 and 4 would need to add those support facilities as part of the terminal construction. No other specific design issues have been identified at any site.

- **Cost Issues**: Working with the design issues identified in the preceding bullets, cost factors were developed to represent relative cost differentials between the sites. The cost estimates reflect the level of effort involved in implementation. Costs for Alternatives 1 and 2 are limited to the cost of the terminal building since support facilities (aircraft apron, auto parking, etc.) will remain usable. For Alternative 3 all facilities will need to be reconstructed and in Alternative 4 reconstruction will also be needed as will land acquisition.

A summary of the Terminal Analysis is shown in Table 5-3.

Table 5-3: Summary of Terminal Location Analysis

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Meets FAR Part 77 Criteria	Yes	Yes	Yes	Yes
Sufficient Land Available	Yes	Yes	Yes	Yes
Can Site Adapt to Unforeseen Needs	Yes	Yes	Yes	Yes
Compatibility with Other Land Uses	Yes	Yes	Yes	Yes
Design Issues	Yes	No	No	No
Cost	$14.5 Million	$18.3 Million	$20.9 Million	$28.5 Million

5.8 RECOMMENDED TERMINAL AREA ALTERNATIVE

Terminal Alternative 2 should be selected as the plan for the development of the terminal at YKM for the following reasons:

1. It is the least expensive of any of the "new building" alternatives because it can be accomplished in a manner that allows continuous use of the terminal support facilities.
2. Rehabilitating the existing terminal provides for a cosmetic upgrade without fully addressing some of the issues that exist at the building such as the external vents for the heating, ventilation, and air conditioning (HVAC) that necessitates all the roof penetrations.
3. Reconstructing the existing terminal will necessitate that operations be conducted during construction. This could suppress demand at a time when the City and community are attempting to promote the use of the local airport.

6

6 AIRPORT LAYOUT PLAN

6.1 INTRODUCTION

This chapter presents the Airport Layout Plan (ALP) for the Yakima Air Terminal/McAllister Field (YKM). The ALP describes and graphically depicts recommended development for the airport based on facility needs and forecast demand. The recommendations shown on the ALP reflect input received from the City of Yakima and Airport Administration, the Federal Aviation Administration (FAA), airport stakeholders, and the general public. The analyses and findings of the previous chapters provided the technical and policy guidance for this plan's outcome as reflected in the ALP.

The following plans make up the set of drawings commonly referred to as the ALP:

- Sheet 1: Cover Sheet
- Sheet 2: Airport Data Sheet
- Sheet 3: Airport Layout Plan
- Sheet 4: General Aviation Plan (West and South Areas)
- Sheet 5: Terminal and General Aviation Plan (East Area)
- Sheet 6: Airspace Plan
- Sheet 7: Airspace Plan (Continued)
- Sheet 8: Runway 9 Approach Plan and Profile
- Sheet 9: Runway 27 Approach Plan and Profile
- Sheet 10: Runway 4-22 Approach Plan and Profile
- Sheet 11: Runway 9 Protection Zone and Inner Approach Plan and Profile
- Sheet 12: Runway 27 Protection Zone and Inner Approach Plan and Profile
- Sheet 13: Runway 4 Protection Zone and Inner Approach Plan and Profile
- Sheet 14: Runway 22 Protection Zone and Inner Approach Plan and Profile
- Sheet 15: On-Airport Land Use Plan

- Sheet 16: Off Airport Land Use Plan
- Sheet 17: Airport Property Map Exhibit A

The plan sheets are found at the end of this chapter.

6.2 COVER SHEET

The Cover Sheet, Sheet 1, serves as an introduction to the Airport Layout Plan (ALP) drawing set, providing a location and vicinity map of the airport and an index of the drawings.

6.3 AIRPORT DATA SHEET

The focus of Sheet 2 includes detailed airport data, runway and taxiway dimensions, FAA dimensional standards, wind roses, and any modifications to standards in-place.

6.4 AIRPORT LAYOUT PLAN

The Airport Layout Plan, Sheet 3 graphically depicts both existing airport facilities and the airside and landside projects that have been recommended for the 20-year planning period. Specifically shown are;

1. The extension of Runway 9/27 to a total length of 7,800 feet is planned to accommodate the change in design aircraft from the Bombardier Q400 to the Embraer 175, which is anticipated in the 20-year planning period. A long-term reserve length of 9,100 feet is depicted to show the length needed to accommodate the Boeing 737 (800/900 series). Although YKM does receive the larger Boeing aircraft, they do not receive the frequency required by FAA to be justified within the time frame (20 years) covered by this master plan. It is included as a contingency should unforeseen demand develop or opportunities present themselves.
2. Based on an updated wind analysis, Runway 4/22 does not meet FAA criteria for a crosswind runway. The City has indicated that it will continue to maintain Runway 4/22 as a B-II secondary runway using non-FAA funding for as long as it is feasible. As the pavement deteriorates and the surface becomes unsuitable for aircraft operations in the future, closure of the runway will be considered.
3. The intersection of Runway 22, Taxiway C, and Taxiway B will be reconfigured to eliminate the aligned taxiway to Runway 22, as well as mitigate the hotspot.

4. A new partial parallel taxiway is recommended on the south side of Runway 9/27 to direct runway crossings to the end of Runway 27 instead of at the intersection at Taxiway C. This project is will increase safety in operations. At the same time an additional parallel taxiway to access the South GA area is recommended to provide two-way traffic to the runway.
5. A new passenger terminal building should be constructed at the site of the existing building. This location allows for the continued use of the access and parking areas as well as of the concrete aircraft apron. The new terminal is required to serve existing as well as projected activity levels.
6. Acquisition of land east of Taxiway C to South 16th Avenue and land west of Runway 4 to South 36th Ave is recommended to support long-term hangar development needs.

6.5 TERMINAL & GENERAL AVIATION AREA PLANS

Sheet 4 details the West and South GA areas including future hangar development with mixed T-hangar, commercial-use and box hangar construction. The West GA area includes expanding the cargo building and associated apron as demand requires, remodeling the existing Airport Snow Removal Equipment (SRE) building to store up-to four pieces of equipment, and construct a separate building for equipment storage. It also includes providing designated paved helicopter parking positions in a grass area where helicopters currently park. Further west are areas available for additional T-hangar and multi-unit hangar development; however, individual box hangars may be constructed in these locations depending on market demand.

YKM has limited space available for long-term hangar development and most of the available space is in the South GA area. Taxiway C provides the only taxiway access to the south area and as development increases, this taxiway will become congested. To help remedy congestion, a partial parallel taxiway from Taxiway C to the end of Runway 27 is planned with an aircraft hold area.

Future development in the south area is constrained by Bachelor Creek, the ASOS clear area, and a former landfill site. The existing Richardson T-hangars will be removed at the end of their useful life and the area will be reconfigured to support new development. Land acquisition to the east of Taxiway C in the South GA area is recommended for long-term hangar needs.

The focus of Sheet 5 includes the passenger Terminal Area and the East GA. As shown on the plan, several improvements and additions are recommended for these facilities:

1. A new passenger terminal building is recommended for construction in the location of the existing building. This was shown to be the least expensive of any of the "new building" alternatives considered because it can be accomplished in a manner that allows continuous use of the existing terminal support facilities such as access, auto parking and aircraft parking.
2. The commercial aircraft apron area should be maintained to provide for up to 4 aircraft parking positions.
3. The existing airport administrative building east of Station 94, would be removed and the area would be reconfigured for automobile parking.
4. At the time that the new terminal building is completed the airport administration offices will be moved to the new building.

Sheet 5 also includes details regarding the East GA area. When demand requires, the east apron adjacent to McAllister Museum would be reconfigured to provide additional tiedowns with ADG-I and ADG-II taxilanes, additionally the self-serve fuel facility would be relocated for easier aircraft access.

6.6 FAR PART 77 AIRSPACE PLAN

The airspace plan for YKM is depicted on Sheets 6 and 7. These sheets illustrate the imaginary surfaces defined in Federal Aviation Regulation (FAR) Part 77, Obstructions to Navigable Airspace as they apply to Runways 9/27 and 4/22. The surfaces shown should not be penetrated by objects of natural growth, man-made objects, or terrain. The airspace surfaces as applied to YKM are as follows.

6.6.1 Primary Surface

The primary surface is an imaginary surface centered on the runway centerline and extending 200 feet beyond each end of the runway. The primary surface width is based on the type of approach procedure available to the runway. The primary surface width for Runway 9/27 is 1,000 feet based on the precision instrument approach procedure to Runway 27. This dimension is applicable for both current and future conditions.

For Runway 4/22, the primary surface is, and will continue to be 250 feet since this is a visual runway.

6.6.2 Approach Surface

The approach surface is the imaginary inclined plane beginning at the end of the primary surface and extending outward to distances up to 50,000 feet, based on the type of approach procedure available to the runway end. The width and slope of the approach surface depend on the type of approach procedure available on the runway.

The approach slope to Runway 27 is based on the precision instrument approach. It begins 200 feet from the physical end of the runway and is 1,000 feet wide at that point. It extends outward for 10,000 feet and upward at a slope of 50:1 then outward for an additional 40,000 feet and upward at a slope of 40:1 at which point it is 16,000 feet wide.

The approach slope to Runway 9 is based on the non-precision approach procedure available. It begins 200 feet from the physical end of the runway and is 1,000 feet wide at that point. It extends outward for 10,000 feet and upward at a slope of 34:1 at which point it is 3,500 feet wide.

Visual approaches are available to Runway 4/22. The approach surfaces begin 200 feet from the end of the runway where they are 250 feet wide. They extend outward for 5,000 feet and upward at a slope of 20:1 at which point they are 1,500 feet wide.

6.6.3 Horizontal Surface

The horizontal surface is the imaginary plane 150 feet above the established airport elevation. The shape of the plane is determined by striking arcs from the end of each primary surface. The radius of each arc is based on the most demanding type of approach procedure planned for the runway. The individual arcs are connected by lines tangent to the arcs. At YKM, the airport elevation is 1,099 feet above mean sea level (MSL), so the Horizontal Surface is 1,249 feet MSL.

6.6.4 Conical Surface

The conical surface is an imaginary inclined plane beginning at the edge of the horizontal surface and extending outward at a 20:1 slope for a distance of 4,000 feet. At YKM the conical surface begins at 1,249 feet at extends outward and upward to 1,449 feet.

6.6.5 Transitional Surface

Transitional surfaces are the inclined planes extending outward from the primary surface, at a 7:1 slope until they intersect with the horizontal surface. They extend upward from the approach surface to the intersection with the horizontal surface.

In reviewing the FAR Part 77 Imaginary Surfaces drawing for YKM, it is seen that numerous objects penetrate the defined surfaces including trees, buildings and terrain. On the sheet, existing and potential obstructions have been identified and are noted and the obstruction removal plan is provided.

6.7 RUNWAY PROTECTION ZONES AND APPROACH SURFACE PLANS AND PROFILES

Sheets 8 thru 14 depict plan and profile views of the runway approach surfaces depicted in the FAR Part 77 airspace plan. The drawings provide additional detail identifying obstructions, terrain and other physical features within the approach surfaces. The drawings include obstruction data tables for items depicted on the drawing, using the same numbering identifiers from the overall Part 77 Airspace Plan.

6.8 AIRPORT LAND USE

YKM is situated within the City of Yakima but two other political jurisdictions exist within the immediate area, Yakima County and the City of Union Gap. Sheets 15 and 16 shows that the land surrounding the airport is a mixture of residential, commercial, industrial and undeveloped. To assure that the airport remains compatible with the surrounding land, two critical factors must be considered: height hazards, as represented on the FAR Part 77 Imaginary Surfaces Plan, and the potential impact of aircraft noise.

6.8.1 Height

Height requirements around the airport are defined by FAR Part 77, Objects Affecting Navigable Airspace. The Part 77 Surfaces surrounding YKM have been discussed and defined previously in this chapter. These drawings illustrate the airspace that needs to be kept clear of obstructions, including objects of natural growth, man-made objects, and terrain to assure safe, all-weather operations.

6.8.2 Noise

Aircraft-generated noise impacts are typically the primary source of concern between airports and surrounding land uses. Preparing and implementing plans for compatible land uses in the airport vicinity is strongly encouraged by the Federal Aviation Administration (FAA). In measuring noise impacts FAA has recognized that the threshold of significance is the 65 day-night sound level (DNL). FAA Advisory Circular 150/5020-1, Noise Control and Compatibility Planning for

Airports, provides guidance in determining land uses that are compatible or incompatible with noise levels of various magnitudes around airports. The following discussion provides details on the methods used to model noise impacts in the vicinity of YKM as well as a discussion of the impacts that this noise has on the area.

6.8.2.1 Day-Night Sound Level

Noise is generally defined as unwanted sound, and as such the determination of what constitutes an acceptable level to any individual is subjective. In analyzing noise impacts from airports the day-night sound level (DNL) methodology is used to determine both the noise levels being experienced under existing conditions and the potential changes to noise levels that can be expected in the future. The basic building block in the computation of DNL is the Sound Exposure Level (SEL). An SEL for each aircraft type has been calculated by FAA and these data sets are included in the Integrated Noise Model (INM) software. The Integrated Noise Model (INM) has been specifically developed by the FAA to plot noise contours for airports. The original version was released in 1977, and the present Version 7.0.d was released in May 2013. The program is provided with standard aircraft noise and performance data.

The SEL levels included in the INM were computed by FAA by adding the decibel (dBA) level for each second of a noise event that is above a certain threshold. An “A”-weighted decibel is the sound level which is weighted in a manner that closely matches the ear's response. Such weighting reduces the influence of lower and higher frequencies relative to the middle frequencies, and is usually expressed in dBA units. To determine the basis for SEL’s the operation of an individual aircraft was monitored in a test environment and the highest dBA reading for each second of the event as an aircraft approached and departed was recorded. Each of these one-second readings was then added logarithmically to compute the SEL for that aircraft type. Figure 6-1 depicts the typical dBA values of noise commonly experienced by people. This illustrates the relative impact of single event noise in "A"-weighted level.

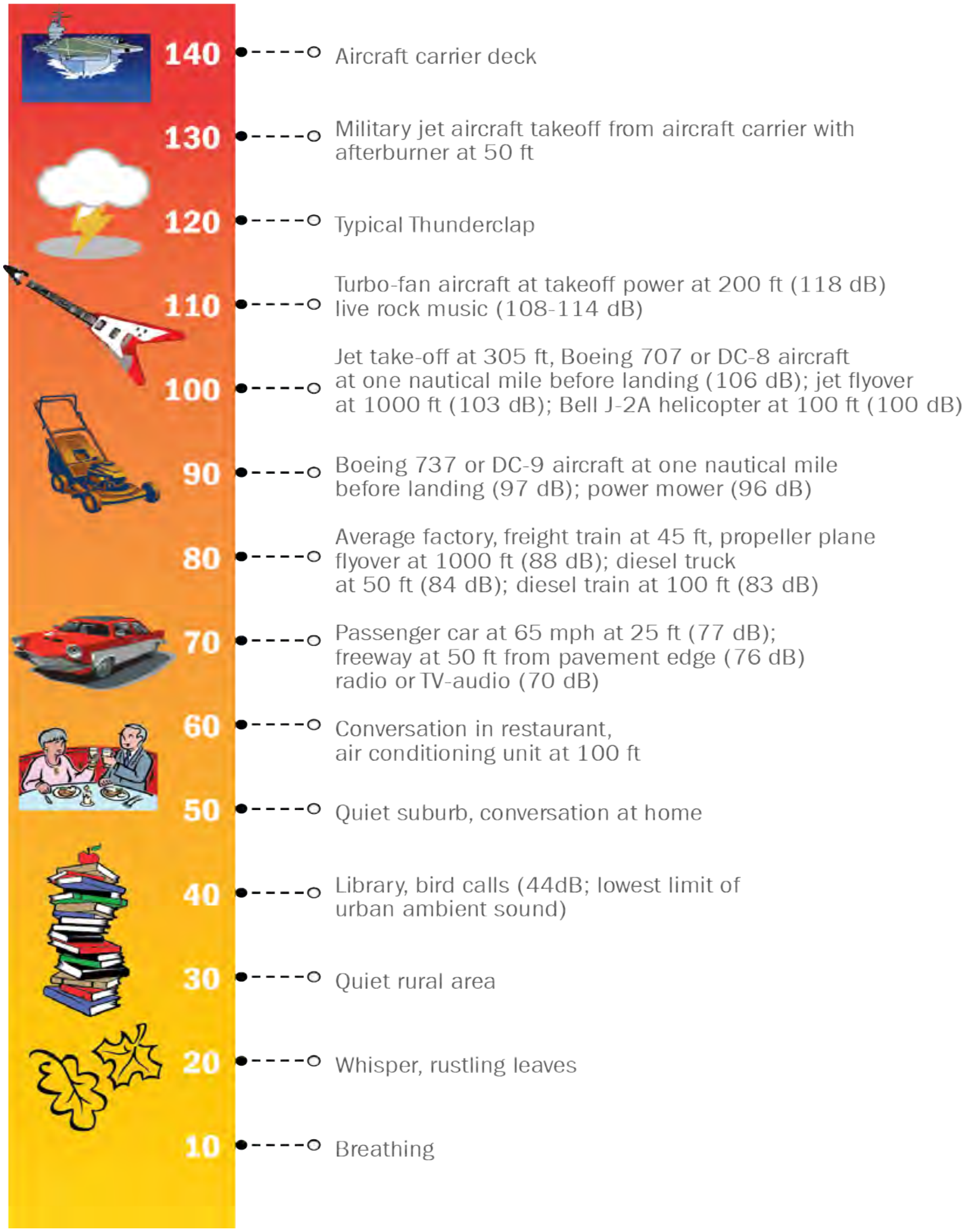


Figure 6-1: A Comparison of Common Noise Levels

It is important to note that SEL levels are not the metric used to assess noise impacts in the vicinity of an airport. Instead they are used to the calculate DNL levels. The FAA relies on DNL contours with levels above 65 as the threshold of significance at an airport. To define this threshold the SEL measurements are converted to DNL. This involves the addition, weighting, and averaging of each SEL to achieve a DNL level for a particular location. The SEL of single noise events that occur between the hours of 10:00 p.m. and 7:00 a.m. are additionally weighted by adding 10 dBA to the SEL to account for the assumed additional disturbance perceived during that time period. All SELs are then averaged to achieve a level characteristic of the total noise environment. Very simply, a DNL level for a specified area over a given time is approximately equal to the average dBA level that has the same sound level as the intermittent noise events. Thus, a DNL 65 dBA level describes an area as having a constant noise level of 65 dBA that is the approximate average of single noise events even though the area would experience noise events much higher than 65 dBA as well as periods of quiet. The main advantage of DNL is that it provides a common measure for a variety of differing noise environments. The same DNL levels can be used to describe either an area with very few high level noise events or an area with many low level events. DNL is thus constructed because it has been found that the total noise energy in an area is a good predictor of community response. Figure 6-2 graphically depicts the relationship between SEL events and the DNL levels.

DNL levels generally are depicted as noise contours. These contours are interpolations of noise levels based on the centroid of a grid cell and drawn to connect all points of similar noise levels. Contours appear similar to topographical contours and form concentric "noise footprints". The footprints of DNL contours as calculated by the INM are drawn about the airport and used to predict community response to the noise from aircraft using that airport.

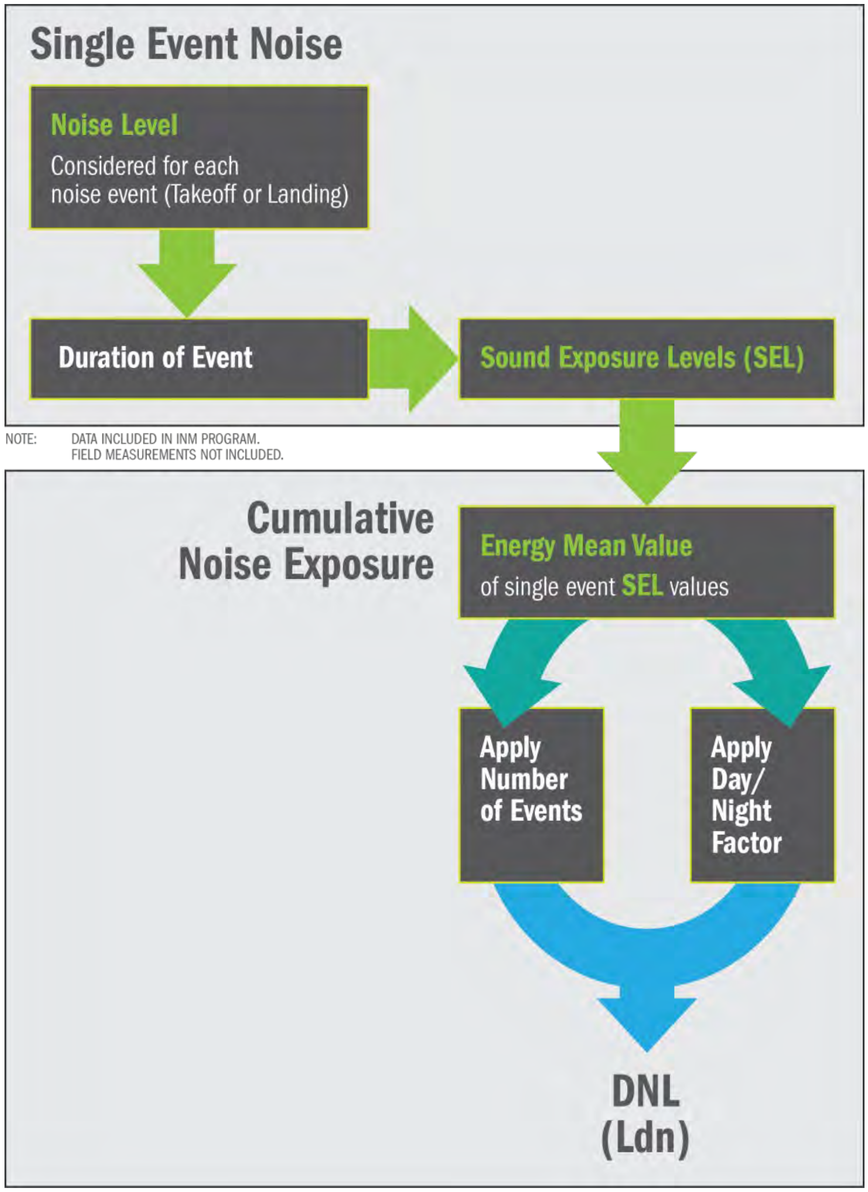


Figure 6-2: Converting SEL to DNL

6.8.2.2 Computer Modeling

The DNL noise contours shown in this report were generated using the Integrated Noise Model (INM), specifically developed by the Federal Aviation Administration (FAA) to plot noise contours for airports. The original version was released in 1977, and the present Version 7.0.d was released in May 2013. The program is provided with standard aircraft noise and performance data that can be tailored to the characteristics of individual airports.

The INM program requires the input of the physical and operational characteristics of the airport. Physical characteristics include runway coordinates, airport altitude, and temperature. Operational characteristics include aircraft mix, flight tracks, and approach profiles. Optional data that is contained within the model includes departure profiles, approach parameters, and aircraft noise curves. All of these options were incorporated in order to model the noise environment at YKM.

Physical Characteristics

The physical configuration of a runway system has obvious impact on the noise environment. Likewise, the direction of flight is a factor in noise exposure (take-offs generate more noise than landings) so defining the percentage of time that operations occur in each direction is key to understanding noise impacts. At YKM there are two runways but activity occurs primarily on Runway 9/27. No changes have been made to the orientation of the runway but the extended runway length was used to calculate the 20 years hence contour (year 2030). Aircraft use the ends of runways for operations based on wind direction and speed and air traffic control guidance. The percentage of time that operations occur on each runway end was determined through wind analysis and discussions with Airport Traffic Control Tower (ATCT) personnel.

Operational Characteristics

To model the existing and predicted noise impacts at YKM, the actual recorded activity levels obtained from ATCT and the airport for 2010 and the forecast operations levels for 2030 presented in the approved aviation demand forecasts presented in Chapter 3 were used.

Since different aircraft types generate different noise profiles it is important to define the types of aircraft that use the airport today and project those likely to use it in the future. The forecast of aviation demand included a detailed breakdown of annual activity by aircraft type and these were used to generate the noise contours.

Flight Tracks - In general, aircraft noise impacts are greater below the takeoff paths than at the arrival end of the runway. When landing, all fixed wing aircraft follow roughly the same approach slopes, thus noise differences depend mostly on the aircraft size and engine types. Also, because engines are set to low power levels on approach, the noise produced by the airframe from features such as wing flap and extended landing gear may be greater than the actual engine noise.

When taking off, fixed wing aircraft do not typically follow the same departure slopes. Within a couple of miles of the runway end, jets reach a higher altitude than do the more slowly climbing propeller aircraft and the noise level on the ground diminishes as they climb.

With this in mind, the path of the approach to (or departure from) a runway helps to define where noise impacts are experienced. The INM input includes flight paths for straight-in approaches to Runways 9 and 27 that are common to commercial aircraft, and circling approaches for other aircraft and touch and go paths for general aviation in training on all runway ends. These are based on both approach and departure plates, ATCT descriptions, and the City's policies.

Day/Night Traffic - The time of day when an operation occurs is important in determining the impact that the noise will have on a community. In the INM, night operations are assigned a 10 dB penalty to reflect the impact that noise has during these hours. Determination of the day/night traffic split for YKM was based on the current airline flight schedule and activity records from the ATCT. It is estimated that 95% of all operations occur during the day.

6.8.3 Land Use Compatibility

The Land Use Compatibility Matrix, Table 6-1, indicates those land uses that are compatible within the specific DNL noise contours. It identifies land uses as being compatible, incompatible, or compatible if sound is attenuated. The matrix reflects the fact that 65 DNL is generally recognized as the threshold of concern by FAA. The matrix acts as a guide for local land use planning and control and a tool to compare relative land use impacts. It must be remembered that the DNL noise contours do not delineate areas that are either free from noise impacts or areas that are subjected to noise impacts. In other words, it cannot be expected that a person living on one side of a DNL noise contour will have a markedly different reaction to the noise event than a person living nearby, but on the other side of the contour line. For this reason, when implementing noise compatibility programs, the contours are used as a guide. Any attenuation programs are adjusted to include neighborhoods rather than individual properties.

What can be expected from analyzing the noise contours is that the general aggregate community response to noise within the DNL 65 noise contour, for example, will be less than the public response within the DNL 75 noise contour.

For this master plan 65, 70, and 75 DNL noise contours were generated to help determine land use impacts and compare the existing condition with that which can be projected for the future years. The area between the 65 and 70 DNL contours is where many types of land uses are normally unacceptable and where land use compatibility controls are recommended. The area located inside the 70 and 75 DNL noise contour is subjected to a significant level of noise and the sensitivity of various uses to noise is increased.

Table 6-1: Land Use Compatibility Matrix

	Yearly Day Night Noise Level (DNL) In Decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
Residential						
Residential other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile Homes	Y	N	N	N	N	N
Transient Lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade - general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communications	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing - general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agricultural (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Marine and fishery resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	N	N	N

Source: Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5020-1 "Noise Control and Compatibility Planning for Airports

Numbers in Parentheses refer to the notes (Continued on Next Page)

Table 6-1: Land Use Compatibility Matrix (Continued)

The designations in this table do not constitute a Federal determination that any land use covered by the program is acceptable or unacceptable under federal, state or local law. The responsibility for determining acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Key to table

Y = land use and related structures compatible without restriction

N = Land use and related structures incompatible without restrictions

20, 30 or 35 = Land use and related structures generally compatible when measures to achieve 25, 30, or 35 dB attenuation incorporated into the design of structures

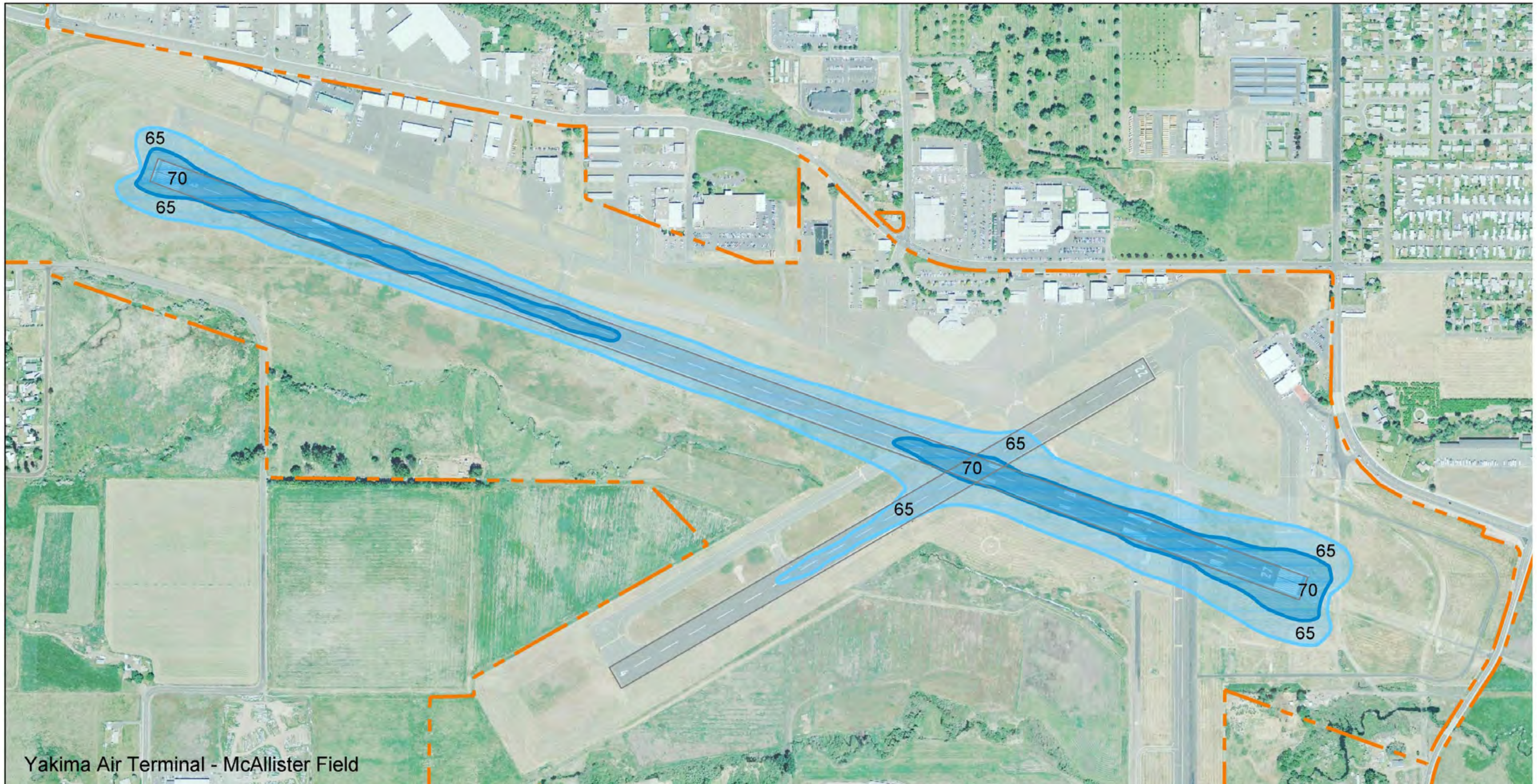
Notes:

1. When the community determines that residential or school uses must be allowed, measures to achieve outdoor or indoor noise level reduction of at least 25 dB to 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide 20dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
2. Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, and noise sensitive areas where noise levels are typically low.
3. Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
4. Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
5. Land uses are compatible provided that special sound reinforcement systems are installed.
6. Residential buildings required a NLR of 25.
7. Residential buildings required a NLR of 30.
8. Residential buildings not permitted.

6.8.4 Noise Impacts

The drawings that follow show the INM contours that were generated for the baseline conditions 2012 (Figure 6-3) and the 20 years hence conditions in 2030 (Figure 6-4). As can be seen, the future noise exposure is only marginally greater than the existing condition. In either the present or future case, there are no noise sensitive public use facilities in the area encompassed by the 65 DNL and there are no incompatible land uses anticipated for the airport within the time frame of the master plan. At present, aircraft operations do not generate much attention in the airport vicinity since most are conducted by small, piston powered aircraft and noise levels exceeding DNL 65 are contained on airport property both today and in the 20-year future. Therefore, the airport's noise impact on the surrounding communities will change as a result of the recommended improvements.

Figure 6-3: Integrated Noise Model (INM) - Year 2012



SCALE IN FEET 0 300 600

LEGEND

Airport Property

INM Contours

65 DNL Contour

70 DNL Contour

Noise Sensitive Facilities Identification		
Item	**65-70 DNL**	**≥ 70 DNL**
Housing Units	0 units	0 units
Noise Sensitive Facilities (Churches, Schools, Libraries, Nursing Homes)	0 units	0 units

Figure 6-3: Integrated Noise Model (INM) - Year 2012

Figure 6-4: Integrated Noise Model (INM) - Year 2030

Noise Sensitive Facilities Identification		
Item	65-70 DNL	≥ 70 DNL
Housing Units	0 units	0 units
Noise Sensitive Facilities (Churches, Schools, Libraries, Nursing Homes)	0 units	0 units

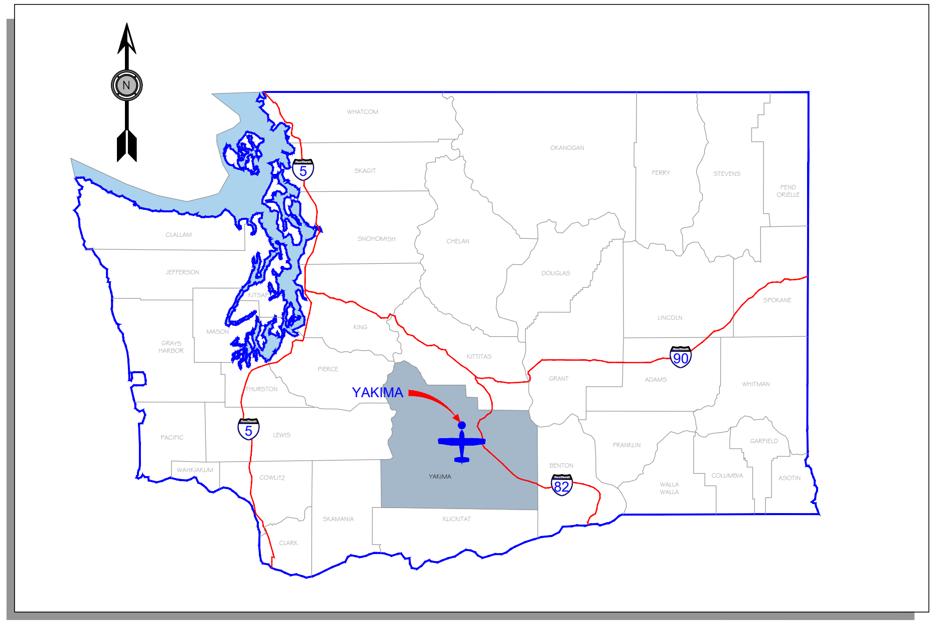
Figure 6-4: Integrated Noise Model (INM) - Year 2030

6.9 AIRPORT EXHIBT A PROPERTY MAP

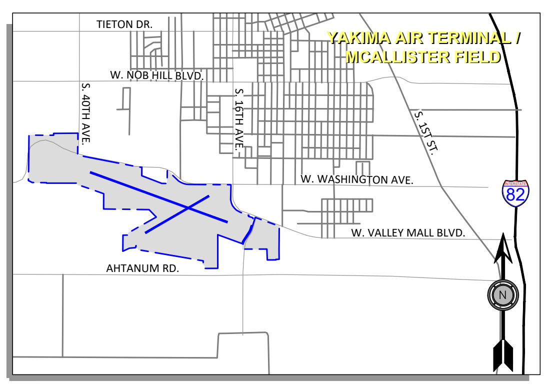
The Airport Exhibit “A” Property Map is shown on Sheet 17. The information on the map details the property acquisition history at the airport. The tabular information shows the parcel numbers, type of acquisition (fee simple or avigation easement), and the Federal program under which the property was purchased.

YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM) AIRPORT MASTER PLAN

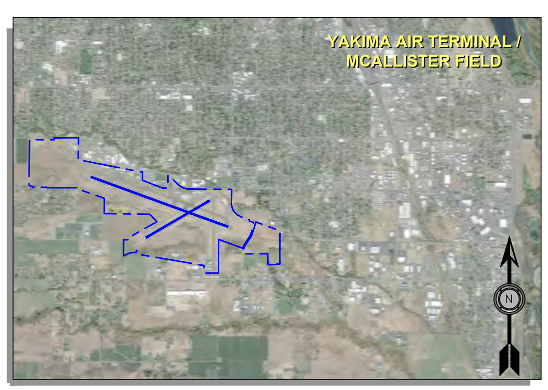
CITY OF YAKIMA, WASHINGTON
AIP NO. 3-53-0089-041-2018
AIRPORT LAYOUT PLAN
OCTOBER 2020



LOCATION MAP



VICINITY MAP



AERIAL PHOTO

SHEET INDEX

NUMBER	REV. DATE	CONTENTS
1		COVER SHEET
2		AIRPORT DATA SHEET
3		AIRPORT LAYOUT PLAN
4		GENERAL AVIATION (WEST AND SOUTH) PLAN
5		TERMINAL AND GENERAL AVIATION (EAST) PLAN
6		AIRPORT AIRSPACE PLAN (FAR PART 77)
7		AIRPORT AIRSPACE PLAN (FAR PART 77)
8		RUNWAY 09 APPROACH SURFACE PLAN AND PROFILE
9		RUNWAY 27 APPROACH SURFACE PLAN AND PROFILE
10		RUNWAY 4-22 APPROACH SURFACE PLAN AND PROFILE
11		RUNWAY 09 RPZ AND INNER APPROACH PLAN AND PROFILE
12		RUNWAY 27 RPZ AND INNER APPROACH PLAN AND PROFILE
13		RUNWAY 4 RPZ AND INNER APPROACH PLAN AND PROFILE
14		RUNWAY 22 RPZ AND INNER APPROACH PLAN AND PROFILE
15		ON AIRPORT LAND USE PLAN
16		OFF AIRPORT LAND USE PLAN
17		EXHIBIT "A" AIRPORT PROPERTY MAP

"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-53-0089-041-2018) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

FLY YKM

ALP & Exhibit A Approval Letter

Date: May 17, 2021
To: Agnes Fisher, Planner, Seattle Airports District Office
From: Robert Harrison, City Manager, City of Yakima
Robert Peterson, Airport Director, City of Yakima
Matt Rogers, Project Manager, Century West Engineering

Background

The updated Airport Layout Plan (ALP) for the Yakima Air Terminal-McAllister Field (YKM) consists of Sheets 1 through 17 dated October 2020. These documents were developed based on the conclusions of the 2020 Airport Master Plan study. 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 acknowledgment 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. The FAA encourages 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 (FAA) will participate in the cost of any development proposed. AIP funding requires evidence of eligibility and justification at the time a funding request is submitted for consideration. When construction of any proposed structure or development indicated on the plan is undertaken, such construction requires a 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 17. It was prepared in accordance with current FAA airport design standards, FAA Standard Operating Procedure 2.00. The last ALP for YKM was approved by FAA in 2015. Major changes in this 2020 ALP from the previous version include:

- Runway 09/27
  - Future runway length will increase to 7,800 feet, based on the future design aircraft (Embraer 175).
- Runway 04/22
  - Existing and future ARC is B-II.
  - Existing design aircraft is the Beechcraft Baron and future is the King Air 350.
  - Future runway length will increase to 4,000 feet and narrowed to 75 feet based on B-II standards.
  - Runway 22 end is reconfigured to mitigate a known hotspot and eliminate the aligned taxiway.
- Taxiways
  - Taxiway A is currently operating under a MOS that was developed to account for the Q400. This specifies a taxiway width of 64 feet, with 20-foot shoulders with the exception of Taxiway A5, which has a width of 75 feet with 35-foot shoulders.

CENTURY WEST ENGINEERING

Page **1** of **2**

FLY YKM

  - Taxiway A1 reconfiguration planned to create a 90-degree connector taxiway.
  - Future partial parallel taxiway is planned to connect Taxiway C to the Runway 27 end on the south side of Runway 9/27.
  - Taxiway B is reconfigured at the Runway 22 end to remove the aligned taxiway, and create 90-degree connector taxiways to Runway 22.
- Landside
  - Future taxilanes are planned in the south landside area (formally known as South Airpark) to support future hangar development.
  - Future reconfigured apron, taxilanes, and fuel island in the northeast landside area (adjacent to McAllister Museum).
  - Future expansion of the Snow Removal Equipment (SRE) building.
  - Future reconstruction of the Terminal building and parking infrastructure.

Exhibit A

The Exhibit A – Airport Property Map consists of Sheet 17. 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 2015. Major changes in this October 2020 Exhibit A Update from the previous version includes:

- Updated existing property boundary.
- Updated property acquisition planned during the 20-year planning period, including the agricultural land west of Runway 4 between S. 36th Ave and airport property; agricultural land between Taxiway C and 16th Ave along Ahtanum Rd.

Signature Blocks

The FAA signature below acknowledges approval of the ALP and acceptance of the Exhibit A.

Federal Aviation Administration (FAA)	City of Yakima
Agnes Fisher (Digitally signed by Agnes Fisher Date: 2021.05.18 14:06:56 -07'00')	Robert W. Harrison
Agnes Fisher, Planner	Robert Harrison, City Manager
Century West Engineering Corp.	**City of Yakima**
Matt Rogers, Project Manager	Robert Peterson, Airport Director

CENTURY WEST ENGINEERING

Page **2** of **2**

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES

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

FEDERAL AVIATION ADMINISTRATION APPROVAL
APPROVAL DATE:
SIGNATURE

CITY OF YAKIMA APPROVAL
APPROVAL DATE:
SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE., #100
BEND, OR 97702
541.322.8962 OFFICE
541.382.2423 FAX

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
SP	JLS	DM	AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL / MCALLISTER FIELD

COVER SHEET

FIGURE NO. -

SHEET NO. 1 OF 17

AIRPORT DATA TABLE

DESCRIPTION		EXISTING	FUTURE
AIRPORT ELEVATION		1,099'	SAME
AIRPORT ACREAGE		821	914
ARP COORDINATES	LAT. LONG.	N 46° 34' 05.39" W 120° 32' 38.63"	N 46° 34' 05.44" W 120° 32' 39.80"
MAGNETIC DECLINATION		14°56'E (8/2020)	ANNUAL RATE OF CHANGE 0°6'W
MEAN MAX. DAILY TEMPERATURE		87° (AUGUST)	SAME
FAA IDENTIFIER		YKM	SAME
DATUM		NAD83/NAVD88	SAME
AIRPORT REFERENCE CODE (ARC)		C-III	SAME
TERMINAL NAVAIDS		ILS, NDB, RNAV, LOM, BEACON	SAME
NPIAS ROLE / SERVICE LEVEL		COMERCIAL SERVICE (CM)	SAME
CRITICAL AIRCRAFT (ARC)		Q-400	E-175
STATE SYSTEM ROLE		CAT III - REGIONAL GA AIRPORT	SAME
FACILITIES		WINDCONE / SEG. CIRCLE / ASOS	SAME

APRON DIMENSIONS

	SQUARE FOOTAGE APPROX.
APRON EXISTING	1,048,213
APRON FUTURE	1,116,695

TAXIWAY / TAXILANE DATA TABLE

	EXISTING		FUTURE	
	CONDITIONS	STANDARDS	CONDITIONS	STANDARDS
TAXIWAY WIDTHS	50', 67.5', & 75'	50' & 75'	SAME	SAME
TAXILANE WIDTHS	25', 35', & 50'	25', 35', & 50'	SAME	SAME
TAXIWAY SAFETY AREA	79' & 118'	79' & 118'	SAME	SAME
TAXILANE SAFETY AREA	79' & 118'	79' & 118'	SAME	SAME
TAXIWAY OBJECT FREE AREA	131' & 186'	131' & 186'	SAME	SAME
TAXILANE OBJECT FREE AREA	115' & 162'	115' & 162'	SAME	SAME
TAXIWAY LIGHTING	MITL		SAME	
TAXIWAY MARKING	STANDARD		SAME	

NON STANDARD CONDITIONS

NO.	ITEM	DESCRIPTION	DISPOSITION
1	TAXIWAY A	SEE MODIFICATION TO STANDARDS BOX	-

RUNWAY DATA TABLE

		EXISTING CONDITIONS RUNWAY 4 - 22	FUTURE CONDITIONS RUNWAY 4 - 22	EXISTING CONDITIONS RUNWAY 9 - 27	FUTURE CONDITIONS RUNWAY 9 - 27
RUNWAY LENGTH AND WIDTH		3,835' X 150'	4,000' X 75'	7,604' X 150'	7,800' X 150'
RUNWAY PAVEMENT STRENGTH	SINGLE GEAR:	70,000 LBS	SAME	95,000 LBS	SAME
	DUAL GEAR:	80,000 LBS	SAME	160,000 LBS	SAME
	DUAL TANDEM GEAR:	120,000 LBS	SAME	220,000 LBS	SAME
PAVEMENT CLASSIFICATION NUMBER (PCN)		36 FBWT	SAME	145 FBWT	SAME
RUNWAY PAVEMENT TYPE		POROUS FRICTION COURSE ASPHALT	SAME	ASPHALT	SAME
AIRPORT PAVEMENT STRENGTH (PCN)		DATA NOT AVAILABLE	SAME	DATA NOT AVAILABLE	SAME
RUNWAY PERCENT GRADIENT / MAXIMUM GRADE		0.54%	0.55%	0.66%	SAME
RUNWAY DESIGN CODE (RDC)		B-II	SAME	C-III	SAME
RUNWAY REFERENCE CODE (RRC)		VISUAL	SAME	PRECISION	SAME
APPROACH REFERENCE CODE (APRC)		B/II/VIS	SAME	C/III/VIS	SAME
DEPARTURE REFERENCE CODE (DPRC)		B/II	SAME	C/III	SAME
FAR PART 77 DESIGNATION		VISUAL	SAME	NPI ≥ 3/4-MILE / PIR ≤ 3/4 -MILE	SAME
TAXIWAY LIGHTING		MITL	SAME	MITL	SAME

	RUNWAY 4-22				RUNWAY 9-27			
	EXISTING CONDITIONS	EXISTING STANDARD	FUTURE CONDITIONS	FUTURE STANDARD	EXISTING CONDITIONS	EXISTING STANDARD	FUTURE CONDITIONS	FUTURE STANDARD
RUNWAY SAFETY AREA LENGTH AND WIDTH LENGTH BEYOND RUNWAY END	4435' X 150' 300'	4435' X 150' 300'	4600' X 150' 300'	4600' X 150' 300'	9604' X 500' 1000'	9604' X 500' 1000'	9800' X 500' 1000'	9800' X 500' 1000'
OBJECT FREE AREA LENGTH AND WIDTH LENGTH BEYOND RUNWAY END	4435' X 500 300'	4435' X 500 300'	4600' X 500' 300'	4600' X 500' 300'	9604' X 800' 1000'	9604' X 800' 1000'	9800' X 800' 1000'	9800' X 800' 1000'
OBSTACLE FREE ZONE LENGTH AND WIDTH LENGTH BEYOND RUNWAY END	4235' X 400' 200'	4235' X 400' 200'	4400' X 400' 200'	4400' X 400' 200'	8004' X 400' 200'	8004' X 400' 200'	8200' X 400' 200'	8200' X 400' 200'

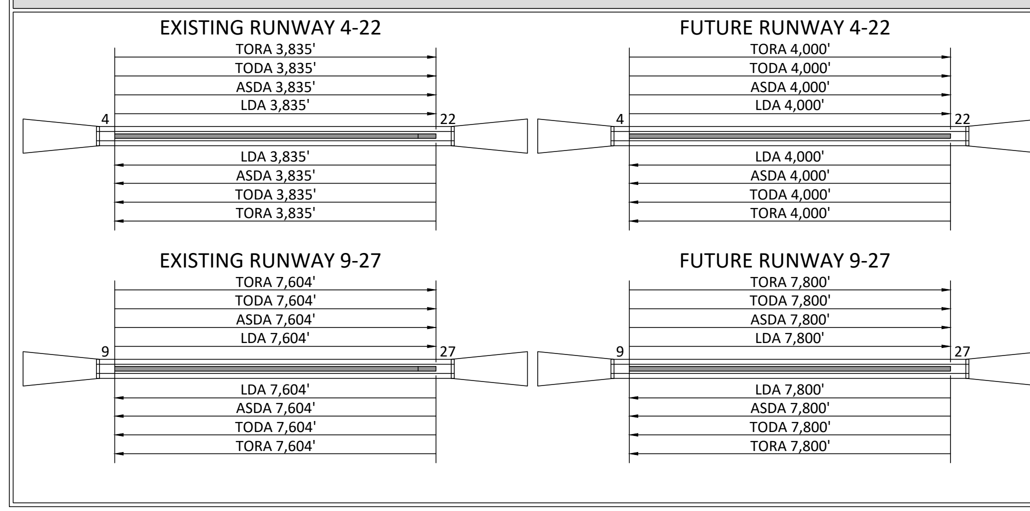
	RUNWAY 4-22				RUNWAY 9-27			
	EXISTING CONDITIONS		FUTURE CONDITIONS		EXISTING CONDITIONS		FUTURE CONDITIONS	
RUNWAY LIGHTING	MIRL		SAME		HIRL		SAME	
RUNWAY END	4	22	4	22	9	27	9	27
RUNWAY PROTECTION ZONE	500' X 700' X 1,000'	500' X 700' X 1,000'	500' X 700' X 1,000'	500' X 700' X 1,000'	1000' X 1510' X 1,700'	1000' X 1750' X 2500'	1000' X 1510' X 1,700'	1000' X 1750' X 2500'
RUNWAY APPROACH CATEGORY	LARGER THAN UTILITY	LARGER THAN UTILITY	SAME	SAME	NPI LARGER THAN UTILITY	PRECISION INSTRUMENT	SAME	SAME
RUNWAY APPROACH SLOPE PART 77	20:1	20:1	20:1	20:1	34:1	50:1	34:1	50:1
RUNWAY DEPARTURE SURFACE (TERPS)	NO	NO	NO	NO	YES (40:1)	YES (40:1)	YES (40:1)	YES (40:1)
THRESHOLD SITING SURFACE (TSS)	NO	NO	NO	NO	NO	NO	NO	NO
APPROACH VISIBILITY MINIMUMS	VISUAL	VISUAL	SAME	SAME	NPI ≥ 3/4 MILE	PIR ≤ 1/2 MILE	SAME	SAME
RUNWAY MARKINGS	VISUAL	VISUAL	VISUAL	VISUAL	NPI	PIR	NPI	PIR
RUNWAY END COORDINATES LAT. / LONG.	N 46° 33' 50.03" W 120° 32' 53.28"	N 46° 34' 09.02" W 120° 32' 05.81"	N 46° 33' 49.21" W 120° 32' 55.34"	N 46° 34' 09.02" W 120° 32' 05.81"	N 46° 34' 21.18" W 120° 33' 34.34"	N 46° 33' 55.53" W 120° 31' 52.08"	N 46° 34 21.84" W 120° 33' 36.99"	N 46° 33' 55.53" W 120° 31' 52.08"
DISPLACED THRESHOLD ELEVATION	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOUCHDOWN ZONE ELEVATION (TDZE)	1076.25'	1064.00'	1077.15'	1064.00'	1098.78'	1067.24'	1100.16'	1067.24'
INSTRUMENTATION AND APPROACH AIDS	NONE	NONE	SAME	SAME	RNAV (RPN)	ILS (CAT I)	SAME	SAME
VISUAL AIDS	PAPI, REILS	PAPI, REILS	SAME	SAME	VASI, REILS	MALSR, PAPI	SAME	SAME
CRITICAL AIRCRAFT (ARC)	BEECHCRAFT BARON		KING AIR 200/350		BOMBARDIER Q400		EMBRAER 175	
WINGSPAN	<40'		<60'		<95		<90'	
WEIGHT	<6,000 LBS.		<10,000 LBS.		<52,000 LBS.		<90,000 LBS.	
APPROACH SPEED	CAT. B, 91-120 KNOTS		CAT. B, 91-120 KNOTS		CAT. C, 121-140 KNOTS		CAT. C, 121-140 KNOTS	
OFZ PENETRATION	YES		YES		YES		YES	

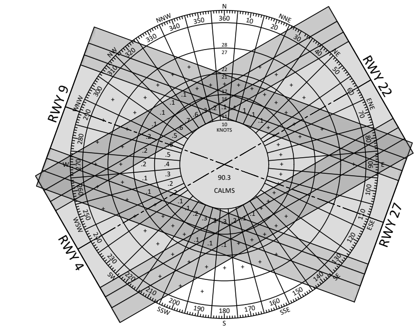
MODIFICATION TO STANDARDS

AIRPORT IS CURRENTLY OPERATING UNDER MOS THAT WAS DEVELOPED TO ACCOUNT FOR THE Q-400. THIS SPECIFIES A TAXIWAY WIDTH OF 64' WITH 20' SHOULDERS WITH THE EXCEPTION OF TAXIWAY A5 WHICH HAS A WIDTH OF 75' WITH 35' SHOULDERS.

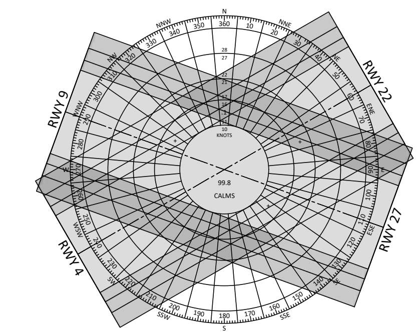
NOTE:
THE PCN DATA WAS COMPLETED IN APRIL 2016, BY THE USAF, 821 CONTINGENCY RESPONSE SUPPORT SQUADRON BASED UPON MAXIMUM ALLOWABLE WEIGHT OF A C-17 AIRCRAFT.

DECLARED DISTANCES

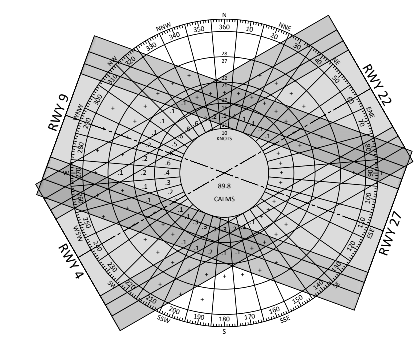




ALL WEATHER WIND ROSE



IFR WIND ROSE



VFR WIND ROSE

RUNWAY WIND COVERAGE

RUNWAY ALIGNMENT	CROSSWIND COMP. (KNOTS)	ALL-WEATHER WIND COVERAGE	VFR WIND COVERAGE	IFR WIND COVERAGE
RUNWAY 4-22	10.5	94.53%	93.82%	99.60%
	13	96.94%	93.82%	99.75%
	16	99.17%	99.07%	99.85%
	20	99.84%	99.83%	99.92%
RUNWAY 9-27	10.5	96.52%	96.17%	99.37%
	13	97.94%	97.75%	99.53%
	16	99.17%	99.11%	99.68%
	20	99.79%	99.78%	99.77%

SOURCE: NATIONAL CLIMATE DATA CENTER (NCDC)
STATION 72781 YAKIMA, WA

PERIOD: 2011 TO 2020
106,475 OBSERVATIONS

"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-53-0089-041-2018) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES

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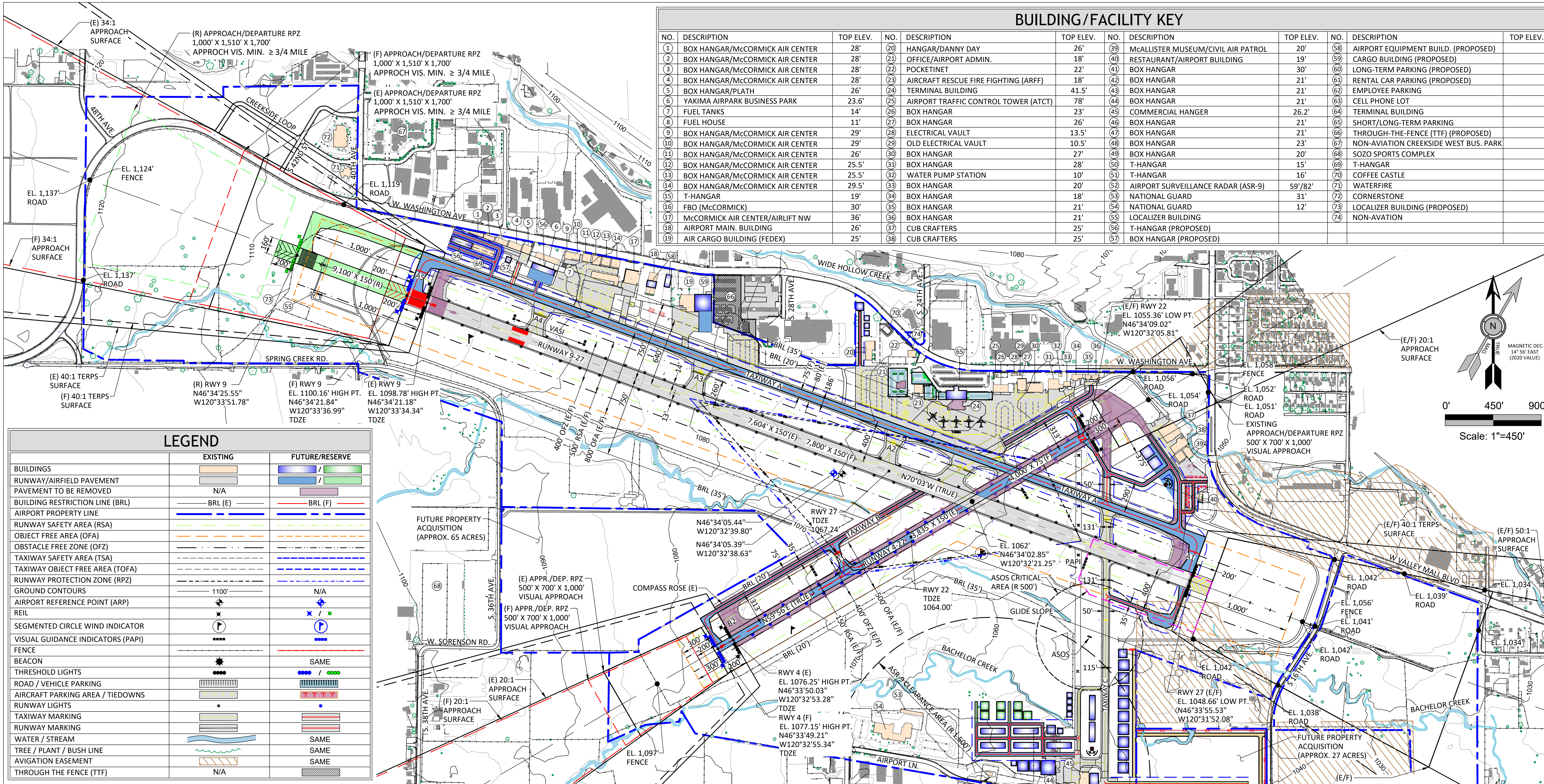
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/
MCALLISTER FIELD

AIRPORT DATA SHEET

FIGURE NO.
-



BUILDING/FACILITY KEY

NO.	DESCRIPTION	TOP ELEV.	NO.	DESCRIPTION	TOP ELEV.	NO.	DESCRIPTION	TOP ELEV.	NO.	DESCRIPTION	TOP ELEV.
1	BOX HANGAR/McCORMICK AIR CENTER	28'	20	HANGAR/DANNY DAY	26'	39	McALLISTER MUSEUM/CIVIL AIR PATROL	20'	58	AIRPORT EQUIPMENT BUILD. (PROPOSED)	
2	BOX HANGAR/McCORMICK AIR CENTER	28'	21	OFFICE/AIRPORT ADMIN.	18'	40	RESTAURANT/AIRPORT BUILDING	19'	59	CARGO BUILDING (PROPOSED)	
3	BOX HANGAR/McCORMICK AIR CENTER	28'	22	POCKETINET	22'	41	BOX HANGAR	30'	60	LONG-TERM PARKING (PROPOSED)	
4	BOX HANGAR/McCORMICK AIR CENTER	28'	23	AIRCRAFT RESCUE FIRE FIGHTING (ARFF)	18'	42	BOX HANGAR	21'	61	RENTAL CAR PARKING (PROPOSED)	
5	BOX HANGAR/PLATH	26'	24	TERMINAL BUILDING	41.5'	43	BOX HANGAR	21'	62	EMPLOYEE PARKING	
6	YAKIMA AIRPARK BUSINESS PARK	23.6'	25	AIRPORT TRAFFIC CONTROL TOWER (ATCT)	78'	44	BOX HANGAR	21'	63	CELL PHONE LOT	
7	FUEL TANKS	14'	26	BOX HANGAR	23'	45	COMMERCIAL HANGER	26.2'	64	TERMINAL BUILDING	
8	FUEL HOUSE	11'	27	BOX HANGAR	26'	46	BOX HANGAR	21'	65	SHORT/LONG-TERM PARKING	
9	BOX HANGAR/McCORMICK AIR CENTER	29'	28	ELECTRICAL VAULT	13.5'	47	BOX HANGAR	21'	66	THROUGH-THE-FENCE (TTF) (PROPOSED)	
10	BOX HANGAR/McCORMICK AIR CENTER	29'	29	OLD ELECTRICAL VAULT	10.5'	48	BOX HANGAR	23'	67	NON-AVIATION CREEKSIDE WEST BUS. PARK	
11	BOX HANGAR/McCORMICK AIR CENTER	26'	30	BOX HANGAR	27'	49	BOX HANGAR	20'	68	SOZO SPORTS COMPLEX	
12	BOX HANGAR/McCORMICK AIR CENTER	25.5'	31	BOX HANGAR	28'	50	T-HANGAR	15'	69	T-HANGAR	
13	BOX HANGAR/McCORMICK AIR CENTER	25.5'	32	WATER PUMP STATION	10'	51	T-HANGAR	16'	70	COFFEE CASTLE	
14	BOX HANGAR/McCORMICK AIR CENTER	29.5'	33	BOX HANGAR	20'	52	AIRPORT SURVEILLANCE RADAR (ASR-9)	59'/82'	71	WATERFIRE	
15	T-HANGAR	19'	34	BOX HANGAR	18'	53	NATIONAL GUARD	31'	72	CORNERSTONE	
16	FBO (McCORMICK)	30'	35	BOX HANGAR	21'	54	NATIONAL GUARD	12'	73	LOCALIZER BUILDING (PROPOSED)	
17	McCORMICK AIR CENTER/AIRLIFT NW	36'	36	BOX HANGAR	21'	55	LOCALIZER BUILDING		74	NON-AVATION	
18	AIRPORT MAIN. BUILDING	26'	37	CUB CRAFTERS	25'	56	T-HANGAR (PROPOSED)				
19	AIR CARGO BUILDING (FEDEX)	25'	38	CUB CRAFTERS	25'	57	BOX HANGAR (PROPOSED)				

LEGEND

	EXISTING	FUTURE/RESERVE
BUILDINGS		/
RUNWAY/AIRFIELD PAVEMENT		/
PAVEMENT TO BE REMOVED	N/A	
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
TAXIWAY SAFETY AREA (TSA)		
TAXIWAY OBJECT FREE AREA (TOFA)		
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS	1100'	N/A
AIRPORT REFERENCE POINT (ARP)		
REIL		/
SEGMENTED CIRCLE WIND INDICATOR		
VISUAL GUIDANCE INDICATORS (PAPI)		
FENCE		
BEACON		SAME
THRESHOLD LIGHTS		/
ROAD / VEHICLE PARKING		
AIRCRAFT PARKING AREA / TIEDOWNS		
RUNWAY LIGHTS		
TAXIWAY MARKING		
RUNWAY MARKING		
WATER / STREAM		SAME
TREE / PLANT / BUSH LINE		SAME
AVIGATION EASEMENT		SAME
THROUGH THE FENCE (TTF)	N/A	

NOTES:

1. SEE SHEETS 4 AND 5 FOR DETAILS ON LANDSIDE DEVELOPMENT.
2. BUILDING RESTRICTION LINES (BRL) IS BASED ON A MAXIMUM BUILDING HEIGHTS OF 20' AT A 140' DISTANCE FROM THE PRIMARY SURFACE AND 35' AT A 250' DISTANCE FROM PRIMARY SURFACE. MAXIMUM ALLOWABLE BUILDING HEIGHT FROM THE BRL INCREASES AT A 7:1 HORIZONTAL TO VERTICAL SLOPE UPWARD AND AWAY FROM THE PRIMARY SURFACE IN CONFORMANCE WITH FAR PART 77 SURFACES.
3. NO DECLARED DISTANCES USED OR PROPOSED.
4. THE EXTENSION TO RUNWAY 9 IS SHOWN FOR LONG-RANGE PLANNING PURPOSES ONLY. FAA APPROVAL OF AN EXTENSION WILL BE BASED ON A CHANGE IN THE CRITICAL AIRCRAFT.
5. ROADS IN RUNWAY 9 EXTENSION RPZ WILL GO THROUGH FAA GUIDANCE AT TIME OF PROJECT INITIATION.
6. FUTURE PROJECTS FOR REHABILITATION OR OVERLAY OF 4-22 IS CONSIDERED WORK EXCEEDING FAA STANDARDS. IF THE CITY OPTS TO MAINTAIN THE RUNWAY, IT WILL BE WITH LOCAL FUNDS OR IF AT SOME POINT THE RUNWAY MEETS CRITERIA TO JUSTIFY AIP FUNDING.
7. AIRPORT IS CURRENTLY OPERATING UNDER MOS THAT WAS DEVELOPED TO ACCOUNT FOR THE Q-400. THIS SPECIFIES A TAXIWAY WIDTH OF 64' WITH 20' SHOULDERS WITH THE EXCEPTION OF TAXIWAY A5 WHICH HAS A WIDTH OF 75' WITH 35' SHOULDERS.
8. FAA AGIS SURVEY (2019).

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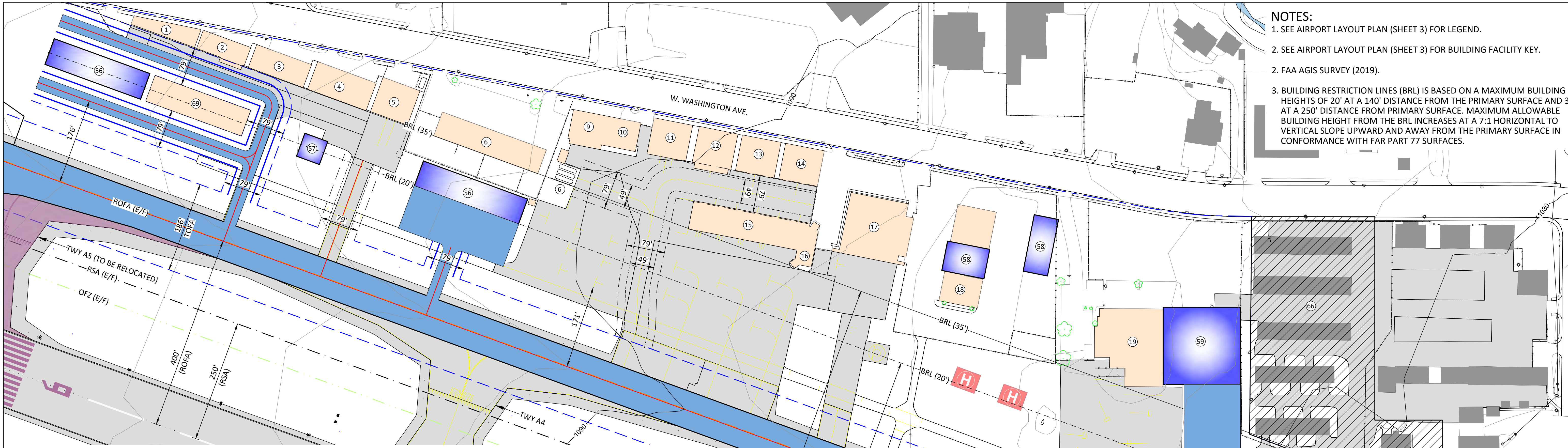
SP	JLS	DM	AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

AIRPORT LAYOUT PLAN

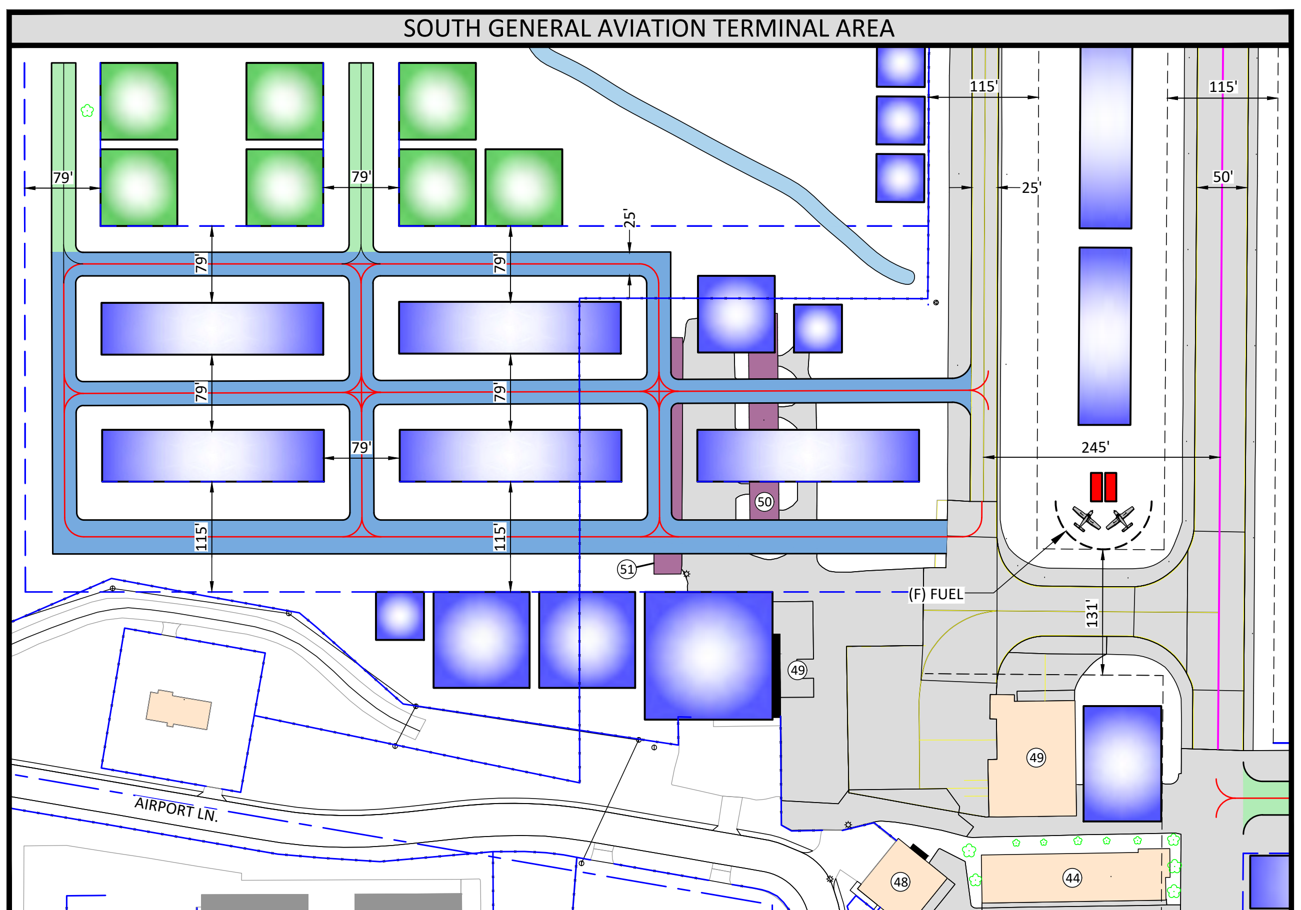
FIGURE NO.
-

SHEET NO.
3 OF 17

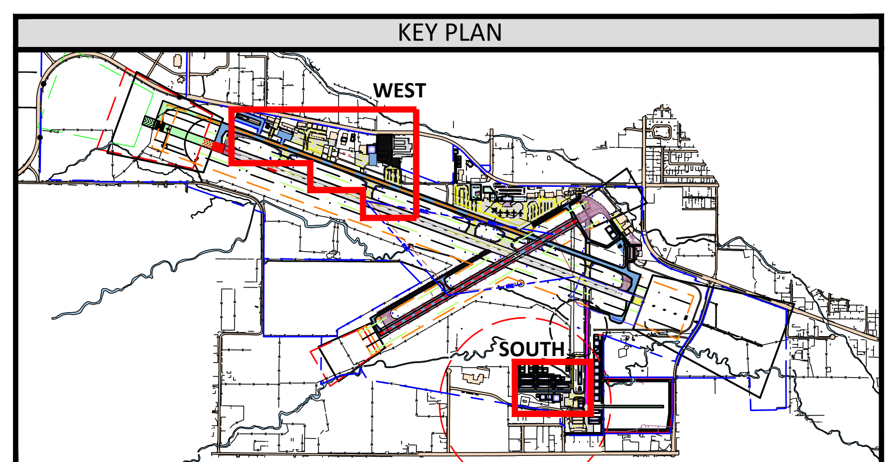


NOTES:
1. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR LEGEND.
2. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR BUILDING FACILITY KEY.
2. FAA AGIS SURVEY (2019).
3. BUILDING RESTRICTION LINES (BRL) IS BASED ON A MAXIMUM BUILDING HEIGHTS OF 20' AT A 140' DISTANCE FROM THE PRIMARY SURFACE AND 35' AT A 250' DISTANCE FROM PRIMARY SURFACE. MAXIMUM ALLOWABLE BUILDING HEIGHT FROM THE BRL INCREASES AT A 7:1 HORIZONTAL TO VERTICAL SLOPE UPWARD AND AWAY FROM THE PRIMARY SURFACE IN CONFORMANCE WITH FAR PART 77 SURFACES.

SOUTH GENERAL AVIATION TERMINAL AREA



KEY PLAN



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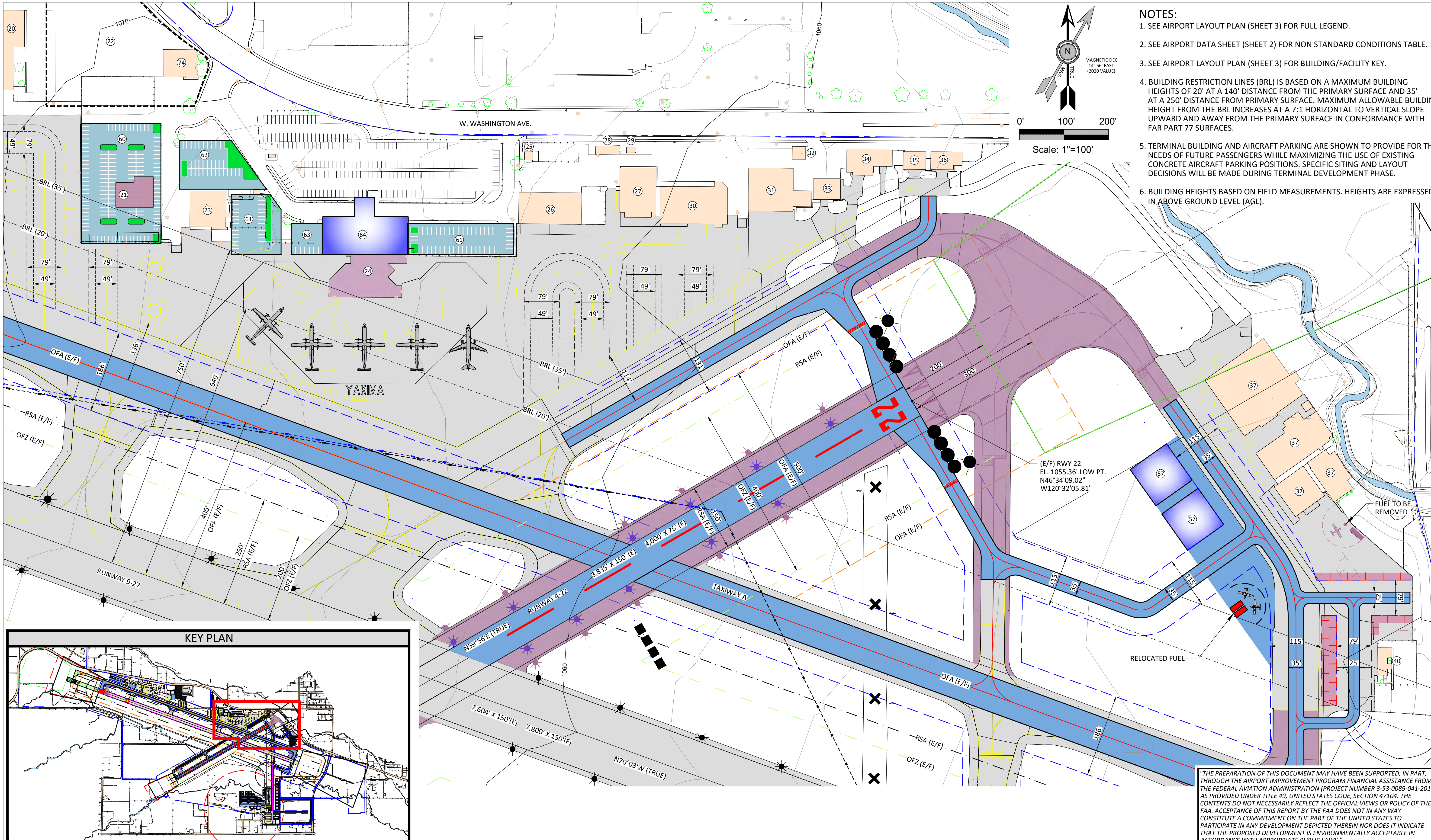
YAKIMA AIR TERMINAL/ MCALLISTER FIELD

GENERAL AVIATION (WEST AND SOUTH) PLAN

FIGURE NO. -



NOTES:

1. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR FULL LEGEND.
2. SEE AIRPORT DATA SHEET (SHEET 2) FOR NON STANDARD CONDITIONS TABLE.
3. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR BUILDING/FACILITY KEY.
4. BUILDING RESTRICTION LINES (BRL) IS BASED ON A MAXIMUM BUILDING HEIGHTS OF 20' AT A 140' DISTANCE FROM THE PRIMARY SURFACE AND 35' AT A 250' DISTANCE FROM PRIMARY SURFACE. MAXIMUM ALLOWABLE BUILDING HEIGHT FROM THE BRL INCREASES AT A 7:1 HORIZONTAL TO VERTICAL SLOPE UPWARD AND AWAY FROM THE PRIMARY SURFACE IN CONFORMANCE WITH FAR PART 77 SURFACES.
5. TERMINAL BUILDING AND AIRCRAFT PARKING ARE SHOWN TO PROVIDE FOR THE NEEDS OF FUTURE PASSENGERS WHILE MAXIMIZING THE USE OF EXISTING CONCRETE AIRCRAFT PARKING POSITIONS. SPECIFIC SITING AND LAYOUT DECISIONS WILL BE MADE DURING TERMINAL DEVELOPMENT PHASE.
6. BUILDING HEIGHTS BASED ON FIELD MEASUREMENTS. HEIGHTS ARE EXPRESSED IN ABOVE GROUND LEVEL (AGL).

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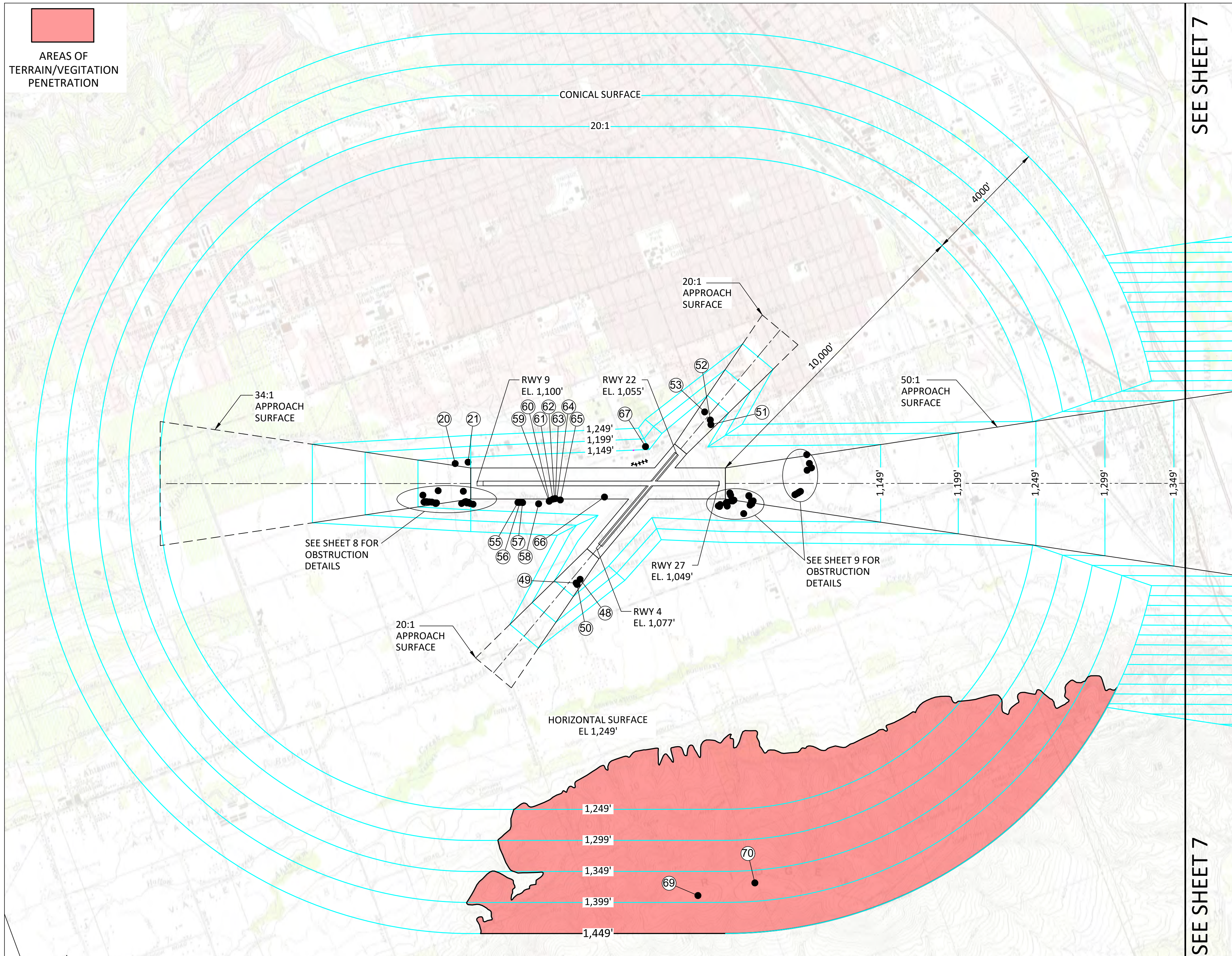
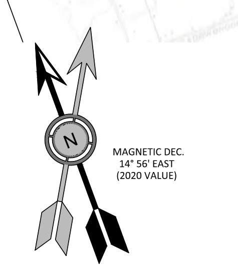
YAKIMA AIR TERMINAL/ MCALLISTER FIELD

TERMINAL AND GENERAL AVIATION (EAST) PLAN

FIGURE NO. -





0' 2000' 4000'

Scale: 1"=2000'

FAR PART 77 PLAN VIEW

OBSTRUCTION CHART

NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
1	SIGN	APPROACH (RWY 9)	1,105'	251' R	439'	0'	YES	FOR REFERENCE ONLY
2	TREE	APPROACH (RWY 9)	1,131'	232' R	1,249'	1.7'	YES	REMOVE
3	TREE/BRUSH	APPROACH (RWY 9)	1,135'	625' R	1,303'	4'	YES	REMOVE
4	TREE/BRUSH	APPROACH (RWY 9)	1,139'	643' R	1,319'	7.5'	YES	REMOVE
5	TREE/BRUSH	APPROACH (RWY 9)	1,139'	641' R	1,339'	7'	YES	REMOVE
6	TREE/BRUSH	APPROACH (RWY 9)	1,137'	624' R	1,345'	5'	YES	REMOVE
7	TREE	APPROACH (RWY 9)	1,136'	599' R	1,451'	<1'	YES	REMOVE
8	TREE/BRUSH	APPROACH (RWY 9)	1,142'	592' R	1,536'	3.5'	YES	REMOVE
9	TREE/BRUSH	APPROACH (RWY 9)	1,142'	587' R	1,616'	1.3'	YES	REMOVE
10	TREE/BRUSH	APPROACH (RWY 9)	1,143'	585' R	1,663'	1.4'	YES	REMOVE
11	TREE/BRUSH	APPROACH (RWY 9)	1,143'	597' R	1,707'	0'	YES	FOR REFERENCE ONLY
12	TREE/BRUSH	APPROACH (RWY 9)	1,144'	376' R	1,741'	0'	YES	FOR REFERENCE ONLY
13	TREE/BRUSH	TRANSITIONAL	1,127'	643' R	495'	5'	YES	REMOVE
14	TREE/BRUSH	TRANSITIONAL	1,124'	597' R	395'	12'	YES	REMOVE
15	TREE/BRUSH	TRANSITIONAL	1,127'	583' R	354'	17'	YES	REMOVE
16	TREE/BRUSH	TRANSITIONAL	1,116'	604' R	283'	4'	YES	REMOVE
17	TREE/BRUSH	TRANSITIONAL	1,124'	628' R	317'	7'	YES	REMOVE
18	TREE/BRUSH	TRANSITIONAL	1,122'	641' R	228'	3'	YES	REMOVE
19	VEGETATION	TRANSITIONAL	1,126'	667' R	127'	4'	YES	REMOVE
20	UTILITY	TRANSITIONAL	1,127'	642' L	702'	5'	NO	LIGHT
21	UTILITY	TRANSITIONAL	1,131'	687' L	286'	2'	NO	LIGHT
22	TREE/BRUSH	APPROACH (RWY 27)	1,052'	308' L	345'	<1'	YES	REMOVE
23	TREE/BRUSH	APPROACH (RWY 27)	1,052'	380' L	370'	0'	YES	FOR REFERENCE ONLY
24	TREE	APPROACH (RWY 27)	1,072'	539' L	476'	17.4'	YES	REMOVE
25	UTILITY POLE	APPROACH (RWY 27)	1,063'	405' L	956'	0'	YES	LIGHT
26	TREE	APPROACH (RWY 27)	1,066'	393' L	958'	1.7'	YES	REMOVE
27	TREE/BRUSH	APPROACH (RWY 27)	1,068'	567' L	1,043'	2.5'	YES	REMOVE
28	TREE/BRUSH	APPROACH (RWY 27)	1,068'	563' L	1,095'	1.0'	YES	REMOVE
29	TREE/BRUSH	APPROACH (RWY 27)	1,094'	363' L	2,439'	<1'	YES	REMOVE
30	TREE/BRUSH	APPROACH (RWY 27)	1,102'	339' L	2,483'	7.3'	YES	REMOVE
31	TREE/BRUSH	APPROACH (RWY 27)	1,096'	310' L	2,541'	<1'	YES	REMOVE
32	TREE/BRUSH	APPROACH (RWY 27)	1,097'	285' L	2,572'	<1'	YES	REMOVE
33	TREE/BRUSH	APPROACH (RWY 27)	1,101'	258' L	2,619'	4.3'	YES	REMOVE
34	TREE/BRUSH	APPROACH (RWY 27)	1,115'	423' R	2,832'	13.2'	NO	REMOVE
35	TREE/BRUSH	APPROACH (RWY 27)	1,108'	645' R	2,906'	5.3'	NO	REMOVE
36	TREE/BRUSH	APPROACH (RWY 27)	1,106'	501' R	2,973'	2.1'	NO	REMOVE
37	VEGETATION	TRANSITIONAL	1,089'	724' L	27'	5'	YES	REMOVE
38	VEGETATION	TRANSITIONAL	1,086'	741' L	14'	1'	YES	REMOVE
39	VEGETATION	TRANSITIONAL	1,087'	681' L	32'	10'	YES	REMOVE
40	VEGETATION	TRANSITIONAL	1,093'	647' L	223'	24'	YES	REMOVE
41	VEGETATION	TRANSITIONAL	1,091'	625' L	227'	27'	YES	REMOVE
42	VEGETATION	TRANSITIONAL	1,082'	607' L	252'	19'	YES	REMOVE
43	VEGETATION	TRANSITIONAL	1,097'	729' L	258'	15'	YES	REMOVE
44	UTILITY POLE	TRANSITIONAL	1,076'	561' L	387'	19'	YES	LIGHT
45	UTILITY POLE	TRANSITIONAL	1,075'	567' L	436'	17'	YES	LIGHT
46	VEGETATION	TRANSITIONAL	1,081'	698' L	996'	5'	YES	REMOVE
47	UTILITY POLE	TRANSITIONAL	1,073'	658' L	1,050'	3'	YES	LIGHT
48	TREE	APPROACH (RWY 4)	1,110'	212' R	1,098'	0'	YES	FOR REFERENCE ONLY
49	TREE/BRUSH	APPROACH (RWY 4)	1,126'	191' R	1,270'	0'	YES	FOR REFERENCE ONLY
50	TREE/BRUSH	APPROACH (RWY 4)	1,132'	243' R	1,287'	1.3'	YES	REMOVE
51	TREE/BRUSH	APPROACH (RWY 22)	1,107'	246' L	1,428'	0'	NO	FOR REFERENCE ONLY
52	TREE/BRUSH	APPROACH (RWY 22)	1,114'	136' L	1,530'	0'	NO	FOR REFERENCE ONLY
53	TREE/BRUSH	APPROACH (RWY 22)	1,117'	170' R	1,613'	0'	NO	FOR REFERENCE ONLY
54	VEGETATION	TRANSITIONAL	1,117'	926' R	2,821'	5'	NO	REMOVE
55	VEGETATION	TRANSITIONAL	1,110'	611' R	-1,319'	4'	YES	REMOVE
56	VEGETATION	TRANSITIONAL	1,116'	610' R	-1,389'	10'	YES	REMOVE
57	VEGETATION	TRANSITIONAL	1,107'	616' R	-1,470'	2'	YES	REMOVE
58	VEGETATION	TRANSITIONAL	1,112'	655' R	-1,986'	4'	YES	REMOVE
59	VEGETATION	TRANSITIONAL	1,117'	573' R	-2,326'	23'	YES	REMOVE
60	VEGETATION	TRANSITIONAL	1,112'	555' R	-2,337'	22'	YES	REMOVE
61	VEGETATION	TRANSITIONAL	1,096'	505' R	-2,448'	12'	YES	REMOVE
62	VEGETATION	PRIMARY	1,096'	492' R	-2,499'	12'	YES	REMOVE
63	VEGETATION	PRIMARY	1,101'	488' R	-2,525'	17'	YES	REMOVE
64	VEGETATION	PRIMARY	1,102'	486' R	-2,573'	19'	YES	REMOVE
65	VEGETATION	TRANSITIONAL	1,096'	532' R	-2,686'	7'	YES	REMOVE
66	TREE/BRUSH	PRIMARY	1,080'	439' L	-3,693'	8'	YES	REMOVE
67	BUILDING	TRANSITIONAL	1,165'	1,186' R	-2,372'	2'	YES	LIGHT
68	TREE/BRUSH	TRANSITIONAL	1,124'	974' L	791'	7'	NO	REMOVE
69	TERRAIN	CONICAL	2,180'	13,277'	-683'	810'	NO	LIGHT
70	TERRAIN	CONICAL	2,140	12,870'	1,150'	780'	NO	LIGHT

NOTES:

1. DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE ULTIMATE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
2. ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL) AT TOP OF OBJECT. THIS VALUE INCLUDES 15' ADDED TO NON-INTERSTATE ROADWAYS, 17' ADDED TO INTERSTATE HIGHWAYS, AND 23' ADDED TO RAILROADS.
3. U.S. GEOLOGICAL SURVEY (USGS) DIGITAL RASTER GRAPHIC (DGR) PROJECTED IN STATE PLANE NAD83, 7.5 MINUTE QUAD. USGS MAP DATED 1994.
4. FAA AGIS SURVEY (2019).
5. SEE INNER APPROACH SURFACES DRAWINGS, SHEETS 6 THROUGH 10 FOR CLOSE-IN DETAIL.

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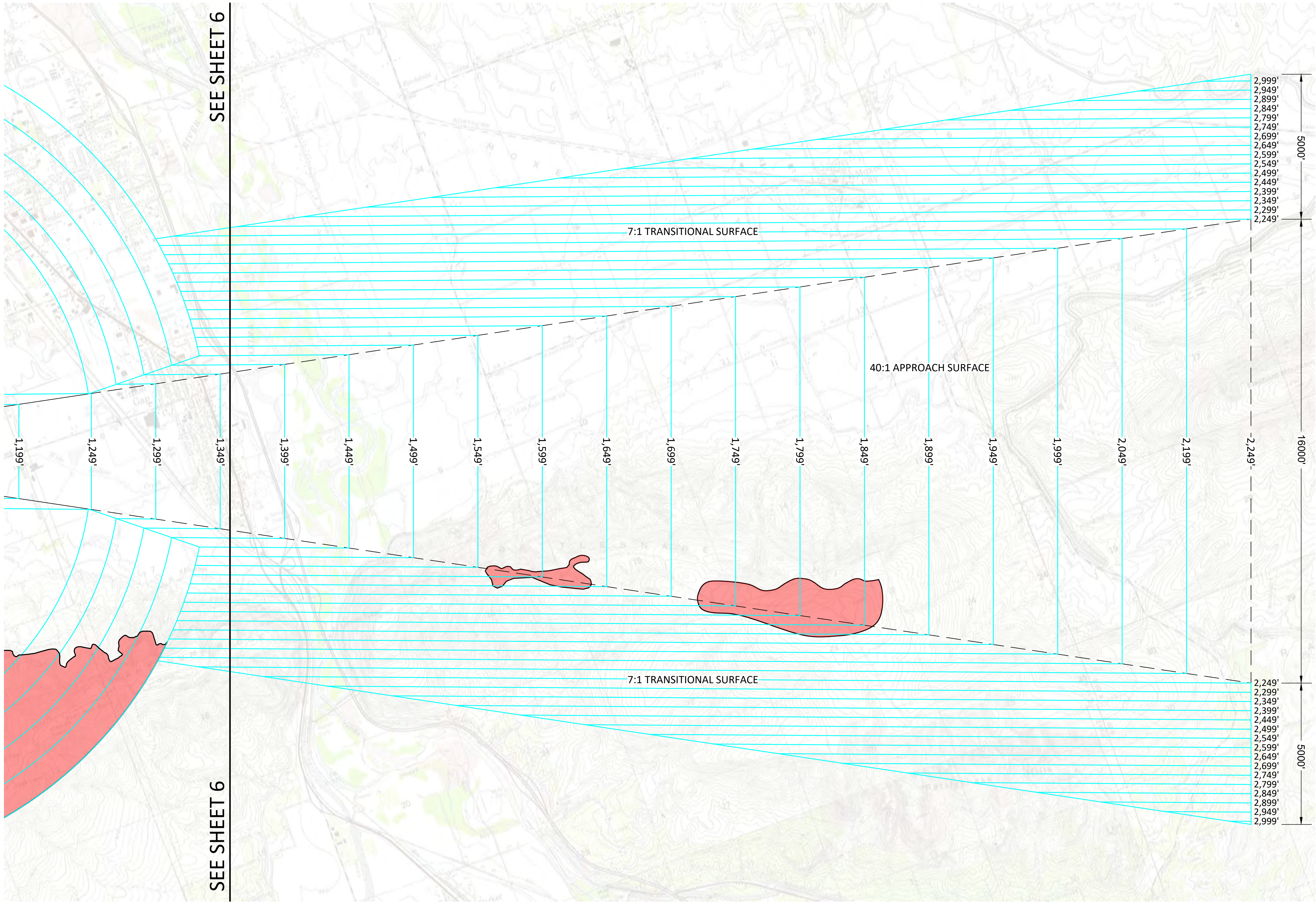
DESIGNED BY: SP	DRAWN BY: JLS	CHECKED BY: DM	SCALE: AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

AIRPORT AIRSPACE PLAN (FAR PART 77)

FIGURE NO. -



FAR PART 77 PLAN VIEW

RUNWAY 9/27

RUNWAY ULTIMATE LENGTH = 7,800'
RUNWAY TYPE = C-III

RUNWAY 9
FAR PART 77 DIMENSIONAL STANDARDS
NPI LARGER THAN UTILITY, VISIBILITY MINIMUMS ≥ 3/4 MILE
PRIMARY SURFACE WIDTH = 1,000'
APPROACH SURFACE INNER WIDTH = 1,000'
APPROACH SURFACE OUTER WIDTH = 4,000'
APPROACH SURFACE LENGTH = 10,000'
RADIUS OF HORIZONTAL SURFACE = 10,000'
APPROACH SLOPE = 34:1

RUNWAY 27
FAR PART 77 DIMENSIONAL STANDARDS
PRECISION INSTRUMENT, VISIBILITY MINIMUMS ≤ 1/2 MILE
PRIMARY SURFACE WIDTH = 1,000'
APPROACH SURFACE INNER WIDTH = 1,000'
APPROACH SURFACE OUTER WIDTH = 16,000'
APPROACH SURFACE LENGTH = 50,000'
RADIUS OF HORIZONTAL SURFACE = 10,000'
APPROACH SLOPE = 50:1

RUNWAY 4/22

RUNWAY ULTIMATE LENGTH = 4,000'
RUNWAY TYPE = B-II

RUNWAY 4
FAR PART 77 DIMENSIONAL STANDARDS
LARGER THAN UTILITY VISUAL
PRIMARY SURFACE WIDTH = 500'
APPROACH SURFACE INNER WIDTH = 500'
APPROACH SURFACE OUTER WIDTH = 1,500'
APPROACH SURFACE LENGTH = 5,000'
RADIUS OF HORIZONTAL SURFACE = 5,000'
APPROACH SLOPE = 20:1

RUNWAY 22
FAR PART 77 DIMENSIONAL STANDARDS
LARGER THAN UTILITY VISUAL
PRIMARY SURFACE WIDTH = 500'
APPROACH SURFACE INNER WIDTH = 500'
APPROACH SURFACE OUTER WIDTH = 1,500'
APPROACH SURFACE LENGTH = 5,000'
RADIUS OF HORIZONTAL SURFACE = 5,000'
APPROACH SLOPE = 20:1

NOTES:

1. U.S. GEOLOGICAL SURVEY (USGS) DIGITAL RASTER GRAPHIC (DGR) PROJECTED IN STATE PLANE NAD83, 7.5 MINUTE QUAD. USGS MAP DATED 1994.
2. FAA AGIS SURVEY (2019).

MAGNETIC DEC.
14° 56' EAST
(2020 VALUE)

0' 2000' 4000'
Scale: 1"=2000'

AREAS OF TERRAIN PENETRATION

"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-53-0089-041-2018) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

NO.	DATE	BY	APPR	REVISIONS

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

FEDERAL AVIATION ADMINISTRATION APPROVAL
APPROVAL DATE:
SIGNATURE

CITY OF YAKIMA APPROVAL
APPROVAL DATE:
SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE., #100
BEND, OR 97702
541.322.8962 OFFICE
541.382.2423 FAX

DESIGNED BY: SP	DRAWN BY: JLS	CHECKED BY: DM	SCALE: AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

AIRPORT AIRSPACE PLAN (FAR PART 77)

FIGURE NO. -

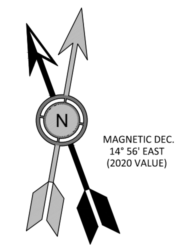
SHEET NO. 7 OF 17

OBSTRUCTION CHART

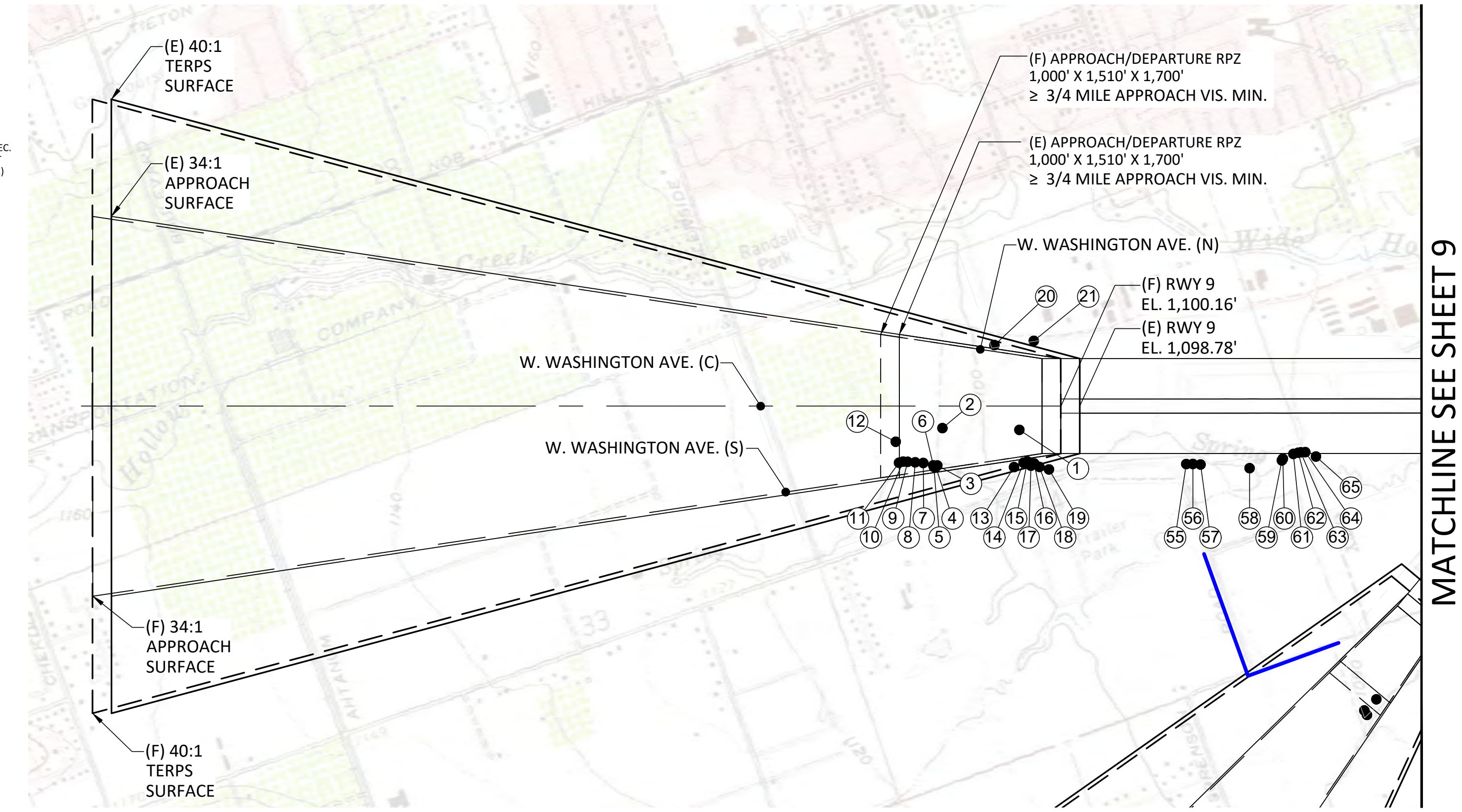
NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
1	SIGN	APPROACH (RWY 9)	1,105'	251' R	439'	0'	YES	FOR REFERENCE ONLY
2	TREE	APPROACH (RWY 9)	1,131'	232' R	1,249'	1.7'	YES	REMOVE
3	TREE/BRUSH	APPROACH (RWY 9)	1,135'	625' R	1,303'	4'	YES	REMOVE
4	TREE/BRUSH	APPROACH (RWY 9)	1,139'	643' R	1,319'	7.5'	YES	REMOVE
5	TREE/BRUSH	APPROACH (RWY 9)	1,139'	641' R	1,339'	7'	YES	REMOVE
6	TREE/BRUSH	APPROACH (RWY 9)	1,137'	624' R	1,345'	5'	YES	REMOVE
7	TREE	APPROACH (RWY 9)	1,136'	599' R	1,451'	<1'	YES	REMOVE
8	TREE/BRUSH	APPROACH (RWY 9)	1,142'	592' R	1,536'	3.5'	YES	REMOVE
9	TREE/BRUSH	APPROACH (RWY 9)	1,142'	587' R	1,616'	1.3'	YES	REMOVE
10	TREE/BRUSH	APPROACH (RWY 9)	1,143'	585' R	1,663'	1.4'	YES	REMOVE
11	TREE/BRUSH	APPROACH (RWY 9)	1,143'	597' R	1,707'	0'	YES	FOR REFERENCE ONLY
12	TREE/BRUSH	APPROACH (RWY 9)	1,144'	376' R	1,741'	0'	YES	FOR REFERENCE ONLY
13	TREE/BRUSH	TRANSITIONAL	1,127'	643' R	495'	5'	YES	REMOVE
14	TREE/BRUSH	TRANSITIONAL	1,124'	597' R	395'	12'	YES	REMOVE
15	TREE/BRUSH	TRANSITIONAL	1,127'	583' R	354'	17'	YES	REMOVE
16	TREE/BRUSH	TRANSITIONAL	1,116'	604' R	283'	4'	YES	REMOVE
17	TREE/BRUSH	TRANSITIONAL	1,124'	628' R	317'	7'	YES	REMOVE
18	TREE/BRUSH	TRANSITIONAL	1,122'	641' R	228'	3'	YES	REMOVE
19	VEGETATION	TRANSITIONAL	1,126'	667' R	127'	4'	YES	REMOVE
20	UTILITY	TRANSITIONAL	1,127'	642' L	702'	5'	NO	LIGHT
21	UTILITY	TRANSITIONAL	1,131'	687' L	286'	2'	NO	LIGHT
55	VEGETATION	TRANSITIONAL	1,110'	611' R	-1,319'	4'	YES	REMOVE
56	VEGETATION	TRANSITIONAL	1,116'	610' R	-1,389'	10'	YES	REMOVE
57	VEGETATION	TRANSITIONAL	1,107'	616' R	-1,470'	2'	YES	REMOVE
58	VEGETATION	TRANSITIONAL	1,112'	655' R	-1,986'	4'	YES	REMOVE
59	VEGETATION	TRANSITIONAL	1,117'	573' R	-2,326'	23'	YES	REMOVE
60	VEGETATION	TRANSITIONAL	1,112'	555' R	-2,337'	22'	YES	REMOVE
61	VEGETATION	TRANSITIONAL	1,096'	505' R	-2,448'	12'	YES	REMOVE
62	VEGETATION	PRIMARY	1,096'	492' R	-2,499'	12'	YES	REMOVE
63	VEGETATION	PRIMARY	1,101'	488' R	-2,525'	17'	YES	REMOVE
64	VEGETATION	PRIMARY	1,102'	486' R	-2,573'	19'	YES	REMOVE
65	VEGETATION	TRANSITIONAL	1,096'	532' R	-2,686'	7'	YES	REMOVE

NOTES:

1. DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE ULTIMATE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
2. ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL) AT TOP OF OBJECT. THIS VALUE INCLUDES 15' ADDED TO NON-INTERSTATE ROADWAYS, 17' ADDED TO INTERSTATE HIGHWAYS, AND 23' ADDED TO RAILROADS.
3. U.S. GEOLOGICAL SURVEY (USGS) DIGITAL RASTER GRAPHIC (DGR) PROJECTED IN STATE PLANE NAD83, 7.5 MINUTE QUAD. USGS MAP DATED 1994.
4. FAA AGIS SURVEY (2019).

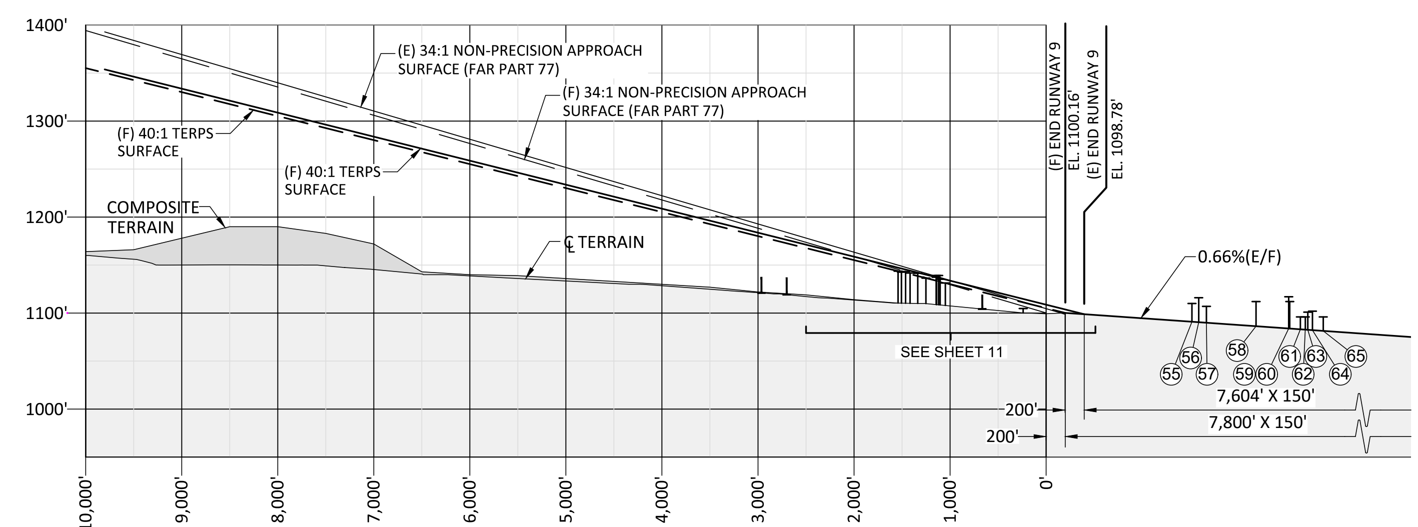


AREAS OF TERRAIN PENETRATION (NONE IDENTIFIED)



RUNWAY 9 PLAN VIEW

0' 1000' 2000'
Scale: 1"=1000'



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

RUNWAY 9 PROFILE VIEW

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

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NO.	DATE	BY	APPR	REVISIONS

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FEDERAL AVIATION ADMINISTRATION APPROVAL
APPROVAL DATE:
SIGNATURE

CITY OF YAKIMA APPROVAL
APPROVAL DATE:
SIGNATURE

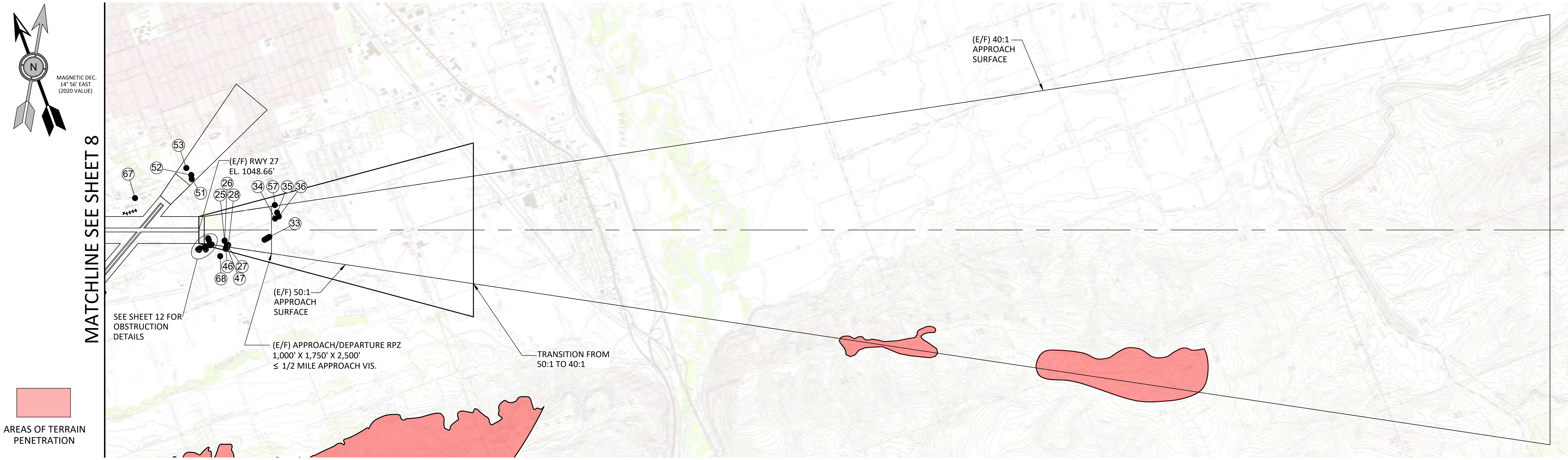
CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE., #100
BEND, OR 97702
541.322.8962 OFFICE
541.382.2423 FAX

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
SP	JLS	DM	AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

RUNWAY 9 APPROACH SURFACE PLAN AND PROFILE

FIGURE NO. -



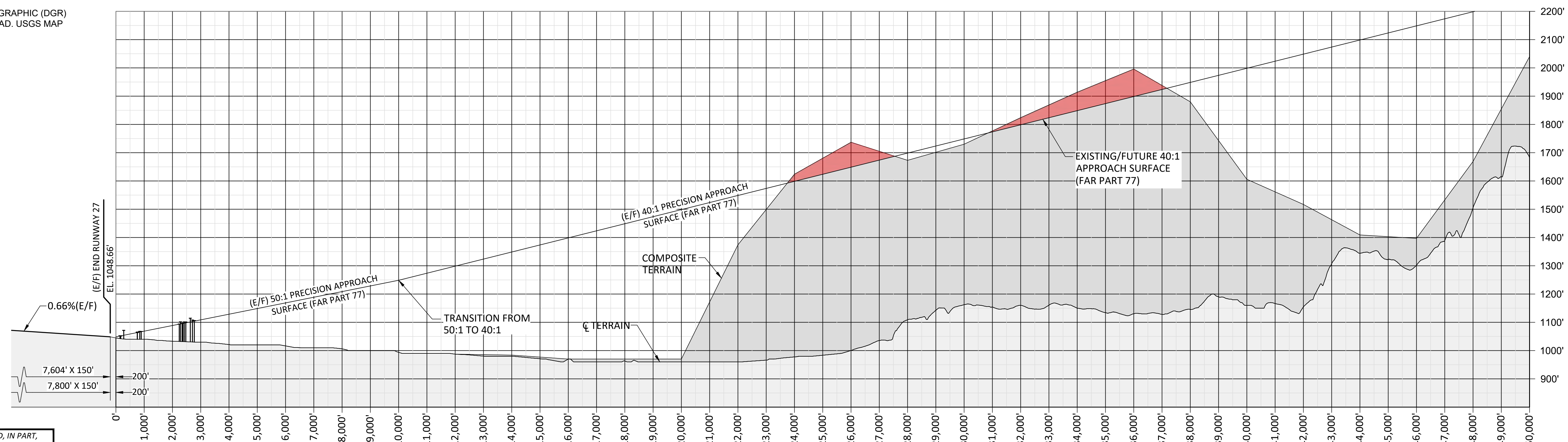
RUNWAY 27 PLAN VIEW

0' 2000' 4000'

Scale: 1"=2000'

NOTES:

1. U.S. GEOLOGICAL SURVEY (USGS) DIGITAL RASTER GRAPHIC (DGR) PROJECTED IN STATE PLANE NAD83, 7.5 MINUTE QUAD. USGS MAP DATED 1994.
2. FAA AGIS SURVEY (2019).



RUNWAY 27 PROFILE VIEW

0' 200' 400'

SCALE OF FEET
VERTICAL SCALE 1"=200'

0' 2000' 4000'

SCALE OF FEET
HORIZONTAL SCALE 1"=2000'

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FEDERAL AVIATION ADMINISTRATION APPROVAL

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SIGNATURE

CITY OF YAKIMA APPROVAL

APPROVAL DATE: ____________

SIGNATURE

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DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

RUNWAY 27 APPROACH SURFACE PLAN AND PROFILE

FIGURE NO. -

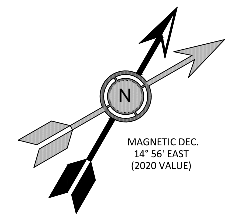
SHEET NO. 9 OF 17

OBSTRUCTION CHART

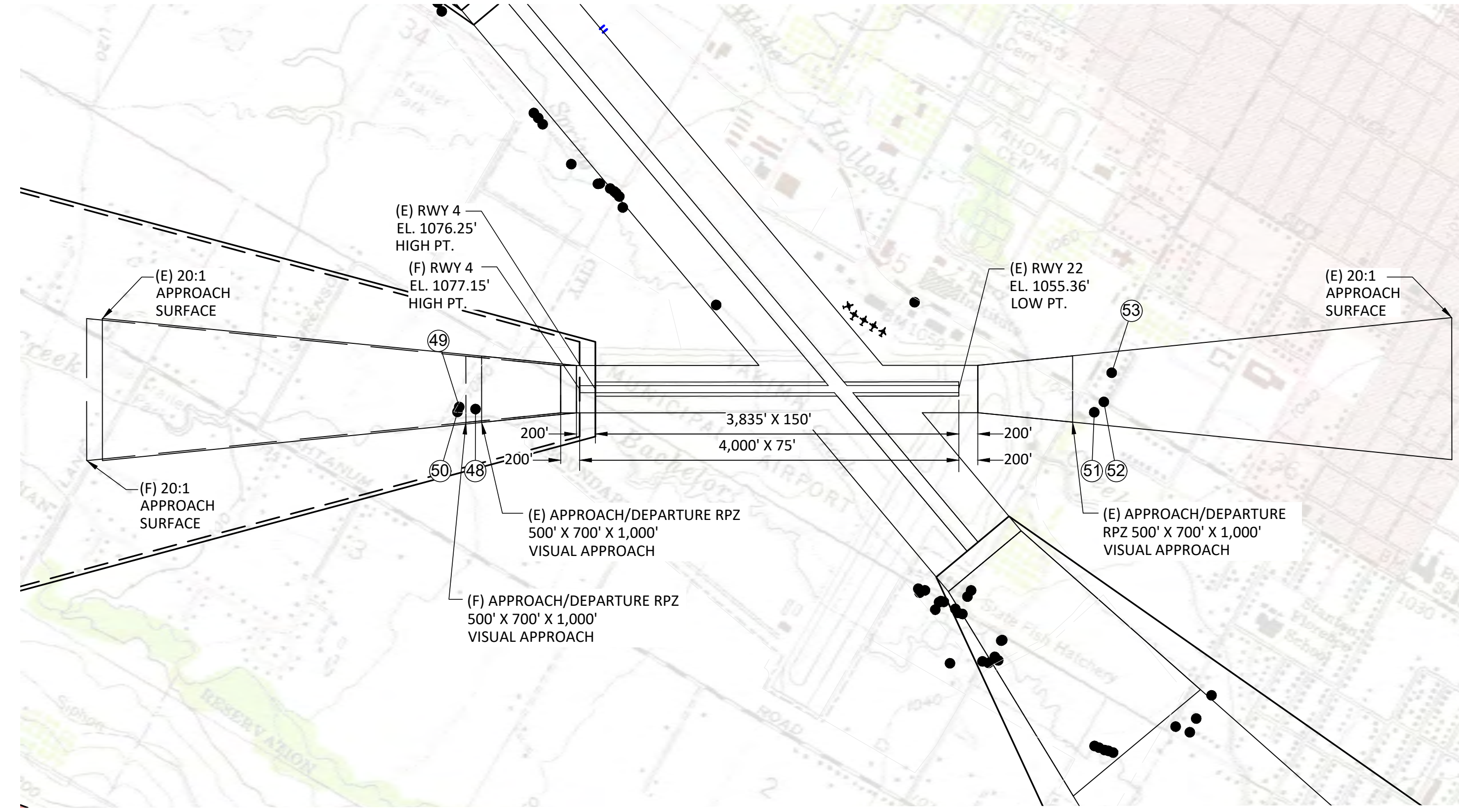
NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
48	TREE	APPROACH (RWY 4)	1,110'	212' R	1,098'	0'	YES	FOR REFERENCE ONLY
49	TREE/BRUSH	APPROACH (RWY 4)	1,126'	191' R	1,270'	0'	YES	FOR REFERENCE ONLY
50	TREE/BRUSH	APPROACH (RWY 4)	1,132'	243' R	1,287'	1.3'	YES	REMOVE
51	TREE/BRUSH	APPROACH (RWY 22)	1,107'	246' L	1,428'	0'	NO	FOR REFERENCE ONLY
52	TREE/BRUSH	APPROACH (RWY 22)	1,114'	136' L	1,530'	0'	NO	FOR REFERENCE ONLY
53	TREE/BRUSH	APPROACH (RWY 22)	1,117'	170' R	1,613'	0'	NO	FOR REFERENCE ONLY

NOTES:

1. DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE ULTIMATE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
2. ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL) AT TOP OF OBJECT. THIS VALUE INCLUDES 15' ADDED TO NON-INTERSTATE ROADWAYS, 17' ADDED TO INTERSTATE HIGHWAYS, AND 23' ADDED TO RAILROADS.
3. U.S. GEOLOGICAL SURVEY (USGS) DIGITAL RASTER GRAPHIC (DGR) PROJECTED IN STATE PLANE NAD83, 7.5 MINUTE QUAD. USGS MAP DATED 1994.
4. FAA AGIS SURVEY (2019).

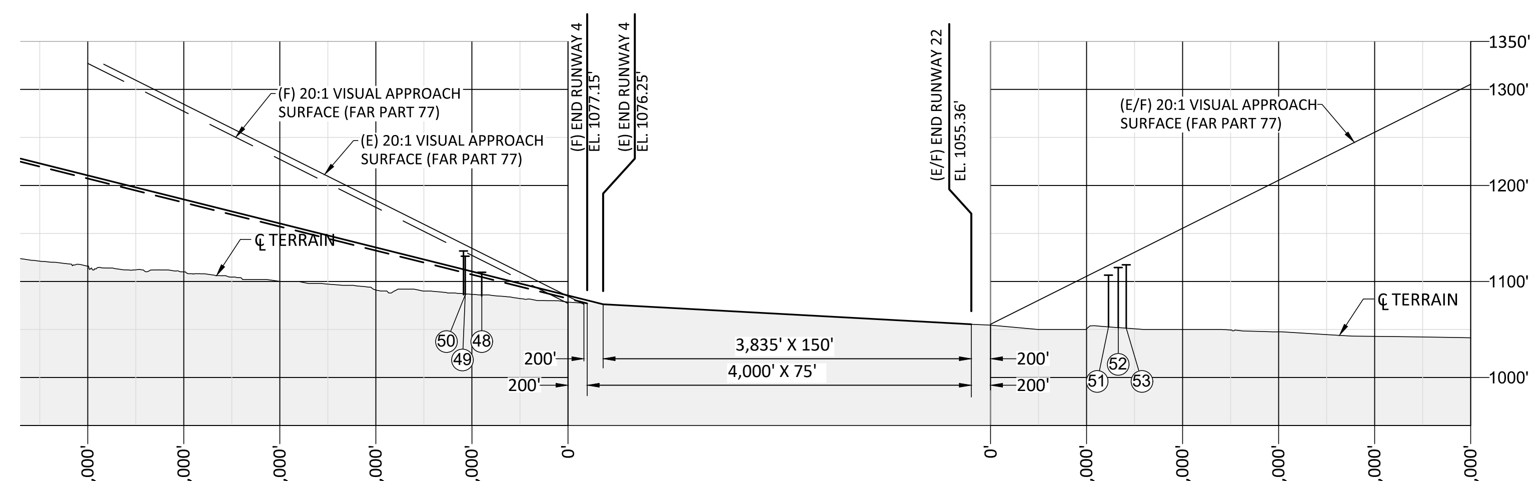


AREAS OF TERRAIN PENETRATION



RUNWAY 4-22 PLAN VIEW

0' 1000' 2000'
Scale: 1"=1000'



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

RUNWAY 4-22 PROFILE VIEW

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

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NO.	DATE	BY	APPR	REVISIONS

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FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE:

SIGNATURE

CITY OF YAKIMA APPROVAL

APPROVAL DATE:

SIGNATURE

CENTURY WEST ENGINEERING

BEND OFFICE
1020 SW EMKAY DRIVE., #100
BEND, OR 97702
541.322.8962 OFFICE
541.382.2423 FAX

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
SP	JLS	DM	AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/
MCALLISTER FIELD

RUNWAY 4-22 APPROACH SURFACE
PLAN AND PROFILE

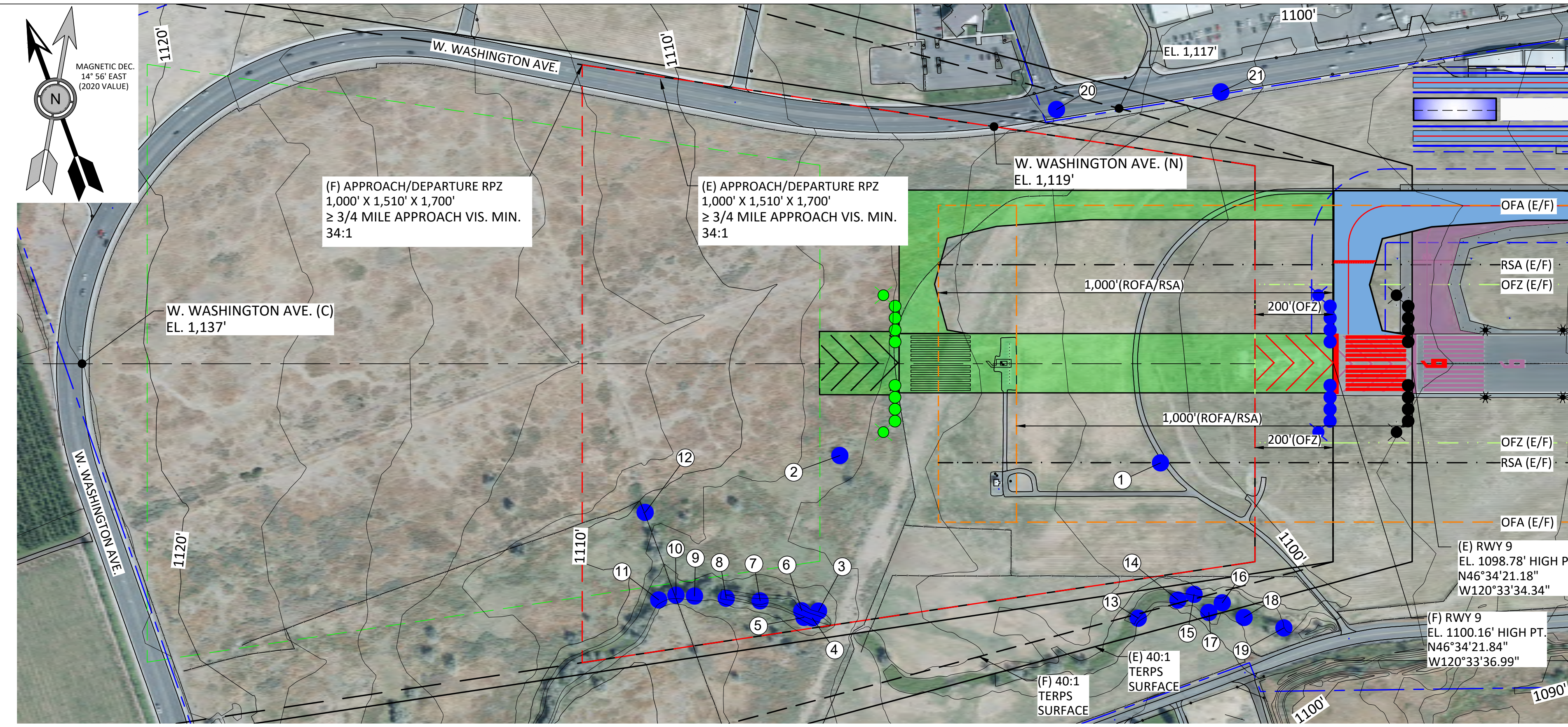
FIGURE NO.
-

OBSTRUCTION CHART

NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
1	SIGN	APPROACH (RWY 9)	1,105'	251' R	439'	0'	YES	FOR REFERENCE ONLY
2	TREE	APPROACH (RWY 9)	1,131'	232' R	1,249'	1.7'	YES	REMOVE
3	TREE/BRUSH	APPROACH (RWY 9)	1,135'	625' R	1,303'	4'	YES	REMOVE
4	TREE/BRUSH	APPROACH (RWY 9)	1,139'	643' R	1,319'	7.5'	YES	REMOVE
5	TREE/BRUSH	APPROACH (RWY 9)	1,139'	641' R	1,339'	7'	YES	REMOVE
6	TREE/BRUSH	APPROACH (RWY 9)	1,137'	624' R	1,345'	5'	YES	REMOVE
7	TREE	APPROACH (RWY 9)	1,136'	599' R	1,451'	<1'	YES	REMOVE
8	TREE/BRUSH	APPROACH (RWY 9)	1,142'	592' R	1,536'	3.5'	YES	REMOVE
9	TREE/BRUSH	APPROACH (RWY 9)	1,142'	587' R	1,616'	1.3'	YES	REMOVE
10	TREE/BRUSH	APPROACH (RWY 9)	1,143'	585' R	1,663'	1.4'	YES	REMOVE
11	TREE/BRUSH	APPROACH (RWY 9)	1,143'	597' R	1,707'	0'	YES	FOR REFERENCE ONLY
12	TREE/BRUSH	APPROACH (RWY 9)	1,144'	376' R	1,741'	0'	YES	FOR REFERENCE ONLY
13	TREE/BRUSH	TRANSITIONAL	1,127'	643' R	495'	5'	YES	REMOVE
14	TREE/BRUSH	TRANSITIONAL	1,124'	597' R	395'	12'	YES	REMOVE
15	TREE/BRUSH	TRANSITIONAL	1,127'	583' R	354'	17'	YES	REMOVE
16	TREE/BRUSH	TRANSITIONAL	1,116'	604' R	283'	4'	YES	REMOVE
17	TREE/BRUSH	TRANSITIONAL	1,124'	628' R	317'	7'	YES	REMOVE
18	TREE/BRUSH	TRANSITIONAL	1,122'	641' R	228'	3'	YES	REMOVE
19	VEGETATION	TRANSITIONAL	1,126'	667' R	127'	4'	YES	REMOVE
20	UTILITY	TRANSITIONAL	1,127'	642' L	702'	5'	NO	LIGHT
21	UTILITY	TRANSITIONAL	1,131'	687' L	286'	2'	NO	LIGHT

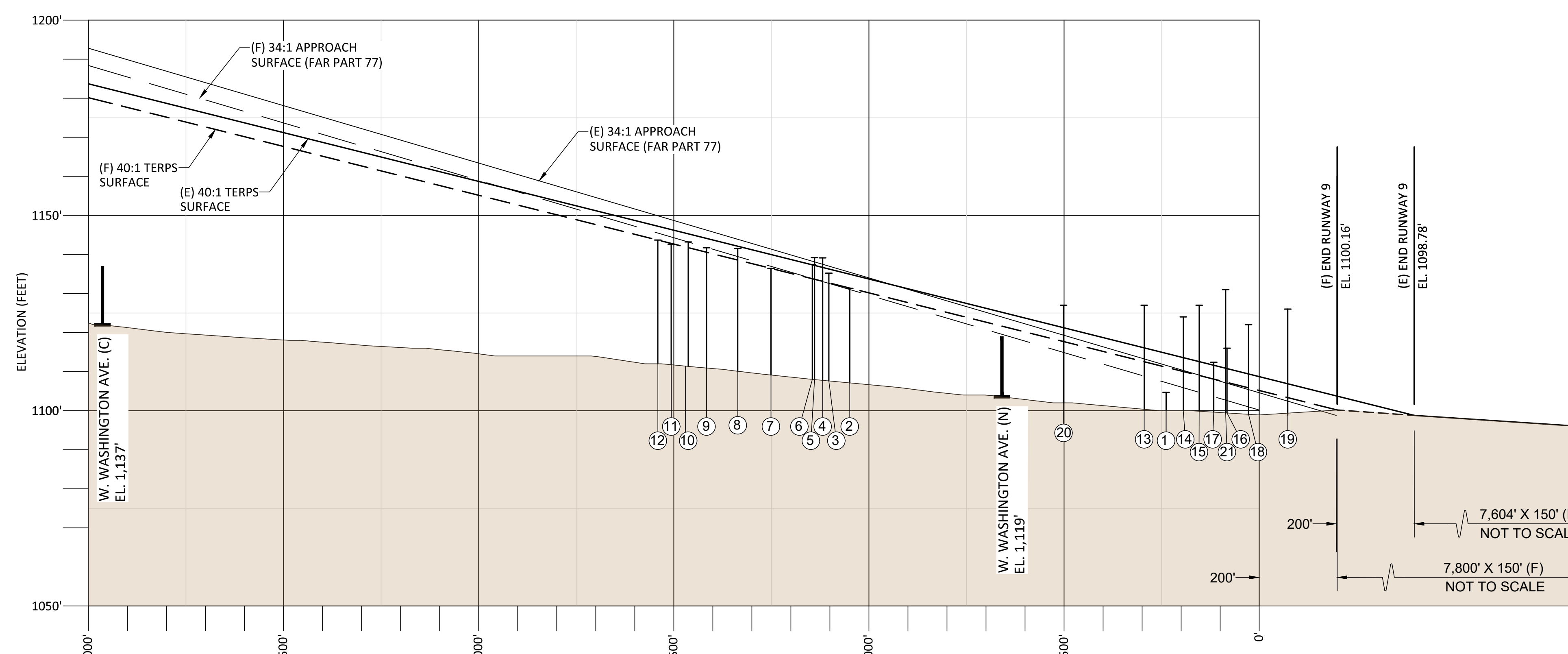
NOTES:

1. DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE ULTIMATE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
2. ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL) AT TOP OF OBJECT. THIS VALUE INCLUDES 15' ADDED TO NON-INTERSTATE ROADWAYS, 17' ADDED TO INTERSTATE HIGHWAYS, AND 23' ADDED TO RAILROADS.
3. FAA AGIS SURVEY (2019).
4. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR FULL LEGEND.



0' 200' 400'
Scale: 1"=200'

RUNWAY 9 PLAN VIEW



0' 200' 400'
Horizontal Scale: 1"=200'

0' 20' 40'
Vertical Scale: 1"=20'

RUNWAY 9 PROFILE VIEW

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NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES
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0" 1"
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FEDERAL AVIATION ADMINISTRATION APPROVAL
APPROVAL DATE: ______
SIGNATURE

CITY OF YAKIMA APPROVAL
APPROVAL DATE: ______
SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE., #100
BEND, OR 97702
541.322.8962 OFFICE
541.382.2423 FAX

DESIGNED BY: SP	DRAWN BY: JLS	CHECKED BY: DM	SCALE: AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

RUNWAY 9 RPZ AND INNER APPROACH PLAN AND PROFILE

FIGURE NO. -

SHEET NO. 11 OF 17

OBSTRUCTION CHART

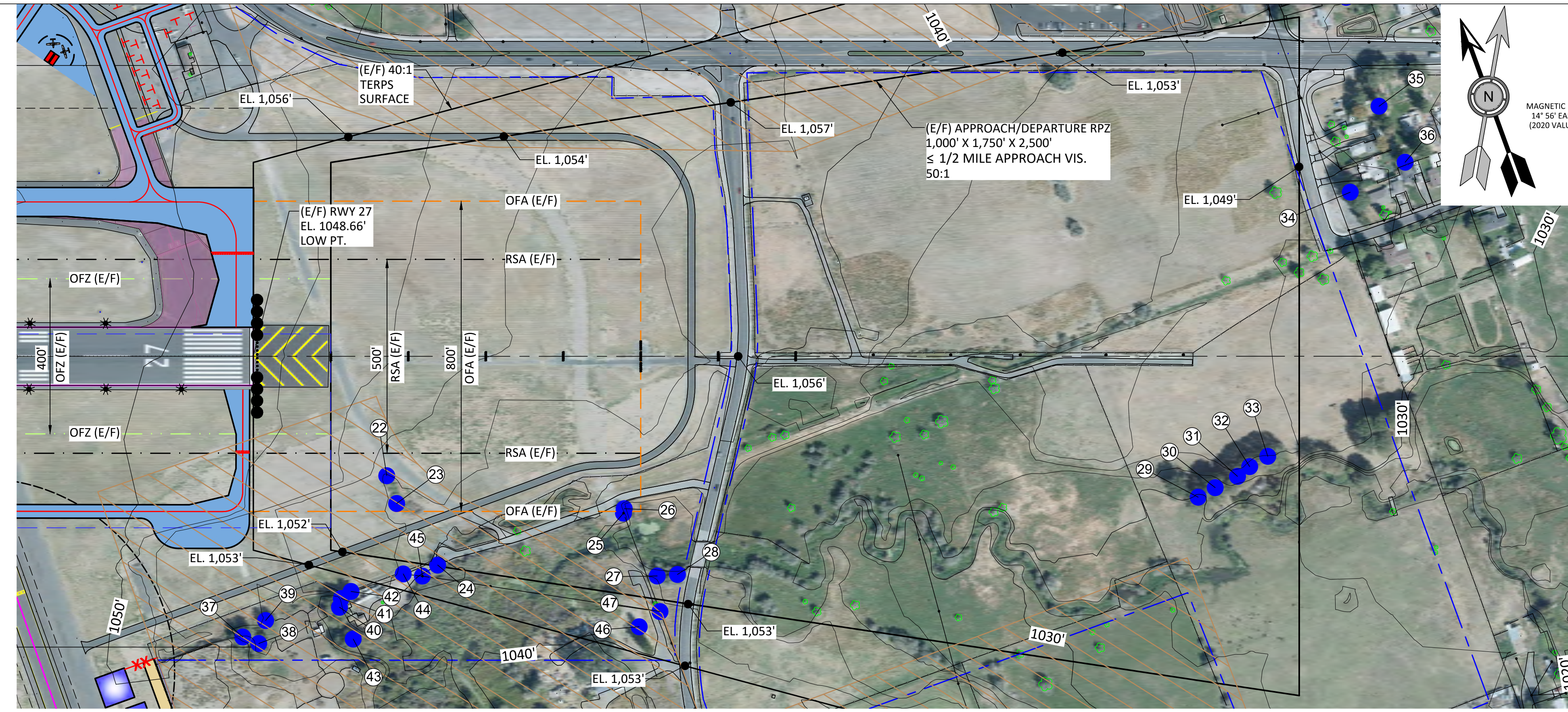
NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
22	TREE/BRUSH	APPROACH (RWY 27)	1,052'	308' L	345'	<1'	YES	REMOVE
23	TREE/BRUSH	APPROACH (RWY 27)	1,052'	380' L	370'	0'	YES	FOR REFERENCE ONLY
24	TREE	APPROACH (RWY 27)	1,072'	539' L	476'	17.4'	YES	REMOVE
25	UTILITY POLE	APPROACH (RWY 27)	1,063'	405' L	956'	0'	YES	LIGHT
26	TREE	APPROACH (RWY 27)	1,066'	393' L	958'	1.7'	YES	REMOVE
27	TREE/BRUSH	APPROACH (RWY 27)	1,068'	567' L	1,043'	2.5'	YES	REMOVE
28	TREE/BRUSH	APPROACH (RWY 27)	1,068'	563' L	1,095'	1.0'	YES	REMOVE
29	TREE/BRUSH	APPROACH (RWY 27)	1,094'	363' L	2,439'	<1'	YES	REMOVE
30	TREE/BRUSH	APPROACH (RWY 27)	1,102'	339' L	2,483'	7.3'	YES	REMOVE
31	TREE/BRUSH	APPROACH (RWY 27)	1,096'	310' L	2,541'	<1'	YES	REMOVE
32	TREE/BRUSH	APPROACH (RWY 27)	1,097'	285' L	2,572'	<1'	YES	REMOVE
33	TREE/BRUSH	APPROACH (RWY 27)	1,101'	258' L	2,619'	4.3'	YES	REMOVE
34	TREE/BRUSH	APPROACH (RWY 27)	1,115'	423' R	2,832'	13.2'	NO	REMOVE
35	TREE/BRUSH	APPROACH (RWY 27)	1,108'	645' R	2,906'	5.3'	NO	REMOVE
36	TREE/BRUSH	APPROACH (RWY 27)	1,106'	501' R	2,973'	2.1'	NO	REMOVE
37	VEGETATION	TRANSITIONAL	1,089'	724' L	27'	5'	YES	REMOVE
38	VEGETATION	TRANSITIONAL	1,086'	741' L	14'	1'	YES	REMOVE
39	VEGETATION	TRANSITIONAL	1,087'	681' L	32'	10'	YES	REMOVE
40	VEGETATION	TRANSITIONAL	1,093'	647' L	223'	24'	YES	REMOVE
41	VEGETATION	TRANSITIONAL	1,091'	625' L	227'	27'	YES	REMOVE
42	VEGETATION	TRANSITIONAL	1,082'	607' L	252'	19'	YES	REMOVE
43	VEGETATION	TRANSITIONAL	1,097'	729' L	258'	15'	YES	REMOVE
44	UTILITY POLE	TRANSITIONAL	1,076'	561' L	387'	19'	YES	LIGHT
45	UTILITY POLE	TRANSITIONAL	1,075'	567' L	436'	17'	YES	LIGHT
46	VEGETATION	TRANSITIONAL	1,081'	698' L	996'	5'	YES	REMOVE
47	UTILITY POLE	TRANSITIONAL	1,073'	658' L	1,050'	3'	YES	LIGHT

NOTES:

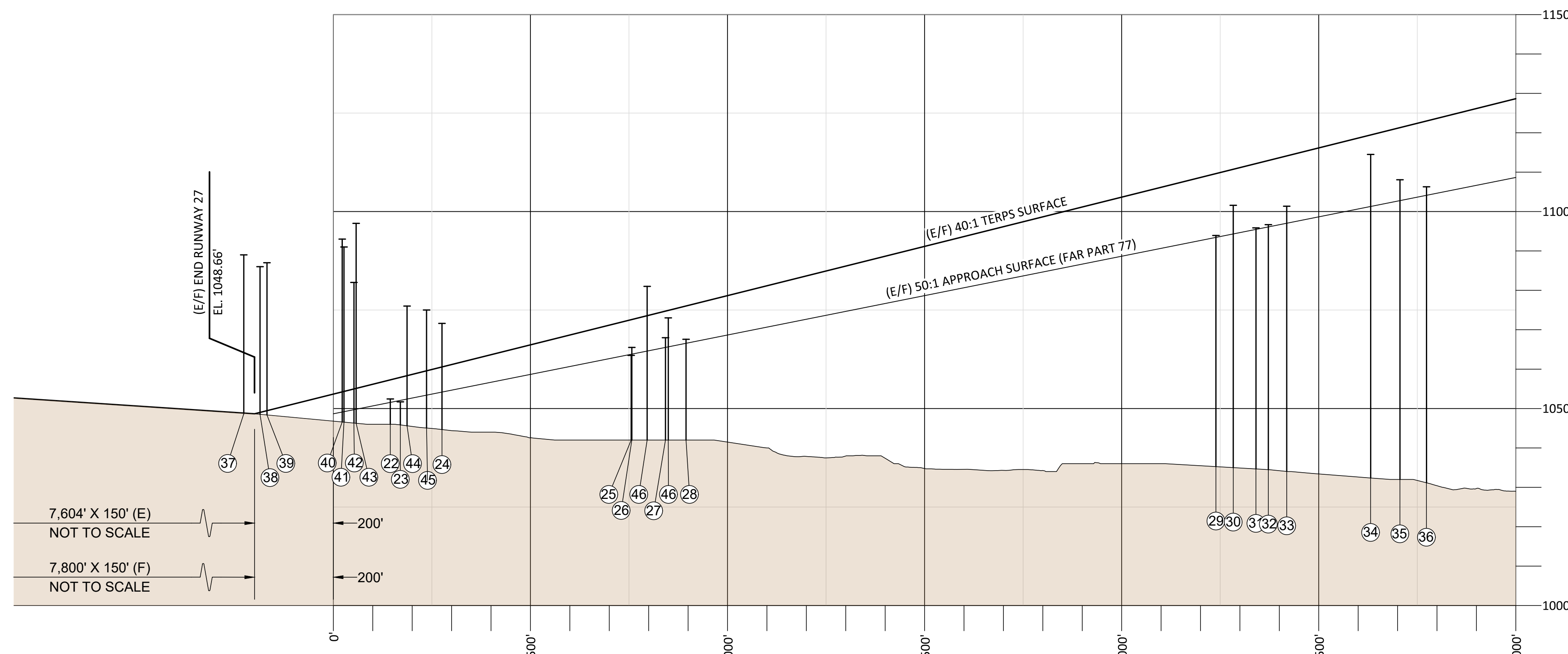
1. DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE ULTIMATE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
2. ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL) AT TOP OF OBJECT. THIS VALUE INCLUDES 15' ADDED TO NON-INTERSTATE ROADWAYS, 17' ADDED TO INTERSTATE HIGHWAYS, AND 23' ADDED TO RAILROADS.
3. FAA AGIS SURVEY (2019).
4. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR FULL LEGEND.
5. TREES 29 THROUGH 33 WERE TOPPED IN 2020 AND NO LONGER AN OBSTRUCTION

0' 200' 400'

Scale: 1"=200'



RUNWAY 27 PLAN VIEW (INNER)



0' 200' 400'

Horizontal Scale: 1"=200'

0' 20' 40'

Vertical Scale: 1"=20'

RUNWAY 27 PROFILE VIEW (INNER)

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NO.	DATE	BY	APPR	REVISIONS

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APPROVAL DATE:

SIGNATURE

CITY OF YAKIMA APPROVAL

APPROVAL DATE:

SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
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541.382.2423 FAX

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
SP	JLS	DM	AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

RUNWAY 27 RPZ AND INNER APPROACH PLAN AND PROFILE

FIGURE NO. -

OBSTRUCTION CHART

NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
48	TREE	APPROACH (RWY 4)	1,110'	212' R	1,098'	0'	YES	FOR REFERENCE ONLY
49	TREE/BRUSH	APPROACH (RWY 4)	1,126'	191' R	1,270'	0'	YES	FOR REFERENCE ONLY
50	TREE/BRUSH	APPROACH (RWY 4)	1,132'	243' R	1,287'	1.3'	YES	REMOVE

NOTES:

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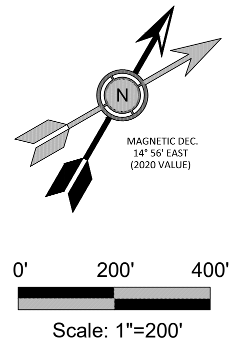
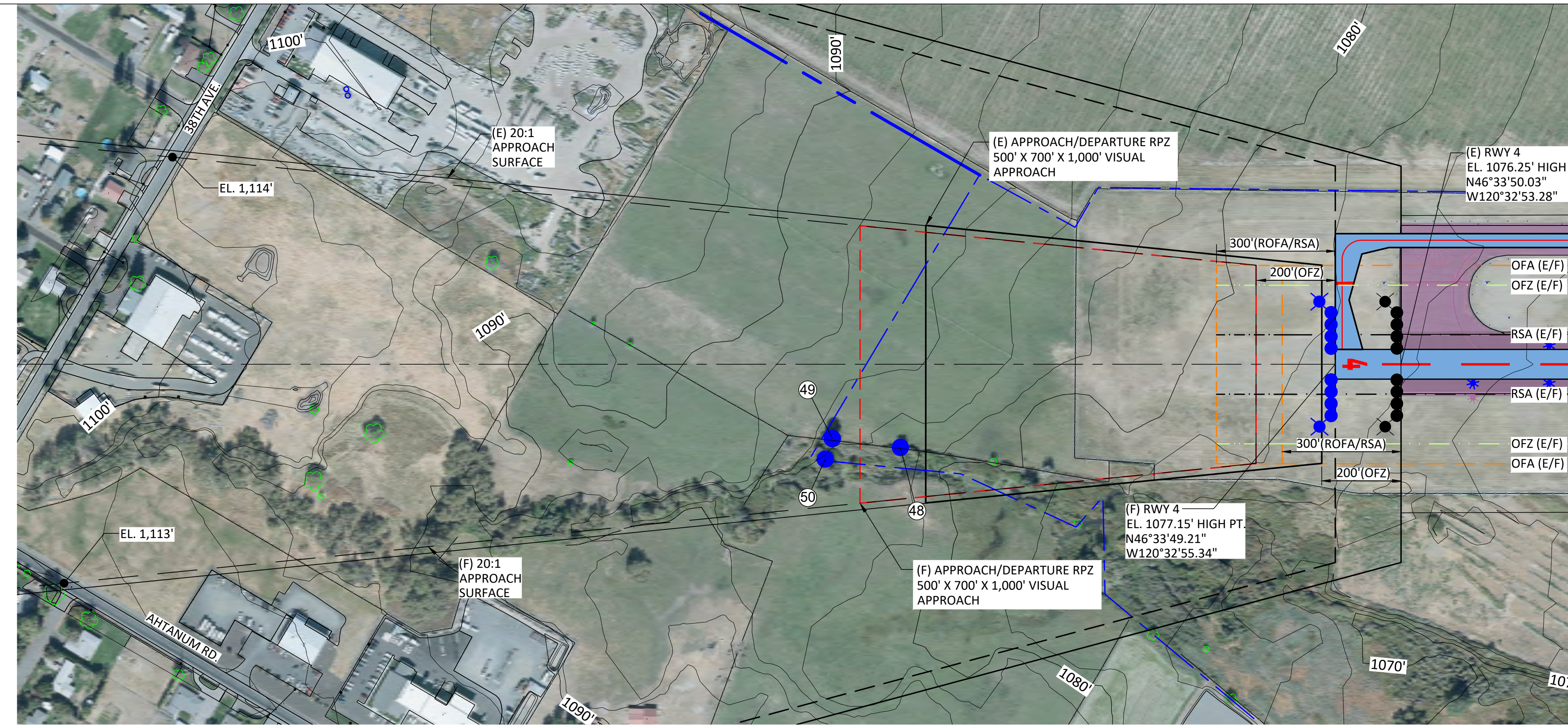
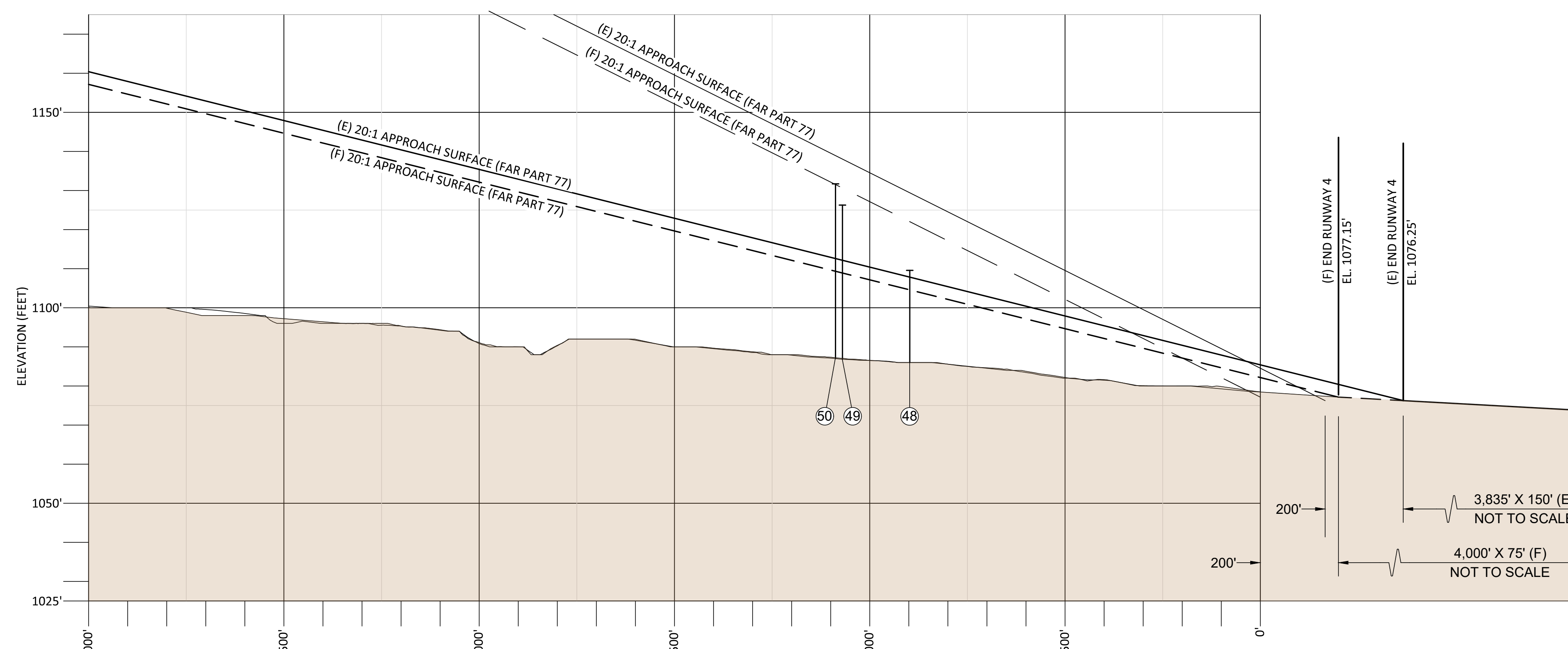
2. ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL) AT TOP OF OBJECT. THIS VALUE INCLUDES 15' ADDED TO NON-INTERSTATE ROADWAYS, 17' ADDED TO INTERSTATE HIGHWAYS, AND 23' ADDED TO RAILROADS.
3. FAA AGIS SURVEY (2019).
4. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR FULL LEGEND.





RUNWAY 4 PLAN VIEW (INNER)



RUNWAY 4 PROFILE VIEW (INNER)

NOTES:

1. SEE RUNWAY 7 APPROACH SURFACE PLAN AND PROFILE (SHEET 8) FOR FULL LIST OF OBSTRUCTIONS.
2. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR FULL LEGEND.
3. SEE AIRPORT DATA SHEET (SHEET 2) FOR NON STANDARD CONDITIONS TABLE.

0' 200' 400'
Horizontal Scale: 1"=200'

0' 20' 40'
Vertical Scale: 1"=20'

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NO.	DATE	BY	APPR	REVISIONS

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CITY OF YAKIMA APPROVAL

APPROVAL DATE: ____________

SIGNATURE

CENTURY WEST ENGINEERING
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541.322.8962 OFFICE
541.382.2423 FAX

DESIGNED BY: SP	DRAWN BY: JLS	CHECKED BY: DM	SCALE: AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

RUNWAY 4 RPZ AND INNER APPROACH PLAN AND PROFILE

FIGURE NO. -

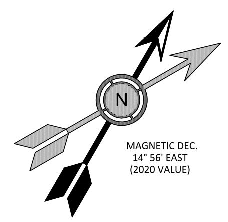
SHEET NO. 13 OF 17

NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
52	TREE/BRUSH	APPROACH (RWY 22)	1,114'	136' L	1,530'	0'	NO	FOR REFERENCE ONLY
53	TREE/BRUSH	APPROACH (RWY 22)	1,117'	170' R	1,613'	0'	NO	FOR REFERENCE ONLY
54	VEGETATION	TRANSITIONAL	1,117'	926' R	2,821'	5'	NO	REMOVE

Table: OBSTRUCTION CHART

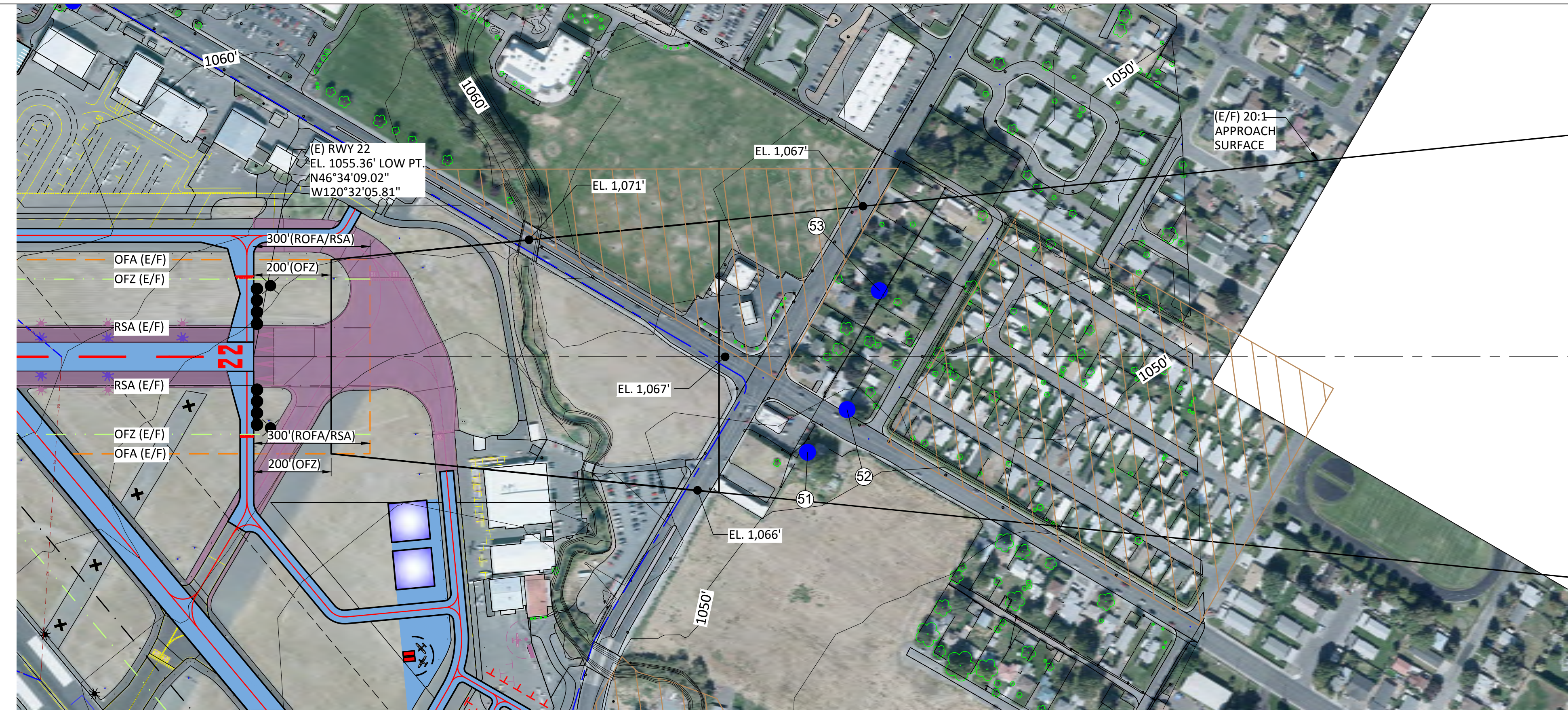
NOTES:

1. DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE ULTIMATE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
2. ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL) AT TOP OF OBJECT. THIS VALUE INCLUDES 15' ADDED TO NON-INTERSTATE ROADWAYS, 17' ADDED TO INTERSTATE HIGHWAYS, AND 23' ADDED TO RAILROADS.
3. FAA AGIS SURVEY (2019).
4. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR FULL LEGEND.

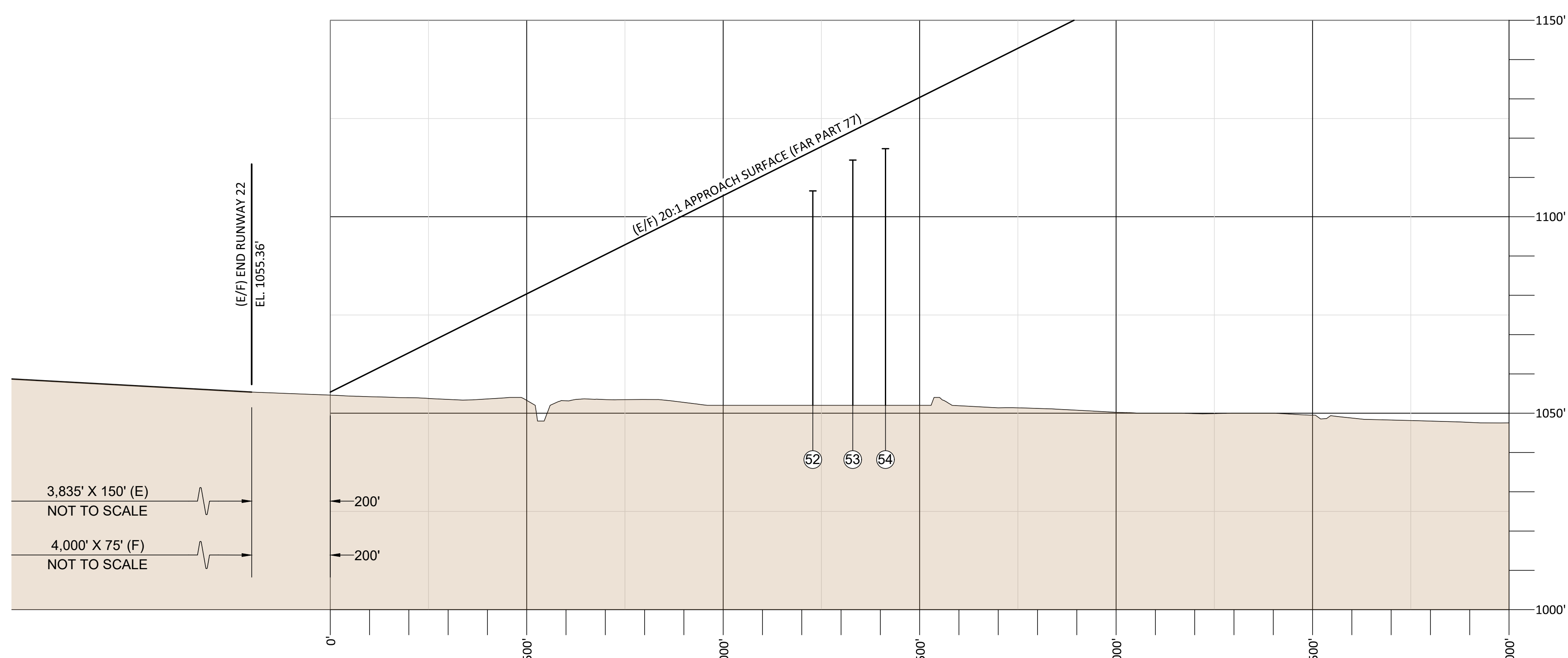


0' 200' 400'

Scale: 1"=200'



RUNWAY 22 PLAN VIEW



0' 200' 400'

Horizontal Scale: 1"=200'

0' 20' 40'

Vertical Scale: 1"=20'

RUNWAY 22 PROFILE VIEW

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SP	JLS	DM	AS SHOWN
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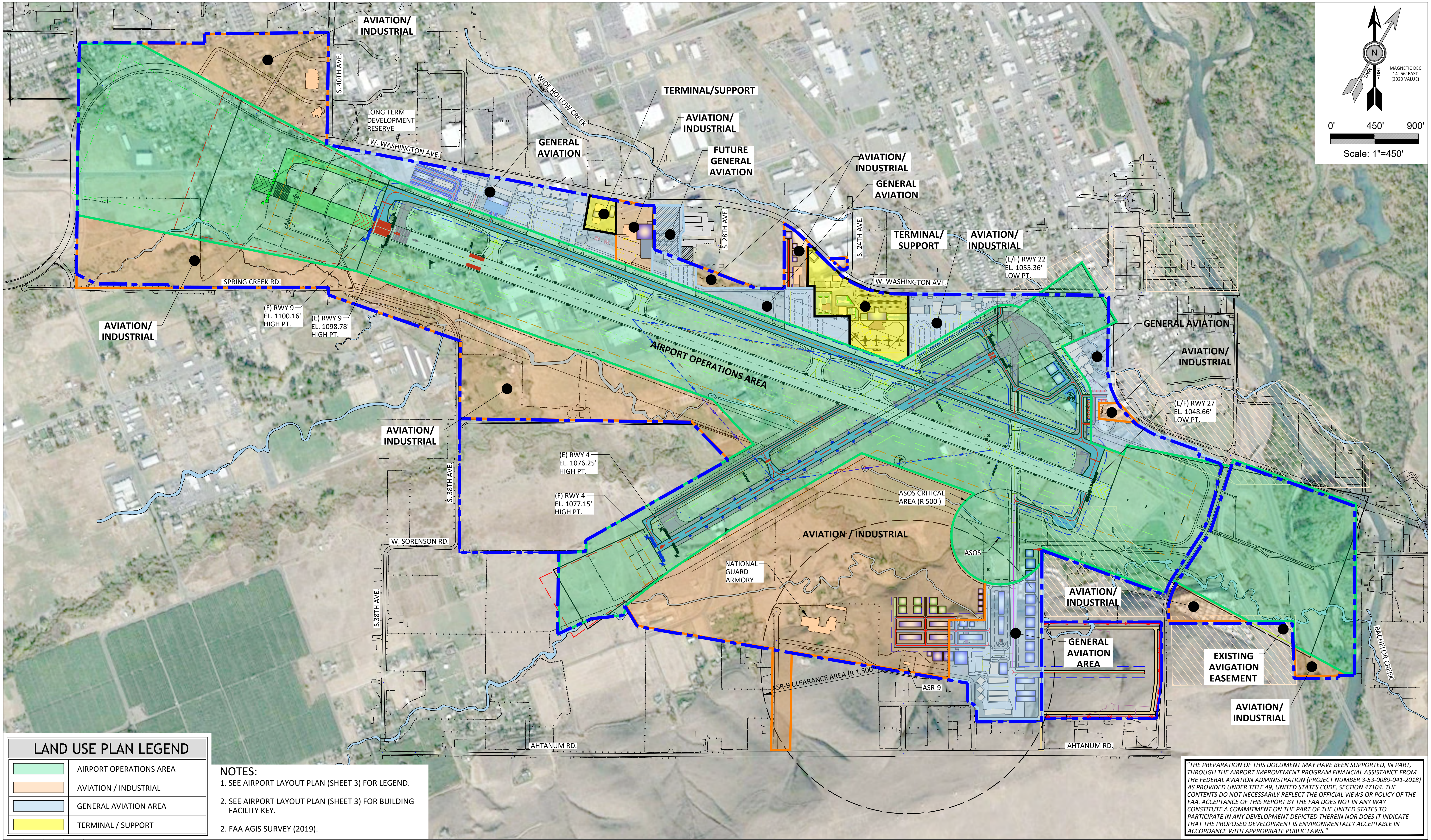
YAKIMA AIR TERMINAL/ MCALLISTER FIELD

RUNWAY 22 RPZ AND INNER APPROACH PLAN AND PROFILE

FIGURE NO. -

SHEET NO. 14 OF 17



LAND USE PLAN LEGEND

	AIRPORT OPERATIONS AREA
	AVIATION / INDUSTRIAL
	GENERAL AVIATION AREA
	TERMINAL / SUPPORT

NOTES:

1. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR LEGEND.
2. SEE AIRPORT LAYOUT PLAN (SHEET 3) FOR BUILDING FACILITY KEY.
2. FAA AGIS SURVEY (2019).

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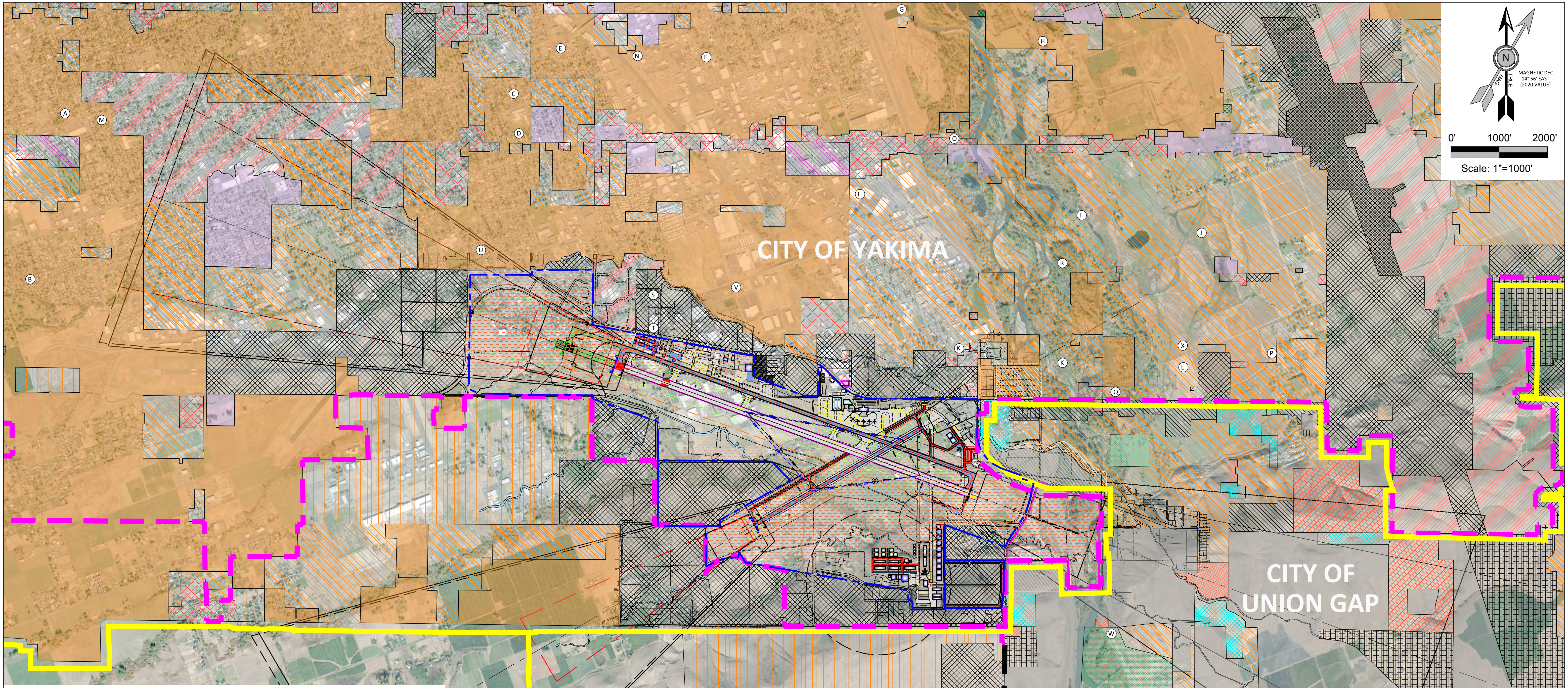
YAKIMA AIR TERMINAL/ MCALLISTER FIELD

ON AIRPORT LAND USE PLAN

FIGURE NO. -

SHEET NO. 15 OF 17



ZONING LEGEND

DESCRIPTION	CODE	HATCH	DESCRIPTION	CODE	HATCH
AIRPORT SUPPORT	AS		HEAVY INDUSTRIAL	M-2	
PROFESSIONAL BUSINESS	B-1		PUBLIC BUILDING DISTRICT	PBD	
LOCAL BUSINESS	B-2		PARKS/OPEN SPACE	PKO	
COMMERCIAL	C-1		PLANNED RECREATIONAL	PRc	
REGIONAL COMMERCIAL	C-2		SINGLE FAMILY	R-1	
CENTRAL BUSINESS DISTRICT	CBD		TWO FAMILY	R-2	
GENERAL COMMERCIAL	GC		MULTI-FAMILY	R-3	
HISTORICAL BUSINESS	HB		CORRIDOR MULTI-FAMILY RES.	R-4	
LIGHT INDUSTRIAL	L-1		REGIONAL DEVELOPMENT	RD	
LARGE CONVENIENCE CENTER	LCC		SUBURBAN RESIDENTIAL	SR	
SMALL CONVENIENCE CENTER	SCC		WHOLESALE/WAREHOUSE DIST.	W/W	
LIGHT INDUSTRIAL	M-1				

PUBLIC FACILITIES KEY

NO.	DESCRIPTION	NO.	DESCRIPTION
A	WIDE HOLLOW ELEMENTARY SCHOOL	M	WEST VALLEY CHURCH
B	WEST VALLEY MIDDLE SCHOOL	N	THE CHURCH OF JESUS CHRIST OF LDS
C	WILSON MIDDLE SCHOOL	O	VALLEY FELLOWSHIP OF YAKIMA
D	WHITNEY ELEMENTARY SCHOOL	P	HOLY REDEEMER CHURCH
E	EISENHOWER HIGH SCHOOL	Q	CALVARY BAPTIST CHURCH
F	NOB HILL ELEMENTARY SCHOOL	R	BETHEL CHRUCH OF THE NAZARENE
G	FRANKLIN MIDDLE SCHOOL	S	CHANGING POINTE CHRUCH
H	MCKINLEY ELEMENTARY SCHOOL	T	PNW ASSOCIATION OF THE CHURCH OF GOD
I	MC CLURE ELEMENTARY SCHOOL	U	RANDALL PARK
J	HOOVER ELEMENTARY SCHOOL	V	EMIL KISSEL PARK
K	LEWIS AND CLARK MIDDLE SCHOOL	W	AHTANUM YOUTH ACTIVITIES PARK
L	RIDGEVIEW ELEMENTARY SCHOOL	X	GARDNER PARK

LEGEND

- AIRPORT PROPERTY LINE (E)
- AIRPORT PROPERTY LINE (F)
- YAKIMA CITY LIMIT LINE
- UNION GAP CITY LIMIT LINE
- URBAN GROWTH AREA

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PROJECT NO: 10074.004.001

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

OFF AIRPORT LAND USE PLAN

FIGURE NO. -

SHEET NO. 16 OF 17

AREA LEGEND	
AVIGATION EASEMENT	
PROPERTY TRANSFER	
PARCEL AREA "A"	
PARCEL AREA "B"	
PARCEL AREA "C"	
PARCEL AREA "D"	

AREA LEGEND	
PARCEL AREA "E"	
PARCEL AREA "F"	
PARCEL AREA "G"	
PARCEL AREA "H"	
PARCEL AREA "I"	
PARCEL AREA "J"	

AIRPORT PROPERTY RELEASE

PARCEL	AREA	GRANTOR	GRANTEE	ACRES	RECORDING INFO AUDITOR'S FILE #	DATE	INTEREST	FEDERAL AGREEMENT	FEDERAL GRANT PARCEL #
81	I	CITY OF YAKIMA (YAKIMA AIR TERMINAL)	CITY OF YAKIMA	.55	-	8-21-18	-	-	-
82	C	CITY OF YAKIMA (YAKIMA AIR TERMINAL)	CITY OF YAKIMA	.64	-	8-21-18	-	-	-

NOTE:
1. INDIVIDUAL PROPERTIES SHOWN ON THE DRAWING WERE PURCHASED IN 10 SPECIFIC PROJECTS. THESE ARE PRESENTED BY THE PARCEL AREAS DEPICTED. PROPERTY-SPECIFIC INFORMATION IS SHOWN IN THE AIRPORT PROPERTY DATA TABLE.
2. PARCEL 31 SOLD TO CITY OF YAKIMA IN MAY 2021.

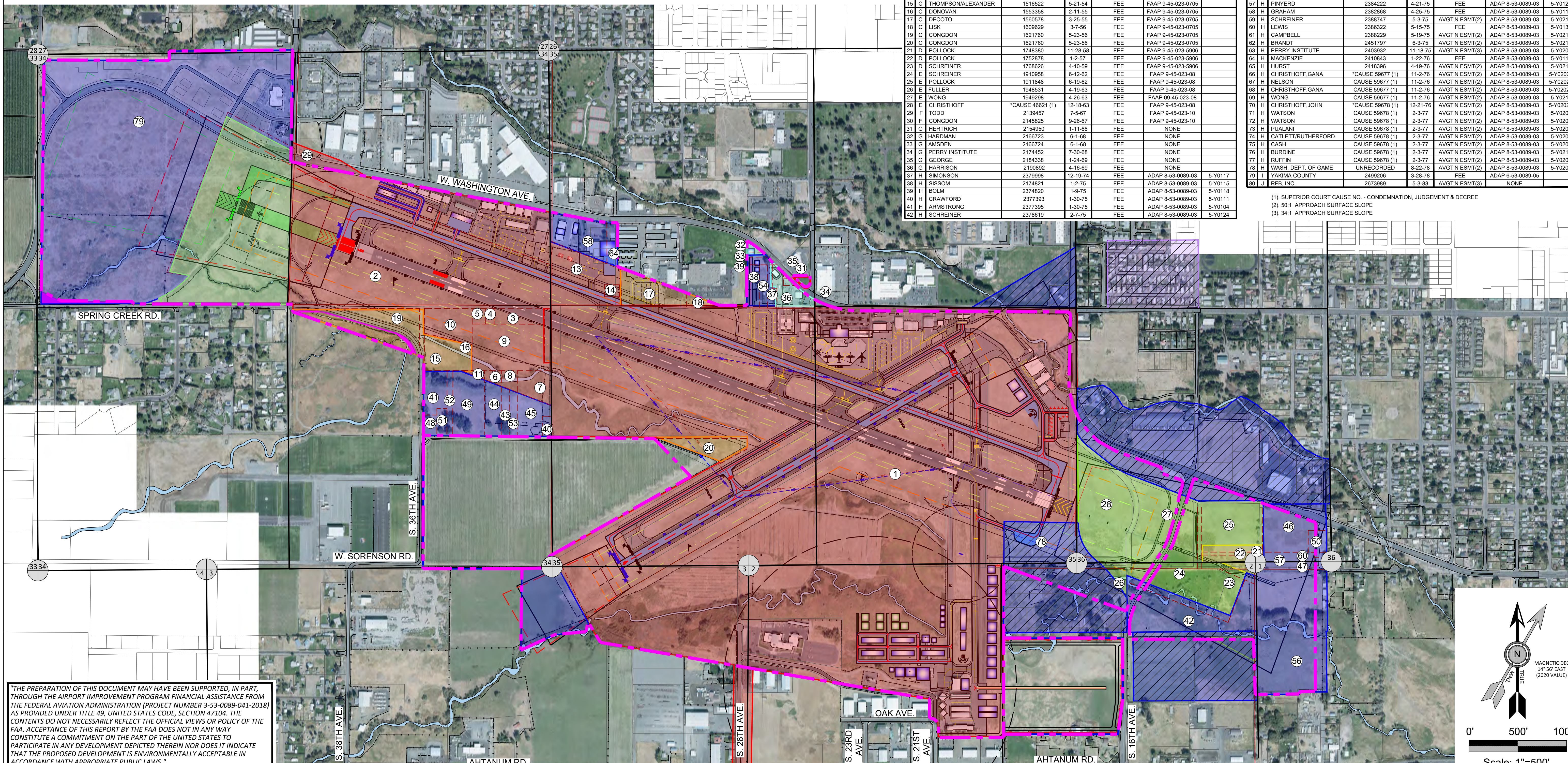
AIRPORT PROPERTY DATA

PARCEL	AREA	OWNER	RECORDING INFO AUDITOR'S FILE #	DATE	INTEREST	FEDERAL AGREEMENT	FEDERAL GRANT PARCEL #
1	A	YAKIMA COUNTY	1217395	6-30-48	FEE	NONE	
2	B	TODD	1416795	5-27-52	FEE	FAAP 9-45-023-902	
3	B	RUA	1494084	12-22-53	FEE	FAAP 9-45-023-902	
4	B	ELDER	1494093	12-22-53	FEE	FAAP 9-45-023-902	
5	B	STONEKING/CURTIS	1494094	12-22-53	FEE	FAAP 9-45-023-902	
6	B	NORTON	1499825	2-3-54	FEE	FAAP 9-45-023-902	
7	B	WEDEKAMPER/CORNELLA	1502726	2-24-54	FEE	FAAP 9-45-023-902	
8	B	ADAMS	1502728	2-24-54	FEE	FAAP 9-45-023-902	
9	B	OHLSON/BOWERS	1514530	5-7-54	FEE	FAAP 9-45-023-902	
10	B	POTTS	1526894	8-6-54	FEE	FAAP 9-45-023-902	
11	B	MCCOY	1553685	2-15-55	FEE	FAAP 9-45-023-902	
12	B	DECOTO	1560580	3-25-55	FEE	FAAP 9-45-023-902	
13	B	GRAHAM	1561542	4-1-55	FEE	FAAP 9-45-023-902	
14	B	MACKENZIE	1561542	4-1-55	FEE	FAAP 9-45-023-902	
15	C	THOMPSON/ALEXANDER	1516522	5-21-54	FEE	FAAP 9-45-023-0705	
16	C	DONOVAN	1553358	2-11-55	FEE	FAAP 9-45-023-0705	
17	C	DECOTO	1560578	3-25-55	FEE	FAAP 9-45-023-0705	
18	C	LISK	1609629	3-7-56	FEE	FAAP 9-45-023-0705	
19	C	CONGDON	1621760	5-23-56	FEE	FAAP 9-45-023-0705	
20	C	CONGDON	1621760	5-23-56	FEE	FAAP 9-45-023-0705	
21	D	POLLOCK	1748380	11-28-58	FEE	FAAP 9-45-023-5906	
22	D	POLLOCK	1752878	1-2-57	FEE	FAAP 9-45-023-5906	
23	D	SCHREINER	1768626	4-10-59	FEE	FAAP 9-45-023-5906	
24	E	SCHREINER	1910958	6-12-62	FEE	FAAP 9-45-023-08	
25	E	POLLOCK	1911848	6-19-62	FEE	FAAP 9-45-023-08	
26	E	FULLER	1948531	4-19-63	FEE	FAAP 9-45-023-08	
27	E	WONG	1949298	4-26-63	FEE	FAAP 09-45-023-08	
28	E	CHRISTHOFF	*CAUSE 46621 (1)	12-18-63	FEE	FAAP 9-45-023-08	
29	F	TODD	2139457	7-5-67	FEE	FAAP 9-45-023-10	
30	F	CONGDON	2145825	9-26-67	FEE	FAAP 9-45-023-10	
31	G	HERTRICH	2154950	1-11-68	FEE	NONE	
32	G	HARDMAN	2166723	6-1-68	FEE	NONE	
33	G	AMSDEN	2166724	6-1-68	FEE	NONE	
34	G	PERRY INSTITUTE	2174452	7-30-68	FEE	NONE	
35	G	GEORGE	2184338	1-24-69	FEE	NONE	
36	G	HARRISON	2190892	4-16-69	FEE	NONE	
37	H	SIMONSON	2379998	12-19-74	FEE	ADAP 8-53-0089-03	5-Y0117
38	H	SISSOM	2174821	1-2-75	FEE	ADAP 8-53-0089-03	5-Y0115
39	H	BOLM	2374820	1-9-75	FEE	ADAP 8-53-0089-03	5-Y0118
40	H	CRAWFORD	2377393	1-30-75	FEE	ADAP 8-53-0089-03	5-Y0111
41	H	ARMSTRONG	2377395	1-30-75	FEE	ADAP 8-53-0089-03	5-Y0104
42	H	SCHREINER	2378619	2-7-75	FEE	ADAP 8-53-0089-03	5-Y0124

AIRPORT PROPERTY DATA

PARCEL	AREA	OWNER	RECORDING INFO AUDITOR'S FILE #	DATE	INTEREST	FEDERAL AGREEMENT	FEDERAL GRANT PARCEL #
43	H	RUDDELL	2377392	2-11-75	FEE	ADAP 8-53-0089-03	5-Y0108
44	H	PAYNE	2377391	2-11-75	FEE	ADAP 8-53-0089-03	5-Y0107
45	H	HARTINGER	2378555	2-24-75	FEE	ADAP 8-53-0089-03	5-Y0110
46	H	WELK	2380110	2-24-75	FEE	ADAP 8-53-0089-03	5-Y0128
47	H	BURRILL	2378961	2-28-75	FEE	ADAP 8-53-0089-03	5-Y0131
48	H	PERRY	2378556	3-6-75	FEE	ADAP 8-53-0089-03	5-Y0102
49	H	JONES	2381376	3-10-75	FEE	ADAP 8-53-0089-03	5-Y0106
50	H	KUKES	2380109	3-10-75	FEE	ADAP 8-53-0089-03	5-Y0129
51	H	LIBY	2379999	3-11-75	FEE	ADAP 8-53-0089-03	5-Y0103
52	H	GALINDO	2318379	3-20-75	FEE	ADAP 8-53-0089-03	5-Y0105
53	H	BURKE	2381878	4-7-75	FEE	ADAP 8-53-0089-03	5-Y0109
54	H	WHITE	2382612	4-9-75	FEE	ADAP 8-53-0089-03	5-Y0116
55	H	DECOTO	2382993	4-15-75	FEE	ADAP 8-53-0089-03	5-Y0121
56	H	ROWLEY	2383857	4-21-75	FEE	ADAP 8-53-0089-03	5-Y0126
57	H	PINYERD	2384222	4-21-75	FEE	ADAP 8-53-0089-03	5-Y0127
58	H	GRAHAM	2382868	4-25-75	FEE	ADAP 8-53-0089-03	5-Y0112
59	H	SCHREINER	2388747	5-3-75	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0211
60	H	LEWIS	2386322	5-15-75	FEE	ADAP 8-53-0089-03	5-Y0130
61	H	CAMPBELL	2388229	5-19-75	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0215
62	H	BRANDT	2451797	6-3-75	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0213
63	H	PERRY INSTITUTE	2403932	11-18-75	AVGT'N ESMT(3)	ADAP 8-53-0089-03	5-Y0201
64	H	MACKENZIE	2410843	1-22-76	FEE	ADAP 8-53-0089-03	5-Y0113
65	H	HURST	2418396	4-19-76	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0214
66	H	CHRISTHOFF,GANA	*CAUSE 59677 (1)	11-2-76	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0202A
67	H	NELSON	CAUSE 59677 (1)	11-2-76	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0202B
68	H	CHRISTHOFF,GANA	CAUSE 59677 (1)	11-2-76	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0202C
69	H	WONG	CAUSE 59677 (1)	11-2-76	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0212
70	H	CHRISTHOFF,JOHN	*CAUSE 59678 (1)	12-21-76	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0202D
71	H	WATSON	CAUSE 59678 (1)	2-3-77	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0204
72	H	WATSON	CAUSE 59678 (1)	2-3-77	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0205
73	H	PUALANI	CAUSE 59678 (1)	2-3-77	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0206
74	H	CATLETT/RUTHERFORD	CAUSE 59678 (1)	2-3-77	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0207
75	H	CASH	CAUSE 59678 (1)	2-3-77	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0208
76	H	BURDINE	CAUSE 59678 (1)	2-3-77	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0210
77	H	RUFFIN	CAUSE 59678 (1)	2-3-77	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0209
78	H	WASH. DEPT. OF GAME	UNRECORDED	8-22-78	AVGT'N ESMT(2)	ADAP 8-53-0089-03	5-Y0203
79	I	YAKIMA COUNTY	2499206	3-28-78	FEE	ADAP 6-53-0089-05	
80	J	RFB, INC.	2673989	5-3-83	AVGT'N ESMT(3)	NONE	

(1). SUPERIOR COURT CAUSE NO. - CONDEMNATION, JUDGEMENT & DECREE
(2). 50:1 APPROACH SURFACE SLOPE
(3). 34:1 APPROACH SURFACE SLOPE



"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-53-0089-041-2018) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES

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

FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE: ____________

SIGNATURE

CITY OF YAKIMA APPROVAL

APPROVAL DATE: ____________

SIGNATURE

CENTURY WEST ENGINEERING
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1020 SW EMKAY DRIVE., #100
BEND, OR 97702
541.322.8962 OFFICE
541.382.2423 FAX

DESIGNED BY: SP	DRAWN BY: JLS	CHECKED BY: DM	SCALE: AS SHOWN
DATE: OCTOBER 2020		PROJECT NO: 10074.004.001	

YAKIMA AIR TERMINAL/ MCALLISTER FIELD

EXHIBIT "A" AIRPORT PROPERTY MAP

FIGURE NO. -

22

7

FINANCIAL IMPLEMENTATION PLAN

7.1 INTRODUCTION

In this chapter the projects and facility improvements recommended in the master plan are organized into an overall Capital Improvement Program (CIP). The CIP was developed using a process that balanced the needs for capital improvement projects against the competing, and sometimes conflicting, financial priorities represented by annual airport operating and maintenance costs. The implementation period for the CIP covers the three phases of development through the year 2048:

- Phase I: Short-term five-year period from 2021 to 2025. Projects assigned to Phase I are shown on a year-by-year basis, consistent with the Federal Aviation Administration's (FAA's) CIP format.
- Phase II: Mid-term five-year period from 2026 through 2030. Projects are allocated to specific years.
- Phase III: Long-term period from 2031 through 2048. These projects are grouped together.

Projects are assigned to a phase based on their anticipated need to meet demand levels or because they are necessary precursors to achieving long-term development goals.

7.2 ESTIMATES OF PROBABLE COST

The first step in the financial plan is the development of an estimate of the probable cost of each project. These estimates cover planning level detail with quantities estimated by scaling the Airport Layout Plan (ALP) or, where appropriate, from data presented in Chapter 5 Evaluation of Alternatives. These estimated quantities were then multiplied by a unit cost based on Washington State Department of Transportation (WSDOT) Standard Bid Item Inquiries, as well as comparable project bid prices from Eastern Washington. All costs are based on 2020 dollars

The cost estimates shown in Table 7-1 summarize total project costs for professional service fees including design, project management, construction management, and others

(15 to 20 percent), and contingencies (20 percent of construction cost) for all projects. Updated estimates need to be prepared for each project prior to design as projects become more defined. Figure 7-1 illustrates when and where the projects listed in the CIP are planned to occur.

Table 7-1: Estimated Cost of Capital Improvement Projects

Short-Term Projects		Total Project Costs
Year	**Description**	
2023	Terminal Building (Design Phase 1)	$2,004,400
2024	Terminal Building (Design Phase 2)	$200,440
2025	Terminal Building - Temporary Building	$1,803,860
	SHORT-TERM TOTAL (1-5 Years)	**$4,008,700**

Mid-Term Projects		Total Project Costs
Year	**Description**	
2026	Terminal Building (Construction Phase 3)	$20,044,700
2030	South GA Area - Taxilanes (Two at 35' x 900')	$1,200,000
	MID-TERM TOTAL (6-10 Years)	**$21,244,700**

Table 7-1: Estimated Cost of Capital Improvement Projects (Continued)

Long-Term Project		Total Project Costs
Year	**Description**	
2031	RWY 4/22 Rehabilitation, MIRL, and Signage (3,865'x75')	$2,100,000
2031	SRE Building Expansion (Design & Const.)	$1,750,000
2032	RWY 27 End Connector (TWY A1) Reconfiguration Project & Partial Parallel TWY between TWY C and RWY 27 End and AC Holding Area (Design)	$434,026
2033	RWY 27 End Connector (TWY A1) Reconfiguration Project & Partial Parallel TWY between TWY C and RWY 27 End and AC Holding Area (Const.)	$4,900,000
2034	SRE Acquisition – Two High Speed Runway Plows & One Ramp Plow	$1,000,000
2036	TWY A and Connectors Maint. Project (Slurry Seal, Crackfill, Markings)	$200,000
2037	TWY C Maint. Project (Slurry Seal, Crackfill, Markings)	$40,000
2038	Vehicle Parking Rehabilitation (Overlay) – Terminal, Rental Car, Employee Parking Lots	$600,000
2039	Former Noland Decoto Apron Maintenance (reconstruction)	$40,000
2040	Cargo (McCormick) Apron Rehabilitation (Design & Const.)	$2,800,000
2041	Cargo (FedEx) Apron Rehabilitation & Expansion (Design & Const.)	$1,000,000
2042	Northeast GA Area Taxilane Maintenance (Slurry Seal, Crack fill, Markings) & Apron Rehab/Reconfiguration Project	$1,500,000
2043	RWY 9 & TWY A Extension & TWY A5 Relocation (Future RWY length 7,800')	$5,500,000
2044	Property Acquisition – Southeast Parcel (Owner – Hartshorn)	$401,730*
2045	Property Acquisition – Southwest Parcel (2) (Owner – Congdon)	$340,000*
2046	Airport Master Plan Update	$1,000,000
2047	TWY A Reconstruction (Widen to 75' to eliminate MOD) & Replace/Relocate MITL	$20,300,000
2048	RWY 9/27 Reconstruction	$27,600,000
	LONG-TERM TOTAL (11-20 Years)	**$71,505,395**

Phases	Total Phase Costs
SHORT-TERM (0-5 Years)	$4,008,700
MID-TERM (6-10 Years)	$21,244,700
LONG-TERM (11-20 Years)	$71,505,396
TOTAL 20-YEAR PERIOD	**$96,758,796**

Source: Mead & Hunt, Inc. 2020 Estimates

*Property values based on 2020 Yakima County Assessor's "Total assessed value"

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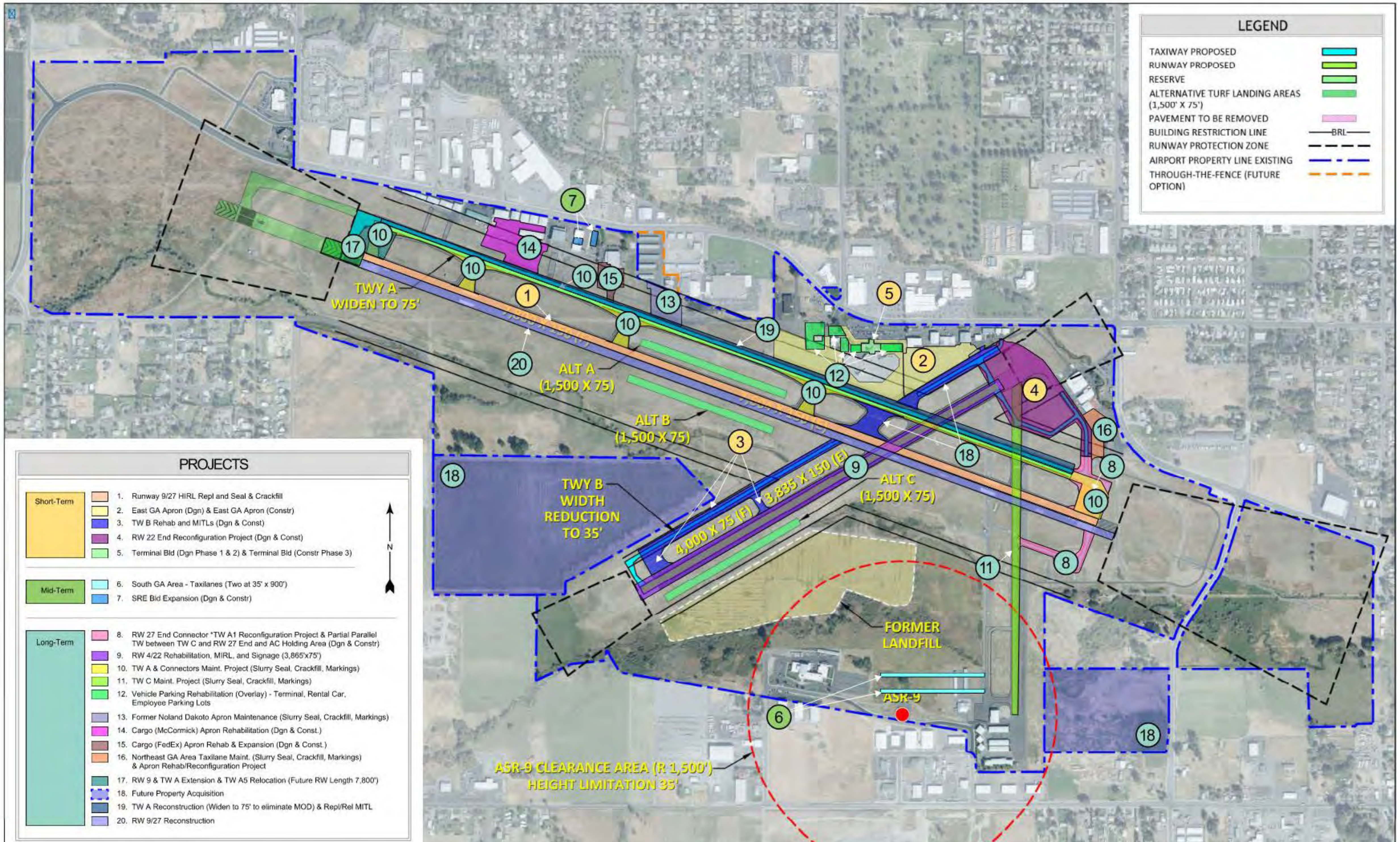
Figure 7-1: Capital Improvement Projects



7.3 ESTIMATES OF PROBABLE COST

The overall cost of the recommended improvements will exceed $70 million over the 20-year period. To fund these projects, a combination of FAA Airport Improvement Program (AIP) entitlement and discretionary funds, WSDOT Aviation Division grants, private third-party financing, and continued financial support from the City of Yakima will be needed. The funding sources that will serve as the airport's primary means to finance the CIP are discussed in the following sections. The tables show project costs and probable funding source contributions in 2020 dollars.

7.3.1 AIP Entitlement Grants

YKM is identified by the National Plan of Integrated Airport Systems (NPIAS) as a Non-Hub Primary Airport. The Airport receives annual AIP entitlement grants from the FAA that are allocated using a formula based on the number of annual enplaned passengers at YKM. A **Non-Hub Primary** airport receives a minimum apportionment of $1 million dollars.

The FAA evaluates all airport grant requests using a priority ranking system weighted toward safety, security, airfield pavement, and airfield capacity projects such as pavement reconstruction and security upgrades. Projects such as terminal building construction and maintenance and construction of roads are also eligible but receive much lower priority rankings.

Once a project at a non-hub airport such as YKM has been identified as eligible, up to 90 percent of project costs are funded. The remaining 10 percent is considered the sponsor’s match, and the sponsor derives that amount from other funds including Passenger Facility Charges (PFCs), WSDOT Grants, and/or Third-Party financing.

7.3.2 AIP Discretionary Grants

YKM is also eligible to receive AIP discretionary grants through the FAA. The approval of an AIP discretionary grant for a project depends on a ranking method the FAA uses to award grants, at their discretion, based on a project’s priority and importance to the National Airspace System (NAS). It is reasonable to assume that YKM will receive some discretionary funding during the planning period for high priority, eligible projects, where the cost of such projects exceed the City’s funding capability. If the FAA does not provide the projected discretionary grants, the City will have to source additional funds to make up the funding gap or delay the project until such funds are available.

7.3.3 Washington Department of Transportation State Aviation Grants

The Washington State Department of Transportation/Aviation Division (WSDOT Aviation) provides grants for projects including pavement maintenance, safety improvements, and others that the State deems to be priority projects for the preservation of the airport and the overall state aviation system. The Master Plan CIP includes many projects that are eligible for partial funding through state aviation grants.

In this analysis, it is assumed that WSDOT grants would be used to pay one half of the local share of most pavement maintenance projects and would participate in the rehabilitation of Runway 4-22. This equals roughly 5 percent of the total project costs

At this time there are no guarantees that WSDOT funds will be available in the future. If state funds are not available when the time approaches for the project to begin, the local project share would increase accordingly.

7.3.4 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 a PFC of up to $3 per enplaned passenger. AIR-21, enacted in 2000, increased the allowable PFC level to $4.50. YKM's existing PFC is the maximum allowable level of $4.50.

The proceeds from PFCs can be used for AIP-eligible projects, such as pavement rehabilitation, runway lighting, or airport maintenance or snow removal equipment, and for additional projects that preserve or enhance airport capacity, safety or security; mitigate the effects of aircraft noise; or enhance airline competition, such as terminal construction or site preparation for general aviation development. PFCs may also be used to pay debt service on bonds and other indebtedness incurred to carry out eligible projects.

7.3.5 Private Financing

Airports often allow private businesses to finance improvements that they consider a business investment. Projects of this kind include aircraft hangars, fixed-base operator facilities, cargo facilities, or exclusive aircraft parking aprons. Such projects are not eligible for federal funding under the AIP.

The implementation analysis assumes that a private party will provide funding for development of all aircraft hangars and the improvements needed to support such hangar development. These improvements will be done on airport property, and the City will receive annual revenue through land leases. Additionally, any private development will include provisions that ownership of the facility will revert to the City after an appropriate period (generally 30 to 50 years).

Should the City decide to construct hangars themselves, it is assumed they will lease them to aircraft owners at a rate that recovers the cost of construction as well as the cost of borrowed money. In this case they are seen as neutral to the CIP, generating neither expense nor income.

Table 7-2 shows the capital improvement projects for the next 20 years with project costs subdivided by the funding sources for which they are eligible. Simply because an individual project is eligible for federal or state funding does not guarantee that funding will be available. All projects will need to be assessed individually as the implementation stage approaches.

Table 7-2: Capital Improvement Projects – Probable Funding Sources

Short-Term Projects					Total Project Costs
Year	Description	FAA	State (5%)	Local	
2023	Terminal Building (Design Phase 1)	$1,803,960	$100,220	$200,440	$2,004,400
2024	Terminal Building (Design Phase 2)	$180,396	$10,022	$20,044	$200,440
2025	Terminal Building - Temporary Building	$1,623,474	$90,193	$180,386	$1,803,860
	SHORT-TERM TOTAL (1-5 Years)	**$3,607,830**	**$200,435**	**$400,870**	**$4,008,700**

Mid-Term Projects					Total Project Costs
Year	Description	FAA	State (5%)	Local	
2026	Terminal Building (Construction Phase 3)	$18,040,230	$1,002,235	$2,004,470	$20,044,700
2030	South GA Area - Taxilanes (Two at 35' x 900')	$1,080,000	$60,000	$120,000	$1,200,000
	MID-TERM TOTAL (6-10 Years)	**$19,120,230**	**$1,062,235**	**$2,124,470**	**$21,244,700**

Source: Mead & Hunt, Inc. 2020 Estimates

Table 7-1: Capital Improvement Projects - Probable Funding Sources (Continued)

Long-Term Projects					Total Project Costs
Year	Description	FAA	State (5%)	Local	
2031	RWY 4/22 Rehabilitation, MIRL, and Signage (3,865'x75')	$1,890,000	$105,000	$210,000	$2,100,000
2031	SRE Building Expansion (Design & Const.)	$1,575,000	$87,500	$175,000	$1,750,000
2032	RWY 27 End Connector (TWY A1) Reconfiguration Project & Partial Parallel TWY between TWY C and RWY 27 End and AC Holding Area (Design)	$390,623	$21,701	$43,403	$434,026
2033	RWY 27 End Connector (TWY A1) Reconfiguration Project & Partial Parallel TWY between TWY C and RWY 27 End and AC Holding Area (Const.)	$4,410,000	$245,000	$490,000	$4,900,000
2034	SRE Acquisition - Two High Speed Runway Plows & One Ramp Plow	$900,000	$50,000	$100,000	$1,000,000
2036	TWY A and Connectors Maint. Project (Slurry Seal, Crackfill, Markings)	$180,000	$10,000	$20,000	$200,000
2037	TWY C Maint. Project (Slurry Seal, Crackfill, Markings)	$36,000	$2,000	$4,000	$40,000
2038	Vehicle Parking Rehabilitation (Overlay) - Terminal, Rental Car, Employee Parking Lots	$540,000	$30,000	$60,000	$600,000
2039	Former Noland Dakoto Apron Maintenance (Slurry Seal, Crackfill, Markings)	$36,000	$2,000	$4,000	$40,000
2040	Cargo (McCormick) Apron Rehabilitation (Design & Const.)	$2,520,000	$140,000	$280,000	$2,800,000
2041	Cargo (FedEx) Apron Rehabilitation & Expansion (Design & Const.)	$900,000	$50,000	$100,000	$1,000,000
2042	Northeast GA Area Taxilane Maintenance (Slurry Seal, Crackfill, Markings) & Apron Rehab/Reconfiguration Project	$1,350,000	$75,000	$150,000	$1,500,000
2043	RWY 9 & TWY A Extension & TWY A5 Relocation (Future RWY length 7,800')	$4,950,000	$275,000	$550,000	$5,500,000
2044	Property Acquisition - Southeast Parcel (Owner - Hartshorn)	$361,233	$20,069	$40,137	$401,370
2045	Property Acquisition - Southwest Parcel (Owner - Condon)	$306,000	$17,000	$34,000	$340,000
2046	Airport Master Plan Update	$900,000	$50,000	$100,000	$1,000,000
2047	TWY A Reconstruction (Widen to 75' to eliminate MOD) & Replace/Relocate MITL	$18,270,000	$1,015,000	$2,030,000	$20,300,000
2048	RWY 9/27 Reconstruction	$24,840,000	$1,380,000	$2,760,000	$27,600,000
	LONG-TERM TOTAL (11-20 Years)	$64,354,856	$3,575,270	$7,150,540	$71,505,396

Phases	Federal (Discretionary)	State	Local	Total Phase Costs
SHORT-TERM (1-5 Years)	$3,607,830	$200,435	$400,870	$4,008,700
MID-TERM (6-10 Years)	$19,120,230	$1,062,235	$2,124,470	$21,244,700
LONG-TERM (11-20 Years)	$64,354,856	$3,575,270	$7,150,540	$71,505,396
TOTAL 20 YEAR PERIOD	$87,082,916	$4,837,940	$9,675,880	$96,758,796

Source: Mead & Hunt, Inc. 2020 Estimates

7.4 CIP IMPLEMENTATION PLAN

The implementation plan shows the planned phased development of the capital projects. While a reasonable degree of certainty is involved in creating the phases, various factors can be expected to cause schedule changes in the plan over time:

- Financial Feasibility: The financial feasibility of projects may change due to changes in project costs, shifting of FAA or State priorities, or changes in the levels of state or FAA funding.
- Activity Levels: Activity levels trigger the need for all demand-driven improvements, such as the runway extension and new hangar construction. Although the CIP attaches timeframes to these developments for scheduling purposes, they will not be constructed until demand materializes. Thus, depending on how a particular segment of activity is tracking with the forecast, certain improvements may be accelerated or delayed.
- Changing Priorities: Over time, changes in airport business and strategic plans occur in response to the dynamic nature of the aviation industry as well as in the direction and policies of the airport's sponsoring body. Such changes will trigger revisions to or adjustments of the CIP.

The CIP does not include all of the projects listed in Chapter 5 Evaluation of Alternatives. The CIP lists projects that are capital development by the airport with eligibility for funding by the FAA AIP and WSDOT. Projects that are privately funded development are not included in the CIP. The ALP, presented in Chapter 6, Airport Plans, incorporates all of the projects reflected in this Implementation Plan.

7.4.1.1 Financial Summary

Given the cost of the improvements, it is essential to identify whether the City will be able to generate sufficient funds to implement all projects included in the CIP.

Table 7-3 compares the cost of each phase of the CIP with the funding that will be available from both AIP entitlement funds (applied to the federal share of the projects) and PFC funding (applied to the local share). The CIP costs listed in the table are from the airport CIP shown in Table 7-2 for the years through 2048. Cost estimates are provided in 2020 dollars and are escalated each year at a 3 percent rate. AIP entitlements are calculated using 10 percent of the inflated costs.

Table 7-3: Project Funding

Fiscal Year	FY AIP (2020 Dollars)	FY CapBudget	AIP Available	FAA	AIP Discretionary	WSDOT	PFC, CFC, Bond	Local (CapEx)	Project + Inflation 3 %
2023	$1,000,000	$ (62,988)	$ (3,220,395)	$ 1,971,236	$ -	$ -	$ 350,555	$ 219,026	$ 2,190,262
2024	$1,000,000	$ (72,625)	$ (4,191,631)	$ 203,037	$ -	$ -	$ 354,306	$ 22,560	$ 225,597
2025	$1,000,000	$ 114,204	$ (3,394,668)	$ 1,882,051	$ -	$ -	$ 358,097	$ 209,117	$ 2,091,168
Totals				**$ 4,056,324**	**$ -**	**$ -**	**$ 1,062,959**	**$ 450,703**	**$ 4,507,027**

Fiscal Year	FY AIP (2020 Dollars)	FY CapBudget	AIP Available	FAA	AIP Discretionary	WSDOT	PFC, CFC, Bond	Local (CapEx)	Project + Inflation 3 %
2026	$ 1,000,000	$ 114,476	**$ (4,276,719)**	$ 21,540,978	$ 20,540,978	$ -	$ 361,929	$ 2,393,442	$ 23,934,420
2027	$ 1,000,000	$ (2,069,577)	**$ (24,817,697)**	$ -	$ -	$ -	$ 365,802	$ -	$ -
2028	$ 1,000,000	$ (1,860,188)	**$ (23,817,697)**	$ -	$ -	$ -	$ 369,716	$ -	$ -
2029	$ 1,000,000	$ (1,650,799)	**$ (22,817,697)**	$ -	$ -	$ -	$ 373,672	$ -	$ -
2030	$ 1,000,000	$ (1,441,410)	**$ (21,817,697)**	$ 1,451,430	$ -	$ -	$ 377,670	$ 161,270	$ 1,612,700
Totals				**$ 22,992,408**	**$ 20,540,978**	**$ -**	**$ 1,848,788**	**$ 2,554,712**	**$ 25,547,120**

Source: Mead & Hunt, Inc. 2020 Estimates

FAA, WSDOT, and Local match fund percentages are calculated from project costs that includes 3% inflationary rate from 2020 values.

Table 7-3: Project Funding - Continued

Fiscal Year	FY AIP (2020 Dollars)	FY CapBudget	AIP Available	FAA	AIP Discretionary	WSDOT, TSA, Other Grants	PFC, CFC, Bond	Local (CapEx)	Project + Inflation 3 %
2031	$ 1,000,000	$ (1,393,291)	**$ (22,269,127)**	$ 2,180,168	$ 1,180,168	$ -	$ 381,711	$ 242,241	$ 2,422,409
2032	$ 1,000,000	$ (1,426,143)	**$ (23,449,295)**	$ 556,936	$ -	$ -	$ 385,795	$ 61,882	$ 618,817
2033	$ 1,000,000	$ (1,278,635)	**$ (23,006,231)**	$ 6,476,234	$ -	$ -	$ 389,923	$ 719,582	$ 7,195,815
2034	$ 1,000,000	$ (1,788,828)	**$ (28,482,465)**	$ 1,361,331	$ -	$ -	$ 394,095	$ 151,259	$ 1,512,590
2035	$ 1,000,000	$ (1,730,698)	**$ (28,843,795)**	$ 2,944,558	$ 1,944,558	$ -	$ 398,312	$ 327,173	$ 3,271,732
2036	$ 1,000,000	$ (1,848,482)	**$ (30,788,354)**	$ 288,847	$ -	$ 10,000	$ 402,574	$ 32,094	$ 320,941
2037	$ 1,000,000	$ (1,671,187)	**$ (30,077,201)**	$ 59,503	$ -	$ 2,000	$ 406,882	$ 6,611	$ 66,114
2038	$ 1,000,000	$ (1,468,409)	**$ (29,136,703)**	$ 919,314	$ -	$ -	$ 411,235	$ 102,146	$ 1,021,460
2039	$ 1,000,000	$ (1,361,166)	**$ (29,056,017)**	$ 63,126	$ -	$ 2,000	$ 415,636	$ 7,014	$ 70,140
2040	$ 1,000,000	$ (1,158,792)	**$ (28,119,144)**	$ 4,551,400	$ 3,551,400	$ -	$ 420,083	$ 505,711	$ 5,057,111
2041	$ 1,000,000	$ (1,455,114)	**$ (31,670,544)**	$ 1,674,265	$ -	$ -	$ -	$ 186,029	$ 1,860,295
2042	$ 1,000,000	$ (1,431,754)	**$ (32,344,809)**	$ 2,586,740	$ -	$ 75,000	$ -	$ 287,416	$ 2,874,155
2043	$ 1,000,000	$ (1,509,781)	**$ (33,931,549)**	$ 9,769,253	$ 8,769,253	$ -	$ -	$ 1,085,473	$ 10,854,726
2044	$ 1,000,000	$ (2,385,864)	**$ (42,700,802)**	$ 734,971	$ -	$ 20,087	$ -	$ 81,663	$ 816,634
2045	$ 1,000,000	$ (2,258,139)	**$ (42,435,773)**	$ 1,884,400	$ -	$ -	$ -	$ 100,000	$ 2,093,778
2046	$ 1,000,000	$ (2,148,750)	**$ (43,320,173)**	$ 39,400,922	$ 2,347,880	$ -	$ -	$ 2,030,000	$ 43,778,803
2047	$ 1,000,000	$ (3,969,361)	**$ (81,721,095)**	$ 55,176,819	$ 3,370,758	$ -	$ -	$ 2,760,000	$ 61,307,577
2048	$ 1,000,000	$ (6,519,972)	**$ (135,897,914)**	$ -	$ -	$ -	$ -	$ -	$ -
Totals				**$ 130,628,787**	**$ 21,164,018**	**$ 109,087**	**$ 4,006,247**	**$ 8,686,294**	**$ 145,143,097**

Source: Mead & Hunt, Inc. 2020 Estimates

FAA, WSDOT, and Local match fund percentages are calculated from project costs that includes 3% inflationary rate from 2020 values.

When matching demand with financial resources, a shortfall can occur in both FAA and local funding. When a shortfall occurs, the question becomes how does the City continue to fund improvements at the airport? One answer is to generate more revenue. The following section explores the revenue sources for YKM.

7.5 BUSINESS PLAN

This section evaluates the capability of the City to fund the local portion of the CIP. Examining the airport's annual revenues and expenditures helps determine the true annual financial commitment associated with owning and operating the airport.

7.5.1 Overall Approach

The City of Yakima currently carries the primary financial responsibility for all maintenance, operation, and capital improvements at YKM. This section will review current rates and fees to assess whether fair market values are being charged and identify where expected revenue funds do not meet operational or capital budget requirements.

To assess the fair market value of current YKM rates and fees, comparable airports in the region were compared for revenue generation. Hangar rental rates at YKM are managed by the fixed-base operator and not the Airport, so the comparison for revenue generated by hangars is based on the aviation land lease rate per square foot per year. Additional revenues may be generated by adjusting rates and fees to meet regional averages. Table 7-4 provides the rates and fees comparisons, with an average provided.

Table 7-4: Rates and Fees Comparisons

AIRPORT FEES	Yakima	Walla Walla	Wenatchee	Pullman	Average	Comparison YKM to Avg
Terminal Rental	$26.47	$14.00	$26.79	Negotiated	$20.40	$6.08
Fuel Flowage Fee	$0.10	$0.15	$0.07	$0.07	$0.10	$0.00
Landing Fee	$1.37	$0.85	$1.05	$1.35	$1.08	$0.29
Tie Down Fee-Month	$45.00	$40.00	$60.00	$50.00	$50.00	-$5.00
Tie Down-Overnight	$3.00	$10.00	$5.00	$5.00	$6.67	-$3.67
Aviation Land Lease Sq Ft-Yr	$0.19	$0.26	$0.30	$0.19	$0.25	-$0.06

7.5.2 Airport Revenues

Airport revenue sources include direct revenues derived from fuel taxes, aircraft storage fees, and other fees assessed for facility use. Operating revenues are those that are directly attributable to an airport's operation as a business enterprise. These vary over time as changes in the level of activity at the airport and the commercial and general aviation industry as a whole influence the types of activity from which the revenues are generated. Using historical records from the airport, the following assumption was made.

Miscellaneous income includes income sources not otherwise accounted for and not associated with the airfield, terminal, or other areas where direct tracking has been established. Although the amount of revenue generated is not predicated on any of the forecast indicators, it can be expected that some miscellaneous income will be registered annually. Table 7-5 illustrates the historical revenue summary for 4 years at YKM, with 2020 numbers being a projected value.

Chapter 2 Aviation Demand Forecasts shows that the preferred high forecast scenario has enplanements increasing over the 20-year planning period to 92,600. The annual increase is a 1.07 percent growth rate. The projected growth rate could cause an increase in performance statistics in areas such as car rental, aviation fuel, aircraft landing fees, and vehicle parking fees, which means that revenues could also increase.

7.5.3 Airport Expenses

The expenses recorded at YKM include those directly related to the day-to-day operation and maintenance of the airport (capital costs discussed above), the indirect costs associated with allocation of overhead, the debt service on long-term loans, and governmental fees and assessments. Table 7-5 provides the summary of historical expenses over 4 years and an estimated projection for 2020. The airport expenditures are organized in five categories:

- Airfield-Includes costs associated with maintaining the airfield, including public utility services and equipment.
- Air terminal includes costs associated with maintaining the terminal facilities.
- Commercial-Consists of maintenance and repairs for airport-owned buildings.
- Security-Providing services to process airport security badges, including conducting security background checks.
- Administration-Includes costs associated with airport administration and professional services. This includes staff salaries, operating supplies, taxes, and insurance.

7.5.4 Airport Administrative Expenses

External Taxes & Operating Assess-Stormwater Fees: A flat annual allocation has been projected for this area into the future. The projection is based on an average of the historical records.

Interest on Short-Term External Debt-SIED Loan: The City was paying interest on a short-term bridge loan from Supporting Investment in Economic Development (SIED). This loan has been paid off but is included here as a historic debt payment to show similar funding sources for loans and how they are repaid.

Salaries and Benefits: The subcategories of Salaries & Wages, Salaries-Overtime, Accrued Annual Leave, Benefits-Direct, Benefits-Indirect, Benefits-Bank Accruals, and Benefits-Unemployment all in the Airport accounting ledgers relate to the cost of providing administrative, maintenance, and other staff required to operate the airport. In 2020 this meant a three-person administrative staff and maintenance personnel.

Wages and benefits for these personnel are based on the number of persons required to keep the airport safe, efficient, and well-maintained as well as to operate the facility. The amount of money required for these services is a function of prevailing rates in the community and negotiated rates for maintenance personnel. Increases in projections would only occur if new personnel were added to staff or wage rates increased. Since additional personnel are not anticipated and wage rates are unlikely to significantly increase near term, no increases have been projected in this category.

Supplies: Operating an airport requires supplies such as office and operating supplies, fire truck supplies, fuel, small tools and minor equipment, and computer software purchases. The level of this expense is not related to airport operations levels. Calculations for future expenses is the result of using an average of past costs.

Other Expenses: The types of expenses included in this category include professional services, telephone expenses, staff travel, equipment rentals and leases, utility services, repairs and maintenance, vehicle repairs, fire truck repair, miscellaneous repairs, postage, insurance, and various miscellaneous expenses. Future expenditures in these areas are not directly related to the activity levels at YKM. Therefore, for this analysis, results are derived from an average of past years projected forward unchanged.

7.5.5 Airport Operations and Management Budgets

Airport operations and management budgets have been prepared based on an analysis of four years of historical expenditures and revenues and an estimated budget for 2020. Table 7-5 illustrates the summary of expenditures and revenues.

Table 7-5: Historical Revenues and Expenditures from Airport Operations

Expenditure Summary					
Expenditures	2016	2017	2018	2019	2020
Airfield	$505,296	$523,099	$549,837	$609,745	$606,794
Air Terminal	$213,793	$192,639	$197,678	$202,006	$202,179
Commercial	$8,364	$8,430	$5,367	$7,000	$7,500
Security	$3,752	$2,183	$2,358	$2,500	$37,500
Administration	$377,718	$510,039	$505,715	$605,416	$637,720
Total Expenditures	$1,108,923	$1,236,390	$1,260,955	$1,426,667	$1,491,693

Revenue Summary					
Revenues	2016	2017	2018	2019	2020
Taxes	$6,606	$24,410	$5,769	$6,633	$7,000
Charges/Goods & Services	$233,220	$211,248	$221,247	$271,030	$272,086
Miscellaneous Revenues	$848,030	$939,460	$984,037	$1,137,745	$1,176,365
Other Financing Sources	$20,604	$0	$60,600	$20,000	$0
Transfers In	$0	$20,000	$78,000	$75,000	$75,000
Total Revenues	$1,108,460	$1,195,118	$1,349,653	$1,510,408	$1,530,451

Budget Summary					
Beginning Balance	$46,313	$39,465	-$1,806	$86,890	$170,631
Net Income	-$463	-$41,272	$88,698	$83,741	$38,758
Ending Balance	$45,850	-$1,807	$86,892	$170,631	$209,389

Source: City of Yakima Published Budget

7.6 FINANCIAL IMPLEMENTATION PLAN SUMMARY

Given the scope of the improvements it is clear that airport income will be insufficient to finance the entire CIP in the years where improvements are scheduled. During the period from 2020 through 2040, additional sources of funding will be required. Several options are available for pursuing to secure additional funding:

1. Discretionary grants can be sought from FAA to overcome some of these shortfalls. However, the project types include reconstruction of the north east tie-down ramp and terminal improvements. These types of projects are commonly low on FAA's funding priorities.

2. For terminal improvements, the airport's PFC and annual revenues can be used to pay debt service for bonds issued for construction of the new passenger terminal. Assuming that other higher priority capacity and safety projects have been accomplished prior to this time, FAA AIP Entitlements can also be used to offset some of the project costs.

3. Alternative funding sources can be explored for the construction of the passenger terminal. These could include City, County, or State funding sources.

Glossary of Terms

A

A GLOSSARY

A.1 ABBREVIATIONS/ACRONYMS

AC - Advisory Circular

ADF - Automatic Direction Finder

ADPM - Average Day of the Peak Month

AGL - Above Ground Level

AIP - Airport Improvement Program

ALP - Airport Layout Plan

ALS - Approach Lighting System

ALSF-1 - Approach Light System with Sequence Flasher Lights

ARC - Airport Reference Code

ARFF - Airport Rescue and Fire Fighting

ARP - Airport Reference Point

ARTCC - Air Route Traffic Control Center

ASDA - Accelerate-Stop Distance Available

ASO - Airport Safety Overlay Zone

ASR - Airport Surveillance Radar

ASV - Annual Service Volume

ATC - Air Traffic Control

ATCT - Airport Traffic Control Tower

AVGAS - Aviation Gasoline

CBP - Customs and Border Patrol

CIP - Capital Improvement Program

CL - Centerline

dBA - A-weighted Decibels

DH - Decision Height

DME - Distance Measuring Equipment

DNL - Day-Night Sound Levels

EA - Environmental Assessment

EIS - Environmental Impact Statement

EPA - The United States Environmental Protection Agency

FAA - Federal Aviation Administration

FAR - Federal Aviation Regulation

FBO - Fixed Based Operator

FIS - Federal Inspection Service

FSS - Flight Service Station

GA - General Aviation

GPS - Global Positioning System

IFR - Instrument Flight Rules

ILS - Instrument Landing System

INM - Integrated Noise Model

LATS - Washington State Department of Transportation – Aviation Division's Long-term Air Transportation Study.

LDA - Landing Distance Available

LIRL - Low-Intensity Runway Lights

MALS - Medium-Intensity Approach Light System

MALSF - Medium-Intensity Approach Light System with sequence flashing Lights

MALSR - Medium-Intensity Approach Lighting System with Runway Alignment Indicators

MGW - Maximum Gross Weight

MIRL - Medium-Intensity Runway Lights

MSL - Mean Sea Level

NAVAID - Air Navigation Facility/Aid

NDB - Non-Directional Beacon

NPIAS - National Plan of Integrated Airport Systems

OFA - Object-Free Area

OFZ - Obstacle-Free Zone

PAPI - Precision Approach Path Indicator

RAIL - Runway Alignment Indicator Lights

REIL - Runway End Identifier Lights

RSA - Runway Safety Area

RPZ - Runway Protection Zone

TAF - FAA Terminal Area Forecasts

TODA - Take-Off Distance Available

TORA - Take-Off Run Available

UHF - Ultra High Frequency

VASI - Visual Approach Slope Indicator

VFR - Visual Flight Rules

VHF - Very High Frequency

WSDOT - Washington State Department of Transportation

YKM - Yakima Air Terminal/McAllister Field

A.2 DEFINITIONS

Active Aircraft - Aircraft registered with the FAA and reported to have flown during the preceding calendar year.

Activity - Used in aviation to refer to any kind of movement; e.g., cargo flights, passenger flights, or passenger enplanements. Without clarification, it has no particular meaning.

ADF - Automatic Direction Finder.

Advisory Circular (AC) - A series of Federal Aviation Administration (FAA) publications providing guidance and standards for the design, operation, and performance of aircraft and airport facilities.

AGL - Above Ground Level.

Airport Improvement Program (AIP) - A congressionally mandated program through which the FAA provides funding assistance for the development and enhancement of airport facilities.

Air Cargo - Commercial freight, including express packages and mail, transported by passenger or all-cargo airlines.

Air Carrier - An airline providing scheduled air service for the commercial transport of passengers or cargo.

Air Navigation Facility (NAVAID) - Although generally referring to electronic radio wave transmitters (VOR, NDB, and ILS), it also includes any structure or mechanism designed to guide or control aircraft involved in flight operations.

Air Route Traffic Control Center (ARTCC) - FAA-manned facility established to provide air traffic control services to aircraft operating in controlled airspace, en route between terminal areas. Although designed to handle aircraft operating under IFR conditions, some advisory services are provided to participating VFR aircraft when controller work loads permit.

Air Taxi - An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Air taxi operators generally operate small aircraft "for hire" for specific trips.

Aircraft Approach Category - A grouping of aircraft based on a speed of 1.3 times the stall speed in the landing configuration at maximum gross landing weight. The aircraft approach categories are:

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; and

Category E - Speed 166 knots or more.

Aircraft Mix - The classification of aircraft into groups that are similar in size, noise, and operational characteristics.

Aircraft Operations - The airborne movement of aircraft. There are two types of operations, local and itinerant, defined as follows:

1. Local Operations are performed by aircraft that:

    (a) Operate in the local traffic pattern or within sight of the airport;

    (b) Are known to be departing for or arriving from a local practice area.

2. Itinerant operations are all others.

Airfield - A defined area on land or water including any buildings, installations, and equipment intended to be used either wholly or in part for the arrival, departure, or movement of aircraft.

Airplane Design Group - A grouping of airplanes based on wingspan. The groups are:

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 up to, but not including, 262 feet

Airport Layout Plan (ALP) - An FAA required map of an airport depicting existing and proposed facilities and uses, with clearance and dimensional information showing compliance with applicable standards.

Airport Reference Code (ARC) - A coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. It is a combination of the aircraft approach category and the airplane design group.

Airport Reference Point (ARP) - The location at which the designated latitude and longitude for an airport are measured.

Airport Service Area - The geographic area that generates demand for aviation services at an airport.

Airport Surveillance Radar (ASR) - Radar providing position of aircraft by azimuth and range data without elevation data. It is designed for a range of approximately 50 miles.

Airport Traffic Area - Unless otherwise specifically designated, that airspace with a horizontal radius of five statute miles from the geographic center of any airport at which a control tower is operating, extending from the surface up to, but not including, 3,000 feet above the surface.

Airside - That portion of the airport facility where aircraft movements take place, airline operations areas, and areas that directly serve the aircraft (taxiway, runway, maintenance, and fueling areas). Also called the airport operations area.

Airspace - The area above the ground in which aircraft travel. It is divided into corridors, routes, and restricted zones for the control and safety of aircraft.

All-Cargo Carrier - An air carrier certificated in accordance with FAR Part 121 to provide scheduled air freight, express, and mail transportation over specific routes, as well as the conduct of nonscheduled operations that may include passengers.

Ambient Noise Level - Background noise level, exclusive of the contribution made by aircraft.

Annual Service Volume (ASV) - A reasonable estimate of an airport's annual capacity. It accounts for differences in runway use, aircraft mix, weather conditions, etc., that would be encountered over a year's time.

Approach End of Runway - The near end of the runway as viewed from the cockpit of a landing aircraft.

Approach Surface - An imaginary surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of the runway based upon the planned approach. The inner edge of the approach surface is the same width as the primary surface and expands uniformly depending upon the planned approach.

Approved Instrument Approach - Instrument approach meeting the design requirements, equipment specifications, and accuracies, as determined by periodic FAA flight checks, and which are approved for general use and publication by the FAA.

Apron - A defined area where aircraft are maneuvered and parked and where activities associated with the handling of flights can be carried out.

ARFF - Aircraft Rescue and Fire Fighting.

ATC - Air Traffic Control.

ATCT - Airport Traffic Control Tower.

AVGAS - Aviation gasoline. Fuel used in reciprocating (piston) aircraft engines. Avgas is manufactured in the following grades; 80/87, 100LL, 100/130, and 115/145.

Avigation Easement - A form of limited property right purchase that establishes legal land-use control prohibiting incompatible development of areas required for airports or aviation-related purposes.

Based Aircraft - Aircraft stationed at an airport on an annual basis.

BRL - Building Restriction Line.

Capacity - (Throughput capacity). A measure of the maximum number of aircraft operations that can be accommodated on the airport component in an hour.

Capital Improvement Program (CIP) - A scheduled of planned projects and costs, often prepared and adopted by public agencies.

CAT I (one) - Category I Instrument Landing System that provides for approach to a height above touchdown of not less than 200 feet and with Runway Visual Range of not less than 1,800 feet.

CAT II (two) - Category II ILS approach procedure that provides for approach to a height above touchdown of not less than 100 feet and a RVR of not less than 1,200 feet.

CAT III (three) - Category III ILS approach that provides for an approach with no decision height and a RVR of not less than 700 feet.

Ceiling - The height above the ground of the base of the lowest layer of clouds or obscuring phenomena aloft that is reported as broken or overcast and not classified as scattered, thin, or partial. Ceiling figures in aviation weather reports may be determined as measured, estimated, or indefinite.

Charter Airline- A nonscheduled flight offered by either a supplemental or certificated air carrier.

Circling Approach - An instrument approach procedure in which an aircraft executes the published instrument approach to one runway, the maneuvers visually to land on a different runway. Circling approaches are also used at airports that have published instrument approaches with a final approach course that is not aligned within 30 degrees of any runway.

Clear Zone - See Runway Protection Zone

Clearway - A clearway is an area available for the continuation of the take-off operation that is above a clearly defined area connected to and extending beyond the end of the runway. The area over which the clearway lies need not be suitable for stopping aircraft in the event of an aborted take-off. Clearways are applicable only in the take-off operations of turbine-engined aircraft.

Commuter Air Carrier - An air carrier certificated in accordance with FAR Part 135, which operates aircraft with a maximum of 60 seats and provides at least five scheduled round trips per week between two or more points, or carries mail.

Commuter/Air Taxi Operations - Those arrivals and departures performed by air carriers certificated in accordance with FAR Part 135.

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

Control Areas - These consist of the airspace designated as Federal Airways, additional Control Areas, and Control Area Extensions, but do not include the Continental Control Areas.

Control Tower - A central operations facility in the terminal air traffic control system consisting of a tower cab structure using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of air traffic.

Control Zones - Areas of controlled airspace that extend upward from the surface and terminate at the base of the continental control area. Control zones that do not underlie the continental control area have no upper limit. A control zone may include one or more airports and is normally a circular area with a radius of five statute miles and any extensions necessary to include instrument departure and arrival paths.

Controlled Airspace - Airspace designated as continental control area, control area, control zone, or transition area within which some or all aircraft may be subject to air traffic control.

Critical Aircraft - The aircraft which controls one or more design items based on wingspan, approach speed, and/or maximum certificated takeoff weight. The same aircraft may not be critical to all design items.

Crosswind - When used concerning wind conditions, the word means a wind not parallel to the runway or the path of an aircraft.

dBA - Decibels measured on the A-weighted scale to factor out anomalies.

Decision Height (DH) - During a precision approach, the height (or altitude) at which a decision must be made to either continue the approach or execute a missed approach.

Declared Distances - The distances the airport owner declares available and suitable for satisfying an airplane's take-off distance, accelerated-stop distance, and landing distance requirements. The distances are:

- **Take-off run available (TORA)** - The runway length declared available and suitable for the ground run of an airplane taking off.
- **Take-off distance available (TODA) -** The TORA plus the length of any remaining runway and/or clearway (CWY) beyond the far end of the TORA.
- **Accelerate-stop distance available (ASDA)** - The runway plus stopway (SWY) length declared available and suitable for the acceleration and deceleration of an airplane aborting take-off.
- **Landing distance available (LDA)** - The runway length declared available and suitable for a landing airplane.

Design Hour - The design hour is an hour close to the peak but not the absolute peak, which is used for airport planning and design purposes. It is usually the peak hour of the average day of the peak month.

Displaced Threshold - Actual touchdown point on specific runways designated due to obstructions that make it impossible to use the actual physical runway end.

Distance Measuring Equipment (DME) - An airborne instrument that indicates the distance the aircraft is from a fixed point, usually a VOR station.

DOT – U. S. Department of Transportation.

Effective Runway Gradient - The maximum difference between runway centerline elevations divided by the runway length, expressed as a percentage.

Eminent Domain - Right of the government to take property from the owner, upon compensation, for public facilities or other purposes in the public interest.

Environmental Assessment (EA) - A report prepared under the National Environmental Policy Act (NEPA), analyzing the potential environmental impacts of a federally funded project.

Environmental Impact Statement (EIS) - A report prepared under NEPA, fully analyzing the potential significant environmental impacts of a federally funded project.

EPA - The United States Environmental Protection Agency.

FAR Part 77 - Federal Aviation Regulations that establish standards for determining obstructions in navigable airspace.

Federal Aviation Administration (FAA) - A branch of the U.S. Department of Transportation responsible for the regulation of all civil aviation activities.

Fixed Base Operator (FBO) - An individual or company located at an airport providing commercial general aviation services.

Final Approach - The flight path of an aircraft that is inbound to the airport on an approved final instrument approach course, beginning at the point of interception of that course and extending to the airport or the point where circling for landing or missed approach is executed.

Fixed Wing - For the purposes of this report, any aircraft not considered rotorcraft.

Flight Plan - A description or outline of a planned flight that a pilot submits to the FAA, usually through a Flight Service Station.

Flight Service Station (FSS) - Air traffic facility operated by the FAA to provide flight service assistance such as pilot briefing, en route communications, search and rescue assistance, and weather information.

General Aviation - All civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire.

Global Positioning System (GPS) - GPS uses a group of many satellites orbiting the earth to determine the position of users on or above the earth's surface. This system will provide at least non-precision approach capability to any airport having published instrument approach procedures.

HIRL – High-Intensity Runway Lights.

Horizontal Surface - A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs with a radius of 5,000 feet for all runways designated as utility or general; and 10,000 feet for all other runways from the center of each end of the primary surface and connecting the adjacent arc by tangent lines.

Instrument Flight Rules (IFR) - These rules govern the procedures for conducting instrument flight. Pilots are required to follow these rules when operating in controlled airspace with visibility of less than three miles and/or ceiling lower than 1,000 feet.

Instrument Landing System (ILS) - ILS is designed to provide an exact approach path for alignment and descent of aircraft. Generally consists of a localizer, glide slope, outer marker, middle marker, and approach lights. This type of precision instrument system is being replaced by Microwave Landing Systems (MLS).

Instrument Runway - A runway equipped with electronic and visual navigation aids for which a precision or non-precision approach procedure having straight-in landing minimums has been approved.

Itinerant Operation - All aircraft operations at an airport other than local.

Local Operation - Aircraft operation in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

LIRL – Low-Intensity Runway Lights.

Mean Sea Level (MSL) - Elevation above Mean Sea Level.

Medium-Intensity Approach Lighting (MALSR) - This system includes runway alignment indicator lights. An airport lighting facility that provides visual guidance to landing aircraft.

Minimums - Weather condition requirements established for a particular operation or type of operation.

MIRL - Medium-Intensity Runway Lights.

Movement Area - The runways, taxiways, and other areas of the airport used for taxiing, takeoff and landing of aircraft, exclusive of loading ramps and parking areas.

Navigational Aid (NAVAID) - Any visual or electronic device, airborne or on the surface that provides point-to-point guidance information or position data to aircraft in flight.

Non-Directional Beacon (NDB) - Transmits a signal on which a pilot may "home" using equipment installed in the aircraft.

Non-Precision Instrument Approach - An instrument approach procedure with only horizontal guidance or area-type navigational guidance for straight-in approaches.

Object Free Area (OFA) - A two-dimensional ground area surrounding runways, taxiways, and taxilanes that is clear of objects except those whose location is fixed by function.

Object Free Zone (OFZ) - The airspace defined by the runway OFZ and, as appropriate, the inner-approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDS.

- **Runway OFZ** - The airspace above a surface centered runway centerline.
- **Inner-approach OFZ** - The airspace above a surface centered on the extended runway centerline. It applies to runways with an approach lighting system.
- **Inner-transitional OFZ** - The airspace above the surfaces located on the outer edges of the runway OFZ and the inner-approach OFZ. It applies to precision instrument runways.

Obstruction - An object that penetrates an imaginary surface described in FAR Part 77.

Peaking Factor - The factor applied to the annual operations to determine the peak-hour activity.

Precision Approach Path Indicator (PAPI) - Provides visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity focused light beams.

Precision Instrument Approach - An instrument approach procedure in which electronic vertical and horizontal guidance is provided; e.g. ILS.

Primary Surface - A surface longitudinally centered on the runway, extending 200 feet beyond each end of the runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.

Rotorcraft (e.g. Helicopter) - A heavier-than-air aircraft supported in flight by the reactions of the air on one or more power-driven rotors on substantially vertical axis.

Runway End Identifier Lights (REIL) - These lights aid in early identification of the approach end of the runway.

Runway Protection Zone (RPZ) - The ground area under the approach surface which extends from the primary surface to a point where the approach surface is fifty feet above the ground. This was formerly known as the clear zone.

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

Segmented Circle - A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

Touch and Go Operation - Practice flight performed by a landing touch down and continuous take off without stopping or exiting the runway.

Transitional Surfaces - These surfaces extend outward and upward at right angles to the runway centerline and the extended runway centerline at a slope of 7:1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of a precision approach surface which project through and beyond the limits of the conical surface extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

VASI - Visual Approach Slope Indicator. See definition of PAPI.

Visual Flight Rules (VFR) - Flight rules by which aircraft are operated by visual reference to the ground. Weather conditions for flying under these rules must include a ceiling greater than 1,000 feet, three-miles visibility, and standard cloud clearance.

Wind Coverage - Wind coverage is the percent of time for which aeronautical operations are considered safe due to acceptable crosswind components.

Wind Rose - A scaled graphical presentation of wind information.

YKM – Yakima Air Terminal/McAllister Field.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APPENDICES

Appendix A **Building Assessment Floor Plans**

Appendix B **Building Assessment Data Inventory Photos**

1

INTRODUCTION

1.1 INTRODUCTION

Yakima Air Terminal/McAllister Field (YKM) is a commercial service airport located in the city and county of Yakima, Washington, approximately five miles south of downtown Yakima. The airport service area consists of portions of Yakima, Lewis, King, and Kittitas Counties—a population of approximately 270,700 people according to an air service study conducted for the Airport Board in 2005. The present passenger terminal building was developed in three major projects. The original building was constructed in 1950 at a cost of $200,000. In 1968, the Airport added ground level concourses in a "V" configuration to provide an enclosed circulation space for passengers closer to the aircraft parking positions. The terminal was expanded and renovated further between 1997 and 2000, expanding the airside passenger hold room, adding toilets to the secure area, and installing a canopy over the baggage unloading area. On the landside, the project reconstructed the departures/arrivals curbside canopy and renovated the passenger ticketing and baggage claim lobbies.

Figure 1–1: Airside View

The terminal currently has approximately 30,838 square feet of space on two levels. All passenger processing occurs on the ground floor. The second floor includes an unoccupied restaurant and bar space that has several different floor elevations, a meeting room, and an unused Airport Traffic Control Tower (ATCT) that offers small office and storage spaces on several levels.

Figure 1–2: Landside View

The terminal houses all existing commercial passenger processing functions but, due to configuration inefficiencies, affords a level of service that is characterized in this report as *adequate* to *unacceptable*. Conditions for the terminal tenants, the air carriers, and the concessionaires are similarly characterized. The functional layout of the ticket lobby does not provide sufficient flexibility to efficiently serve terminal usage patterns by air carriers. The current level of scheduled flights and air charter service can be accommodated, but adding any new air carriers, additional service, or larger aircraft during peak times (i.e., multiple flights within the same hour) would become problematic because of the constraints in space for queuing and processing passengers and bags. The extent of the congestion depends on the specifics of the timing of the flights, the size of the aircraft, and whether a new airline is offering the service, as well as Transportation Security Administration (TSA) staffing levels.

The Airport upgraded existing building systems such as electrical power, heating, and air conditioning during the various terminal improvement projects.

In addition to operational and building systems issues, the terminal building must comply with current building codes when any expansion or major renovation is done. Existing fire-rated construction in portions of the terminal is thought to be in compliance with current codes, but this must be confirmed prior to modification or upgrade. More recent and stringent seismic and energy codes may also mandate upgrade requirements.

With these factors in mind, the Airport Board and its community of stakeholders have a range of issues to consider:

1. What role do the City of Yakima, Yakima County, the City of Union Gap, and the other communities of the Yakima Valley want the terminal facility to create a positive civic gateway for the region?
2. Do the city and county want to commit funding to improve terminal facilities and operations so they provide a level of service comparable to nearby airports in Wenatchee and the Tri-Cities?
3. How does the present terminal factor into the city and county's long-term goals for the airport terminal facilities?
4. What are the priorities for implementing improvements at the terminal?

A URS team conducted the Facility Assessment in June and July of 2011. The team included a terminal planner and architect, an electrical engineer, a mechanical engineer, and a structural engineer. The team evaluated the overall condition of the terminal building and assessed how well the building accommodates air passenger processing. The information included in this report is based on review of documents and information provided by the airport, on-site inspections, and comments and input received from airport personnel.

The physical condition of the terminal facilities is assessed for the following categories:

1. Site, including aircraft apron, terminal drives, public parking, lighting, and landscaping in the immediate terminal area;
2. Structural systems, including the foundations, framing, load bearing capacity, and lateral movement resistance;
3. Building envelope, including the roof, walls, doors, windows, and insulation;
4. Interiors, including furnishings, finishes, and equipment;
5. Building codes, including International Building Code, Washington State Energy, National Fire Protection Association (NFPA) 415, and Americans with Disabilities Act (ADA) Architectural Guidelines;
6. Mechanical systems, including heating, ventilation and air conditioning (HVAC) equipment; distribution system; controls; and plumbing fixtures, fittings, and piping; and
7. Electrical systems, including primary service, distribution, panel boards, emergency power, lighting, communications, and data systems.

The functional or operational performance of the terminal facilities is assessed for the following categories:

1. Departures process, including activities associated with the processing of outbound passengers and their baggage;
2. Arrivals process, including activities associated with the processing of inbound passengers and baggage;
3. Building services, including functions associated with providing and maintaining building services that support terminal activities; and
4. Airport administration, including management and maintenance of overall terminal facilities and operations.

2

APPROACH

2.1 METHODOLOGY

The URS team reviewed existing construction documents, inspected and assessed the physical and operational conditions on site at the terminal, and received airport staff and tenant input on terminal conditions.

2.2 ASSESSMENT OF PHYSICAL CONDITIONS

The on-site inspection was conducted in June 2011 by a terminal architect and planner, an electrical engineer, a mechanical engineer, and a structural engineer. Finishes, furnishings, equipment, and the like, were reviewed and assessed. Each consultant made and recorded assessments using the following definitions:

1. **Excellent:** Materials are in "like new" condition (no wear is visible, and no operational problems known) and have up to 100 percent of their anticipated life span remaining.
2. **Good:** Materials exhibit normal wear, primarily cosmetic, but maintain full functioning capability. Minor repairs might remedy evident wear. Materials have up to 75 percent of their life span remaining.
3. **Fair:** Materials exhibit extensive wear, beyond cosmetic, but are still usable and functional. Recommended repairs may be extensive and costly and should be evaluated relative to replacement to determine cost-effectiveness. Materials have up to 50 percent of life span remaining.
4. **Poor:** Materials are deteriorated or dysfunctional beyond repair or have already failed and need immediate replacement. At best, such material may have less than 25 percent of useful life remaining.

Previous repair or replacement dates are included in the assessment, where known, as well as any airport- or tenant-provided information concerning condition. Material assessments are categorized as follows:

- Site civil;
- Structure;
- Exterior envelope;
- Interior development;
- Mechanical systems; and,
- Electrical systems.

2.3 ASSESSMENT OF OPERATIONAL PERFORMANCE

The URS team assessed terminal operations on-site by inspecting passenger processing functions, with consideration for size, capacity, configuration, and location. Each functional area was assessed as follows:

1. **Desirable:** Functions are ideally sized, configured, or located to accommodate current demand.
2. **Adequate:** Functions are less than ideal in terms of size, configuration, or location to accommodate current demand, but performance is not compromised.
3. **Constrained:** Functions are less than ideal in terms of size, configuration, or location for the current demand and performance is frequently compromised during periods of peak activity.
4. **Unacceptable:** Functions fall significantly short of the ideal size, configuration, or location for current demand, and performance is frequently compromised during periods of peak activity.

The assessment includes information noting when the function in question was last modified, as well as any input by airport personnel regarding specific conditions. Assessment categories include:

- Departures process;
- Arrivals process;
- Building services;
- Administrative services; and,
- General issues.

2.4 DOCUMENTS REVIEW

The Airport provided the URS team with as-built drawings of the terminal rehabilitation project, dated July 20, 2000. URS reviewed and incorporated the relevant information from these materials.

2.5 FACILITIES ASSESSMENT REPORT

This report is produced with Microsoft Word. Photos are digital images (.jpg or .pdf format) inserted in the document. Report contents are available to the Airport in .pdf or hardcopy format.

3

SITE DATA

3.1 PROJECT DATA

♦ Address	Yakima Air Terminal/McAllister Field 2400 West Washington Avenue Yakima, WA 98903
♦ Airport Manager	Rob Peterson, ACE
♦ Terminal Construction History	1950, Original Terminal Construction 1968, Terminal Expansion Project 2000, Rehabilitation Project

♦ Automobile Parking Capacities

Public	188 spaces (6 handicapped)
Rental Car	36 spaces
Terminal Curb	16 spaces
West Side	9 restricted

3.2 BUILDING CODE DATA

♦ Building Code (Current Yakima County)	2006 International Building Code (IBC)
♦ Occupancy Types	A-3 Assembly B Office F-1 Industrial
♦ Occupancy Separations	One hour between A-3 and B or F-1
♦ Construction Types	Expanded Terminal: Type V-N

(per codes in effect at time of most recent expansion, 1994 UBC)

♦ Fire Protection	Building has fire sprinklers
♦ Building Height	Two story

- Enclosed Area (Gross SF)

First Floor:	22,958
Second Floor:	7,880
*Total	30,838 GSF

- Note: Code diagram from the 1997–2000 terminal building rehabilitation project will need to be vetted with the City of Yakima Building Department prior to any future facility expansion. The diagram depicts the two-story portion of the terminal as a B occupancy, but clearly the passenger processing functions on floor one are primarily an A-3 occupancy with B occupancy as a secondary use. This potentially has implications for fire resistive separations between A-3 and B occupancies, but it is also possible, in fact likely, the city and Airport may have agreements from previous building permit reviews accepting this interpretation of occupancy.

4

4 FACILITY ASSESSMENT SITE CIVIL

4.1 ROADWAYS

The airport is accessible from the Interstate 82 interchange and West Valley Mall Boulevard, which connects to West Washington Avenue and the main terminal drive.

The main entry/exit drive is South 24th Avenue, a two-lane, one-way roadway. According to the 1997 airport master plan, this road has a capacity of approximately 700 to 1,000 vehicles per hour in each direction, which is sufficient capacity to handle projected traffic.

South 24th Avenue southbound leads into the Terminal Drive, with two-lane traffic at the immediate entrance that turns into two-lane one-way traffic beyond the parking lot entrance/exit booth. To the right are the Airport Administration Office and a fire station with accompanying employee parking lots. The road in front of the terminal is two lanes, with the curb frontage lane designated for loading and unloading passengers. There is approximately 185 feet of curb directly in front of the terminal. Congestion occurs at the intersection on Terminal Drive Road where vehicles turn left to approach the terminal curbside loading/unloading zone where cars tend to stop at the first opportunity to access the terminal. There is one through lane and a loading/unloading lane in front of the terminal.

Exit from Parking/Toll-Booth Plaza

There is only one exit from the parking lot. The exit from the parking lot is onto South 24th Avenue, which leads directly to West Washington Avenue.

4.2 AUTOMOBILE PARKING

The automobile public parking lot in front of the terminal is a surface lot with existing capacity of 188 spaces, 8 of which are handicapped accessible spaces. To the immediate east of the terminal is a parking lot for rental cars with a capacity of 36 spaces. An additional 8 spaces being used as a cell phone lot are located directly to the west of the terminal building.

4.2.1 Delivery Loading/Unloading

Delivery loading and unloading is currently handled on the landside of the terminal building with trucks temporarily parking on the front drive at the curb or in the rental car parking lot.

4.3 AIRSIDE FACILITIES

4.3.1 Apron

Aircraft maneuver and park on the terminal apron, which is located on the south side of the passenger terminal. The entire aircraft parking apron is Portland Cement Concrete (PCC) pavement. The apron in front of the terminal building was built in 1967 and is in good condition.

4.3.2 Layout

The passenger terminal apron is adjacent to the general aviation aprons to the east and west. Taxiway A, parallel to Runway 09-27, has the most restrictive set back limits that potentially affect the apron use. It is currently an Airplane Design Group (ADG) III taxiway with an object free area (OFA) of 108 feet from the taxiway centerline to the apron. The required OFA for ADG III is 93 feet. The runway Part 77 has a tail height clearance limit of 760 feet from the runway for a B727 aircraft, which is the critical aircraft as defined in the previous airport master plan.

There are five designated departure gates at the terminal. The apron has four aircraft parking positions on the apron that accommodate narrow-body jet aircraft (ADG III). The air carrier regularly uses the remaining apron gate positions as remain-over-night (RON) parking.

Passengers access the parked aircraft by ground level boarding via an open walkway along the airside face of the terminal building walking across the apron to/from the aircraft. This process is described in the “Operations Assessment Summary” for departure and arrivals processes.

Airline equipment staging and ramp functions are supported by a combination of interior and on-apron storage. On the apron these functions are accommodated with a staging area south of the main building, in front of the inbound bag drop-off, and along the head of stand.

McCormick Air Center provides fuel for aircraft using trucks.

4.3.3 Pavement

The apron is 10-inch-thick Portland Cement Concrete (PCC) constructed in 1967. The PCC is typically laid out in 16-foot by 10-foot plain, doweled panels. However, there are many irregular shaped panels because of the apron's shape. Overall the apron is in good condition with a few cracked panels and minor edge and corner spalling.

4.3.4 Aircraft Services

Aircraft potable water, aircraft sanitary waste, 400 Hz, and pre-conditioned air are supplied using stand-alone carts.

5

5 FACILITY ASSESSMENT STRUCTURE

5.1 STRUCTURE

The existing airport terminal was originally constructed in 1949 including the attached FAA control tower. Construction is wood-framed floors with steel beam girders and pipe columns. In 1968 an airport expansion added two boarding concourses (building wings). The terminal was further expanded during the building rehabilitation project occurring between 1997 and 2000. The phases included a mechanical systems upgrade, roof canopy additions, and a passenger concourse area between the old concourse wings. The structural systems for the various building components are summarized below.

Foundation

The foundation plans for the existing structure built in 1949 show shallow foundations. There are continuous wall footings around the perimeter of the building and below interior bearing walls. At interior columns there are spread footings. Similarly at the rehabilitation/additions, foundations are continuous wall footings at bearing walls and spread footings at interior columns.

Gravity Framing

The gravity framing system consists of solid, sawn-wood joists supported on structural steel beam girders supported on steel columns. Floor joists are supported at the building perimeter on bearing walls. The additions have similar construction.

The roof and floor sheathing is plywood sheathing over the roof and floor joists. The additions have similar construction.

Lateral Force-Resisting Systems

The lateral system in the 1949 structure uses conventional wood-framed shear walls with plywood sheathing. The additions have similar construction with the exception of the 1999 passenger concourse, which uses special steel moment frames for the lateral force-resisting system. Wood diaphragms (nailed plywood sheathing) provide the roof and floor diaphragms, for all structures.

The lateral system for the control tower is masonry shear walls.

Expansion Joints

There is a seismic/expansion joint between the 1968 and the 1980 structures. From visual observation, it could not be determined if joint material is deteriorated enough to cause leaking. Airfield maintenance personnel have not noticed leaks at this location. No other physical seismic joints were identified. Seismic joints were not visible between the old control tower and renovation additions.

5.2 BUILDING CODES

The original terminal building dates from 1949 with an upper and lower level. A three-story control tower with masonry wall construction was also built at that time. In 1968 a concourse addition expanded the structure to the south, adding two boarding concourses totaling 6,100 square feet. The 1997 rehabilitation construction design is in accordance with the 1994 Uniform Building Code. The 2000 rehabilitation construction design is in accordance with the 1997 Uniform Building Code.

5.3 STRUCTURAL ASSESSMENT

Concrete flatwork generally appears to be in good condition. Some cracks appear in aged concrete. There are no indications of excessive concrete slab settlement. Slabs generally slope away from structure.

Exterior skin is brick veneer over wood-framed shear wall. Some exterior walls have cement stucco panels with brick veneer on the lower portion of the wall. Generally the brick veneer attachment to wood-framed wall appears to be in good condition, as determined by a visual assessment of the condition of the brick system. Actual visual observation of attachments could not be made. There are locations where the brick veneer is cracked through the thickness and the grout appears to be deteriorating (picture S-1). Waterproofing caulking is also deteriorated around the brick veneer (picture S-2). These locations should be repaired to minimize the intrusion of water behind the veneer. Cement stucco panels generally appear to be in good condition. The rehabilitation additions use similar exterior siding consisting of cement stucco panels and brick veneer. Sidings at rehabilitation additions are in good condition.

The roofing system is a built-up granulated cap sheet that appears to have been installed on all of the buildings and canopies as part of the 1997–2000 rehabilitation projects, with the exception of the roof at the old control tower. Roofing appears to be in good condition with only one indication of standing water. Some standing water appears to occur to the southeast of the restaurant roof deck as indicated by staining (picture S-3). Maintenance personnel indicated there had been some water intrusion in this area. Roofing under the roof deck could not be inspected. It appears the roof deck framing was laid directly on roofing. The condition of this roofing should be inspected further.

The roof system at the control tower does not appear to have been replaced during the rehabilitation and is deteriorated and in need of maintenance (picture S-4).

Exposed fascia board, soffits, and exposed roof beams at overhangs show minor water damage (pictures S-5 and S-6).

Rooftop mechanical systems appear to be properly seismically anchored. There are many rooftop mechanical units, ducting, piping, and roof screens with roof penetrations. The roofing at the penetrations should be inspected regularly for deterioration (pictures S-7and S-8).

At the northwest canopy it appears that proper seismic separation was not provided between the canopy and the top of the building wall. The stucco should be repaired to prevent water intrusion (picture S-9).

URS could not directly visually observe the gravity and lateral resisting systems because of building coverings. Visual observation of non-structural elements indicates there is no visible sagging or settling of roof or floor framing. Floors are generally level with no indication of settlement at grade or at the second floor. Maintenance staff report only minimal roof leakage as noted above. Roof leakage is likely due to poor slope to drainage.

6

FACILITY ASSESSMENT EXTERIOR ENVELOPE

6.1 ROOF

The overall condition of the roof appears to be good, largely due to a building rehabilitation project occurring in phases between 1997 and 2000. As part of this work, the airport expanded and renovated the terminal, with airside additions to expand the passenger gate lobby and add toilets; a new baggage unloading area canopy; reconstruction of the landside departures/arrivals curbside canopy; and renovation of the passenger ticketing lobby and baggage claim lobby. The airport appears to have installed a new built-up roofing system with granulated cap sheet, as part of this effort.

The roof system seems to be in good condition and presumably is well-drained, although our site visit could not confirm the existence of ponding or leaks. Parapets and flashing look to have been refurbished and appear to be in good condition; however, there are several locations where fascia boards at roof eaves show peeling paint in need of touch-up.

While the present roof condition is good, future risks for leaks abound because of the multiple roof levels, the exterior deck framing sitting directly on the built-up roof near the restaurant lounge (picture A-17), and the many roof penetrations by mechanical equipment, ductwork, power/communications conduits, and roof top equipment visual screens and bracing (picture A-20). Each of these, and there are many, represent a potential source of failure at a future date, and will be difficult to track down.

6.2 WINDOWS

All windows have anodized aluminum frames. The glazing is all insulated double pane. The window frames are a mix of existing and new, with many new windows installed as part of the 1997–2000 rehabilitation projects (pictures A-1, -3, -6, -10, -12, and -15).

6.3 WALLS

Exterior wall finishes are a mixture of brick (pictures A-5 and A-6) and cement stucco (pictures A-11, -12, and -13). The brick finish is primarily in the portions of the building exterior built in 1950 and the stucco is primarily in areas built in 1968 and 2000. Both finishes are painted and in good condition.

6.4 CURBSIDE CANOPIES

Exterior curbside canopies were reconstructed in the 1997–2000 rehabilitation project and appear to be in good condition (pictures A-2 and A-4). The soffits of the canopies are an Exterior Insulation and Finishing System (EIFS) version of stucco rather than the cement stucco used for the exterior walls that are exposed to more contact at grade. This choice is likely to have been economically driven in that the EIFS stucco is a lighter weight product and not exposed to the same level of contact as a wall exposure, so its use allows lighter building assembly weight and lighter steel structural framing members.

6.5 FRONT ENTRY VESTIBULE

The entrance vestibule is in good condition (picture A-21). The 1997–2000 building rehabilitation provided new anodized aluminum storefront with insulated glazing, new doors, and new flooring.

6.6 OTHER EXTERIOR DOORS

The other terminal exterior doors appear to be in good condition, again, many being part of the work in the 1997–2000 building rehabilitation project. Door types include: hollow metal, anodized aluminum with glazing, and overhead coiling doors (pictures A-5, -6, -7, -8, and -10). Weather stripping appears to be intact.

7

7 FACILITY ASSESSMENT INTERIOR DEVELOPMENT

7.1 BUILDING INTERIOR

Interior finishes and their condition vary widely on the different levels of the building—floor, walls, and ceiling. The following is a description of the finish conditions by building floor level.

7.1.1 Terminal Level One

As mentioned in earlier sections, the terminal building has a history dating from its 1950 original construction. Some spaces have had minimal changes or upgrades (such as back-of-the-house spaces) and others have had periodic upgrades because of normal wear or changes in use. The condition of finishes in public spaces on level one was uniformly good, owing to the 1997–2000 rehabilitation projects.

Floors

Floor materials/condition include: carpet (ticket lobby, gate lobby, and offices), vinyl tile (baggage claim and some airline office work areas), ceramic tile (toilets and part of entry vestibule), and concrete (utility rooms and outbound baggage makeup rooms). Floors are in good condition (pictures A-21, -22, -23, -24, -27, -28, -34, -35, -37, and -43).

Walls

Wall materials/condition include: painted brick (entry vestibule), painted drywall or plaster (most wall surfaces), and ceramic tile (toilets). Walls are in good condition (pictures A-30, -31, -34, and -43).

Ceilings

Ceiling materials/conditions include: 2’ x 4’ suspended lay-in acoustic tile (most public spaces and offices), 1’ x 1’ tongue-and-groove acoustic tile, and painted drywall or plaster (soffits at changes in ceiling plane, toilets, and outbound baggage makeup rooms). Most ceilings in the public and back-of-house areas are in good shape, with an exception in the rental car counter area. The 1’ x 1’ acoustic tiles in this area are aging, with replacement tiles noticeably different in color.

One aesthetic shortcoming for existing ceilings is the exposed ductwork in the public seating and circulation spaces connecting the ticket lobby and bag claim lobbies. While the ducts are neatly painted, they break up the plane of the ceiling and make it a series of ceiling sections appearing disjointed rather than as one ceiling element connecting multiple terminal functions (pictures A-22, -23, -24, -28, and -29).

The new light fixtures installed in the 1997–2000 rehabilitation projects appear to be in good condition.

Other Components

Public seating in ticket lobby, baggage claim, and airside gate lobby is a high-quality tandem style seating system used frequently in public transit settings. It appears nearly new and is in good condition (pictures A-28, -34, and -43).

Public transaction counters at ticketing, rental cars, and a now-vacated travel agency are plywood cases with plastic laminate finishes and stainless steel trim at exposed edges (pictures A-25, -26, -27, and -32). These materials are durable, appropriate for their use, and are in good shape. In the future, using a single, unifying counter design would help create a continuity of visual appearance rather than having a different style and color for each tenant.

Toilet rooms serving landside and airside public lobbies are in good condition, having been refurbished in the 1997–2000 rehabilitation projects.

Outbound baggage makeup area finishes are appropriately utilitarian in nature consisting of concrete or resilient vinyl flooring, plaster or 1’ x 1’ tongue-and-groove acoustic tile ceilings, and painted plaster or drywall wall finishes. The air cargo counter is a plastic laminate finish, and is in fair, but serviceable shape (picture A-41). Lighting is surface-mounted fluorescent fixtures and appears adequate for the baggage makeup activities.

7.1.2 Terminal Level Two

Level two of the terminal supports three major uses: Banquet/Board Room, Restaurant, and Lounge (pictures A-44, -45, and -47). There is no tenant occupying the spaces, but the Banquet/Board Room does host periodic meetings. The lack of a tenant and the partial dismantling of the kitchen create a sense of benign neglect in this space. Two additional factors diminish the future potential for redevelopment of these spaces:

1. Eight different floor levels within the level two footprint reduce flexibility of tenant use.
2. An elevated roof above the new airside gate lobby largely eliminates the visual connection between the restaurant and lounge areas and the airfield movement areas.

Given the lack of the airside view amenity, the airport should seek a future tenant who desires an airport presence, but does not need the airside view for business success. Office space, perhaps for airport administration or the Transportation Security Administration (TSA), could be the type of tenant that would desire the location.

Floors

Floor materials/condition include: carpet (banquet room, hall, restaurant, and lounge), epoxy (kitchen), and sheet vinyl (toilets). Floors are in generally good condition, but the kitchen was only in fair condition (pictures A-44, -45, -47, and -48).

One other floor surface (so to speak) was the exterior deck (picture A-46), which has an exterior carpet finish over a plywood substrate. The exterior carpet was partially removed at the time of our assessment site visit because of recent exploration under the deck for roof leaks, so its state of condition, other than in a state of disrepair, was hard to determine.

Walls

Wall materials/condition include: painted wood paneling (banquet room and restaurant), painted drywall or plaster (most other wall surfaces), and vinyl wall covering (toilets). Walls are in good condition, but the colors are dated and dark (pictures A-44, -45, and -47).

Ceilings

Ceiling materials/condition include: 2’ x 4’ suspended lay-in acoustic tile (most spaces), 1’ x 1’ tongue-and-groove acoustic tile (in corridors, above stairs, and at upper lounge seating), and painted drywall or plaster (soffits at changes in ceiling plane, and in kitchen and toilets). Most ceilings in the public and back-of-house areas are in good shape (pictures A-44, -45, and -47).

The new light fixtures installed in the 1997–2000 rehabilitation projects appear to be in good condition.

Other Components

Seating in the banquet room is a mix of types and condition. The tables in the banquet room are on the small side, but this appears to offer flexibility in configuring the room for different events. The furnishing colors are dated (picture A-44).

There are few furnishings in the restaurant seating area. The kitchen is a jumbled arrangement of kitchen equipment, with some equipment obviously removed, and other pieces lying on top of counters and stoves, awaiting an uncertain future (picture A-48).

Likewise, the lounge is in a state of transition, largely, but not completely, empty of furnishings. The bar casework is in good shape, but the color scheme for the space is dated (picture A-45). A future tenant would likely want to gut the space and start over.

7.1.3 Tower

The tower portion of the existing terminal was originally built as an ATCT during the 1950 terminal building project. It has three floor levels below the ATCT cab. The tower has not been used for air traffic control since presumably 1968, as photos of the 1968 expansion show the existing, taller, ATCT already built east of the landside public parking lot along West Washington Avenue.

Terminal tenants currently use the tower as office or storage space. The tower cab is not currently used for any specified function.

Floors

Floor materials/condition includes carpet at offices, resilient vinyl tile at storage, and sheet vinyl at the toilet. Floors are in good condition.

Walls

Wall materials/condition include painted drywall throughout, except for the tower cab, which has a painted plywood wainscot below the window sills of the cab. Walls are in fair to good condition.

Ceilings

Ceiling materials/condition include suspended 2’ x 4’ acoustic lay-in tiles at offices and painted drywall at toilet and storage rooms.

7.1.4 Accessibility

With a couple of exceptions, level one appears to comply with ADA accessibility guidelines throughout. The exceptions are transaction counter heights and signage at ticket counters and rental car counters. Level two spaces have partial, but not total, accessibility because of the large number of different floor levels within the level two footprint.

Outside the building, along the terminal loading/unloading curbside sidewalk, there are curb ramps for access at crosswalks.

8

8 FACILITY ASSESSMENT MECHANICAL SYSTEMS

8.1 SITE UTILITIES

Domestic Water

A 3-inch domestic water service line provides service to the terminal. It enters the building in the basement northeast mechanical room. The service is in good condition and the section from the existing underground water meter in the parking lot to the building appears to have been installed in approximately 2001. The water meter appears to be in poor condition (picture M-8) and is due for replacement by the water purveyor.

Fire Protection Water

The 2000 terminal renovation drawings site plan shows a 6-inch fire service that connects to the city branch main upstream of the domestic service and enters the building in the basement northeast mechanical room. The fire service to the terminal also feeds fire hydrants in the terminal area and is arranged in a loop around the entry drive. Two fire hydrants (picture M-9) are fed from the loop with underground isolation valves and are located at the east and west ends of the entry drive. Fire hydrants were not observed on the secure airside of the site.

The building fire service has an integral pumper fire department connection on the building's north face and is in good condition. It appears to transition to a 2½-inch backflow, 3-inch main just after it enters the building. The 6-inch fire service should be adequate to fire sprinkle the building given the 105-pound-per-square-inch (psi) pressure indicated at the incoming service. However, the present 3-inch branch appears undersized for present coverage and future growth.

Natural Gas

The building is served by Cascade Natural Gas with the gas meter located on the exterior of the building. The meter appears to be a 2.0 to 5.0 psi pressure output given the small size of the piping. The main service does not have a seismic shut off valve. The service appears to be wrapped steel below grade and is maintained by Cascade Gas upstream of the meter. The service size appears adequate and presently provides the required energy to heat the building and most of the domestic water.

Sanitary Sewer

The building is served by 6-inch sewers on the west (installed in 2001) and east (installed in 1950) sides of the building. The east side of the building has an underground grease vault of unknown size that connects to the eastern sewer discharge main. The grease vault is presently inactive but reportedly caused clogging and vented noxious fumes too close to the building air intakes when it was active. The sewer cleanout provisions appear to be lacking access but no significant blockages have been reported. Some of the underground pipe is listed as transite on the existing drawings and may be in poor condition.

Site/Building Storm Sewer

The building is served by a single 10-inch storm sewer on the east (original) side of the building that serves the building and parking lot and reportedly drains under the airfield into Spring Creek on the far south side of the airfield. The 10-inch storm sewer has an 8-inch branch that extends under the center of the building to pick up the building drains and catch basins on the west side of the site. The storm sewer cleanout provisions use 42-inch manhole accesses on each side of the building and no significant blockages have been reported. The deicing system reportedly discharges to the storm sewer with no recycle system.

Area and Parking Drainage

The drainage is connected to the single 10-inch storm sewer on the east (original) side of the building that serves the building and parking lot. Various catch basins and area drains are connected to the system (picture M-1). The system appears to provide adequate drainage except where pavement cracks or settling has occurred. The system reportedly has occasional clogs and better cleanout provisions are desired (picture M-6).

8.2 HEATING VENTILATING AND AIR CONDITIONING (HVAC)

HVAC Renovations

The building's original mechanical design included a steam boiler with cast iron radiators providing heat and various ventilation and air handling systems. Nearly all of the original mechanical systems have been removed or were abandoned during renovations over the years. The Traho Architecture as-built drawings that are dated 2000 show that nearly all of the HVAC systems were replaced with new as part of the Phase 1-2-3 Terminal Rehabilitation Project.

Rooftop HVAC

In 2000 the Airport installed new rooftop gas and electric HVAC units on all of the roof areas of the building that serve the first and second floors. The units were low cost tubular aluminized steel heat exchangers with integral direct expansion refrigerant cooling coils/compressors and condensers. The rooftop unit compressors/fans are energized by rooftop conduits via integral disconnect. Heating energy is provided via roof-mounted, steel, medium-pressure gas piping with pressure regulators for each unit. The rooftop units have integral supply fans, 30% filters, air economizer dampers, and gravity relief hoods (picture M-12) that allow the units to use outside air as the first stage of cooling when it is below 55°F outside and thermostats are calling for cooling inside. The rooftop units distribute conditioned supply air to double-walled insulated ductwork mounted on the roof with roof penetrations to diffusers below (picture M-13).

- Heating: The rooftop units use aluminized steel heat exchangers as part of their heating system. These typically last 15 to 18 years before requiring replacement. Assuming the units were installed around 1998–2000 they likely have 4 to 8 more years before requiring replacement.
- Cooling: The rooftop units use R-22 cooling compressors with brass/copper components with a typical life of 12 to 15 years with electronics problems typically after year 10. Assuming the units were installed around 1998–2000 they likely will start requiring significant maintenance within the next few years and experience compressor failures within the next 4 to 8 years. The R-22 refrigerant used by the cooling system is scheduled for phase-out between 2010 and 2020 and will become significantly more expensive to recharge in the last few years of the rooftop units' useful life.
- Steel Casings/Dampers: The steel casing and accessories of the rooftop units appear to be in good condition, showing little rust. However, since their estimated life is about 15 years, significant repainting, damper seizure, and rust failures will likely occur in the next 5 years.
- Controls: Electronic circuit boards within the rooftop units typically start to fail within 10 to 12 years and are likely not available after 20 years. Significant controls problems and failures will likely occur in the next 5 years requiring increased parts costs and proprietary maintenance service calls.
- Rooftop Ductwork: The rooftop ductwork is a mix of aluminum, galvanized steel, and stainless steel and is in fair condition (picture M-18, -19, and -20). It appears many of the joints have cracked sealant, so moisture/mold may be growing in the insulation layer and rusting the inner duct. The roof blocks and fasteners and supports for the ductwork are in poor condition and generally will need replacement in the next 5 years. Rooftop ductwork

also increases heat loss and reduces heating efficiency and should be eliminated if possible. Rooftop ductwork also makes it very difficult to access roof leaks and reroof the building.

- Rooftop Gas Piping: The existing gas piping is all milled steel with steel or cast iron fittings. The pipe is very rusty (pictures M-14 and M-17). Although the pipe will likely last another 20 years, it will be very difficult to re-roof under the failing support blocks (picture M-24). The piping should ultimately be reinstalled in the ceiling cavity (inside) or galvanized/coated steel replacement pipe should be used.

Miscellaneous Split DX Gas Electric HVAC Units

The HVAC renovations completed by tenants in the year 2000 also installed a few indoor residential gas furnaces with rooftop compressor condenser units. The units installed were low cost 80% to 90% efficient gas furnaces with tubular aluminized steel heat exchangers with integral direct expansion refrigerant cooling evaporator sections. Similar cooling only units are provided for spot cooling of high heat output areas (pictures M-7, -11, and -31). The rooftop unit compressors/fans are connected to the indoor evaporator sections with armaflex foam insulated copper CCR refrigerant piping. Various unitary through-the-wall “window shakers” that are in very poor (likely inoperable) condition (picture M-25) are also evident for spot cooling

- Condition: The existing split DX gas electric units are in fair condition. They typically have a 15-year life and appear to be in their last 5 years of life. Their refrigerant likely will need recharge and controls upgraded before they are replaced. Gas flues also appear to have issues with a few remaining years of life.

Miscellaneous Exhaust Fans and Heaters

The exhaust fans appear to be mostly new as of the 2000 renovation. The fans are generally rooftop mushroom exhaust fans of aluminum construction (picture M-15). These types of mushroom fans typically can have a 20- to 30-year life and, therefore, should have another 10 to 15 years of life with proper maintenance. Some of the original swamp cooler and grease exhaust fans (pictures M-21 and M-22) for the kitchen appear to be operational still (inactive during survey) but are in very poor rusty condition and should be replaced if still needed. Various electric heaters in fair condition are provided for freeze protection and spot heating (pictures M-5 and M-26).

HVAC Controls

The existing controls are generally stand-alone programmable type thermostats (picture M-47) and appear to have been mostly new as of the 2000 renovation drawings. The programmable thermostats appear to have 7-day-per-week time schedules and night setback capabilities and should remain fairly trouble free for another 10 to 15 years. A few older mechanical nonprogrammable (mercury bulb) thermostats exist (picture M-35) to serve the smaller units. Although these thermostats are 15 to 20 years old they likely will function for many more years.

Interior Ductwork

Interior supply and return ductwork appears to be mostly new as of the 2000 renovation and is in good condition (picture M-33). The older ductwork installed in earlier renovations and for the restaurant is in poor condition and should be replaced. The older ductwork appears to be full of dust and some of the sound lining was observed to be deteriorating. Some of the ductwork in the first floor lobby installed below the ceiling is damaged and unattractive because of the limited depth of ceiling cavity available (picture M-32).

8.3 PLUMBING

Plumbing Fixtures and Fittings

In public toilet rooms, fixtures are generally vitreous china that is in fair to good condition, having been upgraded over the years. Public toilet rooms appear to be ADA compliant. Urinals have battery-powered, infrared flush valves (picture M-28). Water closets have manual flush valves (picture M-29). Lavatories are self-rimming with mixing valve faucets (picture M-27).

The restaurant, airline, and miscellaneous toilet rooms are a mixture of old and new fixtures and are generally in poor condition (pictures M-46 and M-48) and not ADA compliant.

Domestic Cold Water

The 3-inch (105 psi) domestic water service originating in the old boiler room is copper with brass valves (picture M-38) and is in good condition with a few reported leaks mostly caused by freezing. The domestic water service appears to be missing a backflow preventer (cross connect violation) and has a single pressure regulating valve (picture M-43) that lacks the code-required relief downstream. Some existing galvanized steel piping in poor condition is evident in the older parts of the building but it is not clear if it is still active. Piping insulation is torn and missing in many locations and is in need of repair (picture M-34). Hose bibs serving the building exterior and other locations appear to be in poor condition and need replacement. A sub meter is installed on the service to the restaurant tenant water systems. Shock arrestors appear to be missing on most of the fixtures, causing water hammer.

Domestic Water Heating

The gas and electric water heaters appear to be mostly new as of the 2000 renovation drawings and are in fair to good condition. The gas heaters are generally 90% efficient condensing type (picture

M-44) with a few 80% efficient, gas instantaneous (picture M-50 and M-16) and electric heaters serving outlying fixtures. Domestic water heaters of this type typically have a 10- to 18-year life and thus likely have 5 to 8 years of remaining life. Domestic water expansion tanks were provided per code for tanks in the 2000 renovation drawings. These tanks are steel with bladders and likely near the end of their estimated life of 8 to 12 years.

Domestic hot water systems are mostly copper with brass valves in fair condition with a few reported leaks. Thermostatic mixing valves (picture M-45) appear to provide lower temperature water for public lavatories per code requirements. Hot water circulation pumps appear to be 2000 renovation vintage in fair condition. Since these small pumps typically have an 8- to 12-year life they will likely need replacement soon. Piping insulation is torn and missing in many locations and is in need of repair.

Sanitary Waste and Vent Piping

Most of the main waste piping is cast iron (picture M-36) in good condition with a mixture of hub and spigot and no hub joints. Branch piping and vent piping is a mixture of galvanized in poor condition and copper in fair condition. Some plastic waste and vent piping is present where repairs and renovations have taken place (picture M-37). Drains appear to be missing trap primers at many locations and that may be the source of sewer fumes.

Roof Drainage System

Flat roofs drain via cast iron roof drains with cast iron grates (picture M-10). All roofs appear to overflow to lower roofs or over the lip of the roof such that most roofs do not require overflow drains. Roof drain piping is mostly cast iron in fair to good condition with some galvanized noted on smaller roofs in poor condition.

Interior Gas Piping System

Gas piping (estimated 2.0 to 5 psi) is typically black steel with screwed joints inside the building. Pressure regulators with black steel vent piping are provided for indoor furnaces and water heaters. All indoor gas piping appears to be in good condition with no reported leaks. Indoor medium-pressure gas piping is normally routed in welded piping for public facilities. However, the existing airport piping is screwed steel that can leak eventually from thermal expansion/contraction at the screwed joints.

8.4 FIRE SPRINKLER SYSTEM

Main Service

The fire protection service entrance includes a 6-inch main (picture M-41) (105 psi) (picture M-42) in fair condition with a newer approximately 3-inch backflow preventer assembly that connects to the building distribution system (picture M-39). A 4-inch Siamese pumper connection (FDC) (picture M-2) is located on the face of the building about 75 feet from the nearest fire hydrant. An alarm gong (picture M-3) is located above the FDC.

Distribution Piping/Valves

The distribution piping appears too small for the available pressure and length of piping to the most remote zone. The larger piping is generally painted steel with mechanical joint couplings (picture M-40) that shows evidence of leaking at the joints. The smaller piping is screwed black or galvanized steel (picture M-4) that also shows evidence of leaking at joints. Branch and main valves appear to have tamper switches as required by NFPA.

Fire Sprinkler Heads

Heads within the terminal are a mixture of semi-recessed and exposed of varying vintages (picture M-30 and M-49). Heads generally are in good condition but appear to have lower hazard spacing than required by NFPA in the wood-framed building areas. External canopies and overhangs are generally served by dry sidewall heads from the wet fire sprinkler system.

9

9 FACILITY ASSESSMENT ELECTRICAL SYSTEMS

9.1 POWER DISTRIBUTION SYSTEM

Electrical power to the terminal building is routed underground from a pole located on the north side of West Washington Avenue to a pad-mounted switch in the north parking lot. From the switch, power is routed underground to transformers at the terminal building and at the control tower. The terminal building is served from a 500kVA pad-mounted utility transformer on the east side of the building. The main electrical switchboard is located outside in National Electrical Manufacturer's Association (NEMA) 3R free-standing enclosures against the east building wall. The main switchboard is rated for 2,500 amps at 208Y/120 Volt, 3-Phase. It has a 2,500-amp main circuit breaker and distribution breakers feeding panelboards throughout the building. The main switchboard was installed in approximately 2000 and is in good condition with some minor rust on the enclosure exterior.

All of the panelboards throughout the building were replaced in 2000. Older panels were abandoned in place most with the interiors removed. Some panels are located in outdoor enclosures on the roof, which is not ideal. The panels appeared to be in good to fair condition. Many of the feeder conduits are routed exposed on the roof supported on wooden blocks.

There are outlets for electric vehicle charging located on wooden posts on the east end of the building (airside).

9.2 EMERGENCY POWER SYSTEM

Battery packs provide emergency lighting for the terminal building. There is no emergency generator.

9.2.1 Lighting

Exterior Lighting

The exterior light fixtures are mostly fixtures with high-pressure sodium lamps and a few fluorescent fixtures. They are controlled by photocell. The apron lighting consists of building-mounted flood lights and pole-mounted flood lights. Parking lot lighting consists of pole-mounted architectural (round) high-pressure sodium fixtures on concrete poles.

Interior Lighting

The light fixtures in the public spaces are a combination of recessed fluorescent troffers and surface-mounted fluorescent. Other areas have surface-mounted and pendant-mounted fluorescent wraparound and strip lights. The second floor has some recessed can lights and some custom fan/lights in the vacant restaurant. The fixtures are in fair shape. Many of the lenses are discolored from age.

9.2.2 Fire Alarm System

The existing fire alarm system is an addressable Simplex Grinnell 4100 fire alarm system. Pull stations are located at the exits and speaker/strobes are located throughout the building. The fire alarm system appears to be in good condition.

9.2.3 Clock System

There is no central clock system. All clocks are stand-alone battery operated.

9.2.4 Sound/Paging System

There is an old speaker paging system with two amplifiers (one for inside, one for outside) with eight interior zone controls. This is generally acceptable.

9.2.5 Telephone/Data System

The telephone service to the building is all copper telephone wiring. Fiber optic cable service was installed from the terminal to the airport offices to provide wifi services to passengers. The phone system consists of 66-type wiring blocks and patch panels. There is a digital Inter-Tel phone system with digital handsets in some areas. Several telephone closets are located throughout the building. Some of the old rotary analog handsets have been abandoned in place in the departure lobby.

There are many television satellite discs located on the roof (Dish Network, Direct TV and others). Most appear abandoned.

TSA has a Dell server rack located in one closet that was installed in 2009.

10

OPERATIONS ASSESSMENT

10.1 SUMMARY

This section examines how the various portions of the terminal building function in terms of providing service to the travelling public. In reviewing specific functions, however, we also have the opportunity to assess more subjective components of the airport user's travel experience relating to the terminal facility. Issues such as architectural character, the presentation of community amenities, a sense of welcome to the community, and a sense of community pride are also important factors to consider when discussing the terminal facility. The current terminal at YKM leaves room for improvement with regard to these attributes as well as more objective customer service issues. During future expansion planning, any design should consider the emotional, as well as functional, passenger experience the Airport Board wishes to provide for travelers using the terminal building.

10.1.1 Departures Process

Curbside

Given current levels of commercial service, there is an ample length of available curbside for passenger loading and unloading. The drive in front of the terminal offers frontage for easy loading and unloading from private vehicles, taxis, and buses and extends eastward beyond the terminal should terminal user demand exceed the covered frontage available. The curbside immediately in front of the terminal is covered providing passengers with shelter from inclement weather. However, the curbside width is somewhat narrow, and the north-of-building location tends to make the loading area a bit dark. The location of the concrete-clad steel columns that support the roof canopy overhead can interfere with the opening of passenger-side car doors along the curb. The vestibule at the main terminal entrance is the only terminal entry on the curbside and serves both departing and arriving passengers, which can lead to congestion if departure and arrival traffic occur simultaneously.

Ticket Lobby

The ticket lobby is immediately inside the main terminal entrance. Given current levels of commercial service, the number of ticket counter positions is adequate to handle passenger volumes, although this area could become overcrowded during peak periods of operation when service improves. The orientation of the ticket counters (perpendicular to the curbside); the separated physical locations of airline ticket counters; as well as the inadequate size of the passenger queuing areas pose significant challenges to efficient passenger processing and circulation, but the current low level of passenger volumes has kept these shortcomings from being major problems.

The former travel agency customer service counter in the ticket lobby could contribute to circulation congestion if passenger volumes were higher. The amenity of a travel-related tenant is a positive feature should it return, but the location should be reconsidered during future terminal planning efforts.

The overall passenger processing flow diagram for the terminal is a product of the original small scale 1950 passenger terminal. Given the passenger demands in that era, the layout was efficient and properly scaled. Today's air passenger facility demands are far different. Significant increases in passenger volumes would bring this terminal to gridlock in a number of areas, such as the building entry, the ticketing queues, the ticket counters, and the circulation space connecting these functions.

Airline Ticket Office (ATO) and Baggage Operations

ATO space for Horizon Airlines and a future air carrier appear to be adequate for the immediate future. However, the physical separation of the ATO and baggage areas (as well as the ticket counters) is an inefficient configuration brought about by earlier decisions to expand the building in a cost efficient rather than functional manner.

The Horizon Airlines outbound baggage handling area is currently undersized because of the addition of Transportation Security Administration (TSA) baggage screening operations in the makeup area. Baggage cart circulation is highly constrained, and the airline employee lockers and break area have no enclosed space. An air cargo operation coexists in the makeup room with a public entry and transaction counter opening off a small parking area west of the terminal building. Additional storage area for equipment would be useful.

Concessions

Currently, there is no food and beverage concession in the terminal building. There is a small, vacant space on the ground floor for a coffee/snack-type concession, and there is a vacant restaurant/lounge on the second floor. These concessions are both on the landside (non-secure) of the terminal, and there are no provisions for airside (secure) concessions. Passengers would benefit from concessions, but the small volume of passenger traffic makes it difficult to support the expense of providing the service. An airside food and beverage concession, preferably with a view to airside, would be a big improvement to customer service if passenger volumes supported the investment.

Public Services

Public services include items such as restrooms, telephones, vending machines, automated teller machines (ATM's), and other conveniences provided for the passengers. The primary public restrooms in the main terminal are adequately sized, and have been renovated in recent years. Newer terminal buildings typically include a small "family restroom" wherever men's and women's rooms are located. A family restroom is generally handicap-accessible and includes a baby-changing table. While this type of service may not be possible at the existing restroom location, it is an idea worth exploring should new restrooms be considered as part of future terminal improvements.

A freestanding ATM machine is adjacent to the main entrance in the Ticket Lobby. However, there is no business center or location to send a fax or plug in a computer in the terminal. A small area with these provisions would provide an added level of service to the business traveler.

Security Screening

The passenger security screening checkpoint is immediately adjacent to a ticket counter area. This results in a potential and unfortunate conflict between ticketing and checkpoint queuing lines. These lines, when concurrent, contribute to overall congestion in the ticket lobby and the main circulation areas in the non-secure portion of the terminal building. If future passenger levels or TSA screening requirements dictated a larger footprint for screening, the terminal would have to give up gate lobby space to accommodate the increase.

Passenger Gate Lobby and Boarding Area

The passenger gate lobby and boarding area is south of the ticket lobby and adjacent to the aircraft apron at ground level. It was expanded during the 1997–2000 terminal rehabilitation project, filling in the space between the two diagonal passenger circulation concourses that were added during the 1968 expansion project. Unfortunately this infill diminished the airside views from the restaurant/lounge operation, one of the primary assets of the second-floor concession.

The Airport could improve airside passenger service by providing family restrooms; food and beverage service; sit-down counters for working on laptop computers; or café-type tables and chairs in addition to the traditional gate lobby seating.

10.1.2 Arrivals Process

Arrivals Entrance/Greeters' Area

Upon exiting their aircraft, passengers enter the terminal by way of one of five arrival/departure gates. Once inside the gate lobby, they can proceed to the airside exit doors adjacent to the passenger security checkpoint. These doors allow passage into the Ticket Lobby space, which connects to the rental car counters and the baggage claim lobby beyond. The limited size of the Ticket Lobby space and the arrangement of functions requiring queuing in a main circulation area causes this space to become quite crowded when there are many passengers and meeter/greeters.

Baggage Claim/Rental Cars

The Baggage Claim and Rental Car area functions adequately today because of the small volume of users it serves. Should, as in times past, two or three air carriers serve the terminal, this area would be too small for the number of arriving passengers during peak periods. In addition, the single bag slide would be unable to handle more than one arriving flight at a time.

The rental car counters would also be congested, because the queuing area would become congested during peak periods with passengers circulating through to bag claim for their baggage.

Public Services

Currently, there are small restrooms near the baggage claim area; however, these restrooms are not along the path of travel for arriving passengers and are difficult to locate. Larger restrooms visible from the bag claim area would be preferable.

A number of other items in and around the baggage claim area that would improve passenger service include baggage trolleys, seating, and a visitor's welcome/information desk.

Arrivals Curb

See earlier discussion on departures process. The curbside has adequate length for the passenger volumes encountered and is largely covered to keep passengers protected from the weather. As was noted with the departures curb, the columns supporting the roof canopy are positioned very close to the drive, and pose a hazard to passenger-side car doors.

10.1.3 Building Services

The terminal building operates for the most part as a stand-alone facility without dependence on centralized City or County services for daily operations. Relative to services that the building requires on-site for daily operations (mechanical, electrical, communication, elevator rooms, etc.), the terminal has all the functions that it presently requires.

However, any future expansions must revisit the issue of fire protection with an eye to present code requirements for fire sprinklers and anticipated facility size. While observing that the terminal has existing support spaces for utilities and services, these spaces are in some cases undersized because of incremental growth of demand or addition of new equipment over time. Relocation and/or resizing of spaces are deemed prudent if and when conceptual design for a facility expansion begins.

TSA-required facility security systems include an Access Control and Monitoring System that monitors doors and fences along the Airport Operations Perimeter. The operating system and software for these functions are housed in the Airport Administration Offices. Approved airport personnel are issued badges that allow access via card readers at each door or gate.

10.1.4 Administrative Services

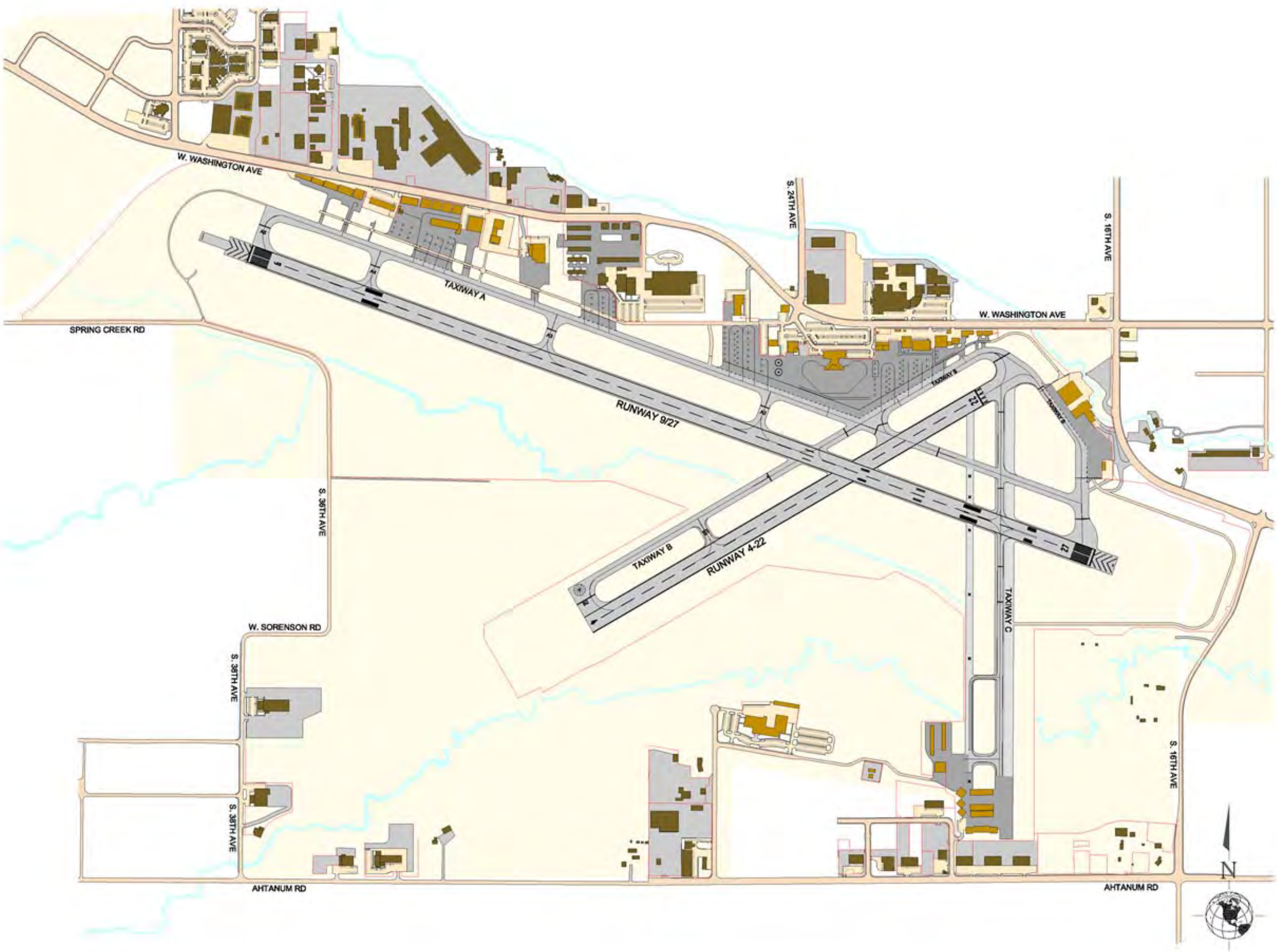
The Airport Administrative Offices are adjacent to the airfield. The space contains a reception area, small conference room, and offices for airport management. Generally, the office space appears to be adequate for its current use.

There is no Emergency Communications Command Center at the airport. Emergency events are managed from County offices downtown. There is no Airport Police Office at the airport. Police services are assigned from Police Department Offices downtown. Neither of these services was mentioned by staff as being deficient.

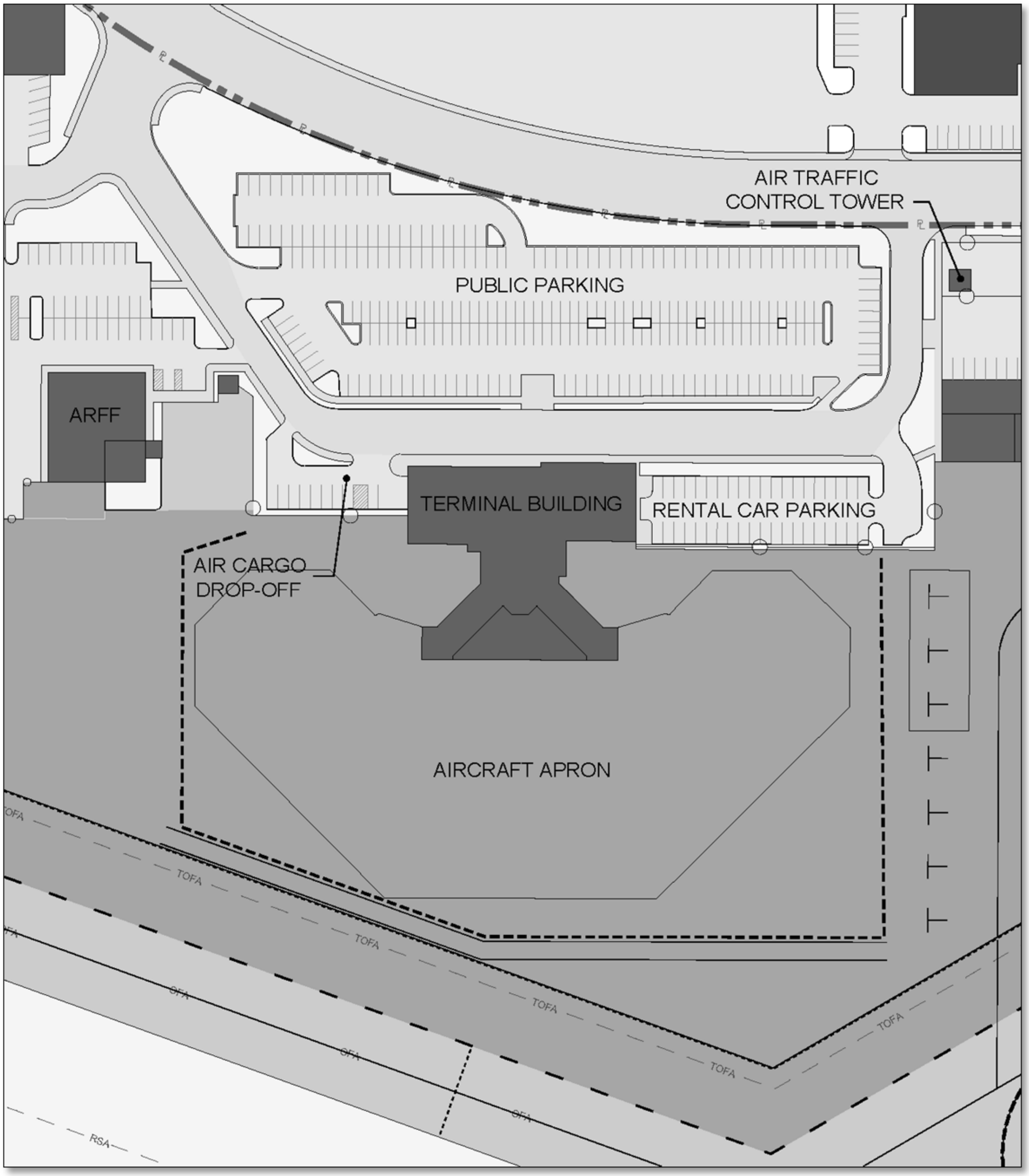
A

BUILDING ASSESSMENT FLOOR PLANS

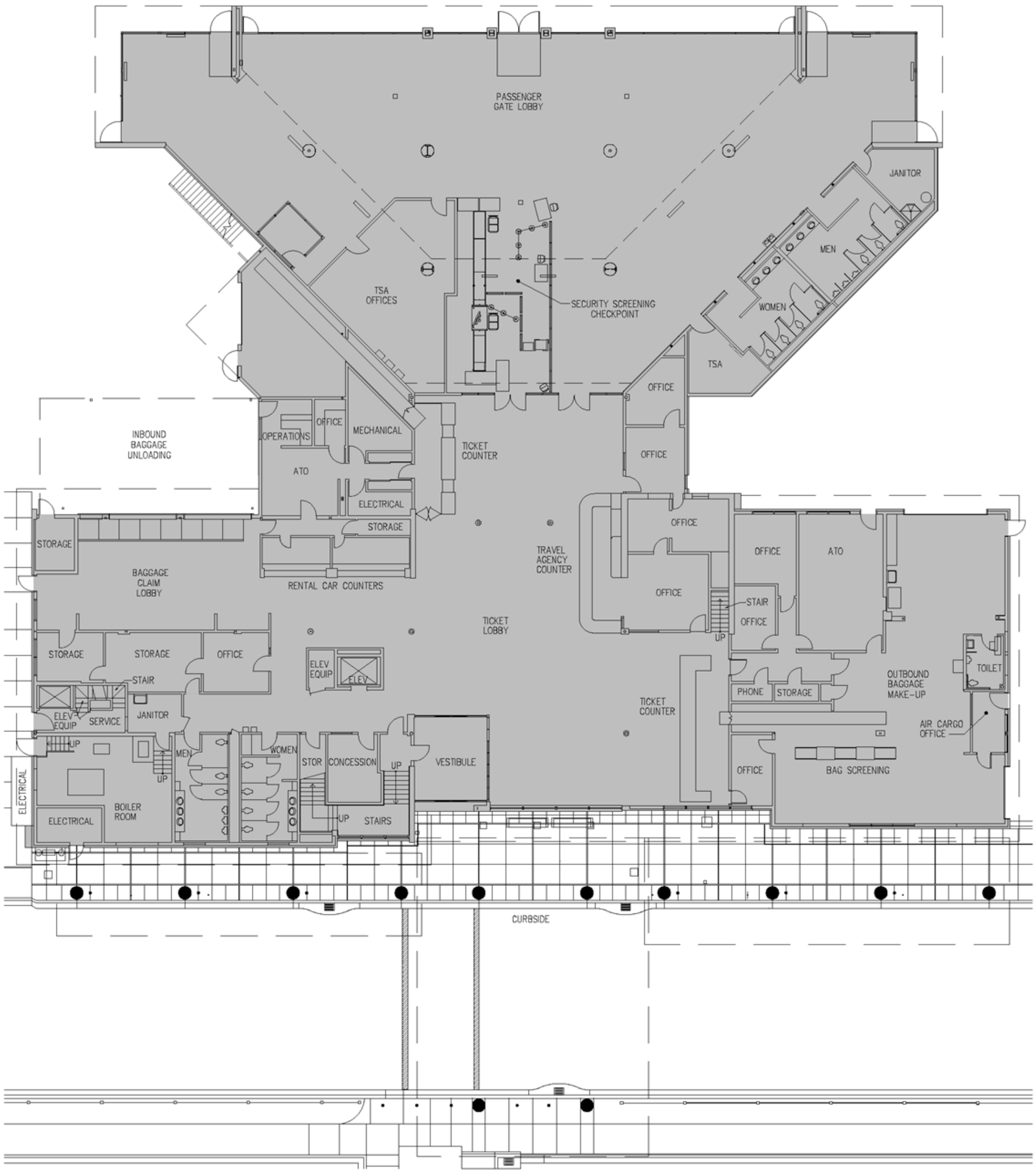
A.1 AIRPORT PLAN



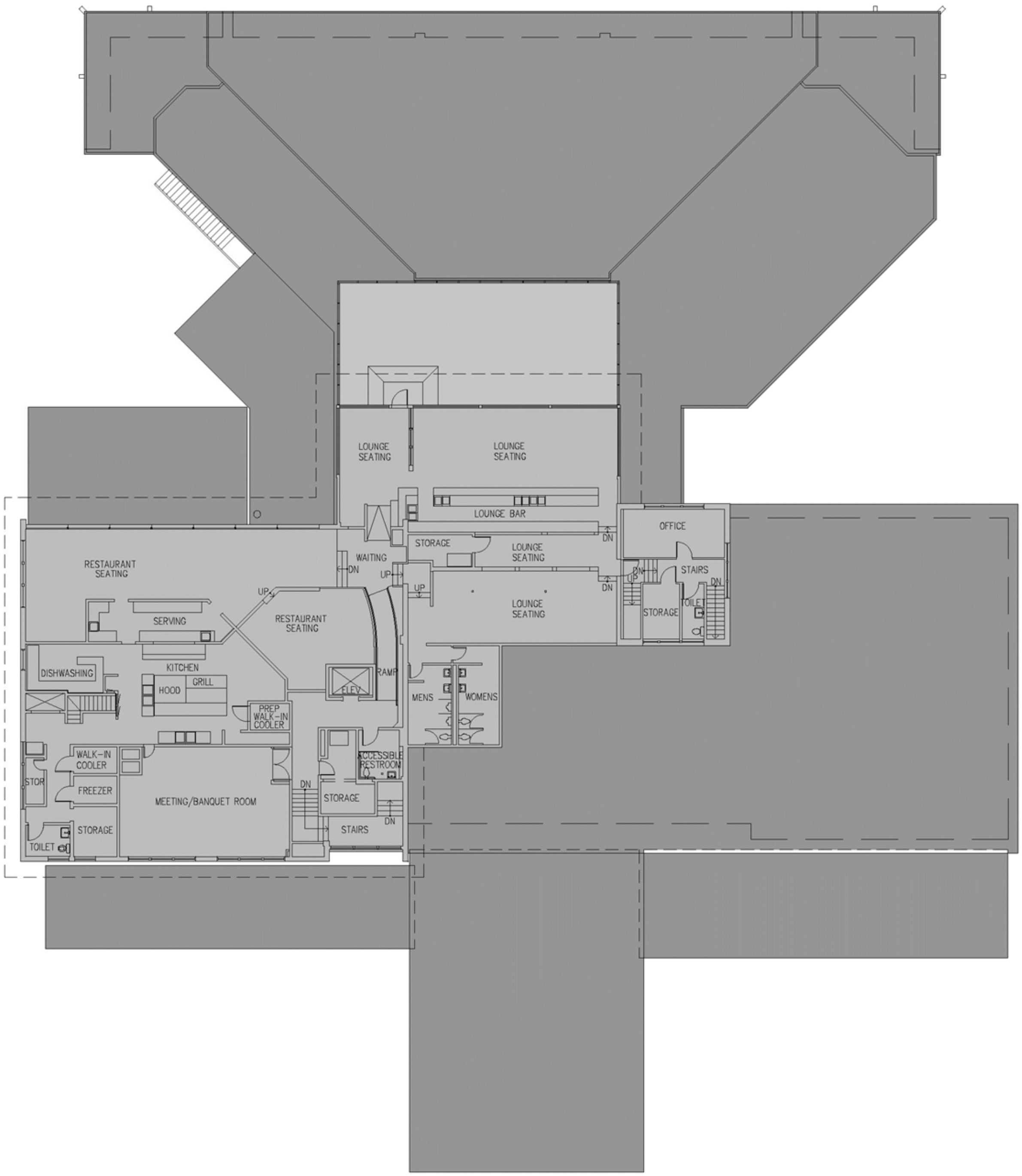
A.2 TERMINAL AREA PLAN



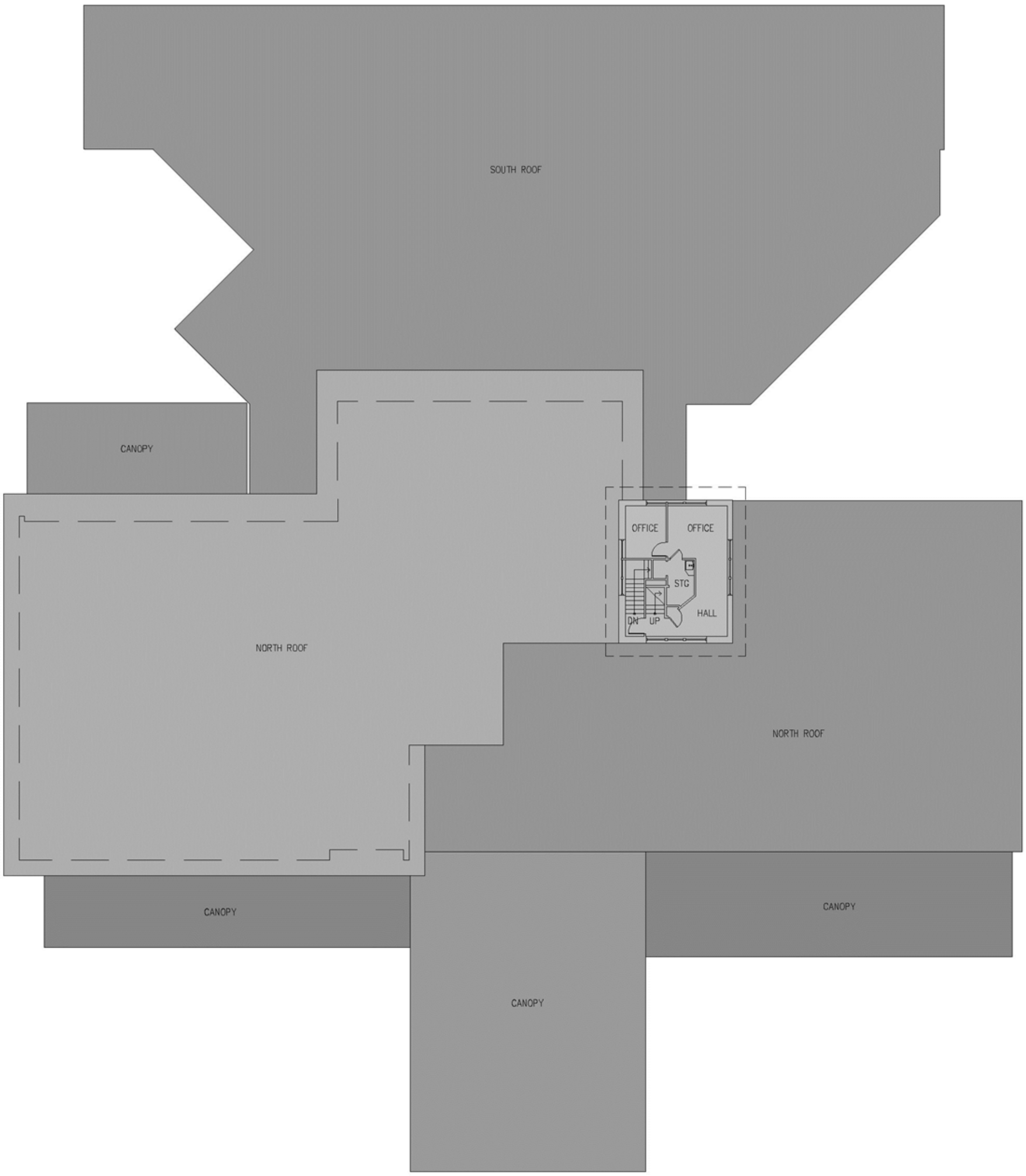
A.3 TERMINAL PLAN FLOOR 1



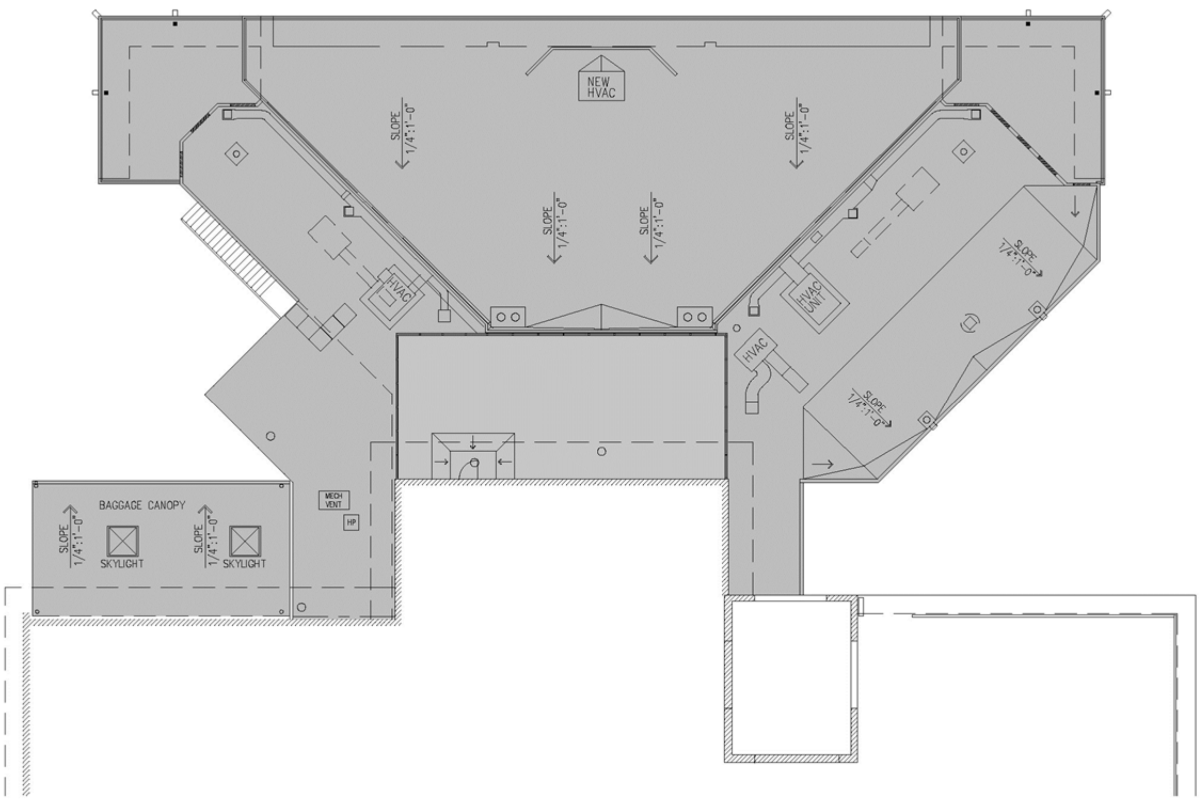
A.4 TERMINAL PLAN FLOOR 2



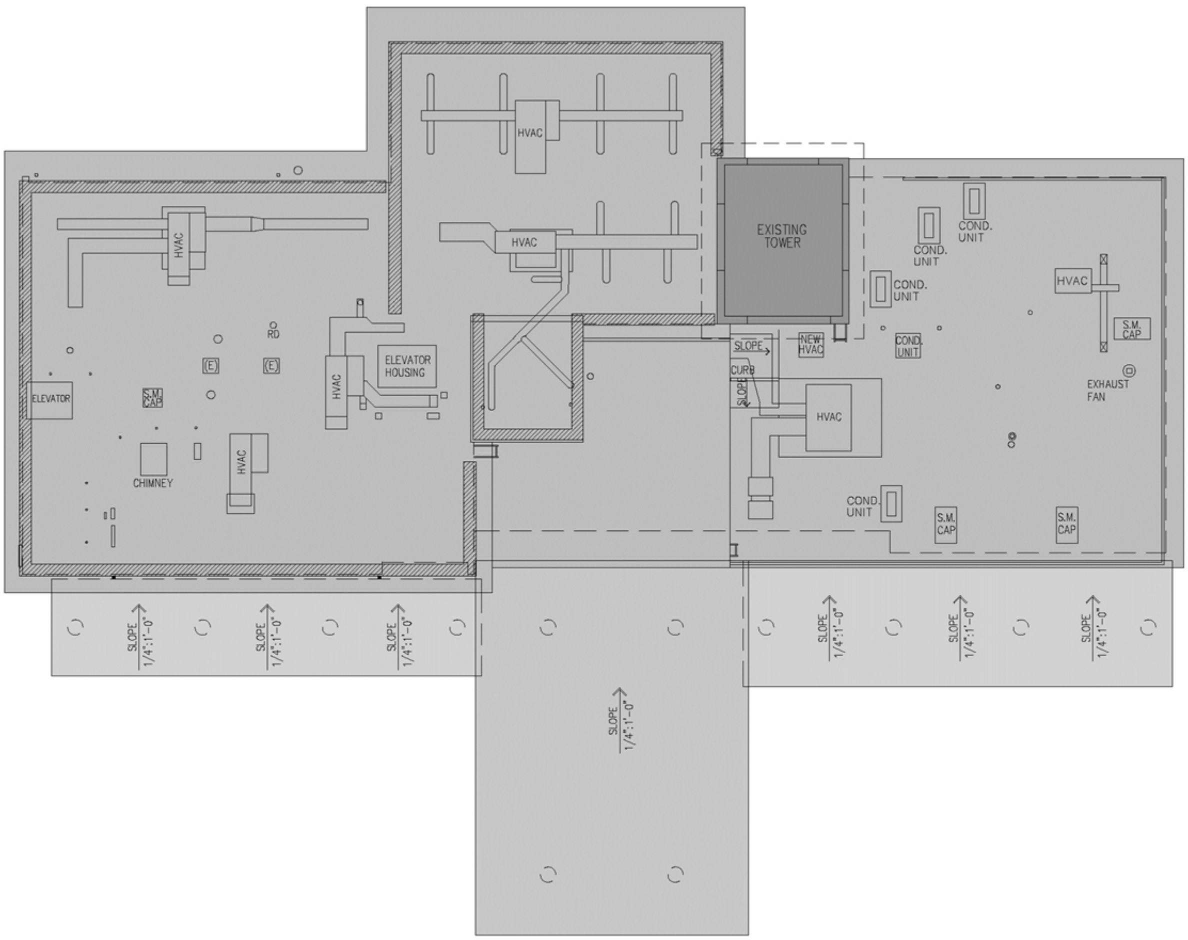
A.5 TERMINAL PLAN FLOOR 3



A.6 TERMINAL PLAN SOUTH ROOF



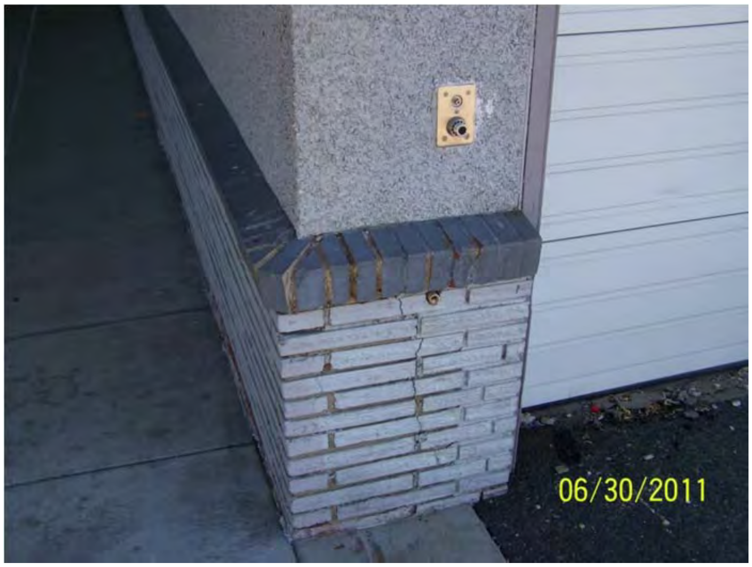
A.7 TERMINAL PLAN NORTH ROOF



B

B. BUILDING ASSESSMENT DATA INVENTORY PHOTOS

B.1 STRUCTURAL SYSTEMS



S-1: Cracked and deteriorated mortar joints in exterior brick veneer

S-2: Deteriorated caulking at exterior face brick veneer

S-3: Evidence of ponding at roof

S-4: Roofing system and flashing in need of repair at low roof at former airport traffic control tower

S-5: Water damage in fascia and overhanging soffit

S-6: Water damage at end of exposed roof beam

S-7: Roof top mechanical equipment

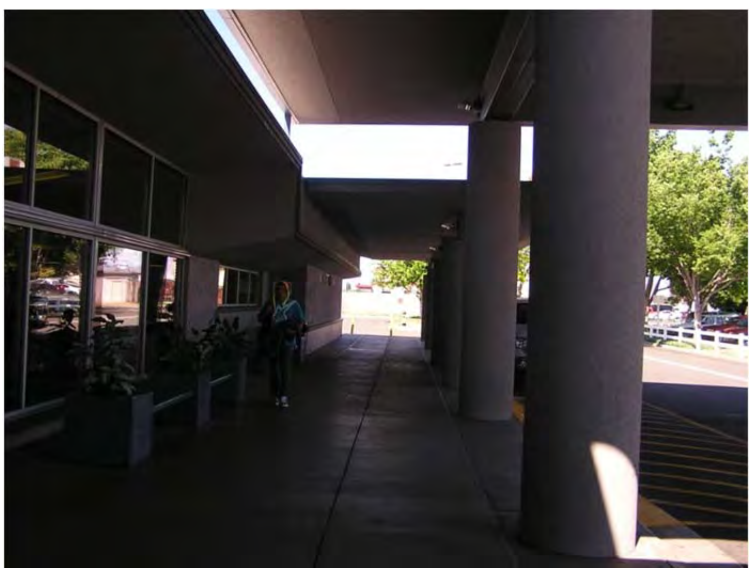
S-8: Roof top mechanical equipment

S-9: Separation in overhang roof at building parapet

B.2 ARCHITECTURAL SYSTEMS

A-1: Air cargo office

A-2: Departures curb



A-3: Covered curbside

A-4: Arrivals curb

A-5: Electrical service entry

A-6: Baggage claim entry

A-7: Inbound baggage area

A-8: Outbound baggage makeup access (inactive)

A-9: Portable aircraft loading stair

A-10: Airside gate lobby access to apron

A-11: Airside gate lobby access to apron

A-12: Airside exterior courtyard for staging ground service equipment

A-13: Airside exterior courtyard for staging ground service equipment

A-14: Alaska Airlines outbound make-up access

A-15: Roof adjacent restaurant space

A-16: Roof adjacent restaurant space

A-17: Exterior deck adjacent lounge

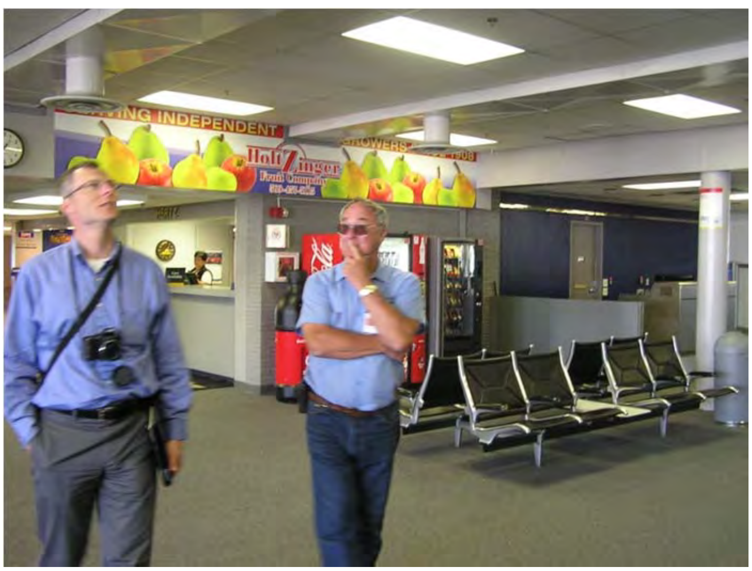
A-18: Former airport traffic control tower (ATCT) adjacent roof level

A-19: Former ATCT cab

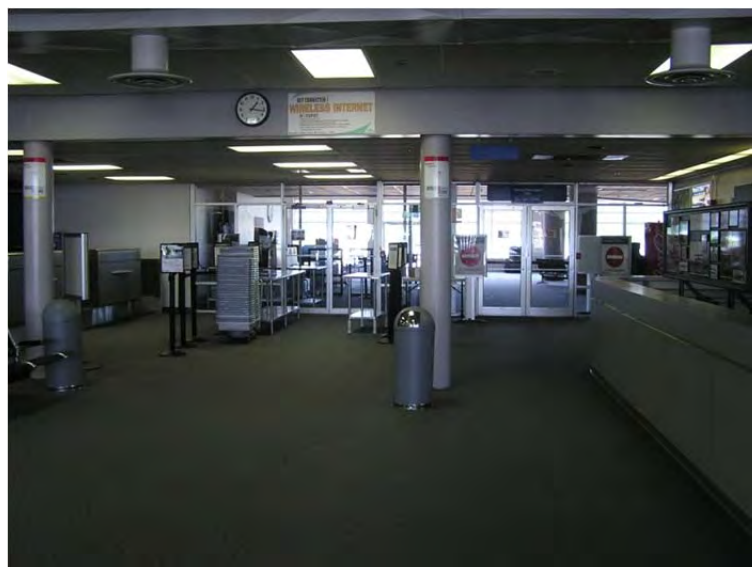
A-20: Roof-mounted mechanical equipment of various vintages

A-21: Terminal building main entry

A-22: Hotel/transportation services phone station



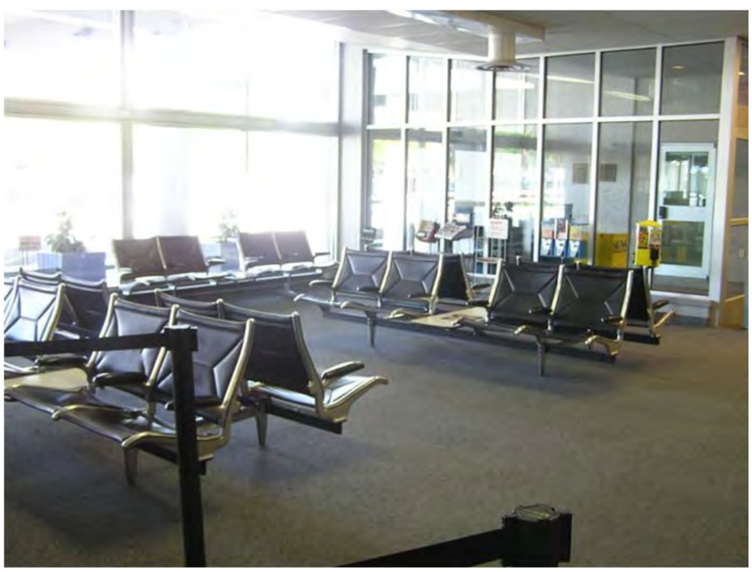
A-23: Rental car and airline ticket counters (airline counter inactive)



A-24: TSA passenger checkpoint and gate lobby landside exit)

A-25: Travel agency counter and offices (inactive)

A-27: Alaska ticket counter

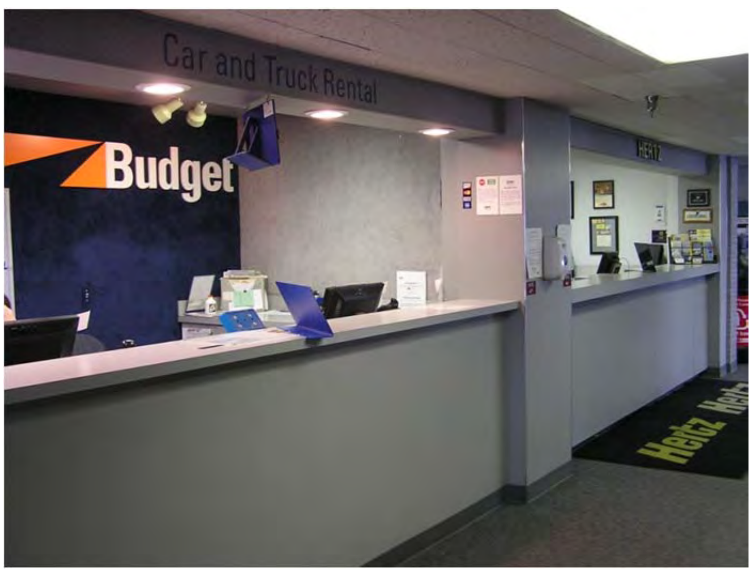


A-28: Ticket lobby seating

A-29: Exposed ductwork in ticket lobby ceiling

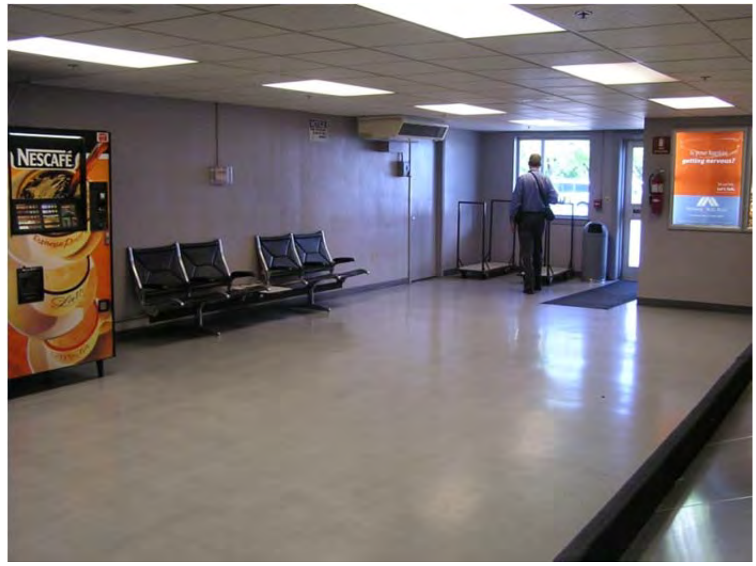
A-30: Food/drink concession (inactive)

A-31: Access to public restrooms and drinking fountain

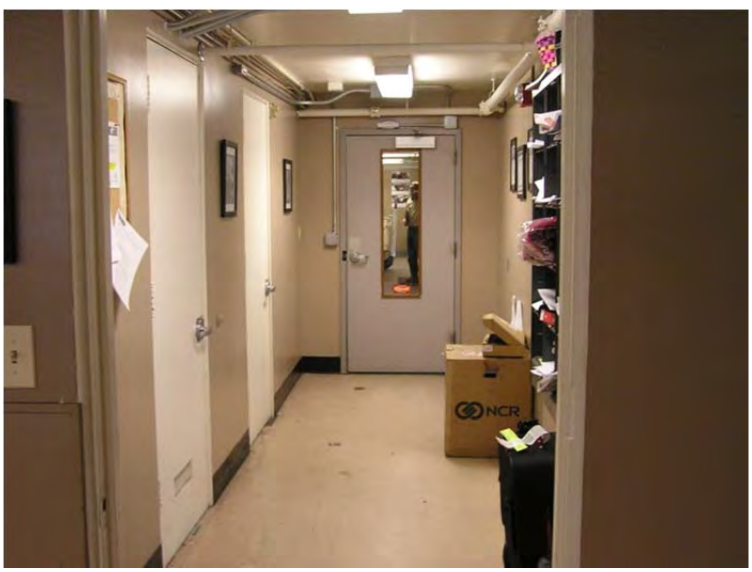


A-32: Rental car counters

A-33: Inbound baggage claim slide



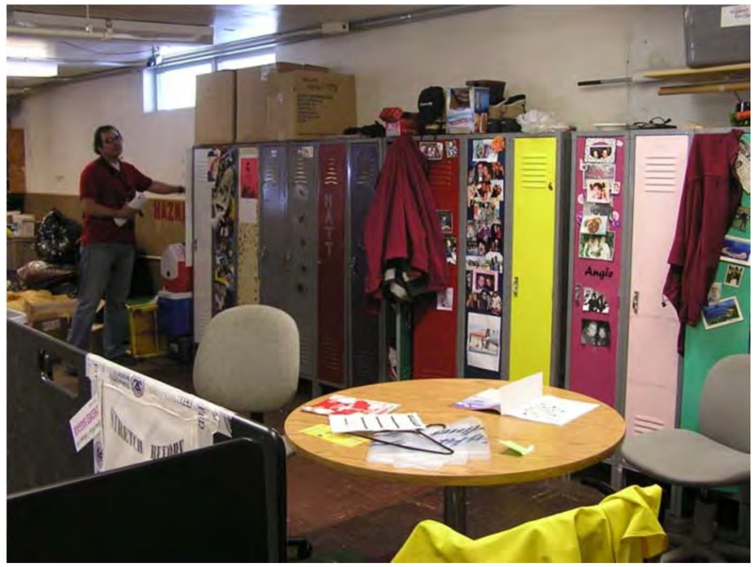
A-34: Baggage claim lobby



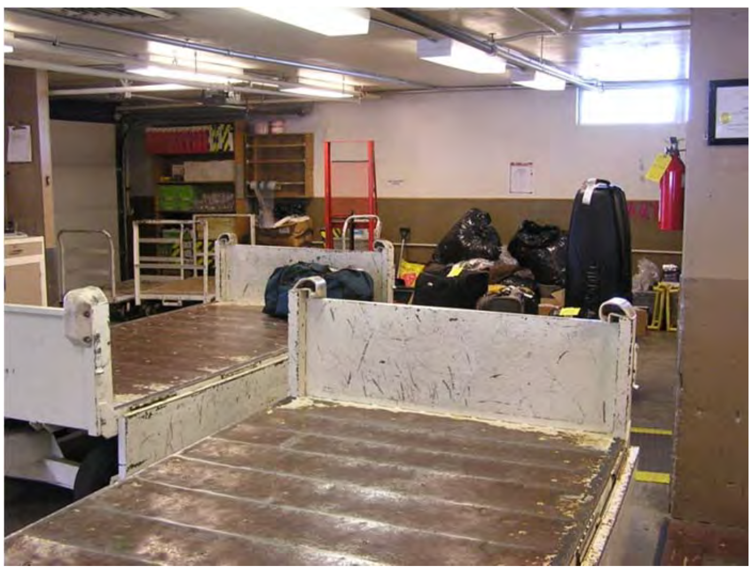
A-35: Horizon ATO access to ticket counters

A-36: Horizon ticket counter baggage belt entering the makeup area

A-37: TSA outbound baggage screening operation



A-38: Horizon staff lockers and break area

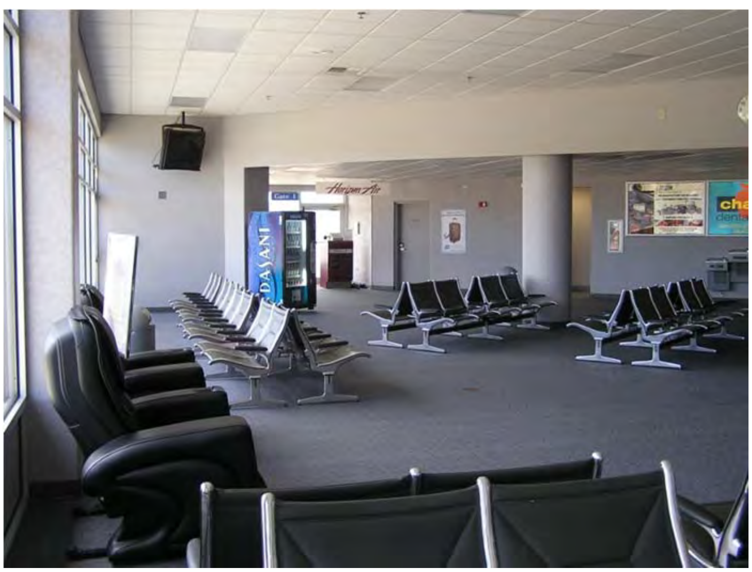


A-39: Horizon air cargo staging area

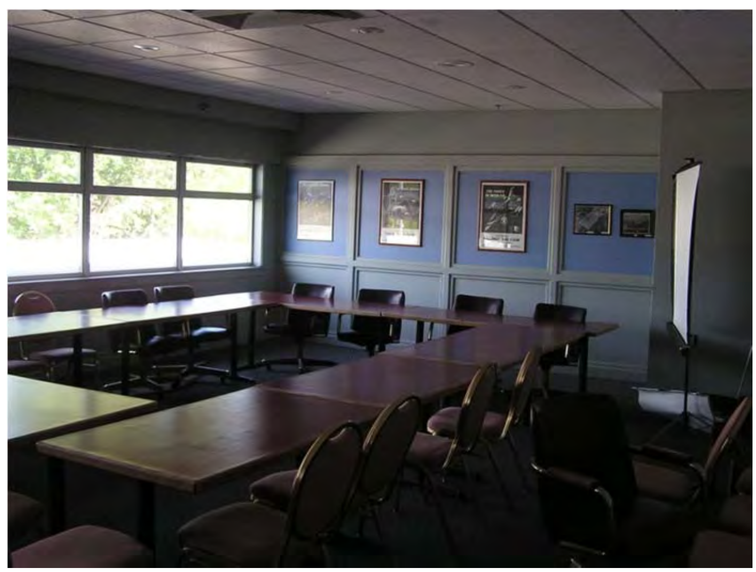
A-40: Horizon outbound baggage makeup area

A-41: Alaska air cargo transaction counter

A-42: Alaska refrigerator and ice machine in makeup area



A-43: Airside gate lobby



A-44: Level 2 banquet/board room

A-45: Lounge space (inactive)

A-46: Lounge deck (inactive)

A-47: Restaurant space (inactive)

A-48: Restaurant commercial kitchen (inactive)

A-49: Office space in former ATCT

A-50: Former ATCT cab (inactive)

B.3 MECHANICAL SYSTEMS

M-1: Storm drain catch basin at entry drive

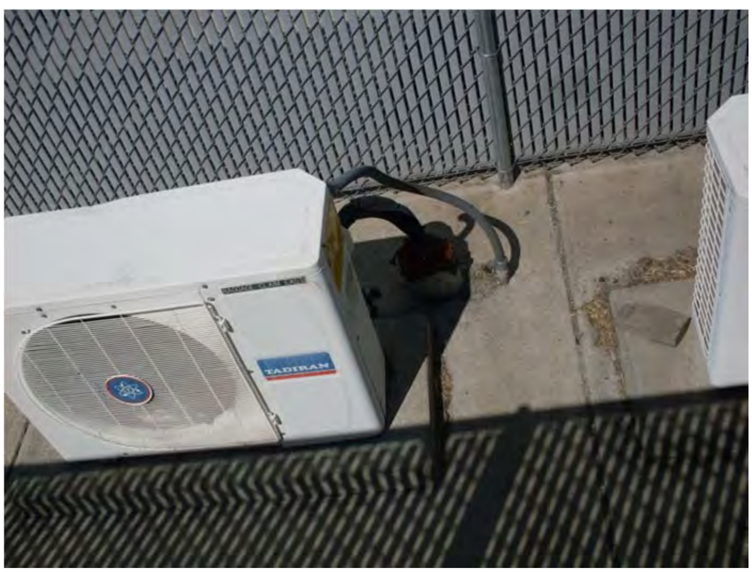
M-2: Fire Department siamese pumper hose connection

M-3: Electric fire alarm gong at front drive

M-4: Typical fire sprinkler head

M-5: Typical electric heater

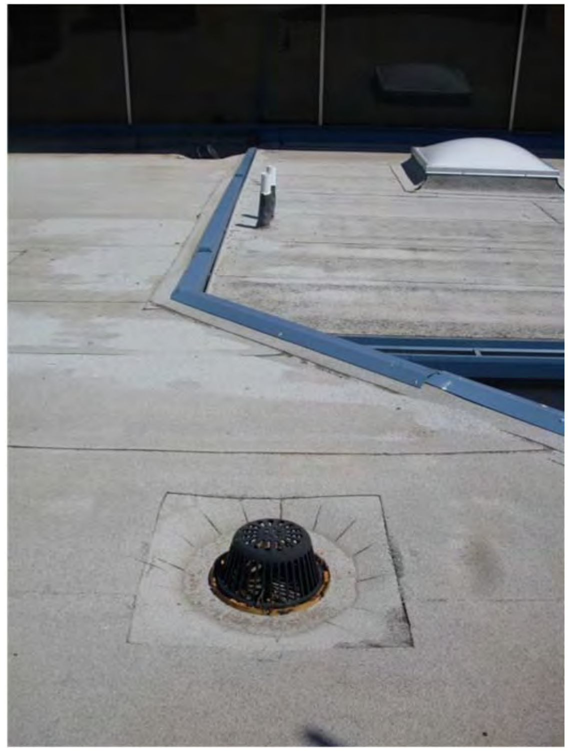
M-6: Parking drainage cleanout



M-7: Typical tenant split AC condensing unit

M-8: Building water meter

M-9: Fire hydrant at entry drive



M-10: Typical roof drain

M-11: Split cooling unit condenser

M-12: Gravity relief integral to rooftop unit

M-13: Typical rooftop ductwork

M-14: Rusty milled steel rooftop gas piping

M-15: Aluminum mushroom roof exhaust fan

M-16: 80% efficient instantaneous gas water heater

M-17: Rusty mild steel rooftop gas piping

M-18: Typical galvanized steel rooftop ductwork

M-19:   Galvanized steel rooftop ductwork

M-20: Double wall galvanized rooftop ductwork

M-21: Abandoned swamp cooler fan

M-22: Kitchen grease hood exhaust fan

*M-24: Failing support blocks –crushed vent flashing

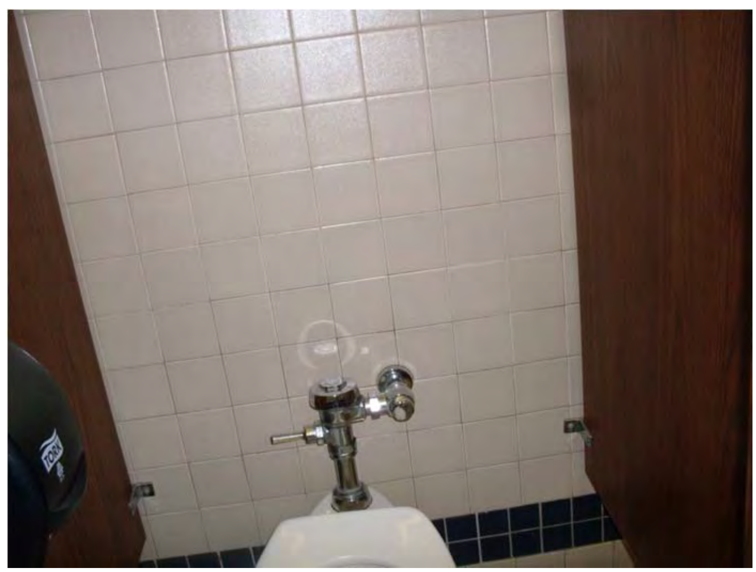
M-25: Through-wall AC unit

*M-23 intentionally skipped.

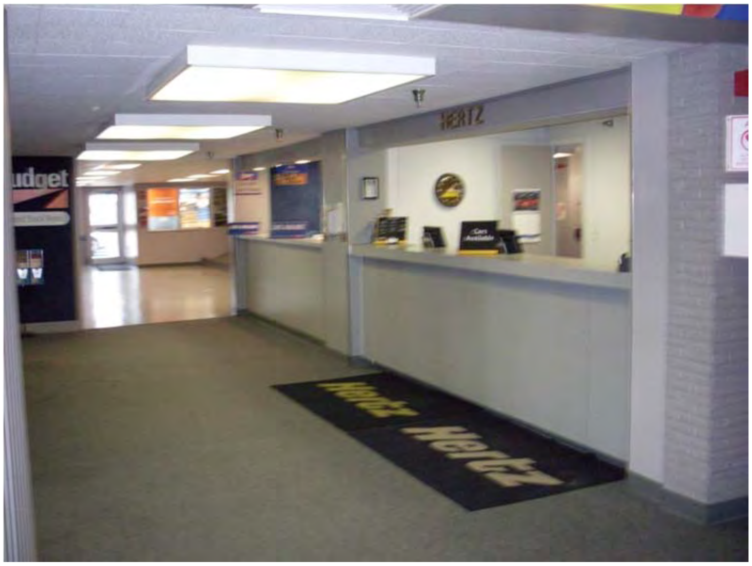
M-26: Typical wall heater

M-27: Renovated self-rimming lavatories/mixing faucet

M-28: Flush valve urinals – one at ADA height

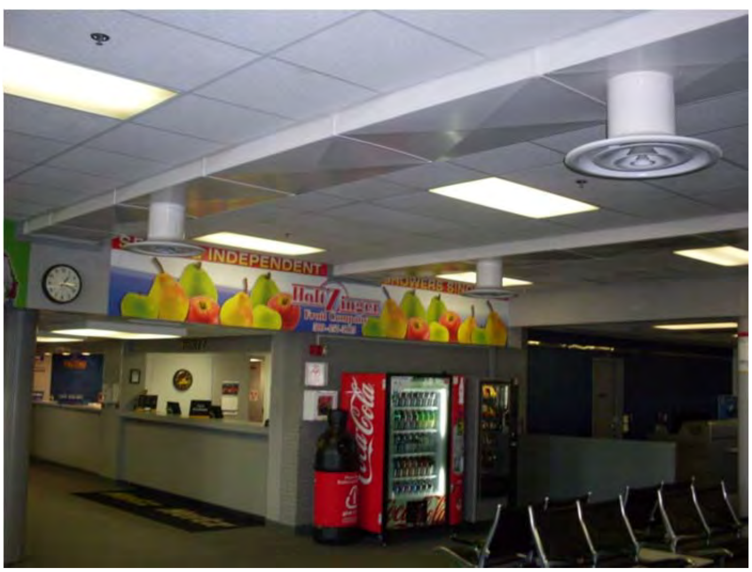


M-29: Manual flush valves on water closets



M-30: Exposed fire sprinkler head

M-31: Semi-recessed fire sprinkler head

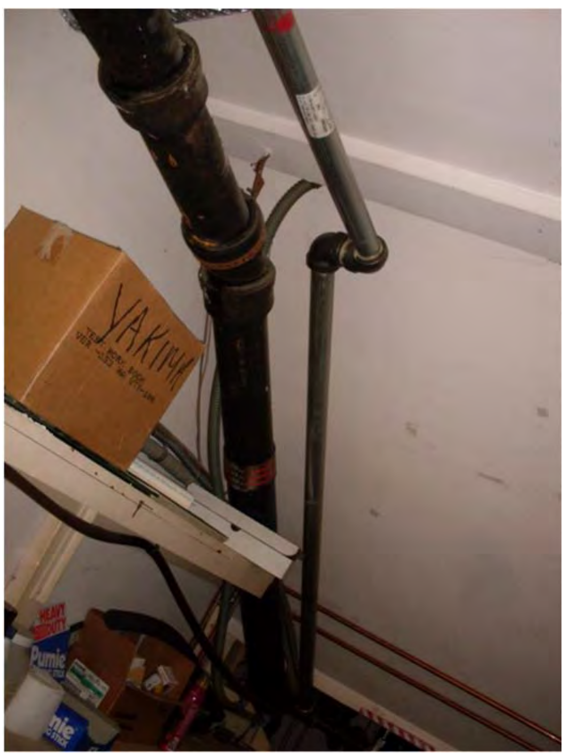


M-32: Ductwork below ceiling

M-33: Year 2000 renovation diffusers

M-34: Missing domestic water pipe insulation

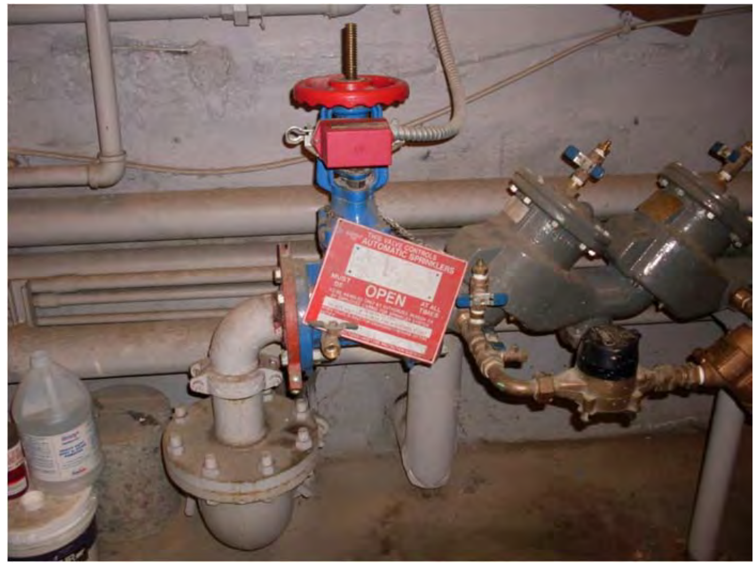
M-35: Typical wall mounted thermostat



M-36: Cast iron hub and spigot waste piping

M-37: Plastic waste and vent piping repairs

M-38: Copper domestic water with brass valves



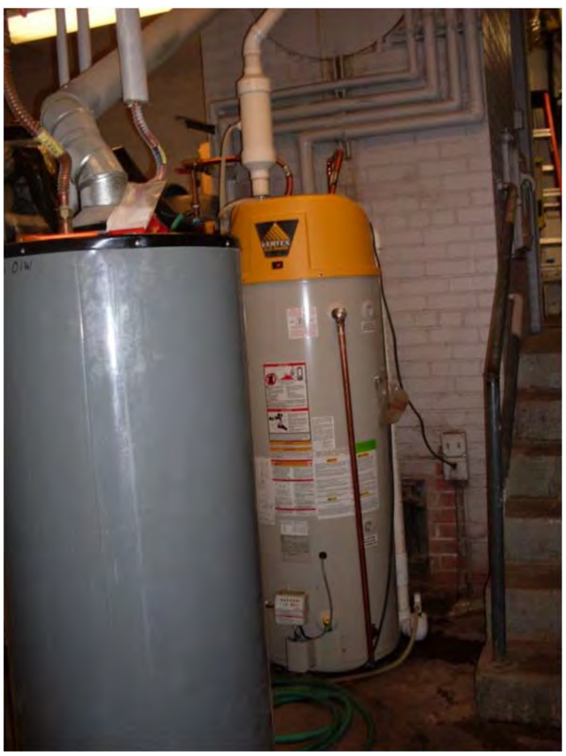
M-39: Fire service main building backflow preventer

M-40: Fire sprinkler pipe with mechanical joints

M-41: Fire sprinkler service entrance transition

M-42: Fire water service pressure = 105 psi static

M-43: Main domestic water regulator without relief



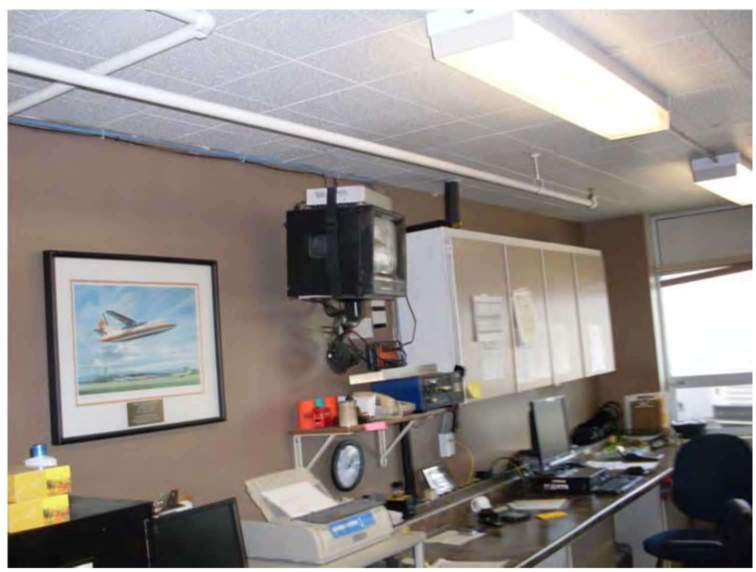
M-44: Newer 90% efficient condensing water heater

M-45: Domestic water thermostatic mixing valve

M-46: Kitchen plumbing fixture in poor condition

M-47: Typical newer electronic thermostat

M-48: Plumbing fixtures in fair condition



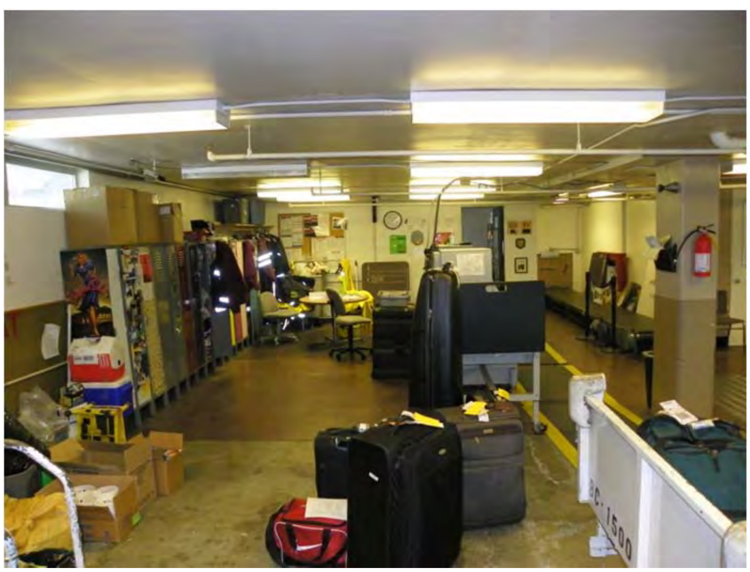
M-49: Exposed fire sprinklers below ceiling

M-50: Gas instantaneous domestic water heater.

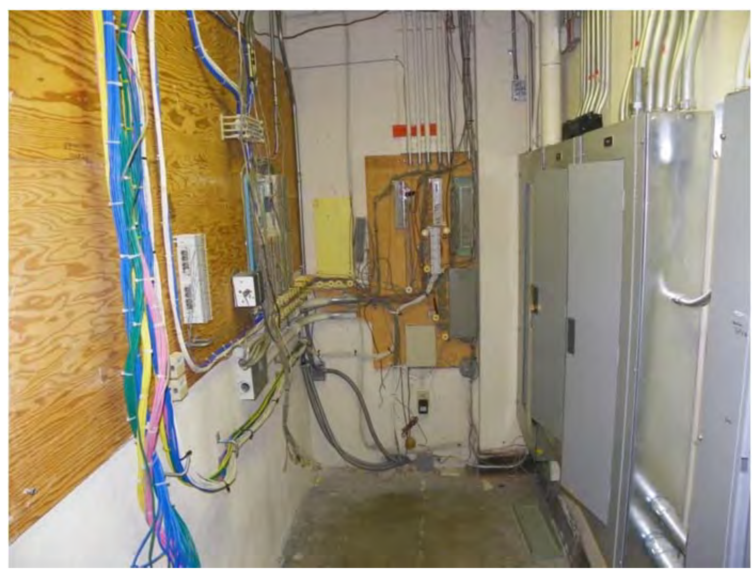
B.4 ELECTRICAL SYSTEMS

E-1: Apron lighting

E-2: Apron lighting



E-3: Baggage area lighting



E-4: Electrical telephone closet

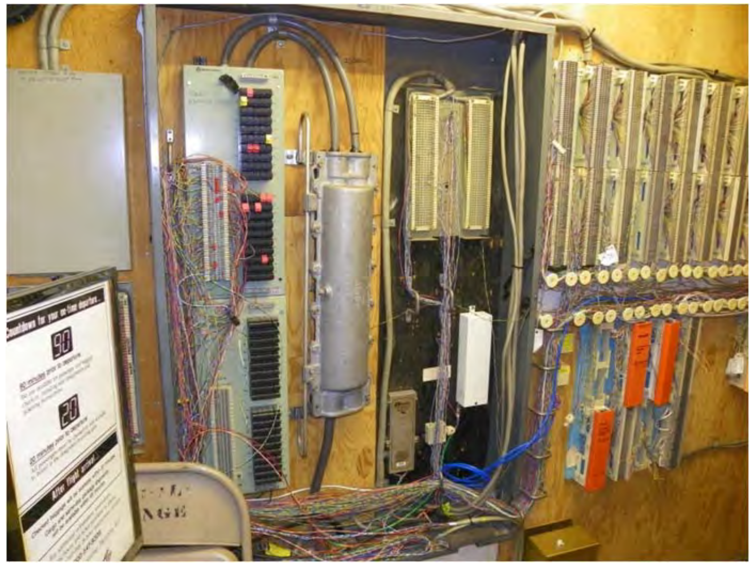
E-5: Fire alarm panel

E-6: Interior lighting

E-7: New and abandoned panels

E-8: Roof panels and conduit routing

E-9: Sound system



E-10: Telephone closet

E-11: Telephone handset

E-12: Transformer and main switchboard

E-13: Under canopy lighting

E-14: Utility primary switch and telephone pedestal

Pavement Management Plan

C

6 PAVEMENT MANAGEMENT PLAN

INTRODUCTION

In 2018, the Washington State Department of Transportation – Aviation Division (WSDOT) conducted an analysis of the condition of runway, apron and taxiway pavements at YKM. The Pavement Condition Index (PCI) is provided to federal, state and local jurisdictions to support strategic pavement management and planning. The PCI ranges from 0–100 (failed to excellent).

Figure 1 and Figure 2 presents existing pavement conditions on the airport as identified in the 2018 PCI report. As shown, most of the airfield pavements are in good condition except for portions of Taxiway B, Runway 4/22, and its connector taxiways (B, B1, andB2), as well as several aprons and hangar taxilanes. Runway 4/22 received a fog seal in 2018 and is in need of reconstruction if it is to remain usable long-term.

Included in Appendix C are the following documents:

1. Pavement Section Details

2. Pavement Distress Data

3. Pavement PCI Summary by Section

4. Recommended Maintenance & Repair Work by Section and Year

Also included in Appendix C is the 2013 URS completed a Pavement Management Plan, completed as part of the 2015 Airport Master Plan update.

Figure 1: 2018 Pavement Condition Map

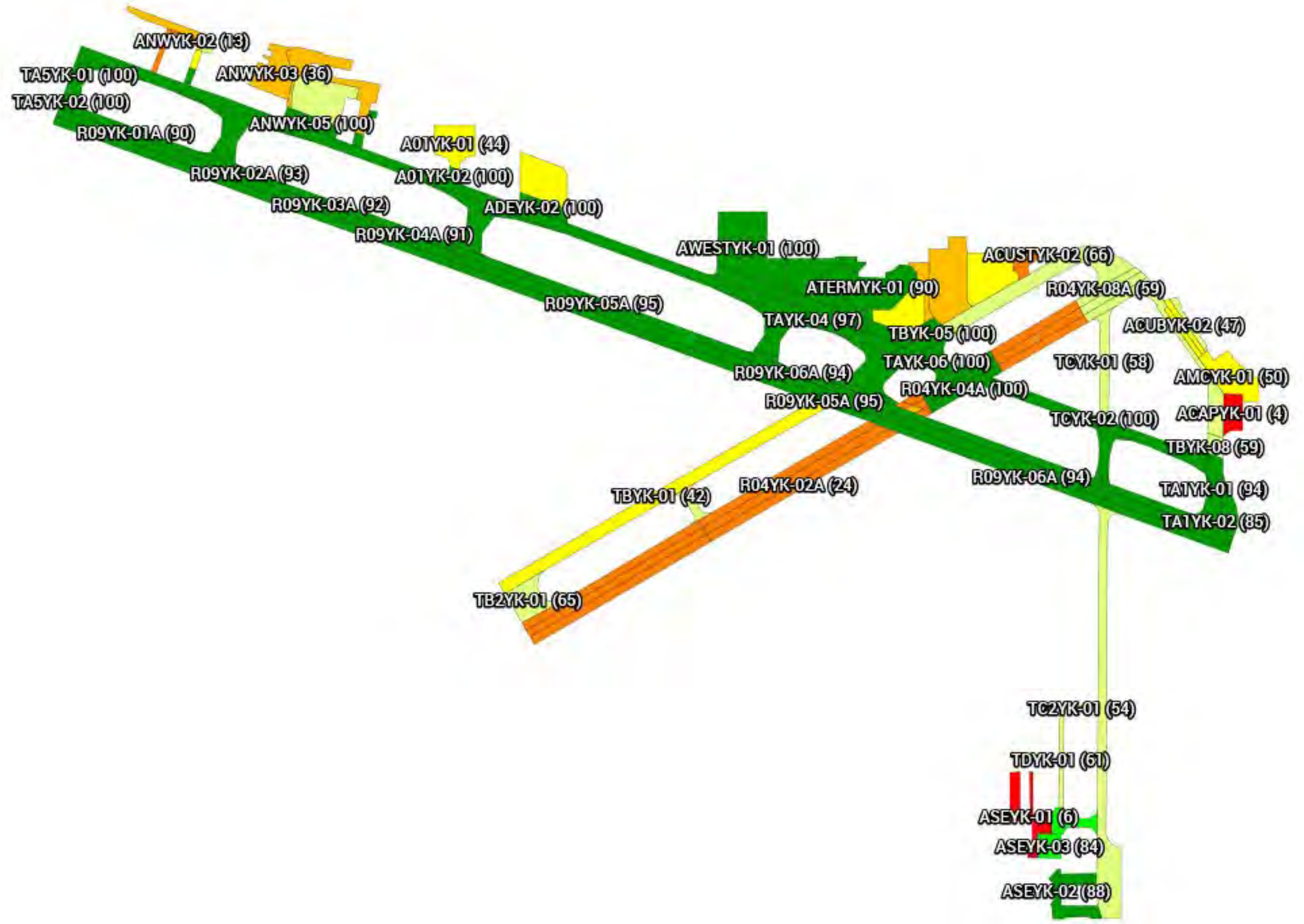
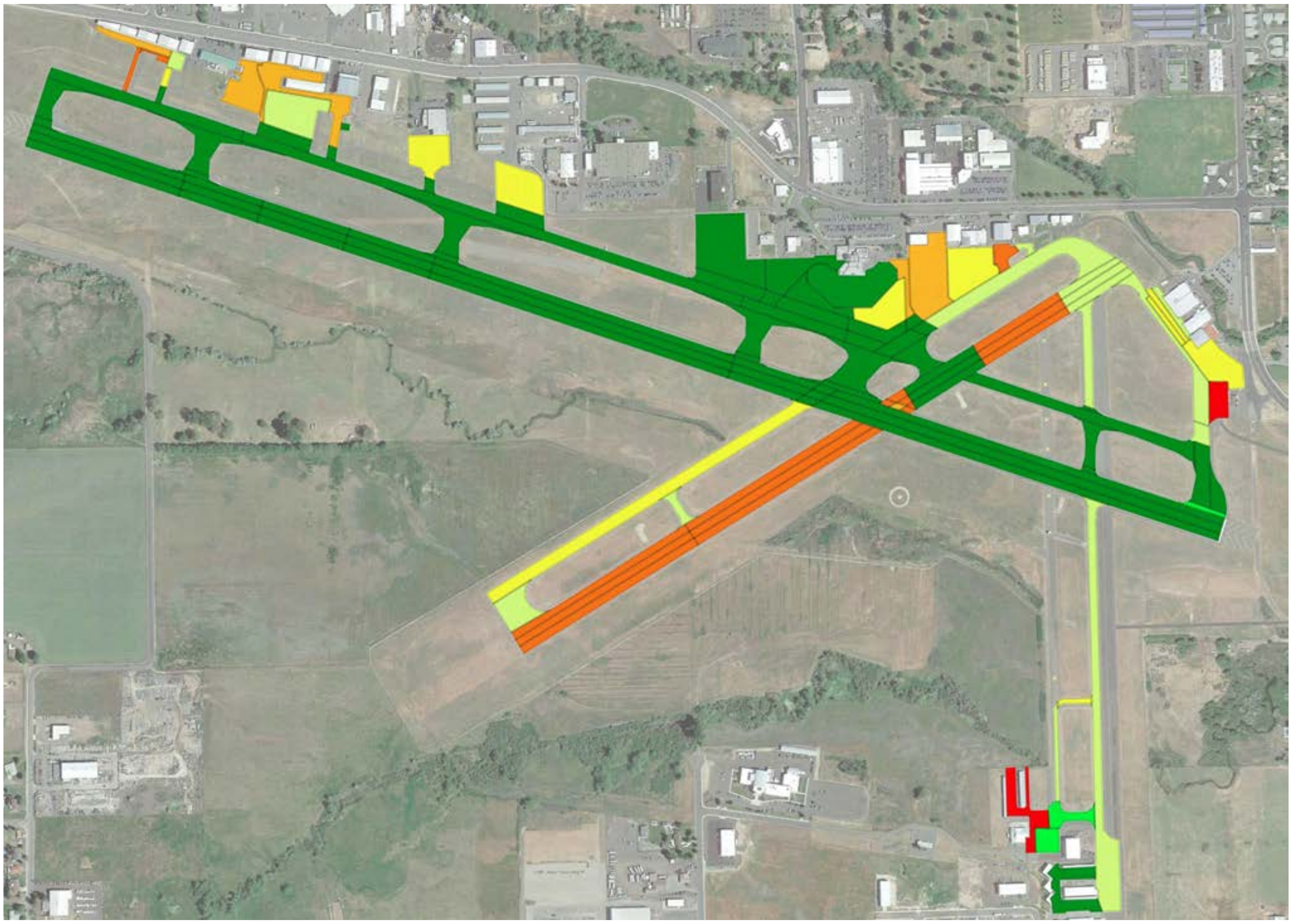


Figure 2: 2018 Pavement Condition Map



Section Inventory Details

Branch ID	Section ID	Surface Type	Area, sf	Last Construction Date	Last Inspection Date
A01YK	01	AC	52,803	6/1/2004	5/15/2018
A01YK	02	AAC	5,016	10/20/2015	5/15/2018
ACAPYK	01	AC	26,166	9/1/1942	5/15/2018
ACENTYK	01	AC	75,375	9/1/1987	5/15/2018
ACUBYK	01	AAC	11,054	9/1/2002	5/15/2018
ACUBYK	02	AAC	12,650	9/1/2002	5/15/2018
ACUBYK	03	AAC	10,023	9/1/2002	5/15/2018
ACUSTYK	01	AC	17,464	6/1/1919	5/15/2018
ACUSTYK	02	AAC	5,607	6/1/2008	5/15/2018
ADEYK	01	AC	69,502	9/3/1987	5/15/2018
ADEYK	02	AAC	24,417	10/20/2015	5/15/2018
AEASTYK	01	AC	106,871	9/1/1984	5/15/2018
AHLD27YK	01	AAC	17,187	10/20/2015	5/14/2018
AMCYK	01	AC	62,071	9/3/1987	5/15/2018
ANWYK	01	AC	20,401	1/11/2011	5/15/2018
ANWYK	02	AC	4,828	6/1/1998	5/15/2018
ANWYK	03	AC	54,932	1/1/1950	5/15/2018
ANWYK	04	AC	77,886	1/1/1950	5/15/2018
ANWYK	05	AAC	26,702	10/20/2015	5/15/2018
ANWYK	06	PCC	2,000	1/1/2015	5/15/2018
ASEYK	01	AC	47,387	1/1/1950	5/15/2018
ASEYK	02	AC	48,051	6/1/2006	5/15/2018
ASEYK	03	AAC	21,021	1/1/2015	5/15/2018
ATCHLDYK	01	AAC	23,528	10/20/2015	5/14/2018
ATCHLDYK	02	AAC	2,982	10/20/2015	5/14/2018

ATERMYK	01	PCC	103,786	9/2/1967	5/14/2018
ATERMYK	02	AAC	57,804	8/2/2018	8/3/2018
ATERMYK	03	AAC	31,727	8/2/2018	8/3/2018
ATERMYK	04	AC	54,497	9/3/1988	5/14/2018
ATERMYK	05	AAC	17,167	9/1/1988	5/14/2018
ATERMYK	06	AAC	8,177	10/20/2015	5/14/2018
ATERMYK	07	AAC	35,452	10/20/2015	5/14/2018
ATERMYK	08	AAC	28,354	10/20/2015	5/15/2018
ATERMYK	09	AAC	5,714	10/20/2015	5/15/2018
AWESTYK	01	AAC	131,214	8/2/2018	8/3/2018
AWESTYK	02	AAC	33,981	10/20/2015	5/15/2018
R04YK	01A	AAC	184,641	9/1/1986	5/14/2018
R04YK	01B	AAC	94,649	9/1/1986	5/14/2018
R04YK	02A	AAC	121,313	9/1/1986	5/14/2018
R04YK	02B	AAC	64,792	9/1/1986	5/14/2018
R04YK	03A	AAC	4,977	9/1/1995	5/14/2018
R04YK	03B	AAC	2,518	9/1/1995	5/14/2018
R04YK	04A	AAC	48,505	10/20/2015	5/14/2018
R04YK	04B	AAC	24,650	10/20/2015	5/14/2018
R04YK	08A	AAC	42,982	9/2/2002	5/14/2018
R04YK	08B	AAC	22,260	9/2/2002	5/14/2018
R09YK	01A	AAC	98,000	10/29/2010	5/14/2018
R09YK	01B	AAC	49,019	10/29/2010	5/14/2018
R09YK	02A	AAC	49,600	10/29/2010	5/14/2018
R09YK	02B	AAC	24,790	10/29/2010	5/14/2018
R09YK	03A	AAC	55,600	10/29/2010	5/14/2018
R09YK	03B	AAC	27,800	10/29/2010	5/14/2018
R09YK	04A	AAC	54,700	10/29/2010	5/14/2018

R09YK	04B	AAC	27,314	10/29/2010	5/14/2018
R09YK	05A	AAC	188,328	10/29/2010	5/14/2018
R09YK	05B	AAC	100,882	10/29/2010	5/14/2018
R09YK	06A	AAC	291,485	10/29/2010	5/14/2018
R09YK	06B	AAC	151,113	10/29/2010	5/14/2018
TA1YK	01	AAC	37,094	10/20/2015	5/14/2018
TA1YK	02	AAC	6,393	10/20/2015	5/14/2018
TA2YK	01	AAC	47,063	10/20/2015	5/14/2018
TA2YK	02	AAC	5,359	10/20/2015	5/14/2018
TA3YK	01	AAC	51,113	10/20/2015	5/14/2018
TA3YK	02	AAC	5,462	10/20/2015	5/14/2018
TA4YK	01	AAC	47,148	10/20/2015	5/14/2018
TA4YK	02	AAC	6,180	10/20/2015	5/14/2018
TA5YK	01	AAC	31,748	10/20/2015	5/14/2018
TA5YK	02	AAC	6,047	10/20/2015	5/14/2018
TAYK	01	AAC	84,504	10/20/2015	5/14/2018
TAYK	02	AAC	208,755	10/20/2015	5/14/2018
TAYK	04	AAC	44,571	10/20/2015	5/14/2018
TAYK	05	AAC	15,211	10/20/2015	5/14/2018
TAYK	06	AAC	31,017	10/20/2015	5/14/2018
TAYK	07	AAC	98,365	10/20/2015	5/14/2018
TB1YK	01	AC	13,103	9/2/1984	5/14/2018
TB2YK	01	AAC	42,784	9/1/1976	5/14/2018
TBYK	01	AAC	168,501	9/1/1976	5/14/2018
TBYK	02	AAC	13,078	10/20/2015	5/14/2018
TBYK	03	AAC	62,790	10/20/2015	5/14/2018
TBYK	04	AAC	22,744	10/20/2015	5/14/2018
TBYK	05	AAC	7,678	10/20/2015	5/14/2018

TBYK	06	AAC	123,350	9/1/2002	5/14/2018
TBYK	07	AAC	56,053	9/2/2002	5/15/2018
TBYK	08	AAC	12,059	9/2/2002	5/15/2018
TC1YK	01	AC	24,484	1/1/1950	5/15/2018
TC2YK	01	AC	6,753	1/1/1950	5/15/2018
TCYK	01	AC	35,338	9/2/2002	5/15/2018
TCYK	02	AAC	2,040	10/20/2015	5/15/2018
TCYK	04	AAC	172,788	9/1/2005	5/15/2018
TDYK	01	AC	15,976	1/1/1950	5/15/2018
TL01YK	01	AC	8,133	1/1/1950	5/15/2018
TL02YK	01	AC	9,665	1/1/1950	5/15/2018
TL03YK	01	AC	4,819	1/1/1950	5/15/2018
TL03YK	02	AAC	4,058	10/20/2015	5/15/2018
TL04YK	01	AC	77,724	1/1/1950	5/15/2018
TL04YK	02	AAC	4,708	10/20/2015	5/15/2018

Distress Data

Branch ID	Section ID	Inspection Date	Distress (Severity)	Extrapolated Quantity	Units
A01YK	01	5/15/2018	Alligator Cracking (Medium)	1,681	sf
A01YK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	999	ft
A01YK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	2,465	ft
A01YK	01	5/15/2018	Rutting (Medium)	362	sf
A01YK	01	5/15/2018	Weathering (Low)	52,803	sf
A01YK	02	5/15/2018	No distresses found.		
ACAPYK	01	5/15/2018	Block Cracking (High)	8,312	sf
ACAPYK	01	5/15/2018	Block Cracking (Medium)	15,988	sf
ACAPYK	01	5/15/2018	Patching (High)	410	sf
ACAPYK	01	5/15/2018	Patching (Low)	607	sf
ACAPYK	01	5/15/2018	Patching (Medium)	849	sf
ACAPYK	01	5/15/2018	Weathering (High)	24,300	sf
ACENTYK	01	5/15/2018	Alligator Cracking (Medium)	86	sf
ACENTYK	01	5/15/2018	Longitudinal and Transverse Cracking (High)	143	ft
ACENTYK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	944	ft
ACENTYK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	6,090	ft
ACENTYK	01	5/15/2018	Patching (Low)	1,773	sf
ACENTYK	01	5/15/2018	Raveling (High)	6	sf
ACENTYK	01	5/15/2018	Weathering (Medium)	73,596	sf
ACUBYK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	600	ft
ACUBYK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	850	ft
ACUBYK	01	5/15/2018	Weathering (Medium)	11,054	sf
ACUBYK	02	5/15/2018	Alligator Cracking (Medium)	100	sf
ACUBYK	02	5/15/2018	Block Cracking (Low)	11,200	sf
ACUBYK	02	5/15/2018	Longitudinal and Transverse Cracking (Medium)	162	ft
ACUBYK	02	5/15/2018	Weathering (Medium)	12,650	sf
ACUBYK	03	5/15/2018	Block Cracking (Low)	6,023	sf
ACUBYK	03	5/15/2018	Block Cracking (Medium)	4,000	sf
ACUBYK	03	5/15/2018	Weathering (Medium)	10,023	sf
ACUSTYK	01	5/15/2018	Alligator Cracking (High)	21	sf
ACUSTYK	01	5/15/2018	Alligator Cracking (Medium)	532	sf

ACUSTYK	01	5/15/2018	Depression (Low)	48	sf
ACUSTYK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	274	ft
ACUSTYK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	1,276	ft
ACUSTYK	01	5/15/2018	Patching (Medium)	3,491	sf
ACUSTYK	01	5/15/2018	Raveling (High)	1,452	sf
ACUSTYK	01	5/15/2018	Weathering (Medium)	12,521	sf
ACUSTYK	02	5/15/2018	Longitudinal and Transverse Cracking (Low)	157	ft
ACUSTYK	02	5/15/2018	Patching (Low)	1,700	sf
ACUSTYK	02	5/15/2018	Patching (Medium)	100	sf
ADEYK	01	5/15/2018	Alligator Cracking (Low)	558	sf
ADEYK	01	5/15/2018	Alligator Cracking (Medium)	234	sf
ADEYK	01	5/15/2018	Block Cracking (Low)	4,674	sf
ADEYK	01	5/15/2018	Longitudinal and Transverse Cracking (High)	380	ft
ADEYK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	856	ft
ADEYK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	4,584	ft
ADEYK	01	5/15/2018	Raveling (High)	9	sf
ADEYK	01	5/15/2018	Weathering (Low)	6,719	sf
ADEYK	01	5/15/2018	Weathering (Medium)	28,090	sf
ADEYK	02	5/15/2018	No distresses found.		
AEASTYK	01	5/15/2018	Alligator Cracking (Medium)	2,806	sf
AEASTYK	01	5/15/2018	Longitudinal and Transverse Cracking (High)	3,204	ft
AEASTYK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	981	ft
AEASTYK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	3,384	ft
AEASTYK	01	5/15/2018	Patching (High)	4	sf
AEASTYK	01	5/15/2018	Weathering (Medium)	106,867	sf
AHLD27YK	01	5/14/2018	No distresses found.		
AMCYK	01	5/15/2018	Alligator Cracking (Medium)	10	sf
AMCYK	01	5/15/2018	Block Cracking (Low)	6,169	sf
AMCYK	01	5/15/2018	Longitudinal and Transverse Cracking (High)	482	ft
AMCYK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	391	ft
AMCYK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	3,562	ft
AMCYK	01	5/15/2018	Patching (Low)	76	sf
AMCYK	01	5/15/2018	Patching (Medium)	1,155	sf
AMCYK	01	5/15/2018	Raveling (High)	38	sf

AMCYK	01	5/15/2018	Weathering (Medium)	60,802	sf
ANWYK	01	5/15/2018	Alligator Cracking (Medium)	1,240	sf
ANWYK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	944	ft
ANWYK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	235	ft
ANWYK	01	5/15/2018	Patching (Low)	901	sf
ANWYK	01	5/15/2018	Weathering (Medium)	19,500	sf
ANWYK	02	5/15/2018	Alligator Cracking (Medium)	1,620	sf
ANWYK	02	5/15/2018	Longitudinal and Transverse Cracking (Medium)	89	ft
ANWYK	02	5/15/2018	Rutting (Low)	40	sf
ANWYK	02	5/15/2018	Rutting (Medium)	30	sf
ANWYK	02	5/15/2018	Weathering (Low)	4,828	sf
ANWYK	03	5/15/2018	Alligator Cracking (Medium)	6,604	sf
ANWYK	03	5/15/2018	Bleeding (N/A)	43	sf
ANWYK	03	5/15/2018	Block Cracking (Low)	4,279	sf
ANWYK	03	5/15/2018	Longitudinal and Transverse Cracking (Low)	682	ft
ANWYK	03	5/15/2018	Longitudinal and Transverse Cracking (Medium)	2,839	ft
ANWYK	03	5/15/2018	Swelling (Low)	86	sf
ANWYK	03	5/15/2018	Weathering (High)	1,141	sf
ANWYK	03	5/15/2018	Weathering (Medium)	53,748	sf
ANWYK	04	5/15/2018	Alligator Cracking (Medium)	13	sf
ANWYK	04	5/15/2018	Depression (Low)	32	sf
ANWYK	04	5/15/2018	Longitudinal and Transverse Cracking (Low)	2,854	ft
ANWYK	04	5/15/2018	Longitudinal and Transverse Cracking (Medium)	4,032	ft
ANWYK	04	5/15/2018	Swelling (Low)	38	sf
ANWYK	04	5/15/2018	Weathering (High)	824	sf
ANWYK	04	5/15/2018	Weathering (Medium)	77,062	sf
ANWYK	05	5/15/2018	No distresses found.		
ANWYK	06	5/15/2018	Joint Sealant Damage (High)	9	slabs
ASEYK	01	5/15/2018	Alligator Cracking (High)	1,226	sf
ASEYK	01	5/15/2018	Alligator Cracking (Medium)	46,151	sf
ASEYK	01	5/15/2018	Patching (High)	10	sf
ASEYK	01	5/15/2018	Rutting (Medium)	2,903	sf
ASEYK	01	5/15/2018	Weathering (Medium)	47,377	sf
ASEYK	02	5/15/2018	Depression (Low)	6	sf

ASEYK	02	5/15/2018	Longitudinal and Transverse Cracking (Low)	1,724	ft
ASEYK	03	5/15/2018	Longitudinal and Transverse Cracking (Low)	1,209	ft
ATCHLDYK	01	5/14/2018	No distresses found.		
ATCHLDYK	02	5/14/2018	No distresses found.		
ATERMYK	01	5/14/2018	Corner Spalling (Low)	8	slabs
ATERMYK	01	5/14/2018	Corner Spalling (Medium)	8	slabs
ATERMYK	01	5/14/2018	Joint Spalling (Low)	27	slabs
ATERMYK	01	5/14/2018	Joint Spalling (Medium)	12	slabs
ATERMYK	01	5/14/2018	LTD Cracking (Low)	19	slabs
ATERMYK	01	5/14/2018	LTD Cracking (Medium)	8	slabs
ATERMYK	01	5/14/2018	Shrinkage Cracking (N/A)	4	slabs
ATERMYK	01	5/14/2018	Small Patch (Low)	89	slabs
ATERMYK	01	5/14/2018	Small Patch (Medium)	16	slabs
ATERMYK	02	8/3/2018	No distresses found.		
ATERMYK	03	8/3/2018	No distresses found.		
ATERMYK	04	5/14/2018	Alligator Cracking (Medium)	702	sf
ATERMYK	04	5/14/2018	Longitudinal and Transverse Cracking (Low)	4,432	ft
ATERMYK	04	5/14/2018	Longitudinal and Transverse Cracking (Medium)	2,210	ft
ATERMYK	04	5/14/2018	Weathering (Medium)	54,497	sf
ATERMYK	05	5/14/2018	Block Cracking (Medium)	5,284	sf
ATERMYK	05	5/14/2018	Longitudinal and Transverse Cracking (Low)	17	ft
ATERMYK	05	5/14/2018	Longitudinal and Transverse Cracking (Medium)	1,115	ft
ATERMYK	05	5/14/2018	Patching (Low)	193	sf
ATERMYK	05	5/14/2018	Weathering (High)	15,878	sf
ATERMYK	05	5/14/2018	Weathering (Low)	1,095	sf
ATERMYK	06	5/14/2018	No distresses found.		
ATERMYK	07	5/14/2018	No distresses found.		
ATERMYK	08	5/15/2018	Longitudinal and Transverse Cracking (Low)	28	ft
ATERMYK	09	5/15/2018	No distresses found.		
AWESTYK	01	8/3/2018	No distresses found.		
AWESTYK	02	5/15/2018	No distresses found.		
R04YK	01A	5/14/2018	Longitudinal and Transverse Cracking (Low)	15,547	ft
R04YK	01A	5/14/2018	Longitudinal and Transverse Cracking (Medium)	7,238	ft
R04YK	01A	5/14/2018	Raveling (High)	18,907	sf

R04YK	01A	5/14/2018	Raveling (Medium)	165,734	sf
R04YK	01B	5/14/2018	Block Cracking (Low)	3,407	sf
R04YK	01B	5/14/2018	Longitudinal and Transverse Cracking (Low)	9,238	ft
R04YK	01B	5/14/2018	Longitudinal and Transverse Cracking (Medium)	2,582	ft
R04YK	01B	5/14/2018	Raveling (High)	15,144	sf
R04YK	01B	5/14/2018	Raveling (Medium)	79,505	sf
R04YK	02A	5/14/2018	Longitudinal and Transverse Cracking (Low)	6,695	ft
R04YK	02A	5/14/2018	Longitudinal and Transverse Cracking (Medium)	5,627	ft
R04YK	02A	5/14/2018	Raveling (High)	9,934	sf
R04YK	02A	5/14/2018	Raveling (Medium)	111,379	sf
R04YK	02B	5/14/2018	Longitudinal and Transverse Cracking (Low)	2,972	ft
R04YK	02B	5/14/2018	Longitudinal and Transverse Cracking (Medium)	3,884	ft
R04YK	02B	5/14/2018	Raveling (High)	13,822	sf
R04YK	02B	5/14/2018	Raveling (Medium)	50,970	sf
R04YK	03A	5/14/2018	Longitudinal and Transverse Cracking (Low)	100	ft
R04YK	03A	5/14/2018	Longitudinal and Transverse Cracking (Medium)	302	ft
R04YK	03A	5/14/2018	Raveling (High)	500	sf
R04YK	03A	5/14/2018	Raveling (Medium)	4,477	sf
R04YK	03B	5/14/2018	Longitudinal and Transverse Cracking (Low)	185	ft
R04YK	03B	5/14/2018	Longitudinal and Transverse Cracking (Medium)	27	ft
R04YK	03B	5/14/2018	Raveling (Medium)	2,518	sf
R04YK	04A	5/14/2018	No distresses found.		
R04YK	04B	5/14/2018	No distresses found.		
R04YK	08A	5/14/2018	Block Cracking (Low)	42,982	sf
R04YK	08A	5/14/2018	Weathering (Medium)	42,982	sf
R04YK	08B	5/14/2018	Block Cracking (Low)	22,260	sf
R04YK	08B	5/14/2018	Weathering (Medium)	22,260	sf
R09YK	01A	5/14/2018	Longitudinal and Transverse Cracking (Low)	2,429	ft
R09YK	01A	5/14/2018	Weathering (Low)	9,800	sf
R09YK	01B	5/14/2018	Longitudinal and Transverse Cracking (Low)	1,749	ft
R09YK	01B	5/14/2018	Weathering (Low)	4,902	sf
R09YK	02A	5/14/2018	Longitudinal and Transverse Cracking (Low)	724	ft
R09YK	02A	5/14/2018	Weathering (Low)	4,960	sf
R09YK	02B	5/14/2018	Longitudinal and Transverse Cracking (Low)	345	ft

R09YK	02B	5/14/2018	Weathering (Low)	2,479	sf
R09YK	03A	5/14/2018	Longitudinal and Transverse Cracking (Low)	851	ft
R09YK	03A	5/14/2018	Weathering (Low)	5,560	sf
R09YK	03B	5/14/2018	Longitudinal and Transverse Cracking (Low)	279	ft
R09YK	03B	5/14/2018	Weathering (Low)	2,780	sf
R09YK	04A	5/14/2018	Longitudinal and Transverse Cracking (Low)	1,097	ft
R09YK	04A	5/14/2018	Weathering (Low)	5,470	sf
R09YK	04B	5/14/2018	Longitudinal and Transverse Cracking (Low)	395	ft
R09YK	04B	5/14/2018	Weathering (Low)	2,731	sf
R09YK	05A	5/14/2018	Longitudinal and Transverse Cracking (Low)	929	ft
R09YK	05A	5/14/2018	Weathering (Low)	18,833	sf
R09YK	05B	5/14/2018	Longitudinal and Transverse Cracking (Low)	544	ft
R09YK	05B	5/14/2018	Weathering (Low)	10,090	sf
R09YK	06A	5/14/2018	Longitudinal and Transverse Cracking (Low)	3,031	ft
R09YK	06A	5/14/2018	Weathering (Low)	29,148	sf
R09YK	06B	5/14/2018	Longitudinal and Transverse Cracking (Low)	2,509	ft
R09YK	06B	5/14/2018	Weathering (Low)	15,111	sf
TA1YK	01	5/14/2018	Longitudinal and Transverse Cracking (Low)	26	ft
TA1YK	01`	5/14/2018	Patching (Low)	1,748	sf
TA1YK	02	5/14/2018	Patching (Low)	700	sf
TA2YK	01	5/14/2018	Longitudinal and Transverse Cracking (Low)	232	ft
TA2YK	02	5/14/2018	No distresses found.		
TA3YK	01	5/14/2018	Longitudinal and Transverse Cracking (Low)	62	ft
TA3YK	02	5/14/2018	No distresses found.		
TA4YK	01	5/14/2018	No distresses found.		
TA4YK	02	5/14/2018	No distresses found.		
TA5YK	01	5/14/2018	No distresses found.		
TA5YK	02	5/14/2018	No distresses found.		
TAYK	01	5/14/2018	No distresses found.		
TAYK	02	5/14/2018	Longitudinal and Transverse Cracking (Low)	226	ft
TAYK	04	5/14/2018	Longitudinal and Transverse Cracking (Low)	194	ft
TAYK	05	5/14/2018	Longitudinal and Transverse Cracking (Low)	16	ft
TAYK	06	5/14/2018	No distresses found.		
TAYK	07	5/14/2018	No distresses found.		

TB1YK	01	5/14/2018	Longitudinal and Transverse Cracking (High)	250	ft
TB1YK	01	5/14/2018	Longitudinal and Transverse Cracking (Low)	597	ft
TB1YK	01	5/14/2018	Weathering (Medium)	13,103	sf
TB2YK	01	5/14/2018	Depression (Low)	40	sf
TB2YK	01	5/14/2018	Longitudinal and Transverse Cracking (High)	40	ft
TB2YK	01	5/14/2018	Longitudinal and Transverse Cracking (Low)	3,652	ft
TB2YK	01	5/14/2018	Longitudinal and Transverse Cracking (Medium)	805	ft
TB2YK	01	5/14/2018	Weathering (Medium)	42,784	sf
TBYK	01	5/14/2018	Bleeding (N/A)	1,346	sf
TBYK	01	5/14/2018	Block Cracking (Low)	49,701	sf
TBYK	01	5/14/2018	Block Cracking (Medium)	17,834	sf
TBYK	01	5/14/2018	Depression (Low)	385	sf
TBYK	01	5/14/2018	Longitudinal and Transverse Cracking (Low)	10,186	ft
TBYK	01	5/14/2018	Longitudinal and Transverse Cracking (Medium)	12,808	ft
TBYK	01	5/14/2018	Raveling (High)	769	sf
TBYK	01	5/14/2018	Rutting (Low)	96	sf
TBYK	01	5/14/2018	Weathering (Medium)	166,385	sf
TBYK	02	5/14/2018	No distresses found.		
TBYK	03	5/14/2018	No distresses found.		
TBYK	04	5/14/2018	No distresses found.		
TBYK	05	5/14/2018	No distresses found.		
TBYK	06	5/14/2018	Block Cracking (Low)	109,235	sf
TBYK	06	5/14/2018	Longitudinal and Transverse Cracking (Low)	3,196	ft
TBYK	06	5/14/2018	Longitudinal and Transverse Cracking (Medium)	543	ft
TBYK	06	5/14/2018	Weathering (Medium)	123,350	sf
TBYK	07	5/15/2018	Block Cracking (Low)	56,053	sf
TBYK	07	5/15/2018	Weathering (Medium)	56,053	sf
TBYK	08	5/15/2018	Block Cracking (Low)	12,059	sf
TBYK	08	5/15/2018	Weathering (Medium)	12,059	sf
TC1YK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	1,424	ft
TC1YK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	82	ft
TC1YK	01	5/15/2018	Raveling (Low)	183	sf
TC1YK	01	5/15/2018	Weathering (Low)	24,484	sf
TC2YK	01	5/15/2018	Longitudinal and Transverse Cracking (High)	45	ft

TC2YK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	370	ft
TC2YK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	302	ft
TC2YK	01	5/15/2018	Swelling (Low)	10	sf
TC2YK	01	5/15/2018	Swelling (Medium)	3	sf
TC2YK	01	5/15/2018	Weathering (Medium)	6,880	sf
TCYK	01	5/15/2018	Block Cracking (Low)	35,338	sf
TCYK	01	5/15/2018	Weathering (High)	720	sf
TCYK	01	5/15/2018	Weathering (Medium)	34,618	sf
TCYK	02	5/15/2018	No distresses found.		
TCYK	04	5/15/2018	Longitudinal and Transverse Cracking (Low)	17,464	ft
TCYK	04	5/15/2018	Longitudinal and Transverse Cracking (Medium)	3,404	ft
TCYK	04	5/15/2018	Weathering (Low)	51,861	sf
TCYK	04	5/15/2018	Weathering (Medium)	124	sf
TDYK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	2,035	ft
TDYK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	244	ft
TDYK	01	5/15/2018	Raveling (High)	10	sf
TDYK	01	5/15/2018	Swelling (Medium)	27	sf
TDYK	01	5/15/2018	Weathering (Medium)	15,966	sf
TL01YK	01	5/15/2018	Alligator Cracking (Medium)	4,080	sf
TL01YK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	78	ft
TL01YK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	60	ft
TL01YK	01	5/15/2018	Patching (Low)	2,940	sf
TL01YK	01	5/15/2018	Rutting (Low)	500	sf
TL01YK	01	5/15/2018	Weathering (Medium)	5,193	sf
TL02YK	01	5/15/2018	Alligator Cracking (Medium)	24	sf
TL02YK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	132	ft
TL02YK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	602	ft
TL03YK	01	5/15/2018	Alligator Cracking (Medium)	160	sf
TL03YK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	208	ft
TL03YK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	175	ft
TL03YK	01	5/15/2018	Weathering (Medium)	4,819	sf
TL03YK	02	5/15/2018	No distresses found.		
TL04YK	01	5/15/2018	Alligator Cracking (Medium)	10,956	sf
TL04YK	01	5/15/2018	Longitudinal and Transverse Cracking (High)	322	ft

TL04YK	01	5/15/2018	Longitudinal and Transverse Cracking (Low)	2,220	ft
TL04YK	01	5/15/2018	Longitudinal and Transverse Cracking (Medium)	1,995	ft
TL04YK	01	5/15/2018	Patching (Low)	3,298	sf
TL04YK	01	5/15/2018	Raveling (High)	644	sf
TL04YK	01	5/15/2018	Rutting (Low)	161	sf
TL04YK	01	5/15/2018	Rutting (Medium)	644	sf
TL04YK	01	5/15/2018	Weathering (Medium)	62,520	sf
TL04YK	02	5/15/2018	No distresses found.		

PCI Summary by Section

The following table summarizes the section PCIs assuming no work is completed at this airport. Note: the 2018 PCIs are from actual inspections, while the 2019-2025 PCIs are forecasted values.

Branch ID	Section ID	2018	2019	2020	2021	2022	2023	2024	2025
A01YK	01	44	43	41	39	37	35	33	31
A01YK	02	100	99	98	97	95	94	92	91
ACAPYK	01	4	3	1	0	0	0	0	0
ACENTYK	01	55	54	52	50	48	46	44	42
ACUBYK	01	58	57	55	53	50	48	46	44
ACUBYK	02	47	46	43	41	39	36	34	32
ACUBYK	03	44	43	40	38	36	33	31	29
ACUSTYK	01	25	24	22	20	18	16	14	12
ACUSTYK	02	66	65	63	61	59	57	55	53
ADEYK	01	52	51	49	47	45	43	41	39
ADEYK	02	100	99	98	97	95	94	92	91
AEASTYK	01	39	38	36	34	32	30	28	26
AHLD27YK	01	100	99	98	97	95	94	92	91
AMCYK	01	50	49	47	45	43	41	39	37
ANWYK	01	40	39	37	35	33	31	29	27
ANWYK	02	13	12	10	8	6	4	2	0
ANWYK	03	36	35	33	31	29	27	25	23
ANWYK	04	59	58	56	54	52	50	48	46
ANWYK	05	100	99	98	97	95	94	92	91
ANWYK	06	88	88	87	86	85	85	84	83
ASEYK	01	6	5	3	1	0	0	0	0
ASEYK	02	88	87	85	83	81	79	77	75
ASEYK	03	84	83	81	80	78	76	75	73
ATCHLDYK	01	100	99	98	97	95	94	92	91
ATCHLDYK	02	100	99	98	97	95	94	92	91
ATERMYK	01	90	90	89	88	87	87	86	85
ATERMYK	02	100	99	98	97	95	94	93	91
ATERMYK	03	100	99	98	97	95	94	93	91
ATERMYK	04	52	51	49	47	45	43	41	39
ATERMYK	05	32	31	28	26	24	21	19	17
ATERMYK	06	100	99	98	97	95	94	92	91
ATERMYK	07	100	99	98	97	95	94	92	91

ATERMYK	08	99	98	97	95	94	93	91	90
ATERMYK	09	100	99	98	97	95	94	92	91
AWESTYK	01	100	99	98	97	95	94	93	91
AWESTYK	02	100	99	98	97	95	94	92	91
R04YK	01A	20	18	16	13	10	8	5	2
R04YK	01B	18	16	14	11	8	6	3	0
R04YK	02A	24	22	20	17	14	12	9	6
R04YK	02B	17	15	13	10	7	5	2	0
R04YK	03A	17	15	13	10	7	5	2	0
R04YK	03B	33	31	28	25	22	19	17	14
R04YK	04A	100	100	100	99	98	97	95	93
R04YK	04B	100	100	100	99	98	97	95	93
R04YK	08A	59	57	53	50	46	43	39	36
R04YK	08B	59	57	53	50	46	43	39	36
R09YK	01A	90	89	86	83	81	78	75	71
R09YK	01B	87	85	83	80	77	74	70	67
R09YK	02A	93	92	90	87	85	82	79	76
R09YK	02B	92	91	88	86	83	80	77	74
R09YK	03A	92	91	88	86	83	80	77	74
R09YK	03B	93	92	90	87	85	82	79	76
R09YK	04A	91	90	87	85	82	79	76	73
R09YK	04B	92	91	88	86	83	80	77	74
R09YK	05A	95	94	92	90	87	85	82	79
R09YK	05B	95	94	92	90	87	85	82	79
R09YK	06A	94	93	91	88	86	83	80	77
R09YK	06B	92	91	88	86	83	80	77	74
TA1YK	01	94	93	91	90	88	86	85	83
TA1YK	02	85	84	82	81	79	77	76	74
TA2YK	01	97	96	94	93	91	89	88	86
TA2YK	02	100	99	97	96	94	92	91	89
TA3YK	01	99	98	96	95	93	91	90	88
TA3YK	02	100	99	97	96	94	92	91	89
TA4YK	01	100	99	97	96	94	92	91	89
TA4YK	02	100	99	97	96	94	92	91	89
TA5YK	01	100	99	97	96	94	92	91	89
TA5YK	02	100	99	97	96	94	92	91	89

TAYK	01	100	99	97	96	94	92	91	89
TAYK	02	99	98	96	95	93	91	90	88
TAYK	04	97	96	94	93	91	89	88	86
TAYK	05	98	97	95	94	92	90	89	87
TAYK	06	100	99	97	96	94	92	91	89
TAYK	07	100	99	97	96	94	92	91	89
TB1YK	01	61	60	58	57	55	54	52	51
TB2YK	01	65	64	62	61	59	57	56	54
TBYK	01	42	41	39	38	36	34	33	31
TBYK	02	100	99	97	96	94	92	91	89
TBYK	03	100	99	97	96	94	92	91	89
TBYK	04	100	99	97	96	94	92	91	89
TBYK	05	100	99	97	96	94	92	91	89
TBYK	06	57	56	54	53	51	49	48	46
TBYK	07	59	58	56	55	53	51	50	48
TBYK	08	59	58	56	55	53	51	50	48
TC1YK	01	75	74	72	71	69	68	66	65
TC2YK	01	54	53	51	50	48	47	45	44
TCYK	01	58	57	55	54	52	51	49	48
TCYK	02	100	99	97	96	94	92	91	89
TCYK	04	69	68	66	65	63	61	60	58
TDYK	01	61	60	58	57	55	54	52	51
TL01YK	01	12	11	9	8	6	5	3	2
TL02YK	01	66	65	63	62	60	59	57	56
TL03YK	01	43	42	40	39	37	36	34	33
TL03YK	02	100	99	97	96	94	92	91	89
TL04YK	01	26	25	23	22	20	19	17	16
TL04YK	02	100	99	97	96	94	92	91	89

Recommended M&R Work by Section and Year

Branch ID	Section ID	2019	2020	2021	2022	2023	2024	2025
A01YK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
A01YK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ACAPYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ACENTYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ACUBYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ACUBYK	02	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ACUBYK	03	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ACUSTYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ACUSTYK	02	Slurry Seal	No Work	No Work	Major Rehabilitation	No Work	No Work	No Work
ADEYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ADEYK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
AEASTYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
AHLD27YK	01	No Work	No Work	No Work	No Work	No Work	No Work	No Work
AMCYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ANWYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ANWYK	02	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ANWYK	03	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ANWYK	04	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ANWYK	05	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ANWYK	06	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ASEYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ASEYK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ASEYK	03	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ATCHLDYK	01	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ATCHLDYK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ATERMYK	01	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ATERMYK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ATERMYK	03	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ATERMYK	04	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ATERMYK	05	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
ATERMYK	06	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ATERMYK	07	No Work	No Work	No Work	No Work	No Work	No Work	No Work

ATERMYK	08	No Work	No Work	No Work	No Work	No Work	No Work	No Work
ATERMYK	09	No Work	No Work	No Work	No Work	No Work	No Work	No Work
AWESTYK	01	No Work	No Work	No Work	No Work	No Work	No Work	No Work
AWESTYK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R04YK	01A	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
R04YK	01B	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
R04YK	02A	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
R04YK	02B	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
R04YK	03A	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
R04YK	03B	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
R04YK	04A	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R04YK	04B	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R04YK	08A	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
R04YK	08B	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	01A	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	01B	No Work	No Work	No Work	No Work	No Work	No Work	Major Rehabilitation
R09YK	02A	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	02B	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	03A	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	03B	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	04A	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	04B	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	05A	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	05B	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	06A	No Work	No Work	No Work	No Work	No Work	No Work	No Work
R09YK	06B	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TA1YK	01	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TA1YK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TA2YK	01	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TA2YK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TA3YK	01	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TA3YK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TA4YK	01	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TA4YK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TA5YK	01	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TA5YK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TAYK	01	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TAYK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work

TAYK	04	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TAYK	05	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TAYK	06	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TAYK	07	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TB1YK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TB2YK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TBYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TBYK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TBYK	03	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TBYK	04	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TBYK	05	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TBYK	06	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TBYK	07	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TBYK	08	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TC1YK	01	Slurry Seal	No Work	No Work	No Work	No Work	No Work	Major Rehabilitation
TC2YK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TCYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TCYK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TCYK	04	No Work	No Work	Major Rehabilitation	No Work	No Work	No Work	No Work
TDYK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TL01YK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TL02YK	01	No Work	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work
TL03YK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TL03YK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work
TL04YK	01	Major Rehabilitation	No Work	No Work	No Work	No Work	No Work	No Work
TL04YK	02	No Work	No Work	No Work	No Work	No Work	No Work	No Work

PAVEMENT MANAGEMENT PLAN

YAKIMA AIR TERMINAL / MCALLISTER FIELD

February 25, 2013

URS

1
INTRODUCTION

1.1 BACKGROUND

Yakima Air Terminal/McAllister Field (YKM) is located in the City of Yakima, Washington. The airport layout is shown on Figure 1-1. YKM is classified as a commercial service airport in the Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS). The airport is owned by the City of Yakima.

YKM has a 7,604–foot-long by 150-foot-wide runway (09-27), a 3,835-foot-long by 150-foot-wide runway (04-22), taxiways, aprons, parking lots, and an on-airport perimeter road. These pavements are a mixture of asphalt and concrete. The runway pavements, parallel taxiways, and interior aprons are included in the Washington Airport Pavement Management System (APMS) compiled by the Washington State Department of Transportation (WSDOT) Aviation Division. The principal objective of the APMS is to assess the relative condition of selected airport pavements in Washington State. Applied Pavement Technology evaluated the condition of the YKM pavements that are part of the APMS in the 2005 Pavement Management Program. URS is developing this pavement management plan in conjunction with updating the YKM Airport Master Plan and the Airport Layout Plan. The results will be used to update the state APMS, as well as to develop the airport's CIP. The pavement management plan will address all pavements, including those that were not part of the APMS but that the airport has a responsibility to maintain and operate. This report presents the results of the Pavement Condition Index (PCI) evaluation and the pavement management plan.

1.2 PURPOSE AND SCOPE

The purpose of the pavement management task is to evaluate the condition of YKM airfield and landside pavements and to guide the airport in establishing a comprehensive pavement management plan.

To achieve these objectives, the following tasks were completed:

- <u>Data Review</u>: URS reviewed previous pavement management reports and construction drawings to identify new construction and pavement maintenance projects (pavement design, type, and history) in MicroPAVER™. Based on the historical information, a pavement inventory and pavement maps were developed to serve as the basis for the pavement management plan.

- Pavement Condition Survey: URS performed visual pavement surveys in November 2011 to record the condition of the pavements in order to identify signs of pavement distress.
- MicroPAVER™ Database Update: URS entered the pavement condition data into the MicroPAVER™ database (first developed by WSDOT) to compute PCI values for each pavement section.
- Pavement Condition Evaluation: Based on the PCI values, URS described the existing pavement condition and estimated remaining life of the pavement.
- Pavement Management Program Update: URS updated the airport's pavement management program to include all of the pavements, for which the Airport Board is responsible.

Chapter 2 summarizes the work completed, results obtained, and the conclusions made.

N

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YAKIMA AIR TERMINAL/McALLISTER FIELD
AIRPORT MASTER PLAN

2011 AIRPORT LAYOUT

SCALE: 1" = 300'

DATE: JANUARY 2013

AIP NUMBER: 3-53-009-32

SHEET NUMBER: FIG 1–1

Site Plan Fig 1-1.dwg

2

PAVEMENT CONDITION EVALUATION

To develop a comprehensive pavement management plan, the construction and maintenance history of each section of pavement must be documented and current conditions verified. In 2005, a pavement condition evaluation report was prepared and a pavement management program for the runways, taxiways, and aprons was established as part of the WSDOT Aviation Division's APMS update. This report evaluates the pavement condition of the runways, taxiways, and aprons that were part of the WSDOT APMS study as well as the perimeter road, auto parking lots, and roads that were not in the APMS but that are the responsibility of the airport. The condition evaluation approach, pavement inventory, evaluation, and pavement condition index that results from the evaluation are presented in this chapter.

2.1 APPROACH

URS visually evaluated the pavement condition using the PCI procedure, as described in ASTM D5340-11 and FAA Advisory Circular AC 150/5380-6B: *Guidelines and Procedures for Maintenance of Airport Pavements*.

2.2 PAVEMENT INVENTORY

As stated, the pavement inventory includes all pavements for which the City of Yakima has responsibility.

Part of the pavement evaluation process involves updating the work history on current pavement sections. However, for this report, the only engineering record plans and reports available were the plans from the 2011 Runway 9-27 overlay project. Therefore, no work history is provided on any of the additional aprons or landside pavements. All previous pavement data shown on the graphs and charts is taken from the pavement condition survey completed in 2005.

WSDOT provided a copy of the MicroPAVER™ database developed for the 2005 pavement management plan to serve as the basis for this plan. URS updated the database through a new pavement evaluation after surveying both portland cement concrete (PCC) and asphalt cement concrete (AC). Approximately 5,573,055 square feet of pavement is included in this pavement management plan. Figure 2-1 shows the function and area of the pavements surveyed for this plan.

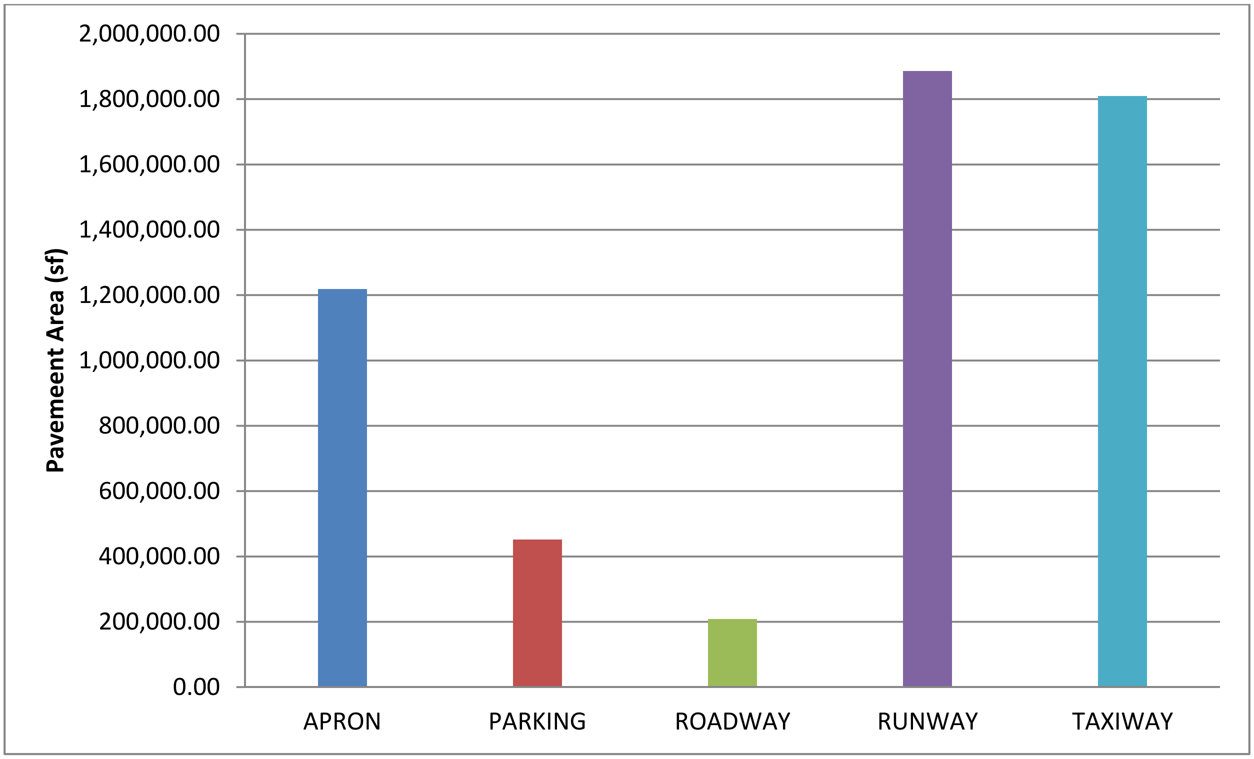


Figure 2-1: Yakima Air Terminal Pavement Inventory

2.3 PAVEMENT NETWORK DEFINITION

The pavements considered are all part of the same pavement network, Yakima Air Terminal Pavements.

Using the updated pavement inventory described in Section 2.2 all pavements were divided into branches, sections, and sample units in accordance with the pavement condition evaluation guidelines set forth in AC 150/5380-6B and ASTM D5430, as follows:

- **Branch**: A branch is a part of a pavement system that serves a single function, i.e., runway, taxiway, apron, or parking lot.
- **Section**: A section is a portion of a branch that has common characteristics such as, pavement cross-section, age, traffic level, or the overall condition of the pavement.

- **Sample Unit**: A sample unit is a portion of a Section. Sections are divided into sample units for the purpose of conducting the pavement inspection and condition assessment. Sample units are divided such that each is about 5,000 square feet.

Figure 2-3 shows the branches divided into sections and sample units. This figure also shows the labels assigned to individual pavement used in the MicroPAVER™ database.

2.4 PAVEMENT EVALUATION

Pavements were inspected in accordance with the PCI and pavement inspection procedure presented in AC 150/5380-6B and ASTM D5430. The PCI rating, which ranges from 0 to 100, represents a numerical presentation of the overall pavement condition. A PCI of 100 represents a pavement in excellent condition while a 0 PCI is a pavement that has failed.

The PCI for a pavement section is calculated based on visual observations of the condition of the pavement and does not provide a true measure of structural capacity. The procedure relies on the inspection of pavement to identify the distress type, severity, and density. The PCI value of the inspected sample is calculated using deduct value charts based on the distress type, severity, and density observed. The observed pavement distresses provide a means to evaluate the condition of the pavement and to determine the cause of pavement deterioration, while the computed PCI helps track the performance of the pavement over time.

Common types of distress in PCC and AC pavements and their probable causes are summarized in Tables A-1 and A-2, of Appendix A. URS visually inspected the pavement sections shown in during a site visit on November 14 through 16, 2011. The network definition map was updated based on our field observations. Representative sample units were selected at random for PCI inspection. The number of samples selected was based on section level sampling criteria in accordance with ASTM D5430, as summarized in Table 2-1.

Table 2-1: Network Level Sampling Criteria

No. of Sample Units in Section (N)	Min. No. of Units Inspected (n)
1-5	1%
6-10	2%
11-15	3%
16-40	4%
40+	10%

Figure 2-4 shows the existing sections and construction dates for the pavements at YKM. Selected photographs taken during the 2011 pavement condition inspection are presented in Appendix B. URS recorded the observed distress data from this inspection and entered it into the MicroPAVER™ database that also contained inspection data from the 2005 pavement update conducted by WSDOT. The combined database was used to forecast pavement conditions for the 2011 pavement management plan. Refer to Appendix C for inspection reports.

2.5 PAVEMENT CONDITION

Using MicroPAVER software and the data collected from the pavement inspections, URS evaluated the PCI values of each pavement section. Figure 2-5 geographically depicts the condition of all pavements. Table 2-2 provides a summary of the results of the pavement condition evaluation showing observed pavement conditions and the computed PCI values. URS evaluated future performance of the pavements using typical performance trends established for airport and roadway pavements in the MicroPAVER™ software. Figure 2-2 shows the PCI ratings for combined square footages of all YKM pavements. Colors correspond to the PCI ratings seen on the Figure 2-5.

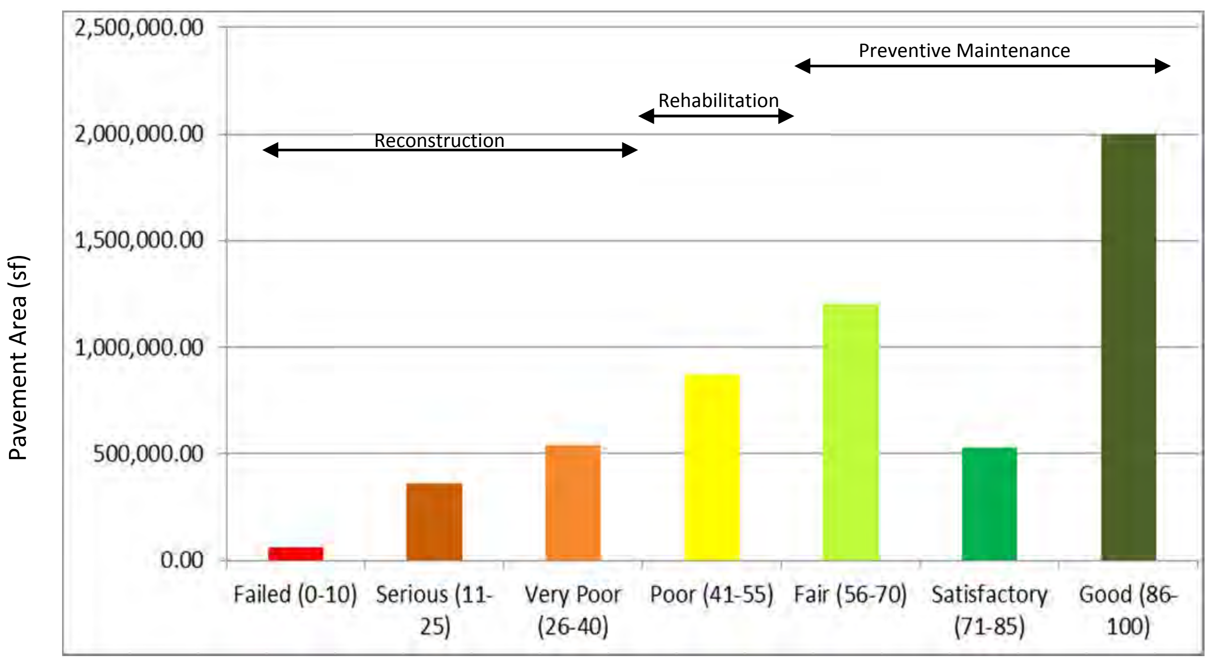
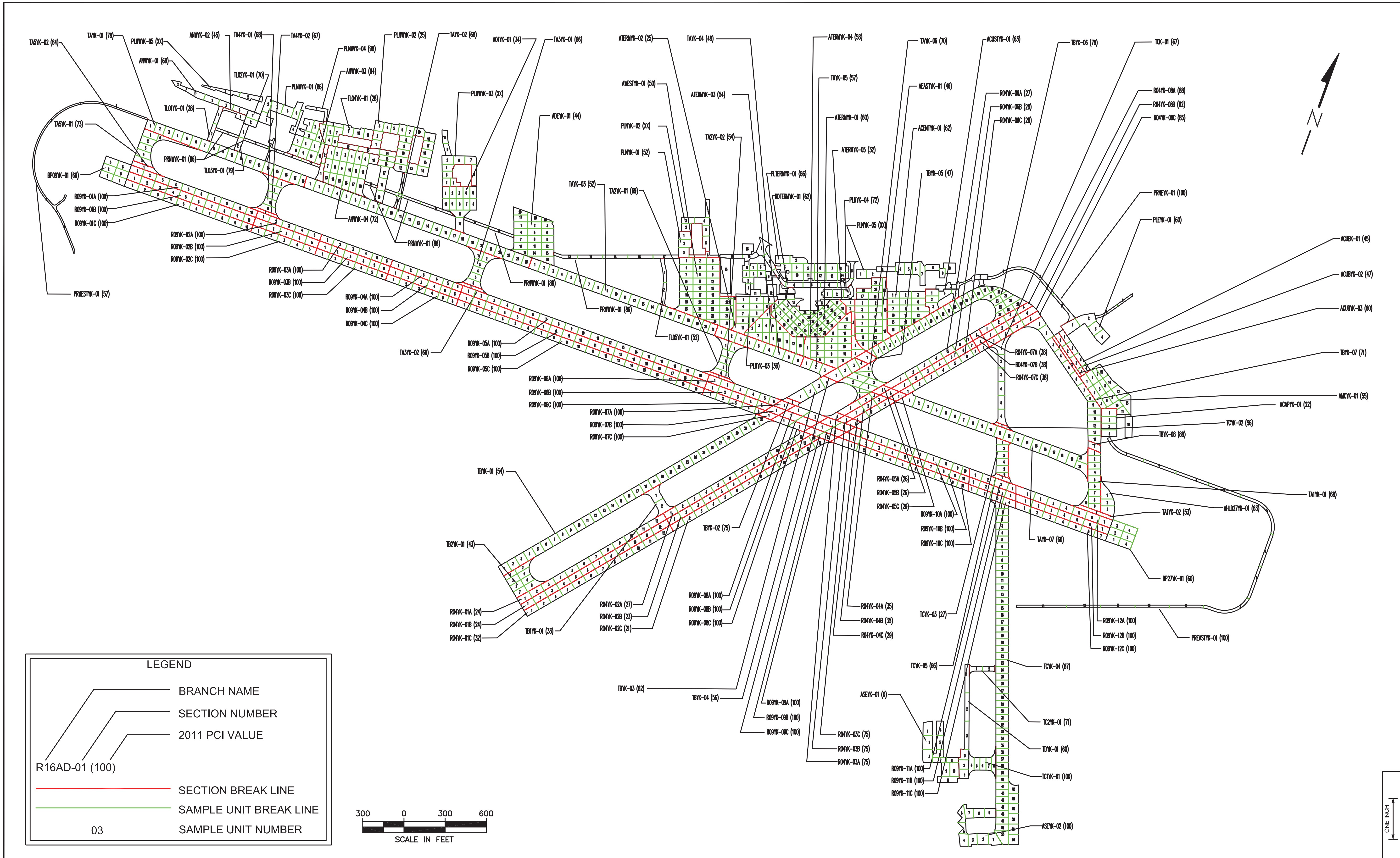


Figure 2-2: Conditions of All Yakima Air Terminal Pavements



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Yakima (Yakima Air Terminal)2013.dwg

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YAKIMA AIR TERMINAL
McALLISTER FIELD

YAKIMA AIR TERMINAL/McALLISTER FIELD
AIRPORT MASTER PLAN

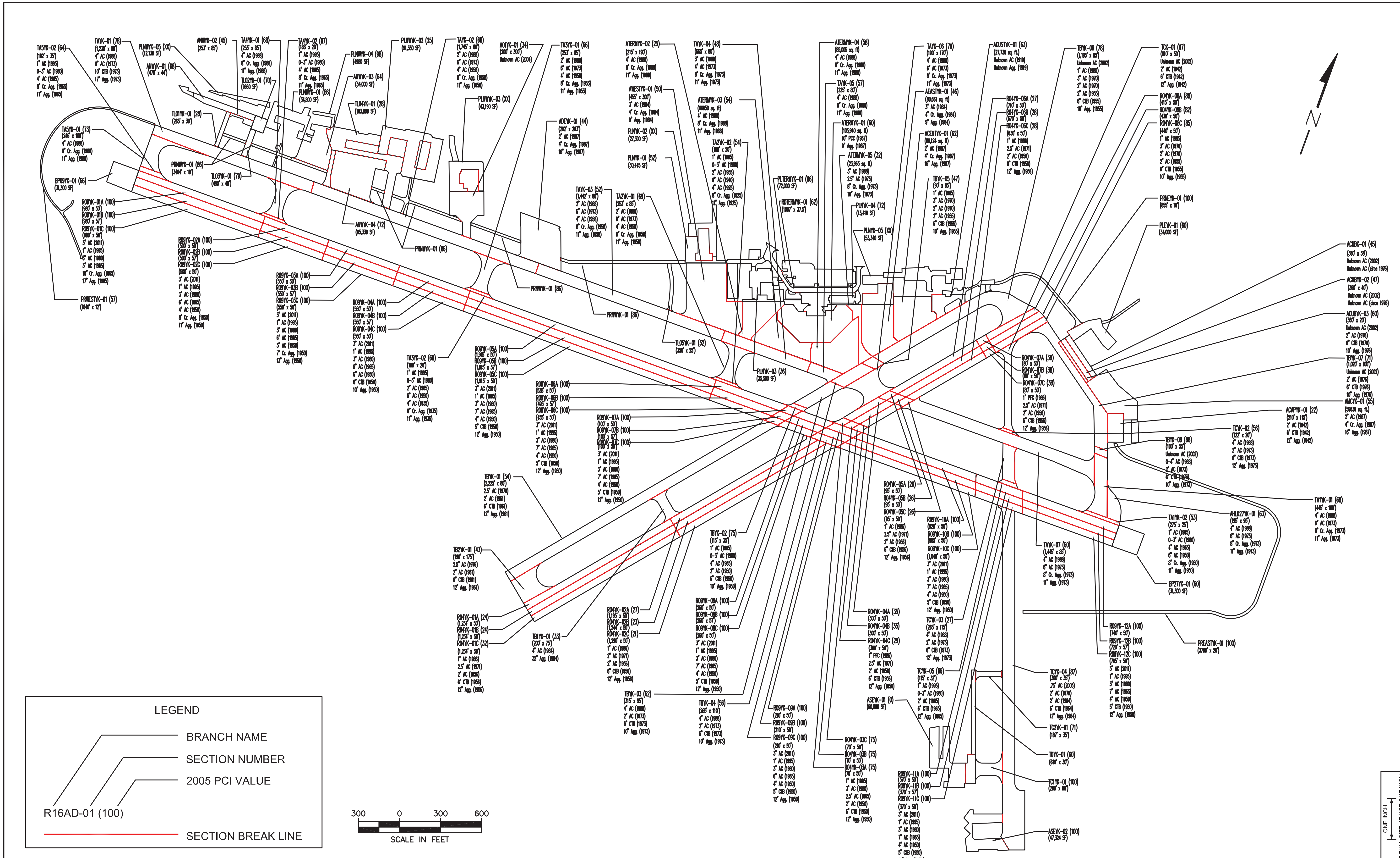
2011 NETWORK DEFINITION MAP

SCALE: 1" = 300'

DATE: JANUARY 2013

AIP NUMBER: 3-53-009-32

SHEET NUMBER: FIG 2-3



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YAKIMA AIR TERMINAL/McALLISTER FIELD
AIRPORT MASTER PLAN

2011 PAVEMENT WORK HISTORY MAP

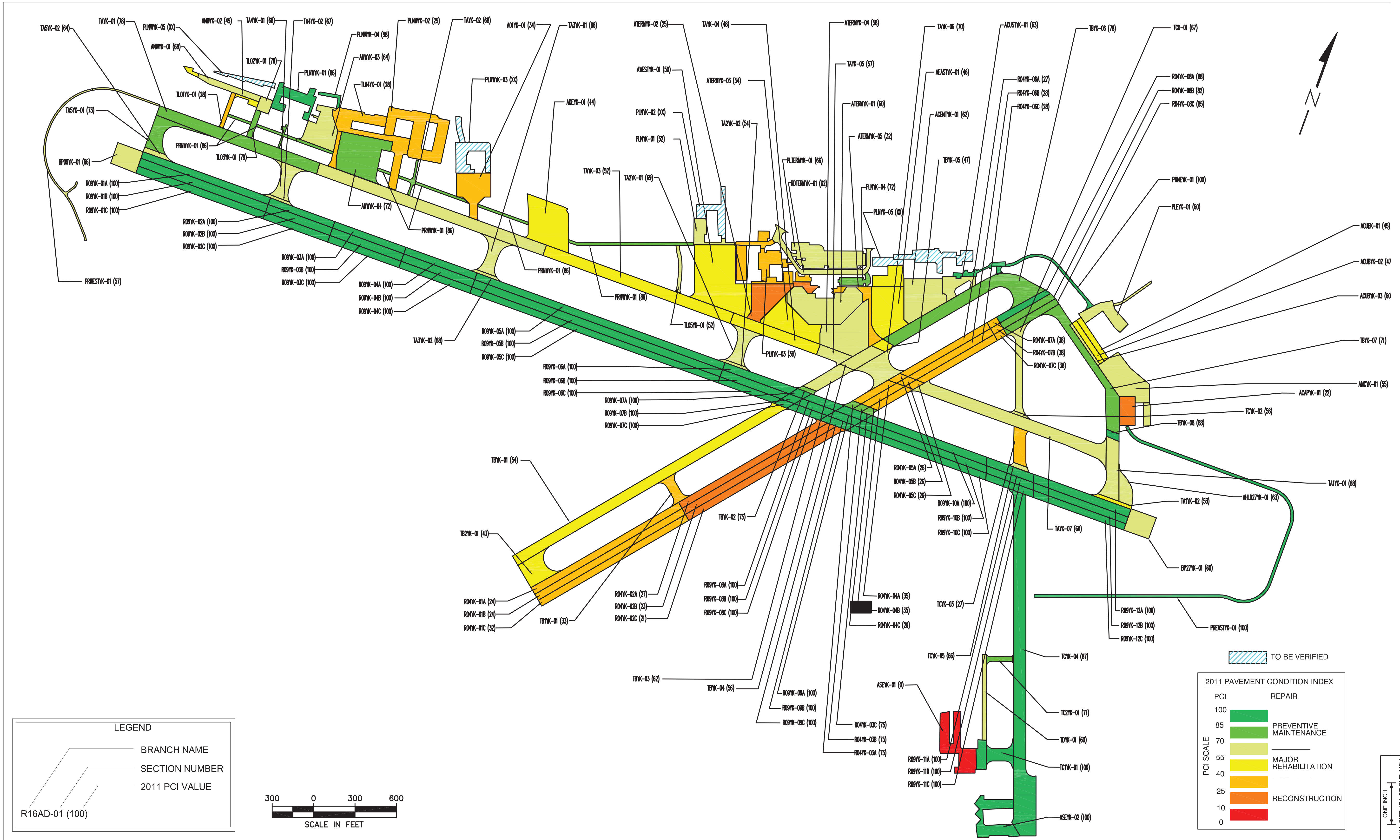
SCALE: 1" = 300'

DATE: JANUARY 2013

AIP NUMBER: 3-53-009-32

SHEET NUMBER: FIG 2–4

Yakima (Yakima Air Terminal)-2013.dwg



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YAKIMA AIR TERMINAL/McALLISTER FIELD
AIRPORT MASTER PLAN

2011 PAVEMENT CONDITION INDEX MAP

SCALE: 1" = 300'
DATE: JANUARY 2013

AIP NUMBER: 3-53-009-32
SHEET NUMBER: FIG 2–5

Table 2-2: 2011 Pavement Condition Evaluation Results

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to			Distress Types
							Load[4]	Climate/ Durability[5]	Other[6]	
A01YK	FED EX APRON	01	AC	55,399	6/1/2004	34	48	52	0	Alligator Cracking, Weathering, Longitudinal/Transverse Cracking
ACAPYK	APRON CAP RAMP	01	AC	23,817	9/3/1942	22	0	100	0	Weathering, Longitudinal/Transverse Cracking, Utility Patch
ACENTYK	APRON CENTRAL RAMP	01	AC	75,378	9/3/1987	62	0	100	0	Weathering, Longitudinal/Transverse Cracking
ACUBYK	APRON CUB RAMP	01	AC	13,897	9/1/2002	45	0	100	0	Weathering, Longitudinal/Transverse Cracking, Block Cracking
ACUBYK	APRON CUB RAMP	02	AAC	13,655	9/1/2002	47	0	100	0	Weathering, Longitudinal/Transverse Cracking, Block Cracking
ACUBYK	APRON CUB RAMP	03	AC	6,852	9/1/2002	60	0	100	0	Weathering, Longitudinal/Transverse Cracking, Block Cracking
ACUSTYK	APRON CUSTOMS RAMP	01	AC	22,649	6/1/1919	63	0	100	0	Patching, Alligator Cracking, Joint Reflection Cracking, and Block Cracking
ADEYK	APRON DECOTO RAMP	01	AC	78,139	9/3/1987	44	34	66	0	Longitudinal/Transverse Cracking, Block Cracking, Alligator Cracking

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to			Distress Types
							Load[4]	Climate/ Durability[5]	Other[6]	
AEASTYK	APRON EAST RAMP	01	AC	79,748	9/3/1984	48	0	100	0	Alligator Cracking, Weathering, Longitudinal/Transverse Cracking
AHLD27YK	APRON HOLD 27	01	AAC	18,573	9/1/1988	63	0	100	0	Weathering, Longitudinal/Transverse Cracking
AMCYK	APRON MCALLISTER RAMP	01	AC	59,613	9/3/1987	55	0	100	0	Weathering, Longitudinal/Transverse Cracking, Utility Patch
ANWYK	NORTHWEST HANGAR APRONS	01	AC	21,032	1/11/2011	68	0	100	0	Weathering, Longitudinal/Transverse Cracking, Patching
ANWYK	NORTHWEST HANGAR APRONS	02	AAC	11,132	1/11/2011	45	66	34	0	Weathering, Longitudinal/Transverse Cracking, Patching
ANWYK	NORTHWEST HANGAR APRONS	03	AAC	54,000	1/1/1950	64	28	72	0	Alligator Cracking , Weathering, Longitudinal/Transverse Cracking
ANWYK	NORTHWEST HANGAR APRONS	04	AAC	95,330	1/1/1950	72	0	100	0	Weathering, Longitudinal/Transverse Cracking
ASEYK	SOUTHEAST HANGAR APRON	01	AAC	60,800	1/1/1950	0	83	17	0	Alligator Cracking, Raveling
ASEYK	SOUTHEAST HANGAR APRON	02	AAC	60,800	1/1/1950	100	0	0	0	None

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to Load[4]	% Distress Due to Climate/ Durability[5]	% Distress Due to Other[6]	Distress Types
ATCHLDYK	TAXIWAY C HOLD APRON	01	AC	31,817	9/3/1942	78	0	100	0	Joint Seal Damage, Corner Spalling, Joint Spalling, Corner Spalling, Large Patch/Utility, and Small Patch
ATCHLDYK	TAXIWAY C HOLD APRON	02	AAC	3,865	9/1/1995	100	0	0	0	Patching
ATERMYK	APRON TERMINAL RAMP	01	PCC	103,513	9/2/1967	60	26	21	53	Joint Seal Damage, Corner Spalling, Shattered Slab, Popouts, and Joint Spalling
ATERMYK	APRON TERMINAL RAMP	02	AC	52,111	9/3/1988	25	27	73	0	Weathering, Block Cracking, Alligator Cracking
ATERMYK	APRON TERMINAL RAMP	03	AAC	65,820	9/3/1988	54	0	100	0	Weathering, Longitudinal/Transverse Cracking
ATERMYK	APRON TERMINAL RAMP	04	AC	86,028	9/3/1988	58	0	100	0	Weathering, Longitudinal/Transverse Cracking
ATERMYK	APRON TERMINAL RAMP	05	AAC	20,783	9/1/1988	32	0	100	0	Block Cracking, Weathering, Longitudinal/Transverse Cracking
AWESTYK	APRON WEST RAMP	01	AC	158,764	9/3/1984	50	0	100	0	Weathering, Longitudinal/Transverse Cracking
BP09YK	RWY 09 END BLAST PAD	01	AAC	31,300	1/1/1950	66	0	100	0	Weathering, Block Cracking, Longitudinal/Transverse Cracking
BP27YK	RWY 27 END BLAST PAD	01	AAC	31,300	1/1/1950	60	0	100	0	Weathering, Block Cracking

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to Load[4]	% Distress Due to Climate/ Durability[5]	% Distress Due to Other[6]	Distress Types
PLEYK	EAST PARKING LOTS	01	AAC	34,000	1/1/1950	60	58	24	18	Utility Patching, Weathering, Longitudinal/Transverse Cracking, Alligator Cracking
PLNWYK	NW PARKING LOTS	01	AAC	91,330	1/1/1950	88	0	100	0	Weathering, Longitudinal/Transverse Cracking, Alligator Cracking
PLNWYK	NW PARKING LOTS	02	AAC	34,800	1/1/1950	25	56	39	5	Alligator Cracking, Raveling, Longitudinal/Transverse Cracking
PLNWYK	NW PARKING LOTS	03	AAC	43,190	1/1/1950	100	0	0	0	Weathering, Longitudinal/Transverse Cracking.
PLNWYK	NW PARKING LOTS	04	AAC	4,980	1/1/1950	98	0	100	0	Weathering, Longitudinal/Transverse Cracking
PLNWYK	NW PARKING LOTS	05	AAC	12,130	1/1/1950	100	0	0	0	Weathering, Longitudinal/Transverse Cracking.
PLNYK	NORTH PARKING LOTS	01	AAC	30,445	1/1/1950	100	0	0	0	Weathering, Longitudinal/Transverse Cracking.
PLNYK	NORTH PARKING LOTS	02	AAC	27,300	1/1/1950	100	0	0	0	Alligator Cracking, Weathering, Longitudinal/Transverse Cracking
PLNYK	NORTH PARKING LOTS	03	AAC	35,500	1/1/1950	36	47	32	21	Weathering, Longitudinal/Transverse Cracking.

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to			Distress Types
							Load[4]	Climate/ Durability[5]	Other[6]	
PLNYK	NORTH PARKING LOTS	04	AAC	13,410	1/1/1950	72	0	96	4	Weathering, Longitudinal/Transverse Cracking.
PLNYK	NORTH PARKING LOTS	05	AAC	53,340	1/1/1950	100	0	0	0	Inspection Has Not Been Completed.
PLTERMYK	TERMINAL PARKING LOT	01	AAC	72,000	1/1/1950	66	0	100	0	Weathering, Longitudinal/Transverse Cracking, Block Cracking
PREASTYK	EAST PERIMETER ROAD	01	AAC	74,000	1/1/1950	100	0	0	0	None
PRNEYK	NE PERIMETER ROAD	01	AAC	15,390	1/1/1950	100	0	0	0	None
PRNWYK	NW PERIMETER ROAD	01	AAC	61,272	1/1/1950	86	0	100	0	Block Cracking, Weathering, Longitudinal/Transverse Cracking
PRWESTYK	WEST PERIMETER ROAD	01	AAC	19,680	1/1/1950	57	67	33	0	Alligator Cracking, Weathering, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	01A	AAC	62,748	9/1/1986	24	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	01B	AAC	62,116	9/1/1986	24	0	100	0	Raveling, Longitudinal/Transverse Cracking

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to Load[4]	% Distress Due to Climate/ Durability[5]	% Distress Due to Other[6]	Distress Types
R04YK	RUNWAY 04/22	01C	AAC	60,858	9/1/1986	32	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	02A	AAC	59,364	9/1/1986	27	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	02B	AAC	63,970	9/1/1986	23	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	02C	AAC	64,477	9/1/1986	21	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	03A	AAC	3,868	9/1/1995	75	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	03B	AAC	3,491	9/1/1995	75	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	03C	AAC	3,718	9/1/1995	75	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	04A	AAC	15,163	9/1/1986	35	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	04B	AAC	14,900	9/1/1986	35	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	04C	AAC	14,862	9/1/1986	29	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	05A	AAC	4,874	9/1/1986	26	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	05B	AAC	4,729	9/1/1986	26	0	100	0	Raveling, Longitudinal/Transverse Cracking

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to Load[4]	% Distress Due to Climate/ Durability[5]	% Distress Due to Other[6]	Distress Types
R04YK	RUNWAY 04/22	05C	AAC	4,587	9/1/1986	26	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	06A	AAC	35,419	9/1/1986	27	0	100	0	Raveling, Longitudinal/Transverse Cracking, Patching.
R04YK	RUNWAY 04/22	06B	AAC	33,646	9/1/1986	28	0	100	0	Raveling, Longitudinal/Transverse Cracking, Patching
R04YK	RUNWAY 04/22	06C	AAC	31,649	9/1/1986	28	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	07A	AAC	3,949	9/1/1986	38	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	07B	AAC	3,977	9/1/1986	38	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	07C	AAC	4,024	9/1/1986	38	0	100	0	Raveling, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	08A	AAC	18,681	9/1/2002	88	0	100	0	Weathering, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	08B	AAC	21,542	9/1/1985	82	0	100	0	Weathering, Longitudinal/Transverse Cracking
R04YK	RUNWAY 04/22	08C	AAC	21,755	9/1/1985	85	0	100	0	Weathering, Longitudinal/Transverse Cracking
R09YK	RUNWAY 09/27	01A	AAC	50,460	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	01B	AAC	57,677	7/1/2011	100	0	0	0	None

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to			Distress Types
							Load[4]	Climate/ Durability[5]	Other[6]	
R09YK	RUNWAY 09/27	01C	AAC	52,240	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	02A	AAC	24,175	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	02B	AAC	28,918	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	02C	AAC	25,452	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	03A	AAC	26,917	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	03B	AAC	31,501	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	03C	AAC	27,511	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	04A	AAC	27,612	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	04B	AAC	31,046	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	04C	AAC	26,891	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	05A	AAC	99,117	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	05B	AAC	106,212	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	05C	AAC	91,041	7/1/2011	100	0	0	0	None

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to			Distress Types
							Load[4]	Climate/ Durability[5]	Other[6]	
R09YK	RUNWAY 09/27	06A	AAC	29,600	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	06B	AAC	26,730	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	06C	AAC	21,153	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	07A	AAC	6,055	9/1/1995	100	0	0	0	None
R09YK	RUNWAY 09/27	07B	AAC	5,610	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	07C	AAC	4,920	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	08A	AAC	13,943	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	08B	AAC	13,546	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	08C	AAC	12,782	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	09A	AAC	11,797	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	09B	AAC	11,233	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	09C	AAC	10,612	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	10A	AAC	52,778	7/1/2011	100	0	0	0	None

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to Load[4]	% Distress Due to Climate/ Durability[5]	% Distress Due to Other[6]	Distress Types
R09YK	RUNWAY 09/27	10B	AAC	51,721	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	10C	AAC	52,385	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	11A	AAC	20,818	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	11B	AAC	18,858	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	11C	AAC	18,141	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	12A	AAC	43,898	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	12B	AAC	36,987	7/1/2011	100	0	0	0	None
R09YK	RUNWAY 09/27	12C	AAC	34,525	9/1/1995	100	0	0	0	None
RDTERMYK	TERMINAL ROAD	01	AAC	37,763	1/1/1950	62	0	100	0	Weathering, Longitudinal/Transverse Cracking, Alligator Cracking
TA1YK	TAXIWAY A1	01	AAC	43,291	9/1/1988	68	0	100	0	Weathering, Longitudinal/Transverse Cracking
TA1YK	TAXIWAY A1	02	AAC	6,982	9/1/1995	53	0	100	0	Weathering, Longitudinal/Transverse Cracking
TA2YK	TAXIWAY A2	01	AAC	28,278	9/1/1988	69	0	100	0	Weathering, Longitudinal/Transverse Cracking

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to			Distress Types
							Load[4]	Climate/ Durability[5]	Other[6]	
TA2YK	TAXIWAY A2	02	AAC	4,126	9/1/1995	54	0	100	0	Weathering, Longitudinal/Transverse Cracking
TA3YK	TAXIWAY A3	01	AAC	28,447	9/1/1988	66	0	100	0	Weathering, Longitudinal/Transverse Cracking,
TA3YK	TAXIWAY A3	02	AAC	4,081	9/1/1995	68	0	100	0	Weathering, Longitudinal/Transverse Cracking
TA4YK	TAXIWAY A4	01	AC	28,260	9/3/1988	68	0	100	0	Weathering, Longitudinal/Transverse Cracking
TA4YK	TAXIWAY A4	02	AAC	3,893	9/1/1995	67	0	100	0	Longitudinal/Transverse Cracking, Weathering, Block Cracking
TA5YK	TAXIWAY A5	01	AC	25,615	9/3/1988	73	0	100	0	Weathering, Longitudinal/Transverse Cracking
TA5YK	TAXIWAY A5	02	AAC	6,615	9/1/1995	64	0	100	0	Longitudinal/Transverse Cracking, Weathering, Block Cracking
TAYK	TAXIWAY A	01	AAC	101,114	9/1/1988	78	0	100	0	Weathering, Longitudinal/Transverse Cracking, Block Cracking
TAYK	TAXIWAY A	02	AAC	141,834	9/1/1988	68	0	100	0	Weathering, Longitudinal/Transverse Cracking
TAYK	TAXIWAY A	03	AAC	115,359	9/1/1988	52	37	63	0	Weathering, Longitudinal/Transverse Cracking, Block Cracking
TAYK	TAXIWAY A	04	AAC	52,230	9/1/1988	48	44	56	0	Weathering, Longitudinal/Transverse Cracking, Block Cracking

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to Load[4]	% Distress Due to Climate/ Durability[5]	% Distress Due to Other[6]	Distress Types
TAYK	TAXIWAY A	05	AC	17,686	9/3/1988	57	46	54	0	Weathering, Longitudinal/Transverse Cracking, Alligator Cracking
TAYK	TAXIWAY A	06	AAC	39,260	9/1/1988	70	32	68	0	Weathering, Longitudinal/Transverse Cracking, Alligator Cracking
TAYK	TAXIWAY A	07	AAC	128,452	9/1/1988	60	0	100	0	Weathering, Longitudinal/Transverse Cracking
TB1YK	TAXIWAY B1	01	AC	16,727	9/2/1984	33	0	100	0	Weathering, Longitudinal/Transverse Cracking
TB2YK	TAXIWAY B2	01	AAC	37,074	9/1/1976	43	0	100	0	Weathering, Longitudinal/Transverse Cracking
TBYK	TAXIWAY B	01	AAC	167,743	9/1/1976	54	0	100	0	Weathering, Longitudinal/Transverse Cracking, Block Cracking
TBYK	TAXIWAY B	02	AAC	3,617	9/1/1995	75	0	100	0	Weathering, Longitudinal/Transverse Cracking
TBYK	TAXIWAY B	03	AAC	26,361	9/1/1988	62	0	100	0	Weathering, Longitudinal/Transverse Cracking
TBYK	TAXIWAY B	04	AAC	23,267	9/1/1988	56	0	100	0	Weathering, Longitudinal/Transverse Cracking, Block Cracking
TBYK	TAXIWAY B	05	AAC	7,678	9/1/1985	47	0	100	0	Block Cracking
TBYK	TAXIWAY B	06	AAC	121,428	9/1/2002	76	0	100	0	Weathering, Longitudinal/Transverse Cracking, Joint Reflection Cracking

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

Branch[1]	Branch Name	Section	Surface Type[2]	Section Area (sf)	Last Construction Date[3]	2011 PCI Rating	% Distress Due to Load[4]	% Distress Due to Climate/ Durability[5]	% Distress Due to Other[6]	Distress Types
TBYK	TAXIWAY B	07	AC	70,270	9/1/2002	71	0	100	0	Weathering, Block Cracking
TBYK	TAXIWAY B	08	AAC	4,865	9/1/2002	88	0	100	0	Weathering
TC1YK	TAXIWAY C1	01	AAC	35,500	1/1/1950	100	0	0	0	None
TC2YK	TAXIWAY C2	01	AAC	6,545	1/1/1950	71	0	100	0	Joint Reflection Cracking and Weathering/Raveling
TCYK	TAXIWAY C	01	AC	34,392	9/1/2002	67	0	100	0	Longitudinal/Transverse Cracking
TCYK	TAXIWAY C	02	AAC	2,450	9/1/1988	56	0	100	0	Longitudinal/Transverse Cracking
TCYK	TAXIWAY C	03	AAC	11,910	9/1/1988	27	17	83	0	Longitudinal/Transverse Cracking, Weathering
TCYK	TAXIWAY C	04	AAC	259,536	9/1/2005	87	0	100	0	Longitudinal/Transverse Cracking, Weathering
TDYK	TAXIWAY D	01	AAC	18,570	1/1/1950	60	0	100	0	Weathering, Longitudinal/Transverse Cracking, Joint Reflection Cracking
TL01YK	TAXILANE 1	01	AAC	7,950	1/1/1950	28	51	49	0	Weathering, Longitudinal/Transverse Cracking, Alligator Cracking
TL02YK	TAXILANE 2	01	AAC	9,776	1/1/1950	70	0	100	0	Weathering, Longitudinal/Transverse Cracking
TL03YK	TAXILANE 3	01	AAC	8,200	1/1/1950	79	0	100	0	Weathering, Longitudinal/Transverse Cracking
TL04YK	TAXILANE 4	01	AAC	103,800	1/1/1950	28	69	31	0	Weathering, Longitudinal/Transverse Cracking, Alligator Cracking

Table 2-2: 2011 Pavement Condition Evaluation Results (Continued)

[1] See Figure 2-3 for branch and section locations of the pavement network

[2] AC= Asphalt cement concrete; AAC= Asphalt overlay on AC; PCC=Portland cement concrete

[3] For sections where the original construction date was not known, the date of 1/1/1950 was used as a default. It is possible that the section has received rehabilitation more recently than the original construction date and evidence by less severe distress than might have been expected.

[4] Distress due to load includes those distresses attributed to structural deficiency in the pavement such as alligator cracking, rutting, or shattered concrete slabs

[5] Distress due to climate or durability includes those distresses attributed to either the aging of the pavement and the effects of the environment such as weathering and raveling or block cracking in AC pavements or to a materials-related problem such as durability cracking in a PCC pavement.

[6] Distress due to other includes distresses not attributed to load or climate. An example is a hole from jet blast.

3

PAVEMENT MAINTENANCE AND REHABILITATION PROGRAM

Using the PCI evaluations, a pavement management plan that consists of a pavement maintenance and rehabilitation projects was developed. The pavement management includes the following:

- A localized preventive maintenance plan for the year 2013
- A six year pavement maintenance and rehabilitation plan for the years 2013 through 2019.

The PCI calculations and the development of the pavement maintenance and rehabilitation plans were completed using the pavement management software, MicroPAVER.

3.1 ANALYSIS APPROACH

3.1.1 Critical PCI Values

The critical PCI values for the airside pavements inspected for the 2005 APMS evaluation were set by WSDOT and FAA (Applied Pavement Technology, 2006), based on the type and wheel load classification of the pavements. Critical PCI values for roadway and parking were selected by URS. Table 3-1 summarizes the critical PCI values used in this evaluation.

Table 3-1: Critical PCI Values for Pavement Types at Yakima Airport

Surface Type	Load Classification	Critical PCI Value
Runway		
AC	< 60,000 lbs	65
	≥ 60,000 lbs	70
PCC	< 60,000 lbs	55
	≥ 60,000 lbs	60
Taxiway		
AC	< 60,000 lbs	60
	≥ 60,000 lbs	65
PCC	< 60,000 lbs	50
	≥ 60,000 lbs	55
Apron		
AC	< 60,000 lbs	60
	≥ 60,000 lbs	60
PCC	< 60,000 lbs	50
	≥ 60,000 lbs	50
Roadway		
AC	HS-20	65
PCC	HS-20	55
Parking		
AC	HS-20	65
PCC	HS-20	55

≥ is greater than or equal to.

< is less than.

HS-20 is the standard AASHTO (American Association of State Highway and Transportation Officials) vehicle load in which, the load on the front axle is 8000 pounds, 32000 pounds on the intermediate axle and 32000 pounds on the later axle.

The preventive maintenance plan and maintenance and rehabilitation plans were developed using the critical PCI approach. The goal of this approach is to maintain and rehabilitate the pavements such that the PCI value is above critical PCI value of each pavement as follows:

- Above the critical PCI, localized (such as crack sealing) and global (such as a slurry seal) preventive maintenance activities are recommended.

- Below the critical PCI, major rehabilitation measures such as an overlay or reconstruction is recommended.

3.1.2 Budget and Inflation Rate

A constrained budget with an annual inflation rate of 3% was used in the development of the pavement management program with a base year of 2013 unit costs. The 3% inflation rate was used because that is the historical norm for construction projects. The base unit 2013 costs include a 30% contingency and a 30% markup that consists of sales tax, design engineering, construction management legal and administration and permitting.

3.1.3 Localized and Global Maintenance Policies and Unit Costs

Localized preventive maintenance policies developed for the 2005 APMS evaluation were used in developing this pavement management plan. WSDOT and FAA reviewed these localized preventive maintenance policies during the APMS evaluation, and determined the policies to be appropriate. The localized preventive maintenance policies used for AC and PCC pavements are in Table D-1 and D-2, respectively, of Appendix D.

Global maintenance policies identify the maintenance actions that are applied over an entire section, rather than just to the distressed areas. Unit costs (base cost year 2013) for the localized preventive maintenance actions used in the URS evaluation are presented on Table D-3 of Appendix D. These 2013 base year unit costs were determined by Huibregtse Louman Associates (HLA) for the Yakima Air Terminal and used in the development of this pavement management program with the annual inflation rates described in Section 3.1.2.

3.1.4 Major Rehabilitation and Unit Costs

The cost of major rehabilitation projects is estimated based upon the PCI value of the pavement. The unit costs (base cost year 2013) for major rehabilitation of AC and PCC pavements were developed for the APMS evaluation. The HLA 2013 base year unit costs were utilized for estimating the cost of the major rehabilitation and are summarized in Table D-4 of Appendix D.

3.2 ANALYSIS RESULTS

The localized preventative maintenance plan for 2013 and the six-year capital improvement plan developed are presented herein.

3.2.1 Localized Preventative Maintenance Program

The 2013 localized preventative maintenance plan developed for the YKM pavements is as summarized and located in Table 3-2.

In addition, the following general maintenance strategies are also recommended to improve the performance of the pavements:

- Control vegetation growth in pavement cracks by conducting regular herbicide programs.
- Implement a periodic crack sealing program.

Table 3-2: 2013 Localized Preventative Maintenance Program

Branch ID[1]	Section ID	Distress Type	Distress Severity	Distress Quantity	Unit	Maintenance Action	Estimated Cost
ACUBYK	1	Longitudinal/Transverse Cracking	Medium	708.31	LF	Crack Sealing - AC	$ 878.00
ACUBYK	2	Longitudinal/Transverse Cracking	Medium	910.33	LF	Crack Sealing - AC	$ 1,129.00
ACUBYK	3	Longitudinal/Transverse Cracking	High	519.09	LF	Crack Sealing - AC	$ 644.00
AMCYK	1	Longitudinal/Transverse Cracking	Medium	3,846.00	LF	Crack Sealing - AC	$ 4,769.00
ANWYK	2	Longitudinal/Transverse Cracking	Medium	690.71	LF	Crack Sealing - AC	$ 856.00
ATERMYK	1	Joint Seal Damage	Low	110	Slabs	Joint Seal (Silicon)	$ 2,354.00
AWESTYK	1	Longitudinal/Transverse Cracking	Medium	6,858.60	LF	Crack Sealing - AC	$ 8,505.00
TA1YK	2	Longitudinal/Transverse Cracking	Medium	1,623.41	LF	Crack Sealing - AC	$ 2,013.00
TA2YK	2	Longitudinal/Transverse Cracking	Medium	124.57	LF	Crack Sealing - AC	$ 154.00
TAYK	3	Longitudinal/Transverse Cracking	High	62.88	LF	Crack Sealing - AC	$ 78.00
TAYK	4	Longitudinal/Transverse Cracking	Medium	9,192.48	LF	Crack Sealing - AC	$ 11,399.00
TAYK	5	Longitudinal/Transverse Cracking	Medium	9,454.07	LF	Crack Sealing - AC	$ 11,723.00

Table 3-2: 2013 Localized Preventative Maintenance Program

Branch ID[1]	Section ID	Distress Type	Distress Severity	Distress Quantity	Unit	Maintenance Action	Estimated Cost
TAYK	7	Longitudinal/Transverse Cracking	Medium	6,074.35	LF	Crack Sealing - AC	$ 7,532.00
TB1YK	1	Weathering	Medium	8,199.51	SqFt	Surface Treatment - Slurry Seal	$ 10,167.00
TB2YK	1	Weathering	Medium	35,245.41	SqFt	Surface Treatment - Slurry Seal	$ 18,328.00
TBYK	1	Longitudinal/Transverse Cracking	Medium	5,751.19	LF	Crack Sealing - AC	$ 7,131.00
TCYK	2	Longitudinal/Transverse Cracking	Medium	782.75	LF	Crack Sealing - AC	$ 971.00
TL01YK	1	Longitudinal/Transverse Cracking	High	300	LF	Crack Sealing - AC	$ 372.00
TL04YK	1	Longitudinal/Transverse Cracking	Medium	8,151.18	LF	Crack Sealing - AC	$ 10,107.00
Total							**$ 99,111.00**

[1]*See Figure 2-3 for the location of the Branch and Section*

3.2.2 Six-Year Capital Improvement Program

A six-year capital improvement program identifying the major rehabilitation items for all YKM pavements considered in this pavement management plan was developed based on the current and future PCI prediction evaluations. Table 3-3 summarizes the prioritized six-year program developed for major rehabilitation projects and presents conceptual level cost estimates with a constrained budget that uses anticipated maximum available funding expected at YKM

The cost estimates for each year are inflated to reflect the annualized inflation rates specified in Section 3.1.2 applied to 2013 base year costs. The six-year capital improvement program using the constrained budget is shown on Figure 3-1.

Table 3-3: 6-Year CIP with Constrained Budget

Branch ID[1]	Section ID	Action	Estimated Cost
2013			
BP27YK	1	2" AC Overlay	$97,468
PLNWYK	3	2" AC Overlay	$115,127
PLNYK	2	2" AC Overlay	$72,771
PRWESTYK	1	2" AC Overlay	$62,602
TA5YK	2	2" AC Overlay	$21,278
TAYK	6	4" AC Overlay	$76,164
TCYK	2	2" AC Overlay	$10,640
TDYK	1	2" AC Overlay	$65,161
		Total	**$521,211**
2014			
R04YK	04A	2.5” AC Overlay	$95,542
	04B	2.5" AC Overlay	$93,885
	04C	2.5" AC Overlay	$96,603
	05A	2.5" AC Overlay	$32,631
	05B	2.5" AC Overlay	$31,661
	05C	2.5" AC Overlay	$30,710
	06A	2.5" AC Overlay	$237,130
	06B	2.5" AC Overlay	$218,699
	06C	2.5" AC Overlay	$211,890
	07A	2.5" AC Overlay	$23,647
	07B	2.5" AC Overlay	$23,814
	07C	2.5" AC Overlay	$24,096
		Total	**$1,120,308**
2015			
R04YK	01A	2.5" AC Overlay	$420,098
	01B	2.5" AC Overlay	$428,343
	01C	2.5" AC Overlay	$395,577
	02A	2.5" AC Overlay	$397,442
	02B	2.5" AC Overlay	$441,127
	02C	2.5" AC Overlay	$444,624
		Total	**$2,527,211**

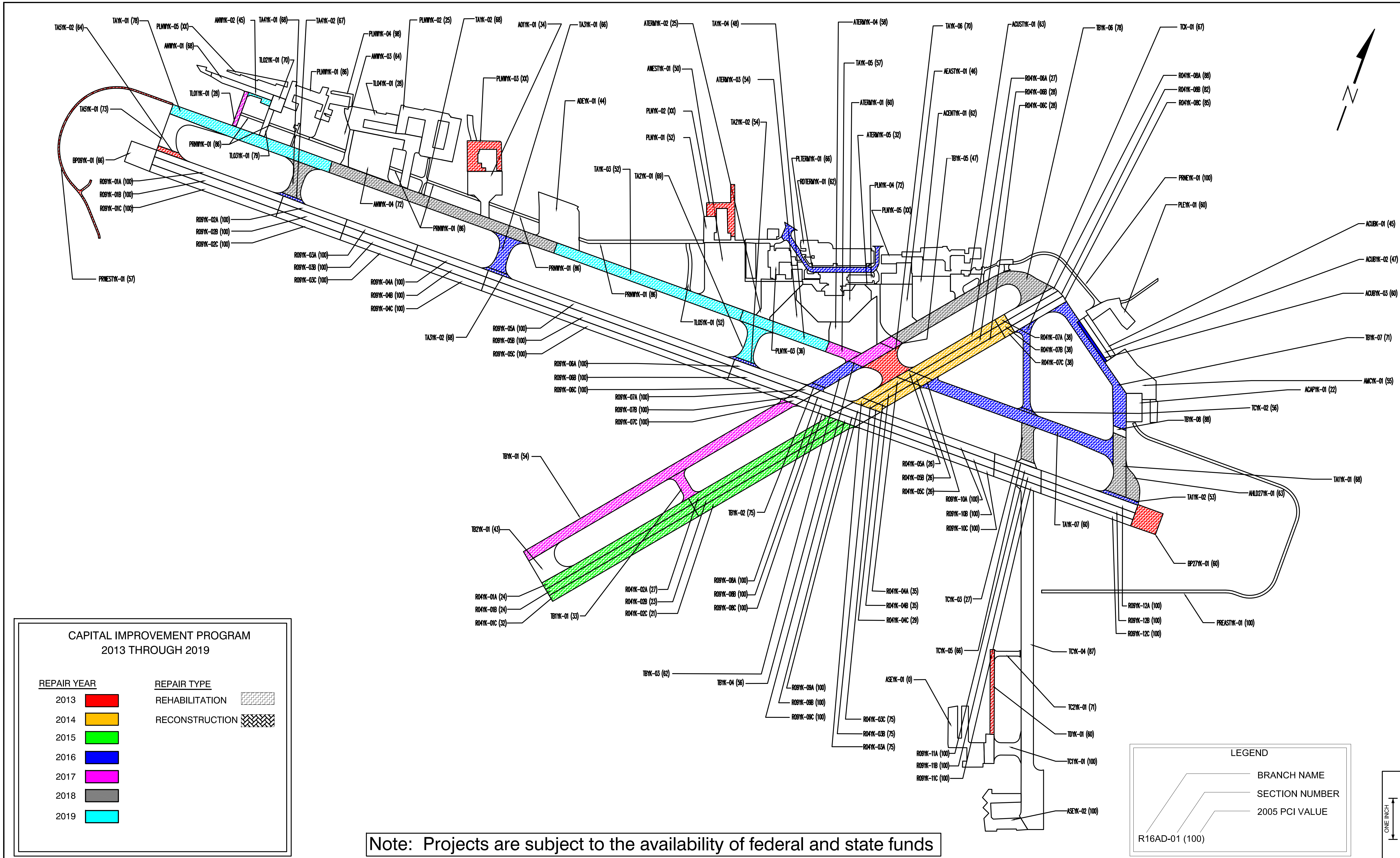
Table 3-3: 6-Year CIP with Constrained Budget (Continued)

Branch ID[1]	Section ID	Action	Estimated Cost
2016			
RDTERMYK	1	4” AC Overlay	$117,850
TA1YK	2	2" AC Overlay	$41,275
TA2YK	2	2" AC Overlay	$23,823
TA3YK	1	2" AC Overlay	$93,767
	2	2" AC Overlay	$13,539
TA4YK	2	2" AC Overlay	$13,713
TAYK	7	4" AC Overlay	$572,470
TBYK	3	2" AC Overlay	$107,286
	7	2" AC Overlay	$255,006
TCYK	1	2" AC Overlay	$157,502
		Total	**$1,396,231**
2017			
ACUBYK	3	2" AC Overlay	$44,313
TAYK	5	4" AC Overlay	$94,712
TB1YK	1	2" AC Overlay	$122,371
TBYK	1	2" AC Overlay	$901,880
	4	2" AC Overlay	$127,846
	5	2" AC Overlay	$50,519
TL01YK	1	2" AC Overlay	$58,161
		Total	**$1,399,802**
2018			
AHLD27YK	1	2" AC Overlay	$86,652
TA1YK	1	4" AC Overlay	$154,397
TA4YK	1	2" AC Overlay	$100,789
TAYK	2	4" AC Overlay	$505,851
TBYK	6	2" AC Overlay	$424,417
TCYK	3	2" AC Overlay	$89,745
		Total	**$1,361,851**
2019			
ANWYK	2	2" AC Overlay	$86,399
ATCHLDYK	2	2" AC Overlay	$14,593
TA2YK	1	2" AC Overlay	$104,234

Table 3-3: 6-Year CIP with Constrained Budget (Continued)

Branch ID[1]	Section ID	Action	Estimated Cost
TAYK	3	4" AC Overlay	$796,716
	4	4" AC Overlay	$393,400
		Total	**$1,395,342**

[1]*See Figure 2-3 for the location of the Branch and Section*



URS
1501 4TH AVENUE, SUITE 1400
SEATTLE, WA 98101
PHONE: (206) 438-2700

PROJECT MANAGER: | DRAFTED BY:
DESIGNED BY: | CHECKED BY:

#	REVISION	COMPANY	BY	DATE

YAKIMA AIR TERMINAL/McALLISTER FIELD
AIRPORT MASTER PLAN

2011 CAPITAL IMPROVEMENT PROGRAM MAP

SCALE: 1" = 300'
DATE: JANUARY 2013

AIP NUMBER: 3-53-009-32

SHEET NUMBER: FIG 3–1

4

CLOSURE AND LIMITATIONS

4.1 CLOSURE

The pavement management plan presented in this report was prepared in accordance with the PCI method described in ASTM D5340 and as adopted by FAA. Also, the report was prepared to meet the requirements of Public Law 103-305.

Public Law 103-305 requires that airport sponsors provide assurances or certifications that an airport has implemented an effective airport pavement maintenance management system (PMMS) before the airport will be considered for funding of pavement replacement or reconstruction projects. To be in full compliance of this Federal law and to satisfy FAA Grant Assurance 11, the PMMS must include at least the following components:

- Pavement Inventory
- Pavement Inspections
- Record Keeping
- Information Retrieval
- Program Funding

As part of this report, a comprehensive pavement inventory, the maintenance of which YKM is responsible for, has been developed. To remain in compliance with the law, the airport will also need to undertake the following:

- Conduct monthly drive-by inspections of pavement conditions
- Track pavement related maintenance activities
- Conduct detailed inspections of the pavements at least once every three years

A sample monthly drive-by inspection form is provided in Appendix E.

The next detailed inspection and PCI evaluation of the pavement should occur in 2016-17.

4.2 LIMITATIONS

This pavement management program was developed as a planning tool to assist the planning of the localized maintenance and capital improvement plans; it consists of a visual network level evaluation, only. The unit costs used in the evaluation reflect local conditions and are conceptual level construction costs that include engineering, construction inspection and administrative fees that have been inflated on an annual basis. The costs for major individual projects should be evaluated in more detail based on a project-level pavement engineering evaluation The capital improvement program may need adjustment to account for economic and/or operational constraints. This report is conceptual as to which pavements need to be repaired/replaced based on the critical PCI value but YKM Master Plan will look into further detail for the specific areas that need to be addressed based on the airports needs and budget.

5

REFERENCES

- Applied Pavement Technology, Inc., “Yakima Air Terminal - 2005 Pavement Management Report” for Washington State Department of Transportation Aviation and Federal Aviation Administration, 2006.
- ASTM, “ASTM D5340-11, Standard Test Method for Airport Pavement Condition Index Surveys”, 2011.
- Federal Aviation Administration (FAA), “FAA Advisory Circular AC 150/5380-6B: Guidelines and Procedures for Maintenance of Airport Pavements”, 2007.
- Federal Aviation Administration (FAA), “Pavement History and AIP Project Records”
- Yakima Air Terminal/McAllister Field, “2003 Airport Layout Plan”, 2003.
- Yakima Air Terminal/McAllister Field, “Engineering record plans and reports”.

APPENDIX A

CAUSES OF PAVEMENT DISTRESS

Table A-1: Probable Causes of Pavement Distress on Asphalt-Surfaced Pavements

Distress Type	Probable Cause of Distress
Alligator Cracking	Fatigue failure of the asphalt concrete surface under repeated traffic loading
Bleeding	Excessive amounts of asphalt cement or tar in the mix and/or low air void content
Block Cracking	Shrinkage of the asphalt concrete and daily temperature cycling
Corrugation	Traffic action combined with an unstable pavement layer
Depression	Settlement of the foundation soil or can be “built-up” during construction
Jet Blast	Bituminous binder has been burned or carbonized
Joint Reflection	Movement of the concrete slab beneath the asphalt concrete surface because of thermal and moisture changes
Longitudinal and Transverse Cracking	Poorly constructed paving lane joint; OR shrinkage of the AC surface due to low temperatures or hardening of the asphalt; OR reflective crack caused by cracks in an underlying Portland Cement Concrete (PCC) slab
Oil Spillage	Deterioration or softening of the pavement surface caused by the spilling of oil, fuel, or other solvents
Patching	N/A
Polished Aggregate	Repeated traffic applications
Raveling and Weathering	Asphalt binder may have hardened significantly
Rutting	Usually by consolidation or lateral movement of the materials due to traffic loads
Shoving	Where PCC pavements adjoin flexible pavements, PCC “growth” may shove the asphalt pavement
Slippage Cracking	Low strength surface mix or poor bond between the surface and next layer of pavement structure
Swelling	Usually by frost action or by swelling soil

Table A-2: Probable Causes of Pavement Distress on Portland Cement Concrete Pavements

Distress Type	Probable Cause of Distress
Blow-up	Incompressibles in joints
Corner Break	Load repetition combined with loss of support and curling stresses
Cracks	Combination of load repetition, curling stresses, and shrinkage stresses
Durability Cracking	Concrete's inability to withstand environmental factors such as freeze-thaw cycles
Joint Seal Damage	Stripping of joint sealant, extrusion of joint sealant, weed growth, hardening of filler (oxidation), loss of bond to slab edges, or absence of sealant in joint
Patching (Small)	N/A
Patching (Large)	N/A
Popouts	Freeze-thaw action in combination with expansive aggregates
Pumping	Poor drainage, poor joint sealant
Scaling	Over finishing of concrete, deicing salts, improper construction, freeze-thaw cycles, poor aggregate, alkali-silica reactivity
Settlement	Upheaval or consolidation
Shattered Slab	Load repetition
Shrinkage	Setting and curing of the concrete
Spalling (Joint and Corner)	Excessive stresses at the joint caused by infiltration of incompressible materials or traffic loads; weak concrete at joint combined with traffic loads

APPENDIX B

B SELECTED PHOTOGRAPHS

R09YK

BP09YK

BP27YK

TA1YK

TAYK

TAYK

TAYK

TAYK

TA2YK

AHLDYK

TBYK

R04YK

R04YK

TB2YK

ASEYK-02

TCYK-04

TC1YK

ASEYK-01

TDYK

TC2YK

TCYK-03 to -02

AEASTYK-01

ACENTYK

ATERMYK-01

ATERMYK-03

ATERMYK-02

AWESTYK

AWESTYK

PLEYK-01

TL04YK-01

ANWYK-04

TL04YK-01

TL03YK

PRNWYK

ANWYK-02 (Left), ANYYK-01 (Right)

PRWESTYK

A01YK

A01YK

PLNYK-03

PLNYK-03

PLNWYK-05

RDTERMYK

RDTERMYK

PLTERMYK

PLTERMYK

PLNYK-04

D

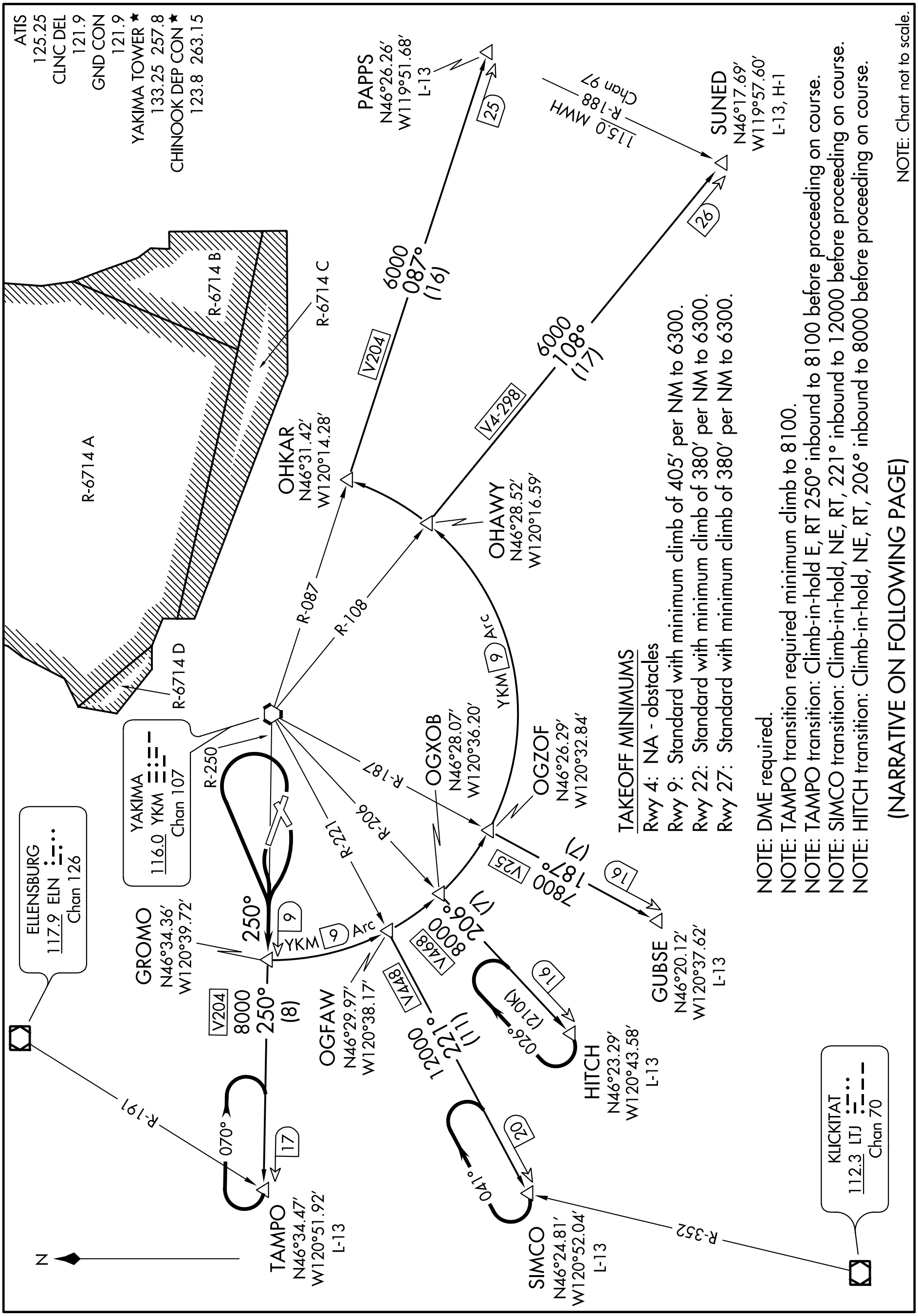
D APPROACH/DEPARTURE PLATES

D.1 INSTRUMENT APPROACH PROCEDURES

- ILS Y RWY 27
- ILS Z RWY 27
- RNAV (RNP) Y RWY 09
- RNAV (RNP) Y RWY 27
- RNAV (RNP) Z RWY 09
- RNAV (RNP) Z RWY 27
- RNAV (GPS) W RWY 27
- RNAV (GPS) X RWY 27
- LOC/DME BC-B
- VOR/DME OR TACAN RWY 27
- VOR-A
- COPTER NDB RWY27

D.2 DEPARTURE PROCEDURES

- GROMO THREE
- NACHES TWO
- WENAS SIX
- YAKIMA SIX   ZILLA THREE (OBSTACLE)



TAKEOFF MINIMUMS
Rwy 4: NA - obstacles
Rwy 9: Standard with minimum climb of 405′ per NM to 6300.
Rwy 22: Standard with minimum climb of 380′ per NM to 6300.
Rwy 27: Standard with minimum climb of 380′ per NM to 6300.

NOTE: DME required.
NOTE: TAMPO transition required minimum climb to 8100.
NOTE: TAMPO transition: Climb-in-hold E, RT 250° inbound to 8100 before proceeding on course.
NOTE: SIMCO transition: Climb-in-hold, NE, RT, 221° inbound to 12000 before proceeding on course.
NOTE: HITCH transition: Climb-in-hold, NE, RT, 206° inbound to 8000 before proceeding on course.

(NARRATIVE ON FOLLOWING PAGE)

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAYS 9, 27: Climbing left turn thence. . . .

TAKEOFF RUNWAY 22: Climbing right turn thence. . . .

. . . . intercept and proceed on YKM R-250 to GROMO/YKM 9 DME, then on assigned transition.

GUBSE TRANSITION (GROMO4.GUBSE): From over GROMO DME Fix on YKM 9 DME Arc to OGZOF DME fix and YKM VORTAC R-187 to GUBSE DME fix.

HITCH TRANSITION (GROMO4.HITCH): From over GROMO DME Fix on YKM 9 DME Arc to OGXOB DME fix and YKM VORTAC R-206 to HITCH DME fix.

PAPPS TRANSITION (GROMO4.PAPPS): From over GROMO DME Fix on YKM 9 DME Arc to OHKAR DME fix and YKM VORTAC R-087 to PAPPS DME fix.

SIMCO TRANSITION (GROMO4.SIMCO): From over GROMO DME Fix on YKM 9 DME Arc to OGFAW DME fix and YKM VORTAC R-221 to SIMCO INT.

SUNED TRANSITION (GROMO4.SUNED): From over GROMO DME Fix on YKM 9 DME Arc to OHAWY DME fix and YKM R-108 to SUNED INT.

TAMPO TRANSITION (GROMO4.TAMPO): From over GROMO DME Fix on YKM VORTAC R-250 to TAMPO INT.

NW-1, 03 DEC 2020 to 31 DEC 2020
NW-1, 03 DEC 2020 to 31 DEC 2020

LOC/DME I-YKM	APP CRS	Rwy ldg	7604
110.1 Chan **38**	**274°**	TDZE	**1068**
		Apt Elev	**1099**

ILS or LOC RWY 27

YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)

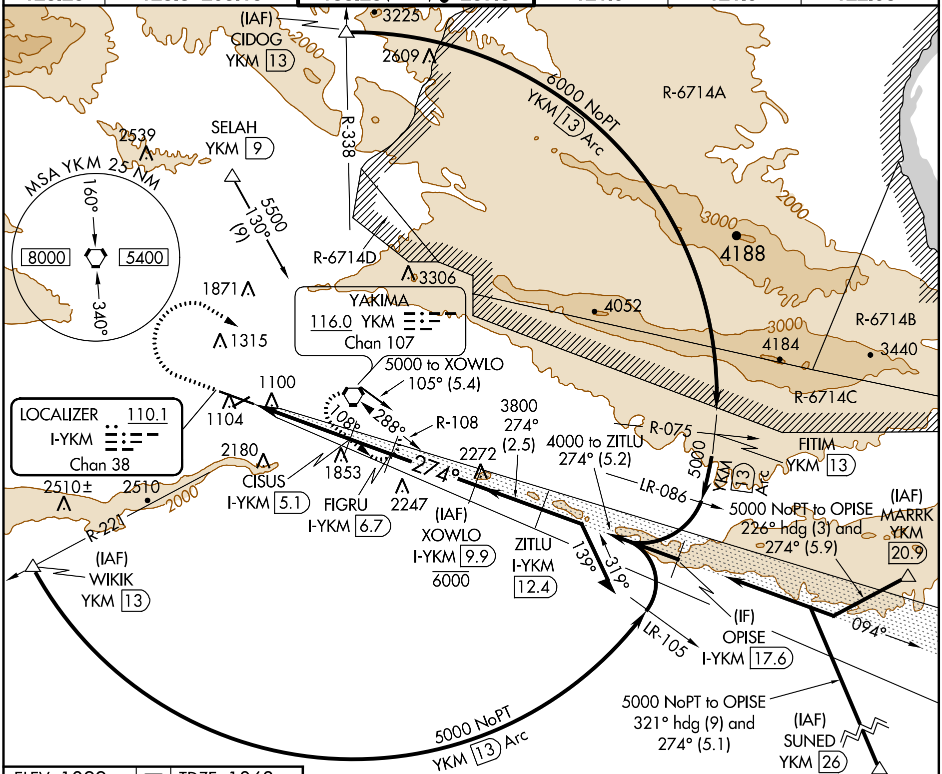
DME required for procedure entry. DME required for LOC only.

When local altimeter setting not received, procedure NA. Circling NA south of Rwys 9 and 27. For inop ALS, increase S-LOC 27 Cats C/D visibility to 2 SM. For inop ALS, increase S-ILS 27 all Cats visibility to 1⅞ SM. #RVR 1800 authorized with use of FD or AP or HUD to DA.

MALSR A5

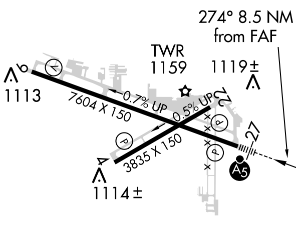
MISSED APPROACH: Climb to 2900 then climbing right turn to 4900 direct YKM VORTAC and hold, continue climb-in-hold to 4900. #Missed approach requires minimum climb of 275 feet per NM to 3600.

ATIS	CHINOOK APP CON★	YAKIMA TOWER★	GND CON	CLNC DEL	UNICOM
125.25	**123.8 263.15**	**133.25** (CTAF) L **257.8**	**121.9**	**121.9**	**122.95**

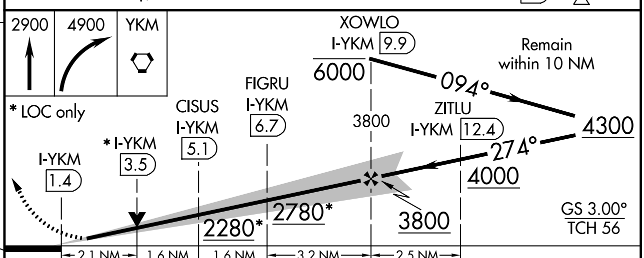


NW-1, 03 DEC 2020 to 31 DEC 2020

ELEV 1099 D TDZE 1068



MIRL Rwy 4-22
HIRL Rwy 9-27 L
REIL Rwys 4, 9, and 22



CATEGORY	A	B	C	D
S-ILS 27 #	1268/24 200 (200-½)			
S-ILS 27	1713-1⅜ 645 (700-1⅜)			
S-LOC 27	1780/24 712 (700-½)		1780-1⅝ 712 (700-1⅝)	
C CIRCLING	1780-1 681 (700-1)		1940-2½ 841 (900-2½)	2280-3 1181 (1200-3)

LOC/DME I-YKM 110.1 Chan 38	APP CRS 094°	Rwy ldg N/A TDZE N/A Apt Elev 1099

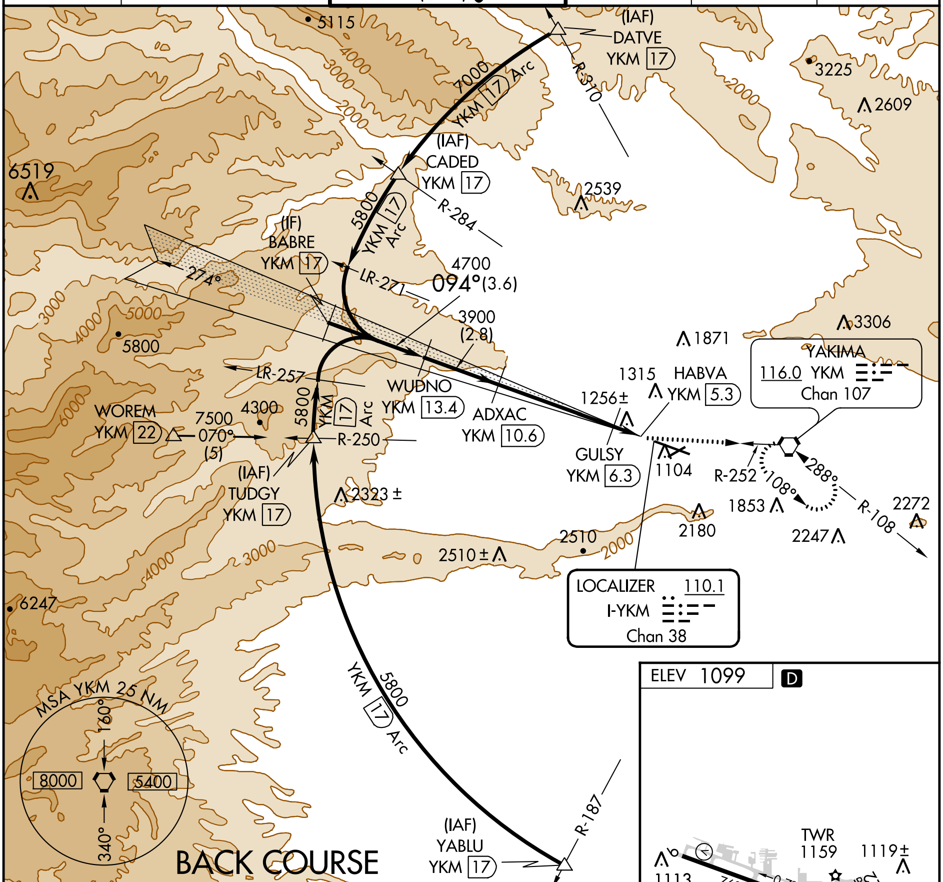
LOC/DME BC-B
YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)

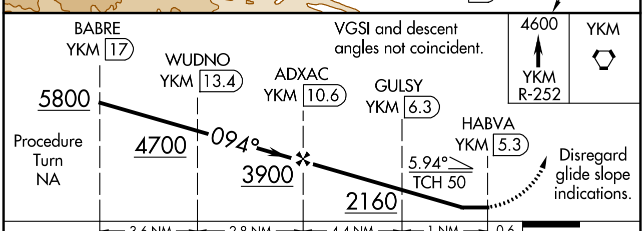
T Simultaneous reception of I-YKM and YKM DME required.
A Circling NA south of Rwy 9-27.
When local altimeter setting not received, procedure NA.

MISSED APPROACH: Climb to 4600 via YKM VORTAC R-252 to YKM VORTAC and hold, continue climb-in-hold to 4600.

ATIS	CHINOOK APP CON ★	YAKIMA TOWER ★	GND CON	CLNC DEL	UNICOM
125.25	123.8 263.15	133.25 (CTAF) L 257.8	121.9	121.9	122.95

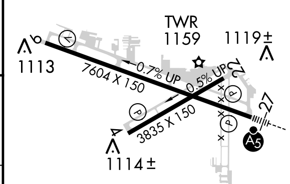
NW-1, 03 DEC 2020 to 31 DEC 2020





CATEGORY	A	B	C	D
C CIRCLING	1760-1 661 (700-1)		1940-2½ 841 (900-2½)	2280-3 1181 (1200-3)

ELEV 1099 D

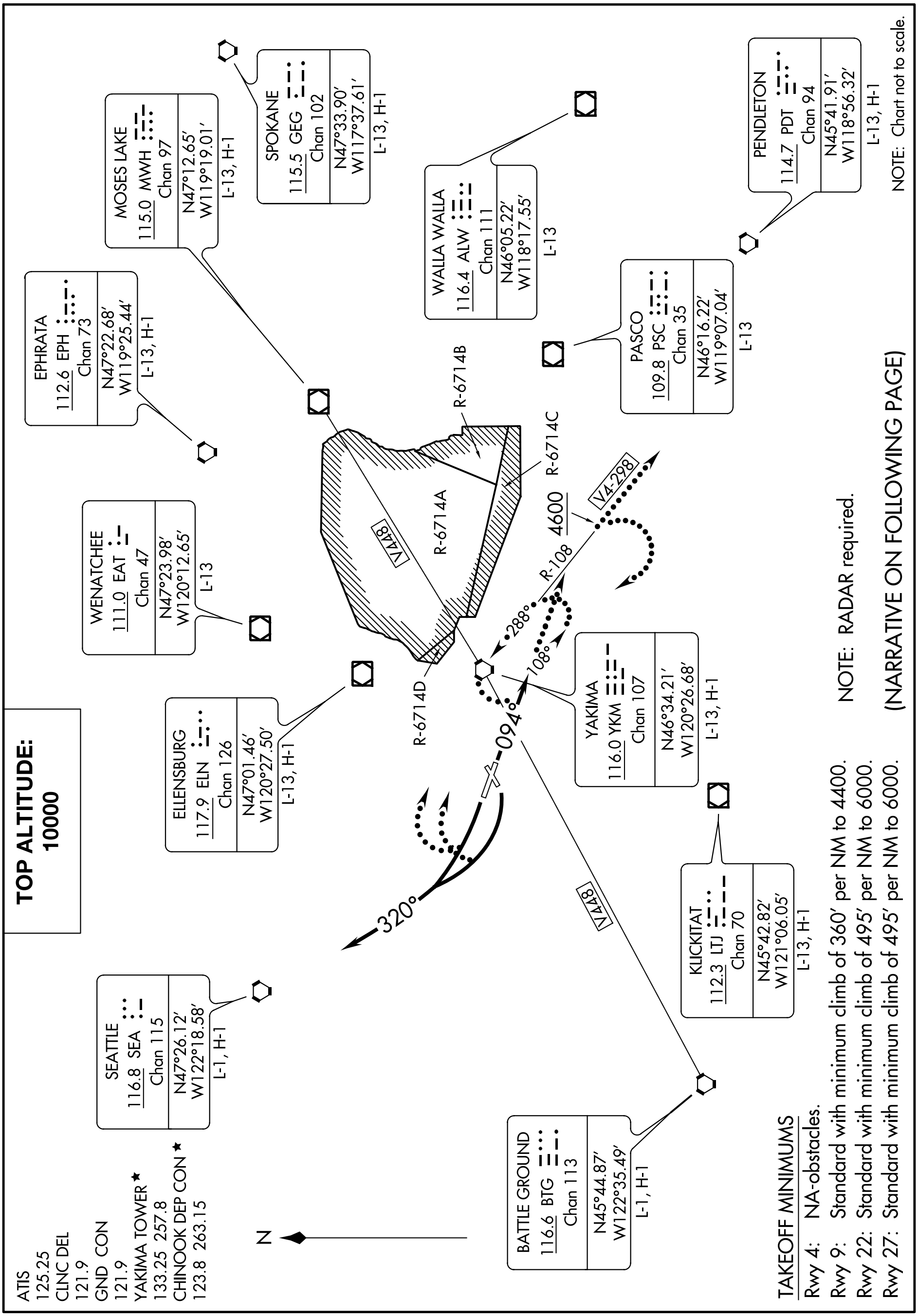


MIRL Rwy 4-22
HIRL Rwy 9-27 L
REIL Rwys 4, 9, and 22

NW-1, 03 DEC 2020 to 31 DEC 2020

NACHES FOUR DEPARTURE

YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)
AL-465 (FAA) YAKIMA, WASHINGTON



NACHES FOUR DEPARTURE
YAKIMA, WASHINGTON
YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAY 9: Climb heading 094° for vector to assigned route/fix. Thence . . . .
TAKEOFF RUNWAYS 22, 27: Climbing right turn heading 320° for vector to assigned route/fix. Thence . . . .

. . . . maintain 10000 or assigned lower altitude. Expect clearance to filed altitude 5 minutes after departure.

LOST COMMUNICATIONS
If no transmissions are received for one minute after departure:

RUNWAY 9: Climb heading 094° and outbound YKM VORTAC R-108.

RUNWAYS 22, 27: Climbing right turn direct YKM VORTAC and outbound YKM R-108, eastbound aircraft V4-V298 continue on course, all other departures continue climb on YKM R-108, until 4600, then climbing right turn direct YKM VORTAC and hold to cross YKM VORTAC at or above MEA or MCA for route of flight.

NW-1, 03 DEC 2020 to 31 DEC 2020
NW-1, 03 DEC 2020 to 31 DEC 2020

RNAV (GPS) X RWY 27
YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)

WAAS CH **90512** **W27A**	APP CRS **274°**	Rwy ldg **7604** TDZE **1068** Apt Elev **1099**

RNP APCH.

Circling NA south of Rwys 9 and 27.

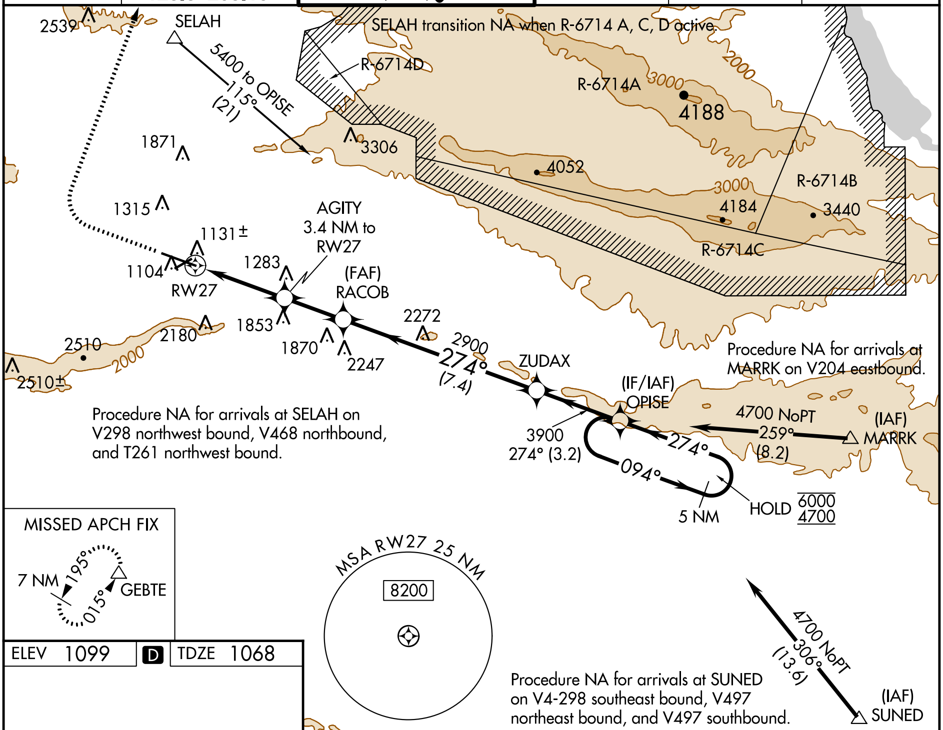
For inop ALS, increase LPV all Cats visibility to 1¾ SM.

*RVR 1800 authorized with use of FD or AP or HUD to DA.

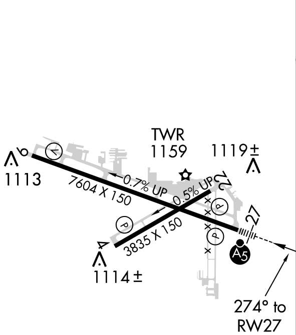
MALSR A5

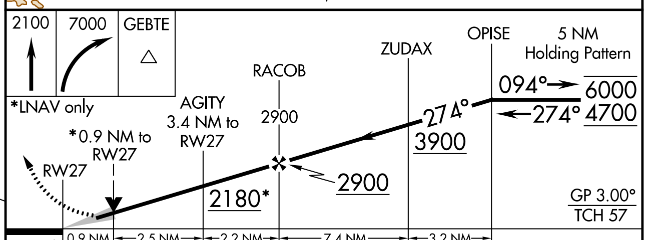
MISSED APPROACH: Climb to 2100 then climbing right turn to 7000 direct GEBTE and hold. Continue climb-in-hold to 7000. *Missed approach requires minimum climb of 300 feet per NM to 3700. #Missed approach requires minimum climb of 300 feet per NM to 4900.

ATIS	CHINOOK APP CON★	YAKIMA TOWER★	GND CON	CLNC DEL	UNICOM
125.25	123.8 263.15	133.25 (CTAF) L 257.8	121.9	121.9	122.95



ELEV 1099 D TDZE 1068





CATEGORY	A	B	C	D
LPV DA*	1268/24 200 (200-½)			
LPV DA	1668-1¼ 600 (600-1¼)			
LNAV MDA#	1400/24 332 (400-½)		1400/26 332 (400-½)	
LNAV MDA	1720/24 652 (700-½)		1720-1⅜ 652 (700-1⅜)	
C CIRCLING	1720-1 621 (700-1)		1880-2¼ 781 (800-2¼)	2280-3 1181 (1200-3)

MIRL Rwy 4-22
HIRL Rwy 9-27 L
REIL Rwys 4, 9, and 22

NW-1, 03 DEC 2020 to 31 DEC 2020

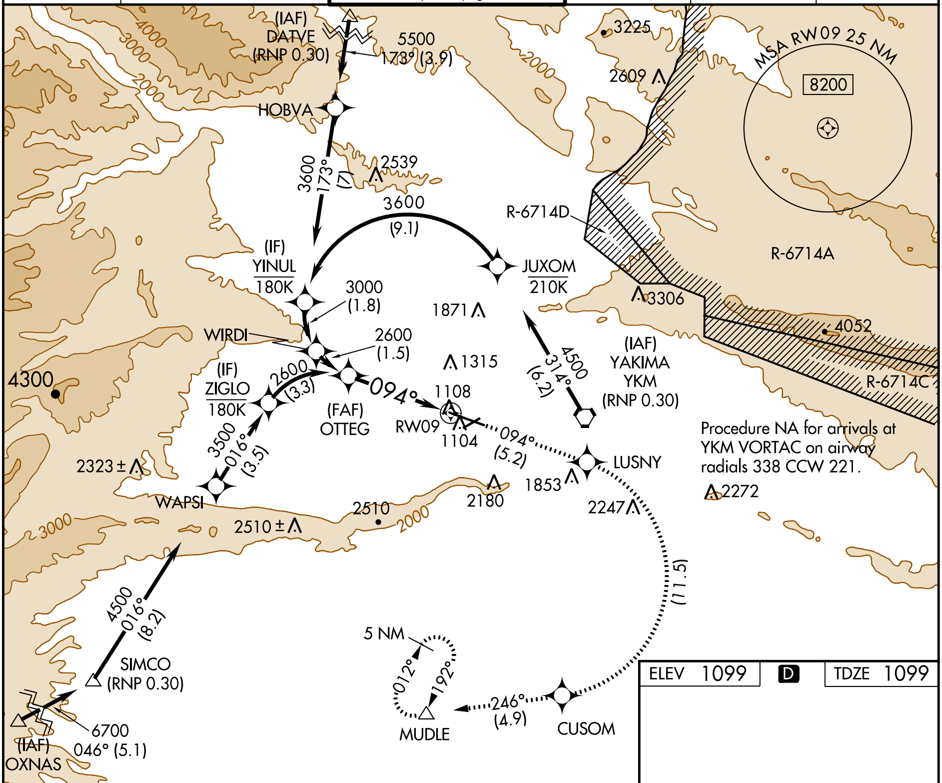
APP CRS	Rwy ldg	7604
094°	TDZE	1099
	Apt Elev	1099

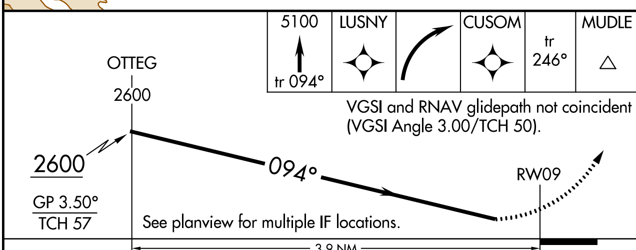
RNAV (RNP) RWY 9
YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)

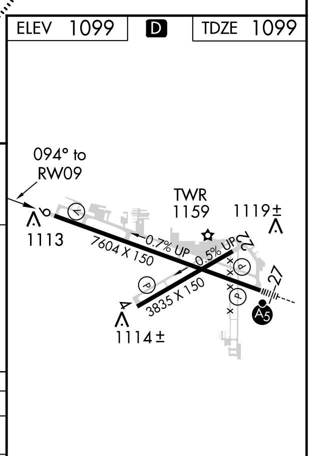
RF required. GPS required. For uncompensated Baro-VNAV systems, procedure NA below -17°C (2°F) or above 45°C (113°F).
*Missed approach requires a minimum climb of 425 feet per NM to 3000.

MISSED APPROACH: Climb to 5100 on track 094° to LUSNY right turn to CUSOM and on track 246° to MUDLE and hold.

ATIS	CHINOOK APP CON *	YAKIMA TOWER *	GND CON	CLNC DEL	UNICOM
125.25	123.8 263.15	133.25 (CTAF) L 257.8	121.9	121.9	122.95







CATEGORY	A	B	C	D
RNP 0.30 DA*	1473-1 374 (400-1)			NA
RNP 0.30 DA	1934-2½ 835 (900-2½)			NA

AUTHORIZATION REQUIRED

MIRL Rwy 4-22
HIRL Rwy 9-27 L
REIL Rwys 4, 9, and 22

NW-1, 03 DEC 2020 to 31 DEC 2020

NW-1, 03 DEC 2020 to 31 DEC 2020

RNAV (RNP) Y RWY 27

YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)

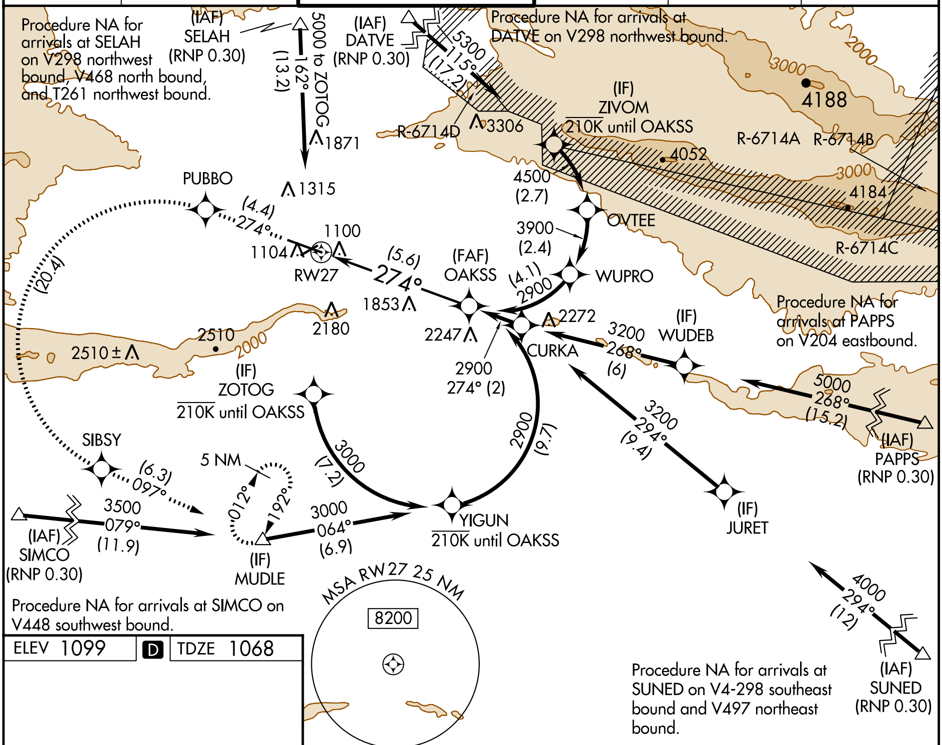
APP CRS	Rwy ldg	7604
274°	TDZE	1068
	Apt Elev	1099

T A For uncompensated Baro-VNAV systems, procedure NA below -17°C (2°F) or above 54°C (130°F). RF required. GPS required. DATVE transition NA when R-6714 A, C, D active.

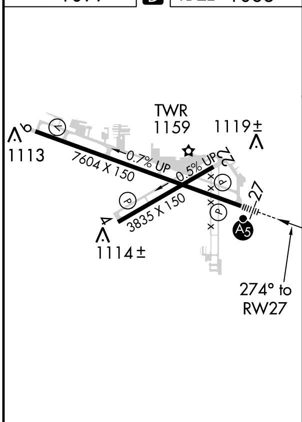
MALSR A5

MISSED APPROACH: Climb to 5100 on track 274° to PUBBO left turn to SIBSY and on track 097° to MUDLE and hold.
*Missed approach requires minimum climb of 425 feet per NM to 3400.

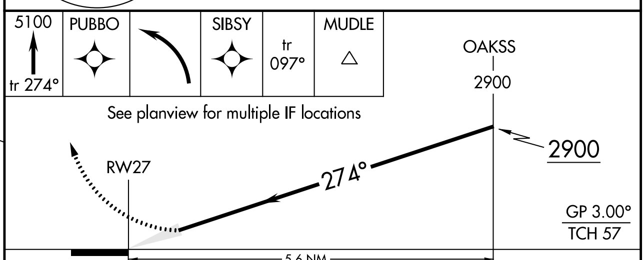
ATIS	CHINOOK APP CON★	YAKIMA TOWER★	GND CON	CLNC DEL	UNICOM
125.25	123.8 263.15	133.25 (CTAF) L 257.8	121.9	121.9	122.95



ELEV 1099 | D | TDZE 1068



MIRL Rwy 4-22
HIRL Rwy 9-27 L
REIL Rwys 4, 9, and 22



CATEGORY	A	B	C	D
RNP 0.30 DA*	1418/30 350 (400-⅝)			
RNP 0.30 DA	1845-2¼ 777 (800-2¼)			

AUTHORIZATION REQUIRED

RNAV (RNP) Z RWY 27

YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)

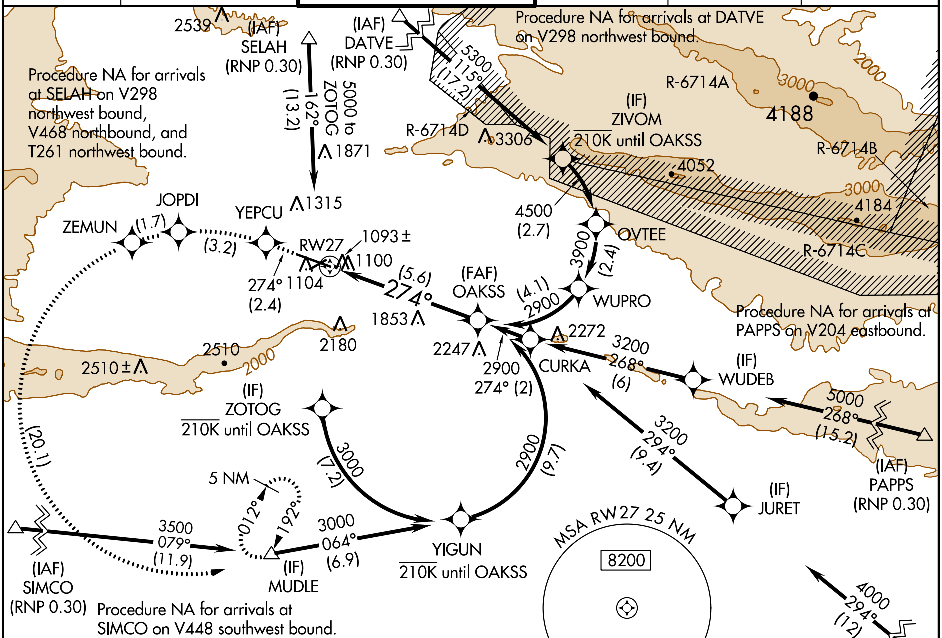
APP CRS	Rwy ldg	7604
274°	TDZE	1068
	Apt Elev	1099

For uncompensated Baro-VNAV systems, procedure NA below -17°C (2°F) or above 54°C (130°F). RF required. GPS required. Missed approach requires RNP less than 1.0. For inop ALS increase *RNP 0.10 DA visibility all Cats to RVR 4500 and RNP 0.30 DA visibility all Cats to 1¼ SM. DATVE transition NA when R-6714 A, C, D active.

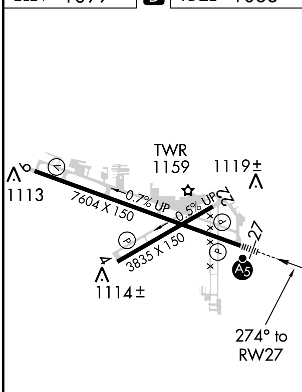
MALSR

MISSED APPROACH: Climb to 5100 on track 274° to YEPCU left turn to JOPDI left turn to ZEMUN left turn to MUDLE and hold.
*Missed approach requires a minimum climb of 215 feet per NM to 4300.

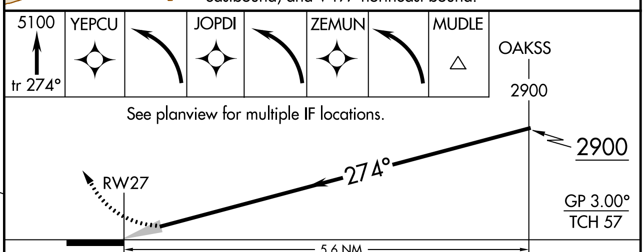
ATIS	CHINOOK APP CON*	YAKIMA TOWER*	GND CON	CLNC DEL	UNICOM
125.25	123.8 263.15	133.25 (CTAF) 257.8	121.9	121.9	122.95



ELEV 1099 | D | TDZE 1068



MIRL Rwy 4-22
HIRL Rwy 9-27
REIL Rwys 4, 9, and 22



CATEGORY	A	B	C	D
RNP 0.10 DA*	1348/24 280 (300-½)			
RNP 0.30 DA	1468/45 400 (400-⅞)			

AUTHORIZATION REQUIRED

VORTAC YKM 116.0 Chan 107	APP CRS 251°	Rwy ldg N/A TDZE N/A Apt Elev 1099

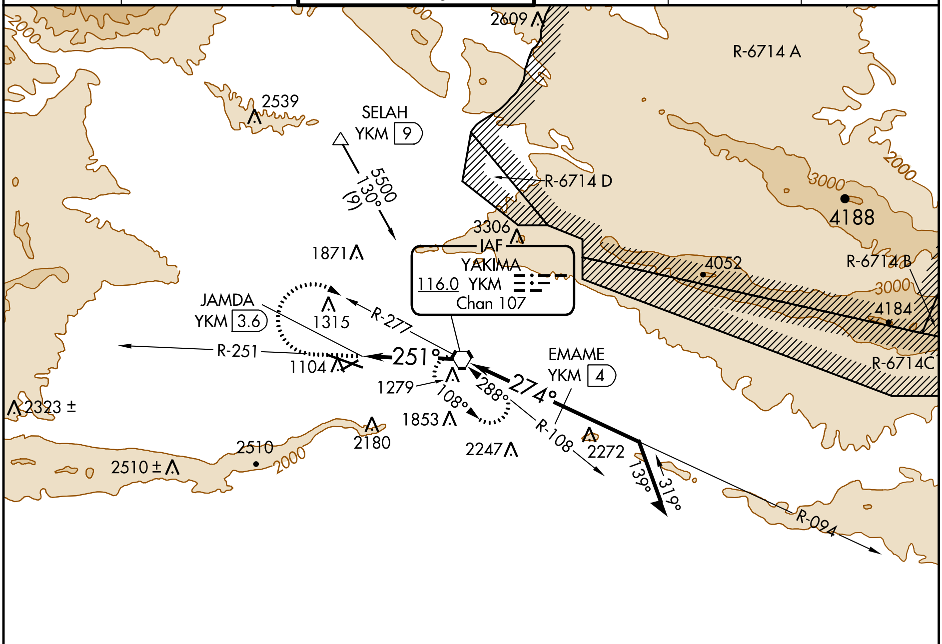
VOR-A

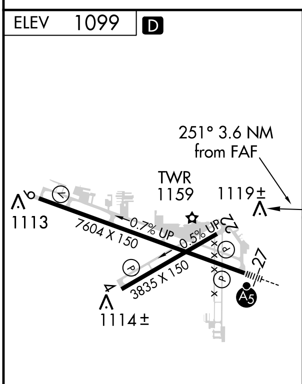
YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)

DME required.
Circling not authorized south of Rwy 9-27.
When local altimeter setting not received, procedure NA.

MISSED APPROACH: Climb to 2600 via YKM VORTAC R-251 then climbing right turn to 4600 via YKM VORTAC R-277 to YKM VORTAC and hold, continue climb-in-hold to 4600.

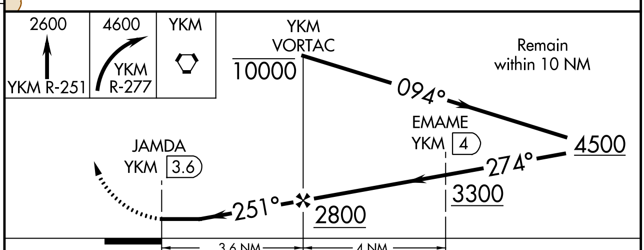
ATIS	CHINOOK APP CON★	YAKIMA TOWER★	GND CON	CLNC DEL	UNICOM
125.25	123.8 263.15	133.25 (CTAF) Ⓛ 257.8	121.9	121.9	122.95





MIRL Rwy 4-22
HIRL Rwy 9-27 Ⓛ
REIL Rwys 4, 9, and 22

FAF to MAP 3.6 NM					
Knots	60	90	120	150	180
Min:Sec	3:36	2:24	1:48	1:26	1:12



CATEGORY	A	B	C	D
Ⓒ CIRCLING	1840-1 741 (800-1)	1840-1¼ 741 (800-1¼)	1940-2½ 841 (900-2½)	2280-3 1181 (1200-3)

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VOR/DME or TACAN RWY 27

YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)

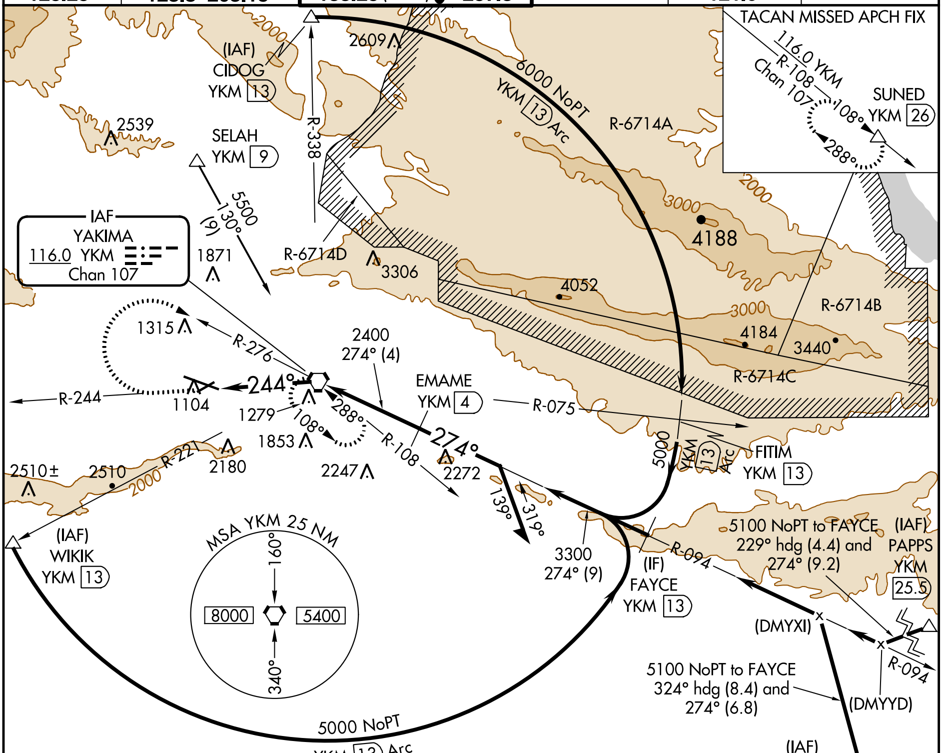
VORTAC YKM 116.0 Chan 107	APP CRS 244°	Rwy ldg 7604 TDZE 1068 Apt Elev 1099

T Inoperative table does not apply.
A Circling NA south of Rwy 9-27.
When local altimeter setting not received, procedure NA.

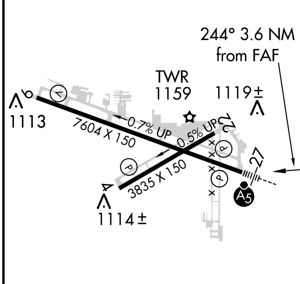
MALSR

MISSED APPROACH: Climb to 2600 via YKM VORTAC R-244, then climbing right turn to 4600 via YKM VORTAC R-276 to YKM VORTAC and hold, continue climb-in-hold to 4600 (TACAN aircraft, continue climb to 5000 via YKM VORTAC R-108 to SUNED/YKM 26 DME and hold west, right turns, 108° inbound).

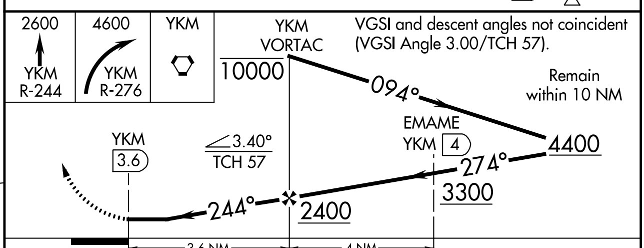
ATIS	CHINOOK APP CON ★	YAKIMA TOWER ★	GND CON	CLNC DEL	UNICOM
125.25	123.8 263.15	133.25 (CTAF) L 257.8	121.9	121.9	122.95



ELEV 1099 D TDZE 1068

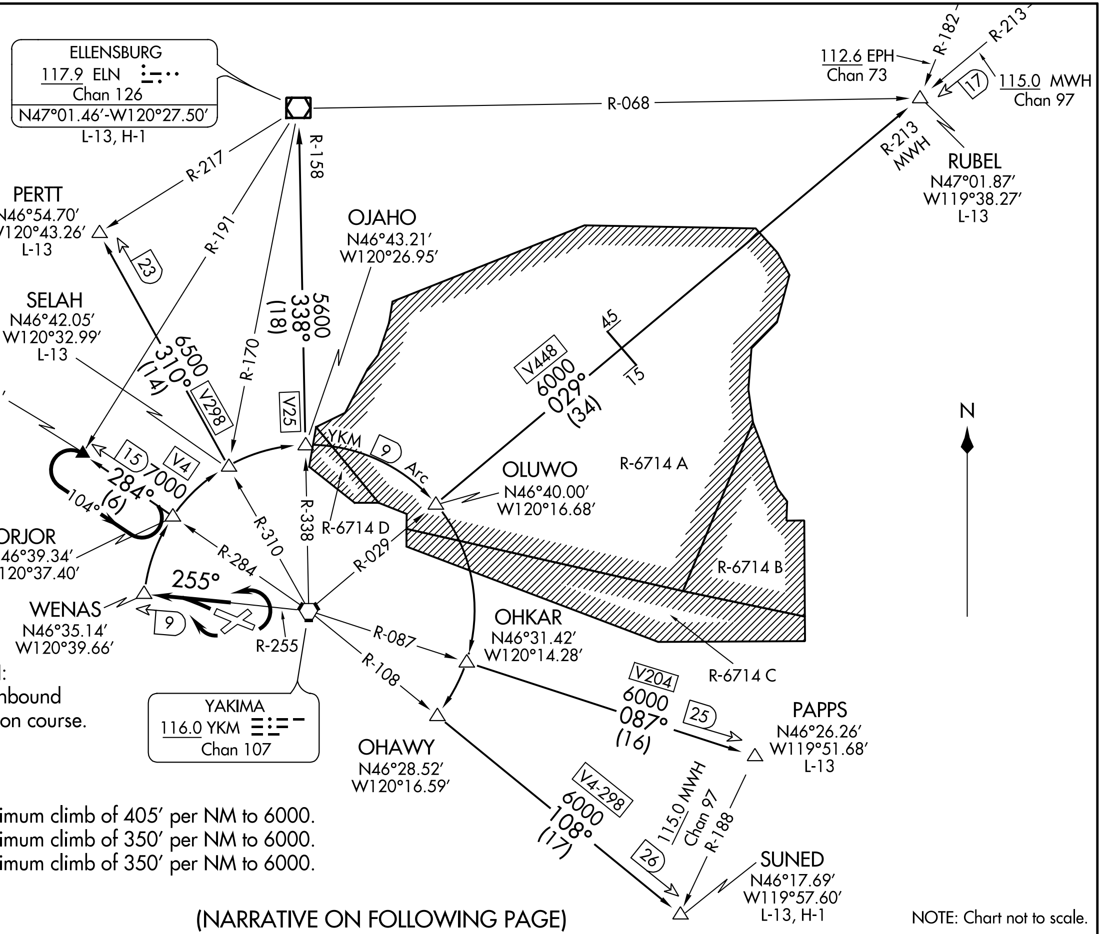


MIRL Rwy 4-22
HIRL Rwy 9-27 L
REIL Rwys 4, 9, and 22



CATEGORY	A	B	C	D
S-27	2100/60 1032 (1100-1¼)	2100-1½ 1032 (1100-1½)	2100-3 1032 (1100-3)	
C CIRCLING	2100-1¼ 1001 (1100-1¼)	2100-1½ 1001 (1100-1½)	2100-3 1001 (1100-3)	2280-3 1181 (1200-3)

ATIS
125.25
CLNC DEL
121.9
GND CON
121.9
YAKIMA TOWER ★
133.25 257.8
CHINOOK DEP CON ★
123.8 263.15



NOTE: DME required.

NOTE: TITON TRANSITION:
Climb-in-hold, E, LT, 284° inbound to 7000 before proceeding on course.

TAKEOFF MINIMUMS

Rwy 4: NA - Obstacles
Rwy 9: Standard with minimum climb of 405′ per NM to 6000.
Rwy 22: Standard with minimum climb of 350′ per NM to 6000.
Rwy 27: Standard with minimum climb of 350′ per NM to 6000.

(NARRATIVE ON FOLLOWING PAGE)

NW-1, 03 DEC 2020 to 31 DEC 2020

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAYS 9, 27: Climbing left turn thence. . . .
TAKEOFF RUNWAY 22 : Climbing right turn thence. . . .

. . . .intercept and proceed on YKM VORTAC R-255 to WENAS/YKM 9 DME, then on assigned transition.

ELLENSBURG TRANSITION (WENAS7.ELN): From over WENAS DME Fix on YKM 9 DME Arc to OJAHO DME fix and YKM VORTAC R-338 and ELN VOR/DME R-158 to ELN VOR/DME.
PAPPS TRANSITION (WENAS7.PAPPS): From over WENAS DME Fix on YKM 9 DME Arc to OHKAR DME fix and YKM VORTAC R-087 to PAPPS INT.
PERTT TRANSITION (WENAS7.PERTT): From over WENAS DME Fix on YKM 9 DME Arc to SELAH DME fix and YKM VORTAC R-310 to PERTT INT.
RUBEL TRANSITION (WENAS7.RUBEL): From over WENAS DME Fix on YKM 9 DME Arc to OLUWO DME fix and YKM VORTAC R-029 and MWH VOR/DME R-213 to RUBEL INT.
SUNED TRANSITION (WENAS7.SUNED): From over WENAS DME Fix on YKM 9 DME Arc to OHAWY DME fix and YKM VORTAC R-108 to SUNED INT.
TITON TRANSITION (WENAS7.TITON): From over WENAS DME Fix on YKM 9 DME Arc to ORJOR DME fix and YKM VORTAC R-284 to TITON INT.

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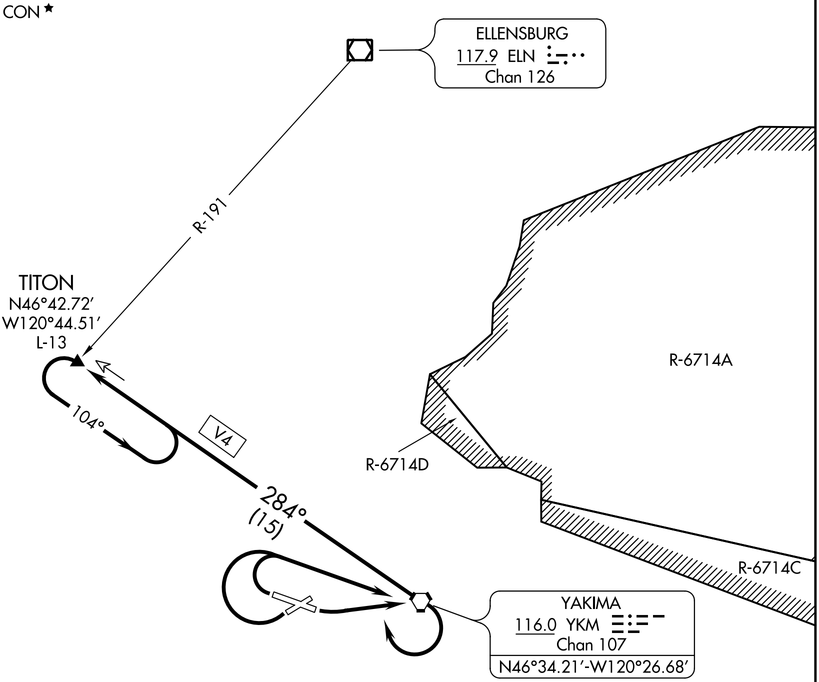
NW-1, 03 DEC 2020 to 31 DEC 2020

YAKIMA SEVEN DEPARTURE

AL-465 (FAA)

YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)
YAKIMA, WASHINGTON

ATIS
125.25
CLNC DEL
121.9
GND CON
121.9
YAKIMA TOWER ★
133.25 257.8
CHINOOK DEP CON ★
123.8 263.15



TAKEOFF MINIMUMS
Rwy 4: NA - obstacles.
Rwy 9: Standard with minimum climb of 325′ per NM to 5000.
Rwy 22: Standard with minimum climb of 325′ per NM to 5000.
Rwy 27: Standard with minimum climb of 325′ per NM to 5000.

NOTE: Chart not to scale.

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAY 9: Climbing left turn direct YKM VORTAC, Thence. . . .

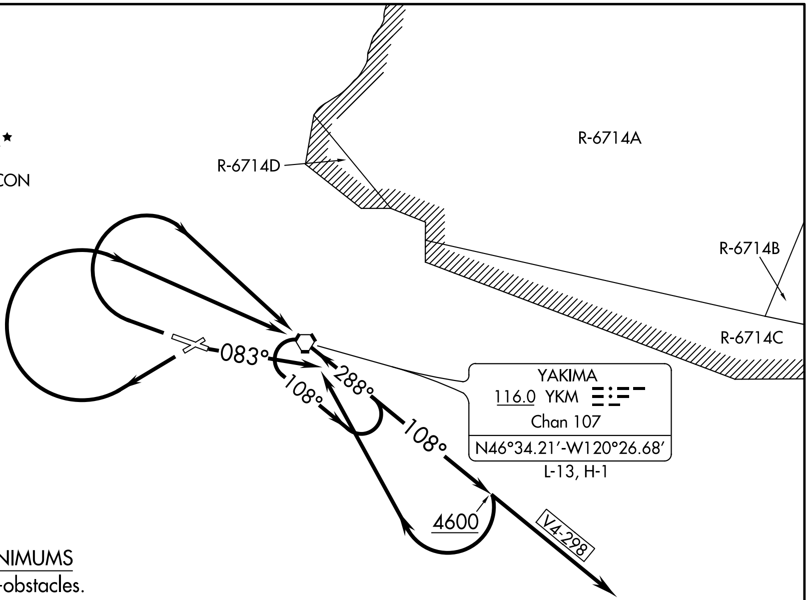
TAKEOFF RUNWAYS 22, 27: Climbing right turn direct YKM VORTAC. Thence. . . .

. . . .then climbing right turn to intercept YKM R-284 outbound to TITON INT and hold. Continue climb in hold to MEA/MCA for route of flight. Then on (assigned route).

ZILLA THREE DEPARTURE (OBSTACLE)

YAKIMA AIR TERMINAL/MCALLISTER FIELD (YKM)
SL-465 (FAA)
YAKIMA, WASHINGTON

ATIS
125.25
CLNC DEL
121.9
GND CON
121.9
YAKIMA TOWER★
133.25 257.8
CHINOOK DEP CON
123.8 263.15



TAKEOFF MINIMUMS

Rwy 4: NA-obstacles.
Rwy 9: Standard with minimum climb of 250′ per NM to 2600.
Rwy 22: Standard with minimum climb of 325′ per NM to 3900.
Rwy 27: Standard with minimum climb of 330′ per NM to 2600.

TAKEOFF OBSTACLE NOTES

Rwy 9: OL on bldg 27′ from DER, 507′ right of centerline, 34′AGL/1074′MSL.
Pole 388′ from DER, 561′ right of centerline, 34′ AGL/1073′MSL.
Trees beginning 586′ from DER, 550′ right of centerline, up to 100′ AGL/1139′ MSL.
Rwy 22: Fence beginning 27′ from DER, 435′ right of centerline, up to 10′ AGL/1085′ MSL.
Trees beginning 570′ from DER, 228′ left of centerline, up to 100′ AGL/1199′ MSL.
Trees beginning 3195′ from DER, 202′ right of centerline, up to 100′ AGL/1199′ MSL.
Trees beginning 1 NM from DER, 732′ left of centerline, up to 100′ AGL/1239′ MSL.
Rwy 27: Antenna on bldg 398′ from DER, 282′ left of centerline, 15′ AGL/1117′ MSL.
Trees beginning 3824′ from DER, 1341′ right of centerline, up to 100′ AGL/1239′ MSL.

NOTE: Chart not to scale.

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAY 9: Climb heading 083° and outbound YKM R-108. Thence. . . .
TAKEOFF RUNWAYS 22, 27: Climbing right turn direct YKM VORTAC and outbound YKM R-108. Thence. . . .

. . . . eastbound aircraft V4-298 continue on course, all other departures continue climb on YKM R-108 until 4600, then climbing right turn direct YKM VORTAC and hold to cross YKM VORTAC at or above MEA/MCA for route of flight.

NW-1, 03 DEC 2020 to 31 DEC 2020

City and County Ordinances

E

E CITY AND COUNTY ORDINANCES

E.1 YAKIMA COUNTY ZONING ORDINANCE

15.08.070 Airport Special Definitions contributing to ASO

2) Airspace Hazard: Structures, trees, or use of land compromising public safety or obstructs the airspace required for the safe operation of aircraft in or around an airport, as determined by the Reviewing Official under this title.

4) Airspace Obstructions: Structures, trees, land mass, smoke or steam penetrating the approach, transitional, horizontal or conical surface of an airport.

5) Civil Airport Imaginary Surfaces: Primary, approach, transitional, horizontal and conical surfaces designated by FAR Part 77.

15.45.045 Height of Buildings and Structures

2(a) Height Limitations: Zones MR, VR, RT, R-1 and R-2 – 35ft.

2(b) Height Limitations: Zones R-3, RS, B-1, B-2, C and HC – 45ft.

2(f) Height Limitations: Buildings or structures within 500 ft. of the end or 100 ft. of the side must be less than 35 ft. tall. (public or private airports)

15.55.20 Application of Airport Safety Overlay Provisions

2(a) Airport safety area addresses land use compatibility with airport operations and structure height. It is bounded by the limits of the Runway Protection Zone and FAA approach and transitional surfaces within the conical surface.

2(b) Structure height where a structure may constitute a potentially incompatible land use as defined in 15.08.070. It is bounded by the exterior of the conical surface area and the approach and transitional approach surfaces extending beyond the conical surface.

15.55.060 Height Limitations and Additional Requirements

1(a) The ground level above sea level plus the height of any building, structure, tower, use or tree at its proposed location shall not penetrate FAR Part 77 designated imaginary surfaces of an airport.

1(b) Structures 35 ft. or more may penetrate the imaginary surface if a Reviewing Official in conjunction with WSDOT or the Airport Manager can determine that it is not an airspace hazard.

1(d) FAA distinguished hazards to air navigation cannot be approved by the Reviewing Official.

2) The more stringent of height limitations between another local ordinance or regulation shall be used.

15.55.70 Special provisions for new airports, heliports and landing fields.

Air traffic shall not exceed 55 Decibels as measured at the property line or be located in close proximity to incompatible land uses. Proponents shall show that adequate controls or measures will be taken to reduce noise, vibrations, dust, and bright lights as required by federal, state and county regulation.

E.2 CITY OF YAKIMA ZONING ORDINANCE

15.50.030 Application of airport safety overlay provisions

B(1) Airport safety area addresses land use compatibility with airport operations and structure height. It is bounded by the limits of the Runway Protection Zone and FAA approach and transitional surfaces within the conical surface.

B(2) Structure height where a structure may constitute a potentially incompatible land use as defined in 15.08.070. It is bounded by the exterior of the conical surface area and the approach and transitional approach surfaces extending beyond the conical surface.

15.50.070 Height Limitations and Additional Requirements

A(1) The ground level above sea level plus the height of any building, structure, tower, use or tree at its proposed location shall not penetrate FAR Part 77 designated imaginary surfaces of an airport.

(2) Structures 35ft. or more may penetrate the imaginary surface if a Reviewing Official in conjunction with WSDOT or the Airport Manager can determine that it is not a likely airspace hazard.

A(4) FAA distinguished hazards to air navigation cannot be approved by the Reviewing Official.

B) The more stringent of height limitations between another local ordinance or regulation shall be used.

15.30.080 Special provisions for new airports, heliports and landings fields.

Air traffic shall not exceed 55 decibels as measured at the property line or be located in close proximity to incompatible land uses. Proponents shall show that adequate controls or measures will be taken to reduce noise, vibrations, dust, and bright lights as required by federal, state and county regulation.

F

AIRPORT LAYOUT PLAN CHECKLIST

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	Yakima Air Terminal / Mcallister Field		
City and State	Yakima, Washington	Location Identifier	YKM
Airport Owner	-		

ALP Submission Information (to be completed by Sponsor or Consultant)		
ALP Prepared by	Centruy West Engineering Name of Consulting Firm	
	Justin Strother Name of Individual	August 2020 Date
	(503) 419-2135 Telephone	
	jstrother@centurywest.com Email address	
Consulting QA/QC Review	David Miller, Lead Aviation Planner Samantha Peterson, Aviation Planner Name and Title of Individual	August 2020 Date
Sponsor Review	Robert Peterson, Airport Director Name and Title of Individual	December 2020 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	Bombardier	Q400	2,590
Future	Embraer	175	4,700

Forecasted Year: Base year 2018 & Forecast 2020- 2040

Airport Reference Code (ARC): C-III

Runway Design Code (RDC) & Runway Reference (RRC):

Runway	RDC	RRC
04-22	B-II	Visual
09-27	C-III	Precision

Approach Minimums:

Rwy End	Minimum	Rwy End	Minimum
04	VIS	22	VIS
09	400’	27	200’

Runways (Existing and Future):

Runway	Existing		Future		Departure Surface (Y or N/A)
	Length (ft)	Width (ft)	Length (ft)	Width (ft)	
04-22	3,835’	150’	4,000’	75’	N/A
09-27	7,604’	150’	7,800’	150’	Y

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 Wildlife hazard management information is included in the airports WHMP in the Airport Certification Manual.					

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					

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					

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)			×		
Remarks					

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					

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					

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. 2. Dimensions of aprons, taxiways, etc.	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.	×			
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					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TECHNICAL MEMORANDUM

DATE: December 6, 2018

TO: Samantha Peterson, Century West Engineering

FROM: Shane Phelps, Parametrix

SUBJECT: Yakima Airport ALP Update - Environmental Overview

CC:

PROJECT NUMBER: 273-2694-020

PROJECT NAME: Yakima Airport ALP Update - Environmental Overview

Yakima Air Terminal/McAllister Field (YKM) is located approximately 3 miles southwest of the Interstate 82/State Route 12 interchange, in the City of Yakima, Yakima County, WA. The main entrance is located at the intersection of South 24th Avenue and West Washington Avenue. YKM comprises an area of 825 acres and has two active runways, Runway 9/27 and Runway 4/22. The airport and related property are referred to in this memorandum collectively as the study area and are shown on Figure 1.

Parametrix collected and reviewed information originating from previous studies and reports written about the study area, as well as reviewed information available at online databases and websites. This technical memorandum provides an overview of existing environmentally related information available for the study area as of the date of this memorandum. The following sections provide a summary of existing conditions.

Threatened and Endangered Species

The US Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC), the National Oceanic and Atmospheric Administration (NOAA) Fisheries, and the Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species and WDFW SalmonScape websites were reviewed on November 12, 2018, to provide a list of federally proposed or listed threatened and endangered species that may occur in the study area (USFWS 2018a; NOAA Fisheries 2018; WDFW 2018a; WDFW 2018b). These species are shown in Table 1 below.

Table 1. Listed Species Potentially Occurring in Project Vicinity

Common Name	Scientific Name	DPS*	Listing Status	Critical Habitat
Marbled Murrelet	*Brachyramphus marmoratus*	N/A	Threatened	Designated
Yellow-billed Cuckoo	*Coccyzus americanus*	Western DPS	Threatened	Proposed
Northern Wormwood	*Artemisia campestris var. wormskioldii*	N/A	Candidate	None
Bull Trout	*Salvelinus confluentus*	Columbia River DPS	Threatened	Designated
Steelhead	*Oncorhynchus mykiss*	Middle Columbia River DPS	Threatened	Designated

Common Name	Scientific Name	DPS*	Listing Status	Critical Habitat
Canada Lynx	*Lynx canadensis*	N/A	Threatened	Designated
Gray Wolf	*Canus lupus*	N/A	Endangered	Designated
North American Wolverine	*Gulo gulo luscus*	N/A	Proposed Threatened	None

*DPS – Distinct Population Segment

Within 1,000 feet of the airport property, Wide Hollow Creek to the north of the airport and Bachelor Creek to the south of the airport both are identified to support summer steelhead (*Oncorhynchus mykiss*), which are designated as threatened under the Endangered Species Act (ESA) (StreamNet 2018). Wide Hollow Creek is also designated as Critical Habitat for steelhead under the ESA.

While not federally listed, WDFW PHS data also indicates the potential presence of Sharp-tailed snake (*Contia tenuis*) and Townsend's Ground Squirrel (*Urocitellus townsendii*), which are designated as State of Washington-listed candidate species (WDFW 2018).

Land Use and Zoning

Airport Zoning

The airport property is located within the city limits of Yakima and is zoned Airport Support (AS) (Figure 2). The purpose of AS zoning is to "accommodate airport and aircraft related activities within the airport property." (Yakima Municipal Code (YMC) 15.03.020(J)).

Airport Safety Overlay Zone

The purpose of the airport overlay zone is "intended to protect the airspace around the Yakima Air Terminal at McAllister Field and any other state and federal system airports from airspace obstructions or hazards and incompatible land uses in proximity to the Yakima Air Terminal at McAllister Field" (YMC 15.30.010).

The airport overlay zone covers an area that that may be exposed to aircraft noise, vibration, fumes, dust and fuel particulates associated with the operation of aircraft taking off, landing or taxiing within the airport area (please note that these airport overlay zones extend into unincorporated Yakima County and Union Gap). The overlay zone is subdivided into safety zones that include Runway Protection (Zone 1), Inner Approach/Departure (Zone 2), Inner Turning (Zone 3), Outer Approach/Departure (Zone 4), Sideline (Zone 5), and Traffic Pattern (Zone 6). These safety overlay zones are further grouped into four Land Use Overlay zones. These are: Land Use Overlay 1 (Zone 1); Land Use Overlay 2 (Zones 2, 3, 4, 4A); Land Use Overlay 3 (Zone 5); and Land Use Overlay 4 (Zone 6). Permitted and prohibited uses are designated in accordance to which land use overlay zone the use will occur (YMC 15.30.060, Union Gap Municipal Code [UGMC] 17.20.040). Please note that county land uses within the airport overlay zones are also regulated in accordance with the City's code as referenced in Yakima County Municipal Code (YCMC) 18.04.

Surrounding Zoning Designations

City zoning immediately adjacent to the airport property is primarily light industrial. Some single family, multi-family, professional business, local business, and general commercial is directly adjacent to the airport property, as well.

Although the airport property is completely within the Yakima city limits, Union Gap is directly to the east and unincorporated Yakima County is to the south of the airport property. Zoning within Union Gap adjacent to the airport is central business district, single family 2 residential, and light industrial. Zoning within Yakima County is light industrial and residential (single family, two family, multi-family, and suburban residential).

Compatibility of Land Uses

Within the City of Yakima, airport uses (landing field and operations) are permitted only within the AS zone as a Class 1 use (YMC 15.04.030). Within Union Gap, the airport landing field is a Class 3 permitted use within the regional commercial, downtown business, wholesale/warehouse, and light industrial zones. With regard to County zoning, public airports and landing fields are permitted as Class 2 uses within light and heavy industrial districts, and as Class 3 uses in agriculture, forest watershed, remote/extremely limited development potential, and Rural-10/5 districts (YCMC 19.14.010)

Air and Water Quality

Air Quality

Yakima County experiences frequent air inversions during winter months when wood stoves are commonly used for heating. $PM_{2.5}$, which is an abbreviation for particulate matter with a diameter of 2.5 micrometers or less, are particles that can be emitted by wood burning and are known to produce respiratory and cardiovascular illness. $PM_{2.5}$ emissions have threatened the County's compliance with federal air quality standards in the past and the Yakima Regional Clean Air Agency (YRCAA) continues to implement clear air strategies to maintain compliance (YRCAA 2018). Currently, no part of the State of Washington is located within an Environmental Protection Agency-designated nonattainment area (Ecology 2018a).

Water Resources and Water Quality

The airport is located in the Lower Yakima Water Resource Inventory Area (WRIA 37) (WDFW 2018a). Wide Hollow Creek is within 1,000 feet to the north of the airport property. Bachelor Creek and its tributary, Spring Creek, are within 1,000 feet to the south of the airport property. These three creeks ultimately flow to the Yakima River approximately 3.5 miles to the southeast of the airport property. The Washington State Department of Ecology (Ecology) website shows that Wide Hollow Creek is 303(d)-listed for dissolved oxygen, pH, toxics (DDT; 4,4'-DDE; 4,4'-DDD), temperature and bacteria. While Bachelor Creek and Spring Creek are not 303(d)-listed, they are tributary Ahtanum Creek, which is 303(d)-listed for bacteria and temperature and meets at the confluence of Bachelor Creek and Ahtanum Creek approximately 1 mile southeast of the airport property (Ecology 2018b).

Three total maximum daily loads (TMDL) projects are currently being developed for waters that include Wide Hollow Creek (Ecology 2018c). One is for bacteria for the Mid-Yakima River Basin, which includes Wide Hollow Creek and its tributaries. A second is for toxics in the Yakima River and specific tributaries including Wide Hollow Creek. A third, a multiparameter TMDL for dissolved oxygen and pH, is being developed specifically for Wide Hollow Creek.

Wastewater and Solid Waste Treatment

Public sewer services near airport property are provided by the Cities of Yakima and Union Gap. All airport services and existing buildings (except the hair salon and McAllister Museum) that require a discharge into the sewer system are connected to one of two trunk lines maintained by the City of Yakima; one in West Washington Avenue and the second in Pioneer Street/Valley Mall Boulevard. The City of Union Gap maintains a sanitary sewer main in Valley Mall Boulevard. No known connections have been made to this sewer main (URS 2015).

As of 2015, there were two known existing and in-use septic systems on airport property. Both the McAllister Museum and an older complex (a hair salon) south of the museum use these onsite sewer disposal systems which are maintained by the airport (URS 2015).

Solid waste collection in the City of Yakima is provided by its Refuse Division and is disposed of primarily at Terrace Heights Landfill in Yakima County (Yakima County 2018).

Drainage Patterns (Stormwater)

All paved areas on the airfield drain to catch basins, or similar stormwater structures, or toward grass shoulders which provide filtration to underlying soils. The taxiways and runways possess subdrain systems which carry away surface stormwater that infiltrates into soils and then reaches the subdrains. Wide Hollow Creek and Bachelor Creek ultimately receive all stormwater discharges that are not infiltrated and retained in soils. No aboveground surface detention systems are present.

None of the stormwater conveyance systems from airport buildings or airport property are known to be connected to City of Yakima or City of Union Gap stormwater conveyance systems (URS 2015).

Wetland and Waters of the State/US

As shown in Figure 3, the National Wetland Inventory (NWI) and data from the City of Yakima indicate that several potential wetland areas are present adjacent to and within the study area (USFWS 2018b, City of Yakima 2018). A contiguous area of wetland associated with Spring Creek is mapped to the south and to the west of the intersections of the two runways. Wetland areas are also present within 1,000 feet of the airport property associated with Wide Hollow Creek (generally to the north of the airport property) and Bachelor Creek (generally to the south of the airport property).

It should be noted that the NWI and the City of Yakima data identify potential wetland areas and do not establish if a wetland is actually present or not at a given location. Prior to development of any of the parcels within the study area, a wetland survey and/or delineation should be performed to ascertain whether or not wetlands are actually present. If wetlands are present, permits may be needed from agencies such as the US Army Corps of Engineers, the Ecology, and the City of Yakima.

Hazardous Materials and Cleanup Sites

Fifty-five sites regulated for hazardous materials are located within a quarter mile buffer of the Yakima Airport (Ecology 2018d). These sites include a mix of regulatory interactions, such as hazardous waste storage and management, hazardous waste generation, stormwater permits, enforcement actions, leaking underground storage tank (LUST), underground storage tank (UST), independent cleanup actions, voluntary cleanup sites, hazardous sites list, and state cleanup sites. Some of these regulatory databases indicate a confirmed release of hazardous materials to the environment and some of these regulatory databases only imply some level of potential for a release (See Attachment A). Considering the large number of sites regulated for hazardous materials located at the Yakima Airport or within the quarter-mile buffer, only sites with confirmed releases of hazardous materials are discussed.

Of the fifty-five hazardous materials sites identified, fourteen have required some level of clean up due to the release of one or more hazardous substances. Table 2 below lists the regulated facilities in the study area with confirmed releases that have required clean up. Once the contaminated site is remediated to regulatory satisfaction, Ecology will remove the site from the Hazardous Sites List and/or grant No Further Action (NFA). Locations of the hazardous materials and cleanup sites are shown on Figure 4.

Table 2. Hazardous Materials Cleanup Sites

Map ID	Site Name	Site Address	Cleanup Site Type	Cleanup Completed?
1*	Richardson Airways	Yakima Municipal Airport	State Cleanup Site	Yes
2	Irwin Research & Development	1702 South 24th Avenue	State Cleanup Site	Yes
10*	Yakima Air Terminal	2400 West Washington Avenue	State Cleanup Site	Yes
16	GE Aviation LLC Yakima	2720 West Washington Avenue	State Cleanup Site	Yes
18*	McAllister Flying Service	2000 South 16th Avenue	Independent Cleanup Site	Yes
22*	Wayne G. Turner Aircraft Service Inc.	2008 West Washington Avenue	Independent Cleanup Site	Yes
23*	Yakima City Airport	2300 West Washington Avenue	Independent Cleanup Site	Yes
26	Noland Decoto Flying Service Inc.	2804-2810 West Washington Avenue	Voluntary Cleanup Site	Yes
29	Western Recreational Vehicles Inc.	3401 West Washington Avenue	State Cleanup Site	Yes
34	Ronald Hartoon	1606 South 36th Avenue	Leaking Underground Storage Tank	Yes
36	Perry Technical Institute	2011 West Washington Avenue	Leaking Underground Storage Tank	Yes
42	Graham Equipment	3003 West Washington Avenue	Leaking Underground Storage Tank	Yes
52	Yakima County Ahtanum Youth Park	1000 West Ahtanum Road	Independent Cleanup Site	No
54	Pacific Power & Light Union Gap Substation	903 West Ahtanum Road	State Cleanup Site	No

* Located within airport property boundary.

Of the fourteen cleanup sites identified, twelve completed cleanup to regulatory satisfaction and were granted an NFA and/or were removed from the Hazardous Sites List. The two sites that have not yet achieved an NFA are the Yakima County Ahtanum Youth Park site and the Pacific Power & Light Union Gap Substation site. These two sites are described in further detail below; please note that neither of these sites are within the airport property boundary.

The Yakima County Ahtanum Youth Park site (Map ID 52, 1000 West Ahtanum Road) is located approximately 1,000 feet to the south of the east end of the airport property boundary. It currently operates as a public park and previously operated as a public works site. According to Ecology, petroleum contaminated soil and groundwater were encountered during the decommissioning of a UST in 1990. Samples taken from the tank basin indicated elevated levels of total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) associated with petroleum fuel as well as benzene, toluene, ethylbenzene, and xylene (BTEX). Petroleum contaminated soils were excavated, and sampling indicated the source contamination was removed but groundwater was still impacted. A limited subsurface site assessment was conducted to assess the extent of groundwater contamination. TPHs and VOCs were non-detect in soil samples but were detected in groundwater at concentrations exceeding Ecology's clean up levels. Various remedies and continued groundwater monitoring were recommended for the site, but no readily ascertainable records are available to confirm if additional clean up or monitoring continued after 1991. However, considering the relative distance from the Yakima Airport, the cleanup efforts conducted, and petroleum fuel's tendency to degrade under natural conditions, this site does not appear to present environmental concern to the Yakima Airport.

The Pacific Power & Light Union Gap Substation site (Map ID 54, 903 West Ahtanum Road) is located approximately 1,000 feet to the southeast of the east end of the airport property boundary. It currently operates as an electrical substation facility. According to Ecology, PacifiCorp crews discovered a large mineral oil leak from a non-PCB (polychlorinated biphenyl) transformer in 2007. The oil was pumped from the transformer vault and soils immediately adjacent to the transformer were excavated. Soil and groundwater samples from the excavation were non-detect for PCBs. However, diesel-range hydrocarbons were detected at (but not exceeding) cleanup levels in soil and two groundwater samples exceeded cleanup levels for oil-range and diesel-range hydrocarbons. Per a subsurface investigation report prepared by CH2M Hill in 2008, "PacifiCorp has removed the source of contamination and left only the small fraction of dissolved phase material. Due to the low and isolated concentrations as well as petroleum hydrocarbon's tendency to degrade under natural conditions, CH2M Hill recommends no further investigation." Considering the relative distance from the Yakima Airport, the cleanup efforts conducted, and CH2M Hill's NFA recommendation, this site does not present environmental concern to the Yakima Airport.

Prior to development of sites with a previous history of hazardous materials and/or cleanup, it is recommended that a Phase I Environmental Site Assessment (ESA) be conducted to ascertain site history. If the Phase I ESA indicates the potential presence of contamination, site sampling may need to be conducted to confirm the presence and concentration of any contaminants that may be present.

References

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Ecology. 2018b. Water Quality Atlas. Available at: <https://fortress.wa.gov/ecy/waterqualityatlas/map.aspx > Accessed on November 13, 2018.

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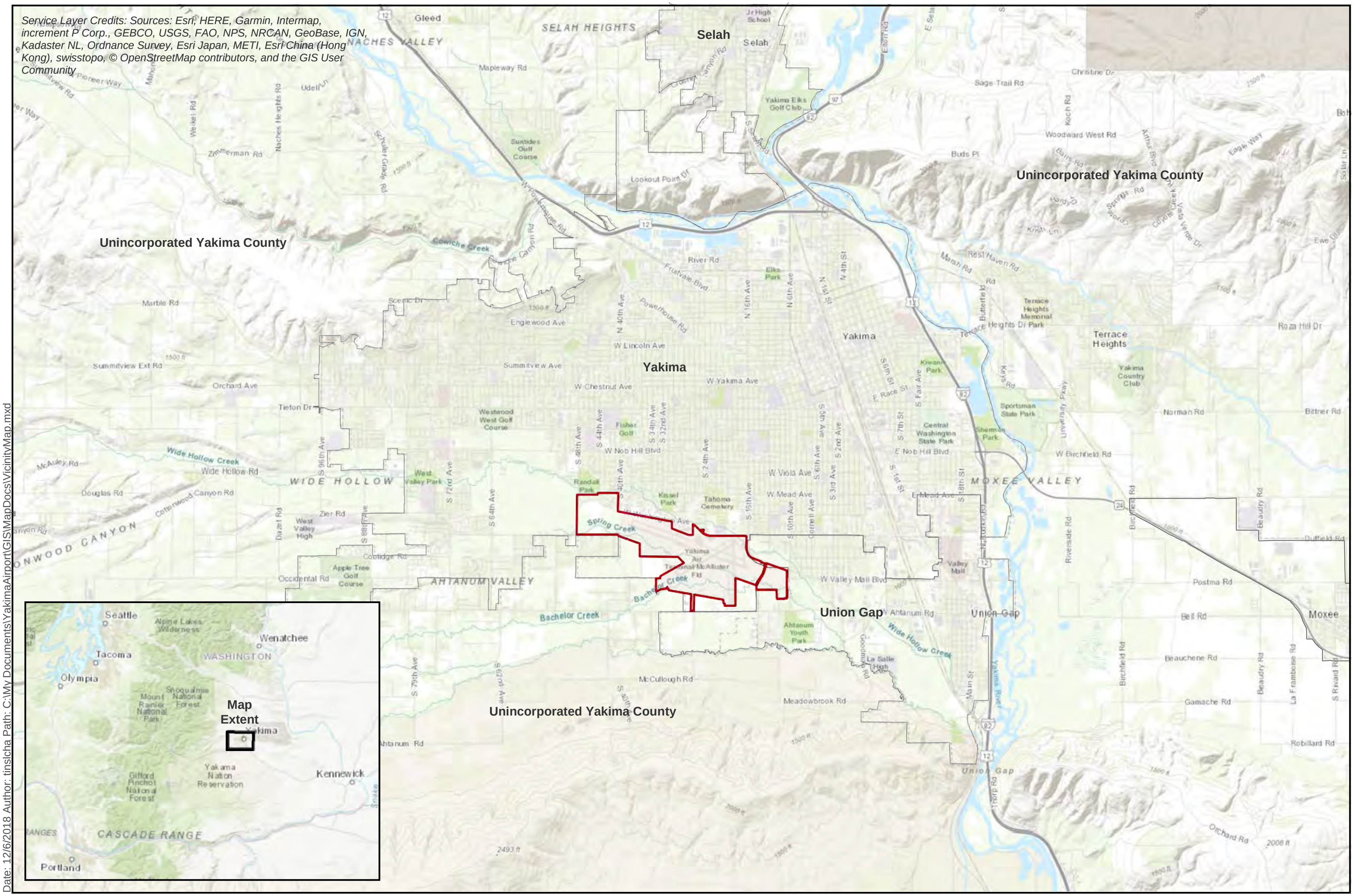
YRCAA (Yakima Regional Clean Air Agency). 2018. About YRCAA. Available at <https://www.yakimacleanair.org/about/> Accessed on November 13, 2018.



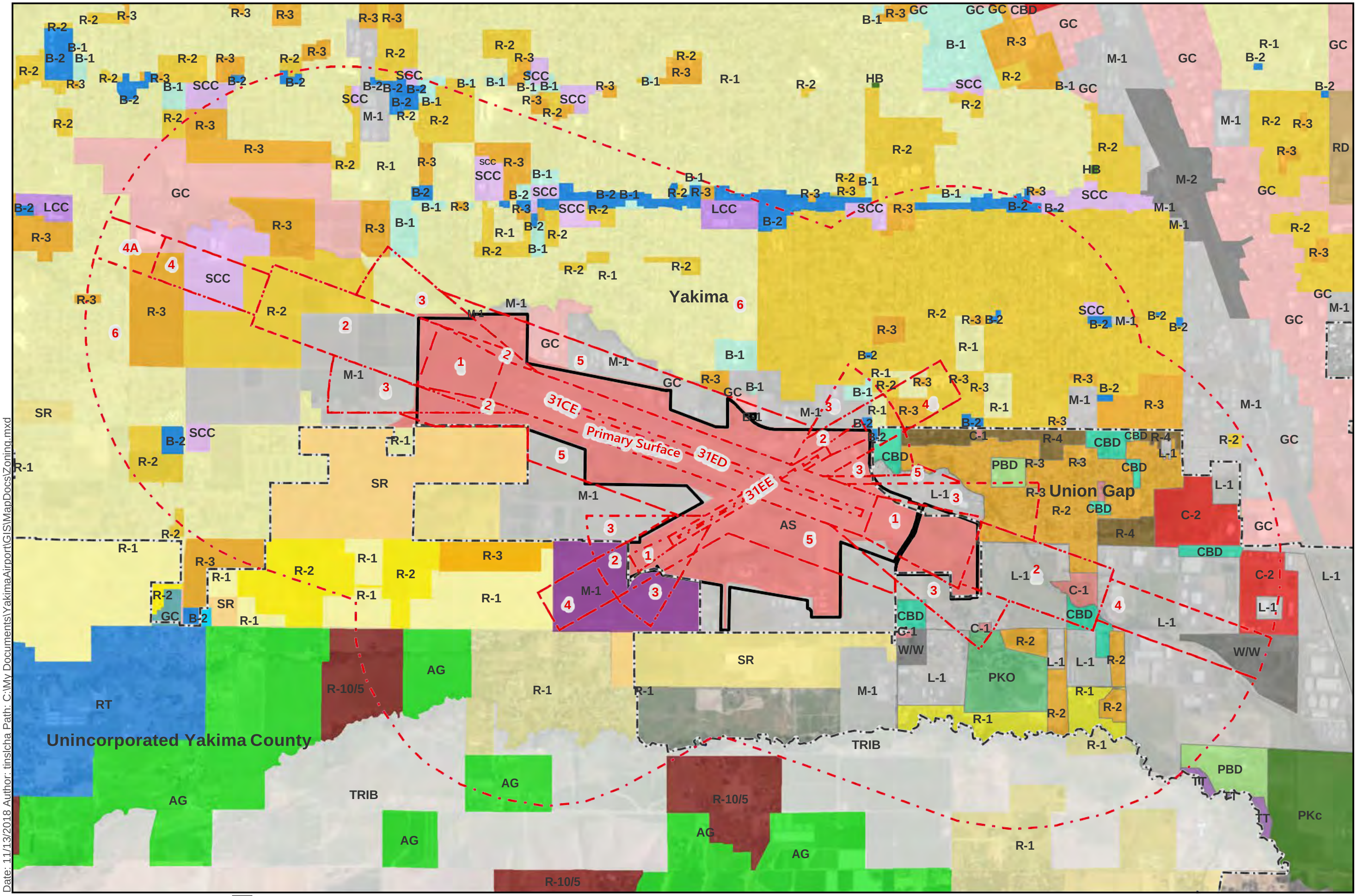
Date: 12/6/2018 Author: tinslcha Path: C:\My Documents\YakimaAirport\GIS\MapDocs\VicinityMap.mxd

Airport Boundary (Approximate)

0 0.5 1 2 Miles

Figure 1
Vicinity Map
Yakima Airport

Yakima, Washington



Date: 11/13/2018 Author: tinslcha Path: C:\My Documents\YakimaAirport\GIS\MapDocs\Zoning.mxd

Source: City of Yakima,
Yakima County, Unioin Gap

0 1,000 2,000 4,000 Feet

Airport Boundary (Approximate)
City Limits
Airport Safety Overlay Zones

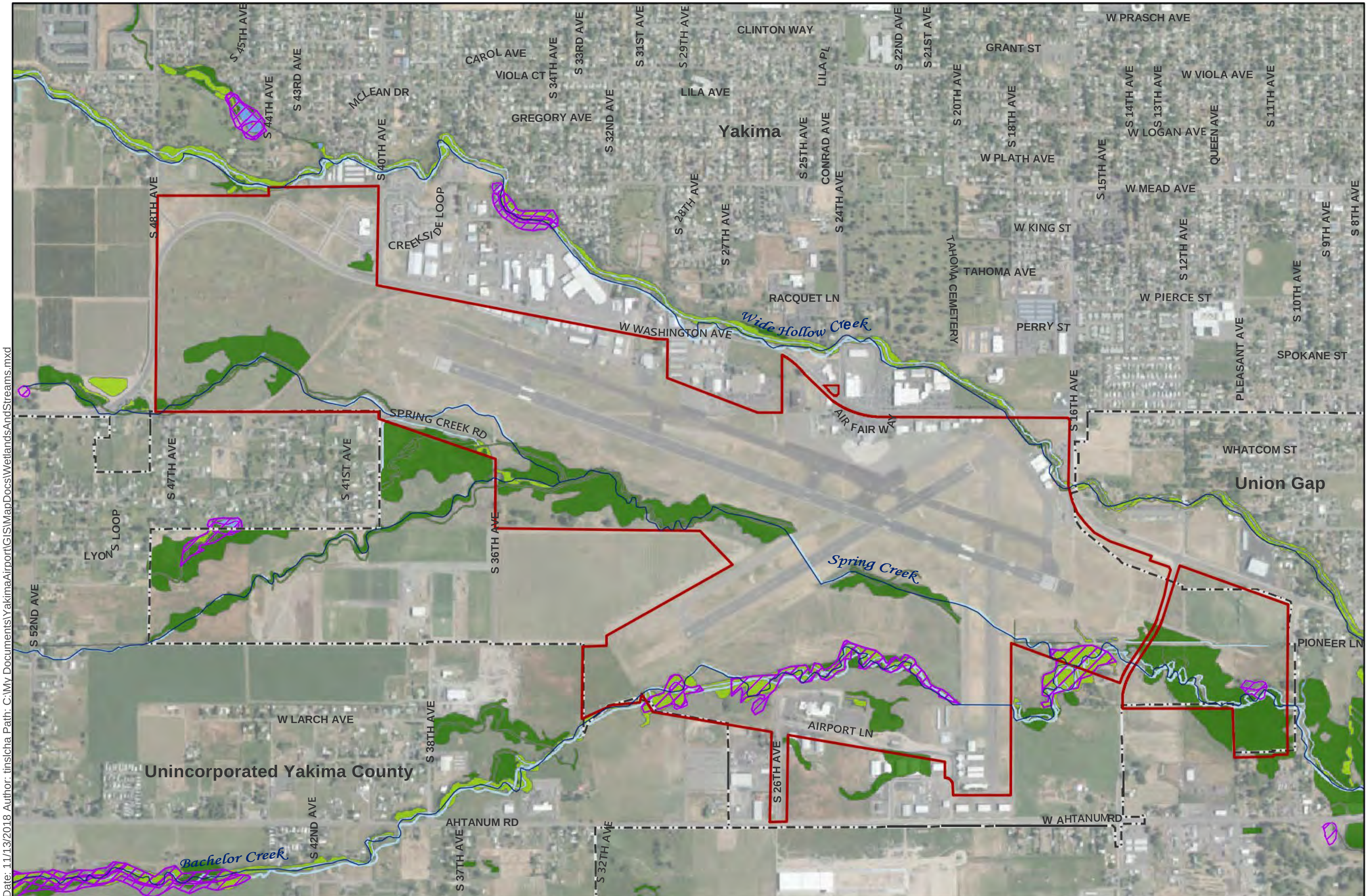
Yakima Urban Area Zoning
SR: Suburban Residential
R-1 Single Family
R-2 Two Family
R-3 Multi-Family
B-1 Professional Business
B-2 Local Business
HB Historical Business
SCC Small Conveneice Center
LCC Large Convenience Center
CBD Central Business District
GC General Commercial
M-1 Light Industrial
M-2 Heavy Industrial
RD Regional Development
AS Airport Support

Union Gap Zoning
Single Family 1 Residential (R-1)
Single Family 2 Residential (R-2)
Multi-Family Residential (R-3)
Corridor Multi-Family Residential (R-4)
Commercial (C-1)
Regional Commercial (C-2)
Central Business District (CBD)
Light Industrial (L-1)
Wholesale/Warehouse District (W/W)
Public Building District (PBD)
Parks/Open Space (PK0)
Planned Recreational (PRc)
Tribal Trust (TT)

County Zoning
Agriculture
Rural-10/5
Rural Transitional
Suburban Residential
Single-Family Residential
Two-Family Residential
Multi-Familiy Residential
Local Business
General Commercial
Light Industrial
Federal Land/Tribal Trust

Figure 2
Zoning
Yakima Airport

Yakima, Washington



Source: USFWS (NWI), WDNR, City of Yakima

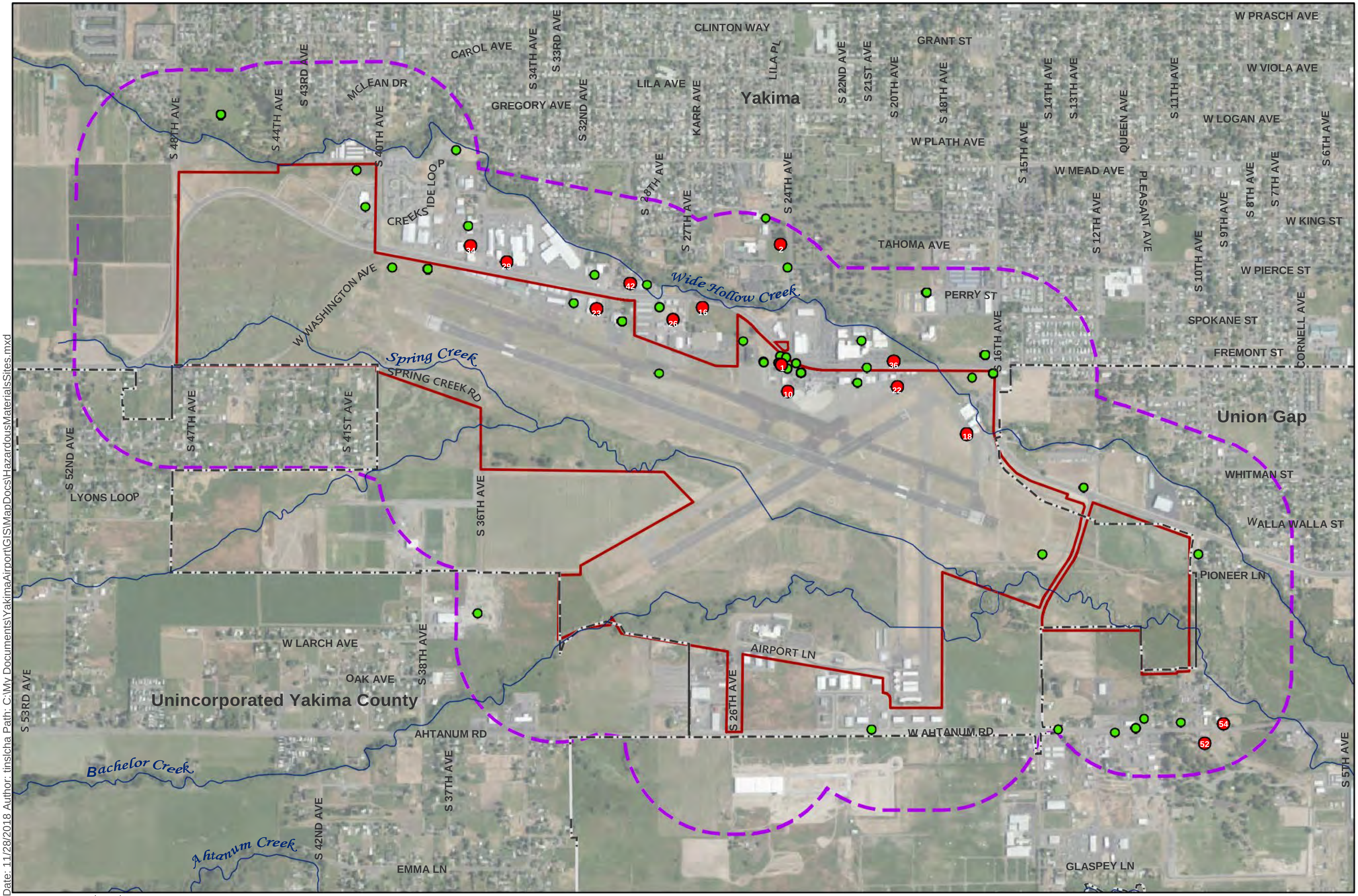
0 500 1,000 2,000 Feet

Airport Boundary (Approximate)
Stream Centerline
City Limits
Potential Wetlands (City of Yakima)

NWI Wetlands
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

Figure 3
Wetlands and Streams
Yakima Airport

Yakima, Washington



Source: USFWS (NWI), WDNR, City of Yakima

0 500 1,000 2,000 Feet

Hazardous Materials Cleanup Site
Other Hazardous Materials Site
Stream Centerline
Airport Boundary (Approximate)
Quarter-Mile Buffer
City Limits

Figure 4
Hazardous Materials Sites
Yakima Airport

Yakima, Washington

Attachment A

Map ID	Facility Site ID	Facility Name	Street Address	City	State	Zip	Interaction Type	Ecology Program	Cleanup Required?	Cleanup Completed?
1	442	Richardson Airways	Yakima Municipal Airport	Yakima	WA	98901	SCS, HWG, ENFORFNL	TOXICS	YES	YES
2	449	Irwin Research & Development	1702 S 24th Ave	Yakima	WA	98902	SCS, HWG, VOLCLNST	TOXICS	YES	YES
3	7417	Memorial Cornerstone Medical	4003 W Creekside Loop	Yakima	WA	98908	CONSTSWGP	WATQUAL	NO	N/A
4	8396	Cubcrafters	1918 S 16th Ave	Yakima	WA	98903	RSVP, NONPOINT, INDSWGP, ENFORFNL	HAZWASTE	NO	N/A
5	10468	Yakima Airport Helicopter Service	2400 W Washington Ave	Yakima	WA	98903	UST	TOXICS	NO	N/A
6	17219	Yakima Air Terminal Runway 27 Safety	S 16th Ave, on the east side of YKM Airport	Yakima	WA	98903	CONSTSWGP	WATQUAL	NO	N/A
7	18275	Plath Hall	2011 W Washington Ave	Yakima	WA	98903	CONSTSWGP	WATQUAL	NO	N/A
8	18852	New Urology Clinic	S 24th Ave & Racquet Ln	Yakima	WA	98902	CONSTSWGP	WATQUAL	NO	N/A
9	22601	Airfield Development	24th & Washington Ave	Yakima	WA	98902	CONSTSWGP	WATQUAL	NO	N/A
10	1137597	Yakima Air Terminal	2400 W Washington Ave	Yakima	WA	98903	SCS, LUST, INDSWGP, UST, ENFORFNL	TOXICS	YES	YES
11	2848734	Fedex Express YKM	3102 W Washington Ave	Yakima	WA	98903	HWG, INDSWGP, HWOTHER	HAZWASTE	NO	N/A
12	4564439	Creekside Dental	1501 S 40th Ave	Yakima	WA	98908	RSVP	HAZWASTE	NO	N/A
13	8363684	Central Regional Office Washington	3601 W Washington Ave	Yakima	WA	98903	HWG	HAZWASTE	NO	N/A
14	8366422	Yakima City Airport Well	W Washington Ave between 16th Ave & 24th Ave	Yakima	WA	98901	TIER2	HAZWASTE	NO	N/A
15	8814385	TSA Yakima Air Terminal Mcallister Field	2400 W Washington Ave, TSA	Yakima	WA	98903	HWG, HWOTHER	HAZWASTE	NO	N/A
16	13175868	Ge Aviation LLC Yakima	2720 W Washington Ave	Yakima	WA	98903	SCS, TRI, TIER2, VOLCLNST, HWG, HWP	TOXICS	YES	YES
17	13654692	Structural Components Inc.	3107 W Washington Ave	Yakima	WA	98903-1140	UST	TOXICS	NO	N/A
18	24492962	Mcallister Flying Service	2000 S 16th Ave	Yakima	WA	98903	LUST, UST, INDPNDNT	TOXICS	YES	YES
19	25285243	Solar Graphics Inc.	2804 W Washington Ave	Yakima	WA	98903	HWG	HAZWASTE	NO	N/A
20	25433282	National Weather Service	2406 W Washington Ave	Yakima	WA	98903-2515	UST	TOXICS	NO	N/A
21	25798875	Flightline Convenience Center	2805 W Washington Ave	Yakima	WA	98903	UST	TOXICS	NO	N/A
22	26698574	Wayne G Turner Aircraft Service Inc.	2008 W Washington Ave	Yakima	WA	98903-1240	INDPNDNT, LUST, UST	TOXICS	YES	YES
23	27389546	Yakima City Airport	2300 W Washington Ave	Yakima	WA	98903-1246	INDPNDNT, LUST, UST	TOXICS	YES	YES
24	28173116	KNDO TV	1608 S 24th Ave	Yakima	WA	98902-9999	UST	TOXICS	NO	N/A
25	37699496	Mesa Airlines Inc.	3112 W Washington Ave	Yakima	WA	98903	HWG	HAZWASTE	NO	N/A
26	39563633	Noland Decoto Flying Services Inc.	2804-2810 W Washington Ave	Yakima	WA	98903	UST, LUST, VOLCLNST	TOXICS	YES	YES
27	43294686	Blaze Construction Inc.	2520 W Washington	Yakima	WA	98903	HWG	HAZWASTE	NO	N/A
28	44852815	Horizon Air Yakima Air Terminal	2400 W Washington Ave	Yakima	WA	98903-1134	HWG, TIER2, NONENFNL, ENFORFNL, INDSWGP	HAZWASTE	NO	N/A
29	46666512	Western Recreational Vehicles Inc.	3401 W Washington Ave	Yakima	WA	98903-1138	HWG, TRI, TIER2, HWP, LUST, AQLA, HWP, SCS, VOLCLNST, INDPNDNT, UST, INDSWGP	HAZWASTE	YES	YES
30	48592659	Yakima School Distritct Central Cooperative	1802 Perry St	Yakima	WA	98902	TIER2, HWG, HWOTHER, NONPOINT, UST, INDSWGP	HAZWASTE	NO	N/A
31	54947796	Hans Properties LLC	1601 W Washington Ave	Yakima	WA	98903	TIER2, HWG, HWOTHER, UST	HAZWASTE	NO	N/A
32	63695694	Heath Signs	2323 W Washington	Yakima	WA	98903	HWG, HWP	HAZWASTE	NO	N/A
33	64219432	Schwitzer Building	1916 S 16th Ave	Yakima	WA	98903-1212	UST	TOXICS	NO	N/A
34	67958727	Ronald Hartoon	1606 S 36th Ave	Yakima	WA	98902-4861	LUST, UST	TOXICS	YES	YES
35	71773912	Provident Services	1510 S 36th Ave	Yakima	WA	98902	HWG	HAZWASTE	NO	N/A
36	73552287	Perry Technical Institute	2011 W Washington Ave	Yakima	WA	98903-1296	HWP, LUST, UST, HWG	HAZWASTE	YES	YES
37	74941527	WA AGR M Yakima 12	Moore Rd, 2 miles NW of Wiley Cy	Yakima	WA	98902	HWG	HAZWASTE	NO	N/A

Map ID	Facility Site ID	Facility Name	Street Address	City	State	Zip	Interaction Type	Ecology Program	Cleanup Required?	Cleanup Completed?
38	77388862	Qwest Communications Ahtanum TD2 723	2 miles SW Of Yakima	Yakima	WA	98901	HWG, TIER2	HAZWASTE	NO	N/A
39	86342998	Yakima City Fire Department UST 7636	2404 W Washington Ave	Yakima	WA	98903-1134	UST	TOXICS	NO	N/A
40	87389547	Yakima Airport	2800 W Washington Ave	Yakima	WA	98903-1100	HWG	HAZWASTE	NO	N/A
41	89259819	Marq Packaging Inc.	3801 W Washington Ave	Yakima	WA	98903	HWG, HWOTHER, HWP	HAZWASTE	NO	N/A
42	92998881	Graham Equipment	3003 W Washington Ave	Yakima	WA	98903	LUST, UST	TOXICS	YES	YES
43	94143617	Federal Express Corporation Yakima	2108 W Washington Ave	Yakima	WA	98903	HWG, UST	HAZWASTE	NO	N/A
44	5279	Creekside Business Park	40th Ave & Washington Ave	Yakima	WA	98902	CONSTSWGP	WATQUAL	NO	N/A
45	16059	Randall Park Pond	1399 S 48th Ave	Yakima	WA	98908	CONSTSWGP, ENFORFNL	WATQUAL	NO	N/A
46	22616	Wilbert Precast 38th Ave	2309 S 38th Ave	Yakima	WA	98903	SANDGP	WATQUAL	NO	N/A
47	3229570	Washington Frontier Juice Inc. Yakima	2013 Ahtanum Rd	Yakima	WA	98903	HWG	HAZWASTE	NO	N/A
48	14267	Valley Mall Boulevard Extension III	Valley Mall Blvd & 3rd Ave	Union Gap	WA	98903	CONSTSWGP	WATQUAL	NO	N/A
49	24891	Pacificorp Union Gap Substation	1007 W Ahtanum Rd	Union Gap	WA	98903	CONSTSWGP	WATQUAL	NO	N/A
50	2957939	Bob Glaspey	1200 Ahtanum Rd	Union Gap	WA	98903	HWG, IND2POTWPRIVSWDP	HAZWASTE	NO	N/A
51	9289731	Ferrellgas Union Gap	2603 Pleasant Ave	Union Gap	WA	98903	TIER2	HAZWASTE	NO	N/A
52	11497931	Yakima County Ahtanum Youth Park	1000 Ahtanum Rd	Yakima	WA	98903	LUST, INDPNDNT, UST	TOXICS	YES	NO
53	16187381	Robert & Frank L Glaspey	1200 Ahtanum Rd	Yakima	WA	98903-9028	UST	TOXICS	NO	N/A
54	76118322	Pacific Power & Light Union Gap Substation	903 W Ahtanum Rd	Union Gap	WA	98903	HWG, SCS, UST	HAZWASTE	YES	NO
55	85343884	Refrigeration Equipment Co. Inc.	1515 W Ahtanum Rd	Union Gap	WA	98903-9028	HWG	HAZWASTE	NO	N/A

Program	Interaction Type Code	Interaction Type Name	Interaction Type Description
ALL	ENFORFNL	Enforcement Final	An Enforcement action (i.e., penalty, order, notice) was finalized and issued to the respective party, indicating the enforcement action was taken. The start and end date listed in the database are both the date the action was issued to the responsible party.
ALL	NONENFNL	Non-Enforcement Final	A Non-Enforcement action (i.e., permit, notice of construction, etc.) was finalized, issued to the respective party, indicating the non-enforcement action was taken.
AIRQUAL	AQLA	Air Qual Local Authority Reg	Small sources governed only by local air authorities.
HAZWASTE	TIER2	Emergency/Haz Chem Rpt TIER2	Businesses that store 10,000 pounds or more of a hazardous chemical or 500 pounds or less, depending on the chemical, of an extremely hazardous chemical on site at any one time must report annually. Reports are sent to the State Emergency Response Commission (represented by Ecology) Local Emergency Planning Committees, and local fire departments for emergency planning. (product, not waste)
HAZWASTE	TRI	Toxics Release Inventory	Facilities in specific industries that manufacture, process or use more than the threshold amount of one or more of 600 listed toxic chemicals. Most threshold amounts are 10,000 or 25,000 pounds per year. Some chemicals have much lower thresholds.
HAZWASTE	HWP	Hazardous Waste Planner	Under Chapter 173-307 WAC, facilities that report under Section 313 of the Emergency Planning/Community Right-To-Know Act (EPCRA), or that generate more than 2,640 pounds of hazardous waste per year, must prepare Pollution Prevention Plans.
HAZWASTE	RSVP	Revised Site Visit Program	HWTR engages in a variety of field work, site visits, and contacts with sites. While most compliance related activity is recorded into the EPA's RCRAInfo system, the other types of activities are recorded into the Revised Site Visit Program (RSVP).
HAZWASTE	HWG	Hazardous Waste Generator	Facilities that generate any quantity of a dangerous waste. They may be classified as SQG, MQG, or LQG depending on hazardous waste generated for a given month.
HAZWASTE	HWOTHER	Haz Waste Management Activity	Facilities that are required to have an EPA/State ID number but who do not generate and/or manage hazardous waste (XQG generator status). This includes transporters, used oil recyclers, and dangerous waste fuel marketers and burners.
TOXICS	INDPNDNT	Independent Cleanup	Any remedial action without department oversight or approval and not under an order or decree.
TOXICS	LUST	LUST Facility	A leaking underground tank cleanup site being cleaned up with Ecology oversight or review.
TOXICS	SCS	State Cleanup Site	A site is being cleaned up under state regulations. Regulations include Model Toxics Control Act or its predecessors.
TOXICS	VOLCLNST	Voluntary Cleanup Sites	For a fee, Ecology staff will review an independent cleanup report(s) and provide a written decision about the adequacy of the cleanup actions taken and described in the report.
TOXICS	UST	Underground Storage Tank	Any one or combination of tanks (including connecting underground pipes) that is used to contain regulated substances and has a tank volume of ten percent or more beneath the surface of the ground. This term does not include any of the exempt UST systems specified in WAC 173-360-110(2) or any piping connected thereto. See WAC 173-360
WATQUAL	CONSTSWGP	Construction SW GP	General permit issued to owner/operators of construction projects that disturb one or more acres of land through clearing, grading, excavating, or stockpiling of fill materials that discharge stormwater to state waters.
WATQUAL	IND2POTWPRIVSWDP	Industrial to POTW/Private SWD	Industrial state waste discharge permit for facilities that discharge pretreated wastewater to a public or privately owned treatment works (POTW).
WATQUAL	INDSWGP	Industrial SW GP	General permit issued to industries to regulate the discharge of contaminated stormwater to state waters.
WATQUAL	NONPOINT	NONPOINT	A facility or site that is discharging polluted runoff from urban, agriculture, forestry or other practices and does not have a water quality permit.
WATQUAL	SANDGP	Sand and Gravel GP	General permit issued to sand and gravel mining operators to regulate the discharge of pollutants to state waters.

Program Acronym	Program Name
ALL	All Programs
AIRQUAL	Air Quality
HAZWASTE	Hazardous Waste and Toxics Reduction
SEA	Shorelands and Environmental Assistance
SOLIDWASTE	Solid Waste Management
SPILLS	Spill Prevention, Preparedness, and Response
TOXICS	Toxics Cleanup
WATQUAL	Water Quality
WATRES	Water Resources

G

G SEPA ENVIRONMENTAL CHECKLIST

WAC 197-11-960 Environmental checklist.

ENVIRONMENTAL CHECKLIST

Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1) Name of proposed project, if applicable:
Yakima Air Terminal/McAllister Field
Master Plan

2) Name of applicant:
City of Yakima

3) Address and phone number of applicant and contact person:
Robert Peterson, MPA
Airport Manager

Yakima Air Terminal
2406 W. Washington Avenue, Suite B
Yakima, WA 98903
(509) 575-6149 (Office)

4) Date checklist prepared:
09/16/2014

5) Agency requesting checklist:
City of Yakima; Federal Aviation Administration (FAA)

6) Proposed timing or schedule (including phasing, if applicable):
The Master Plan's recommended improvements are planned for three implementation phases.
Phase 1 covers the short-term projects (2013-2016);
Phase 2 covers the intermediate term (2017-2021);
Phase 3 covers the long term plan (2022-2031).

7) Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.
Capital Improvement Projects recommended in the ALP Update will be built during the phases noted in the preceding answer. Some Capital Improvement Projects will include asphalt work to rehabilitate Taxiways, Aprons, and Ramps; rehabilitate Federal Aviation Administration required airfield lighting and signage; and acquisition of required equipment to perform maintenance at airport.

8) List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.
Not applicable at the present time. However, future projects may require additional consideration or environmental review depending on the scope of work.

9) Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.
None.

10) List any government approvals or permits that will be needed for your proposal, if known.
The Airport Layout Plan Update will need to be approved by the City of Yakima and Federal Aviation Administration.

11) Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)
The Airport Layout Plan Update (a non-project action) for the Yakima Air Terminal/McAllister Field is intended to evaluate and determine a short, intermediate and long-term maintenance and development program for the airport. A detailed maintenance program for airside and landside facilities has been formulated, and a 20-year capital improvement program has been prepared. The Capital Improvement Project consists of actions that support continued safe and efficient operation of the airport.

12) Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

Yakima Air Terminal/McAllister Field (YKM) is located in Yakima County within the City of Yakima and covers an area of 825 acres. The main entrance is at the intersection of South 24th Avenue and West Washington Avenue approximately three miles southwest from the Interstate 82/State Route 12 Interchange. There are two active runways at the airport. Runway 9/27 is paved with asphalt and is 150 feet wide by 7,604 feet in length. There is a non-precision approach to Runway 9 and a precision approach to Runway 27. Runway 4/22 is also paved with asphalt and is 150 feet wide by 3,835 feet in length. There are visual approaches to both Runway ends.

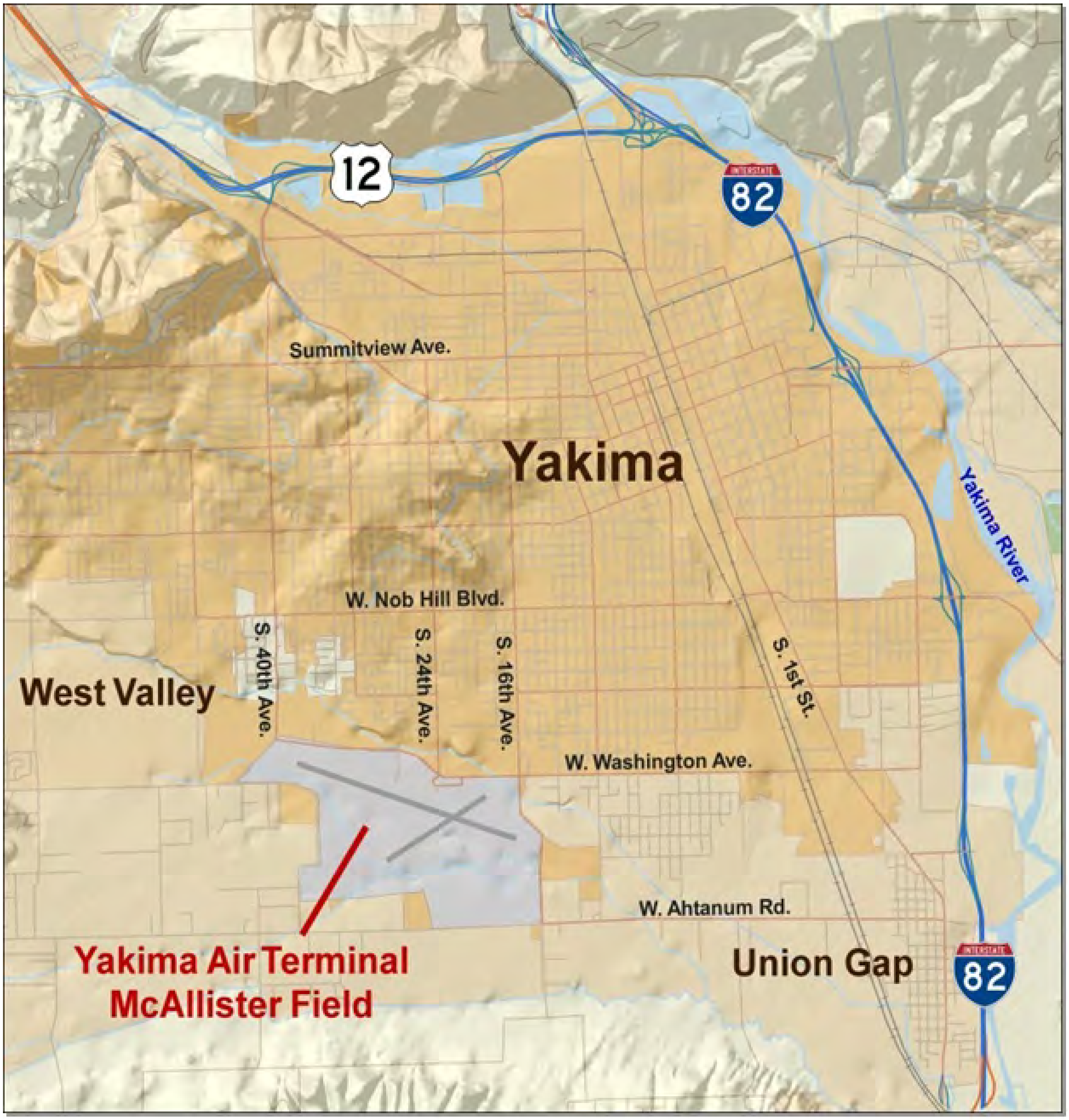


Exhibit 1 – Airport Location

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

B. ENVIRONMENTAL ELEMENTS

1) **Earth**

a. General description of the site (circle one): **FLAT,** rolling, hilly, steep slopes, mountainous, other . . . . . .

b. What is the steepest slope on the site (approximate percent slope)?
Approximately 3 %

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.
The soils on the airport are primarily Alluvium – stream deposits of silt, sand and gravel. None of the soils are classified as prime agricultural.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.
No.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.
Not applicable at the present time. However, specific future projects may require additional filling or grading depending on the scope of work to ensure the airfield meets Federal Aviation Administration standards.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.
Not applicable at the present time. However, specific future projects may require additional consideration to ensure erosion doesn't occur if any clearing or construction is required to meet Federal Aviation Administration standards.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?
Not applicable at the present time. However, specific future projects may require additional pavement or asphalt be installed to meet Federal Aviation Administration standards.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:
Not applicable at the present time. However, future proposed projects may require measures to be implemented to reduce or control erosion to assist the airport in meeting Federal Aviation Administration standards.

2) **Air**

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.
Individual projects in the Master Plan Update may result in increased air emissions due to construction activities. These will be examined on a per project basis.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.
Does not apply.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

c. Proposed measures to reduce or control emissions or other impacts to air, if any:
Mitigation measures for individual projects will be implemented as needed to reduce or control emissions.

3) **Water**

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.
Three permanent streams are located on Yakima Air Terminal/McAllister Field (YKM) property; these are: Bachelor Creek, Spring Creek and Wide Hollow Creek, and a permanent irrigation ditch, Carpenter Ditch.

Bachelor Creek originates approximately 14.75 miles west of the airport. It transits within YKM from a start point near the southwest corner of the intersections of South 36th Avenue and Ahtanum Road. In general, Bachelor Creek runs westerly to easterly, passing through the middle of YKM, south of Runway 4/22. The Creek crosses under the former footprint of South 16th Avenue and the paved perimeter road and continues east to merge with Carpenter Ditch, an irrigation ditch and associated wetlands. Bachelor Creek crosses under the existing South 16th Avenue before meandering southeast approximately 1.5 miles under Ahtanum Road to converge with Ahtanum Creek (a tributary of the Yakima River). The Type 2 Creek requires a 25-foot buffer minimum and 75-foot buffer maximum from its delineated ordinary high water mark (OHWM) within YKM boundaries.

Wide Hollow Creek originates approximately 15 miles west of YKM. It transits within YKM for approximately 1,000 lineal feet near the northeast portion of YKM. From a start point near the intersections of South 16th Avenue and West Washington Avenue, Wide Hollow Creek meanders through a vegetated channel under an access road for Cub Crafters and before exiting YKM under the recently improved South 16th Avenue. Wide Hollow Creek is a tributary of the Yakima River. The Type 2 Creek requires a 25-foot buffer minimum and 75-foot buffer maximum from its delineated OHWM within YKM boundaries.

Spring Creek originates approximately 2,000 feet west of West Washington Avenue in two separate channels. These two channels merge near an agriculture field at West Washington Avenue. The creek crosses under West Washington Avenue into YKM and meanders out of, and back into the airport near the intersections of Spring Creek Road and South 36th Avenue. This is a location of an existing mitigation area for the Runway 27 Safety Area Improvement Project (Widener and Associates September 2008). The creek continues in a partially channelized, partially vegetated, meandering ditch, under Runway 4 and further easterly towards the former South 16th Avenue footprint, towards the weir and former hatchery location, east of the perimeter road. Spring Creek becomes the Carpenter Irrigation Ditch at this location, regulating flows between the ditch and Bachelor Creek. Spring Creek a Type 3 stream (and associated wetlands) flows west to east and through YKM within both the City of Yakima and Yakima County boundaries. It requires a minimum 25-foot and maximum 50-foot buffer from the delineated OHWM.

TO BE COMPLETED BY APPLICANT | EVALUATION FOR AGENCY USE ONLY

Carpenter Irrigation Ditch provides irrigation water to surrounding fields. Waters from the ditch exit airport property as Bachelor Creek, flowing under South 16th Avenue. This ditch is considered waters of the United States within YKM, and is jurisdictional under United States Army Corps of Engineers (Title 33 CFR).

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Projects listed in the Master Plan Update may involve some work within 200 feet of some of the described waters. Specific plans for the projects will be completed as the projects are implemented.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Does not apply.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

Does not apply.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Floodplains are defined by Executive Order 11988, Floodplain Management, as those areas with a one percent chance of flooding in any given year, or once in every 100 years. Examination of Federal Flood Insurance Maps, have revealed the existence of 100 year floodplains north of, within, east of, and west of YKM associated with the meanderings of Bachelor and Spring Creeks. Included in this floodplain area is the south end of Taxiway C and a small part of the proposed extension to Runway end 27 as indicated in the previous Airport Master Plan.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

Does not apply.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

Does not apply.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Does not apply.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.
Does not apply.

2) Could waste materials enter ground or surface waters? If so, generally describe.
Does not apply.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:
Does not apply.

4. **Plants**

a. Check or circle types of vegetation found on the site:

__X__ deciduous tree: <u>alder</u>, <u>maple</u>, aspen, **<u>other (Willow, Russian Olive, Chinese Elm)</u>**

____ evergreen tree: <u>fir</u>, <u>cedar</u>, pine, other:

____ shrubs

__X__ grass

____ pasture

____ crop or grain

__X__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other; **riparian**

____ water plants: water lily, eelgrass, milfoil, other

____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Not applicable at the present time. However, future proposed projects may require some relocation or removal of vegetation depending on the scope of work to meet Federal Aviation Administration standards.

c. List threatened or endangered species known to be on or near the site.

None listed.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Does not apply to the Airport Layout Plan Update.

5. **Animals**

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: <u>hawk</u>, heron, <u>eagle</u>, <u>songbirds</u>, **other (Magpies, Starlings, Crows, Red Tail Hawk, Kestrel Hawk, Kill Deer, Blue Heron):**
mammals: deer, bear, elk, <u>beaver</u>, **other: (Pocket Gopher, Moles, Field Mice, Coyotes)**
fish: bass, <u>salmon</u>, trout, herring, shellfish,

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

b. List any threatened or endangered species known to be on or near the site. **None**

c. Is the site part of a migration route? If so, explain.
No

d. Proposed measures to preserve or enhance wildlife, if any:
Does not apply.

6. **Energy and natural resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.
Does not apply.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.
Does not apply.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:
Does not apply.

7. **Environmental health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.
Not applicable at the present time. However, future proposed projects may require further consideration to the above question depending on the scope of work to be completed to meet Federal Aviation Administration standards.

1) Describe special emergency services that might be required.
Not applicable at the present time. However, future proposed projects may require further consideration for emergency services (responding routes) depending on the scope of work to be completed to meet Federal Aviation Administration standards.

2) Proposed measures to reduce or control environmental health hazards, if any:
Does not apply.

b. **Noise**

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?
Does not apply.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.
Does not apply.

3) Proposed measures to reduce or control noise impacts, if any:
Does not apply. None needed.

8. **Land and shoreline use**

a. What is the current use of the site and adjacent properties?
The current land use is for airport operations.

b. Has the site been used for agriculture? If so, describe.
Yes, portions of airport property are currently used for cattle grazing or Hay Crops.

c. Describe any structures on the site.
The structures include a variety of buildings such as airport hangars, terminal building, and maintenance buildings.

d. Will any structures be demolished? If so, what?
Not as a result of the Airport Layout Plan Update. Individual projects recommended in the various phases may involve demolition of specific structures to accommodate future development of the airport.

e. What is the current zoning classification of the site?
The zoning is airport support.

f. What is the current comprehensive plan designation of the site?
The comprehensive plan designation is airport support.

g. If applicable, what is the current shoreline master program designation of the site?
Does not apply.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.
No.

i. Approximately how many people would reside or work in the completed project?
Not applicable at the present time. However, future proposed projects may require further consideration to the above question depending on the scope of work and building size.

j. Approximately how many people would the completed project displace?
Does not apply.

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k. Proposed measures to avoid or reduce displacement impacts, if any:

Does not apply. None needed.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The Airport Layout Plan Update incorporates a discussion on land use and will be in compliance with existing land use policies. Continuing planning efforts are under way to protect the airport or community within the airport influence area.

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Does not apply.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Does not apply.

c. Proposed measures to reduce or control housing impacts, if any:

Does not apply. None needed.

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Does not apply.

b. What views in the immediate vicinity would be altered or obstructed?

Does not apply.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Does not apply.

11. **Light and glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Airport use requires various lighting intensity levels, day and night as outlined in the Federal Aviation Regulations related to Part 139 commercial service airports.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

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EVALUATION FOR AGENCY USE ONLY

c. What existing off-site sources of light or glare may affect your proposal?

Does not apply.

d. Proposed measures to reduce or control light and glare impacts, if any:

Does not apply. None needed.

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

None.

b. Would the proposed project displace any existing recreational uses? If so, describe.

Does not apply.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Does not apply. None needed.

13. **Historic and cultural preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

No.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

None.

c. Proposed measures to reduce or control impacts, if any:

None needed.

14. **Transportation**

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The main entrance **is at the intersection of South 24th Avenue and West Washington Avenue approximately three miles southwest from the Interstate 82/State Route 12 Interchange.**

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

Yes, Yakima Transit has a bus stop North of the main terminal building along West Washington Ave.

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c. How many parking spaces would the completed project have? How many would the project eliminate?

Does not apply.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

Some of the projects listed in the Master Plan Update may require on-site airport road improvements.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

Not applicable at the present time. However, future proposed projects may require further consideration to the above question depending on the scope of work to be completed on airport property. Projects usually focus on improvements to the airport's transportation system.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

Does not apply.

g. Proposed measures to reduce or control transportation impacts, if any:

Does not apply. None needed.

15. **Public services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

The Airport Layout Plan Update would not require the addition or increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Does not apply. None needed.

16. **Utilities**

a. Circle utilities currently available at the site:

Electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Does not apply.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR
AGENCY USE ONLY

Signature: ....

Date Submitted: ....

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

(do not use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Proposed improvements recommended in the Master Plan Update may result in increased discharges to water; air emissions; or production of noise.

Proposed measures to avoid or reduce such increases are:

SEPA compliance, permits and other agency approvals will be obtained and mitigation provided as needed on a case by case basis for individual projects.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Individual projects listed in the Master Plan Update may have the potential to affect plants or animals.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

Mitigation measures will be outlined as needed for individual projects listed in the Master Plan Update.

3. How would the proposal be likely to deplete energy or natural resources?

Although all of the projects listed in the Master Plan Update will use energy and natural resources, none have the potential to deplete energy or natural resources.

Proposed measures to protect or conserve energy and natural resources are:

Mitigation measure will be outlined as needed for individual projects listed in the Master Plan Update.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

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Individual projects listed in the Master Plan Update may have the potential to affect environmentally sensitive areas.

Proposed measures to protect such resources or to avoid or reduce impacts are:

Mitigation measure will be outlined as needed for individual projects listed in the Master Plan Update.

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

Individual projects listed in the Master Plan Update will be in compliance with existing land and shoreline uses and plans.

Proposed measures to avoid or reduce shoreline and land use impacts are:

None needed.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Individual projects listed in the Master Plan Update may have the potential to increase demands on transportation or public services and utilities.

Proposed measures to reduce or respond to such demand(s) are:

Mitigation measures will be outlined as needed for individual projects listed in the Master Plan Update.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

To the extent known at this time, individual projects listed in the Master Plan Update will not conflict with local, state or federal laws or requirements for protection of the environment.


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H

H WSDOT LAND USE

H.1 INTRODUCTION

The land surrounding the Yakima Air Terminal/McAllister Field (YKM) is a mixture of residential, commercial, industrial and undeveloped property in three distinct political jurisdictions, the City of Yakima, Yakima County and the City of Union Gap. Figure H-1 shows the current situation.

It is recognized that incompatible development around an airport results in potential adverse consequences to airport safety, efficiency, operation, and economic viability. In addition, development near an airport may reduce property available for aviation operations and safety areas. Incompatible development in the vicinity of an airport has been shown to have the following negative consequences on both the community and the airport:

- It reduces the public's access to air transportation.
- It reduces the value of public investment in airport facilities, both currently and in the future.
- It creates a situation where opportunity for economic development within the community is reduced.
- An overall reduction in the quality of life for people living in residential developments that have been located in incompatible areas results from noise and other airport impacts.

To assure that YKM remains compatible with development in the City of Yakima, Yakima County and the City of Union Gap, a range of critical factors must be considered, particularly focused on the interactions that occur between the airport and the neighborhoods. These are focused on;

1. **Noise**: Using the DNL65db noise contour for the year 2030 as generated in the airport master plan the analysis addresses potential impacts that could be disruptive to land use activities.
2. **Airspace protection:** The airspace surfaces identified in the FAR Part 77 Imaginary Surfaces for the ultimate airport layout as shown on the Airport Layout Plan Sheets 3 through 7 are used to assess the areas required for safe airport operations.

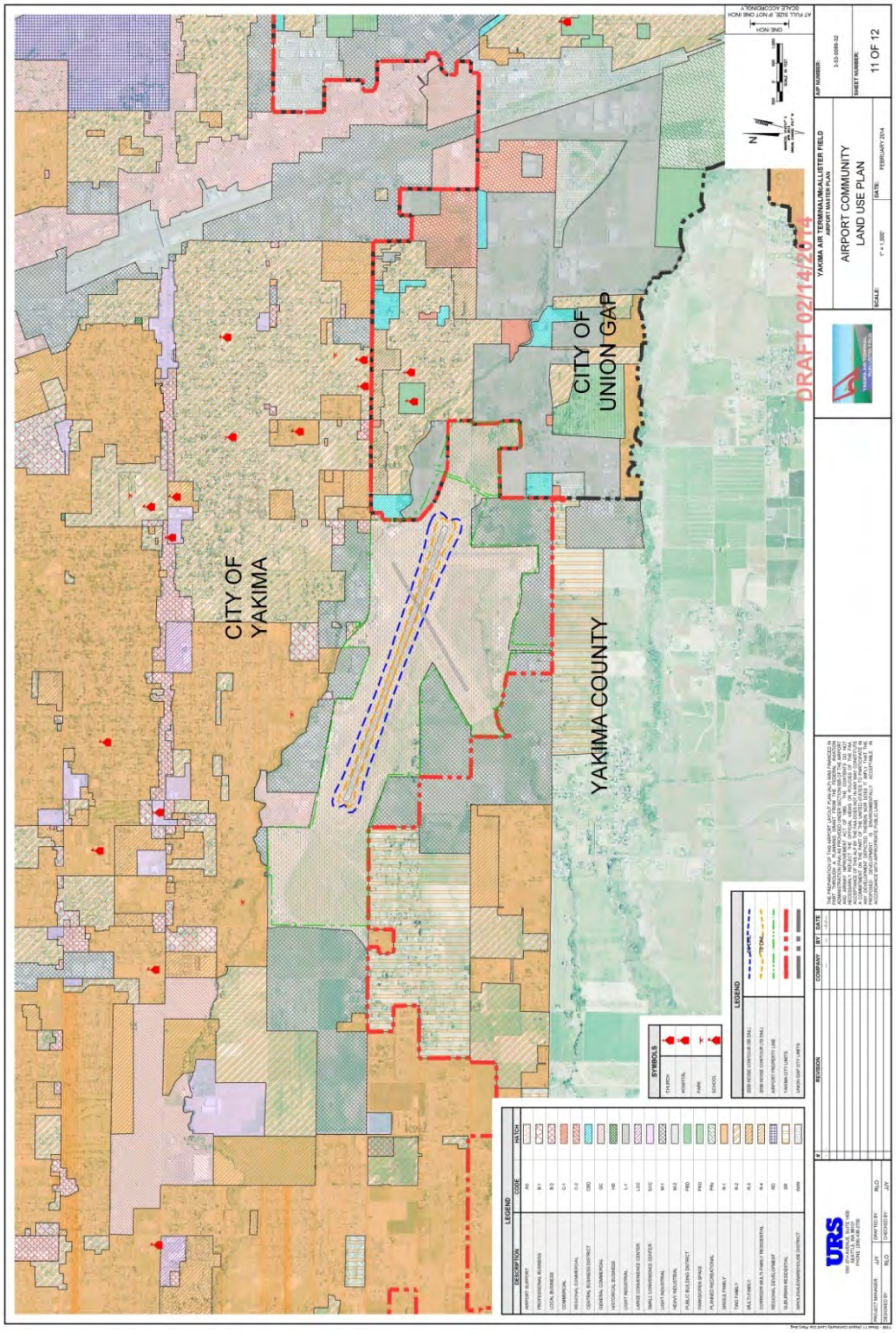

Figure H-1: Airport Community Land Use Plan

1. **Safety**: A series of safety zones referenced in the WSDOT report "Airports and Compatible Land Use Guidebook" are used to consider the consequences of potential accidents in the airport area.

Noise

At present, aircraft operations at YKM do not generate much noise since most are conducted by small, piston powered aircraft and noise levels exceeding DNL 65 are contained on airport property both today and in the 20-year future. Therefore, the airport's noise impact on the surrounding communities will not change as a result of the recommended improvements.

Airspace Protection

Height restrictions around the airport are defined by FAR Part 77, Objects Affecting Navigable Airspace. The Part 77 Surfaces surrounding YKM have been discussed and defined previously in Chapter 6. These drawings illustrate the airspace that needs to be kept clear of obstructions, including objects of natural growth, man-made objects, and terrain to assure safe, all-weather operations.

Safety

The Washington State "Airports and Compatible Land Use Guidebook" provides guidance for identifying Airport Safety Zones near airports. These zones are based on the airport's runway system and associated activity. The objective is to preclude development of non-compatible land uses in locations that statistically, account for potential impacts of aircraft flight including noise, airspace, vibration, odor, and annoyance.

The six zones include;

Zone 1 – Runway Protection Zone – This zone encompasses the runway protection zone (RPZ) at the end of each runway. Also included in the zone are the strips of land immediately adjacent to the runway where FAA standards preclude structures. Zone 1 is where the greatest concentration of accidents take place.

Zone 2 – Inner Approach/Departure Zone – This zone wraps around and extends beyond Zone 1 along the runway centerline. Next to the RPZ, it represents the area where the risk of aircraft accidents is the greatest. On departure, aircraft are typically at full power in the initial phase of climb. On approach, they are at low altitude as they prepare for landing.

Zone 3 – Inner Turning Zone – This zone is a wedge-shaped area lying along the sides of Zone 2. It is primarily significant where most of the flights are visual. When operating visually, departing aircraft may begin turning over this area to fly toward their destination or to remain in the traffic pattern. Arriving aircraft often overfly this area as well, especially if they are flying a tight pattern. One type of accident known to occur in this area is a low-altitude stall- spin that can happen if a pilot attempts to make too tight of a turn.

Zone 4 – Outer Approach/Departure Zone – This area lies beyond Zone 3 along the extended runway centerline. Aircraft flying straight out or in overfly this area at low-altitude. The zone is particularly significant on runways where much of the operations are on instrument procedures and at busy airports where elongated traffic patterns are common. The risks in this area are moderate, but less than in Zones 1 through 3.

Zone 5 – Sideline Zone – Lying in narrow bands along each side of the runway, aircraft do not normally fly over the sideline zone. The principal risk is from aircraft that lose directional control while landing or just after takeoff. The risks are lower than in Zones 1 through 3 and similar to those of Zone 5.

Zone 6 – Traffic Pattern Zone – The final zone contains the remainder of the airport environment where aircraft fly as they approach and depart the airport or are engaged in flight training. In area, Zone 6 is typically larger than the other zones combined. A substantial percentage of accidents take place here, but they are scattered over the large area.

These Safety Zones applied to the YKM are depicted on Figure H-2.

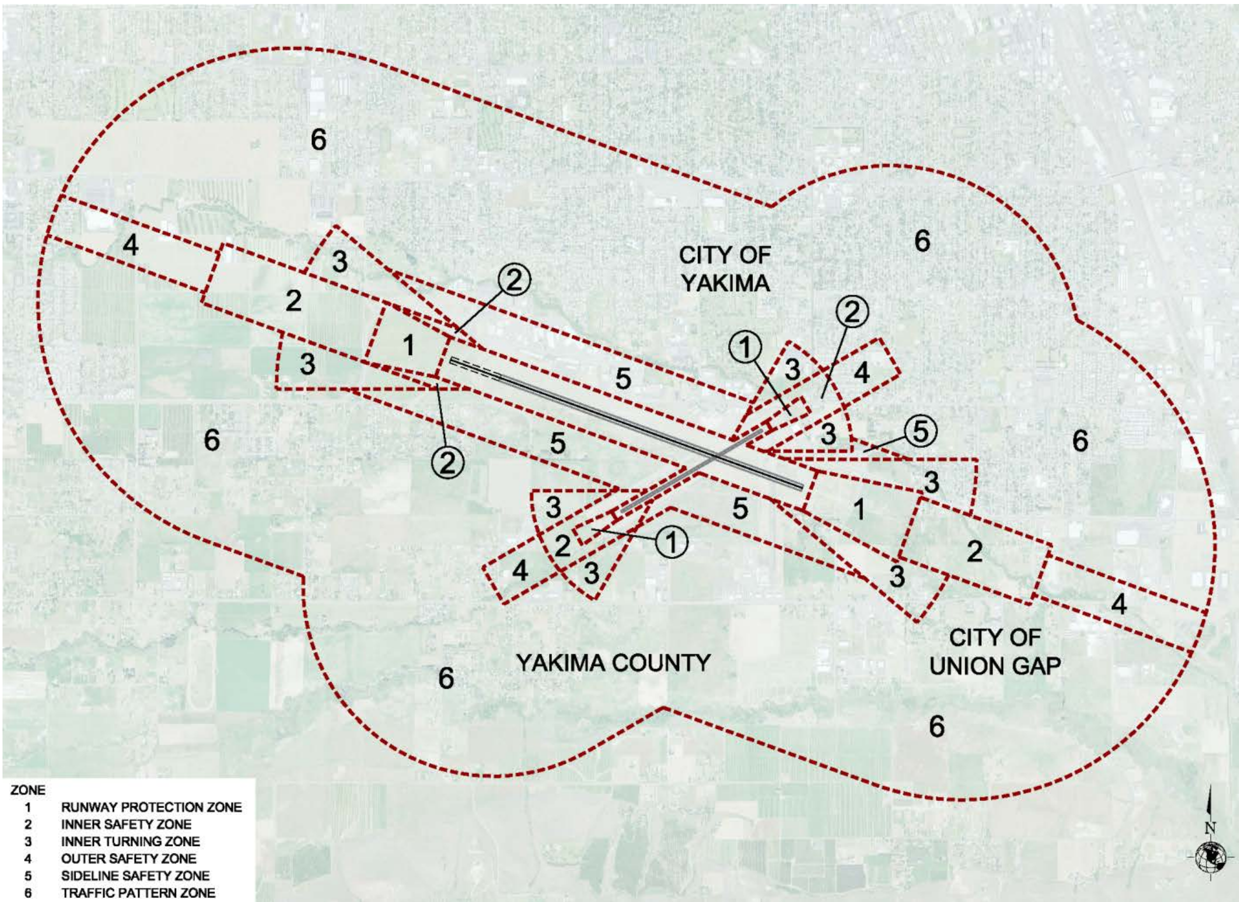

Figure H-2: Aircraft Safety Zones

The recommendations on the compatible and non-compatible land use activities within each of the zones are presented in the following tables. Community land use is shown overlaid with the Safety Zones in Figure H-3.

Table H-1: Washington State Guidelines for Accident Safety Zones

	Compatibility Zones					
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
A. Resource Operations						
1. Agricultural (Commercial)						
Agriculture, horticulture, general farming (crops only, not feedlots and stockyards)	P	P	P	P	P	P
Agricultural building	L	L	P	P	P	P
Agricultural chemical sales/storage	X	L	P	P	P	P
Agricultural Housing/Farm labor	X	X	L	P	L	P
Agricultural housing/farm labor	X	X	L	P	L	P
Agricultural market	X	X	P	P	X	P
Agricultural related industries	X	L	P	P	P	P
Animal husbandry	X	L	L	L	X	P
Agricultural feeding operation or stockyards	X	X	X	X	X	X
Agriculture or food processing facility	X	L	P	P	L	P
Livestock auction	X	X	X	L	X	P
Fairgrounds	X	X	X	X	X	P
Floriculture, aquaculture	X	L	P	P	P	P
Fruit bin sales/storage	X	L	P	P	P	P
2. Forest (Commercial)						
General forest silver culture	L	L	P	P	P	P
Forest product processing	X	L	P	P	P	P
3. Mining/Refining/Offsite Hazardous Waste Treatment						
Asphalt paving and roofing materials, rock crushing	X	X	L	L	L	P
Mining including sand and gravel pits	X	L	L	L	X	P
Stockpiling of earthen materials	X	L	L	L	X	P
B. Rural Development						
1. Rural Residential						
Single-family dwelling (large lot, 5 acres or greater*)	X	L	L	P	X	P
Single-family dwelling, rural centers	X	X	L	L	X	L
Residential Cluster Development, 40% open	X	X	LSC	X	X	P
Multi-family dwelling	X	X	X	X	X	P
Temporary farm housing	X	X	P	P	L	P

	Compatibility Zones					
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
2. Rural Centers						
Single-family dwelling; up to 12 dwelling units/acre	X	X	L	L	X	L
Two - Four family dwelling (duplex) (*)	X	X	X	X	X	L
Multi-family dwelling; 12-20 units/acre	X	X	L	X	X	P
21+ units/acre	X	X	P	P	X	P
Agriculture/forest/mineral resources or industry (see item A)						
Community services (see item D2)						
Retail and commercial service (see items D4 & D5)						
Industrial/manufacturing (see item D4s & D5)						
C. Education Facilities						
Junior or community college	X	X	L	L	L	P
Schools, K-12 elementary, middle, senior high	X	X	X	X	X	X
Business school	X	L	L	L	L	P
Vocational schools	X	L	L	L	L	P
D. Urban Development						
1. Residential						
Single-family dwelling; up to 12 dwelling units/acre	X	X	X	X	X	L
Two - four-family dwelling (duplex)(*)	X	X	X	X	X	L
Multi-family dwelling(*): 15 or more	X	X	LSC	X	X	P
Mixed-use office/commercial/residential use	X	X	P	P	X	P
Residential development cluster 40% > open space	X	X	L	L	X	L
Residential infill	X	X	L	L	L	P
Mobile home parks	X	X	L	L	X	L
Boarding house	X	X	L	L	L	L
Retirement homes	X	X	X	X	X	L

	Compatibility Zones					
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
2. Community Services						
Cemetery	P	P	P	P	L	P
Churches, synagogues, temples	X	X	L	L	X	L
Community center meeting halls, fraternal organizations	X	X	L	L	X	P
Convalescent, nursing home and group homes	X	X	X	X	X	L
Day care facilities, family in-home	X	X	L	L	X	L
Day care center	X	X	L	L	X	L
Funeral home	X	X	P	P	X	P
Police, fire stations, ambulance service	X	L	P	P	P	P
Hospital	X	X	X	X	X	X
Medical clinic	X	X	L	L	X	P
Correction facilities	X	L	L	L	L	L
Libraries	X	X	P	P	X	P
Museums and art galleries	X	X	L	P	P	P
Zoo	X	X	P	P	X	P
3. Amusement and Recreation						
Amusement park (permanent)	X	X	L	L	X	L
Bowling alleys	X	X	P	P	X	P
Campground	X	L	L	P	L	P
Recreational vehicle parks; short term	X	L	L	P	L	P
Drive-in theatres	X	X	L	L	X	P
Fairgrounds	X	X	P	L	L	P
Golf courses	X	L	P	P	X	P
Gymnasiums, exercise facilities	X	L	L	L	L	P
Horse racing tracks, speedways	X	X	X	X	X	X
Miniature golf courses	X	X	P	P	X	P
Movie theatres, auditoriums exhibition halls	X	X	L	L	X	P
Parks	L	L	P	P	L	P
Roller skating rink	X	X	L	L	X	P

	Compatibility Zones					
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
4. Retail Trade and Service						
Addressing, mailing, and stenographic services	X	L	P	P	L	P
Advertising agencies	X	L	P	P	L	P
Airport uses and activities commercial/industrial	L	P	P	P	P	P
Animal clinic/hospital	L	P	P	P	P	P
Antique stores	X	L	P	P	X	P
Automobile, truck, manufactured home, and travel trailer sales	L	P	P	P	P	P
Automobile and recreational vehicle (RV) sales; weekend	L	P	P	P	L	P
Automotive: car wash	L	P	P	P	L	P
Sales lot/auto center	L	P	P	P	P	P
Parking lots and garages	L	P	P	P	P	P
Maintenance and repair shops	X	P	P	P	P	P
Paint and body repair shops	L	P	P	P	P	P
Parts and accessories (tires, batteries, etc.)	X	P	P	P	P	P
Specialized repair shops (radiator, etc.)	L	P	P	P	P	P
Towing services	L	P	P	P	P	P
Wrecking and dismantling yard	L	P	P	P	L	P
Bakery	X	P	P	P	L	P
Beauty and barber shops	X	L	P	P	X	P
Bed and breakfast inn	X	X	L	L	X	P
Boats and marine accessories	X Except	P	P	P	P	P
Books, stationery, office supplies	Storage only	P	P	P	L	P
Building and trade (plumbing, heating, electrical, painting, etc.)	Storage only	P	P	P	L	P
Clothing and accessories	X	L	P	P	L	P
Communication towers	X	X	L	L	L	L
Computer and electronic stores	X	L	P	P	L	P
Department, discount, variety stores	X	X	P	P	X	P
Drug stores (optical goods, orthopedic supplies)	X	L	P	P	L	P
Employment agencies (private)	X	P	P	P	L	P

	Compatibility Zones					
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Farm and implements, tools and heavy construction equipment	X	L	P	P	P	P
Farm supplies	L	P	P	P	P	P
Financial institutions	X	P	P	P	L	P
Food store	X	P	P	P	L	P
Furniture, home furnishings, appliances	X	P	P	P	L	P
General hardware, garden equipment and supplies	X	P	P	P	L	P
Grocery and convenience stores	X	L	P	P	L	P
Heavy equipment storage, maintenance and repair	X	L	P	P	L	P
Insurance agents, brokers, and service agencies	X	P	P	P	L	P
Kennels	L	P	P	P	L	P
Laundries, laundromats, and dry cleaning plants	X	P	P	P	L	P
Liquor stores	X	P	P	P	L	P
Lumber yards	L	P	P	P	L	P
Medical and dental laboratory, offices and clinic	X	X	L	P	x	P
Mini Storage	L	P	P	P	P	P
Motels and Hotels	X	X	P	P	P	P
Motorcycles sales/repair (including maintenance)	X	P	P	P	L	P
Paint, glass, and wallpaper stores	X	P	P	P	L	P
Pet stores, pet supplies, and dog grooming	X	L	P	P	L	
Professional office buildings for architects, attorneys, government, etc.	X	L	P	P	P	P
Rental: auto, truck, trailer, fleet leasing services	L	P	P	P	L	P
Repairs: small appliances, TV, business machines, watches, etc.	L	P	P	P	L	P
Restaurant, cafe and drive-in eating facilities	X	L	P	P	P	P
Service station	X	L	P	P	L	P
Sporting goods, bicycle shops	X	P	P	P	P	P
Taverns, bars, dance establishments	X	L	P	P	L	P

	Compatibility Zones					
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
5. Industry/Manufacturing						
Aircraft parts	Storage only	L	P	P	P	P
Aircraft industrial	Storage only	L	P	P	P	P
Apparel and accessories	X	L	P	P	X	P
Bakery products (wholesale)	Storage only	L	P	P	X	P
Beverage industry	Storage only	L	P	P	X	P
Canning, preserving, and packaging fruits, vegetables, and other foods	X	L	L	L	X	P
Cement and concrete plants	X	L	L	L	X	P
Chemicals (industrial, agricultural, wood, etc.)	X	X	L	L	X	L
Concrete, gypsum, and plaster products	Storage only	L	P	L	L	P
Confectionery and related products (wholesale)	Storage only	P	P	P	L	P
Mini storage	P	P	P	P	P	P
Product assembly	Storage only	L	P	P	L	P
Prefabricated structural wood products and containers	Storage only	P	P	P	L	P
Printing, publishing, and binding	Storage only	P	P	P	L	P
Rendering plants, slaughter houses	X	X	X	X	X	L
Rubber products	X	L	P	P	L	P
Sawmills and planing mills	Storage only	L	P	P	L	P
Sheet metal and welding shops	Storage only	P	P	P	L	P
Stone products (includes finishing of monuments for retail sale)	Storage only	P	P	P	L	P

	Compatibility Zones					
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
6. Wholesale Trade-Storage						
Warehouses	Storage only	P	P	P	P	P
Wholesale trade	Storage only	P	P	P	P	P
Storage facilities; bulk	L	P	P	P	P	P
commercial	L	P	P	P	P	P
mini-storage	L	P	P	P	P	P
E. Transportation and Utilities						
1. Transportation						
Bus terminals	X	L	P	P	L	P
Transportation storage and maintenance facilities	Storage only	P	P	P	P	P
Transportation brokerage offices; without truck parking	X	P	P	P	P	P
with truck parking	L	P	P	P	P	P
Contract truck hauling, rental of trucks with drivers	L	P	P	P	P	P
Rail, truck terminals (for short-term storage, office)	L	P	P	P	P	P
Air storage and office use	Storage only	P	P	P	P	P
Railroad switch yards, maintenance, and repair facilities, etc.	X	P	P	P	P	P
Taxicab terminals, maintenance, and dispatching centers, etc.	X	P	P	P	P	P
2. Utilities						
Power generating facilities	L	L	L	L	L	L
Utility services (substations, etc.)	L	L	L	L	L	P
Wholesale trade	L	P	P	P	L	P
Storage facilities; bulk	L	P	P	P	P	P
Commercial	L	P	P	P	P	P

Chart Symbols

- **"L" Limited** – Uses or activities that may be compatible with airport operations depending on their location, size, bulk, height, density and intensity of use.
- **"LSC" Limited Special Conditions** – Development should be moved away from the extended runway centerline. Open space should be devoted to areas that experience elevated risk.
- **"P" permitted** – Uses or activities that should be permitted, however, these activities should be reviewed to ensure that they will not create height hazard obstructions, smoke, glare, electronic, wildlife attractants, or other airspace hazards.
- **"X" Prohibited** – uses or activities that should not be constructed near the airport.

All uses or activities identified herein are subject to intensity and density limitations set forth in Table F-1. Particular attention should be given to developments that when located in combination with other permitted or limited activities may create cumulative impacts on airport operations. All uses should be reviewed to ensure that they will not create airspace hazards.

Source: Washington State Department of Transportation, Aviation Division, "Airports and Compatible Land Use Guidebook", January 2011.

Based on this information it is recommended that the City work with the land use and comprehensive planning agencies to:

1. Adopt the master plan by reference into local comprehensive plans.
2. Describe airport facilities and operations, existing and future, in the transportation inventory.
3. Discourage incompatible land uses adjacent to public-use airports.
4. Identify the airport as an essential public facility.
5. Identify the important role of airports in local and regional economic development.

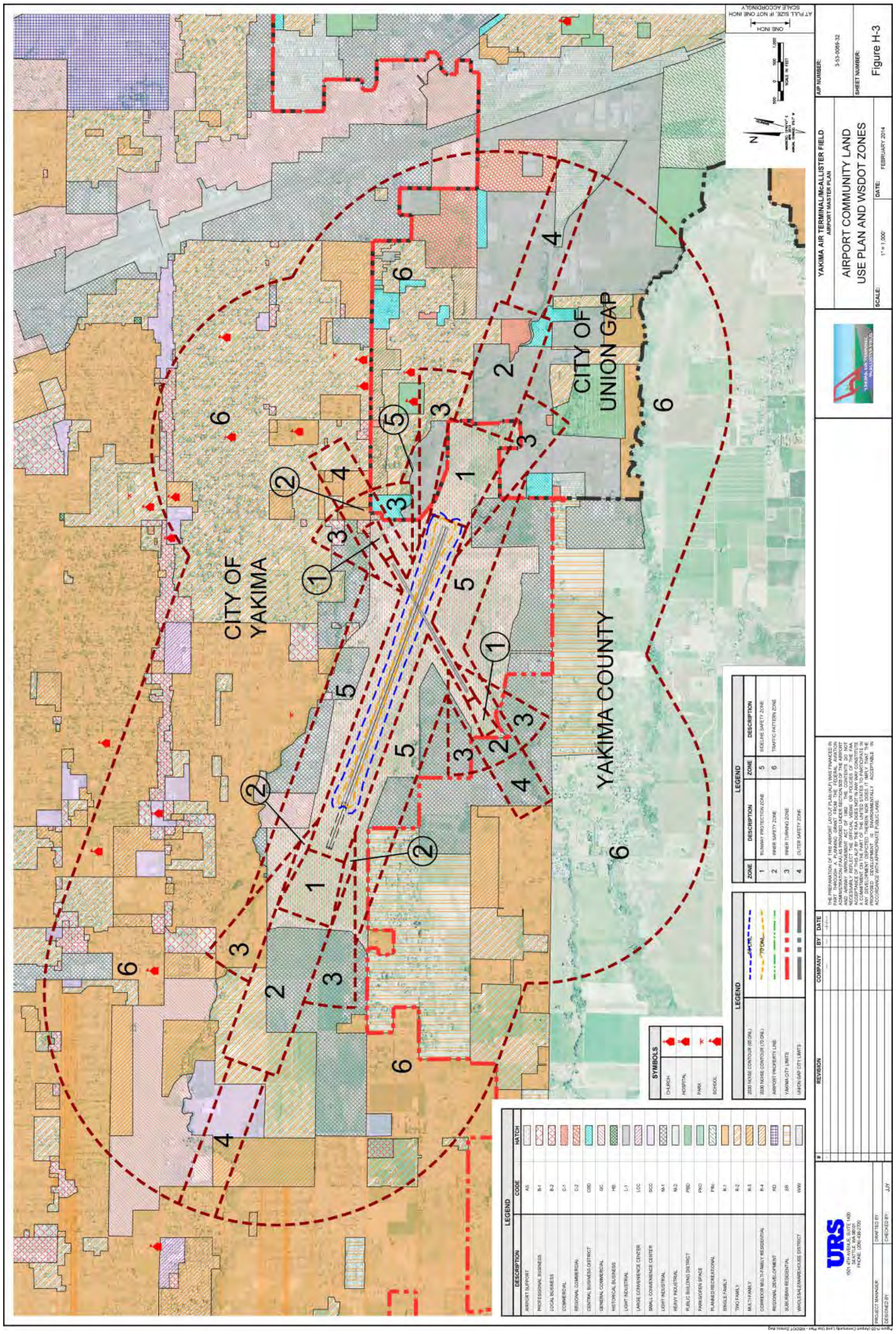

Figure H-3: Community Land Use and WSDOT Zones


22

U.S. Department
of Transportation
**Federal Aviation
Administration**

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

June 28, 2019

Mr. Robert Peterson, C.M.
Airport Director
Yakima Air Terminal-McAllister Field
2406 W. Washington Avenue, Suite B
Yakima, WA 98903

Yakima Air Terminal-McAllister Field (YKM)
Aviation Forecast Approval

Dear Rob:

The Federal Aviation Administration (FAA), Seattle Airports District Office has reviewed the aviation forecast for the Yakima Air Terminal-McAllister Field (YKM) Master Plan Update, submitted June 28, 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 YKM's forecast for enplanements and based aircraft is within the 10 percent and 15 percent allowance for the 5-year and 10-year planning horizons.
2. The difference between the TAF and YKM's total aircraft operations is not within the 10 percent allowance for the 5-year planning horizon, but is within the 15 percent allowance for the 10-year planning horizon, for reasons contained within the forecast. The FAA concurs with these reasons and believes the differences have been resolved.
3. The forecast is based on reasonable planning assumptions, current data and appropriate forecasting methodologies.

Based on the forecast, the FAA approves the existing critical aircraft typified by the Bombardier Q400 (RDC C-III). It also approves the future critical aircraft typified by the Embraer EMB 170/175 (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.

The FAA encourages you to provide comments to the ADO concerning next year's draft TAF numbers when the 2019 Draft TAF comes out this summer. These comments will be forwarded to APP-400 and APO for inclusion into next year's TAF release.

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

Sincerely,

Jennifer I. Kandel
Airport Planner, FAA Seattle Airports District Office

ALP & Exhibit A Approval Letter

Date:	May 17, 2021
To:	Agnes Fisher, Planner, Seattle Airports District Office
From:	Robert Harrison, City Manager, City of Yakima
	Robert Peterson, Airport Director, City of Yakima
	Matt Rogers, Project Manager, Century West Engineering

Background

The updated Airport Layout Plan (ALP) for the Yakima Air Terminal-McAllister Field (YKM) consists of Sheets 1 through 17 dated October 2020. These documents were developed based on the conclusions of the 2020 Airport Master Plan study. 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 acknowledgment 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. The FAA encourages 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 (FAA) will participate in the cost of any development proposed. AIP funding requires evidence of eligibility and justification at the time a funding request is submitted for consideration. When construction of any proposed structure or development indicated on the plan is undertaken, such construction requires a 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 17. It was prepared in accordance with current FAA airport design standards, FAA Standard Operating Procedure 2.00. The last ALP for YKM was approved by FAA in 2015. Major changes in this 2020 ALP from the previous version include:

- Runway 09/27
  - Future runway length will increase to 7,800 feet, based on the future design aircraft (Embraer 175).
- Runway 04/22
  - Existing and future ARC is B-II.
  - Existing design aircraft is the Beechcraft Baron and future is the King Air 350.
  - Future runway length will increase to 4,000 feet and narrowed to 75 feet based on B-II standards.
  - Runway 22 end is reconfigured to mitigate a known hotspot and eliminate the aligned taxiway.
- Taxiways
  - Taxiway A is currently operating under a MOS that was developed to account for the Q400. This specifies a taxiway width of 64 feet, with 20-foot shoulders with the exception of Taxiway A5, which has a width of 75 feet with 35-foot shoulders.

- Taxiway A1 reconfiguration planned to create a 90-degree connector taxiway.
- Future partial parallel taxiway is planned to connect Taxiway C to the Runway 27 end on the south side of Runway 9/27.
- Taxiway B is reconfigured at the Runway 22 end to remove the aligned taxiway, and create 90-degree connector taxiways to Runway 22.

- Landside
    - Future taxilanes are planned in the south landside area (formally known as South Airpark) to support future hangar development.
    - Future reconfigured apron, taxilanes, and fuel island in the northeast landside area (adjacent to McAllister Museum).
    - Future expansion of the Snow Removal Equipment (SRE) building.
    - Future reconstruction of the Terminal building and parking infrastructure.

Exhibit A

The Exhibit A – Airport Property Map consists of Sheet 17. 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 2015. Major changes in this October 2020 Exhibit A Update from the previous version includes:

- Updated existing property boundary.
- Updated property acquisition planned during the 20-year planning period, including the agricultural land west of Runway 4 between S. 36th Ave and airport property; agricultural land between Taxiway C and 16th Ave along Ahtanum Rd.

Signature Blocks

The FAA signature below acknowledges approval of the ALP and acceptance of the Exhibit A.

Federal Aviation Administration (FAA)	**City of Yakima**
Agnes Fisher Digitally signed by Agnes Fisher Date: 2021.05.18 14:06:56 -07'00'	
Agnes Fisher, Planner	Robert Harrison, City Manager
Century West Engineering Corp.	**City of Yakima**
Matt Rogers, Project Manager	Robert Peterson, Airport Director

CENTURY WEST ENGINEERING

Forecast Supporting Material

Appendix J

WORKING PAPER ATTACHMENTS

SUPPORTING MATERIAL

(INFORMATION PROVIDED FOR FAA REVIEW PURPOSES)

#1: FORECAST DATA REFERENCE SOURCES

#2: FAA TERMINAL AREA FORECASTS (02-2019 AND 01-2018)

#3: FAA TAF FORECAST COMPARISON CALCULATION SPREADSHEET

ATTACHMENT #1: FORECAST DATA REFERENCE SOURCES

FAA AVIATION SOURCES

FAA Aerospace Forecasts
https://www.faa.gov/data_research/aviation/aerospace_forecasts/

FAA Terminal Area Forecasts
http://taf.faa.gov/

FAA Traffic Flow Management System Counts (TFMSC)
http://aspmhelp.faa.gov/index.php/TFMSC

FAA Review and Approval of FAA Forecasts (June 2008)
https://www.faa.gov/airports/planning_capacity/.../approval_local_forecasts_2008.pdf

Airport Cooperative Research Program (ACRP) Synthesis 2: Airport Aviation Activity Forecasting
http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=157

FAA Asset (GA Role and Service Area Characteristics)
https://www.faa.gov/airports/planning_capacity/ga_study/

INDUSTRY PUBLICATIONS

General Aviation Manufacturing Association (GAMA) Factbook
https://gama.aero/facts-and-statistics/statistical-databook-and-industry-outlook/

National Business Aviation Association (NBAA) Factbook
https://www.nbaa.org/business-aviation/fact-book/

AIRORT-LOCAL / OTHER

YKMAirport
https://flyykm.com/

US Census Data - Woods and Poole Economic, Inc.
https://www.woodsandpoole.com/

ATTACHMENT #2-A: FAA TERMINAL AREA FORECAST (FEB, 2019)

APO TERMINAL AREA FORECAST DETAIL REPORT
Forecast Issued February 2019

YKM

							AIRCRAFT OPERATIONS								
		Enplanements			Itinerant Operations				Local Operations						
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military	Total	Total Ops	Total Tracon Ops	Based Aircraft
REGION:ANM STATE:WA LOCID:YKM														
CITY:YAKIMA AIRPORT:YAKIMA AIR TERMINAL/MCALLISTER FIELD														
1990	39,022	30,406	69,428	247	15,595	23,086	3,861	42,789	21,595	3,174	24,769	67,558	29,479	118
1991	21,140	74,638	95,778	410	19,240	28,930	3,485	52,065	25,368	3,817	29,185	81,250	27,180	118
1992	24,710	62,710	87,420	676	20,014	30,765	3,083	54,538	22,308	2,678	24,986	79,524	28,539	112
1993	16,826	62,177	79,003	526	19,750	24,974	3,454	48,704	16,970	2,354	19,324	68,028	28,021	112
1994	3,740	71,323	75,063	672	19,273	28,314	3,463	51,722	21,704	3,204	24,908	76,630	26,927	112
1995	4,301	80,717	85,018	530	17,993	25,476	2,954	46,953	25,162	2,392	27,554	74,507	14,016	105
1996	4,633	86,105	90,738	290	18,673	24,620	2,528	46,111	26,157	1,700	27,857	73,968	0	0
1997	3,247	89,162	92,409	360	18,556	20,794	2,082	41,792	17,540	2,353	19,893	61,685	0	124
1998	2,655	84,617	87,272	317	17,484	17,578	1,435	36,814	16,823	2,059	18,882	55,696	0	124
1999	1,154	88,003	89,157	354	16,919	18,471	1,809	37,553	16,567	2,188	18,755	56,308	0	117
2000	1,104	85,266	86,370	553	15,861	21,466	1,854	39,734	18,945	2,147	21,092	60,826	0	117
2001	1,338	80,544	81,882	237	14,485	19,393	1,712	35,827	18,264	1,185	19,449	55,276	0	137
2002	1,514	57,949	59,463	341	11,739	19,601	1,617	33,298	16,989	944	17,933	51,231	0	142
2003	1,543	55,756	57,299	90	11,635	18,935	932	31,592	15,074	565	15,639	47,231	0	143
2004	914	52,241	53,155	60	10,752	18,404	905	30,121	16,227	581	16,808	46,929	0	135
2005	1,567	55,752	57,319	96	10,241	18,483	1,044	29,864	18,553	971	19,524	49,388	0	135
2006	1,004	56,116	57,120	71	9,911	17,278	1,034	28,294	17,797	838	18,635	46,929	0	134
2007	1,281	64,750	66,031	59	9,856	16,888	925	27,728	19,008	1,222	20,230	47,958	0	142
2008	1,678	73,034	74,712	1,046	8,751	16,932	945	27,674	20,778	1,012	21,790	49,464	0	162
2009	2,224	56,770	58,994	2,596	5,777	17,636	1,167	27,176	20,845	1,080	21,925	49,101	0	162
2010	1,968	53,041	55,009	2,211	5,257	18,154	1,136	26,758	20,016	1,259	21,275	48,033	0	162
2011	1,909	53,406	55,315	1,824	4,543	15,355	1,075	22,797	15,819	745	16,564	39,361	0	162
2012	2,434	53,985	56,419	1,827	4,534	16,795	1,054	24,210	14,116	515	14,631	38,841	0	162
2013	1,700	53,352	55,052	1,764	3,187	15,234	1,385	21,570	12,569	1,212	13,781	35,351	0	136
2014	1,486	54,367	55,853	1,737	3,119	14,781	1,012	20,649	11,095	549	11,644	32,293	0	136
2015	1,509	58,605	60,114	1,712	3,296	15,636	908	21,552	14,385	791	15,176	36,728	0	147
2016	932	69,796	70,728	2,228	3,439	16,026	830	22,523	13,273	1,185	14,458	36,981	0	139
2017	1,284	70,616	71,900	2,003	4,056	15,271	820	22,150	13,971	800	14,771	36,921	0	124
2018*	1,382	69,354	70,736	1,930	4,097	16,903	794	23,724	12,538	874	13,412	37,136	0	128
2019*	1,382	70,429	71,811	1,930	4,137	16,835	794	23,696	12,416	874	13,290	36,986	0	130

APO TERMINAL AREA FORECAST DETAIL REPORT
Forecast Issued February 2019

YKM

							AIRCRAFT OPERATIONS							
		Enplanements			Itinerant Operations				Local Operations					
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military	Total	Total Ops	Total Tracon Ops	Based Aircraft
2020*	1,382	71,520	72,902	1,930	4,178	16,942	794	23,844	12,453	874	13,327	37,171	0	132
2021*	1,382	72,628	74,010	1,930	4,219	17,050	794	23,993	12,490	874	13,364	37,357	0	135
2022*	1,382	73,753	75,135	1,930	4,261	17,158	794	24,143	12,527	874	13,401	37,544	0	137
2023*	1,382	74,895	76,277	1,930	4,303	17,267	794	24,294	12,565	874	13,439	37,733	0	140
2024*	1,382	76,056	77,438	1,930	4,346	17,377	794	24,447	12,603	874	13,477	37,924	0	143
2025*	1,382	77,234	78,616	1,930	4,389	17,487	794	24,600	12,641	874	13,515	38,115	0	145
2026*	1,382	78,430	79,812	1,930	4,432	17,598	794	24,754	12,679	874	13,553	38,307	0	147
2027*	1,382	79,645	81,027	1,930	4,476	17,710	794	24,910	12,717	874	13,591	38,501	0	149
2028*	1,382	80,879	82,261	1,930	4,520	17,822	794	25,066	12,755	874	13,629	38,695	0	151
2029*	1,382	82,132	83,514	1,930	4,565	17,935	794	25,224	12,793	874	13,667	38,891	0	153
2030*	1,382	83,405	84,787	1,930	4,610	18,049	794	25,383	12,831	874	13,705	39,088	0	155
2031*	1,382	84,697	86,079	1,930	4,656	18,164	794	25,544	12,870	874	13,744	39,288	0	157
2032*	1,382	86,009	87,391	1,930	4,702	18,279	794	25,705	12,909	874	13,783	39,488	0	159
2033*	1,382	87,342	88,724	1,930	4,749	18,395	794	25,868	12,948	874	13,822	39,690	0	161
2034*	1,382	88,695	90,077	1,930	4,796	18,512	794	26,032	12,987	874	13,861	39,893	0	163
2035*	1,382	90,069	91,451	1,930	4,843	18,630	794	26,197	13,026	874	13,900	40,097	0	165
2036*	1,382	91,465	92,847	1,930	4,891	18,748	794	26,363	13,065	874	13,939	40,302	0	167
2037*	1,382	92,882	94,264	1,930	4,939	18,867	794	26,530	13,104	874	13,978	40,508	0	169
2038*	1,382	94,321	95,703	1,930	4,988	18,987	794	26,699	13,143	874	14,017	40,716	0	171
2039*	1,382	95,782	97,164	1,930	5,037	19,108	794	26,869	13,183	874	14,057	40,926	0	173
2040*	1,382	97,267	98,649	1,930	5,087	19,229	794	27,040	13,223	874	14,097	41,137	0	175
2041*	1,382	98,774	100,156	1,930	5,137	19,351	794	27,212	13,263	874	14,137	41,349	0	177
2042*	1,382	100,304	101,686	1,930	5,188	19,474	794	27,386	13,303	874	14,177	41,563	0	179
2043*	1,382	101,858	103,240	1,930	5,239	19,598	794	27,561	13,343	874	14,217	41,778	0	181
2044*	1,382	103,436	104,818	1,930	5,291	19,723	794	27,738	13,383	874	14,257	41,995	0	183
2045*	1,382	105,039	106,421	1,930	5,343	19,848	794	27,915	13,423	874	14,297	42,212	0	185

ATTACHMENT #2-B: FAA TERMINAL AREA FORECAST (JAN, 2018)

APO TERMINAL AREA FORECAST DETAIL REPORT
Forecast Issued January 2018

YKM

	Enplanements			AIRCRAFT OPERATIONS Itinerant Operations					Local Operations					
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military	Total	Total Ops	Total Tracon Ops	Based Aircraft
REGION:ANM **STATE:**WA **LOCID:**YKM														
CITY:YAKIMA **AIRPORT:**YAKIMA AIR TERMINAL/MCALLISTER FIELD														
1990	39,022	30,406	69,428	247	15,595	23,086	3,861	42,789	21,595	3,174	24,769	67,558	29,479	118
1991	21,140	74,638	95,778	410	19,240	28,930	3,485	52,065	25,368	3,817	29,185	81,250	27,180	118
1992	24,710	62,710	87,420	676	20,014	30,765	3,083	54,538	22,308	2,678	24,986	79,524	28,539	112
1993	16,826	62,177	79,003	526	19,750	24,974	3,454	48,704	16,970	2,354	19,324	68,028	28,021	112
1994	3,740	71,323	75,063	672	19,273	28,314	3,463	51,722	21,704	3,204	24,908	76,630	26,927	112
1995	4,301	80,717	85,018	530	17,993	25,476	2,954	46,953	25,162	2,392	27,554	74,507	14,016	105
1996	4,633	86,105	90,738	290	18,673	24,620	2,528	46,111	26,157	1,700	27,857	73,968	0	0
1997	3,247	89,162	92,409	360	18,556	20,794	2,082	41,792	17,540	2,353	19,893	61,685	0	124
1998	2,655	84,617	87,272	317	17,484	17,578	1,435	36,814	16,823	2,059	18,882	55,696	0	124
1999	1,154	88,003	89,157	354	16,919	18,471	1,809	37,553	16,567	2,188	18,755	56,308	0	117
2000	1,104	85,266	86,370	553	15,861	21,466	1,854	39,734	18,945	2,147	21,092	60,826	0	117
2001	1,338	80,544	81,882	237	14,485	19,393	1,712	35,827	18,264	1,185	19,449	55,276	0	137
2002	1,514	57,949	59,463	341	11,739	19,601	1,617	33,298	16,989	944	17,933	51,231	0	142
2003	1,543	55,756	57,299	90	11,635	18,935	932	31,592	15,074	565	15,639	47,231	0	143
2004	914	52,241	53,155	60	10,752	18,404	905	30,121	16,227	581	16,808	46,929	0	135
2005	1,567	55,752	57,319	96	10,241	18,483	1,044	29,864	18,553	971	19,524	49,388	0	135
2006	1,004	56,116	57,120	71	9,911	17,278	1,034	28,294	17,797	838	18,635	46,929	0	134
2007	1,281	64,750	66,031	59	9,856	16,888	925	27,728	19,008	1,222	20,230	47,958	0	142
2008	1,678	73,034	74,712	1,046	8,751	16,932	945	27,674	20,778	1,012	21,790	49,464	0	162
2009	2,224	56,770	58,994	2,596	5,777	17,636	1,167	27,176	20,845	1,080	21,925	49,101	0	162
2010	1,968	53,041	55,009	2,211	5,257	18,154	1,136	26,758	20,016	1,259	21,275	48,033	0	162
2011	1,909	53,406	55,315	1,824	4,543	15,355	1,075	22,797	15,819	745	16,564	39,361	0	162
2012	2,434	53,985	56,419	1,827	4,534	16,795	1,054	24,210	14,116	515	14,631	38,841	0	162
2013	1,700	53,352	55,052	1,764	3,187	15,234	1,385	21,570	12,569	1,212	13,781	35,351	0	136
2014	1,486	54,367	55,853	1,737	3,119	14,781	1,012	20,649	11,095	549	11,644	32,293	0	136
2015	1,509	58,605	60,114	1,712	3,296	15,636	908	21,552	14,385	791	15,176	36,728	0	147
2016	961	69,767	70,728	2,228	3,439	16,026	830	22,523	13,273	1,185	14,458	36,981	0	139
2017*	1,224	70,455	71,679	2,003	4,056	15,271	820	22,150	13,971	800	14,771	36,921	0	140
2018*	1,224	71,334	72,558	2,015	4,077	14,879	820	21,791	13,771	800	14,571	36,362	0	144
2019*	1,224	72,224	73,448	2,028	4,098	14,955	820	21,901	13,812	800	14,612	36,513	0	146

APO TERMINAL AREA FORECAST DETAIL REPORT
Forecast Issued January 2018

YKM

	Enplanements			AIRCRAFT OPERATIONS											
				Itinerant Operations					Local Operations						
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military	Total	Total Ops	Total Tracon Ops	Based Aircraft
2020*	1,224	73,127	74,351	2,041	4,120	15,032	820	22,013	13,853	800	14,653	36,666	0	148
2021*	1,224	74,041	75,265	2,054	4,142	15,109	820	22,125	13,894	800	14,694	36,819	0	151
2022*	1,224	74,967	76,191	2,067	4,164	15,187	820	22,238	13,935	800	14,735	36,973	0	153
2023*	1,224	75,905	77,129	2,080	4,186	15,265	820	22,351	13,976	800	14,776	37,127	0	156
2024*	1,224	76,854	78,078	2,093	4,208	15,344	820	22,465	14,017	800	14,817	37,282	0	159
2025*	1,224	77,814	79,038	2,106	4,230	15,423	820	22,579	14,059	800	14,859	37,438	0	161
2026*	1,224	78,786	80,010	2,119	4,252	15,502	820	22,693	14,101	800	14,901	37,594	0	163
2027*	1,224	79,770	80,994	2,132	4,274	15,582	820	22,808	14,143	800	14,943	37,751	0	165
2028*	1,224	80,768	81,992	2,145	4,296	15,662	820	22,923	14,185	800	14,985	37,908	0	167
2029*	1,224	81,778	83,002	2,158	4,318	15,742	820	23,038	14,227	800	15,027	38,065	0	169
2030*	1,224	82,801	84,025	2,171	4,340	15,822	820	23,153	14,269	800	15,069	38,222	0	171
2031*	1,224	83,836	85,060	2,185	4,363	15,903	820	23,271	14,311	800	15,111	38,382	0	173
2032*	1,224	84,884	86,108	2,199	4,386	15,984	820	23,389	14,353	800	15,153	38,542	0	175
2033*	1,224	85,945	87,169	2,213	4,409	16,065	820	23,507	14,395	800	15,195	38,702	0	177
2034*	1,224	87,020	88,244	2,227	4,432	16,147	820	23,626	14,437	800	15,237	38,863	0	179
2035*	1,224	88,107	89,331	2,241	4,455	16,229	820	23,745	14,481	800	15,281	39,026	0	181
2036*	1,224	89,208	90,432	2,255	4,478	16,312	820	23,865	14,525	800	15,325	39,190	0	183
2037*	1,224	90,323	91,547	2,269	4,501	16,395	820	23,985	14,569	800	15,369	39,354	0	185
2038*	1,224	91,451	92,675	2,283	4,524	16,479	820	24,106	14,613	800	15,413	39,519	0	187
2039*	1,224	92,595	93,819	2,297	4,547	16,563	820	24,227	14,657	800	15,457	39,684	0	189
2040*	1,224	93,753	94,977	2,311	4,570	16,648	820	24,349	14,701	800	15,501	39,850	0	191
2041*	1,224	94,925	96,149	2,325	4,593	16,733	820	24,471	14,745	800	15,545	40,016	0	193
2042*	1,224	96,112	97,336	2,339	4,616	16,819	820	24,594	14,789	800	15,589	40,183	0	195
2043*	1,224	97,313	98,537	2,353	4,639	16,905	820	24,717	14,833	800	15,633	40,350	0	197
2044*	1,224	98,529	99,753	2,367	4,662	16,991	820	24,840	14,878	800	15,678	40,518	0	199
2045*	1,224	99,761	100,985	2,381	4,685	17,078	820	24,964	14,923	800	15,723	40,687	0	201

ATTACHMENT #2-C: FAA OPSNET (2000-2018)
5% TRAFFIC ADJUSTMENT DURING NON-ATCT HOURS

OPSNET : Airport Operations : Standard Report

From 01/2000 To 11/2018 | Facility=YKM

	Itinerant					Local			Unadjusted	YKM Adjusted (+5% ATCT Closed)
Calendar Year	Air Carrier	Air Taxi	General Aviation	Military	Total	Civil	Military	Total	Total OPSNET Operations	Total OPSNET Operations
2000	443	15,312	20,741	1,837	38,333	18,729	2,041	20,770	59,103	62,058
2001	241	13,631	19,421	1,632	34,925	18,732	911	19,643	54,568	57,296
2002	341	11,860	19,592	1,611	33,404	16,120	948	17,068	50,472	52,996
2003	51	11,541	18,772	838	31,202	15,148	583	15,731	46,933	49,280
2004	67	10,528	18,663	978	30,236	16,964	591	17,555	47,791	50,181
2005	93	10,084	18,332	1,055	29,564	19,031	1,057	20,088	49,652	52,135
2006	74	9,815	16,752	1,047	27,688	16,831	963	17,794	45,482	47,756
2007	98	10,188	13,875	695	24,856	20,079	1,213	21,292	49,790	52,280
2008	1,722	7,232	8,701	626	18,281	21,398	915	22,313	48,980	51,429
2009	2,491	5,880	17,911	1,140	27,422	19,752	1,177	20,929	48,351	50,769
2010	2,040	5,197	17,585	1,086	25,908	18,839	1,158	19,997	45,905	48,200
2011	1,839	4,201	15,927	1,144	23,111	16,420	777	17,197	40,308	42,323
2012	1,806	4,654	15,857	1,089	23,406	13,077	858	13,935	37,341	39,208
2013	1,753	2,967	15,799	1,338	21,857	13,410	716	14,126	35,983	37,782
2014	1,737	3,110	14,620	1,054	20,521	11,115	704	11,819	32,340	33,957
2015	1,836	3,306	15,516	958	21,616	14,238	915	15,153	36,769	38,607
2016	2,192	3,545	16,262	620	22,619	13,251	945	14,196	36,815	38,656
2017	1,943	4,149	15,172	835	22,099	13,393	866	14,259	36,358	38,176
2018	**1,843**	**3,740**	**16,835**	**781**	**23,199**	**12,799**	**906**	**13,705**	**36,904**	**38,749**
Total:	**22,610**	**140,940**	**316,333**	**20,364**	**500,247**	**309,326**	**18,244**	**327,570**	**839,845**	**839,845**
Average	**1,190**	**7,418**	**16,649**	**1,072**	**26,329**	**16,280**	**960**	**17,241**	**44,202**	**46,412**

Report created on Wed Jan 16 17:22:34 EST 2019
Sources: The Operations Network (OPSNET)

ATTACHMENT #3: FAA TAF FORECAST COMPARION SPREADSHEET

FAA Template for Summarizing and Documenting Airport Planning Forecasts

AIRPORT NAME: YKM

A. Forecast Levels and Growth Rates — **Average Annual Compound Growth Rates**

Specify base year: 2018

	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.	Base Yr. + 20 yrs.	Base Yr. to +1	Base Yr. to +5	Base Yr. to +10	Base Yr. to +15	Base Yr. to +20
	2018	**2020**	**2025**	**2030**	**2035**	**2040**	**2020**	**2025**	**2030**	**2035**	**2040**
Passenger Enplanements											
Air Carrier	73,342	74,816	81,550	87,182	91,798	92,627	2.0%	2.1%	1.7%	1.5%	1.4%
Commuter	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL ENPLANED	**73,342**	**74,816**	**81,550**	**87,182**	**91,798**	**92,627**	**2.0%**	**2.1%**	**1.7%**	**1.5%**	**1.4%**
Operations											
Itinerant	**25,282**	**26,086**	**27,513**	**28,902**	**30,364**	**31,727**	3.2%	1.7%	1.3%	1.2%	1.3%
Air carrier	2,535	2,870	3,082	3,190	3,296	3,224	13.2%	4.0%	2.3%	1.8%	0.8%
Commuter/air taxi	2,350	2,462	2,768	3,111	3,497	3,930	4.8%	3.3%	2.8%	2.7%	3.2%
Air Cargo	2,537	2,616	2,811	3,006	3,201	3,396	3.1%	2.1%	1.7%	1.6%	1.8%
Total Commercial Operatio	7,422	7,948	8,661	9,307	9,994	10,550	7.1%	3.1%	2.3%	2.0%	1.9%
General aviation	16,958	17,235	17,949	18,693	19,467	20,274	1.6%	1.1%	1.0%	0.9%	1.1%
Military	903	903	903	903	903	903	0.0%	0.0%	0.0%	0.0%	0.0%
Local	**14,162**	**14,379**	**14,937**	**15,519**	**16,124**	**16,755**	1.5%	1.1%	0.9%	0.9%	1.0%
General aviation	13,259	13,477	14,035	14,616	15,222	15,852	1.6%	1.1%	1.0%	0.9%	1.1%
Military	903	903	903	903	903	903	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL OPERATIONS	**39,440**	**40,470**	**42,450**	**44,420**	**46,490**	**48,570**	2.6%	1.5%	1.2%	1.1%	1.2%
Instrument Operations	10,520	10,792	11,322	11,847	12,399	12,953	2.6%	1.5%	1.2%	1.1%	1.2%
Peak Hour Operations	16	16	17	18	18	19	2.6%	1.5%	1.2%	1.1%	1.2%
Cargo/mail	N/A	N/A	N/A	N/A	N/A	N/A	--	--	--	--	--
Based Aircraft											
Single Engine (Nonjet)	107	112	123	128	133	141	4.6%	2.7%	1.8%	1.5%	1.6%
Multi Engine (Nonjet)	8	8	9	10	10	11	4.6%	2.7%	1.8%	1.5%	1.6%
Jet Engine	6	6	7	7	7	8	0.0%	3.1%	1.6%	1.0%	1.9%
Turboprop	7	8	8	8	9	9	14.3%	2.7%	1.3%	1.7%	0.8%
Helicopter	3	3	3	4	4	4	0.0%	0.0%	2.9%	1.9%	1.9%
Other	0	0	0	0	0	0	--	--	--	--	--
TOTAL BASED AIRCRAF	**131**	**137**	**150**	**157**	**163**	**173**	4.8%	2.7%	1.8%	1.5%	1.5%

B. Operational Factors

	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.	Base Yr. + 20 yrs.
	2018	**2020**	**2025**	**2030**	**2035**	**2040**
Average aircraft size (seats)						
Air carrier	130	130	135	135	135	140
Commuter	76	76	76	76	76	76
Average enplaning load factor						
Air carrier	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Commuter	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
GA operations per based airc	231	224	214	212	213	209

Total subject to rounding.

YKM ENPLANEMENT DATABASE FILE

		ENPLANED												
Year	Year	2018 MP Forecast (Scenario)	2018 MP Forecast (Baseline)	2018 MP Forecast (Mainline)	2018 MP Forecast (Charter)	2018 MP Forecast (Scenario)	2018 MP Forecast (Mainline) Rounded	2018 MP Forecast (Charter) Rounded	2018 MP Forecast (Scenario) Rounded	YKM Records	YKM Records (Mainline)	YKM Records (Charter)	FAA TAF (2018)	FAA TAF (2019)
	1994	--	--	--	--	--				--	--	--	75,063	75,063
	1995	--	--	80,717	4,301	--				--	--	--	85,018	85,018
	1996	--	--	--	--	--				--	--	--	90,738	90,738
	1997	--	--	--	--	--				--	--	--	92,409	92,409
	1998	--	--	--	--	--				--	--	--	87,272	87,272
	1999	--	--	--	--	--				--	--	--	89,157	89,157
	2000	--	--	85,266	1,104	--				--	--	--	86,370	86,370
	2001	--	--	--	--	--				--	--	--	81,882	81,882
	2002	--	--	--	--	--				--	--	--	59,463	59,463
	2003	--	--	--	--	--				55,473	--	--	57,299	57,299
	2004	--	--	--	--	--				54,123	--	--	53,155	53,155
	2005	--	--	55,756	1,567	--				57,483	--	--	57,319	57,319
	2006	--	--	--	--	--				55,506	--	--	57,120	57,120
	2007	--	--	--	--	--				70,880	--	--	66,031	66,031
	2008	--	--	--	--	--				71,162	--	--	74,712	74,712
	2009	--	--	--	--	--				61,571	--	--	58,994	58,994
	2010	--	--	54,439	1,472	--				55,911	54,439	1,472	55,009	55,009
	2011	--	--	55,356	1,943	--				57,299	55,356	1,943	55,315	55,315
	2012	--	--	55,525	1,916	--				57,441	55,525	1,916	56,419	56,419
	2013	--	--	54,355	1,207	--				55,562	54,355	1,207	55,052	55,052
	2014	--	--	57,474	1,798	--				59,272	57,474	1,798	55,853	55,853
	2015	--	--	64,107	1,807					65,914	64,107	1,807	60,114	60,114
	2016	--	--	72,293	1,085	--				73,378	72,293	1,085	70,728	70,728
	2017	--	--	72,070	1,012	--				73,082	72,070	1,012	71,679	71,900