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INTRODUCTION

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration as provided under Title 49, 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 with appropriate public laws.

Introduction

The City of Sunnyside is preparing an Airport Layout Plan (ALP) for Sunnyside Municipal Airport (1S5) in cooperation with the Washington Department of Transportation – Aviation Division (WSDOT – Aviation) and the Federal Aviation Administration (FAA).

Funding for the ALP project is being provided through an FAA Airport Improvement Program (AIP) grant (95%) with a local match (5%) provided by WSDOT - Aviation. The AIP is a dedicated fund administered by FAA with the specific purpose of maintaining and improving the nation's public use airports. The AIP is funded exclusively through fees paid by users of general aviation and commercial aviation. For this specific project, local matching funds (5% of project cost) were provided by WSDOT – Aviation, which covered the entire local financial contribution normally made by the airport sponsor. This increased level of

The purpose of the ALP project is to define the current, short-term and long-term needs of the airport through a comprehensive evaluation of conditions and Federal Aviation Administration (FAA) airport planning and design standards. The ALP will provide specific guidance in making the improvements necessary to maintain a safe and efficient airport that is economically, environmentally, and socially sustainable. The ALP Report will:

- *Provide an updated assessment of existing facilities and activity;*
- *Forecast airport activity measures (based aircraft, aircraft operations, etc.) for the current 20-year planning period.*

- *Examine previous ALP recommendations as appropriate, to meet the current and projected airport facility needs, consistent with FAA airport design standards;*
- *Determine current and future facility requirements for both demand-driven development and conformance with FAA design standards.*
- *Update/prepare the airport layout plan, airspace plan, and land-use plan for the airport to reflect updated planning; and*
- *Develop an Airport Capital Improvement Program (ACIP) that prioritizes improvements and estimates project development costs and funding eligibility for the 20-year planning period.*

The most recent FAA-approved ALP for Sunnyside Municipal Airport was completed in 1992.[1] The 1992 ALP and associated drawings, and a new aerial photography flown specifically for this project will be used as primary information sources in preparing the updated ALP.

National Airport System

Sunnyside Municipal Airport is included in the National Plan of Integrated Airport Systems (NPIAS). Participation in the NPIAS is limited to public use airports that meet specific FAA activity criteria. NPIAS airports are eligible for federal funding of improvements through FAA programs such as the current Airport Improvement Program (AIP). Currently, there are more than 3,300 NPIAS airports, of which more than 75 percent are general aviation airports similar to Sunnyside. In addition to Sunnyside Municipal Airport, only one other NPIAS airport is located in Yakima County (Yakima Air Terminal). There is also one Non-NPIAS public use airport located in Yakima County that is owned and operated by the WSDOT - Aviation Division (Tieton State). Several NPIAS airports located in neighboring Benton and Franklin Counties are in relatively close proximity to Sunnyside, including Prosser, Vista Field, Richland, and Tri Cities.

The FAA has recognized NPIAS airports as being vital to serving the public needs of air transportation. In doing so, the FAA recognizes that access to the nation's air transportation system is not limited to commercial air service. The FAA requires that all NPIAS airports periodically update their airport plans to maintain effective long-term planning. This project will enable the City to meet the FAA's requirement to maintain an up-to-date plan.

State Airport System

Sunnyside Municipal Airport is identified as a public-use "General Aviation" airport in the Washington Aviation System Plan.

[1] Airport Layout Plan, Airspace Plan, Part 77 Plan, and Exhibit "A" Property Plan drawings (dated April, 1991; Approved by FAA August 1992), TRA Airport Consulting and W&H Pacific.

Public Involvement

The public involvement element of the planning process provided opportunities for all interested individuals, organizations, or groups to participate in the project. A planning advisory committee (PAC) was formed for the project, which performed a local review function and provided input into the planning process. The PAC reviewed and commented on draft work products and provided local knowledge and expertise to the planning process. Several project meetings were held to provide information to interested citizens and allow the PAC, the Consultant, the FAA and WSDOT to meet and discuss key project issues.

Summary of Existing Conditions

1. Sunnyside Municipal Airport is owned and operated by City of Sunnyside, Washington.

2. The Airport is located approximately 2 miles east of Sunnyside, immediately east of State Highway 241. Surface access to the airport is provided by connections to Edison County Road.

3. The Airport consists of approximately 80.9 acres, as noted on the 1992 Exhibit "A" property plan.

4. The Airport is included in the National Plan of Integrated Airport System (NPIAS), making it eligible for federal funding through the Federal Aviation Administration (FAA).

5. The Airport has a "General Aviation" service level designation in the Washington State Aviation System Plan.

6. The Airport has one runway that is oriented in an east-west direction. The runway (07/25) is paved and lighted (3,422 feet by 60 feet). The threshold for Runway 07 is relocated approximately 140 feet from the end of pavement to improve obstruction clearance over vehicles traveling on State Highway 241, which is located approximately 210 feet from the end of pavement. The runway is served by a parallel taxiway on its south side that extends from the main aircraft apron, to each end of the runway. The east section of parallel taxiway connects to the runway approximately 180 feet west of the Runway 25 threshold, rather at the actual end of the runway.

7. The airfield facilities are capable of accommodating small single-engine or light twin-engine weighing less than 12,500 pounds, generally consistent with aircraft included FAA Airport Design Group I (ADG-I). ADG I aircraft have wingspans less than 49 feet.

8. The pavement strength for Runway 07/25 is 12,500 pounds for aircraft with single wheel landing gear, as indicated on the 1992 ALP and the current FAA Airport/Facility Directory (A/FD).

9. Airfield lighting currently includes low-intensity runway edge lighting (LIRL), threshold lights, 2-light precision approach path indicators (PAPI) on both runway ends, and a rotating beacon. The airfield lighting is operated on an automatic dusk-dawn photocell switch.

10. All landside facilities (aircraft parking, hangars, etc.) at the airport are located on the south side of Runway 07/25. The Airport has two paved aircraft apron sections located near the middle of runway, with direct connections to the east and west sections of parallel taxiway. An aerial applicator operations area and an aircraft hangar are located west of the main apron with taxiway connections to the west parallel taxiway.

11. The Airport operates under day and night visual flight rules (VFR) and does not currently have instrument approach capabilities.

12. Aviation fuel (100LL AVGAS) is available at the Airport.

13. The most recent air traffic data listed in the WSDOT database is for 2002: 24,000 operations and 12 based aircraft (all single engine aircraft). The current FAA Airport Record Form (5010-1) lists the same activity data. The FAA Terminal Area Forecast (TAF) listed 20 based aircraft and 24,000 annual operations for 2005.

14. An aerial photograph flown in September 2005 identifies eight (8) buildings located on the airport, all on the south side of the runway. These include four hangars and one house located near the main apron; a hangar and another building located west of the apron, and the City's water well system pumping facility.

Summary of Conclusions & Recommendations

1. All federally-funded projects are subject to the environmental regulations contained in the National Environmental Policy Act (NEPA), including property acquisition, major facilities rehabilitation, and new construction.

2. A regular schedule of pavement maintenance (vegetation control, crack filling, fog seals, slurry seals, patching, etc.) should be conducted on airfield pavements to maximize the useful life and optimize life cycle maintenance expenditures. Runway and taxiway markings should be periodically repainted to maintain good visibility.

3. Current and future design standards for Runway 7/25 are based on FAA airport reference code (ARC) B-I (small) for "utility" runways (per FAR Part 77). Future airspace planning for

Runway 7/25 is based on nonprecision instrument approach capabilities. All new hangar developments and aircraft parking aprons should be designed to conform to FAA taxilane/taxiway and airspace clearing standards.

4. A 578-foot extension at the east end of Runway 7/25 is recommended based on the requirements of accommodating 100 percent of the small airplane fleet. The parallel taxiway will also be extended. The runway and parallel taxiway extension projects require acquisition of approximately 16.8 acres of property owned by the Port of Sunnyside. Additional privately owned property (approximately 3.6 acres) on the east side of Ray Road is located with the future runway protection zone (RPZ) for Runway 25. This property should be acquired, if available or the City should acquire an avigation easement for any portions of the RPZ not in airport ownership. The section of overhead electrical power lines located along Ray Road east of the runway should be buried to provide an unobstructed approach to Runway 25.

5. A nonprecision instrument approach is recommended for Runway 7/25. Preliminary FAA feasibility evaluations indicate that developing an approach to both ends of the runway appears to be feasible. However, based on the close proximity of Highway 241 to the end of Runway 7, approach obstruction clearance at the Runway 25 end appears to be superior. The development of a satellite-based Wide Area Augmentation System (WAAS) approach (or other comparable platform) is recommended for Runway 7, with a circling procedure developed for Runway 25 if FAA obstruction clearance standards can be met based on the requirements of the procedure design.

6. The property acquisition required for the runway extension and a portion of the property required along the western section of the parallel taxiway are located outside the City of Sunnyside city limits and urban growth area boundaries. Modification to the City of Sunnyside Comprehensive Plan is recommended to adjust the UGA boundary, which is required for the parcels to be annexed into the City. The property to be annexed should be zoned **AP – Airport Zone**, to ensure consistency with existing airport zoning.

7. Reconstruction of the parallel taxiway for Runway 7/25 is recommended early in the twenty year planning period based on its current deteriorated condition. The lateral separation between the runway and parallel taxiway will be increased to 240 feet, which meets FAA standards for ARC B-II. This is intended to maximize the long-term investment of the taxiway and avoid potential taxiway relocation if business aircraft use of the airport increases in the future. A small area of property acquisition (approximately 1.9 acres) is recommended along the southwest frontage of the airport to accommodate an aircraft holding area on the relocated parallel taxiway at the end of Runway 7.

8. The parallel taxiway project will require reconfiguration of the existing aircraft aprons to eliminate approximately 16 aircraft tiedowns located within the parallel taxiway object free

area. The remaining small aircraft parking capacity is adequate to accommodate near-term locally-based and itinerant aircraft parking needs. Additional aircraft tiedowns will be added through apron expansion, as needed.

9. The existing aircraft fueling area should be marked to identify the required clearance for fueling aircraft and the relocated parallel taxiway.

10. Future landside facilities will be developed on the south side of the runway. The continued development of existing hangar sites will be configured to meet standard FAA taxilane clearance requirements, or modified where approved by FAA. The improvements should follow a logical sequence of development based on demand, funding availability and the ability to integrate new and existing facilities. As currently planned, the landside areas and development reserves provide capacity for aircraft parking and hangars that exceeds 20-year forecast demand. The development area includes:

    a. A new itinerant aircraft parking area is recommended beyond the west end of the main apron that will provide three drive-through parking positions for business class aircraft. The parking positions will accommodate aircraft that are not designed to use light aircraft tiedowns (multi-engine piston, single- and multi-engine turboprops, business jets, etc.) including medevac and corporate aircraft. A helicopter parking pad is also included at the west end of the apron to accommodate itinerant aircraft. Airport fencing will be extended along the airport access road with access provided via a pedestrian and automated vehicle gate located adjacent to the apron. Additional vehicle parking will be provided adjacent to the itinerant parking area.

    b. Future development of aircraft hangar and parking apron development is recommended for the southeast section of the airport. The landside development area is located entirely within airport property and will accommodate small/medium conventional hangars or executive hangars, additional aircraft tiedown apron, and T-hangars. Additional vehicle access to the development area will be extended from the existing airport access road. The development is designed to be constructed in phases, based on facility demand:

        i. Phase 1 development is anticipated to include a taxilane that will provide access to 4 to 5 conventional/executive hangar sites located south of the east end of the tiedown apron and east of the City water facility. This phase may also include a single row of west-facing light aircraft tiedowns if additional tiedown capacity is needed. A vehicle access road will be extended east from the airport access road along the fenced perimeter of the City water facility. An automated vehicle gate will be located at entrance to the new access road.

The new roadway will also provide access to the east end of the existing apron.

ii. The second phase of hangar development includes extending the Phase 1 access taxiway to serve several additional hangar sites and may also include the new aircraft tiedowns noted above, if required.

iii. Future T-hangar development is located near the east end of the area and will require separate vehicle access along the southeast airport boundary. A single taxiway connection to the parallel taxiway will provide aircraft access to the hangars. The physical limits of the site will accommodate one 12-unit and one 8-unit T-hangar (or multiple smaller T-hangars) with access taxilanes. Vehicle access to the area will be extended along the southeast airport boundary, on the north side of the irrigation canal. The physical separation of the T-hangar area from existing or new facilities was needed to accommodate the space requirements of the long term aviation development reserve.

iv. A long term development reserve is identified in the east landside area to preserve the airport's ability to accommodate potential facility needs associated with increased aircraft activity, beyond currently-projected levels. The aviation use reserve includes parking for business class aircraft, expanded light aircraft tiedowns, a development site for a fixed base operator (FBO), commercial hangar sites, a fuel storage and dispensing area, and vehicle parking.

11. The addition of airport security fencing on the airport perimeter and installation of electronic keypad or combination lock gates at primary access points is recommended to limit public access to the airfield, apron and hangar areas.
12. Yakima County should revise its existing airport overlay zone (Chapter 15.55 – Airport Safety Overlay (ASO) District) to reflect planned changes in runway configuration. The dimensions and geometry for the various overlay zones should be reviewed, and revised as necessary, to ensure consistency with a planned runway length of 4,000 feet.
13. The City of Sunnyside and Yakima County should jointly develop and adopt airport overlay zoning to protect the airport from incompatible land uses based on WSDOT Aviation Division airport land use compatibility guidelines. The City of Sunnyside should also adopt overlay zoning based on the FAR Part 77 airspace surfaces (height and hazard) depicted in the updated Airport Layout Plan.
14. The City of Sunnyside and Yakima County should ensure through their comprehensive planning/zoning that development of rural lands in the vicinity of the airport is compatible

with airport activities. Maintaining low density land uses and zoning within areas under the airport traffic pattern provides effective land use compatibility with airport operations. Development of new residential areas, or increasing the densities of existing residential areas within the boundaries of the traffic pattern should be discouraged to ensure the long-term viability of the airport.

15. It is recommended that any proposed changes in land use or zoning in the vicinity of the airport (within the boundaries of the FAR Part 77 airspace surfaces) be coordinated with WSDOT Aviation Division to ensure consistency with Washington airport land use guidelines.

16. The City of Sunnyside should require all development proposals involving construction of structures on the airport to demonstrate compatibility with the airport's protected airspace surfaces, prior to lease approval. The applicant should be required to provide all documentation necessary for the sponsor to obtain "no objection" finding by FAA resulting from the review of FAA Form 7460-1 – Notice of Proposed Construction or Alteration, prior to approval of ground leases. Any proposal that receives an objection by FAA should not be approved without first addressing FAA concerns.

17. City of Sunnyside and/or Yakima County planning and building officials should require that applicants for all proposed development within the boundaries of the airport's FAR Part 77 imaginary surfaces (as defined by the Airport Airspace Plan) demonstrate a finding of "no objection" by FAA resulting from review of proposed development (FAA Form 7460-1) prior to approval/issuance of building permits, approval of plats, binding site plans, etc.

18. The City of Sunnyside and FAA should approve/adopt the Airport Layout Plan Report and drawings in a timely manner to guide future airport development.

19. The City of Sunnyside should initiate the recommended improvements and major maintenance items in a timely manner, requesting funding assistance under FAA and other federal or state funding programs for all eligible capital improvements.

CHAPTER TWO
INVENTORY OF EXISTING CONDITIONS AND FORECASTS OF AVIATION ACTIVITY

Introduction

This chapter documents existing conditions at the airport and provides updated forecasts of aviation activity to support the development of the Airport Layout Plan Report. The forecasts of aviation activity examine based aircraft, aircraft operations (takeoffs and landings), fleet mix, and activity peaks. Based on current and forecast activity, an existing and future design aircraft is selected to represent the most demanding aircraft operating at the airport on a regular basis.

Existing airfield facilities were examined during on-site inspections to update facility inventory data collected in prior planning efforts. Updated aerial photography was flown as part of this project, which was used to verify the current configuration of airport facilities. Data from a variety of sources are used in this evaluation:

- **Washington State Aviation System Plan (WSASP) Database**
- **Sunnyside Municipal Airport 2005 Pavement Management Report** (Applied Pavement Technology, Inc., 2005)
- **1991Airport Layout Plan Set** (TRA Airport Consulting/W&H Pacific, approved 8/19/92 by FAA)
- **Sunnyside Municipal Airport Development Plan** (Airside, 1996)
- **Washington Long Term Air Transportation System (LATS) – Phase I Report &Phase II Forecasts** (September 2006, July 2007)
- **Washington State Aviation System Plan – Forecast and Economic Significance Study** (2000 Bucher Willis Ratliff)
- **FAA Terminal Area Forecasts (TAF)**
- **FAA Airport Master Record Form (5010-1)**
- **Seattle Sectional Aeronautical Chart; IFR Enroute Low Altitude (L-1) Chart; Airport/Facility Directory** (U.S. DOT FAA, National Aeronautical Charting Office)
- **Yakima County Profile** (Washington State Employment Security, 2002)
- **City of Sunnyside Comprehensive Land Use Plan and Zoning Ordinance** (2007)
- **Yakima County Comprehensive Plan and Zoning Ordinance**
- **Washington State Almanac** (19th Ed. , Fox)
- **Soils Survey of Yakima County Area, Washington (**NRCS, 1985)

AIRPORT LOCALE

Sunnyside is located in eastern Yakima County in south-central Washington. Sunnyside is approximately 36 miles southeast of Yakima and 45 miles west of the Tri-Cities on U.S. Interstate 82 (I-82). I-82 is a major north-south travel route that extends from Ellensburg, south through central Washington into Oregon, where it connects to U.S. Interstate 84, a major east-west interstate highway.

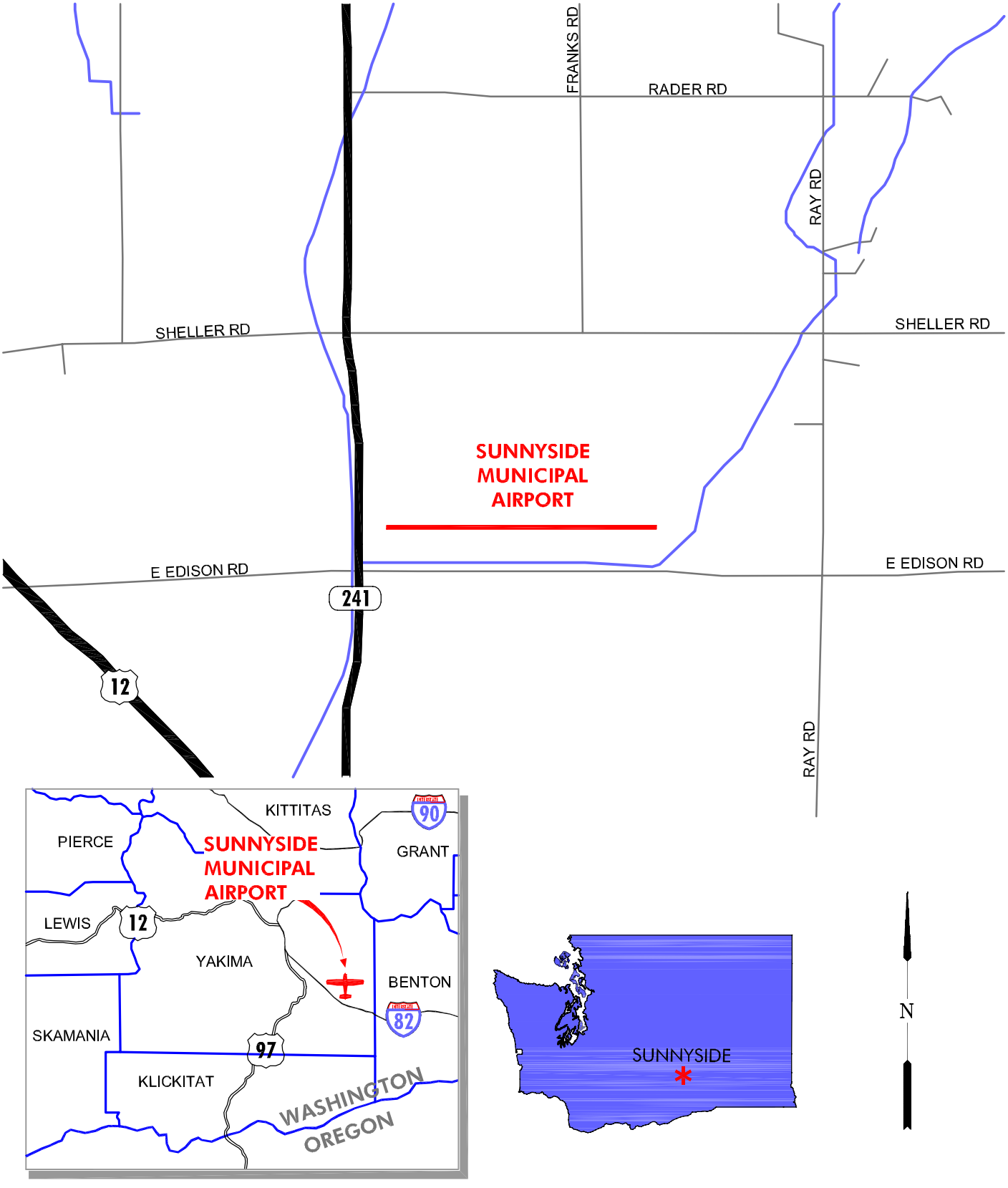
Sunnyside Municipal Airport consists of approximately 80.9 acres that is located at the northeast end of the Sunnyside city limits and Urban Growth Area (UGA) boundary, approximately 2 miles east of the city center and 1 mile north of I-82. The airport is immediately east of State Highway 241 with surface access provided by East Edison Road. Highway 241 connects Mabton and Sunnyside, and extends north to Highway 24, which connects Moxie and Richland.

The airport is surrounded by predominantly agricultural and industrial land uses, including large areas to the north and south that area located outside the city limits, but within the UGA. The Port of Sunnyside owns large tracts of land in the vicinity of the airport, including the majority of the Runway Protection Zones (RPZ) for both runway ends. A location map is provided in **Figure 2-1**.

Climate

Detailed climatic data for Sunnyside (Station: 458207) is available for a 57-year period between 1948 and 2005.[2] The data indicate that July and August are typically the warmest months; December and January are the coldest. On a monthly basis, the average maximum temperature is 89.7 degrees Fahrenheit (July) and the average minimum temperature is 24.0 degrees (January). The highest and lowest recorded temperatures in Sunnyside are 110 degrees F (July 28, 1998) and -20 degrees F (January 26, 1957). Sunnyside averages 6.93 inches of precipitation and 9.9 inches of snowfall annually. Historically, about 40 percent of Sunnyside's annual precipitation occurs in the three months from November through January.

[2] Western Regional Climate Center.



CENTURY WEST
ENGINEERING CORPORATION

LOCATION MAP

SUNNYSIDE MUNICIPAL AIRPORT
AIRPORT LAYOUT PLAN

FIGURE

2-1

The 1991 Airport Layout Plan[3] estimates crosswind coverage for Runway 7/25 at 96.9 percent based on a 12 mile per hour crosswind component (wind data from Yakima Airport 1949-1958). It is noted that Yakima's main runway (5/23) is aligned within approximately 20 degrees of Runway 7/25, which suggests that the prevailing wind direction and crosswind coverage for the two runways are similar. Based on this evaluation, it appears that Runway 7/25 meets the FAA-defined crosswind coverage standard of at least 95 percent for runways used by small airplanes (10.5 knots/12 miles per hour). Wind data is not regularly collected at Sunnyside Municipal Airport; collection of site specific wind data is recommended prior to any major runway expansion or reconfiguration projects to verify runway crosswind coverage.

GEOGRAPHY/GEOLOGY

Sunnyside Municipal Airport has a surveyed elevation of 767 feet above mean sea level (MSL).[4] Sunnyside is located in the lower Yakima Valley in eastern Yakima County. The Yakima River is the dominating natural physical feature within the valley, entering the lower valley near Union Gap and traveling south and eastward before connecting with the Columbia River near Richland. The lower Yakima Valley is bordered by moderately mountainous terrain to the north and south. Irrigated farm land comprises the majority of the land surrounding Sunnyside, although non-irrigated farm land is located on the valley foothills. Terrain in the vicinity of Sunnyside is characterized by level to gently sloping irrigated farmland located within the basin valley.

Maximum elevation figures (MEF) depicted on the Seattle Sectional Aeronautical Chart provides pilots with information on the highest known terrain elevation (above mean sea level - MSL) within defined areas. The MEFs immediately surrounding Sunnyside Municipal Airport are 3,800 feet to 4,600 feet MSL. The Rattlesnake Hills, located five to eight miles north and northeast of the airport, have elevations rising above 3,000 feet MSL. The Horse Heaven Hills are located south of Sunnyside, rising from 1,000 to 2,000 feet MSL within 10 to 15 miles of the airport, with higher elevations (above 5,000 feet MSL) located 30 to 40 miles west and southwest.

The Yakima County Area Soil Survey[5] indicates that predominate soil type in the vicinity of Sunnyside Municipal Airport are silt loams including **Esquatzel silt loam, 0 to 2 percent slopes; Outlook silt loam; and Warden silt loam, 2 to 5 percent slopes.** These loams are commonly found in the low terraces and flood plains associated with the Yakima River drainage. The soils result from normal stream activity and glacial outwash. Areas at the lower end of the Yakima Valley are mantled by loess underlain by lake sediment, deposited during glacial flooding in the late Pleistocene period.

[3] TRA Airport Consulting/W&H Pacific (Approved by City and FAA in late 1992)
[4] Runway survey contained in WSDOT Aviation System database (6/02)
[5] Yakima County Soil Survey – U.S. Natural Resources Conservation Service (NCRS), 1981.

Native vegetation consists of grasses, forbs, and shrubs; the hills and ridges rising above the valley are generally non-forested. These soils have moderate permeability.

Esquatzel soils account for the majority of the airport site; a large area of Outlook soils is located near the west end of the runway and extends beyond the airport; a large area of Warden soils is located just beyond the east end of the runway and extends to the east. The soil survey states:

Esquatzel silt loam, 0 to 2 percent slopes: "This very deep, well drained soil is on flood plains dissected by intermittent and perennial streams. It formed in silty alluvium. The native vegetation is grasses, forbs, and shrubs. Elevation is from 650 to 1,500 feet. The average annual precipitation is 6 to 10 inches. Permeability is moderate. This unit is used for irrigated field and orchard crops. Grasses and legumes are grown for hay, pasture and seed. The main irrigated crops are asparagus, corn, grain, grapes, hops, mint, peas, and tree fruit. Typically, the surface layer is brown silt loam about 17 inches thick. The underlying material to a depth of 60 inches is pale brown silt loam. In some areas the surface layer is a fine sandy loam, in some areas the soil is stratified with thin lenses of sandy loam, and in some areas very gravelly loamy sand is at a depth of 36 inches or more."

Outlook silt loam: "This very deep, artificially drained soil is on flood plains. It formed in silty alluvium. Slope is 0 to 3 percent. The native vegetation are alkali-tolerant grasses and shrubs. Elevation is from 650 to 2,000 feet. The average annual precipitation is 6 to 12 inches. Permeability is moderate. This unit is used for irrigated crops. Where the soil unit is drained, leached, and irrigated the main irrigated crops are asparagus, corn, grain, hops, and mint. Grasses and legumes are grown for hay, pasture and seed. Typically, the surface layer is very dark brown, very dark grayish brown and dark grayish brown silt loam about 8 inches thick and has yellowish brown or dark brown mottles. It is strongly alkali. The subsoil is grayish brown, mottled silt loam about 10 inches thick. The substratum to a depth of 60 inches or more is dark brown silt loam. The subsoil and substratum are moderately alkaline."

Warden silt loam, 0 to 2 percent slopes: "This very deep, well drained soil is on terraces. It formed in lacustrine sediment and has a mantle of loess. The native vegetation is mainly grasses, forbs, and shrubs. Elevation is from 600 to 1,000 feet. The average annual precipitation is 6 to 9 inches. Permeability is moderate. This unit is used for irrigated field crops and orchard crops. The main irrigated crops are corn, grain, grapes, hops, mint, peas and tree fruit. Grasses and legumes are grown for hay, pasture and seed. Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil is pale brown silt loam about 14 inches thick. The substratum to a depth of 60 inches or more is light gray and pale brown, stratified silt loam, loam, and very fine sandy loam. In some areas the surface layer fine sandy loam."

AIRFIELD FACILITIES

Sunnyside Municipal Airport has historically served predominantly small single-engine and twin-engine aircraft associated with business or personal travel, agricultural aviation and medical evacuation (Medevac). The airport is owned and operated by the City of Sunnyside. Records indicate that the original airfield paving was completed in 1975, although it appears that the airport operated with a gravel runway dating back to the 1950s or 1960s. **Table 2-1** summarizes airport data. **Figure 2-2** illustrates existing facilities at the airport.

TABLE 2-1:
AIRPORT DATA

Airport Name/Designation	Sunnyside Municipal Airport (1S5)
Airport Owner	City of Sunnyside, Washington
Date Established	--
Airport Category	National Plan of Integrated Airport Systems (NPIAS) General Aviation FAA Airport Reference Code: B-I (as noted on the 1991 ALP) Washington Aviation System Designation: General Aviation Airport
Airport Acreage	Approximately 80.9 Acres (held in fee) *Acreage as indicated on 5010 Airport Record Form*
Airport Coordinates	N 46º 19' 40" W 119º 58' 14" (Airport Reference Point)
Airport Elevation	767 feet Mean Sea Level (MSL) (surveyed 6/02)
Airport Traffic Pattern Configuration/Altitude	Left Traffic (Rwy 07 & 25) Approximately 1,600 to 1,800 feet MSL

LEGEND

	EXISTING	FUTURE
FACILITIES		
BUILDINGS		
RUNWAY		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
TAXIWAY OBJECT FREE AREA (TOFA)		
OBSTACLE FREE ZONE (OFZ)		
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS		SAME
AIRPORT REFERENCE POINT (ARP)		
PROPOSED AIRFIELD PAVEMENT	N/A	
WIND INDICATOR		
AVIGATION EASEMENT		SAME
FENCE		
PROPOSED ACCESS ROAD	NONE	
BEACON		SAME
THRESHOLD LIGHTS		
SEGMENTED CIRCLE WIND INDICATOR		
PAPI		

AIRPORT DATA

	EXISTING	FUTURE
AIRPORT ELEVATION (MSL)	767'	SAME
DATUM FOR ALL ITEMS	NAD 83/NAVD 88	SAME
AIRPORT REFERENCE POINT COORDINATES (ARP)	LAT. N 46° 19' 39.47" LONG. W 119° 58' 14.14"	SAME
AIRPORT MAGNETIC VARIATION	16° 43' E (2006)	SAME
MEAN MAXIMUM TEMPERATURE	90.2° F	SAME
NPIAS ROLE	GA	-
AIRPORT REFERENCE CODE (ARC)	B-I (SMALL)	SAME
AIRPORT CODE	1S5	SAME
LAND OWNED IN FEE (ACRES)	80.9	-

DECLARED DISTANCES

	RUNWAY 07		RUNWAY 25	
	EXISTING	FUTURE	EXISTING	FUTURE
TAKEOFF RUN AVAILABLE (TORA)	-	-	-	-
TAKEOFF DISTANCE AVAILABLE (TODA)	-	-	-	-
ACCELERATE-STOP DISTANCE (ASDA)	-	-	-	-
LANDING DISTANCE AVAILABLE (LDA)	-	-	-	-

RUNWAY DATA 7/25

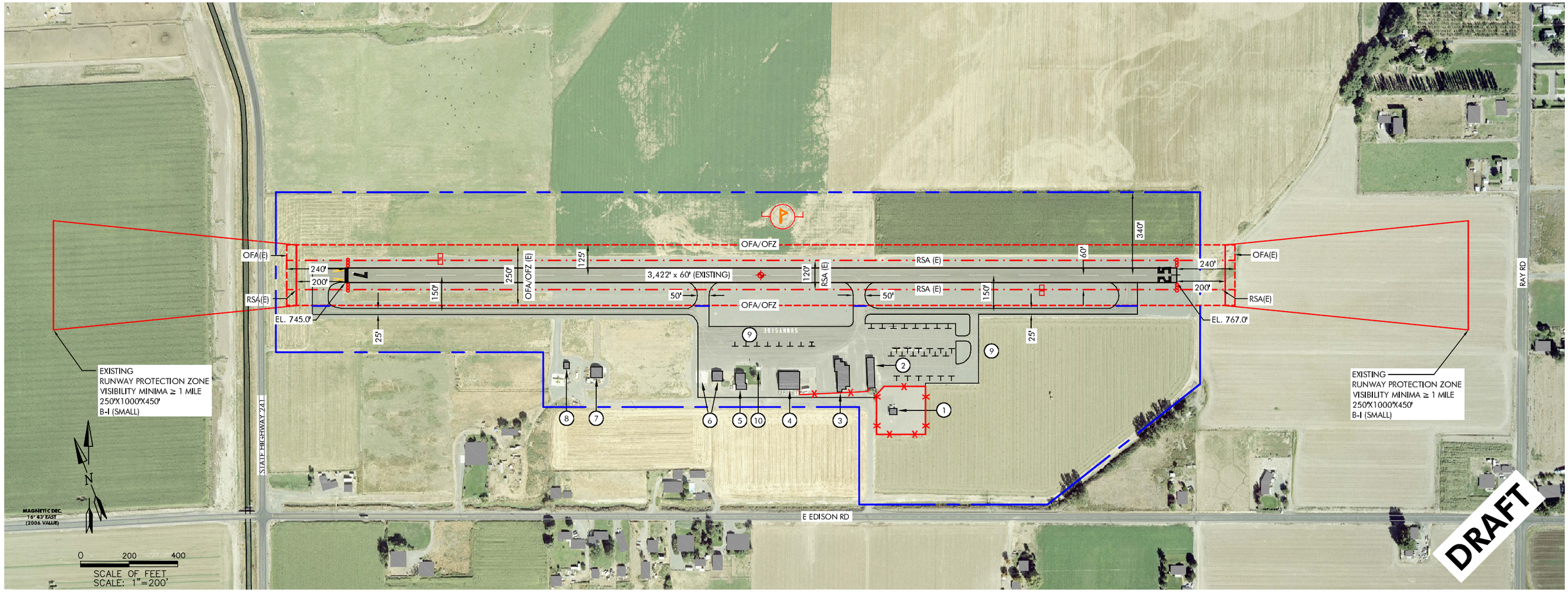
		EXISTING	FUTURE
LENGTH AND WIDTH		3422' X 60'	-
PERCENT EFFECTIVE GRADIENT		0.6%	-
PERCENT WIND COVERAGE (12 MPH)		96.9%	-
PAVEMENT TYPE		ASPHALT CONCRETE	-
PAVEMENT STRENGTH		12,500# SW	-
APPROACH SLOPE/TYPE		20:1/VISUAL	-
RUNWAY LIGHTING		LIRL	-
RUNWAY MARKING		BASIC	-
RUNWAY SAFETY AREA		-	-
OBJECT FREE AREA		-	-
OBSTACLE FREE ZONE		-	-
CRITICAL AIRCRAFT		-	-
NAVIGATIONAL AIDS		NONE	-
APPROACH AND LANDING AIDS	07	PAPI	-
	25	PAPI	-
RUNWAY END COORDINATES (SEE NOTE 8)	07	LAT.N 46° 19' 37.55" LONG.W 119° 58' 37.68"	-
	25	LAT.N 46° 19' 37.37" LONG.W 119° 57' 48.93"	-
TAXIWAY LIGHTING		REFLECTORS	-

FACILITY KEY

1. CITY WATER FACILITY
2. T-HANGAR
3. T-HANGAR
4. CONVENTIONAL HANGAR
5. HOUSE
6. CONVENTIONAL HANGAR
7. QUONSET HANGAR
8. AG OPERATIONS BLDG. & PAD
9. AIRCRAFT APRON
10. AIRCRAFT FUEL

NOTES:

1.



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MANAGER, SEATTLE ADO

CITY OF SUNNYSIDE APPROVAL

APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING CORPORATION
6650 S.W. Redwood Lane, Suite 300
Portland, Oregon 97224
503-419-2130 phone ♦ 503-639-2710 fax
www.centurywest.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS	SLK	AS SHOWN

DATE: FEBRUARY 2008

PROJECT NO: 4140200401

SUNNYSIDE MUNICIPAL AIRPORT-

AIRPORT LAYOUT PLAN (EXISTING CONDITIONS)

DRAWING NO. .

SHEET NO. .

Runways & Taxiways

Sunnyside Municipal Airport has one runway designed to accommodate small aircraft. The runway is oriented in an east-west alignment (070-250 degrees magnetic) with all existing landside development (hangars, aircraft parking, etc.) located on its south side. Runway 07/25 has a south parallel taxiway that extends nearly the full-length of the runway; the taxiway ends approximately 165 feet from the east end of the runway. **Table 2-2** summarizes existing runway and taxiway facilities.

The areas adjacent to the runway, parallel taxiway and aircraft aprons have a prepared gravel surface that is very smooth and well maintained. It appears that great care was taken in grading to achieve the surface consistency. The surface layer is very thin and when disturbed, reveals the underlying soils that were very soft during a wet season site visit.

Runway

Runway 07/25 is paved and lighted with a published length of 3,422 feet and width of 60 feet. The runway has basic (visual) markings, runway edge lighting, threshold lighting and visual guidance indicators (VGI) at both ends. The runway has an effective gradient of approximately 0.643 percent, with the high point (surveyed 767 feet MSL) located at the east end of the runway. The runway markings (runway numbers, threshold demarcation bar (Rwy 07), centerline stripe, and taxiway lead-in stripes) are in very good to excellent condition (freshly painted when the runway was resurfaced in 2003).

The threshold for Runway 07 is relocated approximately 135 feet (east) to improve obstruction clearance over vehicles traveling on Highway 241. Highway 241 is located approximately 200 feet from the west end of pavement, elevated approximately 2 feet above than the runway end. The western 135 feet of runway pavement has been converted to taxiway and is marked with yellow taxiway centerline striping and two yellow arrowheads pointing to a white runway threshold bar.

The most recent approved Airport Layout Plan (ALP), prepared in 1991, depicts a 156-foot relocated threshold at the Runway 25 end lists the existing runway length at 3,365 feet. The 1996 Sunnyside Airport Development Plan[6] does not contain an ALP drawing, although the report indicated that Runway 25 had a relocated threshold (unspecified length) with white chevrons located beyond the threshold. The plan recommended repainting the chevrons yellow. The report also noted that a drainage ditch located beyond the end of Runway 25 prompted the threshold relocation in order to address nonstandard runway safety area conditions. Filling the ditch and piping the drainage was recommended in the plan. It appears that this work was done in conjunction with, or just prior to the

[6] Sunnyside Airport Development Plan (Airside, April, 1996)

most recent runway resurfacing project in 2003. Historical pavement data described later in this chapter, indicates the eastern 265 feet of the runway pavement was constructed in 1999, which is not consistent with the information contained in earlier planning documents. However, a survey conducted in 2002 by WSDOT determined the runway length to be 3,455 feet; recent onsite inspections and review of aerial photography confirm that Runway 25 does not currently have a relocated threshold.

Runway 07/25 has an asphalt surface that is in very good to excellent condition; the runway was rated "excellent" in the most recent WSDOT pavement inspections conducted in 2005. The runway pavement is designed to accommodated small aircraft weighing 12,500 pounds or less with single wheel landing gear configurations.

Taxiways

Runway 07/25 has a south side parallel taxiway that extends outward from the ends of the main aircraft parking apron to each runway end. The east section of parallel taxiway (approximately 1,100 feet long) ends approximately 165 feet west of the Runway 25 threshold. The west section of parallel taxiway is approximately 1,600 feet long and extends fully to the end of Runway 07. The west section of parallel taxiway is 25 feet wide; the east section of parallel taxiway is 30 feet wide. Both sections of parallel taxiway are located 150 feet from the runway centerline. There are four (4) connecting taxiways between the parallel taxiway and runway (one at each runway end and one at the connections to the main apron). The connecting taxiways vary in width from 50 to 60 feet.

The taxiway markings (centerline stripes, arrow heads (Rwy 07 end) and aircraft hold lines) are in good or fair condition; the markings located on the section of taxiway adjacent to the Runway 07 threshold are in excellent condition. All taxiway connections to the runway have aircraft hold line markings 125 feet from runway centerline.

As noted in the pavement condition section of this chapter, some sections of the parallel taxiway and apron taxilanes have severe transverse and longitudinal cracking. Although the asphalt surface is fairly good, the width and depth of the cracks will require significant repair or reconstruction in order to correct the problem. Due to the severity of the crackling, it appears that simple rehabilitation such as asphalt overlay will not be effective.

TABLE 2-2: RUNWAY & TAXIWAY DATA

Runway 07/25	
Dimensions	3,422 x 60 feet; Rwy 07 Relocated Threshold: 135'
Effective Gradient	0.643%
Surface/Condition	Asphalt. Pavement Condition: rated "excellent" in 2005 inspection; minor cracking observed in 2007
Weight Bearing Capacity	12,500 pounds (single wheel landing gear)
Marking	Basic (Visual) all white paint: runway end numbers, centerline stripe; threshold bars; yellow taxiway/relocated threshold markings (Runway 07 end).
Lighting	Low Intensity Runway Edge Lighting (LIRL) 2 Light PAPI (Rwy 07 & 25)
Signage	Taxiway/Runway Hold Signs at taxiway connections to runway; Distance Remaining Signs [2] [1] located on north side of runway; pilot advisory signs.
Wind Coverage	96.9% (as indicated on 1991 ALP, based on Yakima wind data)
Taxiways	
South Parallel Taxiway *(west section)*	Approximately 1,600 x 25 feet (asphalt surface). Runway-Parallel Taxiway Centerline Separation: 150 feet. Yellow centerline stripe and aircraft hold lines (at two runway connections) 125 feet from runway centerline; Edge Reflectors Pavement Condition: Rated "good" in 2005 inspection; severe cracking observed in 2008
South Parallel Taxiway *(east section)*	Approximately 1,100 x 30 feet (asphalt surface). Runway-Parallel Taxiway Centerline Separation: 150 feet. Yellow centerline stripe and aircraft hold lines (at two runway connections) 125 feet from runway centerline; Edge Reflectors Pavement Condition: Rated "good" in 2005 inspection; moderate cracking observed in 2008
Midfield Exit Taxiways (2)	Approximately 180 x 50 feet (asphalt surface) Yellow centerline stripe and aircraft hold lines (at runway connections) 125 feet from runway centerline; Edge Reflectors Pavement Condition: Rated "very good" in 2005 inspection; minor cracking observed in 2008
Agricultural Area Taxiway	Approximately 250 x 25 feet (asphalt surface). Taxiway connects to west section of parallel taxiway; no aircraft hold lines visible; pavement not rated in 2005 WSDOT PCI report.
Apron Taxilanes	Taxilanes located adjacent to aircraft tiedowns and hangars. Widths vary (typical: 20 feet)

Aircraft Apron

Sunnyside Municipal Airport has two public use aircraft aprons, both located on the south side of Runway 07/25. These aprons accommodate aircraft ground operations, aircraft parking, hangar access and fueling. The airport also has a concrete apron used by a local aerial applicator, located west of the main aprons. The AG operations area is physically separated from the main aprons with its own taxiway connection to the parallel taxiway. **Table 2-3** summarizes existing aircraft apron facilities.

The main aircraft apron is located near the middle of Runway 07/25 with connections to the runway and parallel taxiway at its east and west ends. Two 90-degree exit taxiways extend from the runway to the northwest and northeast corners of the apron and the connections to the parallel taxiway. The apron is configured with dual parallel taxilanes located on either side of a single row of 9 south-facing aircraft tiedowns. The taxilane located nearest the runway is approximately 235 feet from runway centerline. The apron taxilanes are connected to the parallel taxiway sections and the two runway exit taxiways at each end of the apron. Hangars, aircraft fueling and a caretaker residence are located along the back of the rectangular apron. The airport name "SUNNYSIDE" is painted (white) on the outer edge of the apron (letters facing north).

A second tiedown apron abuts the main apron on its east side and is connected to the section of the parallel taxiway. The tiedown apron is configured with three rows of parking and two taxilanes that parallel the runway and parallel taxiway. The southern row has 6 north-facing tiedown positions that face toward the southern interior taxilane; the center row is double-sided with 12 tiedowns facing north and south toward the adjacent taxilanes; the north row has 8 south-facing tiedowns adjacent to the northern interior taxilane. The east tiedown apron has a total of 26 tiedowns.

According to available pavement information, the main apron is 695 feet by 182 feet; the east tiedown apron is 375 by 240 feet. The two aprons have a combined capacity of 35 light aircraft parking tiedowns. Two smaller sections of apron are identified adjacent to a hangar located between the main apron and east tiedown apron. The aircraft fueling area is located adjacent to the residence located adjacent to the main apron. The agricultural apron was not included in the WSDOT pavement evaluation study, although it appears to be approximately 50 feet by 50 feet and constructed of concrete (Portland Cement Concrete). A paved taxiway (approximately 250 feet by 20 feet) extends from the agricultural apron to the parallel taxiway, connecting approximately 600 feet west of the main apron.

TABLE 2-3:
AIRCRAFT APRON DATA

Main Apron	Approximately 695 x 182‘ (14,050 square yards) Surface: Asphalt Pavement Condition: Rated “excellent” in 2005 inspection; minor to moderate cracking observed in 2007 9 Aircraft Tiedowns; Aircraft Fueling; Aircraft Parking; Hangar Access
Tiedown Apron (east)	Approximately 375 x 240‘ (10,000 square yards) Surface: Asphalt Pavement Condition: Rated “good” in 2005 inspection; minor to severe cracking observed in 2007 26 Aircraft Tiedowns; Aircraft Parking; Hangar Access
Ag Apron	Approximately 50 x 50’ (280 square yards) Surface: Portland Cement Concrete AG Aircraft Loading Pavement Condition: Not rated in 2005 inspection (unknown)

Airfield Pavement Condition

As part of the Washington State Aviation System Plan, the WSDOT - Aviation Division manages a program of pavement evaluation and maintenance for Washington’s general aviation airports. This evaluation provides standardized pavement condition index (PCI) ratings, pavement features and current conditions. Through the use of MicroPAVER computer software, current pavement condition ratings are entered into the system with the specifics of each pavement section. The program is able to predict future pavement condition based on a rate of deterioration if no action is taken. The plan also identifies the recommended measures needed to extend the useful life of the airfield pavement sections.

Table 2-4 summarizes airfield pavement conditions for Sunnyside Municipal Airport based on the most recent (May 3, 2005) specialized inspections.[7] The area-weighted rating of all pavements at Sunnyside Municipal Airport was 84 (very good) on a pavement condition index (PCI) scale of 0 (failed) to 100 (excellent). The ratings of specific sections ranged from 62 to 100. The 2005 inspection branch report indicated that Sunnyside Municipal Airport had about 534,446 square feet (SF) of airfield pavement, which equals approximately 12.3 acres of surface area.

[7] Applied Pavement Technology (2005).

TABLE 2-4: SUMMARY OF AIRFIELD PAVEMENT CONDITION (2005 PCI DATA)

Pavement	Section Design/Age	PCI Rating[1]	Condition
Runway 07/25	5" Asphalt (AC) Surface (2003); 3" AC Surface (1975); 6" aggregate base (1975) ; eastern 265 feet constructed in 1999 (2" AC; 6" aggregate base over "select fill")	94/97/98 100	Excellent Excellent
West Section Parallel Taxiway	2" Asphalt (AC) Surface (1975); 10" aggregate base (1975)	62	Good
West Parallel Taxiway Runway Connector	3" Asphalt (AC) Surface (1975); 6" aggregate base (1975)	89	Excellent
East Section Parallel Taxiway	2" Asphalt (AC) Surface (1985); 10" aggregate base (1985)	69	Good
East Parallel Taxiway Runway Connector	3" Asphalt (AC) Surface (1975); 6" aggregate base (1975)	82	Very Good
Mid-Runway Exit Taxiways (2)	2" Asphalt (AC) Surface (1998); Single BST (1985); Triple BST (1975); 8" aggregate base (1975)	80/79	Very Good
Main Apron	Single BST (1998); Single BST (1986); Triple BST (1975); 8" aggregate base (1975)	86	Excellent
Tiedown Apron	2" Asphalt (AC) Surface (1985); 10" aggregate base (1985)	66	Good
Small Apron Sections (adjacent to hangars)	West Side: 2" Asphalt (AC) Surface (1998); Triple BST (1975); 8" aggregate base (1975) East Side: 2" Asphalt (AC) Surface (1998); 10" aggregate base (1985)	92/94	Excellent

1. The Pavement Condition Index (PCI) scale ranges from 0 to 100, with seven general condition categories ranging from "failed" to "excellent."

In the 2005 inspection, the runway, parallel taxiways, aprons and main taxiways were rated "good" or better. The condition of the pavements observed during more recent site visits conducted for this project were generally consistent with the 2005 evaluations, although substantial severe cracking was observed on several pavement sections. The runway is in excellent condition, with minor cracking (1/8- to 1/4-inch wide) observed (unfilled). Pavement records indicate that the runway received a 5-inch asphalt overlay in 2003. The current surface courses for the other airfield pavements were applied between 1975 and 1998.

The west section of the parallel taxiway has moderate to severe transverse cracking (1/2- to 4-inches wide). The cracks have been previously filled, although most have reopened and require additional maintenance or major repair. The depth of these cracks was observed to be approximately 1/2- to 2-1/2- inches. Moderate to severe cracking (1/2- to 2-inches wide) was observed on the two mid-

runway connecting taxiways and tiedown apron, with exposed base material visible through some cracks (approximately 2-1/2-inches below the surface) on the tiedown apron. The main apron appears to be in good condition with minor to moderate cracking observed; the southern section of the main apron appeared to have the heaviest cracking (1/4- to 1/2 inch). The east section of parallel taxiway appears to be in fair condition with light to moderate cracking observed. As noted earlier, despite "good" pavement ratings from the 2005 inspection, it is apparent that some sections of taxiway and apron will require more extensive rehabilitation or reconstruction to correct the current cracking.

LANDSIDE FACILITIES

Hangars and Airport Buildings

All structures on Sunnyside Municipal Airport are located on the south side of Runway 07/25. The airport currently has eight structures, including five hangars, a residence, a building used by the local aerial applicator and city water system pump building.

The hangars include one newer 4-unit T-hangar; one older 5-unit T-hangar; one large conventional hangar with pilot lounge; one small conventional hangar, and one Quonset style hangar. During a recent site visit, some doors on the older 5-unit T-hangar were missing or had collapsed. It appears that the hangar is nearing the end of its useful life and will require substantial repair for continued use. The other hangars appear to be in generally good condition, although most appear to be more than 30 years old, with the exception of the newer T-hangar, which appears to be about 20 years old.

The majority of hangars are located along the rear section of the main apron and east tiedown apron; the aerial applicator pad and operations building are located approximately 500 feet west of the main apron. The residence is located adjacent to the airport fuel storage tank, within a fenced area immediately adjacent to the main apron. Existing airport buildings are summarized in **Table 2-5** and depicted in **Figure 2-1**, earlier in the chapter.

TABLE 2-5:
AIRPORT BUILDINGS

Bldg. No.	Building	Existing Use
1	Residence	Caretaker, FBO/Fuel
2	Quonset Hangar	Aircraft storage
3	AG Operations Building	Commercial activities
4	Small Conventional Hangar	Aircraft storage
5	5-Unit T-Hangar	Aircraft storage
6	4-Unit T-Hangar	Aircraft storage
7	Large Conventional Hangar	Aircraft storage, pilot lounge
8	Water Pump Building	City water system facility

Airfield Lighting and Signage

Sunnyside Municipal Airport accommodates day and night operations in visual flight rules (VFR) conditions. The airport is equipped with a rotating beacon, runway edge lighting, runway threshold lights, visual guidance indicators (VGI) at both runway ends, and two lighted wind cones. The

rotating beacon, lighted wind cones, and runway lights operate from dusk to dawn on automatic photocell switches; the VGIs operate continuously. The airport has a variety of airport signs, all of which are reflective and are generally in good condition. **Table 2-6** summarizes existing airfield lighting at Sunnyside Municipal Airport.

Airfield Lighting

The airport beacon is mounted on a pole adjacent to the north end of the eastern-most T-hangar. The beacon appears to be in good condition.

A lighted wind cone (fair condition) is located adjacent to the airport beacon on the north side of the eastern-most T-hangar. A segmented circle and lighted wind cone (fair condition) are located near the midpoint of the runway on its north side. An unlighted wind cone (poor condition) is located near the end of Runway 07, on its south side. During a site visit conducted for this project all of the wind cones were observed to be faded; the wind cone adjacent to the Runway 07 end was partially detached from its frame.

Runway Lighting

Runway 07/25 lighting consists of low runway intensity edge lighting (LIRL) and threshold lights (3 split lens green/red fixtures on each side of the runway). The runway lighting appears to be in good condition and is reported to operate normally.

Runway 07 and 25 are equipped with 2-Box Precision Approach Path Indicators (PAPI), which provide pilots with a 3-degree visual glide path for landing. The PAPIs were observed to be in good condition and operated normally during a daytime site visit conducted for this project.

Taxiway Lighting/Reflectors

The parallel taxiway is not equipped with edge lighting. Blue stake-mounted cylindrical reflectors (good condition) are located along the edges of the parallel taxiway and on all exit taxiways.

Airport Signs

Sunnyside Municipal Airport is equipped with a variety of airport signs: Mandatory Instruction, Runway Distance Remaining, Destination, and Information signs.

Mandatory Instruction Signs: Runway/Taxiway Hold Position signs are located adjacent to all taxiway connections to the runway. The signs have a red background with white letters. The signs are in good condition. The signs are installed adjacent to the aircraft hold lines painted on each of the runway exit taxiways, approximately 125 feet from runway centerline.

Runway Distance Remaining Signs: Runway 07/25 is equipped with two Runway Distance Remaining (RDR) signs [2] [1] located on the north side of the runway. The RDR signs indicate the

amount of runway remaining (for takeoff or landing rollout) in 1,000-foot increments. The signs have a green background with white letters. The signs are in good condition, although it is noted that the current FAA standard for RDR signs is a black background with white letters.

Destination Signs: The airport has destination sign [visitor parking] located adjacent to the main apron. The sign has a yellow background with black letters and is in good condition.

Information Signs: Information signs are located adjacent to the runway reminding pilots to use their checklist and monitor the 121.9 (common traffic advisory frequency 121.9 MHz). The signs have black lettering and white backgrounds and are in good condition. The current FAA standard for Information signs is a yellow background with black letters.

TABLE 2-6:
AIRPORT LIGHTING AND SIGNAGE

Component	Type	Condition
Runway 07/25	Low Intensity Runway Edge Lighting (LIRL) Threshold Lights	Good
Taxiway Lighting	None (Blue edge reflectors)	N/A (Reflectors – Good)
Airfield Signage	A/C Hold, Runway Distance Remaining, Information, Destination Signs	Good
Runway Approach Lighting	None	N/A
Visual Guidance Indicators	PAPI (Rwy 07 & 25) 2-Box units with 3.0-degree glide path	Good
Airfield Lighting	Lighted Wind Cones (2); Rotating Beacon	Fair-Good

AIRSPACE AND NAVIGATIONAL AIDS

Sunnyside Municipal Airport has no electronic navigational aids or published instrument approaches and operates exclusively under visual flight rules (VFR) conditions. As noted above, the runway is equipped with visual landing aids. The airspace surfaces for the runway depicted on the current airport layout plan are based on visual approach capabilities for small aircraft.[8] **Table 2-7** summarizes existing navigational aids and related items. **Table 2-8** summarizes notable obstructions, special airspace designations and IFR routes in the vicinity of Sunnyside, as identified on the Seattle Sectional Aeronautical Chart and the L-1/L-2 Low Altitude Enroute Chart. The airspace surrounding Sunnyside Municipal Airport is illustrated in **Figure 2-3**.

[8] FAR Part 77. Utility aircraft weighing less than 12,500 pounds.

Sunnyside Municipal Airport is located in an area of uncontrolled (Class G) airspace, which permits visual flight rules (VFR) operations only. Class G airspace begins at the surface and may extend upward to 14,500 feet above mean sea level (MSL).

Areas of controlled airspace are located in the vicinity of Sunnyside Municipal Airport – west toward Yakima and east toward the Tri-Cities. The nearest controlled airspace is located approximately 3 miles west of Sunnyside at the outer eastern edge of Class E airspace associated with Yakima/McAlister Field. This area of Class E airspace begins 700 feet above the surface and extends upward to 18,000 feet MSL. A similar area of Class E airspace is located approximately 12 miles east of Sunnyside (the western end of Class E airspace associated with several airports in the Tri-Cities area). Extended areas of Class E airspace are used by aircraft transiting to and from the terminal or en route environment. The Yakima and Pasco airports also have larger areas of Class E airspace near the airports that extend from the surface upward. The nearest area of "surface upward" Class E airspace is located approximately 17 nautical miles northwest of Sunnyside. The "surface upward" sections of Class E airspace associated with Pasco are located east of the airport, approximately 35 miles east of Sunnyside. VFR aircraft operating in Class E airspace are responsible to see and avoid air traffic and there is no mandatory radio communication required.

The Yakima and Pasco airports also have Class D airspace. Class D airspace is associated with airports having operating control towers; pilots are required to establish and maintain two-way radio communications with the ATC facility providing air traffic control services prior to entering the airspace. The Class D areas extend from the surface upward to 3,600 feet MSL for Yakima and 2,900 feet MSL for Pasco with a radius of 5 statute miles. During the hours when the air traffic control towers are not in operation, the airspace reverts to Class E (surface upward).

The nearest low altitude enroute instrument airways are Victor 4-298 and Victor 497, which pass within two miles of Sunnyside Municipal Airport (immediately south and east) at their nearest points. These enroute airways intersect just south of the airport (SUNED intersection). Victor 204 is located approximately 7 miles north of Sunnyside at its nearest point. The minimum altitudes (5,000 to 7,000 feet MSL) associated with these airways are well above the airport traffic pattern and they do not affect local airport operations.

IR 341, a low altitude military training route (MTR), runs in a northwest-southeast direction approximately 1.5 miles southwest of the airport until reaching the Columbia River near Umatilla before heading east. The direction of flight is indicated as southeast. MTRs may extend upward from the surface which requires careful monitoring when traveling west of the airport.

TABLE 2-7: NAVIGATIONAL AIDS AND RELATED ITEMS

Type	Facilities
Electronic Navigational Aids	None on Site Nearby Facilities: Yakima (YKM) VORTAC - 116.0 MHz; 286° 24.4 NM to field Pasco (PSC) VOR/DME - 108.4 MHz; 256° 35.8 NM to field Moses Lake (MWH) VOR/DME - 115.0 MHz; 008° 59 NM to field Pendleton (PDT) VORTAC - 114.7 MHz; 110° 57 NM to field Pelly (MW) Non Directional Beacon (NDB) – 408 LHz 010° 54 NM to field Foris (PD) Non Directional Beacon (NDB) – 230 LHz 104° 62 NM to field
Instrument Approaches	None
Weather Observation	None on site Nearest Airport Weather Observation Stations: Yakima ASOS (509) 248-1502 Pasco ASOS (509) 547-7379 LAWRS. SAWRS Moses Lake ASOS (509) 562-5082; HIWAS 115.0 MWH. LAWRS
Communication	Unicom/Common Traffic Advisory Frequency (CTAF) 122.9 MHz

TABLE 2-8: AIRSPACE/INSTRUMENT ROUTES/LOCAL OBSTRUCTIONS

Airspace Item	Description	Location *(Direction/Distance from 1S5)*
Class D Airspace (from surface upward)	Yakima Class D; surface to 3,600 feet MSL; mandatory radio communication.	24 miles northwest at nearest point
Class D Airspace (from surface upward)	Pasco Class D; surface to 2,900 feet MSL; mandatory radio communication.	31 miles east at nearest point
Class E Airspace (from surface upward)	Yakima Class E; surface to 18,000 feet MSL; mandatory radio communication not required; pilots responsible for traffic avoidance	17 miles northwest at nearest point
Class E Airspace (from surface upward)	Pasco Class E; surface to 18,000 feet MSL; mandatory radio communication not required; pilots responsible for traffic avoidance	35 miles east at nearest point
Class E Airspace (from 700 feet AGL upward)	Yakima Class E; 700' AGL to 18,000 feet MSL; mandatory radio communication not required; pilots responsible for traffic avoidance	3 miles northwest at nearest point
Class E Airspace (from 700' AGL upward)	Pasco Class E; 700' AGL to 18,000 feet MSL; mandatory radio communication not required; pilots responsible for traffic avoidance	12 miles east at nearest point
Instrument Airway	Victor 4-298 Low Altitude Enroute Airway	<2 miles south at nearest point.
Instrument Airway	Victor 497 Low Altitude Enroute Airway	1 mile east at nearest point.
Instrument Airway	Victor 204 Low Altitude Enroute Airway	7 miles north at nearest point.
Tower	Tower 1,100 feet MSL (345' AGL)	2.5 miles west
Tower	Tower 1,438 feet MSL (216' AGL)	4 miles southwest
Tower	Tower 1,048 feet MSL (265' AGL)	7 miles southeast
Tower	Tower 1,030 feet MSL (205' AGL)	8 miles southeast
Tower	Tower 1,099 feet MSL (212' AGL)	8 miles west-southwest
Tower	Tower 981 feet MSL (295' AGL)	8 miles west
Electrical Transmission Line	Large overhead transmission lines; Towers +100 feet AGL	2 miles east
Electrical Transmission Line	Large overhead transmission lines; Towers +100 feet AGL	5 miles northwest
Military Training Routes (MTR)	Surface Upward	Low-altitude training route located <2 miles (south and west).
National Wildlife Refuge	Toppenish NWR. 2,000 feet AGL altitude restrictions for over flights.	6 to 12 miles west-southwest
Restricted Area	R-6714A, R-6714B, R-6714C. Surface upward to 29,000 feet MSL; use intermittent by NOTAM	12 to 15 miles north
National Security Area	Hanford. 1,800 feet MSL altitude restrictions for over flights.	19 miles northeast

Washington State Department of Transportation Aviation Division CENTURY WEST ENGINEERING CORPORATION	AREA AIRSPACE SUNNYSIDE MUNICIPAL AIRPORT	FIGURE 2-3

AIRPORT SUPPORT FACILITIES/SERVICES

Aircraft Fuel

Sunnyside Municipal Airport has aviation gasoline (AVGAS) available for purchase. The single 10,000-gallon aboveground tank is installed in a concrete lined box, which is installed slightly below the apron elevation. The pumps are installed at the edge of the apron. 24-hour cardlock fueling is available. The aerial applicator facilities located west of the main apron appears to have private fuel storage with an above-ground tank.

Surface Access and Vehicle Parking

Surface access to the airport is provided via East Edison Road, which travels along the south side of the airport. The paved airport access road (22 feet wide) enters the south side of the airport approximately ½ mile east of the intersection of Highway 241 and East Edison Road. The 1,600-foot access road serves the south landside area. Vehicle access to the aircraft aprons and hangars is provided through an unfenced opening between the fuel tanks and the large conventional hangar. Vehicle parking is provided on the south side of the fence in a gravel surfaced area immediately adjacent to the paved access road.

Fencing

Airport fencing (6’ chain link w/ 3 strands of wire) extends along the north side of the airport access road adjacent to the eastern end of the landside facilities. The fencing runs along the back edge of the area, from the east tiedown apron to the southeast corner of the large conventional hangar/pilot lounge building. Pedestrian gates are located adjacent to the eastern-most T-hangar and the large conventional hangar. No vehicle access gates are located within this section of fence.

The fuel storage tank is located within a fenced containment area (6-foot chain link) that connects to the fence (5-foot chain link) that encloses the grass yard for the caretaker residence abutting the main apron. A short section of 6-foot chain link fence extends from the west end of caretaker yard fence to the conventional hangar located near the west end of the main apron. No additional fencing is provided between the west end of the main apron and the aerial applicator facilities, located further west. Other areas of the airport have wire range fencing or no fencing. No fencing exists beyond the west end of the runway-taxiway system, which is located within 200 feet of Highway 241.

The City water pump building located adjacent to the east tiedown apron is fully fenced (6’ chain link w/3 strands of wire) with an automated vehicle access gate at the connection to the airport access road.

Utilities

The developed areas of the airport currently have water, telephone, and electrical service. The utility lines serving the airport are located along the airport access road. Three fire hydrants are located within a distance of approximately 1,300 feet from the water pump facility to the aerial applicator facilities. Overhead electrical and buried telephone lines are located on the south side of the access road, with overhead connections to individual structures. Sanitary sewer service is not currently available at the airport; individual septic tanks are used for the caretaker residence, pilot lounge and aerial applicator facilities. Water service is provided by the City of Sunnyside. Electrical service is provided by Pacific Power. Telephone service is provided by Embarq and Sprint. Natural gas service to nearby industrial sites is provided by Cascade Natural Gas.

The airport has a stormwater collection system (swales and culverts) that directs the stormwater runoff to nearby drainage ditches.

LAND USE PLANNING AND ZONING

Sunnyside Municipal Airport is located within the City of Sunnyside city limits and Urban Growth Area (UGA). The majority of land immediately surrounding the airport is currently located outside the city limits, but within the UGA, under the land use jurisdiction of Yakima County. See Chapter Seven for a detailed description of land use and zoning in the vicinity of the airport.

The airport is zoned **AP – Airport Zone** in the City of Sunnyside zoning ordinance (Chapter 17, city code). Permitted uses within AP zoning are limited to airport-related activities. The land use of areas surrounding the airport is predominantly agricultural or industrial. Scattered low density residential activities, typically associated with agricultural land uses are also located in the vicinity of the airport. The Port of Sunnyside owns large areas of land in the vicinity of the airport, including areas immediately beyond both ends of the runway and south of the airport hangar area. It is anticipated that portions of these areas may be used to support of future improvements such as a runway extension and to protect the airspace associated with the runway approaches. The Port-owned parcels adjacent (east and south) to the airport are located outside the Sunnyside city limits and are zoned **Industrial** by Yakima County. The Sunnyside Comprehensive Plan land use designation for these areas (located within the UGA) is industrial; the Port-owned property beyond the west end of the runway is identified on current comprehensive plan mapping with a residential land use designation, although the zoning is PUD consistent with its planned development as an industrial park.

The City of Sunnyside does not currently have an airport overlay zone defined in its zoning ordinance.

Yakima County has an **Airport Safety Overlay (ASO) District** (YCC, Chapter 15.55) that applies to county-zoned lands surrounding Sunnyside Municipal Airport. The ASO incorporates the FAR

Part 77 imaginary surface (airspace) defined for the airport and the runway protection zones (RPZ) depicted on the current airport layout plan (ALP) drawing. The ASO defines primary a secondary safety areas. *"The primary airport safety area addresses land use compatibility with airport operations and structure height. It is located in an area bounded by the limits of the Runway protection zone and the FAA defined approach and transitional surfaces within the conical surface area. The secondary airport safety overlay principally addresses structure height, particularly where a structure may constitute a potentially incompatible land use as defined in Section 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."*

AIRPORT SERVICE AREA

The airport service area refers to the area surrounding an airport that is directly affected by the activities at that airport. Normally a 30 or 60-minute surface travel time is used to approximate the boundaries of a service area. **Table 2-9** lists the public airports within a 40 nautical mile radius of Sunnyside. Despite their relatively close proximity to Sunnyside, the surface travel times to these airports are substantial due to limited surface access routes available.

TABLE 2-9:
PUBLIC USE AIRPORTS IN VICINITY

Airport	Location	Runway Dimension (feet)	Surface	Lighted Runway?	Fuel Available?
Prosser Airport	10.1 NM SE	3,450 x 60'	Asphalt	Yes	Yes
Richland Airport	27.6 NM E	4,009 x 75' (primary rwy)	Asphalt	Yes	Yes
Vista Field (Kennewick)	32.2 NM E	4,008 x 150'	Asphalt	Yes	Yes
Tri-Cities Airport (Pasco)	35.5 NM E	7,700 x 150' (primary rwy)	Asphalt	Yes	Yes
Boardman Airport	31.4 NM S	4,222 x 100'	Asphalt	Yes	No
Desert Aire Airport (Mattawa)	21.7 NM N	3,665 x 36'	Asphalt	Yes	No
Yakima Air Terminal / McAllister Field	27.8 NM NW	7,603 x 150' (primary rwy)	Asphalt	Yes	Yes

POPULATION

In many ways, general aviation airports are a reflection of the communities they serve. Changes in population within an airport's service area often provide a broad indication about trends in airport activity. Although a large number of factors normally affect activities at general aviation airports, changes in population often reflect other economic conditions, which may affect airport activity more directly. However, since it is difficult to identify specific connections between airport activity and

individual economic indicators such as growth in personal income, unemployment rates, or business spending, population provides a general indication of an area's economic health. Regions with flat or declining populations often have weak underlying economic conditions. In contrast, higher rates of population growth often characterize a growing economy that can stimulate individual and business use of general aviation.

Historic Population

The Washington Office of Financial Management (OFM) prepares annual estimates of city and county populations within Washington in support of the Growth Management Act (GMA). The 2007 OFM estimate for the City of Sunnyside population (incorporated area only) was 15,130,[9] up approximately 9 percent (+1,225 residents) from the 2000 census (13,905 residents). This growth equates to an average annual growth rate of 1.20 percent during the seven-year period. Between 1990 and 2000, Sunnyside's population grew at an average annual rate of 2.15 percent. Over the 27-year period from 1980 to 2007, annual growth averaged 1.85 percent. The data indicate sustained growth has occurred, although some slowing has occurred over the last several years.

Sunnyside's population, as a percentage of Yakima County's total population, has increased steadily over the last several decades. In 1950, Sunnyside accounted for 3.1 percent of county population; that percentage was estimated to be 6.46 percent in 2007. This has resulted in population growth within Sunnyside that has consistently outpaced county-wide growth in recent decades.

The 2007 OFM estimate of population for Yakima County was 234,200, which was approximately 5.2 percent (+11,619 residents) above the 2000 Census (222,581). This equates to an average annual growth rate of 0.73 percent during the seven-year period. Between 1990 and 2000, Yakima County's population grew at an average annual rate of 1.66 percent. Over the 27-year period from 1980 to 2007, annual growth averaged 1.14 percent.

The moderate, sustained population growth within Sunnyside and Yakima County in recent years is expected to continue and is reflected in current long-term population forecasts. OFM has developed long-term (2000-2030) population forecasts for Washington counties, based on three growth scenarios (low, intermediate and high series). The forecasts were most recently updated in October 2007. As noted above, these forecasts are used to support local long-term planning in accordance with GMA. For Yakima County, the average annual growth rates in the three scenarios range from 0.38 to 1.54 percent over a 30-year period. A comparison between the three forecast scenarios and 2007 OFM population estimates provides an indication of the current population trend. For Yakima County, population growth since 2000 has tracked very closely with the intermediate forecast series (the 2007 estimate was 1.67 percent above the intermediate projection). The intermediate series

[9] April 1, 2007 estimate from Washington Office of Financial Management (OFM)

forecast projects Yakima County population will increase 35.0 percent between 2000 and 2030, which equates to an average annual growth rate of approximately 1.0 percent.

The OFM intermediate forecast for Yakima County was used in the City of Sunnyside's 2007 Comprehensive Plan Update as the basis for projecting local population. The comprehensive plan's adopted forecast for 2015 (17,647) reflects a slight increase in Sunnyside's current share of county population, applied to the OFM intermediate projection for Yakima County. For consistency, intermediate series GMA forecast will be used to support all population-based projections of airport activity during the current twenty-year airport planning period.

Table 2-10 summarizes the three GMA forecasts. Sunnyside's adopted 2015 population forecast is also referenced; the other projections for Sunnyside are interpolated/extrapolated based on the gradually increasing share of county population reflected in the 2015 projection and the 2007 OFM estimates of local and county population.

The moderate forecasts of population growth for the community and region suggest that future aviation demand at Sunnyside Municipal Airport can be expected to be generally consistent with community growth trends. In addition, the expansion of the area's industrial base can be expected to contribute to growth in aviation activity.

TABLE 2-10:
YAKIMA COUNTY GMA POPULATION FORECASTS

	2000	2007[1]	2010	2015	2020	2025	2030
Low Series *(0.38% AAR)*	222,581	227,300	224,303	233,240	240,233	245,929	249,601
Intermediate Series *(1.0% AAR)*	222,581	234,083	241,446	257,867	272,992	287,468	300,362
High Series *(1.54% AAR)*	222,581	241,088	259,917	283,847	307,116	330,373	352,476
City of Sunnyside /Yakima County Actual Population[2]	13,905 222,581	15,130 234,200					
City of Sunnyside % of Yakima County[3]	6.25%	6.46%	6.6%	6.84%	6.9%	7.1%	7.2%
Projected City of Sunnyside Population[3]			*15,935*	*17,647*	*18,836*	*20,410*	*21,926*

1. OFM Forecasts interpolated between 2005 and 2010 projections.
2. U.S. Census (2000); OFM Estimates April 1, 2007.
3. Projections based on City of Sunnyside adopted comprehensive plan forecast for 2015; interpolation/extrapolation of City share of county population for other years applied to "intermediate series" GMA forecast for Yakima County.

Economy

Yakima County's economy is heavily dependent on agriculture but has also experienced growth in tourism, manufacturing, and service and retail industries. Yakima County a leader among Washington's leading counties for agricultural production, particularly fresh fruits and vegetables. In recent years, the rapid expansion of the region's wine industry has resulted significant growth of wine-related tourism. The region has experienced a substantial increase in the number of vineyards and wineries in the lower Yakima valley and neighboring areas in recent years. In addition, the wines being produced in the region have become recognized for their high quality, both nationally and internationally.

Sunnyside's employment base is relatively diversified and includes retail trade, health services, government, education, manufacturing and professional services. As noted in the City of Sunnyside's recently updated Comprehensive Plan, nearly half of Sunnyside's labor force is employed outside of Sunnyside, throughout Yakima County and the Central Washington region. Economic development efforts, led by the Port of Sunnyside and local economic development groups are focused on attracting manufacturing and other industries to Sunnyside that would increase employment opportunities. The availability of readily-developable industrial land adjacent to the airport also has the potential of creating additional demand for airport activity.

In recent years, unemployment rates within Yakima County have consistently been higher than the statewide or national rates. In 2006, Yakima County's unemployment rate was 7.2 percent compared to the statewide average of 4.9 percent. Seasonal unemployment associated with agricultural industries is generally a significant factor in higher overall unemployment rates. It is interesting to note that current unemployment levels are below even the lowest rates recorded during the prior three decades. In the 30-year period between 1970 and 2000, unemployment rates in Yakima County ranged from a low of 8.6 percent (1974) to a high of 15.8 percent (1982).[10]

With the nearest commercial air service available in Yakima, Sunnyside Municipal Airport has the ability to accommodate a wide range of general aviation aircraft used by local residents, businesses, government and visitors. In its role as a community general aviation airport, Sunnyside provides a convenient transportation option for users operating light single-engine and multi-engine aircraft, and smaller business class aircraft. The use of private aircraft for personal and business transportation can be expected to be an element in Sunnyside's economy, particularly for existing users and in support of attracting new businesses to the community.

[10] Washington State Employment Security Department (ESD) data.

AVIATION ACTIVITY FORECASTS

Introduction

The purpose of this section is to prepare updated forecasts of aviation activity for the twenty-year planning period addressed in the Airport Layout Plan Update (2007-2026). The updated forecasts will provide the basis for estimating future facility needs at Sunnyside Municipal Airport. The scope of work for this project requires use of the Washington State Aviation System (WSASP) forecasts and Federal Aviation Administration (FAA) Terminal Area Forecast (TAF), in addition to developing one other published growth rate as the baseline for developing a 20-year forecast. These forecasts are summarized later in the chapter and depicted in **Figures 2-4 and 2-5** at end of the chapter.

Current and Historic Aviation Activity

Based on a recent count conducted by airport officials, there are currently 15 aircraft based at Sunnyside Municipal Airport on a year-round basis. All of the aircraft are piston-engine models weighing less than 12,500 pounds included in airplane design group I (ADG I). Current based aircraft include one light twin-engine model (Cessna 310) and one agricultural aircraft (Air Tractor 301), with the remaining aircraft being single-engine models. **Table 2-11** summarizes the individual aircraft by type.

In addition to accommodating a wide range of locally-based and transient general aviation aircraft, Sunnyside Municipal Airport accommodates limited turbine aircraft activity including helicopters, business and medevac flights, some of which are generated by larger, ADG II aircraft. Regular users include Les Schwab and Wal-Mart in addition several local or area businesses. ADG II activity is currently estimated to total less than 100 operations per year, although the current length of Runway 07/25 has been cited by local officials as a significant constraint on airport use, including limiting the type of aircraft that can accommodated for fixed-wing medevac flights.

TABLE 2-11:
SUNNYSIDE BASED AIRCRAFT SUMMARY
(JANUARY 2008)

Aircraft Type	Aircraft
Single Engine Piston	14
Multi-Engine Piston	1
Turboprop	0
Business Jet	0
Rotorcraft	0
Other (*Ultralights*)	0
Total	**12**

Source: 2007 City count provided to FAA

Methods for Estimating Aircraft Operations

For Sunnyside Municipal Airport, aircraft operational data (takeoffs and landings, touch and go landings, etc.) are limited to estimates. As a non-towered airport, no record of activity is regularly maintained. The FAA provides planning guidance for estimating activity at general aviation airports without control towers. The FAA recommends use of ratios to project annual aircraft operations from the number of based aircraft. The activity ratios reflect an average number of operations per based aircraft and are intended to account for both locally based and transient aircraft activity. The recommended ratios include 250 operations per based aircraft for small airports with low activity; 350 for airports with moderate local and itinerant activity; and 450 for high activity urban or regional airports. The operating capabilities and characteristics of Sunnyside Municipal Airport are most consistent with the small airport group. Based on a current count of 12 based aircraft and the FAA-recommended ratio of 250 operations per based aircraft for smaller airports, current aircraft activity at Sunnyside Municipal Airport is estimated to total 3,000 operations.

The most recent WSDOT-sponsored estimate of activity at Sunnyside Municipal Airport is contained in the 2007 Long Term Air Transportation Study (LATS) – Phase II Report (Forecasts). The LATS forecasts established base year (2005) activity at 12 based aircraft and 3,000 operations for Sunnyside. The based aircraft estimates for 2005 were developed through updated counts provided by airport sponsors, where available. The base year operations estimate reflects the FAA-recommended ratio for smaller general aviation airports of 250 operations per based aircraft.

Other Activity Estimates

The FAA TAF and the FAA Airport Record Form list 20 based aircraft (all single engine) and 24,000 operations for Sunnyside. The FAA TAF based aircraft count is not consistent with current counts and the ratio of operations per based aircraft (1,200 operations per based aircraft) significantly exceeds what FAA typically projects for most general aviation airports. The WSDOT state aviation system plan database estimated activity (in 2002) at 12 based aircraft and 24,000 operations. The WSDOT database based aircraft number is slightly lower than current counts and the estimate of aircraft operations mirrors the TAF projections.

A review of the FAA and WSDOT operations and based aircraft estimates noted above reveal activity ratios of 1,200 to 2,000 operations per based aircraft, well above those typically found at most general aviation airports. As a result, the current TAF and WSDOT database projections are not considered accurate enough for use in this study.

Local and Itinerant Operations

The FAA and WSDOT activity estimates both indicate that about 25 percent of total airport operations are "local." Local operations are conducted in the vicinity of an airport and include flights that begin and end the airport. Local operations include flight training (touch and goes) and most aerial applicators flights. A 25% local/75% itinerant split is common for general aviation airports with low-to-moderate amounts of flight training or other flight activity occurring in the vicinity of the airport, such as skydivers or gliders.

Design Aircraft

As noted above, all locally based aircraft at Sunnyside Municipal Airport are small single-engine or multi-engine piston aircraft included in Airplane Design Group I (ADG I). By FAA definition, a "small" airplane weighs less than 12,500 pounds. The airport accommodates one light twin-engine aircraft (Cessna 310) that is in aircraft approach category B and the remaining aircraft are in aircraft approach category A. The current level of transient ADG II aircraft operations associated with business and medevac flights is estimated to be less than 100 annual operations.

Locally-based and transient aircraft activity at Sunnyside Municipal Airport is expected to become more diverse during the forecast period. Although small single-engine and twin-engine piston aircraft are expected to continue representing the majority of based aircraft and most airport operations, trends within the general aviation aircraft manufacturing suggest that the addition of light sport aircraft (LSA) and new turbine aircraft, including very light jets (VLJ) and a broader range of corporate aircraft (small/medium business jets and turboprops) could be expected at Sunnyside

Municipal Airport during the current 20-year planning period—either as locally-based or transient activity.[11]

It is recognized that the current runway length (3,422 feet) limits use of the runway by larger business-class aircraft, particularly on typical summer days. The potential of the airport to accommodate increased activity from business class B-I and B-II aircraft, such as piston twin-engine, turboprop or small/medium business jets appears reasonable based on Sunnyside's established agricultural base, medevac activity, growing industrial base and growth in tourism sectors, particularly the region's wine industry. Sunnyside's location between Yakima and the Tri-Cities provides good access throughout the lower Yakima valley and the airport has the ability to expand and improve facilities (runway length, instrument approach, land to develop hangars, etc.) to enable increased use by business class aircraft.

Based on current and near-term expectations, it appears that the level of ADG II activity will remain below the FAA planning standard of a minimum of 500 annual itinerant operations during the current planning period. However, significant changes in facilities and the local market have the potential of eventually generating sufficient B-II activity to meet the FAA criteria for design aircraft earlier in the planning period.

As an element of the City's long-term planning strategy for the airport, consideration may be given to configuring new near-term facilities or setbacks based on ADG II standards for items that would be costly to relocate in the future. An example of this approach would be the reconstruction of the parallel taxiway. Depending on the cost, it may be only marginally more expensive to construct a new parallel taxiway to meet ADG II runway separation standards rather than reconstructing the current taxiway in its current location and relocating it at a later date when the higher design standards were applied. Similarly, the City should consider use of the future ADG II dimensional standards when determining the proper setbacks for new hangars, aircraft parking areas and other related items that may be constructed in the near term. Items such as runway extensions will need to be justified based on current or near-term demand; however, use of reserves to identify a potential extension beyond the current planning period may also be prudent.

The anticipated growth of very light jets (VLJ) within the general aviation fleet is expected to be an element in the airport's modest growth in turbine aircraft activity. Most current design VLJs are included in Airplane Design Group I with airport facility needs comparable to most piston light-twin

[11] Light Sport Aircraft (LSA) is a newly-defined category of aircraft with a maximum gross takeoff weight of 1,320 pounds or less (land planes) and simplified design. The new FAA Sport Pilot Certificate requires a minimum of 20 hours training for non-transitioning pilots. Very Light Jets (VLJ) (also referred to as light jets or micro jets) are small jet-powered aircraft (weighing less than 12,500 pounds) with airport-related performance characteristics (takeoff weight, approach speed, runway length requirements, physical dimensions, passenger load, etc.) comparable to a high-performance light twin-engine aircraft.

or cabin-class twin-engine aircraft. As such, airfield improvements targeted at accommodating the small airplane fleet will also address most VLJ facility needs.

Based on these considerations, **the current and future Airport Reference Code (ARC) recommended for Runway 7/25 is B-I (small).** This ARC reflects projected traffic levels and fleet mix within the category and the airport's potential to accommodate a growing amount of business related activity.

EXISTING FORECASTS

FAA Terminal Area Forecasts (TAF)

The Federal Aviation Administration (FAA) maintains forecasts for Sunnyside Municipal Airport in the TAF. However, the TAF projects no increase in either based aircraft or aircraft operations at Sunnyside Municipal Airport through 2020. When no growth is reflected in the TAF, it generally indicates that inadequate data exists to support projections beyond current estimates. The current TAF lists 20 based aircraft (all single engine) and 24,000 annual operations through 2020. The TAF is summarized in **Table 2-12**.

The FAA's long-term forecasts project a very conservative increase the number of aircraft in the U.S. general aviation fleet, flight hours and other related indicators. The FAA 2001-2015 TAF projects that total airport operations within the Northwest Mountain Region will increase 17.5 percent by 2015, which is an annual average increase of approximately 1.08 percent.

WSDOT - Long Term Air Transportation Study (LATS)

Updated Washington State Aviation System Plan forecasts were developed in 2007 as part of the Long Term Air Transportation Study (LATS), with projections made from 2005 to 2030. The LATS forecasts of based aircraft and operations for Sunnyside Municipal Airport reflect nearly no growth over the 25-year planning period. Based aircraft were forecast to increase from 12 to 13 and operations from 3,000 to 3,251 between 2005 and 2030 (average annual rate of 0.32 percent).The operations forecasts reflect a stable ratio of 250 operations per based aircraft, which is consistent with FAA guidance on projecting activity at smaller general aviation airports. Based on these factors, the LATS forecasts are considered reliable for use as a baseline projection in the airport layout plan project. The LATS forecasts are summarized in **Table 2-11**.

Washington State Aviation System Plan (WSASP)

The 2002 WSASP database includes a 3-year projection of based aircraft and aircraft operations for Sunnyside Municipal Airport that was developed as part of the statewide inventory update. The 2005 forecast for Sunnyside Municipal Airport deviated significantly (upward) from the earlier WSDOT

projections. Based aircraft more than doubled in three years from 12 to 25, while operations increased from 24,000 to 28,000. Although the forecasts address a very short period of time, the growth rates do not appear sustainable over an extended period. The WSAP forecasts are summarized in **Table 2-12**.

Updated Aviation Forecasts

Two new forecasts of based aircraft and aircraft operations were developed for Sunnyside Municipal Airport based on the historic relationship between based aircraft and local population. The new based aircraft projections are directly linked to projected growth in the local community. The basis for this type of projection is the assumption that changes in aircraft activity at a community airport will generally correspond to population changes within the community as a whole. The updated operations forecasts apply different FAA airport activity ratios to the based aircraft projections based on specific assumptions about future airport activity trends. The updated and updated forecasts are summarized in **Table 2-12.** The two updated forecast projections and the LATS forecast are depicted in **Figures 2-4 and 2-5.**

Population-Airport Activity Ratio 1

This projection uses the City of Sunnyside Comprehensive Plan adopted forecast for 2015, which generally corresponds to the OFM Intermediate series projection for Yakima County, with a continued increase in Sunnyside's share of county population during the next 20+ years, as described earlier in this chapter (see **Table 2-10**).

As noted in the description of the airport's service area, Sunnyside Municipal Airport appears to have the potential of attracting new aircraft activity from within the surrounding area as new or improved facilities become available. Development constraints at other nearby airports may also contribute to Sunnyside's ability to attract a larger share of the market within the lower Yakima Valley. These conditions suggest that the airport has the ability to continue in its primary role as a small community general aviation airport, while improving its facilities to accommodate a wider range of business aircraft activity.

Based Aircraft

As noted earlier, the rate of population growth projected for Sunnyside and Yakima County is low to moderate over the next 20 years. It is reasonable to assume that the underlying growth in based aircraft at Sunnyside Municipal Airport will continue to be largely generated from within the local community and will be relatively consistent with overall community growth.

The current count of based aircraft (15) translates into a ratio of 0.991 based aircraft per 1,000 residents within the City of Sunnyside. This projection assumes that this ratio will be maintained through the 20-year planning period. This ratio was applied to the population forecasts described

earlier in this chapter for Sunnyside. Using these assumptions, Sunnyside's based aircraft increase from 15 to 21 between 2007 and 2027. This forecast reflects a 40 percent overall increase, which equates to an average annual growth rate of **1.70 percent.**

Aircraft Operations

This projection assumes that the current aircraft activity ratio will increase from 250 to 300 operations per based aircraft during the twenty-year planning period. This assumption reflects an expectation that future airport activity will be similar to current activity, although increased business use of the airport is expected to coincide with local economic growth and the ability of the airport to improve facilities to better serve this segment of activity.

This projection results in an increase from approximately 3,750 annual operations to 6,300 by 2025. This forecast reflects a 68 percent overall increase over twenty years, which equates to an average annual growth rate of **2.63 percent.**

Population-Airport Activity Ratio 2

Based Aircraft

This projection assumes that the ratio of based aircraft to Sunnyside population will gradually increase from 0.991 to 1.15 based aircraft per 1,000 residents by the end of the 20-year planning period, reflecting stronger demand potential in both new aircraft ownership levels and the ability to draw from the existing population of based aircraft currently located at other airports within the local service area. This ratio was applied to the population forecasts described earlier in this chapter for Sunnyside. Using these assumptions, Sunnyside's based aircraft increase from 15 to 24 between 2007 and 2027. This forecast reflects a 60 percent overall increase, which equates to an average annual growth rate of **2.38 percent.**

Aircraft Operations

This projection assumes that the current aircraft activity ratio will increase from 250 to 325 operations per based aircraft during the twenty-year planning period. This assumption reflects an expectation of slightly more aggressive growth associated with increased use of the airport for both business and personal travel that would coincide with local economic growth and the ability of the airport to improve facilities. The potential extension of the runway and the addition of an instrument approach at Sunnyside Municipal Airport combined with known site constraints at Prosser Airport are key factors that could contribute significantly to stronger growth potential.

This projection results in an increase from approximately 3,000 annual operations to 7,880 by 2025. This forecast reflects a 110 percent overall increase over twenty years, which equates to an average annual growth rate of **3.78 percent.**

Summary

Based on the factors described above, the **Population – Airport Activity Ratio 1** projection is recommended as the preferred forecast for in support of the current ALP planning process. The forecast growth rates are generally consistent with statewide and national trends within general aviation and reflect the upward potential that currently exists within the community to generate significant growth in airport activity. The **Population – Airport Activity Ratio 2** projection is recommended for use in defining long-term airport development reserves. Additional detail is provided for the preferred forecasts in **Table 2-13**.

Fleet Mix

The preferred forecast assumes that A-I & B-I engine piston aircraft will continue to represent the majority of the based aircraft fleet and generate the majority of airport operations during the current twenty-year planning period. The current distribution of aircraft operations at Sunnyside Airport is estimated as follows:

- A-I: 95 percent
- B- I: 4 percent
- B-II: <1 percent
- Helicopters: <1 percent

Some shifting within the current fleet mix operational distribution is expected during the planning period, including an increase in ADG II operations associated with business and medevac use of the airport. The forecast of operations assumes that the number of A-II and B-II operations will increase during the planning period, but would remain well below the FAA threshold of 500 annual operations required for selection as design aircraft.

TABLE 2-12:
EXISTING & UPDATED AVIATION FORCASTS

Source	2002	2005	2007	2012	2017	2022	2027
Based Aircraft ***12/2007 Count: 15***							
2002 WSASP Database *(27.7% AAR 2002-2005)*	12	25	--	--	--	--	--
TAF *(0.0% AAR: 2004-2020)*	20	20	20	20	20	--	--
2007 WSDOT LATS Forecast *(Baseline)* *(0.32% AAR 2005-2030)*	--	12	12	12	12	13	13
Population/Activity Ratio 1 Based Aircraft Forecast ***(Preferred)*** ***(1.70% AAR 2007-2027)***	**--**	**--**	**15**	**17**	**18**	**19**	**21**
Population/Activity Ratio 2 Based Aircraft Forecast (High) *(2.38% AAR 2007-2027)*	--	--	15	17	19	21	24
Aircraft Operations ***2007 Estimate: 3,750***							
2002 WSASP Database *(5.3% AAR 2002-2005)*	24,000	28,000	--	--	--	--	--
TAF *(0.0% AAR: 2004-2020)*	24,000	24,000	24,000	24,000	24,000	24,000	--
2007 WSDOT LATS Forecast *(Baseline)* *(0.32% AAR 2005-2030)*	--	3,000	3,000	3,000	3,000	3,251	3,251
Population/Activity Ratio 1 Based Aircraft Forecast ***(Preferred)*** ***(2.63% AAR 2007-2027)***			**3,750**	**4,420**	**4,860**	**5,320**	**6,300**
Population/Activity Ratio 2 Based Aircraft Forecast (High) *(3.78% AAR 2007-2027)*			3,750	4,500	5,470	6,660	7,880

TABLE 2-13:
SUMMARY OF PREFERRED AVIATION FORECASTS

Activity	2007	2012	2017	2022	2027
Based Aircraft					
Single Engine Piston	14	15	16	16	17
Multi-Engine Piston	1	1	1	1	1
Ultralights/Experimental/LSA	0	1	1	2	3
Total	**15**	**17**	**18**	**19**	**21**
Aircraft Operations					
Local	940	1,105	1,215	1,330	1,575
Itinerant	2,810	3,315	3,645	3,990	4,725
Total	**3,750**	**4,420**	**4,860**	**5,320**	**6,300**
Ratio of Operations Per Based Aircraft	*250*	*260*	*270*	*280*	*300*
A-I Operations	3,540	4,150	4,520	4,900	5,670
B-I Operations	120	130	120	110	130
A-II & B-II Operations	<100	<100	120	170	270
Airport Reference Code	*B-I (small)*	*B-I (small)*	*B-I (small)*	*B-I (small)*	*B-I (small)*

FIGURE 2-4: BASED AIRCRAFT FORECASTS

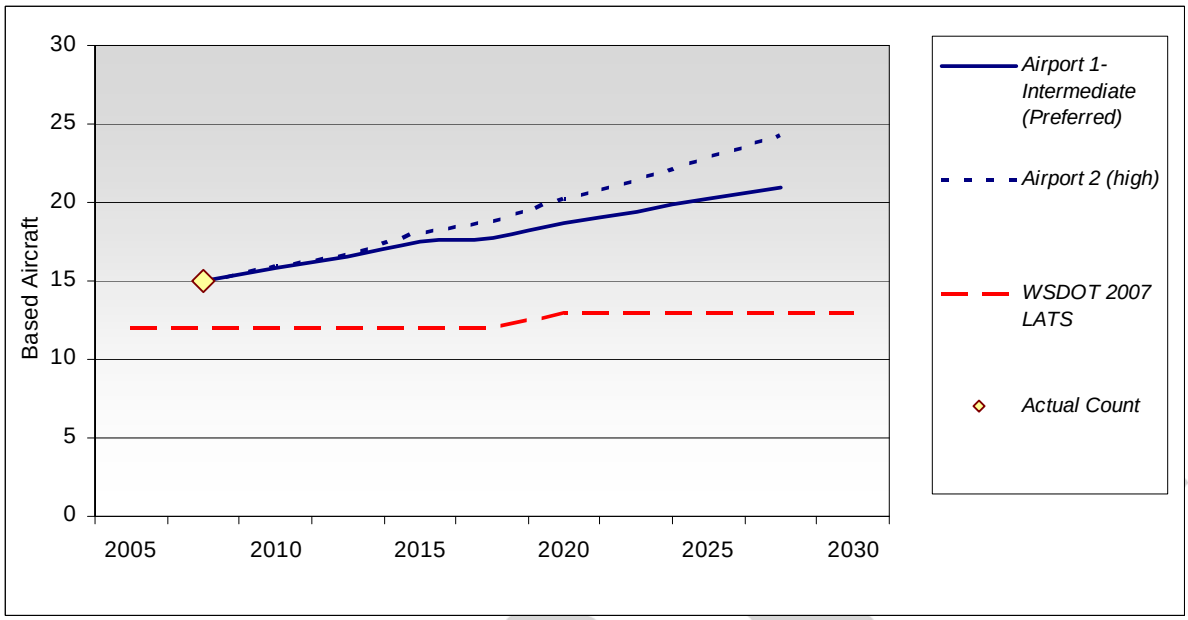
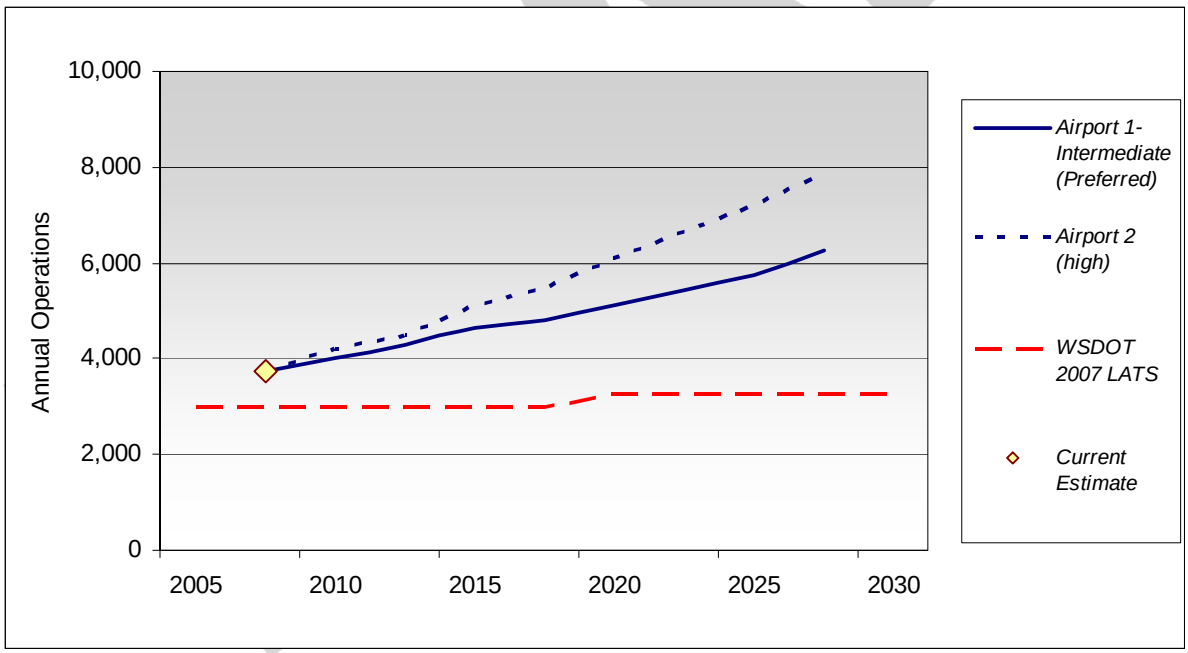


FIGURE 2-5: AIRCRAFT OPERATIONS FORECASTS



CHAPTER THREE
AIRPORT FACILITY REQUIREMENTS

Introduction

This chapter uses the results of the inventory and aviation activity forecasts conducted in Chapter Two, as well as established planning criteria, to determine the airside and landside facility requirements through the current twenty-year planning period. Airside facilities include runways, taxiways, navigational aids and lighting systems. Landside facilities include hangars, fixed base operator (FBO) facilities, aircraft parking apron, aircraft fueling, automobile parking, utilities and surface access.

Detailed descriptions of the primary planning assumptions and applicable FAA airport design and airspace planning standards applied to Sunnyside Municipal Airport are provided in this chapter. These standards are consistent with the current and forecast activity (including the design aircraft) presented in the previous chapter and for runways used by small single-engine and multi-engine aircraft. Airspace planning for Runway 7/25 is based on future nonprecision instrument approach capabilities, which is consistent with other planned runway capabilities.

The facility requirements evaluation is used to identify the adequacy or inadequacy of existing airport facilities and to identify what new facilities may be needed during the planning period based on forecast demand. Options for providing these facilities will be evaluated in Chapter Four to determine the most cost effective and efficient means for implementation.

ORGANIZATION OF MATERIALS

This chapter evaluates facility requirements from two different perspectives: (1) conformance with Federal Aviation Administration (FAA) airport design and airspace planning standards; and (2) demand-based facility needs that reflect the updated aviation activity forecasts presented in Chapter Three.

The first section summarizes Sunnyside Municipal Airport's conformance with the FAA airport design standards and FAR Part 77 airspace planning criteria that are currently in place (small aircraft and visual approaches). The second section provides an in-depth evaluation of these standards and an assessment of the standards that would be required to accommodate nonprecision instrument approaches. The second section also reflects in gross numbers, new facility needs such as runway

length requirements, hangar spaces and aircraft parking positions based on forecast demand and the needs of the design aircraft. Items such as lighting and navigational aids will be evaluated based on the type of airport activity, airport classification and current capabilities.

This approach is consistent with methodology used to develop the aviation activity forecasts. As noted in the previous chapter, the preferred forecasts, facility requirements, and development alternative are interdependent elements that will be used to guide future improvements at Sunnyside Municipal Airport.

SUMMARY OF AIRPORT CONFORMANCE WITH FAA STANDARDS

An evaluation of Sunnyside Municipal Airport's conformance with FAA Airport Design Standards and FAR Part 77 imaginary surfaces was conducted for this project through site visits, review of aerial photography and review of existing airport drawings. This summary outlines initial findings that will be further detailed in the report.

Figures 3-1 and 3-2 on the following pages illustrate the general locations of the non-conforming items identified for airport design standards and the close-in FAR Part 77 airspace imaginary surfaces described throughout this chapter. Summary tables are provided in **Appendix A** that briefly outline the key issues involved and the feasibility of mitigating non-conforming items based on the consultant's facility evaluations (See Appendix **Table A-1 and A-2**). The detailed technical evaluations for each of the items and a summary of activity-driven facility requirements are provided later in this chapter.

The standards assumed for Runway 7/25 are based on small aircraft included in Airplane Design Group I (ADG I) and Aircraft Approach Category B, which is consistent with Airport Reference Code (ARC) B-I (small). The airspace planning criteria for the runway are based on utility runways with visual approaches, which represent the current level of capabilities at Sunnyside Municipal Airport. An evaluation of feasibility for upgrading the approach capabilities of Runway 7/25 to non-precision instrument was conducted prior to the evaluation of facility requirements. This information is presented later in this chapter. The general assessment of conformance indicates that most existing facilities at Sunnyside Municipal Airport meet FAA standards. In instances where standards are not met, it appears that correcting the items is feasible.

LEGEND

	EXISTING	FUTURE
FACILITIES		
BUILDINGS		
RUNWAY		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
TAXIWAY OBJECT FREE AREA (TOFA)		
OBSTACLE FREE ZONE (OFZ)		
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS		SAME
AIRPORT REFERENCE POINT (ARP)		
PROPOSED AIRFIELD PAVEMENT	N/A	
VISUAL GUIDANCE INDICATORS	NONE	PAPI
WIND INDICATOR		
AVIGATION EASEMENT		SAME
FENCE		
PROPOSED ACCESS ROAD	NONE	
BEACON		SAME
THRESHOLD LIGHTS		
SEGMENTED CIRCLE WIND INDICATOR		
REIL	NONE	

FAA AIRPORT DESIGN STANDARDS

1 - RPZ: ROADS, OFF AIRPORT PROPERTY (AIRPORT CONTROL)

2 - TAXILANE OFA: PARKED AIRCRAFT TIEDOWNS LOCATED WITH DEFINED AREA

FAR PART 77 SURFACE PENETRATIONS/CONFLICTS

A - APPROACH SURFACE: ROAD/VEHICLES

B - TRANSITIONAL SURFACE: ROAD/VEHICLES

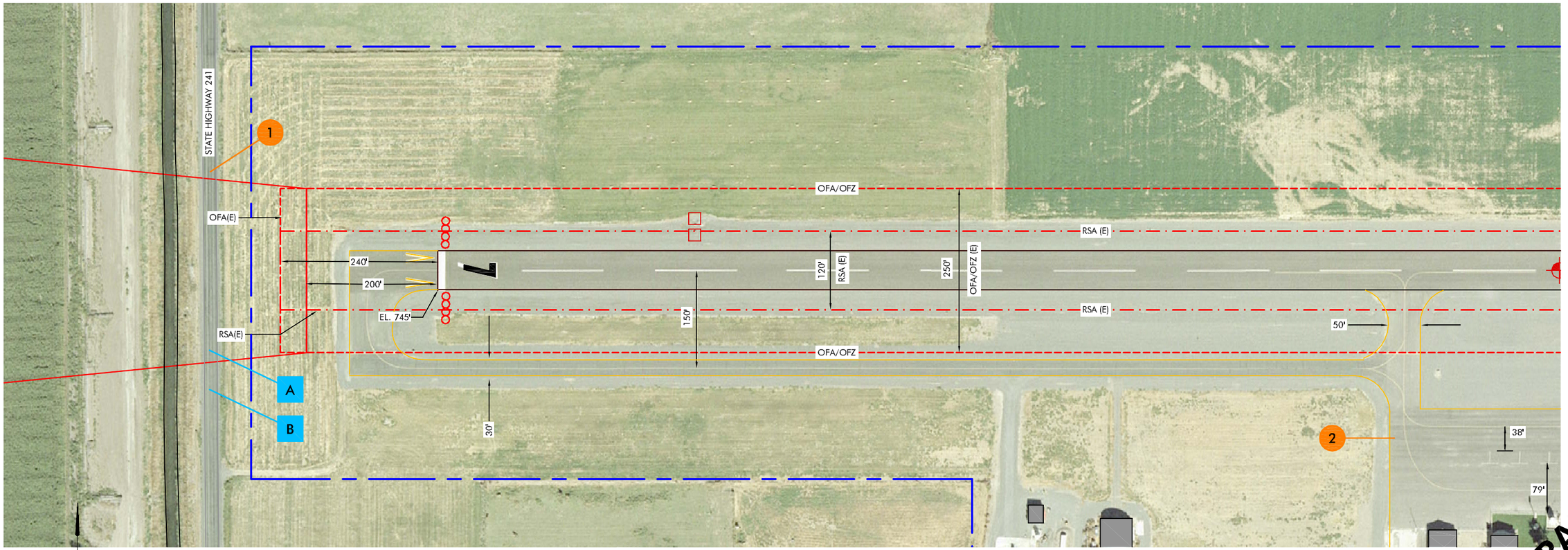


PHOTO SOURCE: WALKER & ASSOCIATES (09-05)

CENTURY WEST ENGINEERING CORPORATION

Washington State Department of Transportation Aviation Division

SUNNYSIDE MUNICIPAL AIRPORT
NONSTANDARD ITEMS
RUNWAY 07 END AND APRON

FIGURE NO. 3-1

DRAFT

LEGEND

	EXISTING	FUTURE
FACILITIES		
BUILDINGS		
RUNWAY		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
TAXIWAY OBJECT FREE AREA (TOFA)		
OBSTACLE FREE ZONE (OFZ)		
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS		SAME
AIRPORT REFERENCE POINT (ARP)		
PROPOSED AIRFIELD PAVEMENT	N/A	
VISUAL GUIDANCE INDICATORS	NONE	PAPI
WIND INDICATOR		
AVIGATION EASEMENT		SAME
FENCE		
PROPOSED ACCESS ROAD	NONE	
BEACON		SAME
THRESHOLD LIGHTS		
SEGMENTED CIRCLE WIND INDICATOR		
REIL	NONE	

FAA AIRPORT DESIGN STANDARDS

1 - RSA/OFA/OFZ: PROTECTED AREAS EXTEND BEYOND AIRPORT PROPERTY; UNIMPROVED (PRIVATE) ROAD LOCATED WITHIN PROTECTED AREAS.

2 - OFZ/OFA: MANHOLE STRUCTURE ELEVATED ABOVE GRADE

3 - RPZ: EXTENDS OFF AIRPORT PROPERTY (AIRPORT CONTROL)

4 - RSA: SURFACE CONDITION STANDARDS (GRADING AND COMPACTION)

5 - TAXILANE OFA: HANGAR LOCATED WITHIN DEFINED AREA

6 - TAXILANE OFA: PARKED AIRCRAFT LOCATED WITHIN DEFINED AREA

FAR PART 77 SURFACE PENETRATIONS/CONFLICTS

A - PRIMARY SURFACE: DEFINED AREA EXTENDS BEYOND AIRPORT PROPERTY; UNIMPROVED (PRIVATE) ROAD LOCATED WITHIN SURFACE.

B - APPROACH SURFACE: VEHICLES TRAVELING ON PRIVATE ROADWAY PENETRATE SURFACE.

C - PRIMARY SURFACE: MANHOLE COVER EXPOSED ABOVE GRADE < 10"

D - TRANSITIONAL SURFACE: ROAD/VEHICLES.

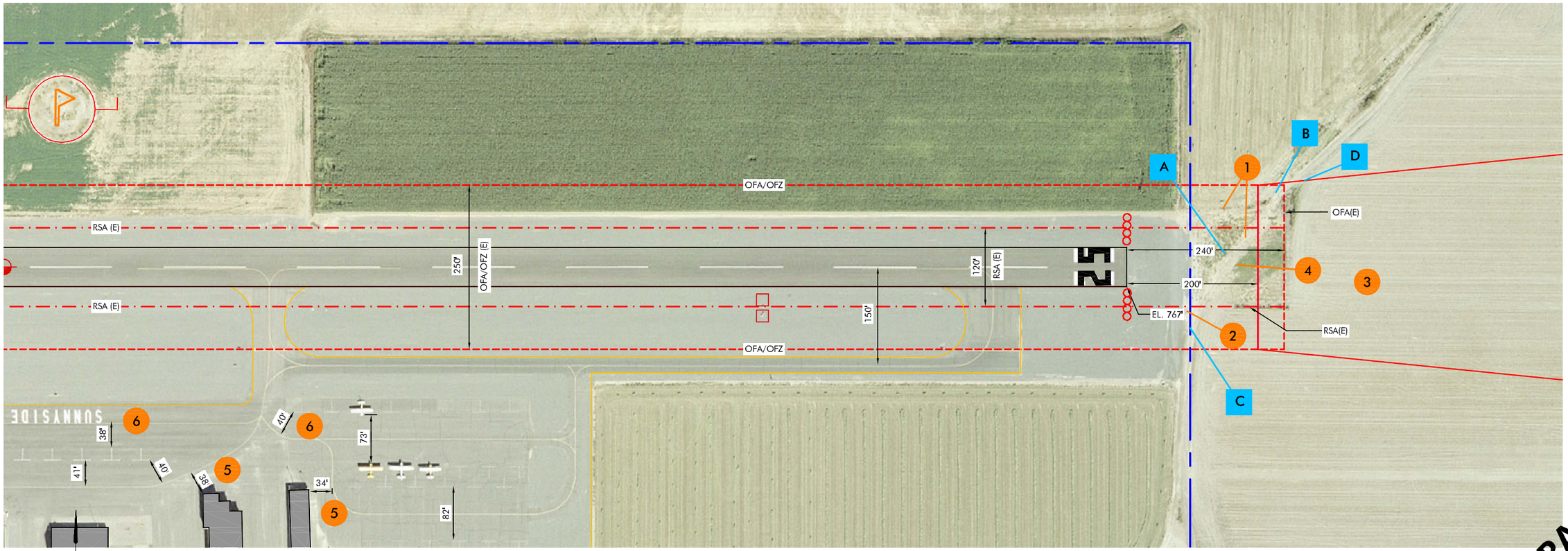


PHOTO SOURCE: WALKER & ASSOCIATES (09-05)

CENTURY WEST ENGINEERING CORPORATION

Washington State Department of Transportation Aviation Division

SUNNYSIDE MUNICIPAL AIRPORT
NONSTANDARD ITEMS
RUNWAY 25 END AND APRON

FIGURE NO. 3-2

DRAFT

AIRPORT FACILITY REQUIREMENTS EVALUATION

Development Issues – Overview

Sunnyside Municipal Airport currently accommodates predominantly small single-engine and multi-engine piston aircraft, with relatively limited amounts of larger aircraft activity consisting mostly of business class turboprops and business jets, including medevac flights.

As noted in the inventory chapter, the parallel taxiway serving Runway 7/25 has extensive cracking that will require major repair or reconstruction, rather than simple repair or rehabilitation. As a result, the existing taxiway pavement will need to be removed, the base and subbase will be upgraded, and a new asphalt surface course will be applied. It is anticipated that the cost of this major reconstruction will be similar to new construction.

In the interest of preserving the airport's long-term potential of accommodating larger business class aircraft, the City of Sunnyside has indicated a desire to relocate parallel taxiway when it is reconstructed to meet the airplane design group (ADG) II runway-taxiway separations. The taxiway would be constructed to ADG I width standards with a pavement strength comparable to the runway (12,500 pounds for aircraft with single wheel landing gear). Although the forecast levels of ADG II aircraft activity during the current planning period are below the levels required by FAA use in defining the design aircraft, designing the taxiway (separation) to exceed ADG I standards eliminates the potential of a future taxiway relocation if ADG II traffic levels increase significantly. Additional information about future taxiway improvements is provided later in the chapter.

Historic Airport Planning Overview

Limited planning evaluations have been conducted for Sunnyside Municipal Airport in recent years. The most recent FAA-approved ALP for the airport was prepared in 1992. At the time the 1992 ALP was prepared, there were 4 hangars the airport, including the T-hangar, the older multiple–unit hangar, a large conventional hangar and the small conventional hangar located near the west end of the apron. No future hangar development sites are depicted on the ALP. One additional hangar has been constructed at the airport since the ALP was last updated (Quonset hangar located west of the main apron).

The 1992 ALP depicts Runway 7/25 with an existing and ultimate length of 3,365 feet. This dimension includes a 147-foot displaced threshold for Runway 7, but does not include the eastern 156 feet of runway pavement, which is identified as "relocated runway threshold." The current surveyed length of Runway 7/25 is 3,422 feet; the Runway 25 threshold is located at the end of the runway pavement and threshold for Runway 7 is relocated 147 feet from the west end of the pavement.

The 1992 ALP indicates an existing and future airport reference code (ARC) of B-I, with a Cessna 310 listed as the design aircraft. The Cessna 310 is a light twin-engine aircraft that weighs less than 12,500 pounds. Based on the selection of the design aircraft, ARC B-I (small aircraft) was used as the planning standard for most facilities. The runway-taxiway facilities are generally consistent with ADG I (small) design standards, although the parallel taxiway width of 30 feet exceeds the ADG I standard (25 feet), but does not meet the ADG II standard (35 feet).

More recently, the **Sunnyside Municipal Airport Development Plan** (Airside, April 1996) was completed. Although the plan referenced some FAA design standards issues, it did not provide the technical analyses required to address FAA requirements currently in the ALP process. Although the Airside plan does not list the specific airport reference code (ARC) recommended for the airport, most of the dimensions reflected in the plan are consistent with airplane design group I (ADG I) and approach category A, which would result in ARC A-I (for small aircraft exclusively). The plan does not provide any quantification of specific need (i.e., forecast demand) for recommended facility improvements.

Based on the limited direction provided for new development in the previous planning efforts, they do not provide sufficient detail in guiding future facility planning.

LAND UTILIZATION

The 1992 Airport Layout Plan does not list the acreage of the airport; however, the current FAA 5010-1 Airport Record Form indicates that airport acreage totals 81 acres (rounded from 80.9). The airport land area includes developed areas (the runway-taxiway system and protected areas, the north and east landside areas) and undeveloped areas. **Table 3-3** summarizes the existing areas and land uses, with acreages estimated based on aerial photography review.

The airport's available undeveloped landside areas appear to have adequate capacity to accommodate 20-year forecast demand and well beyond for facilities (i.e., hangars, apron parking, etc.). Although the existing property ownership cannot accommodate any runway extensions, the property located immediately east of the runway was acquired several years ago by the Port of Sunnyside with the intent of protecting it for future airport development.

TABLE 3-3:
SUNNYSIDE MUNICIPAL AIRPORT LAND USE CONFIGURATION

Existing Land Use	Acreage *(rounded)*	Percentage of Total Airport Property
Airside Area Runway, Parallel Taxiway, Runway Protection Zones, Object Free Area, Runway Safety Area, Obstacle Free Zone, Primary Surface	27.7	34%
North Landside Area Undeveloped area located between OFA and north property line	18.6	23%
Southeast Landside Area Undeveloped land located south of east tiedown apron and east end of the runway (includes City water well facility)	17.9	22%
South Landside Area Development area located between airport access road and aircraft parking apron	16.7	21%
Total	**81**	**100%**

AIRSPACE

The airspace structure in the vicinity of Sunnyside Municipal Airport is uncomplicated and is not expected to constrain future airport development or operation. The current FAR Part 77 airspace surfaces associated with Runway 7/25 are based on visual approach capabilities and use by small aircraft (weighing less than 12,500 pounds).[12,13] The existing visual airspace surfaces are also compatible with a circling instrument approach procedure. A circling instrument approach provides guidance to the airport environment, rather than a particular runway end, and the pilot must maintain visual contact with the airport environment once passed the missed approach point. The 1992 Airspace Plan depicts no areas of terrain penetration within the defined FAR Part 77 airspace surfaces. The airspace surfaces will be reviewed during development of an updated FAR Part 77 airspace plan drawing.

As noted earlier, the FAA Flight Procedures Office conducted a preliminary evaluation of the feasibility of establishing an instrument approach to the airport. Based on a review of the terrain surrounding the airport and established instrument approach planning criteria, the FAA determined that it is feasible to develop a non-precision instrument approach to both ends of Runway 7/25. However, it is noted that the distances between the ends of the runway and nearby roadways, suggests that close-in obstruction clearance for an approach to Runway 25 will easier to obtain than for Runway 7. However, options for accommodating approaches at both ends, or a straight-in

[12] In FAR Part 77, utility runways are designed to accommodate aircraft weighing less than 12,500 pounds.
[13] As depicted on current FAA-approved Airport Airspace Drawing (TRA 1992)

approach to one runway end combined with a circling approach procedure should be considered as part of the runway configuration evaluation in the alternatives analysis.

AIRPORT DESIGN STANDARDS

The selection of the appropriate design standards for the development of airfield facilities is based primarily upon the characteristics of the aircraft that are expected to use the airport. The most critical characteristics are the approach speed and wingspan of the design aircraft anticipated for the airport. The **design aircraft** is defined as the most demanding aircraft type operating at the airport with a minimum of 500 annual itinerant operations (takeoffs and landings). This level of annual activity is considered to be "substantial use" by FAA.

Federal Aviation Administration (FAA) **Advisory Circular (AC) 150/5300-13, Airport Design**, serves as the primary reference in planning airfield facilities. Federal Air Regulation (**FAR) Part 77, Objects Affecting Navigable Airspace**, defines airport imaginary surfaces, which are established to protect the airspace immediately surrounding a runway. The airspace and ground areas surrounding a runway should be free of obstructions (i.e., structures, parked aircraft, terrain, trees, etc.) to the greatest extent possible.

FAA **Advisory Circular 150/5300-13** groups aircraft into five categories based upon their approach speed. Categories A and B include small propeller aircraft, some smaller business jet aircraft, and some larger aircraft with approach speeds of less than 121 knots. Categories C, D, and E consist of the remaining business jets as well as larger jet and propeller aircraft generally associated with commercial and military use; these aircraft have approach speeds of 121 knots or more. The advisory circular also establishes six airplane design groups (ADG), based on the physical size (wingspan) of the aircraft. The categories range from ADG I, for aircraft with wingspans of less than 49 feet, to ADG VI for the largest commercial and military aircraft. ADG I is further divided into two subcategories: runways serving "small airplanes exclusively" and runways serving aircraft weighing more than 12,500 pounds. Aircraft with a maximum gross takeoff weight of less than 12,500 pounds are classified as "small aircraft" by the FAA. A summary of typical aircraft and their respective design categories is presented in **Table 3-4.**

TABLE 3-4:
TYPICAL AIRCRAFT & DESIGN CATEGORIES

Aircraft	Airplane Design Group	Aircraft Approach Category	Maximum Gross Takeoff Weight (Lbs)
Piper PA-28/32 Cherokee	A	I	2,550
Cessna 182	A	I	2,950
Cirrus SR20	A	I	3.000
Lancair Columbia 300	A	I	3,400
Cessna 206	A	I	3,600
Beechcraft Bonanza A36	A	I	3,650
Cessna 210	A	I	3,850
Socata/Aerospatiale TBM 700	A	I	6,579
Beechcraft Baron 58	B	I	6,200
Eclipse 500	B	I	5,640
Piper Aerostar 602P	B	I	6,000
Cessna P337 Skymaster	B	I	4,630
Cessna 402	B	I	6,300
Cessna 421	B	I	7,450
Cessna Citation CJ1 (CE525)	B	I	10,600
Beechcraft Super King Air 200	B	II	12,500
Piper Malibu	A	II	4,300
Cessna Caravan 1	A	II	8,000
Pilatus PC-12	A	II	9,920
Cessna Citation CJ2+ (CE525A)	B	II	12,500
Cessna Citation Bravo (CE550)	B	II	14,800
Cessna Citation Encore (CE560)	B	II	16,630
Cessna Citation Excel (CE560XL)	B	II	20,000
Dassault Falcon 20	B	II	28,660
Learjet 25	C	I	15,000
Learjet 60	C	I	23,100
Canadair Challenger	C	II	45,100
Gulfstream IV (G450)	D	II	71,780

Source: FAA Advisory Circular (AC) 150/5300-13 (change 9); Jane's Aircraft Guide; aircraft manufacturer data.

Design Aircraft

As noted in Chapter Two, current and forecast activity consists of predominantly small single-engine and multi-engine piston aircraft. The characteristics for a typical multi-engine piston aircraft, such as a Cessna 421 are summarized below:

Cessna 421 *(typical cabin-class piston twin; 6-8 passengers; maximum gross takeoff weight 7,450 pounds)*
• Aircraft Approach Category B *(approach speed: 96 knots)* • Airplane Design Group I *(wingspan: 41.7 feet)* • Small Airplane *(maximum gross takeoff weight < 12,500#)*
Airport Reference Code: B-I (small)

The design standards for ADG I (small aircraft) are summarized in **Table 3-5**, in addition to the standards for ADG I (including large and small aircraft) and ADG II aircraft. A summary of Sunnyside Municipal Airport's current conformance with both existing ADG I (small) and the other design standards and FAR Part 77 airspace surfaces is presented in **Table 3-6**. It should be noted that not meeting various design standards does not necessarily indicate an inability to meet standards, but does illustrate a need to upgrades facilities to be consistent with FAA standards.

TABLE 3-5:
AIRPORT DESIGN STANDARDS SUMMARY
(DIMENSIONS IN FEET)

Standard	Runway 7/25 *Existing Conditions*	ADG I[1] *(small aircraft exclusively)*	ADG I[1] A&B Aircraft	ADG II[2] A&B Aircraft
Runway Length	3,422	3,300/3,930 [3]	3,300/3,930 [3]	4,080/5,490 [4]
Runway Width	60	60	60	75
Runway Shoulder Width	10	10	10	10
Runway Safety Area Width	120 [5]	120	120	150
Runway Safety Area Length (Beyond Rwy Roll-out End)	240 (west); 100 (east) [5]	240	240	300
Obstacle-Free Zone Width/ Length Beyond Rwy Roll-out End	250/ 200 (west); 100 (east) [6]	250	400	400
Object Free Area Width	250 [7]	250	400	500
Object Free Area Length (Beyond Rwy Roll-out End)	240 (west); 100 (east) [7]	240	240	300
Primary Surface Width	250 [8]	250	500	500
Primary Surface Length (Beyond Rwy Roll-out End)	200 (west); 100 (east) [8]	200	200	200
Runway Protection Zone Length	1,000 [9]	1,000	1,000	1,000
Runway Protection Zone Inner Width	250 [9]	250	500	500
Runway Protection Zone Outer Width	450 [9]	450	700	700
Runway Centerline to:				
Parallel Taxiway/Taxilane CL	150	150	225	240
Aircraft Parking Area	200 [10]	181/195 [13]	306 [15]	320 [17]
Building Restriction Line	340 (south) [11]	251[14]	376 [16]	376 [18]
Taxiway Width	30	25	25	35
Taxiway Shoulder Width	10	10	10	10
Taxiway Safety Area Width	49	49	49	49
Taxiway Object Free Area Width	89	89	89	131
Taxiway Centerline to Fixed or Movable Object	44.5	44.5	44.5	65.5
Taxilane Object Free Area Width	<79 [12]	79	79	115
Taxilane Centerline to Fixed or Movable Object	<39.5 [12]	39.5	39.5	57.5

Table 3-5 Notes:

1. Utility runways (Per FAR Part 77); all other dimensions reflect visual runways and runways with not lower than 3/4-statute mile approach visibility minimums (per AC 150/5300-13, Change 10). RPZ dimensions base on visual and not lower than 1-mile approach visibility minimums. Dimensions for ADG I (A&B Aircraft) reflect "larger than utility" aircraft and nonprecision instrument approaches (per FAR Part 77).
2. Larger-Than-Utility (nonprecision instrument) runways (Per FAR Part 77); all other dimensions reflect visual runways and runways with not lower than 3/4-statute mile approach visibility minimums (per AC 150/5300-13, Change 10). RPZ dimensions base on visual and not lower than 1-mile approach visibility minimums.
3. Runway lengths required to accommodate 95 and 100 percent of General Aviation Fleet 12,500 pounds or less. 89.7 degrees F, 22-foot change in runway centerline elevation.
4. Runway length required to accommodate 100 percent of General Aviation Fleet 12,500 pounds or less and the design aircraft (75% of large airplane fleet at 60% useful load - typical medium business jet). 89.7 degrees F, 22-foot change in runway centerline elevation.
5. Majority of RSA meets ADG I standard; east end limited by dirt road and property ownership.
6. Majority of runway OFZ meets standard; east end limited by dirt road and property ownership.
7. Majority of runway OFA meets ADG I standard; east end limited by dirt road and property ownership.
8. Majority of primary surface meets clearing standard; east end limited by dirt road and property ownership.
9. RPZs extend beyond airport property at both ends of the runway.
10. The nearest aircraft parking position on the tiedown apron is approximately 200 feet from runway centerline.
11. The nearest hangar is approximately 340 feet from runway centerline.
12. Limited number of aircraft tiedowns (parked aircraft) located within taxilane OFA on aprons.
13. Distance required with/without ADG I (small) parallel taxiway to meet OFA clearance and clear 8-foot aircraft tail height (typ. small single-engine) in transitional surface for visual approach.
14. Distance required to protect an ADG I (small) parallel taxiway OFA and to accommodate an 18-foot structure (top elevation of structure above runway elevation at the BRL) without penetrating the 7:1 Transitional Surface.
15. Distance required to protect an ADG I (A&B Aircraft) parallel taxiway OFA and clear 8-foot aircraft tail height (typ. small single-engine) in transitional surface for nonprecision instrument approach.
16. Distance required to protect an ADG I (A&B Aircraft) parallel taxiway OFA and to accommodate an 18-foot structure (at the BRL) without penetrating the 7:1 Transitional Surface for nonprecision instrument approach.
17. Distance required to protect an ADG II (A&B Aircraft) parallel taxiway OFA and clear 10-foot aircraft tail height (typ. small multi-engine aircraft) in transitional surface for nonprecision instrument approach.
18. Distance required to protect an ADG II (A&B Aircraft) parallel taxiway OFA and to accommodate an 18-foot structure (at the BRL) without penetrating the 7:1 Transitional Surface (assumes 500-foot wide primary surface required for "large airplanes" and nonprecision instrument approaches).

TABLE 3-6:
RUNWAY 7/25 CURRENT CONFORMANCE WITH FAA DESIGN STANDARDS & FAR PART 77 IMAGINARY SURFACE CLEARANCES

Item	**ADG I** (small) *Visual and NTL ¾ Mile Visibility FAR Part 77: Visual (current standard)*	**ADG I** (A & B aircraft) *Visual and NTL ¾ Mile Visibility FAR Part 77: Visual*	**ADG I** (A & B aircraft) *Visual and NTL ¾ Mile Visibility FAR Part 77: Non-Precision Instrument*	**ADG II** (A & B aircraft) *Visual and NTL ¾ Mile Visibility FAR Part 77: Non-Precision Instrument*
Runway Safety Area	No *(east end only)*	No	No	No
Runway Object Free Area	No *(east end only)*	No	No	No
Runway Obstacle Free Zone	No *(east end only)*	No	No	No
Taxiway Safety Area	Yes	No	No	No
Taxiway Object Free Area	Yes	No	No	No
Taxilane Object Free Area	No *(apron only)*	No	No	No
Building Restriction Line – South	No	No	No	No
Aircraft Parking Line – South	Yes	No	No	No
Building Restriction Line – North	N/A	N/A	N/A	N/A
Aircraft Parking Line – North	N/A	N/A	N/A	N/A
Runway Protection Zones	No	No	No	No
Runway-Parallel Taxiway Separation	Yes	No	No	No
Runway Width	Yes	Yes	Yes	No
Runway Length	Yes	Yes	No	No
Taxiway Width	Yes	Yes	Yes	No
Approach Surfaces (Required Slope/Clear: Yes/No?)	20:1/No (Rwy 7)	20:1/No (Rwy 7)	20:1/No (Rwy 7)	20:1/34:1 (Rwy 7) No (Rwy 25) TBD
Primary Surface (Clear)	No *(east end only)*	No *(east end only)*	No *(east end only)*	No *(east end only)*
Transitional Surface (Clear)	Yes	No *(south side only)*	No *(south side only)*	No *(south side only)*
Horizontal Surface (Clear)	Yes	Yes	Yes	Yes
Conical Surface (Clear)	Yes	Yes	Yes	Yes

Runway Safety Area (RSA)

The FAA defines runway safety area (RSA) as "A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." Runway safety areas are most commonly used by aircraft that inadvertently leave (or miss) the runway environment during landing or takeoff.

By FAA design standard, the RSA "*shall be:*

(1) cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;

(2) drained by grading or storm sewers to prevent water accumulation;

(3) capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and

(4) free of objects, except for objects that need to be located in the runway safety area because of their function. Objects higher than 3 inches above grade should be constructed on low impact resistant supports (frangible mounted structures) of the lowest practical height with the frangible point no higher than 3 inches. Other objects such as manholes, should be constructed at grade. In no case should their height exceed 3 inches."

The FAA, emphasizing the significance placed on meeting runway safety area standards provides the following guidance *"RSA standards cannot be modified or waived like other design standards. The dimensional standards remain in effect regardless of the presence of natural or man-made objects or surface conditions that might create a hazard to aircraft that leave the runway surface…A continuous evaluation of all practicable alternatives for improving each sub-standard RSA is required until it meets all standards…"*

The recommended transverse grade for the lateral RSA ranges between 1½ and 5 percent from runway shoulder edges. The recommended longitudinal grade for the first 200 feet of extended RSA beyond the runway end is 0 to 3 percent. The remainder of the RSA must remain below the runway approach surface slope. The maximum negative grade is 5 percent. Limits on longitudinal grade changes are plus or minus 2 percent per 100 feet within the RSA. The airport sponsor should regularly clear the RSA of brush or other debris and periodically grade and compact the RSA to maintain FAA standards.

Items located within the RSA, such as runway edge lights or threshold lights are mounted on frangible supports (breakable coupling and disconnect plug). Any future lighting (such as PAPI, REILS, etc.) located within the RSA also need to meet the FAA frangibility standard.

ARC: B-I (small)

The east end of the RSA is limited by airport property ownership. Although no fence exists within the ADG I (small) RSA dimensional boundary and the overall area is relatively level, there is no evidence of prepared RSA (graded and compacted surface, etc.) beyond the airport property line. The prepared RSA extends approximately 100 feet beyond the Runway 25 threshold. The RSA that is contained within airport property appears to be relatively level and requires only periodic grading and compaction to meet FAA surface condition standards. Any proposed changes in runway length will also require extending the RSA.

Runway Object Free Area (OFA)

Runway object free areas (OFA) are two dimensional surfaces intended to be clear of ground objects that protrude above the runway safety area edge elevation. Obstructions within the OFA may interfere with aircraft flight in the immediate vicinity of the runway. The airport sponsor should regularly clear the OFA of brush or other debris to maintain FAA standards.

The FAA defines the OFA clearing standard:

"The OFA clearing standard requires clearing the OFA of above ground objects protruding above the runway safety area edge elevation. Except where precluded by other clearing standards, it is acceptable to place objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes and to taxi and hold aircraft in the OFA. Objects non-essential for air navigation or aircraft ground maneuvering purposes are not to be placed in the OFA. This includes parked airplanes and agricultural operations."

ARC: B-I (small)

The eastern end of the OFA is limited by airport property ownership, although no fence exists within the ADG I (small) OFA dimensional boundary and the overall area is relatively level. A manhole located near the east end of the OFA has exposed edges that exceed 3 inches above grade; minor grading can be conducted to meet the clearance standard. The OFA that is contained within airport property is relatively level and requires only periodic grading and removal of small bushes and other vegetation to meet the clearing standards. Any proposed changes in runway length will also require extending the OFA.

Obstacle Free Zone (OFZ)

The OFZ is a plane of clear airspace extending upward to a height of 150 feet above runway elevation, which coincides with the FAR Part 77 horizontal surface elevation. The FAA defines the following clearing standard for the OFZ:

"The OFZ clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual NAVAIDs that need to located in the OFZ because of their function."

The OFZ may include the Runway OFZ, the Inner-approach OFZ (for runways with approach lighting systems), and the Inner-transitional OFZ (for runways with lower than ¾-statute mile approach visibility minimums. At Sunnyside Municipal Airport, only the Runway OFZ is required based on runway configuration and planned approach capabilities. The future development of aircraft holding areas or new taxiway connections should be designed to allow holding aircraft to remain clear of the OFZ. The FAA defines the Runway OFZ as:

"The runway OFZ is a defined volume of airspace centered above the runway centerline. The runway OFZ is the airspace above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The runway OFZ extends 200 feet beyond each end of the runway."

ARC: B-I (small)

The OFZ for the runway has the same lateral dimension as the OFA, described above, although it extends 200 feet from each runway end. Any items that conflict with the OFA described earlier, also conflict with the OFZ. Consequently, actions recommended to meet the OFA standards will also address the OFZ standards. Any proposed changes in runway length will also require extending the OFZ.

Taxiway Safety Area

The taxiways at Sunnyside Municipal Airport include a south parallel taxiway with west and east sections that extend from the main apron to both ends of Runway 7/25. The airport has two sections of apron with several defined taxilanes providing access to aircraft parking areas and adjacent hangars.

ARC: B-I (small)

The south parallel taxiway appears to meet safety area dimensional and clearing standards. The taxiway safety areas should be regularly cleared of brush or other debris and periodically graded and compacted to maintain FAA standards.

Taxiway/Taxilane Object Free Area

A taxiway or taxilane object free area (OFA) is intended to protect taxiing aircraft from obstructions that could interfere with safe movement, particularly at night or during reduced visibility conditions. Based on FAA clearance requirements, no parked aircraft or structures should be located within a taxiway or taxilane OFA.

ARC: B-I (small)

The south parallel taxiway appears to meet OFA dimensional (extending 44.5 feet either side of taxiway centerline) and clearing standards. The taxiway OFA should be regularly cleared of brush or other debris and periodically graded to maintain FAA standards.

The taxilanes located on the main apron and the adjacent east tiedown apron, have several items located within the standard taxilane OFA (extending 39.5 feet either side of taxilane centerline). Aircraft parked in several aircraft tiedown positions protrude into the ADG I taxilane OFA. The eastern-most T-hangar (northeast corner) is located approximately 34 feet from the adjacent taxilane centerline serving the east tiedown apron; the northwest corner of the larger multi-unit hangar is located approximately 38 feet from the adjacent taxilane centerline.

Options for retroactively meeting the taxilane clearing standards adjacent to existing hangars are limited and may not be economically feasible. Modification of existing aircraft tiedowns may be done in conjunction with future apron expansion/reconfiguration. Future taxiways or taxilanes and associated development (aircraft parking, hangars, etc.) should be designed to meet the OFA clearing standard.

Building Restriction Line (BRL)

A building restriction line (BRL) identifies areas on an airport where structures can be located to be compatible with airfield operations. Buildings should not conflict with the recommended airport design standards defined for a particular runway-taxiway system or the protected airspace associated with the runway. The location of the BRL is measured from the runway centerline outward in a perpendicular direction. BRL locations are established based on the ability to accommodate common airport building types (e.g., T-hangars, small conventional hangars, large conventional hangars, etc.) while protecting the FAR Part 77 primary and transitional surfaces that extend outward along the sides of a runway.

ARC: B-I (small)

All existing hangars are located on the south side of the runway, with the nearest located approximately 338 feet from centerline. The 1992 ALP depicts a south side BRL located 370 feet from runway centerline, which can accommodate a roof elevation 35 feet above runway elevation

based on the current utility visual runway designation. However, if a nonprecision instrument approach is developed for the runway, the maximum roof elevation at the 370-foot BRL would be reduced to 17.1 feet above the runway elevation due to an increase in the primary surface width. As noted earlier in this chapter (see **Table 3-5**), a 376-foot BRL will accommodate a structure height 18 feet above runway elevation for a utility category nonprecision instrument runway. This distance is recommended and will accommodate typical small/medium conventional hangars and T-hangars. Larger buildings would require greater separation distances, depending on their roof heights.

Any existing structures that penetrate a transitional surface associated with a future instrument approach should be marked with roof-mounted obstruction lights if they cannot be relocated.

Runway Protection Zones (RPZ)

Runway protection zones (RPZ) are located at each end of a runway. The FAA provides the following definition for runway protection zones (RPZ):

"The RPZ's function is to enhance the protection of people and property on the ground. This is achieved through airport owner control over RPZs. Such control includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities. Control is preferably exercised through the acquisition of property interest in the RPZ. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The RPZ begins 200 feet beyond the end of the area useable for takeoff or landing."

As noted above, RPZs with buildings, roadways, or other items do not fully comply with FAA standards. It is recognized that realigning major surface roads routes located within the RPZs may not be highly feasible. Where possible, the City of Sunnyside and Yakima County should discourage development within the RPZs (particularly structures) that is inconsistent with FAA standards.

ARC: B-I (small)

The RPZ dimensions consistent with these design standards are 250 x 450 x 700 feet based on the following criteria: facilities expected to serve small aircraft exclusively with visual and not lower than 1-mile approach visibility minimums. The criteria are consistent with both visual and most nonprecision instrument approaches for utility runways.

The existing RPZs at both ends of the runway extend beyond airport property. The Runway 7 RPZ has a public road (Highway 241) crossing approximately 184 feet from the runway end. The Runway 25 RPZ has a private dirt road located approximately 100 feet from the runway end at its nearest point. The airport should maintain avigation easements for the portions of the RPZs that are not in airport ownership. Options for relocating roads away from runway ends should be considered in the alternatives analysis.

Aircraft Parking Line (APL)

Aircraft parking lines (APL) are used to identify areas on an airport where aircraft can be parked clear of all airfield protected areas and airspace.

ARC: B-I (small)

The nearest aircraft parking positions to the runway are located approximately 200 feet from runway centerline, which is consistent with the required design standards and visual approaches. Based on current design standards and the existing parallel taxiway configurations, the APL would need to be located a minimum of 194.5 feet from runway centerline to accommodate the taxiway object free area (extends 44.5 feet from taxiway centerline); this setback will accommodate a 9.9-foot tail height (above runway elevation) without penetrating the runway transitional surface.

However, if a straight-in nonprecision instrument approach was added and the small airplane design standards were maintained, the APL would need to be relocated to approximately 306 feet from the runway centerline to accommodate an 8-foot tail height without penetrating the runway transitional surface associated with the wider runway primary surface (increased from 250 feet to 500 feet wide).

As noted earlier in this chapter, the City of Sunnyside has decided to increase the lateral separation between the runway and parallel taxiway from 150 to 240 feet (ADG II standard) as part of the reconstruction of the south parallel taxiway. For planning purposes, the ADG II taxiway object free area should be protected (extending 65.5 feet from taxiway centerline), which results in APL of 305.5 feet based on the new taxiway location. This setback is comparable with the distance required to accommodate an 8-foot tail height without penetrating the transitional surface for a nonprecision instrument runway.

Runway-Parallel Taxiway Separation

ARC: B-I (small)

Runway 7/25 is served by a south parallel taxiway with separations of 150 feet, consistent with the ADG I (small) standard.

Since replacement of the parallel taxiway represents a significant long-term investment, the City of Sunnyside has determined that increasing the runway separation distance to meet ADG II standards is a cost effective approach that best preserves the airport's ability to accommodate larger aircraft in the future. This option provides the flexibility for accommodating larger aircraft in the future and eliminates the potential expense of twice-constructing (and relocating) the taxiway if future airport activity justifies an upgrade in design standards.

Based on ADG II standards (Approach Category A & B aircraft), the new parallel taxiway would be located 240 feet from runway centerline. The additional runway-taxiway separation will increase the length of the connecting taxiways by 90 feet, which will increase costs over the in-place reconstruction option. This facility upgrade will eliminate approximately 16 aircraft tiedowns located along the outer edges of the aircraft aprons. These tiedowns are located within the taxiway object free area for the new taxiway location. **Figure 3-3** illustrates the standard runway-parallel taxiway separations required for Airplane Design Group (ADG) I (small aircraft) and ADG II. The specific impacts of a relocated taxiway on existing facilities (i.e., aircraft apron and tiedowns) are addressed later in this chapter.

LEGEND

B-I (SMALL)

B-II

AIRCRAFT APPROACH CATEGORY A&B AIRCRAFT
VISIBILITY NOT LOWER THAN 1 MILE
500 X 700 X 1000

AIRCRAFT APPROACH CATEGORY A&B AIRCRAFT
VISIBILITY NOT LOWER THAN 1 MILE
500 X 700 X 1000

BRL (18')

OFA

RSA

3422' X 60' (E)

4000' X 60' (F)

150'

240'

150'

RSA

500'

300'

OFA

300'

TOFA

65.5'

376'

TOFA

BRL (18')

BRL (18')

STATE HIGHWAY 241

E EDISON RD

RAY RD

15' CLEARANCE (VEHICLES ON ROADWAY) FOR NON PRECISION INSTRUMENT APPROACH SURFACE (34:1).

15' CLEARANCE (VEHICLES ON ROADWAY) FOR VISUAL APPROACH SURFACE (20:1).

N

200 0 200
SCALE: 1"=200'

SOURCE: WALKER AND ASSOCIATES
(9-22-05)

CENTURY WEST
ENGINEERING CORPORATION

SUNNYSIDE MUNICIPAL AIRPORT
RUNWAY-TAXIWAY CONFIGURATION OPTIONS

FIGURE
3-3

FAR Part 77 Surfaces

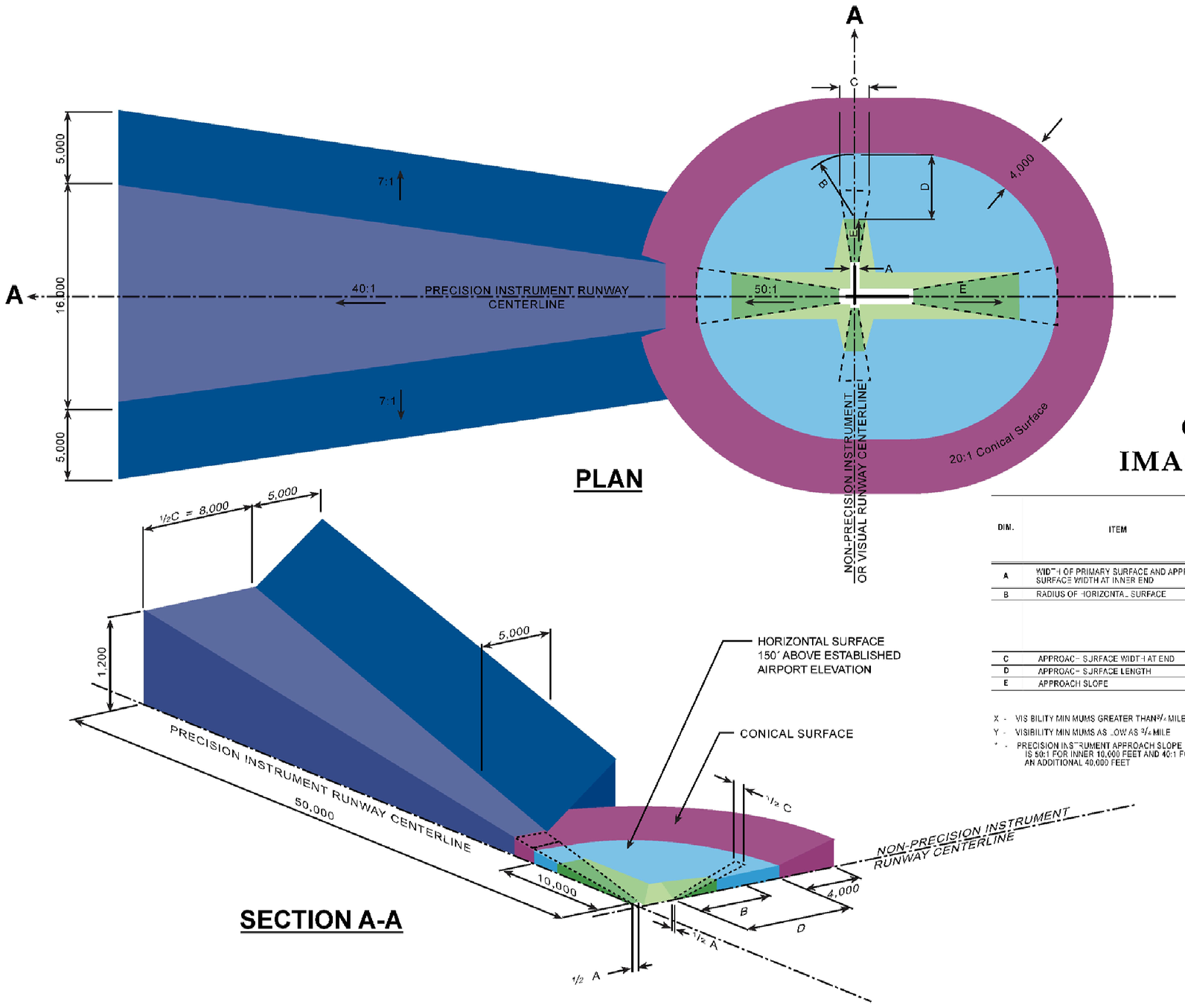
Airspace planning for U.S. airports is defined by Federal Air Regulations (FAR) Part 77 – Objects Affecting Navigable Airspace. FAR Part 77 defines imaginary surfaces (airspace) to be protected around airports. **Figures 3-4 and 3-5** illustrate plan and isometric views of the Part 77 surfaces. As noted earlier in this chapter, the use of "utility" standards based on visual approach capabilities (per Part 77) was determined to be most appropriate for defining long-term airspace planning for Sunnyside Municipal Airport. **Table 3-7** summarizes FAR Part 77 standards for Runway 7/25 both with its current (visual) and future (nonprecision instrument) capabilities. The airspace surfaces for runways designed to accommodate larger than utility aircraft are also provided for comparison.

A review of terrain penetrations and other physical obstructions to Part 77 surfaces is conducted during the update of the Airport Airspace Plan drawings (see chapter six). In cases where obstructions are identified beyond airport property, avigation easements should be acquired by the airport sponsor to preserve the integrity of the protected airspace, particularly within the inner approach surfaces (generally corresponding to the runway protection zones). For obstructions that cannot be removed or eliminated outright, red obstruction lights are recommended to increase visual recognition of potential hazards to pilots operating the vicinity of the airport.

TABLE 3-7:
FAR PART 77 AIRSPACE SURFACES –
SUNNYSIDE MUNICIPAL AIRPORT

Item	Utility (visual)[1]	Utility (nonprecision instrument)[1]	Larger Than Utility (nonprecision instrument)[1]
Width of Primary Surface	250 feet	500 feet	500 feet
Radius of Horizontal Surface	5,000 feet	5,000 feet	10,000 feet
Approach Surface Width at End	1,250 feet	2,000 feet	3,500 feet
Approach Surface Length	5,000 feet	5,000 feet	10,000 feet
Approach Slope	20:1	20:1	34:1

1. Utility runways are designed for aircraft weighing 12,500 pounds or less; larger than utility runways are designed to accommodate aircraft weighing more than 12,500 pounds.



SURFACE SLOPE KEY

- HORIZONTAL SURFACE
- 20:1
- 7:1
- 7:1
- VARIES (SEE "E" VALUE IN TABLE BELOW)
- 40:1 (PRECISION INSTRUMENT RUNWAY ONLY)

CIVIL AIRPORT IMAGINARY SURFACES

DIM.	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		UTILITY	LARGER THAN UTILITY	UTILITY	LARGER THAN UTILITY		
					X	Y	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		UTILITY	LARGER THAN UTILITY	UTILITY	LARGER THAN UTILITY		
					X	Y	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

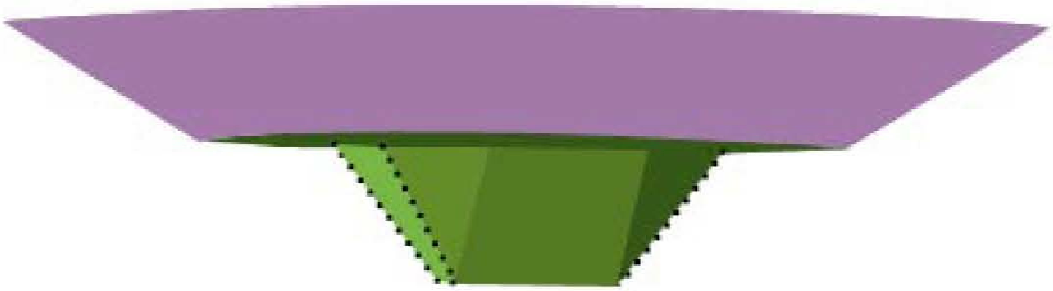
X - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
Y - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

IMAGE SOURCE: WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (AVIATION DIVISION).

CENTURY WEST ENGINEERING CORPORATION

FAR PART 77 DIAGRAM

FIGURE 3-4



PROTECTED AIRSPACE

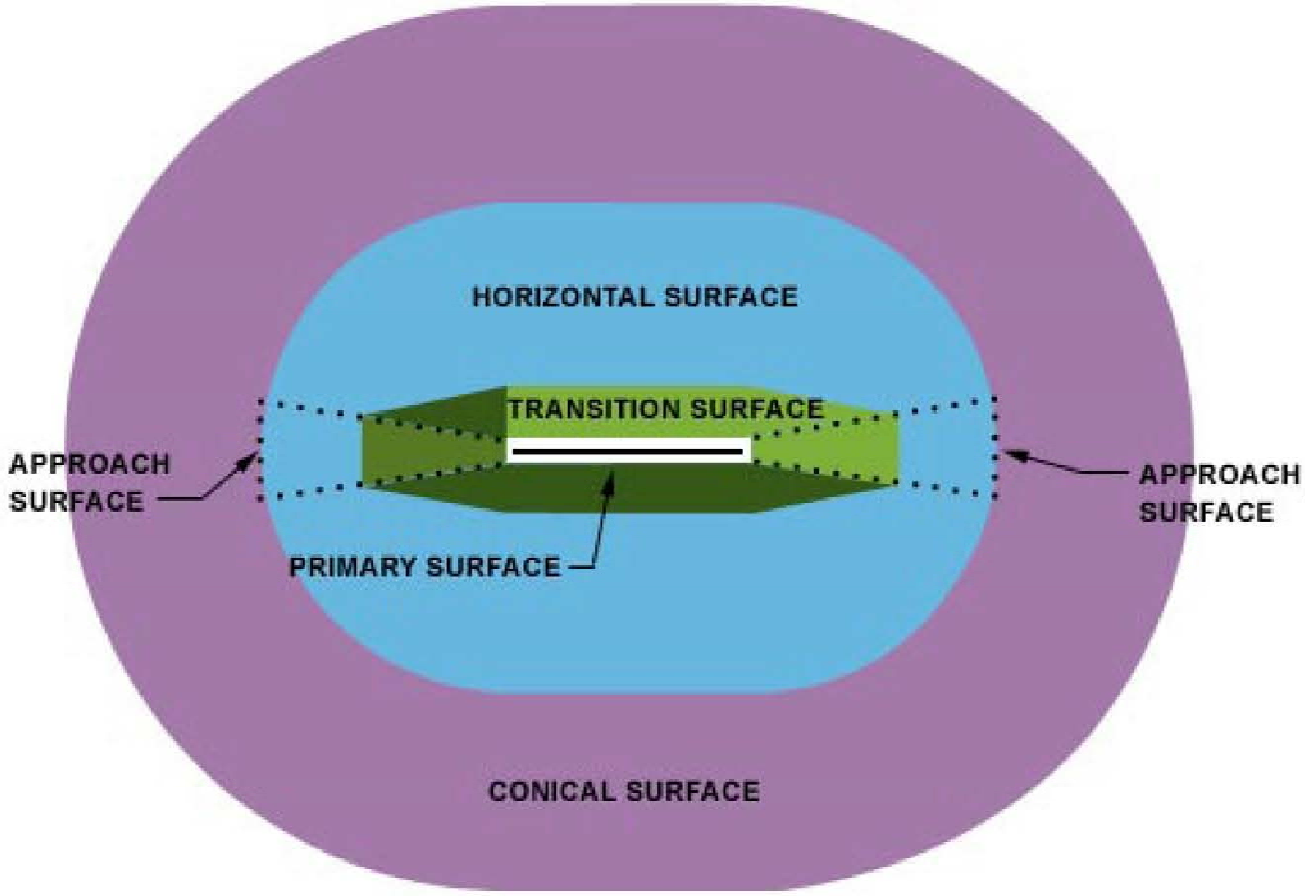


IMAGE SOURCE: WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (AVIATION DIVISION).

CENTURY WEST ENGINEERING CORPORATION

PLAN & PROFILE VIEWS (FAR PART 77 SURFACES)

FIGURE 3-5

Approach Surfaces

Runway approach surfaces extend outward and upward from each end of the primary surface, along the extended runway centerline. As noted earlier, the dimensions and slope of approach surfaces are determined by the type of aircraft intended to use the runway and most demanding approach planned for the runway (e.g., visual, nonprecision, or precision).

Providing unobstructed approaches to runway ends is a high priority item associated with airport safety. When obstructions exist, options include removing, lowering or relocating the obstructions; or modifying runway approaches and/or runway configurations. Use of obstacle clearance surfaces (OCS) is often recommended in conjunction with obstruction removal to mitigate close-in obstructions that cannot otherwise be eliminated.

B-I (small) – Existing Visual Approaches

The existing 20:1 approach surface for Runway 7 is obstructed by vehicles traveling on Highway 241, which results in a clear approach of 6:1. The 20:1 approach surface for Runway 25 is clear. The use of obstacle clearance surface (OCS) criteria is recommended for Runway 7 to address obstruction clearance. Based on the current level of approach capability, the visual 20:1 OCS for Runway 7 begins at the threshold.

B-I (small) –Future Nonprecision Instrument Approaches

As noted earlier in this report, the basic feasibility of developing a nonprecision instrument approach to Runway 7 and 25 has been established by FAA. Based on utility runway standards, the approach surface slope for a nonprecision instrument approach is 20:1. The use of an OCS for Runway 7 would still be required for obstruction clearance; however, by upgrading the runway to accommodate an instrument approach procedure, the OCS would begin 200 feet beyond the threshold. This surface would be penetrated by vehicles traveling on Highway 241. This would require either displacement of the Runway 7 threshold or relocation of the highway in order to obtain an unobstructed 20:1 approach slope.

Primary Surface

The primary surface is a rectangular plane of airspace centered on a runway that follows the runway elevation (typically along the centerline) and extends 200 feet beyond each runway end. The width of the primary surface is determined by the runway category and approach type. Half the width of the primary surface extends on each side of the runway. Any proposed changes in runway length will require extending the primary surface and an upgrade. The primary surface end connects to the inner portion of the runway approach surfaces; the sides of the primary surface connect to the runway

transitional surface. The primary surface should be free of any penetrations, except items with locations fixed by function (i.e., PAPI, runway or taxiway edge lights, etc.).

B-I (small) – Existing Visual Approaches

A 250-foot wide primary surface is required for Runway 7/25 based on utility runway and visual approach standards. The primary surface for the runway has precisely the same dimension as the OFZ, described earlier in this chapter. Most of the items that conflict with the OFZ, also conflict with the primary surface. The nonstandard items associated with the portion of the primary surface not in airport control (beyond the east end of the runway) can be mitigated.

B-I (small) Nonprecision Instrument Approaches

A 500-foot wide primary surface is required for Runway 7/25 to accommodate a future straight-in nonprecision instrument approach for the utility runway designation. Aircraft parked in the south-facing aircraft tiedowns located near the outer (north) edge of the east tiedown apron will be located entirely within the expanded primary surface and will need to be removed/relocated.

Transitional Surface

The transitional surfaces extend from outer edges of the primary surface and continue beyond the runway ends until they connect with the sides of the approach surfaces for the runway. The transitional surface is represented by planes of airspace that rise perpendicularly at a slope of 7 to 1 until reaching the horizontal surface at an elevation 150 feet above runway elevation. This surface should be free of obstructions (i.e., parked aircraft, hangars, trees, etc.). Any structures penetrating transitional surfaces should have red roof-mounted obstruction lights installed if they cannot be relocated. Relocation of existing buildings may also be considered where feasible and no new structures should be permitted that would penetrate the transitional surface.

B-I (small) – Existing Visual Approaches

No on-airport penetrations to the transitional surfaces are depicted on the 1992 Airspace Plan and none are currently observed. Vehicles traveling on Highway 241 penetrate the transitional surfaces where it connects to the north and south sides of the Runway 7 approach surface. Similar penetrations occur at the Runway 25 end (vehicles on private dirt road).

B-I (small) Nonprecision Instrument Approaches

The transitional surfaces for Runway 7/25 associated with a straight-in nonprecision instrument approach (utility runway) begin 250 feet from the runway centerline, which will create several new airspace penetrations. Small aircraft parked in the south-facing aircraft tiedowns located near the outer (north) edge of the main apron will penetrate the transitional surface by approximately 4 to 6 feet. It is noted that these aircraft tiedowns will be eliminated to accommodate the relocated parallel taxiway. Some structures located on the south side of the runway may penetrate the nonprecision instrument transitional surface; a survey of roof elevations for these structures is recommended as part of the FAA-required obstruction surveying required to develop new instrument approach procedures.

Horizontal Surface

The horizontal surface is a flat plane of airspace located 150 feet above runway elevation. For Runway 7/25, the outer boundary of the horizontal surface is defined by 5,000-foot radii, extending from the runway ends (the intersection point of the extended runway centerline, the outer edge of primary surface, and the inner edge of the approach surface). The outer points of the radii for each runway end are connected to form a semi-oval shape, which is defined as the horizontal surface. The elevation of the existing horizontal surface is based on the published elevation of the airport (768 feet MSL), plus 150 feet (918 feet). No terrain or built item penetrations to the horizontal surface for Runway 7/25 are depicted on the 1992 Airspace Plan and none are currently identified.

Conical Surface

The conical surface is an outer band of airspace, which abuts the horizontal surface. The conical surface begins at the elevation of the horizontal surface and extends outward 4,000 feet at a slope of 20:1. The top elevation of the conical surface is 200 feet above the horizontal surface and 350 feet above airport elevation (1,118 feet MSL). No terrain or built item penetrations to the conical surface for Runway 7/25 are depicted on the 1992 Airspace Plan and none are currently identified.

AIRSIDE REQUIREMENTS

Airside facilities are those directly related to the arrival and departure and movement of aircraft:

- Runways
- Taxiways
- Airfield Instrumentation and Lighting

Runways

The adequacy of the existing runway system at Sunnyside Municipal Airport was analyzed from a number of perspectives including runway orientation, airfield capacity, runway length, and pavement strength.

Runway Orientation

The orientation of runways for takeoff and landing operations is primarily a function of wind velocity and direction, combined with the ability of aircraft to operate under adverse wind conditions. When landing and taking off, aircraft are able to maneuver on a runway as long as the wind component perpendicular to the aircraft's direction of travel (defined as crosswind) is not excessive. For runway planning and design, a crosswind component is considered excessive at 12 miles per hour for smaller aircraft (gross takeoff weight 12,500 pounds or less) and 15 miles per hour for larger aircraft. FAA planning standards indicate that an airport should be planned with the capability to operate under allowable wind conditions at least 95 percent of the time.

No tabulated wind data is available for Sunnyside Municipal Airport. The 1992 Airport Layout Plan includes a wind rose that aligns Runway 7/25 over historic wind conditions at Yakima Airport. The wind rose indicates that Runway 7/25 has 96.9 percent coverage of wind conditions at 12 miles per hour. It is noted that Yakima's primary runway (9/27) is oriented within 20 degrees of Runway 7/25. Based on available information, it appears that wind coverage for Runway 7/25 is adequate, although occasional crosswind conditions would be expected.

Runway Length

Runway length requirements are based primarily upon airport elevation, mean maximum daily temperature of the hottest month, runway gradient, and the critical aircraft type expected to use the runway. Runway 7/25 accommodates predominantly small single engine and multi-engine piston aircraft weighing 12,500 pounds or less. The existing dimensions and pavement strength of Runway 7/25 are consistent with FAA design criteria established for small airplanes. Local uses report that the runway also accommodates a limited amount of turbine aircraft activity, including business class

turboprops and business jets weighing more than 12,500 pounds. No runway extensions are depicted on the 1992 ALP.

Medevac flights at Sunnyside occur on a regular basis and include both fixed-wing aircraft and helicopters. The current runway length available at Sunnyside Municipal Airport is cited as a significant constraint in accommodating fixed wing medevac flights. Executive Flight, based in Wenatchee, provides fixed wing flight services for Air Lift Northwest, serving Seattle area hospitals. Executive Flight currently operates a Learjet 35, which cannot be operated at Sunnyside Municipal due to runway length requirements. Based on company procedures, the Learjet 35 normally requires 5,000 feet of dry runway, but can be operated on a 4,000-foot runway under certain conditions. Company officials indicate that 4,000 feet is an "absolute minimum" runway length for their Learjet 35. Executive Flight previously operated an Aero Commander 690, twin-engine turboprop at Sunnyside Municipal, averaging just less than 10 medevac flights per year. Executive Flight indicates that their Sunnyside medevac patients are currently transported by ambulance to Yakima for air transport to Seattle. Other medevac carriers based in Spokane, Boise and Portland use a variety of business class turboprop aircraft (King Air 90 and 200 models, Aero Commander 690, Piper Cheyenne III).

The current level of fixed-wing medevac flights at Sunnyside Municipal Airport is estimated to be less than 20 per year. Medevac providers indicate that the runway length at Sunnyside Municipal Airport limits the number of flights the airport could potentially accommodate and requires other less efficient patient transport options from the Sunnyside area. Although this segment of activity is not expected to be sufficient in numbers to justify use as design aircraft (minimum 500 annual operations), it does illustrate the broader potential use of the airport that exists. These factors indicate a community reliance on the airport that appears to justify increasing the capabilities of Runway 7/25 to accommodate 100 percent of the small airplane fleet. For planning purposes, general aviation (GA) runways that accommodate a substantial amount of multi-engine aircraft activity are typically planned to accommodate 95 or 100 percent of the small airplane fleet, when possible.

It is noted that the Port of Sunnyside has worked closely with the City of Sunnyside dating back many years with a shared interest in protecting Sunnyside Municipal Airport. As part of this effort, the Port acquired properties adjacent to the airport with the specific interest in protecting the airport from incompatible land uses and to accommodate long-term airport expansion. This action has enabled the inner portions of the approaches for Runway 7 and 25, which extend over Port property, to remain free of development that could adversely affect runway function. The acquisition of the large parcel located between the east side of the airport and Ray Road was specifically intended to accommodate a runway extension.

A summary of FAA-recommended runway lengths for small and large aircraft based on local conditions is presented in **Table 3-8**. For comparison, the runway length requirements of several small/medium business jets are also summarized in the table.

TABLE 3-8:
FAA RECOMMENDED RUNWAY LENGTHS
(From FAA Computer Model)

Runway Length Parameters for Sunnyside Municipal Airport
- *Airport Elevation: 767 feet MSL*
- *Mean Max Temperature in Hottest Month: 89.7F*
- *Maximum Difference in Runway Centerline Elevation:22 feet*
- *Existing Runway Length: Runway 7/25 - 3,422 feet*

Small Airplanes with less than 10 seats:	
75 percent of these airplanes	*2,770 feet*
95 percent of these airplanes	*3,300 feet*
100 percent of these airplanes	***3,930 feet***
Small airplanes with 10 or more seats	*4,410 feet*
Large Airplanes of 60,000 pounds or less:	
75 percent of these airplanes at 60 percent useful load	*5,490 feet*
75 percent of these airplanes at 90 percent useful load	*7,000 feet*
100 percent of these airplanes at 60 percent useful load	*5,840 feet*
100 percent of these airplanes at 90 percent useful load	*8,820 feet*
***Selected Small/Medium Business Jets**:*	
Cessna Citation CJI (6-7 passengers / 1 crew 10,600# MGW)[1]	*4,767 feet**
Cessna Citation CJ2 (6-7 passengers / 1 crew 12,375# MGW)[1]	*4,140 feet**
Cessna Citation Bravo (7-11 passengers / 2 crew 14,800# MGW)[1]	*4,511 feet**
Cessna Citation Excel (7-8 passengers / 2 crew 20,000# MGW)[1]	*4,463 feet**

* Takeoff distances based on maximum gross weight and conditions listed above under requirements defined in FAR Part 25; passenger and/or fuel loads may be reduced based on aircraft operating weight limits and runway length available.

1. FAR Part 25 Balanced Field Length at maximum certificated takeoff weight (accelerated/stop distance). Cessna Citation runway length requirements based on 15 degrees flaps, 86 degrees F, MGTW, distance to 35 feet above the runway, and a runway elevation of 1,000 feet; data provided by manufacturer (Cessna Citation Flight Planning Guides).

The limited historic use of the runway-taxiway system by larger, business class aircraft was noted in the forecast chapter. Many of these aircraft are included in airplane design group II (ADG II).[14] The updated activity forecasts suggest that the current modest demand levels may increase in the future as specific airport improvements are completed. It is reasonable to assume that any runway extension designed to accommodate the needs of the small airplanes (the design aircraft) included in airplane design group I (ADG I)[15] will also provide marginal benefits to larger aircraft currently using the runway.

Existing Runway 7/25

At 3,422 feet, Runway 7/25 is 122 feet longer than the length required to accommodate 95 percent of the small airplane fleet under the conditions common during a typical summer day in Sunnyside. However, based on the expectation of continued growth of multi-engine aircraft activity, it is recommended that planning for Runway 7/25 be based on the ability to accommodate 100 percent of the small airplane fleet. In its current configuration, Runway 7/25 is 508 feet shorter than the length needed to accommodate 100 percent of the small airplane fleet. Options for extending Runway 7/25 should be evaluated in the alternatives analysis.

The existing width of Runway 7/25 is 60 feet, which meets the ADG I standard of 60 feet.

Airfield Pavement

The weight bearing capacity for Runway 7/25 is published at 12,500 pounds for aircraft with single wheel landing gear, which is consistent with use by small aircraft. According to available pavement data, Runway 7/25 has a 5-inch asphalt surface course (2003) over an original 2-inch or 3-inch asphalt surface and a 6-inch aggregate base. The resurfacing of the runway in 2003 reportedly corrected the same type of cracking that is currently found on the parallel taxiway and east apron. The aircraft aprons have similar section designs and were constructed during the same period as the runway.

The east and west sections of the south parallel taxiway were constructed in 1985 and currently have severe cracking. Although the surface condition of the taxiway between the cracks is relatively good,

[14] By FAA classification, Airplane Design Group II (ADG II) aircraft have wingspans 49 feet up to but not including 79 feet and tail heights up to but not including 30 feet.

[15] By FAA classification, Airplane Design Group I (ADG I) aircraft have wingspans up to but not including 49 feet and tail heights up to but not including 20 feet.

the width, depth and frequency of cracking contribute to a poor overall condition. The east tiedown apron has cracking similar to the parallel taxiway sections.

Based on 2005 inspections,[16] most pavements at Sunnyside Municipal Airport were rated "good" or better with pavement condition indices (PCI) ranging from 62 to 100. The runway is rated "excellent." The parallel taxiway and east tiedown apron are rated "good," although as mentioned above, the severity of the existing cracking is not generally consistent with pavement in good condition. Most airfield pavements are projected to be in "fair" to "very good" condition in 2015.

The pavement maintenance plan contains a recommended 7-year program of pavement maintenance for the airport. **Table 3-9** summarizes recommended items for the initial seven-year period and items anticipated during the remainder of the current twenty-year planning period.

TABLE 3-9:
SUMMARY OF RECOMMENDED AIRFIELD PAVEMENT MAINTENANCE

Pavement Section	7-Year Recommended Maintenance	Other Recommended Maintenance During 20-Year Planning Period
Runway 7/25	Preventive Maintenance (Vegetation control, crack filling, periodic sealcoats, etc.)	Sealcoats or Slurry Seals on 5 to 6 year intervals; overlay (by 2015)
Main Apron	Preventive Maintenance (Vegetation control, crack filling, periodic sealcoats, etc.)	Sealcoats or Slurry Seals on 5 to 6 year intervals
East Tiedown Apron	Rehabilitation (2008) (2" AC Overlay); Preventive Maintenance (Vegetation control, crack filling, periodic sealcoats, etc.)	Sealcoats or Slurry Seals on 5 to 6 year intervals; overlay (by 2015)
South Parallel Taxiway	Rehabilitation (2008) (2" AC Overlay)[1]; Preventive Maintenance (Vegetation control, crack filling, periodic sealcoats, etc.)	Sealcoats or Slurry Seals on 5 to 6 year intervals
New Airfield Pavements	Preventive Maintenance (Vegetation control, crack filling, periodic sealcoats, etc.)	Sealcoats or Slurry Seals on 5 to 6 year intervals

1. 2005 Pavement Plan indicates rehabilitation (simple overlay); current condition suggests more comprehensive repair/reconstruction may be required to correct severe transverse cracking.

For planning purposes, it is assumed that the useful life of most airfield asphalt pavements is approximately 20 years. The useful life of pavement can be significantly reduced if preventative maintenance is not performed in a timely manner. In addition, the rate of deterioration increases with age. A regular maintenance program of vegetation control, crack filling, and sealcoating is recommended to extend the useful life of all airfield pavements.

[16] Applied Pavement Technology (2005).

Airfield Capacity

The capacity of a single runway with a full length parallel taxiway typically at an uncontrolled airport typically ranges between 40 to 60 operations per hour during visual flight rules (VFR) conditions. The 20-year forecast of peak hour activity at Sunnyside Municipal Airport is expected to remain well below current capacity. The addition of aircraft holding areas at both ends of the runway is recommended to reduce potential congestion when multiple aircraft are preparing for takeoff.

Taxiways

Runway 7/25 is served by a south parallel taxiway that extends to both ends of the runway from the main aircraft apron. The parallel taxiway has a runway-taxiway separation of 150 feet, which meets the ADG I (small) standard. The parallel taxiways is 30 feet wide, which exceeds the ADG I standard width of 25 feet.

As noted earlier, the City of Sunnyside has indicated a desire to increase the runway separation for the parallel taxiway to ADG II standards (240 feet) as part of the upcoming reconstruction project. Additional taxiways will be required to access new landside development areas and as part of any future runway extension.

Airfield Instrumentation, Lighting and Marking

Runway 7/25 has low intensity runway edge lighting (LIRL) and threshold lights. The existing LIRL system appears to be in good condition, although an upgrade to medium intensity system (MIRL) should be considered in conjunction with the addition of an instrument approach or other facility upgrades.

The airport rotating beacon appears to be in good condition and operates normally and reportedly has adequate visibility from the air. Moderately rising terrain several miles north of the airport reportedly results in some light exposure from the beacon at or near ground level. Shielding may be possible to reduce the low angle light exposure without reducing the intended function and effectiveness of the beacon.

The runway has two distance remaining signs (2, 1) installed on the north side of the runway. Any future increase in runway length will require the locations of the signs to be adjusted to accurately reflect the distances to the ends of the runway.

Runway 7 and 25 are equipped with a Precision Approach Path Indicator (PAPI), the current standard for visual guidance indicators (VGI) at general aviation airports. The PAPIs appear to be in good condition and reportedly operate normally. The PAPI for Runway 25 would need to be relocated or replaced in conjunction with the planned runway extension. Replacement of the PAPI

should be expected during the current twenty-year planning period, as the systems reach the end of their useful life (typically 20 to 30 years).

Runway end identifier lights (REILS) should be considered for Runway 7/25 in conjunction with the development of a new instrument approach procedure. REILS consist of two high-intensity flashing strobes located at corners of the runway end. REILS are designed to improve a pilot's ability to identify a runway end during darkness or poor visibility. Ground level shielding is recommended to minimize glare to adjacent property owners and vehicles traveling on nearby roadways. Most REILS are pilot activated by radio with automatic shut off after use.

Most taxiways on the airport have blue stake-mounted cylindrical edge reflectors. Based on the anticipated level of nighttime operations, edge reflectors are adequate.

Limited overhead lighting is available in aircraft hangar and apron areas. Additional flood lighting is recommended for all expanded operations areas for improved utilization and security. The installation of new outdoor lighting for hangars and apron areas should be designed to limit light emissions (glare) that can create a hazard for aircraft and adversely affect the natural dark skies setting of the rural area surrounding the airport. Unshielded floodlights, wallpacks, streetlights, and barn lights are examples of commonly used light fixtures that produce excessive glare. The use of full or partial cutoff (shielded) fixtures is recommended, which will limit the amount of light that escapes outward and upward into the sky, rather than illuminating the areas on the ground that require coverage.

Runway 7/25 has basic runway markings (threshold bars, runway numbers, and centerline stripe) that are in fair/good condition. All markings require periodic repainting.

The rotating beacon, lighted wind cones, and runway edge lights operate from dusk to dawn on automatic photocell switches; the PAPIs operate continuously. The City may want to consider installing pilot-controlled switches to activate one or more of the airfield lighting systems to reduce energy consumption and extend the intervals for bulb replacement.

On-Field Weather Data

Sunnyside Municipal Airport does not have automated weather data available to pilots. The addition of an automated weather observation system such as an AWOS or ASOS may be considered in the future. The nearest airport weather data is available at Yakima and Pasco.

LANDSIDE FACILITIES

The purpose of this section is to determine the space requirements during the planning period for landside facilities. The following types of facilities are associated with landside aviation operations areas:

- *Hangars*
- *Aircraft Parking and Tiedown Apron*
- *Fixed Base Operator (FBO) Facilities*

Hangars

In late 2008 there were a total of five hangars located on the airport, including two multi-unit hangars and three conventional hangars. It is estimated that the hangars can accommodate approximately 14 aircraft. It is noted that the older 5-unit T-hangar at the airport is currently in disrepair and not occupied. As a result, there is currently space to accommodate approximately nine aircraft in hangars. The owner of the 5-unit hangar has indicated plans to renovate the building, which would increase available hangar capacity. It is not known how many of the airport's based aircraft currently parked on the aircraft apron will relocate to the hangar space when it becomes available. However, for planning purposes, it is assumed that 80 percent of forecast based aircraft will be stored in hangars, with the remaining 20 percent parked on aircraft apron.

Although a portion of future demand may be accommodated within the existing hangar capacity, it is assumed that the net increase in forecast hangar demand will be met through new construction. This assumption will ensure that adequate space is reserved to accommodate demand for new hangars. A planning standard of 1,500 square feet per based aircraft stored in hangars is used to project gross space requirements.

As indicated in the updated forecasts, the number of based aircraft at Sunnyside Municipal Airport is projected to increase from 15 to 21 aircraft during the twenty-year planning period. Based on projected hangar utilization levels, long-term demand for new hangar space is estimated to be 5 spaces, or approximately 7,500 square feet. Hangar construction trends vary by tenant needs. As noted above, Sunnyside Municipal Airport currently has both conventional hangars and T-hangars; future hangar developments should be capable of accommodate a variety of hangar types and sizes. The projected hangar needs for the updated forecasts are presented in **Table 3-10**.

Individual aircraft owners needs vary and demand can be influenced by a wide range of factors, often beyond the control of an airport. In addition, the potential exists for significant changes in demand to

occur as the result of specific airport actions, such as completion of a runway extension or development and marketing of new hangar sites that are ready for construction. For these reasons, it is recommended that hangar development reserve areas be identified to accommodate potential demand beyond long-term forecast levels. It is also noted that the airport's developable areas for new landside facilities are relatively limited, and efforts should be made to ensure that long-term aviation use development potential is preserved.

Generally, a reasonable planning standard for defining landside development reserves at small airports is to double the land area needed to accommodate twenty-year forecast demand. However, since the forecast demand levels are very modest, consistent with historic growth at the airport, the potential does exist for new development to quickly outpace projections and typically adequate development reserves. For example, if local and regional market conditions reached the point where a public or private developer saw an opportunity to develop hangars on a slightly larger scale, the construction of just one 8 unit T-hangar would exceed long-term demand projections for the airport. Since demand for hangar space is highly influenced by conditions (availability, price, etc.) within the airport's service area, the best approach is to provide a high degree of flexibility and the ability for the airport to quickly respond to demand as it occurs. Development reserves equal to 2 to 4 times the projected twenty-year demand will preserve the aviation potential for Sunnyside Municipal Airport for the foreseeable future.

Aircraft Parking and Tiedown Apron

Aircraft parking apron should be provided for locally based aircraft that are not stored in hangars and for transient aircraft visiting the airport. The aircraft aprons at Sunnyside Municipal Airport are currently configured with 34 tiedown positions. However, as noted earlier, the planned relocation of the parallel taxiway will eliminate 16 tiedowns, reducing available capacity to 18. It appears that the reduced capacity will be adequate to accommodate demand well into the current planning period. The aircraft parking area requirements for the updated forecasts are described below and summarized in **Table 3-10.**

As noted earlier, for planning purposes it is assumed that 20 percent of the airport's based aircraft fleet will be accommodated on an aircraft apron. The long term (2027) forecast increase from 15 to 21 based aircraft will require 4 parking positions for locally based aircraft. Per FAA design standards, locally based aircraft tiedowns are planned at 300 square yards per position.

FAA **Advisory Circular 150/5300-13** suggests a methodology by which itinerant parking requirements can be determined from knowledge of busy-day operations. At Sunnyside Municipal Airport, the demand for itinerant parking spaces was estimated based on 30 percent of busy day itinerant operations (30% of busy day itinerant operations divided by two, to identify peak parking demand). For planning purposes, busy day activity is estimated to account for 25 percent of the

operations that occur in an average week of the peak month. Peak month is estimated to account for 15 percent of annual operations. Based on these planning assumptions and the updated forecasts, typical peak demand for itinerant parking spaces is estimated to range from 4 to 6 aircraft during the twenty-year planning period. The FAA planning criterion of 360 square yards per itinerant aircraft was applied to the number of itinerant spaces to determine future itinerant ramp requirements.

In addition to accommodating the parking needs of small aircraft in tiedown positions, there is a need to provide parking space designed for multi-engine aircraft. It is recommended that drive-through parking positions be created where aircraft can taxi in and out under their own power. Based on the airport's business class aircraft activity that ranges from light twin-engine piston aircraft to turboprops and business jets, it is recommended that parking positions be designed to accommodate a variety of aircraft types. Initially, it appears that 2 parking positions will be adequate to accommodate typical peak demand, with demand for additional positions expected to increase during the twenty-year planning period. These positions would also accommodate medevac aircraft ground operations.

The addition of a designated helicopter parking pad is recommended to accommodate itinerant medevac and other helicopter activity at the airport. Ideally, itinerant helicopter parking should be physically separated from light aircraft tiedowns to reduce the effects of rotor wash on small airplanes.

TABLE 3-10:
APRON AND HANGAR FACILITY REQUIREMENTS SUMMARY

Item	Base Year (2007)	2012	2017	2022	2027
Total Based Aircraft	15	17	18	19	21
Aircraft Parking Apron					
Light Aircraft Tiedowns	34/18 [1]				
Total Apron Area	24,411 sy				
Projected Needs *(Demand)* [2]					
Itinerant Aircraft Parking (@ 360 SY each)	4 spaces / 1,440 sy	4 spaces / 1,440 sy	5 spaces / 1,800 sy	5 spaces / 1,800 sy	6 spaces / 2,160 sy
Locally-Based Tiedowns (@ 300 SY each)	6 spaces / 1,800 sy	5 spaces / 1,500 sy	4 spaces / 1,200 sy	4 spaces / 1,200 sy	4 spaces / 1,200 sy
Business Aircraft Parking Positions (@ 600 SY each)	1 space / 600 sy	2 spaces / 1,200 sy	2 spaces / 1,200 sy	2 spaces / 1,200 sy	3 spaces / 1,800 sy
Helicopter Parking (@ 400 SY each)	1 space / 400 sy	1 space / 400 sy	1 space / 400 sy	2 spaces / 800 sy	2 spaces / 800 sy
Total Apron Needs	**12 spaces 4,240 SY**	**12 spaces 4,540 SY**	**12 spaces 4,600 SY**	**13 spaces 5,000 SY**	**15 spaces 5,360 SY**
Aircraft Hangars *(Existing Facilities)*					
Existing Hangar Spaces (estimated)	14 spaces				
Projected Needs *(Demand)* [3] **(New) Hangar Space Demand (@ 1,500 SF per space)** *(Cumulative 20-year projected new demand: 5 spaces / 7,500 SF)*		**+2 spaces / 3,000 sf**	**+1 space / 1,500 sf**	**+1 space / 1,500 sf**	**+1 space / 1,500 sf**

1. Total number of aircraft tiedowns (existing configuration)/ total number of existing tiedowns with relocated parallel taxiway.
2. Aircraft parking demand levels identified for each forecast year represent forecast gross demand.
3. Hangar demand levels identified for each forecast year represent the net increase above current hangar capacity.

As with aircraft hangars, reserve areas should be identified to accommodate demand for aircraft parking which may exceed current projections. A development reserve area equal to 100 percent of the 20-year parking demand will provide a conservative planning guideline to accommodate unanticipated demand, changes in existing apron configurations, and demand beyond the current planning period. The location and configuration of the development reserves will be addressed in the alternatives analysis.

FBO Facilities

Sunnyside Municipal Airport has limited fixed base operator (FBO) facilities including aircraft fuel, indoor restrooms and a pilot lounge. FBO facility requirements are driven primarily by market conditions and the particular needs of the FBO and its customers. Because future FBO facility needs are difficult to quantify, the best planning approach is to identify development reserves that could accommodate additional FBO facilities. As noted earlier, a development reserve for additional aircraft fueling facilities is recommended; additional space may also be reserved for FBO hangars and related facilities.

Surface Access & Security Requirements

Surface access to the airport is provided via East Edison Road, which travels along the south side of the airport. Vehicle access to the aircraft aprons and hangars is provided through an unfenced opening between the fuel tanks and the large conventional hangar. Vehicle parking is provided on the south side of the fence in a gravel surfaced area immediately adjacent to the paved access road.

Extensions or reconfiguration of internal airport access roads may be required to serve new landside developments. Adding designated vehicle parking areas adjacent to the primary hangar and tiedown areas is recommended to accommodate local pilots and other users.

Extending fencing and adding vehicle gates should be considered to control unauthorized public access to the airfield and landside developments on the south side of the runway. Some overhead lighting is mounted on aircraft hangars and adjacent to the apron; additional lighting is recommended to illuminate new landside facilities.

SUPPORT FACILITIES

Aviation Fuel Storage

As noted in the inventory chapter, Sunnyside Municipal Airport has a 10,000-gallon aboveground tank used for aviation gasoline (AVGAS) storage. The tank capacity appears to be adequate for current use, although space should be reserved on the airport to accommodate additional capacity or the potential demand for jet fuel. The location of the fuel storage reserve should be determined based on the development alternative selected.

Airport Utilities

The developed areas of the airport currently have water, telephone, and electrical service that are located along the airport access road. Future expansion of landside facilities is expected to occur on the south side of the runway based on the availability of developable land. Extension of utilities to

serve new development areas does not appear to present a significant challenge. As noted in the inventory chapter, sanitary sewer service is not currently available at the airport and individual septic tanks are used for some buildings. Extension of sanitary sewer service or development of onsite systems may be needed to support development of buildings intended for public use (fixed base operator, commercial hangars, etc.).

FACILITY REQUIREMENTS SUMMARY

The projected twenty-year facility needs for Sunnyside Municipal Airport are summarized in **Table 3-11**. The forecasts of aviation activity contained in Chapter Two anticipate moderate growth in activity that will result in specific facility demands. However, several other facility requirements needs are related to upgrading or replacing existing facilities that do not meet FAA airport design standards.

TABLE 3-11: FACILITY REQUIREMENTS SUMMARY (ARC: B-I SMALL)

Item	Short Term (1-10 years)	Long Term (11-20 year)
Runway 7/25	• Pavement Maintenance[1] • Obtain Clear Approaches, and standard RSA, OFA, and OFZ • Extend Runway to 4,000 feet accommodate 100% of small airplane fleet	• Pavement Maintenance
South Parallel Taxiway	• Reconstruct/Relocate Taxiway • Pavement Maintenance[1] • Parallel Taxiway Extension (east end, in conjunction with runway extension) • Construct Aircraft Holding Areas at ends of taxiway • Construct Taxiways/Taxilanes for new hangar areas	• Pavement Maintenance[1] • Construct Taxiways/Taxilanes for New Hangar Areas
Aircraft Aprons	• Pavement Maintenance[1] • Reconfigure Tiedown Apron (in conjunction with parallel taxiway project) • Add Business Aircraft Parking • Add Helicopter Parking	• Pavement Maintenance[1] • Development Reserves (fuel, tiedowns, etc.) • Add Business Aircraft Parking • Overlay Aprons
Hangars	• Hangar Site Improvements (surface access, utilities, taxilane access, etc.)	• Hangar Site Improvements (surface access, utilities, taxilane access, etc.) • Hangar Development Reserves
Navigational Aids and Lighting	• Develop GPS nonprecision instrument approach • Upgrade LIRL to MIRL • Add REIL in conjunction with instrument approach • Add Roof-Mounted Obstruction Lights on Structures Penetrating Transitional Surface	• PAPI Replacement
Fuel Storage & FBO Facilities	• Define Reserve for additional storage capacity	• Same
Utilities	• Extend Electrical to new facilities • Water Improvements (fire protection)	• Same
Roadways & Vehicle Parking	• Extend internal access roads to new facilities; add vehicle parking	• Same
Security	• Airport Perimeter Fencing and Vehicle Gates • Flood Lighting	• Same

1. Vegetation control, crackfill, sealcoat

CHAPTER FOUR
AIRPORT DEVELOPMENT ALTERNATIVES

The evaluation of development options for Sunnyside Municipal Airport is intended to address both FAA airport design standards and demand-driven facility needs (aircraft parking, hangars, etc.). Based on these needs, a set of preliminary runway-taxiway and landside development alternatives have been developed to address the specific facility requirements outlined in Chapter Three.

The preliminary development alternatives are described later in the chapter with graphic depictions (**Figures 4-1, 4-2, and 4-3**) provided to illustrate the key elements of each alternative. The preliminary options are conceptual and intended to facilitate the evaluation of development priorities and specific improvements. The preliminary alternatives are used to define a preferred development alternative that reflects the desired development path for the airport, consistent with the planning assumptions developed through the ALP update process. The preliminary alternatives presented later in this chapter are in their original narrative and graphic format (without revision) in order to illustrate the evaluation process that was used to arrive at a preferred development alternative.

Based on local review of the preliminary alternatives in conjunction with review and comment provided by FAA and WSDOT Aviation, a preferred development option was selected by the City of Sunnyside reflecting the desired development path for the airport. Further refinement occurred through subsequent local, FAA and WSDOT review and coordination. The primary elements of the preferred alternative are summarized below and depicted on the Airport Layout Plan drawing (see Chapter Six).

Summary of Preferred Alternative

The City of Sunnyside selected a preferred alternative concept that included the proposed runway and parallel taxiway improvements and a modified landside facility based on **Landside Facilities Alternative B**. The preferred landside development option does not require property acquisition to accommodate new hangar development, aircraft parking, and other related items; property acquisition is required to accommodate the proposed runway/parallel taxiway improvements, particularly the eastern extension. The preferred alternative addresses a variety of safety and operational improvements within the standards defined for Airport Reference Code (ARC) B-I (small). Key elements include:

- **Runway & Parallel Taxiway Extension.** A 578-foot extension at the east end of Runway 7/25 is recommended based on the requirements of accommodating 100 percent of the small airplane fleet. Runway length is increased to 4,000 feet and the existing width of 60 feet is maintained. The south parallel taxiway will also be extended. The runway and parallel taxiway extension projects require acquisition of approximately 16.8 acres of property owned by the Port of Sunnyside.

- **Runway Obstruction Clearance.** Runway 7 will utilize an FAA-approved obstacle clearance surface (OCS) to improve obstruction clearance for vehicles traveling on Highway 241 and the (future) airport fence. The current OCS is based on visual approach capabilities; the future OCS standards associated with an instrument approach may require a 200-foot displaced threshold for Runway 7.

- **Parallel Taxiway Reconstruction.** The south parallel taxiway reconstruction is recommended early in the twenty year planning period based on its current deteriorated condition. The lateral separation between the runway and parallel taxiway will be increased to 240 feet, to preserve long-term airport development potential. The new parallel taxiway will be 25 feet wide, the standard for the design aircraft category. Aircraft holding areas are recommended at both ends of the parallel taxiway. A small area of property acquisition (approximately 1.9 acres) is recommended along the southwest frontage of the airport to accommodate an aircraft holding area on the relocated parallel taxiway at the end of Runway 7.

- **Nonprecision Instrument Approach.** The development of an instrument approach is recommended for Runway 7/25 in conjunction with the planned runway extension. The specifics of the approach procedure will be determined by FAA during design. For planning purposes, the ALP reflects the addition of a satellite-based Wide Area Augmentation System (WAAS) straight-in approach for Runway 7, with a circling procedure developed for Runway 25.

- **Apron Reconfiguration**. The aircraft parking configuration on the existing apron will be modified in conjunction with the parallel taxiway project. Approximately 16 aircraft tiedowns located within the new parallel taxiway object free area will be eliminated. New apron development areas are included the preferred alternative and would be constructed based on demand. An aircraft activity area line should be added on the apron that identifies the boundary of the parallel taxiway object free area (measured 65.5 feet from taxiway centerline). No aircraft parking or fueling activity is permitted within the protected area for the taxiway.

- **New Landside Facilities:**

  - A new itinerant aircraft parking area is recommended beyond the west end of the main apron that will provide three drive-through parking positions for business class aircraft. The parking positions will accommodate aircraft that are not designed to use light aircraft tiedowns (multi-engine piston, single- and multi-engine turboprops, business jets, etc.) including medevac and corporate aircraft. Airport fencing will be extended along the airport access road with access provided via a pedestrian and automated vehicle gate located adjacent to the apron.

  - A helicopter parking pad is also included at the west end of the apron to accommodate itinerant aircraft.

  - Future development of aircraft hangar and parking apron development is recommended for the southeast section of the airport. The landside development area will accommodate small/medium conventional hangars or executive hangars, additional aircraft tiedown apron, and T-hangars. Additional vehicle access to the development area will be extended from the existing airport access road. The development is designed to be constructed in phases, based on facility demand:

    - Phase 1 development is anticipated to include a taxilane that will provide access to 4 to 5 conventional/executive hangar sites located south of the east end of the tiedown apron and east of the City water facility. A single row of west-facing light aircraft tiedowns would be constructed adjacent to north-south access taxiway when additional tiedown capacity is needed. A vehicle access road will be extended east from the airport access road along the fenced perimeter of the City water facility. An automated vehicle gate will be located at entrance to the new access road. The new roadway will also provide access to the east end of the existing apron.

    - Phase 2 development includes extending the north-south access taxiway to serve several additional hangar sites and may also include the new aircraft tiedowns noted above, if required.

    - T-hangar sites are located near the east end of the development area and will require separate vehicle access along the southeast airport boundary, on the north side of the irrigation canal. A single taxiway connection to the parallel taxiway will provide aircraft access to the hangars. The physical limits of the site will accommodate one 12-unit and one 8-unit T-hangar (or multiple smaller T-hangars) with access taxilanes.

  - A long term development reserve is identified in the east landside area to preserve the airport's ability to accommodate potential facility needs associated with increased aircraft activity, beyond currently-projected levels. The aviation use reserve includes parking for business class aircraft, expanded light aircraft tiedowns, a development site for a fixed base operator (FBO), commercial hangar sites, a fuel storage and dispensing area, and vehicle parking.

- **Security Fencing and Access Control**. Security fencing on the airport perimeter and installation of electronic keypad or combination lock gates at primary access points is recommended to control public access to the airfield, apron and hangar areas.

Preliminary Development Alternatives - Overview of Alternatives Evaluation Process

It is anticipated that the cost of upgrading or expanding existing airport facilities to meet FAA standards and to accommodate demand-related items will involve considerable financial resources. There are two financial scenarios available to an airport sponsor: (1) The airport sponsor determines that it wants to upgrade the airfield facilities following FAA design standards per the ALP and is willing to commit to fund the matching grant share for these improvements. The FAA will assign the maximum annual Non-Primary Entitlement (NPE) funds to the airport. Though other Airport Improvement Program (AIP) grant funds may be available, these will likely not be used at Sunnyside, except for higher priority safety work, as determined by the FAA. (2) The airport sponsor determines that upgrading the airfield facilities to meet FAA standards is too difficult or costly – not financially realistic at this time. The airport sponsor could potentially enter into a "maintenance only" mode using reduced NPE funds for small maintenance projects.

The Airport Capital Improvement Plan (ACIP) should be considered a work in progress. The City should work closely with FAA and WSDOT Aviation in both the development and implementation of the ACIP. The City may refine its project list and financial plan based on receiving only non-primary entitlements. A reasonable approach, at this time, may include an "airport maintenance" program that preserves airfield pavement and other eligible projects such as lighting, signage, marking and lighting to meet RSA and obstruction removal requirements. This assumes FAA concurrence with an airport "maintenance only program" whereby the airport sponsor's budget for AIP eligible projects is limited to NPE funds only.

It should also be recognized that selection of a preferred alternative that addresses FAA standards conformance does not necessarily guarantee that adequate funding will be available to complete all projects. However, creating a viable plan that addresses FAA design standards and larger scale facility upgrades in a systematic manner through the 20-year planning period, while also supporting

the airport's ability to expand on its existing user base, can provide tangible benefits in both safety and airport financial stability.

PRELIMINARY DEVELOPMENT ALTERNATIVES

For the purposes of evaluating airfield configuration needs, three preliminary development options are presented for consideration. A fourth option (no action) also exists, in which the City would essentially maintain existing facilities without performing facility upgrades or expansion to address future demand ("maintenance only" option).

The runway configurations presented in the preliminary alternatives will enable the majority of FAA airport design standards to be met while minimizing existing obstructions to FAR Part 77 airspace surfaces. The following items are among the FAA's highest priorities to enhance airport safety:

- **Clear Approaches to Runway Ends** – Unobstructed approaches (FAR Part 77 or through use of FAA Alternative Threshold Siting Criteria)
- **Runway Safety Area (RSA) -** Standard dimensions, surface gradient, surface condition (no objects > 3" above grade unless frangible) along the sides and beyond the ends of the runway
- **Obstacle Free Zone (OFZ) –** Standard dimensions without physical obstructions along the sides and beyond the ends of the runway
- **Primary Surface** – Unobstructed flat surface along the sides and beyond the ends of the runway
- **Object Free Area (OFA) -** Standard dimensions without physical obstructions along the sides and beyond the ends of the runway

Consistent with the development of the updated forecasts, the preliminary alternatives address both airside (runway-taxiway) and landside needs (aircraft parking, hangars, etc.) based on the requirements associated with the design aircraft category B-I (small).

In addition to runway and taxiway configuration options, future landside development options were created to accommodate future facility demand while providing adequate clearances from the runway-taxiway system, its protected areas and the associated airspace surrounding the runway. The landside components include the following:

- Aircraft Apron (business aircraft parking, tiedown, FBO, fueling area reserve)
- T-hangar and Conventional Hangar Sites
- Taxiway and Taxilane Access to Apron and Hangars
- Vehicle Access and Parking

As noted in the facility requirements chapter, predicting the precise level of future facility demand is difficult, particularly in light of the relatively modest demand forecasts for the airport. The landside development alternatives depict substantial development reserves that are capable of accommodate multiples of the projected twenty-year demand for the airport. However, due to the uncertainty of how a future runway extension may affect airport activity, it is prudent to provide generous reserves capable of accommodate unanticipated demand.

Do-Nothing/No-Action Alternative

This alternative does not include the development of any aviation-related facilities or use of additional land for aviation-related development. As a result, the existing airfield configuration would remain unchanged from its present configuration and the airport would essentially be operated in a "maintenance-only" mode.

The primary result of this alternative would be the inability of the airport to adequately accommodate forecast aviation demand and the associated demand-driven facility requirements. In addition, this alternative would not address facility requirements associated with conformance to FAA design standards, FAR Part 77 protected airspace, capacity, safety or security. Future aviation activity would be constrained by the capacity, safety and operational limits of the existing airport facilities.

The Do-nothing/No-action alternative concept established a baseline from which the action alternatives were developed and compared. The purpose and need for the action alternatives is defined by the findings of the forecasts and facilities requirements analyses. Forecast aviation activity and the factors associated with increased activity (potential for congestion, safety, etc.) are the underlying rationale for making facility improvements. Market factors (demand) effectively determine the level and pace of private investment (i.e. hangar construction) at an airport. Public investment in facilities is driven by safety, capacity and the need to operate the airport on a financially self-sufficient basis.

Based on the factors noted above, the Do-nothing/No-action alternative is inconsistent with the management and development policies of the City of Sunnyside and its long-established commitment to provide a safe and efficient public air transportation facility that is socially, environmentally, and economically sustainable.

Runway-Taxiway Configuration Options

This option (see **Figure 4-1**) addresses airside facility improvements including future runway and parallel taxiway configuration. These improvements assume continued use of B-I (small) design standards and a future non-precision instrument approach to the runway.

Runway

As proposed, a 578-foot runway extension is depicted at the east end of Runway 7/25, which would increase runway length to 4,000 feet. This length is rounded up from the 3,930-foot dimension required to accommodate 100 percent of the small airplane fleet, as described in Chapter Three.

Options for providing the runway extension at both ends of Runway 7/25 were considered. However, the close proximity of Highway 241 and the end of Runway 7 prevents a runway extension without relocating/realigning the state highway and a deep irrigation canal located on the west side of the highway. The cost of roadway and canal relocation and the potential environmental concerns suggest that an east side runway extension may involve fewer impacts. In addition, the property located immediately east of the runway was acquired by the Port of Sunnyside several years earlier specifically to accommodate future airport expansion. Bringing this property into airport ownership will be required, although the process is expected to be relatively straight forward. The distance between the end of Runway 25 and the nearest public road (Ray Road) is approximately 1,400 feet. The land is level and well suited to accommodate a runway extension. It appears that an unobstructed 20:1 approach can be provided over vehicles traveling on the roadway and the adjacent overhead power poles. Burying the overhead electrical lines in the vicinity of the future approach is recommended to eliminate a potential hazard to aircraft.

Parallel Taxiway

As noted in the facility requirements evaluation, the current condition of the south parallel taxiway will require major rehabilitation/reconstruction. The City of Sunnyside has determined that increasing the runway separation distance to meet ADG II standards is a cost effective approach that best preserves the airport's ability to accommodate larger aircraft in the future. As depicted in this option, the new parallel taxiway would be located 240 feet from runway centerline with a width of 25 feet (ADG I width standard). The existing east and west sections of the parallel taxiway would be removed in conjunction with the new taxiway construction. Approximately 147 feet of taxiway pavement at the west end of the runway would also be removed. The new parallel taxiway would extend along the outer edge of the main apron, which will require eliminating approximately 16 aircraft tiedowns to meet ADG I taxiway object free area clearance standards. The option depicts two future aircraft parking lines (APL) that reflect taxiway OFA clearances required for both ADG I and ADG II (reserve) standards. Additional detail for aircraft parking is provided in the landside development options.

Aircraft holding areas are depicted at both ends of the new parallel taxiway. Approximately 1.4 acres of property acquisition is required to accommodate the holding area at the Runway 7 end, on the south side of the runway.

Landside Facilities Alternative A

Landside Alternative A (see **Figure 4-2**) contains elements that provide for the incremental development of facilities while maintaining terminal area services (aircraft fueling, business aircraft parking, etc.) in the vicinity of the main apron. The development of new aircraft storage (hangars and tiedown apron) is located adjacent the east tiedown apron.

This option provides three business class aircraft drive through parking positions immediately west of the main apron, between the Quonset hangar and the western-most hangar located along the back of the main apron. It is noted that the relocation of the parallel taxiway will limit use of the existing main apron for aircraft parking due to required obstacle clearances and the need to provide adequate space for taxiing. The new drive-through parking positions are intended to accommodate itinerant light twin engine piston aircraft to small/medium business turboprops and business jets. Four additional itinerant light aircraft tiedowns are depicted along the west end of the expanded apron. Access to the new section of apron would be provided by direct connections to the parallel taxiway and the west end of the main apron. Additional fencing is shown being extended along the north side of the adjacent airport access road.

The existing aircraft fueling area is maintained, with an area defined on the main apron capable of accommodating two or three aircraft.

A new hangar development area is located near the southeast corner of the east tiedown apron. As proposed, a row of conventional hangar sites and a new access taxilane would be located immediately east and south of the fenced City water well facility. A new vehicle access road would be extended along the south and east perimeter of the water facility to serve the new hangar sites and to provide improved access to the existing apron. These hangar sites are capable of accommodating a variety of small or medium conventional hangars-either as single units, or multiple units with a common roof. As proposed, the area can accommodate the equivalent of approximately 18 hangars (50’ x 50’). The hangar sizes can vary, although a minimum of 79 feet clearance is required along the access taxilane to meet FAA object free area clearance standards for ADG I aircraft.

Due to the loss of 16 aircraft tiedowns on the main apron, additional area is provided for expansion of aircraft tiedown apron to be constructed as existing apron capacity becomes inadequate. As proposed, a section of tiedown apron would be added east of the new north-south section of hangar taxilane described above. Initially, this section of apron would provide 7 light west-facing small airplane tiedowns, with an additional 6 east-facing tiedowns in the long-term development reserve (shown in blue on the figure). An additional tiedown reserve area is depicted immediately east of the current apron that could provide 6 to 11 tiedowns, depending on the location of aircraft parking line (APL) in place.

A T-hangar development area is located on the east side of the development area with three 8-unit T-hangar sites aligned parallel to the runway-taxiway system. The angled configuration of the airport's southeast property line and the need to provide vehicle access to this part of the airport creates some limits on the sizes (length) of the T-hangars that can be accommodated. Initially, the northern-most hangar site could be developed, requiring only short taxilane extensions from the east tiedown apron. The remaining T-hangar sites and the hangar taxilanes are shown as long-term development reserves. Additional reserve areas for larger conventional hangars are depicted on the east side of the new development area.

A new vehicle access road would be extended from the main airport access road, along the southern property line to serve the new development area.

Landside Facilities Alternative B

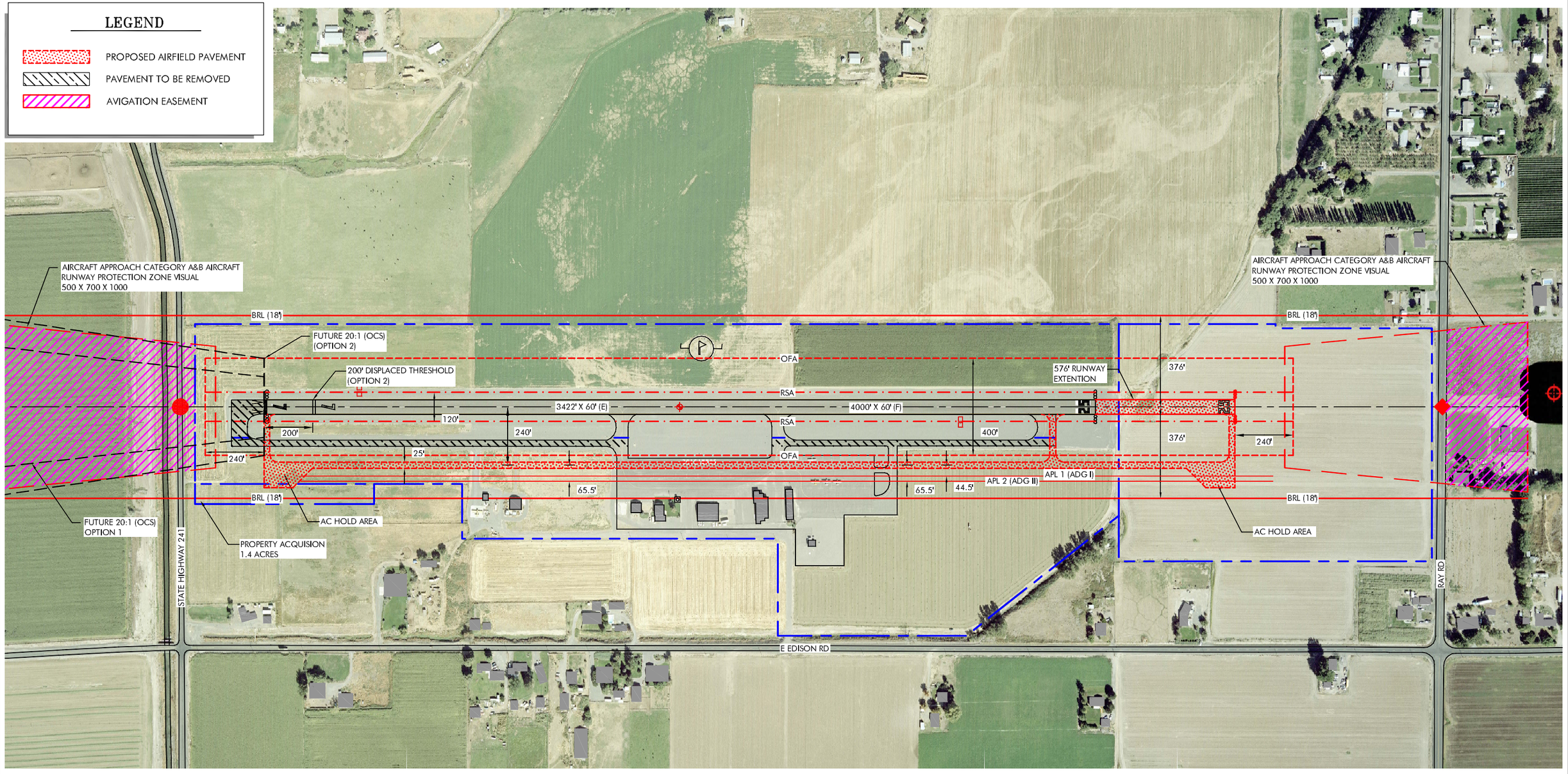
Landside Alternative B (see **Figure 4-3**) provides facility improvements that include a development reserve for new fixed base operator (FBO) facilities, aircraft fueling and business class aircraft parking located east of the current terminal area. It is noted that as the runway is extended to the east, this area will become more centrally located and has very good development potential. This option does not include any specific improvements to the existing main apron and adjacent hangars, although the area has a good redevelopment potential as existing hangars reach the end of their useful life.

Additional aircraft storage hangars would be developed west and south of the main apron. As proposed, the area located west of the main apron would accommodate a T-hangar site, with taxilane access being extended from the west end of the main apron and the parallel taxiway. This option includes a long-term aviation use reserve on the vacant property located immediately south of the main apron and hangars, capable of accommodating a wide variety of hangar types for both large and small aircraft. Access taxiways/taxilanes would be extended into the area from the main apron and parallel taxiway. Modification of the existing airport access road would be required to maintain access to existing tenants and the development would require acquisition of approximately 10 acres of property. This concept illustrates the long-term aviation development potential of the adjacent property.

The east conventional hangar development and new vehicle access roads described in Alternative A are retained in this option, although the subsequent development (reserve) of aircraft apron is designed to accommodate both ADG I and ADG II aircraft. As depicted, the new apron has four drive-through parking positions capable of accommodate a wide range of business class aircraft and up to 15 light aircraft tiedowns. A new aircraft fueling area is located near the rear of the apron. Development areas for an FBO building, hangar and vehicle parking are provided. Additional apron and hangar development reserves are located further east.

LEGEND

- PROPOSED AIRFIELD PAVEMENT
- PAVEMENT TO BE REMOVED
- AVIGATION EASEMENT



N

200 0 200

SCALE: 1"=200'

- 15' CLEARANCE (VEHICLES ON ROADWAY) FOR NON PRECISION INSTRUMENT APPROACH SURFACE (20:1).
- 15' CLEARANCE (VEHICLES ON ROADWAY) WITH 20:1 OBSTACLE CLEARANCE SURFACES (OCS).

SOURCE: WALKER AND ASSOCIATES (9-22-05)

CENTURY WEST
ENGINEERING CORPORATION

SUNNYSIDE MUNICIPAL AIRPORT
RUNWAY-TAXIWAY CONFIGURATION OPTIONS

FIGURE
4-1

NOTES:
1. AIRCRAFT PARKING LINE (APL) 1 AND 2 REFLECT ADG I AND ADG II TAXIWAY OBJECT FREE AREA (OFA) CLEARANCES FOR THE RELOCATED PARALLEL TAXIWAY. INITIALLY, ADG I TAXIWAY OFA STANDARDS WOULD BE APPLIED.

PLANNED DEVELOPMENT

LONG-TERM DEVELOPMENT RESERVE

OFA/OFZ (E)
RSA (E)
RSA (E)
OFA/OFZ (E)
25
RSA (E)
RSA (E)
OFA/OFZ (E)
PAVEMENT TO BE REMOVED
PAVEMENT TO BE REMOVED
OFA/OFZ (E)
TIEDOWNS TO BE REMOVED
TIEDOWNS TO BE REMOVED
APRON RESERVE
PARALLEL TAXIWAY (NEW)
44.5'
65.5'
APL 1 (ADG I)
APL 2 (ADG II)
APL 1 (ADG I)
APL 2 (ADG II)
BRL (E)
BRL (E)
ITINERANT BUSINESS AIRCRAFT PARKING
115'
115'
SMALL A/C TIEDOWNS
ACCESS ROAD
AIRCRAFT FUELING AREA
NEW GATE
CONVENTIONAL HANGARS
8-UNIT T-HANGAR (189' X 50' TYP)
79'
79'
79'
8-UNIT T-HANGAR
15'
30'
LARGE CONVENTIONAL HANGAR RESERVE
79'
25'
T-HANGAR RESERVE
40'
20'
APRON RESERVE
79'
39.5'
HANGAR RESERVE (50' X 50' TYP)
TIEDOWN APRON EXPANSION

N

0 100 200
SCALE: 1"=100'

SOURCE: WALKER AND ASSOCIATES (9-22-05)

CENTURY WEST ENGINEERING CORPORATION

SUNNYSIDE MUNICIPAL AIRPORT
DEVELOPMENT OPTION A

FIGURE NO.
4-2

NOTES:

1. AIRCRAFT PARKING LINE (APL) 1 AND 2 REFLECT ADG I AND ADG II TAXIWAY OBJECT FREE AREA (OFA) CLEARANCES FOR THE RELOCATED PARALLEL TAXIWAY. INITIALLY, ADG I TAXIWAY OFA STANDARDS WOULD BE APPLIED.

PLANNED DEVELOPMENT

LONG-TERM DEVELOPMENT RESERVE

25

RSA (E)

OFA/OFZ (E)

370'

240'

RSA (E)

OFA/OFZ (E)

TIEDOWNS TO BE REMOVED

PARALLEL TAXIWAY (NEW)

25'

APL I (ADG I)

APL 2 (ADG II)

APRON

TIEDOWNS TO BE REMOVED

35'

195'

44.5'

65.5'

APL I (ADG I)

APL 2 (ADG II)

BRL (18')

BRL (18')

115'

8-UNIT T-HANGAR

NEW GATE

NEW TAXILANE

17.5'

LARGE AC PARKING

VEHICLE PARKING

79'

55'

115'

57.5'

APRON & HANGAR RESERVE

HANGAR SITES

T-HANGAR RESERVE

ROAD TO BE CLOSED

115'

25'

79'

25'

80'

270'

80'

80'

60'

60'

LONG TERM AVIATION USE RESERVE

115'

8-UNIT T-HANGAR

T-HANGAR RESERVE

ACCESS ROAD

SMALL AC TIEDOWNS

GATE

HANGARS

115'

45'

15'

25'

FBO

HANGAR RESERVES

79'

FUEL

LARGE AIRCRAFT HANGAR RESERVE (ADG II COMPATIBLE)

APRON RESERVE

VEHICLE PARKING

HANGAR RESERVES

ACCESS ROAD

ACCESS ROAD

PROPERTY AQUISITION ±9.7 ACRES

N

0 100 200

SCALE: 1"=100'

SOURCE: WALKER AND ASSOCIATES (9-22-05)

CENTURY WEST ENGINEERING CORPORATION

SUNNYSIDE MUNICIPAL AIRPORT
DEVELOPMENT OPTION B

FIGURE NO.

4-3

CHAPTER FIVE
FINANCIAL AND DEVELOPMENT PROGRAM

Introduction

The purpose of this chapter is to present the projects identified in the Airport Capital Improvement Program (ACIP) that have been developed and assembled based on the analyses conducted in the Facility Requirements and Development Alternatives chapters (Chapters Three and Four). **Table 5-1** lists all major projects included in the twenty-year planning period addressed in the ALP Report. Individual projects for the first five years of the planning period are listed in order of priority by year. Projects for the second phase of the planning period (years 6-20) are listed in order of priority but have not been assigned a year. Each project's eligibility for FAA funding is noted, based on current federal legislation and funding formulas.

As noted in the previous chapter, the preferred development alternative selected for Sunnyside Municipal Airport is based on maintaining the current design standards for small aircraft (Airplane Design Group I). The preferred alternative includes airside elements (runway extension, parallel taxiway reconstruction, extension) and landside elements (fixed wing aircraft and helicopter parking, hangars, FBO-related facility development areas, additional access roads, etc.). In addition to specific construction-related activities, many projects will require environmental study. Property acquisition is required to accommodate runway and parallel taxiway extensions at the east end of Runway 7/25.

A primary source of potential funding identified in this plan is the FAA's Airport Improvement Program (AIP). As proposed, approximately 95 percent of the airport's 20-year CIP will be eligible for federal funding. Funds from this program are derived from the Aviation Trust Fund, which is the depository for all federal aviation taxes collected on such items as airline tickets, aviation fuel, lubricants, tires, aircraft registrations, and other aviation-related fees. These funds are distributed by FAA under appropriations set by Congress to all airports in the United States that have certified eligibility.

AIRPORT DEVELOPMENT SCHEDULE AND COST ESTIMATES

Cost estimates for each individual project were developed in 2008 dollars based on typical construction costs associated for the specific type of project. The project costs listed in the ACIP represent order-of-magnitude estimates include design engineering and other related costs,

contingencies and Washington state sales tax. The estimates are intended only for preliminary planning and programming purposes. Specific project analysis and detailed engineering design will be required at the time of project implementation to provide more refined and detailed estimates the development costs.

In future years, as the plan is carried out, these cost estimates can continue to assist management by adjusting the 2008-based figures for subsequent inflation. This may be accomplished by converting the interim change in the United States Consumer Price Index (USCPI) into a multiplier ratio through the following formula:

$$\frac{X}{I} = Y$$

Where:
X = USCPI in any given future year
Y = Change Ratio
I = Current Index (USCPI)

USCPI
219.09
(1982-1984 = 100)
August 2008

Multiplying the change ratio (Y) times any 2008-based cost figures presented in this study will yield the adjusted dollar amounts appropriate in any future year evaluation.

The following sections outline the recommended development program and funding assumptions. The scheduling has been prepared according to the facility requirements determined earlier. The projected staging of development projects is based upon anticipated needs and investment priorities. Actual activity levels may vary from projected levels; therefore, the staging of development in this section should be viewed as a general guide. When activity does vary from projected levels, implementation of development projects should occur when demand warrants, rather than according to the estimated staging presented in this chapter. In addition to major projects, the airport will require regular facility maintenance.

Short Term Projects

The short-term program contains work items of the highest priority. Priority items include improvements related to safety. Because of their priority, these items will need to be incorporated into Airport District Office and FAA capital improvement programming. To assist with this process,

the short-term projects are scheduled in specific calendar years for the first five years of the planning period (2009-2013).

Short Term Projects:

- Parallel taxiway reconstruction/relocation with aircraft hold area at Runway 7 end, reconfigure main apron tiedowns;
- Conduct pavement maintenance (crack filling, fog or slurry seals on runway and main apron);
- Construct business aircraft parking apron and helicopter parking pad (west of the main apron);
- Extend airport fencing, add automated vehicle gate in terminal area;
- Acquire Port of Sunnyside property required to construct east runway and parallel taxiway extension;
- Construct east hangar access taxiway (Phase 1 – 350' x 25'); and
- Construct new east hangar access road extension from main airport access road.

Intermediate & Long Term Projects

Several intermediate or long term projects are considered to be current needs. However, based on the limited funding resources available, it was necessary to shift some projects to the longer term timeline. Projects may be completed sooner in the event that additional funding becomes available. Several projects are demand-driven (hangar site improvements, taxilanes, aircraft parking, etc.) and will be implemented accordingly.

Intermediate Term Projects

- Conduct environmental evaluation for east runway and parallel taxiway extension project;
- Extend Runway 7/25 (578' x 60') and south parallel taxiway at east end;
- Relocate Runway 25 PAPI, install wind cone at east end of runway;
- Reconfigure airport fencing and add automated vehicle gate in east hangar & apron area;
- Complete pavement rehabilitation projects: overlay/reconstruct east section of main apron;
- Conduct pavement maintenance (crack filling, fog or slurry seals) on parallel taxiway, west apron, main apron, and east hangar taxiways;
- Expand east tiedown apron (7 tiedowns on east side of hangar access taxiway);
- Construct east hangar access taxiway (Phase 2 – 350' x 25');

- Extend East Landside access road (along southeast property line);
- East T-hangar development (Phase 1 - site preparation, taxiway/taxilane access);
- Extend airport fencing with automated vehicle gate in East T-hangar area;
- Extend airport fencing on airport perimeter (north, east and west);
- Construct aircraft wash pad in terminal area;
- Complete obstruction survey for instrument approach procedure;
- Displace Runway 7 threshold (200 feet) in conjunction with instrument approach development (assumes day/night circling procedure developed for Runway 7 end), reconfigure lighting and PAPI; and
- Acquire and install Super Unicom™.

Long Term Projects

- Replace PAPI - Rwy 7 & 25 (replace at end of useful life);
- Upgrade runway edge lights (MIRL);
- Complete pavement rehabilitation projects: overlay runway, west section of main apron;
- Conduct periodic pavement maintenance (crack filling, fog or slurry seals) on runway, parallel taxiway, aprons, and hangar taxiways/taxilanes; and
- East T-hangar development (Phase 2 - site preparation, taxiway/taxilane access).

Sunnyside Municipal Airport
Sunnyside, Washington
2009-2028

20-YEAR CAPITAL IMPROVEMENT PROGRAM (DRAFT)

Short Term	Yr	Project	Project Category	Unit	Quantity	Unit Cost	Subtotal Cost	35% Eng/Environ/ Contingency and Sales Tax	Total Cost	FAA Eligible	Airport Sponsor	*Accumulated NPE$ (including FY09)* *$688,322*
2009	**1**	Parallel Taxiway Reconstruction (West Section & AC Hold Area @ Rwy 7); demo existing pavement	Pavement Construction	SY	6,182	$65	$417,830	$146,241	$564,071	$535,867	$28,204	
Subtotal - Year 1							$417,830	$146,241	$564,071	$535,867	$28,204	
2010	**2**	Parallel Taxiway Reconstruction (East Section); demo existing pavement	Pavement Construction	SY	6,000	$65	$406,000	$142,100	$548,100	$520,695	$27,405	$150,000
2010	**2**											
Subtotal - Year 2							$406,000	$142,100	$548,100	$520,695	$27,405	
2011	**3**	Business Aircraft Apron & Taxiway Connector (west of main apron)	Pavement Construction	SY	6,770	$65	$440,550	$154,193	$594,743	$565,005	$29,737	$150,000
2011	**3**	Airport Fencing (Terminal Area); install Automated Vehicle Gate	Other	LF	1,200	$18	$33,600	$11,760	$45,360	$43,092	$2,268	
2011	**3**	Slurry Seal Main Apron (west section)	Pavement Maintenance	SY	14,343	$4	$57,873	$20,256	$78,129	$74,223	$3,906	
Subtotal - Year 3							$532,023	$186,208	$718,232	$682,320	$35,912	
												$150,000
2012	**4**	Property Acquisition (Port-Owned Property for East Rwy Extension)	Other	Acres	17	$20,000	$345,000	$120,750	$465,750	$442,463	$23,288	
Subtotal - Year 4							$345,000	$120,750	$465,750	$442,463	$23,288	
2013	**5**	Fog Seal Runway 7/25; repaint markings	Pavement Maintenance	SY	26,670	$0.75	$25,003	$8,751	$33,753	$32,066	$1,688	$150,000
2013		East Hangar - Interior Access Road (Gravel) Extension from Airport Access Rd; install automated vehicle access gate	Other	LF	465	$24	$23,160	$8,106	$31,266	$29,703	$1,563	
2013		East Hangar N/S Taxilane (Phase 1 - 350' x 25')	Pavement Construction	SY	972	$65	$63,680	$22,288	$85,968	$81,670	$4,298	
Subtotal - Year 5							$111,843	$39,145	$150,987	$143,438	$7,549	
						Yr 0-5 Total	$1,812,696	$634,444	$2,447,139	$2,324,782	$122,357	**$1,288,322**

Intermediate Term	Yr	Project	Project Category	Unit	Quantity	Unit Cost	Subtotal Cost	35% Eng/Environ/ Contingency and Sales Tax	Total Cost *	FAA Eligible	Airport Sponsor	
2014-2018		Environmental Assessment (Runway & Parallel Taxiway Extension)	Other	LS	1	$50,000	$50,000	$17,500	$67,500	$64,125	$3,375	
		East Runway Extension (578' x 60') w/ Parallel Taxiway & AC Hold Area; MIRL; relocate PAPI	Pavement Construction	SY	8,548	$65	$585,620	$204,967	$790,587	$751,058	$39,529	
		Wind Sock (east end of runway)	Other	ea	1	$1,500	$1,500	$525	$2,025	$1,924	$101	
		Overlay/Reconstruct Main Apron (east section)	Pavement Rehabilitation	SY	8,971	$50	$449,056	$157,169	$606,225	$575,914	$30,311	
		Fog Seal Parallel Taxiway	Pavement Maintenance	SY	12,182	$0.75	$12,137	$4,248	$16,384	$15,565	$819	
		East Tiedown Apron (7 tiedowns)	Pavement Construction	SY	2,530	$65	$194,450	$68,058	$262,508	$249,382	$13,125	
		East Landside Area Access Road (Gravel)	Other	LF	1,100	$24	$26,400	$9,240	$35,640	$33,858	$1,782	
		T-Hangar Taxilane & Grading (phase 1)	Pavement Construction	SY	1,950	$65	$156,750	$54,863	$211,613	$201,032	$10,581	
		Airport Fencing (North and East PL)	Other	LF	5,000	$18	$90,000	$31,500	$121,500	$115,425	$6,075	
		Airport Fencing (South and West PL)	Other	LF	5,000	$18	$90,000	$31,500	$121,500	$115,425	$6,075	
		Install new Automated Vehicle Access Gates & Reconfigure Fence (East Hangar Area)	Other	LS	1	$12,000	$12,000	$4,200	$16,200	$15,390	$810	
		Property Acquisition (Privately-Owned Property for RPZ - east of Ray Road)	Other	Acres	3.6	$10,000	$41,000	$14,350	$55,350	$52,583	$2,768	
		Construct Aircraft Wash Pad	Other	LS	1	$20,000	$20,000	$7,000	$27,000	$25,650	$1,350	
		Fog Seal Business Aircraft Apron & Taxiway Connector	Pavement Maintenance	SY	6,770	$0.75	$5,578	$1,952	$7,530	$7,153	$376	
		Obstruction Survey (Instrument Approach)	Other	LS	1	$20,000	$20,000	$7,000	$27,000	$25,650	$1,350	
		Rwy 7 Displace Threshold; Reconfigure Marking & Lighting (in conjunction with Instrument Approach)	Other	LS	1	$15,000	$15,000	$5,250	$20,250	$0	$20,250	
		SuperUnicom	Other	ea	1	$75,000	$75,000	$26,250	$101,250	$96,188	$5,063	
		Fog Seal Main Apron (east section)	Pavement Maintenance	SY	8,971	$0.75	$7,728	$2,705	$10,433	$9,912	$522	
		ALP/Master Plan Update	Other	ea	1	$75,000	$75,000	$26,250	$101,250	$96,188	$5,063	
		East Hangar E/W Taxilane (Phase 2 - 350' x 25')	Pavement Construction	SY	860	$65	$56,400	$19,740	$76,140	$72,333	$3,807	
		Slurry Seal East Apron & Hangar Taxilanes (new sections)	Pavement Maintenance	SY	6,300	$4.00	$26,700	$9,345	$36,045	$34,243	$1,802	
Subtotal - Year 6-10						**Yr 6-10 Total**	$2,010,318	$703,611	$2,713,929	$2,558,995	$154,934	$750,000

Long Term	Yr	Project	Project Category	Unit	Quantity	Unit Cost	Subtotal Cost	35% Eng/Environ/ Contingency and Sales Tax	Total Cost	FAA Eligible	Airport Sponsor	
2019-2028												
		Slurry Seal Runway; Repaint Markings	Pavement Maintenance	SY	26,670	$4.00	$112,680	$39,438	$152,118	$144,512	$7,606	
		Overlay/Reconstruct Main Apron (west section)	Pavement Rehabilitation	SY	14,343	$50	$717,667	$251,183	$968,850	$920,408	$48,443	
		T-Hangar Taxilane and Grading (phase 2)	Pavement Construction	SY	1,280	$65	$113,200	$39,620	$152,820	$145,179	$7,641	
		Replace PAPI (Rwy 7 & 25)	Lighting	ea	2	$30,000	$60,000	$21,000	$81,000	$76,950	$4,050	
		Fog Seal Runway & Parallel Taxiway (new east extension)	Pavement Maintenance	SY	8,548	$0.75	$8,411	$2,944	$11,355	$10,787	$568	
		Slurry Seal Parallel Taxiway	Pavement Maintenance	SY	12,182	$4.00	$51,728	$18,105	$69,833	$66,341	$3,492	
		Slurry Seal Main Apron (east section)	Pavement Maintenance	SY	8,971	$4	$36,384	$12,735	$49,119	$46,663	$2,456	
		Slurry Seal East Apron & Hangar Taxilanes	Pavement Maintenance	SY	6,300	$4.00	$26,700	$9,345	$36,045	$34,243	$1,802	
		MIRL (Replace existing lighting system	Lighting	LF	3,422	$40	$136,880	$47,908	$184,788	$175,549	$9,239	
		Overlay Runway 7/25; Repaint Markings	Pavement Rehabilitation	SY	26,670	$40	$1,072,800	$375,480	$1,448,280	$1,375,866	$72,414	
		Fog Seal Main Apron (west section)	Pavement Maintenance	SY	14,343	$0.75	$11,258	$3,940	$15,198	$14,438	$760	
Subtotal - Year 11-20						**Yr 11-20 Total**	$2,347,708	$821,698	$3,169,405	$3,010,935	$158,470	$1,500,000
						20 Yr Total	$6,170,721	$2,159,752	$8,330,474	$7,894,713	$435,761	**$3,538,322**

CAPTIAL FUNDING SOURCES

Federal Grants

Federal funding is provided through the Federal Airport Improvement Program (AIP). This reauthorization is the latest evolution of a funding program originally authorized by Congress in 1946 as the Federal Aid to Airports Program (FAAP). The program provides grant funding for airports listed in the National Plan of Integrated Airport Systems (NPIAS). Under current legislation, eligible general aviation airports can receive up to $150,000 per year in general aviation "non-primary entitlement" grants. If a project is anticipated to cost in excess of $150,000, the participating airport can roll over the funding allocations for up to four years, at which time the accumulated total of funds can be used for larger projects. Any unused funds that remain beyond the maximum allowable roll over period revert to the FAA for use at other airports. These funds may only be used for eligible capital improvement projects and may not support airport operation and maintenance costs.

The FAA also provides discretionary grants to airports. The dollar amounts of individual grants vary and can be significantly larger than the primary entitlements. Discretionary grants are awarded at the FAA's sole discretion. Discretionary funds are distributed after all entitlement funds have been allocated. For larger projects requiring substantially larger amounts of funding, non-primary entitlement and discretionary grants are often combined. Other types of FAA funding include facilities & equipment (F&E) projects and Congressionally-appropriated dollars for specific projects.

FAA funding is limited to projects that have clearly defined need that has been identified through preparation of an FAA-approved airport layout plan (ALP). Periodic updates of the ALP are required when new or unanticipated project needs or opportunities exist that require use of FAA funds. The FAA will not generally participate in vehicle parking, utilities, building renovations or projects associated with non-aviation developments.

Some changes in funding levels and project eligibility were included in the current Airport Improvement Program (AIP) legislation (extending through FY 2009). Projects such as hangar construction or fuel systems, which have not traditionally been eligible for funding, are currently eligible, although the FAA indicates that this category of project would be considered to be a lower priority than other airfield needs. In addition, FAA funding levels have been increased from 90 percent to 95 percent.

State Funding

The Washington State Department of Transportation-Aviation Division (WSDOT) provides an additional source of funding for airport projects. These can take the form of state grants through the

Airport Aid Grants program. The Aviation Division has established new grant criteria for airport sponsors requesting aid to define projects related to pavement, safety, maintenance, security improvements or planning.

Predicting the potential level of state funding for the Sunnyside Municipal Airport capital improvement program is not possible, since funding is determined on a case-by-case basis. Competition among Washington airports for the limited grants funds is consistently high, with a priority generally given to airports with limited resources or airports that are not eligible to receive FAA grants. The current maximum grant award through the Aviation Division is $250,000, although grants of that amount are uncommon due to the large number of applications for funding normally received. It is recommended that the City continue to apply for WSDOT funding whenever possible, in particular to assist with non-FAA eligible projects or to help in providing local match dollars for FAA grants. The Aviation Division places a high priority on assisting NPIAS general aviation airports with funds needed to match FAA grants In some cases, up to half (2.5 percent) of the local 5 percent local match may be funded through Aviation Division grants.

Local Funding

The local match required for AIP-eligible projects is approximately 5 percent of the total project development costs. Non-eligible capital improvements require 100 percent of the development costs with no federal participation. As noted above, it is recommended that the City apply for WSDOT Aviation Division grants whenever available to fund a portion of the local share of the ACIP or other non-eligible airport projects.

As currently defined, the locally-funded portion in the twenty year planning period is estimated to be approximately $435,000 (approximately 5 percent), which includes the local match for AIP-funded projects, and the full cost of non-eligible projects. Hangar construction costs have not been included in the CIP, as it is assumed that the past practice of private hangar construction at the airport will continue. However, in the event that the airport has an interest in constructing hangars, it is likely that local funds would be required based on the other priority facility needs defined that will require use of FAA funds.

The property acquisition required for the recommended runway extension is included in the ACIP as a specific item eligible for FAA funding. The specific arrangements between the City and Port of Sunnyside for the acquisition of this property could affect project funding. If the property is purchased by the City through the use of FAA funds, specific requirements exist for establishing property value through appraisal consistent with federal property acquisition requirements. In the event that the Port elected to fully or partially donate the property to the City in support of airport development, the value of the property could possibly be used as to reduce the City's local matching requirements for other FAA grants. The issues surrounding the property acquisition should be

addressed by the Port and City with FAA coordination to ensure consistency with all FAA requirements.

A review of Sunnyside Municipal Airport's current rates and fees schedule and land lease terms is recommended to ensure that the airport is generating fair and reasonable revenue for its facilities. Smaller general aviation airports often have limited revenues generated from sources as land leases, hangar rentals (when hangars are airport owned), fuel flowage fees/sales, and non-aviation revenues. A periodic assessment of rates and fees ensures that the airport's revenues accurately reflect market conditions.

The terms of airport land leases should be reviewed to ensure consistency with the grants and assurances associated with FAA Airport Improvement Program (AIP) funds. Maintaining consistent lease terms among common types of users, avoiding diversion of airport-generated revenue to non-airport activities, and charging fair market value are among the primary areas of concern for airport sponsors. The length (term) of airport land leases varies considerably, although it is generally recognized that a substantial investment in hangar construction and related site improvements requires a lease term (initial period and options) that is sufficient to recoup the expense. Common land lease terms for hangar construction are 20 years with one or more 10-year options. Some airport leases utilize reversion clauses, in which ownership of hangars revert back to the airport at the end of a pre-determined useful life, usually 30 years or more.

CHAPTER SIX
AIRPORT LAYOUT PLAN DRAWINGS

Introduction

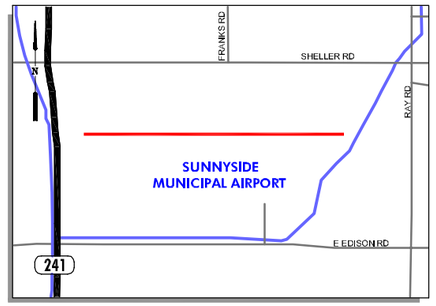
The options that were considered for the long-term development of Sunnyside Municipal Airport resulted in the selection of a preferred alternative. The preferred alternative has been incorporated into the airport layout plan drawings, which are depicted in this chapter. The set of airport plans, which is referred to in aggregate as the "Airport Layout Plan" (ALP) has been prepared in accordance with FAA guidelines. The drawings illustrate existing conditions, recommended changes in airfield facilities, existing and recommended property ownership, land use, and obstruction removal. The ALP set is presented at the end of this chapter:

- *Sheet 1 – Cover Sheet*
- *Sheet 2 - Data Sheet*
- *Sheet 3 – Airport Layout Plan*
- *Sheet 4 – FAR Part 77 Airspace Plan and Rwy 02/20 Approach Surface Plan & Profile*
- *Sheet 5 – Runway 02/20 RPZ and Inner Approach Surface Plan & Profile*
- *Sheet 6 – Airport Land Use Plan*
- Sheet 7 – *Airport Property Plan (Exhibit A)*

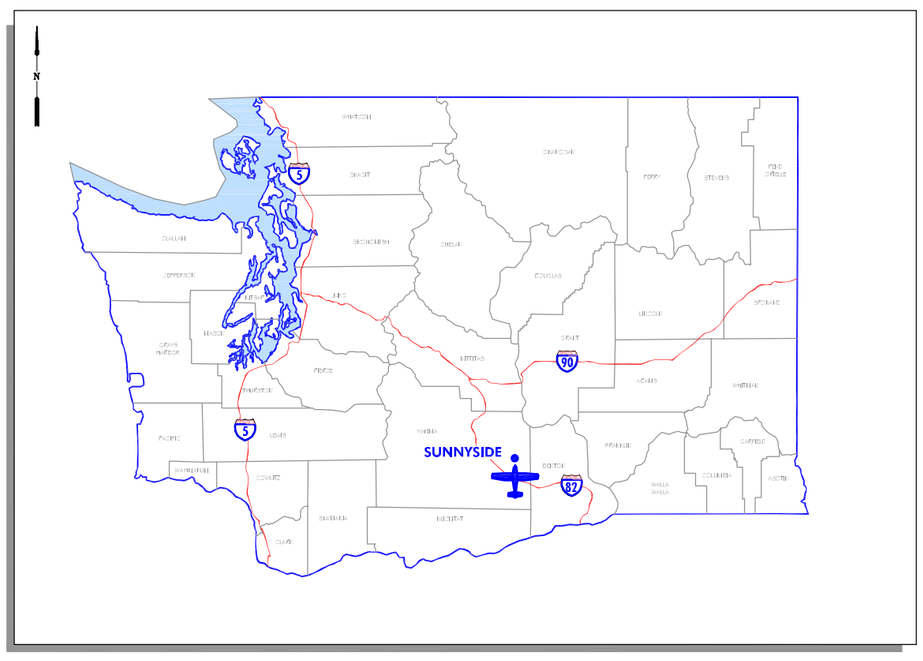
SUNNYSIDE MUNICIPAL AIRPORT

SUNNYSIDE, WASHINGTON
CWEC PROJECT NO. 41402004
AIP NO. 3-53-5300-05
DECEMBER 2008

AERIAL PHOTO



VICINITY MAP



LOCATION MAP

SHEET INDEX

NUMBER	CONTENTS
1	COVER SHEET
2	AIRPORT DATA SHEET
3	AIRPORT LAYOUT PLAN
4	FAR PART 77 AIRSPACE PLAN
5	RPZ AND INNER APPROACH PLAN & PROFILE
6	AIRPORT LAND USE PLAN
7	EXHIBIT "A" PROPERTY PLAN (NOT INCLUDED IN THIS SUBMITTAL

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6650 S.W. Redwood Lane, Suite 350
Portland, Oregon 97224
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AIRPORT DATA TABLE

DESCRIPTION	EXISTING	FUTURE
AIRPORT ELEVATION	767.0'	771
AIRPORT ACREAGE	81 (EST.)	103. (EST)
ARP COORDINATES	LAT. N 46° 19' 39.47" LONG. W 119° 58' 14.14"	LAT. N 46° 19' 37.44" LONG. W 119° 58' 9.18" NOT SURVEYED
MAGNETIC DECLINATION	16° 15'E SOURCE: 12/08 NGDC	0° 9'W /PER YEAR
MEAN MAX. DAILY TEMPERATURE	90.2°	SAME
FAA IDENTIFIER	1S5	SAME
	EXISTING CONDITIONS RUNWAY 7 - 25	FUTURE CONDITIONS RUNWAY 7 - 25
AIRPORT REFERENCE CODE (ARC)	B-I (SMALL)	B-I (SMALL)
FAR PART 77 DESIGNATION	UTILITY-VISUAL	UTILITY-NPI
NPIAS ROLE / SERVICE LEVEL	GENERAL AVIATION	SAME
TERMINAL NAVAIDS (VISUAL)	ROTATING BEACON, LIGHTED WIND CONE, SEGMENTED CIRCLE	SAME
TAXIWAY LIGHTING	NONE "REFLECTORS"	SAME
TAXIWAY MARKING	CENTER LINE, LEAD-IN, AC HOLD LINES	SAME

RUNWAY DATA TABLE

	EXISTING CONDITIONS RUNWAY 7 - 25	FUTURE CONDITIONS RUNWAY 7 - 25
RUNWAY LENGTH AND WIDTH	3422' X 60'	4000' X 60'
RUNWAY PAVEMENT STRENGTH (IN 1000 LBS)	12,500 SW	SAME
RUNWAY PAVEMENT TYPE	ASPHALT	SAME
RUNWAY PERCENT WIND COVERAGE	96.6% @12 MPH	SAME
RUNWAY PERCENT GRADIENT / MAXIMUM GRADE	0.643%	SAME

	EXISTING CONDITIONS	EXISTING STANDARD	FUTURE CONDITIONS (ALL STANDARD)
RUNWAY SAFETY AREA LENGTH AND WIDTH LENGTH BEYOND RUNWAY ROLL-OUT END	3902' X 120' 240'	3902' X 120' 240'	4478' X 120' 240'
OBJECT FREE AREA LENGTH AND WIDTH LENGTH BEYOND RUNWAY ROLL-OUT END	3902' X 250' 240'	3902' X 250' 240'	4478' X 250' 240'
OBSTACLE FREE ZONE LENGTH AND WIDTH LENGTH BEYOND RUNWAY ROLL-OUT END	3822' X 250' 200'	3822' X 250' 200'	4398' X 250' 200'

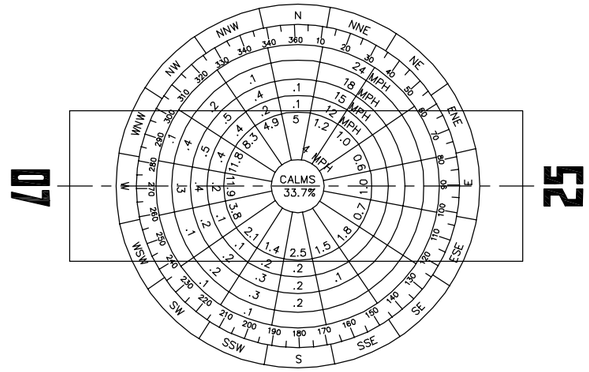
	EXISTING CONDITIONS		FUTURE CONDITIONS	
RUNWAY LIGHTING	LIRL		MIRL	
RUNWAY END	7	25	7	25
RUNWAY APPROACH CATEGORY	A-VISUAL	A-VISUAL	A-VISUAL	A-NPI
RUNWAY APPROACH SLOPE PART 77 REQUIRED	20:1	20:1	20:1	20:1
ACTUAL	7:7	26:1	20:1 W/OCS	20:1
APPROACH VISIBILITY MINIMUMS	VISUAL & NOT LOWER THAN 1-MILE	VISUAL & NOT LOWER THAN 1-MILE	VISUAL & NOT LOWER THAN 1-MILE	VISUAL & NOT LOWER THAN 1-MILE
RUNWAY MARKINGS	VISUAL	VISUAL	VISUAL	NPI
RUNWAY END COORDINATES LAT.	N 46° 19' 37.55"	N 46° 19' 37.37"	N 46° 19' 37.55"	N 46° 19' 37.33"
LONG.	W 119° 58' 37.68"	W 119° 57' 48.93"	W 119° 58' 37.68" NOT SURVEYED	W 119° 57' 40.68" NOT SURVEYED
INSTRUMENTATION AND APPROACH AIDS	NONE	NONE	NONE	WAAS
VISUAL AIDS	PAPI	PAPI	PAPI	PAPI, REIL
CRITICAL AIRCRAFT (ARC)	B-I (SMALL)		B-I (SMALL)	
WINGSPAN	LESS THAN 79'		LESS THAN 79'	
WEIGHT	12,500 * OR LESS		SAME	
APPROACH SPEED	91 TO LESS THAN 121 KNOTS		SAME	
LENGTH OF HAUL	≦ 500 MILES		≦ 500 MILES	
OFZ PENETRATION	NONE		NONE	

DECLARED DISTANCES

EXISTING	RW 7	RW 25	FUTURE	RW 7	RW 25
LDA	3422	3422	LDA	4000	4000
ASDA	3422	3422	ASDA	4000	4000
TORA	3422	3422	TORA	4000	4000
TODA	3422	3422	TODA	4000	4000

BUILDING/FACILITY KEY

1. CITY WATER FACILITY
2. T-HANGAR (EXISTING)
3. T-HANGAR (FUTURE)
4. CONVENTIONAL HANGAR (EXISTING)
5. HOUSE
6. CONVENTIONAL HANGAR (FUTURE)
7. QUONSET HANGAR
8. AG OPERATIONS BLDG. & PAD
9. AIRCRAFT APRON
10. AIRCRAFT FUEL (EXISTING)
11. LONG TERM DEVELOPMENT RESERVE
12. HELICOPTER PARKING (FUTURE)



ALL WEATHER WIND ROSE

SOURCE : YAKIMA, WASHINGTON AIRPORT WIND DATA PERIOD FROM 1/1/49 TO 12/31/58

RUNWAY 07/25 — 12 MPH

COVERAGE — 96.9%

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0" [redacted] 1"
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MANAGER, SEATTLE ADO

CITY OF SUNNYSIDE APPROVAL

APPROVAL DATE: _____

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Portland, Oregon 97224
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DM	SLK	WMR	AS SHOWN

DATE: DECEMBER 2008

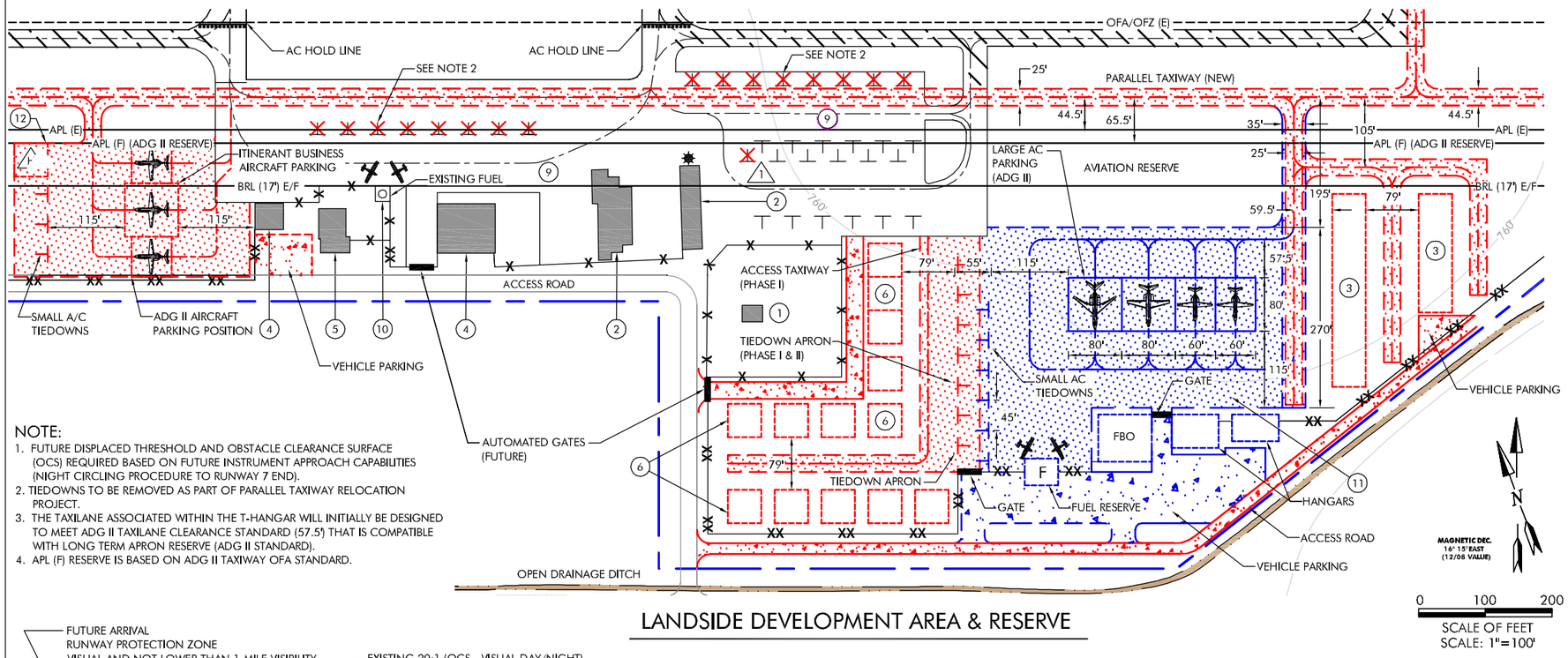
PROJECT NO: 41402004

SUNNYSIDE MUNICIPAL AIRPORT

AIRPORT DATA SHEET

FIGURE NO. .

SHEET NO. 2 OF 7



LANDSIDE DEVELOPMENT AREA & RESERVE

NOTE:

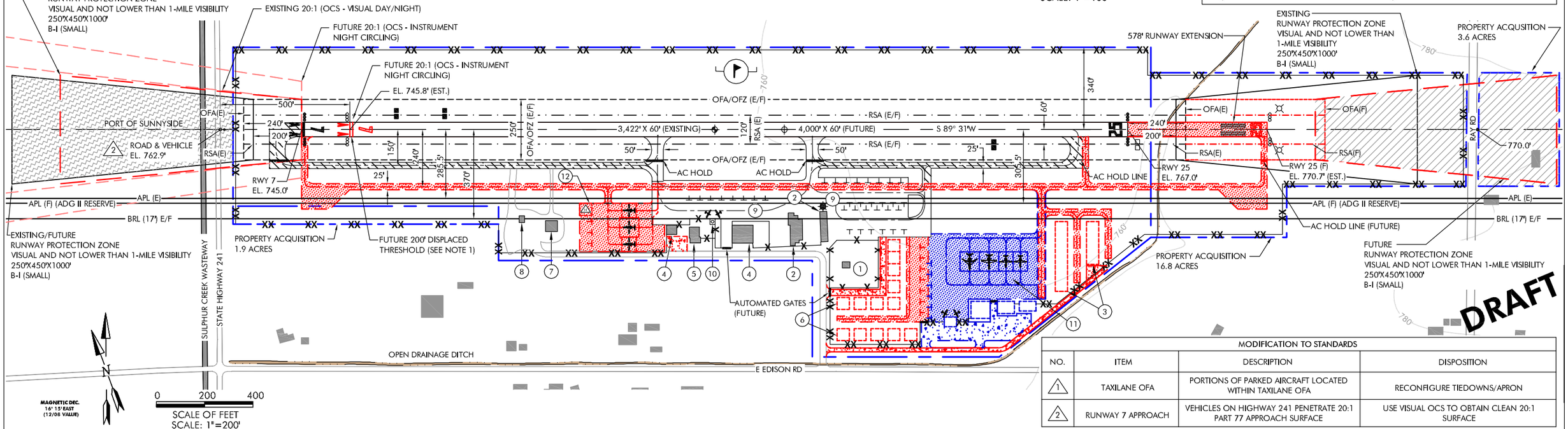
1. FUTURE DISPLACED THRESHOLD AND OBSTACLE CLEARANCE SURFACE (OCS) REQUIRED BASED ON FUTURE INSTRUMENT APPROACH CAPABILITIES (NIGHT CIRCLING PROCEDURE TO RUNWAY 7 END).
2. TIEDOWNS TO BE REMOVED AS PART OF PARALLEL TAXIWAY RELOCATION PROJECT.
3. THE TAXILANE ASSOCIATED WITHIN THE T-HANGAR WILL INITIALLY BE DESIGNED TO MEET ADG II TAXILANE CLEARANCE STANDARD (57.5') THAT IS COMPATIBLE WITH LONG TERM APRON RESERVE (ADG II STANDARD).
4. APL (F) RESERVE IS BASED ON ADG II TAXIWAY OFA STANDARD.

LEGEND

	EXISTING	FUTURE
FACILITIES		
BUILDINGS		
RUNWAY		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
TAXIWAY OBJECT FREE AREA (TOFA)		
OBSTACLE FREE ZONE (OFZ)		
RUNWAY PROTECTION ZONE (RPZ)		
WATER		SAME
AIRPORT REFERENCE POINT (ARP)		
REIL	N/A	
VISUAL GUIDANCE INDICATORS	PAPI	PAPI
WIND INDICATOR		
FENCE		
BEACON		SAME
THRESHOLD LIGHTS		
PROPOSED AIRFIELD PAVEMENT	N/A	
LONG-TERM AVIATION USE DEVELOPMENT RESERVE	N/A	
PROPOSED ACCESS ROAD/VEHICLE PARKING	N/A	
PROPOSED ACCESS ROAD/VEHICLE PARKING RESERVE	N/A	
AVIGATION EASEMENT		
DITCH		SAME

BUILDING/FACILITY KEY

1	CITY WATER FACILITY	7	QUONSET HANGAR
2	T-HANGAR (EXISTING)	8	AG OPERATIONS BLDG. & PAD
3	T-HANGAR (FUTURE)	9	AIRCRAFT APRON
4	CONVENTIONAL HANGAR (EXISTING)	10	AIRCRAFT FUEL (EXISTING)
5	HOUSE	11	LONG TERM DEVELOPMENT RESERVE
6	CONVENTIONAL HANGAR (FUTURE)	12	HELICOPTER PARKING (FUTURE)



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MODIFICATION TO STANDARDS

NO.	ITEM	DESCRIPTION	DISPOSITION
1	TAXILANE OFA	PORTIONS OF PARKED AIRCRAFT LOCATED WITHIN TAXILANE OFA	RECONFIGURE TIEDOWNS/APRON
2	RUNWAY 7 APPROACH	VEHICLES ON HIGHWAY 241 PENETRATE 20:1 PART 77 APPROACH SURFACE	USE VISUAL OCS TO OBTAIN CLEAN 20:1 SURFACE

VERIFY SCALES

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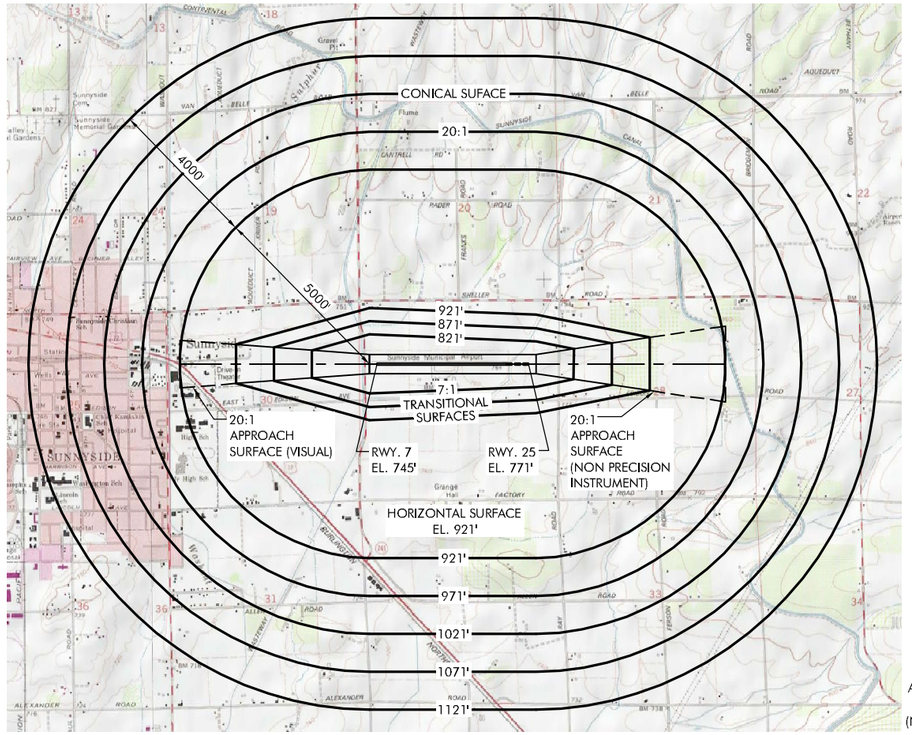
SUNNYSIDE MUNICIPAL AIRPORT

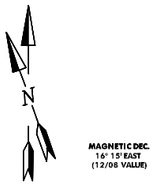
AIRPORT LAYOUT PLAN

FIGURE NO. .

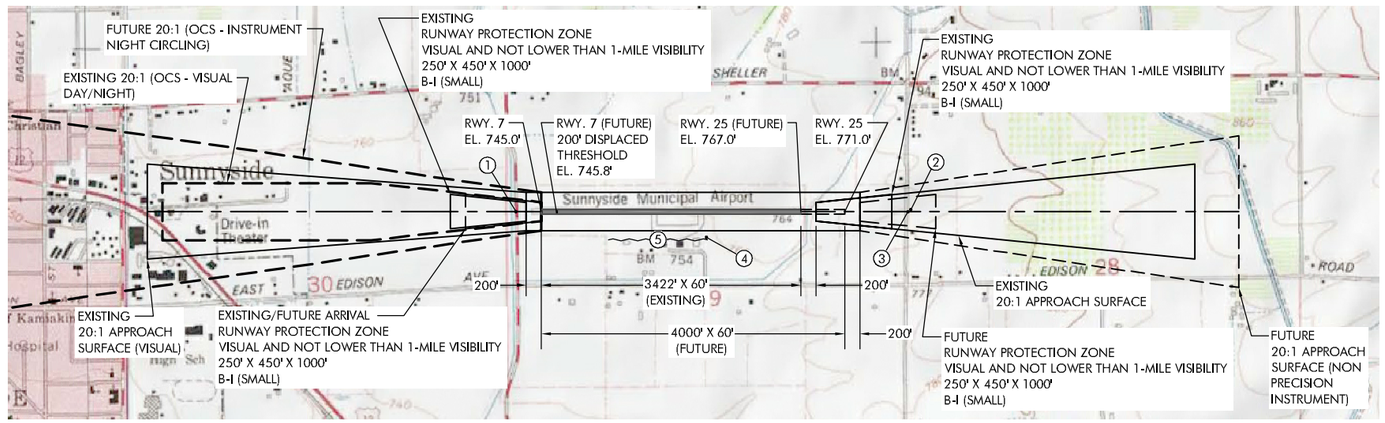
SHEET NO. 3 OF 7



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



AREAS OF TERRAIN
PENETRATION
(NONE IDENTIFIED)



RUNWAY 7-25 PLAN VIEW

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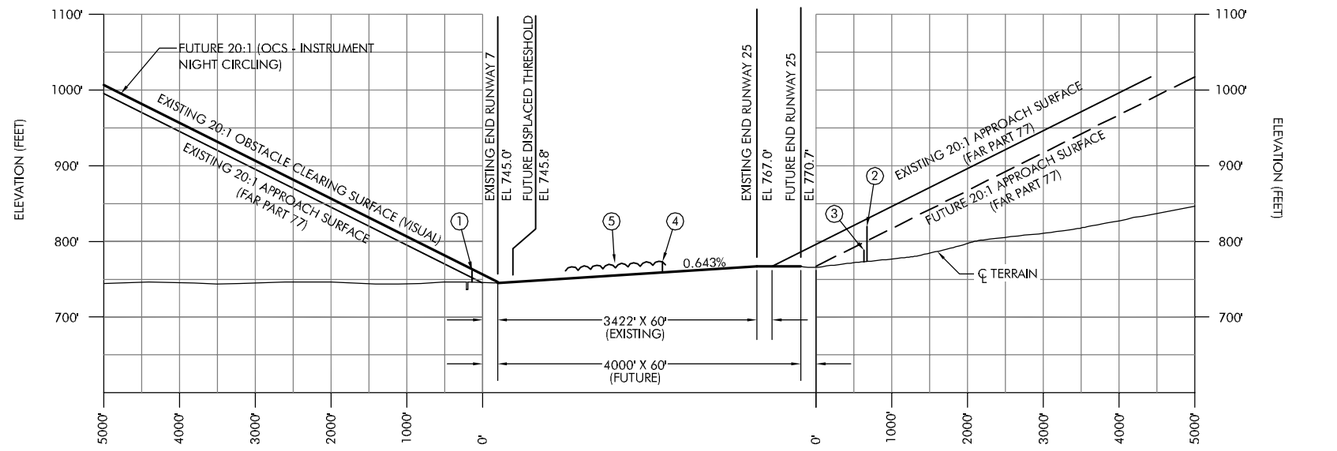
SCALE OF FEET
SCALE: 1"=1000'



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

RUNWAY 7-25 PROFILE VIEW

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

NOTES:

1. DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE FUTURE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
2. OBSTRUCTION ELEVATIONS ESTIMATED, EXCEPT FOR CONTROLLING OBSTRUCTION ITEMS FOR EACH EXISTING RUNWAY END FROM WSDOT AVIATION DATA BASE (SURVEY).
3. OBSTRUCTION ITEMS 4 AND 5 ARE BASED ON FUTURE NONPRECISION INSTRUMENT APPROACH - NO OBSTRUCTION WITH EXISTING VISUAL APPROACH.
4. SURVEY REQUIRED TO VERIFY ROOF ELEVATIONS OF STRUCTURES TO VERIFY/DETERMINE HEIGHT OF OBSTRUCTIONS.

OBSTRUCTION CHART

NO.	ITEM	PART 77 SURFACE	MSL ELEV	DISTANCE FROM RWY CL	DISTANCE FROM RWY END 1	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
1	ROAD (INCLUDES 15' VEHICLE HEIGHT)	APPROACH (RWY 7)	762.9'	0'	337'	10'	NO	OCS (VISUAL) TO CLEAR 20:1 SURFACE FUTURE DISPLACED THRESHOLD AND OCS REQUIRED FOR INSTRUMENT (DAY/NIGHT CIRCLING) APPROACH.
2	POLE	APPROACH (RWY 25)	814.4'	0' R	872'	16'	NO	BURY OVERHEAD POWER LINE
3	ROAD (INCLUDES 15' VEHICLE HEIGHT)	APPROACH (RWY 25)	783.0'	0'	834'	0'	NO	NO OBSTRUCTION - FOR REFERENCE ONLY
4	HANGAR	TRANSITIONAL	773' (EST.)	339'	-1250'	2' (EST.)	YES	OBSTRUCTION LIGHT (SEE NOTE 3 & 4)
5	HANGARS/STRUCTURES	TRANSITIONAL	775' (EST.)	350' - 390'	-1400' - 1800'	0'	YES	OBSTRUCTION LIGHT (SEE NOTE 3 & 4)

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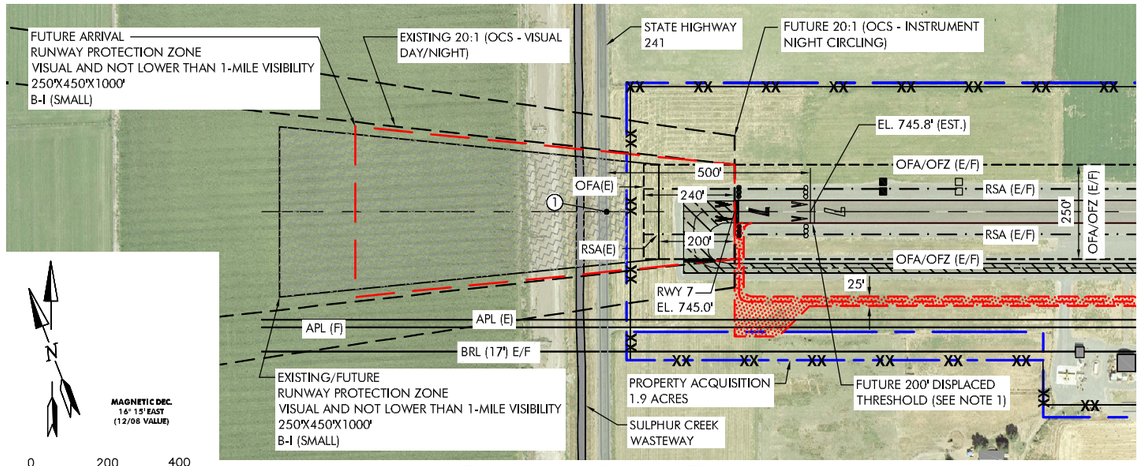
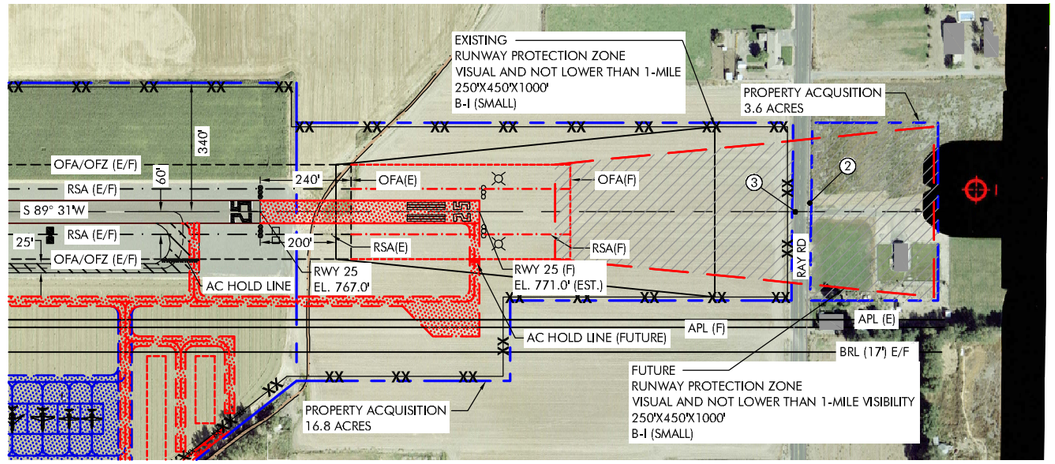
SUNNYSIDE MUNICIPAL AIRPORT

FAR PART 77 AIRSPACE PLAN

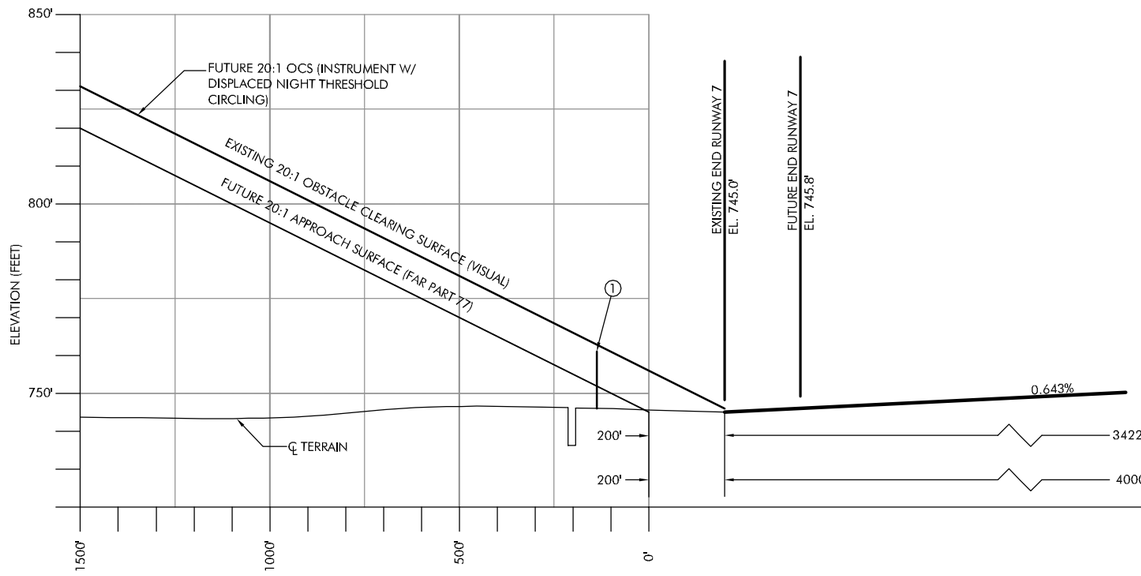
DRAWING NO. .
SHEET NO. 4 OF 7



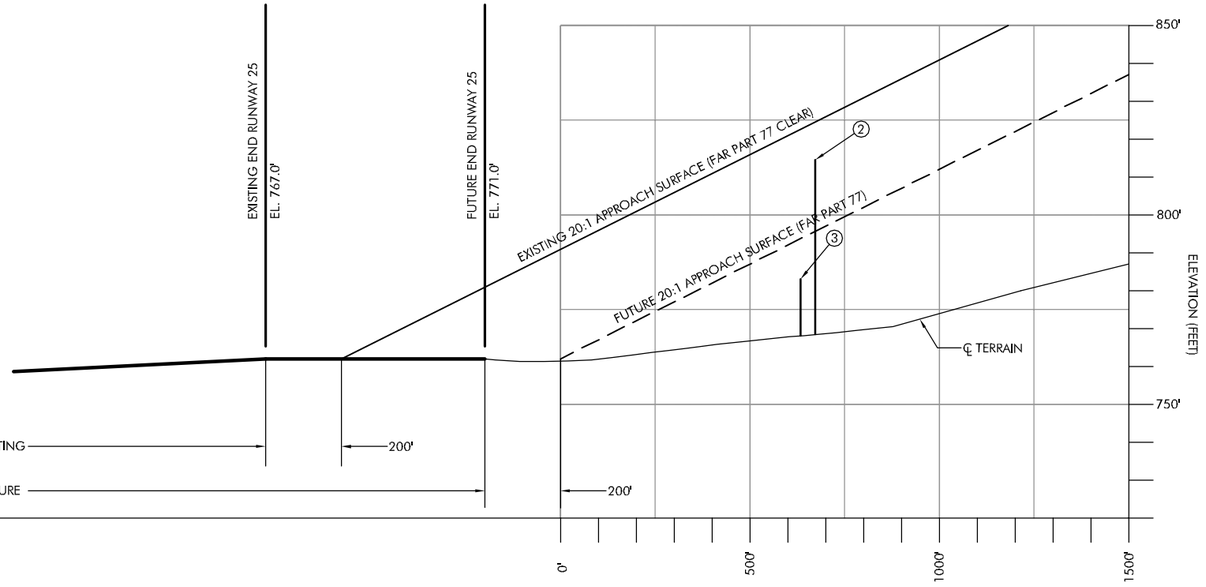
RUNWAY 7 PLAN VIEW



RUNWAY 25 PLAN VIEW



RUNWAY 7 PROFILE VIEW



RUNWAY 25 PROFILE VIEW

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

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

NOTE:
1. FUTURE DISPLACED THRESHOLD AND OBSTACLE CLEARANCE SURFACE (OCS) REQUIRED BASED ON FUTURE INSTRUMENT APPROACH CAPABILITIES (NIGHT CIRCLING PROCEDURE TO RUNWAY 7 END.

OBSTRUCTION CHART

NO.	ITEM	PART 77 SURFACE	MSL ELEV	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
1	ROAD (INCLUDES 15' VEHICLE HEIGHT)	APPROACH (RWY 7)	762.9'	0'	337'	10'	NO	OCS (VISUAL) TO CLEAR 20:1 SURFACE
2	POLE	APPROACH (RWY 25)	814.4'	0' R	872'	16'	NO	BURY OVERHEAD POWER LINE
3	ROAD (INCLUDES 15' VEHICLE HEIGHT)	APPROACH (RWY 25)	783.0'	0'	834'	0'	NO	NO OBSTRUCTION - FOR REFERENCE ONLY

DRAFT

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APPROVAL DATE: _____

_____
MANAGER, SEATTLE ADO

CITY OF SUNNYSIDE APPROVAL

APPROVAL DATE: _____

_____
SIGNATURE

CENTURY WEST
ENGINEERING CORPORATION
6650 S.W. Redwood Lane, Suite 350
Portland, Oregon 97224
503-419-2130 phone ♦ 503-639-2710 fax
www.centurywest.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS	SLK	AS SHOWN
DATE: DECEMBER 2008		PROJECT NO: 41402004	

SUNNYSIDE MUNICIPAL AIRPORT

RPZ AND INNER APPROACH PLAN & PROFILE

FIGURE NO.
.

SHEET NO.
5 OF 7

LEGEND

- ZONING BOUNDARY
- AIRPORT TRAFFIC PATTERN (TYP.)
- RUNWAY PROTECTION ZONE
- APPROACH SURFACE
- AIRPORT PROPERTY LINE
- AIRPORT PROPERTY LINE
- CITY LIMIT BOUNDARY
- URBAN GROWTH BOUNDARY

CITY OF SUNNYSIDE ZONING

PUD	PLANNED UNIT DEVELOPMENT
AP	AIRPORT
M1	LIGHT INDUSTRIAL
B2	LOCAL BUSINESS
R1	SINGLE-FAMILY RESIDENTIAL
R3	MULTI-FAMILY RESIDENTIAL
PB	PUBLIC BUILDING

CITY COMPREHENSIVE PLAN LAND USE DESIGNATIONS

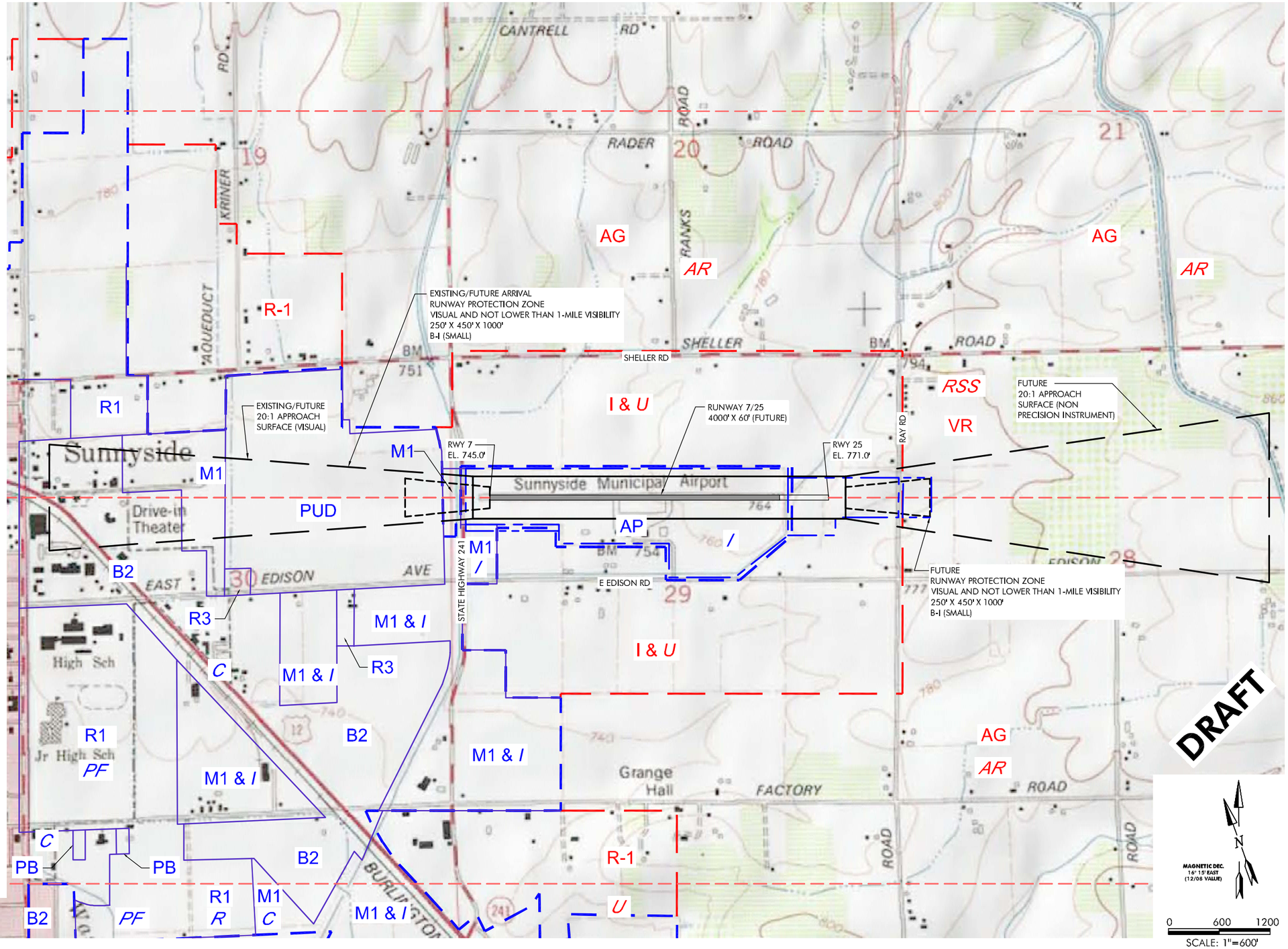
R	RESIDENTIAL
/	INDUSTRIAL
C	COMMERCIAL
PF	PUBLIC FACILITIES

YAKIMA COUNTY ZONING

AG	AGRICULTURE
R-1	SINGLE FAMILY RESIDENTIAL
I	INDUSTRIAL
VR	VALLEY RURAL

COUNTY COMPREHENSIVE PLAN LAND USE DESIGNATIONS

AR	AGRICULTURAL RESOURCE
U	URBAN GROWTH AREA
RSS	RURAL SELF SUFFICIENT



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MANAGER, SEATTLE ADO

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SIGNATURE

CENTURY WEST ENGINEERING CORPORATION
6650 S.W. Redwood Lane, Suite 350
Portland, Oregon 97224
503-419-2130 phone • 503-639-2710 fax
www.centurywest.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DM	JLS	SLK	AS SHOWN
DATE: DECEMBER 2008		PROJECT NO: 41402004	

SUNNYSIDE MUNICIPAL AIRPORT

AIRPORT LAND USE PLAN

FIGURE NO. .

SHEET NO. 6 OF 7

CHAPTER SEVEN
AIRPORT LAND USE

Overview

Land use compatibility is a critical factor in the successful operation of an airport within any community. The effectiveness of land use planning, particularly the ability to accommodate a variety of land uses, is a critical element in maintaining a livable community with efficient transportation systems.

Airports present unique land use planning challenges. In Washington, public use airports are recognized as "Essential Public Facilities (EPF)" in the Washington State Growth Management Act (GMA). In accordance with GMA, local jurisdictions are required to protect airports through effective land use planning.

As Sunnyside Municipal Airport is located within the city limits and urban growth area boundary for Sunnyside, the land use authority on the airport is the City of Sunnyside; however, the airport is surrounded (north, east and south) by unincorporated lands under the jurisdiction of Yakima County.

Although the responsibility for creating and implementing land use controls is exclusively local, most technical evaluation and land use planning tools designed to protect airports from incompatible land uses or development are created at the state or federal government level.

GOVERNMENT ROLES IN AIRPORT LAND USE

Federal

The federal government's primary role in airport land use planning focuses on uses of lands within the boundaries of public use airports (aviation-related uses, aeronautical uses, non-aviation uses, etc.), specifically as related to conformance with Federal Aviation Administration (FAA) grant assurances. Airports that are eligible to receive FAA Airport Improvement Program (AIP) grants pledge to protect the aeronautical function of the facility by restricting non-aviation land uses within airport property. Efficient on-airport land use ensures that meeting FAA airport design standards and protecting the airspace that surrounds a runway (FAR Part 77 – Objects Affecting Navigable Airspace) are among the highest priorities for an airport owner.

The second main area of interest at the federal government level is the protection of airspace associated with public use airports from potential hazards to air navigation (obstructions). FAR Part 77 defines the airspace associated with public-use airports that is protected from incompatible development (obstructions). The three-dimensional "imaginary surface es" extend from the ground surface, upward and outward from a runway. The geometry of Part 77 surfaces varies by runway design category and approach capabilities. The FAR Part 77 airspace associated with Runway 7/25 is depicted on the Airport Airspace Plan drawing included in Chapter Six. Proposed construction on airports and in the vicinity of airports is reviewed by FAA (FAA Form 7460-1 - Notice of Proposed Construction or Alteration) to identify potential hazards to air navigation. If a proposed item penetrates any defined FAR Part 77 surfaces, or is located within the defined visual airport traffic patterns, the FAA will normally issue a "determination of presumed hazard," effectively objecting to the development proposal. It is the responsibility of the local planning/building authorities to address FAA concerns as part of the local permitting process. The execution of airport leases (for hangar construction, etc.) should also be dependent on successful completion of the FAA's 7460 review process.

FAR Part 150 (Airport Noise Compatibility Planning) provides guidance for land-use compatibility around airports. Compatibility or non-compatibility of land use is determined by comparing the noise expose levels with existing and potential land uses. Through established federal standards, the methodology for quantifying and evaluating cumulative noise impacts is defined. Specific levels of noise exposure are also recognized as "significant," which is the threshold used by FAA to consider implementing various noise mitigation measures. FAR Part 150 correlates the compatibility of land uses (residential, commercial, industrial, etc.) to specific noise exposure levels. The 1990 Airport Noise and Capacity Act defines federal policy on the regulation of airport noise (operating curfews, aircraft restrictions, etc.), with the intent of standardizing noise controls throughout the national airport system.

State

The Growth Management Act (GMA) establishes requirements for towns, cities and counties to address airport land use compatibility. The following text (provided by WSDOT Aviation) briefly summarizes the intent of the Act:

In 1996, the Washington State Legislature passed land use legislation (RCW 36.70.547, RCW 36.70A.510) that requires all cities and counties to adopt comprehensive plan goals, policies and regulations to discourage development of incompatible land uses adjacent to public use airports. Local jurisdictions are also required to consult with aviation interests, including WSDOT Aviation, when adopting comprehensive plan amendments. Communities must address airport land use compatibility as part of their scheduled GMA Updates, subject to the schedule designated by state law.

WSDOT Aviation provides airport land use compatibility guidelines and technical resources to assist communities in their efforts to protect airports from incompatible land uses.

Local

The City of Sunnyside does not currently have an adopted airport overlay zone. City officials have indicated that developing airport overlay zoning, consistent with WSDOT Aviation airport land use compatibility guidelines is a high priority. It is recommended that the City of Sunnyside and Yakima County adopt common overlay zone ordinances based on the WSDOT guidelines to ensure consistent land use planning is in place for both incorporated and unincorporated surrounding the airport.

Yakima County has adopted airport overlay zoning, which is applicable to Sunnyside Municipal Airport (**Chapter 15.55 – Airport Safety Overlay (ASO) District**). The county overlay zone is intended to protect the airspace surrounding airports from obstructions, hazards and incompatible land uses. The overlay zones are defined by the FAR Part 77 airspace surfaces established for the runway.

The City of Sunnyside recognizes the importance of protecting Sunnyside Municipal Airport through several transportation, economic development and essential public facility siting goals in its current Comprehensive Plan. The following airport-related policies are contained in the Comprehensive Plan:

Transportation Element

GOAL 1:

To ensure that transportation facilities and services needed to support development are available concurrent with the impacts of such development, which protects investments in existing transportation facilities and services, maximizes the use of these facilities and services, and promotes orderly compact growth.

Policy 1.10 Protect the viability of the airport as a significant economic resource to the community by encouraging compatible land uses, densities, and reducing hazards that may endanger the lives and property of the public and aviation users.

Policy 1.11 Coordinate the protection of the *Sunnyside Municipal* Airport with *Yakima County* by developing consistent development regulations that utilize WSDOT Aviation Airport and Land Use Compatibility guidelines and other best management practices for encouraging compatible land uses adjacent to Sunnyside Airport.

Economic Development

GOAL 3:

Encourage economic growth within the capacity of the City public services, facilities and infrastructure.

Policy 3.4 Support the development of public transportation improvements, including rail service, airport development and roadway systems which support business expansion and economic vitality.

AIRPORT ZONING (CITY OF SUNNYSIDE)

Sunnyside Municipal Airport is located within the City of Sunnyside city limits and urban growth area (UGA). The airport is zoned **AP – Airport Zone** (City of Sunnyside Zoning Ordinance – Chapter 17.62). The purpose of the AP zone is to "provide for general and commercial aviation uses…" Six permitted uses related to normal airport activities are identified including aircraft storage, fuel storage, chemical storage and loading for agricultural spraying. Others uses that are not specifically identified as "permitted" are prohibited.

ZONING & LAND USE IN VICINITY OF SUNNYSIDE MUNICIPAL AIRPORT

The airport is located at the northeast corner of the Sunnyside city limits and urban growth area (UGA) boundary. The urban areas associated with the community are located approximately one to two miles west-southwest of the airport. The area to the west of the airport is largely within city limits or the UGA with a variety of zoning designations including light industrial, commercial, and residential.

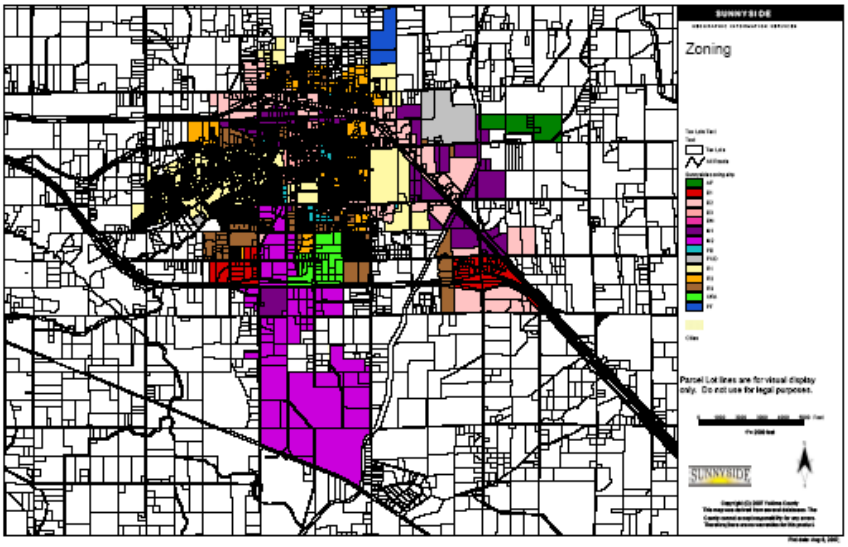
City of Sunnyside Zoning & Land Use Designations

The area located immediately west of the airport, on the west side of State Highway 241, is zoned **PUD (Planned Unit Development)** and has been planned by the Port of Sunnyside for development of a business and industrial park. The platted configuration of parcels restricts development within the runway protection zone and approach surface for Runway 7. The Comprehensive Plan land use designation for this area is **Residential**, which appears to be inconsistent with zoning and planned development.

Large areas of **M-1 – Light Industrial** zoning abut the airport's west end and extend west and southwest along Edison Road, Factory Road and the railroad tracks. This zone accommodates small manufacturing, processing, assembly, and storage facilities. The uses permitted in the B-2 General Commercial zone (see below) are permitted in this zone in addition to a wide range of industrial uses

(lumberyards, food processing, manufacturing, cold storage plants, etc.). There is no minimum lot area. Maximum building height is 60 feet. The Comprehensive Plan land use designation for most of these areas is **Industrial**, which is consistent with zoning; limited areas of M-1 zoning have **Commercial** land use designations.

Areas of residential zoning are located within 1 mile of the airport (northwest and southwest). The majority of these areas are zoned **R-1 – Low Density Residential** within the city jurisdiction. This zone permits one dwelling unit per parcel, with a minimum lot area of 6,500 to 7,500 square feet. Maximum building height is 35 feet. Duplexes are not permitted in this zone, with the exception of those constructed prior to 1980. Included among the conditional uses allowed in this zone are churches, schools, group residential facilities, and libraries. Two areas of **R-3 – High Density Residential** zoning are located on Edison Avenue, southwest of the airport. This zone permits 1 to 10 dwelling units per acre, with a minimum lot area of 4,300 square feet. Maximum building height is 35 feet. The conditional uses identified for the R-1 zone are also allowed in the R-3 zone, with nursing homes, mobile home parks and several other uses also identified. The Comprehensive Plan land use designation for most of these areas is **Residential**, which is consistent with zoning. A large area of R-1 zoning located southwest of the airport that accommodates the local high school and junior high school campus has **Public Facilities** land use designation, which appears to be consistent with actual use.



Large Areas of **B2 - General Commercial** zoning are located within 1 mile west-southwest of the airport, along Edison Avenue on both sides of the railroad tracks. This zone accommodates large retail and wholesale business including shopping centers, auto dealers, and a variety of other commercial activities. There is no minimum lot area. Maximum building height is 45 feet. The Comprehensive Plan land use designation for these areas is **Commercial**, which is consistent with zoning.

Yakima County Zoning & Land Use Designations

The boundary of Sunnyside Municipal Airport forms the northeastern-most appendage of the city limits. It is bordered by lands within the northeastern-most portion of the Sunnyside Urban Growth Area (UGA) along its entire north and south sides and between the east airport property line and Ray Road. The north section of UGA area extends from the north edge of the airport to Sheller Road, from Highway 241 to Ray Road. The south section of UGA area extends from the south edge of the airport to approximately the midpoint between East Edison Road and Factory Road, from the eastern edge of the city limits to Ray Road. Yakima County zoning for these areas is **Industrial**. The Industrial zone permits a wide range of uses, including manufacturing, storage, and processing facilities. The Yakima County Comprehensive Plan land use designation for lands located within a city's defined UGA is **UGA – Urban Growth Area**, which reflects the intended transition from rural to urban land uses to accommodate future community growth.

Beyond the UGA, the zoning is predominantly **Agriculture (AG)**, with **Agricultural Resource (AR)** land use designations. These lands are used for agricultural purposes with limited residential accessory development permitted.

An area of **Valley Rural (VR)** zoning abuts Ray Road on its east side and extends along the western-most section of the UGA. VR zoning is intended to maintain the rural character of outlying areas of Yakima County located along valley floors, often on the periphery of urban growth areas. Isolated and scattered very low density residential development is also accommodated. The Comprehensive Plan land use designation for this area is **RSS - Rural Self Sufficient**, which is consistent with zoning. For the area east of the airport (located within 5 miles of a year-round responding fire station), the zone permits 1 dwelling unit per 5 acres; lots of 3 acres or less are permitted under the clustering provisions of the zone. The provisions of the Yakima County airport overlay zone apply to this area, although changes in the planned airfield configuration should be reflected in county zoning, particularly for the portion of future runway protection zone (RPZ) for Runway 25. It noted that sparsely developed residential land uses currently exist within the VR zone, including a residence located within the future RPZ for Runway 25.

Yakima County has taken several measures to protect Sunnyside Municipal Airport including:

- Comprehensive Planning - Specific goals contained in the transportation section address the need for airport protection and land use compatibility
- Overlay Zoning - Adoption of an airport overlay zoning district (**Chapter 15.55 – Airport Safety Overlay (ASO) District**).

WSDOT AVIATION DIVISION - LAND USE PLANNING GUIDELINES

The following items/issues of interest are identified by WSDOT Aviation Division to assist local officials in evaluating airport land use compatibility. These items have been organized in a checklist format in **Table 7-1**, with responses provided based on the research conducted during this project.

TABLE 7-1:
SUMMARY OF AIRPORT LAND USE CONTROLS

Existing Land Uses	
Are there existing obstructions to the airspace?	Yes (vehicles on Highway 241). Mitigation is considered feasible.
What are the existing land uses located under the airport traffic pattern? What are the densities and intensities of existing uses?	The airport is surrounded by rural agricultural and low density residential land uses outside the UGA (north, east and south). Industrial, commercial, and medium density residential land uses located within UGA, within 2 miles west of the airport.
Are there any significant topographical features that may affect airspace if development were to occur there?	No. Terrain is not expected to limit runway extension potential; other developable areas are relatively level.
Comprehensive Plan Goals and Policies	
Are airport facilities and operations described in the transportation inventory? If so, what is included?	Yes. Sunnyside Municipal Airport is listed with a basic description provided. Also referenced in Yakima County comprehensive plan.
Is the airport recognized as an Essential Public Facility?	Not specifically noted in plan as EPF. EPF siting criteria is described in plan.
Does the plan include a policy that discourages development of incompatible land uses adjacent to the airport? If so, what is the policy and where is it included in the plan?	Yes. Goal 1, Policies 1.10 and 1.11 (Transportation Element). Yakima County Airport Safety Overlay District addresses land use compatibility and FAR Part 77 airspace surfaces are identified to address height limitations of development for county zoned lands.
Does the plan include other policies relevant to the airport, such as a policy that recognizes the significance of the airport for economic development and recreation? If so, what are the policies and where are they included in the plan?	Yes. Goal 3, Policy 3.4 (Economic Development Element).
Which future land uses are anticipated under the airport traffic pattern, according to the comprehensive plan land use map?	Rural Residential (1 dwelling unit per 3 to 5 acres); Industrial, Commercial Agriculture. UGA land use designations for industrially-zoned areas within UGA.
Does the Comprehensive Plan . . .	
. . . describe airport facilities and operations, existing and future, in the transportation inventory?	Yes.
. . recognize the airport as an Essential Public Facility?	No. However, the responsibility for siting EPFs is noted in Chapter 3 (Capital Facilities Element); criteria to be developed jointly with Yakima County through county-wide planning effort.
. . . include a policy discouraging development of incompatible land uses adjacent to the airport?	Yes.
. . . include a policy recognizing the significance of the airport for economic development and recreation?	Yes.

. . identify Part 77 Imaginary Surfaces in the comprehensive plan maps?	No.
Zoning	
Describe permitted or conditional land uses allowed in zoning districts located under the airport traffic pattern:	The airport is bordered by Industrial zones on its north and south sides (within UGA); Valley Rural zoning (low density residential) on the east side of Ray Road; Agricultural zoning outside the UGA (north, east and south); Commercial, Industrial and Residential (low/medium density) zoning within UGA/city limits west of the airport.
Is residential development allowed? If so, at what density?	Yes (1 dwelling unit per 3 or 5 acres) in VR zone (outside of UGA); 5 to 6 dwelling units per acre in R-1 Zone; up to 10 dwelling units per acre permitted in R-3 zone.
At what intensity are non-residential uses allowed?	Rural densities of non-residential uses permitted outright or conditional.
Are high-intensity or special function land uses allowed in areas under the airport traffic pattern?	No.
What is the zoning of the airport property?	City of Sunnyside AP - Airport Zone.
Does the zoning allow development of wildlife attractants such as landfills, storm water detention ponds or stockyards?	Not specified.
Note any inconsistencies between the comprehensive plan map and zoning.	City of Sunnyside Comprehensive Plan mapping identifies PUD-zoned land (owned by Port of Sunnyside) located west of the airport with a Residential land use designation.
Does the existing zoning . . .	
. . . limit structure heights to prohibit penetration of FAR Part 77 Imaginary Surfaces?	Not specified in AP zone; other City of Sunnyside zones have maximum building heights ranging from 35 to 60 feet. No provisions for addressing FAR Part 77 surfaces, with the exception of the PUD zone located immediately west of the runway (Approach Surface and RPZ restrictions). Yakima County airport overlay zoning is based on FAR Part 77 airspace surfaces.
. . . prohibit wildlife attractants, light and glare, smoke and dust, and other airspace obstructions?	Not specified in AP zone.
. . . allow compatible uses such as aviation-related, light industrial, commercial or agriculture?	Aviation-related uses permitted; other non-aviation uses not included among permitted uses in AP zone.
. . . prohibit residential development or limit residential density under the airport traffic pattern?	No. Existing residential zones density is not limited by proximity to airport traffic pattern.
. . . prohibit high-intensity and special function land uses under the airport traffic pattern?	City of Sunnyside: No, with exception of restrictions in the PUD zone under Runway 7 approach. Yakima County Airport Safety Overlay District addresses land use compatibility

	and FAR Part 77 airspace surfaces are identified to address height limitations of development for county zoned lands.
. . . require an aviation activity title notice and/or easement in areas under the airport traffic pattern?	City of Sunnyside: No, with exception of restrictions in the PUD zone under Runway 7 approach. Yakima County Airport Safety Overlay District addresses land use compatibility and FAR Part 77 airspace surfaces are identified to address height limitations of development for county zoned lands.
. . . permit aviation activities as a primary use on airport property?	Yes. Per city zoning of airport (AP).
Describe existing height restrictions adjacent to the airport.	
Do the restrictions prohibit penetration of the Part 77 Imaginary Surfaces?	City of Sunnyside: No, with exception of restrictions in the PUD zone under Runway 7 approach. Yakima County Airport Safety Overlay District addresses land use compatibility and FAR Part 77 airspace surfaces are identified to address height limitations of development for county zoned lands.
What are the height limits in zoning districts adjacent to the airport?	35 to 60 feet for City of Sunnyside Zones. County zoned lands limited by Airport Safety Overlay District height limits (per FAR Part 77).
Review the jurisdiction's storm water regulations and note any implications for managing stormwater adjacent to the airport.	Increase in impervious surfaces on airport will require evaluation of stormwater volumes and required control measures.
Evaluation (Alternatives) Evaluate the current comprehensive plan and zoning, and describe the ways in which planned airport improvements may affect and/or may be affected by existing and proposed land uses. How well do existing goals, policies and development regulations protect the airport from encroachment by incompatible land uses?	The preferred alternative requires acquisition of property currently owned by the Port of Sunnyside to accommodate planned runway extension. The property is located within the Sunnyside UGA (zoned Industrial) and is currently used for agricultural production. The property should be annexed into the city limits and zoned AP. Existing rural zoning and land uses surrounding the airport provide reasonable compatibility, although the potential development of residential lands *immediately* adjacent to the airport is a concern and could create significant land use compatibility conflicts with airport operations. Providing effective land use buffers between the airport and adjacent residential land uses is recommended where feasible. Industrial and commercial zoning and land uses within the Sunnyside city limits provide a buffer between the airport and residential areas west of the airport.

Recommendations: The ALP should include recommendations for amendments to the comprehensive plan and development regulations. 1) General recommendations might include: • Adopt the ALP by reference into local comprehensive plans • Zone airport property as "Airport" or "Industrial" 2) Recommended amendments to comprehensive plan goals, policies and land use map might include: • Describe airport facilities and operations, existing and future, in the transportation inventory • Discourage incompatible land use adjacent to public use airports • Identify the airport as an essential public facility • Identify the important role of airports in local and regional economic development • Identify Part 77 Imaginary Surfaces and compatible land uses on comprehensive plan maps 3) Recommended strategies for adopting/amending development regulations might include: • Identify elements to be included in the regulations • Suggest specific strategies that might be effective. For example: clustering in areas where there are large, undeveloped parcels; prohibiting residential development in areas likely to be affected by airport noise; etc. 4) Recommend a strategy for implementation • Identify appropriate roles for airport sponsor, land use authority, etc. • Provide a timeline for implementation	Yes. Please see list of recommendations provided in Chapter One.

TABLE A-1: SUNNYSIDE MUNICIPAL AIRPORT SUMMARY OF NON-CONFORMING ITEMS (FAA STANDARDS)

Item Number	Item	Description	Non-Conforming Items Airport Design Standards	Non-Conforming Items FAR Part 77 Airspace Surfaces
1.	Public road located beyond west end of Runway 7/25.	**State Highway 241** is located approximately 331 feet from the Runway 7 threshold at its nearest point. The Runway 7 threshold was previously relocated 147 feet (east) to improve obstruction clearance.	Runway Protection Zone (RPZ) *Highway 241 is located within the Runway 7 RPZ.*	Approach Surface Transitional Surface *Vehicles traveling on the highway penetrate the approach surface and adjoining transitional surfaces approximately 331 feet from the runway end, which results in unobstructed approaches of 6:1.* *WSASP Database indicates the actual (clear) slopes are:* *Rwy 7: 6:1 (vehicle traveling on Hwy 241, at 331 feet, on centerline)* *Rwy 25: 26:1 (46-foot pole at 1,437 feet, 21 feet right of center)* *Use of a visual obstacle clearance surface (OCS) on Rwy 7 may provide an unobstructed 20:1 surface (survey required).*
2.	Portions of the Runway 7 and 25 RPZs extend beyond airport property.	The majority of the Runway 7 RPZ and the entire Runway 25 RPZ extend beyond airport property.	Runway Protection Zone (RPZ) *All portions of RPZs located beyond airport property are owned by Port of Sunnyside or are included within highway right of way (Highway 241). Avigation easements and development restrictions are in place to protect the existing approaches to Runway 7/25. A residence is located immediately*	Approach Surface No structures, trees or other physical objects located within inner portion of the runway approach surfaces. Ray Road is located approximately 1,400 feet east of the end of Runway 25 (no obstruction from vehicles or adjacent power lines). Highway 241 noted above.

Item Number	Item	Description	Non-Conforming Items Airport Design Standards	Non-Conforming Items FAR Part 77 Airspace Surfaces
			east of Ray Road, within the boundaries of the future RPZ for Runway 25.	
3.	Parked aircraft and hangars located adjacent to taxilanes.	The spacing between taxilane centerlines and parked aircraft on the east tiedown apron and the spacing between taxilane centerlines and two adjacent hangars is less than 39.5 feet.	Taxilane Object Free Area *The standard ADG I distance from taxilane centerline to a fixed or moveable object is 39.5 feet, which coincides with the edges of the taxilane OFA. Reconfiguration of aircraft tiedowns to meet standard should be considered. FAA modification to standard may be permitted based on the following formula: 1.2 times aircraft wingspan + 20 feet.* *Currently undeveloped hangar sites adjacent to existing taxilanes should be evaluated to determine maximum building footprints that can be accommodated without conflicting with taxilane OFA clearance standard.*	None
4.	Runway safety area, object free area, and obstacle free zone beyond Runway 25 end is unimproved and limited by property ownership.	The eastern airport property line is located approximately 100 feet beyond the end of the runway. An unimproved dirt road located immediately east of the property line travels through the defined areas.	Runway Safety Area Runway Object Free Area Runway Obstacle Free Zone *The standard ADG I RSA and OFA extends 240 feet beyond the runway end; the OFZ extends 200 feet beyond the runway end.*	Primary Surface *The primary surface for Runway 7/25 extends approximately 100 feet beyond the east airport property line.*

Item Number	Item	Description	Non-Conforming Items Airport Design Standards	Non-Conforming Items FAR Part 77 Airspace Surfaces
			The property immediately east of the runway end is owned by the Port of Sunnyside and is intended for future airport expansion. Improvements to the protected areas for the current runway should be completed.	
5.	Manhole collar is exposed > 3" above grade.	Manhole collar is located near the end of Runway 25 is elevated above grade (>3") which creates a hazard within the defined protected areas.	Runway Object Free Area Runway Obstacle Free Zone *The standard ADG I OFA extends 240 feet beyond the runway end; the OFZ extends 200 feet beyond the runway end.* *Minor grading can eliminate the exposure.*	Primary Surface *Minor grading can eliminate the obstruction.*

TABLE A-2: SUNNYSIDE MUNICIPAL AIRPORT
SUMMARY OF FAA STANDARDS CONFORMANCE AND MITIGATION FEASIBILITY

Standard	Non Conforming Use	Feasibility of Mitigating Item		
		Low	Medium	High
Airport Design Standards (ADG I - Small)				
1. Runway Length	Existing length of 3,422 feet is 122 feet longer than the distance required (3,300 feet) to accommodate 95% of small airplane fleet per FAA model. A runway length of 3,930 feet is needed to accommodate 100% of the small airplane fleet, which is 508 feet greater than the existing runway. The property located immediately east of the runway was acquired several years ago by the Port of Sunnyside to protect future runway extension options. The existing runway configuration indicates use of a visual obstacle clearance surface (OCS) is appropriate for Runway 7.			
2. Runway Safety Area (RSA)	A portion of the FAA-recommended RSA dimension for the 3,422-foot runway extends beyond airport property at the east end of the runway. (Requires property acquisition).			
3. Runway Object Free Area (OFA)	A portion of the FAA-recommended OFA dimension for the 3,422-foot runway extends beyond airport property at the east end of the runway. (Requires property acquisition).			
4 Runway Obstacle Free Zone (OFZ)	A portion of the FAA-recommended OFZ dimension for the 3,422-foot runway extends beyond airport property at the east end of the runway. (Requires property acquisition).			

Standard	Non Conforming Use	Feasibility of Mitigating Item		
		Low	Medium	High
5 Runway Protection Zones (RPZ)	Public roads located within Runway 7 RPZ. Relocation of Highway 241 not considered highly feasible; reconfiguration of Runway 7 should be considered. Airport control of RPZs through aviation easements appears feasible.			
6. Taxilane Object Free Area	Two hangars and parked aircraft (main apron and tiedown apron) are located within standard taxilane OFA (as measured 39.5 feet from taxilane centerline). Reconfiguration of main tiedown apron appears feasible; relocation of hangars is not considered highly feasible. Use of alternative clearance formula for taxilane clearances may support modification to standards, with restrictions on the size of aircraft that can be accommodated based on wingspan.			
FAR Part 77 **Utility/Visual**				
1. Primary Surface	A portion of the visual primary surface for the 3,422-foot runway extends beyond airport property at the east end of the runway. (Requires property acquisition).			
2. Approach Surfaces	Vehicles traveling on Highway 241 penetrate the 20:1 visual approach surface for Runway 7. Vehicles traveling on private dirt road located immediately beyond end of Runway 25 penetrate the 20:1 visual approach surface. Previously relocated threshold provides some mitigation of obstructions (6:1 clear). Use of visual obstacle clearance surface (OCS) is recommended to			

Standard	Non Conforming Use	Feasibility of Mitigating Item		
		Low	Medium	High
	obtain clear approach over roads. Potential displacement of runway threshold may be required if runway is upgraded to nonprecision instrument.			
3. Transitional Surface	Vehicles traveling on Highway 241 penetrate the visual runway transitional surface where it connects to the approach surface for Runway 7. Same condition exists for vehicles traveling on private dirt road located immediately beyond end of Runway 25.			

Sunnyside Municipal Airport – Runway 7/25 (Future)
DECLARED DISTANCE LENGTHS (feet)

Aircraft Approach Category B
Airplane Design Group I (Small Airplanes Exclusively)
Runway 7 approach visibility minimums are visual exclusively
Runway 25 approach visibility minimums are not lower than 1 mile

	Runway 7 and 25	
Runway length	4000	4000
Stopway length	0	0
Clearway length	0	0
Runway safety area length beyond the stop end of runway	240	240
Runway object free area length beyond the stop end of runway	240	240

The following distances are positive in the direction of aircraft operations and negative in the opposite direction:

Distance from:		
the departure end of runway to the beginning of clearway	0	0
the departure end of runway to the beginning of departure RPZ	200	200
the approach end of runway to the start of takeoff	0	0
the approach end of runway to the threshold	0	0
the end of approach RPZ to the approach end of runway	200	200

The following lengths are standard RSA and ROFA lengths:

Runway safety area length to be provided:		
beyond the stop end of ASDA	240	240
beyond the stop end of LDA	240	240
before the approach end of LDA	240	240
Runway object free area length to be provided:		
beyond the stop end of ASDA	240	240
beyond the stop end of LDA	240	240
before the approach end of LDA	240	240

The following declared distances are for Approach Category A and B airplanes of 12,500 pounds or less maximum certificated takeoff weight exclusively.

	Runway 7 (feet)	Runway 25 (feet)
Takeoff run available (TORA)	4000	4000
Takeoff distance available (TODA)	4000	4000
Accelerate-stop distance available (ASDA)	4000	4000
Landing distance available (LDA)	4000	4000
Usable stopway length	0	0
Distance from the stop end of LDA to runway end	0	0
Distance from the departure end of TORA to RPZ	200	200
Distance from the approach RPZ to the threshold	200	200

REFERENCE: Appendix 14 of AC 150/5300-13, Airport Design,

including Changes 1 through 4.

SUNNYSIDE MUNICIPAL AIRPORT
AIRPORT AND RUNWAY DATA

Airport elevation	767 feet
Mean daily maximum temperature of the hottest month	89.70 F.
Maximum difference in runway centerline elevation	22 feet
Length of haul for airplanes of more than 60,000 pounds	500 miles
Wet and slippery runways	

RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN

Small airplanes with approach speeds of less than 30 knots	320 feet
Small airplanes with approach speeds of less than 50 knots	860 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	2770 feet
95 percent of these small airplanes	3300 feet
100 percent of these small airplanes	3930 feet
Small airplanes with 10 or more passenger seats	4410 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	5490 feet
75 percent of these large airplanes at 90 percent useful load	7000 feet
100 percent of these large airplanes at 60 percent useful load	5840 feet
100 percent of these large airplanes at 90 percent useful load	8820 feet
Airplanes of more than 60,000 pounds	Approximately 5280 feet

REFERENCE: Chapter 2 of AC 150/5325-4A, Runway Length Requirements for Airport Design, no Changes included.

Representative Small/Medium Business Jet Runway Requirements

(FAR 25 Takeoff Distance @ MGTW for conditions listed above)

Cessna Citation CJ2 (B-II; 6-7 passengers; MGTW: 12,375#)	4,140’
Cessna Citation Bravo (B-II; 7-11 passengers; MGTW: 14,800#)	4,511’
Cessna Citation Excel (B-II; 7-8 passengers; MGTW: 20,000#)	4,463’

Sunnyside Municipal Airport – Runway 7/25 (Existing/Future)
AIRPORT DESIGN AIRPLANE AND AIRPORT DATA

Aircraft Approach Category B
Airplane Design Group I (Small Airplanes Exclusively)
Airplane wingspan . . . . . 48.99 feet
Primary runway end approach visibility minimums are not lower than 1 mile
Other runway end approach visibility minimums are visual exclusively
Airplane undercarriage width (1.15 x main gear track) . . . 14.95 feet

RUNWAY AND TAXIWAY WIDTH AND CLEARANCE STANDARD DIMENSIONS

	Airplane	Group/ARC
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is not treated as a factor:		
VFR operations with no intervening taxiway		700 feet
VFR operations with one intervening taxiway		700 feet
VFR operations with two intervening taxiways		700 feet
IFR approach and departure with approach to near threshold		2500 feet less 100 ft for each 500 ft of threshold stagger to a minimum of 1000 feet.
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is treated as a factor:		
VFR operations		2500 feet
IFR departures		2500 feet
IFR approach and departure with approach to near threshold		2500 feet
IFR approach and departure with approach to far threshold		2500 feet plus 100 feet for each 500 feet of threshold stagger.
IFR approaches		3400 feet
Runway centerline to parallel taxiway/taxilane centerline	149.5	150 feet
Runway centerline to edge of aircraft parking	125.0	125 feet
Runway width		60 feet
Runway shoulder width		10 feet
Runway blast pad width		80 feet
Runway blast pad length		60 feet
Runway safety area width		120 feet
Runway safety area length beyond each runway end or stopway end, whichever is greater		240 feet
Runway object free area width		250 feet
Runway object free area length beyond each runway end or stopway end, whichever is greater		240 feet
Clearway width		500 feet
Stopway width		60 feet
Obstacle free zone (OFZ):		
Runway OFZ width		250 feet
Runway OFZ length beyond each runway end		200 feet
Inner-approach OFZ width		250 feet
Inner-approach OFZ length beyond approach light system		200 feet
Inner-approach OFZ slope from 200 feet beyond threshold		50:1
Inner-transitional OFZ slope		0:1

Runway protection zone at the primary runway end:

Width 200 feet from runway end	250 feet
Width 1200 feet from runway end	450 feet
Length	1000 feet

Runway protection zone at other runway end:

Width 200 feet from runway end	250 feet
Width 1200 feet from runway end	450 feet
Length	1000 feet

Departure runway protection zone:

Width 200 feet from the far end of TORA	250 feet
Width 1200 feet from the far end of TORA	450 feet
Length	1000 feet

Threshold surface at primary runway end:

Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	250 feet
Width of surface at end of trapezoidal section	700 feet
Length of trapezoidal section	2250 feet
Length of rectangular section	2750 feet
Slope of surface	20:1

Threshold surface at other runway end:

Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	250 feet
Width of surface at end of trapezoidal section	700 feet
Length of trapezoidal section	2250 feet
Length of rectangular section	2750 feet
Slope of surface	20:1

Taxiway centerline to parallel taxiway/taxilane centerline	68.8	69 feet
Taxiway centerline to fixed or movable object	44.3	44.5 feet
Taxilane centerline to parallel taxilane centerline	63.9	64 feet
Taxilane centerline to fixed or movable object	39.4	39.5 feet
Taxiway width	25.0	25 feet
Taxiway shoulder width		10 feet
Taxiway safety area width	49.0	49 feet
Taxiway object free area width	88.6	89 feet
Taxilane object free area width	78.8	79 feet
Taxiway edge safety margin		5 feet
Taxiway wingtip clearance	19.8	20 feet
Taxilane wingtip clearance	14.9	15 feet

REFERENCE: AC 150/5300-13, Airport Design, including Changes 1 through 4.

GLOSSARY OF AVIATION TERMS

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The following glossary of aviation terms was compiled and edited by David Miller, AICP for use in aviation planning projects.

Accelerate Stop Distance Available (ASDA) – The length of the takeoff run available plus the length of a stopway, when available.

Agricultural Aviation – The use of fixed-wing or rotor-wing aircraft in the aerial application of agricultural products (i.e., fertilizers, pesticides, etc.).

Air Cargo - All commercial air express and air freight with the exception of airmail and parcel post.

Air Carrier/Airline - All regularly scheduled airline activity performed by airlines certificated in accordance with Federal Aviation Regulations (FAR Part 121).

Air Taxi - Operations of aircraft "for hire" for specific trips, commonly referred to an aircraft available for charter (FAR Part 135).

Aircraft Approach Category - A grouping of aircraft based how fast they come in for landing. As a rule of thumb, slower approach speeds mean smaller airport dimensions and faster speeds mean larger dimensions from runway widths to the separation between runways and taxiways.

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
Category E - Speed 166 knots or more

Aircraft Operation - A landing or takeoff is one operation. An aircraft that takes off and then lands creates two aircraft operations.

Aircraft Owners and Pilots Association (AOPA) – International aviation organization.

Aircraft Holding Area – An area typically located adjacent to a taxiway and runway end designed to accommodate aircraft prior to departure (for pre–takeoff engine checks, instrument flight plan clearances, etc.). Per FAA design standards, aircraft holding areas should be located outside the runway safety area (RSA) and obstacle free zone (OFZ) and aircraft located in the holding area should not interfere with normal taxiway use (taxiway object free area). Sometimes referred to as holding bays or “elephant ear.”

Smaller areas (aircraft turnarounds) are used to facilitate aircraft movement on runways without exit taxiways where back-taxiing is required.

Airplane Design Group - A grouping of airplanes based on wingspan. As with Approach Category, the wider the wingspan, the bigger the aircraft is, the more room it takes up for operating on an airport. The Airplane Design 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 - A landing area regularly used by aircraft for receiving or discharging passengers or cargo, including heliports and seaplane bases.

Airport Improvement Program (AIP) - The funding program administered by the Federal Aviation Administration (FAA) with user fees which are dedicated to improvement of the national airport system. This program currently provides 95% of funding for eligible airport improvement projects. The local sponsor of the project (i.e., airport owner) provides the remaining 5% known as the "match."

Airport Layout Plan (ALP) - The FAA approved drawing which shows the existing and anticipated layout of an airport for the next 20 years or so. An ALP is prepared using FAA design standards.

Airport Reference Code (ARC) - An FAA airport coding system. The system looks at the types of aircraft which use an airport most often and then based upon the characteristics of those airplanes (approach speed and wing span), assigns a code. The code is then used to determine how the airport is designed and what design standards are used. An airport designed for a Piper Cub (an aircraft in the A-I approach/design group) would take less room than a Boeing 747 (an aircraft in the D-V approach/design group).

Airport Reference Point (ARP) – The approximate mid-point of an airfield that is designated as the official airport location.

Airports District Office (ADO) - The "local" office of the FAA that coordinates planning and construction projects. Staff in the ADO is typically assigned to a particular state, i.e., Oregon, Idaho, or Washington. The ADO for Oregon, Washington and Idaho is located in Renton, Washington.

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 traffic.

Alternate Airport – An airport that is available for landing when the intended airport becomes unavailable. Required for instrument flight planning in the event that weather conditions at destination airport fall below approach minimums (cloud ceiling or visibility).

Annual Service Volume (ASV) - An estimate of how many airplanes and airport can handle based upon the number and types of runways, the aircraft mix (large vs. small, etc), and weather conditions with a "reasonable" amount of delay. ASV is a primary planning standard used to determine when a runway (or an airport) is nearing its capacity, and may require new runways or taxiways. As operations levels approach ASV, the amount of delay per operation increases; once ASV is exceeded, "excessive" delay generally exists.

Approach End of Runway - The end of the runway used for landing. Pilots generally land into the wind and choose a runway end that best aligns with the wind.

Approach Surface - Also FAR Part 77 Approach or Obstacle Clearance Approach - An imaginary (invisible) surface which rises off the ends of a runway which must be kept clear to provide airspace for an airplane to land or take off in. The size of the approach surface will vary depending upon how big and how fast the airplanes are, and whether or not the runway has an instrument approach for landing in bad weather.

Apron - An area on an airport designated for the parking, loading, fueling, or servicing of aircraft (also referred to as tarmac and ramp).

ARFF - Aircraft Rescue and Fire Fighting, i.e., an on airport response required for certificated commercial service airports (see FAR Part 139).

Automated Surface Observation System (ASOS) and Automated Weather Observation System (AWOS) – Automated observation systems providing continuous on-site weather data, designed to support aviation activities and weather forecasting.

AVGAS - Gasoline used in airplanes with piston engines.

Avigation Easement - A form of limited property right purchase that establishes legal land use control prohibiting incompatible development of areas required for airports or airport-related purposes.

Back-Taxiing – The practice of aircraft taxiing on a runway before takeoff or after landing, normally, in the opposite direction of the runway's traffic pattern. Back-taxiing is generally required on runways without taxiway access to both runway ends.

Based Aircraft - Aircraft stationed at an airport on an annual basis. Used as a measure of activity at an airport.

Capacity - A measure of the maximum number of aircraft operations that can be accommodated on the runways of an airport in an hour.

Ceiling – The height above the ground or water to base of the lowest cloud layers covering more than 50 percent of the sky.

Charter - Operations of aircraft "for hire" for specific trips, commonly referred to an aircraft available for charter.

Circle to Land or Circling Approach – An instrument approach procedure that allows pilots to "circle" the airfield to land on any authorized runway once visual contact with the runway environment is established and maintained throughout the procedure.

Common Traffic Advisory Frequency (CTAF) – A frequency used by pilots to communicate and obtain airport advisories at an uncontrolled airport.

Conical Surface - One of the "FAR Part 77 "Imaginary" Surfaces. The conical surface extends outward and upward from the edge of the horizontal surface at a slope of 20:1 to a horizontal distance of 4,000 feet.

Critical Aircraft - Aircraft which controls one or more design items based on wingspan, approach speed and/or maximum certificated take off 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. Sometimes used in reference to a runway as in "Runway 7/25 is the crosswind runway" meaning that it is not the runway normally used for the prevailing wind condition. As an aeronautical term, a direct crosswind is exactly 90-degrees opposite the direction of flight; more acute crosswind angles are known as quartering headwinds or tailwinds. From an airport planning perspective, crosswind runways are generally justified when a primary runway accommodates less than 95 percent of documented wind conditions (see wind rose).

Crosswind Runway – A secondary runway that is oriented to allow aircraft to safely take off or land when wind conditions do not favor the primary runway.

Decision Height (DH) – For precision instrument approaches, the height (typically in feet or meters above runway end touchdown zone elevation) at which a decision to land or execute a missed approach must be made by the pilot.

Departure Surface – A surface that extends upward from the departure end of an instrument runway that should be free of any obstacle penetrations. For instrument runways other than air carrier, the slope is 40:1, extending 10,200 feet from the runway end. Air carrier runways have a similar surface designed for one-engine inoperative conditions with a slope of 62.5: 1.

Displaced Threshold – A landing threshold that is located at a point other than the runway end. Usually provided to mitigate close-in obstructions to runway approaches for landing aircraft.

DNL - Day-night sound levels, a method of measuring noise exposure.

Easement – An agreement that provides use or access of land or airspace (see avigation easement) in exchange for compensation.

Enplanements - Domestic, territorial, and international revenue passengers who board an aircraft in the states in scheduled and non-scheduled service of aircraft in intrastate, interstate, and foreign commerce and includes intransit passengers (passengers on board international flights that transit an airport in the US for non-traffic purposes).

Entitlements - Distribution of Airport Improvement Plan (AIP) funds from the Airport & Airways Trust Fund to commercial service airport sponsors based on enplanements or cargo landed weights. Also, Non-Primary General Aviation Entitlements now incorporated in AIP funding for general aviation airports.

Federal Aviation Administration (FAA) - The FAA is the branch of the U.S. Department of Transportation that is responsible for the development of airports and air navigation systems.

FAR Part 77 - Federal Aviation Regulations which establish standards for determining obstructions in navigable airspace. FAR stands for Federal Aviation Regulations, Part 77 refers to the section in the regulations, i.e., #77. FAR Part 77 is commonly used to refer to imaginary surfaces, the primary, transitional, horizontal, conical, and approach surfaces. These surfaces vary with the size and type of airport.

FAR Part 139 - Federal Aviation Regulations which establish standards for airports with scheduled passenger commercial air service. Airports accommodating scheduled passenger service with aircraft more than 9 passenger seats must be certified as a “Part 139” airport. Airports that are not certified under Part 139 may accommodate scheduled commercial passenger service with aircraft having 9 passenger seats or less.

Final Approach Fix (FAF) – The fix (location) from which the final instrument approach to an airport is executed; also identifies beginning of final approach segment.

Final Approach Point (FAP) – For non-precision instrument approaches, the point at which an aircraft is established inbound for the approach and where the final descent may begin.

Fixed Base Operator (FBO) - An individual or company located at an airport providing aviation services. Sometimes further defined as a "full service" FBO or a limited service. Full service FBOs typically provide a broad range of services (flight instruction, aircraft rental, charter, fueling, repair, etc)

where a limited service FBO provides only one or two services (such as fueling, flight instruction or repair).

Fixed Wing - A plane with one or more "fixed wings," as opposed to a helicopter that utilizes a rotary wing.

Flexible Pavement – Typically constructed with an asphalt surface course and one or more layers of base and subbase courses that rest on a subgrade layer.

Flight Service Station (**FSS) -** An office where a pilot can call (on the ground or in the air) to get weather and airport information. Flight plans are also filed with the FSS.

General Aviation (GA) - All civil (non-military) aviation operations other than scheduled air services and non-scheduled air transport operations for hire.

Glide Slope (GS) – For precision instrument approaches, such as an instrument landing system (ILS), the component that provides electronic vertical guidance to aircraft. Visual guidance indicators (VGI) define a glide slope (glide path) through a series of colored lights that are visible to pilots when approaching a runway end for landing.

Global Positioning System (GPS) - GPS is a system of navigating which uses satellites (SATNAV) to establish the location and altitude of an aircraft. GPS supports both enroute flight and instrument approach procedures.

Helicopter Landing Pad (Helipad) – A designated landing area for rotor wing aircraft. Requires protected FAR Part 77 imaginary surfaces, as defined for heliports (FAR Part 77.29).

Helicopter Parking Area – A designated area for rotor wing aircraft parking that is typically accessed via hover-taxi or ground taxiing from a designated landing area (e.g., helipad or runway-taxiway system). If not used as a designated landing area, helicopter parking pads do not require dedicated FAR Part 77 imaginary surfaces.

Heliport – A designated helicopter landing facility (as defined by FAR Part 77).

Height Above Airport (HAA) – The height of the published minimum descent altitude (MDA) above the published airport elevation. This is normally published in conjunction with circling minimums.

High Intensity Runway Lights (HIRL) - High intensity (i.e., very bright) lights are used on instrument runways where landings are made in foggy weather. The bright runway lights help pilots to see the runway when visibility is poor.

High Speed (Taxiway) Exit – An acute-angled exit taxiway extending from a runway to an adjacent parallel taxiway which allows landing aircraft to exit the runway at a higher rate of speed than is possible with standard (90-degree) exit taxiways.

Hold/Holding Procedure – A defined maneuver in controlled airspace that allows aircraft to circle above a fixed point (often over a navigational aid or GPS waypoint) and altitude while awaiting further clearance from air traffic control.

Home Built Aircraft - An aircraft built by an amateur; not an FAA Certified factory built aircraft.

Horizontal Surface - One of the FAR Part 77 Imaginary (invisible) Surfaces. The horizontal surface is an imaginary flat surface 150 feet above the established airport elevation. Its perimeter is constructed by swinging arcs (circles) 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 straight lines. The resulting shape looks like a football stadium. It could also be described as a rectangle with half circles on each end with the runway in the middle.

Initial Approach Point of Fix (IAP/IAF) – For instrument approaches, a designated point where an aircraft may begin the approach procedure.

Instrument Approach Procedure (IAP) – A series of defined maneuvers designed to enable the safe transition between enroute instrument flight and landing under instrument flight conditions at a particular airport or heliport. IAPs define specific requirements for aircraft altitude, course, and missed approach procedures. See precision or nonprecision instrument approach.

Instrument Flight Rules (IFR) - IFR refers to the set of rules pilots must follow when they are flying in bad weather. Pilots are required to follow these rules when operating in controlled airspace with visibility (ability to see in front of themselves) of less than three miles and/or ceiling (a layer of clouds) lower than 1,000 feet.

Instrument Landing System (ILS) - An ILS is a system used to guide a plane in for a landing in bad weather. Sometimes referred to as a precision instrument approach, it is m 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 Meteorological Conditions (IMC) - Meteorological conditions expressed in terms of visibility, distance from clouds, and ceiling less than minima specified for visual meteorological conditions.

Instrument Runway - A runway equipped with electronic and visual navigational aids that has been designated for a straight-in precision or nonprecision instrument approach.

Itinerant Operation - All aircraft operations at an airport other than local, i.e., flights that come in from another airport.

Jet Fuel – Highly refined grade of kerosene used by turbine engine aircraft. Jet-A is currently the common commercial grade of jet fuel.

Landing Area - That part of the movement area intended for the landing and takeoff of aircraft.

Landing Distance Available (LDA) – The length of runway which is available and suitable for the ground run of an airplane landing.

Left Traffic – A term used to describe which side of a runway the airport traffic pattern is located. Left traffic indicates that the runway will be to the pilot's left when in the traffic pattern. Left traffic is standard unless otherwise noted in facility directories at a particular airport.

Large Aircraft - An aircraft that weighs more than 12,500 lbs.

Local Area Augmentation System (LAAS) – GPS-based instrument approach that utilizes ground-based systems to augment satellite coverage to provide vertical (glideslope) and horizontal (course) guidance. LAAS approaches have the technical capabilities to provide approach minimums comparable to a Category I and II instrument landing system (ILS). The FAA indicates that a LAAS system can support approaches to multiple runways and potentially multiple airports within a range of approximately 30 nautical miles.

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.

Localizer – For precision instrument approaches, such as an instrument landing system (ILS), the component that provides electronic lateral (course) guidance to aircraft.

LORAN C - A navigation system using land based radio signals, which indicates position and ground speed, but not elevation. (See GPS)

Localizer Performance with Vertical Guidance (LPV) – Satellite navigation (SATNAV) based GPS approaches providing "near category I" precisions approach capabilities with course and vertical guidance LPV approaches are expected to eventually replace traditional step- down, VOR and NDB procedures by providing a constant, ILS glideslope-like descent path. LPV approaches use high-accuracy WAAS signals, which allows narrower glideslope and approach centerline obstacle clearance areas, safely providing decision altitudes as low as 250 feet, compared with 200 feet for ILS.

Magnetic Declination – Also called magnetic variation, is the angle between magnetic north and true north. Declination is considered positive east of true north and negative when west. Magnetic declination changes over time and with location. Runway end numbers, which reflect the magnetic heading/alignment (within 5 degrees +/-) occasionally require change due to declination.

MALSR - Medium-intensity **A**pproach **L**ighting **S**ystem with **R**unway alignment indicator lights. An airport lighting facility which provides visual guidance to landing aircraft.

Medevac - Fixed wing or rotor-wing aircraft used to transport critical medical patients. These aircraft are equipped to provide life support during transport.

Medium Intensity Runway Lights (MIRL) - Runway lights which are not as intense as HIRLs (high intensity runway lights). Typical at medium and smaller airports which do not have sophisticated instrument landing systems.

Microwave Landing System (MLS) - An instrument landing system operating in the microwave spectrum, which provides lateral and vertical guidance to aircraft with compatible equipment. It was touted as the replacement for the ILS but never achieved this status.

Minimum Descent Altitude (MDA) – The lowest altitude in a nonprecision instrument approach that an aircraft may descend without establishing visual contact with the runway or airport environment.

Minimums - Weather condition requirements established for a particular operation or type of operation.

Missed Approach – A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing.

Missed Approach Point (MAP) – The defined location in a nonprecision instrument approach where the procedure must be terminated if the pilot has not visually established the runway or airport environment.

Movement Area - The runways, taxiways and other areas of the airport used for taxiing, takeoff and landing of aircraft, i.e., for aircraft movement.

MSL - Elevation above Mean Sea Level.

National Plan of Integrated Airport Systems (NPIAS). The NPIAS is the federal airport classification system that includes public use airports that meet specific eligibility and activity criteria. A "NPIAS designation" is required for an airport to be eligible to receive FAA funding for airport projects.

Navigational Aid (Navaid) - Any visual or electronic device that helps a pilot navigate. Can be for use to land at an airport or for traveling from point A to point B.

Noise Contours – Continuous lines of equal noise level usually drawn around a noise source, such as runway, highway or railway. The lines are generally plotted in 5-decibel increments, with higher noise levels located nearer the noise source, and lesser exposure levels extending away from the source.

Non-directional Beacon (NDB) - Non-Directional Beacon which transmits a signal on which a pilot may "home" using equipment installed in the aircraft.

Non-Precision Instrument (NPI) Approach - A non-precision instrument approach provides horizontal (course) guidance to pilots for landing. NPI approaches often involve a series of “step down” sequences where aircraft descend in increments (based on terrain clearance), rather than following a continuous glide path. The pilot is responsible for maintaining altitude control between approach segments since no "vertical" guidance is provided.

Obstacle Clearance Surface (OCS) – As defined by FAA, an approach surface that is used in conjunction with alternative threshold siting/clearing criteria to mitigate obstructions within runway approach surfaces. Dimensions, slope and placement depend on runway type and approach capabilities. Also know as Obstacle Clearance Approach (OCA).

Obstruction - An object (tree, house, road, phone pole, etc) that penetrates an imaginary surface described in FAR Part 77.

Obstruction Chart (OC) - A chart that depicts surveyed obstructions that penetrate an FAR Part 77 imaginary surface surrounding an airport. OC charts are developed by the National Ocean Service (NOS) based on a comprehensive survey that provides detailed location (latitude/longitude coordinates) and elevation data in addition to critical airfield data.

Parallel Taxiway – A taxiway that is aligned parallel to a runway, with connecting taxiways to allow efficient movement of aircraft between the runway and taxiway. The parallel taxiway effectively separates taxiing aircraft from arriving and departing aircraft located on the runway. Used to increase runway capacity and improve safety.

Passenger Facility Charge (PFC) – A user fee charged by public agencies controlling a commercial service airport can charge enplaning passengers a fee facility charge. Public agencies must apply to the FAA and meet certain requirements in order to impose a PFC.

Precision Approach Path Indicator (PAPI) - A system of lights located by the approach end of a runway that provides visual approach slope guidance to aircraft during approach to landing. The lights typically show green if a pilot is on the correct flight path, and turn red of a pilot is too low.

Precision Instrument Runway (PIR) - A runway served by a "precision" instrument approach landing system. The precision landing systems allows property equipped airplanes and trained pilots to land in bad weather.

Precision Instrument Approach - A precision instrument approach is a system which helps guide pilots in for a landing in thick fog and provides "precise" guidance as opposed to a non-precision approach that is less precise.

Primary Runway - That runway which provides the best wind coverage, etc., and receives the most usage at the airport.

Primary Surface - One of the FAR Part 77 Imaginary Surfaces, the primary surface is centered on top of the runway and extends 200 feet beyond each end. The width is from 250' to 1,000' wide depending upon the type of airplanes using the runway.

Procedure Turn (PT) - A maneuver in which a turn is made away from a designated track followed by a turn in an opposite direction to permit an aircraft to intercept the track in the opposite direction (usually inbound).

Relocated Threshold – A runway threshold (takeoff and landing point) that is located at a point other than the runway end. Usually provided to mitigate nonstandard runway safety area (RSA) dimensions beyond the end of a runway.

Rigid Pavement – Typically constructed of Portland cement concrete (PCC), consisting of a slab placed on a prepared layer of imported materials.

Rotorcraft - A helicopter.

Runway – A defined area intended to accommodate aircraft takeoff and landing. Runways may be paved (asphalt or concrete) or unpaved (gravel, turf, dirt, etc.), depending on use. Water runways are defined takeoff and landing areas for use by seaplanes.

Runway End Identifier Lights (REILs) - These are distinctive flashing lights that help a pilot identify the runway.

Runway Object Free Area (OFA) – A defined area surrounding a runway that should be free of any obstructions that could in interfere with aircraft operations. The dimensions for the OFA increase for runways accommodating larger or faster aircraft.

Runway Protection Zone (RPZ) - An area off the end of the runway that is intended to be clear in case an aircraft lands short of the runway. The size is small for airports serving only small airplanes and gets bigger for airports serving large airplanes. The RPZ used to be known as a clear zone – which was a good descriptive term because you wanted to keep it clear.

Runway Safety Area (RSA) – A prepared ground area surrounding a runway that is intended to accommodate inadvertent aircraft passage without causing damage. The dimensions for the RSA increase for runways accommodating larger or faster aircraft.

Segmented Circle - A system of visual indicators designed to show a pilot in the air the direction of the traffic pattern at that airport.

Small Aircraft - An aircraft that weighs less than 12,500 lbs.

Straight-In Approach – An instrument approach that directs aircraft to a specific runway end.

Stop and Go – An aircraft operation where the aircraft lands and comes to a full stop on the runway before takeoff is initiated.

T-Hangar – A rectangular aircraft storage hangar with several interlocking "T" units that minimizes building per storage unit. Usually two-sided with either bi-fold or sliding doors.

Takeoff Distance Available (TODA) – the length of the takeoff run available plus the length of clearway, if available.

Takeoff Run Available (TORA) – the length of runway available and suitable for the ground run of aircraft when taking off.

Threshold – The beginning of that portion of a runway that is useable for landing.

Tiedown - A place where an aircraft is parked and "tied down." Surface can be grass, gravel or paved.

Touch and Go – An aircraft operation involving a landing followed by a takeoff without the aircraft coming to a full stop or exiting the runway.

Traffic Pattern - The flow of traffic that is prescribed for aircraft landing and taking off from an airport. Traffic patterns are typically rectangular in shape, with upwind, crosswind, base and downwind legs and a final approach surrounding a runway.

Transitional Surfaces - One of the FAR Part 77 Imaginary Surfaces, the transitional surface 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.

Transport Airport - An airport designed and constructed to serve large commercial airliners. Portland International and SEATAC are good examples of transport airports.

Utility Airport - An airport designed and constructed to serve small planes. Aurora State Airport in Oregon, Nampa Airport in Idaho, or Arlington Airport in Washington are examples of utility airports.

Vertical Navigation (VNAV) – Vertical navigation descent data or descent path, typically associated with published GPS instrument approaches. The use of any VNAV approach technique requires operator approval, certified VNAV-capable avionics, and flight crew training.

Visual Approach Slope Indicator (VASI) - A system of lights located by the approach end of a runway which provides visual approach slope guidance to aircraft during approach to landing. The lights typically show some combination of green and white if a pilot is on the correct flight path, and turn red of a pilot is too low.

Visual Flight Rules (VFR) - Rules that govern the procedures to conducting flight under visual conditions. The term is also used in the US to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

Visual Guidance Indicator (VGI) – Equipment designed to provide visual guidance for pilots for landing through the use of different color light beams. Visual Approach Slope Indicators (VASI) and Precision Approach Path Indicators (PAPI) defined above are examples.

Waypoint – A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation.

Wide Area Augmentation System (WAAS) – GPS-based instrument approach that can provide both vertical (glideslope) and horizontal (course) guidance. WAAS-GPS approaches have the technical capabilities to provide approach minimums nearly comparable to a Category I instrument landing system (ILS).

Wind Rose - A diagram indicating the prevalence of winds from various directions in relation to existing or proposed runway alignments.