PORT OF PORTLAND

CHAPTER ONE

INVENTORY

The initial step in preparing the master plan update for Hillsboro Airport (Airport) is to collect relevant information that influences the Airport and the area it serves. The information summarized in this chapter will be used in subsequent analyses in this study and includes:

- Background information related to the Hillsboro/Portland region, including descriptions of the local geography, regional climate, and surface transportation systems.

- Physical inventories and descriptions of current facilities and services offered at the Airport. The analysis will include airfield and landside infrastructure and services, as well as local and regional airspace, competing airport facilities, air traffic control, and aircraft operating procedures.

- Hillsboro Airport's role in regional, state, and national aviation systems. Development at the Airport since the completion of the previous master plan (2005) will also be discussed.

- Socioeconomic data, including population, employment, and income activity sectors. These sectors typically offer an indication of future trends that could influence commercial and general aviation activity at the Airport.

- Existing local and regional plans and studies to determine their potential influence on development and implementation of the Airport Master Plan.

- Existing environmental conditions and sensitivities, on or near the Airport. These will be factored in the recommended development plan.

The information outlined in this chapter provides a foundation for all subsequent chapters. Much of the information was obtained through on-site inspections of the Airport and interviews with airport staff and tenants. Information was also obtained from outside resources, including documents prepared by the Federal Aviation Administration (FAA), Oregon Department of Aviation (ODA), Port of Portland, City of Hillsboro, Washington County, and other pertinent regional planning agencies.

1.1 REGIONAL SETTING

Hillsboro Airport is located in the City of Hillsboro, Oregon, which is a suburb on the west side of Portland. It is approximately 13 miles from the Portland central business district. Hillsboro is the fifth-largest city in Oregon and the county seat of Washington County. Hillsboro is a base for many high-tech companies, such as Intel, that comprise what is known locally as the Silicon Forest.

Portland, Oregon

As of 2016, the the City of Hillsboro had approximately 100,000 residents. The Portland-Vancouver-Hillsboro metropolitan statistical area (MSA), which includes Washington, Columbia, Yamhill, Clackamas, and Multnomah counties in Oregon, and Clark and Skamania counties in Washington, had a population of approximately 2,377,000.

1.1.1 AIRPORT LOCATION AND ACCESS

Airports are a significant part of the national transportation infrastructure. Other modes of transportation can work in synergy with airports to promote access and economic development and compete with airports for users. The following discussion also includes various transportation modes available in the area.

Hillsboro Airport is located two miles to the northeast of the central business district of the City of Hillsboro. The facility encompasses approximately 934 acres and at an elevation of 208 feet above mean sea level (MSL). There are facilities on all sides of the Airport which are accessible via the adjacent public roadways. On the south side, the main terminal area is accessible from NE Cornell Road. East side facilities are accessible via NE Brookwood Parkway. On the west side, facilities are accessible from NE 25th Avenue. On the north side, NE 30th Avenue extending from NE Evergreen Road, provides primary surface access. **Exhibit 1A** shows the location of the Airport.

Freeway Access

Compared to other similarly sized airports, access to freeways is somewhat distant from the Airport. The closest access is via NE Brookwood Parkway, which provides access to U.S. Highway 26, an approximate driving distance of three miles from the terminal area. US26 provides connections to Portland and

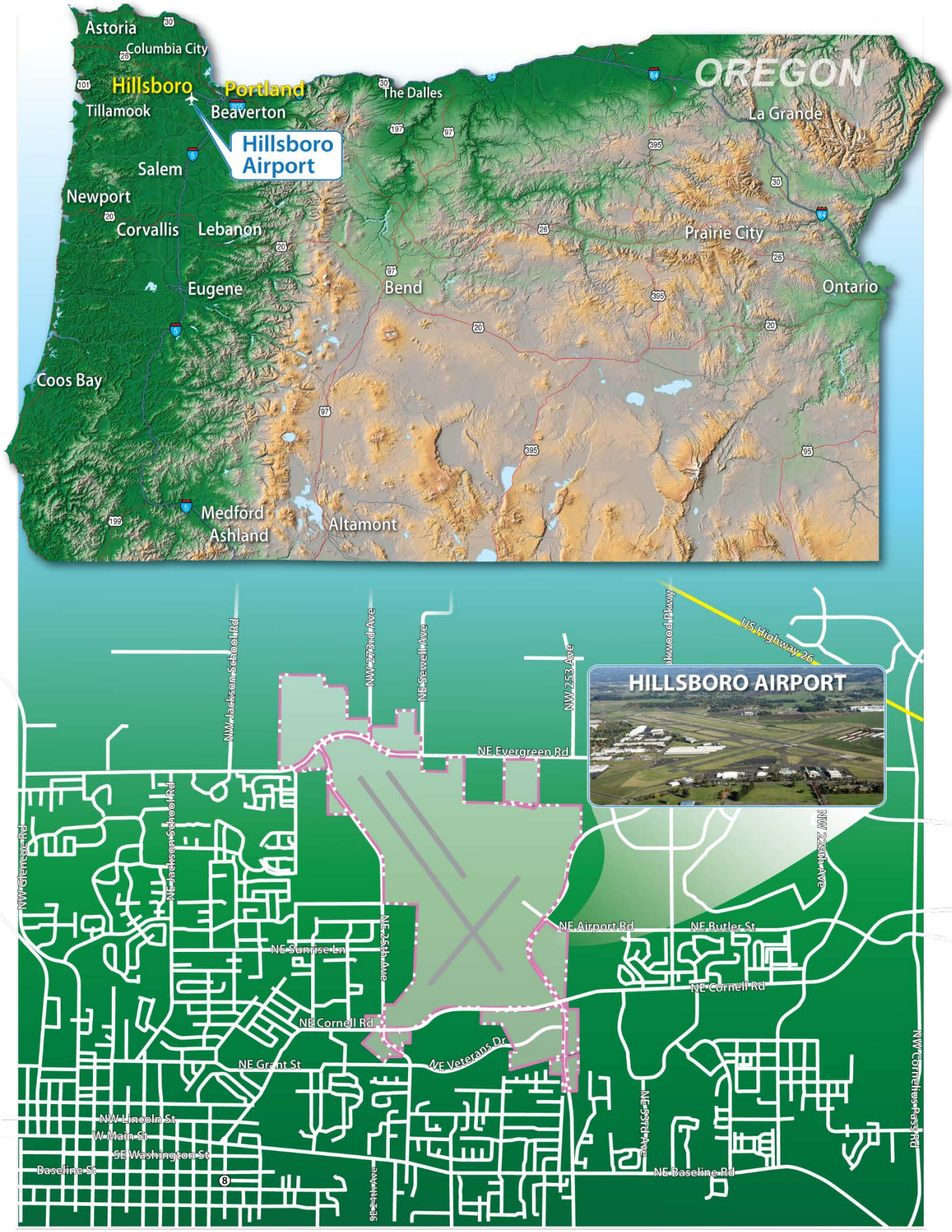


Exhibit 1A
LOCATION MAP

Interstates 405 and 5. Oregon Route 8, commonly known as the Tualatin Valley Highway, passes approximately two miles to the south of the Airport. It provides access from downtown Portland, through Hillsboro, terminating at the town of Gales Creek to the west. Accessing the Airport requires travel over various arterial suburban streets.

Public Transit Access

TriMet provides bus, MAX light rail, and WES commuter rail service in the Portland region. The WES commuter rail line currently provides service between the Beaverton transit station and Wilsonville. It does not impact the Hillsboro Airport. There are bus lines and a MAX light rail station in proximity to the Airport.

Two Hillsboro bus routes operate close to the Airport:

- #46 – North Hillsboro: travels on NE Cornell Road south of the Airport and stops on NE Cornell Road in front of terminal.
- #48 – Cornell: travels on NE Cornell Road south of the Airport

Bus stops:

- Two bus stops are on the west side of the Airport: one at the intersection of NE 25th Avenue and Kathryn Street and the other at the intersection of NE 15th Avenue and NE Edgefield Street.
- Two bus stops are east of the Airport on NE Brookwood Parkway adjacent to Hillsboro-Brookwood Library.
- Another bus stop is located farther east of the terminal area at the intersection of NE Cornell Road and NE Elam Young Parkway.

The *2013 TriMet Westside Service Enhancement Plan* proposes changes to the bus routes in the vicinity of the Airport.

The MAX light rail station - located approximately ⅜-mile south of the Airport:

- The Blue Line extends from the Hatfield Government Center in downtown Hillsboro to Portland and continues to the Cleveland station in Gresham, east of Portland.
- Fair Complex/Hillsboro Airport stop - designated MAX stop south of the Airport. From this stop to PDX takes approximately 88 minutes and requires a connection from the Blue Line to the Red Line, according to the current schedule. Extension of the Red Line to the Hillsboro station is currently in the planning phase.

North Hillsboro Link, a Ride Connection service:

This is a transit service for residents and commuters in North Hillsboro that serves Orenco Station and businesses and destinations in North Hillsboro. No fare is required and it is open to the general public. Ride Connection provides deviated route service (buses that run on a route and schedule) in rural Washington County, Forest Grove, Tualatin, King City, and North Hillsboro. To schedule an off-route pick-up or drop-off (within ½ mile of the route), travelers call a published telephone number.

Other Transportation Methods
Ride share services such as Uber and Lyft are available in the greater Portland area, including Hillsboro. Several taxi services also operate in the Hillsboro area.

One of the corporate air shuttle operators at the Airport provides private bus service from their nearby campus to the Airport. The bus stops at the terminal curb to load and unload employees utilizing the corporate air shuttle.

Freight Rail Access
Freight rail services are available in the Hillsboro area. The Portland & Western short line railroad operates rail lines in Hillsboro which connect to the Union Pacific and BNSF lines in Portland. There is not a railroad spur that connects directly to the Airport.

Long-Distance Bus/Rail
Long-distance bus service is available from Greyhound and long-distance passenger rail service is available from Amtrak. Both have stations located in downtown Portland.

Bicycle and Pedestrian Facilities
In 2015, the City of Hillsboro approved an update to the Trails Master Plan. There are a number of public and private trails in proximity to the Airport. The City is completing planning for the Crescent Park Greenway Trail, a greenway ring around the City on its north, east, and south sides. The northern reach of the greenway is planned along Waibel Creek, approximately one mile north of the Airport. There are no trails on airport property.

The City of Hillsboro Transportation System Plan (2014) discusses elements related to bicycle and pedestrian facilities. These include standard bike lanes, buffered bike lanes, cycle tracks, and multi-use paths and trails. All four arterial streets surrounding the airport have some form of bike/pedestrian infrastructure.

Bicycle parking racks are available at the Airport in the terminal area and appear to be highly utilized. Future planning for the Airport should consider that many Airport users, especially student pilots, will utilize bike facilities.

1.1.2 AIRPORT HISTORY

In 1928, Dr. Elmer Smith purchased 100 acres of the Hawthorn Estate and established a private airport consisting of two turf runways. The construction of the original runways was assisted by the local American Legion post. Prior to establishing the Hillsboro Airport, local pilots utilized Hillsboro's first airstrip located approximately four blocks north of Main Street.

After Dr. Smith's death in the early 1930s, several local businessmen acquired the deed for the airport site, leasing it to the City of Hillsboro for a five-year period. The lease provided the City the option to purchase the Airport at the end of the lease period. Between 1933 and 1938, the City constructed two

runways, one 3,000 feet long (oriented northeast to southwest) and one 2,800 feet long (oriented north-west-southeast). This work was done as a Works Progress Administration project. The City purchased the Airport in 1935 for $7,500.

During World War II, the federal government invested more than $600,000 in improving the Hillsboro Airport to serve as a satellite field for the Portland Air Base. Improvements included grading, drainage, and lighting equipment. The airport site also expanded by 280 acres. The Army did not use Hillsboro Airport significantly during the war and returned it to civilian use in 1945.

The Port of Portland (Port) assumed ownership of Hillsboro Airport on February 1, 1966. With federal assistance, the Port constructed two parallel taxiways, acquired additional land for approach protection, and installed fencing. In 1960, FAA constructed the airport traffic control tower (ATCT). In the early 1970s, the Port constructed the terminal building and acquired an additional 700 acres of land. Runway 12-30 (designation at the time) was extended to 6,300 feet in 1976, when the Instrument Landing System (ILS) was also installed. In 1977, a new threshold taxiway was constructed at the Runway 30 end, providing its current usable runway length of 6,600 feet.

1.1.2.1 Recent Airport Development

The FAA has continued to support development and maintenance of the Airport primarily through the Airport Improvement Program (AIP). Since 2004, the Airport accepted nearly $43 million in grants from the FAA and other sources. Through these grants, the Airport has undertaken many pavement maintenance, capacity enhancement, and improvement projects, including construction of parallel Runway 13L-31R, rehabilitation of Runway 2-20, and various taxiways preservation projects. **Exhibit 1B** presents the capital projects completed since the last master plan.

1.1.3 AIRPORT ADMINISTRATION

The Hillsboro Airport is a public-use facility owned and operated by the Port. The Port is a regional government agency with boundaries that encompass Washington, Clackamas, and Multnomah counties. The nine-member Port Commission sets Port policy. The Port Commission is comprised of members appointed by the Governor, and confirmed by the State Senate, who serve four-year terms.

Every five years, the Port publishes a broad strategic plan that defines the Port's vision, mission, and role of value. The Port's Strategic Plan for 2016-2020 was used to inform this effort.

- **VISION**
  …to be a prominent, innovative economic development engine while stewarding the region's community and environmental best interests.

- **MISSION**
  To enhance the region's economy and quality of life by providing efficient cargo and air passenger access to national and global markets, and by promoting industrial development.

PORT NUMBER	FISCAL YEAR(S)	PROJECT NAME	TOTAL COST SINCE FY 04	AIP GRANT FUNDING	PORT SHARE
102302	2015	Property Acquisition	$7,878,104	$0	$7,878,104
102166	15-16	Perimeter Road Rehab	908,465	0	908,465
101963	14-15	West Tie-Down Rehab	508,255	0	508,255
101962	13-14	Terminal Ramp	441,561	0	441,561
101961	14-15	Terminal Building	143,769	0	143,769
101874	14-15	MX Bldg HVAC Upgrades	61,512	0	61,512
101559	11-16	Jackson Bottom Mitigation	144,031	0	144,031
101554	15-17	RW 13R-31L Rehab	742,872	0	742,872
101235	15-17	Construct E Access Rd	2,669,578	0	2,669,578
101035	11-12	RW 12-30 Threshold Rehab	656,219	460,611	195,608
101032	15-16	Relo Charlie Pattern Lndng	20,812	0	20,812
101025	11-17	RW 2-20 Reloc & Ext TW B	9,666,455	6,903,821	2,762,634
100801	07-11	Tank liners/Land Acquisition	1,362,641	0	1,362,641
100782	07-11	Gimre Property Acq	5,371,119	0	5,371,119
100781	07-11	Hilands Trust Property Acq	1,443,489	0	1,443,489
100603	08-11	Extend TW C	3,593,685	2,350,000	1,243,685
100549	06-08	Rehab Term TW/W Perim Rd	917,491	650,000	267,491
100548	09-17	Construct RW 12L-30R	13,317,439	13,025,718*	291,721
100547	08-11	12L-30R Preliminary Design EA	1,516,136	1,516,136	0
100546	08-11	Terminal Bldg Remodel	1,060,359	0	1,060,359
100543	07-08	Perm Rd & Term Parking Rehab	879,104	0	879,104
100464	07-10	RW 12-30 Hi-Speed Exits	4,558,533	2,348,693	2,209,840
100374	05-07	TW A & Shoulders	1,867,183	1,502,875	364,308
100232	2014	Center Tie-Down Reseal	14,384	0	14,384
100231	04-05	Center Tie-Down Cape Seal	103,800	0	103,800
100221	04-06	Perim Rd Ext & Sec Fence	738,133	549,124	189,009
100122	04-05	TW A & Fog Seal	942,422	701,102	241,320
100120	04-06	PHA TW B Rehab	1,036,464	0	1,036,464
100086	04-06	PHA TW F Widen to 50'	104,076	0	104,076
100030	04-07	RSA Phase 4	4,246,100	3,734,562	511,538
100029	04-07	RSA Obstructions Removal	377,799	283,349	94,450
100028	04-05	RSA Phase 3	2,245,011	1,683,758	561,253
100027	04-06	RSA NAVAIDS	966,952	725,214	241,738
100026	04-05	RSA Mitigation	1,396,245	0	1,396,245
100025	04-06	RSA Evergreen Rd Relocate	4,468,846	3,128,192	1,340,654
100024	04-05	RSA General & Phase 2	4,869,790	3,408,853	1,460,937
		Other General Capital Projects	3,155,398	0	3,155,398
CAPITAL PROJECT TOTAL			**$84,394,232**	**$42,972,008**	**$41,442,224**

- **ROLE OF VALUE**
  We facilitate trade and air passenger travel to foster our region's prosperity.
  The Port plays three primary roles:
  1) Economic Engine
  2) Facilitator of Freight and Air Passenger Travel
  3) Advocate for Trade, Transportation and Industrial Land

  The Port does this by:
  - Planning or building rail and maritime facilities and supporting transportation infrastructure.
  - Operating PDX in a manner that ensures an exceptional passenger experience, reflects the character of our region, and is a source of civic pride.
  - Acquiring and developing industrial property for traded-sector development.
  - Advocating for public policy and fostering market development supports commerce and trade.
  - Catalyzing private investments that result in quality jobs, supports local business and provides a tax base for public services.

While the Port clearly has many responsibilities in addition to aviation, the focus of this master plan is Hillsboro Airport. Direct day-to-day management of the Airport is the responsibility of a professional airport manager (Senior Manager - General Aviation Airports), who has a staff of two operations and four maintenance employees.

1.1.4 REGIONAL CLIMATE

Weather conditions are important to the planning and development of an airport. Temperature is an important factor in determining runway length requirements, while wind direction and speed are used to determine optimum runway orientation. The need for navigational aids and lighting is determined by the percentage of time that visibility is impaired due to cloud coverage or other conditions.

Summers in Hillsboro are generally moderate to warm, with an average high temperature in August of 81.4 degrees Fahrenheit (F). The climate is moderated by the marine influence from the Pacific Ocean, so average low temperatures are still above freezing throughout the year. According to the Koppen climate classification system, Hillsboro has a warm-summer Mediterranean climate.

The area receives nearly 39 inches of precipitation during an average year, with the largest share being received from October through March. Snowfall is minimal, averaging less than two inches per year. It is common for there to be no snowfall during the winter season. Overcast skies are common in Hillsboro as clouds move in from the Pacific. In fact, in 2016, there were 226 days with some form of precipitation and a total of 46 inches for the year.

Table 1A lists common climate data for Hillsboro, Oregon. Information pertaining to temperature and precipitation was obtained from the National Oceanic and Atmospheric Administration (NOAA), while the wind speed, percent of time in instrument and visual flight rule conditions, and sky clear data was pulled from the automated surface observation system (ASOS).

TABLE 1A
Historic Climate Data
Hillsboro Airport

Period	Average Precip. (in.)[1]	Average Daily High Temp (F)[1]	Average Daily Low Temp (F)[1]	Average Wind Speed (mph)[2]	Percent IFR[2]	Percent VFR[2]	Percent Clear Sky[2]
January	6.1	46.9	33.3	3.6	30.6	69.4	30.2
February	4.4	50.9	33.8	4.4	13.0	87.0	37.2
March	3.7	55.6	36.5	5.3	7.3	92.7	36.1
April	3.0	60.7	39.4	5.1	4.1	95.9	42.4
May	2.3	67.6	44.2	4.7	2.8	97.2	51.3
June	1.4	72.7	48.3	4.6	2.2	97.8	51.8
July	0.5	80.1	51.1	4.8	1.0	99.0	74.2
August	0.6	**81.4**	50.3	4.4	1.1	98.9	71.3
September	1.4	74.7	46.3	3.7	4.5	95.5	67.0
October	3.2	62.7	40.3	3.1	12.9	87.1	47.3
November	6.5	52.0	36.7	4.1	22.4	77.6	30.9
December	6.7	45.0	32.1	4.0	28.5	71.5	25.9
TOTAL	**39.8**						

[1]*Source: NOAA - Climatography of the U.S. (30 years of data from 1981-2010) as sourced from the on-airport automated surface observing system (ASOS)*
[2]*Source: On-airport ASOS; 112,331 observations from 1.1.2006 to 12.31.2015.*
Clear Sky is reported ceilings of 72,000 feet or greater.
KEY: In. - Inches; MPH - miles per hour; IFR - Instrument Flight Rule; VFR - Visual Flight Rule

Visual flight rule (VFR) conditions are those when the pilot is allowed to fly with visual reference having a minimum of three miles visibility and at least 1,000-foot cloud ceilings. Instrument flight rule (IFR) conditions are those times where either visibility or cloud heights fall below VFR conditions.

By FAA standards, when calculating runway length needs, a key input is the average daily high temperature for the highest month. At Hillsboro Airport, August is the hottest month, with a monthly average high temperature of 81.4 degrees F.

1.2 AIRPORT SYSTEM PLANNING ROLE

Airport planning exists on several levels: national, state, and local. Each level has a different emphasis and purpose. On the national level, the Hillsboro Airport is included in the *National Plan of Integrated Airport Systems* (NPIAS). On the regional and state levels, the Airport is included in the *Oregon Aviation Plan* (2007). The most recent local planning document for HIO is the Airport Master Plan, which was finalized in 2005 with a base forecast year of 2003.

1.2.1 FEDERAL AIRPORT PLANNING

On the national level, the Hillsboro Airport is included in the *National Plan of Integrated Airport Systems* (NPIAS) as a general aviation airport. The NPIAS identifies 3,332 existing airports which are considered significant to the national air transportation system. The NPIAS is published and used by the FAA in administering the AIP, which is the source of federal funds for airport improvement projects across the country. The AIP program is funded exclusively by user fees and user taxes, such as those on fuel and airline tickets. The 2017-2021 NPIAS estimates that $32.5 billion of needed airport improvements are eligible for AIP funding across the country over the next five years. An airport must be included in the NPIAS to be eligible for federal funding assistance through the AIP.

The NPIAS supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility by identifying specific airport improvements. The current issue of the NPIAS identifies approximately $32.6 million in development needs at Hillsboro Airport for the five-year planning horizon. This figure is not a guarantee of federal funding but represents development needs presented to the FAA by the airport administration in the annual airport capital improvement program. Of the $32.5 billion in airport development needs identified by the NPIAS nationally, approximately five percent, or $1.75 billion, is proposed for the 89 National general aviation airports, including Hillsboro Airport. Exhibit 2A shows the National Aviation System classifications as well as supporting information related to general aviation airports.

Airports that receive AIP grants must adhere to various grant assurances. These assurances include maintaining the airport facility safely and efficiently in accordance with specific conditions. The duration of the assurances depends on the type of airport, the useful life of the facility being developed, and other factors. Typically, the useful life for an airport development project is a minimum of 20 years. Thus, when an airport accepts AIP grants, it is obligated to maintain the facility in accordance with FAA standards for at least that timeframe.

1.2.2 STATE AIRPORT PLANNING

Hillsboro Airport is included in the *Oregon Aviation Plan 2007* (OAP) as a Category II – Urban General Aviation Airport. These airports support all general aviation aircraft and accommodate corporate aviation activity, including business jets, helicopters, and other general aviation activity. These airports service a large geographic region, or they experience high levels of general aviation activity. Hillsboro Airport meets all of the state recommendations for this airport category except for available vehicle parking.

1.2.3 REGIONAL SYSTEM PLANNING

In more urban locales with multiple airports, regional planning agencies may elect to develop a regional aviation system plan. Metro is the Portland metropolitan area's regional government and serves as the designated Metropolitan Planning Organization (MPO) for Washington, Clackamas, and Multnomah

counties. One of Metro's primary responsibilities is coordinating and planning investments in the transportation system for the three-county area. Metro conducts regional long-range transportation planning, manages the Regional Transportation Plan, and leads efforts to plan transportation corridors, including high-capacity transit. To date, Metro has not elected to prepare a regional airport system plan; however, the importance of air transportation is discussed in the Regional Transportation Plan.

The Port owns and operates three aviation facilities: Portland International Airport (PDX), Hillsboro Airport (HIO), and Troutdale Airport (TTD). The Port takes a portfolio approach to managing these three facilities in a coordinated way. Both HIO and TTD are designated reliever airports, which means they are to be developed to accommodate general aviation activity that might otherwise use PDX (further definition in Chapter Two – Role of the Airport).

1.2.4 LOCAL AIRPORT PLANNING

The airport master plan is the primary local airport planning document. The master plan provides a 20-year vision for airport development based on aviation demand forecasts. The most recent update to the airport planning document is the 2005 Airport Master Plan. Over time, the forecast element of an airport master plan typically becomes less reliable due to changes in aviation activity and/or the economy. As a result, the FAA recommends that airports update their master plans every five to ten years, or as necessary, to address any significant changes. Therefore, this is an appropriate time to update the airport master plan and revisit the development assumptions from the previous planning study.

1.2.5 ECONOMIC IMPACT

In 2016, the Port published information related to the economic impact of the Airport. **Table 1B** summarizes the significant economic impact of the Airport. The presence of the Hillsboro Airport resulted in the following:

- 1,472 jobs
  - 697 direct jobs, 336 induced jobs, 439 indirect jobs
- $47,299 average annual income of airport jobs

TABLE 1B
Economic Impact
Hillsboro Airport

Year	Total Jobs	Business Revenue	Personal Income	Local Taxes
2016	1,472	$107.4 million	$83.5 million	$8.4 million
2011	937	$66.3 million	$54.7 million	$5.1 million
5-Year Difference	535	$41.1 million	$28.8 million	$3.3 million
CAGR 2011-2016	9.45%	10.13%	8.83%	10.49%

CAGR: Compound Annual Growth Rate
Source: Martin Associates

1.2.6 AIRPORT PROPERTY

Hillsboro Airport encompasses approximately 963 acres. The Airport owns an avigation easement encompassing 2.3 acres along the southeast property line. When addressing development of airport property, the FAA considers all property to be reserved for aviation purposes. Airports with excess land not necessary to support future aviation development, or land disconnected from the main runway/taxiway system (e.g., separated by roads or challenging terrain), may consider compatible non-aviation development as an additional revenue source. There are approximately 239 acres of airport property disconnected from the main airport property by roads. An additional 26 acres located in the north quadrant of the Airport, immediately west of SunPower, is currently designated for non-aviation uses. Other areas of airport property that may not be necessary for aviation development will be examined in later chapters of this master plan.

1.3 HISTORICAL AERONAUTICAL ACTIVITY

A key aspect of the master planning process is the documentation of historical activity levels for various aviation demand indicators. For Hillsboro Airport, these include based aircraft and annual operations (takeoffs and landings). In Chapter 2, forecasts of each aviation demand indicator will be developed, submitted to the FAA for review and approval, and will serve as the basis for future facility planning.

1.3.1 BASED AIRCRAFT

Identifying the current number of based aircraft is important to master plan analysis, yet it can be challenging due to the transient nature of aircraft storage and the fact that until recently, the FAA did not require tracking of based aircraft by individual airports. Currently, the FAA requires that airports identify the number of based aircraft at their airport and upload that information to a national database (www.basedaircraft.com). The FAA consults the national database to validate the base year master plan forecasts for based aircraft.

Physically counting based aircraft is particularly difficult at Hillsboro Airport because of the varied means for storing aircraft. Many aircraft are stored in privately owned facilities, access to which may not be readily available. However, the Port is able to track based aircraft stored in Port-owned facilities fairly accurately.

To gain a more comprehensive list of based aircraft, the Oregon Department of Aviation (ODA) was contacted because each aircraft based at an Oregon airport is required to register with the state. ODA provided a list of those registered aircraft claiming Hillsboro as their base airport. This list was then cross-referenced with the FAA aircraft registration database (as of June 2017), and only those with an active registration were counted as a based aircraft. In total, there are 354 aircraft listed by ODA that also have a valid operating certificate from the FAA.

Exhibit 1C presents the current based aircraft segmented by aircraft type and by FAA registration location. Typically, aircraft owners choose to base their aircraft at an airport that is convenient to their home or place of business. The vast majority of the based aircraft (91.5 percent) are registered in Oregon, with only 30 being registered out of state. Approximately 82 percent of the based aircraft are registered in Washington, Clackamas, Multnomah, and Yamhill counties.

Additional information related to the based jets is also available. This is important because jets are larger than piston aircraft, thus requiring more space, and they provide a larger economic impact because they take on more fuel and are frequently used for business purposes. Of the 49 jets based at the Airport, 42 are registered in Oregon. **Table 1C** shows the make and model of the jets based at the Airport. As can be seen, some of the largest business jets are based at the Airport, including eight Bombardier Global 5000/Express models.

TABLE 1C
Based Jets by Make/Model
Hillsboro Airport

Aircraft Type	Number of Aircraft	Aircraft Type	Number of Aircraft
Global 5000/Express	8	Lear 45	2
Lear 31/35/36	7	Lear 60	1
G 650	3	GIV	1
Challenger 600	3	IAI Astra	1
Cessna 510	3	Eclipse EA500	1
Cessna 525	3	Falcon 2000EX	1
Falcon 900	2	Cessna 680	1
GV/G550	2	Cessna 550	1
Hawker 800/XP	2	Beech 390	1
Cessna 560	2	War Birds[1]	3
Lear 24	1	**Total**	**49**

[1]Vintage military aircraft
Source: Oregon Department of Aviation aircraft registration database.

1.3.2 AIRCRAFT OPERATIONS

Aircraft operations (a takeoff and a landing are each considered operations), are classified as either local or itinerant. Local operations consist mostly of aircraft training operations conducted within the airport traffic pattern, such as touch-and-go and stop-and-go operations. Itinerant operations are arriving or departing aircraft which have an origin or destination away from an airport.

Aircraft operations are further sub-classified into four general categories: air carrier, air taxi, general aviation, and military. Air carrier operations are defined as those conducted commercially by aircraft having a seating capacity of 60 or more and/or a maximum payload capacity of 18,000 pounds. Air taxi operations can include small commercial service aircraft operations, as well as general aviation aircraft used for the "on-demand" commercial transport of persons and property in accordance with 14 Code of Federal Regulations (CFR) Part 135 and Part 91(k).

LOCATION	NUMBER OF AIRCRAFT	PERCENT
Washington County	200	56.5
Multnomah Couty	68	19.2
Clackamas County	17	4.8
Marion County	8	2.3
Deschutes County	6	1.7
Yamhill County	5	1.4
Other Oregon	20	5.6
Other WA State	4	1.1
Out of state (1 Foreign)	26	7.3
Total Based Aircraft	**354**	

FLEET MIX	
ENGINE TYPE	BASED NUMBER
Single Engine	223
Multi-Engine	25
Turboprop	17
Jet	49
Helicopter	35
Other	5
Total	**354**

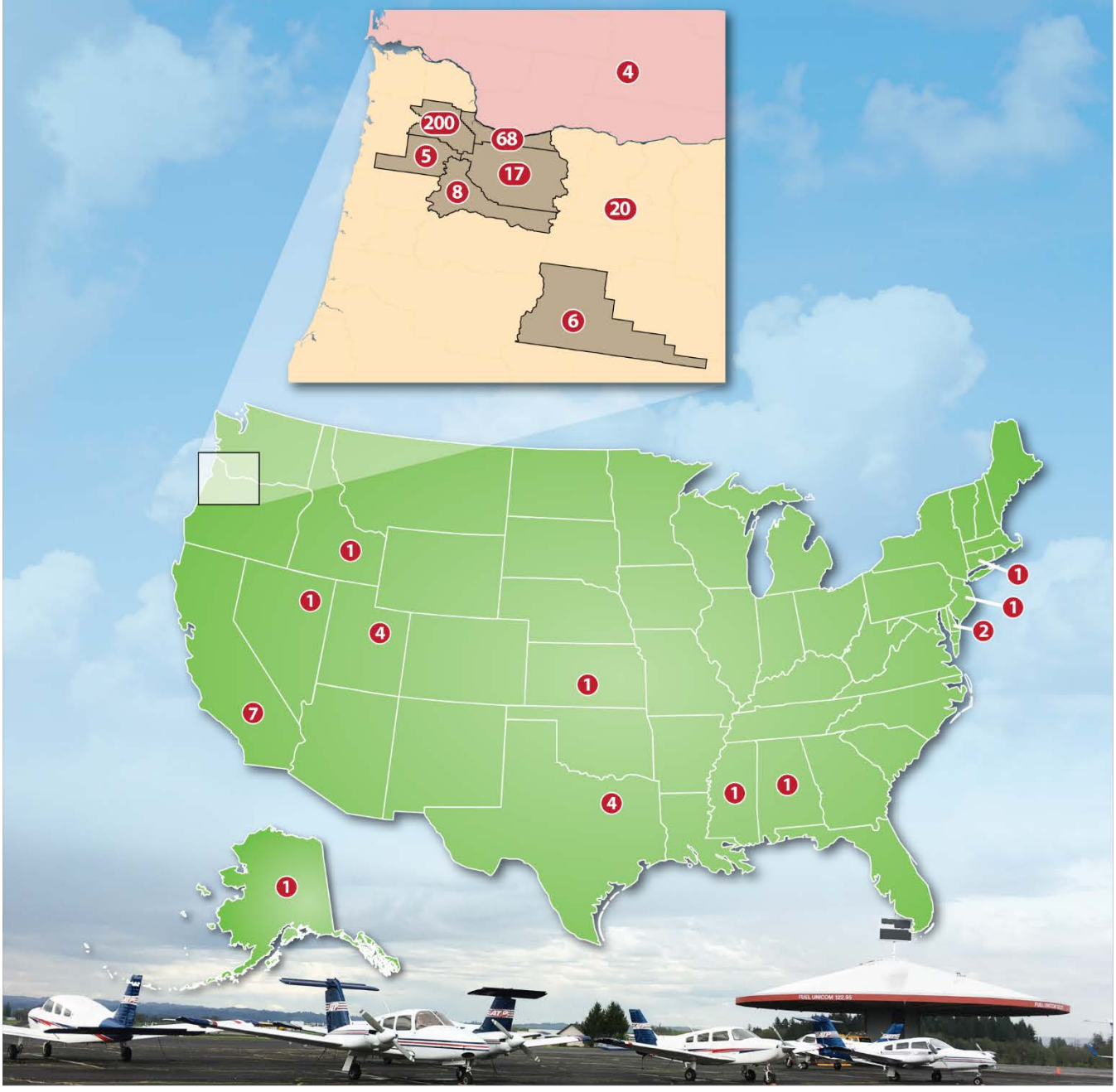


Exhibit 1C: BASED AIRCRAFT REGISTRATION LOCATION

Exhibit 1D shows the annual aircraft operations as counted by the ATCT at the Airport since 2000. The exhibit includes local and itinerant operations. Air carrier operations are included in both the air carrier and air taxi categories. General aviation operations include a wide array of aircraft use ranging from personal to business and corporate uses. On average, 42 percent of operations have been itinerant, and the remaining 58 percent have been local.

1.4 AIRFIELD FACILITIES

Airfield facilities are those which facilitate aircraft movements between the air and ground. Generally, these facilities include runways, taxiways, airport lighting and markings, and navigational aids. **Exhibit 1E** summarizes and depicts airfield facility information atop an aerial photograph for visual reference.

1.4.1 RUNWAYS

Hillsboro Airport has three runways. Runway 13R-31L is the Airport's primary runway. Runway 2-20 is the crosswind runway. Runway 13L-31R is the recently opened parallel training runway. **Table 1D** summarizes the runway characteristics.

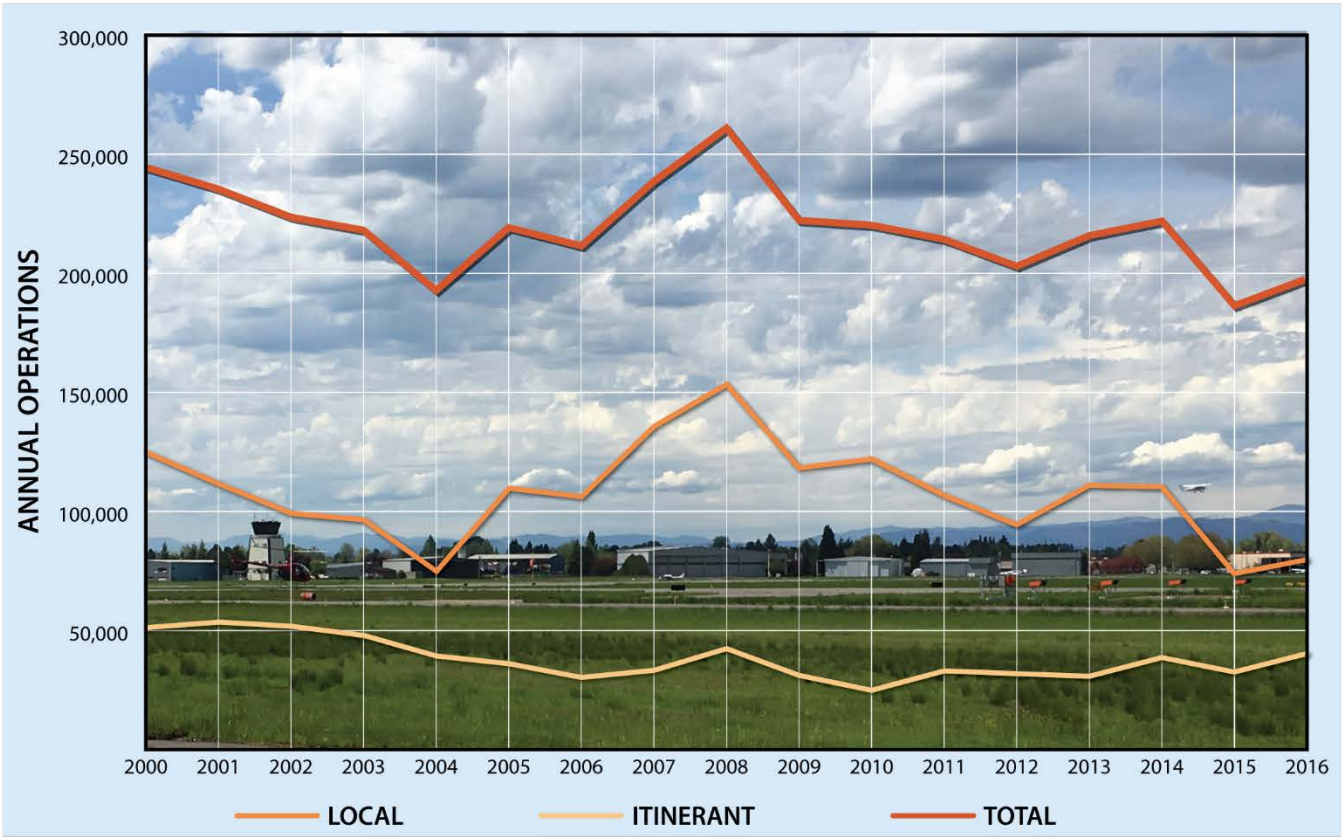
TABLE 1D
Runway Characteristics
Hillsboro Airport

Designation	Markings	Material	Condition[1]	Width (ft.)	Length (ft.)
13R-31L (Primary)	Precision/Non-precision	Asphalt	Good to Very Poor[2]	150	6,600
2-20 (Crosswind)	Basic	Asphalt	Good[3]	75	3,821
13L-31L (Parallel)	Basic	Asphalt	Good[4]	60	3,600

[1]Reference Pavement Condition Map - Exhibit 1F
[2]To be reconstructed by 2020
[3]Reconstructed in 2010
[4]Constructed in 2015

1.4.1.1 Primary Runway 13R-31L

Runway 13R-31L is 6,600 feet long and 150 feet wide. It is oriented in a northwest-southeast manner. The pavement is constructed of asphalt and is reported as being in good to very poor condition according to the most recent pavement condition report (reference **Exhibit 1F**). Runway 13R has precision markings providing threshold bars, threshold markings, runway end designations, touchdown zone, aiming point, centerline, and edge markings. Runway 31L has non-precision markings which are the same markings as Runway 13R, with the exception of touchdown zone markings.

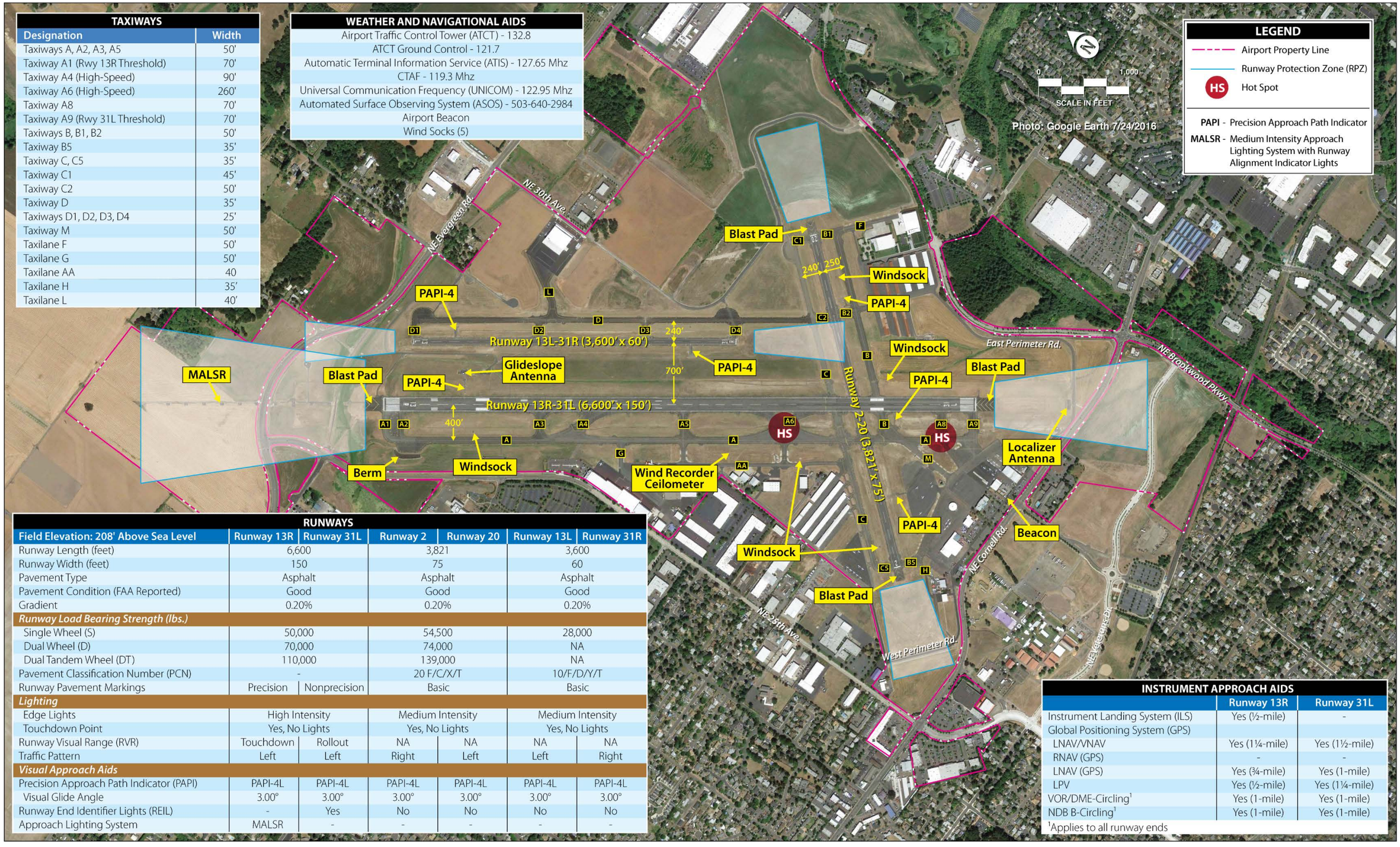


	ITINERANT					LOCAL			
YEAR	AIR CARRIER	AIR TAXI	GENERAL AVIATION	MILITARY	TOTAL	CIVIL	MILITARY	TOTAL	TOTAL
2000	0	7,230	83,201	1,103	91,534	151,645	1,332	152,977	244,511
2001	12	7,931	84,639	873	93,455	141,880	48	141,928	235,383
2002	6	9,078	82,493	426	92,003	131,495	91	131,586	223,589
2003	0	9,386	78,942	450	88,778	129,141	199	129,340	218,118
2004	0	8,287	72,444	834	81,565	111,250	18	111,268	192,833
2005	0	9,689	68,940	227	78,856	140,311	60	140,371	219,227
2006	0	8,773	65,008	262	74,043	137,421	29	137,450	211,493
2007	3	6,571	69,755	219	76,548	162,032	25	162,057	238,605
2008	0	7,615	76,256	268	84,139	176,791	27	176,818	260,957
2009	0	5,749	68,724	295	74,768	147,478	25	147,503	222,271
2010	0	5,738	63,619	176	69,533	149,579	1,101	150,680	220,213
2011	4	6,235	69,770	330	76,339	137,822	82	137,904	214,243
2012	16	6,283	68,696	383	75,378	127,555	34	127,589	202,967
2013	5	3,884	70,187	376	74,452	141,387	22	141,409	215,861
2014	14	4,322	76,453	236	81,025	140,889	18	140,907	221,932
2015	35	4,405	71,144	367	75,951	110,446	5	110,451	186,402
2016	12	4,352	77,778	268	82,410	115,332	21	115,353	197,763

Exhibit 1D
HISTORICAL OPERATIONS

TAXIWAYS	
Designation	**Width**
Taxiways A, A2, A3, A5	50'
Taxiway A1 (Rwy 13R Threshold)	70'
Taxiway A4 (High-Speed)	90'
Taxiway A6 (High-Speed)	260'
Taxiway A8	70'
Taxiway A9 (Rwy 31L Threshold)	70'
Taxiways B, B1, B2	50'
Taxiway B5	35'
Taxiway C, C5	35'
Taxiway C1	45'
Taxiway C2	50'
Taxiway D	35'
Taxiways D1, D2, D3, D4	25'
Taxiway M	50'
Taxilane F	50'
Taxilane G	50'
Taxilane AA	40
Taxilane H	35'
Taxilane L	40'

WEATHER AND NAVIGATIONAL AIDS
Airport Traffic Control Tower (ATCT) - 132.8
ATCT Ground Control - 121.7
Automatic Terminal Information Service (ATIS) - 127.65 Mhz
CTAF - 119.3 Mhz
Universal Communication Frequency (UNICOM) - 122.95 Mhz
Automated Surface Observing System (ASOS) - 503-640-2984
Airport Beacon
Wind Socks (5)



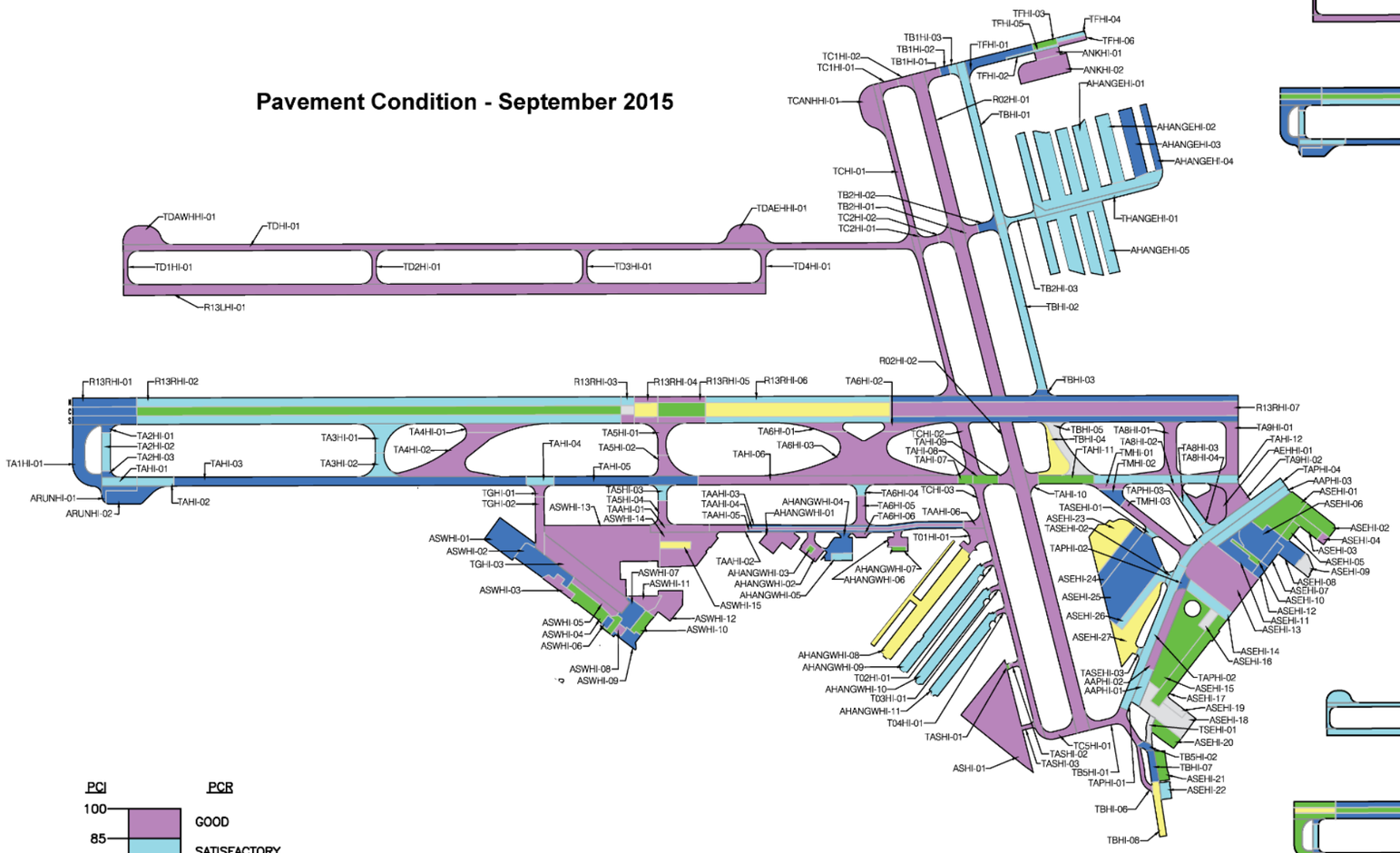
RUNWAYS						
Field Elevation: 208' Above Sea Level	**Runway 13R**	**Runway 31L**	**Runway 2**	**Runway 20**	**Runway 13L**	**Runway 31R**
Runway Length (feet)	6,600		3,821		3,600	
Runway Width (feet)	150		75		60	
Pavement Type	Asphalt		Asphalt		Asphalt	
Pavement Condition (FAA Reported)	Good		Good		Good	
Gradient	0.20%		0.20%		0.20%	
Runway Load Bearing Strength (lbs.)						
Single Wheel (S)	50,000		54,500		28,000	
Dual Wheel (D)	70,000		74,000		NA	
Dual Tandem Wheel (DT)	110,000		139,000		NA	
Pavement Classification Number (PCN)	-		20 F/C/X/T		10/F/D/Y/T	
Runway Pavement Markings	Precision	Nonprecision	Basic		Basic	
Lighting						
Edge Lights	High Intensity		Medium Intensity		Medium Intensity	
Touchdown Point	Yes, No Lights		Yes, No Lights		Yes, No Lights	
Runway Visual Range (RVR)	Touchdown	Rollout	NA	NA	NA	NA
Traffic Pattern	Left	Left	Right	Left	Left	Right
Visual Approach Aids						
Precision Approach Path Indicator (PAPI)	PAPI-4L	PAPI-4L	PAPI-4L	PAPI-4L	PAPI-4L	PAPI-4L
Visual Glide Angle	3.00°	3.00°	3.00°	3.00°	3.00°	3.00°
Runway End Identifier Lights (REIL)	-	Yes	No	No	No	No
Approach Lighting System	MALSR	-	-	-	-	-

INSTRUMENT APPROACH AIDS		
	Runway 13R	**Runway 31L**
Instrument Landing System (ILS)	Yes (½-mile)	-
Global Positioning System (GPS)		
LNAV/VNAV	Yes (1¼-mile)	Yes (1½-mile)
RNAV (GPS)	-	-
LNAV (GPS)	Yes (¾-mile)	Yes (1-mile)
LPV	Yes (½-mile)	Yes (1¼-mile)
VOR/DME-Circling[1]	Yes (1-mile)	Yes (1-mile)
NDB B-Circling[1]	Yes (1-mile)	Yes (1-mile)

[1]Applies to all runway ends

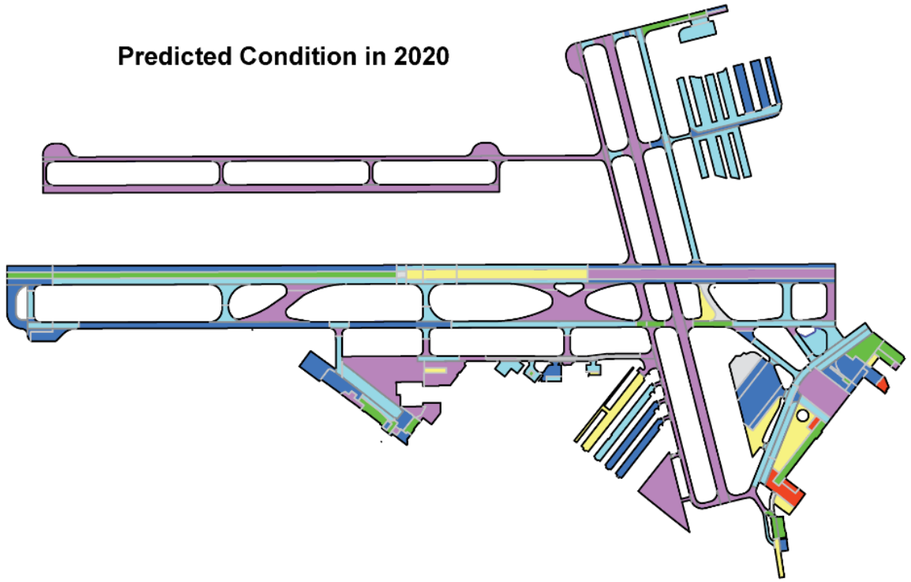
Exhibit 1E
EXISTING AIRFIELD FACILITIES

Pavement Condition - September 2015

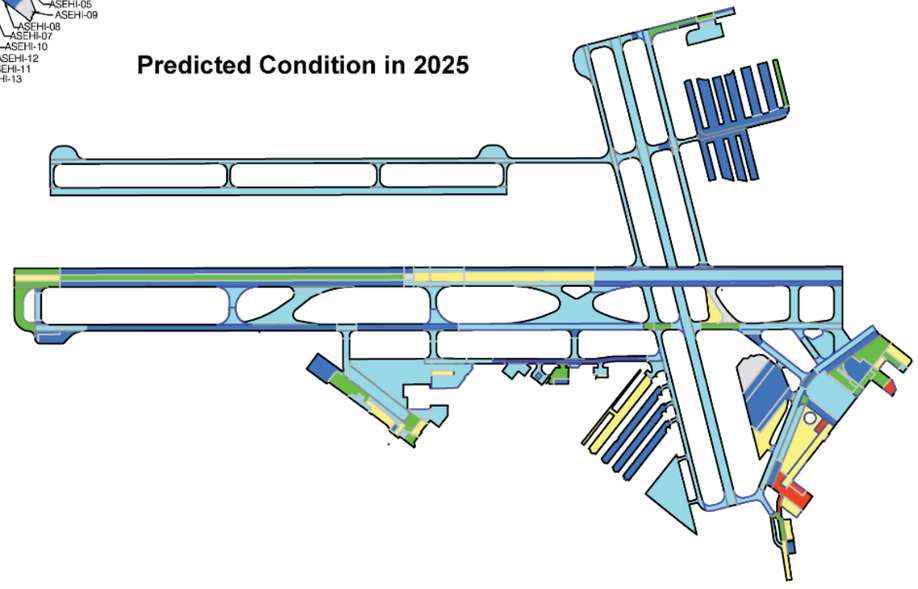


PCI	PCR
100	GOOD
85	SATISFACTORY
70	FAIR
55	POOR
40	VERY POOR
25	SERIOUS
10	FAILED
0	

Predicted Condition in 2020



Predicted Condition in 2025



The runway is equipped with a 200-foot long blast pad on each end. The presence of blast pads helps to limit erosion beyond the runway caused by aircraft engines. The effective gradient of the runway is 0.04 percent and the maximum gradient is 0.43 percent. The elevation at the Runway 13R end is 202 feet above ground level (AGL), and at the Runway 13L end it is 198 AGL. The high point of the runway is approximately 2,200 feet from the Runway 13L end and has an elevation of 204 feet AGL. Runway 13R-31L intersects the crosswind runway approximately 1,340 feet from the Runway 13L pavement end.

Runway 13R-31L is planned to be completely reconstructed beginning in 2019 due to its condition. The reconstruction is being undertaken as a cost-sharing arrangement between the Airport (primarily through FAA AIP grant funding) and the Port. The FAA is providing grant funding for the runway reconstruction to a width of 100 feet, with the Port funding the additional width to 150 feet total.

1.4.1.2 Crosswind Runway 2-20

Oriented in a northeast-southwest manner, crosswind Runway 2-20 is 3,821 feet long and 75 feet wide. The runway is constructed of asphalt pavement and is reported to be in good condition as the runway was recently reconstructed in 2010. The reconstruction project included shifting the runway to the northeast and shortening it by approximately 200 feet in order to resolve runway visibility zone deficiencies. Runway 2-20 has basic markings, which include threshold bars, runway end designations, runway edge and centerline markings. Runway 2-20 intersects the primary runway approximately 1,880 feet from the Runway 2 threshold. The elevation of the Runway 2 end is 204 feet AGL, and on the Runway 20 end it is 208 feet AGL. The effective runway gradient is 0.18 percent and the maximum gradient is 0.33 percent. Both ends of Runway 2-20 have a blast pad that is 150 feet long.

1.4.1.3 Parallel Runway 13L-31R

The construction of the parallel runway was completed in 2015. This runway is 3,600 feet long and 60 feet wide. It is designed to accommodate smaller aircraft and primarily serves training activity. The runway is constructed of asphalt and is in good condition. The elevation on the Runway 13L end is 201 feet AGL and 206 feet AGL on the Runway 13R end. The effective runway gradient is 0.0 percent.

1.4.1.4 Runway Pavement Strength

The strength rating of runway pavement has traditionally been measured in terms of the number of wheels on each landing gear strut of an aircraft. Additional wheels on each landing gear provides greater dispersal of the aircraft weight, enabling the pavement to withstand heavier aircraft. The strength rating, expressed in pounds, indicates that the pavement can withstand repeated usage by aircraft within that weight limitation and the pavement will experience normal wear and tear. Repeated usage of the runway by aircraft that are heavier than the strength rating will exert greater wear and tear and will shorten the useful life of the pavement.

Aircraft with a single wheel on each landing gear strut are classified as single (S). Two wheels on each landing gear strut is classified as dual (D), and dual tandem wheel (DT) has four tires on the landing gear strut. Runway 13R-31L has a pavement strength of 50,000 pounds (S), 70,000 pounds (D), and 110,000 pounds (DT). Runway 2-20 has a pavement strength rating of 54,500 pounds (S), 74,000 pounds (D), and 139,000 pounds (DT). Parallel Runway 13L-31R has a pavement strength rating of 28,000 (S).

The FAA has recently moved to implementing the International Civil Aviation Organization (ICAO) pavement classification number (PCN) for identifying strength of airport pavements. The PCN is a five-part code described as follows:

1) *PCN Numerical Value:* Indicates the load-carrying capacity of the pavement expressed as a whole number. The value is calculated based on several engineering factors such as aircraft geometry and pavement usage.
2) *Pavement Type:* Expressed as either R for rigid pavement (most typically concrete) or F for flexible pavement (most typically asphalt).
3) *Subgrade Strength:* Expressed as A (High), B (Medium), C (Low), or D (Ultra Low). A subgrade of A would be considered very strong, like concrete-stabilized clay, and a subgrade of D would be very weak, similar to un-compacted soil.
4) *Maximum Tire Pressure:* Expressed as W (Unlimited/No Pressure Limit), X (High/254 psi), Y (Medium/181 psi), or Z (Low/72 psi), this indicates the maximum tire pressure the pavement can support. Concrete surfaces are usually rated W.
5) *Process of Determination:* Expressed as either T (technical evaluation) or U (physical evaluation), this indicates the method of pavement testing.

A PCN has been established for Runway 2-20 and parallel Runway 13L-31L. The PCN for primary Runway 13R-31L will be established following the reconstruction project. The PCN for Runway 2-20 is expressed as 20/F/C/X/T. This means that the underlying pavement value has a load-carrying capacity of 20 (unitless), is flexible (asphalt), is low subgrade strength, has high tire pressure capability, and was calculated through a technical evaluation. The PCN for Parallel Runway 13R-31L is 10/F/D/Y/T.

1.4.2 TAXIWAYS AND TAXILANES

Taxiways provide for ground movement of aircraft to and from the runway system. At towered airports, aircraft movements are controlled by tower personnel when the tower is open. Taxilanes provide access to aprons and hangar areas and are typically not controlled by tower personnel.

There are four main parallel taxiways designated A, B, C, and D:

- *Taxiway A* extends from the Runway 13R threshold to the Runway 31L threshold and it is 50 feet wide. There are eight taxiways connecting from Taxiway A to Runway 13R-31L, numbered A1 through A9 (there is no Taxiway A7).
- *Taxiway B* is a partial parallel taxiway to Runway 2-20. It extends from the Runway 20 end to an intersection with Taxiway A. Taxiway B is 50 feet wide. Connecting Taxiways B1, B2 and B5 provide access to the runway.

- *Taxiway C* is a full-length parallel taxiway to Runway 2-20. Taxiway C is 35 feet wide except for that portion between Runway 13R-31L and Taxiway A, where it expands to 65 feet wide. Taxiway C has three connecting taxiways designated C1, C2, and C5.
- *Taxiway D* is 35 feet wide and extends from the Runway 13L end to an intersection with Taxiway C. There are four connecting taxiways designated D1, D2, D3, and D4, each of which is 25 feet wide.
- *Taxiway M* is 50 feet wide and connects between the terminal ramp and Taxiway A.

There are taxilanes providing access to specific areas of the Airport:

- *Taxilane AA* is parallel to Taxiway A. It is 40-feet wide and provides access to various individual box hangars and to the west side FBO apron.
- *Taxilane F* is 50-feet wide and it provides access to the corporate hangar development located closest to Runway 20.
- *Taxilane G* is 50 feet wide and provides access to the apron area located on the west side of the Airport.
- *Taxilane H* is 35 feet wide providing access to the two hangars in the southwest corner of the Cornell Subarea.
- *Taxilane L* is approximately 40 feet wide and provides access to the FBO apron and hangar located adjacent to the parallel runway.

Taxiway and taxilane centerline markings are provided to assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway/taxilane edges. Taxiway markings at the Airport include the following:

- Yellow centerline;
- Continuous type edge markings along paved shoulders;
- Aircraft holding position markings;
- Enhanced centerline markings leading to runway hold lines; and,
- Dashed type edge markings along the taxiways which are contiguous to the terminal ramp.

Aircraft movement areas on various aircraft aprons are identified with centerline markings. Aircraft tie-down positions are identified on various apron surfaces.

1.4.3 AIRFIELD “HOT SPOTS”

The FAA defines an "airport surface hot spot" as a location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary. A “hot spot” is a runway safety-related problem area on an airport that presents increased risk during surface operations. Typically, it is a complex or confusing taxiway/taxiway or taxiway/runway intersection. The area of increased risk has either a history of, or potential for, runway incursions or surface incidents, due to a variety of causes, such as, but not limited to: airport layout, traffic flow, airport marking, signage and lighting, situational awareness, and training. Hot spots are

identified by the FAA, and are depicted on airport diagrams as open circles or polygons designated as "HS 1," "HS 2," etc.

Two hot spots at Hillsboro Airport (see **Exhibit 1E**) described by the FAA are as follows:

- *HS 1:* Aircraft exiting Runway 13R-31L at Taxiway A6 have only 90 feet of clearance between Taxiway A and the hold position markings.

- *HS 2:* Pilots taxiing from the Runway 31L run-up area via Taxiway A8 to Runway 31L for departure sometimes fail to hold short of Runway 13R-31L.

These hot spots will be analyzed during the master plan project and various solutions will be presented. Labeling an area as a hot spot does not mean that the area does not meet design standards. Sometimes, a hot spot only means that pilots should use extra caution in the area. Nonetheless, if a reconstruction project can eliminate potential confusion without negatively impacting airfield operations, that is typically the preferred solution.

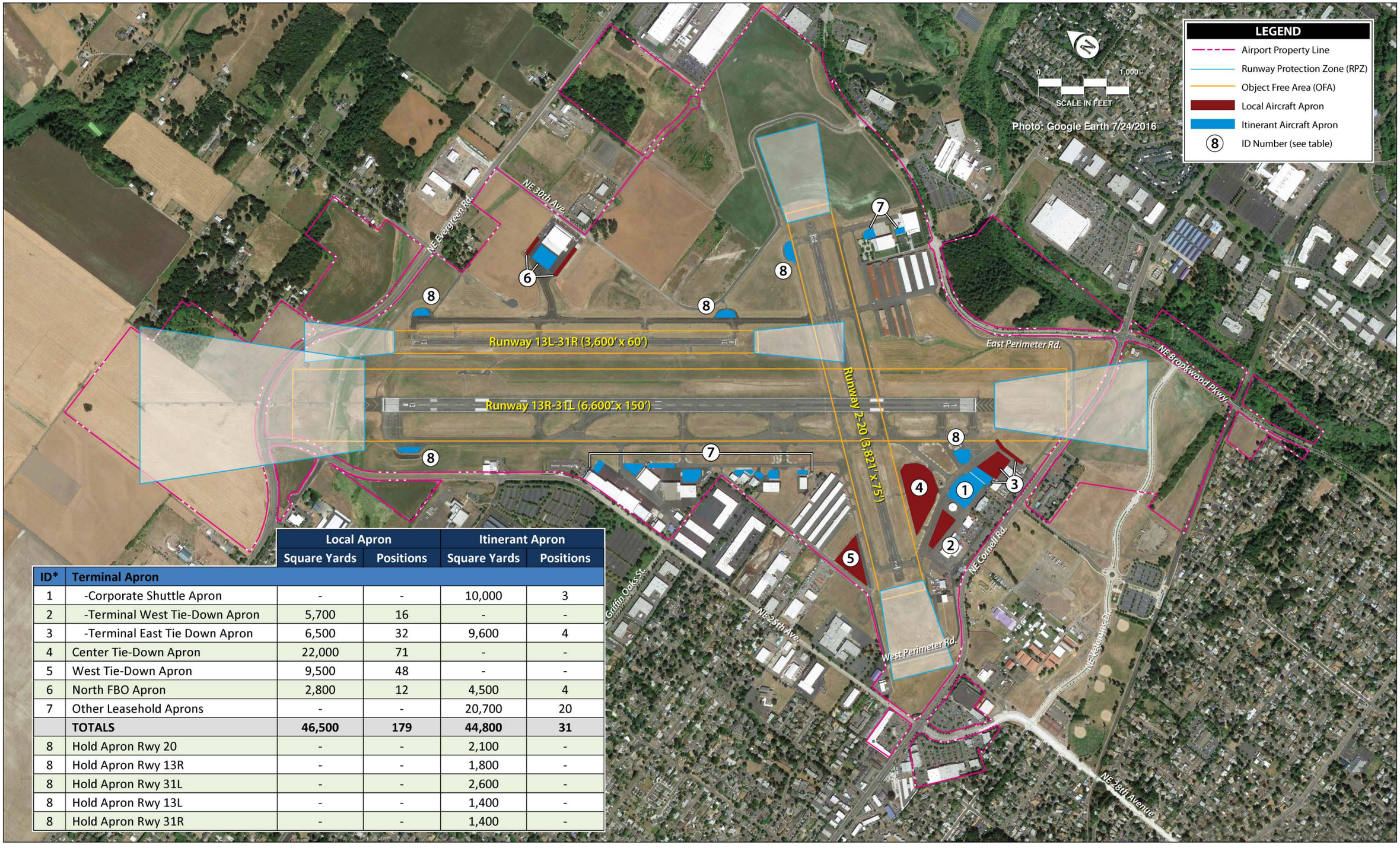
1.4.4 AIRCRAFT APRONS

Aircraft aprons are wide expanses of pavement where various aircraft functions occur. Some apron areas are designated for locally based aircraft that utilize tie-down positions for outdoor storage. Other apron areas are designated for transient aircraft that are visiting for a short period of time. Portions of aprons are used for aircraft circulation purposes. Often, aprons will serve both local and itinerant needs based on demand. Hold aprons provide an area for pilots to perform routine preflight checks and engine run-ups prior to departure and are typically located in proximity to the runway ends.

The terminal apron at Hillsboro serves multiple functions. The terminal-west portion has 16 tie-down positions and generally serves local user needs. The central portion serves transient users, most notably corporate shuttles, and has three positions for larger aircraft. The terminal-east apron has four transient parking positions, eight locally-based helicopter positions and 24 local fixed-wing positions. The east apron positions are managed by the adjacent flight school.

North of the terminal apron is a large central apron designated for local tie-down needs. This apron has a maximum capacity for 71 smaller aircraft. The west apron has 48 positions for small, locally-based aircraft. There are numerous small apron areas adjacent to existing hangars. Collectively, these provide for an estimated 20 transient positions.

Exhibit 1G shows the size and location of the various aircraft aprons as well as the estimated number of aircraft tie-down positions. The map is color-coded to distinguish between local and transient aprons.



		Local Apron		Itinerant Apron	
ID*	Terminal Apron	Square Yards	Positions	Square Yards	Positions
1	-Corporate Shuttle Apron	-	-	10,000	3
2	-Terminal West Tie-Down Apron	5,700	16	-	-
3	-Terminal East Tie Down Apron	6,500	32	9,600	4
4	Center Tie-Down Apron	22,000	71	-	-
5	West Tie-Down Apron	9,500	48	-	-
6	North FBO Apron	2,800	12	4,500	4
7	Other Leasehold Aprons	-	-	20,700	20
	TOTALS	**46,500**	**179**	**44,800**	**31**
8	Hold Apron Rwy 20	-	-	2,100	-
8	Hold Apron Rwy 13R	-	-	1,800	-
8	Hold Apron Rwy 31L	-	-	2,600	-
8	Hold Apron Rwy 13L	-	-	1,400	-
8	Hold Apron Rwy 31R	-	-	1,400	-

Exhibit 1G
AIRCRAFT APRONS

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1.4.5 AIRFIELD LIGHTING SYSTEMS

Airfield lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. A variety of lighting systems are installed at the Airport for this purpose. These lighting systems, categorized by function, are summarized as follows.

Identification Lighting: The location of the Airport at night is universally identified by a rotating beacon. The rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The rotating beacon is located to the south of the terminal building in the vehicle parking lot. The beacon operates sunset to sunrise.

Runway and Taxiway Lighting/Signage: Runway and taxiway edge lighting systems utilize light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility to maintain safe and efficient access to and from the runways and aircraft parking areas.

Runway 13R-31L is equipped with high intensity runway lights (HIRL). The other two runways have medium intensity runway lights (MIRL). For the last 2,000 feet of Runway 13R-31L, edge lighting in both directions is equipped with caution zone lights, which are split white-yellow lighting to warn pilots of the approaching runway end. All taxiways are equipped with medium intensity taxiway edge lighting (MITL). The Airport also has a runway/taxiway signage system, an essential component of a surface movement guidance control system necessary for the safe and efficient operation of the Airport. The signage system installed at the Airport includes runway and taxiway designations, holding positions, instrument landing system (ILS) critical areas, routing/directional, and runway end and exit signs.

Approach Lighting Systems (ALS): The approach to Runway 13R is equipped with a medium intensity approach lighting system (MALS) which offers a lighted, visual grid for pilots to identify the runway end while on final approach. The MALS is supplemented with runway alignment indicator lights (RAIL). The combined MALS and RAIL is referred to as a MALSR. The RAIL portion of the MALSR is a linear progression of strobe lights which provides pilots with a rapid, visual cue of the runway centerline. These approach light stands are spaced every 200 feet and extend approximately 2,800 feet from the runway threshold. No other runway ends have an ALS.

Visual Glide Slope Approach Aids: All runway ends are equipped with a precision approach path indicator (PAPI-4) system. The PAPIs consist of four light boxes which shine red or white light that pilots interpret to determine if they are on the correct glide path to the runway. PAPIs are situated on the left side of the runway (except those for Runway 2, which are on the right side), approximately 1,000 feet from the runway ends. The glide path angle all four runway ends is set to the standard 3 degrees. The Airport Facilities Directory for Hillsboro (FAA publication) notes that the PAPI for both ends of Parallel Runway 13L-31R are baffled (not visible) beyond 8 degrees (10 degrees is typical) to either side of centerline. This was done to avoid tree obstructions.

Runway End Identifier Lights (REIL): Runway 31L is equipped with a REIL system which consists of a flashing strobe light set to the side of the runway landing threshold. These lights provide rapid identification of the runway threshold for a distance of up to 20 miles.

After-Hours Lighting: When the ATCT is closed, all primary airfield lights including the runway edge lights, PAPIs, and the REILs for Runway 31L remain on through the night. Pilots can activate the MALSR utilizing the pilot-controlled lighting (PCL) system through a series of clicks with their microphone transponder on the common traffic advisory channel (CTAF) frequency 119.3 MHz. The MALSR lights will remain on for approximately 15 minutes.

The FAA owns and maintains the MALSR, PAPIs, localizer antenna, glideslope antenna, and the REILs.

1.4.6 WEATHER AND COMMUNICATION AIDS

Wind Indicators: Hillsboro Airport is equipped with seven windsocks. The windsocks provide information to pilots regarding wind conditions, such as direction and intensity. There is a windsock in proximity to each runway end and one located approximately midfield to the primary runway.

Runway Visual Range (RVR): An RVR system measures visibility, background luminance, and runway light intensity to determine the distance that a pilot on the centerline of the runway can see surface markings delineating the runway or identifying its centerline. RVR is expressed in feet and is used as one of the main criteria for minima on instrument approaches. The maximum RVR reading is 6,000 feet, above which the reading becomes insignificant and does not need to be reported. RVR sensor equipment has been installed on the side of Runway 13R at the touchdown zone and on Runway 31L on the rollout. None of the other runways have RVR equipment.

Automated Surface Observing System (ASOS): Hillsboro Airport is served by an ASOS which automatically records weather conditions, such as temperature, dew point, wind speed, altimeter setting, visibility, sky condition, and precipitation. The ASOS updates observations each minute, 24 hours a day, and transmits this information to pilots in the vicinity via an FAA very high frequency (VHF) ground-to-air radio transmitter or via a local telephone number at (503) 640-2984.

Automated Terminal Information Service (ATIS): ATIS broadcasts are updated hourly and provide current surface weather conditions, communication frequencies, and other important airport-specific information for arriving and departing pilots. The ATIS frequency at Hillsboro Airport is 127.65 MHz.

Common Traffic Advisory Frequency (CTAF): The Hillsboro Airport CTAF radio frequency is 119.3 MHz. CTAF is used by pilots in the vicinity of the Airport to communicate with each other about approaches to or departures from the Airport when the ATCT is closed, as well as for activating the PCL. In addition, a UNICOM frequency is also available (122.95 MHz), where a pilot can obtain information pertaining to the Airport.

1.4.7 PAVEMENT CONDITION

The Oregon Department of Aviation (ODA) periodically performs inspections of the pavement conditions at public use airports under its jurisdiction, including Hillsboro Airport. The pavement maintenance management program was developed as part of the Oregon Continuous Aviation System Plan sponsored in part by ODA and the FAA. The information and data generated ensures airport sponsors are in compliance with the requirements of FAA Grant Assurance Number 11, which states that any airport requesting federal funds for pavement improvement projects must have implemented a pavement maintenance management program.

The most recent inspection was in September 2015. The inspections are conducted in compliance with FAA Advisory Circular (AC) 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*. The inspection data is entered into the MicroPAVER software program for analysis. Maintaining a MicroPAVER database ensures that the airport complies with the "record keeping and information retrieval" requirements of the FAA grant assurances.

The MicroPAVER software program calculates a Pavement Condition Index (PCI) for each section of pavement on the airfield (runways, taxiways, and aprons). The program also generates forecasts of pavement condition five and 10 years into the future. PCI values index ranges from 0 to 100, providing an indication of the overall condition of that section of pavement. For Category 2 airports (as described in the Oregon Aviation Plan) such as Hillsboro Airport, pavement condition becomes critical when the PCI falls below 65 for runways, 60 for taxiways, and 55 for aprons. The MicroPAVER software also produces detailed reports indicating what ongoing routine maintenance should be performed to maintain these minimum condition levels. The pavement condition index map for Hillsboro Airport is presented on **Exhibit 1F**.

Runway 2-20 was recently reconstructed and is in good condition with a PCI value of 100. Parallel Runway 13L-31R is the new parallel runway completed in 2015 and also has a PCI value of 100 and is considered in good condition. Primary Runway 13R-31L has PCI values ranging from very poor to good. This runway is scheduled for reconstruction in 2019.

The primary parallel taxiways are in fair to good condition; however, there are some smaller sections listed as being in poor condition. Areas of concern include portions of the aprons and taxilanes. Later in this master plan, capital projects are programmed to maintain adequate pavement condition at the Airport.

The program provided by ODA to monitor pavement condition is a significant asset to the state's system of airports. Continuous and ongoing maintenance of pavement at the Airport contributes to a safe operating environment for aircraft for years to come.

1.5 AREA AIRSPACE AND AIR TRAFFIC CONTROL

The *Federal Aviation Administration Act of 1958* established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA established the National Airspace System (NAS) to protect people and property on the ground and establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS covers the common network of U.S. airspace, including: air navigation facilities; airports and landing areas; aeronautical charts; associated rules, regulations, and procedures; technical information; and personnel and material. The system also includes components shared jointly with the military.

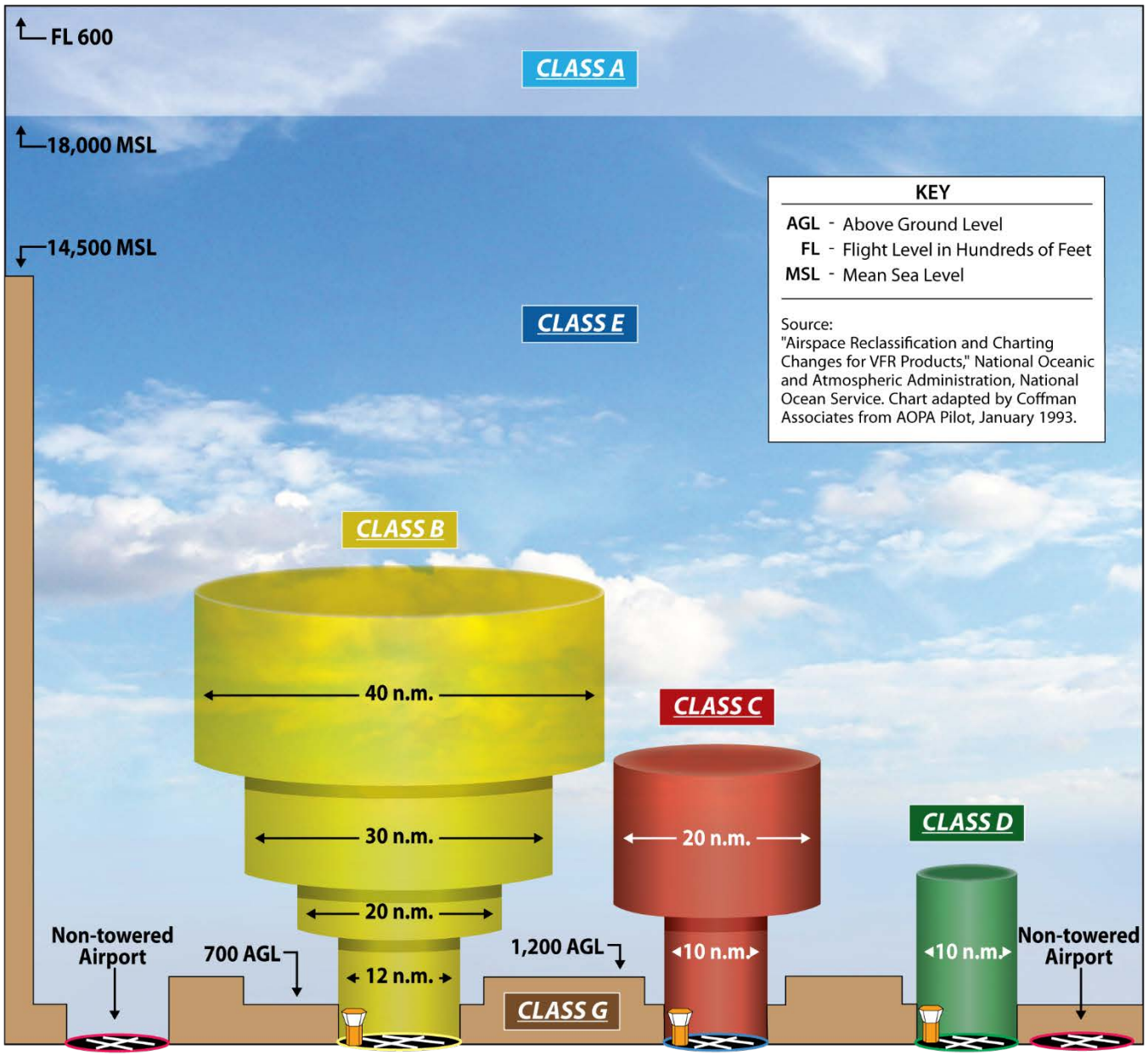
1.5.1 AIRSPACE STRUCTURE

Airspace within the United States is broadly classified as either "controlled" or "uncontrolled." The difference between controlled and uncontrolled airspace relates primarily to requirements for pilot qualifications, ground-to-air communications, navigation and air traffic services, and weather conditions. Six classes of airspace have been designated in the United States, as shown on **Exhibit 1H**. Airspace designated as Class A, B, C, D, or E is considered controlled airspace. Aircraft operating within controlled airspace are subject to varying requirements for positive air traffic control.

Class A Airspace: Class A airspace includes all airspace from 18,000 feet mean sea level (MSL) to flight level (FL) 600 (60,000 feet MSL). This airspace is designated in FAR Part 71.193 for positive control of aircraft. The Positive Control Area (PCA) allows flights governed only under IFR operations. The aircraft must have special radio and navigation equipment, and the pilot must obtain clearance from an ATC facility to enter Class A airspace. In addition, the pilot must possess an instrument rating.

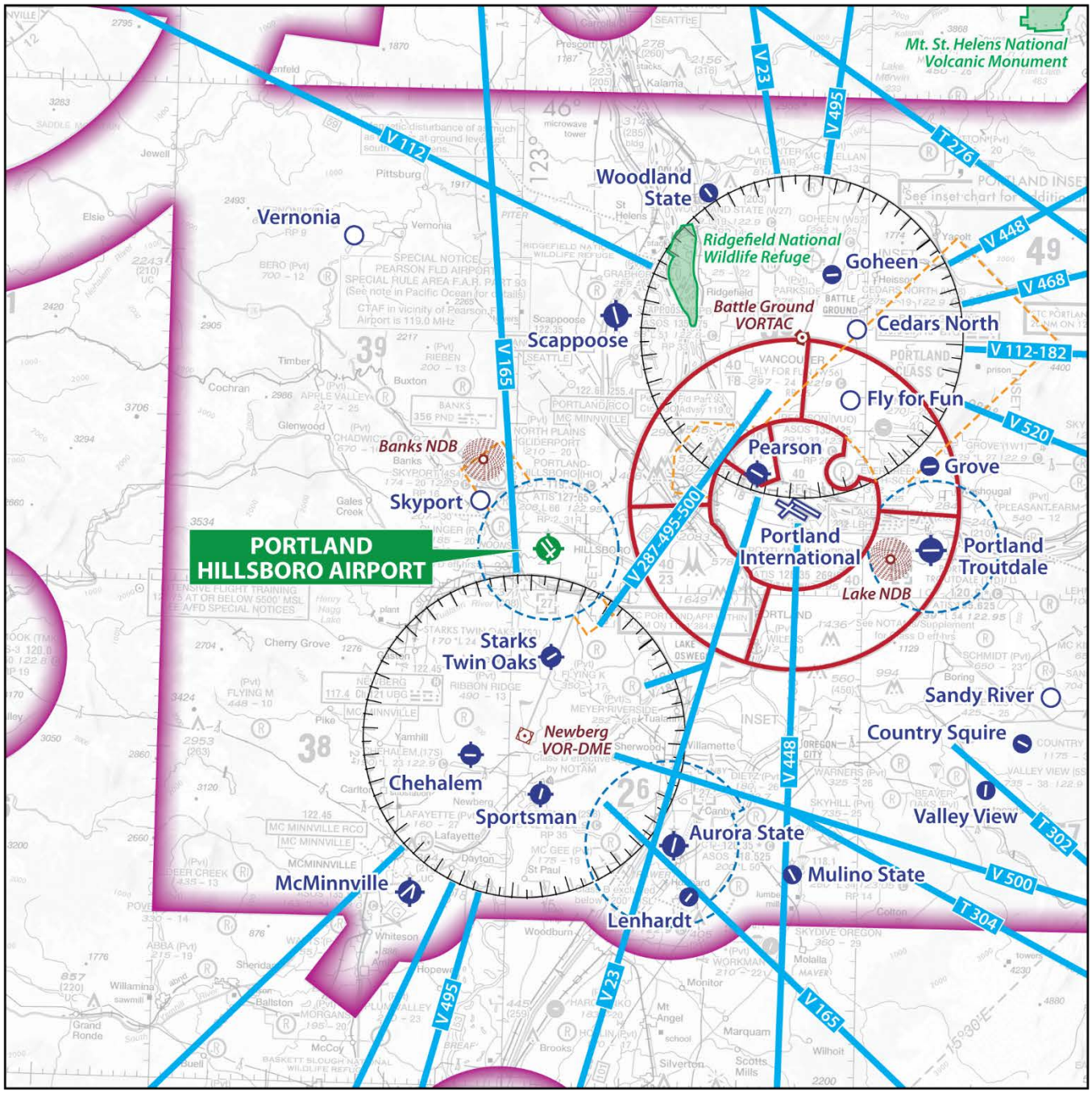
Class B Airspace: Class B airspace has been designated around some of the country's busiest commercial service airports, such as the Seattle-Tacoma International Airport (SEA). Class B airspace is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high-performance, passenger-carrying aircraft at busy commercial service airports. This airspace is the most restrictive controlled airspace encountered by pilots operating under VFR.

To fly within Class B airspace, an aircraft must be equipped with special radio and navigation equipment and must obtain clearance from air traffic control. Additionally, a pilot must have at least a private pilot's certificate or be a student pilot who has met the requirements of FAR Part 61.95, which requires special ground and flight training for Class B airspace. Helicopters do not need special navigation equipment or a transponder if they operate at or below 1,000 feet and have made prior arrangements in the form of a Letter of Agreement with the FAA controlling agency. Aircraft are also required to have and utilize a Mode C transponder within a 30-nautical mile (NM) range of the center of Class B airspace. A Mode C transponder allows the ATCT to track the altitude of the aircraft.



DEFINITION OF AIRSPACE CLASSIFICATIONS

CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600.
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.



LEGEND

- Airport with other than hard-surfaced runways
- Airport with hard-surfaced runways 1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- VORTAC
- VOR-DME
- Non-Directional Radiobeacon (NDB)
- Compass Rose
- Class C Airspace
- Class D Airspace
- Class E Airspace
- Class E Airspace with floor 700 ft. above surface
- Victor Airways
- Wilderness Areas

NORTH

Source: US Department of Commerce, National Oceanic and Atmospheric Administration
Seattle Sectional Chart, 12/08/16

Exhibit 1H (continued)
VICINITY AIRSPACE

Class C Airspace: The FAA has established Class C airspace at 120 airports around the country, as a means of regulating air traffic in these areas. Class C airspace is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high-performance, passenger-carrying aircraft at some commercial service airports. In order to fly inside Class C airspace, the aircraft must have a two-way radio, an encoding transponder, and have established communication with ATC. Aircraft may fly below the floor of the Class C airspace, or above the Class C airspace ceiling without establishing communication with ATC. Portland International Airport (PDX) is in Class C airspace.

Class D Airspace: Class D airspace is controlled airspace surrounding airports with an ATCT, such as at Hillsboro Airport. The Class D airspace typically constitutes a cylinder with a designated horizontal radius from the airport, extending from the surface, up to a designated vertical limit, above the airport elevation. If an airport has an instrument approach or departure, the Class D airspace sometimes extends along the approach or departure path. During periods when the airport's ATCT is closed, Class D airspace typically reverts to Class E airspace.

FAA Order JO 7400.11A, *Airspace Designations and Reporting Points*, describes the Class D airspace surrounding Hillsboro Airport. In summary, the Class D airspace extends from the surface up to, and including, 2,700 feet MSL within a 4.2-mile radius of the Airport.

Class E Airspace: Class E airspace consists of controlled airspace designed to contain IFR operations near an airport, and while aircraft are transitioning between the airport and en route environments. Unless otherwise specified, Class E airspace terminates at the base of the overlying airspace. Only aircraft operating under IFR are required to be in contact with ATC when operating in Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio communications with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist. When the ATCT is closed, Hillsboro Airport reverts to Class E airspace down to the surface.

Class G Airspace: Airspace not designated as Class A, B, C, D, or E is considered uncontrolled, or Class G, airspace. ATC does not have the authority or responsibility to exercise control over air traffic within this airspace. Class G airspace lies between the surface and the overlaying Class E airspace (700 to 1,200 feet above ground level [AGL]) in some areas.

Exhibit 1H also shows the airspace structure surrounding Hillsboro Airport.

1.5.2 SPECIAL USE AIRSPACE

Special use airspace is defined as airspace where activities must be confined because of their nature or where limitations are imposed on aircraft not involved in those activities. The designation of special use airspace identifies for other users the areas where military activity occurs, provides for segregation of that activity from other fliers, and allows charting to keep airspace users informed. Special use airspace in proximity to the Hillsboro Airport is depicted on **Exhibit 1H**.

Military Operating Areas (MOAs): This special use airspace is established outside positive control areas to separate/segregate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. MOAs are established to contain certain military activities, such as air combat maneuvers, air intercepts, acrobatics, etc. The Dolphin North MOA is the closest to Hillsboro and is approximately 100 flying-miles to the southwest.

Victor Airways: A system of Federal Airways, referred to as Victor Airways, was established for aircraft arriving or departing from the area using very high frequency omni-directional range (VOR) facilities. Victor Airways are corridors of airspace eight miles wide that extend upward from 1,200 feet AGL to 18,000 feet MSL and extend between VOR navigational facilities. There are numerous Victor Airways in the area leading to and from the Newberg VOR-DME facility located approximately 11 miles south of the Airport and the Battle Ground VORTAC located approximately 20 miles northeast of the Airport.

Warning Areas: A warning area is airspace of defined dimensions, extending from three nautical miles outward from the coast of the United States, containing activity that may be hazardous to nonparticipating aircraft. The purpose of such areas is to warn nonparticipating pilots of the potential danger. A warning area may be located over domestic or international waters or both. Warning Area W-570 is located west of the Oregon coast.

Restricted Airspace: No person may operate an aircraft within a restricted area between the designated altitudes and during the time of designation without advanced permission of the using and controlling agency. The closest Restricted Airspace is to the east near Hermiston, Oregon and to the north near Seattle.

1.5.3 AIRSPACE CONTROL

The ATCT is located on the west side of the airfield in proximity to the runway intersection. Air traffic controllers staff the ATCT from 6:00 a.m. to 10:00 p.m. daily. Tower controllers provide services to aircraft operating on the Airport and generally within a five-mile radius of the Airport. The tower was constructed in 1960 and it is 65 feet tall.

The ATCT is an FAA-owned and operated facility staffed by FAA controllers. The ATCT staff provides approach, departure, and ground control at the Airport. When the tower is closed, pilots communicate on a Common Traffic Advisory Frequency (CTAF). Communication with the tower is available through the following frequencies:

- Hillsboro Ground Control: 121.7 MHz
- Hillsboro Tower and CTAF: 119.3 MHz
- Portland Approach and Departure: 118.1 (High); 126.0 (Low)

Tower personnel were interviewed regarding the master plan project. They indicated that there are existing line-of-sight issues to Taxiways A1, A2, D1, D2, and the run-up area near Runway 13R. They indicated that raising the tower cab could solve the line of sight issues. They also indicated that ground

movement between the parallel runways is challenging because there is only one taxiway connection between the two. Aircraft landing on Runway 31L have a very long taxi in order to get to the facilities/FBO located adjacent the parallel runway.

There are two Letters of Agreement among tower personnel, the Port, and the flight schools which are designed to allow the signatories to participate, when reasonable, with the Port's "Fly Friendly" program. The first addresses helicopter operations and is designed to minimize the impact of helicopter operations on the surrounding neighborhoods without unduly restricting the use of the Airport. The second letter relates to runway usage and encourages use of Runway 31 to the greatest extent practical.

1.5.4 NAVIGATIONAL AIDS

Navigational aids are electronic devices that typically transmit radio frequencies, which pilots of properly equipped aircraft can translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from Hillsboro Airport include a very high frequency omni-directional range (VOR) facility, the global positioning system (GPS), and a non-directional beacon (NDB).

The VOR provides azimuth readings to pilots of properly equipped aircraft transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility (VOR-DME) to provide distance as well as direction information to the pilot. Military tactical air navigation aids (TACANs) and civil VORs are commonly combined to form a VORTAC. The VORTAC provides distance and direction information to both civil and military pilots. The Newberg VOR-DME facility is located approximately 11 miles south of the Airport and the Battle Ground VORTAC is located approximately 20 miles northeast of the Airport.

GPS is an additional navigational aid for pilots and was initially developed by the United States Department of Defense for military navigation worldwide. GPS differs from a VOR, as pilots are not required to navigate using a specific ground based facility. GPS uses satellites orbiting the earth to transmit electronic radio signals, which pilots with properly equipped aircraft use to determine altitude, speed, and other navigational information. With GPS, pilots can navigate directly to any airport in the country and are not required to use a specific ground-based navigation facility.

Many airports are equipped with an Instrument Landing System (ILS). The ILS serving Runway 13R is comprised of localizer antenna and glideslope equipment. The localizer provides an instrument approach course for horizontal alignment with the runway centerline and transmits on a 14-element antenna array. The glideslopes provide vertical guidance for landing aircraft and transmit on a three-element capture-effect antenna. Additionally, the Runway 13R MALSR is a high intensity approach lighting system providing visual alignment information on the extended course centerline.

A non-directional beacon (NDB) is a radio transmitter at a known location that transmits a signal that does not include inherent directional information. NDB signals follow the curvature of the Earth, so they can be received at much greater distances at lower altitudes, a major advantage over VOR. However,

NDB signals are also affected more by atmospheric conditions, mountainous terrain, coastal refraction and electrical storms, particularly at long range. The Banks NDB is located approximately six miles northwest of the Airport. The FAA is currently considering decommissioning the Banks NDB.

1.5.5 FLIGHT PROCEDURES

Flight procedures are a set of predetermined maneuvers established by the FAA, using electronic or visual navigational aids that assist pilots in locating and landing or departing from an airport. For Hillsboro Airport, there are multiple instrument flight procedures as shown on **Exhibit 1J**.

1.5.5.1 Instrument Approach Procedures

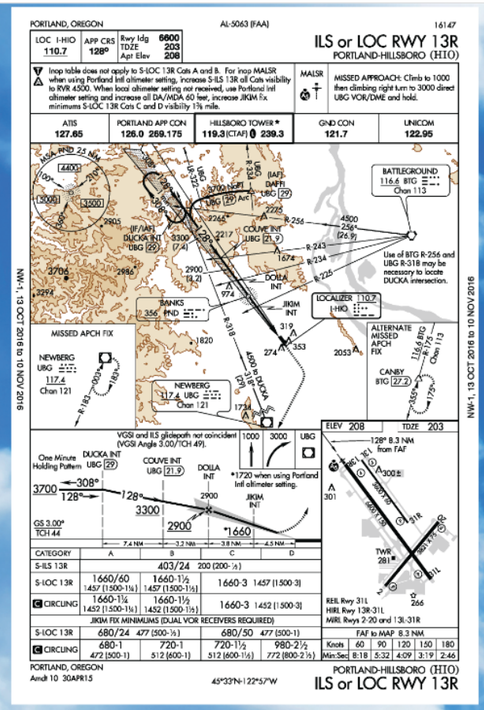
Instrument approach procedures are a series of predetermined maneuvers established by the FAA, using electronic navigational aids that assist pilots in locating and landing at an airport, especially during instrument flight conditions. There are currently five published instrument approach procedures, including one ILS instrument approach to Runway 13R. Precision instrument approaches provide vertical descent information and course guidance information to the pilot. Non-precision approaches only provide course guidance to the pilot; however, the relatively new GPS localizer performance with vertical guidance (LPV) approaches are currently categorized by the FAA as a non-precision approach even though it provides vertical guidance.

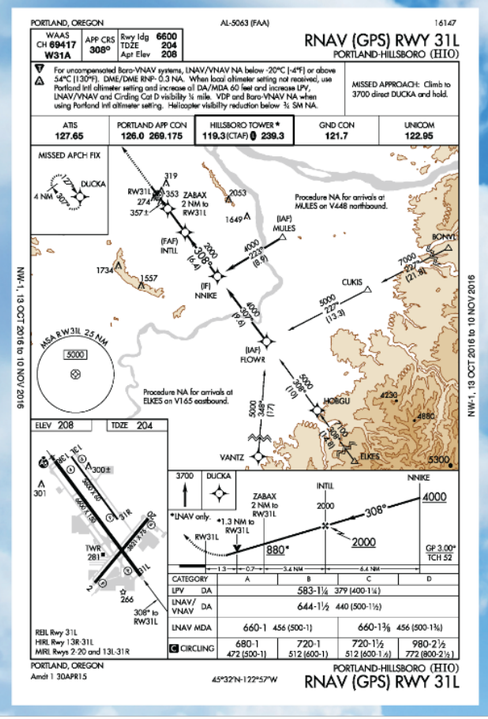
The capability of an instrument approach procedure is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance the pilot must be able to see in order to complete the approach. Cloud ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for the pilot to complete the approach. If the observed visibility or cloud ceilings are below the minimums prescribed for the approach, the pilot cannot complete the instrument approach. **Exhibit 1J** presents FAA approved and published instrument approach procedures (referred to as approach plates). **Table 1E** summarizes the approach plates in tabular format.

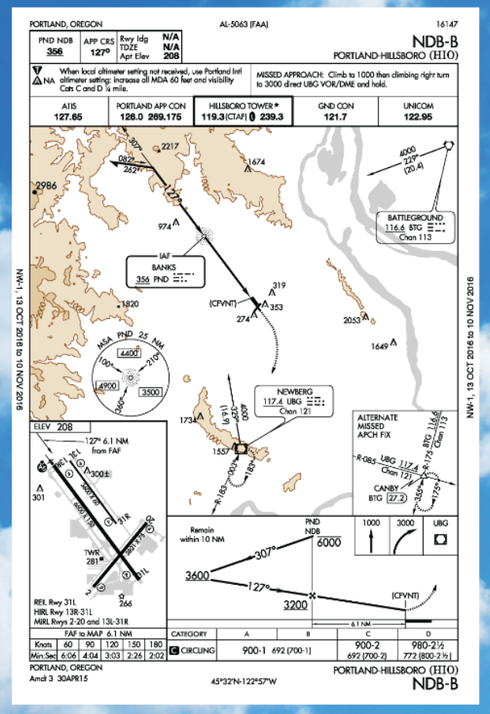
The most sophisticated instrument approach procedure available at the Airport is associated with the ILS to Runway 13R. The ILS instrument approach provides visibility minimums as low as ½-mile (2,400 feet RVR) and cloud ceilings of 200 feet AGL (referred to as a Category I approach).

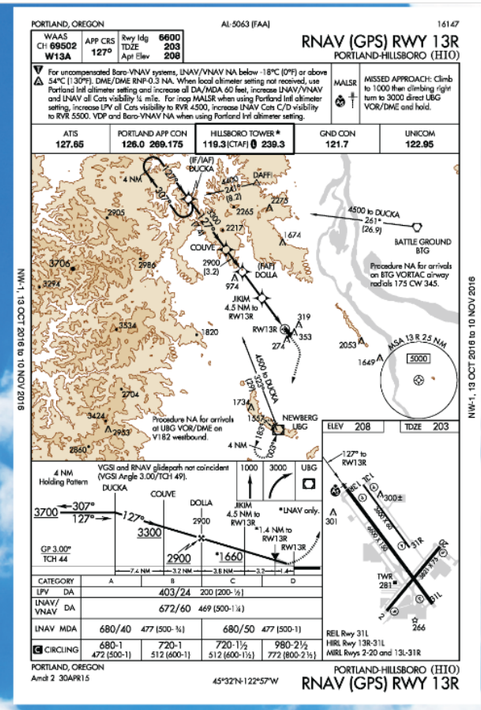
Instrument approaches based on GPS are common. GPS is inexpensive to an airport because it does not require a significant investment in ground-based systems by the airport or FAA. Both ends of Primary Runway 13R-31L are served by GPS approaches (RNAV is a GPS variant). GPS LPV approaches provide both horizontal and vertical guidance information to pilots. Advancements in GPS technology have allowed instrument approach procedures to provide minimums nearly as low as more traditional ILS systems. The GPS approaches to both ends of Runway 13R-31L include an LPV component.

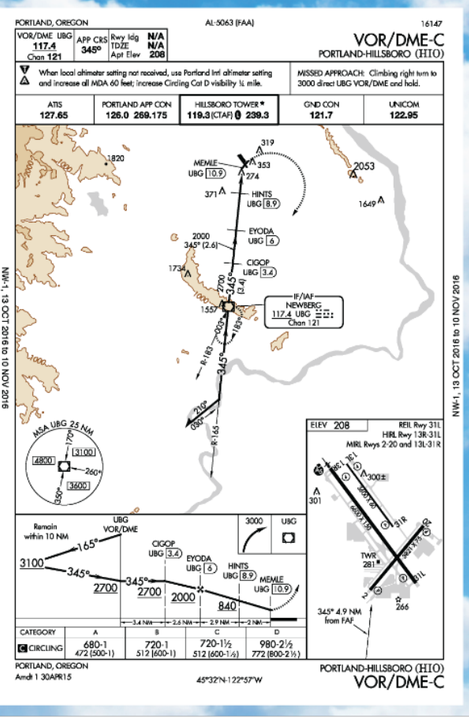
INSTRUMENT APPROACH PROCEDURES



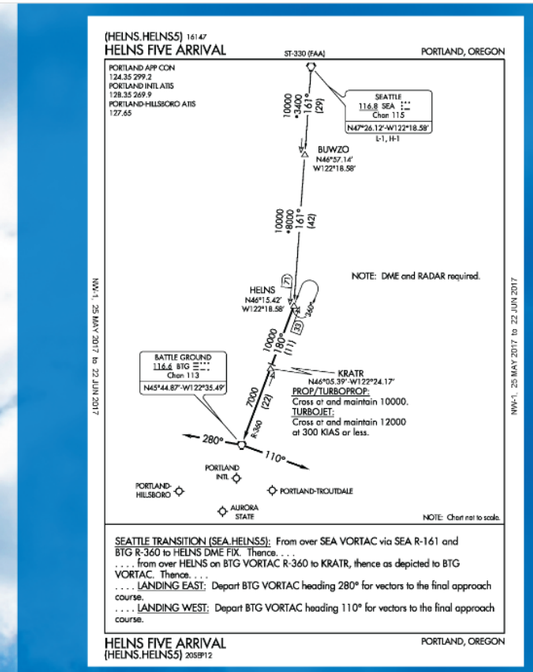


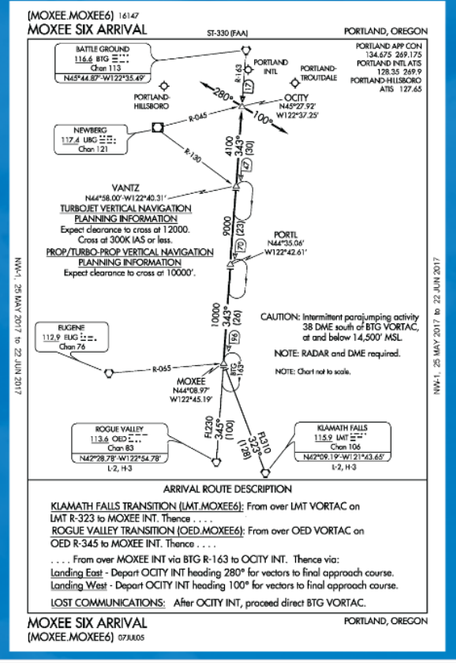






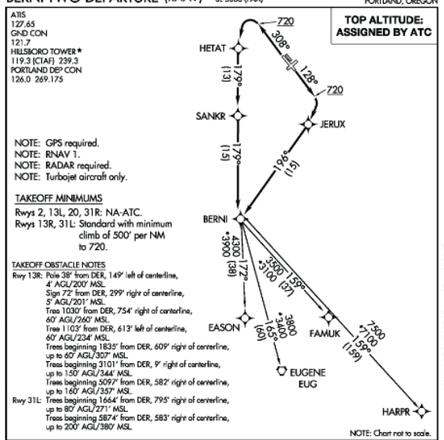
STANDARD ARRIVAL ROUTES (STARS)





DEPARTURE PROCEDURES

(BERNI2.BERNI) 16147
BERNI TWO DEPARTURE (RNAV) SL-5063 (FAA)
PORTLAND-HILLSBORO (HIO)
PORTLAND, OREGON



DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAY 13R: Climb heading 128° to 720, then climbing right turn direct JERUX, then on track 196° to BERNI, thence . . . .
TAKEOFF RUNWAY 31L: Climb heading 308° to 720, then climbing left turn direct HETAT, then on track 179° to SANKR, then on track 179° to BERNI, thence . . . .

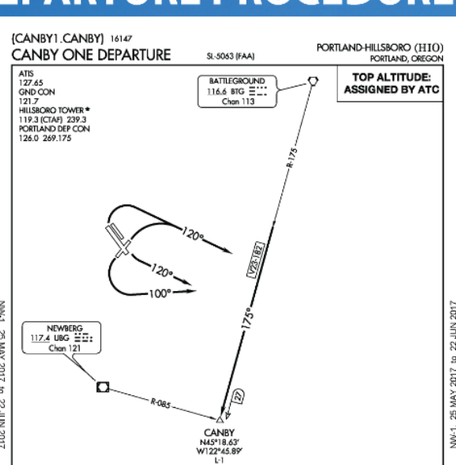
. . . . on (transition). Maintain assigned altitude. Expect filed altitude 10 minutes after departure.

EASON TRANSITION (BERNI2.EASON)
EUGENE TRANSITION (BERNI2.EUG)
FAMUK TRANSITION (BERNI2.FAMUK)
HARPR TRANSITION (BERNI2.HARPR)

BERNI TWO DEPARTURE (RNAV)
(BERNI2.BERNI) 30APR15
PORTLAND, OREGON
PORTLAND-HILLSBORO (HIO)

NW-1, 25 MAY 2017 to 22 JUN 2017

(CANBY1.CANBY) 16147
CANBY ONE DEPARTURE SL-5063 (FAA)
PORTLAND-HILLSBORO (HIO)
PORTLAND, OREGON



TAKEOFF MINIMUMS
Rwys 2: Standard with minimum climb of 305' per NM to 2700.
Rwy 20: Standard.
Rwys 13L/R: Standard with minimum climb of 235' per NM to 1500.
Rwys 31L/R: Standard with minimum climb of 280' per NM to 2700.

(NOTES CONTINUED ON FOLLOWING PAGE) NOTE: Chart not to scale.

DEPARTURE ROUTE DESCRIPTION

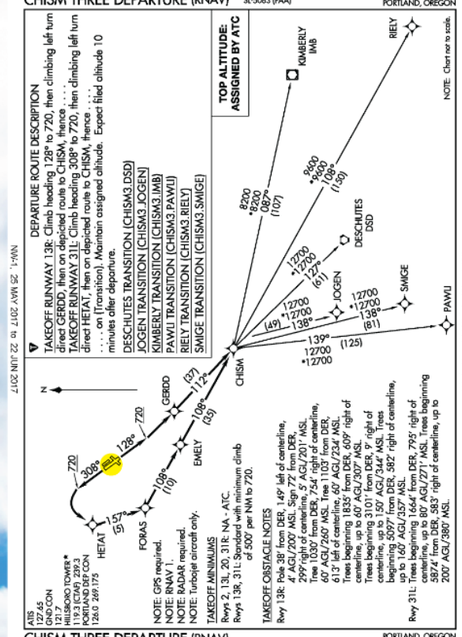
TAKEOFF RUNWAYS 2, 31L/R: Climbing right turn heading 120°, thence. . . .
TAKEOFF RUNWAYS 13L/R: Climbing left turn heading 120°, thence. . . .
TAKEOFF RUNWAY 20: Climbing left turn heading 100°, thence. . . .

. . . .intercept BTG VORTAC R-175 to CANBY INT. Thence on assigned route.

CANBY ONE DEPARTURE
(CANBY1.CANBY) 30APR15
PORTLAND, OREGON
PORTLAND-HILLSBORO (HIO)

NW-1, 25 MAY 2017 to 22 JUN 2017

(CHISM3.CHISM) 16147
CHISM THREE DEPARTURE (RNAV) SL-5063 (FAA)
PORTLAND-HILLSBORO (HIO)
PORTLAND, OREGON



DEPARTURE ROUTE DESCRIPTION

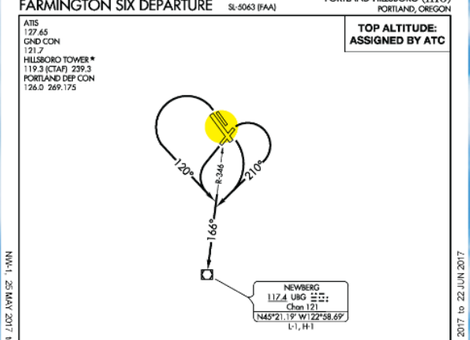
TAKEOFF RUNWAY 13R: Climb heading 128° to 720, then climbing left turn direct GEBOD, then on depicted route to CHISM, thence . . . .
TAKEOFF RUNWAY 31L: Climb heading 308° to 720, then climbing left turn direct HETAT, then on depicted route to CHISM, thence . . . .
. . . . on (transition). Maintain assigned altitude. Expect filed altitude 10 minutes after departure.

DESCHUTES TRANSITION (CHISM3.DSD)
JOGEN TRANSITION (CHISM3.JOGEN)
KIMBERLY TRANSITION (CHISM3.IMB)
PAWLI TRANSITION (CHISM3.PAWLI)
RIELY TRANSITION (CHISM3.RIELY)
SMIGE TRANSITION (CHISM3.SMIGE)

CHISM THREE DEPARTURE (RNAV)
(CHISM3.CHISM) 30APR15
PORTLAND, OREGON
PORTLAND-HILLSBORO (HIO)

NW-1, 25 MAY 2017 to 22 JUN 2017

(FARM6.UBG) 16147
FARMINGTON SIX DEPARTURE SL-5063 (FAA)
PORTLAND-HILLSBORO (HIO)
PORTLAND, OREGON



TAKEOFF MINIMUMS
Rwy 2: Standard with minimum climb of 305' per NM to 2700.
Rwy 20: Standard.
Rwys 13L/R: Standard with minimum climb of 235' per NM to 1500.
Rwys 31L/R: Standard with minimum climb of 240' per NM to 600.

(NOTES CONTINUED ON FOLLOWING PAGE) NOTE: Chart not to scale.

DEPARTURE ROUTE DESCRIPTION

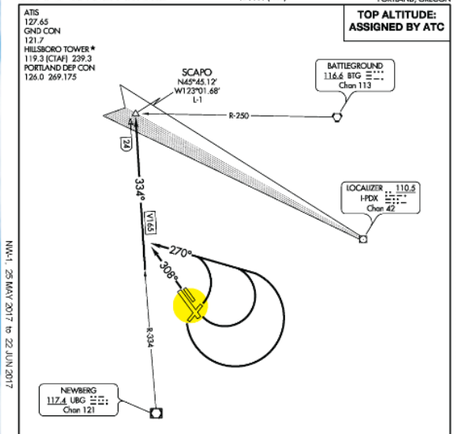
TAKEOFF RUNWAYS 2, 13L/R: Climbing right turn heading 210°, thence . . . .
TAKEOFF RUNWAYS 20, 31L/R: Climbing left turn heading 120°, thence . . . .

. . . . intercept UBG VOR/DME R-346 to UBG VOR/DME. Thence on assigned route.

FARMINGTON SIX DEPARTURE
(FARM6.UBG) 30APR15
PORTLAND, OREGON
PORTLAND-HILLSBORO (HIO)

NW-1, 25 MAY 2017 to 22 JUN 2017

(SCAPO6.SCAPO) 16147
SCAPO SIX DEPARTURE SL-5063 (FAA)
PORTLAND-HILLSBORO (HIO)
PORTLAND, OREGON



TAKEOFF MINIMUMS
Rwy 2: Standard with minimum climb of 235' per NM to 2000.
Rwy 20: Standard.
Rwys 13L/R: Standard with minimum climb of 305' per NM to 2700.
Rwys 31L/R: Standard with minimum climb of 240' per NM to 600.

(NOTES CONTINUED ON FOLLOWING PAGE) NOTE: Chart not to scale.

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAYS 2, 13L/R, 20: Climbing left turn heading 270°, thence . . . .
TAKEOFF RUNWAYS 31L/R: Climb heading 308°, thence . . . .

. . . . intercept UBG VOR/DME R-334 to SCAPO. Thence on assigned route.

SCAPO SIX DEPARTURE
(SCAPO6.SCAPO) 30APR15
PORTLAND, OREGON
PORTLAND-HILLSBORO (HIO)

NW-1, 25 MAY 2017 to 22 JUN 2017

TABLE 1E
Instrument Approach Data
Hillsboro Airport

	WEATHER MINIMUMS BY AIRCRAFT TYPE			
	Category A	**Category B**	**Category C**	**Category D**
ILS or LOC RWY 13R				
ILS	200'/½-mile			
LOC	1457'/1¼-mile	1457'/1½-mile	1457'/3-mile	
Circling	1452'/1¼-mile	1452'/1½-mile	1452'/3-mile	
JIKIM FIX MINIMUMS (DUAL VOR RECEIVERS REQUIRED)				
LOC	477'/½-mile		477'/1-mile	
Circling	472'/1-mile	512'/1-mile	512'/1½-mile	772'/2½-mile
RNAV (GPS) RWY 13R				
LPV DA	200'/½-mile			
LNAV/VNAV DA	469'/1¼-mile			
LNAV MDA	477'/¾-mile		477'/1-mile	
Circling	472'/1-mile	512'/1-mile	512'/1½-mile	772'/2½-mile
RNAV (GPS) RWY 31L				
LPV DA	379'/1¼-mile			
LNAV/VNAV DA	440'/1½-mile			
LNAV MDA	456'/1-mile		456'/1⅜-mile	
Circling	472'/1-mile	512'/1-mile	512'/1½-mile	772'/2½-mile
VOR/DME-C				
Circling	472'/1-mile	512'/1-mile	512'/1½-mile	772'/2½-mile
NDB-B				
Circling	692'/1-mile		692'/2-mile	772'/2½-mile

Aircraft categories are based on the approach speed of aircraft, which is determined as 1.3 times the stall speed in landing configuration. The approach categories are as follows:

Category A:	0-90 knots (e.g., Cessna 172)
Category B:	91-120 knots (e.g., Beechcraft King Air)
Category C:	121-140 knots (e.g., B-737, Regional Jets, Canadair Challenger)
Category D:	141-166 knots (e.g., B-747, Gulfstream IV)
Category E:	Greater than 166 knots (e.g., Certain large military or cargo aircraft)

Abbreviations:
LOC - Localizer
GPS - Global Positioning System
LNAV/RNAV/VNAV - A technical variant of GPS (Lateral, Area, Vertical Navigation)
DA - Decision Altitude (Used for vertically guided approaches)
MDA - Minimum Descent Altitude (Used for non-precision approaches)

Note: (xxx'/ x-mile) = Cloud ceiling height (in feet above ground level)/Visibility (in miles)

Source: U.S. Terminal Procedures - Effective March 30, 2017

1.5.5.2 Visual Flight Procedures

Most flights at the Airport are conducted under visual flight rules (VFR). Under VFR, the pilot is responsible for collision avoidance. Typically, the pilot will make radio calls announcing the position of the aircraft relative to the airport and his/her intentions. At HIO, when the ATCT is operating, the pilot maintains radio contact with ATCT controllers.

In most situations under VFR and basic radar services, the pilot is responsible for navigation and choosing the arrival and departure flight paths to and from the airport, factoring in sequencing and collision avoidance. As a result of individual pilot navigation, aircraft do not fly a set or precise flight path and can fly over a wide area around the airport for sequencing and safety reasons.

While aircraft can be expected to operate over most areas of the City, the density of aircraft operations is higher near the airport. This is the result of aircraft following the established traffic patterns for the airport. The traffic pattern is the traffic flow that is prescribed for aircraft landing or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach.

a. Upwind Leg - A flight path parallel to the landing runway in the direction of landing.

b. Crosswind Leg - A flight path at right angles to the landing runway off its upwind end.

c. Downwind Leg - A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.

d. Base Leg - A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.

e. Final Approach - A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway.

Essentially, the traffic pattern defines which side of the runway that aircraft operate. Traditionally, a left-hand traffic pattern is standard. At Hillsboro Airport, Runways 2 and 31R have non-standard right-hand traffic patterns. On these runways, aircraft make right turns throughout pattern operation. The traffic patterns for the Airport were designed to further separate aircraft activity to the greatest extent practicable.

While the traffic pattern defines the direction of turns that an aircraft will follow on landing or departure, it does not define how far from the runway an aircraft will operate. The distance laterally from the runway centerline an aircraft operates or the distance from the end of the runway is at the discretion of the pilot, based on the operating characteristics of the aircraft, number of aircraft in the traffic pattern, and meteorological conditions. The actual ground location of each leg of the traffic pattern varies from aircraft operation to aircraft operation for the reasons of safety, navigation, and sequencing described above. The distance that the downwind leg is located laterally from the runway will vary based mostly

on the speed of the aircraft. Slower aircraft can operate closer to the runway as their turn radius is smaller.

The published traffic pattern altitude at the Airport is 1,000 feet above ground level (AGL) when on the downwind leg. The traffic pattern altitude is established so that aircraft have a predictable descent profile on base leg to final for landing. The tower controllers may instruct pilots to follow a different traffic pattern altitude as necessary. Turbine and large aircraft will follow a pattern altitude of 1,500 feet AGL.

1.5.5.3 Arrival and Departure Flight Procedures

In more congested airspace, pilots may be instructed to utilize standard terminal arrival (STAR) or departure procedures. There are two published STARs (HELNS FIVE and MOXEE SIX). There are five departure procedures published for the Airport. The FAA continually updates instrument flight procedures to airports.

1.5.6 RUNWAY USE AND TRAFFIC PATTERNS

Identifying general runway use percentages by aircraft type aids in environmental analysis and determining aircraft movement efficiency. **Table 1F** presents the runway use percentage as estimated by ATCT personnel.

Overall, an estimated 45 percent of traffic occurs on primary Runway 13R-31L, 50 percent on parallel Runway 13L-31R, and 5 percent on crosswind Runway 2-20.

TABLE 1F
Runway Use Percent by Aircraft Type
Hillsboro Airport

	Runway Use Percent Estimate					
Runway	**Biz Jet**	**Turboprop**	**Piston**	**Local**	**Military**	**Shuttle**
Runway 13R	24	20	15	10	25	25
Runway 31L	75	70	40	25	75	75
Runway 13L	0	3	5	10	0	0
Runway 31R	0	3	20	35	0	0
Runway 2	0.5	2	10	10	0	0
Runway 20	0.5	2	10	10	0	0
Total	100%	100%	100%	100%	100%	100%

Source: Tower personnel interview.

1.5.6.1 Fixed Wing Aircraft Traffic Pattern

All runways have standard left-hand traffic patterns except for Runways 2 and 31R, which have right hand traffic patterns. Light/slow aircraft have a traffic pattern altitude of 1,000 feet AGL, and heavy/fast aircraft have a traffic pattern altitude of 1,500 feet AGL.

The traffic pattern is generally an oval path that pilots follow when preparing to land or when performing a touch-and-go training operation. Approach and departure operations from the runway are performed along one of the long edges of the oval shape. The purpose of the traffic pattern is to provide predictable flight movements for all pilots and to reduce potential in-air conflicts. Many aircraft may be in the pattern at the same time. To ensure proper and safe separation distances, tower controllers adjust (stretch) the distance pilots must travel while in the pattern. **Exhibit 1K** shows the general traffic patterns around the Airport.

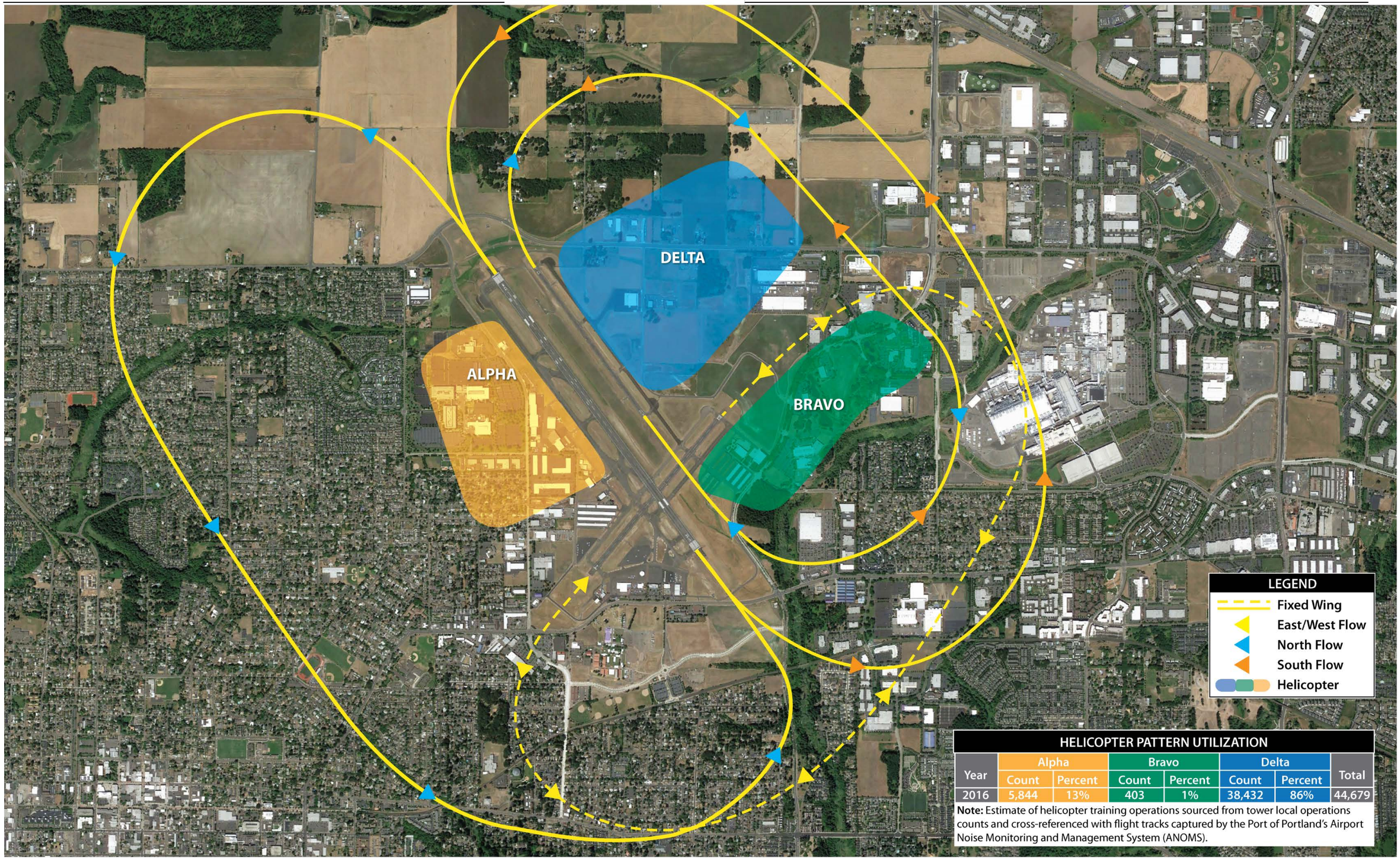
1.5.6.2 Helicopter Traffic Pattern

Hillsboro Airport is home to numerous helicopters, most of which are used in a training function. To ensure proper separation between helicopters and fixed-wing aircraft, three areas (Alpha, Bravo, and Delta) in proximity to the Airport have been designated for helicopter pattern work. The Alpha pattern is located west of the Airport, closest to Taxiway A. The Bravo pattern location is to the east of the Airport and is closest to Taxiway B. The Delta pattern location is north of the Airport and is in proximity of Taxiway D. Charlie pattern was renamed Delta when the parallel runway opened in 2015.

Exhibit 1K also includes a table that provides an estimate of the usage of each of these helicopter pattern areas. Typically, control tower personnel count helicopter operations as either local or itinerant; however, at Hillsboro Airport, the tower additionally counts helicopter operations in each of the pattern areas.

In 2016, the tower captured 44,679 operations in the helicopter traffic pattern, which was approximately 23 percent of total operations. Delta pattern was the most heavily utilized, accounting for 86 percent of helicopter training pattern operations. Alpha pattern accounted for approximately 14 percent. Bravo pattern accounted for less than one percent, primarily because it is located on the approach to Runway 13R thus most helicopters do not use this pattern location.

There is a Letter of Agreement between the Port, tower, and the two helicopter flight schools that establishes helicopter operational procedures to minimize the impact of helicopter operations on the surrounding neighborhoods. The Agreement limits the number of helicopters using the pattern areas to four (4), and it prioritizes which pattern areas to use.



HELICOPTER PATTERN UTILIZATION

Year	Alpha		Bravo		Delta		Total
	Count	Percent	Count	Percent	Count	Percent	
2016	5,844	13%	403	1%	38,432	86%	44,679

Note: Estimate of helicopter training operations sourced from tower local operations counts and cross-referenced with flight tracks captured by the Port of Portland's Airport Noise Monitoring and Management System (ANOMS).

Exhibit 1K
GENERALIZED TRAFFIC PATTERNS

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1.5.7 RUN-UP PROCEDURES

Ground run-ups are routine aircraft engine test procedures performed to ensure safe and reliable operation of aircraft engines as required by FAA regulations and aircraft engine manufacturers. Engine run-ups are commonly conducted following both scheduled and unscheduled maintenance and prior to aircraft departure (piston aircraft only).

It is common for airports to establish run-up procedures to balance the needs of tenants and those of the surrounding community. The Port has developed engine run-up guidelines for Hillsboro Airport. The guidelines describe the recommendations associated with conducting, documenting, and reporting engine run-up activities. The guidelines apply to all engine run-ups (above idle power) conducted as part of maintenance or post-maintenance operations, repair, or testing. These recommendations do not apply to run-up operations performed as part of a preflight inspection.

Engine run-ups conducted as part of **scheduled** maintenance are prohibited between 10:00 p.m. to 7:00 a.m. daily. Engine run-ups conducted as part of **unscheduled** maintenance or repair may be conducted between 10:00 p.m. and 7:00 a.m., as necessary to maintain a planned/scheduled flight. Engine run-ups may be conducted on tenant ramp areas, engine test stands, etc., assuming the proper safety precautions have been taken. Partial-power and high-power run-ups should be conducted in areas designated for these power settings whenever possible.

There are two preferred maintenance/repair run-up locations at Hillsboro. The primary location is at the hold apron near the north end of Taxiway A, at Runway 13R. The preferred orientation is with the tail southeast, parallel to Taxiway A. The second run-up location is the hold apron at the east end of Taxiway C, at Taxiway C1. At this location, aircraft should be oriented with the tail pointing to the north/northeast.

Preflight run-up procedures for piston aircraft can occur on any of the Airport's hold aprons. There are dedicated hold aprons located in proximity to all runway ends except for Runway 2.

1.5.8 LOCAL CONDITIONS

Various pilot information services identify potential obstructions in the vicinity of the Airport which pilots should be aware of. On the approach to Runway 31L, there are 135-foot tall trees located approximately 2,800 feet from the runway end and 200 feet to the right of centerline. A minimum 19:1 slope is necessary to clear the trees. On the approach to Runway 2, there is a road located 1,370 feet from the runway and 270 feet right of centerline. On the approach to Runway 20, there are trees that are 72 feet tall located approximately 2,105 feet from the runway end and 450 feet to the left of centerline. A 26:1 approach slope is recommended to clear these trees. **Appendix B** contains technical drawings that depict the various objects in proximity to HIO.

The Airport publishes several alerts for pilots including possibility of migratory birds in the Airport vicinity from November to May. The Airport requests that pilots avoid nighttime touch-and-go training operations for noise abatement. Glider activity is also possible approximately five miles northwest of the Airport.

1.6 LANDSIDE FACILITIES

Landside facilities support aircraft and pilot/passenger transition between air and ground. Typical landside facilities include the passenger terminal complex, on-airport buildings and hangars, general aviation facilities, and support facilities (i.e., fuel storage, vehicle parking, roadway access, snow removal equipment, and aircraft rescue and firefighting). An overview of the landside facilities and building inventory are depicted on **Exhibit 1L**.

1.6.1 AVIATION BUSINESSES

Hillsboro Airport has numerous aviation businesses including three fixed base operators (FBO). FBOs provide a wide range of services to the general aviation flying public. This includes line-services, fueling, lounge facilities, and pilot services. Some FBOs provide additional services such as aircraft maintenance, flight training, aircraft sales, charter flights, and conference room facilities. There are numerous other aviation services available at the Airport, including specialty aircraft maintenance businesses focusing on piston or turbine engines.

The Airport also supports several non-aviation businesses through leased space in the terminal building. This includes a radio station, insurance sales, and an accounting business. **Table 1G** lists the on-airport businesses. The Airport has land leases with numerous other non-aviation businesses separated from the primary airport property by roads. These include two strip malls (Litchfield Cornell Square and Hillsboro Market Center) and an Albertson's grocery store.

TABLE 1G
Airport Businesses
Hillsboro Airport

Business Category	Business Name	Services Provided
Fixed Base Operators	Aero Air, LLC	Full service FBO; aircraft maintenance; fuel sales, aircraft sales, charter
	Global Aviation	Full service FBO; aircraft maintenance; fuel sales, aircraft sales, charter
	Hillsboro Aviation	Full service FBO; aircraft maintenance; fuel sales, aircraft sales, charter, hangars
Museum	Classic Aircraft Aviation Museum	On-airport museum with more than 13 static display aircraft
Aviation Services	Hillsboro Aero Academy	Flight training
	Airline Transport Professionals (ATP)	Flight training
	Airway Science for Kids	Aviation education
	Direct Avia	Aircraft maintenance specializing in turbine engines.
	Hillsboro Flying club	Local flying club and non-profit
	Northwest Aircraft Maintenance	Aircraft maintenance specializing in piston engines
	Northwest Insurance Group	Insurance for aviation
	Premier Jets	Air ambulance, charter and light cargo services
Hangar Associations	Fliteline Condo Hangar Association	Hangar lease
	Tower Park Condo Association	Hangar lease
	Storage Management Systems	Hangar lease
Other On-Airport Businesses	Comfort Inn Hillsboro	Hotel
	Above All Accounting	Accounting services
	Dolphin Communication	Radio station
	Oregon International Air Show	Annual air show
	Hertz	Rental cars
	Avis	Rental cars

Source: http://www2.portofportland.com/Airports/Hillsboro/Services (Current as of 2017)

Building ID	Description	Total Square Feet	Estimated Square Feet for Aircraft	Estimated Aircraft Parking Positions	Airport Ownership Status	Lease Expiration Date
3355	Terminal	24,400	0	0	Airport	6.30.2019
3119	ATCT	1,500	0	0	Land Lease	-
2850	Local Fire Station	15,300	0	0	Land Lease	5.31.2046
3417	Maintenance	700	0	0	Airport	-
1040	Maintenance	7,000	0	0	Airport	-
3301A	Conventional Hangar	8,700	7,395	3	Airport	6.30.2018
3301	Conventional Hangar	36,500	31,025	14	Airport	6.30.2018
3155	Office	2,900	0	0	Airport	6.30.2018
3005	Executive Hangar	6,400	5,440	0	Land Lease	6.30.2034
2995	Executive Hangar	4,900	4,165	2	Land Lease	4.30.2025
3443	Conventional Hangar	8,800	7,480	3	Land Lease	5.31.2026
3565	Conventional Hangar	27,500	23,375	11	Land Lease	5.31.2026
3999	T-Hangar	13,300	11,305	9	Airport	9.30.2017
	T-Hangar	12,200	10,370	5	Airport	9.30.2017
	T-Hangar	16,300	13,855	10	Airport	9.30.2017
4226	T-Hangar	18,200	15,470	10	Airport	9.30.2017
	T-Hangar	12,800	10,880	9	Airport	9.30.2017
	T-Hangar	12,800	10,880	9	Airport	9.30.2017
4141	T-Hangar	24,400	20,740	18	Airport	9.30.2017
	T-Hangar	24,400	20,740	18	Airport	9.30.2017
	T-Hangar	19,300	16,405	20	Airport	9.30.2017
4297	Conventional Hangar	30,400	25,840	12	Land Lease	9.30.2043
4223	Conventional Hangar	32,400	27,540	13	Land Lease	6.30.2031
3845	Conventional Hangar	43,800	37,230	17	Land Lease	10.31.2049
2955	T-Hangar	27,500	23,375	20	Land Lease	5.31.2028
	T-Hangar	34,600	29,410	26	Land Lease	5.31.2028
	T-Hangar	42,400	36,040	28	Land Lease	5.31.2028
	Connected Box	15,800	13,430	6	Land Lease	4.30.2022
	Connected Box	21,000	17,850	8	Land Lease	4.30.2022
3115	Conventional Hangar	10,100	8,585	4	Land Lease	2.14.2019
3121	Conventional Hangar	18,000	15,300	7	Land Lease	2.28.2025
2010	Executive Hangar	6,400	5,440	2	Land Lease	6.30.2019
2020	Executive Hangar	7,800	6,630	3	Land Lease	8.30.2024
2030	Executive Hangar	4,600	3,910	2	Land Lease	8.30.2024
2050	Conventional Hangar	64,500	54,825	25	Land Lease	10.31.47
2052	Conventional Hangar	32,400	27,540	13	Land Lease	10.31.47
2146	Executive Hangar	4,800	4,080	2	Land Lease	4.30.26
2140	Offices	5,100	0	0	Land Lease	4.30.26
2166	Conventional Hangar	11,500	9,775	4	Land Lease	7.21.2039
2210	Conventional Hangar	24,600	20,910	10	Land Lease	12.31.2043
2250	Conventional Hangar	35,300	30,005	14	Land Lease	12.31.2043
2250	Conventional Hangar	55,000	46,750	21	Land Lease	12.31.2043
TOTAL		**826,300**	**653,990**	**377**		

Source: Airport records. Current as of 2017.

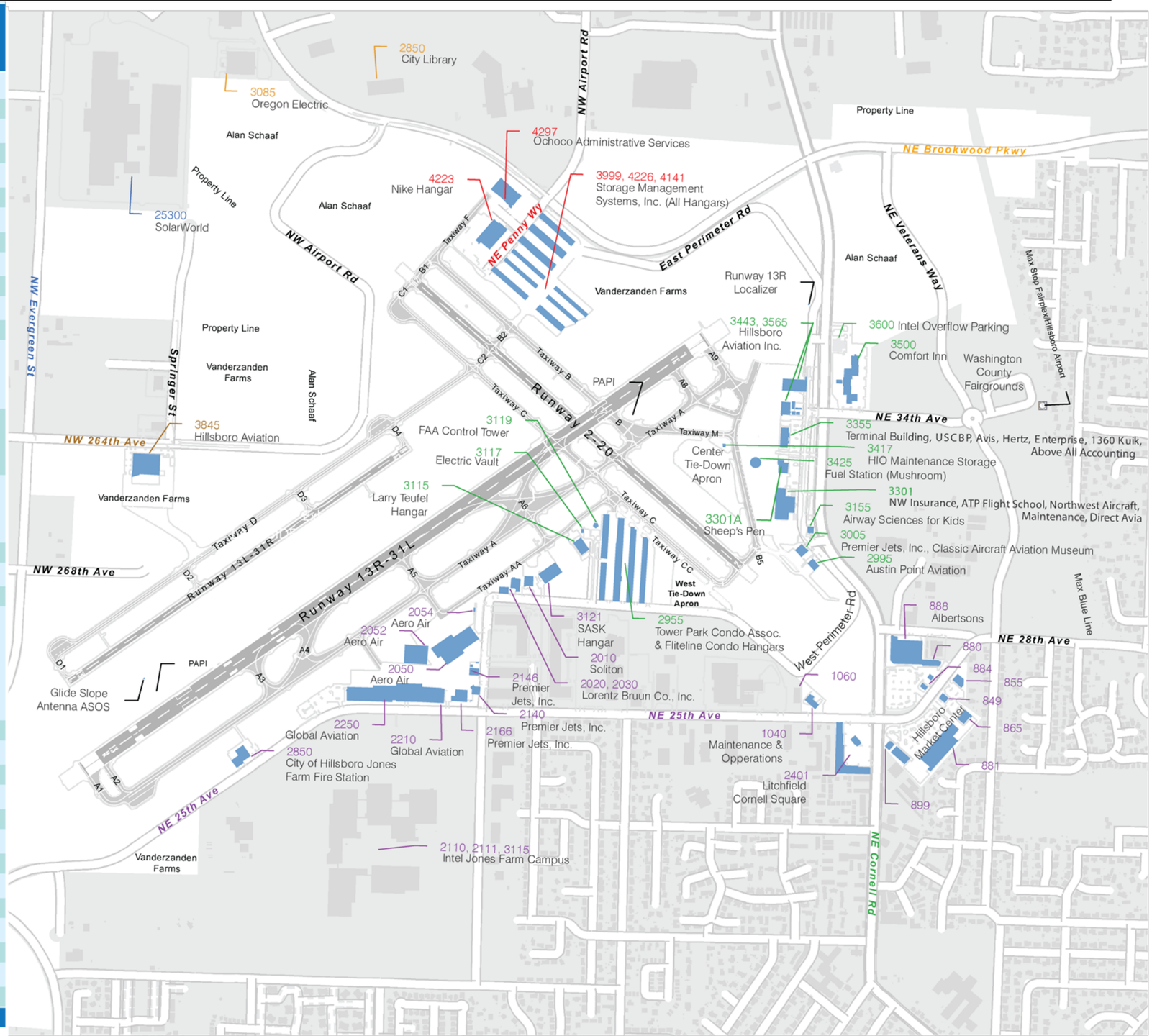

Exhibit 1L
LANDSIDE FACILITIES

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1.6.2 AIRCRAFT HANGARS

Aircraft hangars are an important feature of an airport. Hangars provide enclosed aircraft storage functions and support aviation businesses. When determining future hangar needs, it is necessary to establish the existing hangar capacity by type (conventional, executive/box, and T-hangars). Because each hangar has different aircraft storage capacity based on its use, reasonable estimates have been made.

Table 1H summarizes the existing hangar capacity at the Airport. An estimated total of 769,400 square feet of hangar space is available at the Airport. Of this total, approximately 654,000 square feet is available for aircraft storage functions. The remaining 115,400 square feet is dedicated to office and maintenance functions. There are approximately 377 enclosed aircraft storage spaces at the Airport.

TABLE 1H
Hangar Inventory Summary
Hillsboro Airport

Hangar Type	Total Hangar Footprint (s.f.)	Estimated Aircraft Storage Area (s.f.)[1]	Est. Office/ Maintenance Area (s.f.)	Estimated Aircraft Parking Positions[2]
Conventional	439,500	373,600	65,900	170
Executive/Box	71,700	60,900	10,800	25
T-Hangars	258,200	219,500	38,700	182
Total	**769,400**	**654,000**	**115,400**	**377**

[1]Estimate based on typical aircraft type for that hangar.
[2]Estimated maximum.

1.6.3 TERMINAL COMPLEX

The terminal complex serves several airport businesses and is generally regarded as the aviation entrance to the City of Hillsboro. FBOs can also serve this function. The terminal complex is located on the south side of the Airport between Runways 31L and 2. The major elements of the terminal complex include the terminal building, terminal loop road, vehicle parking, aircraft parking apron, and several hangars. **Exhibit 1M** shows the major features of the terminal complex and its environs which include the Washington County Fair Complex and the TriMet station to the immediate south.

1.6.3.1 Terminal Building

The two-story terminal building was dedicated in 1976 and is constructed of tube steel columns and wood posts supporting glulam beams. The first floor encompasses 10,670 square feet of space and the second floor encompasses 11,908 square feet. The total size of the building is 22,578 square feet. The terminal building is not arranged to serve public passenger air service; rather its layout is similar to that of an office building. A corporate air shuttle operator leases space on the first floor where they have a counter and passenger seating area; however, this space is not available to the general public. **Exhibit 1N** shows the current layout of the terminal building.

1.6.3.2 Terminal Access Roadways

The terminal building is located on NE Cornell Road, which is a major artery serving the City of Hillsboro. The main terminal complex entrance road is at the intersection of NE Cornell Road and NE 34th Avenue, where there is a traffic signal. There is a secondary access point west of NE 34th Avenue that does not have a traffic signal. An internal circulation road provides access to the terminal complex facilities. A loop road extends from the internal circulation road directly in front of the terminal building.

1.6.3.3 Vehicle Parking

Vehicle parking is an extremely important consideration, especially at Hillsboro, where the terminal complex parking lots are regularly filled to capacity. **Exhibit 1P** depicts the current vehicle parking configuration in the terminal complex. There are approximately 560 vehicle parking spaces in the terminal complex. Of this total, approximately 75 spaces are available to the public; 41 are near the terminal building (two-hour parking), and 34 are on the far west end of the parking lot. All other spaces are reserved/leased by airport tenants including 209 leased by the corporate air shuttle operator.

1.6.4 SUPPORT FACILITIES

The previous sections addressed airside and landside facilities. This section discusses other related facilities supporting airport operations.

1.6.4.1 Customs and Border Protection

U.S. Customs and Border Protection maintains an office at Hillsboro Airport in the terminal building. International flights requiring customs clearance are able to utilize Hillsboro Airport as a port of entry. The only other aviation port of entry in the state of Oregon is Portland International Airport.

1.6.4.2 Aircraft Rescue and Firefighting (ARFF)

General aviation airports, such as Hillsboro, are not required to have on-airport firefighting capability. In partnership with the Port, the City of Hillsboro constructed a new fire station on airport property to serve community and airport emergency needs. Hillsboro Fire Station Number 5 (Jones Farm Fire Station) is located on NE 25th Avenue, west of the Airport. An access road is available for firefighters to respond to on-airport emergencies. The fire station is not presently configured to provide full ARFF capabilities; however, it was constructed so that it can transition to that function if necessary in the future.

Exhibit 1M
TERMINAL COMPLEX

TERMINAL BUILDING MAP

1st floor

EAN HOLDINGS, LLC (ENTERPRISE)
LP-3290
HIO16-1
130

ABOVE ALL ACCOUNTING
LP-7007
HIO 07-8
111

DOLPHIN RADIO, LLC.
LP-3165
HIO 11-6
110

INTEL
LP-3308
HIO16-3
212

T147 GA OFFICE 130
T146 GA OFFICE 110
T145 GA OFFICE 111
T144 GA OFFICE 110
T143 GA OFFICE 112
T142 GPA CORRIDOR 180
T141 GPA CORRIDOR 182
T140 GA OFFICE 110
T139 GA OFFICE 110
T138 GA OFFICE/STOR 110
T137 GA ELECTRICAL 111
T135 GPA CORRIDOR 252
T136 GA OFFICE 216
T132 GA STORAGE 75
T131 PMB COMM 75
T130 GA BREAK 75
T133 GA BREAK 75
T170 GPA CORRIDOR 358
T128 GA OFFICE 741
T121 GA OFFICE 110
T120 GA OFFICE 138
T119 GA OFFICE 138
T118 GA OFFICE 110
T117 GA OFFICE 110
T116 GA OFFICE 129
T115 GA OFFICE 1217
T129 GA OFFICE 502
T127 GA OFFICE 363
T124 GA OFFICE 255
T114 GA SEARCH ROOM 109
T113 GA LAN ROOM 129
T112 GA WAITING/PROCESSING 497
T111 GA OFFICE 150
T148 GA OFFICE 166
T149 GA OFFICE 268
T150 GA OFFICE 190
T151 GA RECEPTION 278
T153 GPM STAIRS 211
T154 GPA CORRIDOR 49
T155 GPA VEST 74
T103 GPA CORRIDOR 271
T158 GTO MEN 197
T159 PMB JANITOR 36
T160 GTO WOMEN 182
T162 GA OFFICE 235
T163 GA STORAGE 66
T164 PUBL ELEV 68
T101 GPA CORRIDOR 422
T102 GPA LOBBY 229
T100 GPA VEST 102
T105 GPM STAIRS 74
T104 GA STOR 40
T106 GA VEST 75
T108 GA OFFICE 235
T109 GA STOR/OFFICE 99
T110 GA TOILET 56

INTEL
LP-3308
HIO16-3
330

INTEL
LP-3308
HIO16-3
2693

JOINT USE
LP-7018

HERTZ
LP-3282
HIO 2005-6
502
08-144

AVIS
LP-3295
HIO 2016-2
363

INTEL
LP-3308
HIO16-X
255

ABOVE ALL ACCOUNTING
LP-7007
HIO 07-8
1193

CBP
LP-?
HIO 2007-?
1200

UP

TERMINAL BUILDING MAP

2nd floor

T272 GA OFFICE 197
T273 GA OFFICE 102
T274 GA NEWS RM 63
T275 GA CONTROL 142
T253 GA CORRIDOR 52
T254 GA CORRIDOR 51
T271 GA CONFERENCE 213
T269 GA STORAGE 134
T276 GA PRODUCTION 187
T268 GA BREAK 69
T270 GA CORRIDOR 202
DOLPHIN RADIO, LLC. LP-3164 HIO 11-6 2417
T267 GA OFFICE 109
T255 GA WAITING 143
T256 GA RECEPTION 142
T266 GA OPERATIONS 109
T263 GA SALES 45
T260 GA SALES 45
T258 GA SALES 45
T261 GA COORIDOR 74
T265 GA SALES MGR 142
T262 GA SALES 50
T259 GA SALES 50
T257 GA SALES 51
T241 GA OPEN OFFICE 2425
T240 GA OFFICE 150
OIA LP-7032 HIO 10-1 1293
T239 GA OPEN OFFICE 1143
T238 GA KITCHEN 355
T200 GPA CORRIDOR 324
T203 GPM STAIRS 187
T204 PMB STORAGE 47
T206 PMB JANITOR 62
T208 GTO LOCKERS 51
T210 PMB EL/MECH 145
T205 GTO MEN 204
T207 GTO WOMEN 170
T212 GA STORAGE 98
T211 GA BATH 33
T215 GPM ELEV 67
T214 GA STORAGE 143
T213 GA STORAGE 57
T201 GPA CORRIDOR 324
T218 PMB MECHANICAL 146
T219 GA STORAGE 100
T220 GA STORAGE 123
T221 GA STORAGE 128
T202 STAIRS GPM 161
T233 GA OFFICE 238
T234 GA OFFICE 136
T235 GA OFFICE 251
T232 PMB MECH 84
T228 GA OFFICE 589
HILLSBORO AERO ACADEMY, LLC LP-3332 HIO 17-1 2846
T231 GA WORK/STOR 216
T230 GA SECRETARY 151
T225 GA RECEPTION 116
T227 GA OFFICE 775
T226 GA CONFERENCE 290
DN
DW
REF

Exhibit 1N (continued)
TERMINAL BUILDING

HIO Parking Summary

User	Count	Additional Space (square feet)	Notes
Intel	209	24,000	Lot south of Cornell, east of BHG Hotel (~45 spots)
Hertz	119	13,790	Supplemental parking
Hillsboro Areo Academy	0	26,000	Area south of the flight school (~100 spots)
Avis	20		
EAN	7		
Permit	30		Issued to tenants with leases through a leasing program.
2 Hour	41		
Open Parking	34		These are non-designated spots where airport users often park.
Total designated spots	**460**		
Total supplemental parking		**63,790**	

- The parking facilities accommodate approximately 460 parking spots currently, not including the additional space provided to Hertz, Hillsboro Aero Academy and Intel on square feet basis.
- Additional square feet allocated for parking leases total up to approximately 64,000 square feet.
- This parking allocation does not include any parking that occurs inside the airfield fence.
- Intel has indicated that ideally they would like to have an additional 50-75 spots currently, bringing their desired amount to approximately 300-325 spots in total.

1.6.4.3 Airport Maintenance

Airport personnel handle most airport maintenance and all snow removal operations as necessary. The primary airport maintenance building is located in the southwest corner of the Airport at 1040 NE 25th Avenue. The structure is a two-story building with two large bays to accommodate maintenance equipment. The building footprint is approximately 7,000 square feet and the gross building area is 8,600 square feet. The building was privately constructed in 1976 and acquired by the Port in 1994. The building consists of a large shop area, offices, and a conference room. A smaller 600 square-foot maintenance building is located on the north edge of the terminal apron.

1.6.4.4 Fuel Storage and Sales

Turbine aircraft use Jet A fuel and piston aircraft use aviation fuel (AvGas) which is typically 100 low-lead gasoline. For airports where the airport sponsor is responsible for fuel storage and delivery, a determination of future capacity is an important consideration. At Hillsboro Airport, the FBOs and other tenants determine their own fuel storage and delivery needs. There are 16 Jet A static tanks with a total capacity of 223,500 gallons and 15 AvGas static tanks with a total capacity of 110,000 gallons.

The Port has invested in a 5,000-gallon static storage tank for MoGas (ethanol-free unleaded car gasoline) at the Airport. The static MoGas tank is available for lease by an FBO when use of MoGas as an aviation fuel becomes more common. The FAA is currently conducting an extensive study of the viability of MoGas as an aviation fuel with the aim of ultimately transitioning from leaded to unleaded aviation fuel.

The Port levies a fuel flowage fee for fuel sales on the Airport. **Table 1J** shows the historical fuel sales. As depicted, for the past 11 years, total gallons of fuel sold remained within a narrow range of 3.2 to 3.6 million gallons. Fuel sales for 2016 represented a record high, slightly surpassing the previous high set in 2007.

TABLE 1J
Historic Fuel Sales (in gallons)
Hillsboro Airport

Year	AvGas	Jet A	Total
2006	331,641	3,165,031	3,496,672
2007	368,210	3,176,134	3,544,344
2008	428,252	3,055,845	3,484,097
2009	377,816	2,878,642	3,256,458
2010	392,567	2,950,195	3,342,762
2011	345,079	3,067,865	3,412,944
2012	308,706	3,109,346	3,418,052
2013	281,923	3,039,657	3,321,580
2014	350,894	3,075,778	3,426,672
2015	330,204	3,162,603	3,492,807
2016	284,863	3,273,863	3,558,726

Source: Port of Portland

1.6.4.5 Security/Wildlife Fencing

The Airport is enclosed with eight-foot high chain link fencing. The fence serves the dual purpose of providing a security barrier for the Airport and reducing encroachment of large mammals such as black-tailed deer. There are approximately 20 automatic gates which are operated by a key pad code and several other gates with pad locks. There is approximately 32,100 linear feet of fencing enclosing the main airport property. In several areas, including the terminal area, the fencing stretches between buildings, making the buildings themselves the barrier. According to the 2015 *Wildlife Hazard Management Plan* for the Airport, small mammals such as coyotes have, on occasion, accessed the Airport through gaps under the fence, problem gates, and culverts. The Airport plans to improve/upgrade the fencing as funding becomes available. **Exhibit 1Q** shows the location of the current perimeter fencing at the Airport.

1.6.5 AIRPORT DOCUMENTS

There are a number of additional documents that the Airport maintains. The following briefly discusses each of these documents.

Rules and Regulations: This document outlines the airport rules for administration and tenants.

Minimum Standards: This document outlines the minimum requirements for potential tenants and business operators. Standards outlined are intended to encourage and ensure provisions for adequate services and facilities, economic health, and orderly development of aviation and related aeronautical activities.

Design Standards: The Port has established various design standards for facility development at Hillsboro and Troutdale airports. The General Aviation Airside Standards for Development document codifies these design standards.

Wildlife Hazard Management Plan: The Port has completed a Wildlife Hazard Assessment (WHA) and a Wildlife Hazard Management Plan (WHMP) for Hillsboro Airport that conforms with 14 CFR Part 139.337. While the Airport is not Part 139-certified, the Port elected to address the wildlife hazard issues at Hillsboro using the same Part 139-compliant model mandated at PDX. Both the HIO WHA and WHMP were approved as conformant with Part 139 requirements by the FAA in 2015.

An important goal at HIO is minimizing risks to aviation safety posed by wildlife on and around the airfield. To accomplish this, the WHMP outlines procedures for habitat modification which are intended to remove/relocate any hazardous wildlife on the airfield.

Spill Prevention, Control, and Countermeasure Plan: This document provides guidance and regulations for the prevention and control of spills of potentially hazardous materials, particularly oil and fuel. It outlines procedures, including training, inspections, and storage requirements for spill prevention and provides a methodology for reporting and responding to spills.

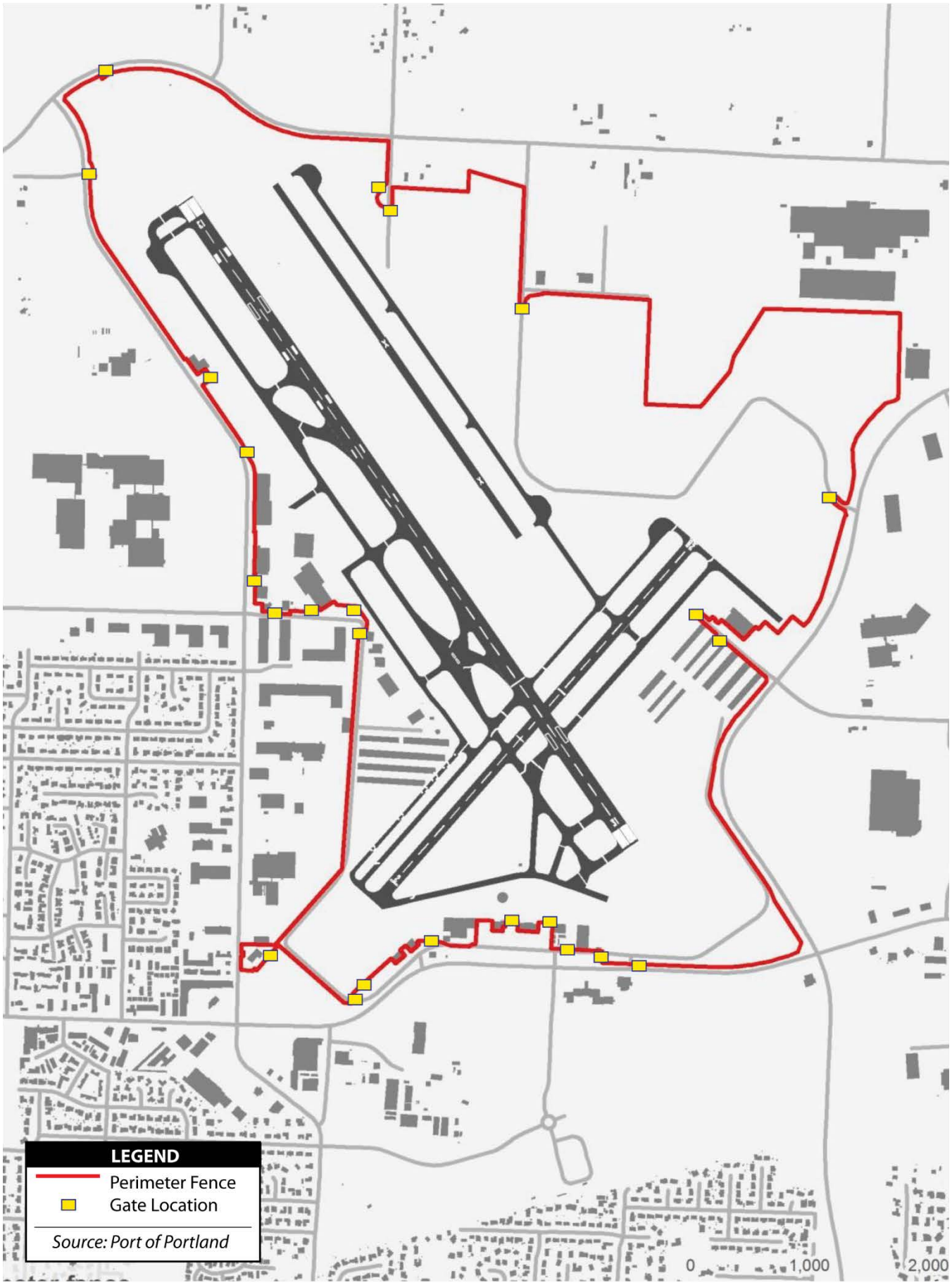


Exhibit 1Q
PERIMETER FENCING AND GATES

1.7 AREA LAND USE

Land uses near the Airport can impact operations and potential growth. The following section identifies baseline information related to both existing and future land uses. By understanding the land use issues surrounding the Airport, the most appropriate recommendations can be made for the Airport's future.

1.7.1 COMPATIBLE LAND USE

The Oregon Department of Aviation publishes and updates the *Airport Land Use Compatibility Guidebook*. This land use planning guidebook provides direction to entities (typically cities and counties) with an airport (or the airspace surrounding airports) within their jurisdiction. The document serves as a statewide planning tool assisting in future land use decisions regarding compatibility within airport planning areas.

According to the guidebook, "Incompatible land uses and their impact on airport development are a continuing threat to airports nationwide. As the population of the State of Oregon continues to grow, so does the demand for space and, with it, the potential for incompatible land uses near airports. Consequently, it is important to properly manage land uses around the airport for the preservation of the state aviation system and, ultimately, the economic vitality of the state." (ODA Airport Land Use Compatibility Guidebook).

1.7.1.1 Federal Legislation and Regulation

Numerous federal laws and regulations relate to airport land use compatibility. Airports accepting federal development grants are required to make every reasonable effort to comply with laws and regulations. The following is a summary of the federal laws and regulations related to land use compatibility surrounding airports.

Airport and Airway Improvement Act of 1982 - United States Code (USC), Title 49: Upon acceptance of Federal funds, this Act obligates airport owners to operate and maintain the airport and comply with specific assurances (commonly referred to as grant assurances), including maintenance of compatible land uses around airports. The implementation of this Act is handled through stipulations outlined in the grant documents signed by airport owners when accepting Federal funds for a project.

Objects Affecting Navigable Airspace - Federal Code of Federal Regulations (CFR) Title 14, Part 77: This Federal regulation establishes standards for determining obstructions in navigable airspace. It sets forth requirements for construction and alteration of structures (i.e., buildings, towers, etc.). It also provides for studies of obstructions to determine their effect on the safe and efficient use of airspace, as well as providing for public hearings regarding these obstructions and provisions for the creation of antenna farm areas. It also establishes methods of identifying surfaces that must be free from penetration by obstructions, including buildings, cranes, cell towers, etc., in the vicinity of an airport. This regulation addresses airspace-related issues. Implementation and enforcement of the elements contained in this

regulation are a cooperative effort between the FAA and the individual state aviation agencies (in this instance, ODA).

Airport Land Use Compatibility Planning - FAA Advisory Circular (AC) 150/5060-6: This document guides the development of a compatibility plan to ensure the environs surrounding an airport are not developed in a manner that could pose a risk to the airport's operations. Land use and noise issues are analyzed in this document.

Airport Master Plans - FAA Advisory Circular (AC) 150/5070-6B: This document guides the development of airport master plans. The airport planning process' main principle is to develop a safe and efficient airport through the use of acceptable standards. While there are many steps in the planning process, none of these steps should be implemented in isolation. Airside and landside issues must be evaluated equally, creating a plan that provides for compatible airport and community development where possible.

A Model Zoning Ordinance to Limit Height of Objects Around Airports FAA Advisory Circular (AC) 150/5190-4A: This advisory circular concerns developing zoning ordinances to control the height of objects. It is based upon the surfaces described in Subpart C of CFR Part 77, *Objects Affecting Navigable Airspace*. This document provides sample language and model ordinances for use by local airports.

Airport Design - Advisory Circular (AC) 150/5300-13A: This document provides the basic standards and recommendations for airport design. Topics include various runway and taxiway safety areas, the runway protection zones, threshold siting surfaces, runway length, and facility separation standards.

Grant Assurances: Pursuant to the provisions of Title 49, U.S.C., subtitle VII, as amended, assurances are required to be submitted as part of a project application by sponsors requesting funds. Upon acceptance of the grant offer by the sponsor, these assurances are incorporated into the grant agreement. There are 39 grant assurances, several of which address airport planning. The following are the primary land use compatibility grant assurances:

- Grant Assurance 20 relates to an airport sponsor's obligation for hazard removal and mitigation to address potential obstructions to the airspace around the airport. Grant Assurance 20 states that the airport sponsor will:

  "…take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards."

- Grant Assurance 21 requires, in part, that the sponsor:

  "…take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft."

In addition to appropriate land use zoning, communities are responsible for protecting airports from obstruction to the airspace. Most communities develop height and hazard regulations surrounding airports.

1.7.1.2 State Statutes and Regulations

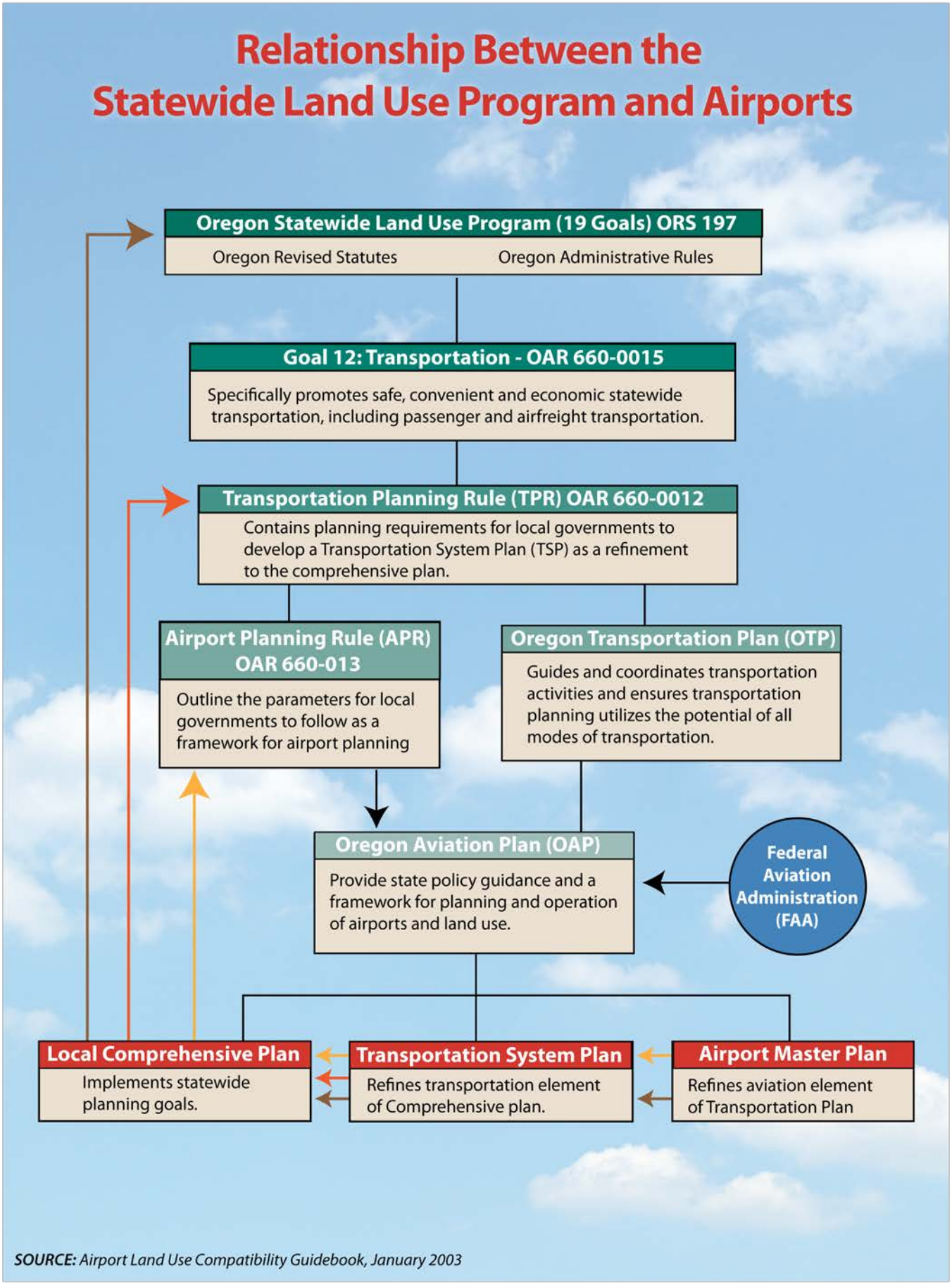
Since 1974, Oregon's *Land Use Planning Act*, embodied in Oregon Revised Statutes (ORS Chapter 197), has required cities and counties to develop and adopt comprehensive plans. Oregon's land use planning program is predicated on conformance with the 19 statewide planning goals and administrative rules (OARs) that implement these goals. Requirements for meeting these goals are outlined in applicable state statutes and administrative rules and must be included in local comprehensive plans adopted by each county and city. Each of these local plans must be acknowledged by the state Land Conservation and Development Commission (LCDC) as, in fact, conforming to the goals, statutes, and rules. **Exhibit 1R** graphically presents the relationship between the Statewide Land Use Program and Airports.

One of these goals (Goal 12, Transportation Planning) promotes the provision of a safe, convenient, and economic statewide transportation network, including passenger and freight air transportation. The goal is achieved by the creation of transportation system plans (TSPs). Oregon Revised Statutes (ORS 197.628 et seq.) also require local governments to periodically review comprehensive plans and to implement land use regulations to ensure that they adequately provide "needed housing, employment, transportation and public facilities and services."

Local jurisdictions are responsible for the maintenance and management of their Comprehensive Plans to address evolving local needs, manage available land supplies to adequately address anticipated growth, and comply with new regulatory requirements. The State can require a local jurisdiction to complete an update of its Comprehensive Plan through a process known as periodic review (ORS 197.682), or jurisdictions can opt to initiate amendments on their own outside of the state-mandated process.

In 2015, the City of Hillsboro began a multi-year project to overhaul its entire Comprehensive Plan. This was followed by a companion project, beginning in 2016, to rewrite its TSP. Both of these projects were voluntary and not part of a state-mandated periodic review process. For both projects, the City convened interjurisdictional Technical Advisory Committees, which included representatives from the Port to review and provide input on draft goals and policies and provide implementation guidance. Adoption of the new Comprehensive Plan is pending. The updated TSP is expected to follow.

New goals and policies in both documents specifically address Hillsboro Airport, not only to satisfy Goal 12 requirements, but also to support the Airport's role in economic development, emergency preparedness, and noise management efforts at the City. The updated Comprehensive Plan and TSP goals and policies are not expected to have a material impact on long-range master planning issues for the Airport.


Relationship Between the Statewide Land Use Program and Airports
Oregon Statewide Land Use Program (19 Goals) ORS 197
Oregon Revised Statutes
Oregon Administrative Rules
Goal 12: Transportation - OAR 660-0015
Specifically promotes safe, convenient and economic statewide transportation, including passenger and airfreight transportation.
Transportation Planning Rule (TPR) OAR 660-0012
Contains planning requirements for local governments to develop a Transportation System Plan (TSP) as a refinement to the comprehensive plan.
Airport Planning Rule (APR) OAR 660-013
Outline the parameters for local governments to follow as a framework for airport planning
Oregon Transportation Plan (OTP)
Guides and coordinates transportation activities and ensures transportation planning utilizes the potential of all modes of transportation.
Oregon Aviation Plan (OAP)
Provide state policy guidance and a framework for planning and operation of airports and land use.
Federal Aviation Administration (FAA)
Local Comprehensive Plan
Implements statewide planning goals.
Transportation System Plan
Refines transportation element of Comprehensive plan.
Airport Master Plan
Refines aviation element of Transportation Plan
SOURCE: Airport Land Use Compatibility Guidebook, January 2003

The following is a summary of major state aviation planning statutes and regulations:

Airport Planning Rule (APR): To aid in implementing Goal 12 and provisions for local government airport regulations outlined in ORS 836.600 et seq., the DLCD adopted the APR. Outlined in OAR Chapter 660, Division 13, the APR establishes a series of local government requirements pertaining to aviation facility planning. These include requirements to:

- Adopt comprehensive plan and land use regulations for airports to implement requirements established in the APR and applicable ORS;
- Map and provide supporting documentation to establish airport boundaries, identify existing and proposed facilities, site future expansion areas and/or airport uses, map airport safety and compatibility zones and imaginary surfaces, and delineate noise impact boundaries;
- Adopt an Airport Safety Overlay Zone prohibiting structures, trees, etc., from penetrating airport imaginary surfaces based upon FAA standards, and establish limited height exceptions and a means of approving variances when supported by the ODA and FAA;
- Develop compatibility standards to prohibit residential and public assembly uses within runway protection zones, limit certain uses within noise impact boundaries, limit outdoor lighting, prohibit new and expanded industrial uses that cause emissions hazardous to aviation, and require coordinated review with ODA of radio, TV, and cellular facilities proximate to airports;
- Regulate water impoundments (e.g., gravel pits) per ORS 836.623(2) through (6), and prohibit new landfills near airports per Oregon Department of Environmental Quality (DEQ) standards;
- Adopt land use regulations for non-towered airports authorizing various aviation and airport-related uses and activities, as well as forestry and agricultural uses;
- Allow certain industrial, manufacturing, and other uses within airport boundaries if no significant hazard or limitation results on approved airport uses, and are consistent with local comprehensive plans, statewide planning goals, and other OARs; and
- Update local plans and land use regulations to conform to the APR during periodic review or a TSP update, and ensure that future amendments to local plans and regulations also comply with provisions of the APR.

The APR serves as the state regulatory basis for ensuring that local government airport planning conforms to the hierarchy of state plans and statutory requirements (i.e., Goal 12, ORS 836.600 et seq., Oregon Transportation Plan, Oregon Aviation Plan). These rules outline clear, comprehensive parameters for local governments to follow as an airport planning framework.

Transportation Planning Rule (TPR): The state Transportation Planning Rule (TPR, embodied in OAR Chapter 660, Division 12) contains planning requirements for local governments to develop TSPs as elements of comprehensive plans. Elements preserving local components of the state's public use aviation system are required in the TSPs, as identified in the 2007 *Oregon Aviation Plan*, and for multi-modal ground transportation system needs.

The TPR requires local jurisdictions to adopt land use regulations for land uses within airport noise corridors and CFR Part 77 imaginary surfaces and to restrict physical hazards to air navigation. Since publication of the 1994 *Oregon Airport Land Use Compatibility Guidebook*, several changes to the TPR were enacted that affect airport planning. These changes include:

- OAR 660-012-0045(2), which requires local governments to adopt land use or subdivision ordinance regulations consistent with federal and state requirements that protect transportation facilities, corridors, and functions, including: controlling land uses within airport noise corridors and imaginary surfaces and limiting physical hazards to air navigation to protect public use airports; and
- Developing a process for coordinated review of future land use decisions affecting transportation corridors or facilities (including public use airports).

These TPR standards obligate a local government through its TSP and comprehensive plan to protect public use airports from incompatible uses. This is achieved through planning and ongoing review of local land use decisions on development proposals that could impact airport facilities.

OAR 660-012-0065(3) allows for expansions or alterations of public-use airports without having to seek exceptions from certain statewide planning goals when the expansion or alteration does not change the design class of aircraft planned for the subject airport. (Goals 3, 4, 11 and 14 cover agricultural lands, forest lands, public facilities/services and urbanization.) This standard significantly streamlines the approval process for certain types of airport expansions and modifications on rural lands surrounding airports.

Notice Requirements: ORS 197.183 requires local governments to provide notice to the Oregon Department of Aviation when applications are received for water impoundments (e.g., new gravel pits) larger than ¼-acre are located within 10,000 feet of an airport identified in ORS 836.610(1). Standards in ORS 836.623 outline the local government responsibilities for approving or denying such impoundments.

Implementing state statutes (ORS 215.223, 215.416, and 227.175) and administrative rules (OAR 738-100-0010) also require local planning authorities to send notice of public hearings and decisions on land use permits or zone changes to owners of public use airports and to the Oregon Department of Aviation when the subject property is within 5,000 feet of the sides or ends of a runway on a visual airport, or 10,000 feet on an instrument airport. Notice need not be provided if the permit or zone change would allow a structure of less than 35 feet tall and the property is located outside the runway approach surface or on property owned by the airport.

Airport Land Use Compatibility Guidebook

The *Airport Land Use Compatibility Guidebook* is published by the Oregon Department of Aviation and is enforced by state statute. The Guidebook is an essential tool for local governments to reference when undertaking airport compatibility issues. This document's purpose is to provide a comprehensive source of information that can be used to preserve aviation facilities and provide for the safety of individuals near these airports through compatible land uses. The document is intended to be a resource for planners, local officials and citizens, regarding airport land use compatibility issues. In an effort to provide a comprehensive picture of the issues surrounding land use compatibility topics, brief summaries of the various federal and state regulations related to airport planning are included. Discussion of environmental and noise-related issues is also included, along with methods of implementation for various preventive and corrective actions and sample agreements, plans, and programs.

1.7.2 CURRENT LAND USE PLANNING AND ZONING

A land use map and a zoning map for the area surrounding HIO have been developed from data sourced from the City of Hillsboro, Washington County, and the Oregon Spatial Data Library. The data was accessed in April 2017.

Exhibit 1S presents the comprehensive land use plan near the Airport. This exhibit shows the planned future land uses. Current agricultural land north of the Airport is planned for industrial land uses. Areas to the east, south, and west are already fully developed. The City of Hillsboro is currently updating their Comprehensive Plan and Washington County is currently updating their Transportation System Plan (TSP). Any land use changes impacting the future of the Airport will be considered during development of this master plan.

Exhibit 1T presents the current (April 2017) zoning for land in the vicinity of the Airport. The Airport is zoned for industrial uses. Areas to the east and a smaller area to the west are also zoned for industrial uses. Slightly farther west, south, and southeast are large areas of residential land uses. Immediately north are agricultural land uses which are primarily in Washington County. There are pockets of commercial land uses adjacent to the Airport.

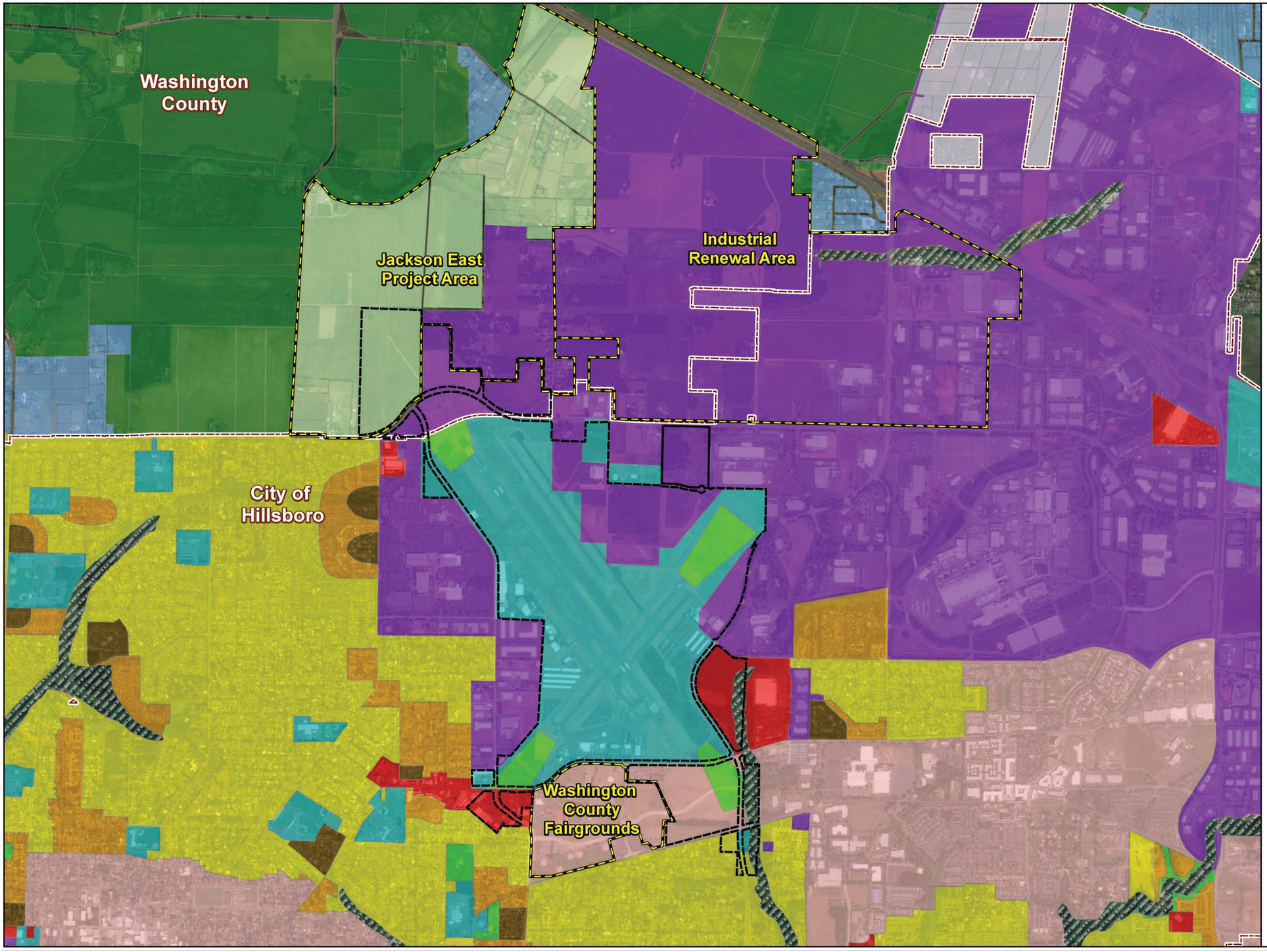
1.7.3 DEVELOPMENT AREAS

There are several areas near the Airport that have been the subject of focused development study. The following briefly describes these areas. The boundaries of each area are shown on **Exhibits 1S and 1T**.

1.7.3.1 Jackson East

In 2014, the Legislature through House Bill 4078 added approximately 545 acres to the region's Urban Growth Boundary (UGB). The City of Hillsboro was awarded a Metro Construction Excise Tax (CET) Grant in the amount of $195,000 to fund necessary planning work for 545 acres and an adjacent rural-residential area brought into the UGB in 2005. The entire project area, referred to as Jackson East, is generally bounded by NE Evergreen Road to the south, Jackson School Road and Waibel and Story Creeks to the west, Sunset Highway to the north, and the North Hillsboro Industrial Renewal Area to the east.

The Jackson East Master Plan began in June 2016. Project planning will result in the adoption of Comprehensive Plan amendments, including the application of Comprehensive Plan Map designations to guide growth and development over the long term. Though preliminary planning was performed for several large lots within Jackson East, alignments, costs, and financing must be completed for utilities, public facilities, and services for the entire project area. This work will include planning for the Crescent Park Greenway—the City's vision for a continuous green loop around Hillsboro with a multitude of recreation and ecosystem, and active transportation functions.



Legend

- Airport Property Line
- City Boundary
- Development Area

Comprehensive Plan

- Commercial
- Floodplain
- High Density Residential
- Industrial
- Low Density Residential
- Medium Density Residential
- Mixed-Use
- Open Space
- Public Facility
- Station Community Planning Area
- AF5 - Agriculture/Forestry
- EFU - Agriculture/Forestry
- FD20 - Agriculture/Forestry

Sources:
City of Hillsboro/GIS,(April 2017)
Washington County GIS.(April 2017)
Oregon Spatial Data Library.(April 2017)

NORTH

0 2,000

1" = 2,000'

Exhibit 1S
AREA LAND USE PLANS

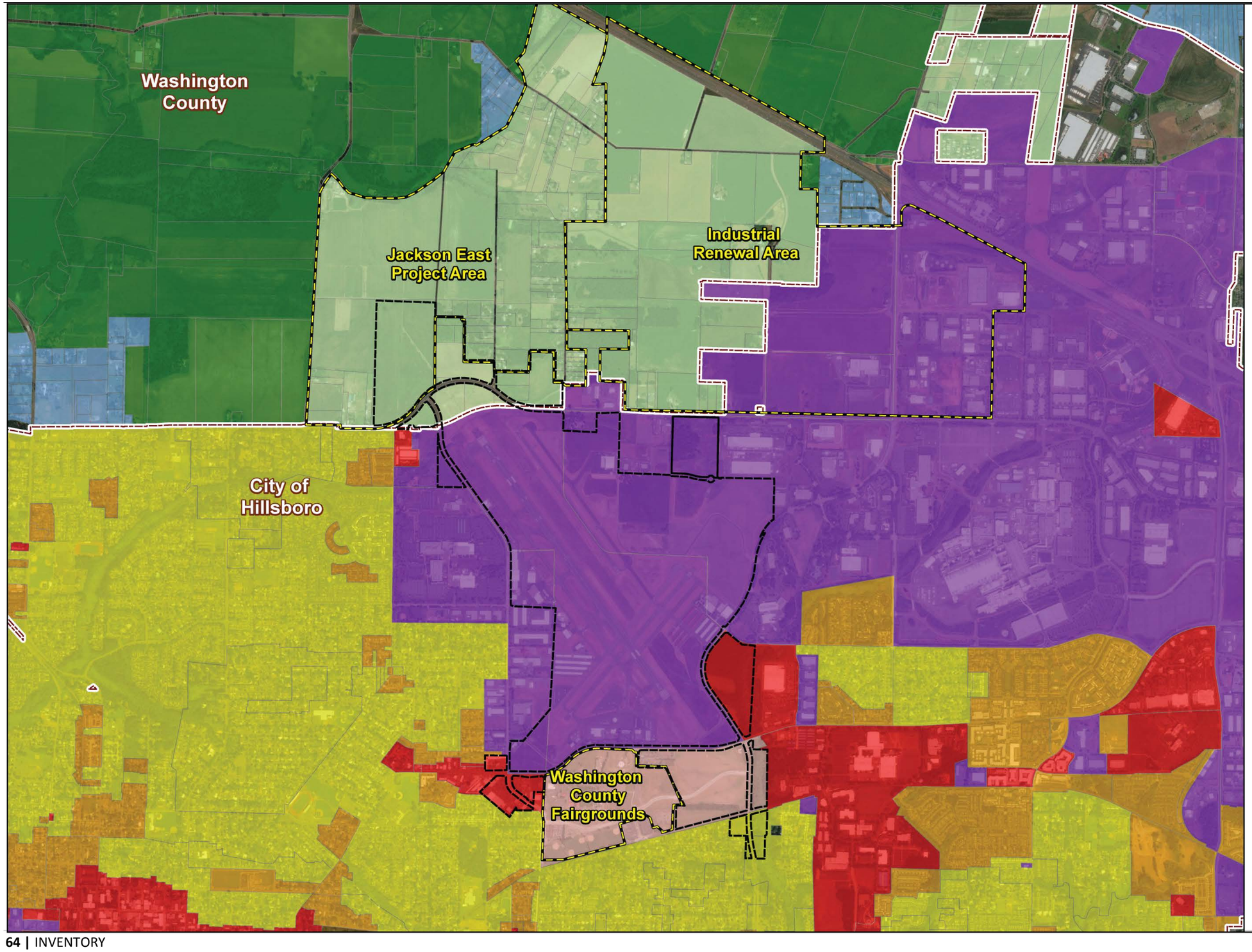


Exhibit 1T
AREA ZONING

While land within the project area was added to the UGB for employment, over three-quarters of project area tax lots are five acres or less. The majority of these tax lots are rural-residential properties clustered north of Waibel Creek and along NE Sewell Avenue. Project planning will involve preparation of a Master Plan to determine the urbanization of these rural-residential lots as residential, industrial/employment, and/or a mix of uses. The City anticipates completion and adoption of the Jackson East Master Plan in 2019.

1.7.3.2 North Hillsboro Industrial District

The North Hillsboro Industrial District is home to many of Oregon's largest and most economically vital companies. Geared toward technology and manufacturing businesses, the District includes well-known names such as Intel, Qorvo, FEI, SolarWorld, Genentech, Oracle, Nike, Beaverton Foods, Reser's Fine Foods, and more. Companies within the North Hillsboro Industrial District employ more than 32,000 people at business parks and individual corporate campuses. Eighty-four percent of Hillsboro's manufacturing jobs are located here, as well as 48 percent of Hillsboro's total jobs, and almost 20 percent of the entire region's manufacturing employment. Development of the District is a key component of Hillsboro's long-term plan to fulfill regional and local goals for managed growth and economic development, including creation and retention of well-paid jobs.

The North Hillsboro Industrial Renewal Area consists of approximately 1,100 acres - most of it undeveloped - on the western end of the North Hillsboro Industrial District. The plan for this area is to invest in public infrastructure - including streets, utilities, and services - to meet the needs of industrial, high tech, and other employment uses. In addition, open space, trails and, other improvements will be created to support and enhance the natural environment.

1.7.3.3 Washington County Fair Complex

Washington County's historic 101-acre fairgrounds is located just south of the Hillsboro Airport along N.E. Cornell Road in Hillsboro. To comply with the County's Fair and Fairgrounds Agreement of 2010, the Washington County Board of County Commissioners created the Fairgrounds Advisory Committee (FAC) to provide counsel to the Board of Commissioners on the Fairgrounds Master Plan, Fairgrounds Capital Projects Plan, and other major site-related initiatives.

1.7.4 HEIGHT AND HAZARD ZONING

Local airport zoning and compatible land use planning is the responsibility of local communities. The FAA provides guidance to airport sponsors through CFR Part 77, *Objects Affecting Navigable Airspace.* A depiction of the Part 77 airport protection surfaces is a required element of an Airport Layout Plan. However, the FAA has no regulatory authority over structures less than 200 feet tall.

In 2005, the City and Port completed the Airport Compatibility Study with recommendations for an Airport Use Zone and Airport Safety and Compatibility Zone. The Hillsboro Airport Issues Roundtable (HAIR)

Land Use Subcommittee was formed to develop recommendations implementing the Compatibility Study and complying with State Law (OAR 660-13). The HAIR Subcommittee worked for 18 months to develop recommendations presented to the City.

The City of Hillsboro drafted Airport Zoning Ordinance # 5935 in January 2010. The zoning ordinance created the Airport Use (AU) zone and the Airport Safety and Compatibility (ASCO) overlay zone. The creation of the zones was appealed to the Oregon Land Use Board of Appeals (LUBA). In June 2010, LUBA sided with the plaintiffs and the Airport Zoning Ordinance never went into effect. LUBA was specific regarding areas the code must address before moving forward with the Airport Use and Airport Safety and Compatibility Overlay zones. The Port recommended that the direction provided by LUBA be considered and addressed as the City moves forward with adoption. Given code and comprehensive plan work undertaken by the City of Hillsboro, further action has been delayed until completion of this Airport Master Plan.

The City of Hillsboro's Community Development Code references the current Part 77 airspace drawing (Hillsboro CDC 12.50.140(D)(3)), which require developers to notify the Port and to file an airspace review (Form 7460) with the FAA. This process protects the Airport from potential airspace obstructions that are potentially hazardous to air navigation in the vicinity of the Airport.

No airport zoning exists in Washington County to protect Hillsboro Airport airspace extending over county lands. The same process for notification and FAA airspace review of development projects applies in Washington County.

1.8 SOCIOECONOMIC CHARACTERISTICS

Airport planning studies collect and examine socioeconomic characteristics to gain understanding of the dynamics of growth within the study area. Socioeconomic information related to the approximate airport service area is an important consideration in the master planning process. Washington, Clackamas, Multnomah, Marion, Yamhill, Clark (WA), and Skamania counties comprise the Portland Metropolitan Statistical Area (MSA). Other nearby counties and communities may influence aviation demand at the Airport, but their impact is less. Socioeconomic data serves as a direct input to the aviation demand forecasting model for the Airport.

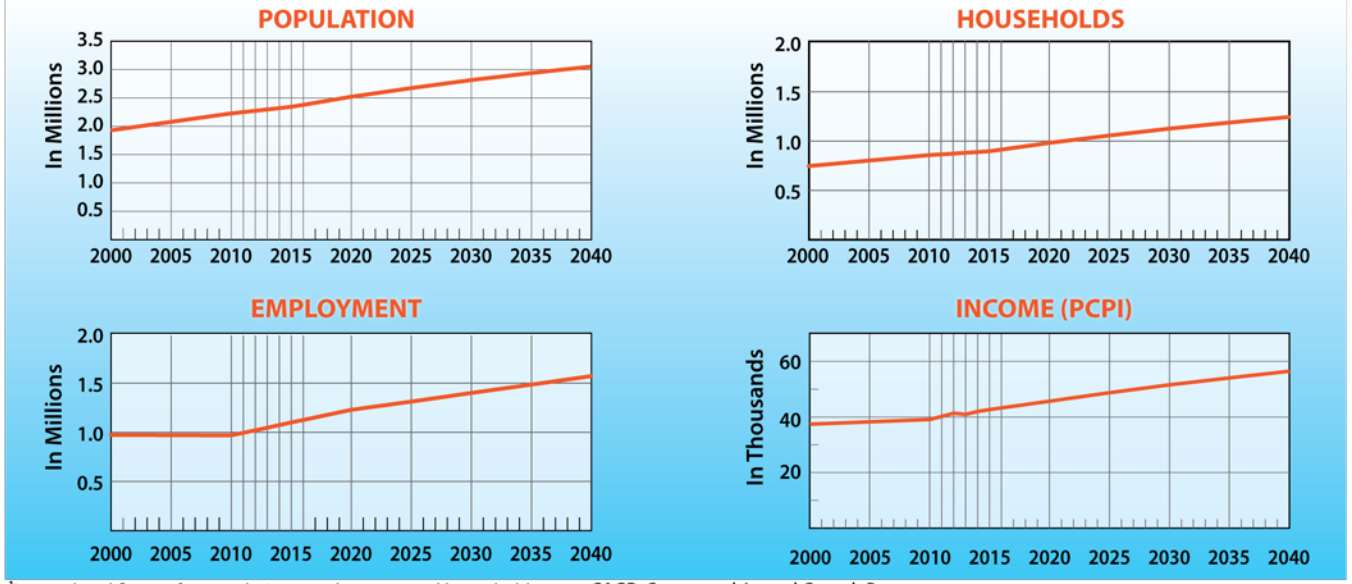
Historic trends in elements, such as population, employment, income, and housing, provides insight into the long-term socioeconomic condition of the region. This information is essential in determining aviation service level requirements, as well as forecasting aviation demand elements. Aviation forecasts are typically tied to the population base, economic strength of the region, and the region's ability to sustain a strong economic base over an extended period of time.

Exhibit 1U presents historical and forecast socioeconomic date related to the Portland MSA. The primary source of the data is Metro, the regional Metropolitan Planning Organization (MPO). The Portland Metro data for population, employment, and households has a base year of 2014. Income information is sourced from Woods & Poole Economics - *Complete Economic and Demographic Data Source*, 2017.

SOCIOECONOMIC DATA

Portland Metropolitan Statistical Area (MSA)

Year	Population[2]	Households[2]	Employment (Non-farm)[2]	Income (PCPI)[3]
2000	1,927,881	746,625	973,230	$37,407
2010	2,226,009	857,379	968,830	$39,087
2011[1]	2,248,834	865,041	993,756	$40,178
2012[1]	2,271,894	872,771	1,019,323	$41,366
2013[1]	2,295,190	880,571	1,045,548	$40,921
2014[1]	2,318,725	888,440	1,072,448	$41,973
2015	2,342,501	896,379	1,100,040	$42,658
2016[1]	2,376,813	912,674	1,124,544	$43,266
CAGR 2000-16	1.32%	1.26%	0.91%	0.91%
HISTORICAL				
FORECASTS				
2020	2,519,163	980,872	1,228,140	$45,679
2025	2,671,777	1,055,978	1,311,570	$48,733
2030	2,814,058	1,125,755	1,399,790	$51,560
2035	2,937,885	1,187,311	1,484,460	$54,046
2040	3,052,078	1,244,034	1,571,290	$56,459
CAGR 2016-40	1.05%	1.30%	1.40%	1.12%



[1]Interpolated figures for population, employment, and households
[2]Metro Research Center (2014 update)
[3]Woods & Poole Economics

CAGR: Compound Annual Growth Rate
PCPI: Per Capita Personal Income
MSA: Washington, Columbia, Clackamas, Multnomah, Yamhill, Clark (WA), Skamania (WA)

1.9 PRIMARY DOCUMENT SOURCES

A variety of sources were used during the inventory process. The following listing reflects a partial compilation of these sources. In addition, considerable information was provided directly to the consultant by Port management.

Airport/Facility Directory Northwest U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office. Effective June 22, 2017.

Seattle Sectional Chart, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office. Effective May 24, 2017.

U.S. Terminal Procedures, North Central U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office. Effective June 24, 2017.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration, 2017-2021.

FAA Aerospace Forecasts – Fiscal Years 2017-2037, Department of Transportation, Federal Aviation Administration, Published March 2017.

Hillsboro Airport Master Plan – Final Report, 2005. Prepared by Coffman Associates, Inc.

A number of internet websites were also used to collect information for the inventory chapter. These include the following:

Hillsboro Airport:
http://www2.portofportland.com/Airports/Hillsboro

Oregon Department of Aviation (ODA):
http://www.oregon.gov/aviation/Pages/index.aspx

Historical FAA Grants:
http://www.faa.gov/airports/aip/grant_histories/

Terminal Area Forecast:
http://aspm.faa.gov/main/taf.asp

Traffic Flow Management System Counts (TFMSC):
https://aspm.faa.gov/tfms/sys/main.asp

FAA 5010 Data:
http://www.airnav.com and http://www.gcr1.com/5010Web

U.S. Census Bureau:
http://www.census.gov

U.S. Bureau of Labor Statistics:
http://www.bls.gov

City of Hillsboro:
https://www.hillsboro-oregon.gov/

Washington County:
http://www.co.washington.or.us/

EPA, Currently Designated Nonattainment Areas for All Criteria Pollutants:
http://www.epa.gov/oar/oaqps/greenbk/ancl3.html

U.S. Fish and Wildlife Service Information, Planning, and Conservation System:
http://ecos.fws.gov/ipac/

FEMA Map Service Center:
https://msc.fema.gov/portal/

EPA MyWaters Mapper:
http://watersgeo.epa.gov/