1. Background and Proposed Action

This chapter describes Hillsboro Airport and the planning background for the proposed project. The Port of Portland (the Port) is the sponsor for the Hillsboro Airport Parallel Runway Project 12L/30R. This chapter also describes the project that the Port is proposing to build to reduce airfield congestion and delay at Hillsboro Airport. This chapter also explains how the project relates to the Airport Layout Plan (ALP) amendment for which the Port will seek Federal Aviation Administration (FAA) approval, and the planned schedule for implementation of the proposed improvements.

1.1 Background

Hillsboro Airport (the Airport, or HIO) is the busiest general aviation (GA) airport in Oregon, and is the state's second-busiest airport. The FAA's National Plan of Integrated Airport Systems (NPIAS) lists HIO as a designated GA reliever airport for Portland International Airport (PDX). The NPIAS[1] describes the role of GA reliever airports in the National Airspace System (NAS) as follows.

> *Due to different operating requirements between small general aviation aircraft and large commercial aircraft, general aviation pilots often find using a congested commercial service airport can be difficult. In recognition of this, FAA has encouraged the development of high capacity general aviation airports in major metropolitan areas. These specialized airports, called relievers, provide pilots with attractive alternatives to using congested hub airports. They also provide general aviation access to the surrounding area.*

The following sections describe the existing facilities at HIO and the Port's planning efforts to ensure that HIO continues to serve as an effective GA reliever airport. As a part of its planning process, the Port conducted a Master Plan to identify future development needs based on forecasts of aviation activity and capacity estimates for the existing airfield at HIO.

1.1.1 Existing Facilities

Exhibit 1-1 shows the existing facilities at HIO. The existing airfield includes the primary Runway 12/30, which is 6,600 feet long and 150 feet wide, and crosswind Runway 2/20, which is 4,049 feet long and 100 feet wide. Three taxiways parallel these runways. Taxiway A runs parallel to the west of Runway 12/30, Taxiway B runs parallel to the south side of Runway 2/20, and Taxiway C runs parallel to the north side of Runway 2/20, west of Taxiway A. These runways and taxiways accommodate fixed-wing aircraft flown by corporate, private, and instructional users. In addition to fixed-wing aircraft, HIO accommodates a large amount of helicopter training activity. Helicopter training flights use three designated training patterns identified as the Alpha, Bravo, and Charlie patterns (see Section 5.1, Noise). These are separate and distinct from the fixed-wing traffic patterns.

[1] National Plan of Integrated Airport Systems 2007-20011, FAA, September 29, 2006, page 8.

LEGEND

Port Property

C - Taxiway Identifier

0 250 500 1,000
Feet

EXHIBIT 1-1
Existing Facilities
Hillsboro Airport Parallel Runway 12L/30R Environmental Assessment

The Alpha pattern landing and take-off site is located at the north end of Taxiway A, the Bravo site is located at the east end of Taxiway B, and the Charlie Helipad, 1,500 feet long and 50 feet wide, is located 700 feet east of Runway 12/30. These traffic patterns enable controllers to segregate fixed-wing and rotary-wing flight operations, thus making more efficient use of the existing runway.

1.1.2 Planning History

During the preparation of the Hillsboro Airport Master Plan (Port of Portland, 2005), the annual service volume (ASV) for the Airport was calculated in accordance with FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*. The ASV represents the capacity of the Airport's current runway system. In 2007, the airfield operated at almost 100 percent of the ASV.[2] In the absence of airfield capacity improvements, the airfield is projected to operate at 146 percent of the ASV by 2025. Current FAA guidance recommends that planning for capacity enhancement begin when airport activity reaches 60 to 75 percent of the ASV to allow sufficient time for airfield improvements to be developed.[3] The Port's planning goal of maintaining aircraft activity levels below 80 percent of capacity is consistent with this guidance.

The Hillsboro Airport Master Plan concluded that current activity levels at HIO exceeded the FAA capacity planning criteria. As activity levels increase, congestion and delay would also increase in the absence of additional airfield capacity. The Master Plan therefore recommended development of a new runway parallel to the main runway in order to segregate small training aircraft operations (primarily piston-powered) to a separate runway away from the larger business aircraft operations (primarily turbine-powered). The parallel runways would accommodate simultaneous operations under visual flight rules (VFR), thus increasing airfield capacity. This new runway would occupy the site of the current Charlie Helipad. As noted above, the Airport accommodates a substantial amount of helicopter training activity. The Master Plan therefore recommended construction of a replacement helipad to maintain the ability to segregate fixed-wing and rotary-wing operations.

1.1.3 Aviation Activity Forecast

The aircraft operational forecast used in this EA was prepared for the Hillsboro Airport Master Plan completed by the Port in 2005. The 2005 Master Plan evaluated several industry standard approaches to aviation forecasts, including a linear trend line based on national general aviation trends; regression analyses based on Portland Metropolitan population, personal income, and employment trends; the constant share of U.S. active aircraft at HIO; the constant share of Washington County registered aircraft; and the FAA Terminal Area Forecast (TAF). Based on these forecast approaches, the Port developed a "Selected Planning Forecast" that was approved by the FAA for use in the Master Plan.

FAA Order 5050.4B (paragraph 504 b) requires that forecasts used in FAA National Environmental Policy Act (NEPA) documents must be "reasonably consistent" with FAA's TAF. FAA's guidance for acceptability of forecasts is a 5-year forecast within 10 percent of

[2] Despite national trends showing decreases in airport operations during 2008, operations at HIO in 2008 increased 9.45 percent over 2007.

[3] National Plan of Integrated Airport Systems 2007-20011, FAA, September 29, 2006, page 14.

the TAF, and a 10-year forecast within 15 percent of the TAF. For this project, 2013 would be the fifth year, and 2018 would be the tenth year. Exhibit 1-2 shows that the Master Plan forecast of aircraft operations falls outside of the FAA's recommended range of variation from the 2007 TAF[4] at the 5-year period (2013), but is within recommended parameters for the 10-year period (2018). As a result of this difference, additional consultation was conducted between the FAA and the Port of Portland. Based on FAA's independent review, the Port's Master Plan forecasts were approved for use in this Environmental Assessment.[5]

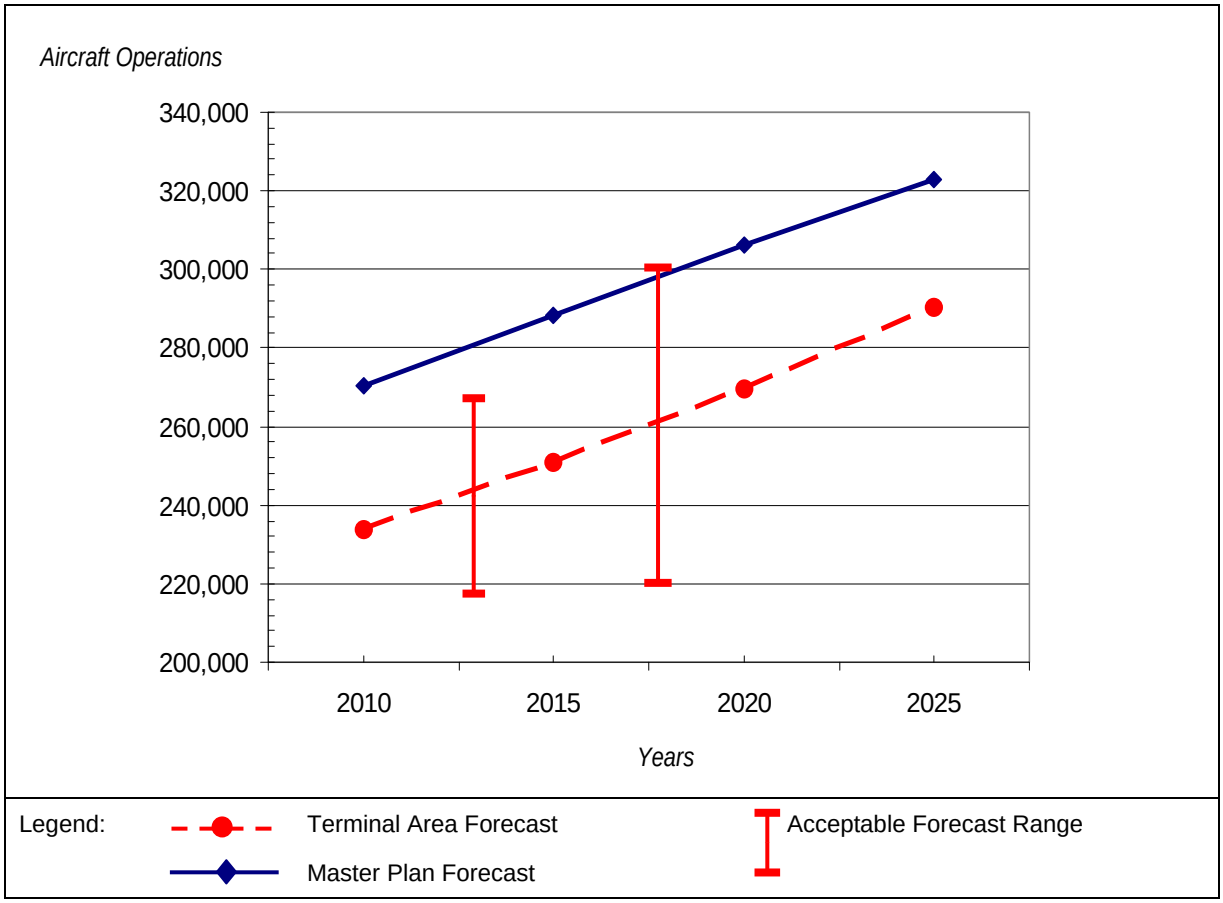


Exhibit 1-2
Comparison of FAA Terminal Area Forecast and Master Plan Forecast

The Master Plan forecast is appropriate to use for the following reasons:

- Existing activity levels at HIO already exceed FAA capacity planning criteria.
- The need for the project is based on existing activity levels, not the forecast activity levels.
- The Master Plan forecast represents a conservative basis for environmental analysis and is consistent with the facility requirements analyses reflected in the Master Plan. For the purposes of this EA, "conservative" means that the expected impacts based

[4] Downloaded from FAA website January 2008
[5] E-mail from Don M. Larson to TJ Stetz, 04/24/2008 02:53 PM (see Appendix A).

on a higher forecast level would tend to be greater than those based on a lower level, and therefore impacts identified would represent the high end of a range of potential impacts.

Alternative forecast scenarios were examined to assess the effects of lower levels of demand on the need for the project. This examination confirmed the continued need for airfield capacity enhancement to maintain acceptable levels of service at HIO. Further information on the development and evaluation of forecasts, their consistency with the FAA TAF, and their effect on the need for the project is provided in Appendix B.1, Hillsboro Airport Forecast Update and Verification.

Although the forecast guidance in FAA Order 5050.4B also applies to the consistency of passenger forecasts with the TAF, passenger activity levels would not affect the need for the proposed improvements, which are solely related to aircraft operations levels. The TAF does not forecast passenger activity at the Airport, nor does the Master Plan address passenger activity. For these reasons, the consideration of forecast consistency with the TAF is limited to the aircraft operations factors discussed above.

1.1.4 Airfield Capacity and Delay

Aircraft operations have an important effect on airfield capacity—not only the total number of annual operations, but also the manner in which they are conducted. The percent of operations occurring during peak periods, the number of touch-and-go operations, and the percent of arrivals during peak periods affect the number of annual operations that can be conducted at an airport over a sustained period. For planning purposes, airfield capacity is often described in terms of the ASV—the number of operations that an airport could accommodate over a year under anticipated conditions and at acceptable levels of service. The ASV calculated for an airport is based on a number of factors, including:

- Airfield characteristics - The layout of the runways and taxiways directly affects an airfield's capacity. This not only includes the location and orientation of the runways, but also the percent of time that a particular runway or combination of runways is in use and the length, width, weight-bearing capacity, and instrument approach capability of each runway.
- Meteorological conditions – Airfield capacity is diminished as weather conditions deteriorate and cloud ceilings and visibility are reduced. As weather conditions deteriorate, the separation of aircraft must increase to provide allowable margins of safety. This increased distance between aircraft has the effect of reducing the total number of aircraft that can operate during any given period. This consequently reduces overall airfield capacity.
- The types or "mix" of aircraft using the airport – Aircraft mix refers to the speed, size, and flight characteristics of aircraft operating at an airport. As the mix of aircraft operating at an airport increases to include larger aircraft, airfield capacity begins to diminish. This is due to larger separation distances that must be maintained between aircraft of different speeds and sizes.
- Demand characteristics - Both the total number of annual operations and the manner in which they are conducted have an important effect on airfield capacity. Peak operational

periods, touch-and-go operations, and the percent of arrivals affect the number of annual operations that can be conducted at an airport.

The ASV for HIO was calculated in the Master Plan in accordance with FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay.* Appendix B2, Hillsboro Airport Airfield Capacity Update and Validation, provides a more detailed explanation of the ASV and the estimated capacity of the airfield. As noted above, this ASV represents the capacity of the Airport's current runway system. A helicopter flight school located at HIO generates a substantial number of helicopter training operations. These operations use existing taxiways and a separate helipad rather than the runway system and do not represent demand for runway capacity.

Delay is the most common descriptor of adverse effects of high annual operations to ASV ratios. As more aircraft attempt to access an airport at the same time, some aircraft operations must be slowed or held in place to allow sufficient time and distance between other aircraft operating in the vicinity of the airport. This need to ensure adequate separation between aircraft causes delay.

Table 1-1 compares the ASV to historic and forecast annual activity levels excluding estimated helicopter training operations. In 2007, the airfield operated at almost 100 percent of the ASV. In the absence of airfield capacity improvements, the airfield is projected to operate at 146 percent of the ASV by 2025. As the number of operations approaches the airfield's capacity, aircraft delay increases. Delays result in longer hold times for aircraft prior to landing or departure.

Exhibit 1-3 shows that current Airport activity levels exceed FAA capacity planning criteria. Forecast activity levels will substantially exceed the ASV of the current airfield in the future. As demand reaches capacity, delays increase exponentially. As noted above, the ratio of demand to ASV would reach 1.46 by the end of the forecast period without airfield capacity improvement. Average delays per operation at HIO would increase from 1.2 minutes in 2007 to 6 minutes by 2025 (see Appendix B). Increased delay would in turn increase aircraft operation time and operating costs due to increased fuel consumption, and would increase air emissions. (See Section 2.1.2. For example, operation of the new runway would reduce carbon monoxide (CO) emissions by 19 tons per year in 2012 compared to the No Action Alternative.)

1.2 Proposed Project

The proposed project includes three components: construction of Runway 12L/30R and associated taxiways, the relocation of the existing Charlie Helicopter Landing and Take-Off Pad (commonly known as the Charlie Helipad), and associated infrastructure improvements as shown in Exhibit 1-4. Section 3.2 describes the operational characteristics of the Port's proposed project.

TABLE 1-1
HIO Current Airfield Capacity Summary

Year	ASV[a]	Annual Runway Operations[b]	Total Forecast Operations	Percent Capacity	Average Delay (minutes)	Total Aircraft Delay (hours/year)
2007[c]	169,000	166,033	240,735	98	1.2	3,321
2010[d]	176,000	196,600	270,300	112	1.9	6,200
2012[e]	174,000	203,594	277,294	117	2.3	7,804
2015[d]	174,000	214,600	288,300	123	3.6	12,900
2025[d]	171,000	249,300	323,000	146	6.0	24,900

[a] ASV varies with changes in fleet mix over the forecast period.
[b] Runway operations = total operations less estimated helicopter training operations.
[c] 2007 = historical operations.
[d] 2010, 2015, and 2025 = Hillsboro Airport Master Plan Forecast.
[e] 2012 = CH2M HILL analysis.
Source: Hillsboro Airport Master Plan, Final Technical Report Tables 3AA, 4G, and 4H; and CH2M HILL analysis.

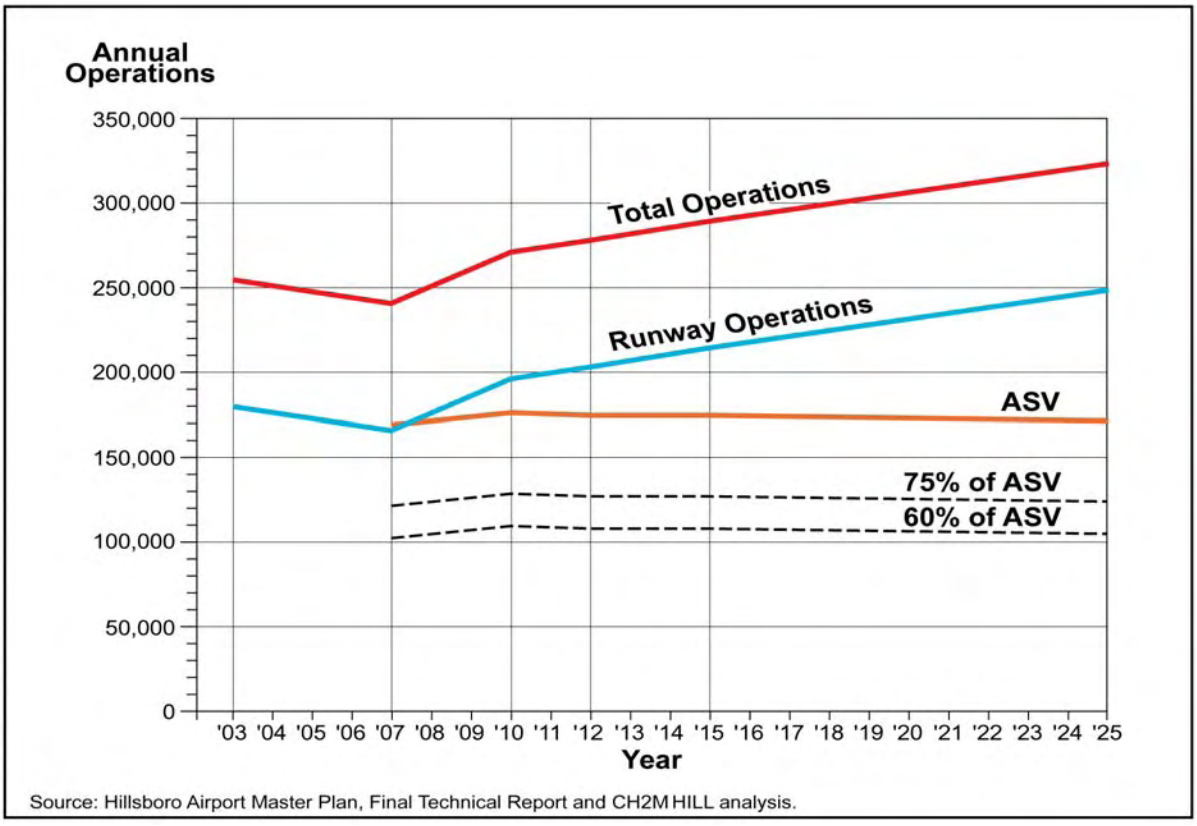
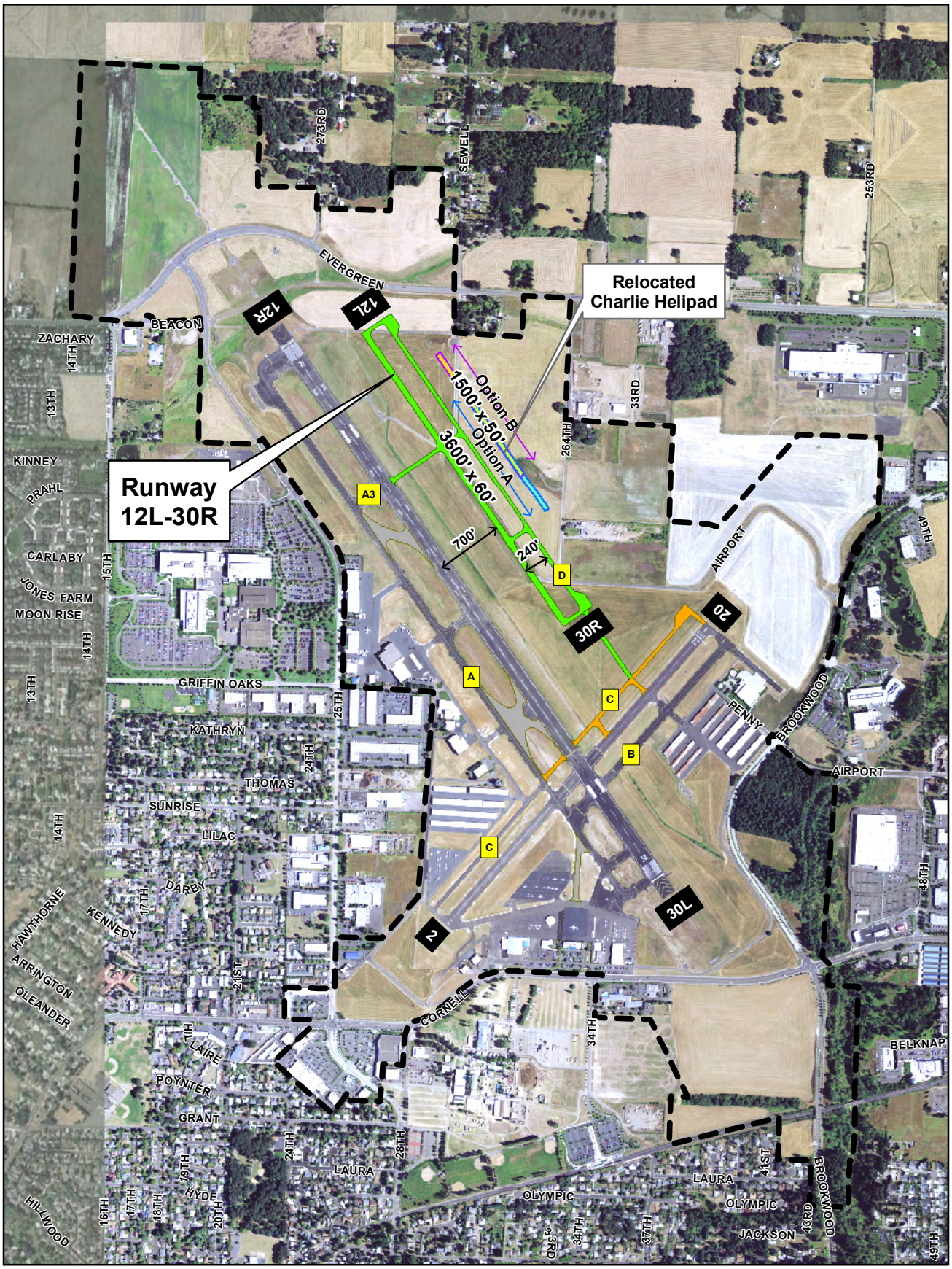


Exhibit 1-3
Annual Operations and Annual Service Volume (ASV)



LEGEND

- Port Property
- Proposed Parallel Runway and Associated Taxiways
- Previously Approved Development
- Charlie Helipad Option A
- Charlie Helipad Option B
- C - Taxiway Identifier

0 250 500 1,000 Feet

N

EXHIBIT 1-4
Proposed Project
Hillsboro Airport Parallel Runway 12L/30R Environmental Assessment

The proposed Runway 12L/30R would be parallel to and 700 feet east of Runway 12/30 (to be re-designated Runway 12R/30L), the Airport's main runway. This new shorter runway would occupy the location of the existing Charlie Helicopter Landing and Take-Off Pad, commonly known as the Charlie Helipad, which is currently used for helicopter training operations. This runway would be 3,600 feet long and 60 feet wide. These dimensions are consistent with the runway's intended use by fixed-wing, piston-engine, propeller-driven airplanes.

The project would include construction of the following taxiways:

- Taxiway D, parallel to and 240 feet east of the new Runway 12L/30R and connecting to the Taxiway C. Taxiway D would provide access to aircraft landing and taking off from the new Runway 12L/30R. Taxiway D would also be used as an interim replacement for the existing Charlie Helipad (see operations discussion below).
- Four runway exit taxiways to new Taxiway D.
- One connector taxiway crossing Runway 12R/30L and providing access to the ramp area via Taxiway A3.[6]

The proposed configuration would be subject to FAA airspace review. Construction of the proposed Runway 12L/30R and associated taxiways would begin in 2010 and they would be in operation by the end of 2011. Helicopter training flights would initially use the new Taxiway D as an interim replacement for the Charlie Helipad. A replacement Charlie Helipad would be constructed as fixed-wing aircraft traffic levels increase to the level where continued use of Taxiway D for helicopter training activity would no longer be practicable. In order to avoid these conflicts, it is assumed that the relocated helipad would need to be operational by 2015.

Additional infrastructure, including electrical infrastructure for lighting and signage, an access roadway, and drainage facilities for new impervious surfaces, would be developed as part of the airfield improvements described above. The proposed new runway would be a visual runway only and would not require any navigational aids as a part of this action. Infrastructure improvements would be constructed concurrently with the initial components starting in 2010, although they would be designed to accommodate the entire project described above. In addition, these infrastructure elements would be designed to accommodate future hangar development planned for the northeast quadrant of HIO. While the hangar development would be privately funded and is not part of the proposed development, it would be prudent to design and build infrastructure to accommodate future needs.

[6] This taxiway connector is currently not on the FAA AIP funding list.